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*Case 9816*

November 1, 1989

HAND-DELIVERED

William J. LeMay, Director  
State of New Mexico  
Energy and Minerals Department  
Oil Conservation Division  
Post Office Box 2088  
Santa Fe, New Mexico 87501

RECEIVED  
NOV - 1 1989  
OIL CONSERVATION DIVISION

Re: Application of Yates Drilling Company for a Waterflood Project, Proposed  
Cactus Queen Unit, Chaves County, New Mexico

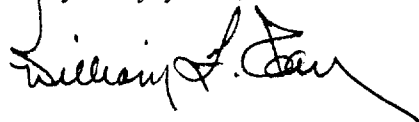
Dear Mr. LeMay:

Enclosed for filing in the above-referenced case is the original and copy of OCD Form C-108. On this date we have also mailed to the Oil Conservation Division district office in Artesia a copy of this completed form.

This matter has been set for hearing before a Division Examiner on November 15, 1989.

Your attention to this matter is appreciated.

Very truly yours,



WILLIAM F. CARR  
WFC:mlh  
ATTORNEY FOR YATES DRILLING COMPANY  
Enclosure  
cc w/o enc.: Toby Rhodes

9809 &  
Case 9810

RECEIVED

NOV 1 1989

WILDLIFE CONSERVATION DIVISION

**YATES DRILLING COMPANY  
PROPOSED CACTUS QUEEN UNIT  
CHAVES COUNTY, NEW MEXICO**

**NMOCD FORM C-108**

APPLICATION FOR AUTHORIZATION TO INJECT

- I. Purpose: ☒ Secondary Recovery ☐ Pressure Maintenance ☐ Disposal ☐ Storage  
Application qualifies for administrative approval? ☐ yes ☒ no
- II. Operator: Yates Drilling Company  
Address: 105 South 4th Street, Artesia, New Mexico 88210  
Contact party: Tobin L. Rhodes Phone: (505) 748-1471
- 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: Tobin L. Rhodes Title Petroleum Engineer

Signature: *Tobin L. Rhodes* Date: 10-13-89

\* 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.

## 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.

## II. WELL DATA

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.

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.

## IV. 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.

---

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.

OIL CONSERVATION DIVISION  
FORM C-108 (Supplement)

Application of Yates Drilling Company  
For a Secondary Recovery Project  
(Proposed Cactus Queen Unit)  
Chaves County, New Mexico

I. Purpose:

Application is made for authorization to inject water into the Queen formation underlying the boundaries of the proposed Cactus Queen Unit. The proposed unit consists of 560 acres, more or less, of Federal, State, and Fee lands in Unit M (SW/4 SW/4) of Section 26, Units I, J, K, M, N, O, P, (SE/4, E/2 SW/4) of Section 27, Units A, B, C, D, H, (N/2 NE/4, NE/4 NW/4) of Section 34 and Unit D (NW/4 NW/4) of Section 35, Township 12 South, Range 31 East, Chaves County New Mexico. This project would be classified as a secondary recovery project with the objective of recovering hydrocarbons that will not and can not be recovered by primary means.

Many wells in the proposed unit area are primary depleted or are very near primary depletion. Our studies show that the injection of water into selected wells will result in the recovery of oil in economic quantities not otherwise recoverable. This project should provide economic benefits to all parties holding any type of interest in the unit acreage.

II. Operator:

Yates Drilling Company  
105 South Fourth Street  
Artesia, New Mexico 88210

Phone Number: (505) 748-1471

III. Injection Well Data:

A well data sheet is attached for each of the six wells proposed for water injection. Each injection well data sheet includes a downhole schematic of how each individual well will be configured if this application is approved.

IV. Existing Project:

The proposed project is not an expansion of an existing project and will be a totally new project.

V. Ownership:

A lease ownership map is attached which identifies all wells and lease ownership within two miles of any of the six proposed injection wells. A map is also attached on which the area of review has been identified by drawing a one-half mile circle around each injection well.

VI. Well Data:

There are presently seventeen wells including proposed injection wells that fall within the boundaries of the proposed unit or within the area of review. Two of these wells have been plugged and abandoned, one well is temporarily abandoned, and the remaining fourteen wells are active pumping oil wells producing from the Queen formation. Available data for each of the wells is included in the attached well data sheets. Additionally a downhole schematic has been drawn depicting each of the two plugged and abandoned wells.

Production figures and decline curves are attached for each well within the proposed unit that has produced from the Queen formation.

VII. Project Data:

1. The proposed daily average water injection rate is approximately 200 barrels per day for each of the six proposed water injection wells. Total water injection for the unit would be 1200 barrels per day. The maximum injection rate for any individual well will be based on fracture pressure as determined by step-rate pressure tests to be conducted on each injection well.

2. Produced water will be stored in covered steel storage tank(s) and in open top fiberglass tanks making the produced water system an open system. Any fresh water will be stored in a covered steel tank. Produced oil will immediately be separated from produced water.

The oil will be stored in a steel covered production tank until sold.

3. Initially the injection wells may take water on a vacuum, but as the reservoir fills a positive surface injection pressure will be required to inject water. The maximum injection pressure will also be determined by proposed step-rate pressure tests. At no time prior to the step-rate tests will the injection pressure exceed a pressure limitation of 0.2 PSIG per foot of depth to the top of the injection interval.

4. The source of injection fluid will be produced water from the producing wells within the unit and fresh water from the Ogollala aquifer in the area. No commitment has been made but commercial sources of fresh water are available in the area.

5. No water compatibility problems are expected as Ogollala water has been successfully injected into the Queen formation, throughout the Caprock Queen Field, without excessive problems. Compatibility tests have been run commingling the produced water and fresh water and no adverse problems were observed.

#### VIII. Geologic Data:

The Proposed Cactus Queen Unit produces from the upper sandstone member of the Queen formation, upper Guadalupian series, Permian system. The average producing depth in the field is approximately 2989 feet. The existing producing formation will be the interval into which water will be injected.

The productive/injection interval, as indicated from a whole core analysis on the DeLuna Federal #3 (330' FNL & 1980' FEL, 34-12s-31e) and sidewall core data from numerous wells, is fine grained, friable, gray, quartz sandstone. The grains are sub-angular to sub-rounded and well sorted. The cementing material is variously from anhydrite and dolomite. The exact depositional environment is unknown. Porosity and permeability are intergranular in nature. The sandstone is not naturally fractured.

The Cactus Queen Field is a stratigraphic trap. Cementation of the sandstone results in the loss of porosity and permeability, creating a barrier on all sides with the exception of the east. A tilted oil-water contact limits the production in that direction. The oil/water contact has been established at (+1440)

in the southeast end of the field and (+1445) at the northeast edge.

The primary underground source of fresh water in this area is the Ogollala formation of Tertiary age, the base of which is estimated to be 300 feet below the surface. This aquifer is protected behind the surface pipe and cement of all existing wells in the unit area. The Chinlee formation is also a fresh water aquifer which immediately underlies the Ogollala formation. The base of the Chinlee is estimated to be approximately 500 feet below the surface in the unit area. The Chinlee is behind the production casing in all existing wells in the unit area.

#### IX. Stimulation Program:

Each of the currently producing wells has previously received a fracture treatment. The details of these treatments are outlined in the data sheet for each individual well. There are no plans to stimulate any of the existing wells which will be producing wells in this project.

The wells which will be injection wells may require a small clean-up acid treatment prior to injection. We plan to treat each of the proposed injection wells with 1000 to 2000 gallons of 15% hydrochloric acid. This treatment should insure that existing perforations are open and that each well will accept water or gas at the lowest possible pressure.

#### X. Well Logs:

Well logs for each of the existing wells in the proposed unit have previously been submitted to the Hobbs office of the NMOCB. Attached for zone identification purposes is a cross section containing portions of the logs from wells in the reservoir.

#### XI. Fresh Water:

The Office of the State Engineer in Roswell has a record of six wells within one mile of the proposed unit. The total depths of two of the wells are unknown, however all six wells are assumed to be producing from the Ogollala formation. Analysis

reports for water taken from three of the wells are attached.

XII. Injection Zone Isolation:

Available engineering and geologic data has been examined and no evidence of open faulting or any other hydrologic connection between the injection zone and any underground source of drinking water has been found.

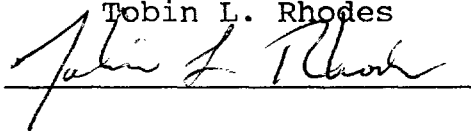
XIII. Proof of Notice:

A listing of off-set leasehold operators, surface owners, royalty owners and working interest owners that have received a copy of this application by certified mail is attached.

XIV. Certification:

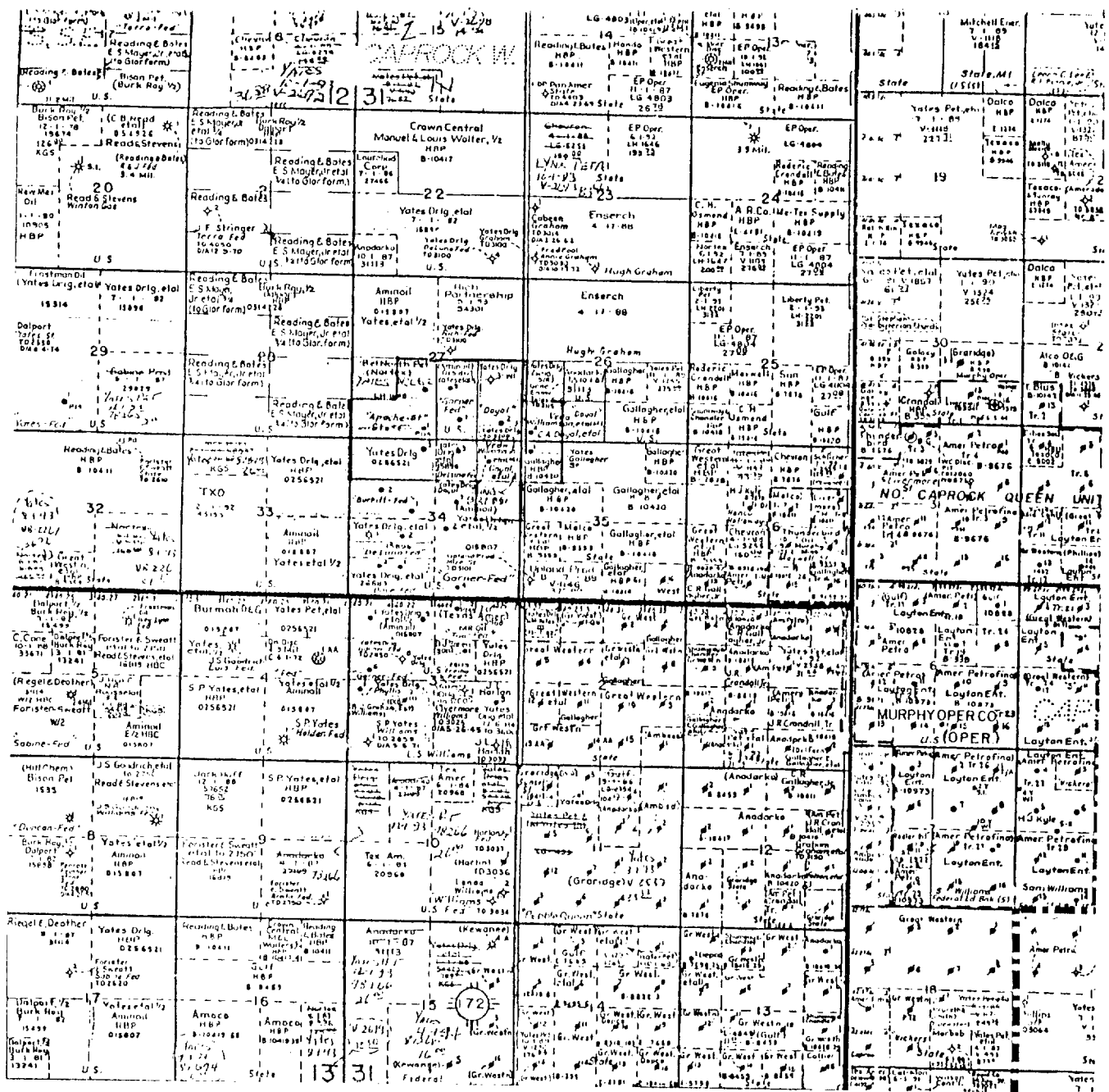
I hereby certify that the information submitted with this application is true and correct to best of my knowledge and belief.

Tobin L. Rhodes

A handwritten signature in dark ink, appearing to read 'Tobin L. Rhodes', is written over a horizontal line.

Petroleum Engineer

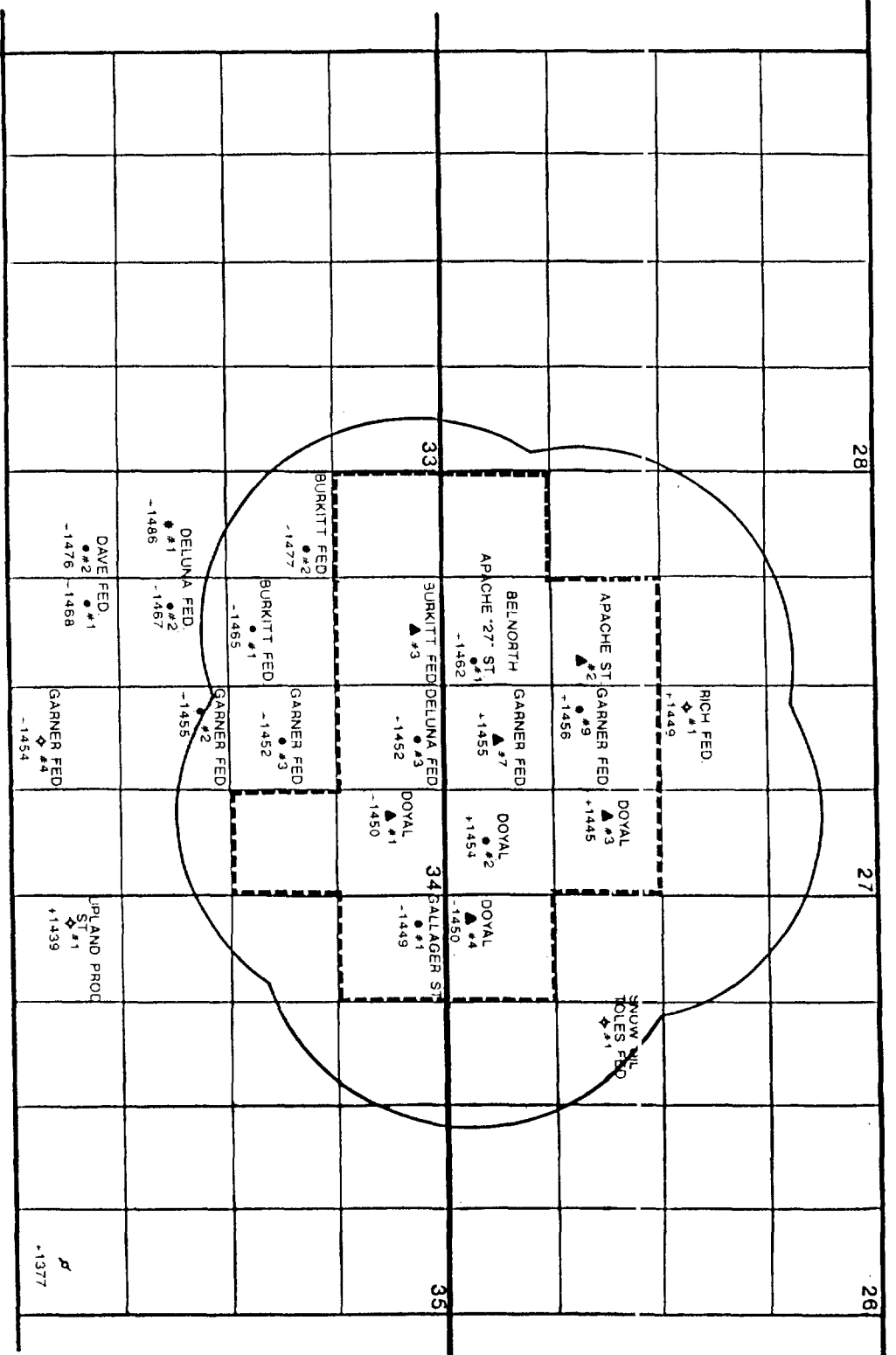
October 13, 1989



TOWNSHIP 12 S  
TOWNSHIP 13 S

YATES DRILLING COMPANY  
PROPOSED CACTUS QUEEN UNIT  
CHAVES CO., NEW MEXICO  
LEASE OWNERSHIP MAP

R31E



AREA OF REVIEW  
 PROPOSED INJECTION WELL  
 UNIT OUTLINE

YATES DRILLING  
 PROPOSED CACTUS QUEEN UNIT  
 CHAVES CO., NM.

T 12 S

WELL DATA SHEET

OPERATOR: Yates Drilling Company LEASE: Apache "27" State

WELL NO.: 1 FOOTAGE: 330' FSL-2310' FWL SEC: 27-T12s-R31e

TUBULAR DATA

SURFACE CASING

SIZE: 8-5/8" CEMENTED WITH: SX.  
TOC: Surface FEET DETERMINED BY: Circulation  
HOLE SIZE: 12-1/4" SETTING DEPTH: 422'

INTERMEDIATE CASING

SIZE: None CEMENTED WITH: SX.  
TOC:  FEET DETERMINED BY:   
HOLE SIZE:  SETTING DEPTH:

LONG STRING

SIZE: 4-1/2" CEMENTED WITH: SX.  
TOC: 210' FEET DETERMINED BY:   
HOLE SIZE: 7-7/8" SETTING DEPTH: 3150'  
TOTAL DEPTH: 3150'

PRODUCING INTERVAL

FORMATION: Queen POOL OR FIELD: SE Chaves Queen  
SPUD DATE: 5-9-85 COMPLETION DATE: 6-27-85  
PERFORATED: 2984 FEET TO 2991 FEET

STIMULATION: 100 gals. 15% HCl acid, 12000 gals. gel water  
4000 gals. CO2, 10500# 20/40 sand, 10000# 12/20 sand

OTHER PERFORATED ZONES: None

CURRENT STATUS

WHAT IS CURRENT STATUS OF WELL? Pumping oil well

IF P&A, LIST PLUGGING DETAILS:

# WELL DATA SHEET

OPERATOR: Yates Drilling Company LEASE: Apache "27" State

WELL NO.: 2 FOOTAGE: 1650' FSL-2310' FEL SEC: 27-T12s-R31e

## TUBULAR DATA

### SURFACE CASING

SIZE: 8-5/8" CEMENTED WITH: SX.  
TOC: Surface FEET DETERMINED BY: Circulation  
HOLE SIZE: 12-1/4" SETTING DEPTH: 454'

### INTERMEDIATE CASING

SIZE: None CEMENTED WITH: SX.  
TOC:  FEET DETERMINED BY:   
HOLE SIZE:  SETTING DEPTH:

### LONG STRING

SIZE: 4-1/2" CEMENTED WITH: SX.  
TOC: Surface FEET DETERMINED BY: Circulation  
HOLE SIZE: 7-7/8" SETTING DEPTH: 3150'  
TOTAL DEPTH: 3150'

## PRODUCING INTERVAL

FORMATION: Queen POOL OR FIELD: SE Chaves Queen  
SPUD DATE: 7-29-85 COMPLETION DATE: 8-23-85  
PERFORATED: 2996 FEET TO 3000 FEET

STIMULATION: 850 gals. 15% HCl acid, 16000 gals. gel water  
25% CO2, 10500# 20/40 sand, 10000# 12/20 sand

OTHER PERFORATED ZONES: None

## CURRENT STATUS

WHAT IS CURRENT STATUS OF WELL? Pumping oil well

IF P&A, LIST PLUGGING DETAILS:

# INJECTION WELL DATA SHEET

OPERATOR: Yates Drilling Company LEASE: Apache "27" State

WELL NO.: 2 FOOTAGE: 1650' FSL-2310' FEL SEC: 27-T12s-R31e

## TUBULAR DATA

### SURFACE CASING

SIZE: 8-5/8" 24# CEMENTED WITH:                      SX.  
TOC: Surface FEET DETERMINED BY: Circulation  
HOLE SIZE: 12-1/4" SETTING DEPTH: 454

### INTERMEDIATE CASING

SIZE: None CEMENTED WITH:                      SX.  
TOC:                      FEET DETERMINED BY:                       
HOLE SIZE:                      SETTING DEPTH:                     

### LONG STRING

SIZE: 4-1/2" CEMENTED WITH:                      SX.  
TOC: Surface FEET DETERMINED BY: Circulation  
HOLE SIZE: 7-7/8" SETTING DEPTH: 3150'  
TOTAL DEPTH: 3150'

### INJECTION INTERVAL

2996' FEET TO 3000' FEET - PERFORATED

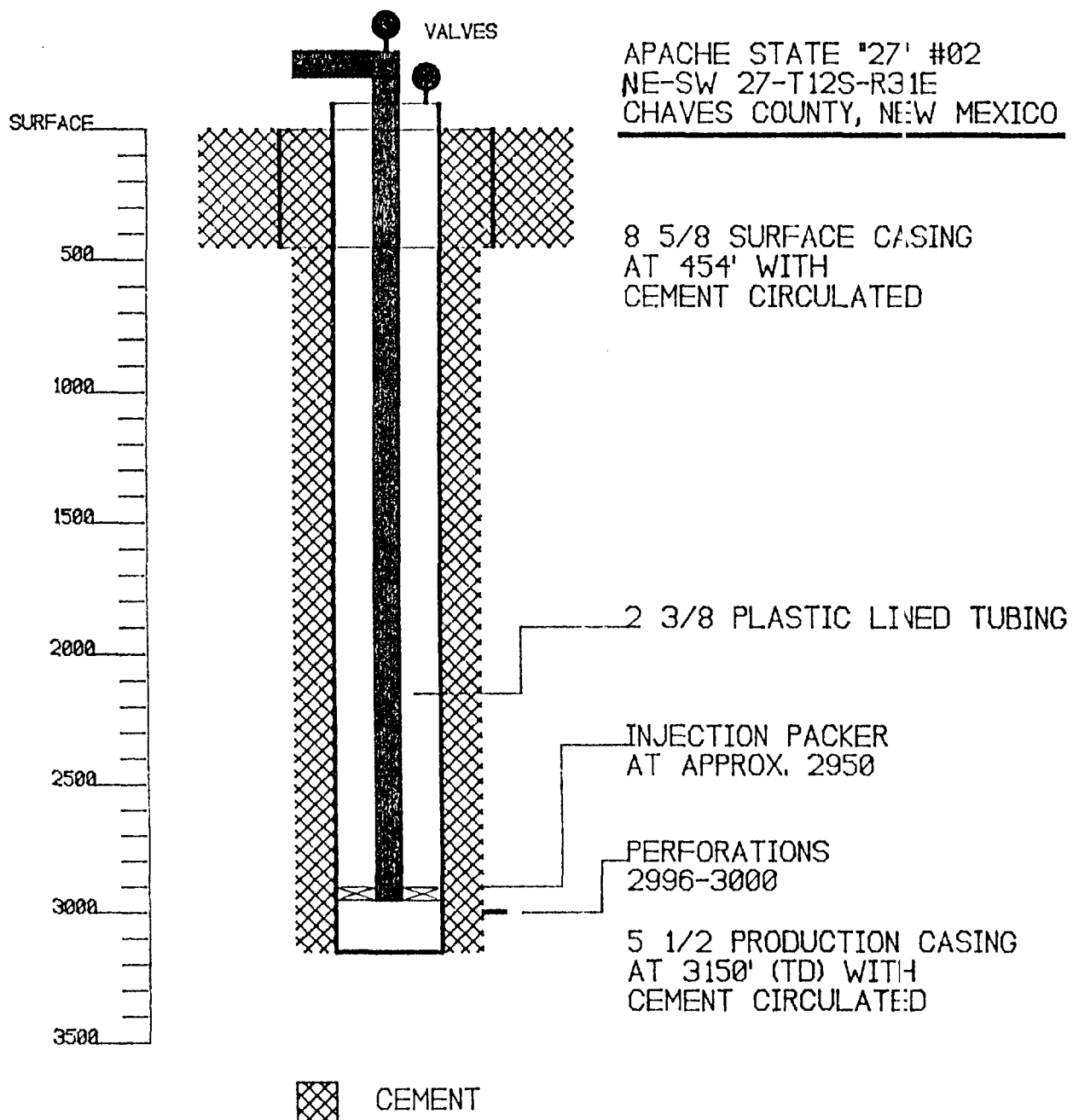
### TUBING

TUBING SIZE: 2-3/8" LINED WITH: Plastic SET IN A  
Baker AD-1 PACKER AT: 2946' FEET

## OTHER DATA

1. NAME OF INJECTION FORMATION: Queen
2. NAME OF FIELD OR POOL (IF APPLICABLE): SE Chaves Queen
3. IS THIS A NEW WELL DRILLED FOR INJECTION? No  
IF NO, FOR WHAT PURPOSE WAS THE WELL ORIGINALLY DRILLED?  
This well was drilled as a Queen producing well.
4. HAS WELL EVER BEEN PERFORATED IN ANY OTHER ZONE(S)? No  
LIST ALL SUCH PERFORATED INTERVALS AND GIVE PLUGGING  
DETAILS (SACKS OF CEMENT OR BRIDGE PLUG(S) USED):
5. GIVE DEPTH TO AND NAME OF ANY OVERLYING AND/OR  
UNDERLYING OIL OR GAS ZONES (POOLS) IN THIS AREA:                       
None known.

WELL SCHEMATIC ATTACHED



WELL DATA SHEET

OPERATOR: Yates Drilling Co. LEASE: Burkitt Federal

WELL NO.: 1 FOOTAGE: 2310' FNL-1980' FEL SEC: 34-T12s-R31e

TUBULAR DATA

SURFACE CASING

SIZE: 8-5/8" 24# CEMENTED WITH: 300 SX.  
TOC: Surface FEET DETERMINED BY: Circulation  
HOLE SIZE: 12-1/4" SETTING DEPTH: 450

INTERMEDIATE CASING

SIZE: None CEMENTED WITH:  SX.  
TOC:  FEET DETERMINED BY:   
HOLE SIZE:  SETTING DEPTH:

LONG STRING

SIZE: 5-1/2" 14# CEMENTED WITH: 360 SX.  
TOC: 1650' FEET DETERMINED BY: Temp. Survey  
HOLE SIZE: 7-7/8" SETTING DEPTH: 3080'  
TOTAL DEPTH: 3100'

PRODUCING INTERVAL

FORMATION: Queen POOL OR FIELD: SE Chaves Queen  
SPUD DATE: 3-23-84 COMPLETION DATE: 4-7-84  
PERFORATED: 2874 FEET TO 2882 FEET

STIMULATION: 750 gals. 15% HCl acid, 20000 gals. 30# gel,  
25% CO2, 16500# 20/40 sand, 6000# 12/20 sand

OTHER PERFORATED ZONES: None

CURRENT STATUS

WHAT IS CURRENT STATUS OF WELL? Pumping oil well

IF P&A, LIST PLUGGING DETAILS:

WELL DATA SHEET

OPERATOR: Yates Drilling Co. LEASE: Burkitt Federal

WELL NO.: 2 FOOTAGE: 1650' FNL - 990' FNL SEC: 34-T12s-R31e

TUBULAR DATA

SURFACE CASING

SIZE: 8-5/8" 24# CEMENTED WITH: 375 SX.  
TOC: Surface FEET DETERMINED BY: Circulation  
HOLE SIZE: 12-1/4" SETTING DEPTH: 370'

INTERMEDIATE CASING

SIZE: None CEMENTED WITH:  SX.  
TOC:  FEET DETERMINED BY:   
HOLE SIZE:  SETTING DEPTH:

LONG STRING

SIZE: 5-1/2" 14# CEMENTED WITH: 250 SX.  
TOC: 1678' FEET DETERMINED BY: Cement Bond Log  
HOLE SIZE: 7-7/8" SETTING DEPTH: 2845'  
TOTAL DEPTH: 2850'

PRODUCING INTERVAL

FORMATION: Queen POOL OR FIELD: SE Chaves Queen  
SPUD DATE: 5-5-84 COMPLETION DATE: 7-10-84  
PERFORATED: 2754 FEET TO 2760 FEET

STIMULATION: 750 gals. 15% HCl acid, 15000 gals. 30# gel,  
5000 gals CO2, 14500# 20/40 sand, 2500# 12/20 sand

OTHER PERFORATED ZONES: None

CURRENT STATUS

WHAT IS CURRENT STATUS OF WELL? Pumping oil well

IF P&A, LIST PLUGGING DETAILS:

# WELL DATA SHEET

OPERATOR: Yates Drilling Co. LEASE: Burkitt Federal

WELL NO.: 3 FOOTAGE: 330' FNL-2310' FWL SEC: 34-T12s-R31e

## TUBULAR DATA

### SURFACE CASING

SIZE: 8-5/8" 24# CEMENTED WITH: 270 SX.  
TOC: Surface FEET DETERMINED BY: Circulation  
HOLE SIZE: 12-1/4" SETTING DEPTH: 424'

### INTERMEDIATE CASING

SIZE: None CEMENTED WITH: \_\_\_\_\_ SX.  
TOC: \_\_\_\_\_ FEET DETERMINED BY: \_\_\_\_\_  
HOLE SIZE: \_\_\_\_\_ SETTING DEPTH: \_\_\_\_\_

### LONG STRING

SIZE: 5-1/2" 14# CEMENTED WITH: 260 SX.  
TOC: 1640' FEET DETERMINED BY: Temp. Survey  
HOLE SIZE: 7-7/8" SETTING DEPTH: 3083'  
TOTAL DEPTH: 3100'

## PRODUCING INTERVAL

FORMATION: Queen POOL OR FIELD: SE Chaves Queen  
SPUD DATE: 8-9-85 COMPLETION DATE: 10-1-85  
PERFORATED: 2988 FEET TO 2992 FEET

STIMULATION: 750 gals. 15% HCl acid, 15000 gals. gel water  
24 tons CO2, 12000# 20/40 sand, 7000# 12/20 sand

OTHER PERFORATED ZONES: None

## CURRENT STATUS

WHAT IS CURRENT STATUS OF WELL? Pumping oil well

IF P&A, LIST PLUGGING DETAILS: \_\_\_\_\_

# INJECTION WELL DATA SHEET

OPERATOR: Yates Drilling Co. LEASE: Burkitt Federal

WELL NO.: 3 FOOTAGE: 330' FNL-2310' FWL SEC: 34-T12s-R31e

## TUBULAR DATA

### SURFACE CASING

SIZE: 8-5/8" 24# CEMENTED WITH: 270 SX.  
TOC: Surface FEET DETERMINED BY: Circulation  
HOLE SIZE: 12-1/4" SETTING DEPTH: 424

### INTERMEDIATE CASING

SIZE: None CEMENTED WITH:  SX.  
TOC:  FEET DETERMINED BY:   
HOLE SIZE:  SETTING DEPTH:

### LONG STRING

SIZE: 5-1/2" 14# CEMENTED WITH: 260 SX.  
TOC: 1640' FEET DETERMINED BY: Temp. Survey  
HOLE SIZE: 7-7/8" SETTING DEPTH: 3083'  
TOTAL DEPTH: 3100'

### INJECTION INTERVAL

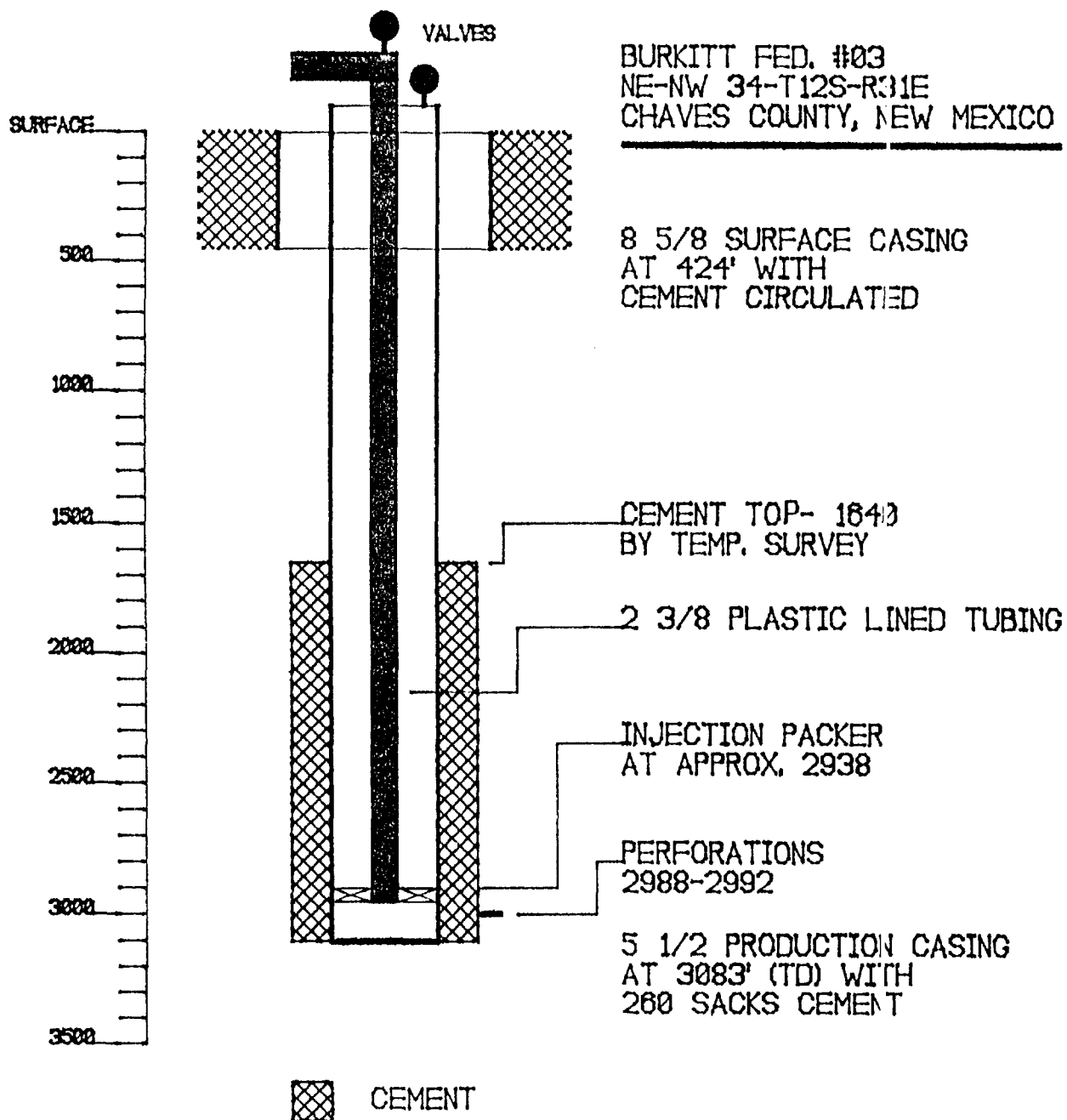
2988' FEET TO 2992' FEET -- PERFORATED

### TUBING

TUBING SIZE: 2-3/8" LINED WITH: Plastic SET IN A  
Baker AD-1 PACKER AT: 2938' FEET

## OTHER DATA

1. NAME OF INJECTION FORMATION: Queen
2. NAME OF FIELD OR POOL (IF APPLICABLE): SE Chaves Queen
3. IS THIS A NEW WELL DRILLED FOR INJECTION? No  
IF NO, FOR WHAT PURPOSE WAS THE WELL ORIGINALLY DRILLED?  
This well was drilled as a Queen producing well.
4. HAS WELL EVER BEEN PERFORATED IN ANY OTHER ZONE(S)? No  
LIST ALL SUCH PERFORATED INTERVALS AND GIVE PLUGGING  
DETAILS (SACKS OF CEMENT OR BRIDGE PLUG(S) USED):
5. GIVE DEPTH TO AND NAME OF ANY OVERLYING AND/OR  
UNDERLYING OIL OR GAS ZONES (POOLS) IN THIS AREA:  
None known.



