

APPLICATION FOR AUTHORIZATION TO INJECT

- I. PURPOSE: X Secondary Recovery Pressure Maintenance Disposal Storage
Application qualifies for administrative approval? Yes X No
- II. OPERATOR: Saga Petroleum LLC
- ADDRESS: 415 W. Wall, #835, Midland, TX 79701
- CONTACT PARTY: Joe Clement PHONE: 915-684-4293
- 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 X 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 geologic data on the injection zone including appropriate lithologic detail, geologic name, thickness, and depth. Give the geologic name, and depth to bottom of all underground sources of drinking water (aquifers containing waters with total dissolved solids concentrations of 10,000 mg/l or less) overlying the proposed injection zone as well as any such sources known to be immediately underlying the injection interval.
- IX. Describe the proposed stimulation program, if any.
- *X. Attach appropriate logging and test data on the well. (If well logs have been filed with the Division, they need not be resubmitted).
- *XI. Attach a chemical analysis of fresh water from two or more fresh water wells (if available and producing) within one mile of any injection or disposal well showing location of wells and dates samples were taken.
- XII. Applicants for disposal wells must make an affirmative statement that they have examined available geologic and engineering data and find no evidence of open faults or any other hydrologic connection between the disposal zone and any underground sources of drinking water.
- XIII. Applicants must complete the "Proof of Notice" section on the reverse side of this form.
- XIV. Certification: I hereby certify that the information submitted with this application is true and correct to the best of my knowledge and belief.

NAME: Joe N. Clement

TITLE: New Mexico Engineer

SIGNATURE: John Clement

DATE: 5/1/00

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

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

BEFORE THE OIL CONSERVATION DIVISION
Santa Fe, New Mexico
Case No. 12417 & 12418 Exhibit No. 9
Submitted by:
Saga Petroleum, L.L.C.
Hearing Date: September 7, 2000

INJECTION WELL DATA SHEET

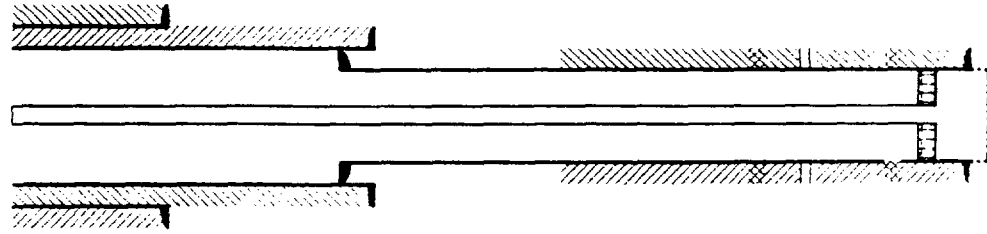
OPERATOR: Saga Petroleum LLC

WELL NAME & NUMBER: U.D. Sawyer #4

WELL LOCATION: 660' FNL & 660' FEL

UNIT LETTER	SECTION	TOWNSHIP	RANGE
A	27	9S	36E

FOOTAGE LOCATION

WELLBORE SCHEMATICWELL CONSTRUCTION DATASurface Casing

Hole Size: 17 1/4" Casing Size: 13 3/8" @ 259'

Cemented with: 300 sx. or ft³

Top of Cement: surface Method Determined: circulation

Intermediate Casing

Hole Size: 12 1/4" Casing Size: 9 5/8" @ 4668'

Cemented with: 2400 sx. or ft³

Top of Cement: surface Method Determined: circulation

Production Casing

Hole Size: 7 7/8" Casing Size: 5 1/2" @ 4544'-12188'

Cemented with: 1175 sx. or ft³

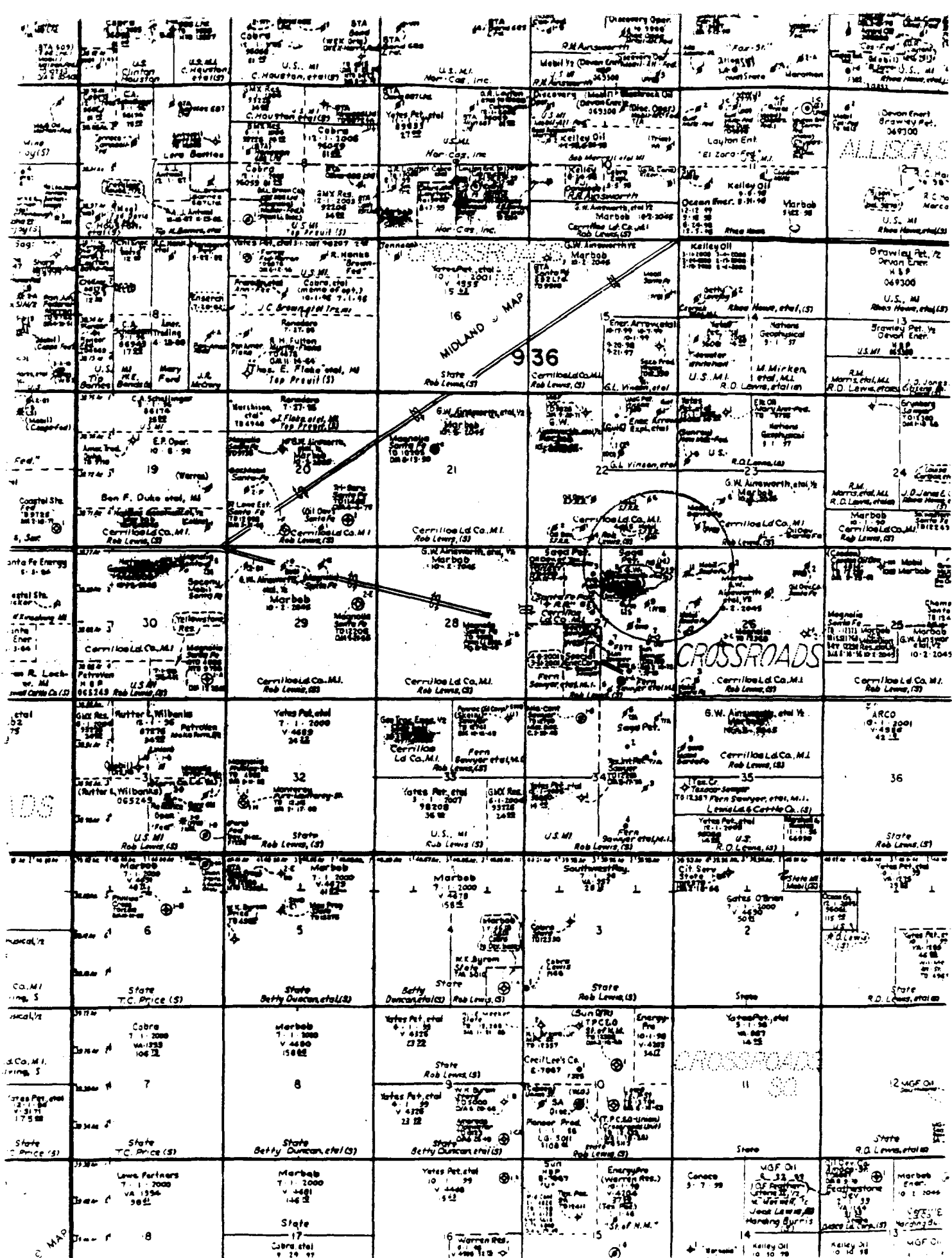
Top of Cement: 6020' Method Determined: temp. survey

Total Depth: 12132'

Injection Interval

Perfs 12085 feet to 12100'

(Perforated or Open Hole; indicate which)



