OIL CONSERVATION DIVISION
DISTRICT I

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

DATE 10/26/82

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

Gentlemen:

I have examined the application for the:

Sage Oil Co. Shell State #1-K 32-14-34
Operator Lease and Well No. Unit, S - T - R

and my recommendations are as follows:

OK JS

Yours very truly,

/mc

DATA SHEET

I. Proposed Daily Injection:

A. Maximum - 3000 barrels produced water

B. Average - 2000 barrels produced water

II. System will be open.

III. Produced Injection Pressure:

A. Maximum - 400 psia

B. Average - 100 psia

IV. Source of injection water:

Major source will be water produced in the Saunder Permo Upper Penn Field from wells owned by Sage Oil Company and located approximately 3 miles West in Section 35, T-14-S, R-33-E. An analysis of this water is attached. Injection will be into the San Andres, not productive of oil or gas in the 2 mile area. A random analysis of water in this formation is also attached.

V. Geological Data on Injection Zone:

Injection will be into the San Andres Formation which is a Limestone-Dolomite Section of Middle Permian Age. It is overlain by the Greyburg Formation and overlays the Glorietta Formation. The top occurs at a depth of 4436' in the proposed well and extends down to 5970', for an overall thickness of 1534'. Maximum porosity is approximately 20 percent and occurs from approximately 5340' to 5400'. Fresh water occurs in the area on a limited basis from shallow tertiary sands that do not occur below a depth of 500' to 600'. Brackish and highly mineralized water could occur at a depth of approximately 2000' from the Santa Rosa Formation of Triassic Age, but would not be suitable for domestic use. There are no fresh water zones underlying the proposed injection interval.

VI. Stimulation Program:

Treat open hole section from 4475' to 5970' with approximately 2500 gallons regular 15% acid.

VII. Well log is attached.
(Also available on file with NMOCC.)

VIII. Fresh Water Wells:

Chemical analysis of fresh water from a windmill located 1 mile Northeast from the proposed injection well is attached. Samples were taken on October 16, 1982.

IX. All geologic and engineering data available has been examined and there is no evidence that open faults or any other hydrologic connection exists between the disposal zone and any underground source of drinking water.

FOY BOYD ASSOCIATES, INC.
ONE MARIENFELD PLACE-SUITE 290
PHONE (915) 684-7877
MIDLAND, TEXAS 79701

October 20, 1982

Mr. Joe Ramey
New Mexico Oil Conservation Commission
P. O. Box 2088
Santa Fe, New Mexico 87501

Re: Salt Water Disposal
Sage Oil Company
Shell-State #1-SWD
Unit K, Sec. 32, T-14-S, R-34-E
Lea County, New Mexico

Dear Mr. Ramey:

Attached is a New Mexico Oil Conservation Commission Form C-108 and all related data, requesting administrative approval to inject produced water into the captioned well. The proposed injection zone is the open hole section from approximately 4475' to 5970' in the San Andres Formation.

Study indicates that this formation is not productive of oil or gas within the two mile radius of investigation and, therefore, qualifies for administrative approval.

Included are schematics, logs, water analysis, maps, advertisement, notices, etc., as required for approval.

It is respectfully requested that approval be granted administratively and at the earliest possible date since wells capable of producing approximately 100 BOPD are shut-in for lack of disposal facilities. Your prompt attention and approval would be appreciated.

Yours very truly,

FOY BOYD ASSOCIATES, INC.

John W. Mulloy

JWM:bb
Enc.

STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT

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

FORM C-108
Revised 7-1-81

APPLICATION FOR AUTHORIZATION TO INJECT

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

II. Operator: Sage Oil Company

Address: 425 Hamilton Bldg., Wichita Falls, Texas 76301

Contact party: J. W. Mulloy Phone: 915/684-7877

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: J. W. Mulloy Title Agent

Signature: J. Mulloy Date: October 20, 1982

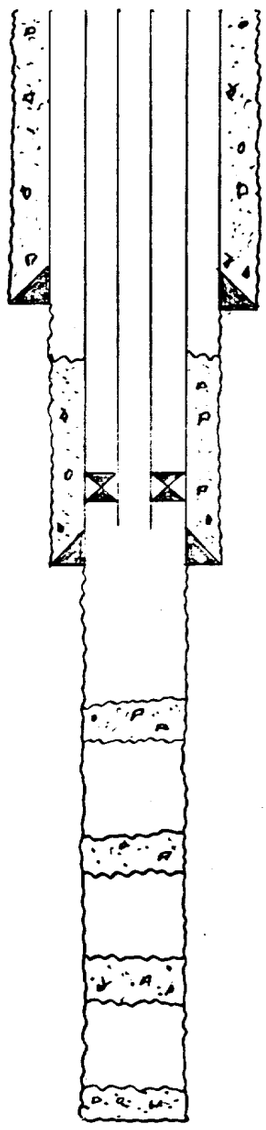
* If the information required under Sections VI, VIII, X, and XI above has been previously submitted, it need not be duplicated and resubmitted. Please show the date and circumstance of the earlier submittal. _____

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

JECTION WELL DATA SHEET

Sage Oil Company	Shell State Lease			
OPERATOR	LEASE			
1-SWD	1980' FSL & 1980' FWL	32	T-14-S	R-34-E
WELL NO.	FOOTAGE LOCATION	SECTION	TOWNSHIP	RANGE

Schematic



Tabular Data

Surface Casing

Size 11 3/4" Cemented with 400 sx.

TOC Surface feet determined by Circulated

Hole size 15"

Intermediate Casing

Size 8 5/8" Cemented with 300 sx.

TOC ± 1200' feet determined by Calculated

Hole size 11"

Long string

Size -- " Cemented with -- sx.

TOC -- feet determined by --

Hole size --

Total depth --

Injection interval

4475 feet to 5895 feet

(perforated or open-hole, indicate which)

Tubing size 2 7/8" lined with Tuboscope TK-75 (or equivalent) (material) set in a

Baker AD-1 Tension Packer (or equivalent) (brand and model) packer at ± 4400' feet

(or describe any other casing-tubing seal).

Other Data

1. Name of the injection formation San Andres

2. Name of Field or Pool (if applicable) None

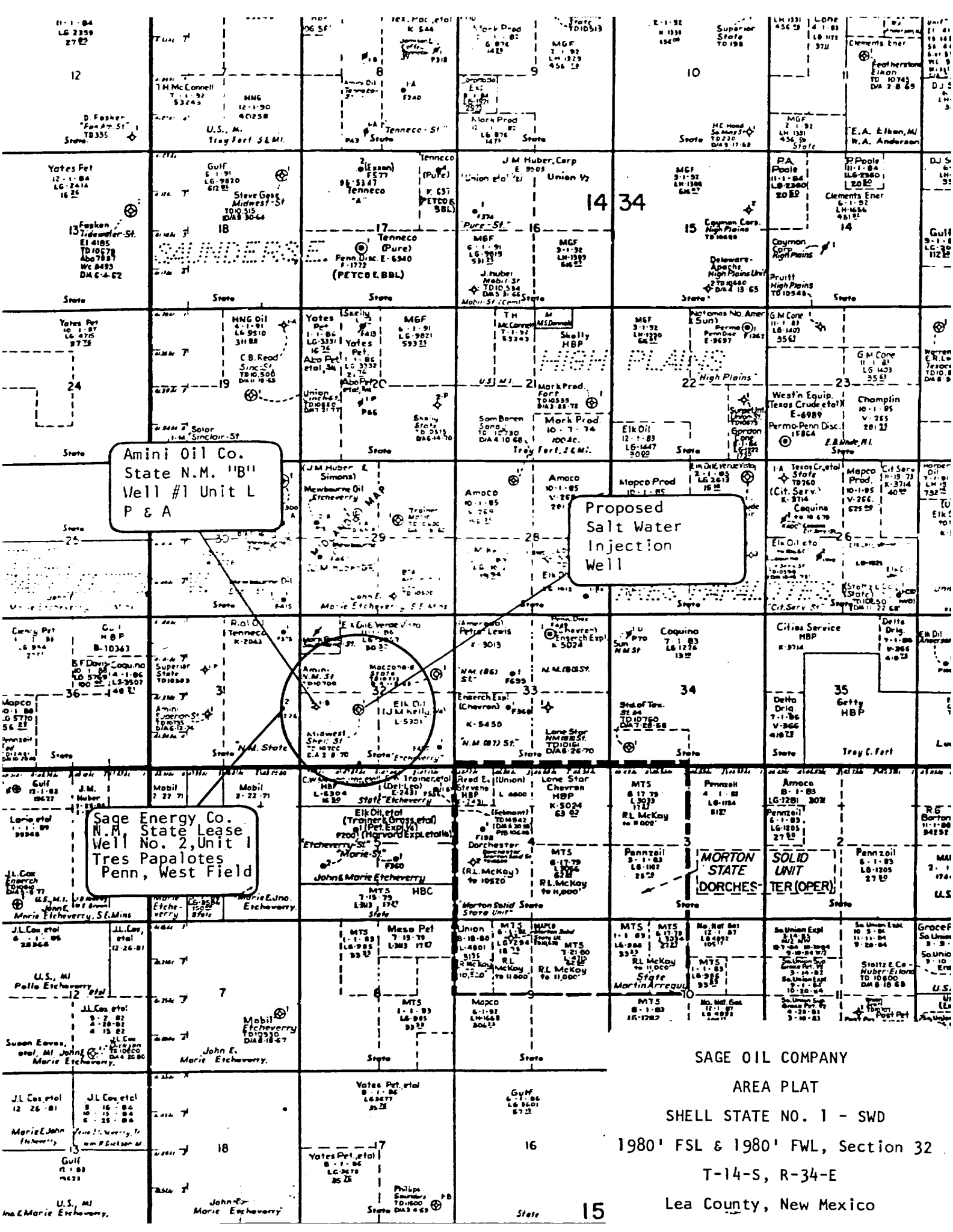
3. Is this a new well drilled for injection? / / Yes /X/ No