# WELL DATA SHEET

OPERATOR: Yates Drilling Co. LEASE: DeLuna Federal

WELL NO.: 3 FOOTAGE: 330' FNL-1980' FEL SEC: 34-T12s-R31e

## TUBULAR DATA

### SURFACE CASING

SIZE: 8-5/8" 24# CEMENTED WITH: 300 SX.  
TOC: Surface FEET DETERMINED BY: Circulation  
HOLE SIZE: 12-1/4" SETTING DEPTH: 433

### INTERMEDIATE CASING

SIZE: None CEMENTED WITH:  SX.  
TOC:  FEET DETERMINED BY:   
HOLE SIZE:  SETTING DEPTH:

### LONG STRING

SIZE: 5-1/2" 14# CEMENTED WITH: 410 SX.  
TOC: 1900' FEET DETERMINED BY: Cement Bond Log  
HOLE SIZE: 7-7/8" SETTING DEPTH: 3094'  
TOTAL DEPTH: 3100'

## PRODUCING INTERVAL

FORMATION: Queen POOL OR FIELD: SE Chaves Queen  
SPUD DATE: 2-11-85 COMPLETION DATE: 3-20-85  
PERFORATED: 2987-1/2 FEET TO 2993 FEET

STIMULATION: 750 gals. 15% hcl, 15000 gals. 30# gel, 23-1/2  
tons CO2, 13000# 20/40 sand, 10000# 10/20 sand

OTHER PERFORATED ZONES: None

## CURRENT STATUS

WHAT IS CURRENT STATUS OF WELL? Pumping oil well

IF P&A, LIST PLUGGING DETAILS:

# WELL DATA SHEET

OPERATOR: Yates Drilling Co. LEASE: Doyal  
WELL NO.: 1 FOOTAGE: 660' FNL - 990' EEL SEC: 34-T12s-R31e

## TUBULAR DATA

### SURFACE CASING

SIZE: 8-5/8" 24# CEMENTED WITH: 250 SX.  
TOC: Surface FEET DETERMINED BY: Circulation  
HOLE SIZE: 12-1/4" SETTING DEPTH: 409.46'

### INTERMEDIATE CASING

SIZE: None CEMENTED WITH:  SX.  
TOC:  FEET DETERMINED BY:   
HOLE SIZE:  SETTING DEPTH:

### LONG STRING

SIZE: 5-1/2" CEMENTED WITH: 250 SX.  
TOC: 2200' FEET DETERMINED BY: Temp. Survey  
HOLE SIZE: 7-7/8" SETTING DEPTH: 3093'  
TOTAL DEPTH: 3100'

## PRODUCING INTERVAL

FORMATION: Queen POOL OR FIELD: SE Chaves Queen  
SPUD DATE: 7-31-84 COMPLETION DATE: 8-25-84  
PERFORATED: 2982' FEET TO 2989' FEET

STIMULATION: 750 gallons of 15 % HCl, 15000 gallons 30# gel  
, 5000 SCF N2 per barrel, 10900# 20/40 sand, and 4200# 10/20  
sand.

OTHER PERFORATED ZONES: None

## CURRENT STATUS

WHAT IS CURRENT STATUS OF WELL? Pumping oil well.

IF P&A, LIST PLUGGING DETAILS:

# INJECTION WELL DATA SHEET

OPERATOR: Yates Drilling Co. LEASE: Doyal

WELL NO.: 1 FOOTAGE: 660' FNL - 990' FEL SEC: 34-T12s-R31e

## TUBULAR DATA

### SURFACE CASING

SIZE: 8-5/8" 24# CEMENTED WITH: 250 SX.  
TOC: Surface FEET DETERMINED BY: Circulation  
HOLE SIZE: 12-1/4" SETTING DEPTH: 409.46

### INTERMEDIATE CASING

SIZE: None CEMENTED WITH:  SX.  
TOC:  FEET DETERMINED BY:   
HOLE SIZE:  SETTING DEPTH:

### LONG STRING

SIZE: 5-1/2" 14# CEMENTED WITH: 250 SX.  
TOC: 2200' FEET DETERMINED BY: Temp. Survey  
HOLE SIZE: 7-7/8" SETTING DEPTH: 3100'  
TOTAL DEPTH: 3100'

### INJECTION INTERVAL

2982' FEET TO 2989' FEET -- PERFORATED

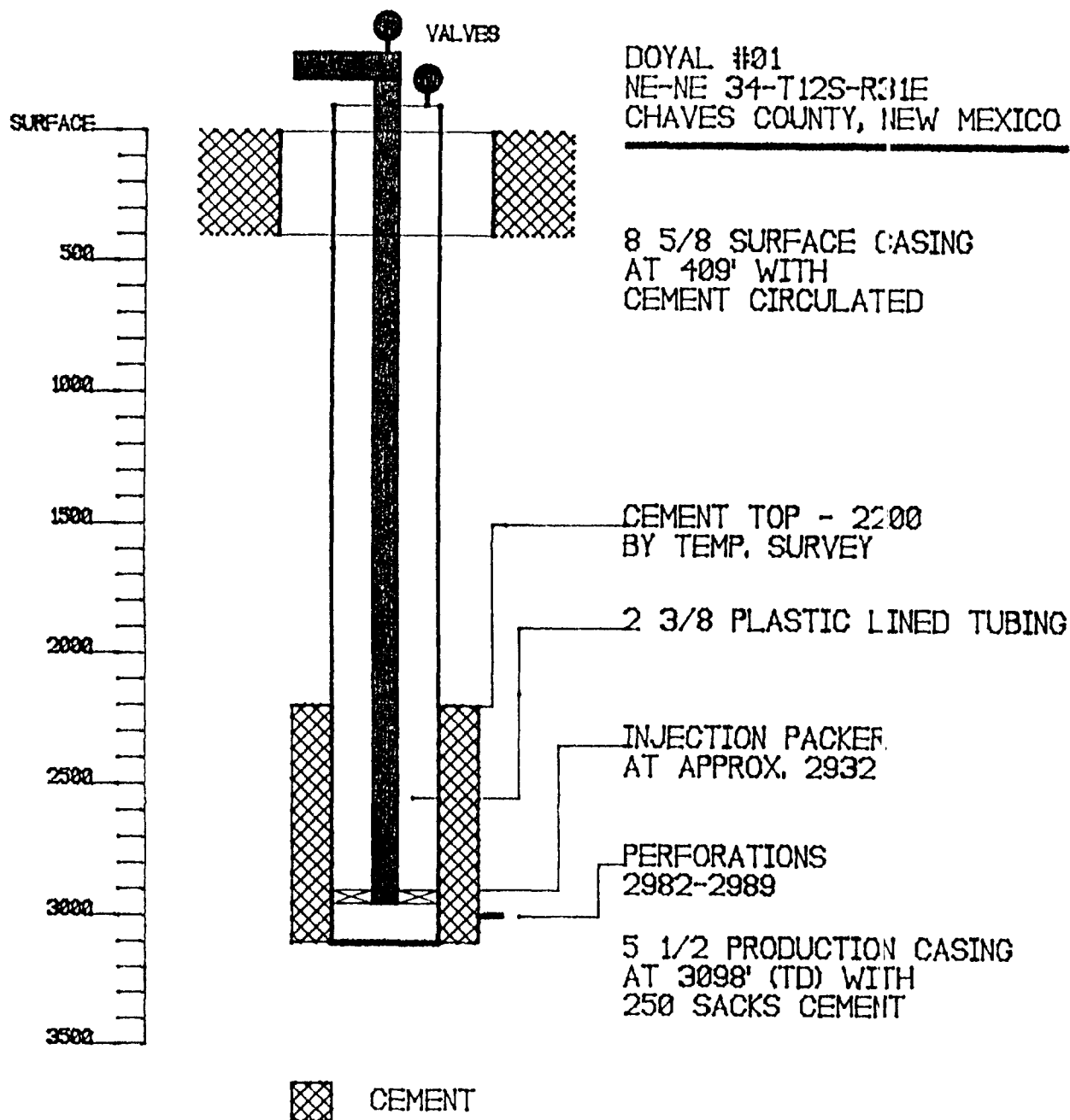
### TUBING

TUBING SIZE: 2-3/8" LINED WITH: Plastic SET IN A  
Baker AD-1 PACKER AT: 2932' FEET

## OTHER DATA

1. NAME OF INJECTION FORMATION: Queen
2. NAME OF FIELD OR POOL (IF APPLICABLE): SE Chaves, Queen
3. IS THIS A NEW WELL DRILLED FOR INJECTION? No  
IF NO, FOR WHAT PURPOSE WAS THE WELL ORIGINALLY DRILLED?  
This well was drilled as a Queen producing well.
4. HAS WELL EVER BEEN PERFORATED IN ANY OTHER ZONE(S)? No  
LIST ALL SUCH PERFORATED INTERVALS AND GIVE PLUGGING  
DETAILS (SACKS OF CEMENT OR BRIDGE PLUG(S) USED):
5. GIVE DEPTH TO AND NAME OF ANY OVERLYING AND/OR  
UNDERLYING OIL OR GAS ZONES (POOLS) IN THIS AREA:  
None known.

WELL SCHEMATIC ATTACHED



WELL DATA SHEET

OPERATOR: Yates Drilling Co. LEASE: Doyal  
WELL NO.: 2 FOOTAGE: 500' FSI - 760' FEL SEC: 27-T12s-R31e

TUBULAR DATA

SURFACE CASING

SIZE: 8-5/8" 24# CEMENTED WITH: 275 SX.  
TOC: Surface FEET DETERMINED BY: Circulation  
HOLE SIZE: 12-1/4" SETTING DEPTH: 411'

INTERMEDIATE CASING

SIZE: None CEMENTED WITH: \_\_\_\_\_ SX.  
TOC: \_\_\_\_\_ FEET DETERMINED BY: \_\_\_\_\_  
HOLE SIZE: \_\_\_\_\_ SETTING DEPTH: \_\_\_\_\_

LONG STRING

SIZE: 5-1/2" CEMENTED WITH: 250 SX.  
TOC: 2200' FEET DETERMINED BY: Temp. Survey  
HOLE SIZE: 7-7/8" SETTING DEPTH: 3093'  
TOTAL DEPTH: 3100'

PRODUCING INTERVAL

FORMATION: Queen POOL OR FIELD: SE Chaves Queen  
SPUD DATE: 9-7-84 COMPLETION DATE: 9-20-84  
PERFORATED: 2981' FEET TO 2987' FEET

STIMULATION: 750 gallons of 15 % HCl, 15000 gallons 30# gel  
, 25% CO2 12000# 20/40 sand, 10000# 10/20 sand.

OTHER PERFORATED ZONES: None

CURRENT STATUS

WHAT IS CURRENT STATUS OF WELL? Pumping oil well.

IF P&A, LIST PLUGGING DETAILS: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

## WELL DATA SHEET

OPERATOR: Yates Drilling Co. LEASE: Doyal  
WELL NO.: 3 FOOTAGE: 1980' FSL - 990' FEL SEC: 27-T12s-R31e

## TUBULAR DATA

## SURFACE CASING

SIZE: 8-5/8" 24# CEMENTED WITH: 260 SX.  
TOC: Surface FEET DETERMINED BY: Circulation  
HOLE SIZE: 12-1/4" SETTING DEPTH: 409'

## INTERMEDIATE CASING

SIZE: None CEMENTED WITH: \_\_\_\_\_ SX.  
TOC: \_\_\_\_\_ FEET DETERMINED BY: \_\_\_\_\_  
HOLE SIZE: \_\_\_\_\_ SETTING DEPTH: \_\_\_\_\_

## LONG STRING

SIZE: 5-1/2" 14# CEMENTED WITH: 850 SX.  
TOC: 630' FEET DETERMINED BY: Temp. Survey  
HOLE SIZE: 7-7/8" SETTING DEPTH: 3099'  
TOTAL DEPTH: 3100'

## PRODUCING INTERVAL

FORMATION: Queen POOL OR FIELD: SE Chaves Queen  
SPUD DATE: 9-20-84 COMPLETION DATE: NONE  
PERFORATED: 2991' FEET TO 2997' FEET

STIMULATION: 750 gallons of 15 % HCl, 15000 gallons 30# gel  
, 25% CO2 20000# 20/40 sand, 10000# 10/20 sand.

OTHER PERFORATED ZONES: None

## CURRENT STATUS

WHAT IS CURRENT STATUS OF WELL? Temp. Abandoned

IF P&A, LIST PLUGGING DETAILS:

# INJECTION WELL DATA SHEET

OPERATOR: Yates Drilling Co. LEASE: Doyal  
 WELL NO.: 3 FOOTAGE: 1980' FSL - 990' FEL SEC: 27-T12s-R31e

## TUBULAR DATA

### SURFACE CASING

SIZE: 8-5/8" 24# CEMENTED WITH: 260 SX.  
 TOC: Surface FEET DETERMINED BY: Circulation  
 HOLE SIZE: 12-1/4" SETTING DEPTH: 409

### INTERMEDIATE CASING

SIZE: None CEMENTED WITH: \_\_\_\_\_ SX.  
 TOC: \_\_\_\_\_ FEET DETERMINED BY: \_\_\_\_\_  
 HOLE SIZE: \_\_\_\_\_ SETTING DEPTH: \_\_\_\_\_

### LONG STRING

SIZE: 5-1/2" 14# CEMENTED WITH: 850 SX.  
 TOC: 630' FEET DETERMINED BY: Cement Bond Log  
 HOLE SIZE: 7-7/8" SETTING DEPTH: 3099'  
 TOTAL DEPTH: 3100'

### INJECTION INTERVAL

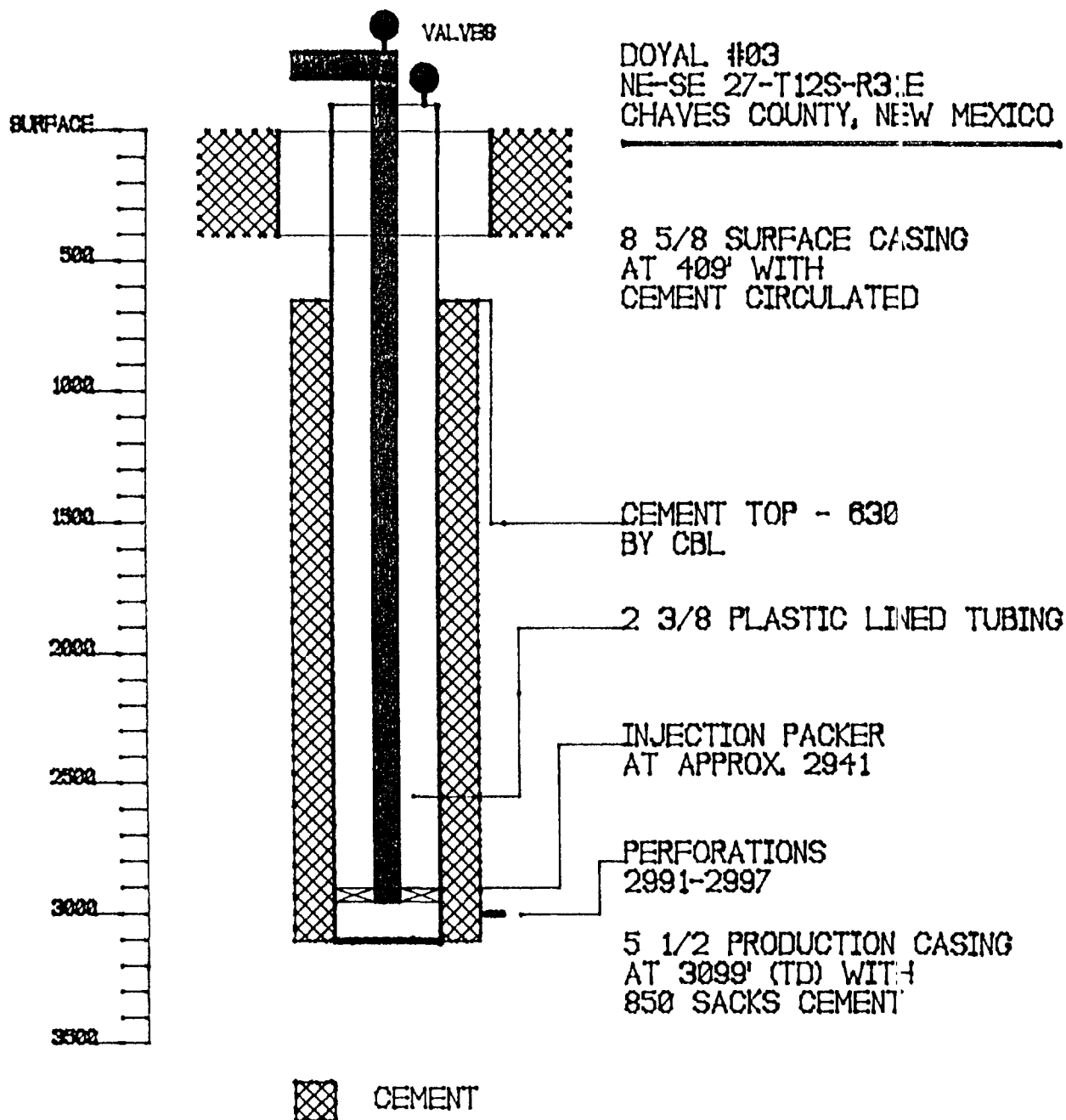
2991' FEET TO 2997' FEET - PERFORATED

### TUBING

TUBING SIZE: 2-3/8" LINED WITH: Plastic SET IN A  
Baker AD-1 PACKER AT: 2941' FEET

## OTHER DATA

1. NAME OF INJECTION FORMATION: Queen
2. NAME OF FIELD OR POOL (IF APPLICABLE): SE Chaves Queen
3. IS THIS A NEW WELL DRILLED FOR INJECTION? No  
 IF NO, FOR WHAT PURPOSE WAS THE WELL ORIGINALLY DRILLED?  
This well was drilled as a Queen producing well.  
This well is temp. aban. due to high water production
4. HAS WELL EVER BEEN PERFORATED IN ANY OTHER ZONE(S)? No  
 LIST ALL SUCH PERFORATED INTERVALS AND GIVE PLUGGING  
 DETAILS (SACKS OF CEMENT OR BRIDGE PLUG(S) USED): \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_
5. GIVE DEPTH TO AND NAME OF ANY OVERLYING AND/OR  
 UNDERLYING OIL OR GAS ZONES (POOLS) IN THIS AREA: \_\_\_\_\_  
None known.



# WELL DATA SHEET

OPERATOR: Yates Drilling Co. LEASE: Doyal  
WELL NO.: 4 FOOTAGE: 330' ESL- 330' FWL SEC: 26-T12s-R31e

## TUBULAR DATA

### SURFACE CASING

SIZE: 8-5/8" 24# CEMENTED WITH: 250 SX.  
TOC: Surface FEET DETERMINED BY: Circulation  
HOLE SIZE: 12-1/4" SETTING DEPTH: 400'

### INTERMEDIATE CASING

SIZE: None CEMENTED WITH:  SX.  
TOC:  FEET DETERMINED BY:   
HOLE SIZE:  SETTING DEPTH:

### LONG STRING

SIZE: 5-1/2" 14# CEMENTED WITH: 975 SX.  
TOC: 310' FEET DETERMINED BY: Temp. Survey  
HOLE SIZE: 7-7/8" SETTING DEPTH: 3088'  
TOTAL DEPTH: 3100'

## PRODUCING INTERVAL

FORMATION: Queen POOL OR FIELD: SE Chaves Queen  
SPUD DATE: 11-18-84 COMPLETION DATE: 1-24-87  
PERFORATED: 2982' FEET TO 2985' FEET

STIMULATION: 750 gallons of 15 % HCl, 15000 gallons 30# gel  
, 22 tons CO2, 12000# 20/40 sand, 8500 # 12/20 sand.

OTHER PERFORATED ZONES: None

## CURRENT STATUS

WHAT IS CURRENT STATUS OF WELL? Pumping oil well

IF P&A, LIST PLUGGING DETAILS:

# INJECTION WELL DATA SHEET

OPERATOR: Yates Drilling Co. LEASE: Doyal  
 WELL NO.: 4 FOOTAGE: 330' FSL - 330' FWL SEC: 26-T12s-R31e

## TUBULAR DATA

### SURFACE CASING

SIZE: 8-5/8" 24# CEMENTED WITH: 250 SX.  
 TOC: Surface FEET DETERMINED BY: Circulation  
 HOLE SIZE: 12-1/4" SETTING DEPTH: 400

### INTERMEDIATE CASING

SIZE: None CEMENTED WITH:  SX.  
 TOC:  FEET DETERMINED BY:   
 HOLE SIZE:  SETTING DEPTH:

### LONG STRING

SIZE: 5-1/2" 14# CEMENTED WITH: 975 SX.  
 TOC: 310' FEET DETERMINED BY: Temp. Survey  
 HOLE SIZE: 7-7/8" SETTING DEPTH: 3088'  
 TOTAL DEPTH: 3100'

### INJECTION INTERVAL

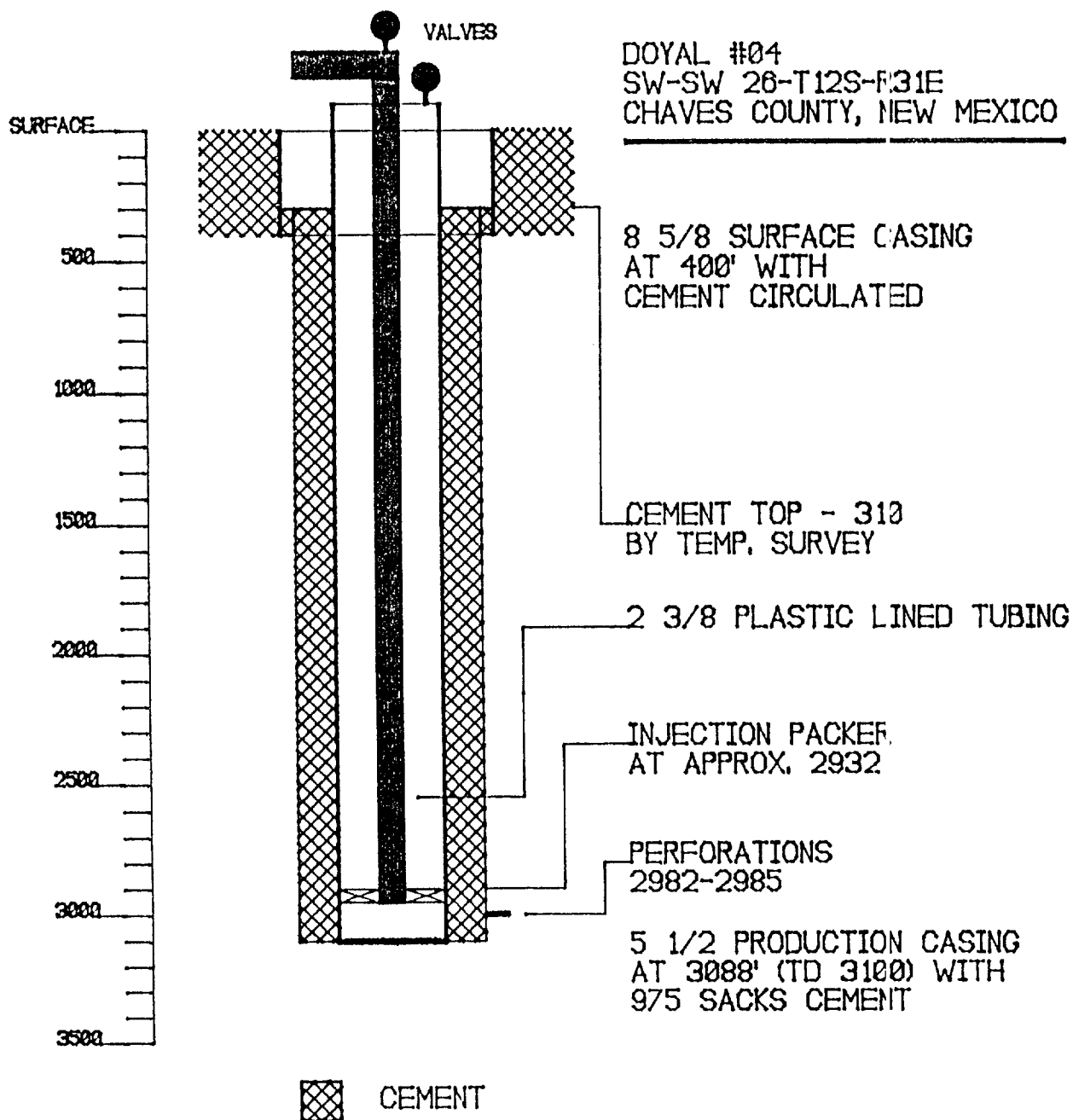
2982' FEET TO 2985' FEET - PERFORATED

### TUBING

TUBING SIZE: 2-3/8" LINED WITH: Plastic SET IN A  
Baker AD-1 PACKER AT: 2932' FEET

## OTHER DATA

1. NAME OF INJECTION FORMATION: Queen
2. NAME OF FIELD OR POOL (IF APPLICABLE): SE Chaves Queen
3. IS THIS A NEW WELL DRILLED FOR INJECTION? No  
 IF NO, FOR WHAT PURPOSE WAS THE WELL ORIGINALLY DRILLED?  
This well was drilled as a Queen producing well.
4. HAS WELL EVER BEEN PERFORATED IN ANY OTHER ZONE(S)? No  
 LIST ALL SUCH PERFORATED INTERVALS AND GIVE PLUGGING  
 DETAILS (SACKS OF CEMENT OR BRIDGE PLUG(S) USED):
5. GIVE DEPTH TO AND NAME OF ANY OVERLYING AND/OR  
 UNDERLYING OIL OR GAS ZONES (POOLS) IN THIS AREA:  
None known.



WELL DATA SHEET

OPERATOR: Yates Drilling Co. LEASE: Gallagher State

WELL NO.: 1 FOOTAGE: 330' FNL- 330' FWL SEC: 35-T12s-R31e

TUBULAR DATA

SURFACE CASING

SIZE: 8-5/8" 24# CEMENTED WITH: 250 SX.  
TOC: Surface FEET DETERMINED BY: Circulation  
HOLE SIZE: 12-1/4" SETTING DEPTH: 433'

INTERMEDIATE CASING

SIZE: None CEMENTED WITH:  SX.  
TOC:  FEET DETERMINED BY:   
HOLE SIZE:  SETTING DEPTH:

LONG STRING

SIZE: 5-1/2" 14# CEMENTED WITH: 900 SX.  
TOC: Surface FEET DETERMINED BY: Circulation  
HOLE SIZE: 7-7/8" SETTING DEPTH: 3084'  
TOTAL DEPTH: 3100'

PRODUCING INTERVAL

FORMATION: Queen POOL OR FIELD: SE Chaves Queen  
SPUD DATE: 10-28-84 COMPLETION DATE: 11-9-84  
PERFORATED: 2982' FEET TO 2987' FEET

STIMULATION: 650 gallons of 15 % HCl, 15000 gallons 30# gel  
, 22 tons CO2, 12000# 20/40 sand, 10750# 10/20 sand.

