Form 3160-3
(March 2012)

FORM APPROVED
OMB No. 1004-0137
Expires October 31, 2014

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

APPLICATION FOR PERMIT TO DRILL OR REENTER

5. Lease Serial No.
NMLC060325

6. If Indian, Allotee or Tribe Name

1a. Type of work: ☑ DRILL ☐ REENTER

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

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

8. Lease Name and Well No.
THUNDERBIRD A 5H 319579

2. Name of Operator
APACHE CORPORATION

9. API Well No.
30-015-44436

3a. Address
303 Veterans Airpark Lane #1000 Midland TX

3b. Phone No. *(include area code)*
(432)818-1000

10. Field and Pool, or Exploratory 96718
YESO / LOCO HILLS; GLORIETA-YESO

4. Location of Well *(Report location clearly and in accordance with any State requirements.*)*
At surface SWNE / 2315 FNL / 1955 FEL / LAT 32.8789277 / LONG -103.9747311
At proposed prod. zone SWSE / 330 FSL / 2159 FEL / LAT 32.8572043 / LONG -103.9753887

11. Sec., T. R. M. or Blk. and Survey or Area
SEC 33 / T16S / R30E / NMP

14. Distance in miles and direction from nearest town or post office*
5.4 miles

12. County or Parish
EDDY

13. State
NM

15. Distance from proposed* location to nearest property or lease line, ft. (Also to nearest drig. unit line, if any)
2373 feet

16. No. of acres in lease
639.09

17. Spacing Unit dedicated to this well
279.64

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

19. Proposed Depth
4715 feet / 12329 feet

20. BLM/BIA Bond No. on file
FED: NMB000736

21. Elevations (Show whether DF, KDB, RT, GL, etc.)
3741 feet

22. Approximate date work will start*
12/01/2016

23. Estimated duration
42 days

24. Attachments

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

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

25. Signature	Name *(Printed Typed)*	Date
(Electronic Submission)	Sorina Flores / Ph: (432)818-1167	09/02/2016

Title
Supv of Drilling Services

Approved by *(Signature)*	Name *(Printed Typed)*	Date
(Electronic Submission)	Cody Layton / Ph: (575)234-5959	09/07/2017

Title	Office
Supervisor Multiple Resources	CARLSBAD

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

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

(Continued on page 2)

*(Instructions on page 2)

APPROVED WITH CONDITIONS

NM OIL CONSERVATION
ARTESIA DISTRICT
SEP 08 2017
RECEIVED

RP 9-14-17

INSTRUCTIONS

GENERAL: This form is designed for submitting proposals to perform certain well operations, as indicated on Federal and Indian lands and leases for action by appropriate Federal agencies, pursuant to applicable Federal laws and regulations. Any necessary special instructions concerning the use of this form and the number of copies to be submitted, particularly with regard to local, area, or regional procedures and practices, either are shown below or will be issued by, or may be obtained from local Federal offices.

ITEM 1: If the proposal is to redrill to the same reservoir at a different subsurface location or to a new reservoir, use this form with appropriate notations. Consult applicable Federal regulations concerning subsequent work proposals or reports on the well.

ITEM 4: Locations on Federal or Indian land should be described in accordance with Federal requirements. Consult local Federal offices for specific instructions.

ITEM 14: Needed only when location of well cannot readily be found by road from the land or lease description. A plat, or plats, separate or on the reverse side, showing the roads to, and the surveyed location of, the well, and any other required information, should be furnished when required by Federal agency offices.

ITEMS 15 AND 18: If well is to be, or has been directionally drilled, give distances for subsurface location of hole in any present or objective productive zone.

ITEM 22: Consult applicable Federal regulations, or appropriate officials, concerning approval of the proposal before operations are started.

NOTICES

The Privacy Act of 1974 and regulation in 43 CFR 2.48(d) provide that you be furnished the following information in connection with information required by this application.
AUTHORITY: 30 U.S.C. 181 et seq., 25 U.S.C. 396; 43 CFR 3160
PRINCIPAL PURPOSES: The information will be used to: (1) process and evaluate your application for a permit to drill a new oil, gas, or service well or to reenter a plugged and abandoned well; and (2) document, for administrative use, information for the management, disposal and use of National Resource Lands and resources including (a) analyzing your proposal to discover and extract the Federal or Indian resources encountered; (b) reviewing procedures and equipment and the projected impact on the land involved; and (c) evaluating the effects of the proposed operation on the surface and subsurface water and other environmental impacts.
ROUTINE USE: Information from the record and/or the record will be transferred to appropriate Federal, State, and local or foreign agencies, when relevant to civil, criminal or regulatory investigations or prosecution, in connection with congressional inquiries and for regulatory responsibilities.
EFFECT OF NOT PROVIDING INFORMATION: Filing of this application and disclosure of the information is mandatory only if you elect to initiate a drilling or reentry operation on an oil and gas lease.

The Paperwork Reduction Act of 1995 requires us to inform you that:
The BLM collects this information to allow evaluation of the technical, safety, and environmental factors involved with drilling for oil and/or gas on Federal and Indian oil and gas leases. This information will be used to analyze and approve applications. Response to this request is mandatory only if the operator elects to initiate drilling or reentry operations on an oil and gas lease. The BLM would like you to know that you do not have to respond to this or any other Federal agency-sponsored information collection unless it displays a currently valid OMB control number.

BURDEN HOURS STATEMENT: Public reporting burden for this form is estimated to average 8 hours per response, including the time for reviewing instructions, gathering and maintaining data, and completing and reviewing the form. Direct comments regarding the burden estimate or any other aspect of this form to U.S. Department of the Interior, Bureau of Land Management (1004-0137), Bureau Information Collection Clearance Officer (WO-630), 1849 C Street, N.W., Mail Stop 401 LS, Washington, D.C. 20240.

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Additional Operator Remarks

Location of Well

1. SHL: SWNE / 2315 FNL / 1955 FEL / TWSP: 16S / RANGE: 30E / SECTION: 33 / LAT: 32.8789277 / LONG: -103.9747311 (TVD: 0 feet, MD: 0 feet)
   PPP: SWNE / 2374 FNL / 1970 FEL / TWSP: 16S / RANGE: 30E / SECTION: 33 / LAT: 32.8787667 / LONG: -103.9747793 (TVD: 4427 feet, MD: 4437 feet)
   BHL: SWSE / 330 FSL / 2159 FEL / TWSP: 16S / RANGE: 30E / SECTION: 4 / LAT: 32.8572043 / LONG: -103.9753887 (TVD: 4715 feet, MD: 12329 feet)

BLM Point of Contact

Name: Deborah McKinney

Title: Legal Instruments Examiner

Phone: 5752345931

Email: dmckinne@blm.gov

Review and Appeal Rights

A person contesting a decision shall request a State Director review. This request must be filed within 20 working days of receipt of the Notice with the appropriate State Director (see 43 CFR 3165.3). The State Director review decision may be appealed to the Interior Board of Land Appeals, 801 North Quincy Street, Suite 300, Arlington, VA 22203 (see 43 CFR 3165.4). Contact the above listed Bureau of Land Management office for further information.

PECOS DISTRICT
SURFACE USE
CONDITIONS OF APPROVAL

OPERATOR'S NAME:	Apache Corporation
LEASE NO.:	NMNM02425
WELL NAME & NO.:	5H-Thunderbird A
SURFACE HOLE FOOTAGE:	2315'/N & 1955'/E
BOTTOM HOLE FOOTAGE	330'/S & 2159'/E
LOCATION:	Section 33, T.16 S., R.30 E., NMPM
COUNTY:	Eddy County, New Mexico

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Standard Conditions of Approval (COA) apply to this APD. If any deviations to these standards exist or special COAs are required, the section with the deviation or requirement will be checked below.

I. GENERAL PROVISIONS

The approval of the Application For Permit To Drill (APD) is in compliance with all applicable laws and regulations: 43 Code of Federal Regulations 3160, the lease terms, Onshore Oil and Gas Orders, Notices To Lessees, New Mexico Oil Conservation Division (NMOCD) Rules, National Historical Preservation Act As Amended, and instructions and orders of the Authorized Officer. Any request for a variance shall be submitted to the Authorized Officer on Form 3160-5, Sundry Notices and Report on Wells.

II. PERMIT EXPIRATION

If the permit terminates prior to drilling and drilling cannot be commenced within 60 days after expiration, an operator is required to submit Form 3160-5, Sundry Notices and Reports on Wells, requesting surface reclamation requirements for any surface disturbance. However, if the operator will be able to initiate drilling within 60 days after the expiration of the permit, the operator must have set the conductor pipe in order to allow for an extension of 60 days beyond the expiration date of the APD. (Filing of a Sundry Notice is required for this 60 day extension.)

III. ARCHAEOLOGICAL, PALEONTOLOGY & HISTORICAL SITES

Any cultural and/or paleontological resource discovered by the operator or by any person working on the operator's behalf shall immediately report such findings to the Authorized Officer. The operator is fully accountable for the actions of their contractors and subcontractors. The operator shall suspend all operations in the immediate area of such discovery until written authorization to proceed is issued by the Authorized Officer. An evaluation of the discovery shall be made by the Authorized Officer to determine the appropriate actions that shall be required to prevent the loss of significant cultural or scientific values of the discovery. The operator shall be held responsible for the cost of the proper mitigation measures that the Authorized Officer assesses after consultation with the operator on the evaluation and decisions of the discovery. Any unauthorized collection or disturbance of cultural or paleontological resources may result in a shutdown order by the Authorized Officer.

IV. NOXIOUS WEEDS

The operator shall be held responsible if noxious weeds become established within the areas of operations. Weed control shall be required on the disturbed land where noxious weeds exist, which includes the roads, pads, associated pipeline corridor, and adjacent land affected by the establishment of weeds due to this action. The operator shall consult with the Authorized Officer for acceptable weed control methods, which include following EPA and BLM requirements and policies.

V. SPECIAL REQUIREMENT(S)

Timing Limitation Stipulation / Condition of Approval for lesser prairie-chicken: Oil and gas activities including 3-D geophysical exploration, and drilling will not be allowed in lesser prairie-chicken habitat during the period from March 1st through June 15th annually. During that period, other activities that produce noise or involve human activity, such as the maintenance of oil and gas facilities, pipeline, road, and well pad construction, will be allowed except between 3:00 am and 9:00 am. The 3:00 am to 9:00 am restriction will not apply to normal, around-the-clock operations, such as venting, flaring, or pumping, which do not require a human presence during this period. Additionally, no new drilling will be allowed within up to 200 meters of leks known at the time of permitting. Normal vehicle use on existing roads will not be restricted. Exhaust noise from pump jack engines must be muffled or otherwise controlled so as not to exceed 75 db measured at 30 feet from the source of the noise.

Below Ground-level Abandoned Well Marker to avoid raptor perching: Upon the plugging and subsequent abandonment of the well, the well marker will be installed at ground level on a plate containing the pertinent information for the plugged well. For more installation details, contact the Carlsbad Field Office at 575-234-5972.

Dunes Sagebrush Lizard Trench Stipulation

- Pre-construction contact with a BLM wildlife biologist is required within 5 days before any ground disturbing activities associated with the project occurs.
- Successful completion of the BLM Trench Stipulation Workshop is required for a non-agency person to be approved as a monitor.
- Any trench left open for (8) hours or less is not required to have escape ramps; however, before the trench is backfilled, an agency approved monitor shall walk the entire length of the open trench and remove all trapped vertebrates. The bottom surface of the trench will be disturbed a minimum of 2 inches in order to arouse any buried vertebrates. All vertebrates will be released a minimum of 100 yards from the trench.
- For trenches left open for eight (8) hours or more the following requirements apply:

    - Earthen escape ramps and/or structures (built at no more than a 30 degree slope and spaced no more than 500 feet apart) shall be placed in the trench. Metal structures will not be authorized. Options will be discussed in detail at the required Trench Stipulation Workshop.
    - One approved monitor shall be required to survey up to three miles of trench between the hours of 11 AM-2 PM. A daily report (consolidate if there is more than one monitor) on the vertebrates found and removed from the trench shall be provided to the BLM (email/fax is acceptable) the following morning.
    - Prior to backfilling of the trench all structures used as escape ramps will be removed and the bottom surface of the trench will be disturbed a

minimum of 2 inches in order to arouse any buried vertebrates. All vertebrates will be released a minimum of 100 yards from the trench.

- This stipulation shall apply to the entire length of the project in the DSL habitat polygon regardless of land ownership or CCA/CCAA enrollment status.
- A project closeout will be required within three business days of the completion of the project.

VI. CONSTRUCTION

A. NOTIFICATION

The BLM shall administer compliance and monitor construction of the access road and well pad. Notify the Carlsbad Field Office at (575) 234-5909 at least 3 working days prior to commencing construction of the access road and/or well pad.

When construction operations are being conducted on this well, the operator shall have the approved APD and Conditions of Approval (COA) on the well site and they shall be made available upon request by the Authorized Officer.

B. TOPSOIL

The operator shall strip the top portion of the soil (root zone) from the entire well pad area and stockpile the topsoil along the edge of the well pad as depicted in the APD. The root zone is typically six (6) inches in depth. All the stockpiled topsoil will be redistributed over the interim reclamation areas. Topsoil shall not be used for berming the pad or facilities. For final reclamation, the topsoil shall be spread over the entire pad area for seeding preparation.

Other subsoil (below six inches) stockpiles must be completely segregated from the topsoil stockpile. Large rocks or subsoil clods (not evident in the surrounding terrain) must be buried within the approved area for interim and final reclamation.

C. CLOSED LOOP SYSTEM

Tanks are required for drilling operations: No Pits.

The operator shall properly dispose of drilling contents at an authorized disposal site.

D. FEDERAL MINERAL MATERIALS PIT

Payment shall be made to the BLM prior to removal of any federal mineral materials. Call the Carlsbad Field Office at (575) 234-5972.

E. WELL PAD SURFACING

Surfacing of the well pad is not required.

If the operator elects to surface the well pad, the surfacing material may be required to be removed at the time of reclamation. The well pad shall be constructed in a manner which creates the smallest possible surface disturbance, consistent with safety and operational needs.

F. EXCLOSURE FENCING (CELLARS & PITS)

Exclosure Fencing
The operator will install and maintain exclosure fencing for all open well cellars to prevent access to public, livestock, and large forms of wildlife before and after drilling operations until the pit is free of fluids and the operator initiates backfilling. (For examples of exclosure fencing design, refer to BLM's Oil and Gas Gold Book, Exclosure Fence Illustrations, Figure 1, Page 18.)

G. ON LEASE ACCESS ROADS

Road Width
The access road shall have a driving surface that creates the smallest possible surface disturbance and does not exceed fourteen (14) feet in width. The maximum width of surface disturbance, when constructing the access road, shall not exceed twenty-five (25) feet.

Surfacing
Surfacing material is not required on the new access road driving surface. If the operator elects to surface the new access road or pad, the surfacing material may be required to be removed at the time of reclamation.

Where possible, no improvements should be made on the unsurfaced access road other than to remove vegetation as necessary, road irregularities, safety issues, or to fill low areas that may sustain standing water.

The Authorized Officer reserves the right to require surfacing of any portion of the access road at any time deemed necessary. Surfacing may be required in the event the road deteriorates, erodes, road traffic increases, or it is determined to be beneficial for future field development. The surfacing depth and type of material will be determined at the time of notification.

Crowning
Crowning shall be done on the access road driving surface. The road crown shall have a grade of approximately 2% (i.e., a 1" crown on a 14' wide road). The road shall conform to Figure 1; cross section and plans for typical road construction.

Ditching
Ditching shall be required on both sides of the road.

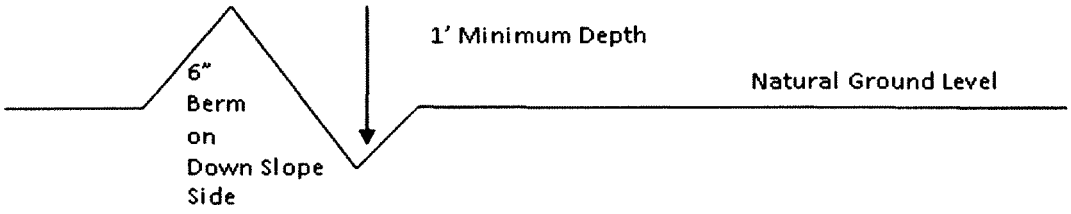
Turnouts
Vehicle turnouts shall be constructed on the road. Turnouts shall be intervisible with interval spacing distance less than 1000 feet. Turnouts shall conform to Figure 1; cross section and plans for typical road construction.

Drainage

Drainage control systems shall be constructed on the entire length of road (e.g. ditches, sidehill outsloping and insloping, lead-off ditches, culvert installation, and low water crossings).

A typical lead-off ditch has a minimum depth of 1 foot below and a berm of 6 inches above natural ground level. The berm shall be on the down-slope side of the lead-off ditch.

Cross Section of a Typical Lead-off Ditch



All lead-off ditches shall be graded to drain water with a 1 percent minimum to 3 percent maximum ditch slope. The spacing interval are variable for lead-off ditches and shall be determined according to the formula for spacing intervals of lead-off ditches, but may be amended depending upon existing soil types and centerline road slope (in %);

Formula for Spacing Interval of Lead-off Ditches

Example - On a 4% road slope that is 400 feet long, the water flow shall drain water into a lead-off ditch. Spacing interval shall be determined by the following formula:

$$\text{400 foot road with 4\% road slope: } \frac{400'}{4\%} + 100' = 200' \text{ lead-off ditch interval}$$

Cattle guards

An appropriately sized cattle guard sufficient to carry out the project shall be installed and maintained at fence/road crossings. Any existing cattle guards on the access road route shall be repaired or replaced if they are damaged or have deteriorated beyond practical use. The operator shall be responsible for the condition of the existing cattle guards that are in place and are utilized during lease operations.

Fence Requirement

Where entry is granted across a fence line, the fence shall be braced and tied off on both sides of the passageway prior to cutting. The operator shall notify the private surface landowner or the grazing allotment holder prior to crossing any fences.

Public Access

Public access on this road shall not be restricted by the operator without specific written approval granted by the Authorized Officer.

Construction Steps

1. Salvage topsoil
2. Construct road
3. Redistribute topsoil
4. Revegetate slopes

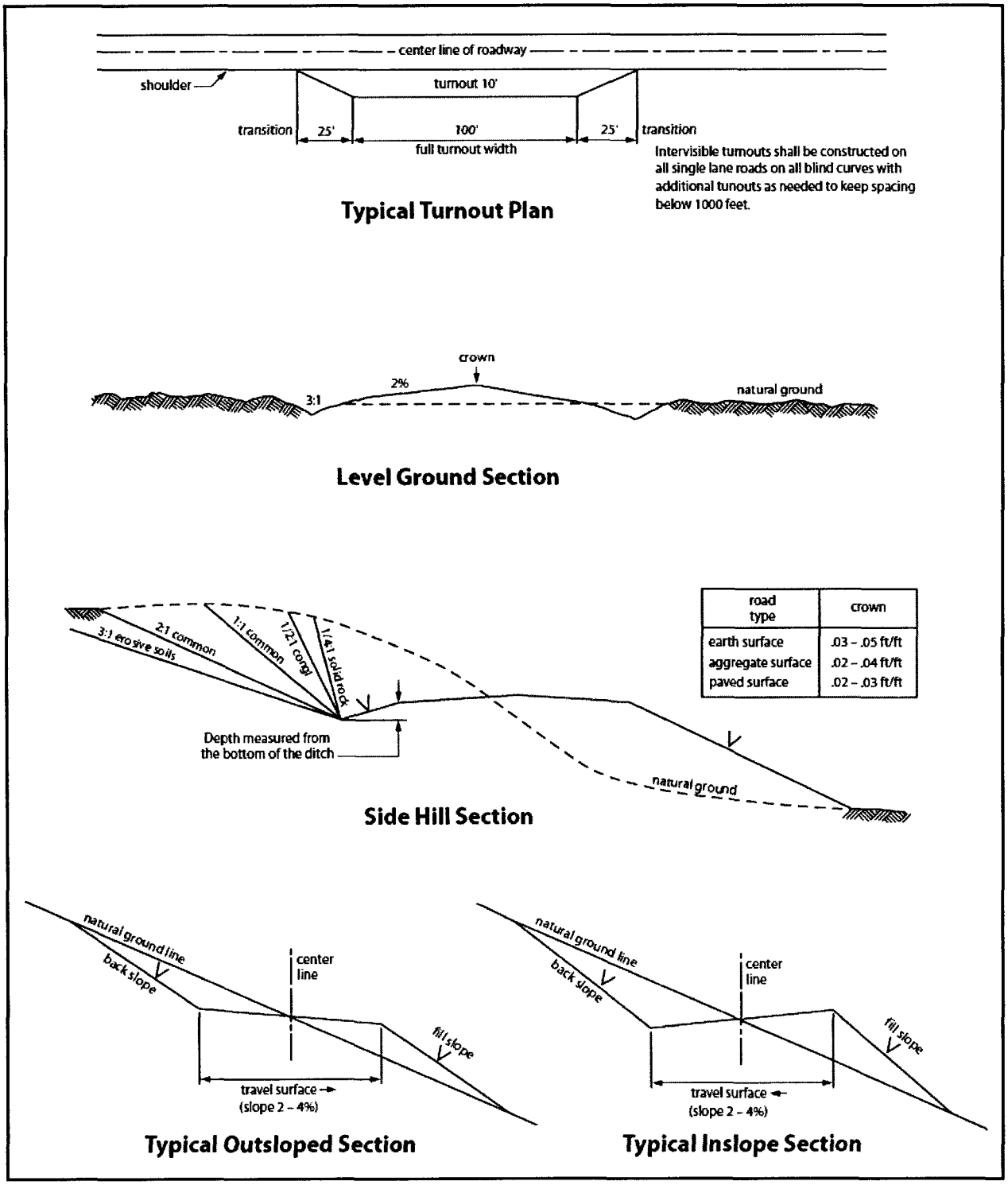


Figure 1. Cross-sections and plans for typical road sections representative of BLM resource or FS local and higher-class roads.

VII. PRODUCTION (POST DRILLING)

A. WELL STRUCTURES & FACILITIES

Placement of Production Facilities
Production facilities should be placed on the well pad to allow for maximum interim recontouring and revegetation of the well location.

Exclosure Netting (Open-top Tanks)
Immediately following active drilling or completion operations, the operator will take actions necessary to prevent wildlife and livestock access, including avian wildlife, to all open-topped tanks that contain or have the potential to contain salinity sufficient to cause harm to wildlife or livestock, hydrocarbons, or Resource Conservation and Recovery Act of 1976-exempt hazardous substances. At a minimum, the operator will net, screen, or cover open-topped tanks to exclude wildlife and livestock and prevent mortality. If the operator uses netting, the operator will cover and secure the open portion of the tank to prevent wildlife entry. The operator will net, screen, or cover the tanks until the operator removes the tanks from the location or the tanks no longer contain substances that could be harmful to wildlife or livestock. Use a maximum netting mesh size of 1 ½ inches. The netting must not be in contact with fluids and must not have holes or gaps.

Chemical and Fuel Secondary Containment and Exclosure Screening
The operator will prevent all hazardous, poisonous, flammable, and toxic substances from coming into contact with soil and water. At a minimum, the operator will install and maintain an impervious secondary containment system for any tank or barrel containing hazardous, poisonous, flammable, or toxic substances sufficient to contain the contents of the tank or barrel and any drips, leaks, and anticipated precipitation. The operator will dispose of fluids within the containment system that do not meet applicable state or U. S. Environmental Protection Agency livestock water standards in accordance with state law; the operator must not drain the fluids to the soil or ground. The operator will design, construct, and maintain all secondary containment systems to prevent wildlife and livestock exposure to harmful substances. At a minimum, the operator will install effective wildlife and livestock exclosure systems such as fencing, netting, expanded metal mesh, lids, and grate covers. Use a maximum netting mesh size of 1 ½ inches.

Open-Vent Exhaust Stack Exclosures
The operator will construct, modify, equip, and maintain all open-vent exhaust stacks on production equipment to prevent birds and bats from entering, and to discourage perching, roosting, and nesting. (*Recommended exclosure structures on open-vent exhaust stacks are in the shape of a cone.*) Production equipment includes, but may not be limited to, tanks, heater-treaters, separators, dehydrators, flare stacks, in-line units, and compressor mufflers.

Containment Structures

Proposed production facilities such as storage tanks and other vessels will have a secondary containment structure that is constructed to hold the capacity of 1.5 times the largest tank, plus freeboard to account for precipitation, unless more stringent protective requirements are deemed necessary.

Painting Requirement
All above-ground structures including meter housing that are not subject to safety requirements shall be painted a flat non-reflective paint color, **Shale Green** from the BLM Standard Environmental Color Chart (CC-001: June 2008).

B. PIPELINES

BURIED PIPELINE STIPULATIONS

A copy of the application (Grant, APD, or Sundry Notice) and attachments, including conditions of approval, survey plat and/or map, will be on location during construction. BLM personnel may request to you a copy of your permit during construction to ensure compliance with all stipulations.

Holder agrees to comply with the following stipulations to the satisfaction of the Authorized Officer:

1. The Holder shall indemnify the United States against any liability for damage to life or property arising from the occupancy or use of public lands under this grant.

2. The Holder shall comply with all applicable Federal laws and regulations existing or hereafter enacted or promulgated. In any event, the holder shall comply with the Toxic Substances Control Act of 1976 as amended, 15 USC 2601 et seq. (1982) with regards to any toxic substances that are used, generated by or stored on the right-of-way or on facilities authorized under this right-of-way grant. (See 40 CFR Part 702-799 and especially, provisions on polychlorinated biphenyls, 40 CFR 761.1-761.193.) Additionally, any release of toxic substances (leaks, spills, etc.) in excess of the reportable quantity established by 40 CFR Part 117 shall be reported as required by the Comprehensive Environmental Response, Compensation, and Liability Act, section 102b. A copy of any report required or requested by any Federal agency or State government as a result of a reportable release or spill of any toxic substances shall be furnished to the authorized officer concurrent with the filing of the reports to the involved Federal agency or State government.

3. The holder agrees to indemnify the United States against any liability arising from the release of any hazardous substance or hazardous waste (as these terms are defined in the Comprehensive Environmental Response, Compensation and Liability Act of 1980, 42 U.S.C. 9601, et seq. or the Resource Conservation and Recovery Act, 42 U.S.C.6901, et seq.) on the Right-of-Way (unless the release or threatened release is wholly unrelated to the Right-of-Way holder's activity on the Right-of-Way), or resulting from the activity of

the Right-of-Way holder on the Right-of-Way. This agreement applies without regard to whether a release is caused by the holder, its agent, or unrelated third parties.

