

Form 3160-3  
(June 2015)

FORM APPROVED  
OMB No. 1004-0137  
Expires: January 31, 2018

UNITED STATES  
DEPARTMENT OF THE INTERIOR  
BUREAU OF LAND MANAGEMENT  
**APPLICATION FOR PERMIT TO DRILL OR REENTER**

1a. Type of work: <input type="checkbox"/> DRILL <input type="checkbox"/> REENTER		5. Lease Serial No.
1b. Type of Well: <input type="checkbox"/> Oil Well <input type="checkbox"/> Gas Well <input type="checkbox"/> Other		6. If Indian, Allottee or Tribe Name
1c. Type of Completion: <input type="checkbox"/> Hydraulic Fracturing <input type="checkbox"/> Single Zone <input type="checkbox"/> Multiple Zone		7. If Unit or CA Agreement, Name and No.
2. Name of Operator		8. Lease Name and Well No.
3a. Address		9. API Well No. <b>30-015-47798</b>
3b. Phone No. (include area code)		10. Field and Pool, or Exploratory <b>Purple Sage;Wolfcamp</b>
4. Location of Well (Report location clearly and in accordance with any State requirements. *) At surface At proposed prod. zone		11. Sec., T. R. M. or Blk. and Survey or Area
14. Distance in miles and direction from nearest town or post office*		12. County or Parish
		13. State
15. Distance from proposed* location to nearest property or lease line, ft. (Also to nearest drig. unit line, if any)	16. No of acres in lease	17. Spacing Unit dedicated to this well
18. Distance from proposed location* to nearest well, drilling, completed, applied for, on this lease, ft.	19. Proposed Depth	20. BLM/BIA Bond No. in file
21. Elevations (Show whether DF, KDB, RT, GL, etc.)	22. Approximate date work will start*	23. Estimated duration
24. Attachments		

The following, completed in accordance with the requirements of Onshore Oil and Gas Order No. 1, and the Hydraulic Fracturing rule per 43 CFR 3162.3-3 (as applicable)

- |  |   |
|--|---|
| 1. Well plat certified by a registered surveyor.   | 4. Bond to cover the operations unless covered by an existing bond on file (see Item 20 above). |
| 2. A Drilling Plan.  | 5. Operator certification.  |
| 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). | 6. Such other site specific information and/or plans as may be requested by the BLM.            |

25. Signature	Name (Printed/Typed)	Date
Title		
Approved by (Signature)	Name (Printed/Typed)	Date
Title	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.

Oil base muds are not to be used until fresh water zones are cased and cemented providing isolation from the oil or diesel. This includes synthetic oils. Oil based mud, drilling fluids and solids must be contained in a steel closed loop system.

Once the well is spud, to prevent ground water contamination through whole or partial conduits from the surface, the operator shall drill without interruption through the fresh water zone or zones and shall immediately set in cement the water protection string

- Will require a directional survey with the C-104
- NSL Will require an administrative order for non-standard location prior to placing the well on production



KP 12/8/2020 GEO Review

\*(Instructions on page 2)

(Continued on page 2)

Approval Date: 11/13/2020





District I  
1625 N. French Dr., Hobbs, NM 88240  
District II  
811 S. First St., Artesia, NM 88210  
District III  
1000 Rio Brazos Road, Aztec, NM 87410  
District IV  
1220 S. St. Francis Dr., Santa Fe, NM 87505

State of New Mexico  
Energy, Minerals and Natural Resources Department

Submit Original  
to Appropriate  
District Office

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

**GAS CAPTURE PLAN**

Date: 01-02-2020

Original

Operator & OGRID No.: OXY USA INC. - 16696

Amended - Reason for Amendment: \_\_\_\_\_

This Gas Capture Plan outlines actions to be taken by the Operator to reduce well/production facility flaring/venting for new completion (new drill, recomplete to new zone, re-frac) activity.

*Note: Form C-129 must be submitted and approved prior to exceeding 60 days allowed by Rule (Subsection A of 19.15.18.12 NMAC).*

**Well(s)/Production Facility – Name of facility**

The well(s) that will be located at the production facility are shown in the table below.

Well Name	API	Well Location (ULSTR)	Footages	Expected MCF/D	Flared orVent	Comments
JEFF SMITH MDP1 7 FED COM 175H	Pending	P-6-T24S-R-31E	331 FSL 565 FEL	2,800	0	
JEFF SMITH MDP1 7 FED COM 176H	Pending	P-6-T24S-R31E	331 FSL 530 FEL	2,800	0	
JEFF SMITH MDP1 7 FED COM 25H	Pending	P-6-T24S-R31E	330 FSL 240 FEL	3,700	0	
JEFF SMITH MDP1 7_18 FED COM 11H	Pending	N-6-T24S-R31E	277 FSL 1926 FWL	2,500	0	
JEFF SMITH MDP1 7_18 FED COM 12H	Pending	N-6-T24S-31E	277 FSL 1961 FWL	2,500	0	
JEFF SMITH MDP1 7_18 FED COM 13H	Pending	P-6-T24S-R31E	418 FSL 994 FEL	2,500	0	
JEFF SMITH MDP1 7_18 FED COM 14H	Pending	P-6-T24S-R31E	348 FSL 994 FEL	2,500	0	
JEFF SMITH MDP1 7_18 FED COM 171H	Pending	M-7-T24S-R31E	779 FSL 705 FWL	4,200	0	
JEFF SMITH MDP1 7_18 FED COM 172H	Pending	M-6-T24S-R31E	779 FSL 740 FWL	4,200	0	
JEFF SMITH MDP1 7_18 FED COM 173H	Pending	N-6-T24S-R31E	275 FSL 2256 FWL	4,200	0	
JEFF SMITH MDP1 7_18 FED COM 174H	Pending	N-6-T23S-R31E	275 FSL 2291 FWL	4,200	0	
JEFF SMITH MDP1 7_18 FED COM 1H	Pending	N-6-T24S-R31E	730 FSL 1755 FWL	3,800	0	
JEFF SMITH MDP1 7_18 FED COM 21H	Pending	D-7-T24S-R31E	198 FNL 321 FWL	5,500	0	
JEFF SMITH MDP1 7_18 FED COM 22H	Pending	D-7-T24S-R31E	198 FNL 421 FWL	5,500	0	
JEFF SMITH MDP1 7_18 FED COM 23H	Pending	C-7-T24S-R31E	233 FNL 2136 FWL	5,500	0	
JEFF SMITH MDP1 7_18 FED COM 24H	Pending	C-7-T24S-R31E	233 FNL 2206 FWL	5,500	0	

JEFF SMITH MDP1 7_18 FED COM 26H	Pending	P-6-T24S-R31E	329 FSL 170 FEL	5,500	0	
JEFF SMITH MDP1 7_18 FED COM 2H	Pending	A-7-T24S-R31E	248 FNL 1200 FEL	3,800	0	
JEFF SMITH MDP1 7_18 FED COM 31H	Pending	N-6-T24S-R31E	730 FSL 1690 FWL	3,000	0	
JEFF SMITH MDP1 7_18 FED COM 32H	Pending	N-6-T24S-R31E	730 FSL 1790 FWL	3,000	0	
JEFF SMITH MDP1 7_18 FED COM 33H	Pending	P-6-T24S-R31E	518 FSL 994 FEL	3,000	0	
JEFF SMITH MDP1 7_18 FED COM 34H	Pending	P-6-T24S-R31E	488 FSL 994 FEL	3,000	0	
JEFF SMITH MDP1 7_18 FED COM 3H	Pending	A-7-T24S-R31E	248 FNL 1100 FEL	3,800	0	
JEFF SMITH MDP1 7_18 FED COM 41H	Pending	N-6-T24S-R31E	279 FSL 1566 FWL	7,200	0	
JEFF SMITH MDP1 7_18 FED COM 42H	Pending	N-6-T24S-R31E	278 FSL 1636 FWL	7,200	0	
JEFF SMITH MDP1 7_18 FED COM 43H	Pending	N-6-T24S-R31E	730 FSL 2020 FWL	7,200	0	
JEFF SMITH MDP1 7_18 FED COM 44H	Pending	N-6-T24S-R31E	730 FSL 2090 FWL	7,200	0	
JEFF SMITH MDP1 7_18 FED COM 45H	Pending	P-6-T24S-R31E	1225 FSL 1200 FEL	7,200	0	
JEFF SMITH MDP1 7_18 FED COM 46H	Pending	P-6-T24S-R31E	1295 FSL 1200 FEL	7,200	0	
NUGGET 6_31 FED COM 11H	Pending	N-6-T24S-31E	277 FSL 1896 FWL	2,500	0	
NUGGET 6_31 FED COM 12H	Pending	N-6-T24S-R31E	277 FSL 1996 FWL	2,500	0	
NUGGET 6_31 FED COM 13H	Pending	P-6-T24S-R31E	453 FSL 994 FEL	2,500	0	
NUGGET 6_31 FED COM 14H	Pending	P-6-T24S-R31E	383 FSL 994 FEL	2,500	0	
NUGGET 6_31 FED COM 171H	Pending	D-7-T24S-R31E	198 FNL 456 FWL	4,200	0	
NUGGET 6_31 FED COM 172H	Pending	D-7-T24S-R31E	198 FNL 491 FWL	4,200	0	
NUGGET 6_31 FED COM 173H	Pending	C-7-T24S-R31E	620 FNL 1994 FWL	4,200	0	
NUGGET 6_31 FED COM 174H	Pending	C-7-T24S-R31E	620 FNL 2029 FWL	4,200	0	
NUGGET 6_31 FED COM 175H	Pending	P-6-T24S-R31E	1089 FSL 300 FEL	4,200	0	
NUGGET 6_31 FED COM 176H	Pending	P-6-T24S-R31E	1089 FSL 265 FEL	4,200	0	
NUGGET 6_31 FED COM 1H	Pending	N-6-T24S-R31E	730 FSL 1720 FWL	3,800	0	
NUGGET 6_31 FED COM 21H	Pending	D-7-T24S-R31E	198 FNL 351 FWL	5,500	0	
NUGGET 6_31 FED COM 22H	Pending	D-7-T24S-R31E	198 FNL 386 FWL	5,500	0	

NUGGET 6_31 FED COM 23H	Pending	C-7-T24S-R31E	233 FNL 2106 FWL	5,500	0	
NUGGET 6_31 FED COM 24H	Pending	C-7-T24S-R31E	233 FNL 2171 FWL	5,500	0	
NUGGET 6_31 FED COM 25H	Pending	P-6-T24S-R31E	330 FSL 270 FEL	5,500	0	
NUGGET 6_31 FED COM 26H	Pending	P-6-T24S-R31E	329 FSL 205 FEL	5,500	0	
NUGGET 6_31 FED COM 2H	Pending	A-7-T24S-R31E	248 FNL 1170 FEL	3,800	0	
NUGGET 6_31 FED COM 31H	Pending	C-7-T24S-R31E	231 FNL 1811 FWL	3,000	0	
NUGGET 6_31 FED COM 32H	Pending	C-7-T24S-R31E	231 FNL 1846 FWL	3,000	0	
NUGGET 6_31 FED COM 33H	Pending	P-6-T24S-R31E	1090 FSL 515 FEL	3,000	0	
NUGGET 6_31 FED COM 34H	Pending	P-6-T24S-R31E	1090 FSL 480 FEL	3,000	0	
NUGGET 6_31 FED COM 3H	Pending	A-7-T24S-R31E	248 FNL 1135 FEL	3,800	0	
NUGGET 6_31 FED COM 41H	Pending	N-6-T24S-R31E	279 FSL 1536 FWL	7,200	0	
NUGGET 6_31 FED COM 42H	Pending	N-6-T24S-R31E	278 FSNL 1601 FWL	7,200	0	
NUGGET 6_31 FED COM 43H	Pending	N-6-T24S-R31E	730 FSL 1990 FWL	7,200	0	
NUGGET 6_31 FED COM 44H	Pending	N-6-T24S-R31E	730 FSL 2055 FWL	7,200	0	
NUGGET 6_31 FED COM 45H	Pending	P-6-T24S-R31E	1195 FSL 1200 FEL	7,200	0	
NUGGET 6_31 FED COM 46H	Pending	P-6-T24S-R31E	1260 FSL 1200 FEL	7,200	0	

### **Gathering System and Pipeline Notification**

Well(s) will be connected to a production facility after flowback operations are complete, where a gas transporter system is in place. The gas produced from production facility is dedicated to Enterprise Field Services, LLC (“Enterprise”) and is connected to Enterprise low/high pressure gathering system located in Eddy County, New Mexico. OXY USA INC. (“OXY”) provides (periodically) to Enterprise a drilling, completion and estimated first production date for wells that are scheduled to be drilled in the foreseeable future. In addition, OXY and Enterprise have periodic conference calls to discuss changes to drilling and completion schedules. Gas from these wells will be processed at Enterprise’s Processing Plant located in Sec. 36, Twn. 24S, Rng. 30E, Eddy County, New Mexico. The actual flow of the gas will be based on compression operating parameters and gathering system pressures.

### **Flowback Strategy**

After the fracture treatment/completion operations, well(s) will be produced to temporary production tanks and gas will be flared or vented. During flowback, the fluids and sand content will be monitored. When the produced fluids contain minimal sand, the wells will be turned to production facilities. Gas sales should start as soon as the wells start flowing through the production facilities, unless there are operational issues on Enterprise system at that time. Based on current information, it is OXY’s belief the system can take this gas upon completion of the well(s).

Safety requirements during cleanout operations from the use of underbalanced air cleanout systems may necessitate that sand and non-pipeline quality gas be vented and/or flared rather than sold on a temporary basis.

### **Alternatives to Reduce Flaring**

Below are alternatives considered from a conceptual standpoint to reduce the amount of gas flared.

- Power Generation – On lease
  - Only a portion of gas is consumed operating the generator, remainder of gas will be flared

- Compressed Natural Gas – On lease
  - Gas flared would be minimal, but might be uneconomical to operate when gas volume declines
- NGL Removal – On lease
  - Plants are expensive, residue gas is still flared, and uneconomical to operate when gas volume declines

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### 1. Geologic Formations

TVD of target	11457'	Pilot Hole Depth	N/A
MD at TD:	22248'	Deepest Expected fresh water:	547'

### Delaware Basin

Formation	TVD - RKB	Expected Fluids
Rustler	547	Brine
Salado	923	Brine
Castile	2,763	Brine
Lamar/Delaware	4,187	Brine
Bell Canyon	4,217	Oil/Gas
Cherry Canyon	5,109	Oil/Gas
Brushy Canyon	6,369	Losses
Bone Spring	8,055	Oil/Gas
1st Bone Spring	9,067	Oil/Gas
2nd Bone Spring	9,791	Oil/Gas
3rd Bone Spring	11,021	Oil/Gas
<b>Wolfcamp</b>	<b>11,476</b>	<b>Oil/Gas</b>

\*H2S, water flows, loss of circulation, abnormal pressures, etc.

### 2. Casing Program

Hole Size (in)	Casing Interval		Csg. Size (in)	Weight (lbs)	Grade	Conn.	SF	SF Burst	Buoyant	Buoyant
	From (ft)	To (ft)					Collapse		Body SF Tension	Joint SF Tension
14.75	0	863	10.75	40.5	J-55	BTC	1.125	1.2	1.4	1.4
9.875	0	10697	7.625	26.4	L-80 HC	BTC	1.125	1.2	1.4	1.4
6.75	0	22248	5.5	20	P-110	DQX	1.125	1.2	1.4	1.4
SF Values will meet or Exceed										

All casing strings will be tested in accordance with Onshore Oil and Gas Order #2 III.B.1.h

\*Oxy requests the option to set casing shallower yet still below the salts if losses or hole conditions require this. Cement volumes may be adjusted if casing is set shallower and a DV tool may be run in case hole conditions merit pumping a second stage cement job to comply with permitted top of cement. If cement circulated to surface during first stage, we will drop a cancelation cone and not pump the second stage.

\*Oxy requests the option to run production casing with DQX, SF TORQ, and/or DQW TORQ connections to accommodate hole conditions or drilling operations.

### Annular Clearance Variance Request

As per the agreement reached in the Oxy/BLM meeting on Feb 22, 2018, Oxy requests permission to allow deviation from the 0.422" annular clearance requirement from Onshore Order #2 under the following conditions:

## Oxy USA Inc. - Nugget 6\_31 Fed Com 171H

1. Annular clearance to meet or exceed 0.422” between intermediate casing ID and production casing coupling only on the first 500’ overlap between both casings.
2. Annular clearance less than 0.422” is acceptable for the curve and lateral portions of the production open hole section.