OTHER PERFORATED ZONES: None

CURRENT STATUS

WHAT IS CURRENT STATUS OF WELL? Pumping oil well

IF P&A, LIST PLUGGING DETAILS:

# WELL DATA SHEET

OPERATOR: Yates Drilling Co. LEASE: Garner Federal  
WELL NO.: 2 FOOTAGE: 2310' FSL-2310' FEL SEC: 34-T12s-R31e

## TUBULAR DATA

### SURFACE CASING

SIZE: 8-5/8" 24# CEMENTED WITH: 250 SX.  
TOC: Surface FEET DETERMINED BY: Circulation  
HOLE SIZE: 12-1/4" SETTING DEPTH: 410

### INTERMEDIATE CASING

SIZE: None CEMENTED WITH: \_\_\_\_\_ SX.  
TOC: \_\_\_\_\_ FEET DETERMINED BY: \_\_\_\_\_  
HOLE SIZE: \_\_\_\_\_ SETTING DEPTH: \_\_\_\_\_

### LONG STRING

SIZE: 5-1/2" 14# CEMENTED WITH: 550 SX.  
TOC: 1992' FEET DETERMINED BY: Cement Bond Log  
HOLE SIZE: 7-7/8" SETTING DEPTH: 3093'  
TOTAL DEPTH: 3100'

## PRODUCING INTERVAL

FORMATION: Queen POOL OR FIELD: SE Chaves Queen  
SPUD DATE: 4-29-84 COMPLETION DATE: 6-1-84  
PERFORATED: 2982 FEET TO 2990 FEET

STIMULATION: 750 gals. 15% HCl acid, 20000 gals. 30# gel,  
25% CO2, 16500# 20/40 sand, 1700# 12/20 sand

OTHER PERFORATED ZONES: None

## CURRENT STATUS

WHAT IS CURRENT STATUS OF WELL? Pumping oil well

IF P&A, LIST PLUGGING DETAILS: \_\_\_\_\_

WELL DATA SHEET

OPERATOR: Yates Drilling Co. LEASE: Garner Federal  
WELL NO.: 3 FOOTAGE: 1980' FNL-1980' FEL SEC: 34-T12s-R31e

TUBULAR DATA

SURFACE CASING

SIZE: 8-5/8" 24# CEMENTED WITH: 225 SX.  
TOC: Surface FEET DETERMINED BY: Circulation  
HOLE SIZE: 12-1/4" SETTING DEPTH: 408'

INTERMEDIATE CASING

SIZE: None CEMENTED WITH: SX.  
TOC: FEET DETERMINED BY:  
HOLE SIZE: SETTING DEPTH:

LONG STRING

SIZE: 5-1/2" 14# CEMENTED WITH: 250 SX.  
TOC: 1810' FEET DETERMINED BY: Temp. Survey  
HOLE SIZE: 7-7/8" SETTING DEPTH: 3100'  
TOTAL DEPTH: 3100'

PRODUCING INTERVAL

FORMATION: Queen POOL OR FIELD: SE Chaves Queen  
SPUD DATE: 7-2-84 COMPLETION DATE: 8-12-84  
PERFORATED: 2981 FEET TO 2986 FEET

STIMULATION: 750 gals. 15% HCl acid, 15000 gals. 30# gel,  
5000 SCF N2 per barre, 1500# 20/40 sand, 1700# 12/20 sand

OTHER PERFORATED ZONES: None

CURRENT STATUS

WHAT IS CURRENT STATUS OF WELL? Pumping oil well

IF P&A, LIST PLUGGING DETAILS:

# WELL DATA SHEET

OPERATOR: Yates Drilling Co. LEASE: Garner Federal  
WELL NO.: 7 FOOTAGE: 660' FSL-1980' FEL SEC: 27-T12s-R31e

## TUBULAR DATA

### SURFACE CASING

SIZE: 8-5/8" 24# CEMENTED WITH: 250 SX.  
TOC: Surface FEET DETERMINED BY: Circulation  
HOLE SIZE: 12-1/4" SETTING DEPTH: 424'

### INTERMEDIATE CASING

SIZE: None CEMENTED WITH:  SX.  
TOC:  FEET DETERMINED BY:   
HOLE SIZE:  SETTING DEPTH:

### LONG STRING

SIZE: 5-1/2" 14# CEMENTED WITH: 270 SX.  
TOC: 1900' FEET DETERMINED BY: Temp. Survey  
HOLE SIZE: 7-7/8" SETTING DEPTH: 3098.54'  
TOTAL DEPTH: 3100'

## PRODUCING INTERVAL

FORMATION: Queen POOL OR FIELD: SE Chaves Queen  
SPUD DATE: 10-14-84 COMPLETION DATE: 10-30-84  
PERFORATED: 2987' FEET TO 2993' FEET

STIMULATION: 750 gallons of 15 % HCl, 15000 gallons 30# gel  
, 1000 SCF/BBL CO2, 13000# 20/40 sand, 9000# 10/20 sand

OTHER PERFORATED ZONES: None

## CURRENT STATUS

WHAT IS CURRENT STATUS OF WELL? Pumping oil well

IF P&A, LIST PLUGGING DETAILS:

INJECTION WELL DATA SHEET

OPERATOR: Yates Drilling Co. LEASE: Garner Federal

WELL NO.: 7 FOOTAGE: 660' FSL-1980' FEL SEC: 27-T12s-R31e

TUBULAR DATA

SURFACE CASING

SIZE: 8-5/8" 24# CEMENTED WITH: 250 SX.  
TOC: Surface FEET DETERMINED BY: Circulation  
HOLE SIZE: 12-1/4" SETTING DEPTH: 424

INTERMEDIATE CASING

SIZE: None CEMENTED WITH: \_\_\_\_\_ SX.  
TOC: \_\_\_\_\_ FEET DETERMINED BY: \_\_\_\_\_  
HOLE SIZE: \_\_\_\_\_ SETTING DEPTH: \_\_\_\_\_

LONG STRING

SIZE: 5-1/2" 14# CEMENTED WITH: 270 SX.  
TOC: 1900' FEET DETERMINED BY: Temp. Survey  
HOLE SIZE: 7-7/8" SETTING DEPTH: 3093.54'  
TOTAL DEPTH: 3100'

INJECTION INTERVAL

2987' FEET TO 2993' FEET - PERFORATED

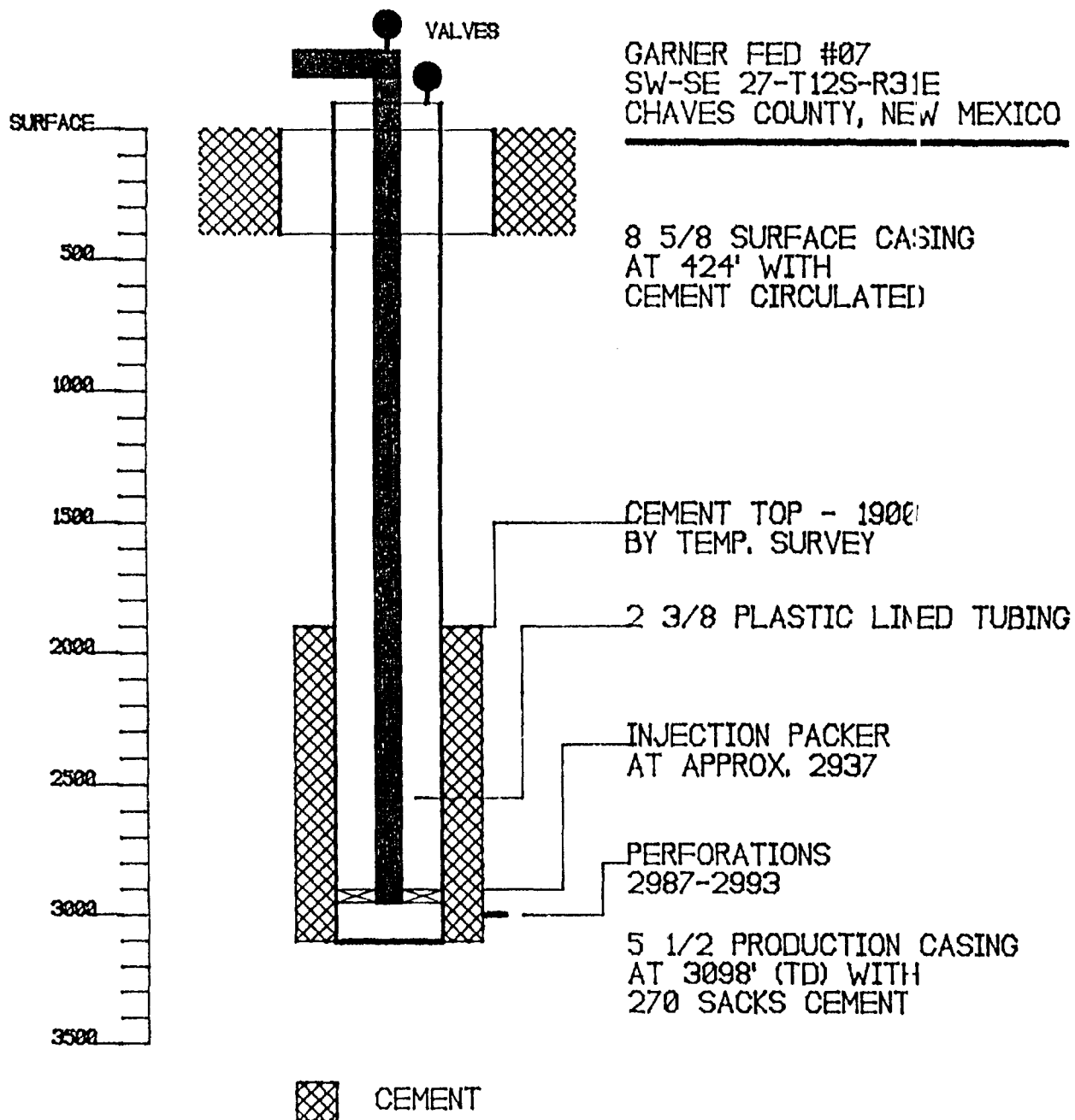
TUBING

TUBING SIZE: 2-3/8" LINED WITH: Plastic SET IN A  
Baker AD-1 PACKER AT: 2937' FEET

OTHER DATA

1. NAME OF INJECTION FORMATION: Queen
2. NAME OF FIELD OR POOL (IF APPLICABLE): SE Chaves Queen
3. IS THIS A NEW WELL DRILLED FOR INJECTION? No  
IF NO, FOR WHAT PURPOSE WAS THE WELL ORIGINALLY DRILLED?  
This well was drilled as a Queen producing well.
4. HAS WELL EVER BEEN PERFORATED IN ANY OTHER ZONE(S)? No  
LIST ALL SUCH PERFORATED INTERVALS AND GIVE PLUGGING  
DETAILS (SACKS OF CEMENT OR BRIDGE PLUG(S) USED): \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_
5. GIVE DEPTH TO AND NAME OF ANY OVERLYING AND/OR  
UNDERLYING OIL OR GAS ZONES (POOLS) IN THIS AREA: \_\_\_\_\_  
None known.

WELL SCHEMATIC ATTACHED



# WELL DATA SHEET

OPERATOR: Yates Drilling Co. LEASE: Garner Federal

WELL NO.: 9 FOOTAGE: 1650' FSL-2310' FEL SEC: 27-T12s-R31e

## TUBULAR DATA

### SURFACE CASING

SIZE: 8-5/8" 24# CEMENTED WITH: 250 SX.  
TOC: Surface FEET DETERMINED BY: Circulation  
HOLE SIZE: 12-1/4" SETTING DEPTH: 428'

### INTERMEDIATE CASING

SIZE: None CEMENTED WITH:  SX.  
TOC:  FEET DETERMINED BY:   
HOLE SIZE:  SETTING DEPTH:

### LONG STRING

SIZE: 5-1/2" 14# CEMENTED WITH: 320 SX.  
TOC: 1820' FEET DETERMINED BY: Temp. Survey  
HOLE SIZE: 7-7/8" SETTING DEPTH: 3098'  
TOTAL DEPTH: 3100'

## PRODUCING INTERVAL

FORMATION: Queen POOL OR FIELD: SE Chaves Queen  
SPUD DATE: 11-11-84 COMPLETION DATE: 11-30-84  
PERFORATED: 2985' FEET TO 2995' FEET

STIMULATION: 750 gallons of 15 % HCl, 15000 gallons 30# gel  
, 16 tons of CO2, 18000# 20/40 sand, 12500# 10/20 sand

OTHER PERFORATED ZONES: None

## CURRENT STATUS

WHAT IS CURRENT STATUS OF WELL? Pumping oil well

IF P&A, LIST PLUGGING DETAILS:

# WELL DATA SHEET

OPERATOR: Yates Drilling Co. LEASE: Rich Federal  
WELL NO.: 1 FOOTAGE: 2310' FNL-2310' FEL SEC: 27-T12s-R31e

## TUBULAR DATA

### SURFACE CASING

SIZE: 8-5/8" 24# CEMENTED WITH: 250 SX.  
TOC: Surface FEET DETERMINED BY: Circulation  
HOLE SIZE: 12-1/4" SETTING DEPTH: 412'

### INTERMEDIATE CASING

SIZE: None CEMENTED WITH:  SX.  
TOC:  FEET DETERMINED BY:   
HOLE SIZE:  SETTING DEPTH:

### LONG STRING

SIZE: None CEMENTED WITH:  SX.  
TOC:  FEET DETERMINED BY:   
HOLE SIZE: 7-7/8" SETTING DEPTH:   
TOTAL DEPTH: 3100'

## PRODUCING INTERVAL

FORMATION: None POOL OR FIELD: SE Chaves Queen  
SPUD DATE: 11-30-84 COMPLETION DATE: None  
PERFORATED:  FEET TO  FEET

STIMULATION: None

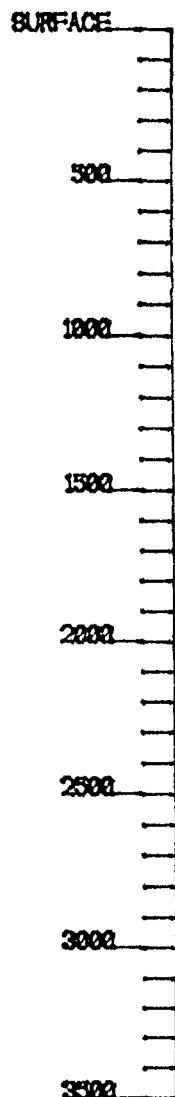
OTHER PERFORATED ZONES: None

## CURRENT STATUS

WHAT IS CURRENT STATUS OF WELL? Plugged and Abandoned

IF P&A, LIST PLUGGING DETAILS: P&A 12-12-84  
Plug 3040-2940' 35 sx Class "C" neat, Plug 2100-2000' 75 sx  
Class "C" w/2% CaCl2, plug 1500-1400' 35 sx Class "C" neat,  
Plug 462-362' 50 sx Class "C" w/2% CaCl2, Plug 50-Sur. 20sx  
Class "C" neat

RICH FED. #01  
SW-NE 27-T12S-R31E  
CHAVES COUNTY, NEW MEXICO



20 SACK SURFACE PLUG



8 5/8 SURFACE CASING  
AT 412' WITH  
CEMENT CIRCULATED

50 SACK PLUG  
362-462

35 SACK PLUG  
1400-1500

75 SACK PLUG  
2000-2100

35 SACK PLUG  
2940-3040



CEMENT

# WELL DATA SHEET

OPERATOR: Snow Oil Company LEASE: Toles Federal  
WELL NO.: 1 FOOTAGE: 1980' FSL-1650' FWL SEC: 26-T12s-R31e

## TUBULAR DATA

### SURFACE CASING

SIZE: 8-5/8" CEMENTED WITH: SX.  
TOC: Surface FEET DETERMINED BY: Circulation  
HOLE SIZE: 12-1/4" SETTING DEPTH: 473'

### INTERMEDIATE CASING

SIZE: None CEMENTED WITH: SX.  
TOC:  FEET DETERMINED BY:   
HOLE SIZE:  SETTING DEPTH:

### LONG STRING

SIZE: 4-1/2" CEMENTED WITH: SX.  
TOC: 900' FEET DETERMINED BY: Estimate  
HOLE SIZE:  SETTING DEPTH: 3115'  
TOTAL DEPTH: 3115'

## PRODUCING INTERVAL

FORMATION: Queen POOL OR FIELD: SE Chaves Queen  
SPUD DATE: 1-8-85 COMPLETION DATE: None  
PERFORATED: 2344 FEET TO 2845 FEET

STIMULATION:

OTHER PERFORATED ZONES: None

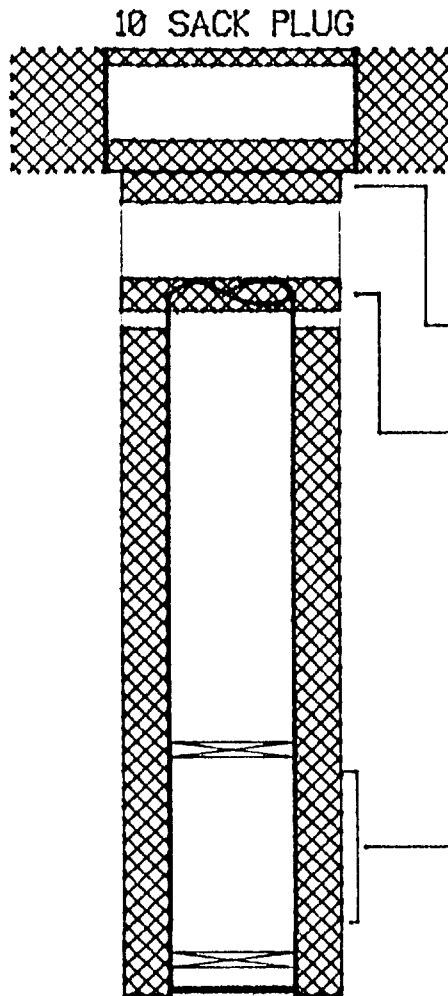
## CURRENT STATUS

WHAT IS CURRENT STATUS OF WELL? Plugged and Abandoned

IF P&A, LIST PLUGGING DETAILS: 35x plug on CIBP @ 2990'  
35x plug on CIBP @ 2290', cut and pulled 4-1/2" casing @ 825'  
355x plug @ 867', 355x plug @ 524', 105x plug @ surface

TOLES FED. #01  
NE-SW 26-T12S-R31E  
CHAVES COUNTY, NEW MEXICO

SURFACE



8 5/8 SURFACE CASING  
AT 473' WITH  
CEMENT CIRCULATED

35 SACK PLUG  
424-525

CUT & PULL CSG.  
AT 825  
35 SACK PLUG  
767-867

3 SACK PLUG  
ON CIBP AT 2290

PERFORATIONS  
2344-2845

3 SACK PLUG  
ON CIBP AT 2990

TD 3115

 CEMENT

Case No.                    Application of Yates Drilling Company for a waterflood project, Chaves County, New Mexico. Applicant, in the above styled cause, seeks authority to institute a waterflood project by injection of water into the Queen formation, Southeast Chaves Queer Field on its Doyal lease underlying portions of Sections 26, 27 and 34, Township 12 South, Range 31 East. Said lease is located approximately 12 miles Southwest by South of Caprock, New Mexico.

*Case No. 9810*

RECEIVED  
NOV 7 1969  
OIL CONSERVATION DIVISION

Case No.                    Application of Yates Drilling Company for a waterflood project, Chaves County, New Mexico. Applicant, in the above styled cause, seeks authority to institute a waterflood project by injection of water into the Queen formation, Southeast Chaves Queen Field (Division Case 9823) underlying portions of Sections 26, 27, 34 and 35, Township 12 South, Range 31 East. Unit Area centered approximately 12 miles Southwest by South of Caprock, New Mexico.

RECEIVED  
NOV 7 1963  
OIL CONSERVATION DIVISION

ALTERNATIVE APPLICATION

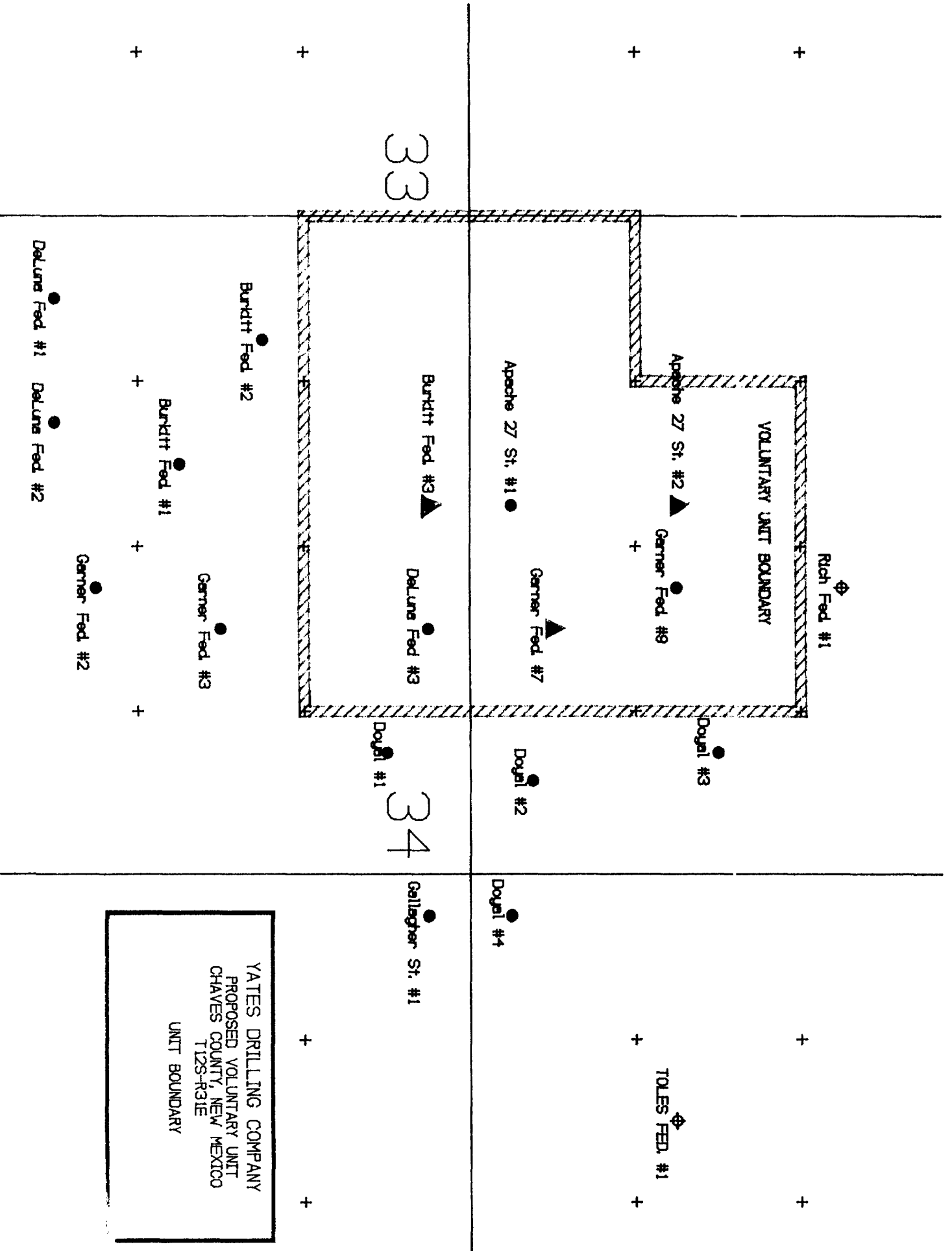
Application of Yates Drilling Company  
For a Secondary Recovery Project  
Voluntary Unit  
Chaves County, New Mexico

All of the information required for this application has been submitted in the Cactus Queen Unit Form C-108 which has been filed jointly with this application. The proposed voluntary unit consists of 320 acres, more or less, of Federal and State lands in Units J, K, M, N, O, (W/2 SE/4, E/2 SW/4, SW/4 SW/4) of Section 27 and Units B, C, D, (N/2 NW/4, NW/4 NE/4) of Section 34, Township 12 South, Range 31 East, Chaves County, New Mexico. A map is attached for identification.

This voluntary unit would have the following three injection wells;

Apache "27" State #2  
Burkitt Federal #3  
Garner Federal #7.

All of these proposed injection wells were also proposed injection wells under the complete C-108 form of the proposed Cactus Queen Unit. All injection rates and pressures will be the same. Fresh water will be from the Ogollala aquifer.



Case No.

Application of Yates Drilling Company for statutory unitization or, in the alternative, a unit agreement, Chaves County, New Mexico. Applicant, in the above-styled cause, seeks an order unitizing, for the purpose of establishing a secondary recovery project, all mineral interests in the Queen formation, Southwest Chaves Queen Field, underlying 560 acres, more or less, of Federal, State and Fee lands in Unit M (SW/4 SW/4) of Section 26, Units I, J, K, M, N, O, P, (SE/4, E/2 SW/4, SW/4 SW/4) of Section 27, Units A, B, C, D, H, (N/2 NE/4, SE/4 NE/4, N/2 NW/4) of Section 34 and Unit D (NW/4 NW/4) of Section 35, Township 12 South, Range 31 East. Said unit is to be designated the Cactus Queen Unit. Among the matters to be considered at the hearing will be the necessity of unit operations; the designation of a unit operator; the determination of horizontal and vertical limits of the unit area; the determination of the fair, reasonable, and equitable allocation of production and costs of production, including capital investment, to each of the various tracts in the unit area; the determination of credits and charges to be made among the various owners in the unit area for their investment in wells and equipment; and such other matters as may be necessary and appropriate for carrying on efficient unit operations; including but not limited to, unit voting procedures, selection, removal or substitution of unit operator, and time of commencement and termination of unit

operations. Applicant also requests that any such order issued in this case include a provision for carrying any nonconsenting working interest owner maintain the unit area upon such terms and conditions to be determined by the Division as just and reasonable. In the alternative, Applicant seeks approval of the Cactus Queen Unit Area, comprising 320 acres, more or less, of Federal and State lands underlying Units J, K, M, N and O, (W/2 SE/4, E/2 SW/4, SW/4 SW/4) of Section 27, and Units B, C and D (NW/4 NE/4, N/2 NW/4) of Section 34, Township 12 South, Range 31 East. Said Unit Area is centered approximately \_\_\_\_ miles \_\_\_\_ of \_\_\_\_\_, New Mexico.

CAMPBELL & BLACK, P.A.

LAWYERS

JACK M. CAMPBELL  
BRUCE D. BLACK  
MICHAEL B. CAMPBELL  
WILLIAM F. CARR  
BRADFORD C. BERGE  
MARK F. SHERIDAN  
J. SCOTT HALL  
JOHN H. BEMIS  
WILLIAM R. SLATTERY  
PATRICIA A. MATTHEWS

JEFFERSON PLACE  
SUITE 1 - 110 NORTH GUADALUPE  
POST OFFICE BOX 2208  
SANTA FE, NEW MEXICO 87504-2208  
TELEPHONE: (505) 988-4421  
TELECOPIER: (505) 983-6043

November 8, 1989

*Case 9810*

**HAND-DELIVERED**

RECEIVED

William J. LeMay, Director  
State of New Mexico  
Energy and Minerals Department  
Oil Conservation Division  
Post Office Box 2088  
Santa Fe, New Mexico 87501

NOV - 8 1989

OIL CONSERVATION DIVISION

Re: Application of Yates Drilling Company for a Waterflood Project, Proposed  
Cactus Queen Voluntary Unit, Chaves County, New Mexico

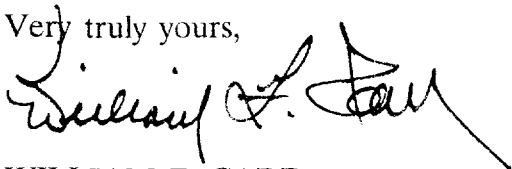
Dear Mr. LeMay:

Enclosed for filing in the above-referenced case is the original and copy of OCD Form C-108. On this date we have also mailed to the Oil Conservation Division district office in Artesia a copy of this completed form.

This matter has been set for hearing before a Division Examiner on November 29, 1989.

Your attention to this matter is appreciated.

Very truly yours,



WILLIAM F. CARR  
WFC:mlh  
ATTORNEY FOR YATES DRILLING COMPANY  
Enclosure  
cc w/o enc.: Toby Rhodes

YATES DRILLING COMPANY  
PROPOSED CACTUS QUEEN VOLUNTARY UNIT  
CHAVES COUNTY, NEW MEXICO

NMOCD FORM C-108

APPLICATION FOR AUTHORIZATION TO INJECT

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

II. Operator: Yates Drilling Company

Address: 105 South 4th Street, Artesia, New Mexico 88210

Contact party: Tobin L. Rhodes Phone: (505) 748-1471

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: Tobin L. Rhodes Title Petroleum Engineer

Signature: Tobin L. Rhodes Date: 10-13-89

\* 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.

## III. WELL DATA

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.

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 2000, Santa Fe, New Mexico 87501 within 15 days.

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

---

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.

**OIL CONSERVATION DIVISION**  
**FORM C-108 (Supplement)**

Application of Yates Drilling Company  
For a Secondary Recovery Project  
(Proposed Cactus Queen Unit)  
Voluntary Unit  
Chaves County, New Mexico

**I. Purpose:**

Application is made for authorization to inject water into the Queen formation underlying the boundaries of the proposed Voluntary Cactus Queen Unit. The proposed unit consists of 320 acres, more or less, of Federal, State, and Fee lands in Units J, K, M, N, O, (W/2 SE/4, E/2 SW/4, SW/4 SW/4) of Section 27, and Units B, C, D, (N/2 NW/4, NW/4 NE/4) of Section 34, Township 12 South, Range 31 East, Chaves County New Mexico. This project would be classified as a secondary recovery project with the objective of recovering hydrocarbons that will not and can not be recovered by primary means.

Many wells in the proposed unit area are primary depleted or are very near primary depletion. Our studies show that the injection of water into selected wells will result in the recovery of oil in economic quantities not otherwise recoverable. This project should provide economic benefits to all parties holding any type of interest in the unit acreage.

**II. Operator:**

Yates Drilling Company  
105 South Fourth Street  
Artesia, New Mexico 88210

Phone Number: (505) 748-1471

**III. Injection Well Data:**

A well data sheet is attached for each of the three wells proposed for water injection. Each injection well data sheet includes a downhole schematic of how each individual well will be configured if this application is approved.

IV. Existing Project:

The proposed project is not an expansion of an existing project and will be a totally new project.

V. Ownership:

A lease ownership map is attached which identifies all wells and lease ownership within two miles of any of the six proposed injection wells. A map is also attached on which the area of review has been identified by drawing a one-half mile circle around each injection well.

VI. Well Data:

There are presently sixteen wells including proposed injection wells that fall within the boundaries of the proposed unit or within the area of review. One of these wells has been plugged and abandoned, one well is temporarily abandoned, and the remaining fourteen wells are active pumping oil wells producing from the Queen formation. Available data for each of the wells is included in the attached well data sheets. Additionally a downhole schematic has been drawn depicting the one plugged and abandoned well.

VII. Project Data:

1. The proposed daily average water injection rate is approximately 200 barrels per day for each of the three proposed water injection wells. Total water injection for the unit would be 600 barrels per day. The maximum injection rate for any individual well will be based on fracture pressure as determined by step-rate pressure tests to be conducted on each injection well.

2. Produced water will be stored in covered steel storage tank(s) and in open top fiberglass tanks making the produced water system an open system. Any fresh water will be stored in a covered steel tank. Produced oil will immediately be separated from produced water. The oil will be stored in a steel covered production tank until sold.

3. Initially the injection wells may take water on a vacuum, but as the reservoir fills a positive surface injection pressure will be required to inject water. The maximum injection pressure will also be determined by proposed step-rate pressure tests. At no time prior to the step-rate tests will the injection pressure exceed a pressure limitation of 0.2 PSIG per foot of depth to the top of the injection interval.

4. The source of injection fluid will be produced water from the producing wells within the unit and fresh water from the Ogollala aquifer in the area. No commitment has been made but commercial sources of fresh water are available in the area.

5. No water compatibility problems are expected as Ogollala water has been successfully injected into the Queen formation, throughout the Caprock Queen Field, without excessive problems. Compatibility tests have been run commingling the produced water and fresh water and no adverse problems were observed.

#### VIII. Geologic Data:

The Proposed Cactus Queen Unit produces from the upper sandstone member of the Queen formation, upper Guadalupian series, Permian system. The average producing depth in the field is approximately 2989 feet. The existing producing formation will be the interval into which water will be injected.

The productive/injection interval, as indicated from a whole core analysis on the DeLuna Federal #3 (330' FNL & 1980' FEL, 34-12s-31e) and sidewall core data from numerous wells, is fine grained, friable, gray, quartz sandstone. The grains are sub-angular to sub-rounded and well sorted. The cementing material is variously from anhydrite and dolomite. The exact depositional environment is unknown. Porosity and permeability are intergranular in nature. The sandstone is not naturally fractured.

The Cactus Queen Field is a stratigraphic trap. Cementation of the sandstone results in the loss of porosity and permeability, creating a barrier on all sides with the exception of the east. A tilted oil-water contact limits the production in that direction. The oil/water contact has been established at (+1440) in the southeast end of the field and (+1446) at the northeast edge.

The primary underground source of fresh water in this area is the Ogollala formation of Tertiary age, the base of which is estimated to be 300 feet below the surface. This aquifer is protected behind the surface pipe and cement of all existing wells in the unit area. The Chinlee formation is also a fresh water aquifer which immediately underlies the Ogollala formation. The Base of the Chinlee is estimated to be approximately 500 feet below the surface in the unit area. The Chinlee is behind the production casing in all existing wells in the unit area.

IX. Stimulation Program:

Each of the currently producing wells has previously received a fracture treatment. The details of these treatments are outlined in the data sheet for each individual well. There are no plans to stimulate any of the existing wells which will be producing wells in this project.

The wells which will be injection wells may require a small clean-up acid treatment prior to injection. We plan to treat each of the proposed injection wells with 1000 to 2000 gallons of 15% hydrochloric acid. This treatment should insure that existing perforations are open and that each well will accept water or gas at the lowest possible pressure.

X. Well Logs:

Well logs for each of the existing wells in the proposed unit have previously been submitted to the Hobbs office of the NMOCB. Attached for zone identification purposes is a cross section containing portions of the logs from wells in the reservoir.

XI. Fresh Water:

The Office of the State Engineer in Roswell has a record of six wells within one mile of the proposed unit. The total depths of two of the wells are unknown, however all six wells are assumed to be producing from the Ogollala formation. Analysis reports for water taken from three of the wells are attached.

XII. Injection Zone Isolation:

Available engineering and geologic data has been examined and no evidence of open faulting or any other hydrologic connection between the injection zone and any underground source of drinking water has been found.

XIII. Proof of Notice:

A listing of off-set leasehold operators within 1/2 mile of any injection wells and the surface owners that have received a copy of this application by certified mail is attached.

XIV. Certification:

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

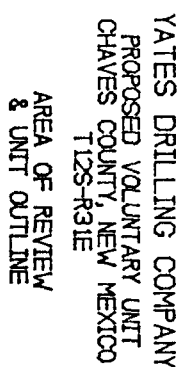
Tobin L. Rhodes

Tobin L. Rhodes

Petroleum Engineer

October 13, 1989





# INJECTION WELL DATA SHEET

OPERATOR: Yates Drilling Company LEASE: Apache "27" State

WELL NO.: 2 FOOTAGE: 1650' FSL-2310' FEL SEC: 27-T12s-R31e

## TUBULAR DATA

### SURFACE CASING

SIZE: 8-5/8" 24# CEMENTED WITH:                      SX.  
 TOC: Surface FEET DETERMINED BY: Circulation  
 HOLE SIZE: 12-1/4" SETTING DEPTH: 454

### INTERMEDIATE CASING

SIZE: None CEMENTED WITH:                      SX.  
 TOC:                      FEET DETERMINED BY:                       
 HOLE SIZE:                      SETTING DEPTH:                     

### LONG STRING

SIZE: 4-1/2" CEMENTED WITH:                      SX.  
 TOC: Surface FEET DETERMINED BY: Circulation  
 HOLE SIZE: 7-7/8" SETTING DEPTH: 3150'  
 TOTAL DEPTH: 3150'

### INJECTION INTERVAL

2996' FEET TO 3000' FEET - PERFORATED

### TUBING

TUBING SIZE: 2-3/8" LINED WITH: Plastic SET IN A  
Baker OD-1 PACKER AT: 2946' FEET

## OTHER DATA

1. NAME OF INJECTION FORMATION: Queen
2. NAME OF FIELD OR POOL (IF APPLICABLE): SE Chaves Queen
3. IS THIS A NEW WELL DRILLED FOR INJECTION? No  
 IF NO, FOR WHAT PURPOSE WAS THE WELL ORIGINALLY DRILLED?  
This well was drilled as a Queen producing well.
4. HAS WELL EVER BEEN PERFORATED IN ANY OTHER ZONE(S)? No  
 LIST ALL SUCH PERFORATED INTERVALS AND GIVE PLUGGING  
 DETAILS (SACKS OF CEMENT OR BRIDGE PLUG(S) USED):
5. GIVE DEPTH TO AND NAME OF ANY OVERLYING AND/OR  
 UNDERLYING OIL OR GAS ZONES (POOLS) IN THIS AREA:                       
None known.