4. If, during any phase of the construction, operation, maintenance, or termination of the pipeline, any oil or other pollutant should be discharged from the pipeline system, impacting Federal lands, the control and total removal, disposal, and cleaning up of such oil or other pollutant, wherever found, shall be the responsibility of holder, regardless of fault. Upon failure of holder to control, dispose of, or clean up such discharge on or affecting Federal lands, or to repair all damages resulting therefrom, on the Federal lands, the Authorized Officer may take such measures as he deems necessary to control and clean up the discharge and restore the area, including where appropriate, the aquatic environment and fish and wildlife habitats, at the full expense of the holder. Such action by the Authorized Officer shall not relieve holder of any responsibility as provided herein.

5. All construction and maintenance activity will be confined to the authorized right-of-way.

6. The pipeline will be buried with a minimum cover of **36** inches between the top of the pipe and ground level.

7. The maximum allowable disturbance for construction in this right-of-way will be **30** feet:

- Blading of vegetation within the right-of-way will be allowed: maximum width of blading operations will not exceed **20** feet. The trench is included in this area. (*Blading is defined as the complete removal of brush and ground vegetation.*)

- Clearing of brush species within the right-of-way will be allowed: maximum width of clearing operations will not exceed **30** feet. The trench and bladed area are included in this area. (*Clearing is defined as the removal of brush while leaving ground vegetation (grasses, weeds, etc.) intact. Clearing is best accomplished by holding the blade 4 to 6 inches above the ground surface.*)

- The remaining area of the right-of-way (if any) shall only be disturbed by compressing the vegetation. (*Compressing can be caused by vehicle tires, placement of equipment, etc.*)

8. The holder shall stockpile an adequate amount of topsoil where blading is allowed. The topsoil to be stripped is approximately 6 inches in depth. The topsoil will be segregated from other spoil piles from trench construction. The topsoil will be evenly distributed over the bladed area for the preparation of seeding.

9. The holder shall minimize disturbance to existing fences and other improvements on public lands. The holder is required to promptly repair improvements to at least their former state. Functional use of these improvements will be maintained at all times. The holder will contact the owner of any improvements prior to disturbing them. When necessary to pass through a fence line, the fence shall be braced on both sides of the passageway prior to cutting of the fence. No permanent gates will be allowed unless approved by the Authorized Officer.

10. Vegetation, soil, and rocks left as a result of construction or maintenance activity will be randomly scattered on this right-of-way and will not be left in rows, piles, or berms, unless otherwise approved by the Authorized Officer. The entire right-of-way shall be recontoured to match the surrounding landscape. The backfilled soil shall be compacted and a 6 inch berm will be left over the ditch line to allow for settling back to grade.

11. In those areas where erosion control structures are required to stabilize soil conditions, the holder will install such structures as are suitable for the specific soil conditions being encountered and which are in accordance with sound resource management practices.

12. The holder will reseed all disturbed areas. Seeding will be done according to the attached seeding requirements, using the following seed mix.

( ) seed mixture 1 ( ) seed mixture 3

() seed mixture 2 ( ) seed mixture 4

(X) seed mixture 2/LPC ( ) Aplomado Falcon Mixture

13. All above-ground structures not subject to safety requirements shall be painted by the holder to blend with the natural color of the landscape. The paint used shall be color which simulates "Standard Environmental Colors" – **Shale Green**, Munsell Soil Color No. 5Y 4/2.

14. The pipeline will be identified by signs at the point of origin and completion of the right-of-way and at all road crossings. At a minimum, signs will state the holder's name, BLM serial number, and the product being transported. All signs and information thereon will be posted in a permanent, conspicuous manner, and will be maintained in a legible condition for the life of the pipeline.

15. The holder shall not use the pipeline route as a road for purposes other than routine maintenance as determined necessary by the Authorized Officer in consultation with the holder before maintenance begins. The holder will take whatever steps are necessary to ensure that the pipeline route is not used as a roadway. As determined necessary during the life of the pipeline, the Authorized Officer may ask the holder to construct temporary deterrence structures.

16. Any cultural and/or paleontological resources (historic or prehistoric site or object) discovered by the holder, or any person working on his behalf, on public or Federal land shall be immediately reported to the Authorized Officer. Holder shall suspend all operations in the immediate area of such discovery until written authorization to proceed is issued by the Authorized Officer. An evaluation of the discovery will be made by the Authorized Officer to determine appropriate actions to prevent the loss of significant cultural or scientific values. The holder will be responsible for the cost of evaluation and any decision as to proper mitigation measures will be made by the Authorized Officer after consulting with the holder.

17. The operator shall be held responsible if noxious weeds become established within the areas of operations. Weed control shall be required on the disturbed land where noxious weeds exist, which includes associated roads, pipeline corridor and adjacent land affected by the establishment of weeds due to this action. The operator shall consult with the Authorized Officer for acceptable weed control methods, which include following EPA and BLM requirements and policies.

18. Escape Ramps - The operator will construct and maintain pipeline/utility trenches [that are not otherwise fenced, screened, or netted] to prevent livestock, wildlife, and humans from becoming entrapped. At a minimum, the operator will construct and maintain escape ramps, ladders, or other methods of avian and terrestrial wildlife escape in the trenches according to the following criteria:

a. Any trench left open for eight (8) hours or less is not required to have escape ramps; however, before the trench is backfilled, the contractor/operator shall inspect the trench for wildlife, remove all trapped wildlife, and release them at least 100 yards from the trench.
b. For trenches left open for eight (8) hours or more, earthen escape ramps (built at no more than a 30 degree slope and spaced no more than 500 feet apart) shall be placed in the trench.

19. Special Stipulations:

Lesser Prairie-Chicken

Oil and gas activities will not be allowed in lesser prairie-chicken habitat during the period from March 1st through June 15th annually. During that period, other activities

that produce noise or involve human activity, such as the maintenance of oil and gas facilities, geophysical exploration other than 3-D operations, and pipeline, road, and well pad construction, will be allowed except between 3:00 am and 9:00 am. The 3:00 am to 9:00 am restriction will not apply to normal, around-the-clock operations, such as venting, flaring, or pumping, which do not require a human presence during this period. Normal vehicle use on existing roads will not be restricted. Exhaust noise from pump jack engines must be muffled or otherwise controlled so as not to exceed 75 db measured at 30 ft. from the source of the noise.

C. ELECTRIC LINES

STANDARD STIPULATIONS FOR OVERHEAD ELECTRIC DISTRIBUTION LINES

A copy of the grant and attachments, including stipulations, survey plat and/or map, will be on location during construction. BLM personnel may request to you a copy of your permit during construction to ensure compliance with all stipulations.

Holder agrees to comply with the following stipulations to the satisfaction of the Authorized Officer:

1. The holder shall indemnify the United States against any liability for damage to life or property arising from the occupancy or use of public lands under this grant.

2. The holder shall comply with all applicable Federal laws and regulations existing or hereafter enacted or promulgated. In any event, the holder shall comply with the Toxic Substances Control Act of 1976 as amended, 15 USC 2601 et seq. (1982) with regards to any toxic substances that are used, generated by or stored on the right-of-way or on facilities authorized under this right-of-way grant. (See 40 CFR, Part 702-799 and especially, provisions on polychlorinated biphenyls, 40 CFR 761.1-761.193.) Additionally, any release of toxic substances (leaks, spills, etc.) in excess of the reportable quantity established by 40 CFR, Part 117 shall be reported as required by the Comprehensive Environmental Response, Compensation, and Liability Act, section 102b. A copy of any report required or requested by any Federal agency or State government as a result of a reportable release or spill of any toxic substances shall be furnished to the authorized officer concurrent with the filing of the reports to the involved Federal agency or State government.

3. The holder agrees to indemnify the United States against any liability arising from the release of any hazardous substance or hazardous waste (as these terms are defined in the Comprehensive Environmental Response, Compensation and Liability Act of 1980, 42 U.S.C. 9601, et seq. or the Resource Conservation and Recovery Act, 42 U.S.C. 6901, et seq.) on the Right-of-Way (unless the release or threatened release is wholly unrelated to the Right-of-Way holder's activity on the Right-of-Way), or resulting from the activity of the Right-of-Way holder on the Right-of-Way. This agreement applies without regard to whether a release is caused by the holder, its agent, or unrelated third parties.

4. There will be no clearing or blading of the right-of-way unless otherwise agreed to in writing by the Authorized Officer.

5. Power lines shall be constructed and designed in accordance to standards outlined in "Suggested Practices for Avian Protection on Power lines: The State of the Art in 2006" Edison Electric Institute, APLIC, and the California Energy Commission 2006 . The holder shall assume the burden and expense of proving that pole designs not shown in the above publication deter raptor perching, roosting, and nesting. Such proof shall be provided by a raptor expert approved by the Authorized Officer. The BLM reserves the right to require modification or additions to all powerline structures placed on this right-of-way, should they be necessary to ensure the safety of large perching birds. Such modifications and/or additions shall be made by the holder without liability or expense to the United States.

Raptor deterrence will consist of but not limited to the following: triangle perch discouragers shall be placed on each side of the cross arms and a nonconductive perching deterrence shall be placed on all vertical poles that extend past the cross arms.

6. The holder shall minimize disturbance to existing fences and other improvements on public lands. The holder is required to promptly repair improvements to at least their former state. Functional use of these improvements will be maintained at all times. The holder will contact the owner of any improvements prior to disturbing them. When necessary to pass through a fence line, the fence shall be braced on both sides of the passageway prior to cutting the fence. No permanent gates will be allowed unless approved by the Authorized Officer.

7. The BLM serial number assigned to this authorization shall be posted in a permanent, conspicuous manner where the power line crosses roads and at all serviced facilities. Numbers will be at least two inches high and will be affixed to the pole nearest the road crossing and at the facilities served.

8. Upon cancellation, relinquishment, or expiration of this grant, the holder shall comply with those abandonment procedures as prescribed by the Authorized Officer.

9. All surface structures (poles, lines, transformers, etc.) shall be removed within 180 days of abandonment, relinquishment, or termination of use of the serviced facility or facilities or within 180 days of abandonment, relinquishment, cancellation, or expiration of this grant, whichever comes first. This will not apply where the power line extends service to an active, adjoining facility or facilities.

10. Any cultural and/or paleontological resource (historic or prehistoric site or object) discovered by the holder, or any person working on his behalf, on public or Federal land shall be immediately reported to the Authorized Officer. Holder shall suspend all operations in the immediate area of such discovery until written authorization to proceed is issued by the Authorized Officer. An evaluation of the discovery will be made by the Authorized Officer to determine appropriate actions to prevent the loss of significant

cultural or scientific values. The holder will be responsible for the cost of evaluation and any decision as to proper mitigation measures will be made by the Authorized Officer after consulting with the holder.

11. Special Stipulations:
    - For reclamation remove poles, lines, transformer, etc. and dispose of properly.
    - Fill in any holes from the poles removed.

Timing Limitation Stipulation/Condition of Approval for Lesser Prairie-Chicken: Oil and gas activities including 3-D geophysical exploration, and drilling will not be allowed in lesser prairie-chicken habitat during the period from March 1st through June 15th annually. During that period, other activities that produce noise or involve human activity, such as the maintenance of oil and gas facilities, geophysical exploration other than 3-D operations, and pipeline, road, and well pad construction, will be allowed except between 3:00 am and 9:00 am. The 3:00 am to 9:00 am restriction will not apply to normal, around-the-clock operations, such as venting, flaring, or pumping, which do not require a human presence during this period. Additionally, no new drilling will be allowed within up to 200 meters of leks known at the time of permitting. Normal vehicle use on existing roads will not be restricted. Exhaust noise from pump jack engines must be muffled or otherwise controlled so as not to exceed 75 db measured at 30 ft. from the source of the noise.

Dunes Sagebrush Lizard Trenching Monitor Stipulation

- Pre-construction contact with a BLM wildlife biologist is required 5 days prior to any ground disturbing activities associated with the project occurs.

- Successful completion of the BLM Trench Stipulation Workshop is required for a non-agency person to be approved as a monitor.

- Any trench left open for (8) hours or less is not required to have escape ramps; however, before the trench is backfilled, an agency approved monitor shall walk the entire length of the open trench and remove all trapped vertebrates. The bottom surface of the trench will be disturbed a minimum of 2 inches in order to arouse any buried vertebrates. All vertebrates will be released a minimum of 100 yards from the trench.

- For trenches left open for eight (8) hours or more the following requirements apply:

    - Earthen escape ramps and/or structures (built at no more than a 30 degree slope and spaced no more than 500 feet apart) shall be placed in the

trench. Metal structures will not be authorized. Options will be discussed in detail at the required Trench Stipulation Workshop.

- One approved monitor shall be required to survey up to three miles of trench between the hours of 11 AM-2 PM. A daily report (consolidate if there is more than one monitor) on the vertebrates found and removed from the trench shall be provided to the BLM (email/fax is acceptable) the following morning.
- Prior to backfilling of the trench all structures used as escape ramps will be removed and the bottom surface of the trench will be disturbed a minimum of 2 inches in order to arouse any buried vertebrates. All vertebrates will be released a minimum of 100 yards from the trench.

- This stipulation shall apply to the entire length of the project in the DSL habitat polygon regardless of land ownership or CCA/CCAA enrollment status.

- A project closeout will be required within three business days of the completion of the project.

VIII. INTERIM RECLAMATION

During the life of the development, all disturbed areas not needed for active support of production operations should undergo interim reclamation in order to minimize the environmental impacts of development on other resources and uses.

Within six (6) months of well completion, operators should work with BLM surface management specialists (Jim Amos: 575-234-5909) to devise the best strategies to reduce the size of the location. Interim reclamation should allow for remedial well operations, as well as safe and efficient removal of oil and gas.

During reclamation, the removal of caliche is important to increasing the success of revegetating the site. Removed caliche that is free of contaminants may be used for road repairs, fire walls or for building other roads and locations. In order to operate the well or complete workover operations, it may be necessary to drive, park and operate on restored interim vegetation within the previously disturbed area. Disturbing revegetated areas for production or workover operations will be allowed. If there is significant disturbance and loss of vegetation, the area will need to be revegetated. Communicate with the appropriate BLM office for any exceptions/exemptions if needed.

All disturbed areas after they have been satisfactorily prepared need to be reseeded with the seed mixture provided below.

Upon completion of interim reclamation, the operator shall submit a Sundry Notices and Reports on Wells, Subsequent Report of Reclamation (Form 3160-5).

IX. FINAL ABANDONMENT & RECLAMATION

At final abandonment, well locations, production facilities, and access roads must undergo "final" reclamation so that the character and productivity of the land are restored.

Earthwork for final reclamation must be completed within six (6) months of well plugging. All pads, pits, facility locations and roads must be reclaimed to a satisfactory revegetated, safe, and stable condition, unless an agreement is made with the landowner or BLM to keep the road and/or pad intact.

After all disturbed areas have been satisfactorily prepared, these areas need to be revegetated with the seed mixture provided below. Seeding should be accomplished by drilling on the contour whenever practical or by other approved methods. Seeding may need to be repeated until revegetation is successful, as determined by the BLM.

Operators shall contact a BLM surface protection specialist prior to surface abandonment operations for site specific objectives (Jim Amos: 575-234-5909).

Below Ground-level Abandoned Well Marker to avoid raptor perching: Upon the plugging and subsequent abandonment of the well, the well marker will be installed at ground level on a plate containing the pertinent information for the plugged well.

Seed Mixture for LPC Sand/Shinnery Sites

Holder shall seed all disturbed areas with the seed mixture listed below. The seed mixture shall be planted in the amounts specified in pounds of pure live seed (PLS)* per acre. There shall be no primary or secondary noxious weeds in the seed mixture. Seed will be tested and the viability testing of seed shall be done in accordance with State law(s) and within nine (9) months prior to purchase. Commercial seed shall be either certified or registered seed. The seed container shall be tagged in accordance with State law(s) and available for inspection by the Authorized Officer.

Seed will be planted using a drill equipped with a depth regulator to ensure proper depth of planting where drilling is possible. The seed mixture will be evenly and uniformly planted over the disturbed area (smaller/heavier seeds have a tendency to drop the bottom of the drill and are planted first). Holder shall take appropriate measures to ensure this does not occur. Where drilling is not possible, seed will be broadcast and the area shall be raked or chained to cover the seed. When broadcasting the seed, the pounds per acre are to be doubled. Seeding shall be repeated until a satisfactory stand is established as determined by the Authorized Officer. Evaluation of growth may not be made before completion of at least one full growing season after seeding.

Species to be planted in pounds of pure live seed* per acre:

Species	lb/acre
Plains Bristlegrass	5lbs/A
Sand Bluestem	5lbs/A
Little Bluestem	3lbs/A
Big Bluestem	6lbs/A
Plains Coreopsis	2lbs/A
Sand Dropseed	1lbs/A

*Pounds of pure live seed:

Pounds of seed **x** percent purity **x** percent germination = pounds pure live seed

AFMSS

U.S. Department of the Interior
BUREAU OF LAND MANAGEMENT

Operator Certification Data Report

09/07/2017

Operator Certification

I hereby certify that I, or someone under my direct supervision, have inspected the drill site and access route proposed herein; that I am familiar with the conditions which currently exist; that I have full knowledge of state and Federal laws applicable to this operation; that the statements made in this APD package are, to the best of my knowledge, true and correct; and that the work associated with the operations proposed herein will be performed in conformity with this APD package and the terms and conditions under which it is approved. I also certify that I, or the company I represent, am responsible for the operations conducted under this application. These statements are subject to the provisions of 18 U.S.C. 1001 for the filing of false statements.

NAME: Sorina Flores **Signed on:** 09/02/2016

Title: Supv of Drilling Services

Street Address: 303 Veterans Airpark Ln #1000

City: Midland **State:** TX **Zip:** 79705

Phone: (432)818-1167

Email address: sorina.flores@apachecorp.com

Field Representative

Representative Name:

Street Address:

City: **State:** **Zip:**

Phone:

Email address:

AFMSS

U.S. Department of the Interior
BUREAU OF LAND MANAGEMENT

Application Data Report
09/07/2017

APD ID: 10400003537
Submission Date: 09/02/2016
Operator Name: APACHE CORPORATION
Well Name: THUNDERBIRD A
Well Number: 5H
Well Type: OIL WELL
Well Work Type: Drill

Highlighted data reflects the most recent changes

Show Final Text

Section 1 - General

APD ID: 10400003537
Tie to previous NOS? 10400001686
Submission Date: 09/02/2016
BLM Office: CARLSBAD
User: Sorina Flores
Title: Supv of Drilling Services
Federal/Indian APD: FED
Is the first lease penetrated for production Federal or Indian? FED
Lease number: NMLC060325
Lease Acres: 639.09
Surface access agreement in place?
Allotted?
Reservation:
Agreement in place? NO
Federal or Indian agreement:
Agreement number:
Agreement name:
Keep application confidential? NO
Permitting Agent? NO
APD Operator: APACHE CORPORATION
Operator letter of designation:

Operator Info

Operator Organization Name: APACHE CORPORATION
Operator Address: 303 Veterans Airpark Lane #1000
Zip: 79705
Operator PO Box:
Operator City: Midland
State: TX
Operator Phone: (432)818-1000
Operator Internet Address:

Section 2 - Well Information

Well in Master Development Plan? NO
Mater Development Plan name:
Well in Master SUPO? NO
Master SUPO name:
Well in Master Drilling Plan? NO
Master Drilling Plan name:
Well Name: THUNDERBIRD A
Well Number: 5H
Well API Number:
Field/Pool or Exploratory? Field and Pool
Field Name: YESO
Pool Name: LOCO HILLS; GLORIETA-YESO
Is the proposed well in an area containing other mineral resources? NATURAL GAS,OIL,POTASH

Operator Name: APACHE CORPORATION

Well Name: THUNDERBIRD A **Well Number:** 5H

Describe other minerals:

Is the proposed well in a Helium production area? N **Use Existing Well Pad?** NO **New surface disturbance?**

Type of Well Pad: MULTIPLE WELL **Multiple Well Pad Name:** PAD 2 **Number:** 5H

Well Class: HORIZONTAL **Number of Legs:** 1

Well Work Type: Drill

Well Type: OIL WELL

Describe Well Type:

Well sub-Type: DELINEATION

Describe sub-type:

Distance to town: 5.4 Miles **Distance to nearest well:** 350 FT **Distance to lease line:** 2373 FT

Reservoir well spacing assigned acres Measurement: 279.64 Acres

Well plat: Plat_REV2_Thunderbird A 5H_Nad83_09-15-2016.pdf

Well work start Date: 12/01/2016 **Duration:** 42 DAYS

Section 3 - Well Location Table

Survey Type: RECTANGULAR

Describe Survey Type:

Datum: NAD83 **Vertical Datum:** NAVD88

Survey number:

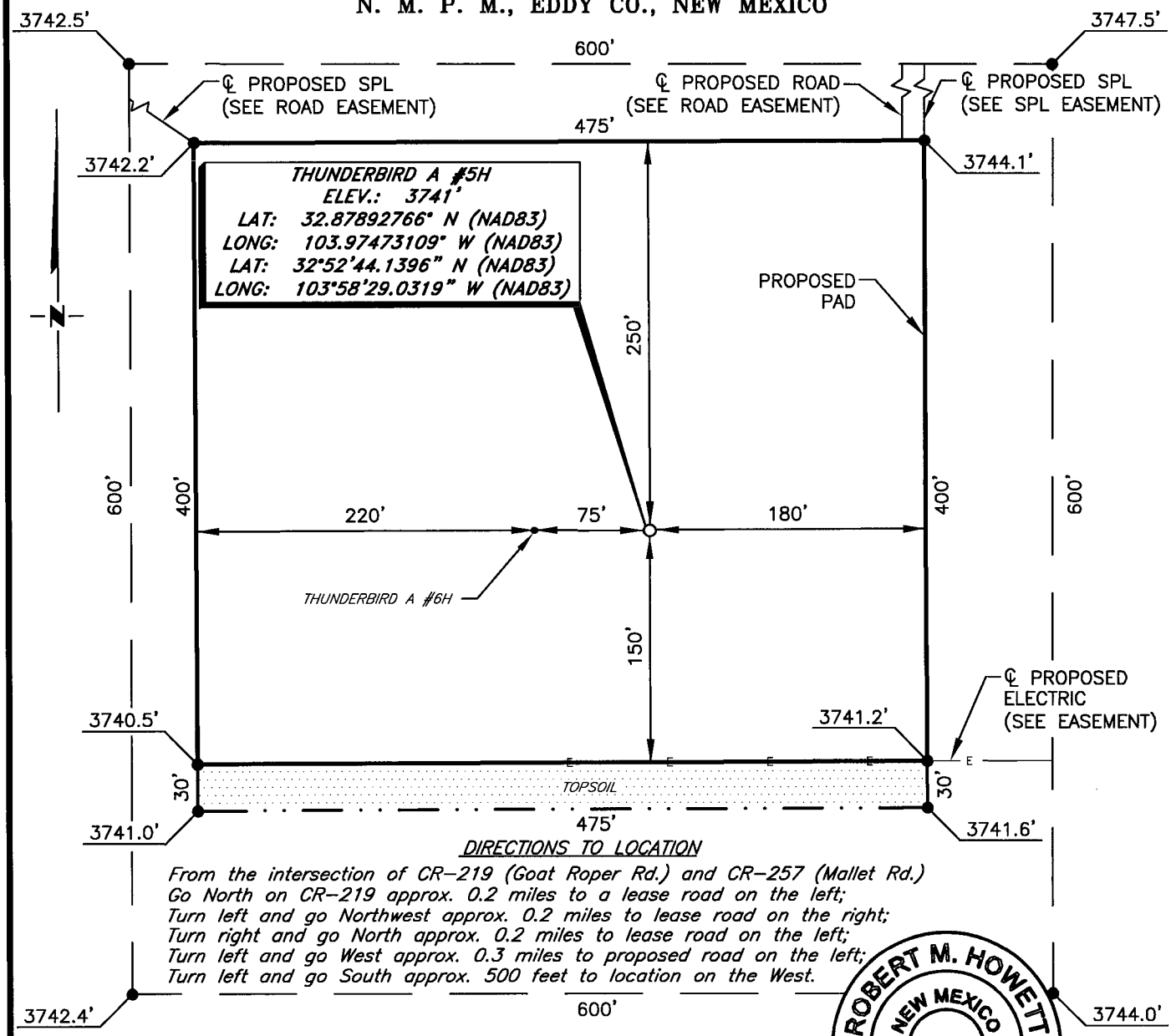
	NS-Foot	NS Indicator	EW-Foot	EW Indicator	Twsp	Range	Section	Aliquot/Lot/Tract	Latitude	Longitude	County	State	Meridian	Lease Type	Lease Number	Elevation	MD	TVD
SHL Leg #1	2315	FNL	1955	FEL	16S	30E	33	Aliquot SWNE	32.8789277	-103.9747311	EDDY	NEW MEXICO	NEW MEXICO	F	NMLC060325	3741	0	0
KOP Leg #1	2315	FNL	1955	FEL	16S	30E	33	Aliquot SWNE	32.8789277	-103.9747311	EDDY	NEW MEXICO	NEW MEXICO	F	NMNM 02425	-453	4194	4194
PPP Leg #1	2374	FNL	1970	FEL	16S	30E	33	Aliquot SWNE	32.8787667	-103.9747793	EDDY	NEW MEXICO	NEW MEXICO	F	NMNM 02425	-686	4437	4427

Operator Name: APACHE CORPORATION

Well Name: THUNDERBIRD A **Well Number:** 5H

	NS-Foot	NS Indicator	EW-Foot	EW Indicator	Twsp	Range	Section	Aliquot/Lot/Tract	Latitude	Longitude	County	State	Meridian	Lease Type	Lease Number	Elevation	MD	TVD
EXIT Leg #1	330	FSL	2159	FEL	16S	30E	4	Aliquot SWSE	32.8572043	-103.9753887	EDDY	NEW MEXICO	NEW MEXICO	F	NMLC060325	-974	12329	4715
BHL Leg #1	330	FSL	2159	FEL	16S	30E	4	Aliquot SWSE	32.8572043	-103.9753887	EDDY	NEW MEXICO	NEW MEXICO	F	NMLC060325	-974	12329	4715

APACHE CORPORATION
THUNDERBIRD A #5H
(2315' FNL & 1955' FEL)
SECTION 33, T16S, R30E
N. M. P. M., EDDY CO., NEW MEXICO



DIRECTIONS TO LOCATION

From the intersection of CR-219 (Goat Roper Rd.) and CR-257 (Mallet Rd.)
Go North on CR-219 approx. 0.2 miles to a lease road on the left;
Turn left and go Northwest approx. 0.2 miles to lease road on the right;
Turn right and go North approx. 0.2 miles to lease road on the left;
Turn left and go West approx. 0.3 miles to proposed road on the left;
Turn left and go South approx. 500 feet to location on the West.

SCALE: 1" = 100'
0 50 100

BEARINGS ARE
NAD 83 GRID - NM EAST
DISTANCES ARE
GROUND.

