

SECRETARY'S POTASH OCD-ARTESIA

ATS-11-533
H-739

Form 3160-3
(August 2007)

UNITED STATES DEPARTMENT OF THE INTERIOR BUREAU OF LAND MANAGEMENT

APPLICATION FOR PERMIT TO DRILL OR REENTER

FORM APPROVED
OMB No 1004-0137
Expires July 31, 2010

5. Lease Serial No.
NM LC 1104684 NM SWD-1269

6. If Indian, Allottee or Tribe Name

1a. Type of work: ☐ DRILL ☒ REENTER

7. If Unit or CA Agreement, Name and No.

1b. Type of Well: ☐ Oil Well ☐ Gas Well ☒ Other ☐ Single Zone ☐ Multiple Zone

8. Lease Name and Well No.
Heavy Metal Federal #1

2. Name of Operator **Mesquite SWD, Inc**

9. API Well No.
30-015-29602

3a. Address **P.O. Box 1479 Carlsbad, NM 88221**

3b. Phone No. (include area code)
575-706-1840

10. Field and Pool, or Exploratory
Bell Canyon / Cherry Canyon

4. Location of Well (Report location clearly and in accordance with any State requirements.)

At surface **1900' FSL & 1900' FWL**

At proposed prod. zone **same**

11. Section, Range or BLM and Survey or Area
Sec. 12, T24S-R31E

14. Distance in miles and direction from nearest town or post office*
22.5 miles east of Lovingl, NM off NM-128 and Buck Jackson Road

12. County or Parish
Eddy

13. State
NM

15. Distance from proposed* location to nearest property or lease line, ft
(Also to nearest drig. unit line, if any)
1900'

16. No. of acres in lease
NA

17. Spacing Unit dedicated to this well
NA

18. Distance from proposed location* to nearest well, drilling, completed, applied for, on this lease, ft
NA

19. Proposed Depth
PBTD 7050'

20. BLM/BIA Bond No. on file
NMB000612

21. Elevations (Show whether DF, KDB, RT, GL, etc.)
GL 3541 KB 3554

22. Approximate date work will start*
02/28/2011

23. Estimated duration
15 days

24. Attachments

The following, completed in accordance with the requirements of Onshore Oil and Gas Order No 1, must be attached to this form:

- | | |
|--|---|
| 1. Well plat certified by a registered surveyor.
2. A Drilling Plan.
3. A Surface Use Plan (if the location is on National Forest System Lands, the SUPO must be filed with the appropriate Forest Service Office) | 4. Bond to cover the operations unless covered by an existing bond on file (see Item 20 above).
5. Operator certification
6. Such other site specific information and/or plans as may be required by the BLM. |
|--|---|

25. Signature **Kay Havenor**
Title
Agent 575-626-4518

Name (Printed Typed)
Kay Havenor

Date
03/31/2011

Approved by (Signature) **/s/ James Stovall**
Title
FIELD MANAGER

Name (Printed Typed)

Date
AUG - 1 2011

Office

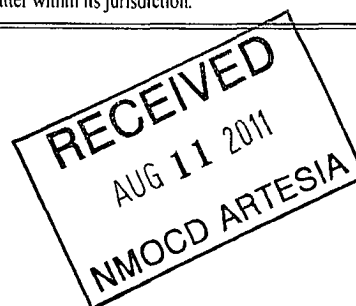
CARLSBAD FIELD OFFICE

Application approval does not warrant or certify that the applicant holds legal or equitable title to those rights in the subject lease which would entitle the applicant to conduct operations thereon.
Conditions of approval, if any, are attached.

Title 18 U.S.C. Section 1001 and Title 43 U.S.C. Section 1212, make it a crime for any person knowingly and willfully to make to any department or agency of the United States any false, fictitious or fraudulent statements or representations as to any matter within its jurisdiction.