	Y or N
Is casing new? If used, attach certification as required in Onshore Order #1	Y
Does casing meet API specifications? If no, attach casing specification sheet.	Y
Is premium or uncommon casing planned? If yes attach casing specification sheet.	Y
Does the above casing design meet or exceed BLM’s minimum standards? If not provide justification (loading assumptions, casing design criteria).	Y
Will the intermediate pipe be kept at a minimum 1/3 fluid filled to avoid approaching the collapse pressure rating of the casing?	Y
Is well located within Capitan Reef?	N
If yes, does production casing cement tie back a minimum of 50’ above the Reef?	
Is well within the designated 4 string boundary.	
Is well located in SOPA but not in R-111-P?	Y
If yes, are the first 2 strings cemented to surface and 3 <sup>rd</sup> string cement tied back 500’ into previous casing?	Y
Is well located in R-111-P and SOPA?	N
If yes, are the first three strings cemented to surface?	
Is 2 <sup>nd</sup> string set 100’ to 600’ below the base of salt?	
Is well located in high Cave/Karst?	N
If yes, are there two strings cemented to surface?	
(For 2 string wells) If yes, is there a contingency casing if lost circulation occurs?	
Is well located in critical Cave/Karst?	N
If yes, are there three strings cemented to surface?	

### 3. Cementing Program

Casing String	# Sks	Wt. (lb/gal)	Yld (ft3/sack)	H2O (gal/sk)	500# Comp. Strength (hours)	Slurry Description
Surface (Lead)	N/A	N/A	N/A	N/A	N/A	N/A
Surface (Tail)	709	14.8	1.33	6.365	5:26	Class C Cement, Accelerator
Intermediate 1st Stage (Lead)	N/A	N/A	N/A	N/A	N/A	N/A
Intermediate 1st Stage (Tail)	565	13.2	1.65	8.640	11:54	Class H Cement, Retarder, Dispersant, Salt
Intermediate 2nd Stage (Tail Slurry) to be pumped as Bradenhead Squeeze from surface, down the Intermediate annulus						
Intermediate 2nd Stage (Lead)	N/A	N/A	N/A	N/A	N/A	N/A
Intermediate 2nd Stage (Tail)	814	12.9	1.92	10.41	23:10	Class C Cement, Accelerator
Production (Lead)	N/A	N/A	N/A	N/A	N/A	N/A
Production (Tail)	883	13.2	1.38	6.686	3:39	Class H Cement, Retarder, Dispersant, Salt

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<b>Casing String</b>	<b>Top (ft)</b>	<b>Bottom (ft)</b>	<b>% Excess</b>
Surface (Lead)	N/A	N/A	N/A
Surface (Tail)	0	863	100%
Intermediate 1st Stage (Lead)	N/A	N/A	N/A
Intermediate 1st Stage (Tail)	6619	10697	5%
Intermediate 2nd Stage (Lead)	N/A	N/A	N/A
Intermediate 2nd Stage (Tail)	0	6619	10%
Production (Lead)	N/A	N/A	N/A
Production (Tail)	10197	22248	20%

Oxy requests a variance to cement the 9.625” and/or 7.625” intermediate casing strings offline in accordance to the approved variance, EC Tran 461365.

The summarized operational sequence will be as follows:

1. Run casing as per normal operations. While running casing, conduct negative pressure test and confirm integrity of the float equipment (float collar and shoe).
2. Land casing.
3. Fill pipe with kill weight fluid, and confirm well is static.
  - a. If well is not static notify BLM and kill well.
  - b. Once well is static notify BLM with intent to proceed with nipple down and offline cementing.
4. Set and pressure test annular packoff.
5. After confirmation of both annular barriers and internal barriers, nipple down BOP and install cap flange. If any barrier fails to test, the BOP stack will not be nipped down until after the cement job is completed.
6. Skid rig to next well on pad.
7. Confirm well is static before removing cap flange.
8. If well is not static notify BLM and kill well prior to cementing or nipping up for further remediation.
9. Install offline cement tool.
10. Rig up cement equipment.
  - a. Notify BLM prior to cement job.
11. Perform cement job.
12. Confirm well is static and floats are holding after cement job.
13. Remove cement equipment, offline cement tools and install night cap with pressure gauge for monitoring.

**Oxy USA Inc. - Nugget 6\_31 Fed Com 171H**

**4. Pressure Control Equipment**

BOP installed and tested before drilling which hole?	Size?	Min. Required WP	Type	✓	Tested to:
9.875" Hole	13-5/8"	5M	Annular	✓	70% of working pressure
		5M	Blind Ram	✓	250 psi / 5000 psi
			Pipe Ram		
			Double Ram	✓	
Other*					
6.75" Hole	13-5/8"	5M	Annular	✓	70% of working pressure
		5M	Blind Ram	✓	250 psi / 5000 psi
			Pipe Ram		
			Double Ram	✓	
Other*					

\*Specify if additional ram is utilized.

Oxy will utilize a 5M annular with a 10M BOPE stack. The BOP/BOPE will be tested by an independent service company to 250 psi low and the high pressure indicated above per Onshore Order 2 requirements. The System may be upgraded to a higher pressure but still tested to the working pressure listed in the table above. If the system is upgraded all the components installed will be functional and tested.

Pipe rams will be operationally checked each 24 hour period. Blind rams will be operationally checked on each trip out of the hole. These checks will be noted on the daily tour sheets. Other accessories to the BOP equipment will include a Kelly cock and floor safety valve (inside BOP) and choke lines and choke manifold. See attached schematics.

Formation integrity test will be performed per Onshore Order #2. On Exploratory wells or on that portion of any well approved for a 5M BOPE system or greater, a pressure integrity test of each casing shoe shall be performed. Will be tested in accordance with Onshore Oil and Gas Order #2 III.B.1.i.
A variance is requested for the use of a flexible choke line from the BOP to Choke Manifold. See attached for specs and hydrostatic test chart.
<b>Y</b> Are anchors required by manufacturer?
A multibowl or a unionized multibowl wellhead system will be employed. The wellhead and connection to the BOPE will meet all API 6A requirements. The BOP will be tested per Onshore Order #2 after installation on the surface casing which will cover testing requirements for a maximum of 30 days. If any seal subject to test pressure is broken the system must be tested. We will test the flange connection of the wellhead with a test port that is directly in the flange. We are proposing that we will run the wellhead through the rotary prior to cementing surface casing as discussed with the BLM on October 8, 2015.  See attached schematics.

**BOP Break Testing Request**

Oxy requests permission to adjust the BOP break testing requirements as per the agreement reached in the OXY/BLM meeting on September 5, 2019. A separate sundry will be sent prior to spud that reflects the pad based break testing plan.

BOP break test under the following conditions:

- After a full BOP test is conducted
- When skidding to drill an intermediate section where ICP is set into the third Bone Spring or shallower.
- When skidding to drill a production section that does not penetrate into the third Bone Spring or deeper.

If the kill line is broken prior to skid, two tests will be performed.

- 1) Wellhead flange, co-flex hose, kill line connections and upper pipe rams
- 2) Wellhead flange, HCR valve, check valve, upper pipe rams

If the kill line is not broken prior to skid, only one test will be performed.

- 1) Wellhead flange, co-flex hose, check valve, upper pipe rams

**5. Mud Program**

Depth		Type	Weight (ppg)	Viscosity	Water Loss
From (ft)	To (ft)				
0	863	Water-Based Mud	8.6-8.8	40-60	N/C
863	10697	Saturated Brine-Based or Oil-Based Mud	8.0-10.0	35-45	N/C
10697	22248	Water-Based or Oil-Based Mud	9.5-12.0	38-50	N/C

Sufficient mud materials to maintain mud properties and meet minimum lost circulation and weight increase requirements will be kept on location at all times. The following is a general list of products: Barite, Bentonite, Gypsum, Lime, Soda Ash, Caustic Soda, Nut Plug, Cedar Fiber, Cotton Seed Hulls, Drilling Paper, Salt Water Clay, CACL2. Oxy will use a closed mud system.

What will be used to monitor the loss or gain of fluid?	PVT/MD Totco/Visual Monitoring
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**6. Logging and Testing Procedures**

**Oxy USA Inc. - Nugget 6\_31 Fed Com 171H**

<b>Logging, Coring and Testing.</b>	
Yes	Will run GR from TD to surface (horizontal well – vertical portion of hole). Stated logs run will be in the Completion Report and submitted to the BLM.
No	Logs are planned based on well control or offset log information.
No	Drill stem test? If yes, explain
No	Coring? If yes, explain

<b>Additional logs planned</b>	<b>Interval</b>
No	Resistivity
No	Density
No	CBL
Yes	Mud log
No	PEX

**7. Drilling Conditions**

<b>Condition</b>	<b>Specify what type and where?</b>
BH Pressure at deepest TVD	7150 psi
Abnormal Temperature	No
BH Temperature at deepest TVD	172°F

Pump high viscosity sweeps as needed for hole cleaning. The mud system will be monitored visually/manually as well as with an electronic PVT. The necessary mud products for additional weight and fluid loss control will be on location at all times. Appropriately weighted mud will be used to isolate potential gas, oil, and water zones until such time as casing can be cemented into place for zonal isolation.

Hydrogen Sulfide (H2S) monitors will be installed prior to drilling out the surface shoe. If H2S is detected in concentrations greater than 100 ppm, the operator will comply with the provisions of Onshore Oil and Gas Order #6. If Hydrogen Sulfide is encountered, measured values and formations will be provided to the BLM.	
N	H2S is present
Y	H2S Plan attached

**8. Other facets of operation**

	<b>Yes/No</b>
Will the well be drilled with a walking/skidding operation? If yes, describe. <ul style="list-style-type: none"> <li>We plan to drill the two well pad in batch by section: all surface sections, intermediate sections and production sections. The wellhead will be secured with a night cap whenever the rig is not over the well.</li> </ul>	Yes

**Oxy USA Inc. - Nugget 6\_31 Fed Com 171H**

<p>Will more than one drilling rig be used for drilling operations? If yes, describe.</p> <ul style="list-style-type: none"> <li>Oxy requests the option to contract a Surface Rig to drill, set surface casing, and cement for this well. If the timing between rigs is such that Oxy would not be able to preset surface, the Primary Rig will MIRU and drill the well in its entirety per the APD. Please see the attached document for information on the spudder rig.</li> </ul>	<p>Yes</p>
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**Total estimated cuttings volume: 1625.2 bbls.**

Attachments

- Directional Plan
- H2S Contingency Plan
- Flex III Attachments
- Spudder Rig Attachment
- Premium Connection Specs

**9. Company Personnel**

<u>Name</u>	<u>Title</u>	<u>Office Phone</u>	<u>Mobile Phone</u>
Linsay Earle	Drilling Engineer		832-596-5507
Margaret Giltner	Drilling Engineer Supervisor	713-366-5026	210-683-8480
Simon Benavides	Drilling Superintendent	713-522-8652	281-684-6897
Diego Tellez	Drilling Manager	713-350-4602	713-303-4932

# **OXY**

**PRD NM DIRECTIONAL PLANS (NAD 1983)**

**Nugget 6\_31**

**Nugget 6\_31 Fed Com 171H**

**Wellbore #1**

**Plan: Permitting Plan**

## **Standard Planning Report**

**09 December, 2019**

**Oxy Inc.**  
Planning Report

<b>Database:</b>	HOPSPP	<b>Local Co-ordinate Reference:</b>	Well Nugget 6_31 Fed Com 171H
<b>Company:</b>	ENGINEERING DESIGNS	<b>TVD Reference:</b>	RKB=26.5' @ 3497.50ft
<b>Project:</b>	PRD NM DIRECTIONAL PLANS (NAD 1983)	<b>MD Reference:</b>	RKB=26.5' @ 3497.50ft
<b>Site:</b>	Nugget 6_31	<b>North Reference:</b>	Grid
<b>Well:</b>	Nugget 6_31 Fed Com 171H	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	Permitting Plan		

<b>Project</b>	PRD NM DIRECTIONAL PLANS (NAD 1983)		
<b>Map System:</b>	US State Plane 1983	<b>System Datum:</b>	Mean Sea Level
<b>Geo Datum:</b>	North American Datum 1983		
<b>Map Zone:</b>	New Mexico Eastern Zone		Using geodetic scale factor

<b>Site</b>	Nugget 6_31				
<b>Site Position:</b>		<b>Northing:</b>	450,899.01 usft	<b>Latitude:</b>	32° 14' 18.857634 N
<b>From:</b>	Map	<b>Easting:</b>	698,758.94 usft	<b>Longitude:</b>	103° 49' 27.058165 W
<b>Position Uncertainty:</b>	1.00 ft	<b>Slot Radius:</b>	13.200 in	<b>Grid Convergence:</b>	0.27 °

<b>Well</b>	Nugget 6_31 Fed Com 171H					
<b>Well Position</b>	<b>+N/-S</b>	0.00 ft	<b>Northing:</b>	450,899.01 usft	<b>Latitude:</b>	32° 14' 18.857634 N
	<b>+E/-W</b>	0.00 ft	<b>Easting:</b>	698,758.94 usft	<b>Longitude:</b>	103° 49' 27.058165 W
<b>Position Uncertainty</b>		1.00 ft	<b>Wellhead Elevation:</b>		<b>Ground Level:</b>	3,471.00 ft

<b>Wellbore</b>	Wellbore #1				
<b>Magnetics</b>	<b>Model Name</b>	<b>Sample Date</b>	<b>Declination (°)</b>	<b>Dip Angle (°)</b>	<b>Field Strength (nT)</b>
	HDGM_FILE	12/9/2019	6.75	59.90	47,877.30000000

<b>Design</b>	Permitting Plan			
<b>Audit Notes:</b>				
<b>Version:</b>	<b>Phase:</b>	PROTOTYPE	<b>Tie On Depth:</b>	0.00
<b>Vertical Section:</b>	<b>Depth From (TVD) (ft)</b>	<b>+N/-S (ft)</b>	<b>+E/-W (ft)</b>	<b>Direction (°)</b>
	0.00	0.00	0.00	359.67

<b>Plan Survey Tool Program</b>	<b>Date</b>	12/9/2019		
<b>Depth From (ft)</b>	<b>Depth To (ft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Remarks</b>
1	0.00	22,247.80	Permitting Plan (Wellbore #1)	B001Mb_MWD+HRGM OWSG MWD + HRGM

<b>Plan Sections</b>										
<b>Measured Depth (ft)</b>	<b>Inclination (°)</b>	<b>Azimuth (°)</b>	<b>Vertical Depth (ft)</b>	<b>+N/-S (ft)</b>	<b>+E/-W (ft)</b>	<b>Dogleg Rate (°/100ft)</b>	<b>Build Rate (°/100ft)</b>	<b>Turn Rate (°/100ft)</b>	<b>TFO (°)</b>	<b>Target</b>
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
9,018.00	0.00	0.00	9,018.00	0.00	0.00	0.00	0.00	0.00	0.00	
9,518.07	10.00	182.10	9,515.54	-43.51	-1.59	2.00	2.00	0.00	182.10	
10,797.11	10.00	182.10	10,775.14	-265.49	-9.72	0.00	0.00	0.00	0.00	
11,796.49	89.95	359.75	11,447.50	298.20	-16.98	10.00	8.00	17.78	177.62	FTP (Nugget 6_31
22,247.80	89.95	359.75	11,457.50	10,749.40	-61.75	0.00	0.00	0.00	0.00	PBHL (Nugget 6_31

# Oxy Inc.

## Planning Report

<b>Database:</b>	HOPSP	<b>Local Co-ordinate Reference:</b>	Well Nugget 6_31 Fed Com 171H
<b>Company:</b>	ENGINEERING DESIGNS	<b>TVD Reference:</b>	RKB=26.5' @ 3497.50ft
<b>Project:</b>	PRD NM DIRECTIONAL PLANS (NAD 1983)	<b>MD Reference:</b>	RKB=26.5' @ 3497.50ft
<b>Site:</b>	Nugget 6_31	<b>North Reference:</b>	Grid
<b>Well:</b>	Nugget 6_31 Fed Com 171H	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	Permitting Plan		