ROBERT M. HOWETT
NEW MEXICO
19680
6/17/16
PROFESSIONAL SURVEYOR

Firm No.: TX 10193838 NM 4655451

NO.	REVISION	DATE

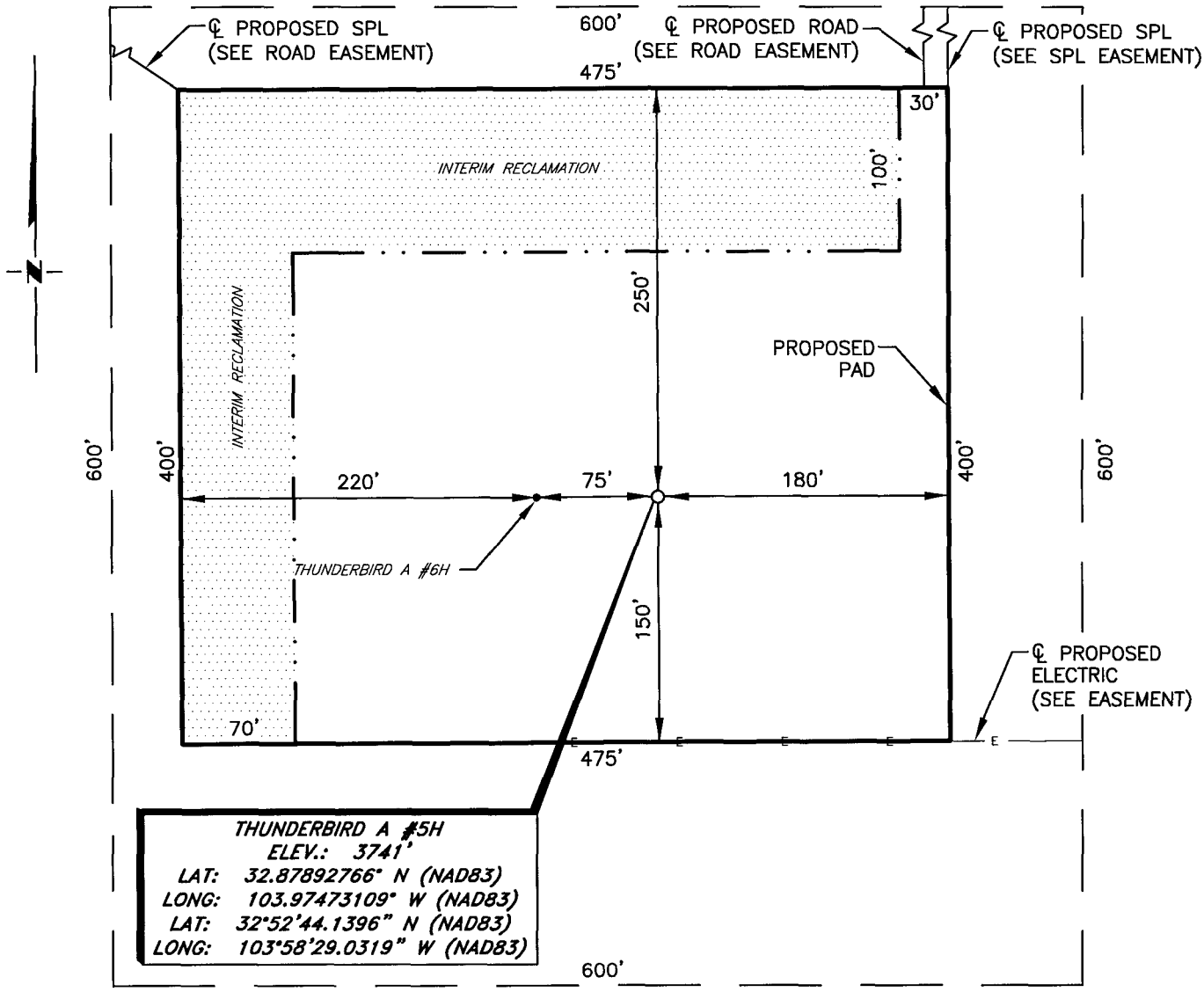
JOB NO.: LS1605195
DWG. NO.: 1605195PAD

RRC

308 W. BROADWAY ST., HOBBS, NM 88240 (575) 964-8200

SCALE: 1" = 100'
DATE: 6-01-2016
SURVEYED BY: BC/HD
DRAWN BY: RMH
APPROVED BY: RMH
SHEET : 1 OF 1

APACHE CORPORATION
INTERIM RECLAMATION
THUNDERBIRD A #5H
(2315' FNL & 1955' FEL)
SECTION 33, T16S, R30E
N. M. P. M., EDDY CO., NEW MEXICO



SCALE: 1" = 100'
0 50 100

BEARINGS ARE
NAD 83 GRID – NM EAST
DISTANCES ARE
GROUND.

DIRECTIONS TO LOCATION

From the intersection of CR–219 (Goat Roper Rd.) and CR–257 (Mallet Rd.)
Go North on CR–219 approx. 0.2 miles to a lease road on the left;
Turn left and go Northwest approx. 0.2 miles to lease road on the right;
Turn right and go North approx. 0.2 miles to lease road on the left;
Turn left and go West approx. 0.3 miles to proposed road on the left;
Turn left and go South approx. 500 feet to location on the West.

Firm No.: TX 10193838 NM 4655451

NO.	REVISION	DATE

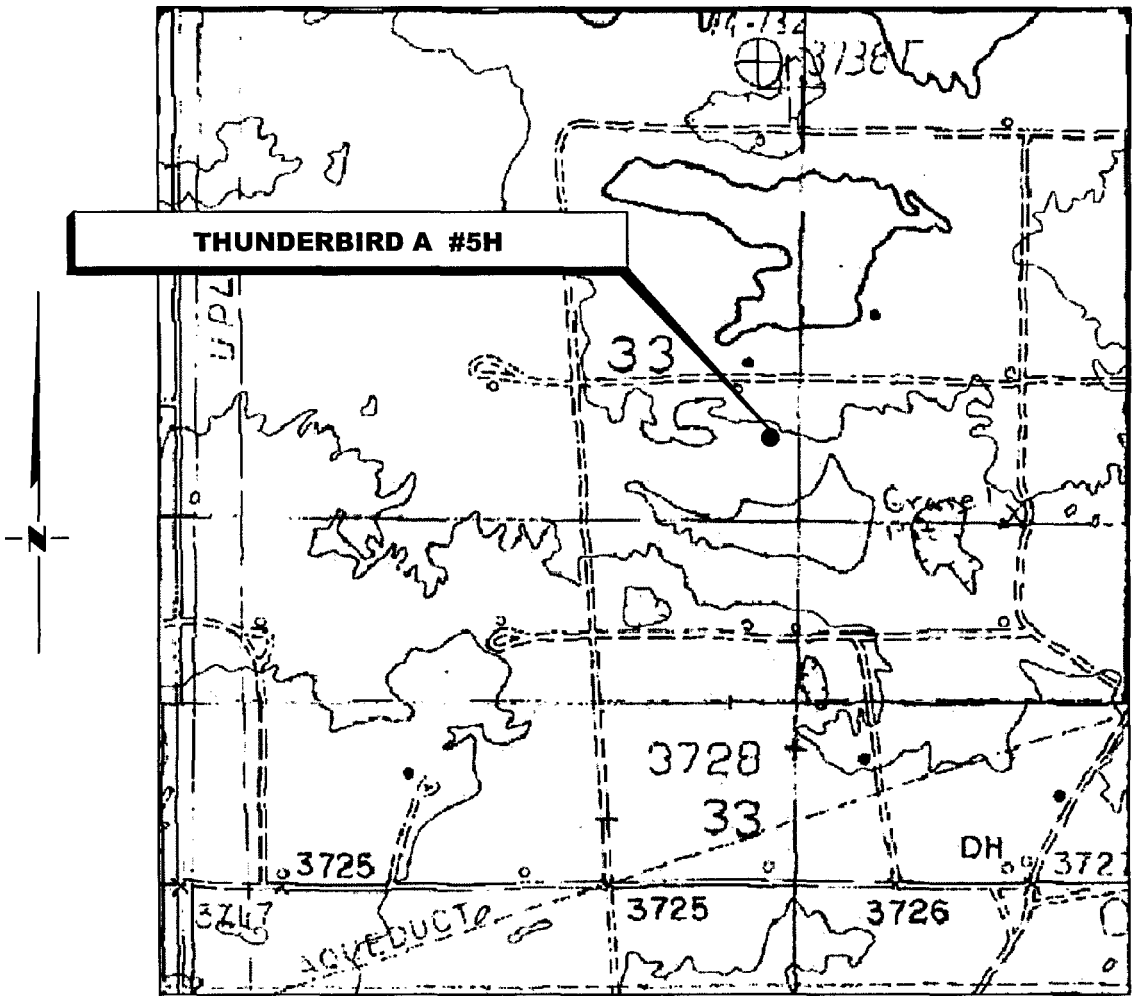
JOB NO.: LS1605195
DWG. NO.: 1605195REC

RRC

308 W. BROADWAY ST., HOBBS, NM 88240 (575) 964–8200

SCALE: 1" = 100'
DATE: 6–01–2016
SURVEYED BY: BC/HD
DRAWN BY: RMH
APPROVED BY: RMH
SHEET : 1 OF 1

LOCATION VERIFICATION MAP



SECTION 33, TWP. 16 SOUTH, RGE. 30 EAST,
N. M. P. M., EDDY CO., NEW MEXICO

OPERATOR: Apache Corporation
LEASE: Thunderbird A
WELL NO.: 5H
ELEVATION: 3741'

LOCATION: 2315' FNL & 1955' FEL
CONTOUR INTERVAL: 10'
USGS TOPO. SOURCE MAP:
Henshaw Tank, NM (P. E. 1985)

NO.	REVISION	DATE

JOB NO.: LS1605195
DWG. NO.: 1605195LVM

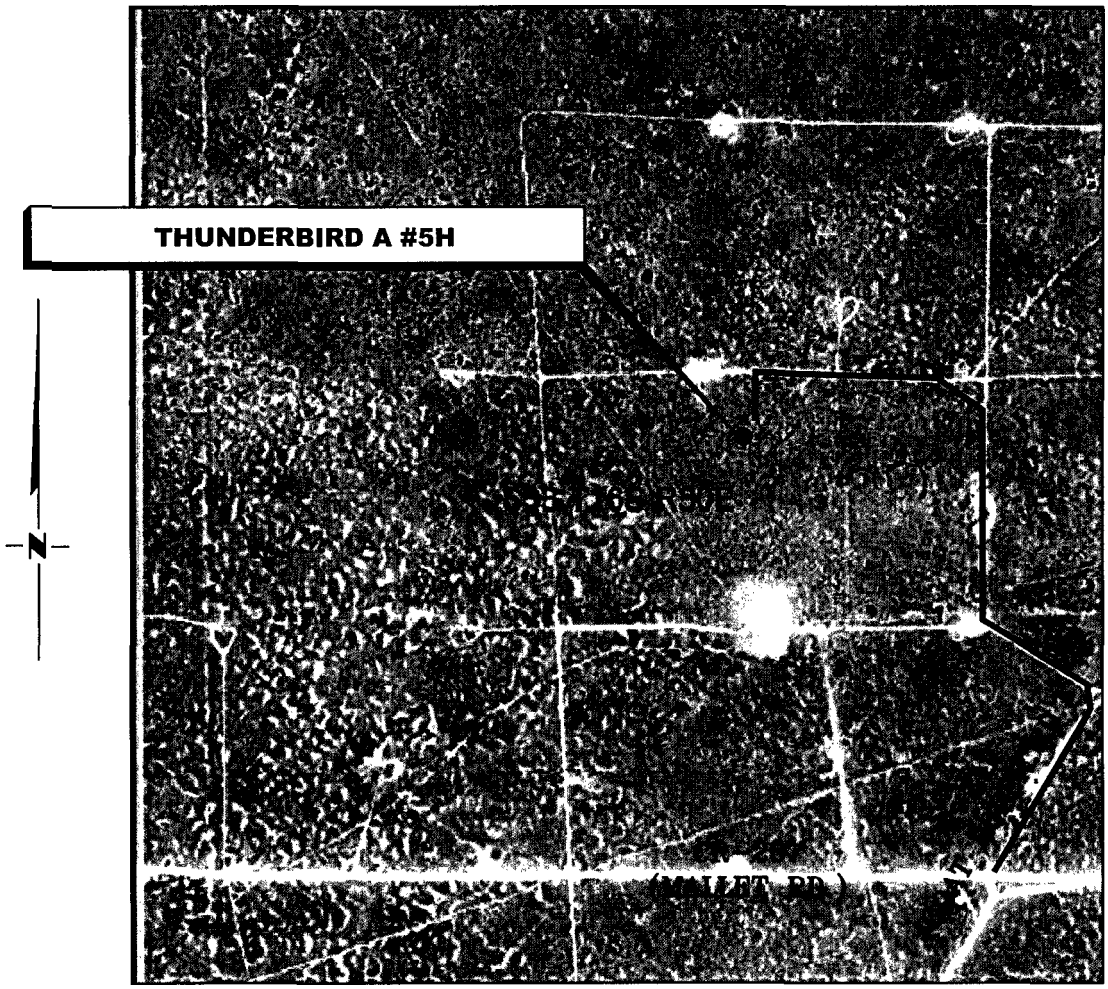
RRC

308 W. BROADWAY ST., HOBBS, NM 88240 (575) 964-8200

SCALE: 1" = 1000'
DATE: 6-01-2016
SURVEYED BY: BC/HD
DRAWN BY: LPS
APPROVED BY: RMH
SHEET : 1 OF 1

VICINITY MAP

NOT TO SCALE



SECTION 33, TWP. 16 SOUTH, RGE. 30 EAST,
N. M. P. M., EDDY CO., NEW MEXICO

OPERATOR: Apache Corporation
LEASE: Thunderbird A
WELL NO.: 5H

LOCATION: 2315' FNL & 1955' FEL
ELEVATION: 3741'

NO.	REVISION	DATE

JOB NO.: LS1605195
DWG. NO.: 1605195VM

RRC

308 W. BROADWAY ST., HOBBS, NM 88240 (575) 964-8200

SCALE: NTS
DATE: 6-01-2016
SURVEYED BY: BC/HD
DRAWN BY: LPS
APPROVED BY: RMH
SHEET : 1 OF 1

APD ID: 10400003537 **Submission Date:** 09/02/2016

Operator Name: APACHE CORPORATION

Well Name: THUNDERBIRD A **Well Number:** 5H

Well Type: OIL WELL **Well Work Type:** Drill

Highlighted data reflects the most recent changes

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Section 1 - Geologic Formations

Formation ID	Formation Name	Elevation	True Vertical Depth	Measured Depth	Lithologies	Mineral Resources	Producing Formation
17746	RUSTLER	3351	390	390		POTASH	No
17718	TOP SALT	3224	517	517		POTASH	No
17722	BASE OF SALT	2571	1170	1170		NATURAL GAS,OIL	No
17694	YATES	2409	1332	1332		NATURAL GAS	No
15319	SEVEN RIVERS	2149	1592	1592		NATURAL GAS,OIL	No
15318	QUEEN	1550	2191	2191		NATURAL GAS,OIL	No
17683	GRAYBURG	1120	2621	2621		NATURAL GAS,OIL	No
15314	SAN ANDRES	798	2943	2943		NATURAL GAS,OIL	No
17701	GLORIETA	-633	4374	4374		NATURAL GAS,OIL	Yes
17700	PADDOCK	-686	4427	4427		NATURAL GAS,OIL	Yes
15342	BLINEBRY	-1171	4912	4912		NATURAL GAS,OIL	Yes
17685	TUBB	-2011	5752	5752		NONE	No

Section 2 - Blowout Prevention

Pressure Rating (PSI): 3M **Rating Depth:** 6818

Equipment: Rotating Head, Mud Gas Separator, Blow Down Pit, Flare Line, Ignitor

Requesting Variance? NO

Variance request:

Testing Procedure: BOP/BOPE will be tested by independent service company to 250psi low & high pressure indicated above per Onshore Order 2 requirements. System may be upgraded to higher pressure but sill tested to WP listed . If system is upgraded, all components installed will be functional & tested. Pipe rams will be operationally checked each 24 hr period.

Blind rams will be operationally checked on each TOOH. These checks will be noted on daily tour sheets. Other accessories to BOP equipment will include Kelly cock & floor safety valve (inside BOP), choke lines & choke manifold. (see attached schematic)

Choke Diagram Attachment:

BOP_3M_2M_Annular_Manifold_Schematic_09-15-2016.pdf

BOP Diagram Attachment:

BOP_3M_2M_Inst on Surf_Manifold_Schem_09-15-2016.pdf

Section 3 - Casing

Casing ID	String Type	Hole Size	Csg Size	Condition	Standard	Tapered String	Top Set MD	Bottom Set MD	Top Set TVD	Bottom Set TVD	Top Set MSL	Bottom Set MSL	Calculated casing length MD	Grade	Weight	Joint Type	Collapse SF	Burst SF	Joint SF Type	Joint SF	Body SF Type	Body SF
1	SURFACE	17.5	13.375	NEW	API	N	0	400	0	400	-974	-1374	400	H-40	48	STC	4.12	1.44	BUOY	2.07	BUOY	3.47
2	INTERMEDIATE	12.25	9.625	NEW	API	N	0	3200	0	3200	-974	-4174	3200	J-55	36	LTC	2.22	2.19	BUOY	2.07	BUOY	2.56
3	PRODUCTION	8.5	7.0	NEW	API	N	0	4194	0	4194	-974	-5168	4194	L-80	29	LTC	3.48	1.4	BUOY	2.61	BUOY	2.98
4	OTHER	8.5	5.5	NEW	API	Y	4194	12392	4194	4715	-5168	-5689	8198	L-80	17	LTC	2.77	1.16	BUOY	1.81	BUOY	2.1

Casing Attachments

Casing ID: 1 **String Type:** SURFACE

Inspection Document:

Spec Document:

Tapered String Spec:

Casing Design Assumptions and Worksheet(s):

Thunderbird 5H Csg Design Assumptions_09-15-2016.pdf

Operator Name: APACHE CORPORATION

Well Name: THUNDERBIRD A **Well Number:** 5H

Casing Attachments

Casing ID: 2 **String Type:** INTERMEDIATE

Inspection Document:

Spec Document:

Tapered String Spec:

Casing Design Assumptions and Worksheet(s):

Thunderbird 5H Csg Design Assumptions_09-15-2016.pdf

Casing ID: 3 **String Type:** PRODUCTION

Inspection Document:

Spec Document:

Tapered String Spec:

Casing Design Assumptions and Worksheet(s):

Thunderbird 5H Csg Design Assumptions_09-15-2016.pdf

Casing ID: 4 **String Type:** OTHER - Tapered Production String

Inspection Document:

Spec Document:

Tapered String Spec:

Thunderbird5HProdCsgTaperedStringSpec_09-15-2016.pdf

Casing Design Assumptions and Worksheet(s):

Thunderbird 5H Csg Design Assumptions_09-15-2016.pdf

Section 4 - Cement

Operator Name: APACHE CORPORATION

Well Name: THUNDERBIRD A **Well Number:** 5H

String Type	Lead/Tail	Stage Tool Depth	Top MD	Bottom MD	Quantity(sx)	Yield	Density	Cu Ft	Excess%	Cement type	Additives
OTHER	Lead	4194	0	0	0	0	0	0	0	0	0
SURFACE	Lead		0	400	342	1.33	14.8	454.86	50	Class C	1% Calcium Chloride
INTERMEDIATE	Lead		0	2275	497	1.84	12.9	914.48	30	Class C	5% Salt + 6% Bentonite + 1#/sk Kolseal + 0.125#/sk Celloflake
INTERMEDIATE	Tail		2275	3200	300	1.32	14.8	396	30	Class C	0.1% Retarder
PRODUCTION	Lead	4194	0	2337	198	1.97	12.6	390.06	25	Class C	5% Salt + 6% Bentonite
PRODUCTION	Tail		2337	4194	210	302.4	13	302.4	25	TXI Lite	3% Gas Migration Expansion Additive + 0.3% Fluid Loss Agent + 1.5% Sodium Metasilicate

Section 5 - Circulating Medium

Mud System Type: Closed

Will an air or gas system be Used? NO

Description of the equipment for the circulating system in accordance with Onshore Order #2:

Diagram of the equipment for the circulating system in accordance with Onshore Order #2:

Describe what will be on location to control well or mitigate other conditions: BOP, Choke Manifold, Gas Buster, Blow Down Pit, Flare Line with Igniter, Pre-Mix Pit, Rotating Head

Describe the mud monitoring system utilized: PVT/Pason/Visual Monitoring

Circulating Medium Table

Top Depth	Bottom Depth	Mud Type	Min Weight (lbs/gal)	Max Weight (lbs/gal)	Density (lbs/cu ft)	Gel Strength (lbs/100 sqft)	PH	Viscosity (CP)	Salinity (ppm)	Filtration (cc)	Additional Characteristics
0	400	SPUD MUD	8.3	9							

Operator Name: APACHE CORPORATION

Well Name: THUNDERBIRD A **Well Number:** 5H

Top Depth	Bottom Depth	Mud Type	Min Weight (lbs/gal)	Max Weight (lbs/gal)	Density (lbs/cu ft)	Gel Strength (lbs/100 sqft)	PH	Viscosity (CP)	Salinity (ppm)	Filtration (cc)	Additional Characteristics
3200	4715	OTHER : Cut Brine	8.6	9.5							
400	3200	SALT SATURATED	9.8	10.5							

Section 6 - Test, Logging, Coring

List of production tests including testing procedures, equipment and safety measures:

If drill stem tests are performed, Onshore Order 2.III.D shall be followed. Apache will core approx. 900 feet, between depths of 4300' - 5200'

List of open and cased hole logs run in the well:

CALIPER,CBL,CDL,CNL,DS,DLL,GR,MWD,MUDLOG,OTH,SONIC,TL

Other log type(s):

Logs to be run in Pilot Hole: Nuclear Magnetic Resonance (NMR), Resistivity and Sonic Formation Imaging Tools, Formation Pressure Tester (MDT) ; Shuttle Logs to be run in Lateral include: Gamma; Dual lateral log, Sonic, Resistivity Formation Imaging Tools, Neutron & Density

Coring operation description for the well:

Whole core will be taken from 4,300' - 5,200' TVD - approx. 900'.

Section 7 - Pressure

Anticipated Bottom Hole Pressure: 2075 **Anticipated Surface Pressure:** 1037.7

Anticipated Bottom Hole Temperature(F): 113

Anticipated abnormal pressures, temperatures, or potential geologic hazards? NO

Describe:

Contingency Plans geoharzards description:

Contingency Plans geohazards attachment:

Hydrogen Sulfide drilling operations plan required? YES

Hydrogen sulfide drilling operations plan:

H2S Drlg Ops_Contg Plan_Well Contg Plan_09-15-2016.pdf

Operator Name: APACHE CORPORATION

Well Name: THUNDERBIRD A **Well Number:** 5H

Section 8 - Other Information

Proposed horizontal/directional/multi-lateral plan submission:

DirPlan_Thunderbird A 5H_09-15-2016.pdf

Other proposed operations facets description:

Other proposed operations facets attachment:

Interm2 StgCmtConting_ThunderbirdA5H_09-15-2016.pdf

Other Variance attachment:

APACHE BOP AND CHOKE MANIFOLD SCHEMATIC

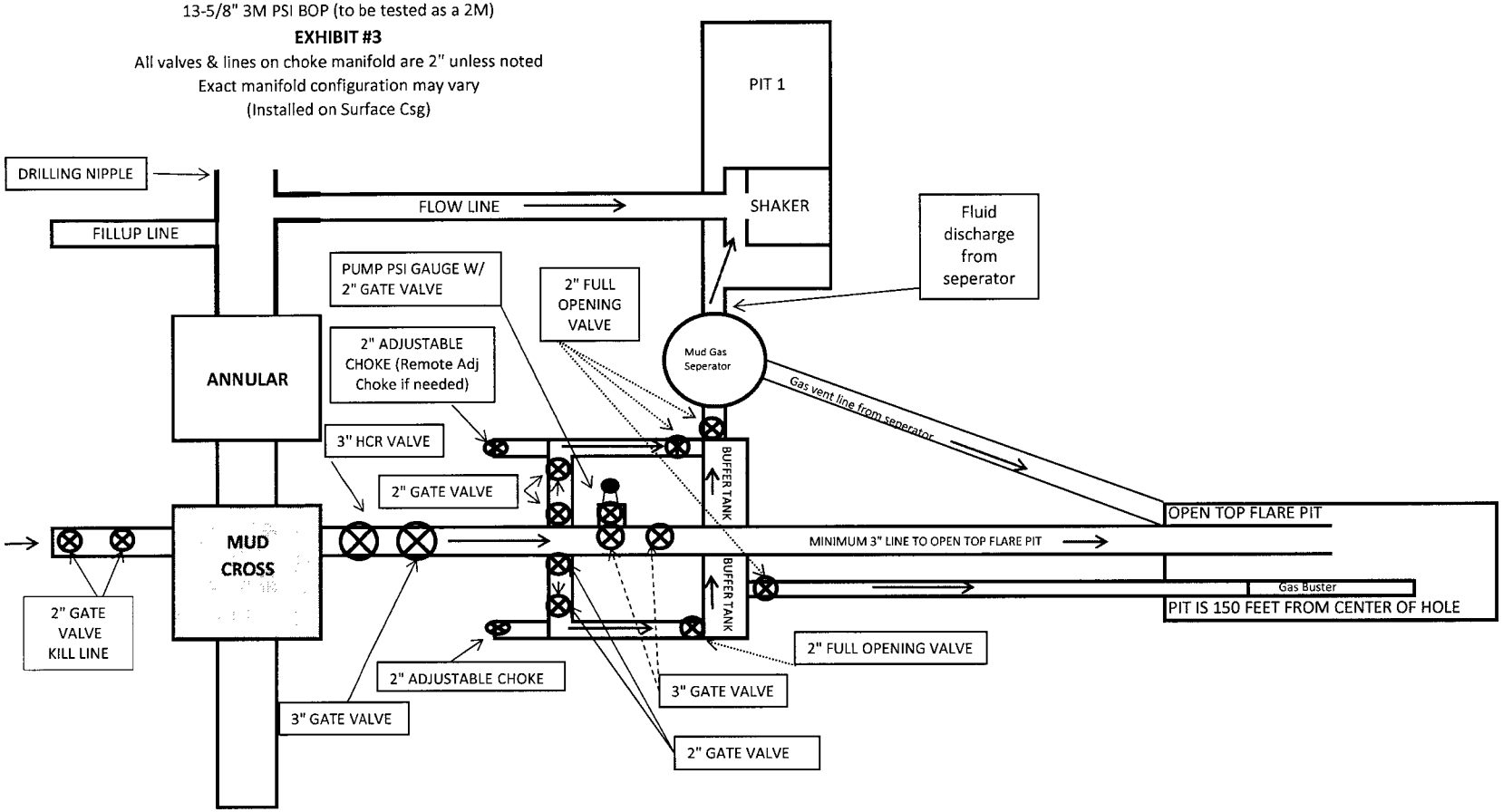
13-5/8" 3M PSI BOP (to be tested as a 2M)