If no, for what purpose was the well originally drilled? Drilled as a producer of oil and abandoned.

4. Has the well ever been perforated in any other zone(s)? List all such perforated intervals and give plugging detail (sacks of cement or bridge plug(s) used) No perforations

10 sx @ surface; 25 sx 4425-4500'; 25 sx 5895-5970'; 25 sx 8050-8125'; 25 sx 9805-9880'; 35 sx 10,300-10,400'.

5. Give the depth to and name of any overlying and/or underlying oil or gas zones (pools) in this area. Proposed injection zone overlies the Tres Papalotes Penn, West Field. There is no overlying producing interval.



SAGE OIL COMPANY

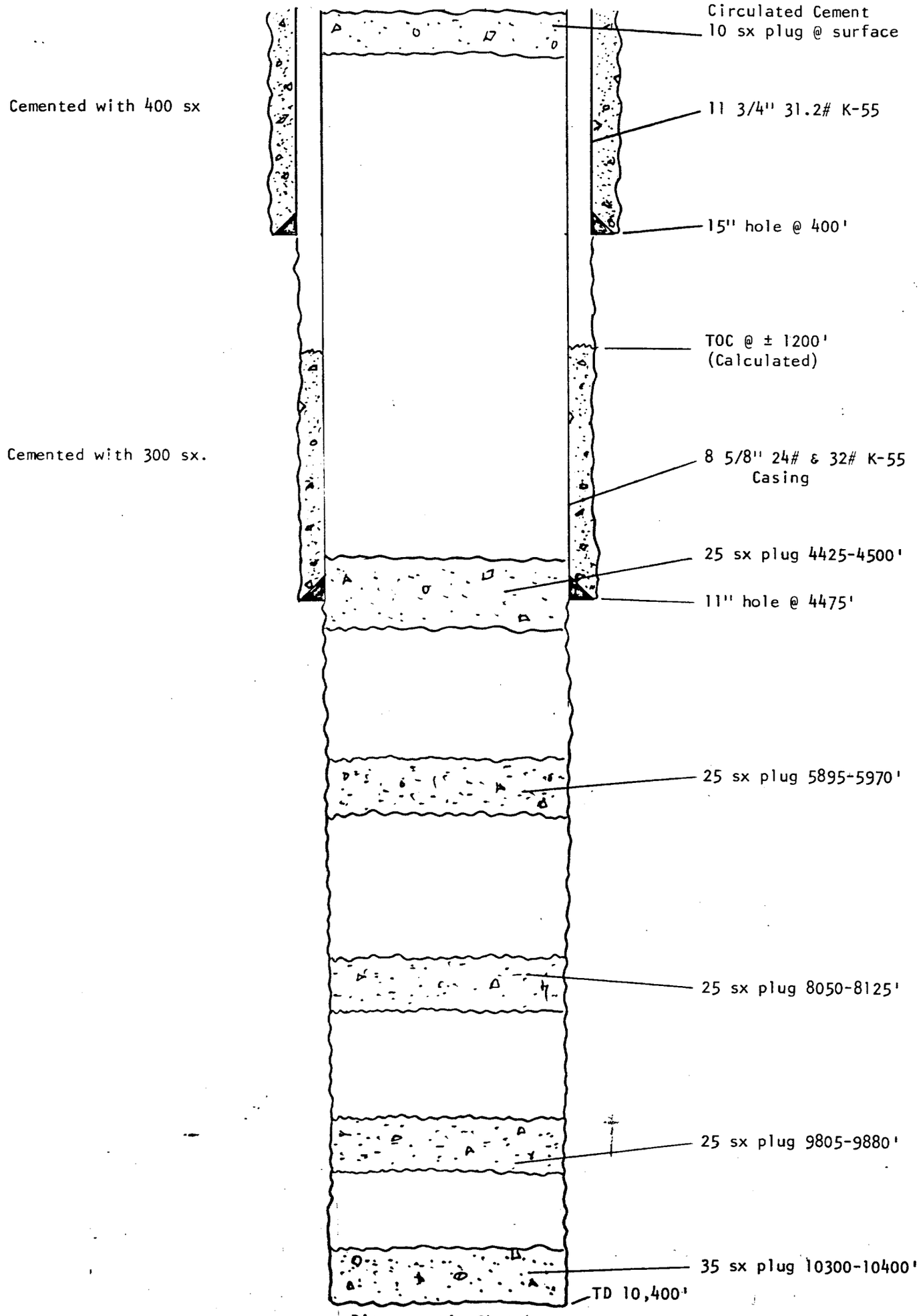
AREA PLAT

SHELL STATE NO. 1 - SWD

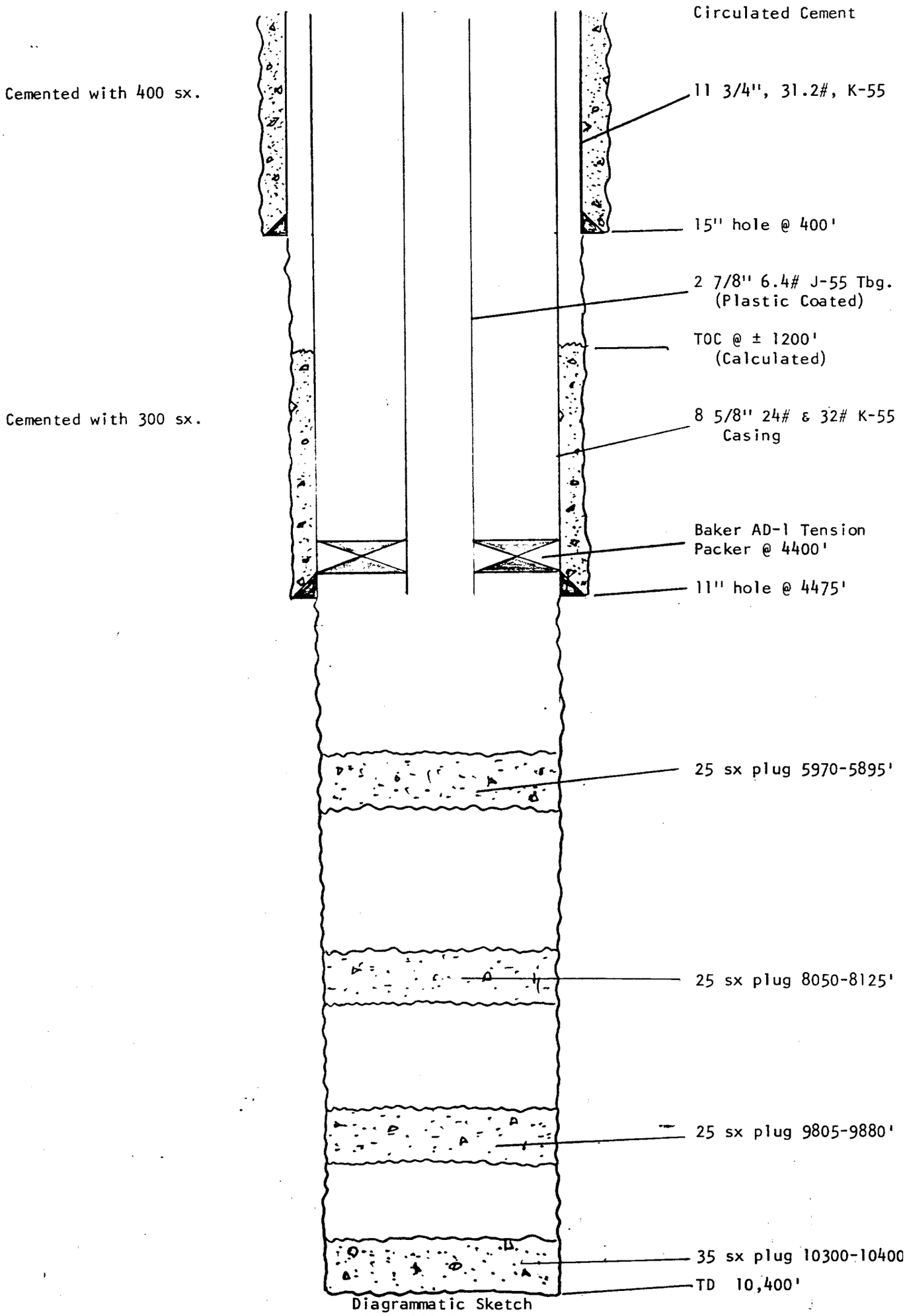
1980' FSL & 1980' FWL, Section 32

T-14-S, R-34-E

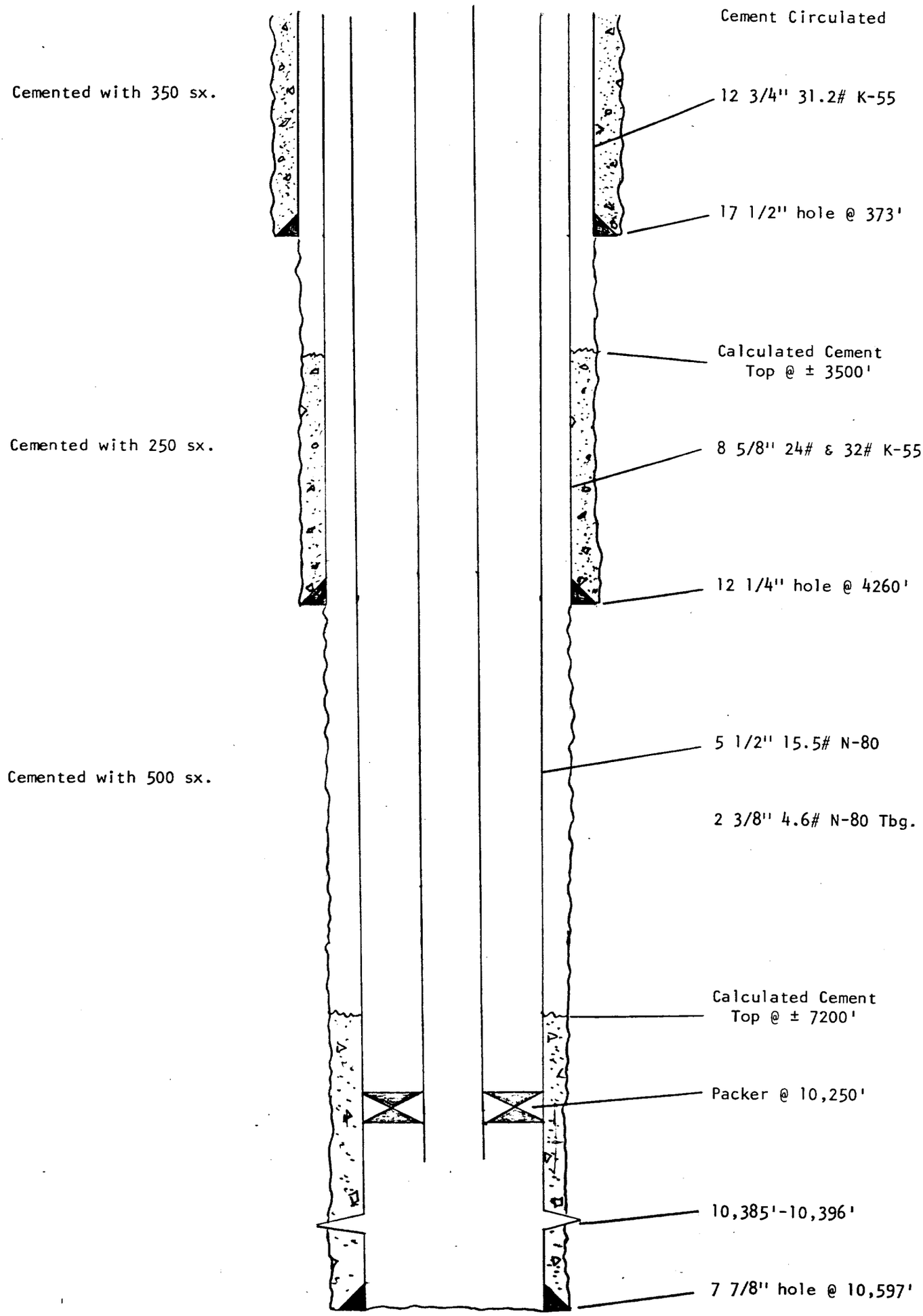
Lea County, New Mexico



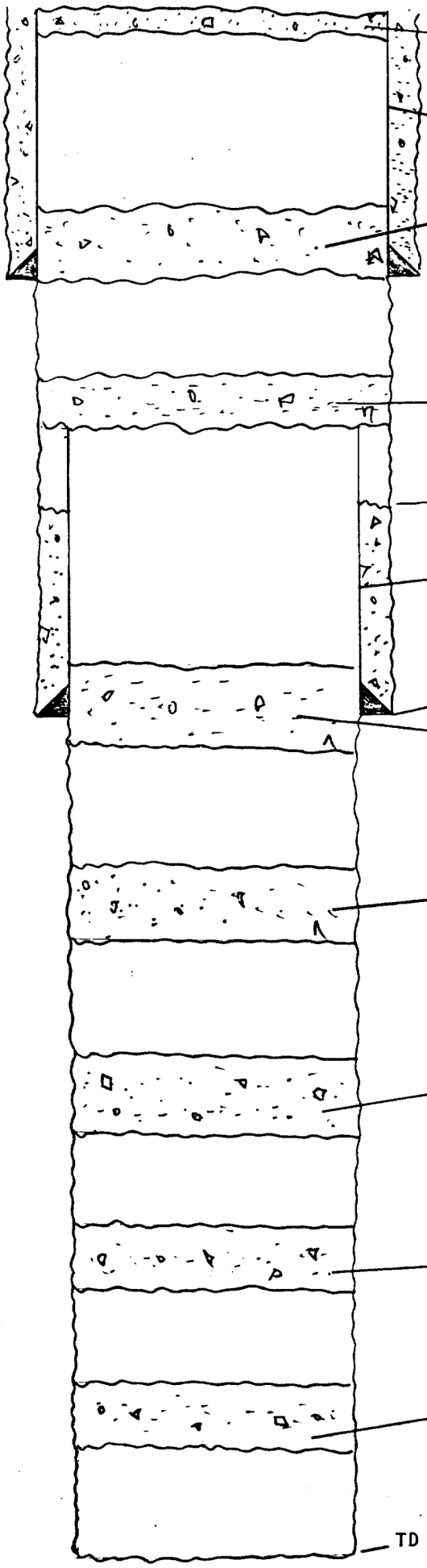