Planned Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
100.00	0.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00
200.00	0.00	0.00	200.00	0.00	0.00	0.00	0.00	0.00	0.00
300.00	0.00	0.00	300.00	0.00	0.00	0.00	0.00	0.00	0.00
400.00	0.00	0.00	400.00	0.00	0.00	0.00	0.00	0.00	0.00
500.00	0.00	0.00	500.00	0.00	0.00	0.00	0.00	0.00	0.00
600.00	0.00	0.00	600.00	0.00	0.00	0.00	0.00	0.00	0.00
700.00	0.00	0.00	700.00	0.00	0.00	0.00	0.00	0.00	0.00
800.00	0.00	0.00	800.00	0.00	0.00	0.00	0.00	0.00	0.00
900.00	0.00	0.00	900.00	0.00	0.00	0.00	0.00	0.00	0.00
1,000.00	0.00	0.00	1,000.00	0.00	0.00	0.00	0.00	0.00	0.00
1,100.00	0.00	0.00	1,100.00	0.00	0.00	0.00	0.00	0.00	0.00
1,200.00	0.00	0.00	1,200.00	0.00	0.00	0.00	0.00	0.00	0.00
1,300.00	0.00	0.00	1,300.00	0.00	0.00	0.00	0.00	0.00	0.00
1,400.00	0.00	0.00	1,400.00	0.00	0.00	0.00	0.00	0.00	0.00
1,500.00	0.00	0.00	1,500.00	0.00	0.00	0.00	0.00	0.00	0.00
1,600.00	0.00	0.00	1,600.00	0.00	0.00	0.00	0.00	0.00	0.00
1,700.00	0.00	0.00	1,700.00	0.00	0.00	0.00	0.00	0.00	0.00
1,800.00	0.00	0.00	1,800.00	0.00	0.00	0.00	0.00	0.00	0.00
1,900.00	0.00	0.00	1,900.00	0.00	0.00	0.00	0.00	0.00	0.00
2,000.00	0.00	0.00	2,000.00	0.00	0.00	0.00	0.00	0.00	0.00
2,100.00	0.00	0.00	2,100.00	0.00	0.00	0.00	0.00	0.00	0.00
2,200.00	0.00	0.00	2,200.00	0.00	0.00	0.00	0.00	0.00	0.00
2,300.00	0.00	0.00	2,300.00	0.00	0.00	0.00	0.00	0.00	0.00
2,400.00	0.00	0.00	2,400.00	0.00	0.00	0.00	0.00	0.00	0.00
2,500.00	0.00	0.00	2,500.00	0.00	0.00	0.00	0.00	0.00	0.00
2,600.00	0.00	0.00	2,600.00	0.00	0.00	0.00	0.00	0.00	0.00
2,700.00	0.00	0.00	2,700.00	0.00	0.00	0.00	0.00	0.00	0.00
2,800.00	0.00	0.00	2,800.00	0.00	0.00	0.00	0.00	0.00	0.00
2,900.00	0.00	0.00	2,900.00	0.00	0.00	0.00	0.00	0.00	0.00
3,000.00	0.00	0.00	3,000.00	0.00	0.00	0.00	0.00	0.00	0.00
3,100.00	0.00	0.00	3,100.00	0.00	0.00	0.00	0.00	0.00	0.00
3,200.00	0.00	0.00	3,200.00	0.00	0.00	0.00	0.00	0.00	0.00
3,300.00	0.00	0.00	3,300.00	0.00	0.00	0.00	0.00	0.00	0.00
3,400.00	0.00	0.00	3,400.00	0.00	0.00	0.00	0.00	0.00	0.00
3,500.00	0.00	0.00	3,500.00	0.00	0.00	0.00	0.00	0.00	0.00
3,600.00	0.00	0.00	3,600.00	0.00	0.00	0.00	0.00	0.00	0.00
3,700.00	0.00	0.00	3,700.00	0.00	0.00	0.00	0.00	0.00	0.00
3,800.00	0.00	0.00	3,800.00	0.00	0.00	0.00	0.00	0.00	0.00
3,900.00	0.00	0.00	3,900.00	0.00	0.00	0.00	0.00	0.00	0.00
4,000.00	0.00	0.00	4,000.00	0.00	0.00	0.00	0.00	0.00	0.00
4,100.00	0.00	0.00	4,100.00	0.00	0.00	0.00	0.00	0.00	0.00
4,200.00	0.00	0.00	4,200.00	0.00	0.00	0.00	0.00	0.00	0.00
4,300.00	0.00	0.00	4,300.00	0.00	0.00	0.00	0.00	0.00	0.00
4,400.00	0.00	0.00	4,400.00	0.00	0.00	0.00	0.00	0.00	0.00
4,500.00	0.00	0.00	4,500.00	0.00	0.00	0.00	0.00	0.00	0.00
4,600.00	0.00	0.00	4,600.00	0.00	0.00	0.00	0.00	0.00	0.00
4,700.00	0.00	0.00	4,700.00	0.00	0.00	0.00	0.00	0.00	0.00
4,800.00	0.00	0.00	4,800.00	0.00	0.00	0.00	0.00	0.00	0.00
4,900.00	0.00	0.00	4,900.00	0.00	0.00	0.00	0.00	0.00	0.00
5,000.00	0.00	0.00	5,000.00	0.00	0.00	0.00	0.00	0.00	0.00
5,100.00	0.00	0.00	5,100.00	0.00	0.00	0.00	0.00	0.00	0.00
5,200.00	0.00	0.00	5,200.00	0.00	0.00	0.00	0.00	0.00	0.00
5,300.00	0.00	0.00	5,300.00	0.00	0.00	0.00	0.00	0.00	0.00

# Oxy Inc.

## Planning Report

<b>Database:</b>	HOPSPP	<b>Local Co-ordinate Reference:</b>	Well Nugget 6_31 Fed Com 171H
<b>Company:</b>	ENGINEERING DESIGNS	<b>TVD Reference:</b>	RKB=26.5' @ 3497.50ft
<b>Project:</b>	PRD NM DIRECTIONAL PLANS (NAD 1983)	<b>MD Reference:</b>	RKB=26.5' @ 3497.50ft
<b>Site:</b>	Nugget 6_31	<b>North Reference:</b>	Grid
<b>Well:</b>	Nugget 6_31 Fed Com 171H	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	Permitting Plan		

Planned Survey										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	
5,400.00	0.00	0.00	5,400.00	0.00	0.00	0.00	0.00	0.00	0.00	
5,500.00	0.00	0.00	5,500.00	0.00	0.00	0.00	0.00	0.00	0.00	
5,600.00	0.00	0.00	5,600.00	0.00	0.00	0.00	0.00	0.00	0.00	
5,700.00	0.00	0.00	5,700.00	0.00	0.00	0.00	0.00	0.00	0.00	
5,800.00	0.00	0.00	5,800.00	0.00	0.00	0.00	0.00	0.00	0.00	
5,900.00	0.00	0.00	5,900.00	0.00	0.00	0.00	0.00	0.00	0.00	
6,000.00	0.00	0.00	6,000.00	0.00	0.00	0.00	0.00	0.00	0.00	
6,100.00	0.00	0.00	6,100.00	0.00	0.00	0.00	0.00	0.00	0.00	
6,200.00	0.00	0.00	6,200.00	0.00	0.00	0.00	0.00	0.00	0.00	
6,300.00	0.00	0.00	6,300.00	0.00	0.00	0.00	0.00	0.00	0.00	
6,400.00	0.00	0.00	6,400.00	0.00	0.00	0.00	0.00	0.00	0.00	
6,500.00	0.00	0.00	6,500.00	0.00	0.00	0.00	0.00	0.00	0.00	
6,600.00	0.00	0.00	6,600.00	0.00	0.00	0.00	0.00	0.00	0.00	
6,700.00	0.00	0.00	6,700.00	0.00	0.00	0.00	0.00	0.00	0.00	
6,800.00	0.00	0.00	6,800.00	0.00	0.00	0.00	0.00	0.00	0.00	
6,900.00	0.00	0.00	6,900.00	0.00	0.00	0.00	0.00	0.00	0.00	
7,000.00	0.00	0.00	7,000.00	0.00	0.00	0.00	0.00	0.00	0.00	
7,100.00	0.00	0.00	7,100.00	0.00	0.00	0.00	0.00	0.00	0.00	
7,200.00	0.00	0.00	7,200.00	0.00	0.00	0.00	0.00	0.00	0.00	
7,300.00	0.00	0.00	7,300.00	0.00	0.00	0.00	0.00	0.00	0.00	
7,400.00	0.00	0.00	7,400.00	0.00	0.00	0.00	0.00	0.00	0.00	
7,500.00	0.00	0.00	7,500.00	0.00	0.00	0.00	0.00	0.00	0.00	
7,600.00	0.00	0.00	7,600.00	0.00	0.00	0.00	0.00	0.00	0.00	
7,700.00	0.00	0.00	7,700.00	0.00	0.00	0.00	0.00	0.00	0.00	
7,800.00	0.00	0.00	7,800.00	0.00	0.00	0.00	0.00	0.00	0.00	
7,900.00	0.00	0.00	7,900.00	0.00	0.00	0.00	0.00	0.00	0.00	
8,000.00	0.00	0.00	8,000.00	0.00	0.00	0.00	0.00	0.00	0.00	
8,100.00	0.00	0.00	8,100.00	0.00	0.00	0.00	0.00	0.00	0.00	
8,200.00	0.00	0.00	8,200.00	0.00	0.00	0.00	0.00	0.00	0.00	
8,300.00	0.00	0.00	8,300.00	0.00	0.00	0.00	0.00	0.00	0.00	
8,400.00	0.00	0.00	8,400.00	0.00	0.00	0.00	0.00	0.00	0.00	
8,500.00	0.00	0.00	8,500.00	0.00	0.00	0.00	0.00	0.00	0.00	
8,600.00	0.00	0.00	8,600.00	0.00	0.00	0.00	0.00	0.00	0.00	
8,700.00	0.00	0.00	8,700.00	0.00	0.00	0.00	0.00	0.00	0.00	
8,800.00	0.00	0.00	8,800.00	0.00	0.00	0.00	0.00	0.00	0.00	
8,900.00	0.00	0.00	8,900.00	0.00	0.00	0.00	0.00	0.00	0.00	
9,000.00	0.00	0.00	9,000.00	0.00	0.00	0.00	0.00	0.00	0.00	
9,018.00	0.00	0.00	9,018.00	0.00	0.00	0.00	0.00	0.00	0.00	
9,100.00	1.64	182.10	9,099.99	-1.17	-0.04	-1.17	2.00	2.00	0.00	
9,200.00	3.64	182.10	9,199.88	-5.78	-0.21	-5.77	2.00	2.00	0.00	
9,300.00	5.64	182.10	9,299.55	-13.86	-0.51	-13.86	2.00	2.00	0.00	
9,400.00	7.64	182.10	9,398.87	-25.41	-0.93	-25.41	2.00	2.00	0.00	
9,500.00	9.64	182.10	9,497.73	-40.43	-1.48	-40.42	2.00	2.00	0.00	
9,518.07	10.00	182.10	9,515.54	-43.51	-1.59	-43.50	2.00	2.00	0.00	
9,600.00	10.00	182.10	9,596.22	-57.73	-2.11	-57.71	0.00	0.00	0.00	
9,700.00	10.00	182.10	9,694.70	-75.08	-2.75	-75.06	0.00	0.00	0.00	
9,800.00	10.00	182.10	9,793.18	-92.44	-3.39	-92.42	0.00	0.00	0.00	
9,900.00	10.00	182.10	9,891.66	-109.79	-4.02	-109.77	0.00	0.00	0.00	
10,000.00	10.00	182.10	9,990.14	-127.15	-4.66	-127.12	0.00	0.00	0.00	
10,100.00	10.00	182.10	10,088.62	-144.50	-5.29	-144.47	0.00	0.00	0.00	
10,200.00	10.00	182.10	10,187.10	-161.86	-5.93	-161.82	0.00	0.00	0.00	
10,300.00	10.00	182.10	10,285.58	-179.22	-6.56	-179.17	0.00	0.00	0.00	
10,400.00	10.00	182.10	10,384.06	-196.57	-7.20	-196.53	0.00	0.00	0.00	
10,500.00	10.00	182.10	10,482.54	-213.93	-7.83	-213.88	0.00	0.00	0.00	

# Oxy Inc.

## Planning Report

<b>Database:</b>	HOPSPP	<b>Local Co-ordinate Reference:</b>	Well Nugget 6_31 Fed Com 171H
<b>Company:</b>	ENGINEERING DESIGNS	<b>TVD Reference:</b>	RKB=26.5' @ 3497.50ft
<b>Project:</b>	PRD NM DIRECTIONAL PLANS (NAD 1983)	<b>MD Reference:</b>	RKB=26.5' @ 3497.50ft
<b>Site:</b>	Nugget 6_31	<b>North Reference:</b>	Grid
<b>Well:</b>	Nugget 6_31 Fed Com 171H	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	Permitting Plan		

Planned Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
10,600.00	10.00	182.10	10,581.02	-231.28	-8.47	-231.23	0.00	0.00	0.00
10,700.00	10.00	182.10	10,679.50	-248.64	-9.11	-248.58	0.00	0.00	0.00
10,797.11	10.00	182.10	10,775.14	-265.49	-9.72	-265.43	0.00	0.00	0.00
10,800.00	9.71	182.17	10,777.98	-265.99	-9.74	-265.93	10.00	-9.99	2.46
10,900.00	0.51	305.40	10,877.52	-274.18	-10.42	-274.12	10.00	-9.20	123.23
11,000.00	10.30	357.48	10,976.96	-264.96	-11.18	-264.90	10.00	9.80	52.09
11,100.00	20.30	358.64	11,073.30	-238.62	-11.99	-238.55	10.00	10.00	1.16
11,200.00	30.30	359.05	11,163.59	-195.95	-12.82	-195.87	10.00	10.00	0.41
11,300.00	40.30	359.27	11,245.10	-138.24	-13.66	-138.16	10.00	10.00	0.22
11,400.00	50.30	359.41	11,315.35	-67.26	-14.47	-67.18	10.00	10.00	0.14
11,500.00	60.30	359.52	11,372.21	14.84	-15.23	14.93	10.00	10.00	0.11
11,600.00	70.30	359.61	11,413.95	105.57	-15.92	105.66	10.00	10.00	0.09
11,700.00	80.30	359.68	11,439.30	202.17	-16.51	202.26	10.00	10.00	0.08
11,796.49	89.95	359.75	11,447.50	298.20	-16.98	298.29	10.00	10.00	0.07
11,800.00	89.95	359.75	11,447.50	301.71	-17.00	301.80	0.00	0.00	0.00
11,900.00	89.95	359.75	11,447.60	401.71	-17.42	401.80	0.00	0.00	0.00
12,000.00	89.95	359.75	11,447.69	501.71	-17.85	501.80	0.00	0.00	0.00
12,100.00	89.95	359.75	11,447.79	601.71	-18.28	601.80	0.00	0.00	0.00
12,200.00	89.95	359.75	11,447.89	701.70	-18.71	701.80	0.00	0.00	0.00
12,300.00	89.95	359.75	11,447.98	801.70	-19.14	801.80	0.00	0.00	0.00
12,400.00	89.95	359.75	11,448.08	901.70	-19.57	901.80	0.00	0.00	0.00
12,500.00	89.95	359.75	11,448.17	1,001.70	-19.99	1,001.80	0.00	0.00	0.00
12,600.00	89.95	359.75	11,448.27	1,101.70	-20.42	1,101.80	0.00	0.00	0.00
12,700.00	89.95	359.75	11,448.36	1,201.70	-20.85	1,201.80	0.00	0.00	0.00
12,800.00	89.95	359.75	11,448.46	1,301.70	-21.28	1,301.80	0.00	0.00	0.00
12,900.00	89.95	359.75	11,448.56	1,401.70	-21.71	1,401.80	0.00	0.00	0.00
13,000.00	89.95	359.75	11,448.65	1,501.70	-22.14	1,501.80	0.00	0.00	0.00
13,100.00	89.95	359.75	11,448.75	1,601.70	-22.57	1,601.80	0.00	0.00	0.00
13,200.00	89.95	359.75	11,448.84	1,701.70	-22.99	1,701.80	0.00	0.00	0.00
13,300.00	89.95	359.75	11,448.94	1,801.69	-23.42	1,801.80	0.00	0.00	0.00
13,400.00	89.95	359.75	11,449.03	1,901.69	-23.85	1,901.80	0.00	0.00	0.00
13,500.00	89.95	359.75	11,449.13	2,001.69	-24.28	2,001.80	0.00	0.00	0.00
13,600.00	89.95	359.75	11,449.23	2,101.69	-24.71	2,101.80	0.00	0.00	0.00
13,700.00	89.95	359.75	11,449.32	2,201.69	-25.14	2,201.80	0.00	0.00	0.00
13,800.00	89.95	359.75	11,449.42	2,301.69	-25.56	2,301.80	0.00	0.00	0.00
13,900.00	89.95	359.75	11,449.51	2,401.69	-25.99	2,401.80	0.00	0.00	0.00
14,000.00	89.95	359.75	11,449.61	2,501.69	-26.42	2,501.80	0.00	0.00	0.00
14,100.00	89.95	359.75	11,449.70	2,601.69	-26.85	2,601.80	0.00	0.00	0.00
14,200.00	89.95	359.75	11,449.80	2,701.69	-27.28	2,701.80	0.00	0.00	0.00
14,300.00	89.95	359.75	11,449.90	2,801.68	-27.71	2,801.80	0.00	0.00	0.00
14,400.00	89.95	359.75	11,449.99	2,901.68	-28.13	2,901.80	0.00	0.00	0.00
14,500.00	89.95	359.75	11,450.09	3,001.68	-28.56	3,001.80	0.00	0.00	0.00
14,600.00	89.95	359.75	11,450.18	3,101.68	-28.99	3,101.80	0.00	0.00	0.00
14,700.00	89.95	359.75	11,450.28	3,201.68	-29.42	3,201.80	0.00	0.00	0.00
14,800.00	89.95	359.75	11,450.37	3,301.68	-29.85	3,301.80	0.00	0.00	0.00
14,900.00	89.95	359.75	11,450.47	3,401.68	-30.28	3,401.80	0.00	0.00	0.00
15,000.00	89.95	359.75	11,450.57	3,501.68	-30.70	3,501.80	0.00	0.00	0.00
15,100.00	89.95	359.75	11,450.66	3,601.68	-31.13	3,601.80	0.00	0.00	0.00
15,200.00	89.95	359.75	11,450.76	3,701.68	-31.56	3,701.80	0.00	0.00	0.00
15,300.00	89.95	359.75	11,450.85	3,801.68	-31.99	3,801.80	0.00	0.00	0.00
15,400.00	89.95	359.75	11,450.95	3,901.67	-32.42	3,901.80	0.00	0.00	0.00
15,500.00	89.95	359.75	11,451.04	4,001.67	-32.85	4,001.80	0.00	0.00	0.00
15,600.00	89.95	359.75	11,451.14	4,101.67	-33.28	4,101.80	0.00	0.00	0.00
15,700.00	89.95	359.75	11,451.24	4,201.67	-33.70	4,201.80	0.00	0.00	0.00