EXHIBIT #3

All valves & lines on choke manifold are 2" unless noted

Exact manifold configuration may vary

(Installed on Surface Csg)



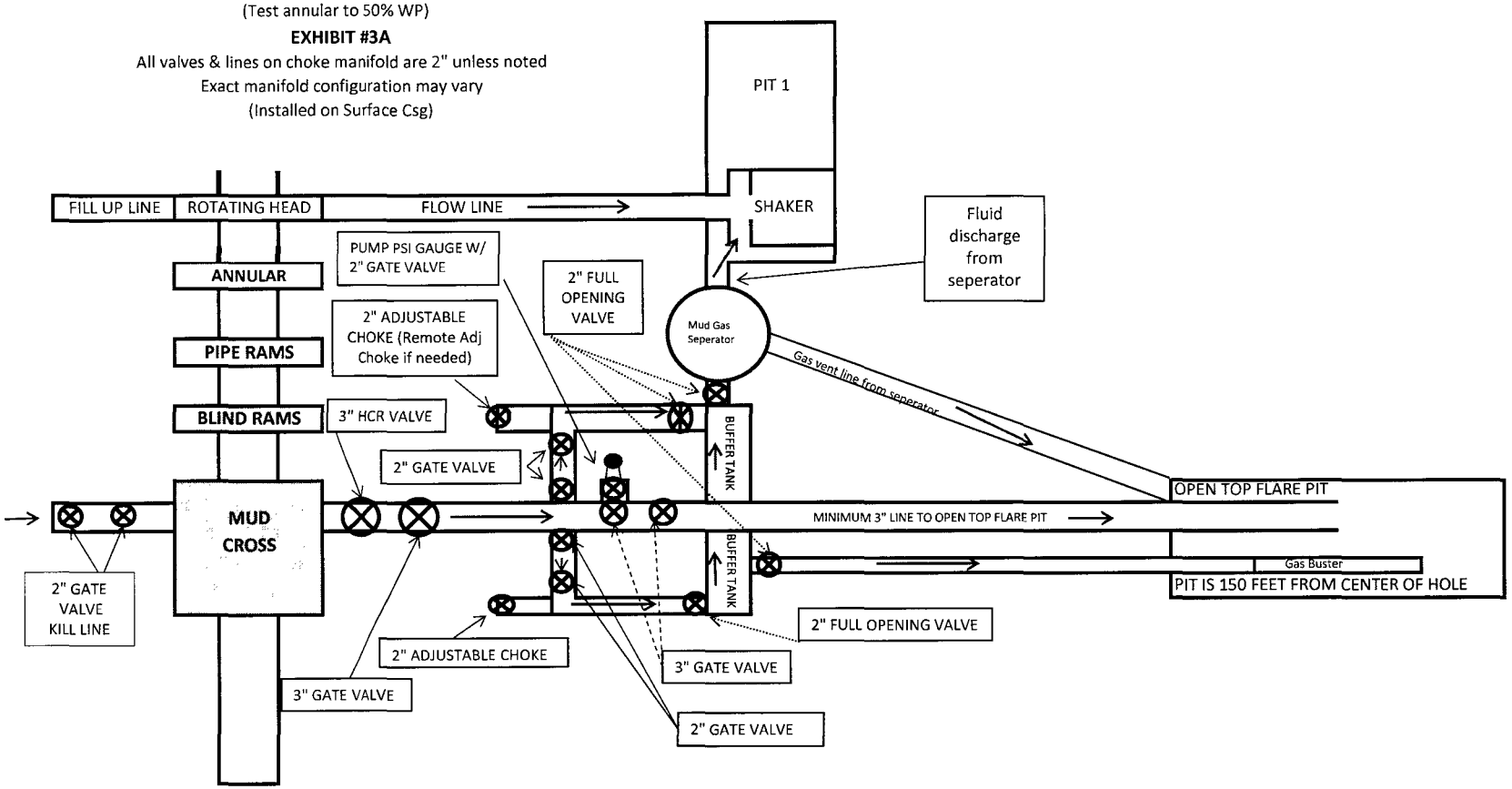
*** If H2S is encountered in quantities greater than 100ppm, Apache will shut in well & install a remote operated choke ***

APACHE BOP AND CHOKE MANIFOLD SCHEMATIC

13-5/8" 3M PSI BOP (to be tested as a 2M)
(Test annular to 50% WP)

EXHIBIT #3A

All valves & lines on choke manifold are 2" unless noted
Exact manifold configuration may vary
(Installed on Surface Csg)



*** If H2S is encountered in quantities greater than 100ppm, Apache will shut in well & install a remote operated choke ***

Thunderbird 5H Production Casing Tapered String Specs

String	OD/Weight/Grade	Connection	MD Interval (ft)	Minimum Safety Factor (Abs)		
				Burst	Collapse	Axial
Production Casing	7", 29.000 ppf, L-80	LTC, L-80	0-4194.0	1.4	3.48	2.61
	5 1/2", 17.000 ppf, L-80	LTC, L-80	4194.0-12392.40	1.16	2.77	1.81

*This will have an open hole completion consisting of open hole hydraulic packers and sliding sleeves attached to the 5-1/2" casing. 5-1/2" will crossover to 7" where a DV tool will be placed at the bottom of the 7" (KOP @ ~4194'). The 5-1/2" casing will be uncemented and the 7" from the DV tool to surface will be cemented.

Production Casing Loads

Burst Loads

Internal Profile

Drilling Loads

- Pressure Test
  - 6500 psi with 8.33 ppg fresh water
- Green Cement Pressure Test
  - 2000 psi put on casing when bumping the plug with 8.33 ppg displacement fresh water at the DV Tool located at kick off point

Production Loads

- Tubing Leak
  - Packer Fluid Density at 8.6 ppg
  - Packer Depth of 4150'
  - Perf Depth at 12392' MD
  - Gas/Oil Gradient 0.35 psi/ft
  - Reservoir pressure at 2072 psi
- Injection Down Casing
  - Injection pressure of 6500 psi
  - Injection density of 9.0 ppg

External Profile

- Fluid Gradients w/ Pore Pressure
  - 9.2 ppg mud weight above TOC
  - 8.33 ppg below TOC
  - Pore pressure applied in the openhole

Collapse Loads

Internal Profile

Drilling Loads

- Cementing
  - Mud weight at shoe is 9.2 ppg
  - TOC at surface
  - Lead Slurry Density is 12.6 ppg
  - Tail Slurry Density is 13.0 ppg
  - Tail Slurry Length at 1000'.
  - Displacement fluid density is 8.33 ppg

Production Loads

- Full Evacuation
- Above/Below Packer
  - Reservoir pressure at 2075 psi
  - Density Above Packer at 8.6 ppg
  - Density Below Packer at 6.0 ppg
  - Assuming a fluid drop above the packer

External Profile

- Fluid Gradients w/ Pore Pressure
  - Fluid Gradient Above TOC is 9.2 ppg
  - Fluid Gradient Below TOC is 9.2 ppg

Axial Loads

- Average Running in hole speed at 2.0 ft/s
- Overpull of 100,000 lbf
- 2000 psi Green Cement Pressure Test
- Service Loads from Burst and Collapse

Thunderbird 5H Casing Design Assumptions

Pore Pressure

Vertical Depth (ft)	Pore Pressure/EMW		Permeable Zones
Depth (ft)	(psi)	(ppg)	Zones
11	5	8.33	No
300	130	8.33	No
1300	563	8.33	No
2900	1261	8.37	No
3500	1527	8.4	No
4436	1950	8.46	No

Fracture Pressure

Vertical Depth (ft)	Fracture Pressure/EMW	
Depth (ft)	(psi)	(ppg)
11	5	9
100	52	10
360	215	11.5
1343	872	12.5
2203	1488	13
2953	2071	13.5
4383	3188	14
4436	3226	14

Temperature Gradient

Ambient Temperature is 80° F

Temperature gradient of 0.7°/100' TVD

Analysis Options

- Single External Pressure Profile
- Temperature Deration
- Buckling

Surface Casing Loads

Burst Loads

Internal Profile

Drilling Loads

- Fracture @ Shoe w/ Gas Gradient Above
  - No margin of error on frac gradient
  - Using a 0.7 ppg gas gradient
- Lost Returns with Water
  - No margin of error on frac gradient
  - Mud/Water Interface at 400'
  - Mud weight with losses at 10.2 ppg
- Pressure Test
  - 1200 psi casing pressure test with 8.33 ppg fresh water
- Green Cement Pressure Test
  - 650 psi put on casing when bumping the plug with 8.33 ppg displacement fresh water

External Profile

- Mud and Cement Mix-Water
  - TOC at surface
  - Mud weight is 8.6 ppg
  - Cement Mix-Water Density is 8.33 ppg

Collapse Loads

Internal Profile

Drilling Loads

- Partial Evacuation
  - 50% evacuation. Top of mud level at 200'.
  - Mud Weight is 8.6 ppg
- Lost Returns with Mud Drop
  - Losses occurring at 3200'
  - Pore Pressure at 8.33 ppg
  - Current Mud Weight at 10.2 ppg
  - Mud level drops to 587'

- Cementing
  - Single Slurry at 14.8 ppg
  - TOC at surface
  - Mud Weight at shoe 8.6 ppg
  - Displacement fluid density at 8.33 ppg

External Profile

- Fluid Gradients w/ Pore Pressure
  - Fluid Gradient Above TOC is 8.6 ppg
  - Fluid Gradient Below TOC is 8.6 ppg

Axial Loads

- Average Running in hole speed at 2.0 ft/s
- Overpull of 100,000 lbf
- 650 psi Green Cement Pressure Test
- Service Loads from Burst and Collapse

Intermediate Casing Loads

Burst Loads

Internal Profile

Drilling Loads

- Gas Kick Profile
  - 50 bbl kick volume
  - 0.5 ppg kick intensity
  - 9.2 ppg max mud weight
  - 0.7 ppg kick gas gravity
  - No margin of error on frac gradient
  - 5" DP OD
  - 600' of 6.5" Drill Collars
- Lost Returns with Water
  - No margin of error on frac gradient
  - Mud/Water Interface at 3200'
  - Mud weight with losses at 9.2 ppg
- Pressure Test
  - 1500 psi casing pressure test with 8.33 ppg fresh water
- Green Cement Pressure Test
  - 1600 psi put on casing when bumping the plug with 8.33 ppg displacement fresh water

External Profile

- Mud and Cement Mix-Water
  - TOC at surface
  - Mud weight is 10.2 ppg
  - Cement Mix-Water Density is 8.33 ppg

Collapse Loads

Internal Profile

Drilling Loads

- Partial Evacuation
  - 50% evacuation. Top of mud level at 1600'.
  - Mud Weight is 10.2 ppg
- Lost Returns with Mud Drop
  - Losses occurring at 12392' MD
  - Pore Pressure at 8.33 ppg
  - Current Mud Weight at 9.2 ppg
  - Mud level drops to 446'
- Cementing
  - Lead Slurry Density at 12.9 ppg
  - Tail Slurry Density at 14.8 ppg
  - Tail Slurry Length of 500'
  - TOC at surface
  - Mud Weight at shoe 10.2 ppg
  - Displacement fluid density at 8.33 ppg

External Profile

- Fluid Gradients w/ Pore Pressure
  - Fluid Gradient Above TOC is 10.2 ppg
  - Fluid Gradient Below TOC is 10.2 ppg

Axial Loads

- Average Running in hole speed at 2.0 ft/s
- Overpull of 100,000 lbf
- 1600 psi Green Cement Pressure Test
- Service Loads from Burst and Collapse

Production Casing Loads

Burst Loads

Internal Profile

Drilling Loads

- Pressure Test
  - 6500 psi with 8.33 ppg fresh water
- Green Cement Pressure Test
  - 2000 psi put on casing when bumping the plug with 8.33 ppg displacement fresh water at the DV Tool located at kick off point

Production Loads

- Tubing Leak
  - Packer Fluid Density at 8.6 ppg
  - Packer Depth of 4150'
  - Perf Depth at 12392' MD
  - Gas/Oil Gradient 0.35 psi/ft
  - Reservoir pressure at 2072 psi
- Injection Down Casing
  - Injection pressure of 6500 psi
  - Injection density of 9.0 ppg

External Profile

- Fluid Gradients w/ Pore Pressure
  - 9.2 ppg mud weight above TOC
  - 8.33 ppg below TOC
  - Pore pressure applied in the openhole

Collapse Loads

Internal Profile

Drilling Loads

- Cementing
  - Mud weight at shoe is 9.2 ppg
  - TOC at surface
  - Lead Slurry Density is 12.6 ppg
  - Tail Slurry Density is 13.0 ppg
  - Tail Slurry Length at 1000'.
  - Displacement fluid density is 8.33 ppg

Production Loads

- Full Evacuation
- Above/Below Packer
  - Reservoir pressure at 2075 psi
  - Density Above Packer at 8.6 ppg
  - Density Below Packer at 6.0 ppg
  - Assuming a fluid drop above the packer

External Profile

- Fluid Gradients w/ Pore Pressure
  - Fluid Gradient Above TOC is 9.2 ppg
  - Fluid Gradient Below TOC is 9.2 ppg

Axial Loads

- Average Running in hole speed at 2.0 ft/s
- Overpull of 100,000 lbf
- 2000 psi Green Cement Pressure Test
- Service Loads from Burst and Collapse

Thunderbird 5H Casing Design Assumptions

Pore Pressure

Vertical Depth (ft)	Pore Pressure/EMW		Permeable Zones
Depth (ft)	(psi)	(ppg)	Zones
11	5	8.33	No
300	130	8.33	No
1300	563	8.33	No
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4436	1950	8.46	No

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Vertical Depth (ft)	Fracture Pressure/EMW	
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4436	3226	14

Temperature Gradient

Ambient Temperature is 80° F

Temperature gradient of 0.7°/100' TVD

Analysis Options

- Single External Pressure Profile
- Temperature Deration
- Buckling

Surface Casing Loads

Burst Loads

Internal Profile

Drilling Loads

- Fracture @ Shoe w/ Gas Gradient Above
  - No margin of error on frac gradient
  - Using a 0.7 ppg gas gradient
- Lost Returns with Water
  - No margin of error on frac gradient
  - Mud/Water Interface at 400'
  - Mud weight with losses at 10.2 ppg
- Pressure Test
  - 1200 psi casing pressure test with 8.33 ppg fresh water
- Green Cement Pressure Test
  - 650 psi put on casing when bumping the plug with 8.33 ppg displacement fresh water

External Profile

- Mud and Cement Mix-Water
  - TOC at surface
  - Mud weight is 8.6 ppg
  - Cement Mix-Water Density is 8.33 ppg

Collapse Loads

Internal Profile

Drilling Loads

- Partial Evacuation
  - 50% evacuation. Top of mud level at 200'.
  - Mud Weight is 8.6 ppg
- Lost Returns with Mud Drop
  - Losses occurring at 3200'
  - Pore Pressure at 8.33 ppg
  - Current Mud Weight at 10.2 ppg
  - Mud level drops to 587'

- Cementing
  - Single Slurry at 14.8 ppg
  - TOC at surface
  - Mud Weight at shoe 8.6 ppg
  - Displacement fluid density at 8.33 ppg

External Profile

- Fluid Gradients w/ Pore Pressure
  - Fluid Gradient Above TOC is 8.6 ppg
  - Fluid Gradient Below TOC is 8.6 ppg

Axial Loads

- Average Running in hole speed at 2.0 ft/s
- Overpull of 100,000 lbf
- 650 psi Green Cement Pressure Test
- Service Loads from Burst and Collapse

Intermediate Casing Loads

Burst Loads

Internal Profile

Drilling Loads

- Gas Kick Profile
  - 50 bbl kick volume
  - 0.5 ppg kick intensity
  - 9.2 ppg max mud weight
  - 0.7 ppg kick gas gravity
  - No margin of error on frac gradient
  - 5" DP OD
  - 600' of 6.5" Drill Collars
- Lost Returns with Water
  - No margin of error on frac gradient
  - Mud/Water Interface at 3200'
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  - Losses occurring at 12392' MD
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  - Lead Slurry Density at 12.9 ppg
  - Tail Slurry Density at 14.8 ppg
  - Tail Slurry Length of 500'
  - TOC at surface
  - Mud Weight at shoe 10.2 ppg
  - Displacement fluid density at 8.33 ppg

External Profile

- Fluid Gradients w/ Pore Pressure
  - Fluid Gradient Above TOC is 10.2 ppg
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Axial Loads

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Production Casing Loads

Burst Loads

Internal Profile

Drilling Loads

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- Tubing Leak
  - Packer Fluid Density at 8.6 ppg
  - Packer Depth of 4150'
  - Perf Depth at 12392' MD
  - Gas/Oil Gradient 0.35 psi/ft
  - Reservoir pressure at 2072 psi
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  - Injection pressure of 6500 psi
  - Injection density of 9.0 ppg

External Profile

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  - Pore pressure applied in the openhole

Collapse Loads

Internal Profile

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- Full Evacuation
- Above/Below Packer
  - Reservoir pressure at 2075 psi
  - Density Above Packer at 8.6 ppg
  - Density Below Packer at 6.0 ppg
  - Assuming a fluid drop above the packer

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Thunderbird 5H Casing Design Assumptions

Pore Pressure

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Depth (ft)	(psi)	(ppg)	Zones
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Ambient Temperature is 80° F

Temperature gradient of 0.7°/100' TVD

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External Profile

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  - Fluid Gradient Above TOC is 8.6 ppg
  - Fluid Gradient Below TOC is 8.6 ppg

Axial Loads

- Average Running in hole speed at 2.0 ft/s
- Overpull of 100,000 lbf
- 650 psi Green Cement Pressure Test
- Service Loads from Burst and Collapse

Intermediate Casing Loads

Burst Loads

Internal Profile

Drilling Loads

- Gas Kick Profile
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  - 9.2 ppg max mud weight
  - 0.7 ppg kick gas gravity
  - No margin of error on frac gradient
  - 5" DP OD
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Production Casing Loads

Burst Loads

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External Profile

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Collapse Loads

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  - Tail Slurry Length at 1000'.
  - Displacement fluid density is 8.33 ppg

Production Loads

- Full Evacuation
- Above/Below Packer
  - Reservoir pressure at 2075 psi
  - Density Above Packer at 8.6 ppg
  - Density Below Packer at 6.0 ppg
  - Assuming a fluid drop above the packer

External Profile

- Fluid Gradients w/ Pore Pressure
  - Fluid Gradient Above TOC is 9.2 ppg
  - Fluid Gradient Below TOC is 9.2 ppg

Axial Loads

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Thunderbird 5H Casing Design Assumptions

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Fracture Pressure

Vertical Depth (ft)	Fracture Pressure/EMW	
Depth (ft)	(psi)	(ppg)
11	5	9
100	52	10
360	215	11.5
1343	872	12.5
2203	1488	13
2953	2071	13.5
4383	3188	14
4436	3226	14

Temperature Gradient

Ambient Temperature is 80° F

Temperature gradient of 0.7°/100' TVD

Analysis Options

- Single External Pressure Profile
- Temperature Deration
- Buckling

Surface Casing Loads

Burst Loads

Internal Profile

Drilling Loads

- Fracture @ Shoe w/ Gas Gradient Above
  - No margin of error on frac gradient
  - Using a 0.7 ppg gas gradient
- Lost Returns with Water
  - No margin of error on frac gradient
  - Mud/Water Interface at 400'
  - Mud weight with losses at 10.2 ppg
- Pressure Test
  - 1200 psi casing pressure test with 8.33 ppg fresh water
- Green Cement Pressure Test
  - 650 psi put on casing when bumping the plug with 8.33 ppg displacement fresh water

External Profile

- Mud and Cement Mix-Water
  - TOC at surface
  - Mud weight is 8.6 ppg
  - Cement Mix-Water Density is 8.33 ppg

Collapse Loads

Internal Profile

Drilling Loads

- Partial Evacuation
  - 50% evacuation. Top of mud level at 200'.
  - Mud Weight is 8.6 ppg
- Lost Returns with Mud Drop
  - Losses occurring at 3200'
  - Pore Pressure at 8.33 ppg
  - Current Mud Weight at 10.2 ppg
  - Mud level drops to 587'

- Cementing
  - Single Slurry at 14.8 ppg
  - TOC at surface
  - Mud Weight at shoe 8.6 ppg
  - Displacement fluid density at 8.33 ppg

External Profile

- Fluid Gradients w/ Pore Pressure
  - Fluid Gradient Above TOC is 8.6 ppg
  - Fluid Gradient Below TOC is 8.6 ppg

Axial Loads

- Average Running in hole speed at 2.0 ft/s
- Overpull of 100,000 lbf
- 650 psi Green Cement Pressure Test
- Service Loads from Burst and Collapse

Intermediate Casing Loads

Burst Loads

Internal Profile

Drilling Loads

- Gas Kick Profile
  - 50 bbl kick volume
  - 0.5 ppg kick intensity
  - 9.2 ppg max mud weight
  - 0.7 ppg kick gas gravity
  - No margin of error on frac gradient
  - 5" DP OD
  - 600' of 6.5" Drill Collars
- Lost Returns with Water
  - No margin of error on frac gradient
  - Mud/Water Interface at 3200'
  - Mud weight with losses at 9.2 ppg
- Pressure Test
  - 1500 psi casing pressure test with 8.33 ppg fresh water
- Green Cement Pressure Test
  - 1600 psi put on casing when bumping the plug with 8.33 ppg displacement fresh water

External Profile

- Mud and Cement Mix-Water
  - TOC at surface
  - Mud weight is 10.2 ppg
  - Cement Mix-Water Density is 8.33 ppg

Collapse Loads

Internal Profile

Drilling Loads

- Partial Evacuation
  - 50% evacuation. Top of mud level at 1600'.
  - Mud Weight is 10.2 ppg
- Lost Returns with Mud Drop
  - Losses occurring at 12392' MD
  - Pore Pressure at 8.33 ppg
  - Current Mud Weight at 9.2 ppg
  - Mud level drops to 446'
- Cementing
  - Lead Slurry Density at 12.9 ppg
  - Tail Slurry Density at 14.8 ppg
  - Tail Slurry Length of 500'
  - TOC at surface
  - Mud Weight at shoe 10.2 ppg
  - Displacement fluid density at 8.33 ppg

External Profile

- Fluid Gradients w/ Pore Pressure
  - Fluid Gradient Above TOC is 10.2 ppg
  - Fluid Gradient Below TOC is 10.2 ppg

Axial Loads

- Average Running in hole speed at 2.0 ft/s
- Overpull of 100,000 lbf
- 1600 psi Green Cement Pressure Test
- Service Loads from Burst and Collapse

Production Casing Loads

Burst Loads

Internal Profile

Drilling Loads

- Pressure Test
  - 6500 psi with 8.33 ppg fresh water
- Green Cement Pressure Test
  - 2000 psi put on casing when bumping the plug with 8.33 ppg displacement fresh water at the DV Tool located at kick off point

Production Loads

- Tubing Leak
  - Packer Fluid Density at 8.6 ppg
  - Packer Depth of 4150'
  - Perf Depth at 12392' MD
  - Gas/Oil Gradient 0.35 psi/ft
  - Reservoir pressure at 2072 psi
- Injection Down Casing
  - Injection pressure of 6500 psi
  - Injection density of 9.0 ppg

External Profile

- Fluid Gradients w/ Pore Pressure
  - 9.2 ppg mud weight above TOC
  - 8.33 ppg below TOC
  - Pore pressure applied in the openhole

Collapse Loads

Internal Profile

Drilling Loads

- Cementing
  - Mud weight at shoe is 9.2 ppg
  - TOC at surface
  - Lead Slurry Density is 12.6 ppg
  - Tail Slurry Density is 13.0 ppg
  - Tail Slurry Length at 1000'.
  - Displacement fluid density is 8.33 ppg

Production Loads

- Full Evacuation
- Above/Below Packer
  - Reservoir pressure at 2075 psi
  - Density Above Packer at 8.6 ppg
  - Density Below Packer at 6.0 ppg
  - Assuming a fluid drop above the packer

External Profile

- Fluid Gradients w/ Pore Pressure
  - Fluid Gradient Above TOC is 9.2 ppg
  - Fluid Gradient Below TOC is 9.2 ppg

Axial Loads

- Average Running in hole speed at 2.0 ft/s
- Overpull of 100,000 lbf
- 2000 psi Green Cement Pressure Test
- Service Loads from Burst and Collapse

HYDROGEN SULFIDE (H_2S) DRILLING OPERATIONS PLAN

Hydrogen Sulfide Training:

All regularly assigned personnel, contracted or employed by Apache Corporation will receive training from qualified instructor(s) in the following areas prior to commencing drilling possible hydrogen sulfide bearing formations in this well:

- The hazards and characteristics of hydrogen sulfide (H_2S)
- The proper use and maintenance of personal protective equipment and life support systems.
- The proper use of H_2S detectors, alarms, warning systems, briefing area, evacuation procedures & prevailing winds.
- The proper techniques for first aid and rescue procedures.

Supervisory personnel will be trained in the following areas:

- The effects of H_2S on metal components. If high tensile tubulars are to be utilized, personnel will be trained in their special maintenance requirements.
- Corrective action & shut-in procedures when drilling or reworking a well & blowout prevention / well control procedures.
- The contents and requirements of the H_2S Drilling Operations Plan

There will be an initial training session just prior to encountering a known or probable H_2S zone (within 3 days or 500') and weekly H_2S and well control drills for all personnel in each crew. The initial training session shall include a review of the site specific H_2S Drilling Operations Plan and the Public Protection Plan. This plan shall be available at the well site. All personnel will be required to carry documentation that they have received proper training.

H_2S SAFETY EQUIPMENT AND SYSTEMS:

Well Control Equipment that will be available & installed if H_2S is encountered:

- Flare Line with electronic igniter or continuous pilot.
- Choke manifold with a minimum of one remote choke.
- Blind rams & pipe rams to accommodate all pipe sizes with properly sized closing unit.
- Auxiliary equipment to include: annular preventer, mud-gas separator, rotating head & flare gun with flares

Protective Equipment for Essential Personnel:

- Mark II Survive-air 30 minute units located in dog house & at briefing areas, as indicated on wellsite diagram.

H2S Dection and Monitoring Equipment:

- Two portable H_2S monitors positioned on location for best coverage & response. These units have warning lights & audible sirens when H_2S levels of 20 ppm are reached.
- One portable H_2S monitor positioned near flare line.

H2S Visual Warning Systems:

- Wind direction indicators are shown on wellsite diagram.
- Caution / Danger signs shall be posted on roads providing direct access to location. Signs will be painted a high visibility yellow with black lettering of sufficient size to be readable at a reasonable distance from the immediate location. Bilingual signs will be used when appropriate.