APACHE STATE "27" #02  
NE-SW 27-T12S-R31E  
CHAVES COUNTY, NEW MEXICO

8 5/8 SURFACE CASING  
AT 454' WITH  
CEMENT CIRCULATED

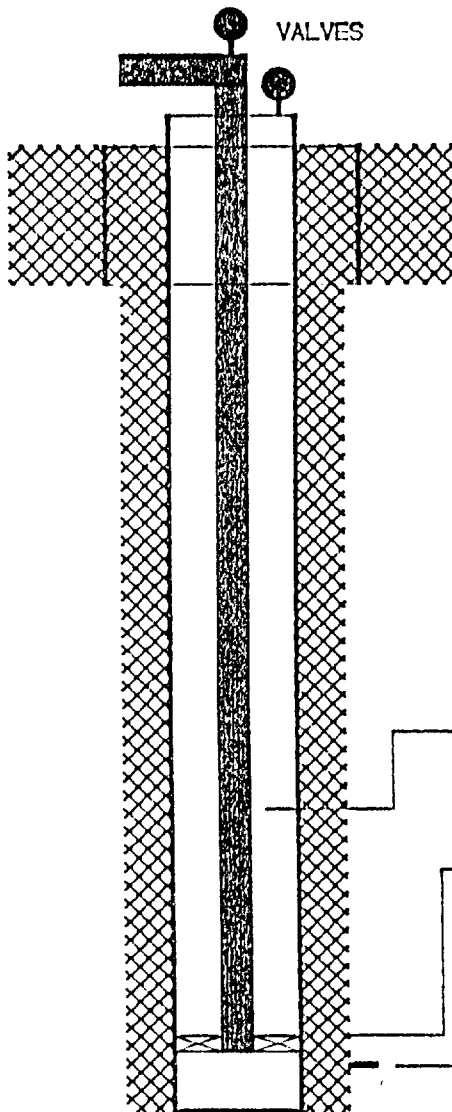
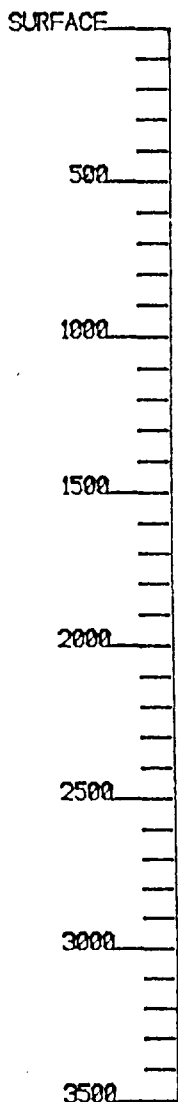
2 3/8 PLASTIC LINED TUBING

INJECTION PACKER  
AT APPROX. 2950

PERFORATIONS  
2996-3000

5 1/2 PRODUCTION CASING  
AT 3150' (TD) WITH  
CEMENT CIRCULATED

 CEMENT



## INJECTION WELL DATA SHEET

OPERATOR: Yates Drilling Co. LEASE: Burkitt Federal  
WELL NO.: 3 FOOTAGE: 330' ENL-2310' FWL SEC: 34-T12s-R31e

## TUBULAR DATA

## SURFACE CASING

SIZE: 8-5/8" 24# CEMENTED WITH: 270 SX.  
TOC: Surface FEET DETERMINED BY: Circulation  
HOLE SIZE: 12-1/4" SETTING DEPTH: 424

## INTERMEDIATE CASING

SIZE: None CEMENTED WITH: \_\_\_\_\_ SX.  
TOC: \_\_\_\_\_ FEET DETERMINED BY: \_\_\_\_\_  
HOLE SIZE: \_\_\_\_\_ SETTING DEPTH: \_\_\_\_\_

## LONG STRING

SIZE: 5-1/2" 14# CEMENTED WITH: 260 SX.  
TOC: 1640' FEET DETERMINED BY: Temp. Survey  
HOLE SIZE: 7-7/8" SETTING DEPTH: 3083'  
TOTAL DEPTH: 3100'

## INJECTION INTERVAL

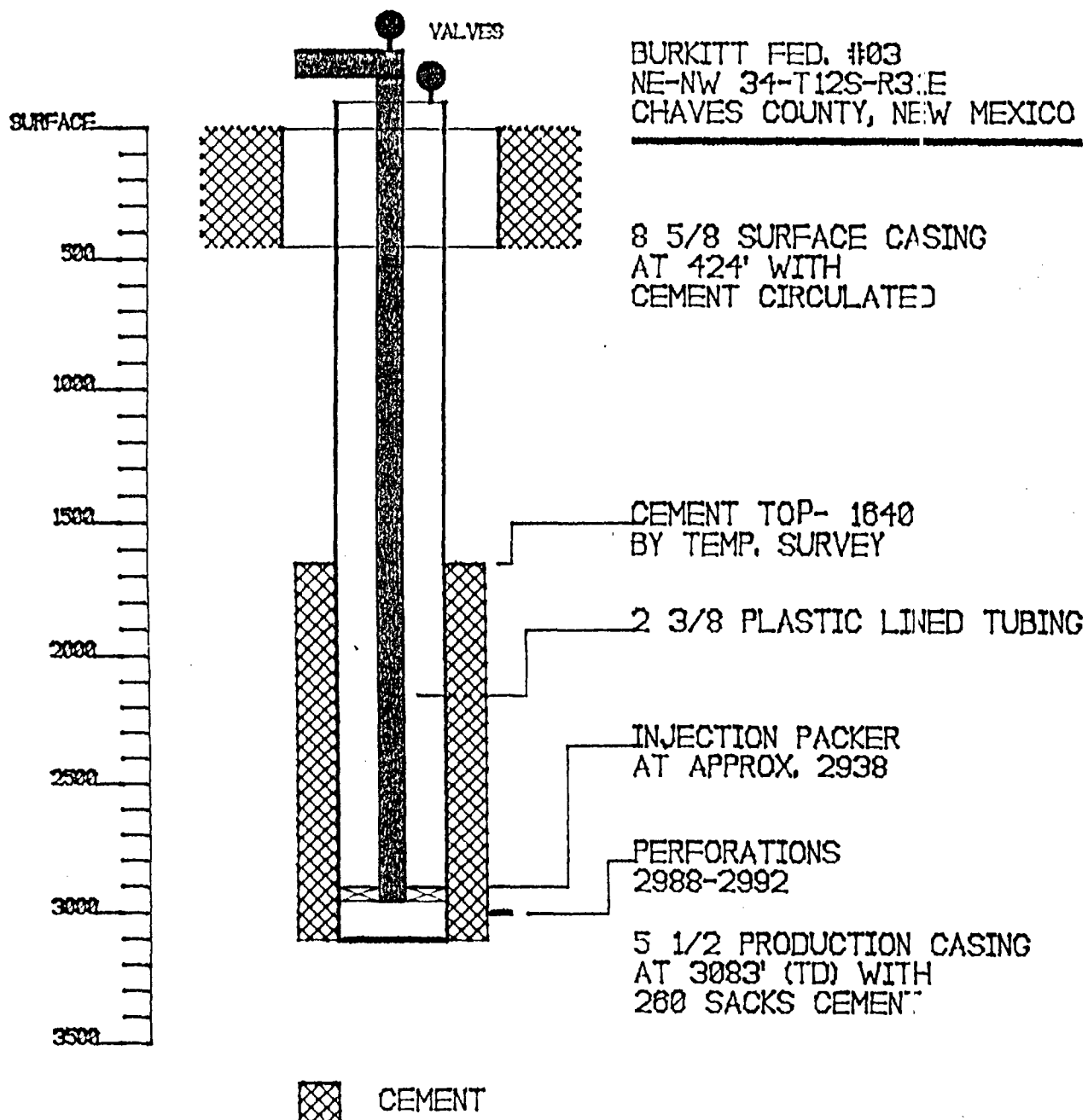
2988' FEET TO 2992' FEET - PERFORATED

## TUBING

TUBING SIZE: 2-3/8" LINED WITH: Plastic SET IN A  
Baker AD-1 PACKER AT: 2938' FEET

## OTHER DATA

1. NAME OF INJECTION FORMATION: Queen
2. NAME OF FIELD OR POOL (IF APPLICABLE): SE Chaves Queen
3. IS THIS A NEW WELL DRILLED FOR INJECTION? No  
IF NO, FOR WHAT PURPOSE WAS THE WELL ORIGINALLY DRILLED?  
This well was drilled as a Queen producing well.
4. HAS WELL EVER BEEN PERFORATED IN ANY OTHER ZONE(S)? No  
LIST ALL SUCH PERFORATED INTERVALS AND GIVE PLUGGING  
DETAILS (SACKS OF CEMENT OR BRIDGE PLUG(S) USED): \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_
5. GIVE DEPTH TO AND NAME OF ANY OVERLYING AND/OR  
UNDERLYING OIL OR GAS ZONES (POOLS) IN THIS AREA: \_\_\_\_\_  
None known.



# INJECTION WELL DATA SHEET

OPERATOR: Yates Drilling Co. LEASE: Garner Federal  
 WELL NO.: 7 FOOTAGE: 660' FSL-1980' FEL SEC: 27-T12s-R31e

## TUBULAR DATA

### SURFACE CASING

SIZE: 8-5/8" 24# CEMENTED WITH: 250 SX.  
 TOC: Surface FEET DETERMINED BY: Circulation  
 HOLE SIZE: 12-1/4" SETTING DEPTH: 424

### INTERMEDIATE CASING

SIZE: None CEMENTED WITH:  SX.  
 TOC:  FEET DETERMINED BY:   
 HOLE SIZE:  SETTING DEPTH:

### LONG STRING

SIZE: 5-1/2" 14# CEMENTED WITH: 270 SX.  
 TOC: 1900' FEET DETERMINED BY: Temp. Survey  
 HOLE SIZE: 7-7/8" SETTING DEPTH: 3098.54'  
 TOTAL DEPTH: 3100'

### INJECTION INTERVAL

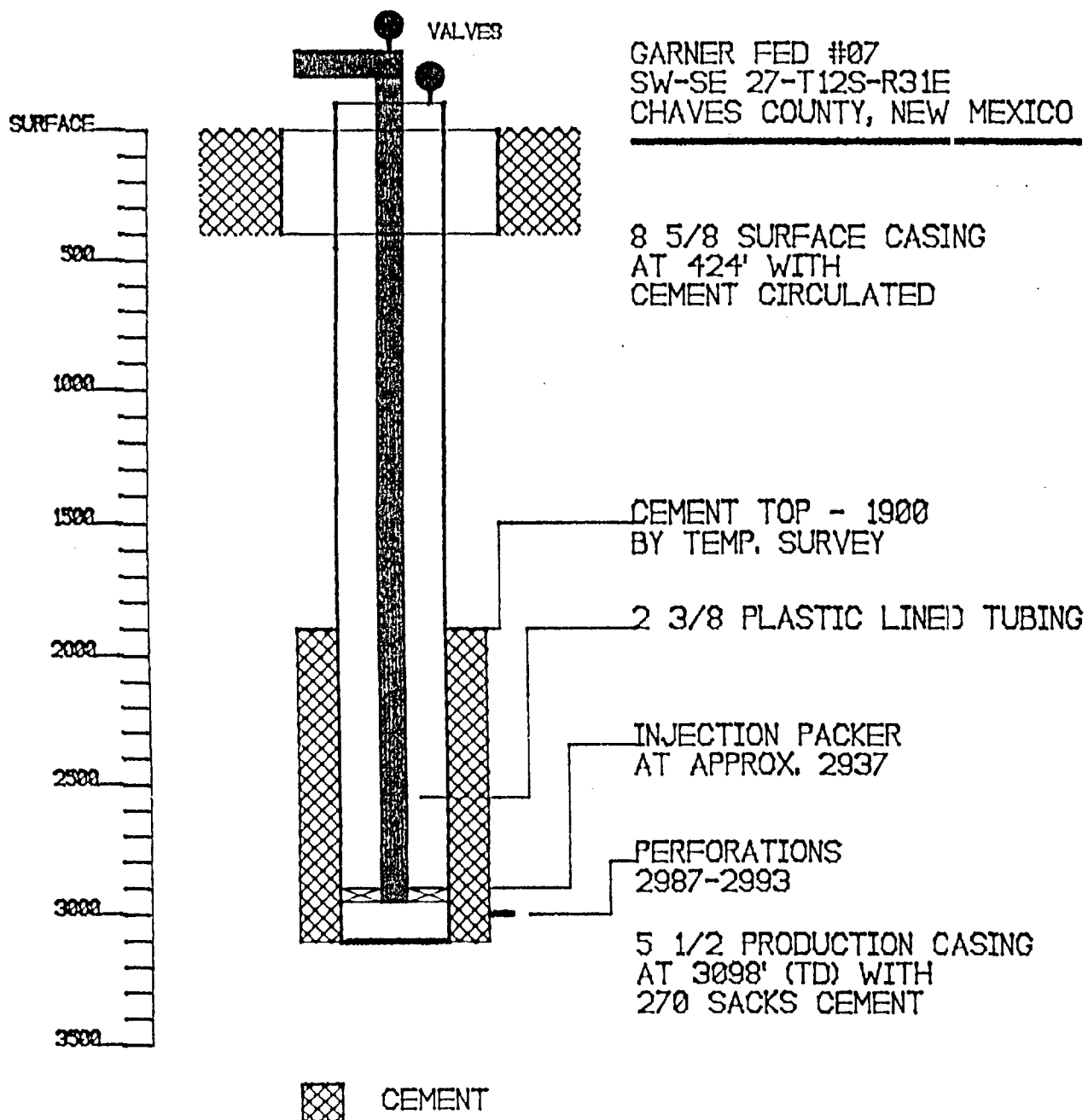
2987' FEET TO 2993' FEET - PERFORATED

### TUBING

TUBING SIZE: 2-3/8" LINED WITH: Elastic SET IN A  
Baker AD-1 PACKER AT: 2937' FEET

## OTHER DATA

1. NAME OF INJECTION FORMATION: Queen
2. NAME OF FIELD OR POOL (IF APPLICABLE): SE Chaves Queen
3. IS THIS A NEW WELL DRILLED FOR INJECTION? No  
 IF NO, FOR WHAT PURPOSE WAS THE WELL ORIGINALLY DRILLED?  
This well was drilled as a Queen producing well.
4. HAS WELL EVER BEEN PERFORATED IN ANY OTHER ZONE(S)? No  
 LIST ALL SUCH PERFORATED INTERVALS AND GIVE PLUGGING  
 DETAILS (SACKS OF CEMENT OR BRIDGE PLUG(S) USED):
5. GIVE DEPTH TO AND NAME OF ANY OVERLYING AND/OR  
 UNDERLYING OIL OR GAS ZONES (POOLS) IN THIS AREA:   
None known.



# WELL DATA SHEET

OPERATOR: Yates Drilling Company LEASE: Apache "27" State  
 WELL NO.: 1 FOOTAGE: 330' FSL-2310' FWL SEC: 27-T12s-R31e

## TUBULAR DATA

### SURFACE CASING

SIZE: 8-5/8" CEMENTED WITH: SX.  
 TOC: Surface FEET DETERMINED BY: Circulation  
 HOLE SIZE: 12-1/4" SETTING DEPTH: 422'

### INTERMEDIATE CASING

SIZE: None CEMENTED WITH: SX.  
 TOC:  FEET DETERMINED BY:   
 HOLE SIZE:  SETTING DEPTH:

### LONG STRING

SIZE: 4-1/2" CEMENTED WITH: SX.  
 TOC: 210' FEET DETERMINED BY:   
 HOLE SIZE: 7-7/8" SETTING DEPTH: 3150'  
 TOTAL DEPTH: 3150'

## PRODUCING INTERVAL

FORMATION: Queen POOL OR FIELD: SE Chaves Queen  
 SPUD DATE: 5-9-85 COMPLETION DATE: 6-27-85  
 PERFORATED: 2984 FEET TO 2991 FEET

STIMULATION: 100 gals. 15% HCl acid, 12000 gals. gel water  
4000 gals. CO2, 10500# 20/40 sand, 10000# 12/20 sand

OTHER PERFORATED ZONES: None

## CURRENT STATUS

WHAT IS CURRENT STATUS OF WELL? Pumping oil well

IF P&A, LIST PLUGGING DETAILS:

# WELL DATA SHEET

OPERATOR: Yates Drilling Company LEASE: Apache "27" State

WELL NO.: 2 FOOTAGE: 1650' FSL-2310' FEL SEC: 27-T12s-R31e

## TUBULAR DATA

### SURFACE CASING

SIZE: 8-5/8" CEMENTED WITH: SX.  
 TOC: Surface FEET DETERMINED BY: Circulation  
 HOLE SIZE: 12-1/4" SETTING DEPTH: 454'

### INTERMEDIATE CASING

SIZE: None CEMENTED WITH: SX.  
 TOC:  FEET DETERMINED BY:   
 HOLE SIZE:  SETTING DEPTH:

### LONG STRING

SIZE: 4-1/2" CEMENTED WITH: SX.  
 TOC: Surface FEET DETERMINED BY: Circulation  
 HOLE SIZE: 7-7/8" SETTING DEPTH: 3150'  
 TOTAL DEPTH: 3150'

## PRODUCING INTERVAL

FORMATION: Queen POOL OR FIELD: SE Chaves Queen  
 SPUD DATE: 7-29-85 COMPLETION DATE: 8-23-85  
 PERFORATED: 2996 FEET TO 3000 FEET

STIMULATION: 850 gals. 15% HCl acid, 16000 gals. gel water  
25% CO2, 10500# 20/40 sand, 10000# 12/20 sand

OTHER PERFORATED ZONES: None

## CURRENT STATUS

WHAT IS CURRENT STATUS OF WELL? Pumping oil well

IF P&A, LIST PLUGGING DETAILS:

# WELL DATA SHEET

OPERATOR: Yates Drilling Co. LEASE: Burkitt Federal

WELL NO.: 1 FOOTAGE: 2310' ENL-1980' FEL SEC: 34-T12s-R31e

## TUBULAR DATA

### SURFACE CASING

SIZE: 8-5/8" 24# CEMENTED WITH: 300 SX.  
TOC: Surface FEET DETERMINED BY: Circulation  
HOLE SIZE: 12-1/4" SETTING DEPTH: 450'

### INTERMEDIATE CASING

SIZE: None CEMENTED WITH: \_\_\_\_\_ SX.  
TOC: \_\_\_\_\_ FEET DETERMINED BY: \_\_\_\_\_  
HOLE SIZE: \_\_\_\_\_ SETTING DEPTH: \_\_\_\_\_

### LONG STRING

SIZE: 5-1/2" 14# CEMENTED WITH: 360 SX.  
TOC: 1450' FEET DETERMINED BY: Temp. Survey  
HOLE SIZE: 7-7/8" SETTING DEPTH: 3080'  
TOTAL DEPTH: 3100'

## PRODUCING INTERVAL

FORMATION: Queen POOL OR FIELD: SE Chaves Queen  
SPUD DATE: 3-23-84 COMPLETION DATE: 4-7-84  
PERFORATED: 2874 FEET TO 2882 FEET

STIMULATION: 750 gals. 15% HCl acid, 20000 gals. 30# gel,  
25% CO2, 16500# 20/40 sand, 6000# 12/20 sand

OTHER PERFORATED ZONES: None

## CURRENT STATUS

WHAT IS CURRENT STATUS OF WELL? Pumping oil well

IF P&A, LIST PLUGGING DETAILS: \_\_\_\_\_

# WELL DATA SHEET

OPERATOR: Yates Drilling Co. LEASE: Burkitt Federal  
 WELL NO.: 2 FOOTAGE: 1650' FNL - 990' FWL SEC: 34-T12s-R31e

## TUBULAR DATA

### SURFACE CASING

SIZE: 8-5/8" 24# CEMENTED WITH: 375 SX.  
 TOC: Surface FEET DETERMINED BY: Circulation  
 HOLE SIZE: 12-1/4" SETTING DEPTH: 370'

### INTERMEDIATE CASING

SIZE: None CEMENTED WITH:  SX.  
 TOC:  FEET DETERMINED BY:   
 HOLE SIZE:  SETTING DEPTH:

### LONG STRING

SIZE: 5-1/2" 14# CEMENTED WITH: 250 SX.  
 TOC: 1678' FEET DETERMINED BY: Cement Bond Log  
 HOLE SIZE: 7-7/8" SETTING DEPTH: 2845'  
 TOTAL DEPTH: 2850'

## PRODUCING INTERVAL

FORMATION: Queen POOL OR FIELD: SE Chaves Queen  
 SPUD DATE: 5-5-84 COMPLETION DATE: 7-10-84  
 PERFORATED: 2754 FEET TO 2760 FEET

STIMULATION: 750 gals. 15% HCl acid, 15000 gals. 30# gel,  
5000 gals CO2, 14500# 20/40 sand, 2500# 12/20 sand

OTHER PERFORATED ZONES: None

## CURRENT STATUS

WHAT IS CURRENT STATUS OF WELL? Pumping oil well

IF P&A, LIST PLUGGING DETAILS:

# WELL DATA SHEET

OPERATOR: Yates Drilling Co. LEASE: Burkitt Federal  
 WELL NO.: 3 FOOTAGE: 330' ENL-2310' FWL SEC: 34-T12s-R31e

## TUBULAR DATA

### SURFACE CASING

SIZE: 8-5/8" 24# CEMENTED WITH: 270 SX.  
 TOC: Surface FEET DETERMINED BY: Circulation  
 HOLE SIZE: 12-1/4" SETTING DEPTH: 424'

### INTERMEDIATE CASING

SIZE: None CEMENTED WITH:  SX.  
 TOC:  FEET DETERMINED BY:   
 HOLE SIZE:  SETTING DEPTH:

### LONG STRING

SIZE: 5-1/2" 14# CEMENTED WITH: 260 SX.  
 TOC: 1640' FEET DETERMINED BY: Temp. Survey  
 HOLE SIZE: 7-7/8" SETTING DEPTH: 3083'  
 TOTAL DEPTH: 3100'

## PRODUCING INTERVAL

FORMATION: Queen POOL OR FIELD: SE Chaves Queen  
 SPUD DATE: 8-9-85# COMPLETION DATE: 10-1-85  
 PERFORATED: 2988 FEET TO 2992 FEET

STIMULATION: 750 gals. 15% HCl acid, 15000 gals. gel water  
24 tons CO2, 12000# 20/40 sand, 7000# 12/20 sand

OTHER PERFORATED ZONES: None

## CURRENT STATUS

WHAT IS CURRENT STATUS OF WELL? Pumping oil well

IF P&A, LIST PLUGGING DETAILS:

## WELL DATA SHEET

OPERATOR: Yates Drilling Co. LEASE: DeLuna Federal  
WELL NO.: 3 FOOTAGE: 330' FNL-1980' FEL SEC: 34-T12s-R31e

## TUBULAR DATA

## SURFACE CASING

SIZE: 8-5/8" 24# CEMENTED WITH: 300 SX.  
TOC: Surface FEET DETERMINED BY: Circulation  
HOLE SIZE: 12-1/4" SETTING DEPTH: 433'

## INTERMEDIATE CASING

SIZE: None CEMENTED WITH: \_\_\_\_\_ SX.  
TOC: \_\_\_\_\_ FEET DETERMINED BY: \_\_\_\_\_  
HOLE SIZE: \_\_\_\_\_ SETTING DEPTH: \_\_\_\_\_

## LONG STRING

SIZE: 5-1/2" 14# CEMENTED WITH: 410 SX.  
TOC: 1900' FEET DETERMINED BY: Cement Bond Log  
HOLE SIZE: 7-7/8" SETTING DEPTH: 3094'  
TOTAL DEPTH: 3100'

## PRODUCING INTERVAL

FORMATION: Queen POOL OR FIELD: SE Chaves Queen  
SPUD DATE: 2-11-85 COMPLETION DATE: 3-20-85  
PERFORATED: 2987-1/2 FEET TO 2993 FEET

STIMULATION: 750 gals. 15% hcl. 15000 gals. 30# gel. 23-1/2  
tons CO2. 13000# 20/40 sand. 10000# 10/20 sand

OTHER PERFORATED ZONES: None

## CURRENT STATUS

WHAT IS CURRENT STATUS OF WELL? Pumping oil well

IF P&A, LIST PLUGGING DETAILS: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

# WELL DATA SHEET

OPERATOR: Yates Drilling Co. LEASE: Doyal  
WELL NO.: 1 FOOTAGE: 660' FNL - 990' FEL SEC: 34-T12s-R31e

## TUBULAR DATA

### SURFACE CASING

SIZE: 8-5/8" 24# CEMENTED WITH: 250 SX.  
TOC: Surface FEET DETERMINED BY: Circulation  
HOLE SIZE: 12-1/4" SETTING DEPTH: 409.46'

### INTERMEDIATE CASING

SIZE: None CEMENTED WITH: \_\_\_\_\_ SX.  
TOC: \_\_\_\_\_ FEET DETERMINED BY: \_\_\_\_\_  
HOLE SIZE: \_\_\_\_\_ SETTING DEPTH: \_\_\_\_\_

### LONG STRING

SIZE: 5-1/2" CEMENTED WITH: 250 SX.  
TOC: 2200' FEET DETERMINED BY: Temp. Survey  
HOLE SIZE: 7-7/8" SETTING DEPTH: 3098'  
TOTAL DEPTH: 3100'

## PRODUCING INTERVAL

FORMATION: Queen POOL OR FIELD: SE Chaves Queen  
SPUD DATE: 7-31-84 COMPLETION DATE: 8-25-84  
PERFORATED: 2982' FEET TO 2989' FEET

STIMULATION: 750 gallons of 15 % HCl, 15000 gallons 30# gel  
, 5000 SCF N2 per barrel, 10900# 20/40 sand, and 4200# 10/20  
sand.

OTHER PERFORATED ZONES: None

## CURRENT STATUS

WHAT IS CURRENT STATUS OF WELL? Pumping oil well.

IF P&A, LIST PLUGGING DETAILS:

# WELL DATA SHEET

OPERATOR: Yates Drilling Co. LEASE: Doyal  
 WELL NO.: 2 FOOTAGE: 500' FSL - 760' FEL SEC: 27-T12s-R31e

## TUBULAR DATA

### SURFACE CASING

SIZE: 8-5/8" 24# CEMENTED WITH: 275 SX.  
 TOC: Surface FEET DETERMINED BY: Circulation  
 HOLE SIZE: 12-1/4" SETTING DEPTH: 411'

### INTERMEDIATE CASING

SIZE: None CEMENTED WITH: \_\_\_\_\_ SX.  
 TOC: \_\_\_\_\_ FEET DETERMINED BY: \_\_\_\_\_  
 HOLE SIZE: \_\_\_\_\_ SETTING DEPTH: \_\_\_\_\_

### LONG STRING

SIZE: 5-1/2" CEMENTED WITH: 250 SX.  
 TOC: 2200' FEET DETERMINED BY: Temp. Survey  
 HOLE SIZE: 7-7/8" SETTING DEPTH: 3098'  
 TOTAL DEPTH: 3100'

## PRODUCING INTERVAL

FORMATION: Queen POOL OR FIELD: SE Chaves Queen  
 SPUD DATE: 9-7-84 COMPLETION DATE: 9-20-84  
 PERFORATED: 2981' FEET TO 2987' FEET

STIMULATION: 750 gallons of 15% HCl, 15000 gallons 30# gel  
, 25% CO2 12000# 20/40 sand, 10000# 10/20 sand.

OTHER PERFORATED ZONES: None

## CURRENT STATUS

WHAT IS CURRENT STATUS OF WELL? Pumping oil well.

IF P&A, LIST PLUGGING DETAILS: \_\_\_\_\_

# WELL DATA SHEET

OPERATOR: Yates Drilling Co. LEASE: Doyal  
 WELL NO.: 3 FOOTAGE: 1980' FSL - 990' FEL SEC: 27-T12s-R31e

## TUBULAR DATA

### SURFACE CASING

SIZE: 8-5/8" 24# CEMENTED WITH: 260 SX.  
 TOC: Surface FEET DETERMINED BY: Circulation  
 HOLE SIZE: 12-1/4" SETTING DEPTH: 409'

### INTERMEDIATE CASING

SIZE: None CEMENTED WITH: \_\_\_\_\_ SX.  
 TOC: \_\_\_\_\_ FEET DETERMINED BY: \_\_\_\_\_  
 HOLE SIZE: \_\_\_\_\_ SETTING DEPTH: \_\_\_\_\_

### LONG STRING

SIZE: 5-1/2" 14# CEMENTED WITH: 850 SX.  
 TOC: 630' FEET DETERMINED BY: Temp. Survey  
 HOLE SIZE: 7-7/8" SETTING DEPTH: 3099'  
 TOTAL DEPTH: 3100'

## PRODUCING INTERVAL

FORMATION: Queen POOL OR FIELD: SE Chaves Queen  
 SPUD DATE: 9-20-84 COMPLETION DATE: NONE  
 PERFORATED: 2991' FEET TO 2997' FEET

STIMULATION: 750 gallons of 15 % HCl, 15000 gallons 30# gel  
. 25% CD2 20000# 20/40 sand, 10000# 10/20 sand.

OTHER PERFORATED ZONES: None

## CURRENT STATUS

WHAT IS CURRENT STATUS OF WELL? Temp. Abandoned

IF P&A, LIST PLUGGING DETAILS:

# WELL DATA SHEET

OPERATOR: Yates Drilling Co. LEASE: Doyal  
 WELL NO.: 4 FOOTAGE: 330'ESL- 330'FWL SEC: 26-T12s-R31e

## TUBULAR DATA

### SURFACE CASING

SIZE: 8-5/8" 24# CEMENTED WITH: 250 SX.  
 TOC: Surface FEET DETERMINED BY: Circulation  
 HOLE SIZE: 12-1/4" SETTING DEPTH: 400'

### INTERMEDIATE CASING

SIZE: None CEMENTED WITH:  SX.  
 TOC:  FEET DETERMINED BY:   
 HOLE SIZE:  SETTING DEPTH:

### LONG STRING

SIZE: 5-1/2" 14# CEMENTED WITH: 975 SX.  
 TOC: 310' FEET DETERMINED BY: Temp. Survey  
 HOLE SIZE: 7-7/8" SETTING DEPTH: 3088'  
 TOTAL DEPTH: 3100'

## PRODUCING INTERVAL

FORMATION: Queen POOL OR FIELD: SE Chaves Queen  
 SPUD DATE: 11-19-84 COMPLETION DATE: 1-24-87  
 PERFORATED: 2982' FEET TO 2985' FEET

STIMULATION: 750 gallons of 15 % HCl, 15000 gallons 30# gel  
, 22 tons CO2, 12000# 20/40 sand, 8500 # 12/20 sand.

OTHER PERFORATED ZONES: None

## CURRENT STATUS

WHAT IS CURRENT STATUS OF WELL? Pumping oil well

IF F&A, LIST PLUGGING DETAILS:

# WELL DATA SHEET

OPERATOR: Yates Drilling Co. LEASE: Gallagher State

WELL NO.: 1 FOOTAGE: 330'FNL- 330'FWL SEC: 35-T12s-R31e

## TUBULAR DATA

### SURFACE CASING

SIZE: 8-5/8" 24# CEMENTED WITH: 250 SX.  
TOC: Surface FEET DETERMINED BY: Circulation  
HOLE SIZE: 12-1/4" SETTING DEPTH: 433'

### INTERMEDIATE CASING

SIZE: None CEMENTED WITH: \_\_\_\_\_ SX.  
TOC: \_\_\_\_\_ FEET DETERMINED BY: \_\_\_\_\_  
HOLE SIZE: \_\_\_\_\_ SETTING DEPTH: \_\_\_\_\_

### LONG STRING

SIZE: 5-1/2" 14# CEMENTED WITH: 900 SX.  
TOC: Surface FEET DETERMINED BY: Circulation  
HOLE SIZE: 7-7/8" SETTING DEPTH: 3084'  
TOTAL DEPTH: 3100'

## PRODUCING INTERVAL

FORMATION: Queen POOL OR FIELD: SE Chaves Queen  
SPUD DATE: 10-28-84 COMPLETION DATE: 11-9-84  
PERFORATED: 2982' FEET TO 2987' FEET

STIMULATION: 650 gallons of 15 % HCl, 15000 gallons 30# gel  
, 22 tons CO2, 12000# 20/40 sand, 10750# 10/20 sand.

OTHER PERFORATED ZONES: None

## CURRENT STATUS

WHAT IS CURRENT STATUS OF WELL? Pumping oil well

IF P&A, LIST PLUGGING DETAILS: \_\_\_\_\_

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

# WELL DATA SHEET

OPERATOR: Yates Drilling Co. LEASE: Garner Federal  
WELL NO.: 2 FOOTAGE: 2310' FSL-2310' FEL SEC: 34-T12s-R31e

## TUBULAR DATA

### SURFACE CASING

SIZE: 8-5/8" 24# CEMENTED WITH: 250 SX.  
TOC: Surface FEET DETERMINED BY: Circulation  
HOLE SIZE: 12-1/4" SETTING DEPTH: 410'

### INTERMEDIATE CASING

SIZE: None CEMENTED WITH:                      SX.  
TOC:                      FEET DETERMINED BY:                       
HOLE SIZE:                      SETTING DEPTH:                     

### LONG STRING

SIZE: 5-1/2" 14# CEMENTED WITH: 550 SX.  
TOC: 1992' FEET DETERMINED BY: Cement Bond Log  
HOLE SIZE: 7-7/8" SETTING DEPTH: 3098'  
TOTAL DEPTH: 3100'

## PRODUCING INTERVAL

FORMATION: Queen POOL OR FIELD: SE Chaves Queen  
SPUD DATE: 4-29-84 COMPLETION DATE: 6-1-84  
PERFORATED: 2982 FEET TO 2990 FEET

STIMULATION: 750 gals. 15% HCl acid, 20000 gals. 30# gel,  
25% CO2, 16500# 20/40 sand, 1700# 12/20 sand

OTHER PERFORATED ZONES: None

## CURRENT STATUS

WHAT IS CURRENT STATUS OF WELL? Pumping oil well

IF P&A, LIST PLUGGING DETAILS:

WELL DATA SHEET

OPERATOR: Yates Drilling Co. LEASE: Garner Federal  
WELL NO.: 3 FOOTAGE: 1980' ENL-1980' FEL SEC: 34-T12s-R31e

TUBULAR DATA

SURFACE CASING

SIZE: 8-5/8" 24# CEMENTED WITH: 225 SX.  
TOC: Surface FEET DETERMINED BY: Circulation  
HOLE SIZE: 12-1/4" SETTING DEPTH: 408'

INTERMEDIATE CASING

SIZE: None CEMENTED WITH: \_\_\_\_\_ SX.  
TOC: \_\_\_\_\_ FEET DETERMINED BY: \_\_\_\_\_  
HOLE SIZE: \_\_\_\_\_ SETTING DEPTH: \_\_\_\_\_

LONG STRING

SIZE: 5-1/2" 14# CEMENTED WITH: 250 SX.  
TOC: 1810' FEET DETERMINED BY: Temp. Survey  
HOLE SIZE: 7-7/8" SETTING DEPTH: 3100'  
TOTAL DEPTH: 3100'

PRODUCING INTERVAL

FORMATION: Queen POOL OR FIELD: SE Craves Queen  
SPUD DATE: 2-2-84 COMPLETION DATE: 8-12-84  
PERFORATED: 2981 FEET TO 2986 FEET

STIMULATION: 750 gals. 15% HCl acid, 13000 gals. 30# gel,  
5000 SCE N2 per barre, 1500# 20/40 sand, 1700# 12/20 sand

OTHER PERFORATED ZONES: None

CURRENT STATUS

WHAT IS CURRENT STATUS OF WELL? Pumping oil well  
IF P&A, LIST PLUGGING DETAILS: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

# WELL DATA SHEET

OPERATOR: Yates Drilling Co. LEASE: Garner Federal  
WELL NO.: 7 FOOTAGE: 660' FSL-1980' FEL SEC: 27-T12s-R31e

## TUBULAR DATA

### SURFACE CASING

SIZE: 8-5/8" 24# CEMENTED WITH: 250 SX.  
TOC: Surface FEET DETERMINED BY: Circulation  
HOLE SIZE: 12-1/4" SETTING DEPTH: 424'

### INTERMEDIATE CASING

SIZE: None CEMENTED WITH:  SX.  
TOC:  FEET DETERMINED BY:   
HOLE SIZE:  SETTING DEPTH:

### LONG STRING

SIZE: 5-1/2" 14# CEMENTED WITH: 270 SX.  
TOC: 1900' FEET DETERMINED BY: Temp. Survey  
HOLE SIZE: 7-7/8" SETTING DEPTH: 3098.54'  
TOTAL DEPTH: 3100'

## PRODUCING INTERVAL

FORMATION: Queen POOL OR FIELD: SE Chaves Queen  
SPUD DATE: 10-14-84 COMPLETION DATE: 10-30-84  
PERFORATED: 2987' FEET TO 2993' FEET

STIMULATION: 750 gallons of 15 % HCl, 15000 gallons 30# gel  
, 1000 SCF/BEL CO2 13000# 20/40 sand, 9000# 10/20 sand

OTHER PERFORATED ZONES: None

## CURRENT STATUS

WHAT IS CURRENT STATUS OF WELL? Pumping oil well  
IF P&A, LIST PLUGGING DETAILS:

# WELL DATA SHEET

OPERATOR: Yates Drilling Co. LEASE: Garner Federal  
 WELL NO.: 9 FOOTAGE: 1650' FSL-2310' FEL SEC: 27-T12s-R31e

## TUBULAR DATA

### SURFACE CASING

SIZE: 8-5/8" 24# CEMENTED WITH: 250 SX.  
 TOC: Surface FEET DETERMINED BY: Circulation  
 HOLE SIZE: 12-1/4" SETTING DEPTH: 428'

### INTERMEDIATE CASING

SIZE: None CEMENTED WITH:  SX.  
 TOC:  FEET DETERMINED BY:   
 HOLE SIZE:  SETTING DEPTH:

### LONG STRING

SIZE: 5-1/2" 14# CEMENTED WITH: 320 SX.  
 TOC: 1820' FEET DETERMINED BY: Temp. Survey  
 HOLE SIZE: 7-7/8" SETTING DEPTH: 3098'  
 TOTAL DEPTH: 3100'

## PRODUCING INTERVAL

FORMATION: Queen POOL OR FIELD: SE Chaves Queen  
 SPUD DATE: 11-11-84 COMPLETION DATE: 11-30-84  
 PERFORATED: 2985' FEET TO 2995' FEET

STIMULATION: 750 gallons of 15 % HCl, 15000 gallons 30# gel  
. 16 tons of CO2, 18000# 20/40 sand, 12500# 10/20 sand

OTHER PERFORATED ZONES: None

## CURRENT STATUS

WHAT IS CURRENT STATUS OF WELL? Pumping oil well

IF P&A, LIST PLUGGING DETAILS:

# WELL DATA SHEET

OPERATOR: Yates Drilling Co. LEASE: Rich Federal  
 WELL NO.: 1 FOOTAGE: 2310' FNL-2310' FEL SEC: 27-T12s-R31e

## TUBULAR DATA

### SURFACE CASING

SIZE: 8-5/8" 24# CEMENTED WITH: 250 SX.  
 TOC: Surface FEET DETERMINED BY: Circulation  
 HOLE SIZE: 12-1/4" SETTING DEPTH: 412'

### INTERMEDIATE CASING

SIZE: None CEMENTED WITH:                      SX.  
 TOC:                      FEET DETERMINED BY:                       
 HOLE SIZE:                      SETTING DEPTH:                     

### LONG STRING

SIZE: None CEMENTED WITH:                      SX.  
 TOC:                      FEET DETERMINED BY:                       
 HOLE SIZE: 7-7/8" SETTING DEPTH:                       
 TOTAL DEPTH: 3100'

## PRODUCING INTERVAL

FORMATION: None POOL OR FIELD: SE Chaves Queen  
 SPUD DATE: 11-30-84 COMPLETION DATE: None  
 PERFORATED:                      FEET TO                      FEET

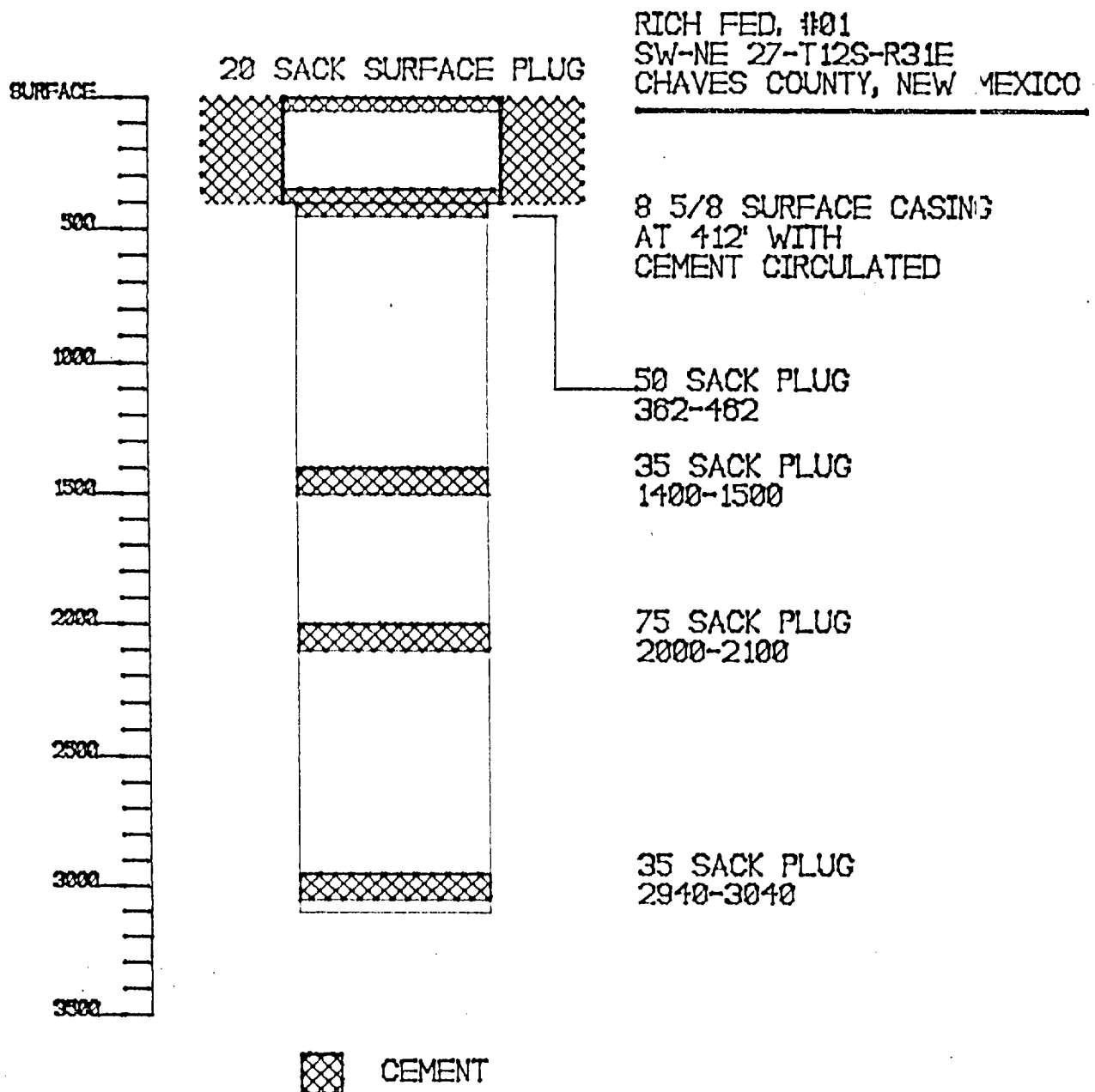
STIMULATION: None  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

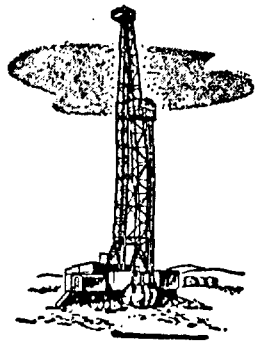
OTHER PERFORATED ZONES: None  
 \_\_\_\_\_  
 \_\_\_\_\_

## CURRENT STATUS

WHAT IS CURRENT STATUS OF WELL? Plugged and Abandoned

IF P&A, LIST PLUGGING DETAILS: P&A 12-12-84  
Plug 3040-2940' 35 sx Class "C" neat, Plug 2100-2000' 75 sx  
Class "C" w/2% CaCl2, plug 1500-1400' 35 sx Class "C" neat,  
Plug 462-362' 30 sx Class "C" w/2% CaCl2, Plug 50-Sur. 20sx  
Class "C" neat





## YATES DRILLING COMPANY

105 SOUTH FOURTH STREET — (505) 746-9889

FAX (505) 746-6480

TELEX 508891 (YPCART)

ARTESIA, NEW MEXICO 88210

May 31, 1989

PEYTON YATES  
PRESIDENT

S. P. YATES  
VICE PRESIDENT

RANDY G. PATTERSON  
SECRETARY

DENNIS G. KINSEY  
TREASURER

New Mexico State Engineer  
District 2 Office  
P.O. Box 1717  
Roswell, New Mexico 88202

Attention: Glen Brim, District Supervisor 

Gentlemen:

Yates Drilling Company is proposing to waterflood the Queen formation underlying portions of Township 12 South, Range 31 East and Township 13 South, Range 31 East, Chaves County, New Mexico.

To insure the protection of fresh water aquifers in this area we would like to obtain the location, depth and geological name of the producing formation for any water wells located in either described township. Additionally, the identification of any commercial water wells in the area would be helpful.

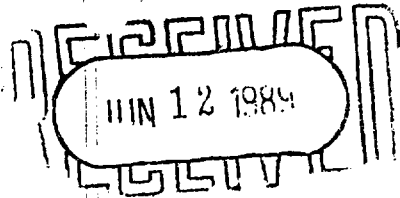
Any information that your office can provide concerning this matter will be greatly appreciated.

Sincerely yours,

YATES DRILLING COMPANY

  
Tobin L. Rhodes  
Petroleum Engineer

89 JUN 1 AM 8 35  
STATE ENGINEER OFFICE  
ROSWELL, NEW MEXICO



June 9, 1989

Yates Drilling Company

ATTN: Tobin L. Rhodes, Petroleum Engineer

Enclosed are well locations and some information pertaining to these wells. They were drilled and finished in the Ogallala Formation (TO). Record of other wells finished deeper on other water formations were found north of Township 12 South in Township 11 South, Range 31 East. These wells are finished in the Triassic Formation (TRC), depth of wells are between + 200 feet to 300 feet.

Johnny R. Hernandez

Basin Supervisor

Section 24 Township 12 South Range 31 East

|       |                                   |           |          |                                    |
|-------|-----------------------------------|-----------|----------|------------------------------------|
| -4993 | NE $\frac{1}{4}$ SW $\frac{1}{4}$ | Dom.      | T.D. 146 | 5 $\frac{1}{2}$ " casing - Shallow |
| -6649 | SE $\frac{1}{4}$ SE $\frac{1}{4}$ | Dom & Stk | T.D. 160 | 4 $\frac{1}{2}$ " casing - Shallow |

Section 26 Township 12 South Range 31 East

|        |                                   |                   |          |                     |
|--------|-----------------------------------|-------------------|----------|---------------------|
| -2117  | NW $\frac{1}{4}$ SW $\frac{1}{4}$ | Irr.              |          |                     |
| -6746  | SW $\frac{1}{4}$ NW $\frac{1}{4}$ | Dom. & Stk        | T.D. 166 | Not used - Shallow  |
| -6749  | SW $\frac{1}{4}$ SE $\frac{1}{4}$ | Comm. & DOM & STK | T.D. 198 | 6" casing - Shallow |
| L-9566 | SW $\frac{1}{4}$ SE $\frac{1}{4}$ | COM, Oil & Gas    | Same     |                     |

Well L-9566 is stock well L-6749\*\* Comm.

Section 27 Township 12 S Range 31 E.

|        |                                   |           |          |                                    |
|--------|-----------------------------------|-----------|----------|------------------------------------|
| L-6650 | SE $\frac{1}{4}$ NE $\frac{1}{4}$ | Dom & Stk | T.D. 160 | 4 $\frac{1}{2}$ " casing - Shallow |
|--------|-----------------------------------|-----------|----------|------------------------------------|

Section 35 Township 12 South Range 31 East

|            |                                                    |      |           |                   |
|------------|----------------------------------------------------|------|-----------|-------------------|
| L-2932     | SE $\frac{1}{4}$                                   | OWD  | T.D. 55   | Casing 8" Shallow |
| L-4170     | NW $\frac{1}{4}$ SE $\frac{1}{4}$ NW $\frac{1}{4}$ | Dom. |           |                   |
| L-4296     | NW $\frac{1}{4}$ NW $\frac{1}{4}$                  | WF   | Cancelled |                   |
| L-4296-X   | SW $\frac{1}{4}$ SW $\frac{1}{4}$                  | WF   | Cancelled |                   |
| L-4296-X-2 | NE $\frac{1}{4}$ NE $\frac{1}{4}$                  | WF   | Cancelled |                   |
| L-4296-X-3 | SE $\frac{1}{4}$ SE $\frac{1}{4}$                  | WF   | Cancelled |                   |

↑  
Nowells  
↓

## Section 23

Township 13 South Range 31 East

|             |                                   |      |
|-------------|-----------------------------------|------|
| L-3914-X-10 | SE $\frac{1}{4}$ SE $\frac{1}{4}$ | Ind. |
| L-3914-X-11 | SE $\frac{1}{4}$ NW $\frac{1}{4}$ | Ind. |
| L-3914-X-12 | NE $\frac{1}{4}$ NE $\frac{1}{4}$ | Ind. |
| L-3914-X-13 | SE $\frac{1}{4}$ SW $\frac{1}{4}$ | Ind. |
| L-3914-X-14 | NW $\frac{1}{4}$ SE $\frac{1}{4}$ | Ind. |

↑  
WELLS NOT DRILLED  
↓

## Section 24

Township 13 South Range 31 East

|            |                                                                     |      |
|------------|---------------------------------------------------------------------|------|
| L-3914     | NE $\frac{1}{4}$ SE $\frac{1}{4}$ SW $\frac{1}{4}$ NE $\frac{1}{4}$ | Ind. |
| L-3914-X   | NE $\frac{1}{4}$ SW $\frac{1}{4}$                                   | Ind. |
| L-3914-X-2 | NE $\frac{1}{4}$ NW $\frac{1}{4}$                                   | Ind. |
| L-3914-X-3 | SW $\frac{1}{4}$ SE $\frac{1}{4}$                                   | Ind. |
| L-3914-X-4 | SE $\frac{1}{4}$ NE $\frac{1}{4}$                                   | Ind. |
| L-3914-X-5 | NE $\frac{1}{4}$ SE $\frac{1}{4}$                                   | Ind. |
| L-3914-X-6 | NW $\frac{1}{4}$ NE $\frac{1}{4}$                                   | Ind. |
| L-3914-X-7 | NE $\frac{1}{4}$ NE $\frac{1}{4}$                                   | Ind. |
| L-3914-X-8 | SW $\frac{1}{4}$ NW $\frac{1}{4}$                                   | Ind. |
| L-3914-X-9 | SE $\frac{1}{4}$ NW $\frac{1}{4}$                                   | Ind. |

T.D. 176' 8 $\frac{5}{8}$ " casing - Shallow

↑  
WELLS NOT DRILLED  
↓

## Section 35

Township 13 South Range 31 East

|        |                                                    |      |
|--------|----------------------------------------------------|------|
| L-2849 | SW $\frac{1}{4}$ SE $\frac{1}{4}$ NW $\frac{1}{4}$ | Dom. |
|--------|----------------------------------------------------|------|

No well record info.

3460  
3461  
8837  
8837-X

SE $\frac{1}{4}$ NE $\frac{1}{4}$ SW $\frac{1}{4}$   
SE $\frac{1}{4}$ SE $\frac{1}{4}$ SE $\frac{1}{4}$   
SW $\frac{1}{4}$ SW $\frac{1}{4}$ SW $\frac{1}{4}$   
SW $\frac{1}{4}$ SW $\frac{1}{4}$ SW $\frac{1}{4}$

WF

WF

Com. & Stock

Com. & Stock

— T.D. 14- ' 8 $\frac{5}{8}$ " casing - Shallow  
— T.D. 220' 8 $\frac{5}{8}$ " casing - Shallow  
— Rptd to '65' 6" casing - Shallow  
— Rptd T.D. 190' 7" casing - Shallow

806  
833  
834  
835  
295

SE $\frac{1}{4}$ SE $\frac{1}{4}$ SE $\frac{1}{4}$   
NE $\frac{1}{4}$ NE $\frac{1}{4}$ SE $\frac{1}{4}$   
SW $\frac{1}{4}$ SE $\frac{1}{4}$ NE $\frac{1}{4}$   
SW $\frac{1}{4}$ SE $\frac{1}{4}$ NE $\frac{1}{4}$   
SE $\frac{1}{4}$ NE $\frac{1}{4}$

Stock

Com.

Dec.

Dec.

WF

NO well record info.

With drawn NO well

— Rptd — T.D. 165' 6 $\frac{7}{8}$ " casing - Shallow  
— Rptd — T.D. 165' 6 $\frac{7}{8}$ " casing - Shallow

3914

NE $\frac{1}{4}$ SE $\frac{1}{4}$ NE $\frac{1}{4}$

SRO

— T.D. 194' 8 $\frac{5}{8}$ " casing - Shallow

2745

NE $\frac{1}{4}$ NE $\frac{1}{4}$ SE $\frac{1}{4}$

SRO

— T.D. 216' 6 $\frac{1}{4}$ " casing - Shallow

934

NE $\frac{1}{4}$

OWD

NO well record info.

-3460

NE $\frac{1}{4}$ NE $\frac{1}{4}$

SRO

— T.D. 217' — 8 $\frac{5}{8}$ " casing - Shallow

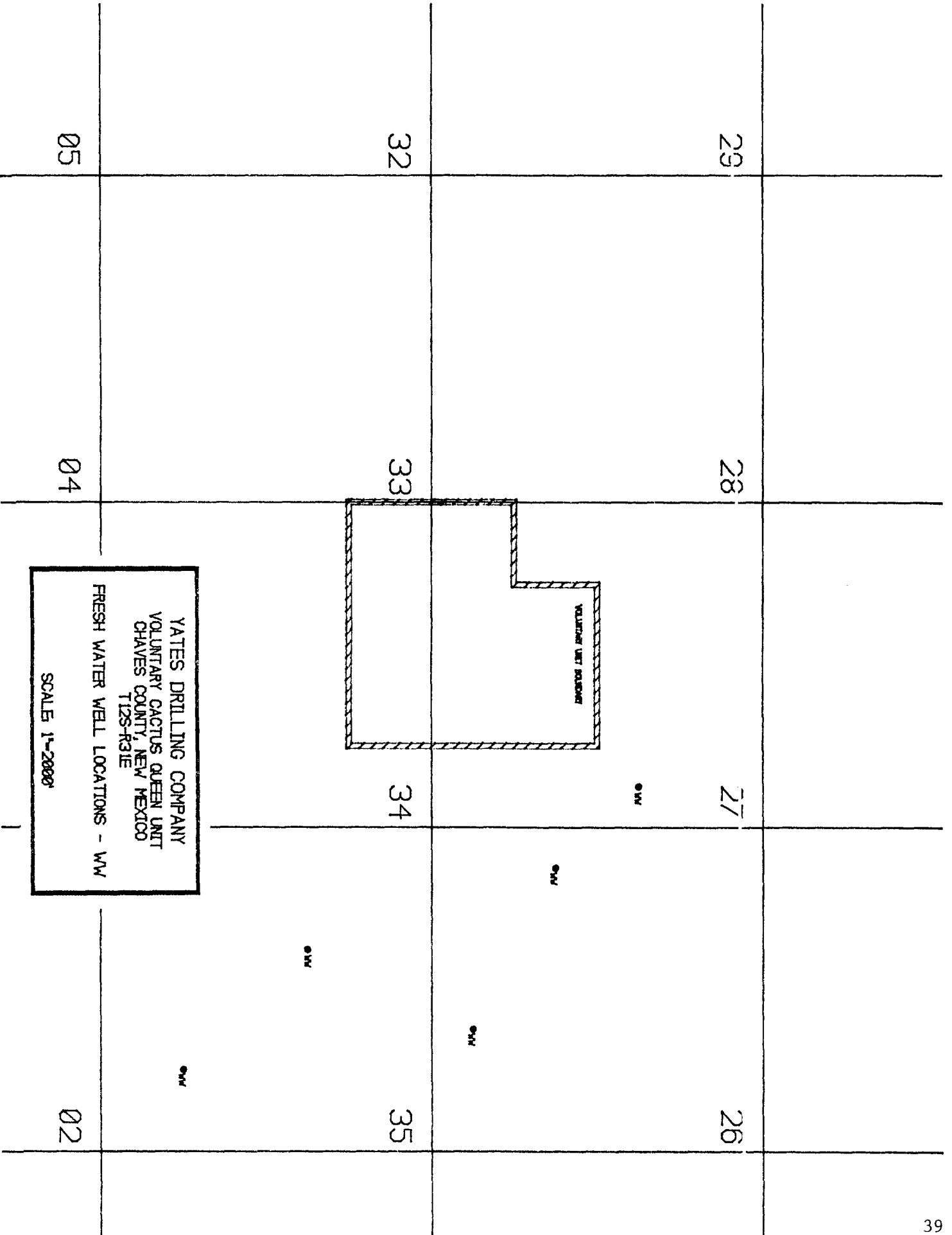
2933

NE $\frac{1}{2}$

OWD

NO well record info.

| SEC | TWN  | RNG  | UNIT<br>LTR | QTR<br>OF<br>UNIT | TD  | TYPE              | #       |
|-----|------|------|-------------|-------------------|-----|-------------------|---------|
| 24  | 112S | 131E | 1K          | 1?                | 148 | 1DOM.             | 1L4993  |
| 24  | 112S | 131E | 1P          | 1?                | 160 | 1DOM.             | 1L6649  |
| 26  | 112S | 131E | 1E          | 1?                | 166 | 1DOM. & STK       | 1L6746  |
| ✓26 | 112S | 131E | 1L          | 1?                | 1?  | 1IRR.             | 1L2117  |
| ✓26 | 112S | 131E | 1O          | 1?                | 198 | 1COM. (OIL & GAS) | 1L9566  |
| ✓26 | 112S | 131E | 1O          | 1?                | 198 | 1COM., DOM. & STK | 1L6749  |
| ✓27 | 112S | 131E | 1H          | 1?                | 160 | 1DOM. & STK       | 1L6650  |
| ✓35 | 112S | 131E | 1F          | 1NW               | 55  | 1DOM.             | 1L4170  |
| ✓35 | 112S | 131E | 1IJOP       | 1?                | 1?  | 1?                | 1L2932  |
| 1   | 113S | 131E | 1K          | 1SE               | 190 | 1WF               | 1L3460  |
| 1   | 113S | 131E | 1P          | 1SE               | 220 | 1WF               | 1L3461  |
| 1   | 113S | 131E | 1M          | 1SW               | 190 | 1COM. & STK       | 1L3837X |
| 1   | 113S | 131E | 1M          | 1SW               | 165 | 1COM. & STK       | 1L3837  |
| 2   | 113S | 131E | 1H          | 1SW               | 165 | 1DEC.             | 1L3834  |
| 2   | 113S | 131E | 1H          | 1?                | 1?  | 1WF               | 1L4295  |
| 2   | 113S | 131E | 1H          | 1NE               | 196 | 1SRO              | 1L3914  |
| 2   | 113S | 131E | 1H          | 1SW               | 165 | 1DEC.             | 1L3835  |
| 2   | 113S | 131E | 1P          | 1SE               | 1?  | 1?                | 1L3806  |
| 2   | 113S | 131E | 1I          | 1NE               | 216 | 1SRO              | 1L2745  |
| 12  | 113S | 131E | 1A          | 1?                | 217 | 1SRO              | 1L3460  |
| 13  | 113S | 131E | 1ABCD       | 1?                | 1?  | 1OWD              | 1L2933  |
| 24  | 113S | 131E | 1H          | 1NE               | 196 | 1IND.             | 1L3914  |
| 35  | 113S | 131E | 1F          | 1SW               | 1?  | 1DOM.             | 1L2849  |



YATES DRILLING COMPANY  
 VOLUNTARY CACTUS QUEEN UNIT  
 CHAVES COUNTY, NEW MEXICO  
 T12S-R31E  
 FRESH WATER WELL LOCATIONS - VW  
 SCALE 1"=2000'

# PERMIAN

Treating Chemicals, Inc.

P. O. BOX 728

LOVINGTON, N.M. 88260

PHONE (505) 396-5674

## WATER ANALYSIS REPORT

Company Yates Drilling Date Sampled 1-22-88  
 Field Caprock County Chavez  
 Lease Graham Water Station State NM  
 Well \_\_\_\_\_ Formation \_\_\_\_\_  
 Type of Water Fresh Water, B/D \_\_\_\_\_  
 Sampling Point Water Tanks Sampled By Blackwell

### DISSOLVED SOLIDS

| CATIONS           | mg/l | meq/l |
|-------------------|------|-------|
| Sodium, Na+(Calc) | 230  | 10    |
| Calcium, Ca++     | 120  | 6     |
| Magnesium, Mg++   | 24   | 2     |
| Barium, Ba++      | neg  | -     |
| Iron, Fe (Total)  |      |       |
|                   |      |       |
|                   |      |       |

### OTHER PROPERTIES

pH 8.2  
 Specific Gravity 1.000  
 H<sub>2</sub>S neg  
 Total Dissolved Solids 1144  
 Total Hardness 400

### ANIONS

|                                 |     |      |    |
|---------------------------------|-----|------|----|
| Chloride, Cl-                   | 350 | 35.5 | 10 |
| Sulfate, So <sub>4</sub> =      | 120 | 48   | 3  |
| Carbonate, Co <sub>3</sub> =    | 0   | 30   | 0  |
| Bicarbonate, HCo <sub>3</sub> - | 300 | 61   | 5  |
|                                 |     |      |    |
|                                 |     |      |    |

Remarks and Recommendations \_\_\_\_\_

# PERMIAN

treating Chemicals, Inc.

P.O. BOX 728  
LOVINGTON, N.M. 88260  
PHONE (505) 396-5674

## WATER ANALYSIS REPORT

Company Yates Drilling Date Sampled 1-22-88  
Field Caprock County Chavez  
Lease Graham Water well (fresh) State NM  
Well North of Lease Formation Blackwell  
Type of Water Fresh Water, B/D \_\_\_\_\_  
Sampling Point Well head Sampled By \_\_\_\_\_

### DISSOLVED SOLIDS

#### CATIONS

|                   | mg/l | meq/l |
|-------------------|------|-------|
| Sodium, Na+(Calc) | 115  | 5     |
| Calcium, Ca++     | 120  | 6     |
| Magnesium, Mg++   | 15   | 1     |
| Barium, Ba++      | Neg  | 68.7  |
| Iron, Fe (Total)  |      |       |
|                   |      |       |
|                   |      |       |

### OTHER PROPERTIES

pH 8.3  
Specific Gravity 1.000  
H<sub>2</sub>S Neg  
Total Dissolved Solids 817  
Total Hardness 360

#### ANIONS

|                                 | mg/l | meq/l |
|---------------------------------|------|-------|
| Chloride, Cl-                   | 200  | 35.5  |
| Sulfate, So <sub>4</sub> =      | 55   | 48    |
| Carbonate, Co <sub>3</sub> =    | 0    | 30    |
| Bicarbonate, HCo <sub>3</sub> - | 312  | 61    |
|                                 |      |       |
|                                 |      |       |

Remarks and Recommendations \_\_\_\_\_

# BERMIAN

ating Chemicals, Inc.

P.O. BOX 728  
LOVINGTON, NM 88260  
PHONE (505) 396-5674

## WATER ANALYSIS REPORT

Company Yates Drilling Report Date Sampled 1-22-88  
Field Caprock County Lea  
Lease Williams Ranch State NM  
Well Williams Fresh Water Formation \_\_\_\_\_  
Type of Water Fresh Water Water, B/D \_\_\_\_\_  
Sampling Point Well head Sampled By Blackwell

### DISSOLVED SOLIDS

#### CATIONS

|                   | mg/l | meq/l |
|-------------------|------|-------|
| Sodium, Na+(Calc) | 70   | 3.0   |
| Calcium, Ca++     | 80   | 4.0   |
| Magnesium, Mg++   | 20   | 1.6   |
| Barium, Ba++      | Neg  | 68.7  |
| Iron, Fe (Total)  |      |       |
|                   |      |       |
|                   |      |       |

### OTHER PROPERTIES

pH 8.2  
Specific Gravity 1.000  
H<sub>2</sub>S Neg  
Total Dissolved Solids 602  
Total Hardness 271

#### ANIONS

|                                 |     |      |     |
|---------------------------------|-----|------|-----|
| Chloride, Cl-                   | 100 | 35.5 | 2.8 |
| Sulfate, So <sub>4</sub> =      | 40  | 48   | 0.8 |
| Carbonate, Co <sub>3</sub> =    | 0   | 30   | 0   |
| Bicarbonate, HCo <sub>3</sub> - | 292 | 61   | 4.8 |

Remarks and Recommendations \_\_\_\_\_

# PERMIAN

Treating Chemicals, Inc.

P. O. BOX 72  
LOVINGTON, N.M.  
PHONE (505) 396

## WATER ANALYSIS REPORT

|                |                |              |           |
|----------------|----------------|--------------|-----------|
| Company        | Yates Drilling | Date Sampled | 1-22-88   |
| Field          | Caprock        | County       | Lea       |
| Lease          | Gallagher      | State        | NM        |
| Well           | 1              | Formation    | Queens    |
| Type of Water  | Produced       | Water, B/D   |           |
| Sampling Point | Treater        | Sampled By   | Blackwell |

### DISSOLVED SOLIDS

| CATIONS           | mg/l  | meq/l |
|-------------------|-------|-------|
| Sodium, Na+(Calc) | 98100 | 4265  |
| Calcium, Ca++     | 3750  | 188   |
| Magnesium, Mg++   | 12900 | 1057  |
| Barium, Ba++      | neg   | 68.7  |
| Iron, Fe (Total)  |       |       |
|                   |       |       |
|                   |       |       |

### OTHER PROPERTIES

|                        |         |
|------------------------|---------|
| pH                     | 5.9     |
| Specific Gravity       | 1.200   |
| H <sub>2</sub> S       | Neg     |
| Total Dissolved Solids | 314,240 |
| Total Hardness         | 62,800  |

### ANIONS

|                                 |        |      |      |
|---------------------------------|--------|------|------|
| Chloride, Cl-                   | 198000 | 35.5 | 5577 |
| Sulfate, So <sub>4</sub> =      | 1350   | 48   | 28   |
| Carbonate, Co <sub>3</sub> =    | 0      | 30   | 0    |
| Bicarbonate, HCo <sub>3</sub> - | 140    | 61   | 2.3  |
|                                 |        |      |      |

Remarks and Recommendations

# PERMIAN

Treating Chemicals, Inc.

P. O. BOX 72  
LOVINGTON, NM  
PHONE (505) 396

## WATER ANALYSIS REPORT

|                |                |              |           |
|----------------|----------------|--------------|-----------|
| Company        | Yates Drilling | Date Sampled | 1-22-88   |
| Field          | Caprock        | County       | Lea       |
| Lease          | Doyle          | State        | NM        |
| Well           | 12 & 4         | Formation    | Queens    |
| Type of Water  | Produced       | Water, B/D   |           |
| Sampling Point | Treater        | Sampled By   | Blackwell |

### DISSOLVED SOLIDS

#### CATIONS

|                   | mg/l  | meq/l       |
|-------------------|-------|-------------|
| Sodium, Na+(Calc) | 97900 | ÷ 23 4257   |
| Calcium, Ca++     | 3800  | ÷ 20 190    |
| Magnesium, Mg++   | 13300 | ÷ 12.2 1090 |
| Barium, Ba++      | 0     | ÷ 68.7      |
| Iron, Fe (Total)  | 58    |             |

### OTHER PROPERTIES

|                        |         |
|------------------------|---------|
| pH                     | 5.7     |
| Specific Gravity       | 1.200   |
| H <sub>2</sub> S       | neg.    |
| Total Dissolved Solids | 312,598 |
| Total Hardness         | 64,900  |

#### ANIONS

|                                            |         |        |      |
|--------------------------------------------|---------|--------|------|
| Chloride, Cl-                              | 196,000 | ÷ 35.5 | 5521 |
| Sulfate, So <sub>4</sub> <sup>=</sup>      | 1400    | ÷ 48   | 29   |
| Carbonate, Co <sub>3</sub> <sup>=</sup>    | 0       | ÷ 30   | 0    |
| Bicarbonate, HCo <sub>3</sub> <sup>-</sup> | 140     | ÷ 61   | 2.3  |

Remarks and Recommendations

# PERMIAN

Treating Chemicals, Inc.