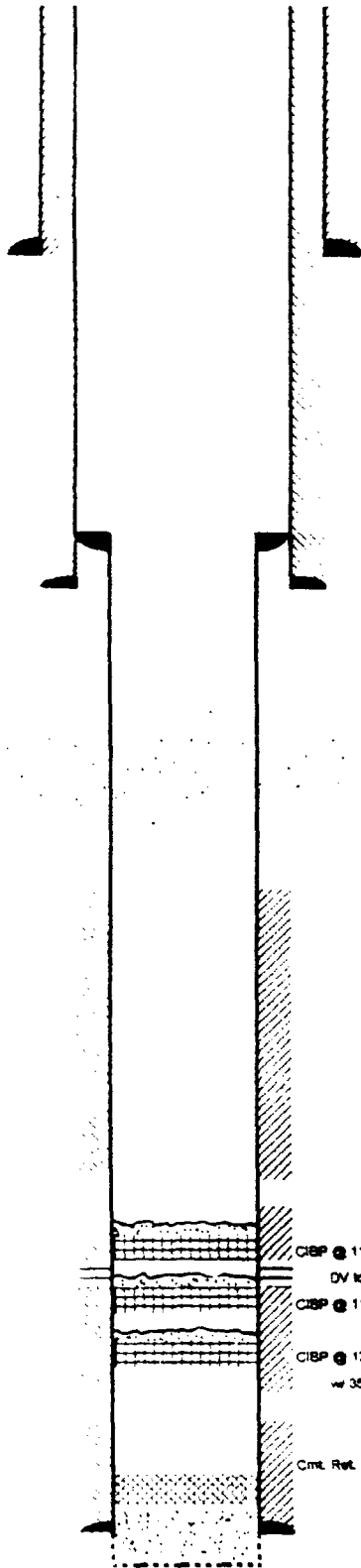
**Offset wells to the
U.D. Sawyer #4**

Well	Location	Surface Casing	Inter. Casing	Prod. Casing	TD	Completions	P&A
U.D. Sawyer #2 Spud 6/25/50	Sec. 27-T9S-R36E Unit I 1980' FSL & 990' FEL	13 3/8" @ 240' Cmt. w/ 300 sx TOC @ surf by circ.	9 5/8" @ 4614' Cmt. w/ 3500 sx TOC @ surf by circ.	5 1/2" @ 12097' Cmt. w/ 1178 sx TOC @ 6320' by TS	12100	12040-092' Open hole 12097-102' 12010-016'	
U.D. Sawyer #3 Spud 2/25/49	Sec. 27-T9S-R36E Unit G 1980' FNL & 1980' FWL	13 3/8" @ 258' Cmt. w/ 300 sx TOC @ surf by circ.	9 5/8" @ 4651' Cmt. w/ 2125 sx TOC @ 648' by calc.	5 1/2" @ 12147' Cmt. w/ 1090 sx TOC @ 6550' by TS	12147	12000-050'	
U.D. Sawyer #4 Spud 12/19/51	Sec. 27-T9S-R36E Unit A 660' FNL & 660' FEL	13 3/8" @ 259' Cmt. w/ 300 sx TOC @ surf by circ.	9 5/8" @ 4668' Cmt. w/ 2400 sx TOC @ surf by circ.	5 1/2" @ 4544-12147' Cmt. w/ 1175 sx TOC @ 6020' by TS	12132	11400-450' 12085-100' sqz w/ 290sx 12118-32' sqz w/ 290sx	
U.D. Sawyer #8 Spud 7/11/72	Sec. 27-T9S-R36E Unit B 990' FNL & 2310' FEL	13 3/8" @ 266' Cmt. w/ 275 sx TOC @ surf by circ.	9 5/8" @ 4294' Cmt. w/ 1440 sx TOC @ 1100' by TS	7" @ 12057' Cmt. w/ 250 sx TOC @ 10140' by TS	12057	12029-051'	P/A'd Schematic Attached
U.D. Sawyer #9 Spud 9/10/72	Sec. 27-T9S-R36E Unit H 1980' FNL & 990' FEL	13 3/8" @ 273' Cmt. w/ 275 sx TOC @ surf by circ.	9 5/8" @ 4240' Cmt. w/ 1440 sx TOC @ 1520' by TS	7" @ 12049' Cmt. w/ 250 sx TOC @ 9400' by TS	12068	12020-48' sqz w/ 250sx Open hole 12049-068' 11358-368'	P/A'd Schematic Attached
U.D. Sawyer #11 Spud 10/4/84	Sec. 27-T9S-R36E Unit J 2561' FSL & 1610' FEL	13 3/8" @ 356' Cmt. w/ 350 sx TOC @ surf by circ.	9 5/8" @ 4500' Cmt. w/ 2000 sx TOC @ surf by circ.	5 1/2" @ 12890' Cmt. w/ 1650 sx TOC @ 1550' by TS	12890'	12120-54' sqz w/ 60 sx 12074-84' sqz w/ 100 sx 12007-017'	
Santa Fe Pacific #1 Spud 4/25/51	Sec. 26-T9S-R36E Unit E 1980' FNL & 660' FWL	13 3/8" @ 393' Cmt. w/ 400 sx TOC @ surf by circ.	9 5/8" @ 4273' Cmt. w/ 2300 sx TOC @ surf by circ.	7" @ 12130' Cmt. w/ 2310 sx TOC @ surf by circ.	12137	Open hole 12130-137'	P/A'd Schematic Attached
Santa Fe Pacific #2 Spud 11/6/63	Sec. 26-T9S-R36E Unit C 660' FNL & 1980' FWL	13 3/8" @ 472' Cmt. w/ 500 sx TOC @ surf by circ.	9 5/8" @ 4765' Cmt. w/ 2615 sx TOC @ surf by calc.	5 1/2" @ 4557-12174' Cmt. w/ 850 sx TOC @ 4557' by sqz.	12183'	Open hole 12174-183' 12140-160' 11999-12026', 109-129'	P/A'd Schematic Attached
Santa Fe Pacific "D" #1 (#4 on map) Spud 1/19/50	Sec. 22-T9S-R36E Unit O 660' FSL & 1980' FEL	13 3/8" @ 335' Cmt. w/ 350 sx TOC @ surf by circ.	8 5/8" @ 4555' Cmt. w/ 2450 sx TOC @ surf by circ.	7" @ 9650' Cmt. w/ 2167 sx TOC @ 3840' by TS	9670'	Open hole 9650-670'	P/A'd Schematic Attached
Santa Fe Pacific #5 Spud 3/26/53	Sec. 22-T9S-R36E Unit O 660' FSL & 1880' FEL	13 3/8" @ 441' Cmt. w/ 500 sx TOC @ surf by circ.	8 5/8" @ 4805' Cmt. w/ 3497 sx TOC @ surf by calc.	5 1/2" @ 4595-12136' Cmt. w/ 990 sx TOC @ 4595' by sqz.	12150'	Open hole 12136-150' 12096-110'	P/A'd Schematic Attached
Santa Fe Pacific #6 Spud 3/11/74	Sec. 22-T9S-R36E Unit I 1651' 8' FSL & 990' FEL	13 3/8" @ 426' Cmt. w/ 425 sx TOC @ surf by circ.	8 5/8" @ 4950' Cmt. w/ 3250 sx TOC @ surf by calc.	5 1/2" @ 4586'-12153' Cmt. w/ 1400 sx TOC @ 5729' by calc.	12190'	Open hole 12153-190'	P/A'd Schematic Attached