Mud Program:

- The Mud Program has been designed to minimize the volume of H_2S circulated to the surface. Proper mud weights, safe drilling practices & the use of H_2S scavengers will minimize hazards when penetrating H_2S bearing zones.
- A mud-gas separator and H_2S gas buster will be utilized as needed.

Metallurgy:

- All drill strings, casing, tubing, wellhead, blowout preventers, drilling spool, kill lines, choke manifold & lines, & valves will be suitable for H_2S service.
- All elastomers used for packing & seals shall be H_2S trim.

Communication:

- Cellular telephone and 2-way radio communications in company vehicles, rig floor and mud logging trailer.

HYDROGEN SULFIDE (H_2S) CONTINGENCY PLAN

Assumed 100 ppm ROE = 3000'

100 ppm H_2S concentration shall trigger activation of this plan.

Emergency Procedures

In the event of a release of gas containing H_2S, the first responder(s) must

- Isolate the area and prevent entry by other persons into the 100 ppm ROE.
- Evacuate any public places encompassed by the 100 ppm ROE.
- Be equipped with H_2S monitors and air packs in order to control the release.
- Use the "buddy system" to ensure no injuries occur during the response
- Take precautions to avoid personal injury during this operation.
- Contact operators and/or local officials to aid in operation. See list of phone numbers attached.
- Have received training in the :
    - Detection of H_2S, and
    - Measures for protection against the gas,
    - Equipment used for protection and emergency response.

Ignition of Gas source

Should control of the well be considered lost and ignition considered, take care to protect against exposure to Sulfur Dioxide (SO_2). Intentional ignition must be coordinated with the NMOCD and local officials. Additionally the NM State Police may become involved. NM State Police shall be the Incident Command on scene of any major release. Take care to protect downwind whenever this is an ignition of the gas.

Characteristics of H_2S and SO_2

Common Name	Chemical Formula	Specific Gravity	Threshold Limit	Hazardous Limit	Lethal Concentration
Hydrogen Sulfide	H_2S	1.189 Air = I	10 ppm	100 ppm/hr	600 ppm
Sulfur Dioxide	SO_2	2.21 Air = I	2 ppm	N/A	1000 ppm

Contacting Authorities

Apache Corporation personnel must liaison with local and state agencies to ensure a proper response to a major release. Additionally, the OCD must be notified of the release as soon as possible but no later than 4 hours. Agencies will ask for information such as type and volume of release, wind direction, location of release, etc. Be prepared with all information available including directions to site. The following call list of essential and potential responders has been prepared for use during a release. Apache's response must be in coordination with the State of New Mexico's *"Hazardous Materials Emergency Response Plan" (HMER).*

WELL CONTROL EMERGENCY RESPONSE PLAN

I. GENERAL PHILOSOPHY

Our objective is to ensure that during an emergency, a predetermined procedure is followed so that prompt decisions can be made based on accurate information.

The best way to handle and emergency is with an experienced organization set up for the sole purpose of solving the problem. The *Well Control Emergency Response Team* was organized to handle dangerous & expensive well control problems. The *Team* is structured such that each individual can contribute the most from his area of expertise. Key decision-makers are determined prior to an emergency to avoid confusion about who is in charge.

If the well is flowing uncontrolled at the surface or subsurface, *The Emergency Response Team* will be mobilized. The *Team* is customized for the people currently on the Apache staff. Staff changes may require a change in the plan.

II. EMERGENCY PROCEDURE ON DRILLING OR COMPLETION OPERATIONS

A. In the event of an emergency the *Drilling Foreman or Tool-Pusher* will immediately contact only one of the following starting with the first name listed:

Name	Office	Mobile	Home
Danny Laman – Drlg Superintendent	432-818-1022	432-634-0288	
John Vacek – Drilling Engineer	432-818-1882	281-222-1812	
Bobby Smith – Drilling Manager	432-818-1020	432-556-7701	
Bill Jones – EH&S Coordinator		432-967-9576	

***This one phone call will free the Drilling Foreman to devote his full time to securing the safety of personnel & equipment. This call will initiate the process to mobilize the Well Control Emergency Response Team. Apache maintains an Emergency Telephone Conference Room in the Houston office. This room is available for us by the Permian Region. The room has 50 separate telephone lines.*

B. The Apache employee contacted by the Drilling Foreman will begin contacting the rest of the *Team*. If **DANNY LAMAN** is out of contact, **JOHN VACEK** will be notified.

C. If a member of the *Emergency Response Team* is away from the job, he must be available for call back. Telephone numbers should be left with secretaries or a key decision-maker.

D. Apache's reporting procedure for spills or releases of oil or hazardous materials will be implemented when spills or releases have occurred or are probable.

EMERGENCY RESPONSE NUMBERS:

SHERIFF DEPARTMENT	
Eddy County	575-887-7551
Lea County	575-396-3611
FIRE DEPARTMENT	911
Artesia	575-746-5050
Carlsbad	575-885-2111
Eunice	575-394-2111
Hobbs	575-397-9308
Jal	575-395-2221
Lovington	575-396-2359
HOSPITALS	911
Artesia Medical Emergency	575-746-5050
Carlsbad Medical Emergency	575-885-2111
Eunice Medical Emergency	575-394-2112
Hobbs Medical Emergency	575-397-9308
Jal Medical Emergency	575-395-2221
Lovington Medical Emergency	575-396-2359
AGENT NOTIFICATIONS	
Bureau of Land Management	575-393-3612
New Mexico Oil Conservation Division	575-393-6161

Apache
EXPLORING WHAT'S POSSIBLE

Project: Eddy County, NM (NAD27 NME)
Site: Thunderbird A
Well: 5H
Wellbore: ST01
Design: Plan 1 08-03-16
Rig:

PHOENIX TECHNOLOGY SERVICES

T G M

Azimuths to Grid North
True North: -0.20°
Magnetic North: 7.42°

Magnetic Field
Strength: 48432.0snT
Dip Angle: 60.73°
Date: 8/3/2016
Model: HDGM

WELL DETAILS

Ground Level: 3741.00

+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
0.00	0.00	683610.80	610247.90	32° 52' 43.72324 N	103° 58' 27.20137 W

SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	DLeg	TFace	VSect	Target	Annotation
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
2	4194.54	0.00	0.00	4194.54	0.00	0.00	0.00	0.00	0.00		KOP, Begin 12.00°/100' Build
3	4941.79	89.67	194.03	4672.00	-460.55	-115.09	12.00	194.03	462.99		LP, Hold 89.67° Inc, Begin 2.00°/100' Turn
4	5654.09	89.67	179.78	4676.12	-1165.85	-200.52	2.00	-90.04	1170.00		Hold 179.78° Azm
5	12392.40	89.67	179.78	4715.00	-7904.00	-175.10	0.00	0.00	7905.94	BHL - Thunderbird A 5H	TD at 12392.40

DESIGN TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
SHL - Thunderbird A 5H	0.00	0.00	0.00	683610.80	610247.90	32° 52' 43.72324 N	103° 58' 27.20137 W
KOP - Thunderbird A 5H	4194.54	0.00	0.00	683610.80	610247.90	32° 52' 43.72324 N	103° 58' 27.20137 W
PP - Thunderbird A 5H	4427.00	-58.61	-14.65	683552.19	610233.25	32° 52' 43.14378 N	103° 58' 27.37550 W
LP - Thunderbird A 5H	4672.00	-460.55	-115.09	683150.25	610132.81	32° 52' 39.16987 N	103° 58' 28.56922 W
BHL - Thunderbird A 5H	4715.00	-7904.00	-175.10	675706.80	610072.80	32° 51' 25.51776 N	103° 58' 29.56930 W

Map System: US State Plane 1927 (Exact solution)
Datum: NAD 1927 (NADCON CONUS)
Ellipsoid: Clarke 1866
Zone Name: New Mexico East 3001

Local Origin: Well 5H, Grid North

Latitude: 32° 52' 43.72324 N
Longitude: 103° 58' 27.20137 W

Grid East: 610247.90
Grid North: 683610.80
Scale Factor: 1.000

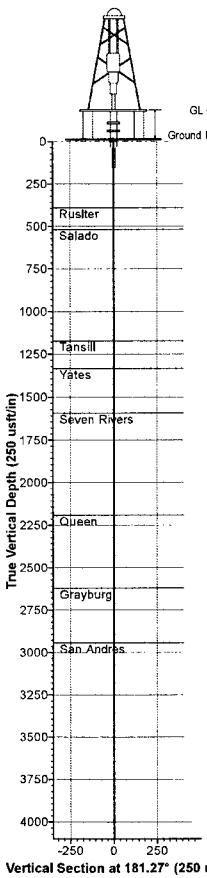
Geomagnetic Model: HDGM
Sample Date: 03-Aug-16
Magnetic Declination: 7.62°
Dip Angle from Horizontal: 60.73°
Magnetic Field Strength: 48432

To convert a Magnetic Direction to a Grid Direction, Add 7.42°
To convert a Magnetic Direction to a True Direction, Add 7.62° East
To convert a True Direction to a Grid Direction, Subtract 0.19°

FORMATION TOP DETAILS

TVDPath	MDPath	Formation	DipAngle	DipDir
390.00	390.00	Rustler	0.00	
517.00	517.00	Salado	0.00	
1170.00	1170.00	Tansill	0.00	
1332.00	1332.00	Yates	0.00	
1592.00	1592.00	Seven Rivers	0.00	
2191.00	2191.00	Queen	0.00	
2621.00	2621.00	Grayburg	0.00	
2943.00	2943.00	San Andres	0.00	
4374.00	4378.52	Glorieta	0.00	
4427.00	4437.33	Paddock	0.00	

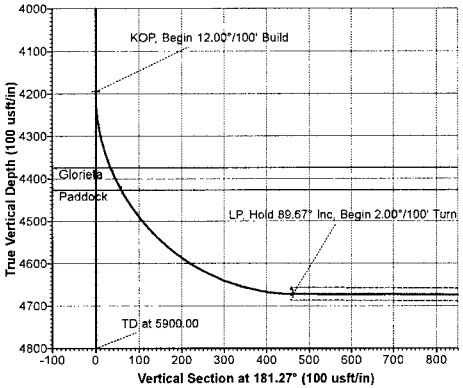
GL + KB @ 3752.00usft
Ground Level: 3741.00



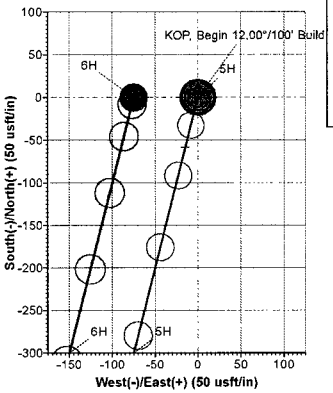
Vertical Section at 181.27° (250 usft/in)

LEGEND

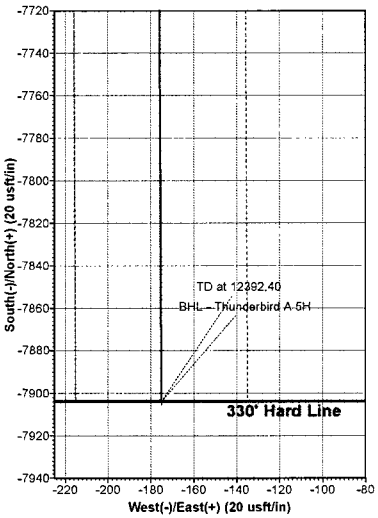
- 7H, OH, Plan 1 08-03-16 V0
- 4H, OH, Plan 1 08-03-16 V0
- 6H, OH, Plan 1 08-03-16 V0
- 3H, OH, Plan 1 08-03-16 V0
- 8H, OH, Plan 1 08-03-16 V0
- #9, OH, Surveys V0
- 5H, OH, Pilot Hole V0
- Plan 1 08-03-16



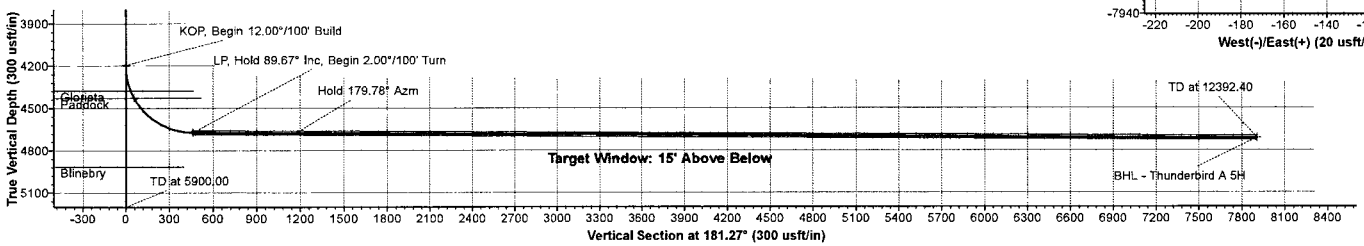
Vertical Section at 181.27° (100 usft/in)



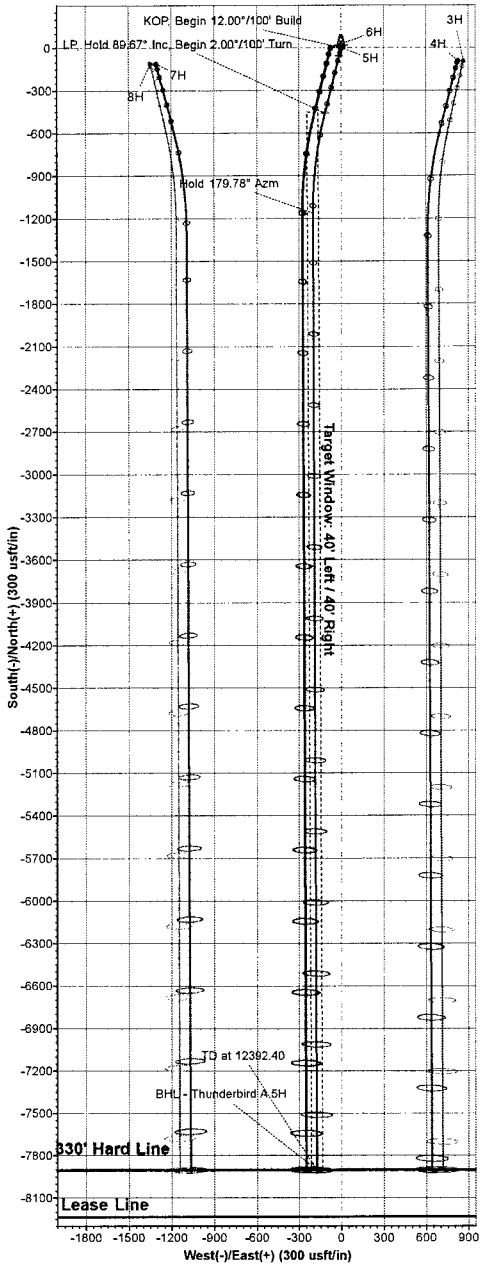
West(-)/East(+) (50 usft/in)



West(-)/East(+) (20 usft/in)



Vertical Section at 181.27° (300 usft/in)



West(-)/East(+) (300 usft/in)

Created By: Bianca LaCombe Date: 9:12, August 05 2016

Apache
EXPLORING WHAT'S POSSIBLE

Apache Corporation

Eddy County, NM (NAD27 NME)
Thunderbird A
5H

OH

Plan: Plan 1 08-03-16

Standard Planning Report

03 August, 2016

PHOENIX
TECHNOLOGY SERVICES

Database:	Compass 5000 GCR	**Local Co-ordinate Reference:**	Well 5H
Company:	Apache Corporation	**TVD Reference:**	GL + KB @ 3752.00usft
Project:	Eddy County, NM (NAD27 NME)	**MD Reference:**	GL + KB @ 3752.00usft
Site:	Thunderbird A	**North Reference:**	Grid
Well:	5H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	OH		
Design:	Plan 1 08-03-16		

Project	Eddy County, NM (NAD27 NME)		
Map System:	US State Plane 1927 (Exact solution)	**System Datum:**	Mean Sea Level
Geo Datum:	NAD 1927 (NADCON CONUS)		
Map Zone:	New Mexico East 3001		

Site	Thunderbird A				
Site Position:		**Northing:**	683,518.00 usft	**Latitude:**	32° 52' 42.77301 N
From:	Map	**Easting:**	611,193.10 usft	**Longitude:**	103° 58' 16.12161 W
Position Uncertainty:	0.00 usft	**Slot Radius:**	13-3/16 "	**Grid Convergence:**	0.20 °

Well	5H					
Well Position	**+N/-S**	92.80 usft	**Northing:**	683,610.80 usft	**Latitude:**	32° 52' 43.72324 N
	+E/-W	-945.20 usft	**Easting:**	610,247.90 usft	**Longitude:**	103° 58' 27.20137 W
Position Uncertainty		0.00 usft	**Wellhead Elevation:**	0.00 usft	**Ground Level:**	3,741.00 usft

Wellbore	OH				
Magnetics	**Model Name**	**Sample Date**	**Declination (°)**	**Dip Angle (°)**	**Field Strength (nT)**
	HDGM	8/3/2016	7.60	60.73	48,426

Design	Plan 1 08-03-16				
Audit Notes:					
Version:		**Phase:**	PROTOTYPE	**Tie On Depth:**	0.00
Vertical Section:	**Depth From (TVD) (usft)**	**+N/-S (usft)**	**+E/-W (usft)**	**Direction (°)**	
	0.00	0.00	0.00	181.27	

Plan Sections

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	TFO (°)	Target
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
4,194.54	0.00	0.00	4,194.54	0.00	0.00	0.00	0.00	0.00	0.00	
4,941.79	89.67	194.03	4,672.00	-460.55	-115.09	12.00	12.00	0.00	194.03	
5,654.09	89.67	179.78	4,676.12	-1,165.85	-200.52	2.00	0.00	-2.00	-90.04	
12,392.40	89.67	179.78	4,715.00	-7,904.00	-175.10	0.00	0.00	0.00	0.00	BHL - Thunderbird A 5

Database:	Compass 5000 GCR	**Local Co-ordinate Reference:**	Well 5H
Company:	Apache Corporation	**TVD Reference:**	GL + KB @ 3752.00usft
Project:	Eddy County, NM (NAD27 NME)	**MD Reference:**	GL + KB @ 3752.00usft
Site:	Thunderbird A	**North Reference:**	Grid
Well:	5H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	OH		
Design:	Plan 1 08-03-16		

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
390.00	0.00	0.00	390.00	0.00	0.00	0.00	0.00	0.00	0.00
Rustler									
517.00	0.00	0.00	517.00	0.00	0.00	0.00	0.00	0.00	0.00
Salado									
1,170.00	0.00	0.00	1,170.00	0.00	0.00	0.00	0.00	0.00	0.00
Tansill									
1,332.00	0.00	0.00	1,332.00	0.00	0.00	0.00	0.00	0.00	0.00
Yates									
1,592.00	0.00	0.00	1,592.00	0.00	0.00	0.00	0.00	0.00	0.00
Seven Rivers									
2,191.00	0.00	0.00	2,191.00	0.00	0.00	0.00	0.00	0.00	0.00
Queen									
2,621.00	0.00	0.00	2,621.00	0.00	0.00	0.00	0.00	0.00	0.00
Grayburg									
2,943.00	0.00	0.00	2,943.00	0.00	0.00	0.00	0.00	0.00	0.00
San Andres									
4,194.54	0.00	0.00	4,194.54	0.00	0.00	0.00	0.00	0.00	0.00
KOP, Begin 12.00°/100' Build									
4,200.00	0.66	194.03	4,200.00	-0.03	-0.01	0.03	12.00	12.00	0.00
4,300.00	12.66	194.03	4,299.14	-11.25	-2.81	11.31	12.00	12.00	0.00
4,378.52	22.08	194.03	4,374.00	-33.97	-8.49	34.14	12.00	12.00	0.00
Glorieta									
4,400.00	24.66	194.03	4,393.72	-42.23	-10.55	42.45	12.00	12.00	0.00
4,437.33	29.13	194.03	4,427.00	-58.61	-14.65	58.92	12.00	12.00	0.00
Paddock									
4,500.00	36.66	194.03	4,479.59	-91.61	-22.89	92.09	12.00	12.00	0.00
4,600.00	48.66	194.03	4,553.00	-157.22	-39.29	158.05	12.00	12.00	0.00
4,700.00	60.66	194.03	4,610.74	-236.21	-59.03	237.46	12.00	12.00	0.00
4,800.00	72.66	194.03	4,650.29	-325.13	-81.24	326.84	12.00	12.00	0.00
4,900.00	84.66	194.03	4,669.93	-420.07	-104.97	422.29	12.00	12.00	0.00
4,941.79	89.67	194.03	4,672.00	-460.55	-115.09	462.99	12.00	12.00	0.00
LP, Hold 89.67° Inc, Begin 2.00°/100' Turn									
5,000.00	89.67	192.87	4,672.33	-517.17	-128.62	519.89	2.00	0.00	-2.00
5,100.00	89.67	190.87	4,672.91	-615.02	-149.18	618.18	2.00	0.00	-2.00
5,200.00	89.67	188.87	4,673.49	-713.54	-166.32	717.05	2.00	0.00	-2.00
5,300.00	89.67	186.87	4,674.07	-812.59	-180.00	816.38	2.00	0.00	-2.00
5,400.00	89.67	184.87	4,674.65	-912.06	-190.22	916.05	2.00	0.00	-2.00
5,500.00	89.67	182.87	4,675.23	-1,011.82	-196.96	1,015.94	2.00	0.00	-2.00
5,600.00	89.67	180.87	4,675.81	-1,111.76	-200.22	1,115.93	2.00	0.00	-2.00
5,654.09	89.67	179.78	4,676.12	-1,165.85	-200.52	1,170.00	2.00	0.00	-2.00
Hold 179.78° Azm									
5,700.00	89.67	179.78	4,676.39	-1,211.76	-200.35	1,215.90	0.00	0.00	0.00
5,800.00	89.67	179.78	4,676.97	-1,311.76	-199.97	1,315.87	0.00	0.00	0.00
5,900.00	89.67	179.78	4,677.54	-1,411.76	-199.59	1,415.83	0.00	0.00	0.00
6,000.00	89.67	179.78	4,678.12	-1,511.75	-199.22	1,515.80	0.00	0.00	0.00
6,100.00	89.67	179.78	4,678.70	-1,611.75	-198.84	1,615.76	0.00	0.00	0.00
6,200.00	89.67	179.78	4,679.27	-1,711.75	-198.46	1,715.73	0.00	0.00	0.00
6,300.00	89.67	179.78	4,679.85	-1,811.75	-198.08	1,815.69	0.00	0.00	0.00
6,400.00	89.67	179.78	4,680.43	-1,911.74	-197.71	1,915.65	0.00	0.00	0.00
6,500.00	89.67	179.78	4,681.00	-2,011.74	-197.33	2,015.62	0.00	0.00	0.00
6,600.00	89.67	179.78	4,681.58	-2,111.74	-196.95	2,115.58	0.00	0.00	0.00
6,700.00	89.67	179.78	4,682.16	-2,211.74	-196.58	2,215.55	0.00	0.00	0.00

Database:	Compass 5000 GCR	**Local Co-ordinate Reference:**	Well 5H
Company:	Apache Corporation	**TVD Reference:**	GL + KB @ 3752.00usft
Project:	Eddy County, NM (NAD27 NME)	**MD Reference:**	GL + KB @ 3752.00usft
Site:	Thunderbird A	**North Reference:**	Grid
Well:	5H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	OH		
Design:	Plan 1 08-03-16		