(Continued on page 2)

*(Instructions on page 2)



**SEE ATTACHED FOR
CONDITIONS OF APPROVAL**

**Approval Subject to General Requirements
& Special Stipulations Attached**

Mesquite SWD, Inc.
RE-ENTRY PROGRAM

Heavy Metal 12 Federal #1 API: 30-015-29602

Sec. 12, T24S-R31E Eddy Co., NM

Supplemental to Form 3160-3, Application for Permit to Re-enter the subject well, Mesquite SWD, Inc submits the following information as per Bureau of Land Management requirements.

1. Geologic Name of Surface Formation

Surface is Quaternary eolian and piedmont deposits (Qep) Holocene to middle Pleistocene. (New Mexico Bureau of Geology and Mineral Resources, 2003, Geologic Map of New Mexico, 1:500,000)

Soil map with legend. Source: <http://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx>

Eddy Area, New Mexico (NM614)

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
PA	Pajarito loamy fine sand, 0 to 3 percent slopes, eroded	33,993.3	1.3%



Mesquite SWD, Inc.

API 30-015-29602

Heavy Metal 12 Fed #1

1900' FSL & 1900' FWL

Sec. 12, T24S-R31E Eddy Co., NM

2. Formation Tops and Estimated Fresh Water:

The of geologic markers and estimated depths at which anticipated water, oil or gas formations are expected to be encountered as follows: Density-Neutron log tops in this well.

Rustler	758'
Salado	1,232'
Top main salt	2,380'
Base of salt	4,298'
Lamar limestone	4,532'
Bell Canyon	4,587'
Cherry Canyon	5,515'
Brushy Canyon	7,080'
Bone Springs	8,396'

Note: PB TD will be 7050' KB

None of the above formations were found to be commercially productive of oil or gas in this well or other wells in the NM OCD area of review. Although no fresh water is known in the NM OCD area of review, potential shallow sands are protected by 13-3/8" casing set at 608' and cement circulated to the surface, and 8-5/8" casing set at 4,415' and cement circulated to the surface.

3. Casing: (Currently in hole, no casing pulled)

Hole Size	Casing	Depth Set	Cement	Top Cement
17-1/2"	13-3/8" H-40 48#	608'	600 sx	Circulated
11"	8-5/8" K-55 32 & 24#	4415'	1800 sx	Circulated

Proposed Casing:

Hole Size	Interval	OD Casing	New*	Wt	Collar	Grade	Collapse Design Factor	Burst Design Factor	Tension Design Factor
7 7/8"	0-4550'	7" Flush Joint	New*	23#	FL-4S	K-55	1.125	1.125	1.5

*New or White Band (used certified to API standards). Additional data attached below.

See COA

Below BLM minimum

Mesquite SWD, Inc.

API 30-015-29602

Heavy Metal 12 Fed #1

1900' FSL & 1900' FWL

Sec. 12, T24S-R31E-Eddy Co., NM

4. Cement Program: (Original completion - not pulled)

13-3/8" Surface casing w/600 sx Class C w/2% CaCl_2 . Circulated 113 sx to pit.

8-5/8" Intermediate string 1800 sx Class C. Circulated 50 sx to pit.

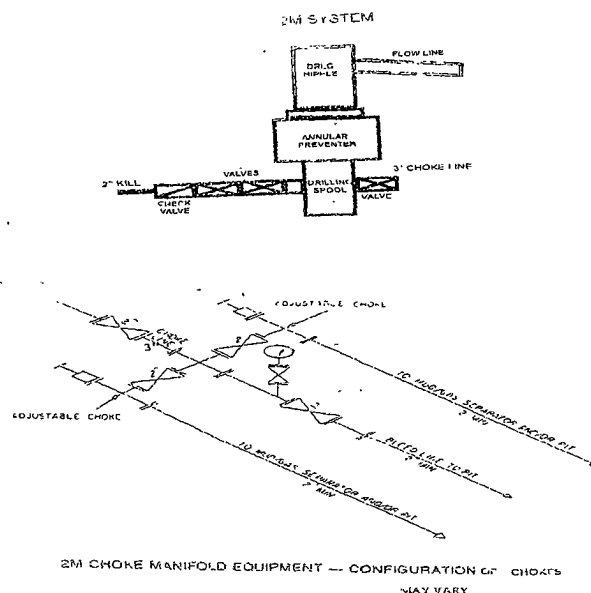
Proposed production string on re-entry:

Float and set 7" at 4550' with 310 sxs Class C+1% CaCl_2 +0.25% R-3, density 14.80#/gal, yield 1.34 cu.ft/sx, 126.11 bbls, circulate to surface. Calculates ~~25%~~ excess. -18

Note: Clean-out will be w/7-7/8" bit to TD 8543, set bottom plug 200' cmt 8543' to approximately 8343' covering top Bone Springs @8396'. Additional 100' cmt plug will be set 6150'-6250' tagged, as per requirement with COG. A temporary 50' plug will be set 4550'-4600' tagged to prevent 7" csg cmt from going down hole.

5. Pressure Control Equipment:

2M BOP shown on the following diagram is representative of the type to be utilized by the workover contractor. The BOP and manifold test will be used to pressure casing/tubing for 30 minutes prior to reaching 8-5/8" casing shoe at 4415'. BOP equipment will be tested daily during re-entry.



Nipple-up on 8-5/8" casing with 2M system and test to 2000# with independent tester.

Mesquite SWD, Inc.

API 30-015-29602

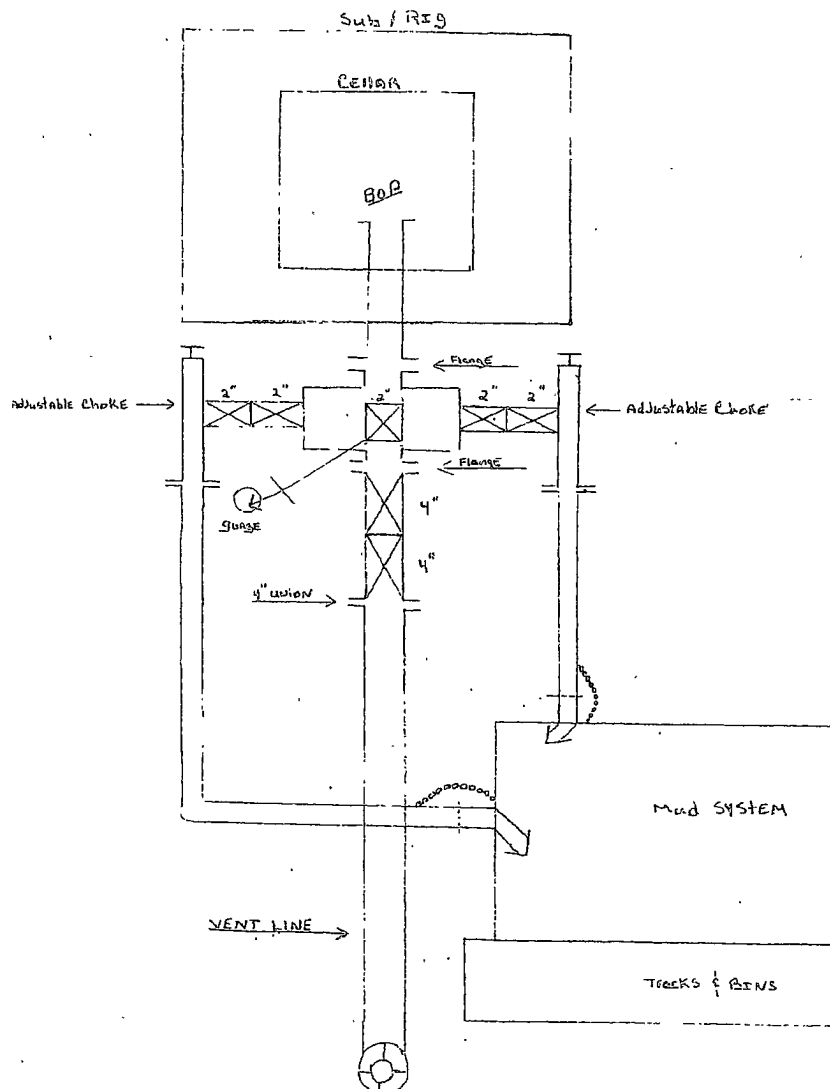
Heavy Metal 12 Fed #1

1900' FSL & 1900' FWL

Sec. 12, T24S-R31E Eddy Co., NM

BOP will be operationally checked each 24 hour period. BOP will be operationally checked on each trip out of the hole. These checks will be noted on the daily tour sheets. A 2" kill line and a 3" choke line will be included in the drilling spool located below the BOP. Other accessories to the BOP equipment will include a Kelly cock and floor safety valve (inside BOP) and choke lines and choke manifold with 2000 psi working pressure rating.

Choke Manifold Equipment



Vent line will extend to pad margin to provide sufficient distance, approximately 100' to flare boom, from any ignition source in the event natural gas should be encountered. No gas was encountered to TD in the original drilling of the hole.

BOP will be operationally checked each 24 hour period. BOP will be operationally checked on each trip out of the hole. These checks will be noted on the daily tour sheets. A 2" kill line and a 3" choke line will be included in the drilling spool located below the BOP. Other accessories to the BOP equipment will include a Kelly cock and floor safety valve (inside BOP) and choke lines and choke manifold with 2000 psi working pressure rating.