**Offset wells to the
U.D. Sawyer #4**

Santa Fe Pacific #7 1/6/53	Sec. 23-T9S-R36E Unit M 660' FSL & 660' FWL	13 3/8" @ 380' Cmt. w/ 375 sx TOC @ surf by circ.	8 5/8" @ 4895' Cmt w/ 2500 sx TOC @ surf by calc.	5 1/2" @ 4645-12191' Cmt w/ 2075 sx TOC @ 2669' by calc.	12212'	12191-212' sqz w/ CIBP 11367-378'sqz w/ CIBP 9652-660' sqz w/ CIBP 4818-899'	P/A'd Schematic Attached
Santa Fe Pacific #10 Spud 9/24/72	Sec. 22-T9S-R36E Unit P 330' FSL & 990' FEL	13 3/8" @ 360' Cmt. w/ 400 sx TOC @ surf by circ.	9 5/8" @ 5000' Cmt w/ 2600 sx TOC @ surf by circ.	7" @ 4800 - 12108' Cmt w/ 1800 sx TOC @ 4800' by sqz	12126'	Open hole 12108-126'	P/A'd Schematic Attached
Santa Fe Pacific #11 Spud 7/31/72	Sec. 26-T9S-R36E Unit D 990' FNL & 360' FWL	13 3/8" @ 380' Cmt. w/ 400 sx TOC @ surf by circ.	9 5/8" @ 5000' Cmt w/ 2000 sx TOC @ 1535' by TS	7" @ 4785 - 12096' Cmt w/ 1800 sx TOC @ 4785' by sqz.	12117	Open hole 12096-117'	P/A'd Schematic Attached
Santa Fe Pacific #12 Spud 11/27/72	Sec. 26-T9S-R36E Unit L 2310' FSL & 330' FWL	13 3/8" @ 360' Cmt. w/ 400 sx TOC @ surf by circ.	9 5/8" @ 5000' Cmt w/ 2600 sx TOC @ surf by circ.	7" @ 4810 - 12119' Cmt w/ 2050 sx TOC @ 4810' by calc.	12120	12076-102'	P/A'd Schematic Attached
Santa Fe Pacific #27-3 Spud 6/7/72	Sec. 27-T9S-R36E Unit C 2310' FNL & 2310' FWL	13 3/8" @ 315' Cmt. w/ 300 sx TOC @ surf by circ.	8 5/8" @ 5000' Cmt w/ 400 sx TOC @ 4200' by calc.	5 1/2" @ 4873-11987' Cmt w/ 350 sx TOC @ 10026' by CBL	12018	11277-88' sqz 11930-940' sqz 11972-85' 987-12018'	
SFPRR "27" #4 Spud 1/18/73	Sec. 22-T9S-R36E Unit N 330' FSL & 2310' FWL	13 3/8" @ 309' Cmt. w/ 300 sx TOC @ surf by circ.	9 5/8" @ 4200' Cmt w/ 625 sx TOC @ 2006 by calc.	7" @ 12170' Cmt w/ 200 sx TOC @ 11112' by calc.	12170'	12128-160' sqz w/ 50 sx 12020-174' sqz w/ 50 sx 12128-144'	P/A'd Schematic Attached

OPERATOR: Saga Petroleum	LOCATION: Sec. 27, T9S, R36E, Lea County, NM
LEASE: U.D. Sawyer #4	Unit A, 660' FNL & 660' FEL



13 3/8 " casing set at 299 ' with 300 sx of cement.

Hole Size: 17 1/2 ". TOC @ Surface by circ.

5 1/2" cut and pulled from 4566', ran 5 1/2" casing patch and hanger.
5 1/2" casing hung @ 4544'.

9 5/8 " casing set at 4668 ' with 2400 sx of cement.

Hole Size: 12 1/4 ". TOC @ Surface by Circ.

Perts - 11400-413, 442-450 '

CIBP @ 11400' w/ 35' cmt.

DV tool @ 11638'

CIBP @ 11650' w/ 45' cmt.

CIBP @ 12010'

w/ 35' cmt.

Cmt. Ret. @ 12108'

Perts - 12089-95 '

Perts - 12085-100 ' squeezed

Open hole - 12118-32 ' squeezed

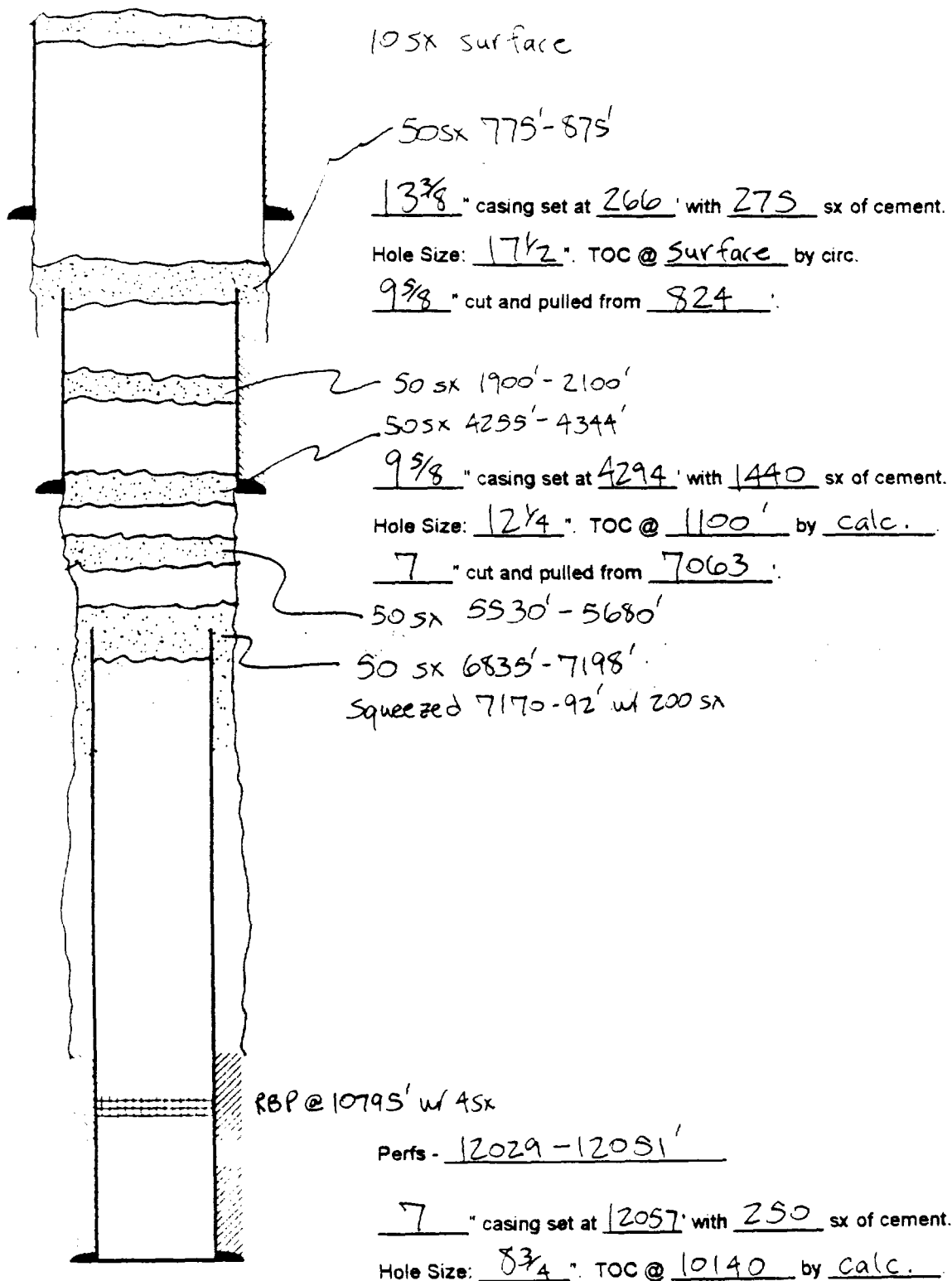
5 1/2 " casing set at 12118 ' with 1175 sx of cement