P. O. BOX 728  
LOVINGTON, N.M. 88263  
PHONE (505) 396-5674

## WATER ANALYSIS REPORT

Company Yates Drilling Date Sampled 1-22-88  
Field Caprock County Lea  
Lease Burkett State NM  
Well \_\_\_\_\_ Formation Queers  
Type of Water Produced Water, B/D \_\_\_\_\_  
Sampling Point Treater Sampled By Blackwell

### DISSOLVED SOLIDS

| CATIONS           | mg/l  | meq/l |
|-------------------|-------|-------|
| Sodium, Na+(Calc) | 98000 | 4261  |
| Calcium, Ca++     | 4100  | 205   |
| Magnesium, Mg++   | 12800 | 1049  |
| Barium, Ba++      | Neg   | 68.7  |
| Iron, Fe (Total)  |       |       |
|                   |       |       |
|                   |       |       |

### OTHER PROPERTIES

pH 5.9  
Specific Gravity 1.200  
H<sub>2</sub>S Neg.  
Total Dissolved Solids 313,220  
Total Hardness 6300

### ANIONS

|                                 |         |      |
|---------------------------------|---------|------|
| Chloride, Cl-                   | 197,000 | 5549 |
| Sulfate, So <sub>4</sub> =      | 1200    | 25   |
| Carbonate, Co <sub>3</sub> =    | 0       | 30   |
| Bicarbonate, HCo <sub>3</sub> - | 120     | 61   |

Remarks and Recommendations \_\_\_\_\_

# ERMFAN

ating Chemicals, Inc.

P.C. 100-728  
 100-100-89200  
 100-100-301-5674

WATER ANALYSIS REPORT

Company Yates Drilling

Field

Lease Deluna

Well

Type of Water Produced

Sampling Point Treater

Date Sampled 1-22-88

County Lea

State NM

Location Queens

Water, B/D

Sampled By Blackwell

## DISSOLVED SOLIDS

### CATIONS

Sodium, Na (Calc)

97600

4243

Calcium, Ca++

3960

198

Magnesium, Mg++

12900

1075

Barium, Ba++

0

Iron, Fe (Total)

## OTHER PROPERTIES

pH 6.0

Specific Gravity

1.200

H<sub>2</sub>S Neg

Total Dissolved

Solids 135,148

Total Hardness

63,000

### ANIONS

Chloride, Cl-

194,000

5465

Sulfate, SO<sub>4</sub>==

1200

25

Carbonate, CO<sub>3</sub>==

0

Bicarbonate, HCO<sub>3</sub>-

88

1.1

Remarks and Recommendations

# ERMIAN

ating Chemicals, Inc.

P.C. 104726  
 10.5 C.V. 11.88100  
 10.05 10.11 10.17

WATER ANALYSIS

Company Yates Drilling

Field

Lease

Garner

Well 7

Type of Water Produced

Sampling Point

DISSOLVED SOLI

CATIONS

Sodium, Na (Total)

105,000

Calcium, Ca

4,750

Magnesium, Mg

11,900

Barium, Ba

Iron, Fe (Total)

ANIONS

Chloride, Cl-

204,000

Sulfate, SO<sub>4</sub>

1,100

Carbonate, CO<sub>3</sub>

0

Bicarbonate, HCO<sub>3</sub>

205

Chloride and Sulfate Analyses

Date Sampled

1-22-88

Locality

Lea

State

NM

Population

Queens

Water, B/D

Sampled by

Blackwell

OTHER PROPERTIES

pH 5.8

Specific Gravity

1.200

H<sub>2</sub>S Neg

Total Dissolved

Solids 326,955

Total Hardness

60,700

## HALLIBURTON DIVISION LABORATORY

## HALLIBURTON SERVICES

## ARTESIA DISTRICT

## LABORATORY REPORT

No. W539, W540 &amp; W541-89

TO Yates Drilling  
105 South Fourth Street  
Artesia, NM 88210

Date October 17, 1989

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Submitted by \_\_\_\_\_ Date Rec. October 16, 1989

Well No. \_\_\_\_\_ Depth \_\_\_\_\_ Formation \_\_\_\_\_

Field \_\_\_\_\_ County \_\_\_\_\_ Source: \_\_\_\_\_

|                     | SPEAR WW #1 | GF #7        | DEL FED. #3  |
|---------------------|-------------|--------------|--------------|
| Resistivity .....   | 0.74 @ 70°  | 0.052 @ 70°  | 0.054 @ 70°  |
| Specific Gravity .. | 1.006 @ 70° | 1.1730 @ 70° | 1.1571 @ 70° |
| pH .....            | 6.4         | 6.6          | 6.6          |
| Calcium .....       | 1,686       | 6,744        | 7,418        |
| Magnesium .....     | 546         | 10,230       | 7,979        |
| Chlorides .....     | 5,000       | 159,000      | 143,000      |
| Sulfates .....      | Nil         | Nil          | Medium       |
| Bicarbonates .....  | 305         | 214          | 183          |
| Soluble Iron .....  | Nil         | 10           | 3            |
| -----               | -----       | -----        | -----        |
| -----               | -----       | -----        | -----        |
| -----               | -----       | -----        | -----        |

Remarks:

Eric Jacobson  
 Respectfully submitted

Analyst: Eric Jacobson - EIT

HALLIBURTON SERVICES

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# HALLIBURTON DIVISION LABORATORY

## HALLIBURTON SERVICES

### ARTESIA DISTRICT

#### LABORATORY REPORT

No. W536, W537 & W538-89

TO Yates Drilling  
105 South Fourth Street  
Artesia, NM 88210

Date October 17, 1989

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Submitted by \_\_\_\_\_ Date Rec. October 16, 1989

Well No. \_\_\_\_\_ Depth \_\_\_\_\_ Formation \_\_\_\_\_

Field \_\_\_\_\_ County \_\_\_\_\_ Source: \_\_\_\_\_

|                     | <u>BUR FEDERAL #3</u> | <u>GALLAHAN ST. #1</u> | <u>AP STATE #1</u> |
|---------------------|-----------------------|------------------------|--------------------|
| Resistivity .....   | <u>0.051 @ 70°</u>    | <u>0.051 @ 70°</u>     | <u>0.058 @ 70°</u> |
| Specific Gravity .. | <u>1.1200 @ 70°</u>   | <u>1.196 @ 70°</u>     | <u>1.137 @ 70°</u> |
| pH .....            | <u>6.5</u>            | <u>6.6</u>             | <u>6.8</u>         |
| Calcium .....       | <u>6,070</u>          | <u>5,620</u>           | <u>6,407</u>       |
| Magnesium .....     | <u>10,912</u>         | <u>12,685</u>          | <u>6,615</u>       |
| Chlorides .....     | <u>184,000</u>        | <u>180,000</u>         | <u>122,000</u>     |
| Sulfates .....      | <u>Heavy</u>          | <u>Medium</u>          | <u>Medium</u>      |
| Bicarbonates .....  | <u>214</u>            | <u>183</u>             | <u>305</u>         |
| Soluble Iron .....  | <u>10</u>             | <u>25</u>              | <u>0</u>           |
| -----               | -----                 | -----                  | -----              |
| -----               | -----                 | -----                  | -----              |
| -----               | -----                 | -----                  | -----              |

Remarks:

Eric Jacobson  
 Respectfully submitted

Analyst: Eric Jacobson - EIT

HALLIBURTON SERVICES

# HALLIBURTON DIVISION LABORATORY.

## HALLIBURTON SERVICES

### ARTESIA DISTRICT

#### LABORATORY REPORT

No. W542, W543 & W544-89

TO Yates Drilling  
105 South Fourth Street  
Artesia, NM 88210

Date October 17, 1989

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Submitted by \_\_\_\_\_ Date Rec. October 16, 1989

Well No. \_\_\_\_\_ Depth \_\_\_\_\_ Formation \_\_\_\_\_

Field \_\_\_\_\_ County \_\_\_\_\_ Source \_\_\_\_\_

|                     | <u>Graham WW #1</u> | <u>Graham WW #2</u> | <u>Doy #1</u>  |
|---------------------|---------------------|---------------------|----------------|
| Resistivity .....   | <u>0.60 @ 70°</u>   | <u>0.91 @ 70°</u>   | <u>N.A.</u>    |
| Specific Gravity .. | <u>1.007 @ 70°</u>  | <u>1.005 @ 70°</u>  | <u>N.A.</u>    |
| pH .....            | <u>6.5</u>          | <u>6.7</u>          | <u>6.6</u>     |
| Calcium .....       | <u>1,124</u>        | <u>1,124</u>        | <u>4,946</u>   |
| Magnesium .....     | <u>477</u>          | <u>614</u>          | <u>14,186</u>  |
| Chlorides .....     | <u>6,000</u>        | <u>4,000</u>        | <u>198,000</u> |
| Sulfates .....      | <u>Nil</u>          | <u>Nil</u>          | <u>Nil</u>     |
| Bicarbonates .....  | <u>214</u>          | <u>214</u>          | <u>153</u>     |
| Soluble Iron .....  | <u>Nil</u>          | <u>Nil</u>          | <u>75</u>      |
| -----               | -----               | -----               | -----          |
| -----               | -----               | -----               | -----          |
| -----               | -----               | -----               | -----          |

Remarks:

Eric Jacobson  
 Respectfully submitted

Analyst: Eric Jacobson - EIT

HALLIBURTON SERVICES

CAMPBELL & BLACK, P.A.  
LAWYERS

JACK M. CAMPBELL  
BRUCE D. BLACK  
MICHAEL B. CAMPBELL  
WILLIAM F. CARR  
BRADFORD C. BERGE  
MARK F. SHERIDAN  
J. SCOTT HALL  
JOHN H. BEMIS  
WILLIAM P. SLATTERY  
PATRICIA A. MATTHEWS

JEFFERSON PLACE  
SUITE 1 - 110 NORTH GUADALUPE  
POST OFFICE BOX 2208  
SANTA FE, NEW MEXICO 87504-2208  
TELEPHONE: (505) 988-4421  
TELECOPIER: (505) 983-6043

November 8, 1989

**HAND-DELIVERED**

RECEIVED

NOV 8 1989

OIL CONSERVATION DIVISION

William J. LeMay, Director  
State of New Mexico  
Energy and Minerals Department  
Oil Conservation Division  
Post Office Box 2088  
Santa Fe, New Mexico 87501

Re: Application of Yates Drilling Company for a Waterflood Project, Proposed  
Doyal Fee Lease Waterflood Project, Chaves County, New Mexico

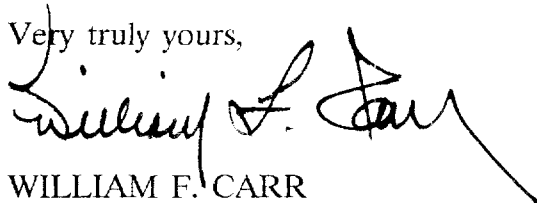
Dear Mr. LeMay:

Enclosed for filing in the above-referenced case is the original and copy of OCD Form C-108. On this date we have also mailed to the Oil Conservation Division district office in Artesia a copy of this completed form.

This matter has been set for hearing before a Division Examiner on November 29, 1989.

Your attention to this matter is appreciated.

Very truly yours,



WILLIAM F. CARR  
WFC:mlh  
ATTORNEY FOR YATES DRILLING COMPANY  
Enclosure  
cc w/o enc.: Toby Rhodes

Case No.                    Application of Yates Drilling Company for a waterflood project, Chaves County, New Mexico. Applicant, in the above styled cause, seeks authority to institute a waterflood project by injection of water into the Queen formation, Southeast Chaves Queen Field (Division Case 9823) underlying portions of Sections 26, 27, 34 and 35, Township 12 South, Range 31 East. Unit Area centered approximately 12 miles Southwest by South of Caprock, New Mexico.

RECEIVED

NOV - 7 1983

OIL CONSERVATION DIVISION

YATES DRILLING COMPANY  
PROPOSED DOYAL FEE LEASE WATERFLOOD PROJECT  
CHAVES COUNTY, NEW MEXICO

NMOCD FORM C-108

APPLICATION FOR AUTHORIZATION TO INJECT

- I. Purpose: ☒ Secondary Recovery ☐ Pressure Maintenance ☐ Disposal ☐ Storage  
Application qualifies for administrative approval? ☐ yes ☒ no
- II. Operator: Yates Drilling Company  
Address: 105 South 4th Street, Artesia, New Mexico 88210  
Contact party: Tobin L. Rhodes Phone: (505) 748-1471
- 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: Tobin L. Rhodes Title Petroleum Engineer

Signature: Tobin L. Rhodes Date: 10-13-89

\* 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.

## 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 2008, 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.

OIL CONSERVATION DIVISION  
FORM C-108 (Supplement)

Application of Yates Drilling Company  
For a Secondary Recovery Project  
Doyal Fee Lease Project  
Chaves County, New Mexico

I. Purpose:

Application is made for authorization to inject water into the Queen formation underlying the Doyal Fee Lease. The proposed project consists of 160 acres, more or less, of Fee lands in Unit M, (SW/4 SW/4) Section 26, Units I, P, (E/2 SE/4) of Section 27, and Unit A, (NE/4 NE/4) of Section 34, Township 12 South, Range 31 East, Chaves County New Mexico. This project would be classified as a secondary recovery project with the objective of recovering hydrocarbons that will not and can not be recovered by primary means.

Many wells in the proposed project area are primary depleted or are very near primary depletion. Our studies show that the injection of water into selected wells will result in the recovery of oil in economic quantities not otherwise recoverable. This project should provide economic benefits to all parties holding any type of interest in the project acreage.

II. Operator:

Yates Drilling Company  
105 South Fourth Street  
Artesia, New Mexico 88210

Phone Number: (505) 748-1471

III. Injection Well Data:

A well data sheet is attached for each of the three wells proposed for water injection. Each injection well data sheet includes a downhole schematic of how each individual well will be configured if this application is approved.

#### IV. Existing Project:

The proposed project is not an expansion of an existing project and will be a totally new project.

#### V. Ownership:

A lease ownership map is attached which identifies all wells and lease ownership within two miles of any of the six proposed injection wells. A map is also attached on which the area of review has been identified by drawing a one-half mile circle around each injection well.

#### VI. Well Data:

There are presently fifteen wells including proposed injection wells that fall within the boundaries of the proposed project or within the area of review. Two of these wells has been plugged and abandoned, one well is temporarily abandoned, and the remaining twelve wells are active pumping oil wells producing from the Queen formation. Available data for each of the wells is included in the attached well data sheets. Additionally a downhole schematic has been drawn depicting each of the two plugged and abandoned wells.

#### VII. Project Data:

1. The proposed daily average water injection rate is approximately 200 barrels per day for each of the three proposed water injection wells. Total water injection for the project would be 600 barrels per day. The maximum injection rate for any individual well will be based on fracture pressure as determined by step-rate pressure tests to be conducted on each injection well.

2. Produced water will be stored in covered steel storage tank(s) and in open top fiberglass tanks making the produced water system an open system. Any fresh water will be stored in a covered steel tank. Produced oil will immediately be separated from produced water. The oil will be stored in a steel covered production tank until sold.

3. Initially the injection wells may take water on a vacuum, but as the reservoir fills a positive surface

injection pressure will be required to inject water. The maximum injection pressure will also be determined by proposed step-rate pressure tests. At no time prior to the step-rate tests will the injection pressure exceed a pressure limitation of 0.2 PSIG per foot of depth to the top of the injection interval.

4. The source of injection fluid will be produced water from the producing wells within the unit and fresh water from the Ogollala aquifer in the area. No commitment has been made but commercial sources of fresh water are available in the area.

5. No water compatibility problems are expected as Ogollala water has been successfully injected into the Queen formation, throughout the Caprock Queen Field, without excessive problems. Compatibility tests have been run commingling the produced water and fresh water and no adverse problems were observed.

#### VIII. Geologic Data:

The proposed project area produces from the upper sandstone member of the Queen formation, upper Guadalupian series, Permian system. The average producing depth in the field is approximately 2989 feet. The existing producing formation will be the interval into which water will be injected.

The productive/injection interval, as indicated from a whole core analysis on the DeLuna Federal #3 (330' FNL & 1980' FEL, 34-12s-31e) and sidewall core data from numerous wells, is fine grained, friable, gray, quartz sandstone. The grains are sub-angular to sub-rounded and well sorted. The cementing material is variously from anhydrite and dolomite. The exact depositional environment is unknown. Porosity and permeability are intergranular in nature. The sandstone is not naturally fractured.

The Cactus Queen Field is a stratigraphic trap. Cementation of the sandstone results in the loss of porosity and permeability, creating a barrier on all sides with the exception of the east. A tilted oil-water contact limits the production in that direction. The oil/water contact has been established at (+1440) in the southeast end of the field and (+1446) at the northeast edge.

The primary underground source of fresh water in this area is the Ogollala formation of Tertiary age, the base of which is estimated to be 300 feet below the

surface. This aquifer is protected behind the surface pipe and cement of all existing wells in the unit area. The Chinlee formation is also a fresh water aquifer which immediately underlies the Ogollala formation. The Base of the Chinlee is estimated to be approximately 500 feet below the surface in the project area. The Chinlee is behind the production casing in all existing wells in the project area.

IX. Stimulation Program:

Each of the currently producing wells has previously received a fracture treatment. The details of these treatments are outlined in the data sheet for each individual well. There are no plans to stimulate any of the existing wells which will be producing wells in this project.

The wells which will be injection wells may require a small clean-up acid treatment prior to injection. We plan to treat each of the proposed injection wells with 1000 to 2000 gallons of 15% hydrochloric acid. This treatment should insure that existing perforations are open and that each well will accept water or gas at the lowest possible pressure.

X. Well Logs:

Well logs for each of the existing wells in the proposed unit have previously been submitted to the Hobbs office of the NMOCD.

XI. Fresh Water:

The Office of the State Engineer in Roswell has a record of six wells within one mile of the proposed project. The total depths of two of the wells are unknown, however all six wells are assumed to be producing from the Ogollala formation. Analysis reports for water taken from three of the wells are attached.

XII. Injection Zone Isolation:

Available engineering and geologic data has been examined and no evidence of open faulting or any other hydrologic connection between the injection zone and

any underground source of drinking water has been found.

XIII. Proof of Notice:

A listing of off-set leasehold operators within 1/2 mile of any injection wells and the surface owners that have received a copy of this application by certified mail is attached.

XIV. Certification:

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

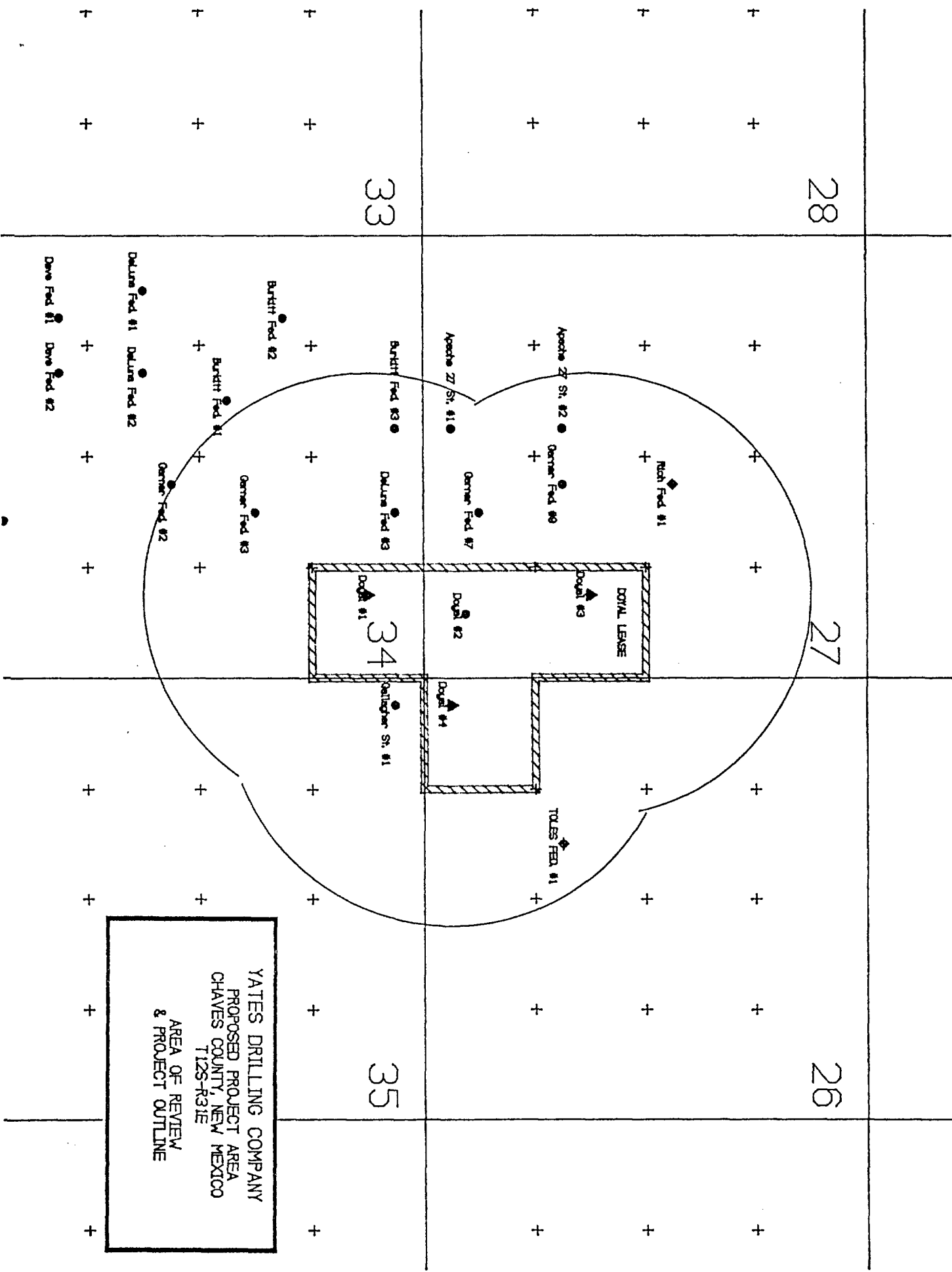
Tobin L. Rhodes

Tobin L. Rhodes

Petroleum Engineer

October 13, 1989





# INJECTION WELL DATA SHEET

OPERATOR: Yates Drilling Co. LEASE: Doyal  
 WELL NO.: 1 FOOTAGE: 660'FNL- 990'FEL SEC: 34-T12s-R31e

## TUBULAR DATA

### SURFACE CASING

SIZE: 8-5/8" 24# CEMENTED WITH: 250 SX.  
 TOC: Surface FEET DETERMINED BY: Circulation  
 HOLE SIZE: 12-1/4" SETTING DEPTH: 409.46

### INTERMEDIATE CASING

SIZE: None CEMENTED WITH:  SX.  
 TOC:  FEET DETERMINED BY:   
 HOLE SIZE:  SETTING DEPTH:

### LONG STRING

SIZE: 5-1/2" 14# CEMENTED WITH: 250 SX.  
 TOC: 2200' FEET DETERMINED BY: Temp. Survey  
 HOLE SIZE: 7-7/8" SETTING DEPTH: 3100'  
 TOTAL DEPTH: 3100'

### INJECTION INTERVAL

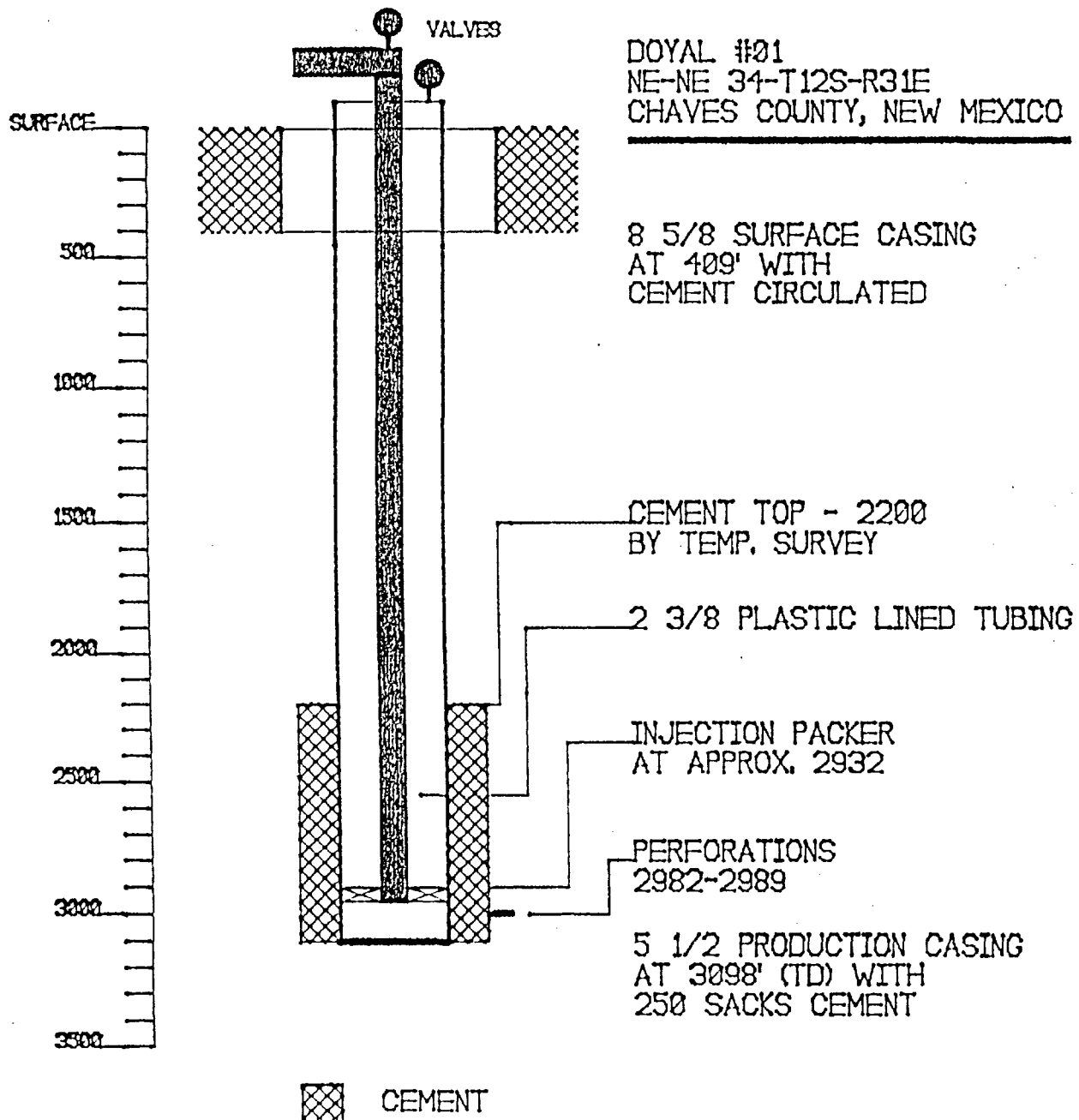
2982' FEET TO 2989' FEET - PERFORATED

### TUBING

TUBING SIZE: 2-3/8" LINED WITH: Plastic SET IN A  
Baker AD-1 PACKER AT: 2932' FEET

## OTHER DATA

1. NAME OF INJECTION FORMATION: Queen
2. NAME OF FIELD OR POOL (IF APPLICABLE): SE Chaves Queen
3. IS THIS A NEW WELL DRILLED FOR INJECTION? No  
 IF NO, FOR WHAT PURPOSE WAS THE WELL ORIGINALLY DRILLED?  
This well was drilled as a Queen producing well.
4. HAS WELL EVER BEEN PERFORATED IN ANY OTHER ZONE(S)? No  
 LIST ALL SUCH PERFORATED INTERVALS AND GIVE PLUGGING  
 DETAILS (SACKS OF CEMENT OR BRIDGE PLUG(S) USED):
5. GIVE DEPTH TO AND NAME OF ANY OVERLYING AND/OR  
 UNDERLYING OIL OR GAS ZONES (POOLS) IN THIS AREA:  
None known.



# INJECTION WELL DATA SHEET

OPERATOR: Yates Drilling Co. LEASE: Doval  
 WELL NO.: 3 FOOTAGE: 1990' FSL - 990' FEL SEC: 27-T12s-R31e

## TUBULAR DATA

### SURFACE CASING

SIZE: 8-5/8" 24# CEMENTED WITH: 260 SX.  
 TOC: Surface FEET DETERMINED BY: Circulation  
 HOLE SIZE: 12-1/4" SETTING DEPTH: 409'

### INTERMEDIATE CASING

SIZE: None CEMENTED WITH:  SX.  
 TOC:  FEET DETERMINED BY:   
 HOLE SIZE:  SETTING DEPTH:

### LONG STRING

SIZE: 5-1/2" 14# CEMENTED WITH: 850 SX.  
 TOC: 630' FEET DETERMINED BY: Cement Bond Log  
 HOLE SIZE: 7-7/8" SETTING DEPTH: 3099'  
 TOTAL DEPTH: 3100'

### INJECTION INTERVAL

2991' FEET TO 2997' FEET - PERFORATED

### TUBING

TUBING SIZE: 2-3/8" LINED WITH: Plastic SET IN A  
Baker AD-1 PACKER AT: 2941' FEET

## OTHER DATA

1. NAME OF INJECTION FORMATION: Queen
2. NAME OF FIELD OR POOL (IF APPLICABLE): SE Chaves Queen
3. IS THIS A NEW WELL DRILLED FOR INJECTION? No  
 IF NO, FOR WHAT PURPOSE WAS THE WELL ORIGINALLY DRILLED?  
This well was drilled as a Queen producing well.  
This well is temp. aban. due to high water production
4. HAS WELL EVER BEEN PERFORATED IN ANY OTHER ZONE(S)? No  
 LIST ALL SUCH PERFORATED INTERVALS AND GIVE PLUGGING  
 DETAILS (SACKS OF CEMENT OR BRIDGE PLUG(S) USED):
5. GIVE DEPTH TO AND NAME OF ANY OVERLYING AND/OR  
 UNDERLYING OIL OR GAS ZONES (POOLS) IN THIS AREA:   
None known.

DOYAL #103  
NE-SE 27-T12S-R31E  
CHAVES COUNTY, NEW MEXICO

8 5/8 SURFACE CASING  
AT 409' WITH  
CEMENT CIRCULATED

CEMENT TOP - 830  
BY CBL

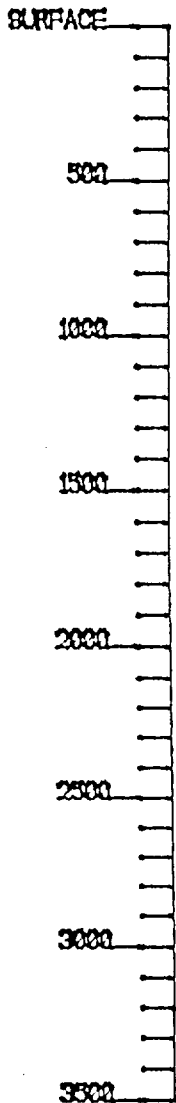
2 3/8 PLASTIC LINED TUBING

INJECTION PACKER  
AT APPROX. 2941

PERFORATIONS  
2991-2997

5 1/2 PRODUCTION CASING  
AT 3099' (TD) WITH  
850 SACKS CEMENT

 CEMENT



# INJECTION WELL DATA SHEET

OPERATOR: Yates Drilling Co. LEASE: Doyal

WELL NO.: 4 FOOTAGE: 330' FSL - 330' FWL SEC: 26-T12s-R31e

## TUBULAR DATA

### SURFACE CASING

SIZE: 8-5/8" 24# CEMENTED WITH: 250 SX.  
 TOC: Surface FEET DETERMINED BY: Circulation  
 HOLE SIZE: 12-1/4" SETTING DEPTH: 400

### INTERMEDIATE CASING

SIZE: None CEMENTED WITH:  SX.  
 TOC:  FEET DETERMINED BY:   
 HOLE SIZE:  SETTING DEPTH:

### LONG STRING

SIZE: 5-1/2" 14# CEMENTED WITH: 975 SX.  
 TOC: 310' FEET DETERMINED BY: Temp. Survey  
 HOLE SIZE: 7-7/8" SETTING DEPTH: 3088'  
 TOTAL DEPTH: 3100'

### INJECTION INTERVAL

2982' FEET TO 2985' FEET - PERFORATED

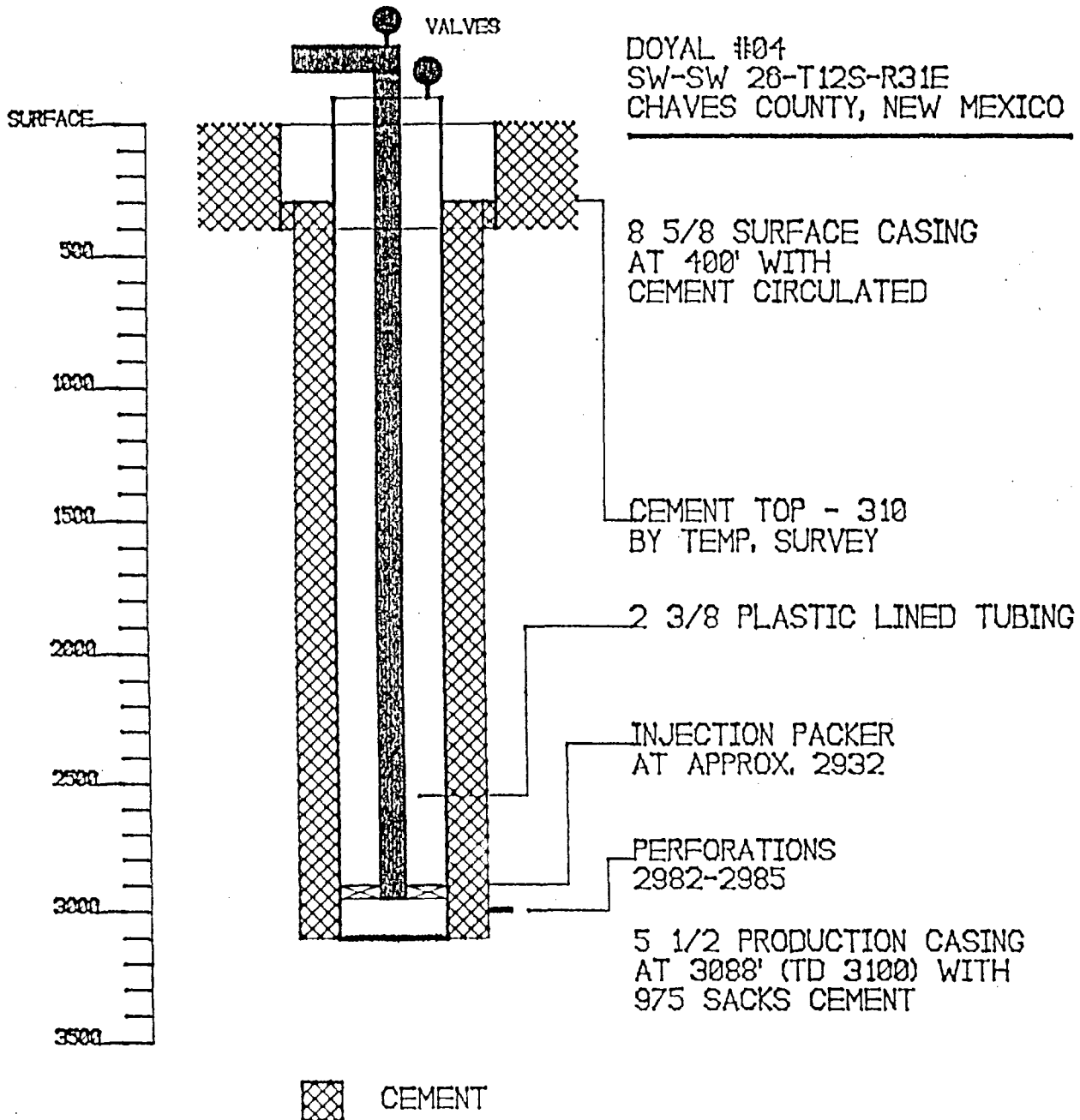
### TUBING

TUBING SIZE: 2-3/8" LINED WITH: Plastic SET IN A  
Baker AD-1 PACKER AT: 2932' FEET

## OTHER DATA

1. NAME OF INJECTION FORMATION: Queen
2. NAME OF FIELD OR POOL (IF APPLICABLE): SE Chaves Queen
3. IS THIS A NEW WELL DRILLED FOR INJECTION? No  
 IF NO, FOR WHAT PURPOSE WAS THE WELL ORIGINALLY DRILLED?  
This well was drilled as a Queen producing well.
4. HAS WELL EVER BEEN PERFORATED IN ANY OTHER ZONE(S)? No  
 LIST ALL SUCH PERFORATED INTERVALS AND GIVE PLUGGING  
 DETAILS (SACKS OF CEMENT OR BRIDGE PLUG(S) USED):
5. GIVE DEPTH TO AND NAME OF ANY OVERLYING AND/OR  
 UNDERLYING OIL OR GAS ZONES (POOLS) IN THIS AREA:   
None known.