Diagrammatic Sketch
Sage Oil Company
* * Existing * *
Shell State No. 1 P & A Unit "K"
1980' FSL & 1980' FWL, Section 32, T-14-S, R-34-E
Lea County, New Mexico



Diagrammatic Sketch
Sage Oil Company
* * Proposed * *
Shell State No. 1 - SWD Unit K
1980' FSL & 1980' FWL, Section 32, T-14-S, R-34-E
Lea County, New Mexico



Sage Energy Company
State New Mexico Well No. 2
Tres Papalotes Penn, West Field
2080' FSL & 560' FEL, Unit "I"
Section 31, T-14-S, R-34-E
Lea County, New Mexico



Amini Oil Company
State New Mexico "B" Well No. 1
2080' FSL & 560' FWL, Unit "L"
Section 32, T-14-S, R-34-E
Lea County, New Mexico

WELL SUMMARY

OPERATOR	LEASE & WELL	TYPE	DATE DRILLED	LOCATION	DEPTH	COMPLETION RECORD
Amini Oil Co.	State N.M. "B" Well No. 1	Oil (P & A)		Unit "L" 32-14-34	10,700'	P & A
Sage Energy Co.	State N.M. Well No. 2	Oil		Unit I 31-14-34	10,597'	10,385'-10,396'