Hole Size: 7 7/8 ". TOC @ 6020 ' by TS

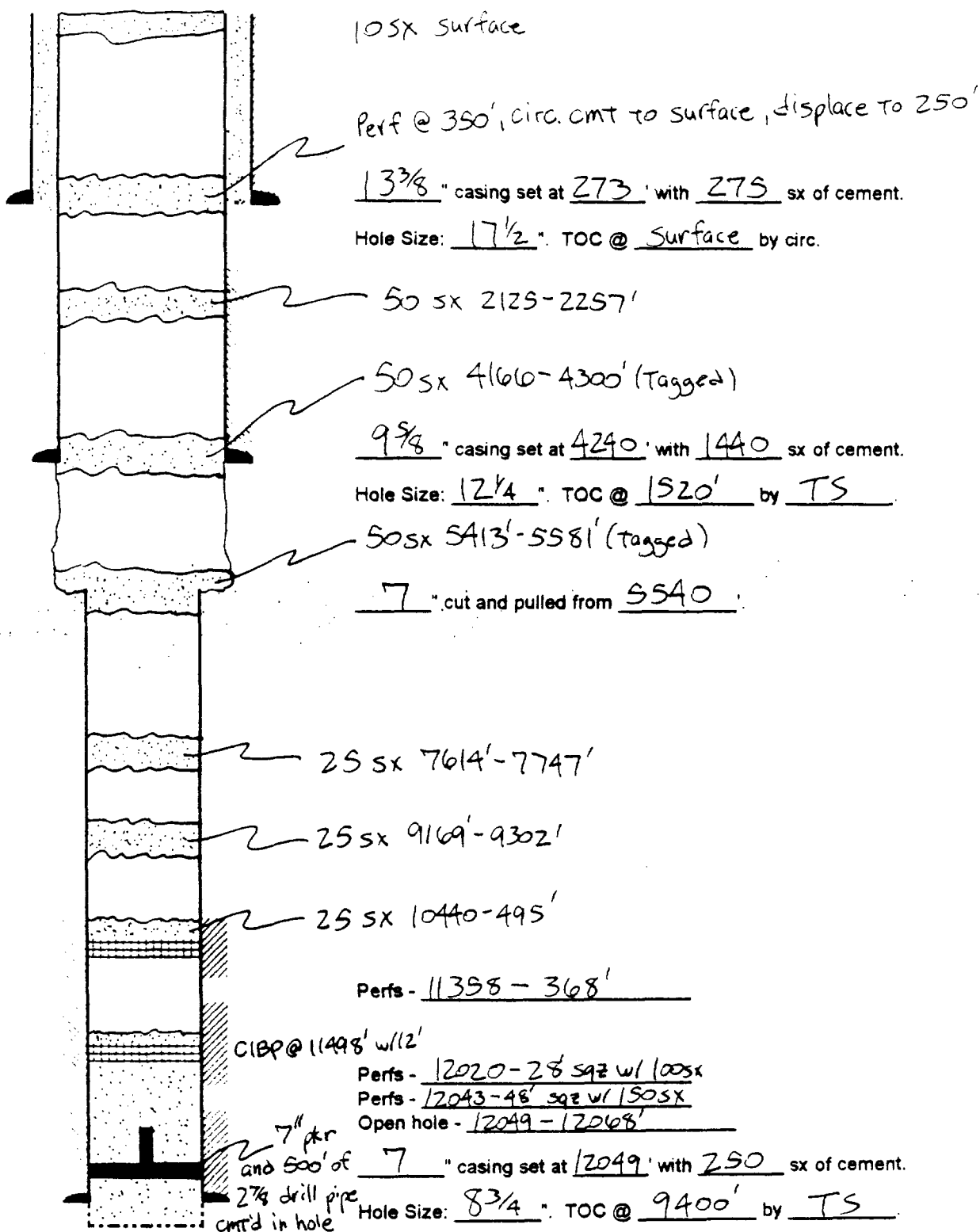
Prepared by: JNC

Revised: 4/25/00

OPERATOR: Saga Petroleum LLC	LOCATION: Sec. 27, T9S, R36E, Lea County, NM
LEASE: U.D. Sawyer #8	Unit 8, 990' FNL & 2310' FEL



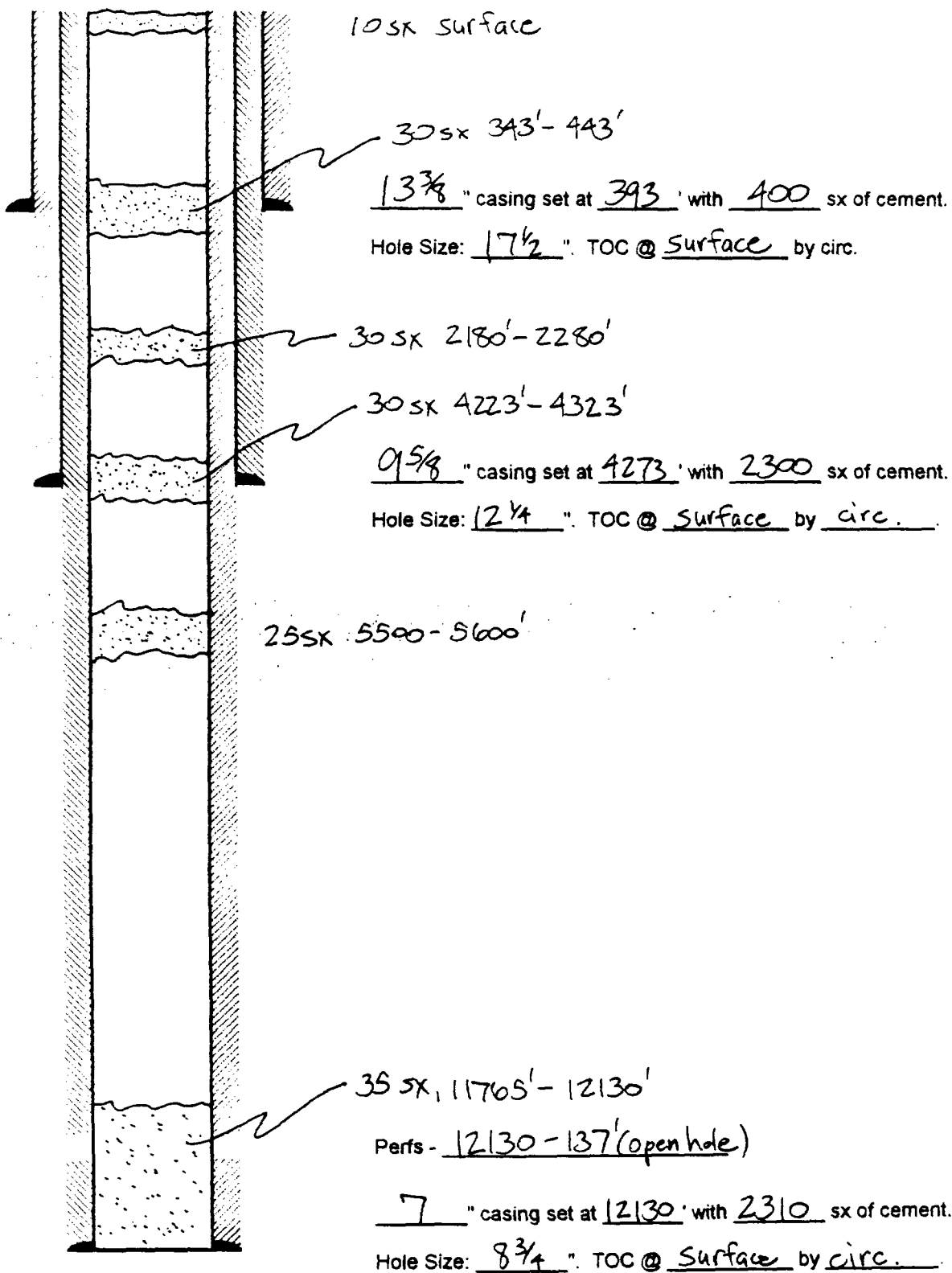
OPERATOR: Saga Petroleum LLC	LOCATION: Sec. 27, T9S, R36E, Lea County, NM
LEASE: U.D. Sawyer #9	Unit H, 1980' FNL & 990' FEL