6. Proposed Mud Circulation System:

Drilling and returned circulation will be from and to a closed loop-like system w/surface tanks. No earthen mud or reserves pits will be constructed or used for this re-entry. Drilling fluids and cuttings, if any, will be trucked to a certified disposal facility upon completion of re-entry operations. Cement cuttings will be removed to a certified disposal facility.

7. Estimated BHP: 4030 psi

8. Mud Program:

Fresh water will be used for the re-entry mud system until 8-5/8" is exited. 7" is set and cemented at 4550'. From 4550' to re-entry clean-out 8543' the mud system will be cut brine 9.0#.

9. Auxiliary Well Control and Monitoring Equipment:

- a. A Kelly cock will be in the drill string at all times.
- b. H₂S detection equipment will be in operation during the drilling operation. H₂S is not considered a potential hazard because it was not reported in the original drilling and the entire hole is cased and cemented.

10. Logging, Coring, and Testing Program:

No logging, coring, or testing is anticipated.

11. Potential Hazards:

No abnormal pressures or temperatures were encountered in the original drilling operations. No H₂S was encountered in the original drilling operations. All personnel will be familiar with all aspects of safe operation of equipment being used to re-enter this well. BHT of this re-entry was originally measured 123° at 8526'.

FL-4S CASING CONNECTION SPECIFICATIONS

		Plain		Nominal		Pin		Critical	
	Nom	End	Wall	Inside	Drift	I.D.	Make-Up	Area of	Tensile
Size OD	Weight	Weight	Thickness	Diameter	Diameter	Bored	Loss	Connection	Efficiency
Inches	Lbs/Ft	Lbs/Ft	Inches	Inches	Inches	Inches	Inches	Sq. Inch	%
7	23	22.63	0.317	6.366	6.241	6.261	2.178	3.493	52.5

Flush Joint casing pressure/strength ratings

Size OD	Nom Weight	Grade	Drift ID	Collapse	Internal Yield	Joint Strength
Inches	Lbs/Ft	API	Inches	PSI	PSI	1000 lbs
7	23	J-55	6.250	3270	4360	499

Flush Joint connectors are all FL-4S. All test and certification data will be present when delivered.