# Oxy Inc.

## Planning Report

<b>Database:</b>	HOPSPP	<b>Local Co-ordinate Reference:</b>	Well Nugget 6_31 Fed Com 171H
<b>Company:</b>	ENGINEERING DESIGNS	<b>TVD Reference:</b>	RKB=26.5' @ 3497.50ft
<b>Project:</b>	PRD NM DIRECTIONAL PLANS (NAD 1983)	<b>MD Reference:</b>	RKB=26.5' @ 3497.50ft
<b>Site:</b>	Nugget 6_31	<b>North Reference:</b>	Grid
<b>Well:</b>	Nugget 6_31 Fed Com 171H	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	Permitting Plan		

Planned Survey										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	
15,800.00	89.95	359.75	11,451.33	4,301.67	-34.13	4,301.80	0.00	0.00	0.00	
15,900.00	89.95	359.75	11,451.43	4,401.67	-34.56	4,401.80	0.00	0.00	0.00	
16,000.00	89.95	359.75	11,451.52	4,501.67	-34.99	4,501.80	0.00	0.00	0.00	
16,100.00	89.95	359.75	11,451.62	4,601.67	-35.42	4,601.79	0.00	0.00	0.00	
16,200.00	89.95	359.75	11,451.71	4,701.67	-35.85	4,701.79	0.00	0.00	0.00	
16,300.00	89.95	359.75	11,451.81	4,801.67	-36.27	4,801.79	0.00	0.00	0.00	
16,400.00	89.95	359.75	11,451.90	4,901.66	-36.70	4,901.79	0.00	0.00	0.00	
16,500.00	89.95	359.75	11,452.00	5,001.66	-37.13	5,001.79	0.00	0.00	0.00	
16,600.00	89.95	359.75	11,452.10	5,101.66	-37.56	5,101.79	0.00	0.00	0.00	
16,700.00	89.95	359.75	11,452.19	5,201.66	-37.99	5,201.79	0.00	0.00	0.00	
16,800.00	89.95	359.75	11,452.29	5,301.66	-38.42	5,301.79	0.00	0.00	0.00	
16,900.00	89.95	359.75	11,452.38	5,401.66	-38.84	5,401.79	0.00	0.00	0.00	
17,000.00	89.95	359.75	11,452.48	5,501.66	-39.27	5,501.79	0.00	0.00	0.00	
17,100.00	89.95	359.75	11,452.57	5,601.66	-39.70	5,601.79	0.00	0.00	0.00	
17,200.00	89.95	359.75	11,452.67	5,701.66	-40.13	5,701.79	0.00	0.00	0.00	
17,300.00	89.95	359.75	11,452.77	5,801.66	-40.56	5,801.79	0.00	0.00	0.00	
17,400.00	89.95	359.75	11,452.86	5,901.65	-40.99	5,901.79	0.00	0.00	0.00	
17,500.00	89.95	359.75	11,452.96	6,001.65	-41.41	6,001.79	0.00	0.00	0.00	
17,600.00	89.95	359.75	11,453.05	6,101.65	-41.84	6,101.79	0.00	0.00	0.00	
17,700.00	89.95	359.75	11,453.15	6,201.65	-42.27	6,201.79	0.00	0.00	0.00	
17,800.00	89.95	359.75	11,453.24	6,301.65	-42.70	6,301.79	0.00	0.00	0.00	
17,900.00	89.95	359.75	11,453.34	6,401.65	-43.13	6,401.79	0.00	0.00	0.00	
18,000.00	89.95	359.75	11,453.44	6,501.65	-43.56	6,501.79	0.00	0.00	0.00	
18,100.00	89.95	359.75	11,453.53	6,601.65	-43.99	6,601.79	0.00	0.00	0.00	
18,200.00	89.95	359.75	11,453.63	6,701.65	-44.41	6,701.79	0.00	0.00	0.00	
18,300.00	89.95	359.75	11,453.72	6,801.65	-44.84	6,801.79	0.00	0.00	0.00	
18,400.00	89.95	359.75	11,453.82	6,901.65	-45.27	6,901.79	0.00	0.00	0.00	
18,500.00	89.95	359.75	11,453.91	7,001.64	-45.70	7,001.79	0.00	0.00	0.00	
18,600.00	89.95	359.75	11,454.01	7,101.64	-46.13	7,101.79	0.00	0.00	0.00	
18,700.00	89.95	359.75	11,454.11	7,201.64	-46.56	7,201.79	0.00	0.00	0.00	
18,800.00	89.95	359.75	11,454.20	7,301.64	-46.98	7,301.79	0.00	0.00	0.00	
18,900.00	89.95	359.75	11,454.30	7,401.64	-47.41	7,401.79	0.00	0.00	0.00	
19,000.00	89.95	359.75	11,454.39	7,501.64	-47.84	7,501.79	0.00	0.00	0.00	
19,100.00	89.95	359.75	11,454.49	7,601.64	-48.27	7,601.79	0.00	0.00	0.00	
19,200.00	89.95	359.75	11,454.58	7,701.64	-48.70	7,701.79	0.00	0.00	0.00	
19,300.00	89.95	359.75	11,454.68	7,801.64	-49.13	7,801.79	0.00	0.00	0.00	
19,400.00	89.95	359.75	11,454.78	7,901.64	-49.55	7,901.79	0.00	0.00	0.00	
19,500.00	89.95	359.75	11,454.87	8,001.63	-49.98	8,001.79	0.00	0.00	0.00	
19,600.00	89.95	359.75	11,454.97	8,101.63	-50.41	8,101.79	0.00	0.00	0.00	
19,700.00	89.95	359.75	11,455.06	8,201.63	-50.84	8,201.79	0.00	0.00	0.00	
19,800.00	89.95	359.75	11,455.16	8,301.63	-51.27	8,301.79	0.00	0.00	0.00	
19,900.00	89.95	359.75	11,455.25	8,401.63	-51.70	8,401.79	0.00	0.00	0.00	
20,000.00	89.95	359.75	11,455.35	8,501.63	-52.12	8,501.79	0.00	0.00	0.00	
20,100.00	89.95	359.75	11,455.45	8,601.63	-52.55	8,601.79	0.00	0.00	0.00	
20,200.00	89.95	359.75	11,455.54	8,701.63	-52.98	8,701.79	0.00	0.00	0.00	
20,300.00	89.95	359.75	11,455.64	8,801.63	-53.41	8,801.79	0.00	0.00	0.00	
20,400.00	89.95	359.75	11,455.73	8,901.63	-53.84	8,901.79	0.00	0.00	0.00	
20,500.00	89.95	359.75	11,455.83	9,001.63	-54.27	9,001.79	0.00	0.00	0.00	
20,600.00	89.95	359.75	11,455.92	9,101.62	-54.69	9,101.79	0.00	0.00	0.00	
20,700.00	89.95	359.75	11,456.02	9,201.62	-55.12	9,201.79	0.00	0.00	0.00	
20,800.00	89.95	359.75	11,456.11	9,301.62	-55.55	9,301.79	0.00	0.00	0.00	
20,900.00	89.95	359.75	11,456.21	9,401.62	-55.98	9,401.79	0.00	0.00	0.00	
21,000.00	89.95	359.75	11,456.31	9,501.62	-56.41	9,501.79	0.00	0.00	0.00	
21,100.00	89.95	359.75	11,456.40	9,601.62	-56.84	9,601.79	0.00	0.00	0.00	

**Oxy Inc.**  
Planning Report

<b>Database:</b>	HOPSP	<b>Local Co-ordinate Reference:</b>	Well Nugget 6_31 Fed Com 171H
<b>Company:</b>	ENGINEERING DESIGNS	<b>TVD Reference:</b>	RKB=26.5' @ 3497.50ft
<b>Project:</b>	PRD NM DIRECTIONAL PLANS (NAD 1983)	<b>MD Reference:</b>	RKB=26.5' @ 3497.50ft
<b>Site:</b>	Nugget 6_31	<b>North Reference:</b>	Grid
<b>Well:</b>	Nugget 6_31 Fed Com 171H	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	Permitting Plan		

Planned Survey										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	
21,200.00	89.95	359.75	11,456.50	9,701.62	-57.27	9,701.79	0.00	0.00	0.00	
21,300.00	89.95	359.75	11,456.59	9,801.62	-57.69	9,801.79	0.00	0.00	0.00	
21,400.00	89.95	359.75	11,456.69	9,901.62	-58.12	9,901.79	0.00	0.00	0.00	
21,500.00	89.95	359.75	11,456.78	10,001.62	-58.55	10,001.79	0.00	0.00	0.00	
21,600.00	89.95	359.75	11,456.88	10,101.61	-58.98	10,101.79	0.00	0.00	0.00	
21,700.00	89.95	359.75	11,456.98	10,201.61	-59.41	10,201.79	0.00	0.00	0.00	
21,800.00	89.95	359.75	11,457.07	10,301.61	-59.84	10,301.79	0.00	0.00	0.00	
21,900.00	89.95	359.75	11,457.17	10,401.61	-60.26	10,401.79	0.00	0.00	0.00	
22,000.00	89.95	359.75	11,457.26	10,501.61	-60.69	10,501.79	0.00	0.00	0.00	
22,100.00	89.95	359.75	11,457.36	10,601.61	-61.12	10,601.79	0.00	0.00	0.00	
22,200.00	89.95	359.75	11,457.45	10,701.61	-61.55	10,701.79	0.00	0.00	0.00	
22,247.80	89.95	359.75	11,457.50	10,749.40	-61.75	10,749.58	0.00	0.00	0.00	

Design Targets										
Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (usft)	Easting (usft)	Latitude	Longitude	
FTP (Nugget 6_31 Fed - plan hits target center - Point	0.00	0.00	11,447.50	298.20	-16.98	451,197.19	698,741.96	32° 14' 21.809115 N	103° 49' 27.239409	
PBHL (Nugget 6_31 - plan hits target center - Point	0.00	0.00	11,457.50	10,749.40	-61.75	461,647.72	698,697.19	32° 16' 5.225758 N	103° 49' 27.183658	

Plan Annotations					
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment	
		+N/-S (ft)	+E/-W (ft)		
9,018.00	9,018.00	0.00	0.00	Build 2°/100'	
9,518.07	9,515.54	-43.51	-1.59	Hold 10° Tangent	
10,797.11	10,775.14	-265.49	-9.72	KOP, Build & Turn 10°/100'	
11,796.49	11,447.50	298.20	-16.98	Landing Point	
22,247.80	11,457.50	10,749.40	-61.75	TD at 22247.80' MD	



Project: PRD NM DIRECTIONAL PLANS (NAD 1983)  
 Site: Nugget 6\_31  
 Well: Nugget 6\_31 Fed Com 171H  
 Wellbore: Wellbore #1  
 Design: Permitting Plan

PROJECT DETAILS: NM DIRECTIONAL PLANS (NAD 1983)

Geodetic System: US State Plane 1983  
 Datum: North American Datum 1983  
 Ellipsoid: GRS 1980  
 Zone: New Mexico Eastern Zone

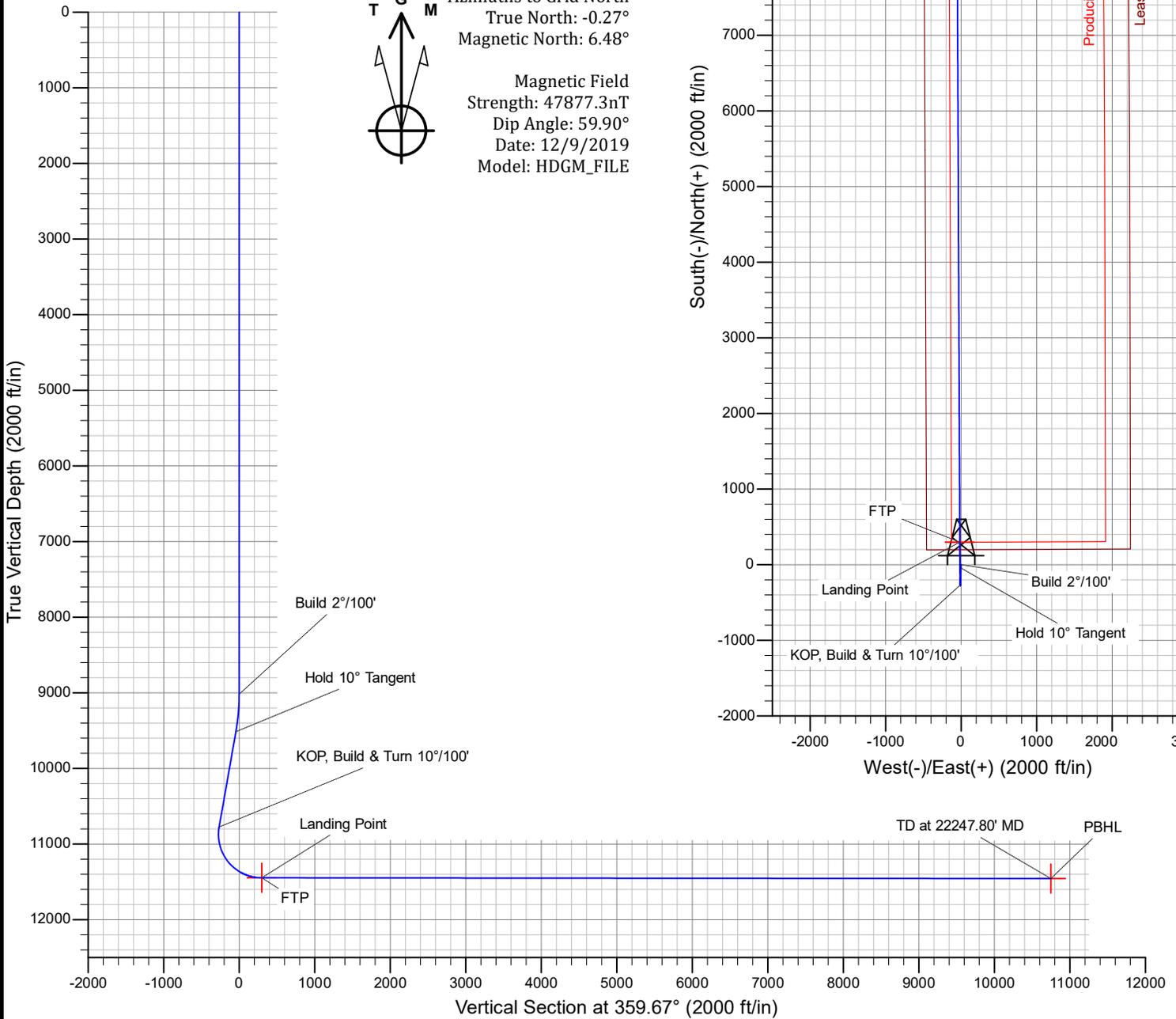
System Datum: Mean Sea Level

WELL DETAILS: Nugget 6\_31 Fed Com 171H

			3471.00						
+N/-S	+E/-W	Northing	Easting	Latitude	Longitude				
0.00	0.00	450899.01	698758.94	32° 14' 18.857634 N	103° 49' 27.058165 W				

SECTION DETAILS

MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSect	Annotation
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
9018.00	0.00	0.00	9018.00	0.00	0.00	0.00	0.00	0.00	Build 2°/100'
9518.07	10.00	182.10	9515.54	-43.51	-1.59	2.00	182.10	-43.50	Hold 10° Tangent
10797.11	10.00	182.10	10775.14	-265.49	-9.72	0.00	0.00	-265.43	KOP, Build & Turn 10°/100'
11796.49	89.95	359.75	11447.50	298.20	-16.98	10.00	177.62	298.29	Landing Point
22247.80	89.95	359.75	11457.50	10749.40	-61.75	0.00	0.00	10749.58	TD at 22247.80' MD