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
6,800.00	89.67	179.78	4,682.74	-2,311.74	-196.20	2,315.51	0.00	0.00	0.00
6,900.00	89.67	179.78	4,683.31	-2,411.73	-195.82	2,415.48	0.00	0.00	0.00
7,000.00	89.67	179.78	4,683.89	-2,511.73	-195.44	2,515.44	0.00	0.00	0.00
7,100.00	89.67	179.78	4,684.47	-2,611.73	-195.07	2,615.41	0.00	0.00	0.00
7,200.00	89.67	179.78	4,685.04	-2,711.73	-194.69	2,715.37	0.00	0.00	0.00
7,300.00	89.67	179.78	4,685.62	-2,811.72	-194.31	2,815.34	0.00	0.00	0.00
7,400.00	89.67	179.78	4,686.20	-2,911.72	-193.93	2,915.30	0.00	0.00	0.00
7,500.00	89.67	179.78	4,686.77	-3,011.72	-193.56	3,015.27	0.00	0.00	0.00
7,600.00	89.67	179.78	4,687.35	-3,111.72	-193.18	3,115.23	0.00	0.00	0.00
7,700.00	89.67	179.78	4,687.93	-3,211.71	-192.80	3,215.20	0.00	0.00	0.00
7,800.00	89.67	179.78	4,688.50	-3,311.71	-192.43	3,315.16	0.00	0.00	0.00
7,900.00	89.67	179.78	4,689.08	-3,411.71	-192.05	3,415.13	0.00	0.00	0.00
8,000.00	89.67	179.78	4,689.66	-3,511.71	-191.67	3,515.09	0.00	0.00	0.00
8,100.00	89.67	179.78	4,690.24	-3,611.70	-191.29	3,615.06	0.00	0.00	0.00
8,200.00	89.67	179.78	4,690.81	-3,711.70	-190.92	3,715.02	0.00	0.00	0.00
8,300.00	89.67	179.78	4,691.39	-3,811.70	-190.54	3,814.98	0.00	0.00	0.00
8,400.00	89.67	179.78	4,691.97	-3,911.70	-190.16	3,914.95	0.00	0.00	0.00
8,500.00	89.67	179.78	4,692.54	-4,011.69	-189.78	4,014.91	0.00	0.00	0.00
8,600.00	89.67	179.78	4,693.12	-4,111.69	-189.41	4,114.88	0.00	0.00	0.00
8,700.00	89.67	179.78	4,693.70	-4,211.69	-189.03	4,214.84	0.00	0.00	0.00
8,800.00	89.67	179.78	4,694.27	-4,311.69	-188.65	4,314.81	0.00	0.00	0.00
8,900.00	89.67	179.78	4,694.85	-4,411.69	-188.28	4,414.77	0.00	0.00	0.00
9,000.00	89.67	179.78	4,695.43	-4,511.68	-187.90	4,514.74	0.00	0.00	0.00
9,100.00	89.67	179.78	4,696.01	-4,611.68	-187.52	4,614.70	0.00	0.00	0.00
9,200.00	89.67	179.78	4,696.58	-4,711.68	-187.14	4,714.67	0.00	0.00	0.00
9,300.00	89.67	179.78	4,697.16	-4,811.68	-186.77	4,814.63	0.00	0.00	0.00
9,400.00	89.67	179.78	4,697.74	-4,911.67	-186.39	4,914.60	0.00	0.00	0.00
9,500.00	89.67	179.78	4,698.31	-5,011.67	-186.01	5,014.56	0.00	0.00	0.00
9,600.00	89.67	179.78	4,698.89	-5,111.67	-185.63	5,114.53	0.00	0.00	0.00
9,700.00	89.67	179.78	4,699.47	-5,211.67	-185.26	5,214.49	0.00	0.00	0.00
9,800.00	89.67	179.78	4,700.04	-5,311.66	-184.88	5,314.46	0.00	0.00	0.00
9,900.00	89.67	179.78	4,700.62	-5,411.66	-184.50	5,414.42	0.00	0.00	0.00
10,000.00	89.67	179.78	4,701.20	-5,511.66	-184.13	5,514.39	0.00	0.00	0.00
10,100.00	89.67	179.78	4,701.77	-5,611.66	-183.75	5,614.35	0.00	0.00	0.00
10,200.00	89.67	179.78	4,702.35	-5,711.65	-183.37	5,714.31	0.00	0.00	0.00
10,300.00	89.67	179.78	4,702.93	-5,811.65	-182.99	5,814.28	0.00	0.00	0.00
10,400.00	89.67	179.78	4,703.51	-5,911.65	-182.62	5,914.24	0.00	0.00	0.00
10,500.00	89.67	179.78	4,704.08	-6,011.65	-182.24	6,014.21	0.00	0.00	0.00
10,600.00	89.67	179.78	4,704.66	-6,111.64	-181.86	6,114.17	0.00	0.00	0.00
10,700.00	89.67	179.78	4,705.24	-6,211.64	-181.48	6,214.14	0.00	0.00	0.00
10,800.00	89.67	179.78	4,705.81	-6,311.64	-181.11	6,314.10	0.00	0.00	0.00
10,900.00	89.67	179.78	4,706.39	-6,411.64	-180.73	6,414.07	0.00	0.00	0.00
11,000.00	89.67	179.78	4,706.97	-6,511.64	-180.35	6,514.03	0.00	0.00	0.00
11,100.00	89.67	179.78	4,707.54	-6,611.63	-179.98	6,614.00	0.00	0.00	0.00
11,200.00	89.67	179.78	4,708.12	-6,711.63	-179.60	6,713.96	0.00	0.00	0.00
11,300.00	89.67	179.78	4,708.70	-6,811.63	-179.22	6,813.93	0.00	0.00	0.00
11,400.00	89.67	179.78	4,709.27	-6,911.63	-178.84	6,913.89	0.00	0.00	0.00
11,500.00	89.67	179.78	4,709.85	-7,011.62	-178.47	7,013.86	0.00	0.00	0.00
11,600.00	89.67	179.78	4,710.43	-7,111.62	-178.09	7,113.82	0.00	0.00	0.00
11,700.00	89.67	179.78	4,711.01	-7,211.62	-177.71	7,213.79	0.00	0.00	0.00
11,800.00	89.67	179.78	4,711.58	-7,311.62	-177.33	7,313.75	0.00	0.00	0.00
11,900.00	89.67	179.78	4,712.16	-7,411.61	-176.96	7,413.72	0.00	0.00	0.00
12,000.00	89.67	179.78	4,712.74	-7,511.61	-176.58	7,513.68	0.00	0.00	0.00
12,100.00	89.67	179.78	4,713.31	-7,611.61	-176.20	7,613.64	0.00	0.00	0.00

Database:	Compass 5000 GCR	**Local Co-ordinate Reference:**	Well 5H
Company:	Apache Corporation	**TVD Reference:**	GL + KB @ 3752.00usft
Project:	Eddy County, NM (NAD27 NME)	**MD Reference:**	GL + KB @ 3752.00usft
Site:	Thunderbird A	**North Reference:**	Grid
Well:	5H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	OH		
Design:	Plan 1 08-03-16		

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
12,200.00	89.67	179.78	4,713.89	-7,711.61	-175.83	7,713.61	0.00	0.00	0.00
12,300.00	89.67	179.78	4,714.47	-7,811.60	-175.45	7,813.57	0.00	0.00	0.00
12,392.40	89.67	179.78	4,715.00	-7,904.00	-175.10	7,905.94	0.00	0.00	0.00
TD at 12392.40									

Design Targets

Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
BHL - Thunderbird A 5H - plan hits target center - Rectangle (sides W80.00 H7,450.61 D30.00)	0.33	179.78	4,715.00	-7,904.00	-175.10	675,706.80	610,072.80	32° 51' 25.51776 N	103° 58' 29.56930 W

Formations

Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
390.00	390.00	Rustler		0.00	
517.00	517.00	Salado		0.00	
1,170.00	1,170.00	Tansill		0.00	
1,332.00	1,332.00	Yates		0.00	
1,592.00	1,592.00	Seven Rivers		0.00	
2,191.00	2,191.00	Queen		0.00	
2,621.00	2,621.00	Grayburg		0.00	
2,943.00	2,943.00	San Andres		0.00	
4,378.52	4,374.00	Glorieta		0.00	
4,437.33	4,427.00	Paddock		0.00	

Plan Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates +N/-S (usft)	Local Coordinates +E/-W (usft)	Comment
4,194.54	4,194.54	0.00	0.00	KOP, Begin 12.00°/100' Build
4,941.79	4,672.00	-460.55	-115.09	LP, Hold 89.67° Inc, Begin 2.00°/100' Turn
5,654.09	4,676.12	-1,165.85	-200.52	Hold 179.78° Azm
12,392.40	4,715.00	-7,904.00	-175.10	TD at 12392.40

INTERMEDIATE 2 STAGE CEMENT JOB CONTINGENCY:

* DVT depth(s) will be adjusted based on hole conditions & cmt volumes will be adjusted proportionally. DVT will be set a minimum of 50 feet below previous casing & a minimum of 200 feet above current shoe. Lab reports with 500psi compressive strength time for cement will be onsite for review.
* If lost circ is encountered, Apache may 2-stage Interm csg. A DVT may be used int eh 9-5/8" csg & ECP may be placed below DVT.

1st Stage:

Lead:

Top MD of segment: 450 — Btm MD of segment: 2275.38
Cmt type: Class C — Cmt Additives: 5% Salt + 6% Bentonite + 1#/sk Kolseal + 0.125#/sk CF
Quantity (sks): 404
Yield(cu/ft/sk): 1.84 — Volume (cu/ft): 743.36
Density(lbs/gal): 12.9 — Percent excess: 30%

Tail:

Top MD of segment: 2275.38 — Btm MD of segment: 3200
Cmt type: Class C — Cmt Additives: 0.1% Retarder
Quantity (sks): 300
Yield(cu/ft/sk): 1.32 — Volume (cu/ft): 396
Density(lbs/gal): 14.8 — Percent excess: 30%

STAGE TOOL DEPTH: 450'

2ND Stage:

Lead:

Top MD of segment: 0 — Btm MD of segment: 450
Cmt type: Class C — Cmt Additives: 2% Calcium Chloride
Quantity (sks): 129
Yield(cu/ft/sk): 1.33 — Volume (cu/ft): 171.57
Density(lbs/gal): 14.8 — Percent excess: 30%

***** Apache will have an open hole completion attached to the 5.5" csg. 5.5" csg will crossover to 7" where DVT will be placed at bottom of 7" csg. 5.5" csg will be uncemented & the 7" csg from DVT to surface will be cemented.**

Apache plans to drill a pilot hole for this well, Thunderbird A #5H. Below are plugs to be set:

Cement: 150' Bottom plug

Top MD of segment: 5750'
Btm MD of segment: 5900'
Cmt type: Class C
Cmt Additives: 0.2% Retarder + 0.2% Dispersant + 0.025% Anti-settling additive

Quantity (sks): 48
Yield(cu/ft/sk): 1.25
Volume (cu/ft): 59.12
Density(lbs/gal): 15.2
Percent excess: 0%

Cement: 750' Kickoff plug

Top MD of segment: 3750'
Btm MD of segment: 4450'
Cmt type: Class H
Cmt Additives: 0.75% Dispersant + 0.3% Retarder

Quantity (sks): 291
Yield(cu/ft/sk): 0.95
Volume (cu/ft): 275.85
Density(lbs/gal): 17.5
Percent excess: 0%

APD ID: 10400003537 **Submission Date:** 09/02/2016

Operator Name: APACHE CORPORATION

Well Name: THUNDERBIRD A **Well Number:** 5H

Well Type: OIL WELL **Well Work Type:** Drill

Highlighted data reflects the most recent changes

Show Final Text

Section 1 - Existing Roads

Will existing roads be used? YES

Existing Road Map:

Vicinity_Loc_Verif_Thunderbird A 5H_09-15-2016.pdf

Existing Road Purpose: ACCESS **Row(s) Exist?** NO

ROW ID(s)

ID:

Do the existing roads need to be improved? YES

Existing Road Improvement Description: Road will be improved by adding 3" - 6" of compacted caliche cap.

Existing Road Improvement Attachment:

Section 2 - New or Reconstructed Access Roads

Will new roads be needed? YES

New Road Map:

Plat_Access Rd_Thunderbird A 5H_09-15-2016.pdf

New road type: LOCAL

Length: 86.17 Feet **Width (ft.):** 30

Max slope (%): 2 **Max grade (%):** 2

Army Corp of Engineers (ACOE) permit required? NO

ACOE Permit Number(s):

New road travel width: 14

New road access erosion control: Road will b crowned for water drainage and to control erosion

New road access plan or profile prepared? NO

New road access plan attachment:

4_Plat_Access Road_Thunderbird A 5H_6.20.16_08-18-2016.pdf

Access road engineering design? NO

Access road engineering design attachment:

Access surfacing type: OTHER

Access topsoil source: ONSITE

Access surfacing type description: Caliche

Access onsite topsoil source depth: 6

Offsite topsoil source description:

Onsite topsoil removal process: Push top 6"

Access other construction information:

Access miscellaneous information:

Number of access turnouts: 0 **Access turnout map:**

Drainage Control

New road drainage crossing: OTHER

Drainage Control comments: Road will be crowned for water drainage

Road Drainage Control Structures (DCS) description: Road will be crowned to allow for water drainage

Road Drainage Control Structures (DCS) attachment:

Access Additional Attachments

Additional Attachment(s):

Section 3 - Location of Existing Wells

Existing Wells Map? YES

Attach Well map:

1 Mile Radius_Thunderbird A 5H_09-15-2016.pdf

Existing Wells description:

Section 4 - Location of Existing and/or Proposed Production Facilities

Submit or defer a Proposed Production Facilities plan? SUBMIT

Estimated Production Facilities description:

Production Facilities description: A pipeline to transport production will be installed from the proposed well to the proposed production facility. Apache plans to install a 4 inch buried spoolable fiberglass pipeline from the proposed well to the offsite production facility. The proposed length of the pipeline will be 3664.33 feet with working pressure of 250psi. A 30 feet wide disturbance will be needed to install the buried pipeline. In areas where blading is allowed, topsoil will be stockpiled and separated from the excavated trench mineral material. Final reclamation procedures will match procedures in plans for surface reclamation. When excavated soil is backfilled, it will be compacted to prevent subsidence. No berm over pipeline will be evident. The proposed pipeline does not cross lease boundaries, so a ROW will not need to be acquired from BLM. The proposed production facility will have a secondary containment structure that is constructed to hold the capacity of 1-1/2

times the largest tank, plus freeboard to account for precipitation, unless more stringent protective requirements are deemed necessary.

Production Facilities map:

Flowline_Thunderbird A 5H_09-15-2016.pdf

Battery_Thunderbird A 5H_09-15-2016.pdf

Section 5 - Location and Types of Water Supply

Water Source Table

Water source use type: INTERMEDIATE/PRODUCTION CASING **Water source type:** OTHER

Describe type:

Source latitude: 32.87279 **Source longitude:** -103.5045

Source datum: NAD83

Water source permit type: PRIVATE CONTRACT

Source land ownership: STATE

Water source transport method: TRUCKING

Source transportation land ownership: STATE

Water source volume (barrels): 2214.2856 **Source volume (acre-feet):** 0.28540614

Source volume (gal): 93000

Water source use type: INTERMEDIATE/PRODUCTION CASING, SURFACE CASING **Water source type:** GW WELL

Describe type:

Source latitude: 32.819386 **Source longitude:** -103.98483

Source datum: NAD83

Water source permit type: PRIVATE CONTRACT

Source land ownership: PRIVATE

Water source transport method: TRUCKING

Source transportation land ownership: PRIVATE

Water source volume (barrels): 2214.2856 **Source volume (acre-feet):** 0.28540614

Source volume (gal): 93000

Water source and transportation map:

Thunderbird 5H FW Sources_09-15-2016.pdf

Thunderbird 5H BrineWtr Source_09-15-2016.pdf

Water source comments:

New water well? NO

New Water Well Info

Operator Name: APACHE CORPORATION

Well Name: THUNDERBIRD A **Well Number:** 5H

Well latitude: **Well Longitude:** **Well datum:**

Well target aquifer:

Est. depth to top of aquifer(ft): **Est thickness of aquifer:**

Aquifer comments:

Aquifer documentation:

Well depth (ft): **Well casing type:**

Well casing outside diameter (in.): **Well casing inside diameter (in.):**

New water well casing? **Used casing source:**

Drilling method: **Drill material:**

Grout material: **Grout depth:**

Casing length (ft.): **Casing top depth (ft.):**

Well Production type: **Completion Method:**

Water well additional information:

State appropriation permit:

Additional information attachment:

Section 6 - Construction Materials

Construction Materials description: Caliche and tin horn cellar

Construction Materials source location attachment:

Section 7 - Methods for Handling Waste

Waste type: DRILLING

Waste content description: Drilling fluid from well, during drilling operations, will be stored safely and recycled to next well. Any excess will be hauled to approved NMOCD disposal facility

Amount of waste: 3600 barrels

Waste disposal frequency : One Time Only

Safe containment description: Drilling fluids will be stored in sealed frac tanks

Safe containmant attachment:

Waste disposal type: RECYCLE **Disposal location ownership:** OTHER

Disposal type description:

Disposal location description: Operators next well

Waste type: SEWAGE

Waste content description: Human waste and grey water

Amount of waste: 2000 gallons

Waste disposal frequency : Weekly

Safe containment description: Sewage will be stored in steel waste tanks

Safe containmant attachment:

Waste disposal type: OTHER **Disposal location ownership:** STATE

Disposal type description: Municipal waste facility

Disposal location description: Hobbs Municipal Waste Facility

Waste type: DRILLING

Waste content description: Excess cement returns

Amount of waste: 40 barrels

Waste disposal frequency : Weekly

Safe containment description: Cement returns will be stored in steel roll off bins then transferred to disposal vacuum trucks

Safe containmant attachment:

Waste disposal type: OTHER **Disposal location ownership:** PRIVATE

Disposal type description: Haul to private facility

Disposal location description: R360, 6601 W. Hobbs Hwy, Carlsbad, NM, 88220

Waste type: GARBAGE

Waste content description: Household garbage, trash and non-toxic mud sacks

Amount of waste: 1500 pounds

Waste disposal frequency : Weekly

Safe containment description: Garbage will be disposed off in portable trash trailers

Safe containmant attachment:

Waste disposal type: OTHER **Disposal location ownership:** STATE

Disposal type description: Private Land Fill

Disposal location description: Lea County Landfill

Reserve Pit

Reserve Pit being used? NO

Temporary disposal of produced water into reserve pit?

Reserve pit length (ft.) **Reserve pit width (ft.)**

Reserve pit depth (ft.) **Reserve pit volume (cu. yd.)**

Is at least 50% of the reserve pit in cut?

Reserve pit liner

Reserve pit liner specifications and installation description

Operator Name: APACHE CORPORATION

Well Name: THUNDERBIRD A **Well Number:** 5H

Cuttings Area

Cuttings Area being used? NO

Are you storing cuttings on location? YES

Description of cuttings location Cuttings will be stored in steel haul off bins & taken to an NMOCD approved disposal facility

Cuttings area length (ft.)

Cuttings area width (ft.)

Cuttings area depth (ft.)

Cuttings area volume (cu. yd.)

Is at least 50% of the cuttings area in cut?

WCuttings area liner

Cuttings area liner specifications and installation description

Section 8 - Ancillary Facilities

Are you requesting any Ancillary Facilities?: NO

Ancillary Facilities attachment:

Comments:

Section 9 - Well Site Layout

Well Site Layout Diagram:

WellsiteRigLayout_Thunderbird A 5H_09-15-2016.pdf

Comments:

Section 10 - Plans for Surface Reclamation

Type of disturbance: NEW

Recontouring attachment:

Drainage/Erosion control construction: Slight slope for water drainage

Drainage/Erosion control reclamation: Reclamation is going to follow natural terrain to control erosion, runoff and siltation of surrounding area

Wellpad long term disturbance (acres): 2.69

Wellpad short term disturbance (acres): 4.36

Access road long term disturbance (acres): 0.01

Access road short term disturbance (acres): 0.01

Pipeline long term disturbance (acres): 1.834938

Pipeline short term disturbance (acres): 1.834938

Other long term disturbance (acres): 9.18

Other short term disturbance (acres): 9.18

Operator Name: APACHE CORPORATION

Well Name: THUNDERBIRD A **Well Number:** 5H

Total long term disturbance: 13.714938 **Total short term disturbance:** 15.384938

Reconstruction method: Areas planned for interim reclamation will be contoured to original contour if feasible, or if not feasible, to an interim contour that blends with surrounding topography as much as possible. Where applicable, fill material of well pad will be back filled into the cut to bring area back to original contour.
Topsoil redistribution: Topsoil that was spread over interim reclamation areas will be stockpiled prior to recontouring. Topsoil will be redistributed evenly over entire disturbed site to ensure successful revegetation
Soil treatment: No soil treatment expected

Existing Vegetation at the well pad: Plants are sparse but include grasses, some mesquite and shinnery oak

Existing Vegetation at the well pad attachment:

Existing Vegetation Community at the road: Plants are sparse but include grasses, some mesquite and shinnery oak

Existing Vegetation Community at the road attachment:

Existing Vegetation Community at the pipeline: Plants are sparse but include grasses, some mesquite and shinnery oak

Existing Vegetation Community at the pipeline attachment:

Existing Vegetation Community at other disturbances: Plants are sparse but include grasses, some mesquite and shinnery oak
Existing Vegetation Community at other disturbances attachment:

Non native seed used? NO

Non native seed description:

Seedling transplant description:

Will seedlings be transplanted for this project? NO

Seedling transplant description attachment:

Will seed be harvested for use in site reclamation? NO

Seed harvest description:

Seed harvest description attachment:

Seed Management

Seed Table

Seed type: **Seed source:**

Seed name:

Source name: **Source address:**

Source phone:

Seed cultivar:

Seed use location:

PLS pounds per acre: **Proposed seeding season:**

Total pounds/Acre:

Seed Summary	
Seed Type	**Pounds/Acre**

Seed reclamation attachment:

Operator Contact/Responsible Official Contact Info

First Name: **Last Name:**

Phone: **Email:**

Seedbed prep:

Seed BMP:

Seed method:

Existing invasive species? NO

Existing invasive species treatment description:

Existing invasive species treatment attachment:

Weed treatment plan description: Operator will consult with authorized officer for acceptable weed control methods, which include following EPA and BLM requirements and policies.
Weed treatment plan attachment:

Monitoring plan description: Interim reclamation, reclaimed areas, will be monitored periodically to ensure vegetation has re-established, that area is not redisturbed, and erosion is controlled
Monitoring plan attachment:

Success standards: Objective of interim reclamation is to resore vegetative cover and a portion of landform sufficient to maintain healthy, biologically active topsoil, control erosion, and minimize habitat and forage loss, visual impact, and weed infestation during life of well or facilities. Long term objective of final reclamation is to return land to a condition similar to what existed prior to disturbance. This includes restoration of landform and natural vegetative community, hydrologic systems, visual resources, and wildlife habitats. To ensure that the long term objective will be reached through human and natural processes, actions will be taken to ensure standards are met for site stability, visual quality, hydrological functioning, and vegetative productivity. BLM will be notified 3 days prior to commencement of any reclamation procedures. If circumstances allow, interim and/or final reclamation actions will be completed no later than 6 months from when the final well on location has been completed or plugged. We will gain written permission from BLM if more time is needed.
Pit closure description: Not applicable

Pit closure attachment:

Section 11 - Surface Ownership

Disturbance type: WELL PAD

Describe:

Surface Owner: BUREAU OF LAND MANAGEMENT

Other surface owner description:

BIA Local Office:

BOR Local Office:

COE Local Office:

DOD Local Office:

Operator Name: APACHE CORPORATION

Well Name: THUNDERBIRD A **Well Number:** 5H

NPS Local Office:

State Local Office:

Military Local Office:

USFWS Local Office:

Other Local Office:

USFS Region:

USFS Forest/Grassland: **USFS Ranger District:**

Section 12 - Other Information

Right of Way needed? NO **Use APD as ROW?**

ROW Type(s):

ROW Applications

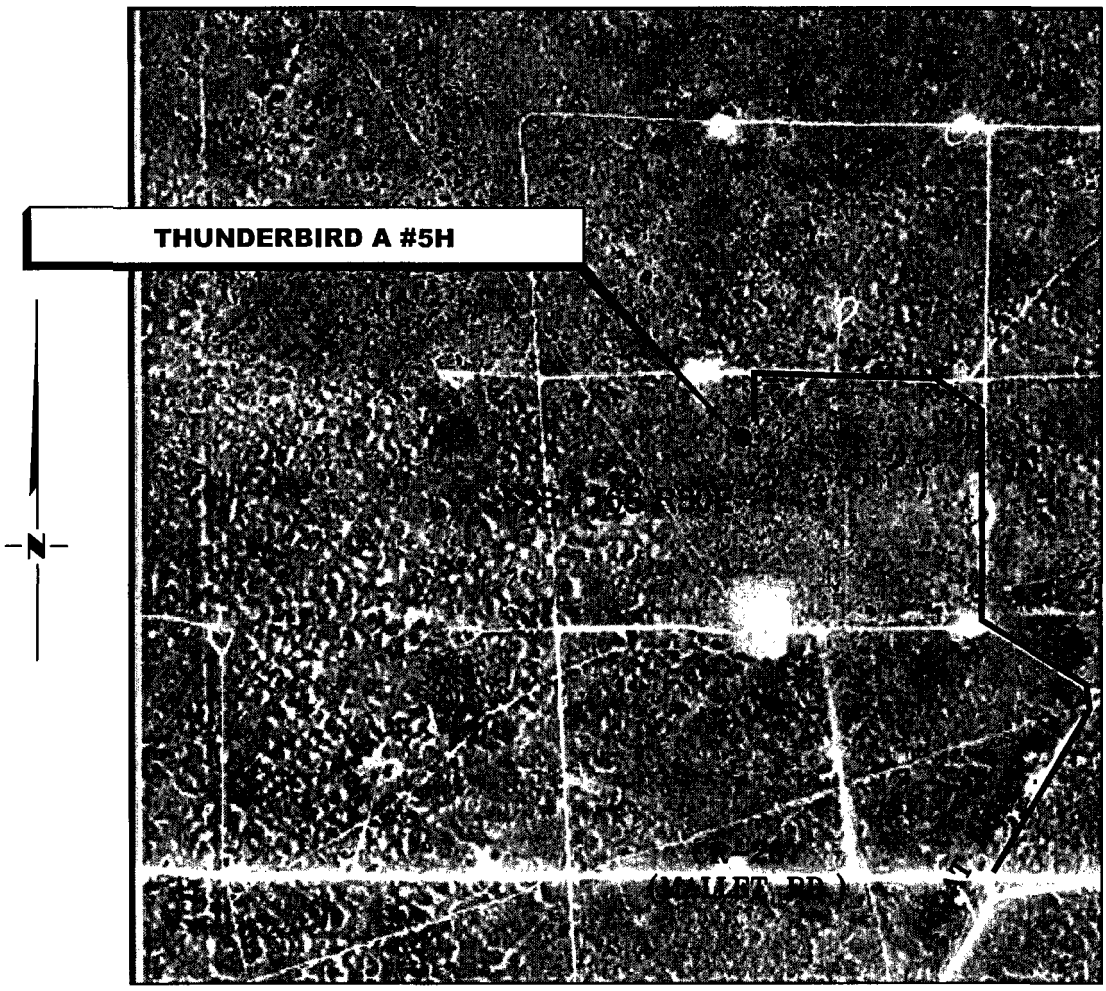
SUPO Additional Information: Apache plans to install an overhead electrical line for the proposed well. The proposed length of the electrical line will be 720.82 feet from Pad 1- Thunderbird A 1H, 2H, 3H to Pad 2-Thunderbird A 5H, 6H. Electrical line will e constructed to provide protection from raptor electrocution. The proposed electrical line does not cross lease boundaries, so a ROW grant will not need to be acquired from BLM.
Use a previously conducted onsite? YES

Previous Onsite information: 5/26/2016; BLM Rep: Jeffery Robertson; Thunderbird A 1H - 10H

Other SUPO Attachment

VICINITY MAP

NOT TO SCALE



SECTION 33, TWP. 16 SOUTH, RGE. 30 EAST,
N. M. P. M., EDDY CO., NEW MEXICO

OPERATOR: Apache Corporation
LEASE: Thunderbird A
WELL NO.: 5H

LOCATION: 2315' FNL & 1955' FEL
ELEVATION: 3741'