Safety factors for this 7" pipe at 4550' comparison to API safety factors:

Size OD Inches	Weight Lbs/Ft	Collapse Safety	Collapse API	Burst Safety	Burst API	Tension Safety	Tension API
7	23	1.521	1.25	1.80	1.0	3.36	1.5

Safety factors for the Flush Joint pipe to be utilized significantly exceeds API minimum standards.

See pipe supplier's data and safety factors for this specific pipe below.

Smith Bros Pipe, Midland, TX pipe specifications for this job :

7" to be set at ⁴⁵⁵⁰~~4300~~. Note: This pipe is API. All parameters utilized are the same for both J-55 and K-55.

Design Parameters:

Mud weight (9.63 ppg) : 0.500 psi/ft
 Shut in surface pressure : 2425 psi
 Internal gradient (burst) : 0.000 psi/ft
 Annular gradient (burst) : 0.000 psi/ft
 Tensile load is determined using air weight
 Service rating is "Sweet"

Design Factors:

Collapse : 1.125
 Burst : 1.00
 8 Pound : 1.80 (J)
 Buttress : 1.60 (J)
 Other : 1.750 (J)
 Body Yield : 1.750 (B)

Length (feet)	Size (in.)	Weight (lb/ft)	Grade	Joint	Depth (feet)	Drift (in.)	Cost		
1	4,300	7.000	23.00	K-55	AB FL-4S	4,300	6.250		
	Collapse			Burst Load (psi)	Min Int Strgth (psi)	Yield S.F.	Tension		
	Load (psi)	Strgth (psi)	S.F.				Load (kips)	Strgth (kips)	S.F.
1	2150	3270	1.521	2425	4360	1.80	98.90	332	3.36 J

Prepared by : , Artesia, New Mexico
 Date : 05-14-2011
 Remarks :

Minimum segment length for the ~~4300~~ foot well is 1,000 feet.

Surface/Intermediate string:

Next string will set at 4,850 ft. with 9.63 ppg mud (pore pressure of 2,425 psi.) The frac gradient of 0.750 psi/ft at 4,300 feet results in an injection pressure of 3,225 psi. Effective BHP (for burst) is 2,425 psi.

NOTE: The design factors used in this casing string design are as shown above. As a general guideline, Lone Star Steel recommends using minimum design factors of 1.125 - Collapse (with evacuated casing), 1.0 - Burst, 1.8 - 8 Round Tension, 1.6 - Buttress Tension, and 1.5 - Body Yield. Collapse strength under axial tension was calculated based on the Westcott, Dunlop and Kemler curve. Engineering responsibility for use of this design will be that of the purchaser.

Data on 7" 23# Flush Joint and FL-4S connectors:

FL-4S CASING CONNECTION SPECIFICATIONS

		Plain	Wall	Nom.		Pin		Critical	Tensile
	Nom	End	Thick-	Inside Dia.	Drift	I.D.	Make-Up	Area	Eff-
Size OD	Weight	Weight	ness	Dia.	Diam.	Bored	Loss	of Conn.	ciency
In.	Lbs/Ft	Lbs/Ft.	In.	In.	In.	In.	In.	Sq. In.	%
7	23	22.63	0.317	6.366	6.241	6.291	2.178	3.493	52.5

Paperwork on pipe specifications and certification on White Band to API specs will accompany pipe delivery.

Mesquite SWD, Inc.
 Heavy Metal 12 Fed #1
 1900' FSL & 1900' FWL
 Sec. 12, T24S-R31E Eddy Co., NM

API 30-015-29602

Data on 7" Flush Joint 23# and FL-4S connectors

PROPOSED COMPLETION PLAN

API: 3001529602
 Operator: Mesquite SWD, Inc.
 Lease: Heavy Metal 12 Federal
 Location: Sec 12, T24S-R31E Eddy Co., NM
 Footage: 1900 FSL, 1900 FWL

Well No:1

KB: 3554
 GL: 3541

Original Surface Csg

Size: 13-3/8"
 Set @: 608
 Sxs cmt: 600
 Circ: Circulated
 TOC: Surface
 Hole Size: 17-1/2"