## PECOS DISTRICT DRILLING CONDITIONS OF APPROVAL

<b>OPERATOR'S NAME:</b>	<b>OXY USA Incorporated</b>
<b>LEASE NO.:</b>	<b>NMNM057273</b>
<b>LOCATION:</b>	Section 7, T.24 S., R.31 E., NMPM
<b>COUNTY:</b>	Eddy County, New Mexico

<b>WELL NAME &amp; NO.:</b>	Nugget 6 31 Fed Com 171H
<b>SURFACE HOLE FOOTAGE:</b>	198'/N & 456'/W
<b>BOTTOM HOLE FOOTAGE:</b>	20'/N & 440'/W

<b>WELL NAME &amp; NO.:</b>	Nugget 6 31 Fed Com 172H
<b>SURFACE HOLE FOOTAGE:</b>	198'/N & 491'/W
<b>BOTTOM HOLE FOOTAGE:</b>	20'/N & 1260'/W

<b>WELL NAME &amp; NO.:</b>	Nugget 6 31 Fed Com 173H
<b>SURFACE HOLE FOOTAGE:</b>	620'/N & 1994'/W
<b>BOTTOM HOLE FOOTAGE:</b>	20'/N & 2200'/W

<b>WELL NAME &amp; NO.:</b>	Nugget 6 31 Fed Com 174H
<b>SURFACE HOLE FOOTAGE:</b>	620'/N & 2029'/W
<b>BOTTOM HOLE FOOTAGE:</b>	20'/N & 2200'/E

<b>WELL NAME &amp; NO.:</b>	Nugget 6 31 Fed Com 175H
<b>SURFACE HOLE FOOTAGE:</b>	1089'/S & 300'/E
<b>BOTTOM HOLE FOOTAGE:</b>	20'/N & 1260'/E

COA

H2S	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	
Potash	<input type="checkbox"/> None	<input checked="" type="checkbox"/> Secretary	<input type="checkbox"/> R-111-P
Cave/Karst Potential	<input checked="" type="checkbox"/> Low	<input type="checkbox"/> Medium	<input type="checkbox"/> High
Cave/Karst Potential	<input type="checkbox"/> Critical		
Variance	<input type="checkbox"/> None	<input checked="" type="checkbox"/> Flex Hose	<input type="checkbox"/> Other
Wellhead	<input type="checkbox"/> Conventional	<input type="checkbox"/> Multibowl	<input checked="" type="checkbox"/> Both
Other	<input type="checkbox"/> 4 String Area	<input type="checkbox"/> Capitan Reef	<input type="checkbox"/> WIPP
Other	<input checked="" type="checkbox"/> Fluid Filled	<input checked="" type="checkbox"/> Cement Squeeze	<input type="checkbox"/> Pilot Hole
Special Requirements	<input type="checkbox"/> Water Disposal	<input checked="" type="checkbox"/> COM	<input type="checkbox"/> Unit

## A. HYDROGEN SULFIDE

Hydrogen Sulfide (H<sub>2</sub>S) monitors shall be installed prior to drilling out the surface shoe. If H<sub>2</sub>S is detected in concentrations greater than 100 ppm, the Hydrogen Sulfide area shall meet Onshore Order 6 requirements, which includes equipment and personnel/public protection items. If Hydrogen Sulfide is encountered, provide measured values and formations to the BLM.

## B. CASING

1. The **10-3/4** inch surface casing shall be set at approximately **897 feet** (a minimum of **70 feet (Eddy County)** into the Rustler Anhydrite and above the salt) and cemented to the surface.
  - a. If cement does not circulate to the surface, the appropriate BLM office shall be notified and a temperature survey utilizing an electronic type temperature survey with surface log readout will be used or a cement bond log shall be run to verify the top of the cement. Temperature survey will be run a minimum of six hours after pumping cement and ideally between 8-10 hours after completing the cement job.
  - b. Wait on cement (WOC) time for a primary cement job will be a minimum of **24 hours in the Potash Area** or 500 pounds compressive strength, whichever is greater. (This is to include the lead cement)
  - c. Wait on cement (WOC) time for a remedial job will be a minimum of 4 hours after bringing cement to surface or 500 pounds compressive strength, whichever is greater.
  - d. If cement falls back, remedial cementing will be done prior to drilling out that string.

**Intermediate casing must be kept fluid filled to meet BLM minimum collapse requirement.**

2. The minimum required fill of cement behind the **7-5/8** inch intermediate casing is:

### **Option 1 (Single Stage):**

- Cement to surface. If cement does not circulate see B.1.a, c-d above.  
**Wait on cement (WOC) time for a primary cement job is to include the lead cement slurry due to cave/karst or potash.**  
**Cement excess is less than 25%, more cement might be required.**

**Option 2:**

Operator has proposed a DV tool, the depth may be adjusted as long as the cement is changed proportionally. The DV tool may be cancelled if cement circulates to surface on the first stage.

- a. First stage to DV tool: Cement to circulate. If cement does not circulate off the DV tool, contact the appropriate BLM office before proceeding with second stage cement job.
- b. Second stage above DV tool:
  - Cement to surface. If cement does not circulate, contact the appropriate BLM office.  
**Wait on cement (WOC) time for a primary cement job is to include the lead cement slurry due to cave/karst or potash.  
Cement excess is less than 25%, more cement might be required.**

❖ In Secretary Potash Areas if cement does not circulate to surface on the first two casing strings, the cement on the 3rd casing string must come to surface.

**Operator has proposed to pump down 10-3/4" X 7-5/8" annulus. Operator must run a CBL or ECHO-METRER from TD of the 7-5/8" casing to surface. Submit results to BLM.**

3. The minimum required fill of cement behind the 5-1/2 inch production casing is:

**Option 1 (Single Stage):**

- Cement should tie-back at least **500 feet** into previous casing string. Operator shall provide method of verification.  
**Cement excess is less than 25%, more cement might be required.**

**Option 2:**

Operator has proposed a DV tool, the depth may be adjusted as long as the cement is changed proportionally. The DV tool may be cancelled if cement circulates to surface on the first stage.

- a. First stage to DV tool: Cement to circulate. If cement does not circulate off the DV tool, contact the appropriate BLM office before proceeding with second stage cement job.
- b. Second stage above DV tool:

- Cement should tie-back at least **500 feet** into previous casing string. Operator shall provide method of verification.  
**Cement excess is less than 25%, more cement might be required.**

### **C. PRESSURE CONTROL**

1. Variance approved to use flex line from BOP to choke manifold. Manufacturer's specification to be readily available. No external damage to flex line. Flex line to be installed as straight as possible (no hard bends).'
- 2.

#### **Option 1:**

- a. Minimum working pressure of the blowout preventer (BOP) and related equipment (BOPE) required for drilling below the surface casing shoe shall be **5000 (5M)** psi.
- b. Minimum working pressure of the blowout preventer (BOP) and related equipment (BOPE) required for drilling below the intermediate casing shoe shall be **5000 (5M)** psi.

#### **Option 2:**

1. Operator has proposed a multi-bowl wellhead assembly. This assembly will only be tested when installed on the surface casing. Minimum working pressure of the blowout preventer (BOP) and related equipment (BOPE) required for drilling below the surface casing shoe shall be **5000 (5M)** psi.
  - a. Wellhead shall be installed by manufacturer's representatives, submit documentation with subsequent sundry.
  - b. If the welding is performed by a third party, the manufacturer's representative shall monitor the temperature to verify that it does not exceed the maximum temperature of the seal.
  - c. Manufacturer representative shall install the test plug for the initial BOP test.
  - d. If the cement does not circulate and one inch operations would have been possible with a standard wellhead, the well head shall be cut off, cementing operations performed and another wellhead installed.
  - e. Whenever any seal subject to test pressure is broken, all the tests in OOGO2.III.A.2.i must be followed.

## **D. SPECIAL REQUIREMENT (S)**

### **Communitization Agreement**

- The operator will submit a Communitization Agreement to the Santa Fe Office, 301 Dinosaur Trail Santa Fe, New Mexico 87508, at least 90 days before the anticipated date of first production from a well subject to a spacing order issued by the New Mexico Oil Conservation Division. The Communitization Agreement will include the signatures of all working interest owners in all Federal and Indian leases subject to the Communitization Agreement (i.e., operating rights owners and lessees of record), or certification that the operator has obtained the written signatures of all such owners and will make those signatures available to the BLM immediately upon request.
- If the operator does not comply with this condition of approval, the BLM may take enforcement actions that include, but are not limited to, those specified in 43 CFR 3163.1.
- In addition, the well sign shall include the surface and bottom hole lease numbers. When the Communitization Agreement number is known, it shall also be on the sign.

### **Offline Cementing**

Contact the BLM prior to the commencement of any offline cementing procedure.

## GENERAL REQUIREMENTS

The BLM is to be notified in advance for a representative to witness:

- a. Spudding well (minimum of 24 hours)
- b. Setting and/or Cementing of all casing strings (minimum of 4 hours)
- c. BOPE tests (minimum of 4 hours)

Eddy County

Call the Carlsbad Field Office, 620 East Greene St., Carlsbad, NM 88220,  
(575) 361-2822

Lea County

Call the Hobbs Field Station, 414 West Taylor, Hobbs NM 88240, (575)  
393-3612

1. Unless the production casing has been run and cemented or the well has been properly plugged, the drilling rig shall not be removed from over the hole without prior approval.
  - a. In the event the operator has proposed to drill multiple wells utilizing a skid/walking rig. Operator shall secure the wellbore on the current well, after installing and testing the wellhead, by installing a blind flange of like pressure rating to the wellhead and a pressure gauge that can be monitored while drilling is performed on the other well(s).
  - b. When the operator proposes to set surface casing with Spudder Rig
    - Notify the BLM when moving in and removing the Spudder Rig.
    - Notify the BLM when moving in the 2<sup>nd</sup> Rig. Rig to be moved in within 90 days of notification that Spudder Rig has left the location.
    - BOP/BOPE test to be conducted per Onshore Oil and Gas Order No. 2 as soon as 2nd Rig is rigged up on well.
2. Floor controls are required for 3M or Greater systems. These controls will be on the rig floor, unobstructed, readily accessible to the driller and will be operational at all times during drilling and/or completion activities. Rig floor is defined as the area immediately around the rotary table; the area immediately above the substructure on which the draw works are located, this does not include the dog house or stairway area.
3. The record of the drilling rate along with the GR/N well log run from TD to surface (horizontal well – vertical portion of hole) shall be submitted to the BLM office as well as all other logs run on the borehole 30 days from completion. If available, a digital copy of the logs is to be submitted in addition to the paper copies. The Rustler top and top and bottom of Salt are to be recorded on the Completion Report.

A. CASING

1. Changes to the approved APD casing program need prior approval if the items substituted are of lesser grade or different casing size or are Non-API. The Operator can exchange the components of the proposal with that of superior strength (i.e. changing from J-55 to N-80, or from 36# to 40#). Changes to the approved cement program need prior approval if the altered cement plan has less volume or strength or if the changes are substantial (i.e. Multistage tool, ECP, etc.). The initial wellhead installed on the well will remain on the well with spools used as needed.
2. Wait on cement (WOC) for Potash Areas: After cementing but before commencing any tests, the casing string shall stand cemented under pressure until both of the following conditions have been met: 1) cement reaches a minimum compressive strength of 500 psi for all cement blends, 2) until cement has been in place at least 24 hours. WOC time will be recorded in the driller's log. The casing integrity test can be done (prior to the cement setting up) immediately after bumping the plug.
3. Wait on cement (WOC) for Water Basin: After cementing but before commencing any tests, the casing string shall stand cemented under pressure until both of the following conditions have been met: 1) cement reaches a minimum compressive strength of 500 psi at the shoe, 2) until cement has been in place at least 8 hours. WOC time will be recorded in the driller's log. See individual casing strings for details regarding lead cement slurry requirements. The casing integrity test can be done (prior to the cement setting up) immediately after bumping the plug.
4. Provide compressive strengths including hours to reach required 500 pounds compressive strength prior to cementing each casing string. Have well specific cement details onsite prior to pumping the cement for each casing string.
5. No pea gravel permitted for remedial or fall back remedial without prior authorization from the BLM engineer.
6. On that portion of any well approved for a 5M BOPE system or greater, a pressure integrity test of each casing shoe shall be performed. Formation at the shoe shall be tested to a minimum of the mud weight equivalent anticipated to control the formation pressure to the next casing depth or at total depth of the well. This test shall be performed before drilling more than 20 feet of new hole.
7. If hardband drill pipe is rotated inside casing, returns will be monitored for metal. If metal is found in samples, drill pipe will be pulled and rubber protectors which have a larger diameter than the tool joints of the drill pipe will be installed prior to continuing drilling operations.
8. Whenever a casing string is cemented in the R-111-P potash area, the NMOCD requirements shall be followed.

B. PRESSURE CONTROL

1. All blowout preventer (BOP) and related equipment (BOPE) shall comply with well control requirements as described in Onshore Oil and Gas Order No. 2 and API RP 53 Sec. 17.
2. If a variance is approved for a flexible hose to be installed from the BOP to the choke manifold, the following requirements apply: The flex line must meet the requirements of API 16C. Check condition of flexible line from BOP to choke manifold, replace if exterior is damaged or if line fails test. Line to be as straight as possible with no hard bends and is to be anchored according to Manufacturer's requirements. The flexible hose can be exchanged with a hose of equal size and equal or greater pressure rating. Anchor requirements, specification sheet and hydrostatic pressure test certification matching the hose in service, to be onsite for review. These documents shall be posted in the company man's trailer and on the rig floor.
3. 5M or higher system requires an HCR valve, remote kill line and annular to match. The remote kill line is to be installed prior to testing the system and tested to stack pressure.
4. If the operator has proposed a multi-bowl wellhead assembly in the APD. The following requirements must be met:
  - a. Wellhead shall be installed by manufacturer's representatives, submit documentation with subsequent sundry.
  - b. If the welding is performed by a third party, the manufacturer's representative shall monitor the temperature to verify that it does not exceed the maximum temperature of the seal.
  - c. Manufacturer representative shall install the test plug for the initial BOP test.
  - d. Whenever any seal subject to test pressure is broken, all the tests in OOGO2.III.A.2.i must be followed.
  - e. If the cement does not circulate and one inch operations would have been possible with a standard wellhead, the well head shall be cut off, cementing operations performed and another wellhead installed.
5. The appropriate BLM office shall be notified a minimum of 4 hours in advance for a representative to witness the tests.
  - a. In a water basin, for all casing strings utilizing slips, these are to be set as soon as the crew and rig are ready and any fallback cement remediation has been done. The casing cut-off and BOP installation can be initiated four hours after installing the slips, which will be approximately six hours after bumping the plug. For those casing strings not using slips, the minimum wait time before cut-off is eight hours after bumping the plug. BOP/BOPE testing can begin after cut-off or once cement reaches 500 psi compressive strength (including lead when specified), whichever is greater. However, if the float does not

hold, cut-off cannot be initiated until cement reaches 500 psi compressive strength (including lead when specified).

- b. In potash areas, for all casing strings utilizing slips, these are to be set as soon as the crew and rig are ready and any fallback cement remediation has been done. For all casing strings, casing cut-off and BOP installation can be initiated at twelve hours after bumping the plug. However, **no tests** shall commence until the cement has had a minimum of 24 hours setup time, except the casing pressure test can be initiated immediately after bumping the plug (only applies to single stage cement jobs).
- c. The tests shall be done by an independent service company utilizing a test plug not a cup or J-packer. The operator also has the option of utilizing an independent tester to test without a plug (i.e. against the casing) pursuant to Onshore Order 2 with the pressure not to exceed 70% of the burst rating for the casing. Any test against the casing must meet the WOC time for water basin (8 hours) or potash (24 hours) or 500 pounds compressive strength, whichever is greater, prior to initiating the test (see casing segment as lead cement may be critical item).
- d. The test shall be run on a 5000 psi chart for a 2-3M BOP/BOP, on a 10000 psi chart for a 5M BOP/BOPE and on a 15000 psi chart for a 10M BOP/BOPE. If a linear chart is used, it shall be a one hour chart. A circular chart shall have a maximum 2 hour clock. If a twelve hour or twenty-four hour chart is used, tester shall make a notation that it is run with a two hour clock.
- e. The results of the test shall be reported to the appropriate BLM office.
- f. All tests are required to be recorded on a calibrated test chart. A copy of the BOP/BOPE test chart and a copy of independent service company test will be submitted to the appropriate BLM office.
- g. The BOP/BOPE test shall include a low pressure test from 250 to 300 psi. The test will be held for a minimum of 10 minutes if test is done with a test plug and 30 minutes without a test plug. This test shall be performed prior to the test at full stack pressure.
- h. BOP/BOPE must be tested by an independent service company within 500 feet of the top of the Wolfcamp formation if the time between the setting of the intermediate casing and reaching this depth exceeds 20 days. This test does not exclude the test prior to drilling out the casing shoe as per Onshore Order No. 2.