PREPARED BY: JNC

Revised 5/4/00

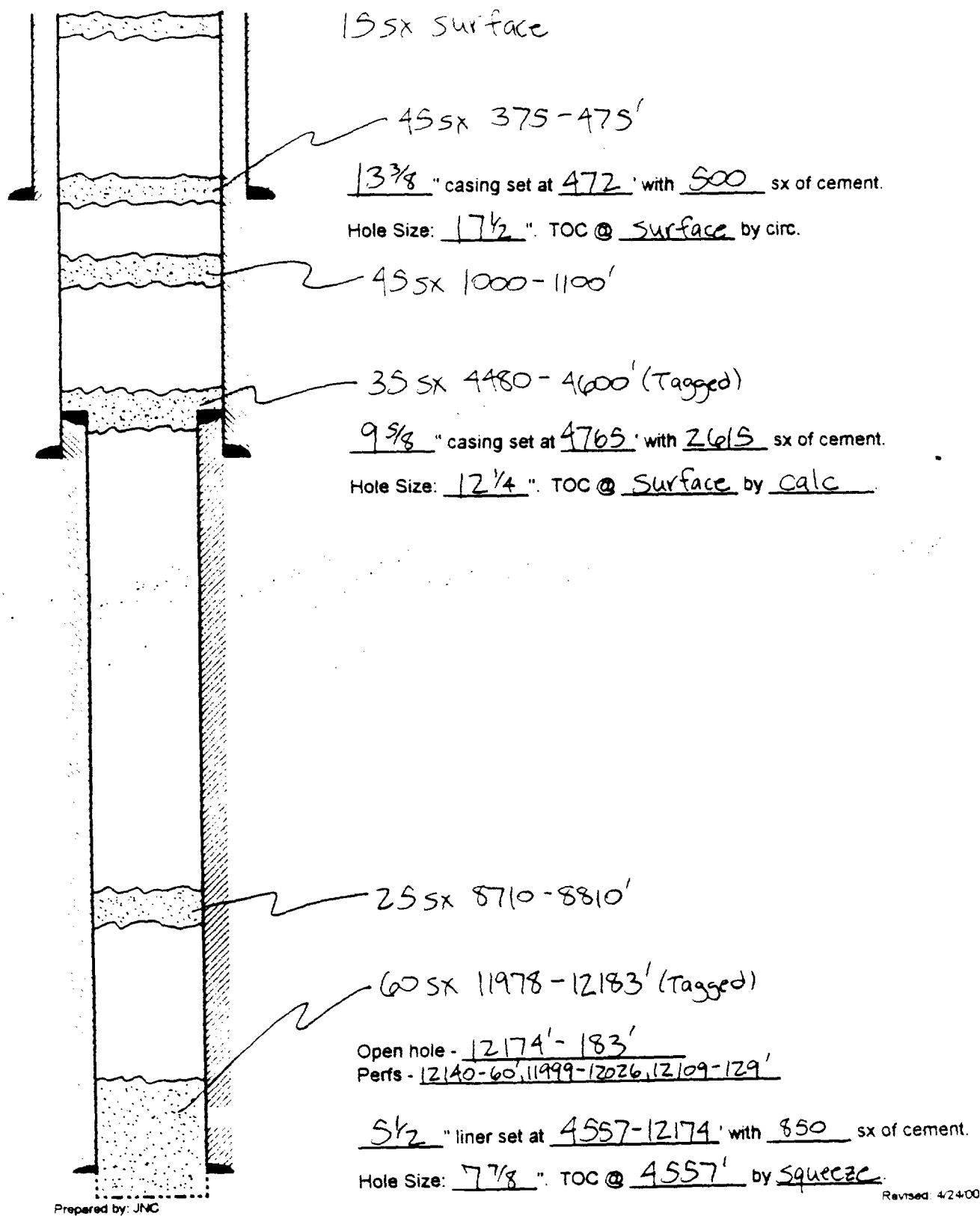
OPERATOR: Meteor Developments	LOCATION: Sec. 26, T9S, R36E, Lea County, NM
LEASE: Santa Fe Pacific #1	Unit E, 1980' FNL & 660' FWL



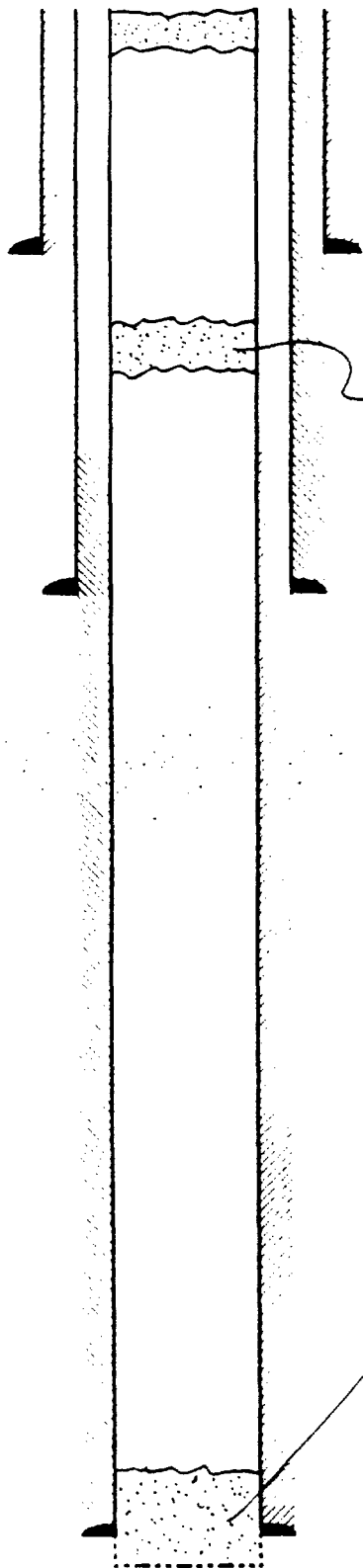
PREPARED BY: JNC

Revised: 4/24/00

OPERATOR: Meteor Developments	LOCATION: Sec. 26, T9S, R36E, Lea County, NM
LEASE: Santa Fe Pacific #2	Unit C, 660' FNL & 1980' FWL



OPERATOR: Socony Mobil Oil Co.	LOCATION: Sec. 22, T9S, R36E, Lea County, NM
LEASE: Santa Fe Pacific "D" #1	Unit O, 660' FSL & 1980' FEL



10 sx surface

13^{3/8} " casing set at 335 ' with 350 sx of cement.

Hole Size: 17^{1/2} ". TOC @ surface by circ.

Cut 7" @ 3500' & 2008', could not pull

25 sx 1900-2057'

8^{5/8} " casing set at 4555 ' with 2450 sx of cement.

Hole Size: 12^{1/4} ". TOC @ surface by circ.

80 sx 9460'-9670'

Open hole - 9650-70'

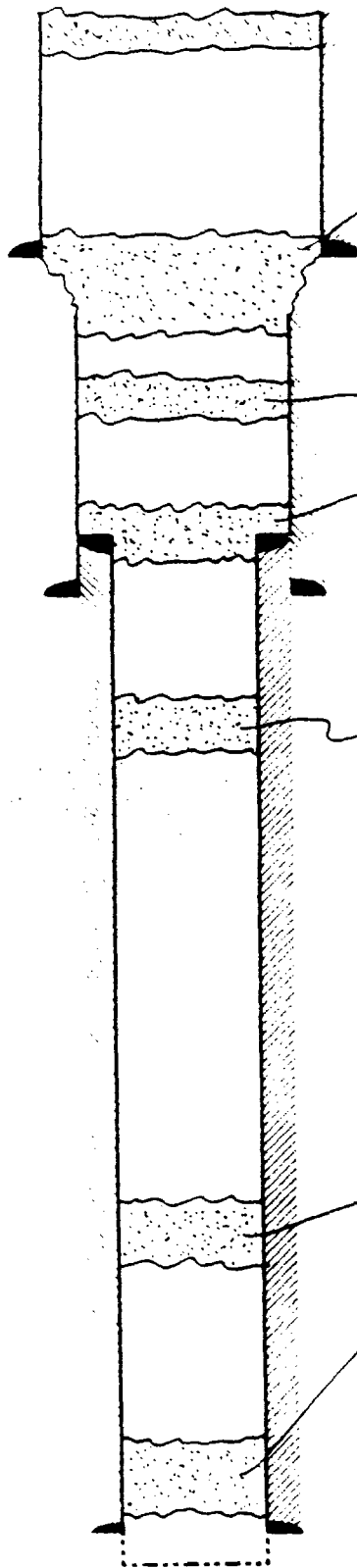
7 " casing set at 9650 ' with 2167 sx of cement.

Hole Size: 8^{3/4} ". TOC @ 3840' by TS

PREPARED BY: JNC

Revised: 4/24/00

OPERATOR: Meteor Developments	LOCATION: Sec. 22, T9S, R36E, Lea County, NM
LEASE: Santa Fe Pacific #5	Unit P, 660' FSL & 1880' FEL



30 sx surface

120sx 386'-555' (tagged)

13 7/8" casing set at 441' with 500 sx of cement.

Hole Size: 17 1/2". TOC @ Surface by circ.

8 5/8" cut and pulled from 505'

35 sx 2147'-2247'

35 sx 4755'-4855'

8 5/8" casing set at 4805' with 3497 sx of cement.

Hole Size: 11". TOC @ Surface by calc.

25 sx 5475'-5575'

25sx 8896'-8996'

50sx 11649'-12118' (tagged)

Open hole - 12136'-150'

Perfs - 12096'-110'

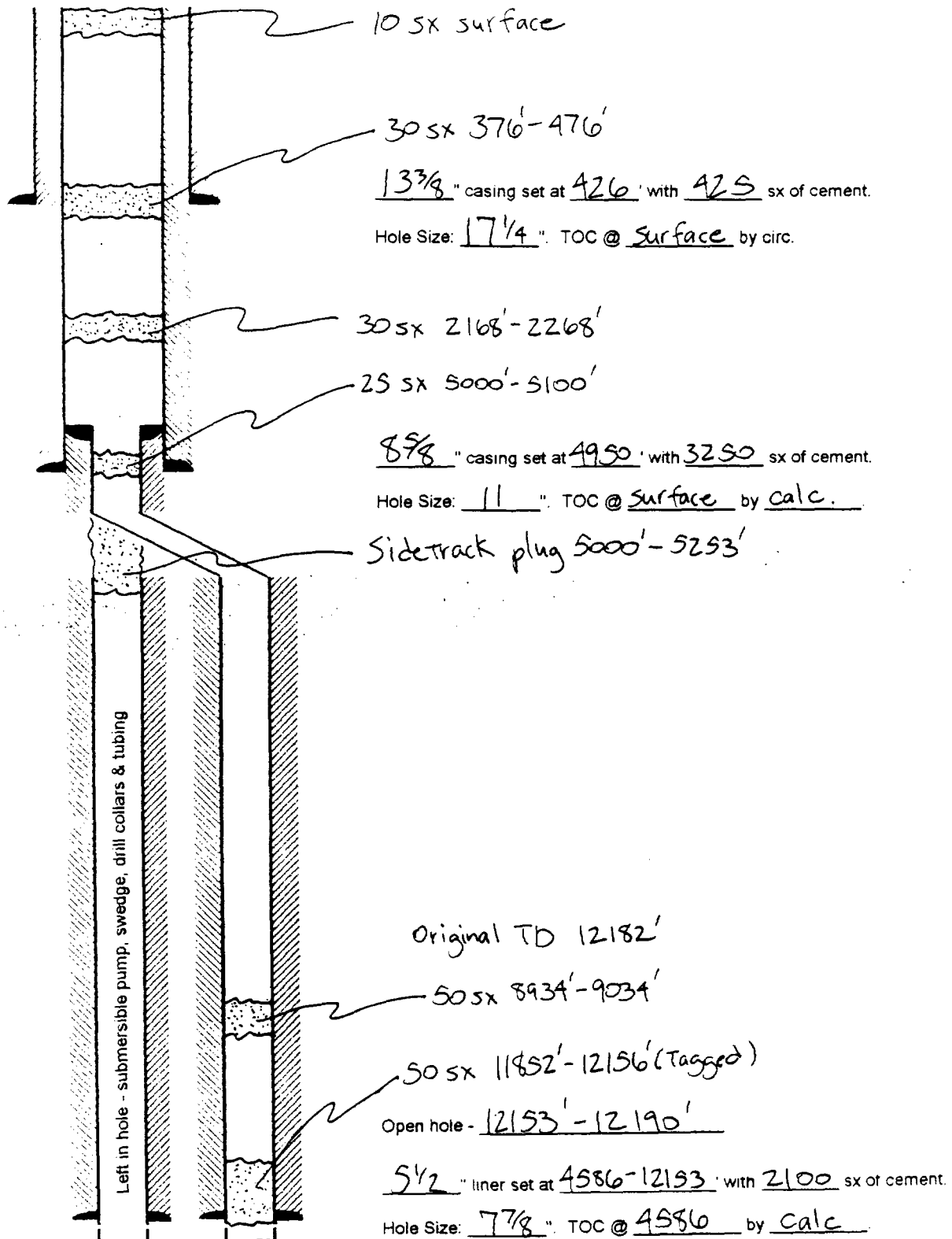
5 1/2" liner set at 4595'-12136' with 990 sx of cement.

Hole Size: 7 7/8". TOC @ 4595' by squeeze.

Prepared by: JNC

Revised: 4/24/00

OPERATOR: Meteor Developments	LOCATION: Sec. 22, T9S, R36E, Lea County, NM
LEASE: Santa Fe Pacific #6	Unit I, 1651.8' FSL & 990' FEL

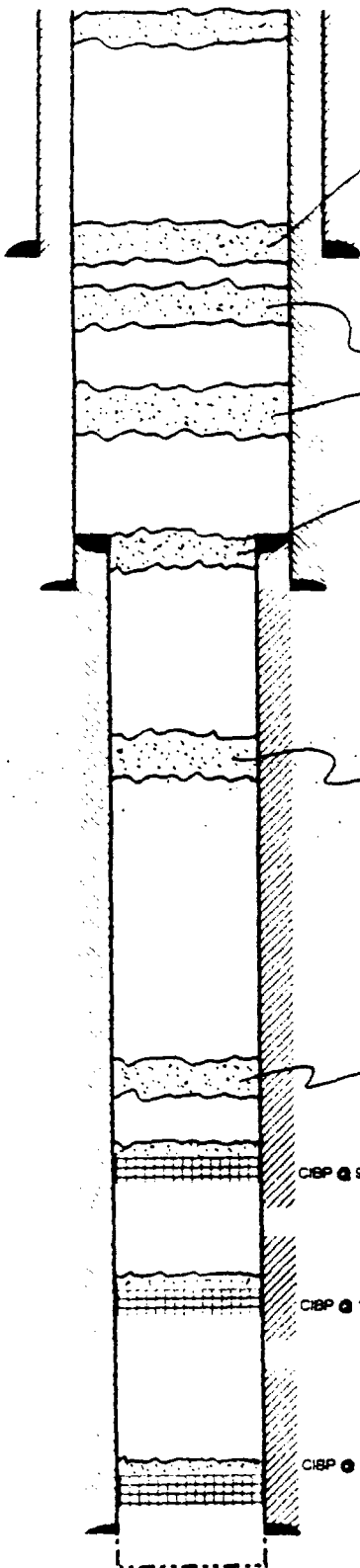


Prepared by: JNC

Revised: 4/25/00

OPERATOR: Meteor Developments
LEASE: Santa Fe Pacific #7

LOCATION: Sec. 23, T9S, R36E, Lea County, NM
Unit M, 660' FSL & 660' FWL



10 SX Surface

35 SX 386-486'

Perf 438' & 708', c/s pump in

13 3/8 " casing set at 380 ' with 375 sx of cement.

Hole Size: 17 1/2 ". TOC @ Surface by circ.

35 SX 650'-790'

40 SX 2168'-2268'

50 SX 4667'-4819' (Tagged)

Perfs - 4818-899'

8 5/8 " casing set at 4895 ' with 2500 sx of cement.

Hole Size: 11 ". TOC @ Surface by calc

25 SX 5471'-5571'

25 SX 8915'-9015'

CIBP @ 9630' w/ 35' cmt.

Perfs - 9652-660'

CIBP @ 11130' w/ 35' cmt.

Perfs - 11367-378'

Open hole - 12191-212'

CIBP @ 12030' w/ 35' cmt.

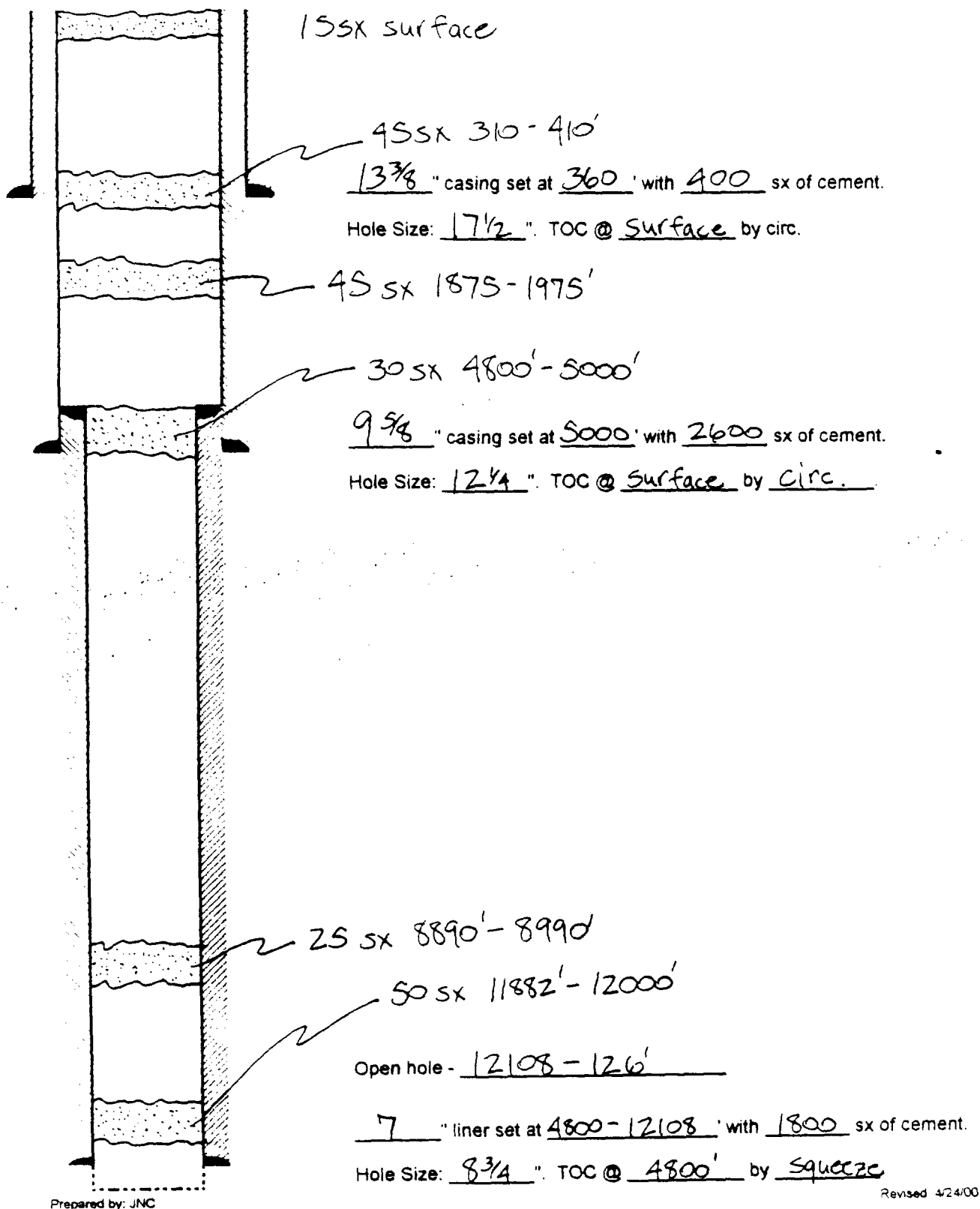
5 1/2 " liner set at 4645-12191 ' with 2075 sx of cement.

Hole Size: 7 7/8 ". TOC @ 2669' by calc

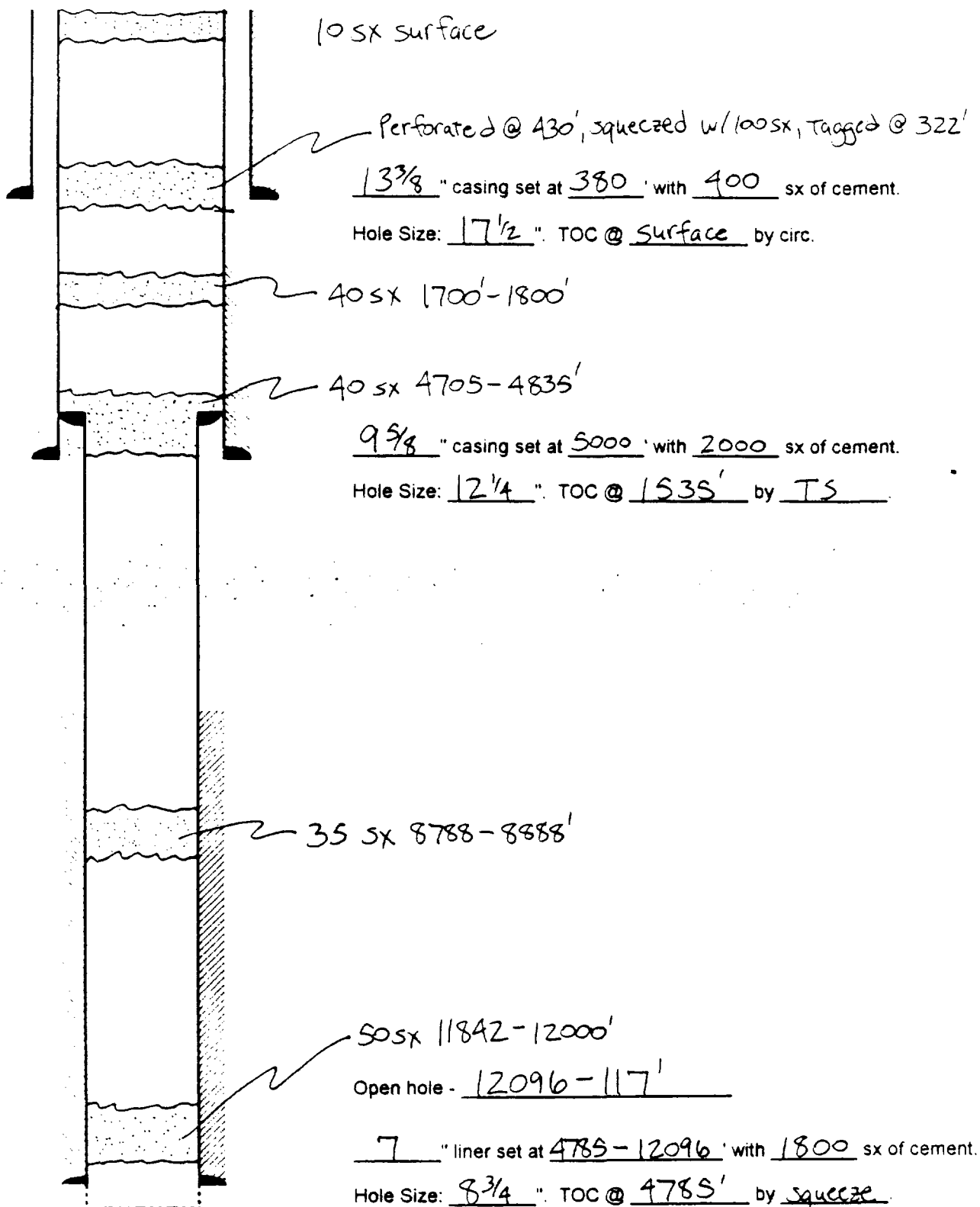
Prepared by: JNC

Revised: 4/24/00

OPERATOR: Meteor Developments	LOCATION: Sec. 22, T9S, R36E, Lea County, NM
LEASE: Santa Fe Pacific #10	Unit P, 330' FSL & 290' FEL



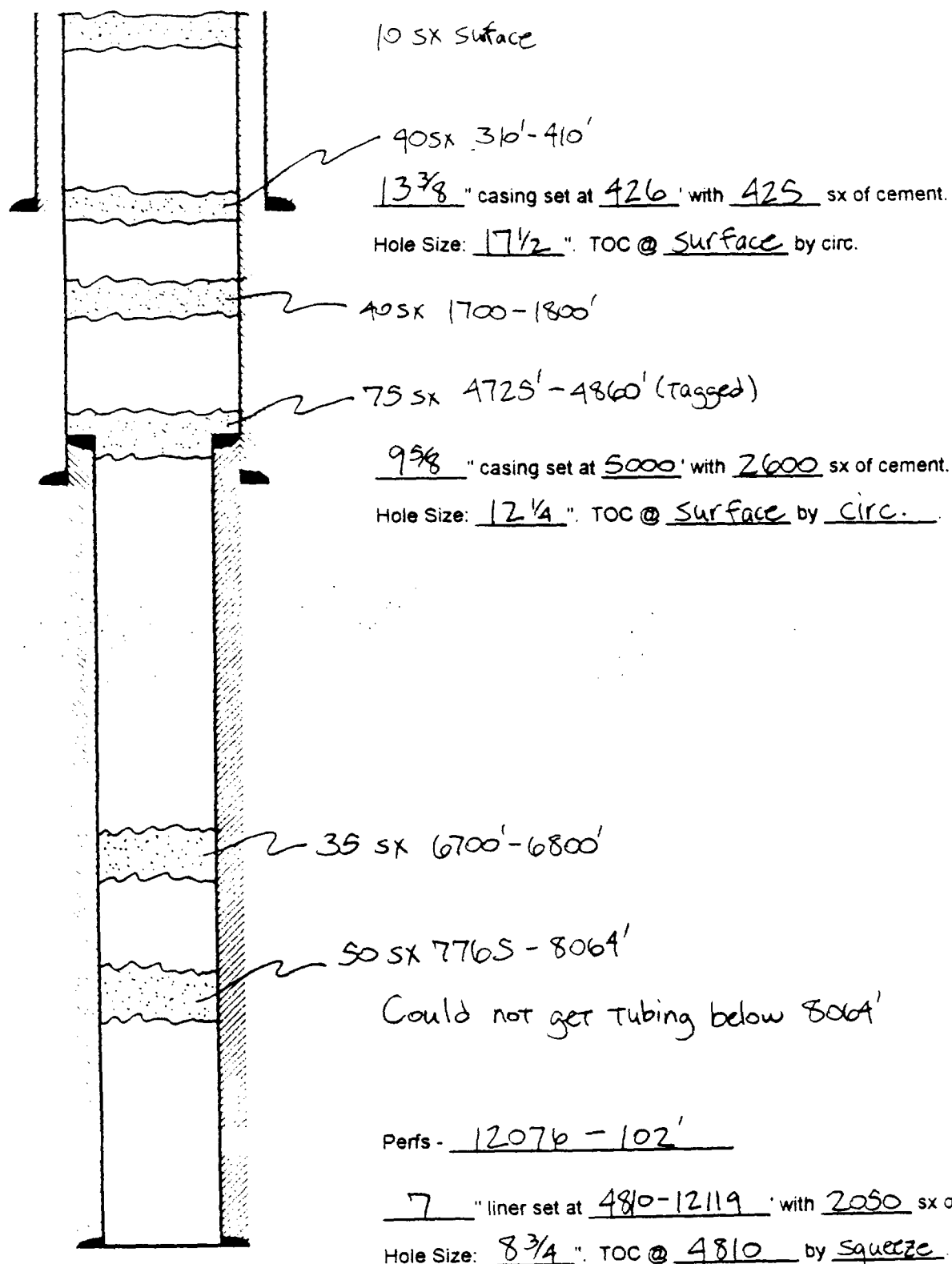
OPERATOR: Meteor Developments	LOCATION: Sec. 26, T9S, R36E, Lea County, NM
LEASE: Santa Fe Pacific #11	Unit D, 990' FNL & 380' FWL



Prepared by: JNC

Revised 4/24/00

OPERATOR: Meteor Developments	LOCATION: Sec. 26, T9S, R36E, Lea County, NM
LEASE: Santa Fe Pacific #12	Unit L, 2310' FSL & 330' FWL



Prepared by: JNC

Revised: 4/24/00

Application for Authorization to Inject

- VI. Attached is a tabulation of all wells of public record that fall within the $\frac{1}{2}$ mile radius of the proposed injection well, the U.D. Sawyer #4. This investigation has further shown that all these wells have a good cement seal around their casing shoe and will therefore prevent the upward migration of the disposed water into any potable water zone. The U.D. Sawyer #4 was abandoned as a Devonian producer in 1978, and recompleted in the Penn (11400-450'). The Penn zone would be cement squeezed. Geologic data and producing volumes would indicate the Devonian in the #4 is currently below the oil-water contact, and on the flank of the structure.
- VII. The proposed average daily injection rate for the subject well is 1,000 BWPD; the maximum daily injection rate would be 1,500 BWPD. This will be a closed system with an average pressure of zero and a maximum pressure of 1000 psi. Only produced Devonian water will be injected in the proposed well, so incompatibility will not be a problem.
- VIII. The injection zone is a dolomite known as the Devonian. The top of the Devonian in this well is at 12,070', and is approximately 300' thick. The zone will be selectively perforated from 12,085' - 12,100', correlative to the Upper producing zone in the offset wells. The main source of drinking water in this area comes from the Cretaceous formation, the base of which is at 180'. The Ogallala overlies the Cretaceous, but pinches out in certain areas around the zone of interest. There are no known sources of drinking water underlying the injection interval.
- IX. After perforation, the well will be stimulated with 3000 gallons of 15% NEFE HCl and ball sealers.
- X. Log and test data is on file with the Division.
- XI. Attached is an analysis of the water from a water well approximately $\frac{1}{2}$ mile northwest of the proposed disposal. This is the only well which could be located.
- XII. Saga Petroleum LLC has examined the available geologic and engineering data and can find no evidence of open faults or any other hydrologic connection between the disposal zone and any underground source of drinking water.
- XIII. The required "Proof of Notice" is attached.
-

U.D. Sawyer #4
660' FNL & 660' FEL
Unit A, Sec. 27-T9S-R36E
Lea County, New Mexico

Offset Operators

G.W. Ainsworth
PO Box 7
Milnesand, NM 88215

Yates Petroleum
105 S. 4th
Artesia, NM 88210

Marbob Energy
PO Box 227
Artesia, NM 88211-0227

Southwest Royalty
Drawer 11390
Midland, TX 79702

C.L. House
401 W. Texas
Midland, TX 79701

Gates-O'Brian
550 W. Texas #1140
Midland, TX 79701

Meteor Development
216 16th Street, Suite 730
Denver, CO 80202

Special Energy Corp.
PO Box 369
Stillwater, OK 74076-0369

Kelly H. Baxter
PO Box 11193
Midland, TX 79702

Surface Owner

Williams Ranch
Crossroads, NM 88114

HALLIBURTON ENERGY SERVICES
WATER ANALYSIS REPORT
HOBBS NEW MEXICO

COMPANY Saga Petroleum
Fax: 915-684-0829

REPORT DATE 97-152
5/2/97
DISTRICT Hobbs

SUBMITTED BY _____

WELL Off set water well DEPTH _____ FORMATION _____
COUNTY _____ FIELD _____ SOURCE _____

SAMPLE	<u>See below</u>		
RESISTIVITY	<u>11.0988 @ 72 °F</u>	<u> @ °F</u>	<u> @ °F</u>
SPECIFIC GR.	<u>0.988</u>	<u> </u>	<u> </u>
pH	<u>7.46</u>	<u> </u>	<u> </u>
CALCIUM	<u>150</u> <u>mpl</u>	<u> </u> <u>mpl</u>	<u> </u> <u>mpl</u>
MAGNESIUM	<u>75</u> <u>mpl</u>	<u> </u> <u>mpl</u>	<u> </u> <u>mpl</u>
CHLORIDE	<u>270</u> <u>mpl</u>	<u> </u> <u>mpl</u>	<u> </u> <u>mpl</u>
SULFATES	<u>100</u> <u>mpl</u>	<u> </u> <u>mpl</u>	<u> </u> <u>mpl</u>
BICARBONATES	<u>195</u> <u>mpl</u>	<u> </u> <u>mpl</u>	<u> </u> <u>mpl</u>
SOLUBLE IRON	<u>0</u> <u>mpl</u>	<u> </u> <u>mpl</u>	<u> </u> <u>mpl</u>
	<u> </u>	<u> </u>	<u> </u>
	<u> </u>	<u> </u>	<u> </u>
OIL GRAVITY	<u> @ °F</u>	<u> @ °F</u>	<u> @ °F</u>

REMARKS Water well located approximately 1 mile north west of disposal

ANALYST: *QLEWANE*

This report is the property of Halliburton Company and neither it nor any part thereof nor a copy thereof is to be published or disclosed without first securing the express written approval of laboratory management. It may however, be used in the course of regular business operations by any person or concern and employees thereof receiving such report from Halliburton Co.

Resistivity measured in: Ohm/m2/m