TYPICAL WATER ANALYSIS

SAN ANDRES FORMATION

LEA COUNTY, NEW MEXICO

ANALYSIS		PPM or Mg/L	EPM or Meq./L	Ionic PPM	
1. PH	7.25				
2. H_2S	Pos.				
3. CO_2	Pos.				
4. Specific Gravity	1.12				
5. Phenol Alkalinity ($CaCO_3$)		0.0			
6. M.P. Alkalinity ($CaCO_3$)		520.0			
7. Bicarbonate ($CaCO_3$)		520.0	10.4	HCO_3	634
8. Chlorides (Cl)		187,000.0	5,267.6	Cl	187,000
9. Sulphates (SO_4)		2,800.0	58.33	SO_4	2,800
10. Total Hardness ($CaCO_3$)		10,000.0			
11. Calcium ($CaCO_3$)		5,750.0	115.0	Ca	2,300
12. Magnesium ($CaCO_3$)		4,250.0	85.0	Mg	1,037
13. Sodium (Na)			5,135.73	Na	118,122
14. [illegible]	Barium (Ba)			NO_3	0
15. Iron (Fe)					
16. Total Disolved Solids					311,893

Martin Water Laboratories, Inc.

P O BOX 1468
MONAHANS, TEXAS 79756
PH 943-3234 OR 563-1040

WATER CONSULTANTS SINCE 1953

BACTERIAL AND CHEMICAL ANALYSES

709 W INDIANA
MIDLAND, TEXAS 79701
PHONE 683-4521

To: Mr. Bob Musell
425 Hamilton Building
Wichita Falls, Texas 76301

Laboratory No. 1082171
Samples received 10-18-82
Results reported 10-20-82

Company: Sage Oil Company

Project: Windmill-New Mexico

Subject: To make the determinations listed below on windmill water. Sample submitted by Bob Munsell.

DETERMINATION	MG/L
Aluminum, as Al	0.037
Arsenic, as As	0.000
Barium, as Ba	0
Boron, as B	0.00
Cadmium, as Cd	0.00
Chloride, as Cl	71
Chromium, as Cr	0.00
Cobalt, as Co	0.0
Copper, as Cu	0.00
Cyanide, as CN	0.0
Fluoride, as F	2.5
Iron, as Fe	0.39
Lead, as Pb	0.00
Manganese, as Mn	0.00
Mercury, as Hg	0.0000
Molybdenum, as Mo	<100
Nickel, as Ni	0.00
Nitrate Nitrogen, as N	3.4
pH	8.1
Sulfate, as SO_4	123
Total Dissolved Solids, evaporated	*150
Zinc, as Zn	0.10

Remarks: The undersigned certifies the above to be true and correct to the best of his knowledge and belief.

*Insufficient sample submitted for accurate determination.

W. Reagan White, B.S.

cc: Mr. Johnny Mulloy, Foy Boyd Associates, Midland

Martin Water Laboratories, Inc.

P. O. BOX 1468
MONAHANS, TEXAS 79756
PH. 943-3234 OR 563-1040

WATER CONSULTANTS SINCE 1953

BACTERIAL AND CHEMICAL ANALYSES

709 W. INDIANA
MIDLAND, TEXAS 79701
PHONE 683-4521

To: Mr. Bob Munsell
425 Hamilton Building
Wichita Falls, Texas 76301

Laboratory No. 1082169
Samples received 10-18-82
Results reported 10-20-82

Company: Sage Oil Company

Project: CK lease in New Mexico

Subject: To make the determinations listed below on produced water from CK lease. Sample submitted by Bob Munsell.

DETERMINATION	MG/L
Aluminum, as Al	0.00
Arsenic, as As	0.000
Barium, as Ba	0
Boron, as B	22.0
Cadmium, as Cd	0.07
Chloride, as Cl	75,280
Chromium, as Cr	0.00
Cobalt, as Co	10.0
Copper, as Cu	0.00
Cyanide, as CN	0.0
Fluoride, as F	0.0
Iron, as Fe	8.7
Lead, as Pb	1.00
Manganese, as Mn	1.00
Mercury, as Hg	0.000
Molybdenum, as Mo	<100
Nickel, as Ni	1.40
Nitrate Nitrogen, as N	0.0
pH	7.8
Sulfate, as SO_4	3,223
Total Dissolved Solids, evaporated	119,180
Zinc, as Zn	0.40

Remarks: The undersigned certifies the above to be true and correct to the best of his knowledge and belief.

W. Reagan White, B.S.

cc: Mr. Johnny Mulloy, Foy Boyd Associates, Midland

Martin Water Laboratories, Inc.

P. O. BOX 1468
MONAHANS, TEXAS 79756
PH. 943-3234 OR 563-1040

WATER CONSULTANTS SINCE 1953

BACTERIAL AND CHEMICAL ANALYSES

709 W. INDIANA
MIDLAND, TEXAS 79701
PHONE 683-4521

To: Mr. Bob Munsell
425 Hamilton Building
Wichita Falls, Texas 76301

Laboratory No. 1082170
Samples received 10-18-82
Results reported 10-20-82

Company: Sage Oil Company

Project: Hobbs "O" lease in New Mexico

Subject: To make the determinations listed below on produced water from Hobbs "O" lease. Sample submitted by Bob Munsell.

DETERMINATION	MG/L
Aluminum, as Al	0.00
Arsenic, as As	0.000
Barium, as Ba	0
Boron, as B	17.50
Cadmium, as Cd	0.00
Chloride, as Cl	13,139
Chromium, as Cr	0.00
Cobalt, as Co	5.0
Copper, as Cu	0.00
Cyanide, as CN	0.0
Fluoride, as F	2.0
Iron, as Fe	22.6
Lead, as Pb	0.00
Manganese, as Mn	0.00
Mercury, as Hg	0.0000
Molybdenum, as Mo	<100
Nickel, as Ni	0.00
Nitrate Nitrogen, as N	0.0
pH	7.3
Sulfate, as SO_4	2,370
Total Dissolved Solids, evaporated	20,412
Zinc, as Zn	0.40

Remarks: The undersigned certifies the above to be true and correct to the best of his knowledge and belief.

W. Reagan White, B.S.

cc: Mr. Johnny Mulloy, Foy Boyd Associates, Midland

SCHLUMBERGER

SIDEWALL NEUTRON POROSITY LOG

COUNTY LEA
FIELD or LOCATION WILDCAT
WELL SHELL STATE 1
COMPANY MIDWEST OIL CORP

COMPANY MIDWEST OIL CORPORATION

WELL SHELL STATE 1

FIELD WILDCAT

COUNTY LEA STATE NEW MEXICO

Location: 1980' FSL & 1980' FWL

Sec. 32 Twp. 14-S Rge. 34-E

Other Services
ML, IES

Permanent Datum: GL Elev. 4135
Log Measured From KB, 13 Ft. Above Perm. Datum
Drilling Measured From KB

Elev.: K.B. 4147
D.F. 4147
G.L. 4135

Date	2-4-70
Run No.	ONE
Type Log	EPT NEUTRON
Depth—Driller	10700
Depth—Logger	10697
Bottom logged interval	10696
Top logged interval	0
Type fluid in hole	LOW SOLID
Salinity, PPM Cl	3200
Density	8.8
Level	FULL
Max rec. temp., deg F	141
Operating rig time	4.5 HOURS
Recorded by	FREEMAN & WALLS
Witnessed by	BLACKWELL

RUN No.	BORE HOLE RECORD Bit	From	To	CASING RECORD Size	Wgt	From	To
1	7 7/8	4485	10700	8 5/8		0	4485

The well name, location and borehole reference lines were furnished by the customer.

TUBULAR SUMMARY

OPERATOR	LEASE & WELL	SURFACE CASING	SURFACE CEMENT	SURFACE TOC	INTER. CASING	INTER. CEMENT	INTER. TOC	PROD. CASING	PROD. CEMENT	PROD. TOC	TOTAL DEPTH	PRODUCING INTERVAL
Amini Oil Co.	St. N.M. "B" Well No. 1	12 3/4" @ 390'	425 Sx.	Circulated	*8 5/8" @ 4270'	250 Sx.	Calculated @ ± 3500'	None	None	None	10,700'	P & A
Sage Energy Co.	St. N.M. Well No. 2	12 3/4" @ 373'	350 Sx.	Circulated	8 5/8" @ 4260'	250 Sx.	Calculated @ ± 3500'	5 1/2" @ 10,597'	500 Sx.	7200'	10,597'	10,385-10,396

* Cut and Pulled @ 1251'