Original Intermediate Csg

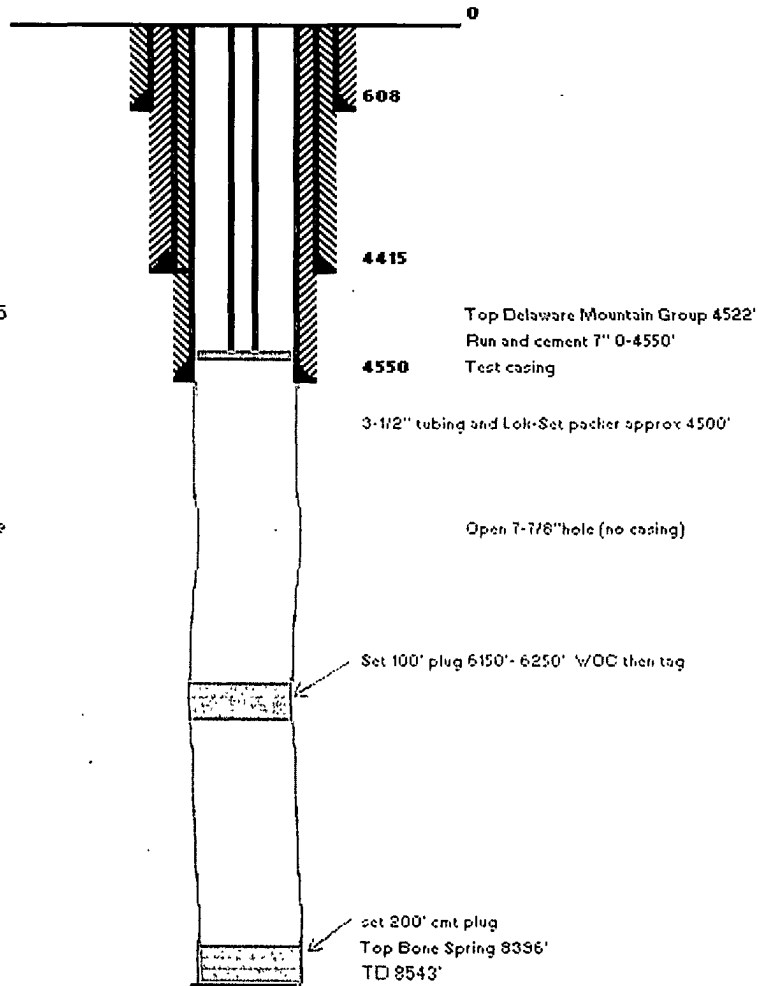
Size: 8-5/8" 32, 24# K-55
 Set @: 4415
 Sxs cmt: 1800
 Circ: Circulated
 TOC: Surface
 Hole Size: 11"

Proposed Production Csg

Size: 7" 23# J-55 Extreme line
 Set @: 4550
 Sxs cmt: 285
 Circ: Circulate to surf
 TOC: Surface
 Hole Size: 7-7/8"

Tubular requirements (made-up):
 4500' 3-1/2" N80 9.3# upset Fiberglass coated
 Lock-Set Packer set approx 4830'

Acidized selectively
 Load tubing annulus w/corrosion inhibitor
 Complete surface head for disposal



Not to Scale

Mesquite SWD, Inc.

API 30-015-29602

Heavy Metal 12 Fed #1

1900' FSL & 1900' FWL

Sec. 12, T24S-R31E Eddy Co., NM

Addendum: Well Diagrams

PLUG AND ABANDON WELL DIAGRAM

API: 3001529602

Originally: Devon SFS Operating, Inc. Heavy Metal 12 Federal No. 1

Operator: Devon SFS Operating, Inc.