DOYAL #04  
SW-SW 28-T12S-R31E  
CHAVES COUNTY, NEW MEXICO



# WELL DATA SHEET

OPERATOR: Yates Drilling Company LEASE: Apache "27" State  
 WELL NO.: 1 FOOTAGE: 330' FSL-2310' FWL SEC: 27-T12s-R31e

## TUBULAR DATA

### SURFACE CASING

SIZE: 8-5/8" CEMENTED WITH:                      SX.  
 TOC: Surface FEET DETERMINED BY: Circulation  
 HOLE SIZE: 12-1/4" SETTING DEPTH: 422'

### INTERMEDIATE CASING

SIZE: None CEMENTED WITH:                      SX.  
 TOC:                      FEET DETERMINED BY:                       
 HOLE SIZE:                      SETTING DEPTH:                     

### LONG STRING

SIZE: 4-1/2" CEMENTED WITH:                      SX.  
 TOC: 210' FEET DETERMINED BY:                       
 HOLE SIZE: 7-7/8" SETTING DEPTH: 3150'  
 TOTAL DEPTH: 3150'

## PRODUCING INTERVAL

FORMATION: Queen POOL OR FIELD: SE Chaves Queen  
 SPUD DATE: 5-9-85 COMPLETION DATE: 6-27-85  
 PERFORATED: 2984 FEET TO 2991 FEET

STIMULATION: 100 gals. 15% HCl acid, 12000 gals. gel water  
4000 gals. CO2, 10500# 20/40 sand, 10000# 12/20 sand

OTHER PERFORATED ZONES: None

## CURRENT STATUS

WHAT IS CURRENT STATUS OF WELL? Pumping oil well

IF P&A, LIST PLUGGING DETAILS:

# WELL DATA SHEET

OPERATOR: Yates Drilling Company LEASE: Apache "27" State

WELL NO.: 2 FOOTAGE: 1650' FSL-2310' FEL SEC: 27-T12s-R31e

## TUBULAR DATA

### SURFACE CASING

SIZE: 8-5/8" CEMENTED WITH:  SX.  
 TOC: Surface FEET DETERMINED BY: Circulation  
 HOLE SIZE: 12-1/4" SETTING DEPTH: 454'

### INTERMEDIATE CASING

SIZE: None CEMENTED WITH:  SX.  
 TOC:  FEET DETERMINED BY:   
 HOLE SIZE:  SETTING DEPTH:

### LONG STRING

SIZE: 4-1/2" CEMENTED WITH:  SX.  
 TOC: Surface FEET DETERMINED BY: Circulation  
 HOLE SIZE: 7-7/8" SETTING DEPTH: 3150'  
 TOTAL DEPTH: 3150'

## PRODUCING INTERVAL

FORMATION: Queen POOL OR FIELD: SE Chaves Queen  
 SPUD DATE: 7-29-85 COMPLETION DATE: 8-23-85  
 PERFORATED: 2996 FEET TO 3000 FEET

STIMULATION: 850 gals. 15% HCl acid, 16000 gals. gel water  
25% CO2, 10500# 20/40 sand, 10000# 12/20 sand

OTHER PERFORATED ZONES: None

## CURRENT STATUS

WHAT IS CURRENT STATUS OF WELL? Pumping oil well

IF P&A, LIST PLUGGING DETAILS:

# WELL DATA SHEET

OPERATOR: Yates Drilling Co. LEASE: Burkitt Federal  
 WELL NO.: 3 FOOTAGE: 330' FNL-2310' FWL SEC: 34-T12s-R31e

## TUBULAR DATA

### SURFACE CASING

SIZE: 8-5/8" 24# CEMENTED WITH: 270 SX.  
 TOC: Surface FEET DETERMINED BY: Circulation  
 HOLE SIZE: 12-1/4" SETTING DEPTH: 424'

### INTERMEDIATE CASING

SIZE: None CEMENTED WITH:  SX.  
 TOC:  FEET DETERMINED BY:   
 HOLE SIZE:  SETTING DEPTH:

### LONG STRING

SIZE: 5-1/2" 14# CEMENTED WITH: 260 SX.  
 TOC: 1640' FEET DETERMINED BY: Temp. Survey  
 HOLE SIZE: 7-7/8" SETTING DEPTH: 3083'  
 TOTAL DEPTH: 3100'

## PRODUCING INTERVAL

FORMATION: Queen POOL OR FIELD: SE Chaves Queen  
 SPUD DATE: 8-9-85 COMPLETION DATE: 10-1-85  
 PERFORATED: 2988 FEET TO 2992 FEET

STIMULATION: 750 gals. 15% HCl acid, 15000 gals. gel water  
24 tons CO2, 12000# 20/40 sand, 7000# 12/20 sand

OTHER PERFORATED ZONES: None

## CURRENT STATUS

WHAT IS CURRENT STATUS OF WELL? Pumping oil well

IF P&A, LIST PLUGGING DETAILS:

# WELL DATA SHEET

OPERATOR: Yates Drilling Co. LEASE: DeLuna Federal  
 WELL NO.: 3 FOOTAGE: 330' FNL-1980' FEL SEC: 34-T12s-R31e

## TUBULAR DATA

### SURFACE CASING

SIZE: 8-5/8" 24# CEMENTED WITH: 300 SX.  
 TOC: Surface FEET DETERMINED BY: Circulation  
 HOLE SIZE: 12-1/4" SETTING DEPTH: 433'

### INTERMEDIATE CASING

SIZE: None CEMENTED WITH: \_\_\_\_\_ SX.  
 TOC: \_\_\_\_\_ FEET DETERMINED BY: \_\_\_\_\_  
 HOLE SIZE: \_\_\_\_\_ SETTING DEPTH: \_\_\_\_\_

### LONG STRING

SIZE: 5-1/2" 14# CEMENTED WITH: 410 SX.  
 TOC: 1900' FEET DETERMINED BY: Cement Bond Log  
 HOLE SIZE: 7-7/8" SETTING DEPTH: 3074'  
 TOTAL DEPTH: 3100'

## PRODUCING INTERVAL

FORMATION: Queen POOL OR FIELD: SE Chaves Queen  
 SPUD DATE: 2-11-85 COMPLETION DATE: 3-20-85  
 PERFORATED: 2987-1/2 FEET TO 2993 FEET

STIMULATION: 750 gals. 15% hcl, 15000 gals. 30# gel, 23-1/2  
tons CO2, 13000# 20/40 sand, 10000# 10/20 sand

OTHER PERFORATED ZONES: None

## CURRENT STATUS

WHAT IS CURRENT STATUS OF WELL? Pumping oil well

IF P&A, LIST PLUGGING DETAILS:

WELL DATA SHEET

OPERATOR: Yates Drilling Co. LEASE: Doyal  
WELL NO.: 1 FOOTAGE: 660'FNL- 990'FEL SEC: 34-T12s-R31e

TUBULAR DATA

SURFACE CASING

SIZE: 8-5/8" 24# CEMENTED WITH: 250 SX.  
TOC: Surface FEET DETERMINED BY: Circulation  
HOLE SIZE: 12-1/4" SETTING DEPTH: 409.46'

INTERMEDIATE CASING

SIZE: None CEMENTED WITH:                      SX.  
TOC:                      FEET DETERMINED BY:                       
HOLE SIZE:                      SETTING DEPTH:                     

LONG STRING

SIZE: 5-1/2" CEMENTED WITH: 250 SX.  
TOC: 2200' FEET DETERMINED BY: Temp. Survey  
HOLE SIZE: 7-7/8" SETTING DEPTH: 3098'  
TOTAL DEPTH: 3100'

PRODUCING INTERVAL

FORMATION: Queen POOL OR FIELD: SE Chaves Queen  
SPUD DATE: 7-31-84 COMPLETION DATE: 8-25-84  
PERFORATED: 2982' FEET TO 2989' FEET

STIMULATION: 750 gallons of 15% HCl, 15000 gallons 30# gel  
, 5000 SCF N2 per barrel, 10900# 20/40 sand, and 4200# 10/20  
sand.

OTHER PERFORATED ZONES: None

CURRENT STATUS

WHAT IS CURRENT STATUS OF WELL? Pumping oil well.

IF P&A, LIST PLUGGING DETAILS:

## WELL DATA SHEET

OPERATOR: Yates Drilling Co. LEASE: Doyal  
WELL NO.: 2 FOOTAGE: 500'ESL- 760'FEL SEC: 27-T12s-R31e

## TUBULAR DATA

## SURFACE CASING

SIZE: 8-5/8" 24# CEMENTED WITH: 275 SX.  
TOC: Surface FEET DETERMINED BY: Circulation  
HOLE SIZE: 12-1/4" SETTING DEPTH: 411'

## INTERMEDIATE CASING

SIZE: None CEMENTED WITH: \_\_\_\_\_ SX.  
TOC: \_\_\_\_\_ FEET DETERMINED BY: \_\_\_\_\_  
HOLE SIZE: \_\_\_\_\_ SETTING DEPTH: \_\_\_\_\_

## LONG STRING

SIZE: 5-1/2" CEMENTED WITH: 250 SX.  
TOC: 2200' FEET DETERMINED BY: Temp. Survey  
HOLE SIZE: 7-7/8" SETTING DEPTH: 3098'  
TOTAL DEPTH: 3100'

## PRODUCING INTERVAL

FORMATION: Queen POOL OR FIELD: SE Chaves Queen  
SPUD DATE: 9-7-84 COMPLETION DATE: 9-20-84  
PERFORATED: 2981' FEET TO 2987' FEET

STIMULATION: 750 gallons of 15 % HCl, 15000 gallons 30# gel  
, 25% CO2 12000# 20/40 sand, 10000# 10/20 sand.

OTHER PERFORATED ZONES: None

## CURRENT STATUS

WHAT IS CURRENT STATUS OF WELL? Pumping oil well.

IF P&A, LIST PLUGGING DETAILS: \_\_\_\_\_

# WELL DATA SHEET

OPERATOR: Yates Drilling Co. LEASE: Doyal  
 WELL NO.: 3 FOOTAGE: 1980' FSL - 990' FEL SEC: 27-T12s-R31e

## TUBULAR DATA

### SURFACE CASING

SIZE: 8-5/8" 24# CEMENTED WITH: 260 SX.  
 TOC: Surface FEET DETERMINED BY: Circulation  
 HOLE SIZE: 12-1/4" SETTING DEPTH: 409'

### INTERMEDIATE CASING

SIZE: None CEMENTED WITH: \_\_\_\_\_ SX.  
 TOC: \_\_\_\_\_ FEET DETERMINED BY: \_\_\_\_\_  
 HOLE SIZE: \_\_\_\_\_ SETTING DEPTH: \_\_\_\_\_

### LONG STRING

SIZE: 5-1/2" 14# CEMENTED WITH: 850 SX.  
 TOC: 630' FEET DETERMINED BY: Temp. Survey  
 HOLE SIZE: 7-7/8" SETTING DEPTH: 3099'  
 TOTAL DEPTH: 3100'

## PRODUCING INTERVAL

FORMATION: Queen POOL OR FIELD: SE Chaves Queen  
 SPUD DATE: 9-20-84 COMPLETION DATE: NONE  
 PERFORATED: 2991' FEET TO 2997' FEET

STIMULATION: 750 gallons of 15 % HCl, 15000 gallons 30# gel  
, 25% CD2 20000# 20/40 sand, 10000# 10/20 sand.

OTHER PERFORATED ZONES: None

## CURRENT STATUS

WHAT IS CURRENT STATUS OF WELL? Temp. Abandoned

IF P&A, LIST PLUGGING DETAILS:

# WELL DATA SHEET

OPERATOR: Yates Drilling Co. LEASE: Doyal  
 WELL NO.: 4 FOOTAGE: 330' FSL- 330' FWL SEC: 26-T12s-R31e

## TUBULAR DATA

### SURFACE CASING

SIZE: 8-5/8" 24# CEMENTED WITH: 250 SX.  
 TOC: Surface FEET DETERMINED BY: Circulation  
 HOLE SIZE: 12-1/4" SETTING DEPTH: 400'

### INTERMEDIATE CASING

SIZE: None CEMENTED WITH: \_\_\_\_\_ SX.  
 TOC: \_\_\_\_\_ FEET DETERMINED BY: \_\_\_\_\_  
 HOLE SIZE: \_\_\_\_\_ SETTING DEPTH: \_\_\_\_\_

### LONG STRING

SIZE: 5-1/2" 14# CEMENTED WITH: 975 SX.  
 TOC: 310' FEET DETERMINED BY: Temp. Survey  
 HOLE SIZE: 7-7/8" SETTING DEPTH: 3088'  
 TOTAL DEPTH: 3100'

## PRODUCING INTERVAL

FORMATION: Queen POOL OR FIELD: SE Chaves Queen  
 SPUD DATE: 11-18-84 COMPLETION DATE: 1-24-87  
 PERFORATED: 2982' FEET TO 2985' FEET

STIMULATION: 750 gallons of 15 % HCl, 15000 gallons 30# gel  
, 22 tons CO2, 12000# 20/40 sand, 8500 # 12/20 sand.

OTHER PERFORATED ZONES: None

## CURRENT STATUS

WHAT IS CURRENT STATUS OF WELL? Pumping oil well

IF P&A, LIST PLUGGING DETAILS:

WELL DATA SHEET

OPERATOR: Yates Drilling Co. LEASE: Gallagher State  
WELL NO.: 1 FOOTAGE: 330' FNL - 330' FWL SEC: 35-T12s-R31e

TUBULAR DATA

SURFACE CASING

SIZE: 8-5/8" 24# CEMENTED WITH: 250 SX.  
TOC: Surface FEET DETERMINED BY: Circulation  
HOLE SIZE: 12-1/4" SETTING DEPTH: 433'

INTERMEDIATE CASING

SIZE: None CEMENTED WITH:  SX.  
TOC:  FEET DETERMINED BY:   
HOLE SIZE:  SETTING DEPTH:

LONG STRING

SIZE: 5-1/2" 14# CEMENTED WITH: 900 SX.  
TOC: Surface FEET DETERMINED BY: Circulation  
HOLE SIZE: 7-7/8" SETTING DEPTH: 3084'  
TOTAL DEPTH: 3100'

PRODUCING INTERVAL

FORMATION: Queen POOL OR FIELD: SE Chaves Queen  
SPUD DATE: 10-28-84 COMPLETION DATE: 11-9-84  
PERFORATED: 2982' FEET TO 2987' FEET

STIMULATION: 650 gallons of 15% HCl, 15000 gallons 30# gel  
, 22 tons CO2, 12000# 20/40 sand, 10750# 10/20 sand.

OTHER PERFORATED ZONES: None

CURRENT STATUS

WHAT IS CURRENT STATUS OF WELL? Pumping oil well

IF P&A, LIST PLUGGING DETAILS:

# WELL DATA SHEET

OPERATOR: Yates Drilling Co. LEASE: Garner Federal  
WELL NO.: 2 FOOTAGE: 2310' FSL-2310' FEL SEC: 34-T12s-R31e

## TUBULAR DATA

### SURFACE CASING

SIZE: 8-5/8" 24# CEMENTED WITH: 250 SX.  
TOC: Surface FEET DETERMINED BY: Circulation  
HOLE SIZE: 12-1/4" SETTING DEPTH: 410'

### INTERMEDIATE CASING

SIZE: None CEMENTED WITH:  SX.  
TOC:  FEET DETERMINED BY:   
HOLE SIZE:  SETTING DEPTH:

### LONG STRING

SIZE: 5-1/2" 14# CEMENTED WITH: 550 SX.  
TOC: 1792' FEET DETERMINED BY: Cement Bond Log  
HOLE SIZE: 7-7/8" SETTING DEPTH: 3098'  
TOTAL DEPTH: 3100'

## PRODUCING INTERVAL

FORMATION: Queen POOL OR FIELD: SE Chaves Queen  
SPUD DATE: 4-29-84 COMPLETION DATE: 6-1-84  
PERFORATED: 2982 FEET TO 2990 FEET

STIMULATION: 750 gals. 15% HCl acid, 20000 gals. 30# gel,  
25% CO2, 16500# 20/40 sand, 1700# 12/20 sand

OTHER PERFORATED ZONES: None

## CURRENT STATUS

WHAT IS CURRENT STATUS OF WELL? Pumping oil well

IF P&A, LIST PLUGGING DETAILS:

# WELL DATA SHEET

OPERATOR: Yates Drilling Co. LEASE: Garner Federal  
 WELL NO.: 3 FOOTAGE: 1980' ENL-1980' FEL SEC: 34-T12s-R31e

## TUBULAR DATA

### SURFACE CASING

SIZE: 8-5/8" 24# CEMENTED WITH: 225 SX.  
 TOC: Surface FEET DETERMINED BY: Circulation  
 HOLE SIZE: 12-1/4" SETTING DEPTH: 408'

### INTERMEDIATE CASING

SIZE: None CEMENTED WITH: \_\_\_\_\_ SX.  
 TOC: \_\_\_\_\_ FEET DETERMINED BY: \_\_\_\_\_  
 HOLE SIZE: \_\_\_\_\_ SETTING DEPTH: \_\_\_\_\_

### LONG STRING

SIZE: 5-1/2" 14# CEMENTED WITH: 250 SX.  
 TOC: 1810' FEET DETERMINED BY: Temp. Survey  
 HOLE SIZE: 7-7/8" SETTING DEPTH: 3100'  
 TOTAL DEPTH: 3100'

## PRODUCING INTERVAL

FORMATION: Queen POOL OR FIELD: SE Chaves Queen  
 SPUD DATE: 7-2-84 COMPLETION DATE: 8-12-84  
 PERFORATED: 2981 FEET TO 2986 FEET

STIMULATION: 750 gals. 15% HCl acid, 15000 gals. 30# gel,  
5000 SCE N2 per barre, 1500# 20/40 sand, 1700# 12/20 sand

OTHER PERFORATED ZONES: None

## CURRENT STATUS

WHAT IS CURRENT STATUS OF WELL? Pumping oil well

IF F&A, LIST PLUGGING DETAILS: \_\_\_\_\_

# WELL DATA SHEET

OPERATOR: Yates Drilling Co. LEASE: Garner Federal  
 WELL NO.: 7 FOOTAGE: 660' FSL-1980' FEL SEC: 27-T12s-R31e

## TUBULAR DATA

### SURFACE CASING

SIZE: 8-5/8" 24# CEMENTED WITH: 250 SX.  
 TOC: Surface FEET DETERMINED BY: Circulation  
 HOLE SIZE: 12-1/4" SETTING DEPTH: 424'

### INTERMEDIATE CASING

SIZE: None CEMENTED WITH: \_\_\_\_\_ SX.  
 TOC: \_\_\_\_\_ FEET DETERMINED BY: \_\_\_\_\_  
 HOLE SIZE: \_\_\_\_\_ SETTING DEPTH: \_\_\_\_\_

### LONG STRING

SIZE: 5-1/2" 14# CEMENTED WITH: 270 SX.  
 TOC: 1900' FEET DETERMINED BY: Temp. Survey  
 HOLE SIZE: 7-7/8" SETTING DEPTH: 3098.54'  
 TOTAL DEPTH: 3100'

## PRODUCING INTERVAL

FORMATION: Queen POOL OR FIELD: SE Chaves Queen  
 SPUD DATE: 10-14-84 COMPLETION DATE: 10-30-84  
 PERFORATED: 2987' FEET TO 2993' FEET

STIMULATION: 750 gallons of 15 % HCl, 15000 gallons 30# gel  
, 1000 SCF/REL CO2 13000# 20/40 sand, 9000# 10/20 sand

OTHER PERFORATED ZONES: None

## CURRENT STATUS

WHAT IS CURRENT STATUS OF WELL? Pumping oil well

IF P&A, LIST PLUGGING DETAILS: \_\_\_\_\_

WELL DATA SHEET

OPERATOR: Yates Drilling Co. LEASE: Garner Federal  
WELL NO.: 9 FOOTAGE: 1650' FSL-2310' FEL SEC: 27-T12s-R31e

TUBULAR DATA

SURFACE CASING

SIZE: 8-5/8" 24# CEMENTED WITH: 250 SX.  
TOC: Surface FEET DETERMINED BY: Circulation  
HOLE SIZE: 12-1/4" SETTING DEPTH: 420'

INTERMEDIATE CASING

SIZE: None CEMENTED WITH: \_\_\_\_\_ SX.  
TOC: \_\_\_\_\_ FEET DETERMINED BY: \_\_\_\_\_  
HOLE SIZE: \_\_\_\_\_ SETTING DEPTH: \_\_\_\_\_

LONG STRING

SIZE: 5-1/2" 14# CEMENTED WITH: 320 SX.  
TOC: 1820' FEET DETERMINED BY: Temp. Survey  
HOLE SIZE: 7-7/8" SETTING DEPTH: 3098'  
TOTAL DEPTH: 3100'

PRODUCING INTERVAL

FORMATION: Queen POOL OR FIELD: SE Chaves Queen  
SPUD DATE: 11-11-84 COMPLETION DATE: 11-30-84  
PERFORATED: 2985' FEET TO 2995' FEET

STIMULATION: 750 gallons of 15 % HCl, 15000 gallons 30# gel  
, 16 tons of CO2, 18000# 20/40 sand, 12500# 10/20 sand

OTHER PERFORATED ZONES: None

CURRENT STATUS

WHAT IS CURRENT STATUS OF WELL? Pumping oil well

IF P&A, LIST PLUGGING DETAILS: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

WELL DATA SHEET

OPERATOR: Yates Drilling Co. LEASE: Rich Federal

WELL NO.: 1 FOOTAGE: 2310' FNL-2310' FEL SEC: 27-T12s-R31e

TUBULAR DATA

SURFACE CASING

SIZE: 8-5/8" 24# CEMENTED WITH: 250 SX.  
TOC: Surface FEET DETERMINED BY: Circulation  
HOLE SIZE: 12-1/4" SETTING DEPTH: 412'

INTERMEDIATE CASING

SIZE: None CEMENTED WITH: \_\_\_\_\_ SX.  
TOC: \_\_\_\_\_ FEET DETERMINED BY: \_\_\_\_\_  
HOLE SIZE: \_\_\_\_\_ SETTING DEPTH: \_\_\_\_\_

LONG STRING

SIZE: None CEMENTED WITH: \_\_\_\_\_ SX.  
TOC: \_\_\_\_\_ FEET DETERMINED BY: \_\_\_\_\_  
HOLE SIZE: 7-7/8" SETTING DEPTH: \_\_\_\_\_  
TOTAL DEPTH: 3100'

PRODUCING INTERVAL

FORMATION: None POOL OR FIELD: SE Chaves Queen  
SPUD DATE: 11-30-84 COMPLETION DATE: None  
PERFORATED: \_\_\_\_\_ FEET TO \_\_\_\_\_ FEET

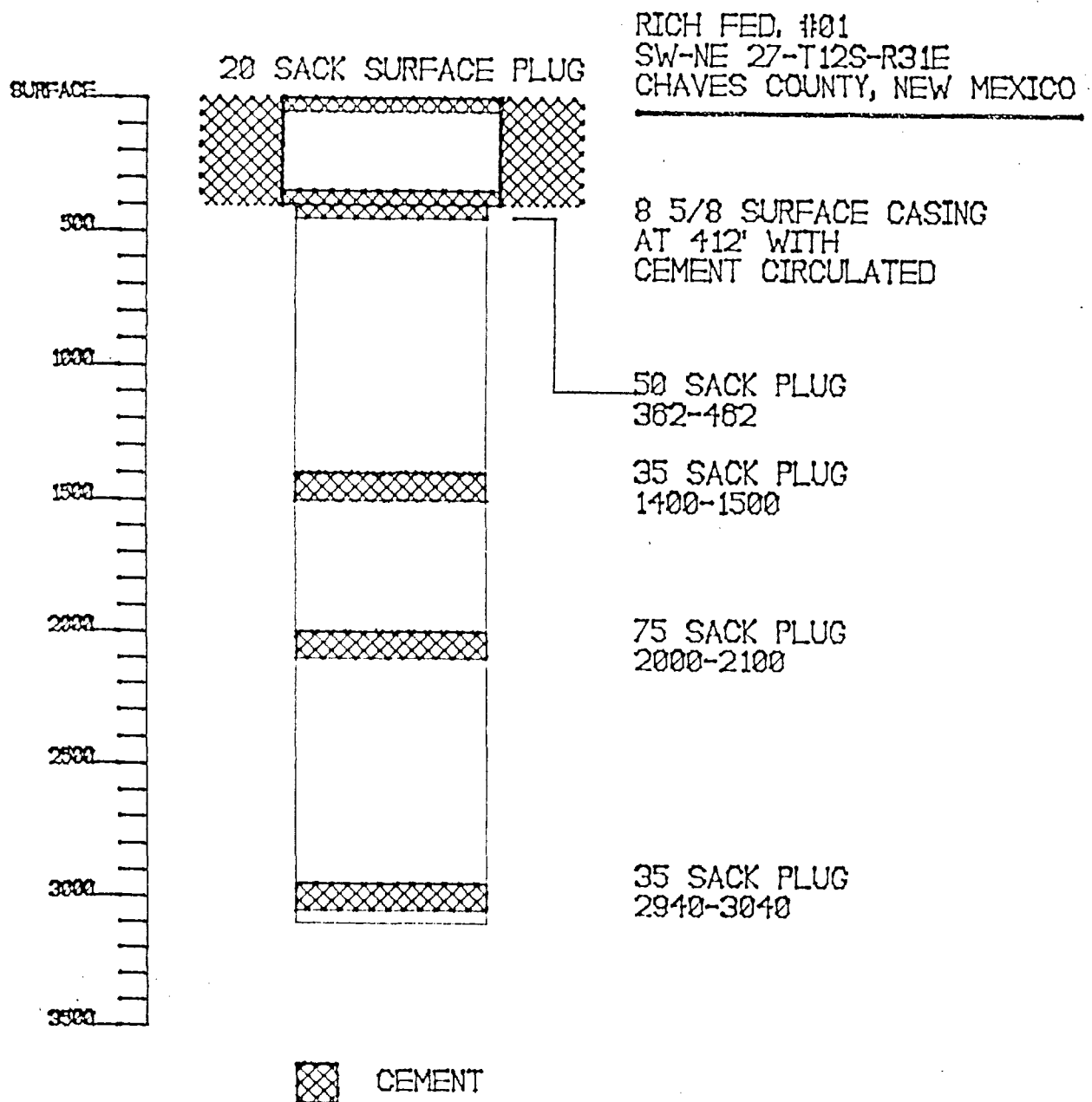
STIMULATION: None  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

OTHER PERFORATED ZONES: None  
\_\_\_\_\_  
\_\_\_\_\_

CURRENT STATUS

WHAT IS CURRENT STATUS OF WELL? Plugged and Abandoned

IF P&A, LIST PLUGGING DETAILS: P&A 12-12-84  
Plug 3040-2940' 35 sx Class "C" neat, Plug 2100-2000' 75 sx  
Class "C" w/2% CaCl2, plug 1500-1400' 35 sx Class "C" neat,  
Plug 462-362' 50 sx Class "C" w/2% CaCl2, Plug 50-Sur. 20sx  
Class "C" neat



# WELL DATA SHEET

OPERATOR: Snow Oil Company LEASE: Toles Federal  
 WELL NO.: 1 FOOTAGE: 1980' FSL-1650' FWL SEC: 26-T12s-R31e

## TUBULAR DATA

### SURFACE CASING

SIZE: 8-5/8" CEMENTED WITH:  SX.  
 TOC: Surface FEET DETERMINED BY: Circulation  
 HOLE SIZE: 12-1/4" SETTING DEPTH: 473'

### INTERMEDIATE CASING

SIZE: None CEMENTED WITH:  SX.  
 TOC:  FEET DETERMINED BY:   
 HOLE SIZE:  SETTING DEPTH:

### LONG STRING

SIZE: 4-1/2" CEMENTED WITH:  SX.  
 TOC: 900' FEET DETERMINED BY: Estimate  
 HOLE SIZE:  SETTING DEPTH: 3115'  
 TOTAL DEPTH: 3115'

## PRODUCING INTERVAL

FORMATION: Queen POOL OR FIELD: SE Chaves Queen  
 SPUD DATE: 1-8-85 COMPLETION DATE: None  
 PERFORATED: 2344 FEET TO 2845 FEET

STIMULATION:

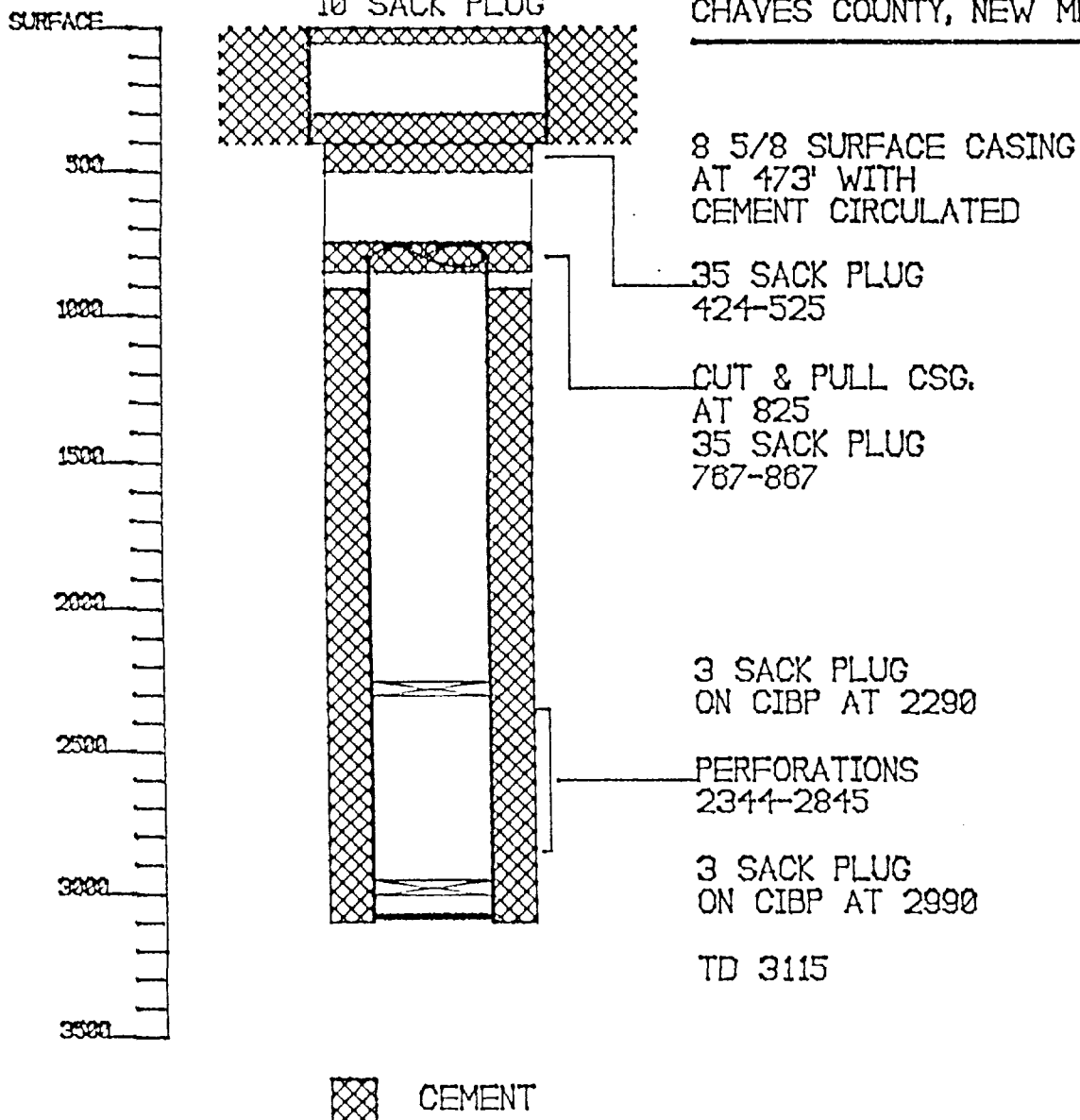
OTHER PERFORATED ZONES: None

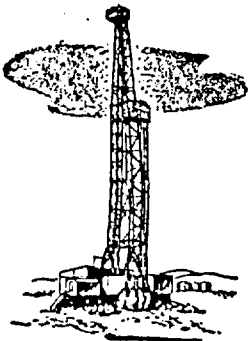
## CURRENT STATUS

WHAT IS CURRENT STATUS OF WELL? Plugged and Abandoned

IF P&A, LIST PLUGGING DETAILS: 3sx plug on CIBP @ 2990'  
3sx plug on CIBP @ 2290', cut and pulled 4-1/2" casing @ 825  
35sx plug @ 867', 35sx plug @ 524', 10sx plug @ surface

TOLES FED. #01  
NE-SW 28-T12S-R31E  
CHAVES COUNTY, NEW MEXICO





# YATES DRILLING COMPANY

105 SOUTH FOURTH STREET — (505) 746-9889

FAX (505) 746-6480

TELEX 508891 (YPCART)

ARTESIA, NEW MEXICO 88210

May 31, 1989

PEYTON YATES  
PRESIDENT

S. P. YATES  
VICE PRESIDENT

RANDY G. PATTERSON  
SECRETARY

DENNIS G. KINSEY  
TREASURER

New Mexico State Engineer  
District 2 Office  
P.O. Box 1717  
Roswell, New Mexico 88202

Attention: Glen Brim, District Supervisor 

Gentlemen:

Yates Drilling Company is proposing to waterflood the Queen formation underlying portions of Township 12 South, Range 31 East and Township 13 South, Range 31 East, Chaves County, New Mexico.