C. DRILLING MUD

Mud system monitoring equipment, with derrick floor indicators and visual and audio alarms, shall be operating before drilling into the Wolfcamp formation, and shall be used until production casing is run and cemented.

**D. WASTE MATERIAL AND FLUIDS**

All waste (i.e. drilling fluids, trash, salts, chemicals, sewage, gray water, etc.) created as a result of drilling operations and completion operations shall be safely contained and disposed of properly at a waste disposal facility. No waste material or fluid shall be disposed of on the well location or surrounding area.

Porto-johns and trash containers will be on-location during fracturing operations or any other crew-intensive operations.



## **Permian Drilling Hydrogen Sulfide Drilling Operations Plan NUGGET 6\_31 FED COM 171H**

Open drill site. No homes or buildings are near the proposed location.

### 1. Escape

Personnel shall escape upwind of wellbore in the event of an emergency gas release. Escape can take place through the lease road on the Southeast side of the location. Personnel need to move to a safe distance and block the entrance to location. If the primary route is not an option due to the wind direction, then a secondary egress route should be taken.

▲ H2S Detectors. At least three detectors will be installed: bell nipple, rig floor and Shakers.

● Briefing Areas. At least two briefing areas will be placed, 90 deg off.

■ Wind direction indicators. Visible from rig floor and from the mud pits area.

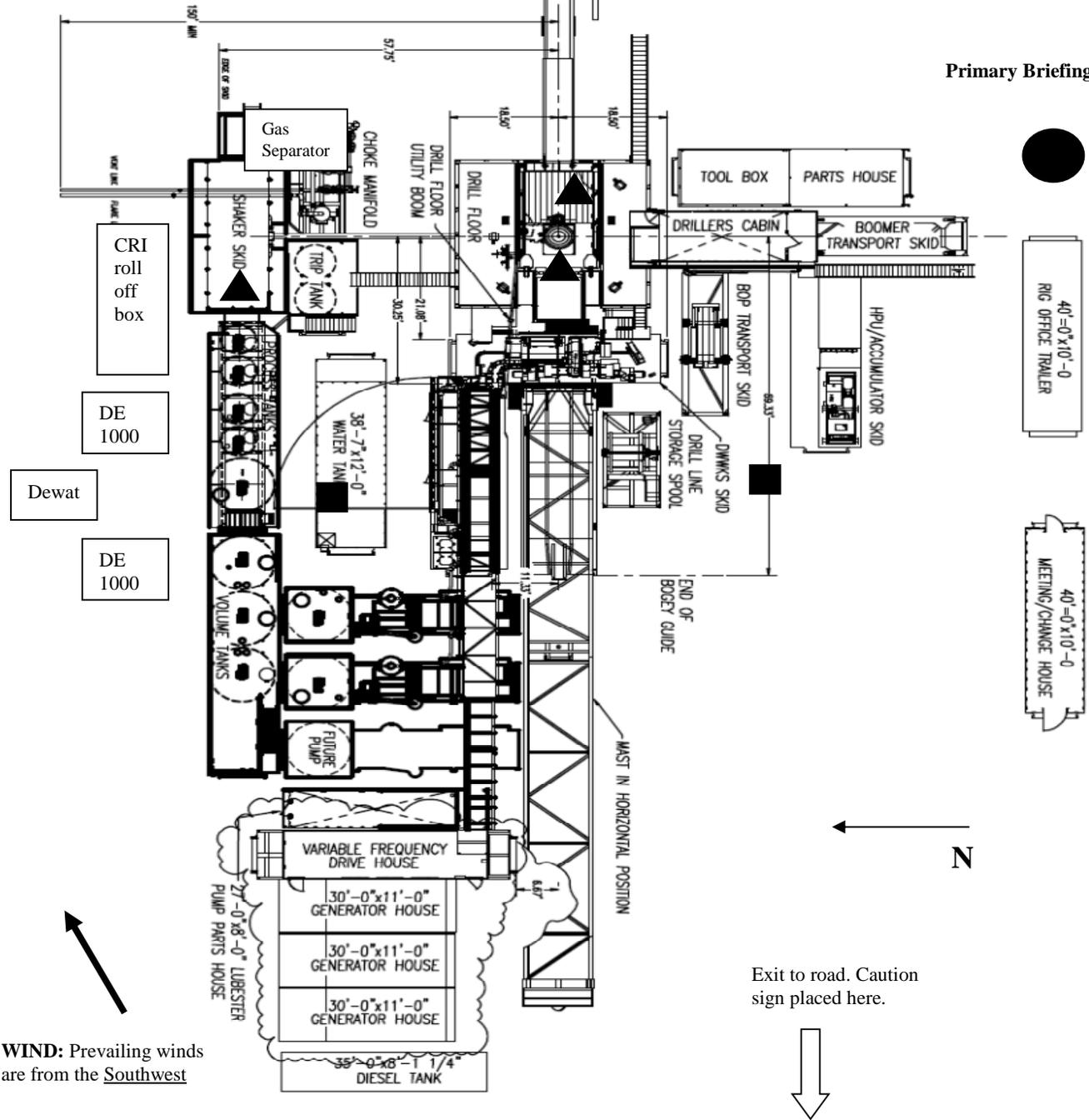
A gas buster is connected to both the choke manifold and flowline outlets.

Secondary Briefing Area

Secondary Egress

Primary Briefing Area

WIND: Prevailing winds are from the Southwest





# **Permian Drilling Hydrogen Sulfide Drilling Operations Plan New Mexico**

## **Scope**

This contingency plan establishes guidelines for the public, all company employees, and contract employees who's work activities may involve exposure to hydrogen sulfide (H<sub>2</sub>S) gas.

While drilling this well, it is possible to encounter H<sub>2</sub>S bearing formations. At all times, the first barrier to control H<sub>2</sub>S emissions will be the drilling fluid, which will have a density high enough to control influx.

## **Objective**

1. Provide an immediate and predetermined response plan to any condition when H<sub>2</sub>S is detected. All H<sub>2</sub>S detections in excess of 10 parts per million (ppm) concentration are considered an Emergency.
2. Prevent any and all accidents, and prevent the uncontrolled release of hydrogen sulfide into the atmosphere.
3. Provide proper evacuation procedures to cope with emergencies.
4. Provide immediate and adequate medical attention should an injury occur.

## Discussion

Implementation:	This plan with all details is to be fully implemented before drilling to <u>commence</u> .
Emergency response Procedure:	This section outlines the conditions and denotes steps to be taken in the event of an emergency.
Emergency equipment Procedure:	This section outlines the safety and emergency equipment that will be required for the drilling of this well.
Training provisions:	This section outlines the training provisions that must be adhered to prior to drilling.
Drilling emergency call lists:	Included are the telephone numbers of all persons to be contacted should an emergency exist.
Briefing:	This section deals with the briefing of all people involved in the drilling operation.
Public safety:	Public safety personnel will be made aware of any potential evacuation and any additional support needed.
Check lists:	Status check lists and procedural check lists have been included to insure adherence to the plan.
General information:	A general information section has been included to supply support information.

## Hydrogen Sulfide Training

All personnel, whether regularly assigned, contracted, or employed on an unscheduled basis, will receive training from a qualified instructor in the following areas prior to commencing drilling operations on the well:

1. The hazards and characteristics of H<sub>2</sub>S.
2. Proper use and maintenance of personal protective equipment and life support systems.
3. H<sub>2</sub>S detection.
4. Proper use of H<sub>2</sub>S detectors, alarms, warning systems, briefing areas, evacuation procedures and prevailing winds.
5. Proper techniques for first aid and rescue procedures.
6. Physical effects of hydrogen sulfide on the human body.
7. Toxicity of hydrogen sulfide and sulfur dioxide.
8. Use of SCBA and supplied air equipment.
9. First aid and artificial respiration.
10. Emergency rescue.

In addition, supervisory personnel will be trained in the following areas:

1. The effects of H<sub>2</sub>S on metal components. If high tensile strength tubular is to be used, personnel will be trained in their special maintenance requirements.
2. Corrective action and shut-in procedures when drilling a well, blowout prevention and well control procedures.
3. The contents and requirements of the H<sub>2</sub>S Drilling Operations Plan.

H<sub>2</sub>S training refresher must have been taken within one year prior to drilling the well. Specifics on the well to be drilled will be discussed during the pre-spud meeting. H<sub>2</sub>S and well control (choke) drills will be performed while drilling the well, at least on a weekly basis. This plan shall be available in the well site. All personnel will be required to carry the documentation proving that the H<sub>2</sub>S training has been taken.

### Service company and visiting personnel

- A. Each service company that will be on this well will be notified if the zone contains H<sub>2</sub>S.
- B. Each service company must provide for the training and equipment of their employees before they arrive at the well site.
- C. Each service company will be expected to attend a well site briefing

## Emergency Equipment Requirements

### 1. Well control equipment

The well shall have hydraulic BOP equipment for the anticipated pressures. Equipment is to be tested on installation and follow Oxy Well Control standard, as well as BLM Onshore Order #2.

*Special control equipment:*

- A. Hydraulic BOP equipment with remote control on ground. Remotely operated choke.
- B. Rotating head
- C. Gas buster equipment shall be installed before drilling out of surface pipe.

### 2. Protective equipment for personnel

- A. Four (4) 30-minute positive pressure air packs (2 at each briefing area) on location.
- B. Adequate fire extinguishers shall be located at strategic locations.
- C. Radio / cell telephone communication will be available at the rig.
  - Rig floor and trailers.
  - Vehicle.

### 3. Hydrogen sulfide sensors and alarms

- A. H<sub>2</sub>S sensor with alarms will be located on the rig floor, at the bell nipple, and at the flow line. These monitors will be set to alarm at 10 ppm with strobe light, and audible alarm.
- B. Hand operated detectors with tubes.
- C. H<sub>2</sub>S monitor tester (to be provided by contract Safety Company.)
- D. There shall be one combustible gas detector on location at all times.

### 4. Visual Warning Systems

- A. One sign located at each location entrance with the following language:

**Caution – potential poison gas  
Hydrogen sulfide  
No admittance without authorization**

*Wind sock – wind streamers:*

- A. One 36” (in length) wind sock located at protection center, at height visible from rig floor.
- B. One 36” (in length) wind sock located at height visible from pit areas.

*Condition flags*

- A. One each condition flag to be displayed to denote conditions.

**green – normal conditions**  
**yellow – potential danger**  
**red – danger, H2S present**

- B. Condition flag shall be posted at each location sign entrance.

5. Mud Program

The mud program is designed to minimize the risk of having H2S and other formation fluids at surface. Proper mud weight and safe drilling practices will be applied. H2S scavengers will be used to minimize the hazards while drilling. Below is a summary of the drilling program.

*Mud inspection devices:*

Garrett gas train or hatch tester for inspection of sulfide concentration in mud system.

6. Metallurgy

- A. Drill string, casing, tubing, wellhead, blowout preventers, drilling spools or adapters, kill lines, choke manifold, lines and valves shall be suitable for the H2S service.
- B. All the elastomers, packing, seals and ring gaskets shall be suitable for H2S service.

7. Well Testing

No drill stem test will be performed on this well.

8. Evacuation plan

Evacuation routes should be established prior to well spud for each well and discussed with all rig personnel.

9. Designated area

- A. Parking and visitor area: all vehicles are to be parked at a predetermined safe distance from the wellhead.
- B. There will be a designated smoking area.
- C. Two briefing areas on either side of the location at the maximum allowable distance from the well bore so they offset prevailing winds perpendicularly, or at a 45-degree angle if wind direction tends to shift in the area.

**Emergency procedures**

- A. In the event of any evidence of H<sub>2</sub>S level above 10 ppm, take the following steps:
  - 1. The Driller will pick up off bottom, shut down the pumps, slow down the pipe rotation.
  - 2. Secure and don escape breathing equipment, report to the upwind designated safe briefing / muster area.
  - 3. All personnel on location will be accounted for and emergency search should begin for any missing, the Buddy System will be implemented.
  - 4. Order non-essential personnel to leave the well site, order all essential personnel out of the danger zone and upwind to the nearest designated safe briefing / muster area.
  - 5. Entrance to the location will be secured to a higher level than our usual “Meet and Greet” requirement, and the proper condition flag will be displayed at the entrance to the location.
  - 6. Take steps to determine if the H<sub>2</sub>S level can be corrected or suppressed and, if so, proceed as required.
- B. If uncontrollable conditions occur:
  - 1. Take steps to protect and/or remove any public in the down-wind area from the rig – partial evacuation and isolation. Notify necessary public safety personnel and appropriate regulatory entities (i.e. BLM) of the situation.

2. Remove all personnel to the nearest upwind designated safe briefing / muster area or off location.
3. Notify public safety personnel of safe briefing / muster area.
4. An assigned crew member will blockade the entrance to the location. No unauthorized personnel will be allowed entry to the location.
5. Proceed with best plan (at the time) to regain control of the well. Maintain tight security and safety procedures.

C. Responsibility:

1. Designated personnel.
  - a. Shall be responsible for the total implementation of this plan.
  - b. Shall be in complete command during any emergency.
  - c. Shall designate a back-up.

All personnel:

1. On alarm, don escape unit and report to the nearest upwind designated safe briefing / muster area upw
2. Check status of personnel (buddy system).
3. Secure breathing equipment.
4. Await orders from supervisor.

Drill site manager:

1. Don escape unit if necessary and report to nearest upwind designated safe briefing / muster area.
2. Coordinate preparations of individuals to return to point of release with tool pusher and driller (using the buddy system).
3. Determine H2S concentrations.
4. Assess situation and take control measures.

Tool pusher:

1. Don escape unit Report to up nearest upwind designated safe briefing / muster area.
2. Coordinate preparation of individuals to return to point of release with tool pusher drill site manager (using the buddy system).
3. Determine H2S concentration.
4. Assess situation and take control measures.

Driller:

1. Don escape unit, shut down pumps, continue

- rotating DP.
  - 2. Check monitor for point of release.
  - 3. Report to nearest upwind designated safe briefing / muster area.
  - 4. Check status of personnel (in an attempt to rescue, use the buddy system).
  - 5. Assigns least essential person to notify Drill Site Manager and tool pusher by quickest means in case of their absence.
  - 6. Assumes the responsibilities of the Drill Site Manager and tool pusher until they arrive should they be absent.
- Derrick man  
Floor man #1  
Floor man #2
- 1. Will remain in briefing / muster area until instructed by supervisor.
- Mud engineer:
- 1. Report to nearest upwind designated safe briefing / muster area.
  - 2. When instructed, begin check of mud for ph and H2S level. (Garett gas train.)
- Safety personnel:
- 1. Mask up and check status of all personnel and secure operations as instructed by drill site manager.

**Taking a kick**

When taking a kick during an H2S emergency, all personnel will follow standard Well control procedures after reporting to briefing area and masking up.

**Open-hole logging**

All unnecessary personnel off floor. Drill Site Manager and safety personnel should monitor condition, advise status and determine need for use of air equipment.

**Running casing or plugging**

Following the same “tripping” procedure as above. Drill Site Manager and safety personnel should determine if all personnel have access to protective equipment.

### **Ignition procedures**

The decision to ignite the well is the responsibility of the operator (Oxy Drilling Management). The decision should be made only as a last resort and in a situation where it is clear that:

1. Human life and property are endangered.
2. There is no hope controlling the blowout under the prevailing conditions at the well.

#### **Instructions for igniting the well**

1. Two people are required for the actual igniting operation. They must wear self-contained breathing units and have a safety rope attached. One man (tool pusher or safety engineer) will check the atmosphere for explosive gases with the gas monitor. The other man is responsible for igniting the well.
2. Primary method to ignite: 25 mm flare gun with range of approximately 500 feet.
3. Ignite upwind and do not approach any closer than is warranted.
4. Select the ignition site best for protection, and which offers an easy escape route.
5. Before firing, check for presence of combustible gas.
6. After lighting, continue emergency action and procedure as before.
7. All unassigned personnel will remain in briefing area until instructed by supervisor or directed by the Drill Site Manager.

**Remember:** After well is ignited, burning hydrogen sulfide will convert to sulfur dioxide, which is also highly toxic. **Do not assume the area is safe after the well is ignited.**

### **Status check list**

Note: All items on this list must be completed before drilling to production casing point.

1. H2S sign at location entrance.
2. Two (2) wind socks located as required.
3. Four (4) 30-minute positive pressure air packs (2 at each Briefing area) on location for all rig personnel and mud loggers.
4. Air packs inspected and ready for use.
5. Cascade system and hose line hook-up as needed.
6. Cascade system for refilling air bottles as needed.
7. Condition flag on location and ready for use.
8. H2S detection system hooked up and tested.
9. H2S alarm system hooked up and tested.
10. Hand operated H2S detector with tubes on location.
11. 1 – 100' length of nylon rope on location.
12. All rig crew and supervisors trained as required.
13. All outside service contractors advised of potential H2S hazard on well.
14. No smoking sign posted and a designated smoking area identified.
15. Calibration of all H2S equipment shall be noted on the IADC report.

Checked by: \_\_\_\_\_ Date: \_\_\_\_\_

## **Procedural check list during H2S events**

### **Perform each tour:**

1. Check fire extinguishers to see that they have the proper charge.
2. Check breathing equipment to ensure that it is in proper working order.
3. Make sure all the H2S detection system is operative.

### **Perform each week:**

1. Check each piece of breathing equipment to make sure that demand or forced air regulator is working. This requires that the bottle be opened and the mask assembly be put on tight enough so that when you inhale, you receive air or feel air flow.
2. BOP skills (well control drills).
3. Check supply pressure on BOP accumulator stand by source.
4. Check breathing equipment mask assembly to see that straps are loosened and turned back, ready to put on.
5. Check pressure on breathing equipment air bottles to make sure they are charged to full volume. ( Air quality checked for proper air grade "D" before bringing to location)
6. Confirm pressure on all supply air bottles.
7. Perform breathing equipment drills with on-site personnel.
8. Check the following supplies for availability.
  - A. Emergency telephone list.
  - B. Hand operated H2S detectors and tubes.

### **General evacuation plan**

1. When the company approved supervisor (Drill Site Manager, consultant, rig pusher, or driller) determines the H<sub>2</sub>S gas cannot be limited to the well location and the public will be involved, he will activate the evacuation plan.
2. Drill Site Manager or designee will notify local government agency that a hazardous condition exists and evacuation needs to be implemented.
3. Company or contractor safety personnel that have been trained in the use of H<sub>2</sub>S detection equipment and self-contained breathing equipment will monitor H<sub>2</sub>S concentrations, wind directions, and area of exposure. They will delineate the outer perimeter of the hazardous gas area. Extension to the evacuation area will be determined from information gathered.
4. Law enforcement personnel (state police, police dept., fire dept., and sheriff's dept.) Will be called to aid in setting up and maintaining road blocks. Also, they will aid in evacuation of the public if necessary.
5. After the discharge of gas has been controlled, company safety personnel will determine when the area is safe for re-entry.

**Important: Law enforcement personnel will not be asked to come into a contaminated area. Their assistance will be limited to uncontaminated areas. Constant radio contact will be maintained with them.**

## **Emergency actions**

### Well blowout – if emergency

1. Evacuate all personnel to “Safe Briefing / Muster Areas” or off location if needed.
2. If sour gas – evacuate rig personnel.
3. If sour gas – evacuate public within 3000 ft radius of exposure.
4. Don SCBA and shut well in if possible using the buddy system.
5. Notify Drilling Superintendent and call 911 for emergency help (fire dept and ambulance) if needed.
6. Implement the Blowout Contingency Plan, and Drilling Emergency Action Plan.
6. Give first aid as needed.

### Person down location/facility

1. If immediately possible, contact 911. Give location and wait for confirmation.
2. Don SCBA and perform rescue operation using buddy system.

### **Toxic effects of hydrogen sulfide**

Hydrogen sulfide is extremely toxic. The acceptable ceiling concentration for eight-hour exposure is 10 ppm, which is .001% by volume. Hydrogen sulfide is heavier than air (specific gravity – 1.192) and colorless. It forms an explosive mixture with air between 4.3 and 46.0 percent by volume. Hydrogen sulfide is almost as toxic as hydrogen cyanide and is between five and six times more toxic than carbon monoxide. Toxicity data for hydrogen sulfide and various other gases are compared in table i. Physical effects at various hydrogen sulfide exposure levels are shown in table ii.

Table i  
Toxicity of various gases

Common name	Chemical formula	Specific gravity (sc=1)	Threshold limit (1)	Hazardous limit (2)	Lethal concentration (3)
Hydrogen Cyanide	Hcn	0.94	10 ppm	150 ppm/hr	300 ppm
Hydrogen Sulfide	H2S	1.18	10 ppm	250 ppm/hr	600 ppm
Sulfur Dioxide	So2	2.21	5 ppm	-	1000 ppm
Chlorine	Cl2	2.45	1 ppm	4 ppm/hr	1000 ppm
Carbon Monoxide	Co	0.97	50 ppm	400 ppm/hr	1000 ppm
Carbon Dioxide	Co2	1.52	5000 ppm	5%	10%
Methane	Ch4	0.55	90,000 ppm	Combustible above 5% in air	

- 1) threshold limit – concentration at which it is believed that all workers may be repeatedly exposed day after day without adverse effects.
- 2) hazardous limit – concentration that will cause death with short-term exposure.
- 3) lethal concentration – concentration that will cause death with short-term exposure.

### **Toxic effects of hydrogen sulfide**

Table ii  
Physical effects of hydrogen sulfide

<u>Percent (%)</u>	<u>Ppm</u>	<u>Concentration</u>		<u>Physical effects</u>
		<u>Grains</u>	<u>100 std. Ft3*</u>	
0.001	<10	00.65		Obvious and unpleasant odor.

0.002	10	01.30	Safe for 8 hours of exposure.
0.010	100	06.48	Kill smell in 3 – 15 minutes. May sting eyes and throat.
0.020	200	12.96	Kills smell shortly; stings eyes and throat.
0.050	500	32.96	Dizziness; breathing ceases in a few minutes; needs prompt artificial respiration.
0.070	700	45.36	Unconscious quickly; death will result if not rescued promptly.
0.100	1000	64.30	Unconscious at once; followed by death within minutes.

\*at 15.00 psia and 60'f.

### **Use of self-contained breathing equipment (SCBA)**

1. Written procedures shall be prepared covering safe use of SCBA's in dangerous atmosphere, which might be encountered in normal operations or in emergencies. Personnel shall be familiar with these procedures and the available SCBA.
2. SCBA's shall be inspected frequently at random to insure that they are properly used, cleaned, and maintained.
3. Anyone who may use the SCBA's shall be trained in how to insure proper face-piece to face seal. They shall wear SCBA's in normal air and then wear them in a test atmosphere. (note: such items as facial hair {beard or sideburns} and eyeglasses will not allow proper seal.) Anyone that may be reasonably expected to wear SCBA's should have these items removed before entering a toxic atmosphere. A special mask must be obtained for anyone who must wear eyeglasses or contact lenses.
4. Maintenance and care of SCBA's:
  - a. A program for maintenance and care of SCBA's shall include the following:
    1. Inspection for defects, including leak checks.
    2. Cleaning and disinfecting.
    3. Repair.
    4. Storage.
  - b. Inspection, self-contained breathing apparatus for emergency use shall be inspected monthly.
    1. Fully charged cylinders.
    2. Regulator and warning device operation.
    3. Condition of face piece and connections.
    4. Rubber parts shall be maintained to keep them pliable and prevent deterioration.
  - c. Routinely used SCBA's shall be collected, cleaned and disinfected as frequently as necessary to insure proper protection is provided.
5. Persons assigned tasks that requires use of self-contained breathing equipment shall be certified physically fit (medically cleared) for breathing equipment usage at least annually.
6. SCBA's should be worn when:
  - A. Any employee works near the top or on top of any tank unless test reveals less than 10 ppm of H<sub>2</sub>S.

- B. When breaking out any line where H<sub>2</sub>S can reasonably be expected.
- C. When sampling air in areas to determine if toxic concentrations of H<sub>2</sub>S exists.
- D. When working in areas where over 10 ppm H<sub>2</sub>S has been detected.
- E. At any time there is a doubt as to the H<sub>2</sub>S level in the area to be entered.

**Rescue**  
**First aid for H<sub>2</sub>S poisoning**

Do not panic!

Remain calm – think!

1. Don SCBA breathing equipment.
2. Remove victim(s) utilizing buddy system to fresh air as quickly as possible. (go up-wind from source or at right angle to the wind. Not down wind.)
3. Briefly apply chest pressure – arm lift method of artificial respiration to clean the victim's lungs and to avoid inhaling any toxic gas directly from the victim's lungs.
4. Provide for prompt transportation to the hospital, and continue giving artificial respiration if needed.
5. Hospital(s) or medical facilities need to be informed, before-hand, of the possibility of H<sub>2</sub>S gas poisoning – no matter how remote the possibility is.
6. Notify emergency room personnel that the victim(s) has been exposed to H<sub>2</sub>S gas.

Besides basic first aid, everyone on location should have a good working knowledge of artificial respiration.

Revised CM 6/27/2012

**OXY Permian Delaware NM Basin Drilling & Completions Incident Reporting**

**OXY Permian Crisis Team Hotline Notification**

<b>Person</b>	<b>Location</b>	<b>Office Phone</b>	<b>Cell/Mobile Phone</b>	<b>Home Phone</b>	<b>Pager Number</b>
<b>Drilling &amp; Completions Department</b>					
Drilling & Completions Manager: John Willis	Houston	(713) 366-5556	(713) 259-1417		
Drilling Superintendent: Simon Benavides	Houston	(713) 215-7403	(832) 528-3547		
Completions Superintendent: Chris Winter	Houston	(713) 366-5212	(806) 239-8774		
Drilling Eng. Supervisor: Diego Tellez	Houston	(713) 350-4602	(713) 303-4932		
Drilling Eng. Supervisor: Randy Neel	Houston	(713) 215-7987	(713) 517-5544		
Completions Eng. Supervisor: Evan Hinkel	Houston	(713) 366-5436	(281) 236-6153		
Drilling & Completions HES Lead. Ryan Green	Houston	713-336-5753	281-520-5216		
Drilling & Completions HES Advisor:Kenny Williams	Carlsbad	(432) 686-1434	(337) 208-0911		
Drilling & Completions HES Advisor:Kyle Holden	Carlsbad	(432) 686-1435	(661) 369-5328		
Drilling & Completions HES Advisor Sr:Dave Schmidt	Carlsbad		(559) 310-8572		
Drilling & Completions HES Advisor. :Seth Doyle	Carlsbad		(337) 499-0756		
<b>HES / Enviromental &amp; Regulatory Department</b>					
	<b>Location</b>	<b>Office</b>	<b>Cell Phone</b>		
Jon Hamil-HES Manager	Houston	(713) 497-2494	(832) 537-9885		
Mark Birk-HES Manager	Houston	(713) 350-4615	(949) 413-3127		
Austin Tramell	Midland	(432) 699-4208	(575) 499-4919		
Rico Munoz	Midland	(432) 699-8366	(432) 803-4116		
Amber DuckWorth	Midland		(832) 966-1879		
Kelley Montgomery- Regulatory Manager	Houston	(713) 366-5716	(832) 454-8137		
Sandra Musallam -Regulatory Lead	Houston	+1 (713) 366-5106	+1 (713) 504-8577		
Bishop, Steve-DOT Pipeline Coordinator	Midland	432-685-5614			

Wilson, Dusty-Safety Advisor	Midland	432-685-5771	(432) 254-2336		
John W Dittrich Eniromental Advisor	Midland		(575) 390-2828		
William (Jack) Calhoun-Environmental Lead	Houston	+713 (350) 4906	(281) 917-8571		
Robert Barrow-Risk Engineer Manager	Houston	(713) 366-5611	(832) 867-5336		
Sarah Holmes-HSE Cordinator	Midland	432-685-5758			
<b>Administrative</b>	<b>Location</b>	<b>Office</b>			
Sarah Holmes	Midland	432-685-5830			
Robertson, Debbie	Midland	432-685-5812			
Laci Hollaway	Midland	(432) 685-5716	(432) 631-6341		
<b>Administrative</b>	<b>Location</b>	<b>Office</b>			
Rosalinda Escajeda	Midland	432-685-5831			
Moreno, Leslie (contract)	Hobbs	575-397-8247			
Sehon, Angela (contractor)	Levelland	806-894-8347			
Vasquez, Claudia (contractor)	North Cowden	432-385-3120			
<b>XstremeMD</b>	<b>Location</b>	<b>Office</b>			
Medical Case Management	Orla, TX	(337) 205-9314			
<b>Axiom Medical Consulting</b>	<b>Location</b>	<b>Office</b>			
Medical Case Management		(877) 502-9466			
<b>Regulatory Agencies</b>					
Bureau of Land Management	Carlsbad, NM	(505) 887-6544			
Bureau of Land Management	Hobbs, NM	(505) 393-3612			
Bureau of Land Management	Roswell, NM	(505) 393-3612			
Bureau of Land Management	Santa Fe, NM	(505) 988-6030			
DOT Juisdictional Pipelines-Incident Reporting New Mexico Public Regulaion Commission	Santa Fe, NM	(505) 827-3549 (505) 490-2375			
DOT Juisdictional Pipelines-Incident Reporting Texas Railroad Commission	Austin, TX	(512) 463-6788			
EPA Hot Line	Dallas, Texas	(214) 665-6444			

Federal OSHA, Area Office	Lubbock, Texas	(806) 472-7681			
National Response Center	Washington, D. C.	(800) 424-8802			
National Infrastructure Coordinator Center		(202) 282-9201			
New Mexico Air Quality Bureau	Santa Fe, NM	(505) 827-1494			
New Mexico Oil Conservation Division	Artesia, NM	(505) 748-1283	After Hours (505) 370-7545		
New Mexico Oil Conservation Division	Hobbs, NM	(505) 393-6161			
New Mexico Oil Conservation Division	Santa Fe, NM	(505) 471-1068			
New Mexico OCD Environmental Bureau	Santa Fe, NM	(505) 476-3470			
New Mexico Environmental Department	Hobbs, NM	(505) 827-9329			
NM State Emergency Response Center	Santa Fe, NM	(505) 827-9222			
Railroad Commission of TX	District 1 San Antonio,	(210) 227-1313			
Railroad Commission of TX	District 7C San Angelo	(325) 657-7450			
Railroad Commission of TX	District 8, 8A Midland,	(432) 684-5581			
Texas Emergency Response Center	Austin, TX	(512) 463-7727			
TCEQ Air	Region 2 Lubbock, TX	(806) 796-3494			
TCEQ Water/Waste/Air	Region 3 Abilene, TX	(325) 698-9674			
TCEQ Water/Waste/Air	Region 7 Midland, TX	(432) 570-1359			
TCEQ Water/Waste/Air	Region 9 San Antonio,	(512) 734-7981			
TCEQ Water/Waste/Air	Region 8 San Angelo	(325) 655-9479			
<b>Medical Facilities</b>					
Abernathy Medical Clinic	Abernathy, TX	(806) 298-2524			
Alliance Hospital	Odessa, TX	(432) 550-1000			
Artesia General Hospital	Artesia, NM	(505) 748-3333			
Brownfield Regional Medical Center	Brownfield, TX	(806) 637-3551			
Cogdell Memorial Hospital	Snyder, TX	(325) 573-6374			
Covenant Hospital Levelland	Levelland, TX	(806) 894-4963			
Covenant Medical Center	Lubbock, TX	(806) 725-1011			
Covenant Medical Center Lakeside	Lubbock, TX	(806) 725-6000			
Covenant Family Health	Snyder, TX	(325) 573-1300			

Crockett County Hospital	Ozona, TX	(325) 392-2671			
Guadalupe Medical Center	Carlsbad, NM	(505) 887-6633			
Lea Regional Hospital	Hobbs, NM	(505) 492-5000			
McCamey Hospital	McCamey, TX	(432) 652-8626			
Medical Arts Hospital	Lamesa, TX	(806) 872-2183			
Medical Center Hospital	Odessa, TX	(432) 640-4000			
Medi Center Hospital	San Angelo, TX	(325) 653-6741			
Memorial Hospital	Ft. Stockton	(432) 336-2241			
Memorial Hospital	Seminole, TX	(432) 758-5811			
Midland Memorial Hospital	Midland, TX	(432) 685-1111			
Nor-Lea General Hospital	Lovington, NM	(505) 396-6611			
Odessa Regional Hospital	Odessa, TX	(432) 334-8200			
Permian General Hospital	Andrews, TX	(432) 523-2200			
Reagan County Hospital	Big Lake, TX	(325) 884-2561			
Reeves County Hospital	Pecos, TX	(432) 447-3551			
Shannon Medical Center	San Angelo, TX	(325) 653-6741			
Union County General Hospital	Clayton, NM	(505) 374-2585			
University Medical Center	Lubbock, TX	(806) 725-8200			
Val Verde Regional Medical Center	Del Rio, TX	(830) 775-8566			
Ward Memorial Hospital	Monahans, TX	(432) 943-2511			
Yoakum County Hospital	Denver City, TX	(806) 592-5484			
<b>Law Enforcement - Sheriff</b>					
Andrews Cty Sheriff's Department	Andrews County(Andre	(432) 523-5545			
Crane Cty Sheriff's Department	Crane, County (Crane)	(432) 558-3571			
Crockett Cty Sheriff's Department	Crockett County (Ozon	(325) 392-2661			
Dawson Cty Sheriff's Department	Dawson County (Lame	(806) 872-7560			
Ector Cty Sheriff's Department	Ector County (Odessa)	(432) 335-3050			
Eddy Cty Sheriff's Department	Eddy County (Artesia)	(505) 746-2704			
Eddy Cty Sheriff's Department	Eddy County (Carlsbad	(505) 887-7551			

Gaines Cty Sheriff's Department	Gaines County (Seminol)	(432) 758-9871			
Hockley Cty Sheriff's Department	Hockley County (Levelland)	(806) 894-3126			
Kent Cty (Jayton City Sheriff's Dept.)	Kent County (Jayton)	(806) 237-3801			
Lea Cty Sheriff's Department	Lea County (Eunice)	(505) 384-2020			
Lea Cty Sheriff's Department	Lea County (Hobbs)	(505) 393-2515			
Lea Cty Sheriff's Department	Lea County (Lovington)	(505) 396-3611			
Lubbock Cty Sheriff's Department	Lubbock Cty (Abernathy)	(806) 296-2724			
Midland Cty Sheriff's Department	Midland County (Midland)	(432) 688-1277			
Pecos Cty Sheriff's Department	Pecos County (Iran)	(432) 639-2251			
Reeves Cty Sheriff's Department	Reeves County (Pecos)	(432) 445-4901			
Scurry Cty Sheriff's Department	Scurry County (Snyder)	(325) 573-3551			
Terry Cty Sheriff's Department	Terry County (Brownfield)	(806) 637-2212			
Union Cty Sheriff's Department	Union County (Clayton)	(505) 374-2583			
Upton Cty Sheriff's Department	Upton County (Rankin)	(432) 693-2422			
Ward Cty Sheriff's Department	Ward County (Monahans)	(432) 943-3254			
Yoakum City Sheriff's Department	Yoakum Co. (Denver)	(806) 456-2377			
<b>Law Enforcement - Police</b>					
Abernathy City Police	Abernathy, TX	(806) 298-2545			
Andrews City Police	Andrews, TX	(432) 523-5675			
Artesia City Police	Artesia, NM	(505) 746-2704			
Brownfield City Police	Brownfield, TX	(806) 637-2544			
Carlsbad City Police	Carlsbad, NM	(505) 885-2111			
Clayton City Police	Clayton, NM	(505) 374-2504			
Denver City Police	Denver City, TX	(806) 592-3516			
Eunice City Police	Eunice, NM	(505) 394-2112			
Hobbs City Police	Hobbs, NM	393-2677			
Jal City Police	Jal, NM	(505) 395-2501			
Jayton City Police	Jayton, TX	(806) 237-3801			
Lamesa City Police	Lamesa, TX	(806) 872-2121			

Levelland City Police	Levelland, TX	(806) 894-6164			
Lovington City Police	Lovington, NM	(505) 396-2811			
Midland City Police	Midland, TX	(432) 685-7113			
Monahans City Police	Monahans, TX	(432) 943-3254			
Odessa City Police	Odessa, TX	(432) 335-3378			
Seminole City Police	Seminole, TX	(432) 758-9871			
Snyder City Police	Snyder, TX	(325) 573-2611			
Sundown City Police	Sundown, TX	(806) 229-8241			
<b>Law Enforcement - FBI</b>					
FBI	Albuquerque, NM	(505) 224-2000			
FBI	Midland, TX	(432) 570-0255			
<b>Law Enforcement - DPS</b>					
NM State Police	Artesia, NM	(505) 746-2704			
NM State Police	Carlsbad, NM	(505) 885-3137			
NM State Police	Eunice, NM	(505) 392-5588			
NM State Police	Hobbs, NM	(505) 392-5588			
NM State Police	Clayton, NM	(505) 374-2473; 911			
TX Dept of Public Safety	Andrews, TX	(432) 524-1443			
TX Dept of Public Safety	Big Lake, TX	(325) 884-2301			
TX Dept of Public Safety	Brownfield, TX	(806) 637-2312			
TX Dept of Public Safety	Iraan, TX	(432) 639-3232			
TX Dept of Public Safety	Lamesa, TX	(806) 872-8675			
TX Dept of Public Safety	Levelland, TX	(806) 894-4385			
TX Dept of Public Safety	Lubbock, TX	(806) 747-4491			
TX Dept of Public Safety	Midland, TX	(432) 697-2211			
TX Dept of Public Safety	Monahans, TX	(432) 943-5857			
TX Dept of Public Safety	Odessa, TX	(432) 332-6100			
TX Dept of Public Safety	Ozona, TX	(325) 392-2621			

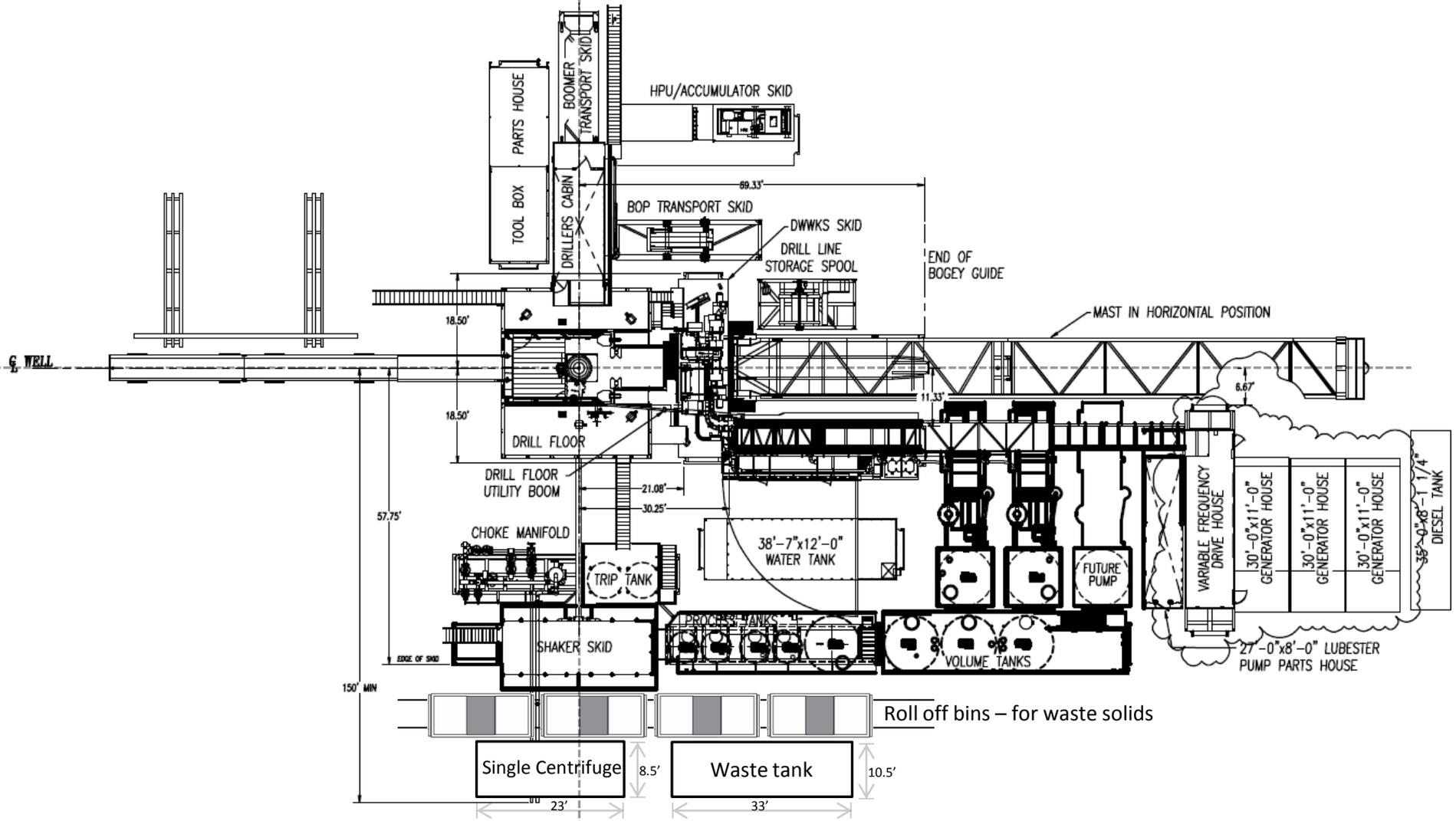
TX Dept of Public Safety	Pecos, TX	(432) 447-3533			
TX Dept of Public Safety	Seminole, TX	(432) 758-4041			
TX Dept of Public Safety	Snyder, TX	(325) 573-0113			
TX Dept of Public Safety	Terry County TX	(806) 637-8913			
TX Dept of Public Safety	Yoakum County TX	(806) 456-2377			
<b>Firefighting &amp; Rescue</b>					
Abernathy	Abernathy, TX	(806) 298-2022			
Amistad/Rosebud	Amistad/Rosebud, NM	(505) 633-9113			
Andrews	Andrews, TX	523-3111			
Artesia	Artesia, NM	(505) 746-5051			
Big Lake	Big Lake, TX	(325) 884-3650			
Brownfield-Administrative & other calls	Brownfield, TX	(816) 637-4547			
Brownfield emergency only	Brownfield, TX	-911			
<b>Carlsbad</b>	<b>Carlsbad, NM</b>	<b>(505) 885-3125</b>			
Clayton	Clayton, NM	(505) 374-2435			
Cotton Center	Cotton Center, TX	(806) 879-2157			
Crane	Crane, TX	(432) 558-2361			
Del Rio	Del Rio, TX	(830) 774-8650			
Denver City	Denver City, TX	(806) 592-3516			
Eldorado	Eldorado, TX	(325) 853-2691			
Eunice	Eunice, NM	(505) 394-2111			
Garden City	Garden City, TX	(432) 354-2404			
Goldsmith	Goldsmith, TX	(432) 827-3445			
Hale Center	Hale Center, TX	(806) 839-2411			
Halfway	Halfway, TX				
Hobbs	Hobbs, NM	(505) 397-9308			
Jal	Jal, NM	(505) 395-2221			
Jayton	Jayton, TX	(806) 237-3801			
Kermit	Kermit, TX	(432) 586-3468			

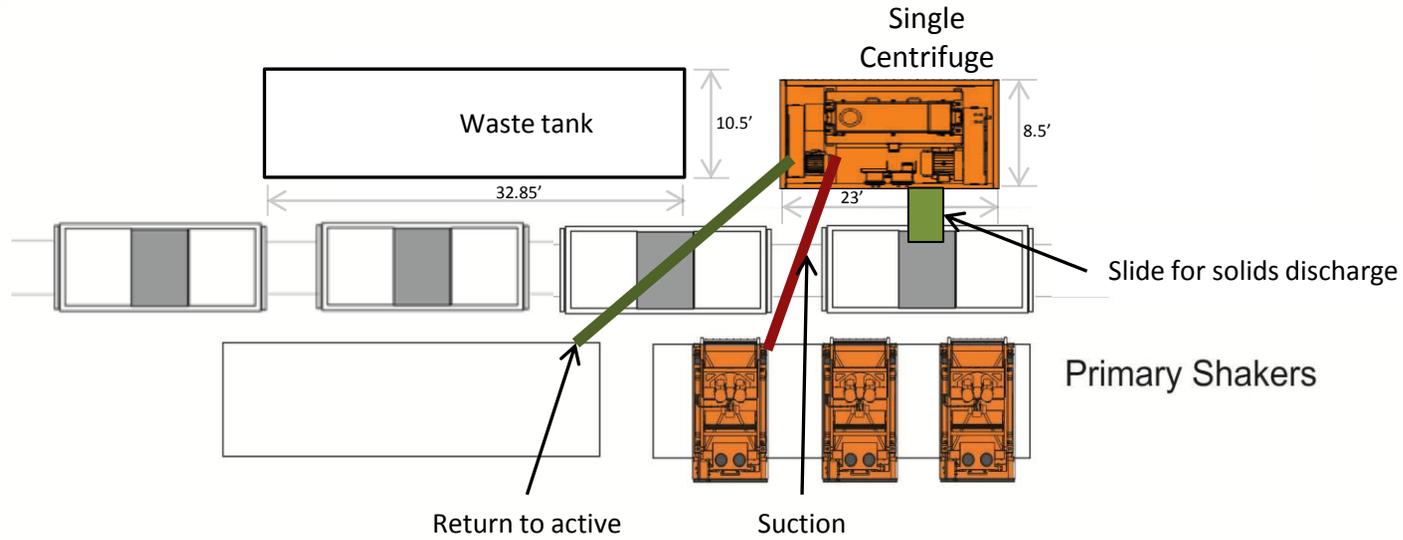
Lamesa	Lamesa, TX	(806) 872-4352			
Levelland	Levelland, TX	(806) 894-3154			
Lovington	Lovington, NM	(505) 396-2359			
Maljamar	Maljamar, NM	(505) 676-4100			
McCamey	McCamey, TX	(432) 652-8232			
Midland	Midland, TX	(432) 685-7346			
Monahans	Monahans, TX	(432) 943-4343			
Nara Visa	Nara Visa, NM	(505) 461-3300			
Notrees	Notress, TX	(432) 827-3445			
Odessa	Odessa, TX	(432) 335-4659			
Ozona	Ozona, TX	(325) 392-2626			
Pecos	Pecos, TX	(432) 445-2421			
Petersburg	Petersburg, TX	(806) 667-3461			
Plains	Plains, TX	(806) 456-8067			
Plainview	Plainview, TX	(806) 296-1170			
Rankin	Rankin, TX	(432) 693-2252			
San Angelo	San Angelo, TX	(325) 657-4355			
Sanderson	Sanderson, TX	(432) 345-2525			
Seminole	Seminole, TX	758-9871			
Smyer	Smyer, TX	(806) 234-3861			
Snyder	Snyder, TX	(325) 573-6215			
Sundown	Sundown, TX	<b>911</b>			
Tucumcari	Tucumcari, NM	911			
West Odessa	Odessa, TX	(432) 381-3033			
<b>Ambulance</b>					
Abernathy Ambulance	Abernathy, TX	(806) 298-2241			
Amistad/Rosebud	Amistad/Rosebud, NM	(505) 633-9113			
Andrews Ambulance	Andrews, TX	(432) 523-5675			
Artesia Ambulance	Artesia, NM	(505) 746-2701			

Big Lake Ambulance	Big Lake, TX	(325) 884-2423			
Big Spring Ambulance	Big Spring, TX	(432) 264-2550			
Brownfield Ambulance	Brownfield, TX	(806) 637-2511			
Carlsbad Ambulance	Carlsbad, NM	(505) 885-2111; 911			
Clayton, NM	Clayton, NM	(505) 374-2501			
Denver City Ambulance	Denver City, TX	(806) 592-3516			
Eldorado Ambulance	Eldorado, TX	(325) 853-3456			
Eunice Ambulance	Eunice, NM	(505) 394-3258			
Goldsmith Ambulance	Goldsmith, TX	(432) 827-3445			
Hobbs, NM	Hobbs, NM	(505) 397-9308			
Jal, NM	Jal, NM	(505) 395-2501			
Jayton Ambulance	Jayton, TX	(806) 237-3801			
Lamesa Ambulance	Lamesa, TX	(806) 872-3464			
Levelland Ambulance	Levelland, TX	(806) 894-8855			
Lovington Ambulance	Lovington, NM	(505) 396-2811			
McCamey Hospital	McCamey, TX	(432) 652-8626			
Midland Ambulance	Midland, TX	(432) 685-7499			
Monahans Ambulance	Monahans, TX	3731			
Nara Visa, NM	Nara Visa, NM	(505) 461-3300			
Odessa Ambulance	Odessa, TX	(432) 335-3378			
Ozona Ambulance	Ozona, TX	(325) 392-2671			
Pecos Ambulance	Pecos, TX	(432) 445-4444			
Rankin Ambulance	Rankin, TX	(432) 693-2443			
San Angelo Ambulance	San Angelo, TX	(325) 657-4357			
Seminole Ambulance	Seminole, TX	758-9871			
Snyder Ambulance	Snyder, TX	(325) 573-1911			
Stanton Ambulance	Stanton, TX	(432) 756-2211			
Sundown Ambulance	Sundown, TX	<b>911</b>			
Tucumcari, NM	Tucumcari, NM	911			

<b>Medical Air Ambulance Service</b>					
AEROCARE - Methodist Hospital	Lubbock, TX	(800) 627-2376			
San Angelo Med-Vac Air Ambulance	San Angelo, TX	(800) 277-4354			
Southwest Air Ambulance Service	Stanford, TX	(800) 242-6199			
Southwest MediVac	Snyder, TX	(800) 242-6199			
Southwest MediVac	Hobbs, NM	(800) 242-6199			
Odessa Care Star	Odessa, TX	(888) 624-3571			
NWTH Medivac	Amarillo, TX	(800) 692-1331			

Oxy Single Centrifuge  
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