Lease: Heavy Metal 12 Federal

Well No: 1

KB: 3554

Location: Sec 12, T24S-R31E Eddy Co., NM

GL: 3541

Footage: 1900 FSL, 1900 FWL

Original Surface Csg

Size: 13-3/8"

Set @: 608

Sxs cmt: 600

Circ: Circulated

TOC: Surface

Hole Size: 17-1/2"

Original Intermediate Csg

Size: 8-5/8"

Set @: 4415

Sxs cmt: 1800

Circ: Circulated

TOC: Surface

Hole Size: 11"

Original Production Csg

Size: None

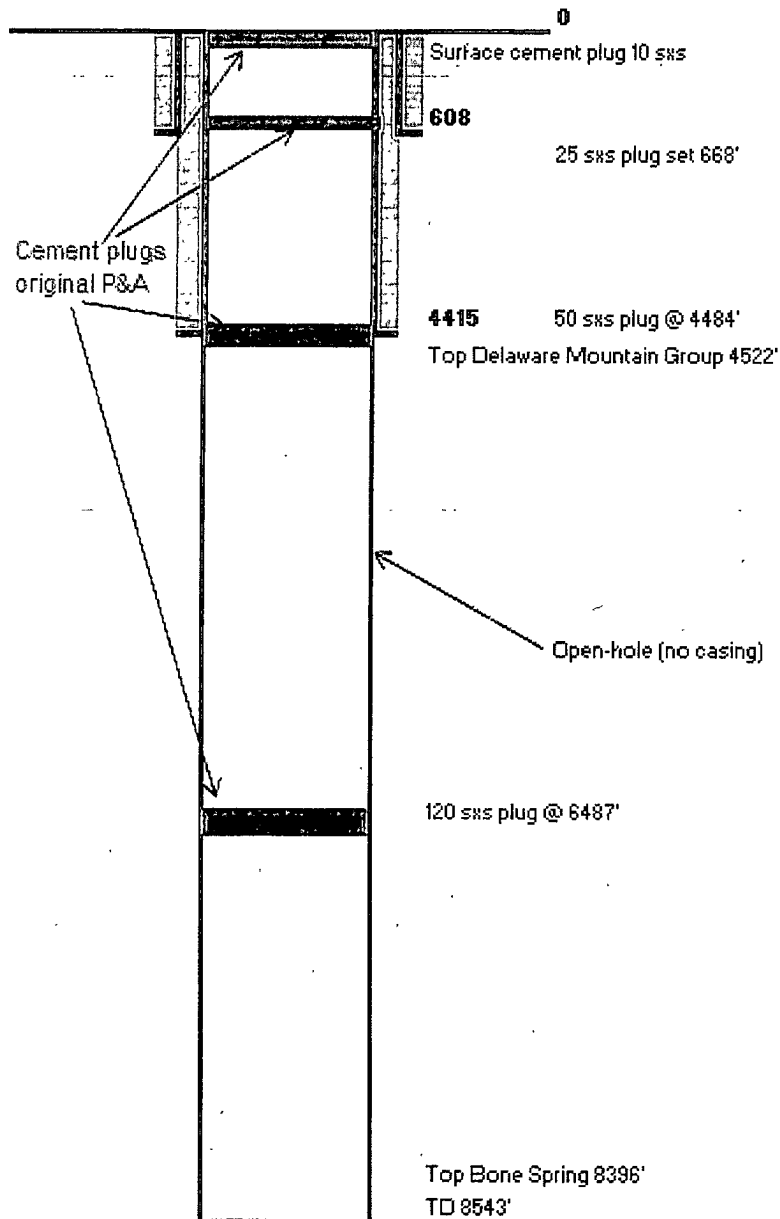
Set @:

Sxs cmt:

Circ:

TOC:

Hole Size: 7-7/8"



Not to Scale

Mesquite SWD, Inc.

API 30-015-29602

Heavy Metal 12 Fed #1

1900' FSL & 1900' FWL

Sec. 12, T24S-R31E-Eddy Co., NM

Well Site Lay-Out Plat