To insure the protection of fresh water aquifers in this area we would like to obtain the location, depth and geological name of the producing formation for any water wells located in either described township. Additionally, the identification of any commercial water wells in the area would be helpful.

Any information that your office can provide concerning this matter will be greatly appreciated.

Sincerely yours,

YATES DRILLING COMPANY



Tobin L. Rhodes  
Petroleum Engineer

89 JUN 1 AM 8 35  
STATE ENGINEER OFFICE  
ROSWELL, NEW MEXICO

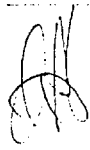
JUN 12 1989

June 9, 1989

Yates Drilling Company

ATTN: Tobin L. Rhodes, Petroleum Engineer

Enclosed are well locations and some information pertaining to these wells. They were drilled and finished in the Ogallala Formation (TO). Record of other wells finished deeper on other water formations were found north of Township 12 South in Township 11 South, Range 31 East. These wells are finished in the Triassic Formation (TRC), depth of wells are between  $\pm$  200 feet to 300 feet.

 Johnny R. Hernandez

Basin Supervisor

4993

NE $\frac{1}{4}$ SW $\frac{1}{4}$ 

Dom.

T.D. 140

5 $\frac{1}{2}$ " casing - Shallow

-6649

SE $\frac{1}{4}$ SE $\frac{1}{4}$ 

Dom &amp; Stk

T.D. 160'

4 $\frac{1}{2}$ " casing - Shallow

Section 26

Township 12 South Range 31 East

-2117

NW $\frac{1}{4}$ SW $\frac{1}{4}$ 

Irr.

-6746

SW $\frac{1}{4}$ NW $\frac{1}{4}$ 

Dom. &amp; Stk

-6749

SW $\frac{1}{4}$ SE $\frac{1}{4}$ 

Comm. &amp; DOM &amp; STK

L-9566

SW $\frac{1}{4}$ SE $\frac{1}{4}$ 

COM, Oil &amp; Gas

Well L-9566 is stock well L-6749\*\* Comm.

T.D. 166'

NOT cased - Shallow

T.D. 198'

6" casing - Shallow

Same

Section 27

Township 12 S

Range 31 E.

L-6650

SE $\frac{1}{4}$ NE $\frac{1}{4}$ Dom & Stk - T.D. 160' 4 $\frac{1}{2}$ " casing - Shallow

Section 35

Township 12 South Range 31 East

L-2932

SE $\frac{1}{4}$ 

OWD

L-4170

NW $\frac{1}{4}$ SE $\frac{1}{4}$ NW $\frac{1}{4}$ 

Dom. —

T.D. 55'

casing 8" Shallow

L-4296

NW $\frac{1}{4}$ NW $\frac{1}{4}$ 

WF —

Cancelled

L-4296-X

SW $\frac{1}{4}$ SW $\frac{1}{4}$ 

WF —

Cancelled

L-4296-X-2

NE $\frac{1}{4}$ NE $\frac{1}{4}$ 

WF —

Cancelled

L-4296-X-3

SE $\frac{1}{4}$ SE $\frac{1}{4}$ 

WF —

Cancelled

NO wells

↓

## Section 23

Township 13 South Range 31 East

|             |                                   |      |
|-------------|-----------------------------------|------|
| L-3914-X-10 | SE $\frac{1}{4}$ SE $\frac{1}{4}$ | Ind. |
| L-3914-X-11 | SE $\frac{1}{4}$ NW $\frac{1}{4}$ | Ind. |
| L-3914-X-12 | NE $\frac{1}{4}$ NE $\frac{1}{4}$ | Ind. |
| L-3914-X-13 | SE $\frac{1}{4}$ SW $\frac{1}{4}$ | Ind. |
| L-3914-X-14 | NW $\frac{1}{4}$ SE $\frac{1}{4}$ | Ind. |

↑  
WELLS NOT DRILLED  
↓

## Section 24

Township 13 South Range 31 East

|            |                                                                     |      |
|------------|---------------------------------------------------------------------|------|
| L-3914     | NE $\frac{1}{4}$ SE $\frac{1}{4}$ SW $\frac{1}{4}$ NE $\frac{1}{4}$ | Ind. |
| L-3914-X   | NE $\frac{1}{4}$ SW $\frac{1}{4}$                                   | Ind. |
| L-3914-X-2 | NE $\frac{1}{4}$ NW $\frac{1}{4}$                                   | Ind. |
| L-3914-X-3 | SW $\frac{1}{4}$ SE $\frac{1}{4}$                                   | Ind. |
| L-3914-X-4 | SE $\frac{1}{4}$ NE $\frac{1}{4}$                                   | Ind. |
| L-3914-X-5 | NE $\frac{1}{4}$ SE $\frac{1}{4}$                                   | Ind. |
| L-3914-X-6 | NW $\frac{1}{4}$ NE $\frac{1}{4}$                                   | Ind. |
| L-3914-X-7 | NE $\frac{1}{4}$ NE $\frac{1}{4}$                                   | Ind. |
| L-3914-X-8 | SW $\frac{1}{4}$ NW $\frac{1}{4}$                                   | Ind. |
| L-3914-X-9 | SE $\frac{1}{4}$ NW $\frac{1}{4}$                                   | Ind. |

T.D. 176' 8 $\frac{5}{8}$ " casing - Shallow

↑  
WELLS NOT DRILLED  
↓

## Section 35

Township 13 South Range 31 East

|        |                                                    |      |
|--------|----------------------------------------------------|------|
| L-2849 | SW $\frac{1}{4}$ SE $\frac{1}{4}$ NW $\frac{1}{4}$ | Dom. |
|--------|----------------------------------------------------|------|

No well record info.

3460  
3461  
3837  
3837-X

SE $\frac{1}{4}$ NE $\frac{1}{4}$ SW $\frac{1}{4}$   
SE $\frac{1}{4}$ SE $\frac{1}{4}$ SE $\frac{1}{4}$   
SW $\frac{1}{4}$ SW $\frac{1}{4}$ SW $\frac{1}{4}$   
SW $\frac{1}{4}$ SW $\frac{1}{4}$ SW $\frac{1}{4}$

WF

WF

Com. &amp; Stock

Com. &amp; Stock

— TD. 17' 8 $\frac{5}{8}$ " casing - Shallow  
— TD. 220' 8 $\frac{5}{8}$ " casing - Shallow  
— Rptd TD 165' 6" casing - Shallow  
— Rptd TD. 190' 7" casing - Shallow

## Section 2

Township 13 South Range 31 East

3806  
3833  
3834  
3835  
4295

SE $\frac{1}{4}$ SE $\frac{1}{4}$ SE $\frac{1}{4}$   
NE $\frac{1}{4}$ NE $\frac{1}{4}$ SE $\frac{1}{4}$   
SW $\frac{1}{4}$ SE $\frac{1}{4}$ NE $\frac{1}{4}$   
SW $\frac{1}{4}$ SE $\frac{1}{4}$ NE $\frac{1}{4}$   
SE $\frac{1}{4}$ NE $\frac{1}{4}$

Stock

Com.

Dec.

Dec.

WF

NO well record info.

With drawn. NO well

— Rptd — TD 165' 6 $\frac{1}{2}$ " casing - Shallow  
— Rptd — TD 165' 6 $\frac{1}{2}$ " casing - Shallow

3914

NE $\frac{1}{4}$ SE $\frac{1}{4}$ NE $\frac{1}{4}$ 

SRO

— TD. 194' 8 $\frac{5}{8}$ " casing - Shallow

2745

NE $\frac{1}{4}$ NE $\frac{1}{4}$ SE $\frac{1}{4}$ 

SRO

— TD. 216' 6 $\frac{1}{2}$ " casing - Shallow

## Section 12

Township 13 South Range 31 East

2934

NE $\frac{1}{4}$ 

OWD

NO well record info.

3460

NE $\frac{1}{4}$ NE $\frac{1}{4}$ 

SRO

— T.D. 217' — 8 $\frac{5}{8}$ " casing — Shallow

## Section 13

Township 13 South Range 31 East

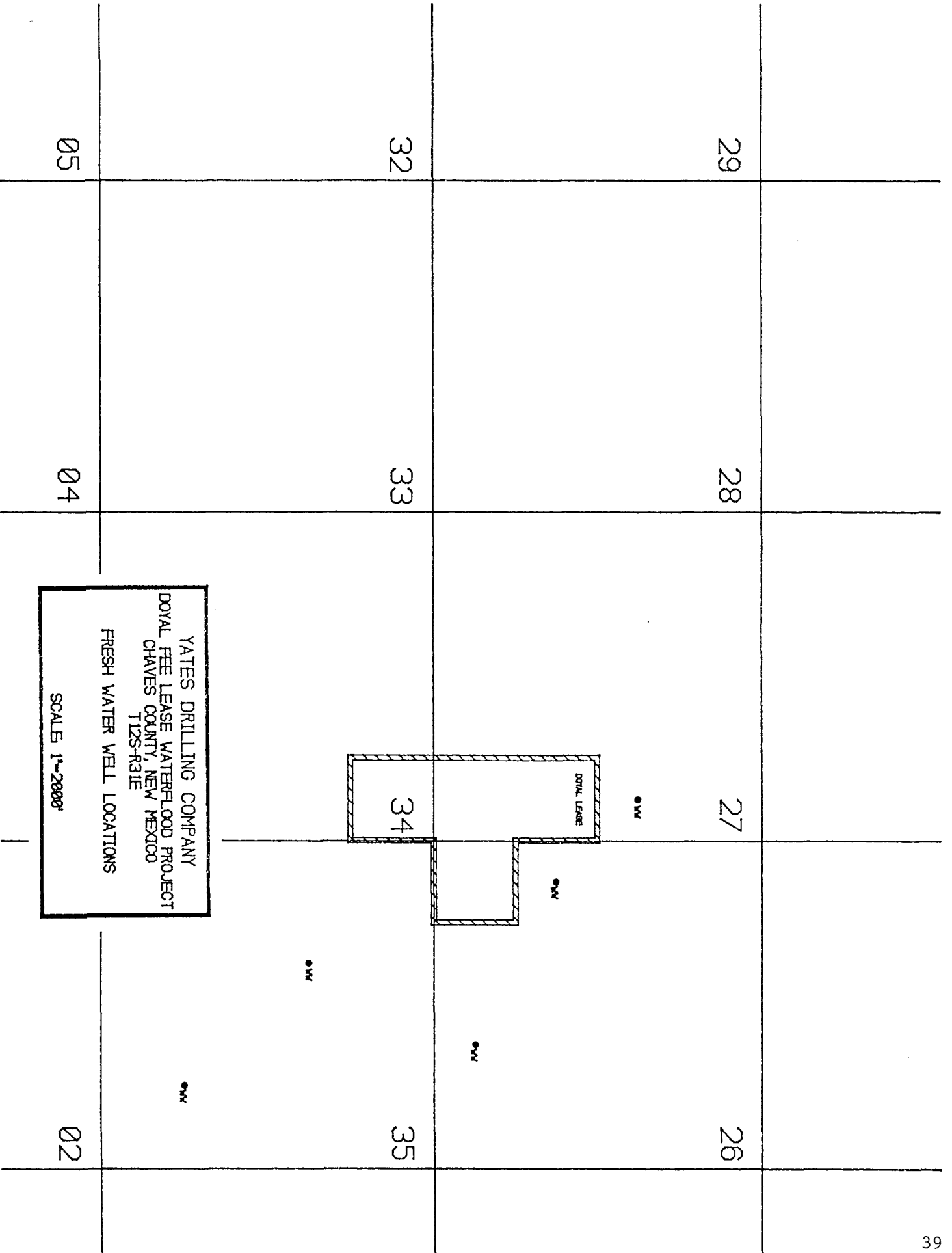
2933

NE $\frac{1}{2}$ 

OWD

NO well record info.

| SEC | TWN | RNG | UNIT<br>LTR | QTR<br>OF<br>UNIT | TD  | TYPE             | #      |
|-----|-----|-----|-------------|-------------------|-----|------------------|--------|
| 24  | 12S | 31E | K           | ?                 | 148 | DOM.             | L4993  |
| 24  | 12S | 31E | P           | ?                 | 160 | DOM.             | L6649  |
| 26  | 12S | 31E | E           | ?                 | 166 | DOM. & STK       | L6746  |
| ✓26 | 12S | 31E | L           | ?                 | ?   | IRR.             | L2117  |
| ✓26 | 12S | 31E | O           | ?                 | 198 | COM. (OIL & GAS) | L9566  |
| ✓26 | 12S | 31E | O           | ?                 | 198 | COM., DOM. & STK | L6749  |
| ✓27 | 12S | 31E | H           | ?                 | 160 | DOM. & STK       | L6650  |
| ✓35 | 12S | 31E | F           | NW                | 55  | DOM.             | L4170  |
| ✓35 | 12S | 31E | IJOP        | ?                 | ?   | ?                | L2932  |
| 1   | 13S | 31E | K           | SE                | 190 | WF               | L3460  |
| 1   | 13S | 31E | P           | SE                | 220 | WF               | L3461  |
| 1   | 13S | 31E | M           | SW                | 190 | COM. & STK       | L3837X |
| 1   | 13S | 31E | M           | SW                | 165 | COM. & STK       | L3837  |
| 2   | 13S | 31E | H           | SW                | 165 | DEC.             | L3834  |
| 2   | 13S | 31E | H           | ?                 | ?   | WF               | L4295  |
| 2   | 13S | 31E | H           | NE                | 196 | SRO              | L3914  |
| 2   | 13S | 31E | H           | SW                | 165 | DEC.             | L3835  |
| 2   | 13S | 31E | P           | SE                | ?   | ?                | L3806  |
| 2   | 13S | 31E | I           | NE                | 216 | SRO              | L2745  |
| 12  | 13S | 31E | A           | ?                 | 217 | SRO              | L3460  |
| 13  | 13S | 31E | ABCD        | ?                 | ?   | OWD              | L2933  |
| 24  | 13S | 31E | H           | NE                | 196 | IND.             | L3914  |
| 35  | 13S | 31E | F           | SW                | ?   | DOM.             | L2849  |



# PERMIAN

Treating Chemicals, Inc.

P. O. BOX 728  
LOVINGTON, NM 88260  
PHONE (505) 396-5674

## WATER ANALYSIS REPORT

Company Yates Drilling Date Sampled 1-22-88  
Field Caprock County Chavez  
Lease Graham Water Station State NM  
Well \_\_\_\_\_ Formation \_\_\_\_\_  
Type of Water Fresh Water, B/D \_\_\_\_\_  
Sampling Point Water Tanks Sampled By Blackwell

### DISSOLVED SOLIDS

| CATIONS           | mg/l | meq/l |
|-------------------|------|-------|
| Sodium, Na+(Calc) | 230  | 10    |
| Calcium, Ca++     | 120  | 6     |
| Magnesium, Mg++   | 24   | 2     |
| Barium, Ba++      | neg  | -     |
| Iron, Fe (Total)  |      |       |
|                   |      |       |
|                   |      |       |

### OTHER PROPERTIES

pH 8.2  
Specific Gravity 1.000  
H<sub>2</sub>S neg  
Total Dissolved Solids 1144  
Total Hardness 400

### ANIONS

|                                 |     |      |    |
|---------------------------------|-----|------|----|
| Chloride, Cl-                   | 350 | 35.5 | 10 |
| Sulfate, So <sub>4</sub> =      | 120 | 48   | 3  |
| Carbonate, Co <sub>3</sub> =    | 0   | 30   | 0  |
| Bicarbonate, HCo <sub>3</sub> - | 300 | 61   | 5  |

Remarks and Recommendations \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

# PERMIAN

Treating Chemicals, Inc.

P.O. BOX 728  
LOVINGTON, N.M. 88260  
PHONE (505) 396-5674

## WATER ANALYSIS REPORT

Company Yates Drilling Date Sampled 1-22-88  
Field Caprock County Chavez  
Lease Graham Water well (fresh) State NM  
Well North of Lease Formation Blackwell  
Type of Water Fresh Water, B/D Blackwell  
Sampling Point Well head Sampled By

### DISSOLVED SOLIDS

#### CATIONS

|                   | mg/l | meq/l |
|-------------------|------|-------|
| Sodium, Na+(Calc) | 115  | 5     |
| Calcium, Ca++     | 120  | 6     |
| Magnesium, Mg++   | 15   | 1     |
| Barium, Ba++      | Neg  |       |
| Iron, Fe (Total)  |      |       |
|                   |      |       |
|                   |      |       |

### OTHER PROPERTIES

pH 8.3  
Specific Gravity 1.000  
H<sub>2</sub>S Neg  
Total Dissolved Solids 817  
Total Hardness 360

#### ANIONS

|                                 |     |      |   |
|---------------------------------|-----|------|---|
| Chloride, Cl-                   | 200 | 35.5 | 6 |
| Sulfate, So <sub>4</sub> =      | 55  | 48   | 1 |
| Carbonate, Co <sub>3</sub> =    | 0   | 30   | 0 |
| Bicarbonate, HCo <sub>3</sub> - | 312 | 61   | 5 |

Remarks and Recommendations

# ERMIAN

Leasing Chemicals, Inc.

P.O. BOX 728  
LOVINGTON, N.M. 88260  
PHONE (505) 396-5674

## WATER ANALYSIS REPORT

Company Yates Drilling Report Date Sampled 1-22-88  
Field Caprock County Lea  
Lease Williams Ranch State NM  
Well Williams Fresh Water Formation \_\_\_\_\_  
Type of Water Fresh Water Water, B/D \_\_\_\_\_  
Sampling Point Well head Sampled By Blackwell

### DISSOLVED SOLIDS

| CATIONS           | mg/l |        | meq/l |
|-------------------|------|--------|-------|
| Sodium, Na+(Calc) | 70   | ÷ 23   | 3.0   |
| Calcium, Ca++     | 80   | ÷ 20   | 4.0   |
| Magnesium, Mg++   | 20   | ÷ 12.2 | 1.6   |
| Barium, Ba++      | Neg  | ÷ 68.7 |       |
| Iron, Fe (Total)  |      |        |       |
|                   |      |        |       |
|                   |      |        |       |

### OTHER PROPERTIES

pH 8.2  
Specific Gravity 1.000  
H<sub>2</sub>S Neg  
Total Dissolved Solids 602  
Total Hardness 271

### ANIONS

|                                 |     |        |     |
|---------------------------------|-----|--------|-----|
| Chloride, Cl-                   | 100 | ÷ 35.5 | 2.8 |
| Sulfate, So <sub>4</sub> =      | 40  | ÷ 48   | 0.8 |
| Carbonate, Co <sub>3</sub> =    | 0   | ÷ 30   | 0   |
| Bicarbonate, HCo <sub>3</sub> - | 292 | ÷ 61   | 4.8 |
|                                 |     |        |     |
|                                 |     |        |     |

Remarks and Recommendations \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

# PERMIAN

Treating Chemicals, Inc.

P.O. BOX 72  
LOVINGTON, N.M.  
PHONE (505) 396

## WATER ANALYSIS REPORT

|                |                |              |           |
|----------------|----------------|--------------|-----------|
| Company        | Yates Drilling | Date Sampled | 1-22-88   |
| Field          | Caprock        | County       | Lea       |
| Lease          | Gallagher      | State        | NM        |
| Well           | 1              | Formation    | Queens    |
| Type of Water  | Produced       | Water, B/D   |           |
| Sampling Point | Treater        | Sampled By   | Blackwell |

### DISSOLVED SOLIDS

#### CATIONS

|                   | mg/l  | meq/l |
|-------------------|-------|-------|
| Sodium, Na+(Calc) | 98100 | 4265  |
| Calcium, Ca++     | 3750  | 188   |
| Magnesium, Mg++   | 12900 | 1057  |
| Barium, Ba++      | neg   | 0.7   |
| Iron, Fe (Total)  |       |       |

### OTHER PROPERTIES

|                        |         |
|------------------------|---------|
| pH                     | 5.9     |
| Specific Gravity       | 1.200   |
| H <sub>2</sub> S       | Neg     |
| Total Dissolved Solids | 314,240 |
| Total Hardness         | 62,800  |

#### ANIONS

|                                 |        |      |      |
|---------------------------------|--------|------|------|
| Chloride, Cl-                   | 198000 | 35.5 | 5577 |
| Sulfate, So <sub>4</sub> =      | 1350   | 48   | 28   |
| Carbonate, Co <sub>3</sub> =    | 0      | 30   | 0    |
| Bicarbonate, HCo <sub>3</sub> - | 140    | 61   | 2.3  |

Remarks and Recommendations

# PERMIAN

Treating Chemicals, Inc.

P. O. BOX 72  
LOVINGTON, N.M.  
PHONE (505) 396

## WATER ANALYSIS REPORT

|                |                |              |           |
|----------------|----------------|--------------|-----------|
| Company        | Yates Drilling | Date Sampled | 1-22-88   |
| Field          | Caprock        | County       | Lea       |
| Lease          | Doyle          | State        | NM        |
| Well           | 12 & 4         | Formation    | Queens    |
| Type of Water  | Produced       | Water, B/D   |           |
| Sampling Point | Treater        | Sampled By   | Blackwell |

### DISSOLVED SOLIDS

#### CATIONS

|                   | mg/l  | meq/l     |
|-------------------|-------|-----------|
| Sodium, Na+(Calc) | 97900 | 23 4257   |
| Calcium, Ca++     | 3800  | 20 190    |
| Magnesium, Mg++   | 13300 | 12.2 1090 |
| Barium, Ba++      | 0     | 0 8.7     |
| Iron, Fe (Total)  | 58    |           |

#### ANIONS

|                          |         |           |
|--------------------------|---------|-----------|
| Chloride, Cl-            | 196,000 | 35.5 5521 |
| Sulfate, $SO_4^{=}$      | 1400    | 48 29     |
| Carbonate, $CO_3^{=}$    | 0       | 0         |
| Bicarbonate, $HCO_3^{-}$ | 140     | 61 2.3    |

### OTHER PROPERTIES

|                        |         |
|------------------------|---------|
| pH                     | 5.7     |
| Specific Gravity       | 1.200   |
| $H_2S$                 | neg.    |
| Total Dissolved Solids | 312,598 |
| Total Hardness         | 64,900  |

Remarks and Recommendations

# PERMIAN

Treating Chemicals, Inc.

P. O. BOX 728  
LOVINGTON, NM 88260  
PHONE (505) 396-5674

## WATER ANALYSIS REPORT

Company Yates Drilling Date Sampled 1-22-88  
Field Caprock County Lea  
Lease Burkett State NM  
Well \_\_\_\_\_ Formation Queens  
Type of Water Produced Water, B/D \_\_\_\_\_  
Sampling Point Treater Sampled By Blackwell

### DISSOLVED SOLIDS

#### CATIONS

|                   | mg/l  | meq/l |
|-------------------|-------|-------|
| Sodium, Na+(Calc) | 98000 | 4261  |
| Calcium, Ca++     | 4100  | 205   |
| Magnesium, Mg++   | 12800 | 1049  |
| Barium, Ba++      | Neg   | 68.7  |
| Iron, Fe (Total)  |       |       |
|                   |       |       |
|                   |       |       |

### OTHER PROPERTIES

pH 5.9  
Specific Gravity 1.200  
H<sub>2</sub>S Neg.  
Total Dissolved Solids 313,220  
Total Hardness 6300

#### ANIONS

|                                 | mg/l    | meq/l |
|---------------------------------|---------|-------|
| Chloride, Cl-                   | 197,000 | 5549  |
| Sulfate, So <sub>4</sub> =      | 1200    | 25    |
| Carbonate, Co <sub>3</sub> =    | 0       | 30    |
| Bicarbonate, HCo <sub>3</sub> - | 120     | 61    |
|                                 |         |       |
|                                 |         |       |

Remarks and Recommendations \_\_\_\_\_

# BERNARD

Coating Chemicals, Inc.

P.C. 102738  
 100-101-102-103  
 104-105-106-107

## WATER ANALYSIS

Company Yates Drilling  
 Field  
 Lease Deluna  
 Well  
 Type of Water Produced  
 Sampling Point Treater

Date Sampled 1-22-88  
 County Lea  
 State NM  
 Location Queens  
 Water, B/E  
 Sampled by Blackwell

### DISSOLVED SOLIDS

#### CATIONS

|                    |       |      |
|--------------------|-------|------|
| Sodium, Na+ (Calc) | 97600 | 4243 |
| Calcium, Ca++      | 3960  | 198  |
| Magnesium, Mg++    | 12900 | 1075 |
| Barium, Ba++       |       |      |
| Iron, Fe (Total)   | 0     |      |

### OTHER PROPERTIES

|                        |         |
|------------------------|---------|
| pH                     | 6.0     |
| Specific Gravity       | 1.200   |
| H <sub>2</sub> S       | Neg     |
| Total Dissolved Solids | 135,148 |
| Total Hardness         | 63,000  |

#### ANIONS

|                                 |         |      |
|---------------------------------|---------|------|
| Chloride, Cl-                   | 194,000 | 5465 |
| Sulfate, SO <sub>4</sub> =      | 1200    | 25   |
| Carbonate, CO <sub>3</sub> =    | 0       |      |
| Bicarbonate, HCO <sub>3</sub> - | 88      | 1.1  |

Remarks and Recommendations

# ERMIAN

ating Chemicals, Inc.

P.C. 104726  
 100.5 (S.G.) 88220  
 100.5 (S.G.) 88220

WATER ANALYSIS

Company Yates Drilling

Date Sampled 1-22-88

Well

Lea

Lease

Garner

NM

Well

7

Queens

Type of Water Produced

Water, B/D

Sampling Point

Sampled by Blackwell

## DISSOLVED SOLI

## OTHER PROPERTIES

### CATIONS

Sodium, Na (ppm) 105,000

4565

Calcium, Ca (ppm) 4,750

238

Magnesium, Mg (ppm) 11,900

975

Barium, Ba (ppm)

Iron, Fe (Total)

5.8

Specific Gravity

1.200

H<sub>2</sub>S Neg

Total Dissolved

Solids 326,955

Total Hardness

60,700

### ANIONS

Chloride, Cl<sup>-</sup> 204,000

5746

Sulfate, SO<sub>4</sub><sup>2-</sup> 1,100

23

Carbonate, CO<sub>3</sub><sup>2-</sup> 0

Bicarbonate, HCO<sub>3</sub><sup>-</sup> 205

3.4

Remarks and Notes

## HALLIBURTON DIVISION LABORATORY

## HALLIBURTON SERVICES

## ARTESIA DISTRICT

## LABORATORY REPORT

No. W539, W540 &amp; W541-89

TO Yates DrillingDate October 17, 1989105 South Fourth StreetArtesia, NM 88210

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Submitted by \_\_\_\_\_ Date Rec. October 16, 1989

Well No. \_\_\_\_\_ Depth \_\_\_\_\_ Formation \_\_\_\_\_

Field \_\_\_\_\_ County \_\_\_\_\_ Source \_\_\_\_\_

SPEAR WW #1

GF #7

DEL FED. #3

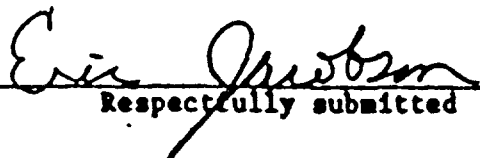
Resistivity ..... 0.74 @ 70° 0.052 @ 70° 0.054 @ 70°Specific Gravity .. 1.006 @ 70° 1.1730 @ 70° 1.1571 @ 70°pH ..... 6.4 6.6 6.6Calcium ..... 1,686 6,744 7,418Magnesium ..... 546 10,230 7,979Chlorides ..... 5,000 159,000 143,000Sulfates ..... Nil Nil MediumBicarbonates ..... 305 214 183Soluble Iron ..... Nil 10 3

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Remarks:


  
Respectfully submitted
Analyst: Eric Jacobson - EIT

HALLIBURTON SERVICES

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# HALLIBURTON DIVISION LABORATORY

## HALLIBURTON SERVICES

### ARTESIA DISTRICT

#### LABORATORY REPORT

No. W536, W537 & W538-89

TO Yates Drilling  
105 South Fourth Street  
Artesia, NM 88210

Date October 17, 1989

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Submitted by \_\_\_\_\_ Date Rec. October 16, 1989

Well No. \_\_\_\_\_ Depth \_\_\_\_\_ Formation \_\_\_\_\_

Field \_\_\_\_\_ County \_\_\_\_\_ Source \_\_\_\_\_

|                     | <u>BUR FEDERAL #3</u> | <u>GALLAHAN ST. #1</u> | <u>AP STATE #1</u> |
|---------------------|-----------------------|------------------------|--------------------|
| Resistivity .....   | <u>0.051 @ 70°</u>    | <u>0.051 @ 70°</u>     | <u>0.058 @ 70°</u> |
| Specific Gravity .. | <u>1.1200 @ 70°</u>   | <u>1.196 @ 70°</u>     | <u>1.137 @ 70°</u> |
| pH .....            | <u>6.5</u>            | <u>6.6</u>             | <u>6.8</u>         |
| Calcium .....       | <u>6,070</u>          | <u>5,620</u>           | <u>6,407</u>       |
| Magnesium .....     | <u>10,912</u>         | <u>12,685</u>          | <u>6,615</u>       |
| Chlorides .....     | <u>184,000</u>        | <u>180,000</u>         | <u>122,000</u>     |
| Sulfates .....      | <u>Heavy</u>          | <u>Medium</u>          | <u>Medium</u>      |
| Bicarbonates .....  | <u>214</u>            | <u>183</u>             | <u>305</u>         |
| Soluble Iron .....  | <u>10</u>             | <u>25</u>              | <u>0</u>           |
| -----               | -----                 | -----                  | -----              |
| -----               | -----                 | -----                  | -----              |
| -----               | -----                 | -----                  | -----              |

Remarks:

Eric Jacobson  
 Respectfully submitted

Analyst: Eric Jacobson - EIT

HALLIBURTON SERVICES

## HALLIBURTON DIVISION LABORATORY

## HALLIBURTON SERVICES

## ARTESIA DISTRICT

## LABORATORY REPORT

No. W542, W543 &amp; W544-89

TO Yates Drilling  
105 South Fourth Street  
Artesia, NM 88210

Date October 17, 1989

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Submitted by \_\_\_\_\_ Date Rec. October 16, 1989

Well No. \_\_\_\_\_ Depth \_\_\_\_\_ Formation \_\_\_\_\_

Field \_\_\_\_\_ County \_\_\_\_\_ Source \_\_\_\_\_

|                     | <u>Graham WW #1</u> | <u>Graham WW #2</u> | <u>Doy #1</u>  |
|---------------------|---------------------|---------------------|----------------|
| Resistivity .....   | <u>0.60 @ 70°</u>   | <u>0.91 @ 70°</u>   | <u>N.A.</u>    |
| Specific Gravity .. | <u>1.007 @ 70°</u>  | <u>1.005 @ 70°</u>  | <u>N.A.</u>    |
| pH .....            | <u>6.5</u>          | <u>6.7</u>          | <u>6.6</u>     |
| Calcium .....       | <u>1,124</u>        | <u>1,124</u>        | <u>4,946</u>   |
| Magnesium .....     | <u>477</u>          | <u>614</u>          | <u>14,186</u>  |
| Chlorides .....     | <u>6,000</u>        | <u>4,000</u>        | <u>198,000</u> |
| Sulfates .....      | <u>Nil</u>          | <u>Nil</u>          | <u>Nil</u>     |
| Bicarbonates .....  | <u>214</u>          | <u>214</u>          | <u>153</u>     |
| Soluble Iron .....  | <u>Nil</u>          | <u>Nil</u>          | <u>75</u>      |
| -----               | -----               | -----               | -----          |
| -----               | -----               | -----               | -----          |
| -----               | -----               | -----               | -----          |

Remarks:

Eric Jacobson  
 Respectfully submitted

Analyst: Eric Jacobson - EIT

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