NO.	REVISION	DATE

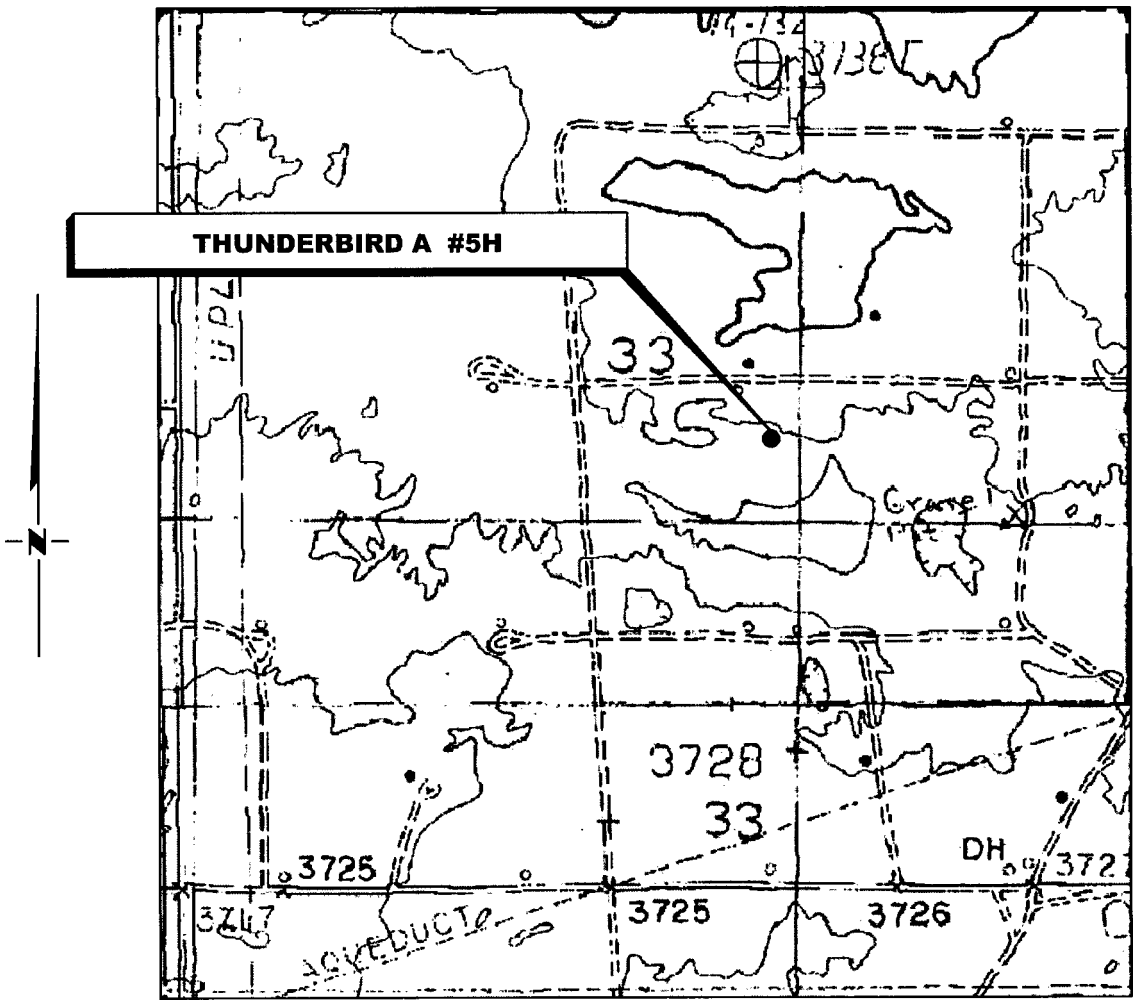
JOB NO.: LS1605195
DWG. NO.: 1605195VM

RRC

308 W. BROADWAY ST., HOBBS, NM 88240 (575) 964-8200

SCALE: NTS
DATE: 6-01-2016
SURVEYED BY: BC/HD
DRAWN BY: LPS
APPROVED BY: RMH
SHEET : 1 OF 1

LOCATION VERIFICATION MAP



SECTION 33, TWP. 16 SOUTH, RGE. 30 EAST,
N. M. P. M., EDDY CO., NEW MEXICO

OPERATOR: Apache Corporation
LEASE: Thunderbird A
WELL NO.: 5H
ELEVATION: 3741'

LOCATION: 2315' FNL & 1955' FEL
CONTOUR INTERVAL: 10'
USGS TOPO. SOURCE MAP:
Henshaw Tank, NM (P. E. 1985)

NO.	REVISION	DATE

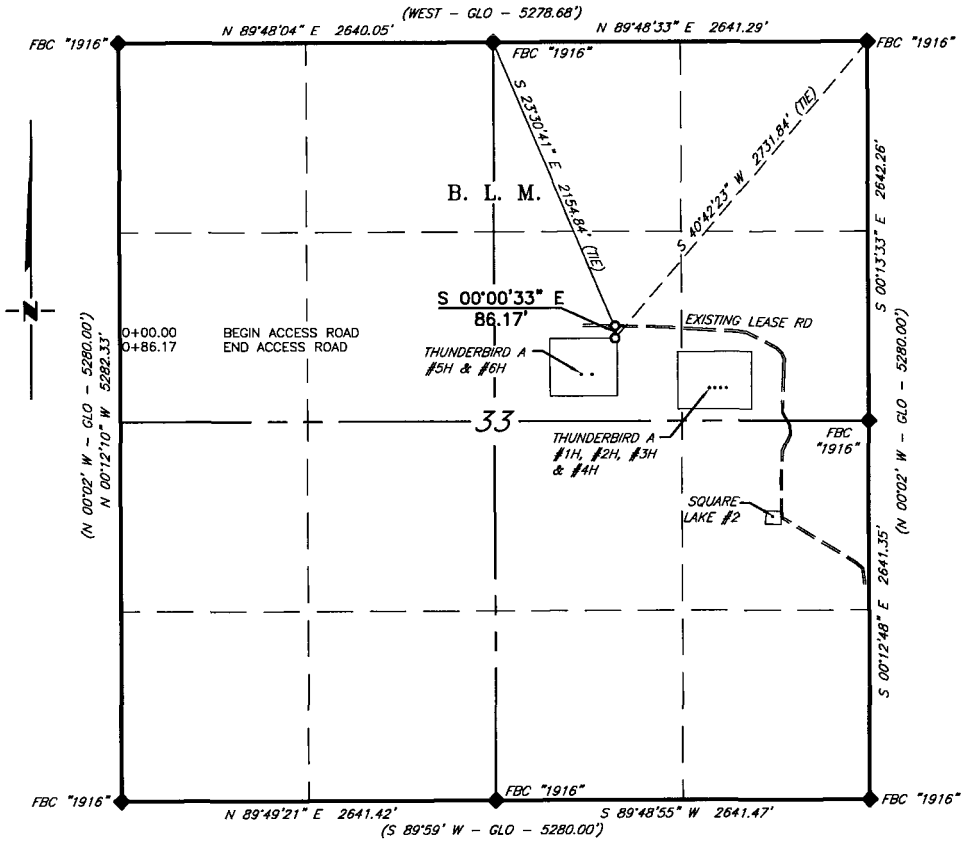
JOB NO.: LS1605195
DWG. NO.: 1605195LVM

RRC

308 W. BROADWAY ST., HOBBS, NM 88240 (575) 964-8200

SCALE: 1" = 1000'
DATE: 6-01-2016
SURVEYED BY: BC/HD
DRAWN BY: LPS
APPROVED BY: RMH
SHEET : 1 OF 1

APACHE CORPORATION
PROPOSED ACCESS ROAD
FOR THE THUNDERBIRD A #5H & #6H WELL LOCATIONS
SECTION 33, T16S, R30E,
N. M. P. M., EDDY CO., NEW MEXICO



DESCRIPTION

A strip of land 30 feet wide, being 86.17 feet or 5.222 rods in length, lying in Section 33, Township 16 South, Range 30 East, N. M. P. M., Eddy County, New Mexico, being 15 feet left and 15 feet right of the following described survey of a centerline across B. L. M. land:

BEGINNING at Engr. Sta. 0+00, a point in the Northeast quarter of Section 33, which bears, S 23°30'41" E, 2,154.84 feet, from a brass cap, stamped "1916", found for the North quarter corner of Section 33;

Thence S 00°00'33" E, 86.17 feet, to Engr. Sta. 0+86.17, the End of Survey, a point in the Northeast quarter of Section 33, which bears, S 40°42'23" W, 2,731.84 feet, from a brass cap, stamped "1916", found for the Northeast corner of Section 33.

Said strip of land contains 0.059 acres, more or less, and is allocated by forties as follows:

SW 1/4 NE 1/4	5.222 Rods	0.059 Acres

SCALE: 1" = 1000'
0 500' 1000'

BEARINGS ARE GRID NAD 27 NM EAST
DISTANCES ARE HORIZ. GROUND.

LEGEND
( ) RECORD DATA - GLO
◆ FOUND MONUMENT AS NOTED
PROPOSED ACCESS ROAD

I, R. M. Howett, a N. M. Professional Surveyor, hereby certify that I prepared this plat from an actual survey made on the ground under my direct supervision, said survey and plat meet the Min. Stds. for Land Surveying in the State of N. M. and are true and correct to the best of my knowledge and belief.

Robert M. Howett
Robert M. Howett NM PS 19680

ROBERT M. HOWETT NEW MEXICO 19680 6/17/16 PROFESSIONAL SURVEYOR

Firm No.: TX 10193838 NM 4655451

NO.	REVISION	DATE

JOB NO.: LS1605195RD
DWG. NO.: 1605195-1

RRC

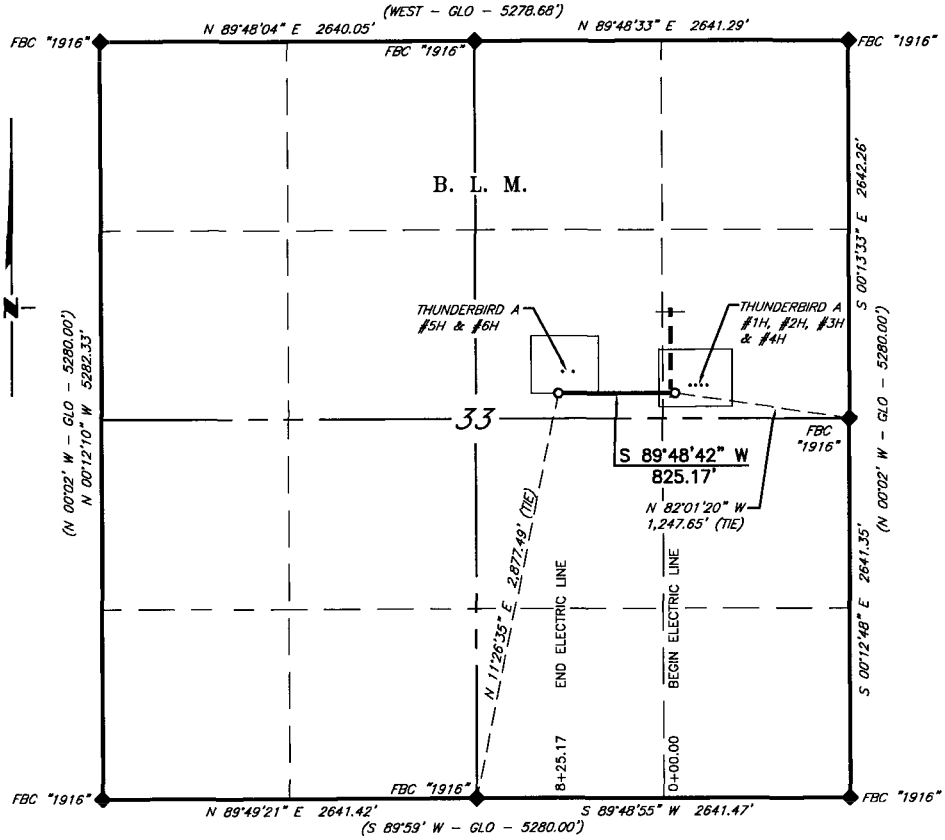
308 W. BROADWAY ST., HOBBS, NM 88240 (575) 964-8200

SCALE: 1" = 1000'
DATE: 6-01-2016
SURVEYED BY: BC/HD
DRAWN BY: LPS
APPROVED BY: RMH
SHEET : 1 OF 1

APACHE CORPORATION

PROPOSED ELECTRIC LINE FROM THE THUNDERBIRD A #1H, #2H, #3H & #4H TO THE THUNDERBIRD A #5H & #10H WELL LOCATIONS

SECTION 33, T16S, R30E,
N. M. P. M., EDDY CO., NEW MEXICO



DESCRIPTION

A strip of land 30 feet wide, being 825.17 feet or 50.010 rods in length, lying in Section 33, Township 16 South, Range 30 East, N. M. P. M., Eddy County, New Mexico, being 15 feet left and 15 feet right of the following described survey of a centerline across B. L. M. land:

BEGINNING at Engr. Sta. 0+00, a point in the Northeast quarter of Section 33, which bears, N 82°01'20" W, 1,247.65 feet, from a brass cap, stamped "1916", found for the East quarter corner of Section 33;

Thence S 89°48'42" W, 825.17 feet, to Engr. Sta. 8+25.17, the End of Survey, a point in the Northeast quarter of Section 33, which bears, N 11°26'35" E, 2,877.49 feet, from a brass cap, stamped "1916", found for the South quarter corner of Section 33.

Said strip of land contains 0.568 acres, more or less, and is allocated by forties as follows:

SE 1/4 NE 1/4	5.208 Rods	0.059 Acres
SW 1/4 NE 1/4	44.802 Rods	0.509 Acres

SCALE: 1" = 1000'
0 500' 1000'

BEARINGS ARE GRID NAD 27 NM EAST
DISTANCES ARE HORIZ. GROUND.

LEGEND

( ) RECORD DATA - GLO

◆ FOUND MONUMENT AS NOTED

PROPOSED ELECTRIC LINE

Firm No.: TX 10193838 NM 4655451

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Robert M. Howett

Robert M. Howett NM PS 19680

ROBERT M. HOWETT NEW MEXICO 19680 6/17/16 PROFESSIONAL SURVEYOR

NO.	REVISION	DATE

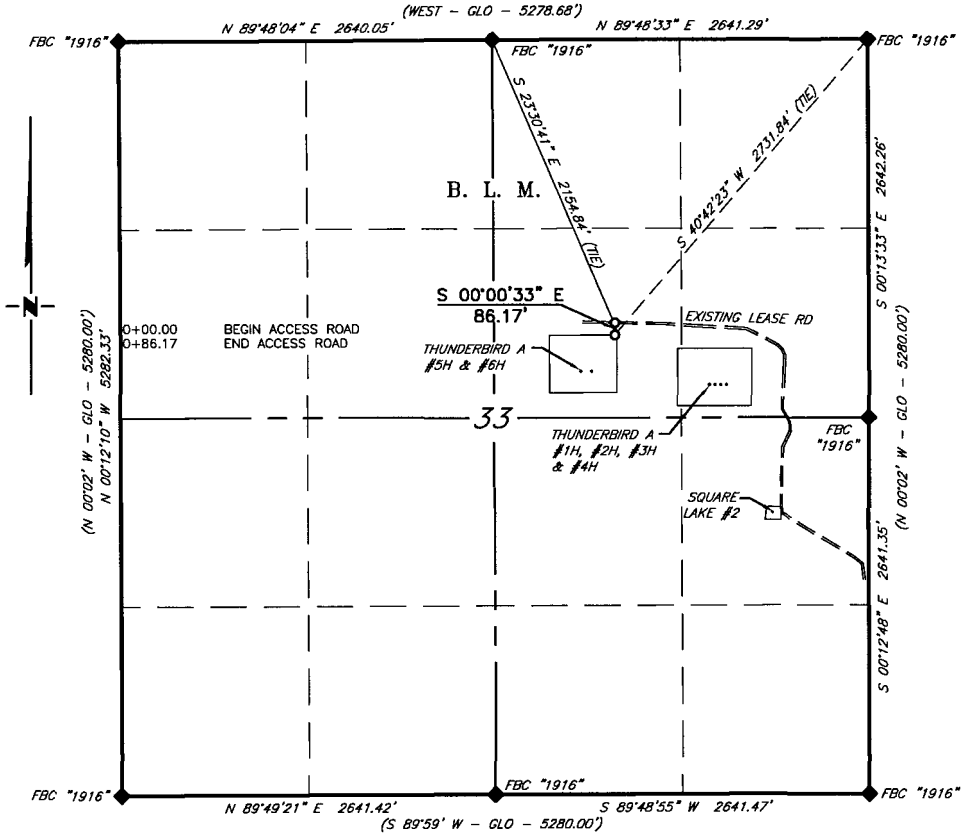
JOB NO.: LS1605195EL
DWG. NO.: 1605195-1

RRC

308 W. BROADWAY ST., HOBBS, NM 88240 (575) 964-8200

SCALE: 1" = 1000'
DATE: 6-01-2016
SURVEYED BY: BC/HD
DRAWN BY: LPS
APPROVED BY: RMH
SHEET : 1 OF 1

APACHE CORPORATION
PROPOSED ACCESS ROAD
FOR THE THUNDERBIRD A #5H & #6H WELL LOCATIONS
SECTION 33, T16S, R30E,
N. M. P. M., EDDY CO., NEW MEXICO



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SCALE: 1" = 1000'
0 500' 1000'

BEARINGS ARE GRID NAD 27 NM EAST.
DISTANCES ARE HORIZ. GROUND.

LEGEND
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PROPOSED ACCESS ROAD

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Robert M. Howett
Robert M. Howett NM PS 19680

ROBERT M. HOWETT NEW MEXICO 19680 6/17/16 PROFESSIONAL SURVEYOR

Firm No.: TX 10193838 NM 4655451

NO.	REVISION	DATE

JOB NO.: LS1605195RD
DWG. NO.: 1605195-1

RRC

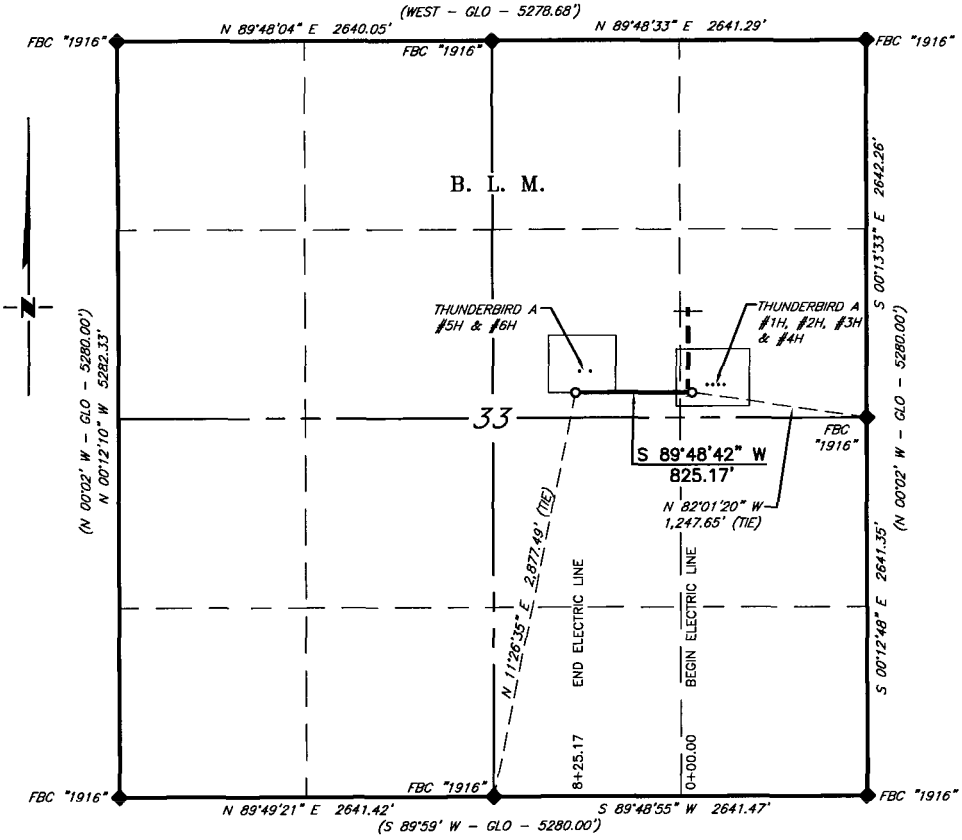
308 W. BROADWAY ST., HOBBS, NM 88240 (575) 964-8200

SCALE: 1" = 1000'
DATE: 6-01-2016
SURVEYED BY: BC/HD
DRAWN BY: LPS
APPROVED BY: RMH
SHEET : 1 OF 1

APACHE CORPORATION

PROPOSED ELECTRIC LINE FROM THE THUNDERBIRD A #1H, #2H, #3H & #4H TO THE THUNDERBIRD A #5H & #10H WELL LOCATIONS

SECTION 33, T16S, R30E,
N. M. P. M., EDDY CO., NEW MEXICO



DESCRIPTION

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SW 1/4 NE 1/4	44.802 Rods	0.509 Acres

SCALE: 1" = 1000'
0 500' 1000'

BEARINGS ARE GRID NAD 27 NM EAST
DISTANCES ARE HORIZ. GROUND.

LEGEND
( ) RECORD DATA - GLO
◆ FOUND MONUMENT AS NOTED
PROPOSED ELECTRIC LINE

Firm No.: TX 10193838 NM 4655451

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Robert M. Howett
Robert M. Howett NM PS 19680

ROBERT M. HOWETT NEW MEXICO 19680 6/17/16 PROFESSIONAL SURVEYOR

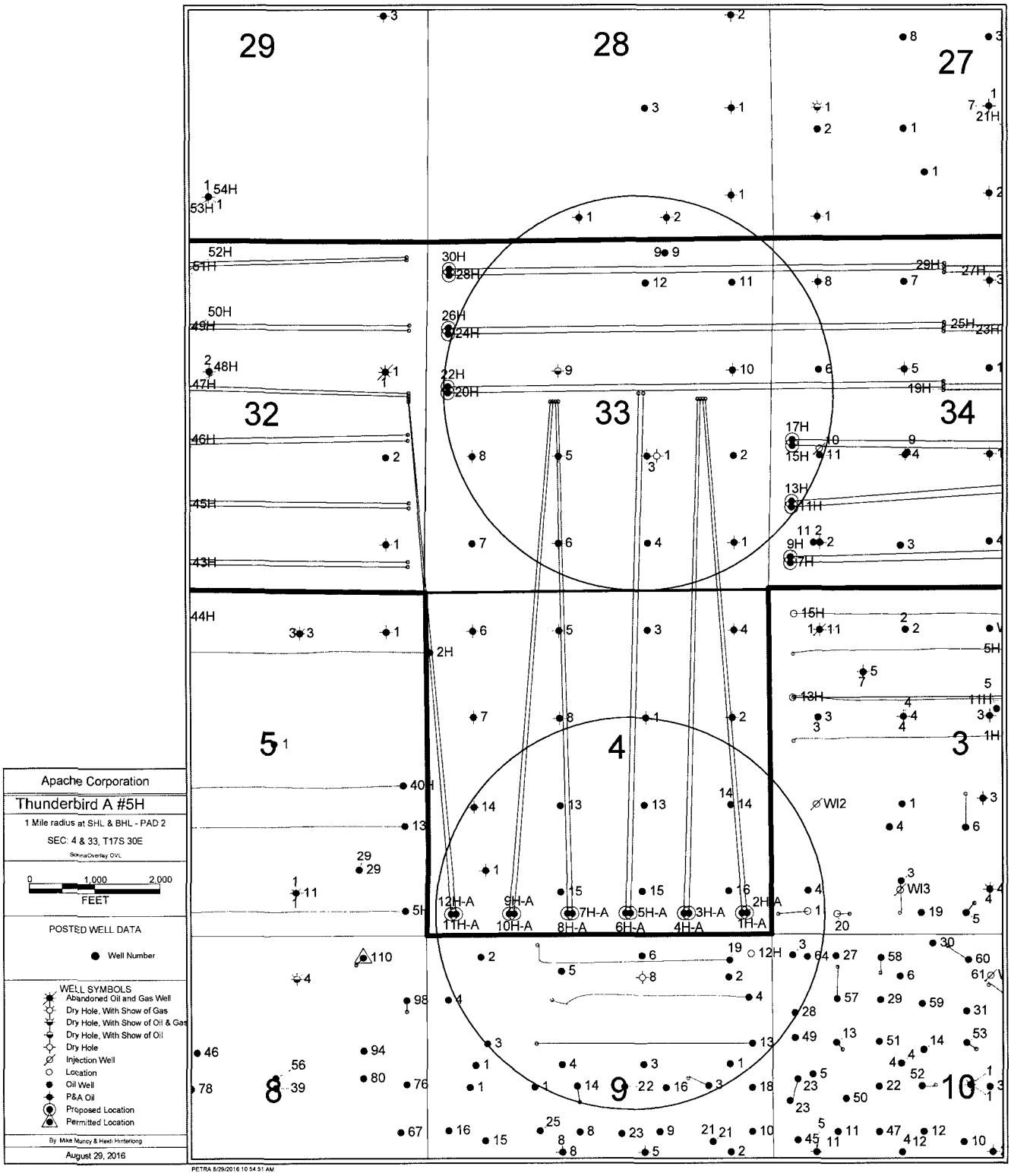
NO.	REVISION	DATE

JOB NO.: LS1605195EL
DWG. NO.: 1605195-1

RRC

308 W. BROADWAY ST., HOBBS, NM 88240 (575) 964-8200

SCALE: 1" = 1000'
DATE: 6-01-2016
SURVEYED BY: BC/HD
DRAWN BY: LPS
APPROVED BY: RMH
SHEET : 1 OF 1


Apache Corporation
Thunderbird A #5H
1 Mile radius at SHL & BHL - PAD 2
SEC: 4 & 33, T17S 30E
SonnaOverlay OVL
0 1,000 2,000
FEET
POSTED WELL DATA
Well Number
WELL SYMBOLS
Abandoned Oil and Gas Well
Dry Hole, With Show of Gas
Dry Hole, With Show of Oil & Gas
Dry Hole, With Show of Oil
Dry Hole
Injection Well
Location
Oil Well
P&A Oil
Proposed Location
Permitted Location
By: Mike Muncy & Heidi Hinterlong
August 29, 2016
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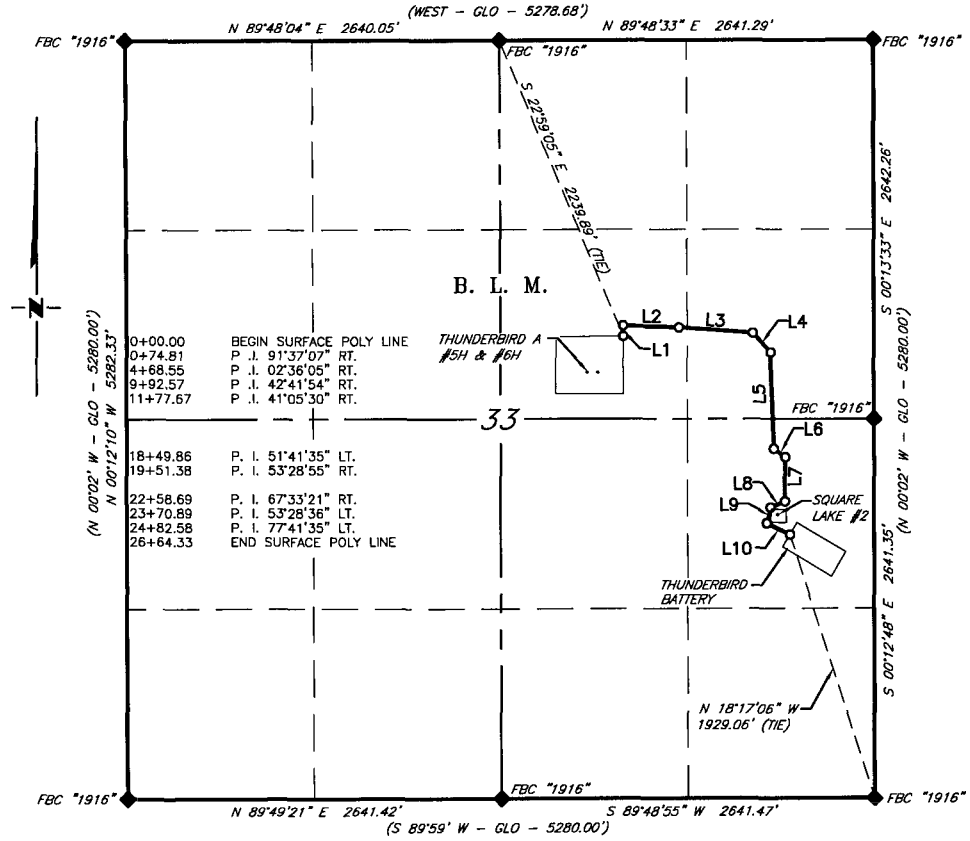
APACHE CORPORATION
PROPOSED SURFACE POLY LINE
FROM THE THUNDERBIRD A #5H & #6H
TO THE THUNDERBIRD BATTERY
SECTION 33, T16S, R30E,
N. M. P. M., EDDY CO., NEW MEXICO



LINE TABLE		
LINE	BEARING	LENGTH
L1	N 00°00'08" W	74.81'
L2	S 88°23'01" E	393.74'
L3	S 85°46'56" E	524.02'
L4	S 43°05'02" E	185.10'
L5	S 01°59'32" E	672.19'
L6	S 53°41'07" E	101.52'
L7	S 00°12'12" E	307.31'
L8	S 67°21'09" W	112.20'
L9	S 13°52'33" W	111.69'
L10	S 63°49'02" E	181.75'

SCALE: 1" = 1000'
0 500' 1000'

BEARINGS ARE GRID NAD 27 NM EAST
DISTANCES ARE HORIZ. GROUND.

LEGEND
( ) RECORD DATA - GLO
◆ FOUND MONUMENT AS NOTED
PROPOSED SURFACE POLY LINE

I, R. M. Howett, a N. M. Professional Surveyor, hereby certify that I prepared this plat from an actual survey made on the ground under my direct supervision, said survey and plat meet the Min. Stds. for Land Surveying in the State of N. M. and are true and correct to the best of my knowledge and belief.

Robert M. Howett
Robert M. Howett NM PS 19680

ROBERT M. HOWETT NEW MEXICO 19680 6/10/16 PROFESSIONAL SURVEYOR

Firm No.: TX 10193838 NM 4655451

NO.	REVISION	DATE

JOB NO.: LS1605195PL
DWG. NO.: 1605195-1

RRC

308 W. BROADWAY ST., HOBBS, NM 88240 (575) 964-8200

SCALE: 1" = 1000'
DATE: 6-01-2016
SURVEYED BY: ML/CG
DRAWN BY: LPS
APPROVED BY: RMH
SHEET : 1 OF 2

APACHE CORPORATION
PROPOSED SURFACE POLY LINE
FOR THE THUNDERBIRD A #5H & #6H
TO THE THUNDERBIRD BATTERY
SECTION 33, T16S, R30E,
N. M. P. M., EDDY CO., NEW MEXICO

DESCRIPTION

A strip of land 30 feet wide, being 2,664.33 feet or 161.475 rods in length, lying in Section 33, Township 16 South, Range 30 East, N. M. P. M., Eddy County, New Mexico, being 15 feet left and 15 feet right of the following described survey of a centerline across B. L. M. land:

BEGINNING at Engr. Sta. 0+00, a point in the Northeast quarter of Section 33, which bears, S 22°59'05" E, 2,239.89 feet, from a brass cap, stamped "1916", found for the North quarter corner of Section 33;

Thence N 00°00'08" W, 74.81 feet, to Engr. Sta. 0+74.81, a P. I. of 91°37'07" right;

Thence S 88°23'01" E, 393.74 feet, to Engr. Sta. 4+68.55, a P. I. of 02°36'05" right;

Thence S 85°46'56" E, 524.02 feet, to Engr. Sta. 9+92.57, a P. I. of 42°41'54" right;

Thence S 43°05'02" E, 185.10 feet, to Engr. Sta. 11+77.67, a P. I. of 41°05'30" right;

Thence S 01°59'32" E, 672.19 feet, to Engr. Sta. 18+49.86, a P. I. of 51°41'35" left;

Thence S 53°41'07" E, 101.52 feet, to Engr. Sta. 19+51.38, a P. I. of 53°28'55" right;

Thence S 00°12'12" E, 307.31 feet, to Engr. Sta. 22+58.69, a P. I. of 67°33'21" right;

Thence S 67°21'09" W, 112.20 feet, to Engr. Sta. 23+70.89, a P. I. of 53°28'36" left;

Thence S 13°52'33" W, 111.69 feet, to Engr. Sta. 24+82.58, a P. I. of 77°41'35" left;

Thence S 63°49'02" E, 181.75 feet, to Engr. Sta. 26+64.33, the End of Survey, a point in the Southeast quarter of Section 33, which bears, N 18°17'06" W, 1,929.06 feet, from a brass cap, stamped "1916", found for the Southeast corner of Section 33.

Said strip of land contains 1.835 acres, more or less, and is allocated by forties as follows:

SW 1/4 NE 1/4	32.054 Rods	0.364 Acres
SE 1/4 NE 1/4	67.437 Rods	0.766 Acres
NE 1/4 SE 1/4	61.984 Rods	0.705 Acres

NO.	REVISION	DATE

JOB NO.: LS1605195PL
DWG. NO.: 1605195-2

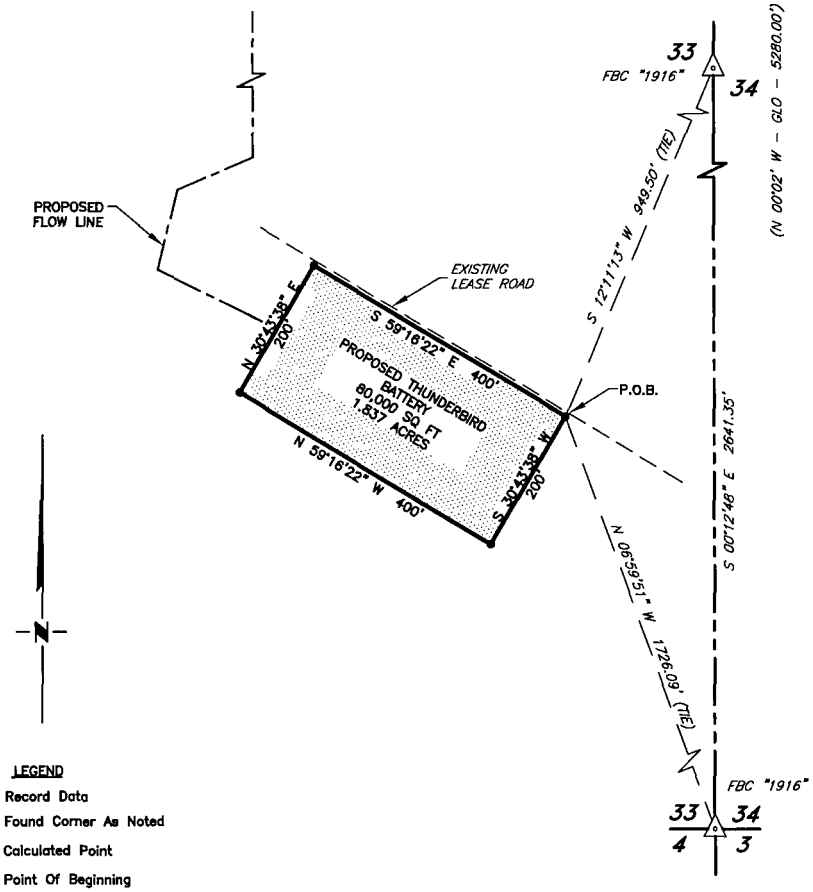
RRC

308 W. BROADWAY ST., HOBBS, NM 88240 (575) 964-8200

SCALE: 1" = 1000'
DATE: 6-01-2016
SURVEYED BY: ML/CG
DRAWN BY: LPS
APPROVED BY: RMH
SHEET : 2 OF 2

APACHE CORPORATION

SURVEY OF THE PROPOSED THUNDERBIRD BATTERY SITUATED WITHIN THE NE 1/4, SE 1/4, SECTION 33, TOWNSHIP 16 SOUTH, RANGE 30 EAST, N. M. P. M., EDDY CO., NEW MEXICO



LEGEND

(-GLO-)	Record Data
△	Found Corner As Noted
●	Calculated Point
P.O.B.	Point Of Beginning

SCALE: 1" = 200'
0 200'

BEARINGS ARE NAD 27 GRID NM EAST & DISTANCES ARE HORIZ. GROUND.

ROBERT M. HOWETT NEW MEXICO 19680 PROFESSIONAL SURVEYOR

I, Robert M. Howett, New Mexico Professional Surveyor No. 19680, do hereby certify that this survey plat and the actual survey on the ground upon which it is based was performed under my direct supervision and this survey meets the minimum standards for surveying in the State of New Mexico and is true and correct to the best of my knowledge and belief.

Robert M. Howett
Robert M. Howett
Date: 6/17/2016

Firm No.: TX 10193838 NM 4655451

DESCRIPTION

A tract of land situated within the Northeast quarter, of the Southeast quarter of Section 33, Township 16 South, Range 30 East, N. M. P. M., Eddy County, New Mexico, across B. L. M. land, and being more particularly described by metes and bounds as follows:

BEGINNING at a point, which bears N 06°59'51" W, 1,726.09 feet, from a brass cap, stamped "1916", found for the Southeast corner of Section 33 and being S 12°11'13" W, 949.50 feet, from a brass cap, stamped "1916", found for the East quarter corner of Section 33;

Thence S 30°43'38" W, 200 feet, to a point;

Thence N 59°16'22" W, 400 feet, to a point;

Thence N 30°43'38" E, 200 feet, to a point;

Thence S 59°16'22" E, 400 feet, to the Point Of Beginning.

Said tract of land contains 80,000 square feet or 1.837 acres, more or less.

NO.	REVISION	DATE

JOB NO.: LS1606200
DWG. NO.: 1606200BT

RRC

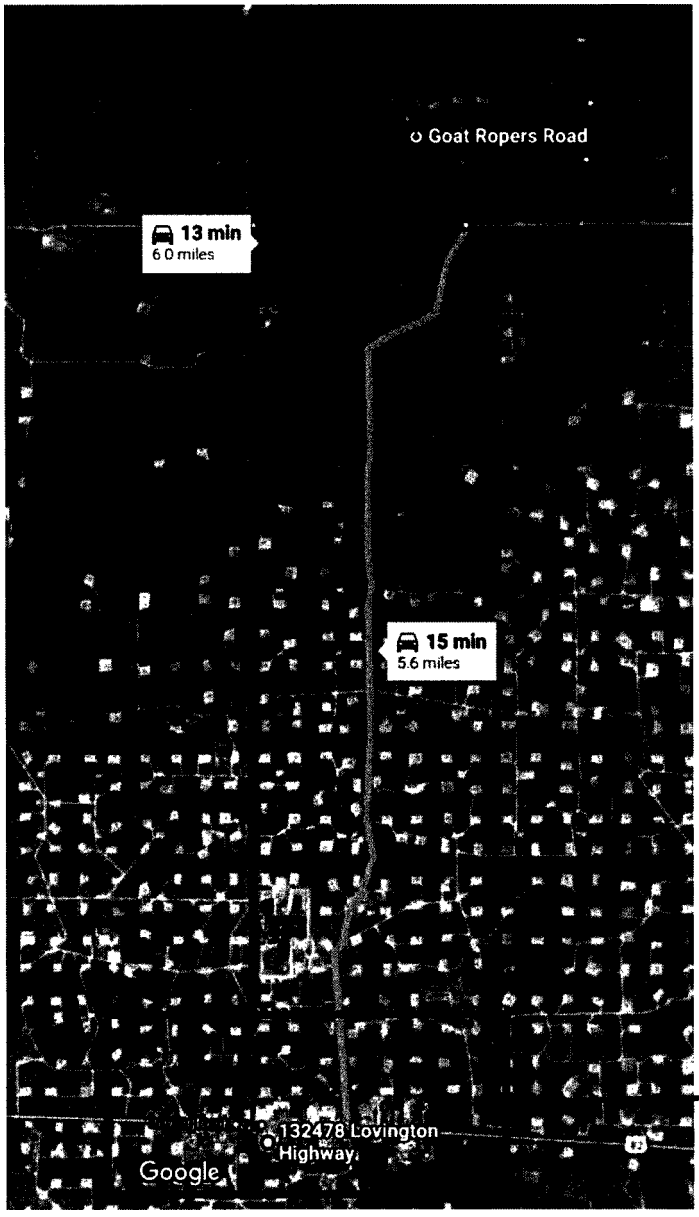
308 W. BROADWAY ST., HOBBS, NM 88240 (575) 964-8200

SCALE:	1"=200'
DATE:	6-1-2016
SURVEYED BY:	BC/HD
DRAWN BY:	CMJ
APPROVED BY:	RMH
SHEET :	1 OF 1

Thunderbird 5H Fresh Water Sources

Source:

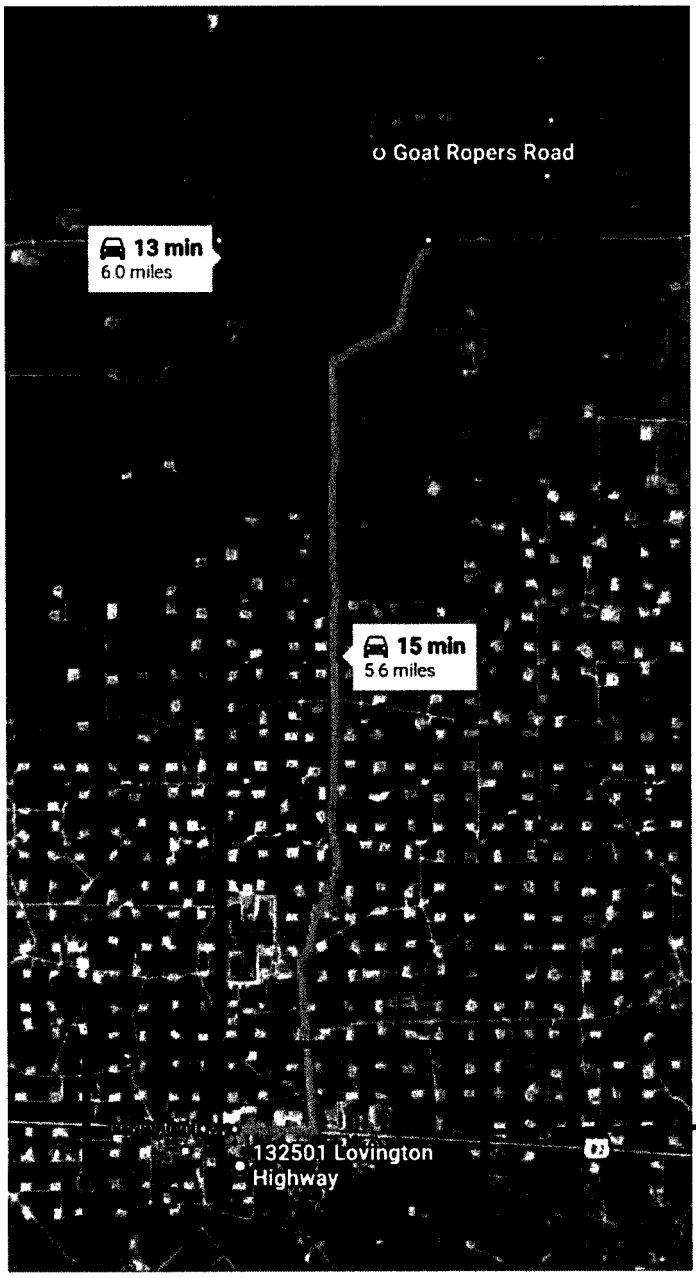
Mor-West Corporation



Loco Hills, New Mexico

Source:

Loco Hills Water Solutions, LLC

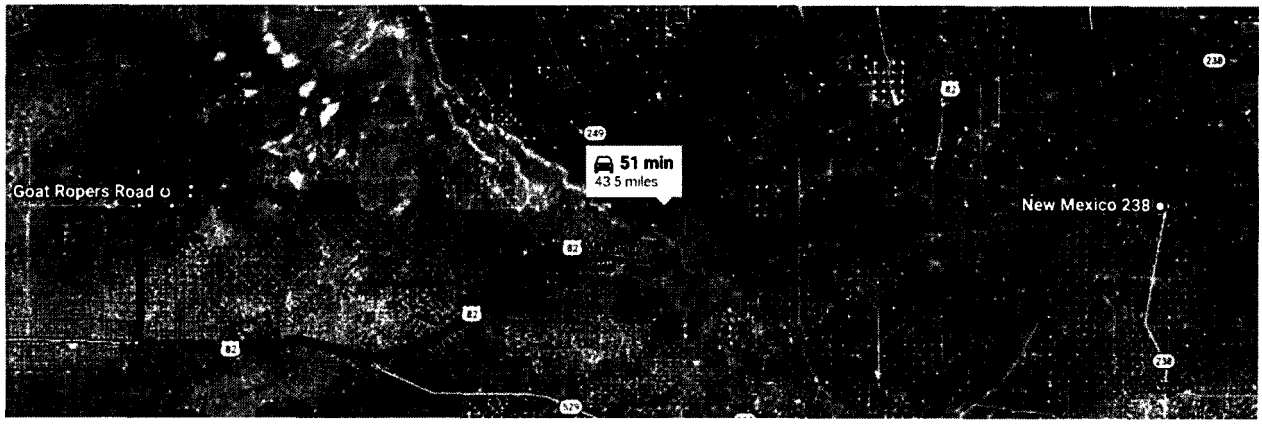


Loco Hills, New Mexico

Thunderbird 5H Brine Water Sources

Source:

Wesserhund



New Mexico 238
Lovington, NM 88260

- **Head north on NM-238 N**
  5.3 mi
- **Turn left onto US-82 W**
  32.3 mi
- **Turn right onto Hagerman Cutoff Rd**
  3.7 mi
- **Turn right onto Mallett Rd**
  0.9 mi
- **Turn left at the 1st cross street onto Goat Ropers Rd**
  0.6 mi
- **Turn left**
  0.2 mi
- **Turn left**
  0.4 mi

Destination: Thunderbird 5H

Source:

Salty Dog

Salty Dog Road

Hobbs, NM 88240

1. Head north on Salty Dog Rd toward US-180 E/US-62 E

22 s (453 ft)

Take NM-529 to Hagerman Cutoff Rd in Loco Hills

38 min (38.4 mi)

2. Turn left at the 1st cross street onto US-180 W/US-62 W

0.8 mi

3. Turn right onto NM-529

31.0 mi

4. Turn left onto US-82 W

6.6 mi

Continue on Hagerman Cutoff Rd to your destination

13 min (5.9 mi)

5. Turn right onto Hagerman Cutoff Rd

3.7 mi

6. Turn right onto Mallett Rd

0.9 mi

7. Turn left at the 1st cross street onto Goat Ropers Rd

0.6 mi

8. Turn left

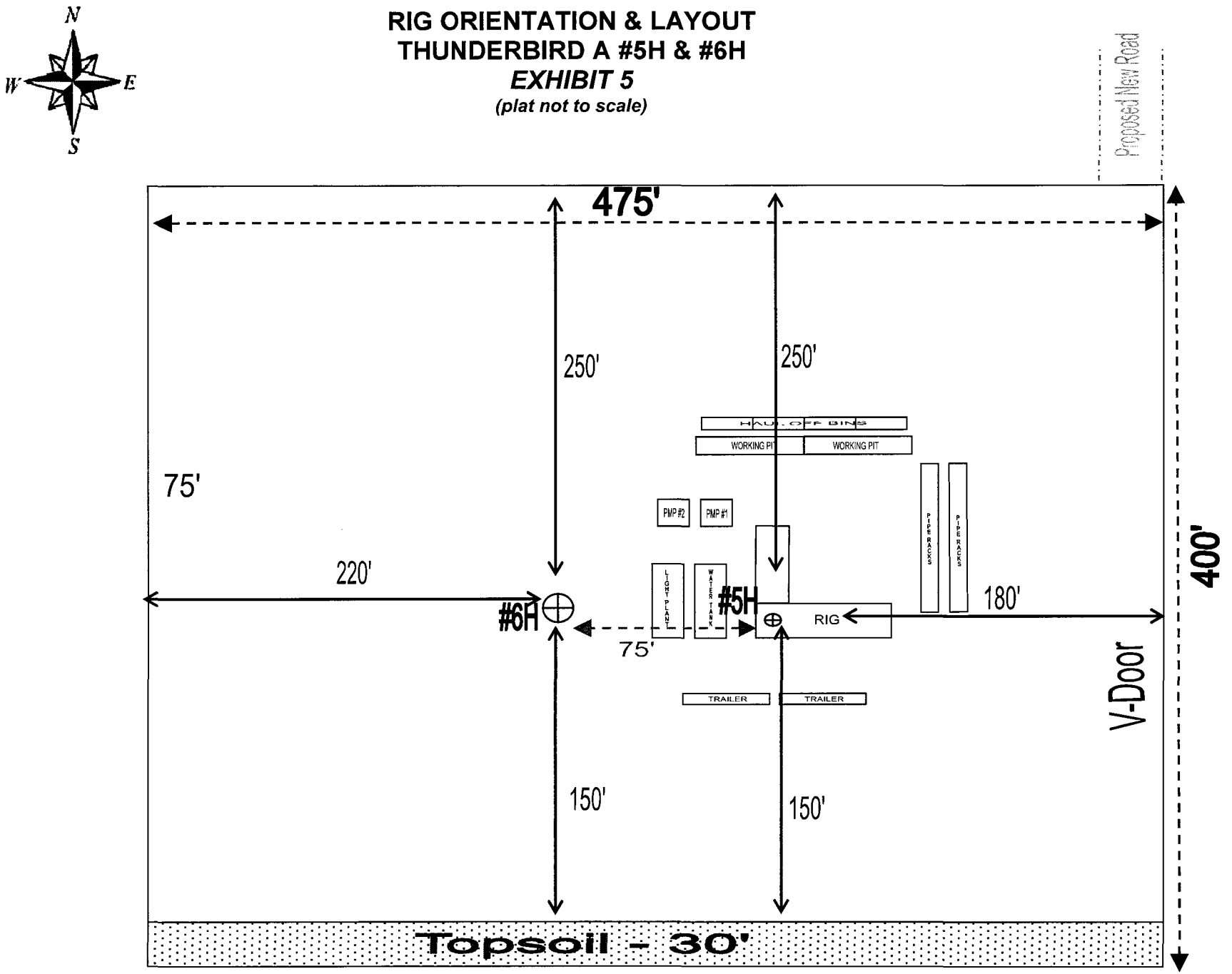
0.2 mi

9. Turn left

0.4 mi

Destination: Thunderbird 5H

RIG ORIENTATION & LAYOUT
THUNDERBIRD A #5H & #6H
EXHIBIT 5
(plat not to scale)



Section 1 - General

Would you like to address long-term produced water disposal? NO

Section 2 - Lined Pits

Would you like to utilize Lined Pit PWD options? NO

Produced Water Disposal (PWD) Location:

PWD surface owner:

PWD disturbance (acres):

Lined pit PWD on or off channel:

Lined pit PWD discharge volume (bbl/day):

Lined pit specifications:

Pit liner description:

Pit liner manufacturers information:

Precipitated solids disposal:

Decribe precipitated solids disposal:

Precipitated solids disposal permit:

Lined pit precipitated solids disposal schedule:

Lined pit precipitated solids disposal schedule attachment:

Lined pit reclamation description:

Lined pit reclamation attachment:

Leak detection system description:

Leak detection system attachment:

Lined pit Monitor description:

Lined pit Monitor attachment:

Lined pit: do you have a reclamation bond for the pit?

Is the reclamation bond a rider under the BLM bond?

Lined pit bond number:

Lined pit bond amount:

Additional bond information attachment:

Section 3 - Unlined Pits

Would you like to utilize Unlined Pit PWD options? NO

Produced Water Disposal (PWD) Location:

PWD surface owner: **PWD disturbance (acres):**

Unlined pit PWD on or off channel:

Unlined pit PWD discharge volume (bbl/day):

Unlined pit specifications:

Precipitated solids disposal:

Decribe precipitated solids disposal:

Precipitated solids disposal permit:

Unlined pit precipitated solids disposal schedule:

Unlined pit precipitated solids disposal schedule attachment:

Unlined pit reclamation description:

Unlined pit reclamation attachment:

Unlined pit Monitor description:

Unlined pit Monitor attachment:

Do you propose to put the produced water to beneficial use?

Beneficial use user confirmation:

Estimated depth of the shallowest aquifer (feet):

Does the produced water have an annual average Total Dissolved Solids (TDS) concentration equal to or less than that of the existing water to be protected?

TDS lab results:

Geologic and hydrologic evidence:

State authorization:

Unlined Produced Water Pit Estimated percolation:

Unlined pit: do you have a reclamation bond for the pit?

Is the reclamation bond a rider under the BLM bond?

Unlined pit bond number:

Unlined pit bond amount:

Additional bond information attachment:

Section 4 - Injection

Would you like to utilize Injection PWD options? NO

Produced Water Disposal (PWD) Location:

PWD surface owner: **PWD disturbance (acres):**

Injection PWD discharge volume (bbl/day):

Injection well mineral owner:

Injection well type:

Injection well number: **Injection well name:**

Assigned injection well API number? **Injection well API number:**

Injection well new surface disturbance (acres):

Minerals protection information:

Mineral protection attachment:

Underground Injection Control (UIC) Permit?

UIC Permit attachment:

Section 5 - Surface Discharge

Would you like to utilize Surface Discharge PWD options? NO

Produced Water Disposal (PWD) Location:

PWD surface owner: **PWD disturbance (acres):**

Surface discharge PWD discharge volume (bbl/day):

Surface Discharge NPDES Permit?

Surface Discharge NPDES Permit attachment:

Surface Discharge site facilities information:

Surface discharge site facilities map:

Section 6 - Other

Would you like to utilize Other PWD options? NO

Produced Water Disposal (PWD) Location:

PWD surface owner: **PWD disturbance (acres):**

Other PWD discharge volume (bbl/day):

Other PWD type description:

Other PWD type attachment:

Have other regulatory requirements been met?

Other regulatory requirements attachment:

AFMSS

U.S. Department of the Interior
BUREAU OF LAND MANAGEMENT

Bond Info Data Report

09/07/2017

Bond Information

Federal/Indian APD: FED

BLM Bond number: NMB000736

BIA Bond number:

Do you have a reclamation bond? NO

Is the reclamation bond a rider under the BLM bond?

Is the reclamation bond BLM or Forest Service?

BLM reclamation bond number:

Forest Service reclamation bond number:

Forest Service reclamation bond attachment:

Reclamation bond number:

Reclamation bond amount:

Reclamation bond rider amount:

Additional reclamation bond information attachment: