AFMSS

U.S. Department of the Interior
Bureau of Land Management

Application for Permit to Drill

APD Package Report

Date Printed:

APD ID:	Well Status:
APD Received Date:	Well Name:
Operator:	Well Number:

APD Package Report Contents

- Form 3160-3

- Operator Certification Report

- Application Report
- Application Attachments
  -- Well Plat: 2 file(s)

- Drilling Plan Report
- Drilling Plan Attachments
  -- Blowout Prevention Choke Diagram Attachment: 2 file(s)
  -- Blowout Prevention BOP Diagram Attachment: 2 file(s)
  -- Casing Taperd String Specs: 4 file(s)
  -- Casing Design Assumptions and Worksheet(s): 8 file(s)
  -- Hydrogen sulfide drilling operations plan: 1 file(s)
  -- Proposed horizontal/directional/multi-lateral plan submission: 1 file(s)
  -- Other Facets: 4 file(s)
  -- Other Variances: 2 file(s)

- SUPO Report
- SUPO Attachments
  -- Existing Road Map: 1 file(s)
  -- New Road Map: 1 file(s)
  -- Attach Well map: 1 file(s)
  -- Production Facilities map: 1 file(s)
  -- Water source and transportation map: 1 file(s)
  -- Construction Materials source location attachment: 1 file(s)
  -- Well Site Layout Diagram: 1 file(s)
  -- Recontouring attachment: 1 file(s)
  -- Other SUPO Attachment: 3 file(s)

- PWD Report
- PWD Attachments

-- None

- Bond Report
- Bond Attachments
  -- None

Form 3160-3
(October 2024)

FORM APPROVED
OMB No. 1004-0137
Expires: October 31, 2027

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

APPLICATION FOR PERMIT TO DRILL OR REENTER

5. Lease Serial No.

6. If Indian, Allotee or Tribe Name

1a. Type of work: ☐ DRILL ☐ REENTER

1b. Type of Well: ☐ Oil Well ☐ Gas Well ☐ Other

1c. Type of Completion: ☐ Hydraulic Fracturing ☐ Single Zone ☐ Multiple Zone

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

8. Lease Name and Well No.

2. Name of Operator

9. API Well No.
30-015-58075

3a. Address	3b. Phone No. *(include area code)*	10. Field and Pool, or Exploratory

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

At surface

At proposed prod. zone

11. Sec., T. R. M. or Blk. and Survey or Area

14. Distance in miles and direction from nearest town or post office*	12. County or Parish	13. State

15. Distance from proposed* location to nearest property or lease line, ft. (Also to nearest drig. unit line, if any)	16. No of acres in lease	17. Spacing Unit dedicated to this well

18. Distance from proposed location* to nearest well, drilling, completed, applied for, on this lease, ft.	19. Proposed Depth	20. BLM/BIA Bond No. in file

21. Elevations (Show whether DF, KDB, RT, GL, etc.)	22. Approximate date work will start*	23. Estimated duration

24. Attachments

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

1. Well plat certified by a registered surveyor.
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 requested by the BLM.

25. Signature	Name *(Printed/Typed)*	Date

Title

Approved by *(Signature)*	Name *(Printed/Typed)*	Date

Title	Office

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

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

APPROVED WITH CONDITIONS

(Continued on page 2)

*(Instructions on page 2)

Approval Date: 03/27/2026

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 I: 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 wen, 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 directionany 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.

ITEM 24: If the proposal will involve hydraulic fracturing operations, you must comply with 43 CFR 3162.3-3, including providing information about the protection of usable water. Operators should provide the best available information about all formations containing water and their depths. This information could include data and interpretation of resistivity logs run on nearby wells. Information may also be obtained from state or tribal regulatory agencies and from local BLM offices.

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 wen 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 win 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 conects this information to anow 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 Conection Clearance Officer (WO-630), 1849 C Street, N.W., Mail Stop 401 LS, Washington, D.C. 20240.

Approval Date: 03/27/2026

Additional Operator Remarks

Location of Well

0. SHL: LOT 4 / 1135 FSL / 920 FWL / TWSP: 17S / RANGE: 28E / SECTION: 30 / LAT: 32.8009144 / LONG: -104.2206153 (TVD: 0 feet, MD: 0 feet)

PPP: NESW / 1885 FSL / 2639 FWL / TWSP: 17S / RANGE: 27E / SECTION: 25 / LAT: 32.80302 / LONG: -104.23222 (TVD: 2400 feet, MD: 5625 feet)

PPP: NWSE / 1885 FSL / 1321 FEL / TWSP: 17S / RANGE: 27E / SECTION: 25 / LAT: 32.80299 / LONG: -104.22792 (TVD: 2413 feet, MD: 4300 feet)

PPP: NESE / 1885 FSL / 100 FEL / TWSP: 17S / RANGE: 27E / SECTION: 25 / LAT: 32.8029651 / LONG: -104.2239456 (TVD: 2425 feet, MD: 3080 feet)

BHL: NWSW / 1885 FSL / 50 FWL / TWSP: 17S / RANGE: 27E / SECTION: 25 / LAT: 32.8030818 / LONG: -104.2406644 (TVD: 2375 feet, MD: 8218 feet)

BLM Point of Contact

Name: CANDY VIGIL
Title: LLE
Phone: (575) 234-5982
Email: CVIGIL@BLM.GOV

Pecos District

Application for Permit to Drill

Conditions of Approval

Geology Concerns

Potash	☒ None	☐ Secretary	☐ R-111-P
Cave/Karst	☐ Medium	☒ High	☐ Critical
H2S	☐ None	☐ Below 100 PPM	☒ Above 100 PPM
Other	☐ 4 String Area	☐ Capitan Reef	☐ SWD Well

Note: The geology of the area where the well is being drilled determines the COAs that apply, not the above table.

Additional Engineering Requirements

Surface casing must be set at: 400 feet

Intermediate casing must be set at: 1,367 feet

General Requirements

1. Changes to the approved APD casing program need prior approval.

2. The Bureau of Land Management (BLM) will be notified in advance for a representative to witness:
   a. Well spudding (minimum of 24 hours notice)
   b. Setting and/or cementing of all casing strings (minimum of 4 hours notice)
   c. BOPE tests (minimum of 4 hours notice)

   Eddy County
   620 East Greene Street, Carlsbad, NM 88220
   (575) 361-2822
   BLM_NM_CFO_DrillingNotifications@BLM.GOV

   Lea County
   414 West Taylor, Hobbs, NM 88240
   (575) 689-5981

3. The initial wellhead installed on the well will remain on the well with spools used as needed.

4. Unless the production casing has been run and cemented or the well has been properly plugged, the drilling rig shall not be removed from over the hole without prior approval.

 Approval Date: 03/27/2026

a. In the event the operator has proposed to drill multiple wells utilizing a skid/walking rig:
    i. Operator shall secure the wellbore on the current well, after installing and testing the wellhead, by installing a blind flange of like pressure rating to the wellhead and a pressure gauge that can be monitored while drilling is performed on the other well(s).
b. When the operator proposes to set surface casing with a Spudder Rig:
    i. Notify the BLM when moving in and removing the Spudder Rig.
    ii. Notify the BLM when moving in the 2nd Rig. Rig to be moved in within 90 days of notification that Spudder Rig has left the location.
    iii. BOP/BOPE test to be conducted per 43 CFR 3172.6 as soon as 2nd Rig is rigged up on well.

5. Floor controls are required for 3M or greater systems. These controls will be on the rig floor, unobstructed, readily accessible to the driller, and will always be operational during drilling and/or completion activities. Rig floor is defined as the area immediately around the rotary table or the area immediately above the substructure on which the draw works are located (this does not include the doghouse or stairway area).

6. The record of the drilling rate along with the GR/N well log run from TD to surface (horizontal well – vertical portion of hole) shall be submitted to the BLM office as well as all other logs run on the borehole 30 days from completion. If available, a digital copy of the logs is to be submitted in addition to the paper copies. The Rustler top and top and bottom of Salt are to be recorded on the Completion Report.

Pressure Control

1. All blowout preventer (BOP) and related equipment (BOPE) shall comply with well control requirements as described in 43 CFR 3172.6 and API STD 53 Sec. 5.3.

2. 5M or higher systems require an HCR valve, remote kill line, and annular to match. The remote kill line is to be installed prior to testing the system and tested to stack pressure.

3. The appropriate BLM office shall be notified a minimum of 4 hours in advance for a representative to witness the tests.
    a. The test shall be run on a 5000 psi chart for a 2-3M BOP/BOP, on a 10000 psi chart for a 5M BOP/BOPE, and on a 15000 psi chart for a 10M BOP/BOPE. If a linear chart is used, it shall be a one hour chart. A circular chart shall have a maximum 2 hour clock. If a twelve hour or twenty-four hour chart is used, tester shall make a notation that it is run with a two hour clock.
    b. The results of the test shall be reported to the appropriate BLM office.
    c. All tests are required to be recorded on a calibrated test chart. A copy of the BOP/BOPE test chart and a copy of independent service company test will be submitted to the appropriate BLM office.

d. The BOP/BOPE test shall include a low pressure test from 250 to 300 psi. The test will be held for a minimum of 10 minutes if test is done with a test plug and 30 minutes without a test plug. This test shall be performed prior to the test at full stack pressure.
e. BOP/BOPE must be tested by an independent service company within 500 feet of the top of the Wolfcamp formation if the time between the setting of the intermediate casing and reaching this depth exceeds 20 days. This test does not exclude the test prior to drilling out the casing shoe as per 43 CFR 3172.6(b)(9).
f. In a water basin, for all casing strings utilizing slips, these are to be set as soon as the crew and rig are ready and any fallback cement remediation has been done. The casing cut-off and BOP installation can be initiated four hours after installing the slips, which will be approximately six hours after bumping the plug. For those casing strings not using slips, the minimum wait time before cut-off is eight hours after bumping the plug. BOP/BOPE testing can begin after cut-off or once cement reaches 500 psi compressive strength (including lead when specified), whichever is greater. However, if the float does not hold, cut-off cannot be initiated until cement reaches 500 psi compressive strength (including lead when specified).
g. In potash areas, for all casing strings utilizing slips, these are to be set as soon as the crew and rig are ready and any fallback cement remediation has been done. For all casing strings, casing cut-off and BOP installation can be initiated at twelve hours after bumping the plug. However, no tests shall commence until the cement has had a minimum of 24 hours setup time.
h. The tests shall be done by an independent service company utilizing a test plug, not a cup or J-packer and can be initiated immediately with the casing valve open. The operator also has the option of utilizing an independent tester to test without a plug (i.e. against the casing) pursuant to 43 CFR 3172 with the pressure not to exceed 70% of the burst rating for the casing. Any test against the casing must meet the WOC time for water basin (8 hours) or potash (24 hours) or 500 pounds compressive strength, whichever is greater, prior to initiating the test (see casing segment as lead cement may be critical item).

4. If the operator has proposed using a 5,000 (5M) Annular on a 10M BOP:
   a. Minimum working pressure of the blowout preventer (BOP) and related equipment (BOPE) required for drilling below the surface casing shoe shall be 10,000 (10M) psi.

5. If the operator has proposed a multi-bowl wellhead assembly in the APD. The following requirements must be met:
   a. Wellhead shall be installed by manufacturer's representatives (submit documentation with subsequent sundry).

b. If the welding is performed by a third party, the manufacturer's representative shall monitor the temperature to verify that it does not exceed the maximum temperature of the seal.
c. Manufacturer representative shall install the test plug for the initial BOP test.
d. Whenever any seal subject to test pressure is broken, all the tests in 43 CFR 3172 must be followed.
e. If the cement does not circulate and one inch operations would have been possible with a standard wellhead, the well head shall be cut off, cementing operations performed, and another wellhead installed.

6. If a variance is approved for break testing the BOPE, the following requirements apply:
   a. BOPE break testing is only approved for a BOP rated at 5M or less.
   b. Approval is only for the intermediate hole sections, so long as those sections do not go deeper than the Bone Springs formation.
   c. The Annular Preventer must be tested to a minimum of 70% of BOPE working pressure and shall be higher than the MASP.
   d. A full BOP test shall be performed every 21 days (at a minimum).
   e. A full BOP test is required prior to drilling the first intermediate hole section (if applicable). If any subsequent intermediate hole interval is deeper than the first, a full BOP test shall be required (a maximum 200 foot difference in true vertical depth (TVD) is allowed).
   f. BOPE break testing is not permitted for drilling the production hole section.
   g. While in transfer, the BOP shall be secured by the hydraulic carrier or cradle.
   h. If any repairs or replacements of the BOPE is required, the BOPE shall be tested as required by 43 CFR 3172.
   i. Pressure tests shall be performed on any BOPE components that have been disconnected. A low pressure (250-300 psi) and a high pressure (BOP max pressure rating) test are required.
   j. If a testing plug is used, pressure shall be maintained for at least 10 minutes. If there is any bleed off in pressure, the test shall be considered to have failed.
   k. If no testing plug is used, pressure shall be maintained for at least 30 minutes. If there is a decline in pressure of more than 10 percent, the test shall be considered to have failed.
   l. The appropriate Bureau of Land Management (BLM) office shall be notified a minimum of 4 hours before testing occurs.
   m. Any well control event while drilling require notification to the BLM Petroleum Engineer (575-706-2779) prior to the commencement of any BOPE Break Testing operations.
   n. If break testing is not used, then a full BOPE test shall be conducted.

7. If a variance is approved for a flexible hose to be installed from the BOP to the choke manifold, the following requirements apply:
   a. The flex line must meet the requirements of API 16C.

b. Check condition of flexible line from BOP to choke manifold (replace if exterior is damaged or if line fails test).
c. Line is to be as straight as possible with no hard bends and is to be anchored according to Manufacturer's requirements.
d. The flexible hose can be exchanged with a hose of equal size and equal or greater pressure rating.
e. Anchor requirements, specification sheet and hydrostatic pressure test certification matching the hose in service, shall be onsite for review. These documents shall be posted in the company man's trailer and on the rig floor.

Casing and Cement

1. Changes to the approved cement program need prior approval if the altered cement plan has less volume or strength or if the changes are substantial (i.e. Multistage tool, ECP, etc.).

2. On any well approved for a 5M BOPE system or greater, a pressure integrity test of each casing shoe shall be performed. The formation at the shoe shall be tested to a minimum of the mud weight equivalent anticipated to control the formation pressure to the next casing depth or at total depth of the well. This test shall be performed before drilling more than 20 feet of new hole.

3. Provide compressive strengths (including hours to reach required 500 pounds compressive strength) prior to cementing each casing string. Have well specific cement details onsite prior to pumping the cement for each casing string.

4. The surface casing shall be set at a minimum of 25 feet into the Rustler Anhydrite and 80 feet above the salt and cemented to the surface.
    a. If cement does not circulate to the surface, the appropriate BLM office shall be notified and a temperature survey utilizing an electronic type temperature survey with surface log readout will be used or a cement bond log shall be run to verify the top of the cement. Temperature survey will be run a minimum of six hours after pumping cement and ideally between 8-10 hours after completing the cement job.
    b. Wait on cement (WOC) time for a primary cement job will be a minimum of 8 hours (or 24 hours in the Potash Area) or 500 pounds compressive strength, whichever is greater. (This is to include the lead cement)
    c. Wait on cement (WOC) time for a remedial job will be a minimum of 4 hours after bringing cement to surface or 500 pounds compressive strength, whichever is greater.
    d. If cement falls back, remedial cementing will be done prior to drilling out that string.

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

6. Intermediate casing must be cemented to surface. For medium/high cave/karst, potash, and Capitan Reef, wait on cement (WOC) time for a primary cement job is to include the lead cement slurry.

7. The production cement should tie-back at least 200 feet (500 feet in Secretary Potash, surface in R-111-P potash) into previous casing string. Operator shall provide method of verification.

8. Production liner cement should tie-back at least 100 feet into previous casing string. Operator shall provide verification of cement top.

9. In WIPP Areas, cement must come to surface on the first three casing strings.

10. If cement does not circulate to surface on the first two casing strings, the cement on the 3rd casing string must come to surface. The casing integrity test can be done (prior to the cement setting up) immediately after bumping the plug.

11. No pea gravel permitted for remedial cement or fall back remedial cement without prior authorization from a BLM petroleum engineer.

12. If hardband drill pipe is rotated inside casing, returns will be monitored for metal. If metal is found in samples, drill pipe will be pulled and rubber protectors which have a larger diameter than the tool joints of the drill pipe will be installed prior to continuing drilling operations.

13. DV tools:
    a. First stage to DV tool (The DV tool may be cancelled if cement circulates to surface on the first stage):
        i. Cement to circulate. If cement does not circulate off the DV tool, contact the appropriate BLM office before proceeding with second stage cement job.
    b. Second stage above DV tool:
        i. For intermediate casing, cement to surface.
        ii. For production casing, cement should tie-back at least 200 feet (500 feet in Secretary Potash, surface in R-111-P potash) into previous casing string. Operator shall provide method of verification.
        iii. If cement does not circulate, contact the appropriate BLM office.

14. Potash Areas:
    a. Wait on cement (WOC) time for a primary cement job is to include the lead cement slurry.
    b. After cementing but before commencing any tests, the casing string shall stand cemented under pressure until both of the following conditions have been met:
        i. Cement reaches a minimum compressive strength of 500 psi for all cement blends
        ii. Until cement has been in place at least 24 hours.
    c. WOC time will be recorded in the driller's log.
    d. Whenever a casing string is cemented in the R-111-P potash area, the NMOCD requirements shall be followed.
    e. In R111 Potash Areas, if cement does not circulate to surface on the first two salt protection casing strings, the cement on the 3rd casing salt string must come to surface.
    f. In Secretary Potash Areas, if cement does not circulate to surface on the first two casing strings, the cement on the 3rd casing string must come to surface.

15. Wait on cement (WOC) for Water Basin:
    a. After cementing but before commencing any tests, the casing string shall stand cemented under pressure until both of the following conditions have been met:
        i. Cement reaches a minimum compressive strength of 500 psi at the shoe
        ii. Until cement has been in place at least 8 hours.
    b. WOC time will be recorded in the driller's log.

16. Medium/High/Critical Cave/Karst Areas:
    a. Wait on cement (WOC) time for a primary cement job is to include the lead cement slurry.
    b. In Critical Cave/Karst Areas cement must come to surface on the first three casing strings.
    c. In Medium and High Cave/Karst Areas, if cement does not circulate to surface on the first two casing strings, the cement on the 3rd casing string must come to surface.
    d. In Critical Cave/Karst Areas, if cement does not circulate to surface on the first three casing strings, the cement on the 4th casing string must come to surface.

Drilling Mud

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

Waste Material and Fluids

1. All waste (i.e. drilling fluids, trash, salts, chemicals, sewage, gray water, etc.) created as a result of drilling operations and completion operations shall be safely contained and

disposed of properly at a waste disposal facility. No waste material or fluid shall be disposed of on the well location or surrounding area.

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

Special Requirements

1. Communitization Agreement
    a. The operator will submit a Communitization Agreement to the Santa Fe Office (301 Dinosaur Trail, Santa Fe, NM 87508), at least 90 days before the anticipated date of first production from a well subject to a spacing order issued by the New Mexico Oil Conservation Division.
    b. The Communitization Agreement will include the signatures of all working interest owners in all Federal and Indian leases subject to the Communitization Agreement (i.e., operating rights owners and lessees of record), or certification that the operator has obtained the written signatures of all such owners and will make those signatures available to the BLM immediately upon request.
        i. The operator will submit an as-drilled survey well plat of the well completion, but are not limited to, those specified in 43 CFR 3171 and 3172.
        ii. If the operator does not comply with this condition of approval, the BLM may take enforcement actions that include, but are not limited to, those specified in 43 CFR 3163.1.
    c. In addition, the well sign shall include the surface and bottom hole lease numbers.
        i. When the Communitization Agreement number is known, it shall also be on the sign.

2. Unit Wells
    a. The well sign for a unit well shall include the unit number in addition to the surface and bottom hole lease numbers. This also applies to participating area numbers.
        i. If a participating area has not been established, the operator can use the general unit designation, but will replace the unit number with the participating area number when the sign is replaced.
    b. Commercial Well Determination
        i. A commercial well determination shall be submitted after production has been established for at least six months (this is not necessary for secondary recovery unit wells).

3. Hydrogen Sulfide (H2S)
    a. If H2S is encountered, provide measured values and formations to the BLM.
    b. An H2S area must meet 43 CFR 3176 requirements, which includes equipment and personnel/public protection items.

c. An H2S Drilling Plan shall be activated 500 feet prior to drilling into any formation designated as having H2S.
d. Hydrogen Sulfide monitors shall be installed prior to drilling out the surface shoe. If H2S is detected in concentrations greater than 100 ppm, the Hydrogen Sulfide area shall meet 43 CFR 3176 requirements, which includes equipment and personnel/public protection items.

4. Capitan Reef
   a. If lost circulation (50% or greater) occurs below the Base of the Salt, the operator shall do the following (Use this for 3 string wells in the Capitan Reef, if it is a 4 string well ensure fresh water based mud is used across the Capitan interval):
      i. Switch to fresh water mud to protect the Capitan Reef and use fresh water mud until setting the intermediate casing. The appropriate BLM office is to be notified for a PET to witness the switch to fresh water.
      ii. Daily drilling reports from the Base of the Salt to the setting of the intermediate casing are to be submitted to the BLM CFO engineering staff via e-mail by 0800 hours each morning. Any lost circulation encountered is to be recorded on these drilling reports.
      iii. The daily drilling report should show mud volume per shift/tour.
      iv. Failure to submit these reports will result in an Incidence of Non-Compliance being issued for failure to comply with the Conditions of Approval.
      v. If not already planned, the operator shall run a caliper survey for the intermediate well bore and submit to the appropriate BLM office.

5. Salt Water Disposal Wells
   a. The operator shall supply the BLM with a copy of a mudlog over the permitted disposal interval and estimated in situ water salinity based on open-hole logs.
   b. If hydrocarbons are encountered while drilling, the operator shall notify the BLM.
   c. The operator shall provide to the BLM a summary of formation depth picks based on mudlog and geophysical logs along with a copy of the mudlog and open-hole logs from total depth to top of Devonian.
   d. An NOI sundry with the completion procedure for this well shall be submitted and approved prior to commencing completion work. The procedure will be reviewed to verify that the completion proposal will allow the operator to:
      i. Properly evaluate the injection zone utilizing open-hole logs, swab testing and/or any other method to confirm that hydrocarbons cannot be produced in paying quantities. This evaluation shall be reviewed by the BLM prior to injection commencing.
      ii. Restrict the injection fluid to the approved formation.
      iii. If a step rate test will be run, an NOI sundry shall be submitted to the BLM for approval.

e. If off-lease water will be disposed in this well, the operator shall provide proof of right-of-way approval.

6. WIPP Requirements
   a. If the proposed surface well or bottom hole is located within 330 feet of the WIPP Land Withdrawal Area boundary:
      i. Daily drilling reports, logs, and deviation survey information are required to be submitted to the Bureau of Land Management Engineering Department and the U.S. Department of Energy (per requirements of the Joint Powers Agreement) until a total vertical depth of 7,000 feet is reached. These reports will have at a minimum the rate of penetration and a clearly marked section showing the deviation for each 500-foot interval. Operator may be required to do more frequent deviation surveys based on the daily information submitted and may be required to take other corrective measures.
      ii. Information will also be provided to the New Mexico Oil Conservation Division after drilling activities have been completed.
      iii. Upon completion of the well, the operator shall submit a complete directional survey.
      iv. Any future entry into the well for purposes of completing additional drilling will require supplemental information.
   b. Required information shall be emailed to OilGasReports@wipp.ws.
      i. Attached files must not be greater than 20 MB.
      ii. Call WIPP Tech Support at 575-234-7422, during the hours of 7:00am to 4:30pm, if there are any issues sending to this address.

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

Operator Certification Data Report

03/30/2026

Operator

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: SARAH CHAPMAN **Signed on:** 02/24/2026

Title: Regulatory Director

Street Address: 9655 KATY FREEWAY SUITE 500

City: HOUSTON **State:** TX **Zip:** 77024

Phone: (281)642-5503

Email address: SCHAPMAN@SPURENERGY.COM

Field

Representative Name:

Street Address:

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

Phone:

Email address:

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

Application Data
03/30/2026

APD ID: 10400109646
Submission Date: 01/21/2026
Operator Name: SPUR ENERGY PARTNERS LLC
Well Name: BLACK CHERRY FEDERAL COM
Well Number: 110H
Well Type: OIL WELL
Well Work Type: Drill

Highlighted data reflects the most recent changes
Show Final Text

Section 1 - General

APD ID: 10400109646
Tie to previous NOS? N
Submission Date: 01/21/2026
BLM Office: Carlsbad
User: SARAH CHAPMAN
Title: Regulatory Director
Federal/Indian APD: FED
Is the first lease penetrated for production Federal or Indian? FED
Lease number: NMLC058181
Lease Acres:
Surface access agreement in place?
Allotted?
Reservation:
Agreement in place? NO
Federal or Indian agreement:
Agreement number:
Agreement name:
Keep application confidential? Y
Permitting Agent? NO
APD Operator: SPUR ENERGY PARTNERS LLC
Operator letter of

Operator Info

Operator Organization Name: SPUR ENERGY PARTNERS LLC
Operator Address: 9655 KATY FREEWAY SUITE 500
Zip: 77024
Operator PO Box:
Operator City: HOUSTON
State: TX
Operator Phone: (832)930-8548
Operator Internet Address:

Section 2 - Well Information

Well in Master Development Plan? NO
Master Development Plan name:
Well in Master SUPO? NO
Master SUPO name:
Well in Master Drilling Plan? NO
Master Drilling Plan name:
Well Name: BLACK CHERRY FEDERAL COM
Well Number: 110H
Field/Pool or Exploratory? Field and Pool
Field Name: RED LAKE
Pool Name: QUEEN-GRAYBURG - SAN ANDRES

Operator Name: SPUR ENERGY PARTNERS LLC

Well Name: BLACK CHERRY FEDERAL COM **Well Number:** 110H

Is the proposed well in an area containing other mineral resources? NATURAL GAS,OIL

Is the proposed well in a Helium production area? N **Use Existing Well Pad?** N **New surface disturbance?**

Type of Well Pad: SINGLE WELL **Multiple Well Pad Name:** **Number:**

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

Well Work Type: Drill

Well Type: OIL WELL

Describe Well Type:

Well sub-Type: INFILL

Describe sub-type:

Distance to town: **Distance to nearest well:** 669 FT **Distance to lease line:** 1 FT

Reservoir well spacing assigned acres Measurement: 160 Acres

Well plat: Black_Cherry_Federal_Com_110H_C_102_20260113114600.pdf

Black_Cherry_Federal_Com_110H_Revised_Site_Plan_20260224132607.pdf

Well work start Date: 05/16/2026 **Duration:** 90 DAYS

Section 3 - Well Location Table

Survey Type: RECTANGULAR

Describe Survey Type:

Datum: NAD83 **Vertical Datum:** NAVD88

Survey number: 14400 **Reference Datum:** GROUND LEVEL

Wellbore	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	Will this well produce from this
SHL Leg #1	1135	FSL	920	FWL	17S	28E	30	Lot 4	32.8009144	-104.2206153	EDDY	NEW MEXICO	NEW MEXICO	S	STATE	3606			N
KOP Leg #1	1679	FSL	754	FWL	17S	28E	30	Lot 3	32.8024063	-104.2211651	EDDY	NEW MEXICO	NEW MEXICO	S	STATE	1865	1878	1741	N

Operator Name: SPUR ENERGY PARTNERS LLC

Well Name: BLACK CHERRY FEDERAL COM **Well Number:** 110H

Wellbore	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	Will this well produce from this
PPP Leg #1-1	1885	FSL	100	FEL	17S	27E	25	Aliquot NESE	32.8029651	-104.2239456	EDDY	NEW MEXICO	NEW MEXICO	S	STATE	1181	3080	2425	Y
PPP Leg #1-2	1885	FSL	1321	FEL	17S	27E	25	Aliquot NWSE	32.80299	-104.22792	EDDY	NEW MEXICO	NEW MEXICO	F	NMLC058181	1193	4300	2413	Y
PPP Leg #1-3	1885	FSL	2639	FWL	17S	27E	25	Aliquot NESW	32.80302	-104.23222	EDDY	NEW MEXICO	NEW MEXICO	F	NMNM 96836	1206	5625	2400	Y
EXIT Leg #1	1885	FSL	100	FWL	17S	27E	25	Aliquot NWSW	32.8030807	-104.2405017	EDDY	NEW MEXICO	NEW MEXICO	F	NMNM 94593	1231	8168	2375	Y
BHL Leg #1	1885	FSL	50	FWL	17S	27E	25	Aliquot NWSW	32.8030818	-104.2406644	EDDY	NEW MEXICO	NEW MEXICO	F	NMNM 94593	1231	8218	2375	Y

C-102 Submit Electronically Via OCD Permitting	State of New Mexico Energy, Minerals & Natural Resources Department OIL CONSERVATION DIVISION	Revised July 9, 2024 Submittal Type: ☒ Initial Submittal ☐ Amended Report ☐ As Drilled

WELL LOCATION INFORMATION

API Number	Pool Code	Pool Name
30-015- 58075	51300	RED LAKE; QUEEN-GRAYBURG-SAN ANDRES

Property Code	Property Name	Well Number
339079	BLACK CHERRY FEDERAL COM	110H

OGRID No.	Operator Name	Ground Level Elevation
328947	SPUR ENERGY PARTNERS LLC.	3606'

Surface Owner: ☐ State ☒ Fee ☐ Tribal ☐ Federal — Mineral Owner: ☒ State ☐ Fee ☐ Tribal ☒ Federal

Surface Location

UL	Section	Township	Range	Lot	Ft. from N/S	Ft. from E/W	Latitude	Longitude	County
M	30	17S	28E	4	1135 FSL	920 FWL	32.8009144°N	104.2206152°W	EDDY

Bottom Hole Location

UL	Section	Township	Range	Lot	Ft. from N/S	Ft. from E/W	Latitude	Longitude	County
L	25	17S	27E		1885 FSL	50 FWL	32.8030818°N	104.2406644°W	EDDY

Dedicated Acres	Infill or Defining Well	Defining Well API	Overlapping Spacing Unit (Y/N)	Consolidation Code
160	DEFINING		Y	F & C

Order Numbers. R-23912 CA: PENDING — Well setbacks are under Common Ownership: ☐ Yes ☐ No NA

Kick Off Point (KOP)

UL	Section	Township	Range	Lot	Ft. from N/S	Ft. from E/W	Latitude	Longitude	County
L	30	17S	28E	3	1679 FSL	754 FWL	32.8024063°N	104.2211651°W	EDDY

First Take Point (FTP)

UL	Section	Township	Range	Lot	Ft. from N/S	Ft. from E/W	Latitude	Longitude	County
I	25	17S	27E		1885 FSL	100 FEL	32.8029651°N	104.2239456°W	EDDY

Last Take Point (LTP)

UL	Section	Township	Range	Lot	Ft. from N/S	Ft. from E/W	Latitude	Longitude	County
L	25	17S	27E		1885 FSL	100 FWL	32.8030807°N	104.2405017°W	EDDY

Unitized Area or Area of Uniform Interest	Spacing Unit Type	Ground Floor Elevation:
NA	☒ Horizontal ☐ Vertical	3606' GL

OPERATOR CERTIFICATIONS

I hereby certify that the information contained herein is true and complete to the best of my knowledge and belief, and , if the well is a vertical or directional well, that this organization either owns a working interest or unleased mineral interest in the land including the proposed bottom hole location or has a right to drill this well at this location pursuant to a contract with an owner of a working interest or unleased mineral interest, or to a voluntary pooling agreement or a compulsory pooling order heretofore entered by the division.

If this well is a horizontal well, I further certify that this organization has received the consent of at least one lessee or owner of a working interest or unleased mineral interest in each tract (in the target pool or formation) in which any part of the well's completed interval will be located or obtained a compulsory pooling order from the division.

Sarah Savino 01/13/2026

Signature Date

SARAH SAVINO

Printed Name

SSAVINO@SPURENERGY.COM

Email Address

SURVEYOR CERTIFICATIONS

I hereby certify that the well location shown on this plat was plotted from field notes of actual surveys made by me under my supervision, and that the same is true and correct to the best of my belief.

DALE E. BELL NEW MEXICO 14400 01/13/2026 PROFESSIONAL SURVEYOR

Signature and Seal of Professional Surveyor

Certificate Number	Date of Survey
14400	06/26/2025

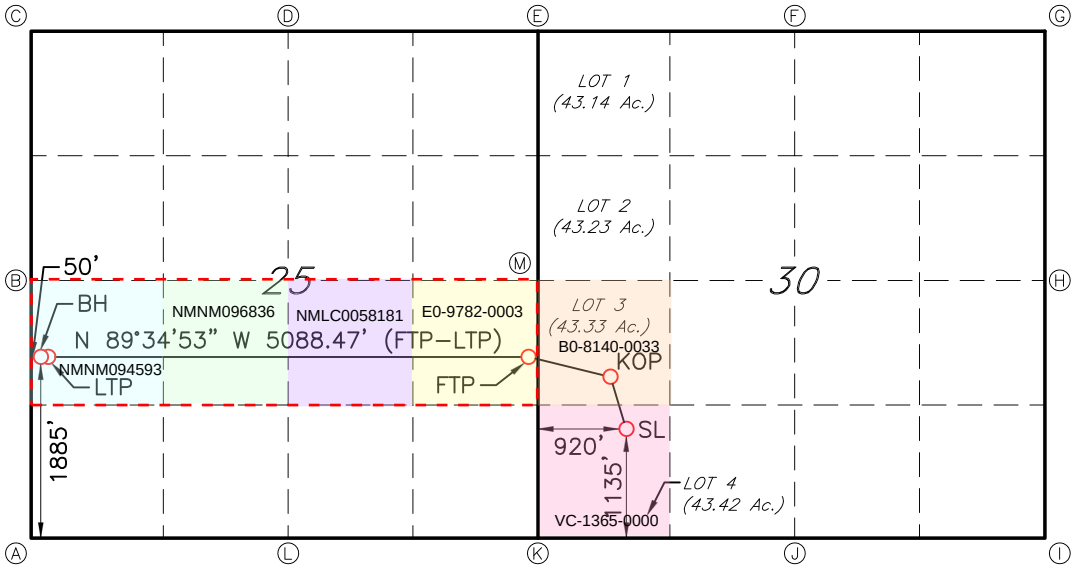
Note: No allowable will be assigned to this completion until all interests have been consolidated or a non-standard unit has been approved by the division.

ACREAGE DEDICATION PLATS

This grid represents a standard section. You may superimpose a non-standard section, or larger area, over this grid. Operators must outline the dedicated acreage in a red box, clearly show the well surface location and bottom hole location, if it is a directionally drilled, with the dimensions from the section lines in the cardinal directions. If this is a horizontal wellbore show on this plat the location of the First Take Point and Last Take Point, and the point within the Completed interval (other than the First Take Point or Last Take Point) that is closest to any outer boundary of the tract.

Surveyors shall use the latest United States government survey or dependent resurvey. Well locations will be in reference to the New Mexico Principal Meridian. If the land is not surveyed, contact the OCD Engineering Bureau. Independent subdivision surveys will not be acceptable.

BLACK CHERRY FEDERAL COM #110H



GEODETIC DATA
NAD 83 GRID – NM EAST

SURFACE LOCATION (SL)
1135' FSL & 920' FWL SEC.30
N: 655123.6 – E: 575971.6

LAT: 32.8009144° N
LONG: 104.2206152° W

KICK OFF POINT (KOP)
1679' FSL & 754' FWL SEC.30
N: 655666.2 – E: 575802.1

LAT: 32.8024063° N
LONG: 104.2211651° W

FIRST TAKE POINT (FTP)
1885' FSL & 100' FEL SEC.25
N: 655868.6 – E: 574947.6

LAT: 32.8029651° N
LONG: 104.2239456° W

LAST TAKE POINT (LTP)
1885' FSL & 100' FWL SEC.25
N: 655905.7 – E: 569860.6

LAT: 32.8030807° N
LONG: 104.2405017° W

BOTTOM HOLE (BH)
1885' FSL & 50' FWL SEC.25
N: 655906.1 – E: 569810.6

LAT: 32.8030818° N
LONG: 104.2406644° W

CORNER DATA
NAD 83 GRID – NM EAST

A: FOUND BRASS CAP "1941"
N: 654022.0 – E: 569763.3

B: FOUND BRASS CAP "1941"
N: 656655.2 – E: 569759.5

C: FOUND BRASS CAP "1941"
N: 659289.8 – E: 569756.0

D: FOUND BRASS CAP "1941"
N: 659278.4 – E: 572390.9

E: FOUND BRASS CAP "1941"
N: 659266.3 – E: 575026.6

F: FOUND BRASS CAP "1941"
N: 659287.7 – E: 577748.5

G: FOUND BRASS CAP "1914"
N: 659309.9 – E: 580369.6

H: FOUND BRASS CAP "1914"
N: 656663.6 – E: 580349.6

I: FOUND BRASS CAP "1914"
N: 654017.3 – E: 580331.9

J: FOUND BRASS CAP "1941"
N: 653999.6 – E: 577752.7

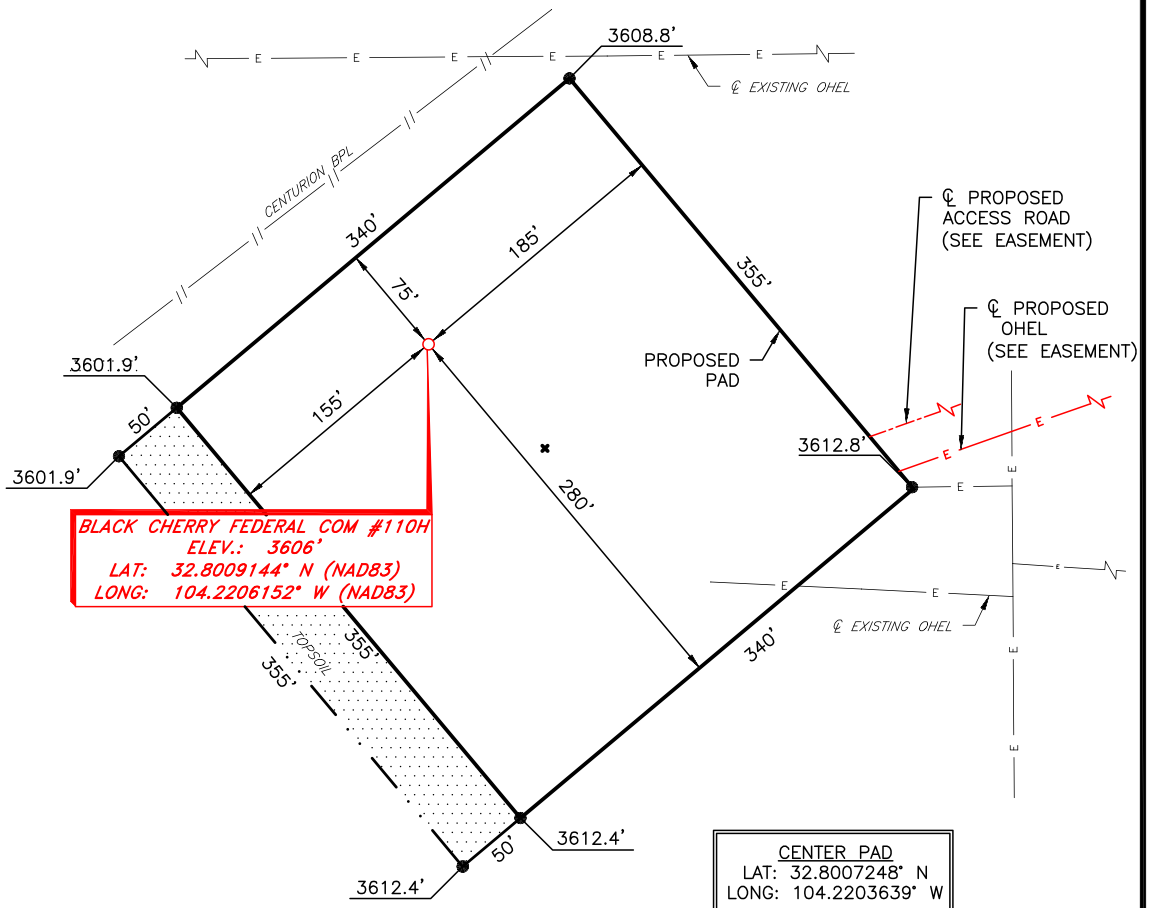
K: FOUND BRASS CAP "1941"
N: 653983.4 – E: 575058.5

L: FOUND BRASS CAP "1941"
N: 654002.1 – E: 572411.1

M: FOUND BRASS CAP "1941"
N: 656625.0 – E: 575043.2

JOB #: LS25060528D1

SPUR ENERGY PARTNERS LLC.
BLACK CHERRY FEDERAL COM #110H
(1135' FSL & 920' FWL)
SECTION 30, T17S, R28E
N. M. P. M., EDDY CO., NEW MEXICO



DIRECTIONS TO LOCATION

From the intersection of U.S. Hwy 82 (Lovington Hwy) & CR #206 (Illinois Camp Rd.);

Go Northwest on U.S. Hwy 82 approx. 0.6 miles to a lease road on the left;

Turn left and go West approx. 0.7 miles to a lease road on the left:

Turn left and go South approx. 310 feet to a proposed road on the right;

Turn right and go Southwest approx. 0.2 miles to location on the right.

SCALE: 1" = 100'
0 50 100

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

I, Dale E. Bell, New Mexico Professional Surveyor No. 14400, do hereby certify that this Plat and the actual survey on the ground upon which it is based were performed by me or under my direct supervision; that I am responsible for this survey, said survey and plat meets the Minimum Standards for Land Surveying in the State of New Mexico and that it is true and correct to the best of my knowledge and belief.

Dale E. Bell NM PS 14400

DALE E. BELL
NEW MEXICO
14400
02/19/2026
PROFESSIONAL SURVEYOR

NO.	REVISION	DATE
2	ADD TOPSOIL	2/19/26
1	REMOVE BATTERY	1/13/26

JOB NO.: LS25060528D1
DWG. NO.: 25060528D1–5

RRC ENERGY SERVICES, LLC.
701 S. CECIL ST., HOBBS, NM 88240 (575) 964–8200

SCALE: 1" = 100'
DATE: 06/26/2025
SURVEYED BY: RG/JA
DRAWN BY: RQ
APPROVED BY: DEB
SHEET: 1 OF 1

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

Drilling Plan Data Report
03/30/2026

APD ID: 10400109646
Submission Date: 01/21/2026
Operator Name: SPUR ENERGY PARTNERS LLC
Well Name: BLACK CHERRY FEDERAL COM
Well Number: 110H
Well Type: OIL WELL
Well Work Type: Drill

Highlighted data reflects the most recent changes

Show Final Text

Section 1 - Geologic Formations

Formation ID	Formation Name	Elevation	True Vertical	Measured Depth	Lithologies	Mineral Resources	Producing Formatio
17742529	QUATERNARY	3606	0	0	DOLOMITE, OTHER : Caliche	USEABLE WATER	N
17742530	TANSILL	3431	175	175	DOLOMITE, SANDSTONE	NONE	N
17742531	YATES	3341	265	265	DOLOMITE, LIMESTONE, SILTSTONE	NONE	N
17742532	SEVEN RIVERS	3111	495	495	DOLOMITE, LIMESTONE	NATURAL GAS, OIL	N
17742533	QUEEN	2581	1025	1050	ANHYDRITE, DOLOMITE, SILTSTONE	NATURAL GAS, OIL	N
17742537	PENROSE	2361	1245	1298	ANHYDRITE, DOLOMITE, SANDSTONE	NATURAL GAS, OIL	N
17742534	GRAYBURG	2131	1475	1589	ANHYDRITE	NATURAL GAS, OIL	N
17742535	SAN ANDRES	1831	1775	1925	DOLOMITE, LIMESTONE	NATURAL GAS, OIL	Y
17742536	GLORIETA	461	3145	4000	DOLOMITE, SILTSTONE	NATURAL GAS, OIL	N

Section 2 - Blowout Prevention

Pressure Rating (PSI): 5M
Rating Depth: 5000

Equipment: A 5000-psi 5000' rated BOP stack with annular preventer and blind and pipe rams will be used before drilling the surface hole and continuously to TD. See attached BOP and choke manifold diagrams. A conventional wellhead system will be used. The wellhead and connection to the BOPE will meet all API 6A requirements.

Requesting Variance? YES

Variance request: Spur requests a variance to use a flex line from the BOP to the choke manifold. A typical flex line certificate is attached. Certificate for actual flex line in use will be on site. Flex line will have no external damage. Flex line will be installed as straight as possible to avoid bends. Spur requests a variance to adjust the BOP break testing requirements as follows: BOP break test will be conducted under the following conditions: - After a full BOP test is conducted - When skidding to drill the production section, where the surface casing point is shallower than the 3rd Bone Spring or 10,000' TVD. - When skidding to drill a production section that does not penetrate the 3rd Bone Spring or deeper. If the kill line is broken prior to the skid, then 4 tests will be performed. - The void between the wellhead and the spool (this consists of 2 tests) - The spool between the kill lines and choke manifold (also 2 tests) If the kill line is not broken before the skid,

Operator Name: SPUR ENERGY PARTNERS LLC

Well Name: BLACK CHERRY FEDERAL COM **Well Number:** 110H

then 2 tests will be performed. - The void between the well head and the pipe rams.

Testing Procedure: BOP/BOPE will be tested by an independent service company. Annular will be tested to 70% of its working pressure. Rams will be tested to 250 psi low and 3000 psi high. The system may be upgraded to a higher pressure, but still tested to the above listed working pressure. If the system is upgraded, then all the installed components will be functional and tested. Pipe rams will be operationally checked each 24-hour period. Blind rams will be operationally checked on each trip out of the hole. These checks will be noted on the daily tour sheets. Other BOP accessories will include a Kelly cock and floor safety valve (inside BOP), choke lines, and choke manifold. Formation integrity test will be performed per 43 CFR 3172. On Exploratory wells or on that portion of any well approved for a 5M BOPE system or greater, a pressure integrity test of each casing shoe shall be performed. Will be tested in accordance with 43 CFR 3172. The BOP will be tested per 43 CFR 3172 after installation on the surface casing which will cover testing requirements for a maximum of 30 days.

Choke Diagram Attachment:

Spur_13.625ChokeBOPDiagramUpdate_20260113115947.pdf

Spur_FlexHoseCert_20260113115948.pdf

BOP Diagram Attachment:

Spur_13.625ChokeBOPDiagramUpdate_20260113120004.pdf

Spur_FlexHoseCert_20260113120004.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	3606	3206	400	J-55	54.5	BUTT	1.125	1.2	DRY	1.4	DRY	1.4
2	INTERMEDIATE	12.25	9.625	NEW	API	N	0	1450	0	1367	3606	2239	1450	J-55	36	BUTT	1.125	1.2	DRY	1.4	DRY	1.4
3	PRODUCTION	8.75	7.0	NEW	API	Y	0	2850	0	2381	0	1225	2850	L-80	32	OTHER - GBCD	1.125	1.2	DRY	1.4	DRY	1.4
4	PRODUCTION	8.75	5.5	NEW	API	Y	2850	8218	2382	2375	1224	1231	5368	L-80	20	OTHER - GBCD	1.125	1.2	DRY	1.4	DRY	1.4

Casing Attachments

Operator Name: SPUR ENERGY PARTNERS LLC

Well Name: BLACK CHERRY FEDERAL COM **Well Number:** 110H

Casing Attachments

Casing ID: 1 **String** SURFACE

Inspection Document:

Spec Document:

Tapered String Spec:

Casing Design Assumptions and Worksheet(s):

Casing_Assumptions_Sheet_L80_20260116085747.pdf

Csg13.375_54.50_J55_20260116085747.pdf

Casing ID: 2 **String** INTERMEDIATE

Inspection Document:

Spec Document:

Tapered String Spec:

Casing Design Assumptions and Worksheet(s):

Casing_Assumptions_Sheet_L80_20260116085939.pdf

Csg9.625_36_J55_20260116085939.pdf

Casing ID: 3 **String** PRODUCTION

Inspection Document:

Spec Document:

Tapered String Spec:

Casing_Assumptions_Sheet_20251209113431.pdf

Csg5.5_GBCD_20_L_80_20260116090039.pdf

Casing Design Assumptions and Worksheet(s):

Casing_Assumptions_Sheet_20251209113447.pdf

Csg7_GBCD_32_L_80_20260121111516.pdf

Operator Name: SPUR ENERGY PARTNERS LLC

Well Name: BLACK CHERRY FEDERAL COM **Well Number:** 110H

Casing Attachments

Casing ID: 4 **String** PRODUCTION

Inspection Document:

Spec Document:

Tapered String Spec:

Casing_Assumptions_Sheet_20251209113540.pdf
Csg7_GBCD_32_L_80_20260116090124.pdf

Casing Design Assumptions and Worksheet(s):

Casing_Assumptions_Sheet_20251209113559.pdf

Csg5.5_GBCD_20_L_80_20260116090132.pdf

Section 4 - Cement

String Type	Lead/Tail	Stage Tool Depth	Top MD	Bottom MD	Quantity(sx)	Yield	Density	Cu Ft	Excess%	Cement type	Additives
SURFACE	Lead		0	0	0	0	0	0	0	NONE	NONE
SURFACE	Tail		0	450	278	2.32	13.2	644.96	100	CLASS C PREMIUM PLUS	0.25 lbs/sk LCM
INTERMEDIATE	Lead		0	450	89	1.84	12.2	163.76	50	CLASS C PREMIUM PLUS	0.25 lbs/sk LCM
INTERMEDIATE	Tail		450	1450	278	2.32	13.2	644.96	100	CLASS C PREMIUM PLUS	0.25 lbs/sk LCM
PRODUCTION	Lead		0	1850	367	2.54	11.8	932.18	0	CLASS C PREMIUM PLUS	0.25 lbs/sk LCM
PRODUCTION	Tail		1850	8218	1254	1.81	13.2	2269.74	50	CLASS C PREMIUM PLUS	0.25 lbs/sk LCM + 0.35% retarder

Operator Name: SPUR ENERGY PARTNERS LLC

Well Name: BLACK CHERRY FEDERAL COM **Well Number:** 110H

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 43 CFR 3172:

Diagram of the equipment for the circulating system in accordance with 43 CFR 3172:

Describe what will be on location to control well or mitigate other conditions: : Mud products (e. g., barite, bentonite, gypsum, lime, soda ash, caustic soda, nut plug, cedar bark fiber, cotton seed hulls, drilling paper, saltwater clay, CaCl2) will be on site to handle any abnormal hole condition that may be encountered while drilling. High viscosity sweeps will be pumped as needed to clean the hole.
Describe the mud monitoring system utilized: Mud system will be monitored visually and electronically with a Pason PVT system or its equivalent.

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
1450	8218	WATER-BASED MUD	9	10							
0	450	WATER-BASED MUD	8.6	8.9							
450	1450	WATER-BASED MUD	9	10							

Section 6 - Test, Logging, Coring

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

A mud logger will be used from surface casing point to TD. A gamma ray log will be run from TD to the surface casing point. No other logs are planned at this time.

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

MUD LOG/GEOLOGICAL LITHOLOGY LOG,GAMMA RAY LOG,

Coring operation description for the well:

No core or drill stem test is planned.

Operator Name: SPUR ENERGY PARTNERS LLC

Well Name: BLACK CHERRY FEDERAL COM **Well Number:** 110H

Section 7 - Pressure

Anticipated Bottom Hole Pressure: 1123 **Anticipated Surface Pressure:** 589

Anticipated Bottom Hole Temperature(F): 100

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

Describe:

Contingency Plans geoharzards description:

Contingency Plans geohazards

Hydrogen Sulfide drilling operations plan required? YES

Hydrogen sulfide drilling operations

Black_Cherry_Federal_Com_110H_H2S_20260116091414.pdf

Section 8 - Other Information

Proposed horizontal/directional/multi-lateral plan submission:

Black_Cherry_Federal_Com_110H_Directional_Plan_20260116091425.pdf

Other proposed operations facets description:

Spur Energy Partners LLC. requests the option to contract a Surface Rig to drill, set surface casing, and cement for this well. If the timing between rigs is such that Spur Energy Partners LLC. would not be able to preset surface, the Primary Rig will MIRU and drill the well in its entirety per the APD. Please see the attached document for information on the spudder rig.

Other proposed operations facets attachment:

Black_Cherry_Federal_Com_110H_Drill_Plan_20260116091444.pdf

Black_Cherry_Federal_Com_110H_WMP_20260116091444.pdf

Black_Cherry_Federal_Com_110H_SpudderRig_20260116091545.pdf

Black_Cherry_Federal_Com_110H_RigSpecs_20260116091545.pdf

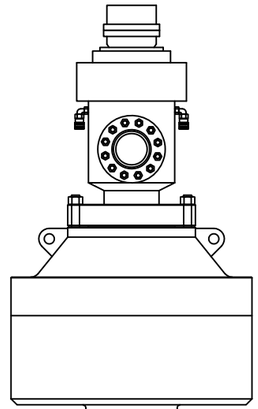
Other Variance request(s)?: Y

Other Variance attachment:

Spur_FlexHoseCert_20260116091615.pdf

Spur_13.625ChokeBOPDiagramUpdate_20260116091615.pdf

ANNULAR
13 5/8" 5,000 psi SHAFFER STYLE



DOUBLE GATE
13 5/8" 5,000 psi SHAFFER LWS STYLE

PIPE RAM

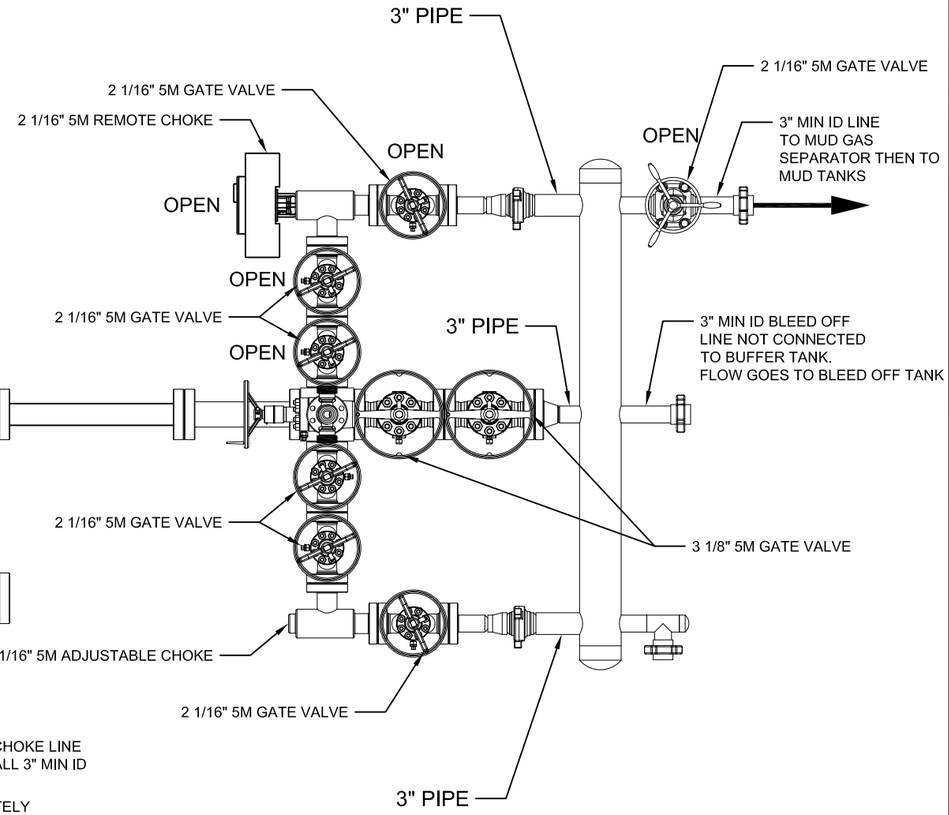
BLIND RAM

MUD CROSS
13 5/8" 5,000 psi, 3 1/8" 5M OUTLETS

CHOKE LINE
ALL 3" MIN ID

3 1/8" 5M REMOTELY
OPERATED VALVE

3 1/8" 5M GATE VALVE



Notes
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No.	Revision	Date

AKITA DRILLING LTD.
2302 8th Street, Nisku Alberta
T9E 7Z2 Tel: (780) 955-6700

Date	Scale
5-6-2021	NTS
Dwn / Chk'd By: BG	File Name: R57 13 5M dou..
Project: R57	

RIG 57 BOP SCHEMATIC

POWERING PROGRESS™

MTR DATA BOOK

CL2013

CUSTOMER: GATES CANADA INC
DATE: 12/19/2017
Purchase Order: D235455 (PO 45750)
Sales Order #: 509128
Product Description: 5K 3 1/2 in. 17 FT. Fire Rated Choke & Kill Gates Hose Assembly c/w 3 1/8 5K Flange with Safety Clamps & Slings Attached

Hose S/N: H-121917-14
PART NUMBER: FR5K3.517.0CK31/85KFLG S/C

CONTENTS INCLUDED

GMCO FITTINGS

17-309-1	INSERT STEM
15-095-1A	FERRULE

3 1/8 in. 5K FIXED FLANGE X 3 1/8 in. 5K FLOAT FLANGE

V4131	FIXED FLANGE
V5054	FLOAT FLANGE

WELDING SPECIFICATIONS
Certification and Procedure for welding

NDE RESULTS
1622371-03/1622371-01 Ultrasonic Test Results and Imaging

Safey Clamps
34145/34144

TEST CHART
Chart Recording of Hydrostatic Test

TEST CERTIFICATE
Document Product Details & Positive Results of Hydrostatic Testing

CERTIFICATE OF CONFORMANCE
A Declaration of the conformity with the type approval

IMAGES
Images of the product prior to shipping.

PACKING LIST
Details of Shipping Contents, Dimensions and Weights

BLACK GOLD®

GATES ENGINEERING & SERVICES NORTH AMERICA
7603 Prairie Oak Dr. Suite 190
Houston, TX. 77086

PHONE: +1 (281) 602-4100
FAX: +1 (281) 602-4147
EMAIL: gesna.quality@gates.com
WEB: www.gates.com/oilandgas

PRESSURE TEST CERTIFICATE

Customer:	GATES CANADA INC	Test Date:	12/19/2017
Customer Ref.:	D235455 (PO 45750)	Hose Serial No.:	H-121917-14
Invoice No.:	509128	Created By:	Cristian Rivera

Product Description:	5K 3 1/2 in. 17 FT. Fire Rated Choke & Kill c/w 3 1/8 5K Flange with Safety Clamps & Slings Attached

End Fitting 1:	3 1/8 in. 5K FIXED FLG	End Fitting 2:	3 1/8 in. 5K FLOAT FLG
Oracle Star No.:	68903550-9725917	Assembly Code:	15M5019042016H-121917-14
CUSTOMER P/N:	FR5K3.517.0CK31/85KFLG S/C	Test Pressure:	7,500 psi.
		Working Pressure:	5,000 psi.

Gates Engineering & Services North America certifies that:

The following hose assembly has successfully passed all pressure testing requirements set forth in Gates specifications: GTS-04-052 (for 5K assemblies) or GTS-04-053 (10K assemblies) or GTS-04-048 (15K assemblies), which include reference to Specification API 16C (2nd Edition); sections 7.5.4, 7.5.9, and 10.8.7. A test graph will accompany this test certificate to illustrate conformity to test requirements. This hose assembly was pressure tested using equipment and instrumentation that has been calibrated in accordance with the requirements set-forth in the GESNA management system.

Quality:	QUALITY	Production:	PRODUCTION
Date :	8/5/2021	Date :	8/5/2021
Signature :		Signature :	

F-PRD-005B

Revision 6_05032021

BLACK GOLD®

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WEB: www.gates.com/oilandgas

CERTIFICATE OF CONFORMANCE

This is to certify that all parts and materials included in this shipment have manufactured and/or processed in accordance with various Gates and API assembly and test specifications. Records of required tests are on-file and subject to examination. Test reports and subsequent test graphs have been made available with this shipment. Additional supporting documentation related to materials, welding, weld inspections, and heat-treatment activities are available upon request.

CUSTOMER:	GATES CANADA INC
CUSTOMER P.O.#:	D235455 (PO 45750)
PART DESCRIPTION:	FR5K3.517.0CK31/85KFLG S/C
PART DESCRIPTION:	5K 3 1/2 in. 17 FT. Fire Rated Choke & Kill c/w 3 1/8 5K Flange with Safety Clamps & Slings Attached
SALES ORDER #:	509128
QUANTITY:	1
SERIAL #:	H-121917-14

SIGNATURE: J Rivera

TITLE: QUALITY ASSURANCE

DATE: 8/5/2021

Gates E&S

North America

7603 Prairie Oak dr.

Houston,TX

Hydrostatic Test

Customer= GATES CANADA

Date of test= 12/19/17

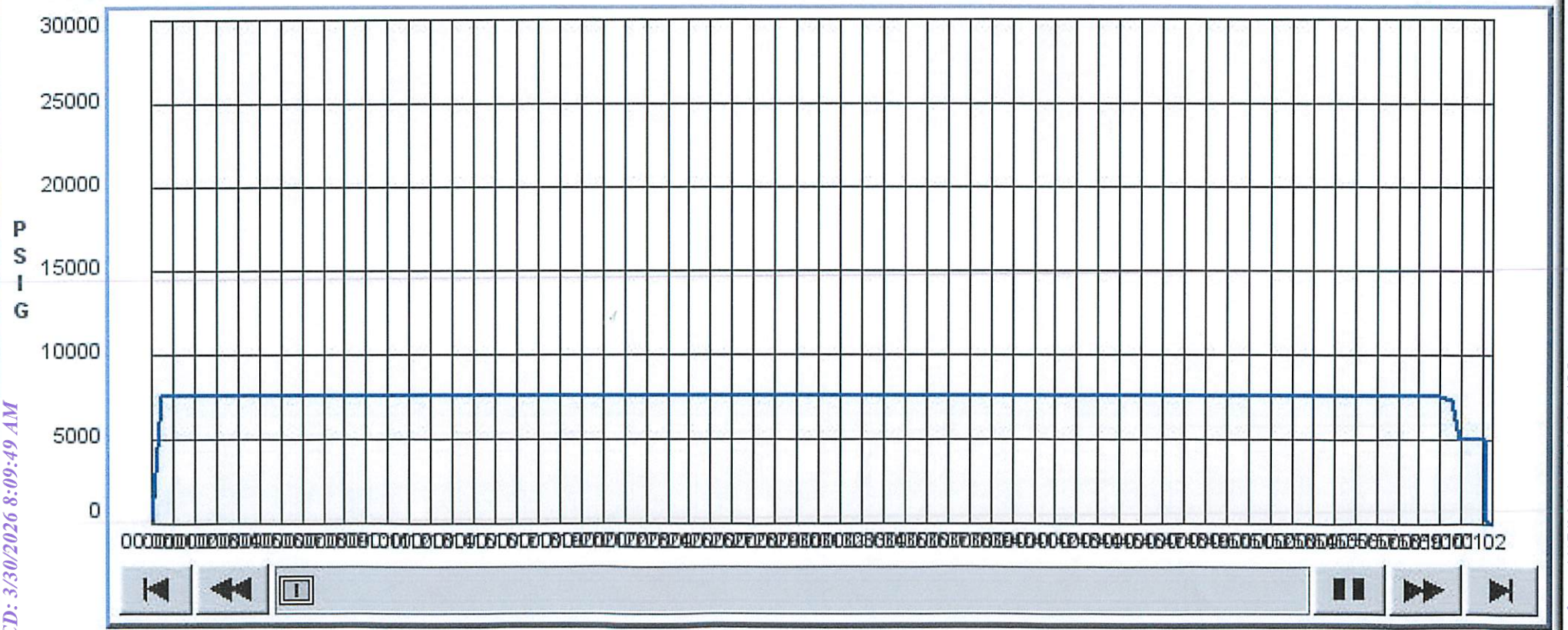
Serial # = H-121917-13,-14

Description = 3.5 5K 3 1/8 FLG 5K

Technician= CHRIS OLIVO

12/19/2017 16:53:26

17:55:52



Edwards Fabrication

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O: (361) 790-7910
F: (361) 790-7927

tedwards@edwardsfabrication.com
www.edwardsfabrication.com

CERTIFICATE OF TEST

Client:
Gates E & S North America
134 44th Street
Corpus Christi, TX 78405

Purchase Order: 1592198/0

Certificate Number				Date of Examination
34145				04/27/17
ID#	**Part Number**	**Description**	**SWL***	**Proofload**
34145	E3.5S	3.5" E Safety Clamp	6016 lbs.	12031 lbs.

The Safety Clamp unit identified on this certificate has been load tested completely assembled; including the clamp body, (2) 3/4" shackles, 5/8" x 48" wire rope sling and anchor tab. Thus, all components are tested at the "Proof" load. Do not disassemble. Do not interchange any part or parts of this tested unit with parts of other Safety Clamp units. DO NOT WELD, CUT, ADD-TO, TAKE AWAY ANY COMPONENTS OR MAKE ANY MODIFICATION TO THIS CLAMP UNIT. Doing so voids this test certificate.

Cutting/Removing either one or both stainless steel Tamper-proof hardware cables renders this Test Certificate VOID.

** Safe Work Load*

THIS PRODUCT IS MANUFACTURED IN THE U.S.A.

We hereby verify that the above information is correct
as contained in the records of Edwards Fabrication L.L.C.

ISO 9001:2008
BUREAU VERITAS
Certification

Edwards Fabrication L.L.C. is certified as having a Quality Management System.

Thomas F. Edwards
President
Edwards Fabrication L.L.C.

Edwards Fabrication LLC

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CERTIFICATE OF TEST

Client:
Gates E & S North America
134 44th Street
Corpus Christi, TX 78405

Purchase Order: 1592198/0

Certificate Number				Date of Examination
34144				04/27/17
ID#	**Part Number**	**Description**	**SWL***	**Proofload**
34144	E3.5S	3.5" E Safety Clamp	6014 lbs.	12027 lbs.

The Safety Clamp unit identified on this certificate has been load tested completely assembled; including the clamp body, (2) 3/4" shackles, 5/8" x 48" wire rope sling and anchor tab. Thus, all components are tested at the "Proof" load. Do not disassemble. Do not interchange any part or parts of this tested unit with parts of other Safety Clamp units. DO NOT WELD, CUT, ADD-TO, TAKE AWAY ANY COMPONENTS OR MAKE ANY MODIFICATION TO THIS CLAMP UNIT. Doing so voids this test certificate.

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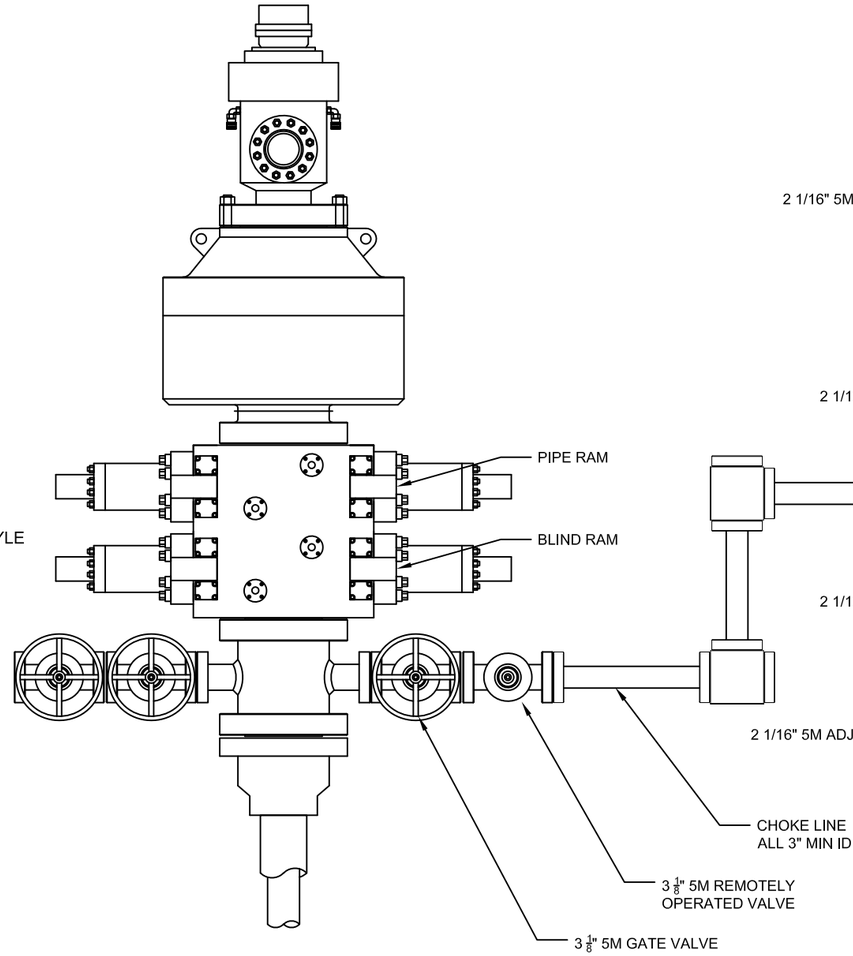
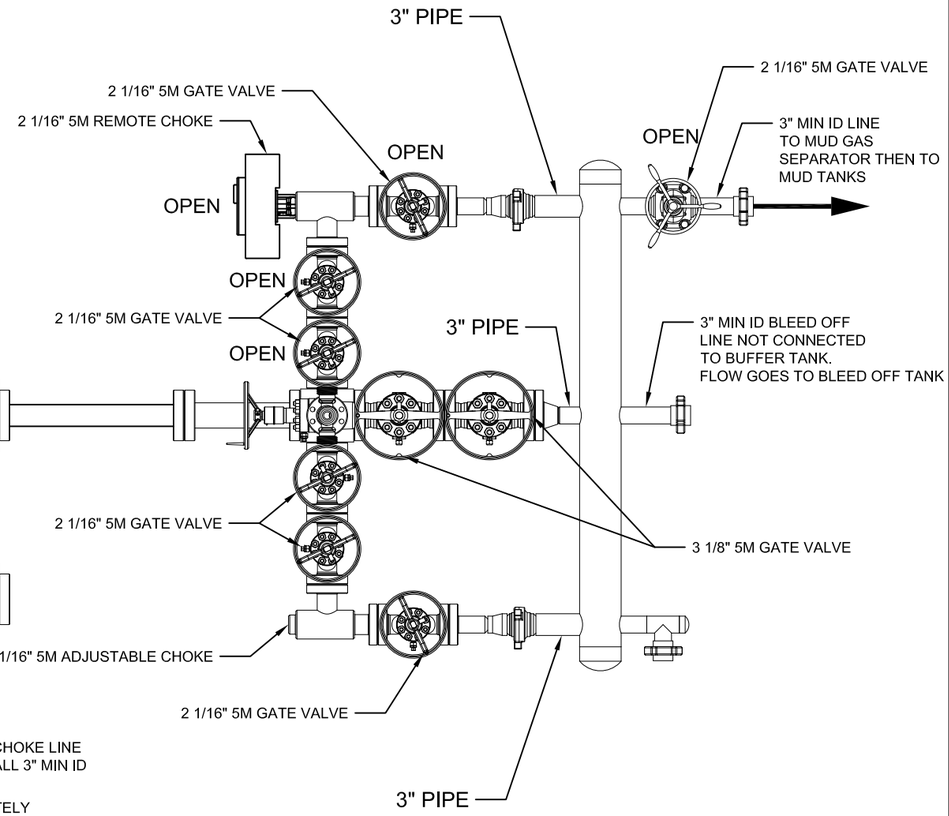
Thomas F. Edwards
President
Edwards Fabrication L.L.C.

ANNULAR
13 5/8" 5,000 psi SHAFFER STYLE

DOUBLE GATE
13 5/8" 5,000 psi SHAFFER LWS STYLE

MUD CROSS
13 5/8" 5,000 psi, 3 1/8" 5M OUTLETS





Notes
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No.	Revision	Date

AKITA DRILLING LTD.
2302 8th Street, Nisku Alberta
T9E 7Z2 Tel: (780) 955-6700

Date	Scale
5-6-2021	NTS
Dwn / Chk'd By: BG	File Name: R57 13 5M dou..
Project: R57	

RIG 57 BOP SCHEMATIC

POWERING PROGRESS™

MTR DATA BOOK

CL2013

CUSTOMER: GATES CANADA INC
DATE: 12/19/2017
Purchase Order: D235455 (PO 45750)
Sales Order #: 509128
Product Description: 5K 3 1/2 in. 17 FT. Fire Rated Choke & Kill Gates Hose Assembly c/w 3 1/8 5K Flange with Safety Clamps & Slings Attached

Hose S/N: H-121917-14
PART NUMBER: FR5K3.517.0CK31/85KFLG S/C

CONTENTS INCLUDED

GMCO FITTINGS

17-309-1	INSERT STEM
15-095-1A	FERRULE

3 1/8 in. 5K FIXED FLANGE X 3 1/8 in. 5K FLOAT FLANGE

V4131	FIXED FLANGE
V5054	FLOAT FLANGE

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Certification and Procedure for welding

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1622371-03/1622371-01 Ultrasonic Test Results and Imaging

Safey Clamps
34145/34144

TEST CHART
Chart Recording of Hydrostatic Test

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Document Product Details & Positive Results of Hydrostatic Testing

CERTIFICATE OF CONFORMANCE
A Declaration of the conformity with the type approval

IMAGES
Images of the product prior to shipping.

PACKING LIST
Details of Shipping Contents, Dimensions and Weights

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FAX: +1 (281) 602-4147
EMAIL: gesna.quality@gates.com
WEB: www.gates.com/oilandgas

PRESSURE TEST CERTIFICATE

Customer:	GATES CANADA INC	Test Date:	12/19/2017
Customer Ref.:	D235455 (PO 45750)	Hose Serial No.:	H-121917-14
Invoice No.:	509128	Created By:	Cristian Rivera

Product Description:	5K 3 1/2 in. 17 FT. Fire Rated Choke & Kill c/w 3 1/8 5K Flange with Safety Clamps & Slings Attached

End Fitting 1:	3 1/8 in. 5K FIXED FLG	End Fitting 2:	3 1/8 in. 5K FLOAT FLG
Oracle Star No.:	68903550-9725917	Assembly Code:	15M5019042016H-121917-14
CUSTOMER P/N:	FR5K3.517.0CK31/85KFLG S/C	Test Pressure:	7,500 psi.
		Working Pressure:	5,000 psi.

Gates Engineering & Services North America certifies that:

The following hose assembly has successfully passed all pressure testing requirements set forth in Gates specifications: GTS-04-052 (for 5K assemblies) or GTS-04-053 (10K assemblies) or GTS-04-048 (15K assemblies), which include reference to Specification API 16C (2nd Edition); sections 7.5.4, 7.5.9, and 10.8.7. A test graph will accompany this test certificate to illustrate conformity to test requirements. This hose assembly was pressure tested using equipment and instrumentation that has been calibrated in accordance with the requirements set-forth in the GESNA management system.

Quality:	QUALITY	Production:	PRODUCTION
Date :	8/5/2021	Date :	8/5/2021
Signature :		Signature :	

F-PRD-005B

Revision 6_05032021

BLACK GOLD®

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CERTIFICATE OF CONFORMANCE

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CUSTOMER:	GATES CANADA INC
CUSTOMER P.O.#:	D235455 (PO 45750)
PART DESCRIPTION:	FR5K3.517.0CK31/85KFLG S/C
PART DESCRIPTION:	5K 3 1/2 in. 17 FT. Fire Rated Choke & Kill c/w 3 1/8 5K Flange with Safety Clamps & Slings Attached
SALES ORDER #:	509128
QUANTITY:	1
SERIAL #:	H-121917-14

SIGNATURE: O Rivera

TITLE: QUALITY ASSURANCE

DATE: 8/5/2021

Gates E&S

North America

7603 Prairie Oak dr.

Houston,TX

Hydrostatic Test

Customer= GATES CANADA

Date of test= 12/19/17

Serial # = H-121917-13,-14

Description = 3.5 5K 3 1/8 FLG 5K

Technician= CHRIS OLIVO

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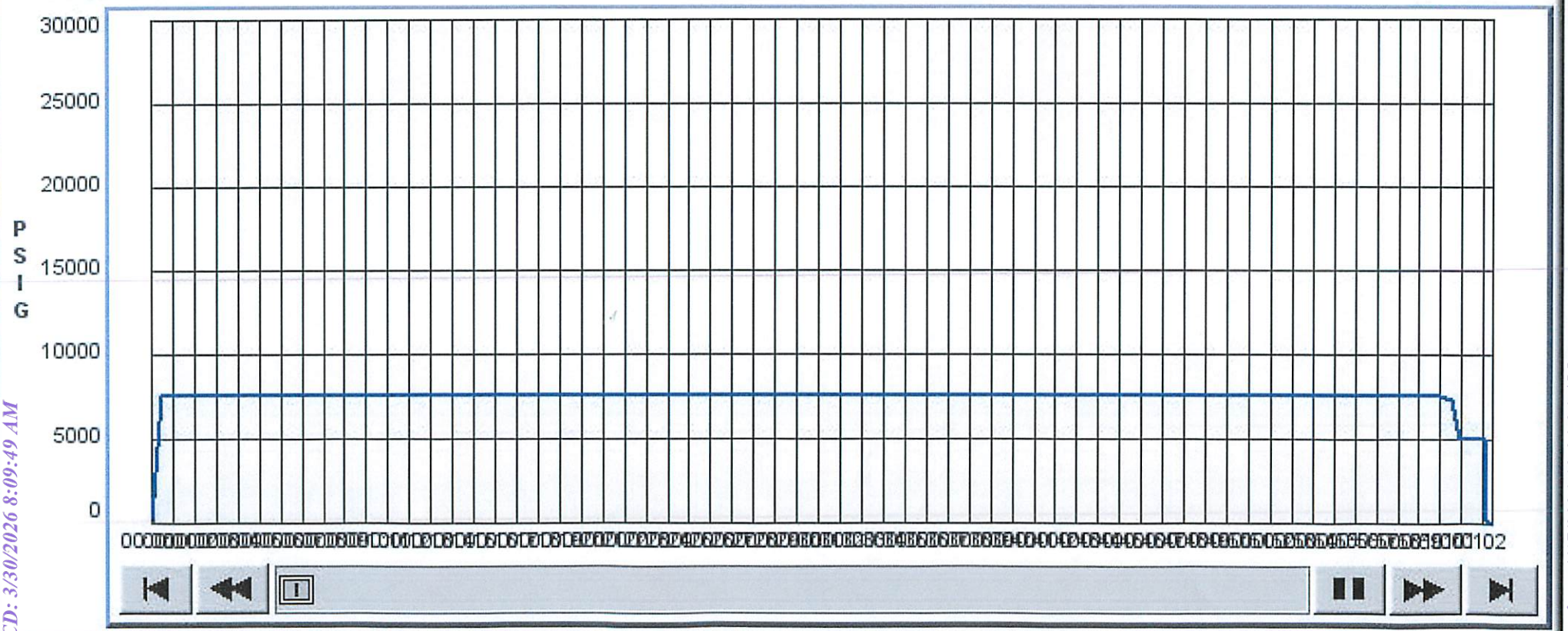

Edwards Fabrication LLC

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Rockport, TX 78381

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F: (361) 790-7927

tedwards@edwardsfabrication.com
www.edwardsfabrication.com

CERTIFICATE OF TEST

Client:
Gates E & S North America
134 44th Street
Corpus Christi, TX 78405

Purchase Order: 1592198/0

Certificate Number				Date of Examination
34145				04/27/17
ID#	**Part Number**	**Description**	**SWL***	**Proofload**
34145	E3.5S	3.5" E Safety Clamp	6016 lbs.	12031 lbs.

The Safety Clamp unit identified on this certificate has been load tested completely assembled; including the clamp body, (2) 3/4" shackles, 5/8" x 48" wire rope sling and anchor tab. Thus, all components are tested at the "Proof" load. Do not disassemble. Do not interchange any part or parts of this tested unit with parts of other Safety Clamp units. DO NOT WELD, CUT, ADD-TO, TAKE AWAY ANY COMPONENTS OR MAKE ANY MODIFICATION TO THIS CLAMP UNIT. Doing so voids this test certificate.

Cutting/Removing either one or both stainless steel Tamper-proof hardware cables renders this Test Certificate VOID.

** Safe Work Load*

THIS PRODUCT IS MANUFACTURED IN THE U.S.A.

We hereby verify that the above information is correct
as contained in the records of Edwards Fabrication L.L.C.

ISO 9001:2008
BUREAU VERITAS
Certification

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Thomas F. Edwards
President
Edwards Fabrication L.L.C.

Edwards Fabrication...

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CERTIFICATE OF TEST

Client:
Gates E & S North America
134 44th Street
Corpus Christi, TX 78405

Purchase Order: 1592198/0

Certificate Number				Date of Examination
34144				04/27/17
ID#	**Part Number**	**Description**	**SWL***	**Proofload**
34144	E3.5S	3.5" E Safety Clamp	6014 lbs.	12027 lbs.

The Safety Clamp unit identified on this certificate has been load tested completely assembled; including the clamp body, (2) 3/4" shackles, 5/8" x 48" wire rope sling and anchor tab. Thus, all components are tested at the "Proof" load. Do not disassemble. Do not interchange any part or parts of this tested unit with parts of other Safety Clamp units. DO NOT WELD, CUT, ADD-TO, TAKE AWAY ANY COMPONENTS OR MAKE ANY MODIFICATION TO THIS CLAMP UNIT. Doing so voids this test certificate.

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President
Edwards Fabrication L.L.C.

Casing Design Criteria and Load Case Assumptions

1. Collapse: DF_C=1.125
   a. Full Internal Evacuation: Collapse force equal to the mud gradient in which the casing will be run (0.65 psi/ft). The effects of axial load on collapse will be considered.
   b. Cementing: Collapse force equal to the gradient of planned cement slurries to planned depths and minimum mud gradient in which the casing will be run above that (0.65 psi/ft) and an internal force equal to mud gradient of displacement fluid (0.43 psi/ft)
2. Burst: DF_B=1.125
   a. Pressure Test: psi casing test with an external force equal to the mud gradient in which the casing will be run (0.65 psi/ft), which is a more conservative backup force than pore pressure.
   b. Injection Down Casing: psi surface injection pressure plus an internal pressure gradient of 0.65 psi/ft with an external force equal to the mud gradient in which the casing will be run (0.65 psi/ft), which is a more conservative backup force than pore pressure.
3. Tensile: DF_T=1.4
   a. Overpull: An overpull force of 100,000 lbs is applied at the shoe along with the weight of the casing string utilizing the effects of buoyancy (8.5 ppg).

Surface Casing Program									
Casing Size (in)	**Weight (ppf)**	**Grade**	**Connection**	**ID**	**ID (drift)**	**Collapse (psi)**	**Burst (psi)**	**Tension (1,000 lbs)**	**Capacity (bbl/ft)**
13-3/8”	54.5	J-55	BTC	12.615	12.459	1,130	2,740	909	0.1545
Safety Factors									
	API Rec. SF	**ACTUAL SF**	Case		External Fluids		Internal Fluids		
Collapse	1.125	**3.30**	Lost Circulation		Mud		*None*		
Burst	1.125	**1.46**	Plug Bump		Green Cement + 2ksi surf pressure		Displacement Fluid/Mud		
Tension	1.4	**2.8**	100 klbs Overpull		Mud		Mud		

Buoyed Casing Weight: ***23,755 lbs (assuming 8.4 ppg fluid and 500’ casing-worst case scenario)***

Intermediate Casing Program									
Casing Size (in)	**Weight (ppf)**	**Grade**	**Connection**	**ID**	**ID (drift)**	**Collapse (psi)**	**Burst (psi)**	**Tension (1,000 lbs)**	**Capacity (bbl/ft)**
9-5/8”	36	J-55	BTC	8.921	8.765	2,020	3,520	639	0.0773
Safety Factors									
	API Rec. SF	**ACTUAL SF**	Case		External Fluids		Internal Fluids		
Collapse	1.125	**3.30**	Lost Circulation		Mud		*None*		
Burst	1.125	**1.46**	Plug Bump		Green Cement + 2ksi surf pressure		Displacement Fluid/Mud		
Tension	1.4	**2.8**	100 klbs Overpull		Mud		Mud		

Buoyed Casing Weight: ***40,798 lbs (assuming 8.4 ppg fluid and 1,300’ casing-worst case scenario)***

Production Casing Program									
Casing Size (in)	**Weight (ppf)**	**Grade**	**Connection**	**ID**	**ID (drift)**	**Collapse (psi)**	**Burst (psi)**	**Tension (1,000 lbs)**	**Capacity (bbl/ft)**
7”	32	L-80	GBCD	6.094	5.969	10,400	9,060	745	0.0361

Safety Factors					
	API Rec. SF	**ACTUAL SF**	Case	External Fluids	Internal Fluids
Collapse	1.125	**3.75**	Lost Circulation	Mud	*None*
Burst	1.125	**2.47**	Plug Bump	Green Cement + 2ksi surf pressure	Displacement Fluid/Mud
Tension	1.4	**2.29**	100 klbs Overpull	Mud	Mud

Buoyed Casing Weight: ***90,662 lbs (assuming 8.4 ppg fluid and 3,250’ TVD-worst case scenario)***

Production Casing Program									
Casing Size (in)	**Weight (ppf)**	**Grade**	**Connection**	**ID**	**ID (drift)**	**Collapse (psi)**	**Burst (psi)**	**Tension (1,000 lbs)**	**Capacity (bbl/ft)**
5-1/2”	20	L-80	GBCD	4.778	4.653	10,630	9,190	466	0.0222

Safety Factors					
	API Rec. SF	**ACTUAL SF**	Case	External Fluids	Internal Fluids
Collapse	1.125	**3.75**	Lost Circulation	Mud	*None*
Burst	1.125	**2.47**	Plug Bump	Green Cement + 2ksi surf pressure	Displacement Fluid/Mud
Tension	1.4	**2.29**	100 klbs Overpull	Mud	Mud

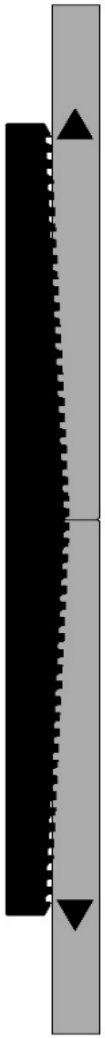
Buoyed Casing Weight: ***56,664 lbs (assuming 8.4 ppg fluid and 3,250’ TVD-worst case scenario)***

GB connections
Engineering the Right Connections

GB Connection Performance Properties Sheet

Rev. 1 (08/25/2015)

ENGINEERING THE RIGHT CONNECTIONS™



Casing: 5.5 OD, 20 ppf
Casing Grade: L-80

Connection: GB CD Butt 6.300
Coupling Grade: API L-80

PIPE BODY GEOMETRY					
Nominal OD (in.)	5 1/2	Wall Thickness (in.)	0.361	Drift Diameter (in.)	4.653
Nominal Weight (ppf)	20.00	Nominal ID (in.)	4.778	API Alternate Drift Dia. (in.)	N/A
Plain End Weight (ppf)	19.83	Plain End Area (in.^{2})	5.828		

PIPE BODY PERFORMANCE					
Material Specification	L-80	Min. Yield Str. (psi)	80,000	Min. Ultimate Str. (psi)	95,000
Collapse		**Tension**		**Pressure**	
API (psi)	8,830	Pl. End Yield Str. (kips)	466	Min. Int. Yield Press. (psi)	9,190
High Collapse (psi)	10,630	**Torque**		**Bending**	
		Yield Torque (ft-lbs)	54,120	Build Rate to Yield (°/100 ft)	66.7

GB CD Butt 6.300 COUPLING GEOMETRY			
Coupling OD (in.)	6.300	Makeup Loss (in.)	4.2500
Coupling Length (in.)	8.500	Critical Cross-Sect. (in.^{2})	8.527

GB CD Butt 6.300 CONNECTION PERFORMANCE RATINGS/EFFICIENCIES					
Material Specification	API L-80	Min. Yield Str. (psi)	80,000	Min. Ultimate Str. (psi)	95,000
Tension		**Efficiency**		**Bending**	
Thread Str. (kips)	503	Internal Pressure (%)	100%	Build Rate to Yield (°/100 ft)	58.2
Min. Tension Yield (kips)	648	External Pressure (%)	100%	**Yield Torque**	
Min. Tension Ult. (kips)	770	Tension (%)	100%	Yield Torque (ft-lbs)	22,680
Joint Str. (kips)	503	Compression (%)	100%		
		Ratio of Areas (Cplg/Pipe)	1.46		

MAKEUP TORQUE					
Min. MU Tq. (ft-lbs)	8,620	Max. MU Tq. (ft-lbs)	17,240	Running Tq. (ft-lbs)	See GBT RP
				Max. Operating Tq. (ft-lbs)*	21,540

Units: US Customary (lbm, in., °F, lbf)
1 kip = 1,000 lbs
* See Running Procedure for description and limitations.
See attached: Notes for GB Connection Performance Properties.
GBT Running Procedure (GBT RP): www.gbconnections.com/pdf/RP-GB-DWC-Connections.pdf
Blanking Dimensions: www.gbconnections.com/pdf/GB-DWC-Blanking-Dimensions.pdf
Connection yield torque rating based on physical testing or extrapolation therefrom

GB connections
Engineering the Right Connections

Notes for GB Connections Performance Properties

Rev. 1 (May, 2018)

ENGINEERING THE RIGHT CONNECTIONS™

1. All dimensions shown are nominal. Plain end weight is calculated in accordance with API TR 5C3. Performance properties are empirical, based on nominal dimensions, minimum material yield and ultimate strengths, and calculated in general accordance with industry standard formula(s) assuming uniaxial loading. All properties are calculated on the basis of materials at room temperature. NOTE: Material properties change with temperature.
2. Joint strength is the lesser of pipe thread strength and minimum coupling tension as calculated in accordance with API TR 5C3. Tensile efficiency is calculated using coupling strength based on ultimate material strength per API TR 5C3 divided by plain end yield strength of the casing. Minimum Coupling Tension based on material *yield* strength is provided *for information only*. Performance values presented for tension do not account for failure by pull-out (which can occur with heavy wall casing), effects of internal and external pressure, thermally induced axial loads, casing curvature (bending), and/or other static and dynamic loads that may occur singularly or in combination during downhole deployment and with subsequent well operations.
3. Drift diameters are based on Standard and Alternate drift sizes per API 5CT. Drift diameters are not specified for API 5L pipe. Drift diameters shown on GB Connection Performance Property Sheets represent the diameter of the drift mandrel used for end-drifting after coupling buck on. When shown, the alternate drift diameter is used for end drifting. Drift testing is performed in accordance with currently applicable API Specifications.
4. Minimum Internal Yield Pressure Performance values for Casing (API 5CT), Line Pipe (API 5L), and mill casing proprietary grades are based on API TR 5C3 formulas and assume 87.5% minimum wall thicknesses. Minimum Internal Yield Pressure efficiency for GB Connections is the lesser of the Minimum Internal Yield Pressure of the coupling and Leak Resistance divided by pipe body Minimum Internal Yield Pressure (all based on API TR 5C3 formulas). GB Connections typically demonstrate pressure resistance exceeding the mating pipe body unless otherwise noted with a pressure efficiency < 100%. Pressure efficiency can only be achieved when connections are properly assembled in strict accordance with GB Connections' Running Procedures (www.gbconnections.com/pdf/RP-GB-DWC-Connections.pdf.
5. Compression efficiency of the Casing/Connection combinations does not consider the axial load that causes pipe body buckling. The compressive load that causes buckling is usually less than the pipe body compressive yield strength and is dependent on a number of factors including, but not limited to, string length (or slenderness ratio; L/D), thermally induced axial loads, and annular clearance that may (or may not) lend side support to the casing string.
6. Bending values assume a constant radius of curvature where the casing is in uniformly intimate contact with the wall of the wellbore (i.e. when the upset at the coupling OD is small compared with wellbore wall irregularities). When the radius of curvature is not constant due to large wellbore wall irregularities, varying trajectory, micro doglegs, wash-outs, rock ledges, and other downhole conditions, unpredictable excessive bending stresses can occur that may be detrimental to casing and connection performance.
7. Fatigue failures are a function of material properties, stress range, and number of stress reversal cycles. API 5CT, API 5L, and mill proprietary casing/coupling materials have a finite fatigue life. Higher stress ranges yield lower fatigue life. So as a general rule of thumb, casing should never be rotated at higher RPMs than needed for task accomplishment. For the same stress range, casing rotated at 25 RPMs will generally last 4 times longer (more rotating hours) than casing rotated at 100 RPMs. However with fatigue, there are opportunities for unexpected higher stress reversal levels associated with vibration, thermally induced axial loads, and bending (see above) in addition to all other stress reversals imparted during running, rotating, reciprocating, pressure testing, pumping, etc. The extent and quality of the cement job is also a factor. Under aggressive, high-volume, multi-stage hydraulic fracturing operations, the casing string (including the connections) is severely taxed such that local stress range(s) and actual number of applied cycles cannot be precisely determined without full string instrumentation.
8. External pressure efficiency (expressed in percent) is the ratio of the lesser of Minimum Internal Yield Pressure and Leak Resistance for coupling (calculated per API TR 5C3) divided by the API collapse rating of the casing. External pressure efficiency has not been verified by testing and does not consider other applied loads. External pressure efficiency does not account for any high collapse rating that may be shown on GB Connection Performance Property Sheets.
9. Maximum Makeup Torque is provided for guidance only. This value is not the same as the Connection Yield Torque shown. Connection Yield Torque is the lesser of yield torque rating for the critical cross-section of pipe body, connector body, and pin nose and the threadform load flank bearing area. Connection Yield Torque does not consider radial buckling of the pipe or connection due to excessive jaw pressure during torque application. Torque in connections can increase or decrease over that applied at makeup (connection tightening/loosening) with rotating and stimulation operations due to slip-stick, shock loads, bending, tight spots, vibration(s), temperature, and other downhole factors that may occur individually or in combination. Due to circumstances beyond the control of GB Connections, User accepts all risks associated with casing and connection related issues that occur during and after rotating operations.
10. **Every** GB Connection requires the proper amount and distribution of thread compound to all pin and coupling threads and careful field make up in strict accordance with GB Connections' Running Procedures to provide expected levels of performance in service.
11. Reactions among water, drilling muds and other fluids, and chemicals introduced by User with downhole formation fluids may result in an environment detrimental to casing and connection performance. User should carefully consider all aspects of the string design including material compatibility with respect to possible corrosion, sour conditions, and other factors that may result in unexpected casing and/or connection failure at or below published ratings.
12. Performance Properties are subject to change without notice. User is advised to obtain the current GB Connection Performance Property Sheet for each application. Please visit **www.gbconnections.com** to download.

Limitations

Data presented in GB Performance Property Sheets and Running Procedures ("GB Information") is provided for informational purposes only and intended to be supplemented by the professional judgment of qualified personnel during design, field handling, deployment, and all subsequent well operations. The use of GB Information is at the User's sole risk.

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GB connections Engineering the Right Connections	**Running Procedure for Casing with GB *Drilling with Casing* Connections**	October 29, 2007
		Rev. 14 (04/09/2020)

OVERVIEW

This field running procedure applies to makeup of **GB *Drilling with Casing*** (GB DwC) Connections which include GB CD, GB CDE, GB RDB, GB EHTQ, and GB RDB WS Connections with GB Butt (Buttress), GB 4P, and GB 3P thread forms. All GBC Connections are suitable for ***Running*** (standard casing applications), ***Rotating*** (to aid string advancement), ***Drilling*** (Drilling with Casing/Drilling with Liners) and ***Driving***. This procedure also applies to the legacy GB Connections known as GB Butt and GB 3P.

Numerous factors impact the makeup torque of Buttress (GB Butt) and Modified Buttress Threads (such as GB 4P and GB 3P). Some of these factors include but are not limited to: allowable threading tolerances, joint characteristics (OD, straightness, hooked ends, and weight), vertical alignment (derrick, top drive, and elevator alignment relative to rotary table), thread compound (type, amount, and distribution), snub line (location and orientation), distance between tongs and backups, temperature/weather, equipment type, efficiencies (electrical, hydraulic and mechanical), grips/dies (type, condition, orientation, location, contact area, and grip distribution), measurement equipment, gauge calibration, personnel, etc. The nature of these types of connections makes it impossible to provide makeup torque values that will yield proper power tight makeup on every rig under all circumstances with the wide variety of existing connection makeup equipment.

This procedure has been designed to determine the ***Running Torque*** required for proper power tight makeup of GB Connections under the circumstances and with the actual equipment, set up conditions, weather, etc. that exist at the time of running. With proper execution of this procedure, GB Connections will be properly and consistently assembled.

LIMITATIONS

This GBC Running Procedure provides the basic recommended practices and is intended to be supplemented by the professional judgment of qualified personnel based on observation of actual makeups throughout the casing run. GB DwC Connections require the proper amount and distribution of thread compound to **all pin and coupling threads** and careful field makeup in strict accordance with GB Connections' Running Procedures to provide expected levels of performance in service.

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DEFINITIONS

1. Minimum Makeup (MU) Torque: Connections must have at least this amount of torque applied and clearly exhibit shoulder engagement.
2. Shoulder Torque: MU torque required to achieve shoulder engagement.
3. Running Torque: Developed at start of casing run per GBC Running Procedure and once established, used for the rest of the joints in the string, using data established with progression of the casing run. The ***Running Torque*** may be adjusted during the casing run as needed to stay within parameters defined here. The ***Running Torque*** will likely vary with each job due to the factors listed in the Overview section.
4. Delta Torque: Difference between ***Shoulder Torque*** and final makeup (or dump) torque.

5. Maximum Makeup (MU) Torque: Final assembly torque including shoulder engagement shall not exceed the ***Maximum MU Torque*** shown on size, weight, and grade-specific GB Performance Property Sheets at the beginning of a casing run when establishing the ***Running Torque***. In the unlikely event that ***Running Torque*** determined by the procedure meets or exceeds the ***Maximum MU Torque***, call GB Connections for assistance.
6. Yield Torque: Torque that causes yielding in the connection (usually yielding of the pin nose). ***Yield Torque*** rating does **NOT** consider the torque that may radially buckle the pipe body at the grip points. ***Yield Torque*** values for the pipe body and connection are based on nominal dimensions and minimum material yield strength.
7. Maximum Operating Torque: The ***Maximum Operating Torque*** shown on the GB Connections Performance Property Sheets includes a 5% safety factor on ***Yield Torque***. As such, it represents the ***limiting torque spike*** that can be applied to the connection during rotating operations. The ***Maximum Operating Torque*** is **NOT** the ***Maximum MU Torque*** and is **NOT** a sustainable rotating torque. Operating at the ***Maximum Operating Torque*** for any length of time may damage connections due to likely random, unexpected torque spikes that occur during rotating operations. USER should carefully consider this value to determine if a higher Safety Factor on ***Yield Torque*** is more suitable for the project-specific application.

   As a general rule of thumb, rotating RPMs and Torque should be *"walked up"* to determine the minimum needed for task accomplishment. Additional information on best practices for rotating casing can be found at http://www.gbconnections.com/pdf/White-Paper-Rotating-Casing.pdf.

KEY INFORMATION

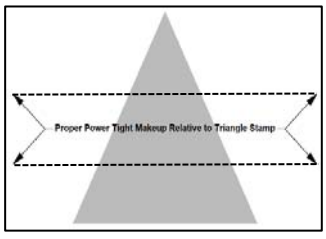
Thread Compound: Best-O-Life 2000, Best-O-Life 2000 Arctic Grade (AG), API Modified, API Modified Hi-Pressure, or any industry recognized equivalent to these products. Thread compound may also be referred to as "dope". User should avoid products that include Metal Free (MF) in the product name. Tool joint compounds are **expressly forbidden** for makeup of any GBC Connections. Thread compound shall be applied to all pin and box threads as described here.

Torque Values: ***Minimum and Maximum MU Torque*** values are provided on individual GB Connections Performance Property Sheets available at the following link: http://www.gbconnectionss.com/connection_selector.php.

Continuous Makeup: Makeup of GB Connections **SHALL START AND CONTINUE WITHOUT STOPPING** until full power tight makeup is achieved.

Makeup Speed: Use of high gear at no more than 20 RPMs is permissible once proper starting thread engagement has occurred. **THE FINAL TWO (2) TURNS, AT A MINIMUM, SHALL BE COMPLETED IN LOW GEAR AT LESS THAN 6 RPMS**.

Pin Nose Engagement: Pin nose engagement is indicated by a spike on an analog torque gauge or a sharp vertical spike on a torque vs. turn plot. As a secondary check, proper power tight makeup is achieved when the coupling covers approximately the **middle third of the API Triangle Stamp** on the pin (see graphic). The triangle will be stamped on the pin member as indicated by a white locator stripe.

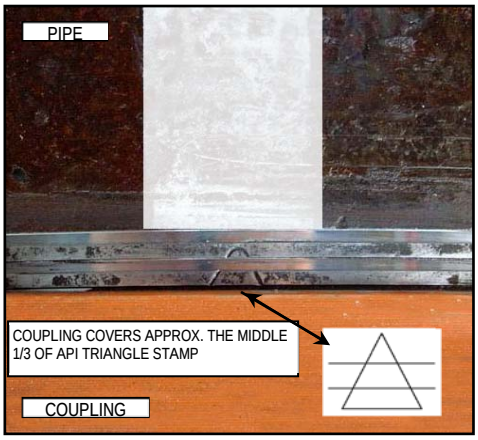


Acceptance Criteria: All GB Connections must exhibit shoulder engagement (achieve pin-to-pin or pin-to-shoulder engagement) with a: (1) ***Delta Torque*** ranging between 10% and 50% of majority of the

Shoulder Torque and (2) final torque not exceeding the ***Running Torque*** as established in this procedure. Outlier joints that require additional attention would be an exception to ***Maximum MU Torque*** limit as discussed under Comments, Troubleshooting.

It is imperative that the following procedure be executed carefully at the beginning of every casing run to determine the ***Running Torque*** (torque to be used for the rest of the string). Torque values established on an individual casing run are never transferrable to other runs.

The ***Running Torque*** is determined while running the first 10 joints after joints assembled with threadlocking compounds are made up. Sometimes more than the first 10 joints will be needed to establish the ***Running Torque*** due to erratic results and/or other run-specific conditions. The ***Running Torque*** may have to be re-established or adjusted during the casing run under certain conditions[1] and observations. Use the size-specific GBC Connections Performance Property Sheets (http://www.gbconnections.com/connection_selector.php) for physical properties for the ***Minimum*** and ***Maximum MU Torque*** values.



Connections shall be made up until shoulder engagement with ***Delta Torque*** between 10% and 50% of the ***Shoulder Torque*** (not to exceed the ***Maximum MU Torque***, see procedure below) using the ***Running Torque*** value established in this procedure. The ***Maximum MU Torque*** at the beginning of the casing run for establishing the ***Running Torque*** shall be limited to the value shown on the applicable GBC Connections Performance Property Sheet. The ***Running Torque*** shall be used thereafter and throughout the run as the limiting makeup torque value. The ***Maximum MU Torque*** on the GBC Performance Property Sheet value is given as a practical limit for avoidance of thread galling, connection damage, and possible tube damage due to excessive jaw pressure that can occur with application of extreme makeup torque. Contact GB Connections if more than the ***Maximum MU Torque*** value is required for shoulder engagement and/or final makeup, or if torque exceeding the ***Maximum Operating Torque*** value is required for the intended service.

PROCEDURE FOR ESTABLISHING ***RUNNING TORQUE***

1. Remove coupling thread protectors only after casing is set in V-Door.
2. ***Always apply fresh thread compound to coupling threads and internal shoulder (where applicable).*** See Comment No. 1 (below) for discussion on proper amount of thread compound.
3. Remove pin thread protectors only after joint is raised in the derrick. Visually inspect pin threads for sufficient thread compound as described in Comment No. 1; ***add fresh compound to pin threads and pin nose***.
4. Fresh thread compound should **NEVER** be added on top of dope contaminated with dust, dirt, and/or debris. Threads observed to have contaminated thread compound shall be thoroughly cleaned and dried before applying fresh thread compound.
5. Stab the pin carefully into the coupling of the joint hanging in the rotary table. A stabbing guide is recommended to protect the pin nose and leading thread from physical damage that may contribute to thread galling. Make up each connection until shoulder engagement plus ***Delta Torque***. Record the ***Shoulder Torque*** observed for the first 10 joints (excluding threadlocked accessory joints). The ***Running Torque*** is (a) the ***Minimum MU Torque*** shown on the GB Connections Performance Property Sheets ***or*** (b) the Maximum ***Shoulder Torque*** recorded from the first 10 makeups + 10%, ***whichever is higher*** (rounded to the next highest 500 ft-lbs.) ***Delta Torque*** should be between 10% and 50% of the ***Shoulder Torque. Running Torque*** shall not exceed the ***Maximum***

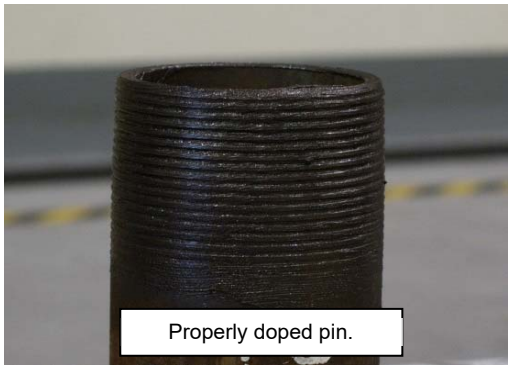
[1] Examples include but are not limited to more than an occasional low or high ***Delta Torque***, string of mixed mills, equipment change, large temperature change, and wobbling or noticeable vibration when joint is turning.

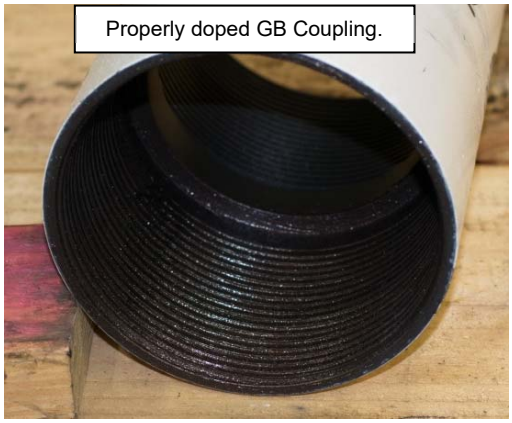
MU Torque. When making up the initial joints for establishing the ***Running Torque*** carefully watch the torque gauge for the ***Shoulder Torque*** and try to manually shut down the tongs before reaching ***Maximum MU Torque*** shown on the GB Connections Performance Property Sheets. Alternately, the dump valve should be set to 80% of the ***Maximum MU Torque*** during this initial process.

6. After the first 10 makeups (more if necessary due to conditions at the time of the run), use the ***"Running Torque"*** established in Step 5 for the remainder of the string. A dump valve is strongly recommended to stop makeup once the established ***Running Torque*** is achieved.
7. All connections made up with the established ***Running Torque*** should achieve shoulder engagement with the small amount of ***Delta Torque***. Carefully watch for the spike on the torque gauge during each make up to verify shoulder engagement. As a ***secondary*** verification, randomly check the makeup position relative to the API Triangle Stamp during the run. Proper power tight makeup position is achieved when the coupling covers the middle 1/3 of the API Triangle Stamp on the pin (see accompanying photo).
8. All connections should achieve shoulder engagement with at least 10% ***Delta Torque*** before the ***Maximum MU Torque*** is achieved.

COMMENTS, TROUBLESHOOTING

1. GB Connections are thread compound friendly. Thread compounds shall be handled, mixed, and applied in strict accordance with the manufacturer's instructions. **THREAD COMPOUND SHALL BE APPLIED TO BOTH PIN AND COUPLING THREADS AND OPPOSING PIN NOSE OR SHOULDER AREA OF EVERY CONNECTION**. Thread compound "transfer" between pin and coupling will not provide proper sealing mechanism for the connection to function properly. Sufficient thread compound has been applied when all threads (pin and coupling), pin nose, and coupling ID surfaces are completely covered **WITH NO GAPS OR BARE SPOTS**. The thread form should be discernible beneath the compound, i.e. when the thread valleys appear half full. Be generous with the thread compound; but avoid over-doping to the point where ***excessive*** amounts are squeezed out during assembly. Use of a mustache brush is the preferred method for applying and distributing thread compounds to GB Connections.


Properly doped pin.

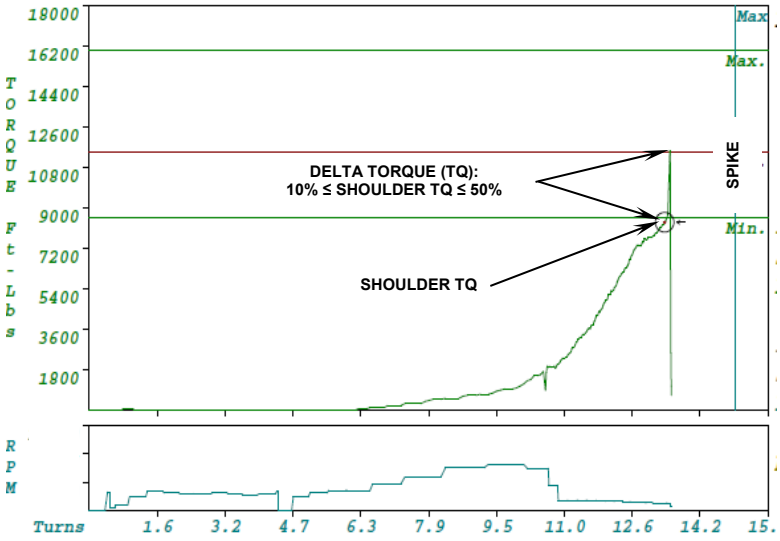

Properly doped GB Coupling.

2. If threads are cleaned on racks, new dope shall be applied in a light, even coat to both pin and coupling threads. See Comment No. 1 above for description of sufficient thread compound. Clean thread protectors shall be re-applied to freshly doped pin and coupling threads unless the casing run is imminent (no more than a few hours) to avoid contaminating exposed thread compound.
3. All connections should achieve shoulder engagement before reaching the "***Running Torque***" value determined by this procedure. Any connection that does not achieve shoulder engagement at the established "***Running Torque"*** value shall be visually inspected for position relative to the API Triangle Stamp.
   a) If the coupling is shy of the API Triangle Stamp Base, the connection shall be broken out, cleaned and inspected visually for thread damage, re-doped, and made-up again (or laid down if threads are damaged). Connections that have not achieved shoulder engagement **SHALL NEVER** be backed up a couple of turns and remade. They shall be completely broken out, cleaned and inspected as described above.

b) If the coupling covers the API Triangle base but does not land in approximately the middle third of the API Triangle Stamp, add additional torque to achieve shouldering and finish the makeup. Except to initiate additional turning, it is common to see high torque (possibly exceeding the ***Maximum MU Torque***) to initiate connection turning. This is acceptable as long as the torque drops off once movement starts and then spikes with shoulder engagement. If acceptable makeup doesn't occur with one additional torque application, the connection shall be broken out (as described in 3a above).

c) Any connection not properly assembled (i.e. not meeting the acceptance criteria) in two (2) attempts (provided threads pass a visual inspection each time) is reject and shall be laid down.

4. At the established ***Running Torque***, the connections will generally shoulder with ***Delta Torque*** between 10% and 50%. High interference connections will tend to have a higher ***Shoulder Torque*** and less ***Delta Torque*** (at least 10% of the ***Shoulder Torque*** is required). Low interference connections will tend to have lower ***Shoulder Torque*** and more ***Delta Torque***. In general, GB Connections makeup consistently but will vary due to any of the factors enumerated in the second paragraph of the Overview section of this procedure. However, wide variability on more than a few joints should be investigated for a root cause and, if necessary, a new ***Running Torque*** should be adjusted as described below.



If a connection appears to have shouldered but doesn't have at least 10% ***Delta Torque***, the position relative to the API Triangle Stamp should be checked. In just about every instance, the position will have covered the triangle base, so additional torque can be added to complete the makeup as discussed in 3.b) above. Expect an instantaneous spike with showing more than 50% ***Delta Torque*** with application of additional torque. Under this condition, this makeup is acceptable.

Similarly, random connections here and there with more than 50% ***Delta Torque*** is generally not cause for concern. However, if overshooting the 50% maximum ***Delta Torque*** target occurs frequently, then the established ***Running Torque*** value should be walked down in 500 ft-lbs. to 1,000 ft-lbs. increments until connection makeup routinely falls in line with the stated acceptance criteria.

5. ***Torque vs. Turn monitoring systems are recommended for field makeup of GB Connections.*** While Torque vs. Turn plots provide good information about makeup, they **SHALL NOT BE SUBSTITUTED FOR DIRECT VISUAL OBSERVATION OF THE CONNECTION DURING ASSEMBLY**. There is no second chance to watch field assembly of a connection. Torque vs. Turn plots can always be viewed for verification purposes once a makeup is finished. When available, torque vs. turn plots shall finish with a clearly defined spike as shown in the graphic to the right. The general character of torque vs. turn plots for good makeups will become evident after the first ten (10) makeups (again, more may be necessary due to rig and/or equipment-specific conditions). Any makeup that results in a plot that is "out-of-character"[2] when compared with most plots from previous good makeups should be checked carefully.

[2] An "out-of-character" plot may initiate with a high torque, show significantly steeper slope from the start of makeup, wide torque undulations as makeup progresses, no clearly defined spike, insufficient/inconsistent turns, etc.

When using Torque vs. Turn monitoring equipment, GB recommends setting a reference torque value of 500 ft-lbs. or 10% of the minimum makeup torque (whichever is lower) to help normalize the turns-to-power-tight variability in the Tq-Tn graphs. Setting a reference torque reduces field stab variability resulting in more consistency in the Tq-Tn data. Plot scales should be set so data spans at least 2/3 of the turns scale on each plot (15 turns will usually be sufficient at the start and can be reduced based on data from the first few joints). **UNDER NO CIRCUMSTANCE SHOULD MAKEUP BE STARTED UNTIL THE MONITORING SYSTEM IS READY TO RECORD DATA**.

6. Occasionally the mill side of a GB Connection may turn during field makeup. When observed, the makeup should continue without stopping per this procedure. It may be helpful to scribe a vertical line across the coupling-pipe interface to aid estimation of mill side turning if it is observed with some frequency. The amount of mill side turn should be carefully observed and estimated. If the mill side turns less than ½ turn and all other aspects of the makeup are good, the connection is acceptable. If the mill side turns more than ½ turn, trouble- shooting should be initiated. Pay particular attention to amount and distribution of thread compound, vertical alignment, weight of joint, hooked end on pipe, and other possible factors that may contribute to possible high torque during field makeup. Counting turns can help to estimate if coupling will need to be stopped to avoid over rotation. It should be noted that mill side turning during field makeup occurs occasionally and should not be concerning. Frequent or persistent mill side turning is a symptom that needs troubleshooting and appropriate corrective action.
7. A double wrap of the pick-up sling should be used when raising casing into the derrick when lifting subs, single joint, side-door, or slip elevators are not being used.
8. Higher torque may be required to achieve shoulder engagement when threadlock compounds are applied. User is advised to carefully follow the manufacturer's instructions with respect to mixing, application, temperature, and time. Torque ranges with threadlock compounds cannot be estimated due to many variables including but not limited to temperature, time, connection tolerances, and surface finish. In these cases, carefully monitor makeup to be sure shouldering occurs. The only exception to the shouldering requirement is with float equipment (float shoe and float collar) that will be assembled with a threadlocking compound. In this case, makeup to a position that covers the base of API Triangle Stamp is considered satisfactory.
9. Manual and automated dump valves can overshoot the established ***Running Torque*** due to several factors. Slightly overshooting the ***Running Torque*** is not cause for concern as long as the final "dump" torque is not excessive, and the equipment used is generally consistent joint-to-joint. Overshooting the ***Running Torque*** with a final makeup speed greater than 10 RPMs is risky and potentially harmful to the connection as discussed below.
10. Attached is a "Worksheet for determining GB Connections ***Running Torque*** at the beginning of a Casing Run" for use at the start of any casing run using GB Connections. GB recommends that this worksheet be filled out and maintained with the casing run records.

MAKEUP SPEED

To reiterate: Use of high gear at no more than 20 RPMs is permissible once proper starting thread engagement has occurred. **THE FINAL TWO (2) FULL TURNS, AT A MINIMUM, SHALL BE COMPLETED IN LOW GEAR AT LESS THAN 6 RPMS**. Be sure that the final 2 turns occur after the tong speed has slowed completely to less than 6 RPMs.

Making up connections at RPM exceeding those listed above may result in unsatisfactory connection performance downhole. Risks associated with excessive makeup RPMs are common for any connection with internal pin nose engagement. High speed makeup can:

1. Impart an unnecessary impulse load at nose contact. Certain materials are more susceptible to cracking under sudden or instantaneously applied loads.
2. Inhibit efficient movement of and trap thread compound under high pressure causing additional and unquantifiable high hoop stresses in the connection.

3. Result in significant overshoot of established dump torque value due to equipment latency between signal and equipment shut down resulting in higher but unknown actual final torque value. Excessive overshoot can result in pin nose yielding.

PROCEDURE SUMMARY

1. Remove coupling protectors after casing is set in V-Door and apply fresh thread compound to coupling threads.
2. Raise joint in derrick, remove pin protectors, and apply fresh thread compound to pin threads and pin nose.
3. Carefully stab pin into coupling and makeup to pin nose engagement. Try to stop makeup without exceeding the ***Maximum MU Torque*** (shown on GB Connections Performance Property Sheets). Carefully watch for and note the ***Shoulder Torque***.
4. Record ***Shoulder Torque*** and Final Torque values, and position relative to API Triangle Stamp for first ten (10) connections, more if necessary due to run/rig-specific conditions.
5. The ***Running Torque*** is (a) the ***Minimum MU Torque*** shown on the GB Connections Performance Property Sheet or (b) the maximum torque required for shoulder engagement + 10% ***Delta Torque*** determined from the first 10 makeups, ***whichever is higher***. Use the attached Worksheet to record this data and determine the ***Running Torque***.
6. Make up the rest of the string at the ***Running Torque*** determined in the previous step verifying each connection has shouldered with between 10% and 50% ***Delta Torque***. Small incremental adjustments to the established Running Torque (500 to 1,000 ft-lbs) are advised if delta torques routinely fall short of the 10% requirement or routinely exceed the 50% requirement.

NOTES:

- *This summary is provided for quick reference and is not a substitute for the comprehensive procedure provided above.*
- *Does not apply to threadlock connections.*

DO's and DONT's

1. **DO** check vertical alignment.
2. **DO** apply thread compound to all pin and coupling threads, pin nose and coupling shoulder area.
3. **DO** establish the ***Running Torque*** in accordance with GB Procedures.
4. **DO** make adjustments to ***Running Torque*** if indicated by inconsistent makeups during the casing run.
5. **DO** check every makeup for a clear indication of shouldering with a minimum ***Delta Torque*** ≥ 10% of the ***Shoulder Torque***.
6. **DO** reject any coupling that is not properly made up after two (2) attempts.
7. **DO** carefully stab pins into coupling (use a stabbing guide for casing smaller than 9 5/8" OD).
8. **DO** finish the makeup with at least two (2) full turns in low gear at 6 RPMs or less.
9. **DO** make up every connection continuously to pin nose engagement without stopping.

10. **DO** make note of anything that occurs with any connection makeup such as backup grips slipped, connection inspected and remade, etc.
11. **Do** check out every connection that appears out of character relative to the population. An example would be a connection that is completed with significantly fewer turns than most others. Check the triangle stamp and record position and take corrective action if needed.
12. **DO** add torque to any connection that appears to achieve pin nose engagement but not 10% delta torque.
13. **DO** adjust the ***Running Torque*** up or down in increments to achieve consistent ***Delta Torque*** between 10% and 50%.
14. **Do** make note of any anomaly during any connection makeup, such as backups slipped, mill side turned, etc.
15. **DO** minimize the weight on the connection, i.e. weight neutral, during break out as much as possible to minimize thread galling.
16. **DO NOT** over dope.
17. **DO NOT** exceed the ***Maximum MU Torque*** as shown on the GB Connections Performance Property Sheets during assembly.
18. **DO NOT** make up any misaligned connection.
19. **DO NOT** exceed 20 RPMs in high gear and 6 RPMs in low gear for the final two (2) full turns.
20. **DO NOT** remove pin thread protectors until pipe is hanging in the derrick.
21. **DO NOT** ever back a connection up a couple of turns and remake. Any connection requiring this type of attention **SHALL** be broken out completely, cleaned, visually inspected, and if OK, re-doped and remade.
22. **DO NOT** hesitate to contact GB Connections with questions before and during any casing run.

RECOMMENDED EQUIPMENT

- Stabbing Guide
- Mustache Brush
- Torque vs. Turn Monitoring Equipment or Dump Valve

Worksheet for determining GB Connection Running Torque at the beginning of a Casing Run

Ignore joints that are assembled with threadlock compounds. See "Addendum Procedure for GB Connections Assembled with Threadlocking Compounds" available at www.gbconnections.com.

Pertinent Excerpt from GB Running Procedure

5. Stab the pin carefully into the coupling of the joint hanging in the rotary table. A stabbing guide is recommended to protect the pin nose and leading thread from physical damage that may contribute to thread galling. Make up each connection until shoulder engagement plus Delta Torque. Record the Shoulder Torque observed for the first 10 joints (excluding threadlocked accessory joints). The Running Torque is (a) the Minimum MU Torque shown on the GB Connections Performance Property Sheets or (b) the Maximum Shoulder Torque recorded from the first 10 makeups + 10%, whichever is higher (rounded to the next highest 500 ft-lbs.) Delta Torque should be between 10% and 50% of the Shoulder Torque. Running Torque shall not exceed the Maximum MU Torque. When making up the initial joints for establishing the Running Torque carefully watch the torque gauge for the Shoulder Torque and try to manually shut down the tongs before reaching Maximum MU Torque shown on the GB Connections Performance Property Sheets. Alternately, the dump valve should be set to **80% of the Maximum MU Torque** during this initial process.

6. After the first 10 makeups (more if necessary due to conditions at the time of the run), use the "Running Torque" established in Step 5 for the remainder of the string. A dump valve is strongly recommended to stop makeup once the established Running Torque is achieved.

Casing Data		Comment
OD (in)		See GBC Performance Property Sheet
Weight (ppf)		See GBC Performance Property Sheet
Grade		See GBC Performance Property Sheet
Min MU Torque (ft-lbs)		See GBC Performance Property Sheet
Max MU Torque (ft-lbs)		See GBC Performance Property Sheet
Max Operating Torque (ft-lbs)		The Maximum Operating Torque is **NOT** the Maximum Makeup Torque and is **NOT** a sustainable rotating torque. Operating at the Maximum Operating Torque for any length of time will likely damage the connection.

Notes	Joint No.	Shoulder Torque (ft-lbs)	Final Torque (ft-lbs)	Triangle Stamp Position Sketch (△)
Required	1			
Required	2			
Required	3			
Required	4			
Required	5			
Required	6			
Required	7			
Required	8			
Required	9			
Required	10			
Optional	11			
Optional	12			
Optional	13			
Optional	14			
Optional	15			
Max. Shoulder Torque				
A Max. Shoulder Torque + 10%				
B Min. Makeup Torque (from GB Conn. Data Sheet)				
Running Torque (ft-lbs)		-	**A** or **B**, whichever is **greater**.	

Optional joints should be added if there is wide variability in shoulder torques recorded during the initial 10 joints. Judgement should be used to determine if more than 10 joints are needed for the purpose of establishing the Running Torque and, if so, how many more should be added.

Wide variations in Shoulder Torque during the first ten (10) joints suggest other issues requiring attention such as poor alignment, improper amount and distribution of thread compound, etc. Refer to 2nd paragraph of GB Running Procedure for possible contributing factors to aid troubleshooting.

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Casing Design Criteria and Load Case Assumptions

1. Collapse: DF_C=1.125
    a. Full Internal Evacuation: Collapse force equal to the mud gradient in which the casing will be run (0.65 psi/ft). The effects of axial load on collapse will be considered.
    b. Cementing: Collapse force equal to the gradient of planned cement slurries to planned depths and minimum mud gradient in which the casing will be run above that (0.65 psi/ft) and an internal force equal to mud gradient of displacement fluid (0.43 psi/ft)
2. Burst: DF_B=1.125
    a. Pressure Test: psi casing test with an external force equal to the mud gradient in which the casing will be run (0.65 psi/ft), which is a more conservative backup force than pore pressure.
    b. Injection Down Casing: psi surface injection pressure plus an internal pressure gradient of 0.65 psi/ft with an external force equal to the mud gradient in which the casing will be run (0.65 psi/ft), which is a more conservative backup force than pore pressure.
3. Tensile: DF_T=1.4
    a. Overpull: An overpull force of 100,000 lbs is applied at the shoe along with the weight of the casing string utilizing the effects of buoyancy (8.5 ppg).

Surface Casing Program									
Casing Size (in)	**Weight (ppf)**	**Grade**	**Connection**	**ID**	**ID (drift)**	**Collapse (psi)**	**Burst (psi)**	**Tension (1,000 lbs)**	**Capacity (bbl/ft)**
13-3/8”	54.5	J-55	BTC	12.615	12.459	1,130	2,740	909	0.1545
Safety Factors									
	API Rec. SF	**ACTUAL SF**	Case		External Fluids		Internal Fluids		
Collapse	1.125	**3.30**	Lost Circulation		Mud		*None*		
Burst	1.125	**1.46**	Plug Bump		Green Cement + 2ksi surf pressure		Displacement Fluid/Mud		
Tension	1.4	**2.8**	100 klbs Overpull		Mud		Mud		

Buoyed Casing Weight: ***23,755 lbs (assuming 8.4 ppg fluid and 500’ casing-worst case scenario)***

Intermediate Casing Program									
Casing Size (in)	**Weight (ppf)**	**Grade**	**Connection**	**ID**	**ID (drift)**	**Collapse (psi)**	**Burst (psi)**	**Tension (1,000 lbs)**	**Capacity (bbl/ft)**
9-5/8”	36	J-55	BTC	8.921	8.765	2,020	3,520	639	0.0773
Safety Factors									
	API Rec. SF	**ACTUAL SF**	Case		External Fluids		Internal Fluids		
Collapse	1.125	**3.30**	Lost Circulation		Mud		*None*		
Burst	1.125	**1.46**	Plug Bump		Green Cement + 2ksi surf pressure		Displacement Fluid/Mud		
Tension	1.4	**2.8**	100 klbs Overpull		Mud		Mud		

Buoyed Casing Weight: ***40,798 lbs (assuming 8.4 ppg fluid and 1,300’ casing-worst case scenario)***

Production Casing Program									
Casing Size (in)	**Weight (ppf)**	**Grade**	**Connection**	**ID**	**ID (drift)**	**Collapse (psi)**	**Burst (psi)**	**Tension (1,000 lbs)**	**Capacity (bbl/ft)**
7”	32	L-80	GBCD	6.094	5.969	10,400	9,060	745	0.0361
Safety Factors									
	API Rec. SF	**ACTUAL SF**	Case		External Fluids		Internal Fluids		
Collapse	1.125	**3.75**	Lost Circulation		Mud		*None*		
Burst	1.125	**2.47**	Plug Bump		Green Cement + 2ksi surf pressure		Displacement Fluid/Mud		
Tension	1.4	**2.29**	100 klbs Overpull		Mud		Mud		

Buoyed Casing Weight: ***90,662 lbs (assuming 8.4 ppg fluid and 3,250’ TVD-worst case scenario)***

Production Casing Program									
Casing Size (in)	**Weight (ppf)**	**Grade**	**Connection**	**ID**	**ID (drift)**	**Collapse (psi)**	**Burst (psi)**	**Tension (1,000 lbs)**	**Capacity (bbl/ft)**
5-1/2”	20	L-80	GBCD	4.778	4.653	10,630	9,190	466	0.0222
Safety Factors									
	API Rec. SF	**ACTUAL SF**	Case		External Fluids		Internal Fluids		
Collapse	1.125	**3.75**	Lost Circulation		Mud		*None*		
Burst	1.125	**2.47**	Plug Bump		Green Cement + 2ksi surf pressure		Displacement Fluid/Mud		
Tension	1.4	**2.29**	100 klbs Overpull		Mud		Mud		

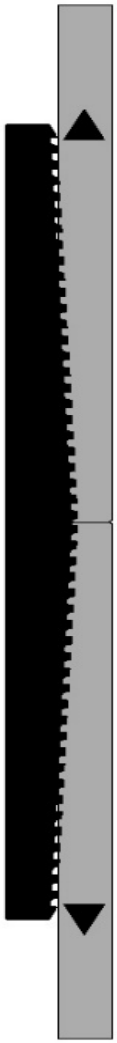
Buoyed Casing Weight: ***56,664 lbs (assuming 8.4 ppg fluid and 3,250’ TVD-worst case scenario)***

GB connections
Engineering the Right Connections

GB Connection Performance Properties Sheet

Rev. 2 (07/11/2017)

ENGINEERING THE RIGHT CONNECTIONS



Casing: 7 OD, 32 ppf
Casing Grade: L-80

Connection: GB CD Butt 7.875
Coupling Grade: API L-80

PIPE BODY GEOMETRY					
Nominal OD (in.)	7	Wall Thickness (in.)	0.453	Drift Diameter (in.)	5.969
Nominal Weight (ppf)	32.00	Nominal ID (in.)	6.094	API Alternate Drift Dia. (in.)	6.000
Plain End Weight (ppf)	31.70	Plain End Area (in.^{2})	9.317		

PIPE BODY PERFORMANCE					
Material Specification	L-80	Min. Yield Str. (psi)	80,000	Min. Ultimate Str. (psi)	95,000
Collapse		**Tension**		**Pressure**	
API (psi)	8,600	Pl. End Yield Str. (kips)	745	Min. Int. Yield Press. (psi)	9,060
High Collapse (psi)	10,400	**Torque**		**Bending**	
		Yield Torque (ft-lbs)	110,320	Build Rate to Yield (°/100 ft)	52.4

GB CD Butt 7.875 COUPLING GEOMETRY			
Coupling OD (in.)	7.875	Makeup Loss (in.)	4.6250
Coupling Length (in.)	9.250	Critical Cross-Sect. (in.^{2})	11.894

GB CD Butt 7.875 CONNECTION PERFORMANCE RATINGS/EFFICIENCIES					
Material Specification	API L-80	Min. Yield Str. (psi)	80,000	Min. Ultimate Str. (psi)	95,000
Tension		**Efficiency**		**Bending**	
Thread Str. (kips)	791	Internal Pressure (%)	100%	Build Rate to Yield (°/100 ft)	46.6
Min. Tension Yield (kips)	904	External Pressure (%)	100%	**Yield Torque**	
Min. Tension Ult. (kips)	1,073	Tension (%)	100%	Yield Torque (ft-lbs)	49,870
Joint Str. (kips)	791	Compression (%)	100%		
		Ratio of Areas (Cplg/Pipe)	1.28		

MAKEUP TORQUE					
Min. MU Tq. (ft-lbs)	10,000	Max. MU Tq. (ft-lbs)	20,000	Running Tq. (ft-lbs)	See GBT RP
				Max. Operating Tq. (ft-lbs)*	47,380

Units: US Customary (lbm, in., °F, lbf)
1 kip = 1,000 lbs
* See Running Procedure for description and limitations.
See attached: Notes for GB Connection Performance Properties.
GBC Running Procedure (GBC RP): www.gbconnections.com/pdf/RP-GB-DWC-Connections.pdf
Blanking Dimensions: www.gbconnections.com/pdf/GB-DWC-Blanking-Dimensions.pdf
Connection yield torque rating based on physical testing or extrapolation therefrom

GB connections
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Notes for GB Connections Performance Properties

Rev. 1 (May, 2018)

ENGINEERING THE RIGHT CONNECTIONS™

1. All dimensions shown are nominal. Plain end weight is calculated in accordance with API TR 5C3. Performance properties are empirical, based on nominal dimensions, minimum material yield and ultimate strengths, and calculated in general accordance with industry standard formula(s) assuming uniaxial loading. All properties are calculated on the basis of materials at room temperature. NOTE: Material properties change with temperature.
2. Joint strength is the lesser of pipe thread strength and minimum coupling tension as calculated in accordance with API TR 5C3. Tensile efficiency is calculated using coupling strength based on ultimate material strength per API TR 5C3 divided by plain end yield strength of the casing. Minimum Coupling Tension based on material *yield* strength is provided *for information only*. Performance values presented for tension do not account for failure by pull-out (which can occur with heavy wall casing), effects of internal and external pressure, thermally induced axial loads, casing curvature (bending), and/or other static and dynamic loads that may occur singularly or in combination during downhole deployment and with subsequent well operations.
3. Drift diameters are based on Standard and Alternate drift sizes per API 5CT. Drift diameters are not specified for API 5L pipe. Drift diameters shown on GB Connection Performance Property Sheets represent the diameter of the drift mandrel used for end-drifting after coupling buck on. When shown, the alternate drift diameter is used for end drifting. Drift testing is performed in accordance with currently applicable API Specifications.
4. Minimum Internal Yield Pressure Performance values for Casing (API 5CT), Line Pipe (API 5L), and mill casing proprietary grades are based on API TR 5C3 formulas and assume 87.5% minimum wall thicknesses. Minimum Internal Yield Pressure efficiency for GB Connections is the lesser of the Minimum Internal Yield Pressure of the coupling and Leak Resistance divided by pipe body Minimum Internal Yield Pressure (all based on API TR 5C3 formulas). GB Connections typically demonstrate pressure resistance exceeding the mating pipe body unless otherwise noted with a pressure efficiency < 100%. Pressure efficiency can only be achieved when connections are properly assembled in strict accordance with GB Connections' Running Procedures (www.gbconnections.com/pdf/RP-GB-DWC-Connections.pdf.
5. Compression efficiency of the Casing/Connection combinations does not consider the axial load that causes pipe body buckling. The compressive load that causes buckling is usually less than the pipe body compressive yield strength and is dependent on a number of factors including, but not limited to, string length (or slenderness ratio; L/D), thermally induced axial loads, and annular clearance that may (or may not) lend side support to the casing string.
6. Bending values assume a constant radius of curvature where the casing is in uniformly intimate contact with the wall of the wellbore (i.e. when the upset at the coupling OD is small compared with wellbore wall irregularities). When the radius of curvature is not constant due to large wellbore wall irregularities, varying trajectory, micro doglegs, wash-outs, rock ledges, and other downhole conditions, unpredictable excessive bending stresses can occur that may be detrimental to casing and connection performance.
7. Fatigue failures are a function of material properties, stress range, and number of stress reversal cycles. API 5CT, API 5L, and mill proprietary casing/coupling materials have a finite fatigue life. Higher stress ranges yield lower fatigue life. So as a general rule of thumb, casing should never be rotated at higher RPMs than needed for task accomplishment. For the same stress range, casing rotated at 25 RPMs will generally last 4 times longer (more rotating hours) than casing rotated at 100 RPMs. However with fatigue, there are opportunities for unexpected higher stress reversal levels associated with vibration, thermally induced axial loads, and bending (see above) in addition to all other stress reversals imparted during running, rotating, reciprocating, pressure testing, pumping, etc. The extent and quality of the cement job is also a factor. Under aggressive, high-volume, multi-stage hydraulic fracturing operations, the casing string (including the connections) is severely taxed such that local stress range(s) and actual number of applied cycles cannot be precisely determined without full string instrumentation.
8. External pressure efficiency (expressed in percent) is the ratio of the lesser of Minimum Internal Yield Pressure and Leak Resistance for coupling (calculated per API TR 5C3) divided by the API collapse rating of the casing. External pressure efficiency has not been verified by testing and does not consider other applied loads. External pressure efficiency does not account for any high collapse rating that may be shown on GB Connection Performance Property Sheets.
9. Maximum Makeup Torque is provided for guidance only. This value is not the same as the Connection Yield Torque shown. Connection Yield Torque is the lesser of yield torque rating for the critical cross-section of pipe body, connector body, and pin nose and the threadform load flank bearing area. Connection Yield Torque does not consider radial buckling of the pipe or connection due to excessive jaw pressure during torque application. Torque in connections can increase or decrease over that applied at makeup (connection tightening/loosening) with rotating and stimulation operations due to slip-stick, shock loads, bending, tight spots, vibration(s), temperature, and other downhole factors that may occur individually or in combination. Due to circumstances beyond the control of GB Connections, User accepts all risks associated with casing and connection related issues that occur during and after rotating operations.
10. **Every** GB Connection requires the proper amount and distribution of thread compound to all pin and coupling threads and careful field make up in strict accordance with GB Connections' Running Procedures to provide expected levels of performance in service.
11. Reactions among water, drilling muds and other fluids, and chemicals introduced by User with downhole formation fluids may result in an environment detrimental to casing and connection performance. User should carefully consider all aspects of the string design including material compatibility with respect to possible corrosion, sour conditions, and other factors that may result in unexpected casing and/or connection failure at or below published ratings.
12. Performance Properties are subject to change without notice. User is advised to obtain the current GB Connection Performance Property Sheet for each application. Please visit **www.gbconnections.com** to download.

Limitations

Data presented in GB Performance Property Sheets and Running Procedures ("GB Information") is provided for informational purposes only and intended to be supplemented by the professional judgment of qualified personnel during design, field handling, deployment, and all subsequent well operations. The use of GB Information is at the User's sole risk.

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GB connections Engineering the Right Connections	**Running Procedure for Casing with GB *Drilling with Casing* Connections**	October 29, 2007
		Rev. 14 (04/09/2020)

OVERVIEW

This field running procedure applies to makeup of **GB *Drilling with Casing*** (GB DwC) Connections which include GB CD, GB CDE, GB RDB, GB EHTQ, and GB RDB WS Connections with GB Butt (Buttress), GB 4P, and GB 3P thread forms. All GBC Connections are suitable for ***Running*** (standard casing applications), ***Rotating*** (to aid string advancement), ***Drilling*** (Drilling with Casing/Drilling with Liners) and ***Driving***. This procedure also applies to the legacy GB Connections known as GB Butt and GB 3P.

Numerous factors impact the makeup torque of Buttress (GB Butt) and Modified Buttress Threads (such as GB 4P and GB 3P). Some of these factors include but are not limited to: allowable threading tolerances, joint characteristics (OD, straightness, hooked ends, and weight), vertical alignment (derrick, top drive, and elevator alignment relative to rotary table), thread compound (type, amount, and distribution), snub line (location and orientation), distance between tongs and backups, temperature/weather, equipment type, efficiencies (electrical, hydraulic and mechanical), grips/dies (type, condition, orientation, location, contact area, and grip distribution), measurement equipment, gauge calibration, personnel, etc. The nature of these types of connections makes it impossible to provide makeup torque values that will yield proper power tight makeup on every rig under all circumstances with the wide variety of existing connection makeup equipment.

This procedure has been designed to determine the ***Running Torque*** required for proper power tight makeup of GB Connections under the circumstances and with the actual equipment, set up conditions, weather, etc. that exist at the time of running. With proper execution of this procedure, GB Connections will be properly and consistently assembled.

LIMITATIONS

This GBC Running Procedure provides the basic recommended practices and is intended to be supplemented by the professional judgment of qualified personnel based on observation of actual makeups throughout the casing run. GB DwC Connections require the proper amount and distribution of thread compound to **all pin and coupling threads** and careful field makeup in strict accordance with GB Connections' Running Procedures to provide expected levels of performance in service.

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DEFINITIONS

1. Minimum Makeup (MU) Torque: Connections must have at least this amount of torque applied and clearly exhibit shoulder engagement.
2. Shoulder Torque: MU torque required to achieve shoulder engagement.
3. Running Torque: Developed at start of casing run per GBC Running Procedure and once established, used for the rest of the joints in the string, using data established with progression of the casing run. The ***Running Torque*** may be adjusted during the casing run as needed to stay within parameters defined here. The ***Running Torque*** will likely vary with each job due to the factors listed in the Overview section.
4. Delta Torque: Difference between ***Shoulder Torque*** and final makeup (or dump) torque.

5. Maximum Makeup (MU) Torque: Final assembly torque including shoulder engagement shall not exceed the ***Maximum MU Torque*** shown on size, weight, and grade-specific GB Performance Property Sheets at the beginning of a casing run when establishing the ***Running Torque***. In the unlikely event that ***Running Torque*** determined by the procedure meets or exceeds the ***Maximum MU Torque***, call GB Connections for assistance.
6. Yield Torque: Torque that causes yielding in the connection (usually yielding of the pin nose). ***Yield Torque*** rating does **NOT** consider the torque that may radially buckle the pipe body at the grip points. ***Yield Torque*** values for the pipe body and connection are based on nominal dimensions and minimum material yield strength.
7. Maximum Operating Torque: The ***Maximum Operating Torque*** shown on the GB Connections Performance Property Sheets includes a 5% safety factor on ***Yield Torque***. As such, it represents the ***limiting torque spike*** that can be applied to the connection during rotating operations. The ***Maximum Operating Torque*** is **NOT** the ***Maximum MU Torque*** and is **NOT** a sustainable rotating torque. Operating at the ***Maximum Operating Torque*** for any length of time may damage connections due to likely random, unexpected torque spikes that occur during rotating operations. USER should carefully consider this value to determine if a higher Safety Factor on ***Yield Torque*** is more suitable for the project-specific application.

   As a general rule of thumb, rotating RPMs and Torque should be *"walked up"* to determine the minimum needed for task accomplishment. Additional information on best practices for rotating casing can be found at http://www.gbconnections.com/pdf/White-Paper-Rotating-Casing.pdf.

KEY INFORMATION

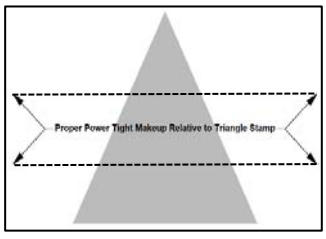
Thread Compound: Best-O-Life 2000, Best-O-Life 2000 Arctic Grade (AG), API Modified, API Modified Hi-Pressure, or any industry recognized equivalent to these products. Thread compound may also be referred to as "dope". User should avoid products that include Metal Free (MF) in the product name. Tool joint compounds are **expressly forbidden** for makeup of any GBC Connections. Thread compound shall be applied to all pin and box threads as described here.

Torque Values: ***Minimum and Maximum MU Torque*** values are provided on individual GB Connections Performance Property Sheets available at the following link: http://www.gbconnectionss.com/connection_selector.php.

Continuous Makeup: Makeup of GB Connections **SHALL START AND CONTINUE WITHOUT STOPPING** until full power tight makeup is achieved.

Makeup Speed: Use of high gear at no more than 20 RPMs is permissible once proper starting thread engagement has occurred. **THE FINAL TWO (2) TURNS, AT A MINIMUM, SHALL BE COMPLETED IN LOW GEAR AT LESS THAN 6 RPMS**.

Pin Nose Engagement: Pin nose engagement is indicated by a spike on an analog torque gauge or a sharp vertical spike on a torque vs. turn plot. As a secondary check, proper power tight makeup is achieved when the coupling covers approximately the **middle third of the API Triangle Stamp** on the pin (see graphic). The triangle will be stamped on the pin member as indicated by a white locator stripe.

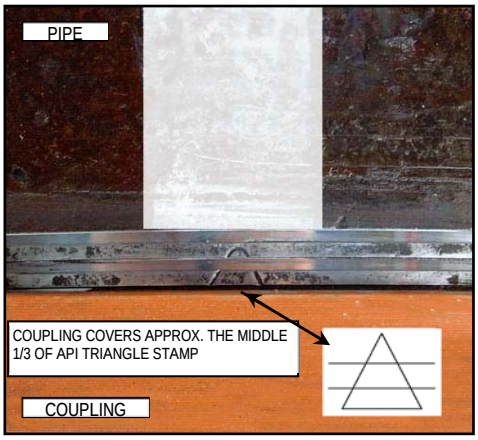


Acceptance Criteria: All GB Connections must exhibit shoulder engagement (achieve pin-to-pin or pin-to-shoulder engagement) with a: (1) ***Delta Torque*** ranging between 10% and 50% of majority of the

Shoulder Torque and (2) final torque not exceeding the ***Running Torque*** as established in this procedure. Outlier joints that require additional attention would be an exception to ***Maximum MU Torque*** limit as discussed under Comments, Troubleshooting.

It is imperative that the following procedure be executed carefully at the beginning of every casing run to determine the ***Running Torque*** (torque to be used for the rest of the string). Torque values established on an individual casing run are never transferrable to other runs.

The ***Running Torque*** is determined while running the first 10 joints after joints assembled with threadlocking compounds are made up. Sometimes more than the first 10 joints will be needed to establish the ***Running Torque*** due to erratic results and/or other run-specific conditions. The ***Running Torque*** may have to be re-established or adjusted during the casing run under certain conditions[1] and observations. Use the size-specific GBC Connections Performance Property Sheets (http://www.gbconnections.com/connection_selector.php) for physical properties for the ***Minimum*** and ***Maximum MU Torque*** values.



Connections shall be made up until shoulder engagement with ***Delta Torque*** between 10% and 50% of the ***Shoulder Torque*** (not to exceed the ***Maximum MU Torque***, see procedure below) using the ***Running Torque*** value established in this procedure. The ***Maximum MU Torque*** at the beginning of the casing run for establishing the ***Running Torque*** shall be limited to the value shown on the applicable GBC Connections Performance Property Sheet. The ***Running Torque*** shall be used thereafter and throughout the run as the limiting makeup torque value. The ***Maximum MU Torque*** on the GBC Performance Property Sheet value is given as a practical limit for avoidance of thread galling, connection damage, and possible tube damage due to excessive jaw pressure that can occur with application of extreme makeup torque. Contact GB Connections if more than the ***Maximum MU Torque*** value is required for shoulder engagement and/or final makeup, or if torque exceeding the ***Maximum Operating Torque*** value is required for the intended service.

PROCEDURE FOR ESTABLISHING ***RUNNING TORQUE***

1. Remove coupling thread protectors only after casing is set in V-Door.
2. ***Always apply fresh thread compound to coupling threads and internal shoulder (where applicable).*** See Comment No. 1 (below) for discussion on proper amount of thread compound.
3. Remove pin thread protectors only after joint is raised in the derrick. Visually inspect pin threads for sufficient thread compound as described in Comment No. 1; ***add fresh compound to pin threads and pin nose***.
4. Fresh thread compound should **NEVER** be added on top of dope contaminated with dust, dirt, and/or debris. Threads observed to have contaminated thread compound shall be thoroughly cleaned and dried before applying fresh thread compound.
5. Stab the pin carefully into the coupling of the joint hanging in the rotary table. A stabbing guide is recommended to protect the pin nose and leading thread from physical damage that may contribute to thread galling. Make up each connection until shoulder engagement plus ***Delta Torque***. Record the ***Shoulder Torque*** observed for the first 10 joints (excluding threadlocked accessory joints). The ***Running Torque*** is (a) the ***Minimum MU Torque*** shown on the GB Connections Performance Property Sheets ***or*** (b) the Maximum ***Shoulder Torque*** recorded from the first 10 makeups + 10%, ***whichever is higher*** (rounded to the next highest 500 ft-lbs.) ***Delta Torque*** should be between 10% and 50% of the ***Shoulder Torque. Running Torque*** shall not exceed the ***Maximum***

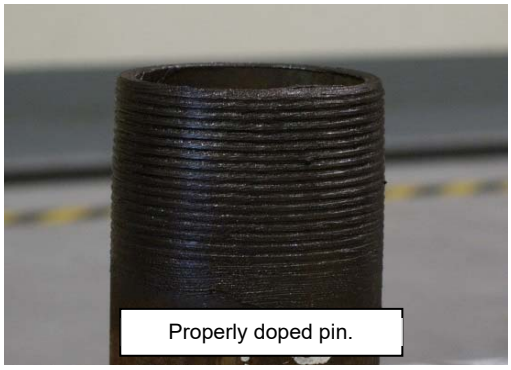
[1] Examples include but are not limited to more than an occasional low or high ***Delta Torque***, string of mixed mills, equipment change, large temperature change, and wobbling or noticeable vibration when joint is turning.

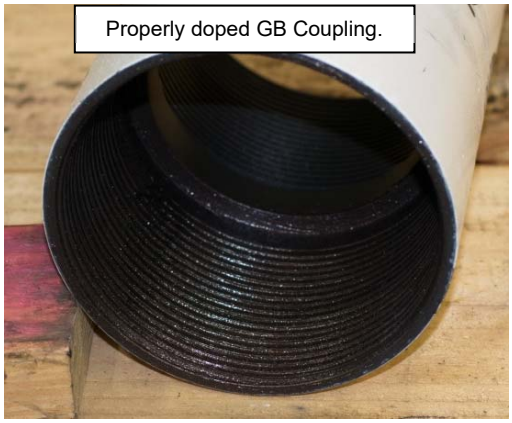
MU Torque. When making up the initial joints for establishing the ***Running Torque*** carefully watch the torque gauge for the ***Shoulder Torque*** and try to manually shut down the tongs before reaching ***Maximum MU Torque*** shown on the GB Connections Performance Property Sheets. Alternately, the dump valve should be set to 80% of the ***Maximum MU Torque*** during this initial process.

6. After the first 10 makeups (more if necessary due to conditions at the time of the run), use the ***"Running Torque"*** established in Step 5 for the remainder of the string. A dump valve is strongly recommended to stop makeup once the established ***Running Torque*** is achieved.
7. All connections made up with the established ***Running Torque*** should achieve shoulder engagement with the small amount of ***Delta Torque***. Carefully watch for the spike on the torque gauge during each make up to verify shoulder engagement. As a ***secondary*** verification, randomly check the makeup position relative to the API Triangle Stamp during the run. Proper power tight makeup position is achieved when the coupling covers the middle 1/3 of the API Triangle Stamp on the pin (see accompanying photo).
8. All connections should achieve shoulder engagement with at least 10% ***Delta Torque*** before the ***Maximum MU Torque*** is achieved.

COMMENTS, TROUBLESHOOTING

1. GB Connections are thread compound friendly. Thread compounds shall be handled, mixed, and applied in strict accordance with the manufacturer's instructions. **THREAD COMPOUND SHALL BE APPLIED TO BOTH PIN AND COUPLING THREADS AND OPPOSING PIN NOSE OR SHOULDER AREA OF EVERY CONNECTION**. Thread compound "transfer" between pin and coupling will not provide proper sealing mechanism for the connection to function properly. Sufficient thread compound has been applied when all threads (pin and coupling), pin nose, and coupling ID surfaces are completely covered **WITH NO GAPS OR BARE SPOTS**. The thread form should be discernible beneath the compound, i.e. when the thread valleys appear half full. Be generous with the thread compound; but avoid over-doping to the point where ***excessive*** amounts are squeezed out during assembly. Use of a mustache brush is the preferred method for applying and distributing thread compounds to GB Connections.


Properly doped pin.

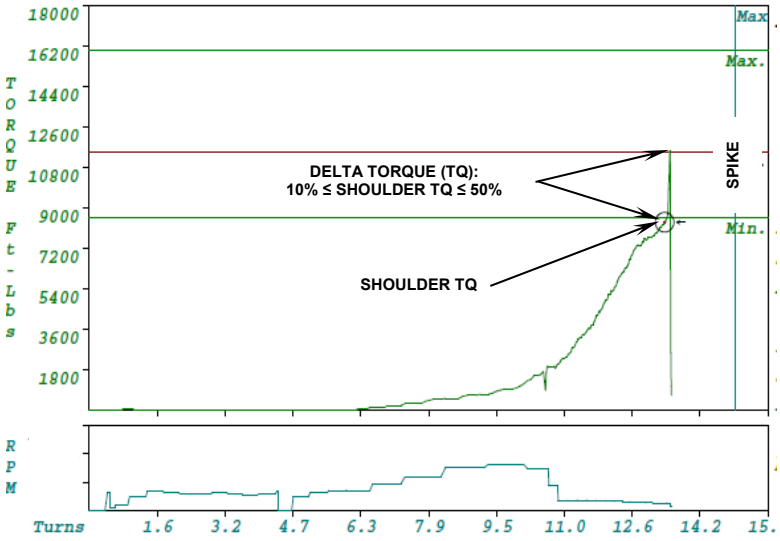

Properly doped GB Coupling.

2. If threads are cleaned on racks, new dope shall be applied in a light, even coat to both pin and coupling threads. See Comment No. 1 above for description of sufficient thread compound. Clean thread protectors shall be re-applied to freshly doped pin and coupling threads unless the casing run is imminent (no more than a few hours) to avoid contaminating exposed thread compound.
3. All connections should achieve shoulder engagement before reaching the "***Running Torque***" value determined by this procedure. Any connection that does not achieve shoulder engagement at the established "***Running Torque"*** value shall be visually inspected for position relative to the API Triangle Stamp.
   a) If the coupling is shy of the API Triangle Stamp Base, the connection shall be broken out, cleaned and inspected visually for thread damage, re-doped, and made-up again (or laid down if threads are damaged). Connections that have not achieved shoulder engagement **SHALL NEVER** be backed up a couple of turns and remade. They shall be completely broken out, cleaned and inspected as described above.

b) If the coupling covers the API Triangle base but does not land in approximately the middle third of the API Triangle Stamp, add additional torque to achieve shouldering and finish the makeup. Except to initiate additional turning, it is common to see high torque (possibly exceeding the ***Maximum MU Torque***) to initiate connection turning. This is acceptable as long as the torque drops off once movement starts and then spikes with shoulder engagement. If acceptable makeup doesn't occur with one additional torque application, the connection shall be broken out (as described in 3a above).

c) Any connection not properly assembled (i.e. not meeting the acceptance criteria) in two (2) attempts (provided threads pass a visual inspection each time) is reject and shall be laid down.

4. At the established ***Running Torque***, the connections will generally shoulder with ***Delta Torque*** between 10% and 50%. High interference connections will tend to have a higher ***Shoulder Torque*** and less ***Delta Torque*** (at least 10% of the ***Shoulder Torque*** is required). Low interference connections will tend to have lower ***Shoulder Torque*** and more ***Delta Torque***. In general, GB Connections makeup consistently but will vary due to any of the factors enumerated in the second paragraph of the Overview section of this procedure. However, wide variability on more than a few joints should be investigated for a root cause and, if necessary, a new ***Running Torque*** should be adjusted as described below.



If a connection appears to have shouldered but doesn't have at least 10% ***Delta Torque***, the position relative to the API Triangle Stamp should be checked. In just about every instance, the position will have covered the triangle base, so additional torque can be added to complete the makeup as discussed in 3.b) above. Expect an instantaneous spike with showing more than 50% ***Delta Torque*** with application of additional torque. Under this condition, this makeup is acceptable.

Similarly, random connections here and there with more than 50% ***Delta Torque*** is generally not cause for concern. However, if overshooting the 50% maximum ***Delta Torque*** target occurs frequently, then the established ***Running Torque*** value should be walked down in 500 ft-lbs. to 1,000 ft-lbs. increments until connection makeup routinely falls in line with the stated acceptance criteria.

5. ***Torque vs. Turn monitoring systems are recommended for field makeup of GB Connections.*** While Torque vs. Turn plots provide good information about makeup, they **SHALL NOT BE SUBSTITUTED FOR DIRECT VISUAL OBSERVATION OF THE CONNECTION DURING ASSEMBLY**. There is no second chance to watch field assembly of a connection. Torque vs. Turn plots can always be viewed for verification purposes once a makeup is finished. When available, torque vs. turn plots shall finish with a clearly defined spike as shown in the graphic to the right. The general character of torque vs. turn plots for good makeups will become evident after the first ten (10) makeups (again, more may be necessary due to rig and/or equipment-specific conditions). Any makeup that results in a plot that is "out-of-character"[2] when compared with most plots from previous good makeups should be checked carefully.

[2] An "out-of-character" plot may initiate with a high torque, show significantly steeper slope from the start of makeup, wide torque undulations as makeup progresses, no clearly defined spike, insufficient/inconsistent turns, etc.

When using Torque vs. Turn monitoring equipment, GB recommends setting a reference torque value of 500 ft-lbs. or 10% of the minimum makeup torque (whichever is lower) to help normalize the turns-to-power-tight variability in the Tq-Tn graphs. Setting a reference torque reduces field stab variability resulting in more consistency in the Tq-Tn data. Plot scales should be set so data spans at least 2/3 of the turns scale on each plot (15 turns will usually be sufficient at the start and can be reduced based on data from the first few joints). **UNDER NO CIRCUMSTANCE SHOULD MAKEUP BE STARTED UNTIL THE MONITORING SYSTEM IS READY TO RECORD DATA**.

6. Occasionally the mill side of a GB Connection may turn during field makeup. When observed, the makeup should continue without stopping per this procedure. It may be helpful to scribe a vertical line across the coupling-pipe interface to aid estimation of mill side turning if it is observed with some frequency. The amount of mill side turn should be carefully observed and estimated. If the mill side turns less than ½ turn and all other aspects of the makeup are good, the connection is acceptable. If the mill side turns more than ½ turn, trouble- shooting should be initiated. Pay particular attention to amount and distribution of thread compound, vertical alignment, weight of joint, hooked end on pipe, and other possible factors that may contribute to possible high torque during field makeup. Counting turns can help to estimate if coupling will need to be stopped to avoid over rotation. It should be noted that mill side turning during field makeup occurs occasionally and should not be concerning. Frequent or persistent mill side turning is a symptom that needs troubleshooting and appropriate corrective action.
7. A double wrap of the pick-up sling should be used when raising casing into the derrick when lifting subs, single joint, side-door, or slip elevators are not being used.
8. Higher torque may be required to achieve shoulder engagement when threadlock compounds are applied. User is advised to carefully follow the manufacturer's instructions with respect to mixing, application, temperature, and time. Torque ranges with threadlock compounds cannot be estimated due to many variables including but not limited to temperature, time, connection tolerances, and surface finish. In these cases, carefully monitor makeup to be sure shouldering occurs. The only exception to the shouldering requirement is with float equipment (float shoe and float collar) that will be assembled with a threadlocking compound. In this case, makeup to a position that covers the base of API Triangle Stamp is considered satisfactory.
9. Manual and automated dump valves can overshoot the established ***Running Torque*** due to several factors. Slightly overshooting the ***Running Torque*** is not cause for concern as long as the final "dump" torque is not excessive, and the equipment used is generally consistent joint-to-joint. Overshooting the ***Running Torque*** with a final makeup speed greater than 10 RPMs is risky and potentially harmful to the connection as discussed below.
10. Attached is a "Worksheet for determining GB Connections ***Running Torque*** at the beginning of a Casing Run" for use at the start of any casing run using GB Connections. GB recommends that this worksheet be filled out and maintained with the casing run records.

MAKEUP SPEED

To reiterate: Use of high gear at no more than 20 RPMs is permissible once proper starting thread engagement has occurred. **THE FINAL TWO (2) FULL TURNS, AT A MINIMUM, SHALL BE COMPLETED IN LOW GEAR AT LESS THAN 6 RPMS**. Be sure that the final 2 turns occur after the tong speed has slowed completely to less than 6 RPMs.

Making up connections at RPM exceeding those listed above may result in unsatisfactory connection performance downhole. Risks associated with excessive makeup RPMs are common for any connection with internal pin nose engagement. High speed makeup can:

1. Impart an unnecessary impulse load at nose contact. Certain materials are more susceptible to cracking under sudden or instantaneously applied loads.
2. Inhibit efficient movement of and trap thread compound under high pressure causing additional and unquantifiable high hoop stresses in the connection.

3. Result in significant overshoot of established dump torque value due to equipment latency between signal and equipment shut down resulting in higher but unknown actual final torque value. Excessive overshoot can result in pin nose yielding.

PROCEDURE SUMMARY

1. Remove coupling protectors after casing is set in V-Door and apply fresh thread compound to coupling threads.
2. Raise joint in derrick, remove pin protectors, and apply fresh thread compound to pin threads and pin nose.
3. Carefully stab pin into coupling and makeup to pin nose engagement. Try to stop makeup without exceeding the ***Maximum MU Torque*** (shown on GB Connections Performance Property Sheets). Carefully watch for and note the ***Shoulder Torque***.
4. Record ***Shoulder Torque*** and Final Torque values, and position relative to API Triangle Stamp for first ten (10) connections, more if necessary due to run/rig-specific conditions.
5. The ***Running Torque*** is (a) the ***Minimum MU Torque*** shown on the GB Connections Performance Property Sheet or (b) the maximum torque required for shoulder engagement + 10% ***Delta Torque*** determined from the first 10 makeups, ***whichever is higher***. Use the attached Worksheet to record this data and determine the ***Running Torque***.
6. Make up the rest of the string at the ***Running Torque*** determined in the previous step verifying each connection has shouldered with between 10% and 50% ***Delta Torque***. Small incremental adjustments to the established Running Torque (500 to 1,000 ft-lbs) are advised if delta torques routinely fall short of the 10% requirement or routinely exceed the 50% requirement.

NOTES:

- *This summary is provided for quick reference and is not a substitute for the comprehensive procedure provided above.*
- *Does not apply to threadlock connections.*

DO's and DONT's

1. **DO** check vertical alignment.
2. **DO** apply thread compound to all pin and coupling threads, pin nose and coupling shoulder area.
3. **DO** establish the ***Running Torque*** in accordance with GB Procedures.
4. **DO** make adjustments to ***Running Torque*** if indicated by inconsistent makeups during the casing run.
5. **DO** check every makeup for a clear indication of shouldering with a minimum ***Delta Torque*** ≥ 10% of the ***Shoulder Torque***.
6. **DO** reject any coupling that is not properly made up after two (2) attempts.
7. **DO** carefully stab pins into coupling (use a stabbing guide for casing smaller than 9 5/8" OD).
8. **DO** finish the makeup with at least two (2) full turns in low gear at 6 RPMs or less.
9. **DO** make up every connection continuously to pin nose engagement without stopping.

10. **DO** make note of anything that occurs with any connection makeup such as backup grips slipped, connection inspected and remade, etc.
11. **Do** check out every connection that appears out of character relative to the population. An example would be a connection that is completed with significantly fewer turns than most others. Check the triangle stamp and record position and take corrective action if needed.
12. **DO** add torque to any connection that appears to achieve pin nose engagement but not 10% delta torque.
13. **DO** adjust the ***Running Torque*** up or down in increments to achieve consistent ***Delta Torque*** between 10% and 50%.
14. **Do** make note of any anomaly during any connection makeup, such as backups slipped, mill side turned, etc.
15. **DO** minimize the weight on the connection, i.e. weight neutral, during break out as much as possible to minimize thread galling.
16. **DO NOT** over dope.
17. **DO NOT** exceed the ***Maximum MU Torque*** as shown on the GB Connections Performance Property Sheets during assembly.
18. **DO NOT** make up any misaligned connection.
19. **DO NOT** exceed 20 RPMs in high gear and 6 RPMs in low gear for the final two (2) full turns.
20. **DO NOT** remove pin thread protectors until pipe is hanging in the derrick.
21. **DO NOT** ever back a connection up a couple of turns and remake. Any connection requiring this type of attention **SHALL** be broken out completely, cleaned, visually inspected, and if OK, re-doped and remade.
22. **DO NOT** hesitate to contact GB Connections with questions before and during any casing run.

RECOMMENDED EQUIPMENT

- Stabbing Guide
- Mustache Brush
- Torque vs. Turn Monitoring Equipment or Dump Valve

Worksheet for determining GB Connection Running Torque at the beginning of a Casing Run

Ignore joints that are assembled with threadlock compounds. See "Addendum Procedure for GB Connections Assembled with Threadlocking Compounds" available at www.gbconnections.com.

Pertinent Excerpt from GB Running Procedure

5. Stab the pin carefully into the coupling of the joint hanging in the rotary table. A stabbing guide is recommended to protect the pin nose and leading thread from physical damage that may contribute to thread galling. Make up each connection until shoulder engagement plus Delta Torque. Record the Shoulder Torque observed for the first 10 joints (excluding threadlocked accessory joints). The Running Torque is (a) the Minimum MU Torque shown on the GB Connections Performance Property Sheets or (b) the Maximum Shoulder Torque recorded from the first 10 makeups + 10%, whichever is higher (rounded to the next highest 500 ft-lbs.) Delta Torque should be between 10% and 50% of the Shoulder Torque. Running Torque shall not exceed the Maximum MU Torque. When making up the initial joints for establishing the Running Torque carefully watch the torque gauge for the Shoulder Torque and try to manually shut down the tongs before reaching Maximum MU Torque shown on the GB Connections Performance Property Sheets. Alternately, the dump valve should be set to **80% of the Maximum MU Torque** during this initial process.

6. After the first 10 makeups (more if necessary due to conditions at the time of the run), use the "Running Torque" established in Step 5 for the remainder of the string. A dump valve is strongly recommended to stop makeup once the established Running Torque is achieved.

Casing Data		Comment
OD (in)		See GBC Performance Property Sheet
Weight (ppf)		See GBC Performance Property Sheet
Grade		See GBC Performance Property Sheet
Min MU Torque (ft-lbs)		See GBC Performance Property Sheet
Max MU Torque (ft-lbs)		See GBC Performance Property Sheet
Max Operating Torque (ft-lbs)		The Maximum Operating Torque is **NOT** the Maximum Makeup Torque and is **NOT** a sustainable rotating torque. Operating at the Maximum Operating Torque for any length of time will likely damage the connection.

Notes	Joint No.	Shoulder Torque (ft-lbs)	Final Torque (ft-lbs)	Triangle Stamp Position Sketch (△)
Required	1			
Required	2			
Required	3			
Required	4			
Required	5			
Required	6			
Required	7			
Required	8			
Required	9			
Required	10			
Optional	11			
Optional	12			
Optional	13			
Optional	14			
Optional	15			
Max. Shoulder Torque				
A Max. Shoulder Torque + 10%				
B Min. Makeup Torque (from GB Conn. Data Sheet)				
Running Torque (ft-lbs)		-	**A** or **B**, whichever is **greater**.	

Optional joints should be added if there is wide variability in shoulder torques recorded during the initial 10 joints. Judgement should be used to determine if more than 10 joints are needed for the purpose of establishing the Running Torque and, if so, how many more should be added.

Wide variations in Shoulder Torque during the first ten (10) joints suggest other issues requiring attention such as poor alignment, improper amount and distribution of thread compound, etc. Refer to 2nd paragraph of GB Running Procedure for possible contributing factors to aid troubleshooting.

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Casing Design Criteria and Load Case Assumptions

1. Collapse: DF_C=1.125
   a. Full Internal Evacuation: Collapse force equal to the mud gradient in which the casing will be run (0.65 psi/ft). The effects of axial load on collapse will be considered.
   b. Cementing: Collapse force equal to the gradient of planned cement slurries to planned depths and minimum mud gradient in which the casing will be run above that (0.65 psi/ft) and an internal force equal to mud gradient of displacement fluid (0.43 psi/ft)
2. Burst: DF_B=1.125
   a. Pressure Test: psi casing test with an external force equal to the mud gradient in which the casing will be run (0.65 psi/ft), which is a more conservative backup force than pore pressure.
   b. Injection Down Casing: psi surface injection pressure plus an internal pressure gradient of 0.65 psi/ft with an external force equal to the mud gradient in which the casing will be run (0.65 psi/ft), which is a more conservative backup force than pore pressure.
3. Tensile: DF_T=1.4
   a. Overpull: An overpull force of 100,000 lbs is applied at the shoe along with the weight of the casing string utilizing the effects of buoyancy (8.5 ppg).

Surface Casing Program									
Casing Size (in)	**Weight (ppf)**	**Grade**	**Connection**	**ID**	**ID (drift)**	**Collapse (psi)**	**Burst (psi)**	**Tension (1,000 lbs)**	**Capacity (bbl/ft)**
13-3/8”	54.5	J-55	BTC	12.615	12.459	1,130	2,740	909	0.1545
Safety Factors									
	API Rec. SF	**ACTUAL SF**	Case		External Fluids		Internal Fluids		
Collapse	1.125	**3.30**	Lost Circulation		Mud		*None*		
Burst	1.125	**1.46**	Plug Bump		Green Cement + 2ksi surf pressure		Displacement Fluid/Mud		
Tension	1.4	**2.8**	100 klbs Overpull		Mud		Mud		

Buoyed Casing Weight: ***23,755 lbs (assuming 8.4 ppg fluid and 500’ casing-worst case scenario)***

Intermediate Casing Program									
Casing Size (in)	**Weight (ppf)**	**Grade**	**Connection**	**ID**	**ID (drift)**	**Collapse (psi)**	**Burst (psi)**	**Tension (1,000 lbs)**	**Capacity (bbl/ft)**
9-5/8”	36	J-55	BTC	8.921	8.765	2,020	3,520	639	0.0773
Safety Factors									
	API Rec. SF	**ACTUAL SF**	Case		External Fluids		Internal Fluids		
Collapse	1.125	**3.30**	Lost Circulation		Mud		*None*		
Burst	1.125	**1.46**	Plug Bump		Green Cement + 2ksi surf pressure		Displacement Fluid/Mud		
Tension	1.4	**2.8**	100 klbs Overpull		Mud		Mud		

Buoyed Casing Weight: ***40,798 lbs (assuming 8.4 ppg fluid and 1,300’ casing-worst case scenario)***

Production Casing Program									
Casing Size (in)	**Weight (ppf)**	**Grade**	**Connection**	**ID**	**ID (drift)**	**Collapse (psi)**	**Burst (psi)**	**Tension (1,000 lbs)**	**Capacity (bbl/ft)**
7”	32	L-80	GBCD	6.094	5.969	10,400	9,060	745	0.0361

Safety Factors					
	API Rec. SF	**ACTUAL SF**	Case	External Fluids	Internal Fluids
Collapse	1.125	**3.75**	Lost Circulation	Mud	*None*
Burst	1.125	**2.47**	Plug Bump	Green Cement + 2ksi surf pressure	Displacement Fluid/Mud
Tension	1.4	**2.29**	100 klbs Overpull	Mud	Mud

Buoyed Casing Weight: ***90,662 lbs (assuming 8.4 ppg fluid and 3,250’ TVD-worst case scenario)***

Production Casing Program									
Casing Size (in)	**Weight (ppf)**	**Grade**	**Connection**	**ID**	**ID (drift)**	**Collapse (psi)**	**Burst (psi)**	**Tension (1,000 lbs)**	**Capacity (bbl/ft)**
5-1/2”	20	L-80	GBCD	4.778	4.653	10,630	9,190	466	0.0222

Safety Factors					
	API Rec. SF	**ACTUAL SF**	Case	External Fluids	Internal Fluids
Collapse	1.125	**3.75**	Lost Circulation	Mud	*None*
Burst	1.125	**2.47**	Plug Bump	Green Cement + 2ksi surf pressure	Displacement Fluid/Mud
Tension	1.4	**2.29**	100 klbs Overpull	Mud	Mud

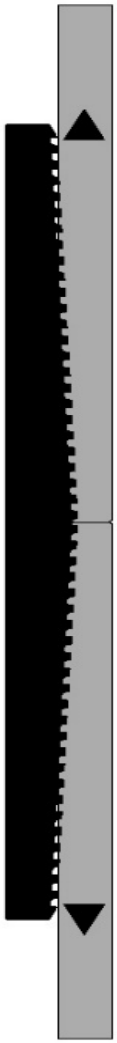
Buoyed Casing Weight: ***56,664 lbs (assuming 8.4 ppg fluid and 3,250’ TVD-worst case scenario)***

GB connections
Engineering the Right Connections

GB Connection Performance Properties Sheet

Rev. 2 (07/11/2017)

ENGINEERING THE RIGHT CONNECTIONS



Casing: 7 OD, 32 ppf
Casing Grade: L-80

Connection: GB CD Butt 7.875
Coupling Grade: API L-80

PIPE BODY GEOMETRY					
Nominal OD (in.)	7	Wall Thickness (in.)	0.453	Drift Diameter (in.)	5.969
Nominal Weight (ppf)	32.00	Nominal ID (in.)	6.094	API Alternate Drift Dia. (in.)	6.000
Plain End Weight (ppf)	31.70	Plain End Area (in.^{2})	9.317		

PIPE BODY PERFORMANCE					
Material Specification	L-80	Min. Yield Str. (psi)	80,000	Min. Ultimate Str. (psi)	95,000
Collapse		**Tension**		**Pressure**	
API (psi)	8,600	Pl. End Yield Str. (kips)	745	Min. Int. Yield Press. (psi)	9,060
High Collapse (psi)	10,400	**Torque**		**Bending**	
		Yield Torque (ft-lbs)	110,320	Build Rate to Yield (°/100 ft)	52.4

GB CD Butt 7.875 COUPLING GEOMETRY			
Coupling OD (in.)	7.875	Makeup Loss (in.)	4.6250
Coupling Length (in.)	9.250	Critical Cross-Sect. (in.^{2})	11.894

GB CD Butt 7.875 CONNECTION PERFORMANCE RATINGS/EFFICIENCIES					
Material Specification	API L-80	Min. Yield Str. (psi)	80,000	Min. Ultimate Str. (psi)	95,000
Tension		**Efficiency**		**Bending**	
Thread Str. (kips)	791	Internal Pressure (%)	100%	Build Rate to Yield (°/100 ft)	46.6
Min. Tension Yield (kips)	904	External Pressure (%)	100%	**Yield Torque**	
Min. Tension Ult. (kips)	1,073	Tension (%)	100%	Yield Torque (ft-lbs)	49,870
Joint Str. (kips)	791	Compression (%)	100%		
		Ratio of Areas (Cplg/Pipe)	1.28		

MAKEUP TORQUE					
Min. MU Tq. (ft-lbs)	10,000	Max. MU Tq. (ft-lbs)	20,000	Running Tq. (ft-lbs)	See GBT RP
				Max. Operating Tq. (ft-lbs)*	47,380

Units: US Customary (lbm, in., °F, lbf)
1 kip = 1,000 lbs
* See Running Procedure for description and limitations.
See attached: Notes for GB Connection Performance Properties.
GBC Running Procedure (GBC RP): www.gbconnections.com/pdf/RP-GB-DWC-Connections.pdf
Blanking Dimensions: www.gbconnections.com/pdf/GB-DWC-Blanking-Dimensions.pdf
Connection yield torque rating based on physical testing or extrapolation therefrom

GB connections
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Notes for GB Connections Performance Properties

Rev. 1 (May, 2018)

ENGINEERING THE RIGHT CONNECTIONS™

1. All dimensions shown are nominal. Plain end weight is calculated in accordance with API TR 5C3. Performance properties are empirical, based on nominal dimensions, minimum material yield and ultimate strengths, and calculated in general accordance with industry standard formula(s) assuming uniaxial loading. All properties are calculated on the basis of materials at room temperature. NOTE: Material properties change with temperature.
2. Joint strength is the lesser of pipe thread strength and minimum coupling tension as calculated in accordance with API TR 5C3. Tensile efficiency is calculated using coupling strength based on ultimate material strength per API TR 5C3 divided by plain end yield strength of the casing. Minimum Coupling Tension based on material *yield* strength is provided *for information only*. Performance values presented for tension do not account for failure by pull-out (which can occur with heavy wall casing), effects of internal and external pressure, thermally induced axial loads, casing curvature (bending), and/or other static and dynamic loads that may occur singularly or in combination during downhole deployment and with subsequent well operations.
3. Drift diameters are based on Standard and Alternate drift sizes per API 5CT. Drift diameters are not specified for API 5L pipe. Drift diameters shown on GB Connection Performance Property Sheets represent the diameter of the drift mandrel used for end-drifting after coupling buck on. When shown, the alternate drift diameter is used for end drifting. Drift testing is performed in accordance with currently applicable API Specifications.
4. Minimum Internal Yield Pressure Performance values for Casing (API 5CT), Line Pipe (API 5L), and mill casing proprietary grades are based on API TR 5C3 formulas and assume 87.5% minimum wall thicknesses. Minimum Internal Yield Pressure efficiency for GB Connections is the lesser of the Minimum Internal Yield Pressure of the coupling and Leak Resistance divided by pipe body Minimum Internal Yield Pressure (all based on API TR 5C3 formulas). GB Connections typically demonstrate pressure resistance exceeding the mating pipe body unless otherwise noted with a pressure efficiency < 100%. Pressure efficiency can only be achieved when connections are properly assembled in strict accordance with GB Connections' Running Procedures (www.gbconnections.com/pdf/RP-GB-DWC-Connections.pdf.
5. Compression efficiency of the Casing/Connection combinations does not consider the axial load that causes pipe body buckling. The compressive load that causes buckling is usually less than the pipe body compressive yield strength and is dependent on a number of factors including, but not limited to, string length (or slenderness ratio; L/D), thermally induced axial loads, and annular clearance that may (or may not) lend side support to the casing string.
6. Bending values assume a constant radius of curvature where the casing is in uniformly intimate contact with the wall of the wellbore (i.e. when the upset at the coupling OD is small compared with wellbore wall irregularities). When the radius of curvature is not constant due to large wellbore wall irregularities, varying trajectory, micro doglegs, wash-outs, rock ledges, and other downhole conditions, unpredictable excessive bending stresses can occur that may be detrimental to casing and connection performance.
7. Fatigue failures are a function of material properties, stress range, and number of stress reversal cycles. API 5CT, API 5L, and mill proprietary casing/coupling materials have a finite fatigue life. Higher stress ranges yield lower fatigue life. So as a general rule of thumb, casing should never be rotated at higher RPMs than needed for task accomplishment. For the same stress range, casing rotated at 25 RPMs will generally last 4 times longer (more rotating hours) than casing rotated at 100 RPMs. However with fatigue, there are opportunities for unexpected higher stress reversal levels associated with vibration, thermally induced axial loads, and bending (see above) in addition to all other stress reversals imparted during running, rotating, reciprocating, pressure testing, pumping, etc. The extent and quality of the cement job is also a factor. Under aggressive, high-volume, multi-stage hydraulic fracturing operations, the casing string (including the connections) is severely taxed such that local stress range(s) and actual number of applied cycles cannot be precisely determined without full string instrumentation.
8. External pressure efficiency (expressed in percent) is the ratio of the lesser of Minimum Internal Yield Pressure and Leak Resistance for coupling (calculated per API TR 5C3) divided by the API collapse rating of the casing. External pressure efficiency has not been verified by testing and does not consider other applied loads. External pressure efficiency does not account for any high collapse rating that may be shown on GB Connection Performance Property Sheets.
9. Maximum Makeup Torque is provided for guidance only. This value is not the same as the Connection Yield Torque shown. Connection Yield Torque is the lesser of yield torque rating for the critical cross-section of pipe body, connector body, and pin nose and the threadform load flank bearing area. Connection Yield Torque does not consider radial buckling of the pipe or connection due to excessive jaw pressure during torque application. Torque in connections can increase or decrease over that applied at makeup (connection tightening/loosening) with rotating and stimulation operations due to slip-stick, shock loads, bending, tight spots, vibration(s), temperature, and other downhole factors that may occur individually or in combination. Due to circumstances beyond the control of GB Connections, User accepts all risks associated with casing and connection related issues that occur during and after rotating operations.
10. **Every** GB Connection requires the proper amount and distribution of thread compound to all pin and coupling threads and careful field make up in strict accordance with GB Connections' Running Procedures to provide expected levels of performance in service.
11. Reactions among water, drilling muds and other fluids, and chemicals introduced by User with downhole formation fluids may result in an environment detrimental to casing and connection performance. User should carefully consider all aspects of the string design including material compatibility with respect to possible corrosion, sour conditions, and other factors that may result in unexpected casing and/or connection failure at or below published ratings.
12. Performance Properties are subject to change without notice. User is advised to obtain the current GB Connection Performance Property Sheet for each application. Please visit **www.gbconnections.com** to download.

Limitations

Data presented in GB Performance Property Sheets and Running Procedures ("GB Information") is provided for informational purposes only and intended to be supplemented by the professional judgment of qualified personnel during design, field handling, deployment, and all subsequent well operations. The use of GB Information is at the User's sole risk.

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GB connections Engineering the Right Connections	**Running Procedure for Casing with GB *Drilling with Casing* Connections**	October 29, 2007
		Rev. 14 (04/09/2020)

OVERVIEW

This field running procedure applies to makeup of **GB *Drilling with Casing*** (GB DwC) Connections which include GB CD, GB CDE, GB RDB, GB EHTQ, and GB RDB WS Connections with GB Butt (Buttress), GB 4P, and GB 3P thread forms. All GBC Connections are suitable for ***Running*** (standard casing applications), ***Rotating*** (to aid string advancement), ***Drilling*** (Drilling with Casing/Drilling with Liners) and ***Driving***. This procedure also applies to the legacy GB Connections known as GB Butt and GB 3P.

Numerous factors impact the makeup torque of Buttress (GB Butt) and Modified Buttress Threads (such as GB 4P and GB 3P). Some of these factors include but are not limited to: allowable threading tolerances, joint characteristics (OD, straightness, hooked ends, and weight), vertical alignment (derrick, top drive, and elevator alignment relative to rotary table), thread compound (type, amount, and distribution), snub line (location and orientation), distance between tongs and backups, temperature/weather, equipment type, efficiencies (electrical, hydraulic and mechanical), grips/dies (type, condition, orientation, location, contact area, and grip distribution), measurement equipment, gauge calibration, personnel, etc. The nature of these types of connections makes it impossible to provide makeup torque values that will yield proper power tight makeup on every rig under all circumstances with the wide variety of existing connection makeup equipment.

This procedure has been designed to determine the ***Running Torque*** required for proper power tight makeup of GB Connections under the circumstances and with the actual equipment, set up conditions, weather, etc. that exist at the time of running. With proper execution of this procedure, GB Connections will be properly and consistently assembled.

LIMITATIONS

This GBC Running Procedure provides the basic recommended practices and is intended to be supplemented by the professional judgment of qualified personnel based on observation of actual makeups throughout the casing run. GB DwC Connections require the proper amount and distribution of thread compound to **all pin and coupling threads** and careful field makeup in strict accordance with GB Connections' Running Procedures to provide expected levels of performance in service.

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DEFINITIONS

1. Minimum Makeup (MU) Torque: Connections must have at least this amount of torque applied and clearly exhibit shoulder engagement.
2. Shoulder Torque: MU torque required to achieve shoulder engagement.
3. Running Torque: Developed at start of casing run per GBC Running Procedure and once established, used for the rest of the joints in the string, using data established with progression of the casing run. The ***Running Torque*** may be adjusted during the casing run as needed to stay within parameters defined here. The ***Running Torque*** will likely vary with each job due to the factors listed in the Overview section.
4. Delta Torque: Difference between ***Shoulder Torque*** and final makeup (or dump) torque.

5. Maximum Makeup (MU) Torque: Final assembly torque including shoulder engagement shall not exceed the ***Maximum MU Torque*** shown on size, weight, and grade-specific GB Performance Property Sheets at the beginning of a casing run when establishing the ***Running Torque***. In the unlikely event that ***Running Torque*** determined by the procedure meets or exceeds the ***Maximum MU Torque***, call GB Connections for assistance.
6. Yield Torque: Torque that causes yielding in the connection (usually yielding of the pin nose). ***Yield Torque*** rating does **NOT** consider the torque that may radially buckle the pipe body at the grip points. ***Yield Torque*** values for the pipe body and connection are based on nominal dimensions and minimum material yield strength.
7. Maximum Operating Torque: The ***Maximum Operating Torque*** shown on the GB Connections Performance Property Sheets includes a 5% safety factor on ***Yield Torque***. As such, it represents the ***limiting torque spike*** that can be applied to the connection during rotating operations. The ***Maximum Operating Torque*** is **NOT** the ***Maximum MU Torque*** and is **NOT** a sustainable rotating torque. Operating at the ***Maximum Operating Torque*** for any length of time may damage connections due to likely random, unexpected torque spikes that occur during rotating operations. USER should carefully consider this value to determine if a higher Safety Factor on ***Yield Torque*** is more suitable for the project-specific application.

   As a general rule of thumb, rotating RPMs and Torque should be *"walked up"* to determine the minimum needed for task accomplishment. Additional information on best practices for rotating casing can be found at http://www.gbconnections.com/pdf/White-Paper-Rotating-Casing.pdf.

KEY INFORMATION

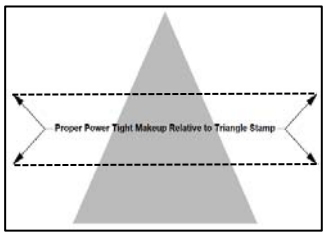
Thread Compound: Best-O-Life 2000, Best-O-Life 2000 Arctic Grade (AG), API Modified, API Modified Hi-Pressure, or any industry recognized equivalent to these products. Thread compound may also be referred to as "dope". User should avoid products that include Metal Free (MF) in the product name. Tool joint compounds are **expressly forbidden** for makeup of any GBC Connections. Thread compound shall be applied to all pin and box threads as described here.

Torque Values: ***Minimum and Maximum MU Torque*** values are provided on individual GB Connections Performance Property Sheets available at the following link: http://www.gbconnectionss.com/connection_selector.php.

Continuous Makeup: Makeup of GB Connections **SHALL START AND CONTINUE WITHOUT STOPPING** until full power tight makeup is achieved.

Makeup Speed: Use of high gear at no more than 20 RPMs is permissible once proper starting thread engagement has occurred. **THE FINAL TWO (2) TURNS, AT A MINIMUM, SHALL BE COMPLETED IN LOW GEAR AT LESS THAN 6 RPMS**.

Pin Nose Engagement: Pin nose engagement is indicated by a spike on an analog torque gauge or a sharp vertical spike on a torque vs. turn plot. As a secondary check, proper power tight makeup is achieved when the coupling covers approximately the **middle third of the API Triangle Stamp** on the pin (see graphic). The triangle will be stamped on the pin member as indicated by a white locator stripe.

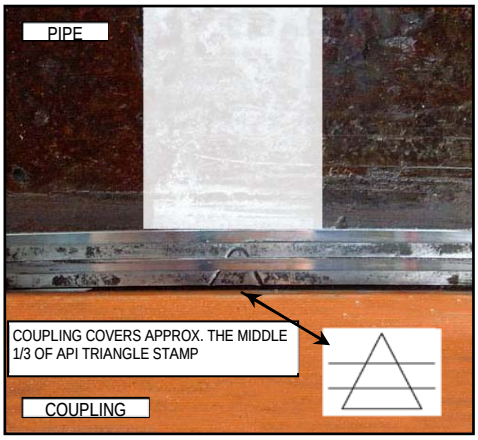


Acceptance Criteria: All GB Connections must exhibit shoulder engagement (achieve pin-to-pin or pin-to-shoulder engagement) with a: (1) ***Delta Torque*** ranging between 10% and 50% of majority of the

Shoulder Torque and (2) final torque not exceeding the ***Running Torque*** as established in this procedure. Outlier joints that require additional attention would be an exception to ***Maximum MU Torque*** limit as discussed under Comments, Troubleshooting.

It is imperative that the following procedure be executed carefully at the beginning of every casing run to determine the ***Running Torque*** (torque to be used for the rest of the string). Torque values established on an individual casing run are never transferrable to other runs.

The ***Running Torque*** is determined while running the first 10 joints after joints assembled with threadlocking compounds are made up. Sometimes more than the first 10 joints will be needed to establish the ***Running Torque*** due to erratic results and/or other run-specific conditions. The ***Running Torque*** may have to be re-established or adjusted during the casing run under certain conditions[1] and observations. Use the size-specific GBC Connections Performance Property Sheets (http://www.gbconnections.com/connection_selector.php) for physical properties for the ***Minimum*** and ***Maximum MU Torque*** values.



Connections shall be made up until shoulder engagement with ***Delta Torque*** between 10% and 50% of the ***Shoulder Torque*** (not to exceed the ***Maximum MU Torque***, see procedure below) using the ***Running Torque*** value established in this procedure. The ***Maximum MU Torque*** at the beginning of the casing run for establishing the ***Running Torque*** shall be limited to the value shown on the applicable GBC Connections Performance Property Sheet. The ***Running Torque*** shall be used thereafter and throughout the run as the limiting makeup torque value. The ***Maximum MU Torque*** on the GBC Performance Property Sheet value is given as a practical limit for avoidance of thread galling, connection damage, and possible tube damage due to excessive jaw pressure that can occur with application of extreme makeup torque. Contact GB Connections if more than the ***Maximum MU Torque*** value is required for shoulder engagement and/or final makeup, or if torque exceeding the ***Maximum Operating Torque*** value is required for the intended service.

PROCEDURE FOR ESTABLISHING ***RUNNING TORQUE***

1. Remove coupling thread protectors only after casing is set in V-Door.
2. ***Always apply fresh thread compound to coupling threads and internal shoulder (where applicable).*** See Comment No. 1 (below) for discussion on proper amount of thread compound.
3. Remove pin thread protectors only after joint is raised in the derrick. Visually inspect pin threads for sufficient thread compound as described in Comment No. 1; ***add fresh compound to pin threads and pin nose***.
4. Fresh thread compound should **NEVER** be added on top of dope contaminated with dust, dirt, and/or debris. Threads observed to have contaminated thread compound shall be thoroughly cleaned and dried before applying fresh thread compound.
5. Stab the pin carefully into the coupling of the joint hanging in the rotary table. A stabbing guide is recommended to protect the pin nose and leading thread from physical damage that may contribute to thread galling. Make up each connection until shoulder engagement plus ***Delta Torque***. Record the ***Shoulder Torque*** observed for the first 10 joints (excluding threadlocked accessory joints). The ***Running Torque*** is (a) the ***Minimum MU Torque*** shown on the GB Connections Performance Property Sheets ***or*** (b) the Maximum ***Shoulder Torque*** recorded from the first 10 makeups + 10%, ***whichever is higher*** (rounded to the next highest 500 ft-lbs.) ***Delta Torque*** should be between 10% and 50% of the ***Shoulder Torque. Running Torque*** shall not exceed the ***Maximum***

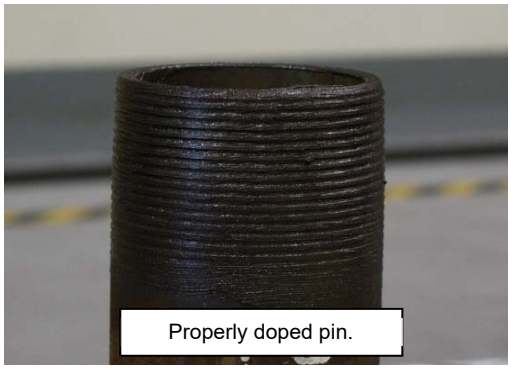
[1] Examples include but are not limited to more than an occasional low or high ***Delta Torque***, string of mixed mills, equipment change, large temperature change, and wobbling or noticeable vibration when joint is turning.

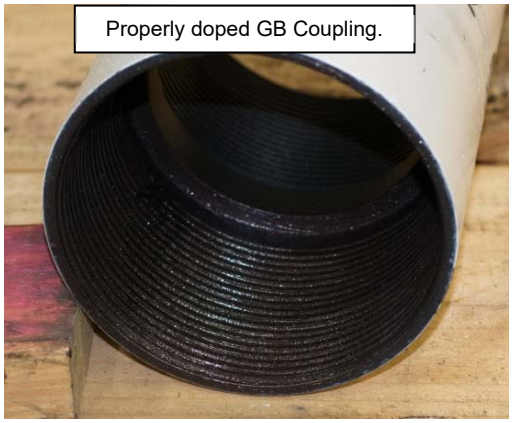
MU Torque. When making up the initial joints for establishing the ***Running Torque*** carefully watch the torque gauge for the ***Shoulder Torque*** and try to manually shut down the tongs before reaching ***Maximum MU Torque*** shown on the GB Connections Performance Property Sheets. Alternately, the dump valve should be set to 80% of the ***Maximum MU Torque*** during this initial process.

6. After the first 10 makeups (more if necessary due to conditions at the time of the run), use the ***"Running Torque"*** established in Step 5 for the remainder of the string. A dump valve is strongly recommended to stop makeup once the established ***Running Torque*** is achieved.
7. All connections made up with the established ***Running Torque*** should achieve shoulder engagement with the small amount of ***Delta Torque***. Carefully watch for the spike on the torque gauge during each make up to verify shoulder engagement. As a ***secondary*** verification, randomly check the makeup position relative to the API Triangle Stamp during the run. Proper power tight makeup position is achieved when the coupling covers the middle 1/3 of the API Triangle Stamp on the pin (see accompanying photo).
8. All connections should achieve shoulder engagement with at least 10% ***Delta Torque*** before the ***Maximum MU Torque*** is achieved.

COMMENTS, TROUBLESHOOTING

1. GB Connections are thread compound friendly. Thread compounds shall be handled, mixed, and applied in strict accordance with the manufacturer's instructions. **THREAD COMPOUND SHALL BE APPLIED TO BOTH PIN AND COUPLING THREADS AND OPPOSING PIN NOSE OR SHOULDER AREA OF EVERY CONNECTION**. Thread compound "transfer" between pin and coupling will not provide proper sealing mechanism for the connection to function properly. Sufficient thread compound has been applied when all threads (pin and coupling), pin nose, and coupling ID surfaces are completely covered **WITH NO GAPS OR BARE SPOTS**. The thread form should be discernible beneath the compound, i.e. when the thread valleys appear half full. Be generous with the thread compound; but avoid over-doping to the point where ***excessive*** amounts are squeezed out during assembly. Use of a mustache brush is the preferred method for applying and distributing thread compounds to GB Connections.


Properly doped pin.

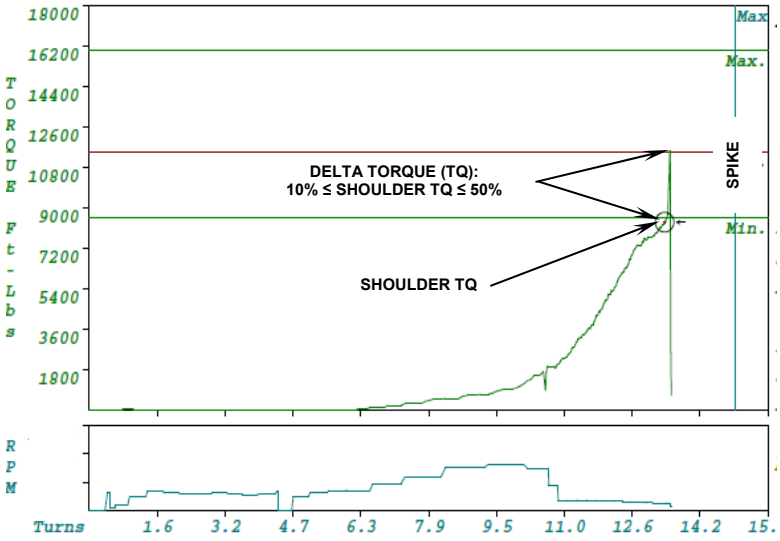

Properly doped GB Coupling.

2. If threads are cleaned on racks, new dope shall be applied in a light, even coat to both pin and coupling threads. See Comment No. 1 above for description of sufficient thread compound. Clean thread protectors shall be re-applied to freshly doped pin and coupling threads unless the casing run is imminent (no more than a few hours) to avoid contaminating exposed thread compound.
3. All connections should achieve shoulder engagement before reaching the "***Running Torque***" value determined by this procedure. Any connection that does not achieve shoulder engagement at the established "***Running Torque"*** value shall be visually inspected for position relative to the API Triangle Stamp.
   a) If the coupling is shy of the API Triangle Stamp Base, the connection shall be broken out, cleaned and inspected visually for thread damage, re-doped, and made-up again (or laid down if threads are damaged). Connections that have not achieved shoulder engagement **SHALL NEVER** be backed up a couple of turns and remade. They shall be completely broken out, cleaned and inspected as described above.

b) If the coupling covers the API Triangle base but does not land in approximately the middle third of the API Triangle Stamp, add additional torque to achieve shouldering and finish the makeup. Except to initiate additional turning, it is common to see high torque (possibly exceeding the ***Maximum MU Torque***) to initiate connection turning. This is acceptable as long as the torque drops off once movement starts and then spikes with shoulder engagement. If acceptable makeup doesn't occur with one additional torque application, the connection shall be broken out (as described in 3a above).

c) Any connection not properly assembled (i.e. not meeting the acceptance criteria) in two (2) attempts (provided threads pass a visual inspection each time) is reject and shall be laid down.

4. At the established ***Running Torque***, the connections will generally shoulder with ***Delta Torque*** between 10% and 50%. High interference connections will tend to have a higher ***Shoulder Torque*** and less ***Delta Torque*** (at least 10% of the ***Shoulder Torque*** is required). Low interference connections will tend to have lower ***Shoulder Torque*** and more ***Delta Torque***. In general, GB Connections makeup consistently but will vary due to any of the factors enumerated in the second paragraph of the Overview section of this procedure. However, wide variability on more than a few joints should be investigated for a root cause and, if necessary, a new ***Running Torque*** should be adjusted as described below.



If a connection appears to have shouldered but doesn't have at least 10% ***Delta Torque***, the position relative to the API Triangle Stamp should be checked. In just about every instance, the position will have covered the triangle base, so additional torque can be added to complete the makeup as discussed in 3.b) above. Expect an instantaneous spike with showing more than 50% ***Delta Torque*** with application of additional torque. Under this condition, this makeup is acceptable.

Similarly, random connections here and there with more than 50% ***Delta Torque*** is generally not cause for concern. However, if overshooting the 50% maximum ***Delta Torque*** target occurs frequently, then the established ***Running Torque*** value should be walked down in 500 ft-lbs. to 1,000 ft-lbs. increments until connection makeup routinely falls in line with the stated acceptance criteria.

5. ***Torque vs. Turn monitoring systems are recommended for field makeup of GB Connections.*** While Torque vs. Turn plots provide good information about makeup, they **SHALL NOT BE SUBSTITUTED FOR DIRECT VISUAL OBSERVATION OF THE CONNECTION DURING ASSEMBLY**. There is no second chance to watch field assembly of a connection. Torque vs. Turn plots can always be viewed for verification purposes once a makeup is finished. When available, torque vs. turn plots shall finish with a clearly defined spike as shown in the graphic to the right. The general character of torque vs. turn plots for good makeups will become evident after the first ten (10) makeups (again, more may be necessary due to rig and/or equipment-specific conditions). Any makeup that results in a plot that is "out-of-character"[2] when compared with most plots from previous good makeups should be checked carefully.

[2] An "out-of-character" plot may initiate with a high torque, show significantly steeper slope from the start of makeup, wide torque undulations as makeup progresses, no clearly defined spike, insufficient/inconsistent turns, etc.

When using Torque vs. Turn monitoring equipment, GB recommends setting a reference torque value of 500 ft-lbs. or 10% of the minimum makeup torque (whichever is lower) to help normalize the turns-to-power-tight variability in the Tq-Tn graphs. Setting a reference torque reduces field stab variability resulting in more consistency in the Tq-Tn data. Plot scales should be set so data spans at least 2/3 of the turns scale on each plot (15 turns will usually be sufficient at the start and can be reduced based on data from the first few joints). **UNDER NO CIRCUMSTANCE SHOULD MAKEUP BE STARTED UNTIL THE MONITORING SYSTEM IS READY TO RECORD DATA**.

6. Occasionally the mill side of a GB Connection may turn during field makeup. When observed, the makeup should continue without stopping per this procedure. It may be helpful to scribe a vertical line across the coupling-pipe interface to aid estimation of mill side turning if it is observed with some frequency. The amount of mill side turn should be carefully observed and estimated. If the mill side turns less than ½ turn and all other aspects of the makeup are good, the connection is acceptable. If the mill side turns more than ½ turn, trouble- shooting should be initiated. Pay particular attention to amount and distribution of thread compound, vertical alignment, weight of joint, hooked end on pipe, and other possible factors that may contribute to possible high torque during field makeup. Counting turns can help to estimate if coupling will need to be stopped to avoid over rotation. It should be noted that mill side turning during field makeup occurs occasionally and should not be concerning. Frequent or persistent mill side turning is a symptom that needs troubleshooting and appropriate corrective action.
7. A double wrap of the pick-up sling should be used when raising casing into the derrick when lifting subs, single joint, side-door, or slip elevators are not being used.
8. Higher torque may be required to achieve shoulder engagement when threadlock compounds are applied. User is advised to carefully follow the manufacturer's instructions with respect to mixing, application, temperature, and time. Torque ranges with threadlock compounds cannot be estimated due to many variables including but not limited to temperature, time, connection tolerances, and surface finish. In these cases, carefully monitor makeup to be sure shouldering occurs. The only exception to the shouldering requirement is with float equipment (float shoe and float collar) that will be assembled with a threadlocking compound. In this case, makeup to a position that covers the base of API Triangle Stamp is considered satisfactory.
9. Manual and automated dump valves can overshoot the established ***Running Torque*** due to several factors. Slightly overshooting the ***Running Torque*** is not cause for concern as long as the final "dump" torque is not excessive, and the equipment used is generally consistent joint-to-joint. Overshooting the ***Running Torque*** with a final makeup speed greater than 10 RPMs is risky and potentially harmful to the connection as discussed below.
10. Attached is a "Worksheet for determining GB Connections ***Running Torque*** at the beginning of a Casing Run" for use at the start of any casing run using GB Connections. GB recommends that this worksheet be filled out and maintained with the casing run records.

MAKEUP SPEED

To reiterate: Use of high gear at no more than 20 RPMs is permissible once proper starting thread engagement has occurred. **THE FINAL TWO (2) FULL TURNS, AT A MINIMUM, SHALL BE COMPLETED IN LOW GEAR AT LESS THAN 6 RPMS**. Be sure that the final 2 turns occur after the tong speed has slowed completely to less than 6 RPMs.

Making up connections at RPM exceeding those listed above may result in unsatisfactory connection performance downhole. Risks associated with excessive makeup RPMs are common for any connection with internal pin nose engagement. High speed makeup can:

1. Impart an unnecessary impulse load at nose contact. Certain materials are more susceptible to cracking under sudden or instantaneously applied loads.
2. Inhibit efficient movement of and trap thread compound under high pressure causing additional and unquantifiable high hoop stresses in the connection.

3. Result in significant overshoot of established dump torque value due to equipment latency between signal and equipment shut down resulting in higher but unknown actual final torque value. Excessive overshoot can result in pin nose yielding.

PROCEDURE SUMMARY

1. Remove coupling protectors after casing is set in V-Door and apply fresh thread compound to coupling threads.
2. Raise joint in derrick, remove pin protectors, and apply fresh thread compound to pin threads and pin nose.
3. Carefully stab pin into coupling and makeup to pin nose engagement. Try to stop makeup without exceeding the ***Maximum MU Torque*** (shown on GB Connections Performance Property Sheets). Carefully watch for and note the ***Shoulder Torque***.
4. Record ***Shoulder Torque*** and Final Torque values, and position relative to API Triangle Stamp for first ten (10) connections, more if necessary due to run/rig-specific conditions.
5. The ***Running Torque*** is (a) the ***Minimum MU Torque*** shown on the GB Connections Performance Property Sheet or (b) the maximum torque required for shoulder engagement + 10% ***Delta Torque*** determined from the first 10 makeups, ***whichever is higher***. Use the attached Worksheet to record this data and determine the ***Running Torque***.
6. Make up the rest of the string at the ***Running Torque*** determined in the previous step verifying each connection has shouldered with between 10% and 50% ***Delta Torque***. Small incremental adjustments to the established Running Torque (500 to 1,000 ft-lbs) are advised if delta torques routinely fall short of the 10% requirement or routinely exceed the 50% requirement.

NOTES:

- *This summary is provided for quick reference and is not a substitute for the comprehensive procedure provided above.*
- *Does not apply to threadlock connections.*

DO's and DONT's

1. **DO** check vertical alignment.
2. **DO** apply thread compound to all pin and coupling threads, pin nose and coupling shoulder area.
3. **DO** establish the ***Running Torque*** in accordance with GB Procedures.
4. **DO** make adjustments to ***Running Torque*** if indicated by inconsistent makeups during the casing run.
5. **DO** check every makeup for a clear indication of shouldering with a minimum ***Delta Torque*** ≥ 10% of the ***Shoulder Torque***.
6. **DO** reject any coupling that is not properly made up after two (2) attempts.
7. **DO** carefully stab pins into coupling (use a stabbing guide for casing smaller than 9 5/8" OD).
8. **DO** finish the makeup with at least two (2) full turns in low gear at 6 RPMs or less.
9. **DO** make up every connection continuously to pin nose engagement without stopping.

10. **DO** make note of anything that occurs with any connection makeup such as backup grips slipped, connection inspected and remade, etc.
11. **Do** check out every connection that appears out of character relative to the population. An example would be a connection that is completed with significantly fewer turns than most others. Check the triangle stamp and record position and take corrective action if needed.
12. **DO** add torque to any connection that appears to achieve pin nose engagement but not 10% delta torque.
13. **DO** adjust the ***Running Torque*** up or down in increments to achieve consistent ***Delta Torque*** between 10% and 50%.
14. **Do** make note of any anomaly during any connection makeup, such as backups slipped, mill side turned, etc.
15. **DO** minimize the weight on the connection, i.e. weight neutral, during break out as much as possible to minimize thread galling.
16. **DO NOT** over dope.
17. **DO NOT** exceed the ***Maximum MU Torque*** as shown on the GB Connections Performance Property Sheets during assembly.
18. **DO NOT** make up any misaligned connection.
19. **DO NOT** exceed 20 RPMs in high gear and 6 RPMs in low gear for the final two (2) full turns.
20. **DO NOT** remove pin thread protectors until pipe is hanging in the derrick.
21. **DO NOT** ever back a connection up a couple of turns and remake. Any connection requiring this type of attention **SHALL** be broken out completely, cleaned, visually inspected, and if OK, re-doped and remade.
22. **DO NOT** hesitate to contact GB Connections with questions before and during any casing run.

RECOMMENDED EQUIPMENT

- Stabbing Guide
- Mustache Brush
- Torque vs. Turn Monitoring Equipment or Dump Valve

Worksheet for determining GB Connection Running Torque at the beginning of a Casing Run

Ignore joints that are assembled with threadlock compounds. See "Addendum Procedure for GB Connections Assembled with Threadlocking Compounds" available at www.gbconnections.com.

Pertinent Excerpt from GB Running Procedure

5. Stab the pin carefully into the coupling of the joint hanging in the rotary table. A stabbing guide is recommended to protect the pin nose and leading thread from physical damage that may contribute to thread galling. Make up each connection until shoulder engagement plus Delta Torque. Record the Shoulder Torque observed for the first 10 joints (excluding threadlocked accessory joints). The Running Torque is (a) the Minimum MU Torque shown on the GB Connections Performance Property Sheets or (b) the Maximum Shoulder Torque recorded from the first 10 makeups + 10%, whichever is higher (rounded to the next highest 500 ft-lbs.) Delta Torque should be between 10% and 50% of the Shoulder Torque. Running Torque shall not exceed the Maximum MU Torque. When making up the initial joints for establishing the Running Torque carefully watch the torque gauge for the Shoulder Torque and try to manually shut down the tongs before reaching Maximum MU Torque shown on the GB Connections Performance Property Sheets. Alternately, the dump valve should be set to **80% of the Maximum MU Torque** during this initial process.

6. After the first 10 makeups (more if necessary due to conditions at the time of the run), use the "Running Torque" established in Step 5 for the remainder of the string. A dump valve is strongly recommended to stop makeup once the established Running Torque is achieved.

Casing Data		Comment
OD (in)		See GBC Performance Property Sheet
Weight (ppf)		See GBC Performance Property Sheet
Grade		See GBC Performance Property Sheet
Min MU Torque (ft-lbs)		See GBC Performance Property Sheet
Max MU Torque (ft-lbs)		See GBC Performance Property Sheet
Max Operating Torque (ft-lbs)		The Maximum Operating Torque is **NOT** the Maximum Makeup Torque and is **NOT** a sustainable rotating torque. Operating at the Maximum Operating Torque for any length of time will likely damage the connection.

Notes	Joint No.	Shoulder Torque (ft-lbs)	Final Torque (ft-lbs)	Triangle Stamp Position Sketch (△)
Required	1			
Required	2			
Required	3			
Required	4			
Required	5			
Required	6			
Required	7			
Required	8			
Required	9			
Required	10			
Optional	11			
Optional	12			
Optional	13			
Optional	14			
Optional	15			
Max. Shoulder Torque				
A Max. Shoulder Torque + 10%				
B Min. Makeup Torque (from GB Conn. Data Sheet)				
Running Torque (ft-lbs)		-	**A** or **B**, whichever is **greater**.	

Optional joints should be added if there is wide variability in shoulder torques recorded during the initial 10 joints. Judgement should be used to determine if more than 10 joints are needed for the purpose of establishing the Running Torque and, if so, how many more should be added.

Wide variations in Shoulder Torque during the first ten (10) joints suggest other issues requiring attention such as poor alignment, improper amount and distribution of thread compound, etc. Refer to 2nd paragraph of GB Running Procedure for possible contributing factors to aid troubleshooting.

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Casing Design Criteria and Load Case Assumptions

1. Collapse: DF_C=1.125
   a. Full Internal Evacuation: Collapse force equal to the mud gradient in which the casing will be run (0.65 psi/ft). The effects of axial load on collapse will be considered.
   b. Cementing: Collapse force equal to the gradient of planned cement slurries to planned depths and minimum mud gradient in which the casing will be run above that (0.65 psi/ft) and an internal force equal to mud gradient of displacement fluid (0.43 psi/ft)
2. Burst: DF_B=1.125
   a. Pressure Test: psi casing test with an external force equal to the mud gradient in which the casing will be run (0.65 psi/ft), which is a more conservative backup force than pore pressure.
   b. Injection Down Casing: psi surface injection pressure plus an internal pressure gradient of 0.65 psi/ft with an external force equal to the mud gradient in which the casing will be run (0.65 psi/ft), which is a more conservative backup force than pore pressure.
3. Tensile: DF_T=1.4
   a. Overpull: An overpull force of 100,000 lbs is applied at the shoe along with the weight of the casing string utilizing the effects of buoyancy (8.5 ppg).

Surface Casing Program									
Casing Size (in)	**Weight (ppf)**	**Grade**	**Connection**	**ID**	**ID (drift)**	**Collapse (psi)**	**Burst (psi)**	**Tension (1,000 lbs)**	**Capacity (bbl/ft)**
13-3/8”	54.5	J-55	BTC	12.615	12.459	1,130	2,740	909	0.1545
Safety Factors									
	API Rec. SF	**ACTUAL SF**	Case		External Fluids		Internal Fluids		
Collapse	1.125	**3.30**	Lost Circulation		Mud		*None*		
Burst	1.125	**1.46**	Plug Bump		Green Cement + 2ksi surf pressure		Displacement Fluid/Mud		
Tension	1.4	**2.8**	100 klbs Overpull		Mud		Mud		

Buoyed Casing Weight: ***23,755 lbs (assuming 8.4 ppg fluid and 500’ casing-worst case scenario)***

Intermediate Casing Program									
Casing Size (in)	**Weight (ppf)**	**Grade**	**Connection**	**ID**	**ID (drift)**	**Collapse (psi)**	**Burst (psi)**	**Tension (1,000 lbs)**	**Capacity (bbl/ft)**
9-5/8”	36	J-55	BTC	8.921	8.765	2,020	3,520	639	0.0773
Safety Factors									
	API Rec. SF	**ACTUAL SF**	Case		External Fluids		Internal Fluids		
Collapse	1.125	**3.30**	Lost Circulation		Mud		*None*		
Burst	1.125	**1.46**	Plug Bump		Green Cement + 2ksi surf pressure		Displacement Fluid/Mud		
Tension	1.4	**2.8**	100 klbs Overpull		Mud		Mud		

Buoyed Casing Weight: ***40,798 lbs (assuming 8.4 ppg fluid and 1,300’ casing-worst case scenario)***

Production Casing Program									
Casing Size (in)	**Weight (ppf)**	**Grade**	**Connection**	**ID**	**ID (drift)**	**Collapse (psi)**	**Burst (psi)**	**Tension (1,000 lbs)**	**Capacity (bbl/ft)**
7”	32	L-80	GBCD	6.094	5.969	10,400	9,060	745	0.0361
Safety Factors									
	API Rec. SF	**ACTUAL SF**	Case		External Fluids		Internal Fluids		
Collapse	1.125	**3.75**	Lost Circulation		Mud		*None*		
Burst	1.125	**2.47**	Plug Bump		Green Cement + 2ksi surf pressure		Displacement Fluid/Mud		
Tension	1.4	**2.29**	100 klbs Overpull		Mud		Mud		

Buoyed Casing Weight: ***90,662 lbs (assuming 8.4 ppg fluid and 3,250’ TVD-worst case scenario)***

Production Casing Program									
Casing Size (in)	**Weight (ppf)**	**Grade**	**Connection**	**ID**	**ID (drift)**	**Collapse (psi)**	**Burst (psi)**	**Tension (1,000 lbs)**	**Capacity (bbl/ft)**
5-1/2”	20	L-80	GBCD	4.778	4.653	10,630	9,190	466	0.0222
Safety Factors									
	API Rec. SF	**ACTUAL SF**	Case		External Fluids		Internal Fluids		
Collapse	1.125	**3.75**	Lost Circulation		Mud		*None*		
Burst	1.125	**2.47**	Plug Bump		Green Cement + 2ksi surf pressure		Displacement Fluid/Mud		
Tension	1.4	**2.29**	100 klbs Overpull		Mud		Mud		

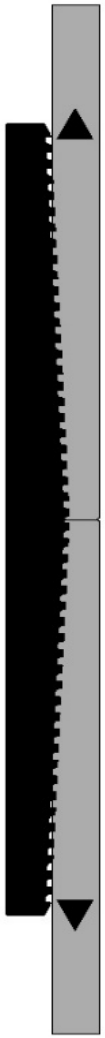
Buoyed Casing Weight: ***56,664 lbs (assuming 8.4 ppg fluid and 3,250’ TVD-worst case scenario)***

GB connections
Engineering the Right Connections

GB Connection Performance Properties Sheet

Rev. 1 (08/25/2015)

ENGINEERING THE RIGHT CONNECTIONS™



Casing: 5.5 OD, 20 ppf
Casing Grade: L-80

Connection: GB CD Butt 6.300
Coupling Grade: API L-80

PIPE BODY GEOMETRY					
Nominal OD (in.)	5 1/2	Wall Thickness (in.)	0.361	Drift Diameter (in.)	4.653
Nominal Weight (ppf)	20.00	Nominal ID (in.)	4.778	API Alternate Drift Dia. (in.)	N/A
Plain End Weight (ppf)	19.83	Plain End Area (in.^{2})	5.828		

PIPE BODY PERFORMANCE					
Material Specification	L-80	Min. Yield Str. (psi)	80,000	Min. Ultimate Str. (psi)	95,000
Collapse		**Tension**		**Pressure**	
API (psi)	8,830	Pl. End Yield Str. (kips)	466	Min. Int. Yield Press. (psi)	9,190
High Collapse (psi)	10,630	**Torque**		**Bending**	
		Yield Torque (ft-lbs)	54,120	Build Rate to Yield (°/100 ft)	66.7

GB CD Butt 6.300 COUPLING GEOMETRY			
Coupling OD (in.)	6.300	Makeup Loss (in.)	4.2500
Coupling Length (in.)	8.500	Critical Cross-Sect. (in.^{2})	8.527

GB CD Butt 6.300 CONNECTION PERFORMANCE RATINGS/EFFICIENCIES					
Material Specification	API L-80	Min. Yield Str. (psi)	80,000	Min. Ultimate Str. (psi)	95,000
Tension		**Efficiency**		**Bending**	
Thread Str. (kips)	503	Internal Pressure (%)	100%	Build Rate to Yield (°/100 ft)	58.2
Min. Tension Yield (kips)	648	External Pressure (%)	100%	**Yield Torque**	
Min. Tension Ult. (kips)	770	Tension (%)	100%	Yield Torque (ft-lbs)	22,680
Joint Str. (kips)	503	Compression (%)	100%		
		Ratio of Areas (Cplg/Pipe)	1.46		

MAKEUP TORQUE					
Min. MU Tq. (ft-lbs)	8,620	Max. MU Tq. (ft-lbs)	17,240	Running Tq. (ft-lbs)	See GBT RP
				Max. Operating Tq. (ft-lbs)*	21,540

Units: US Customary (lbm, in., °F, lbf)
1 kip = 1,000 lbs
* See Running Procedure for description and limitations.
See attached: Notes for GB Connection Performance Properties.
GBT Running Procedure (GBT RP): www.gbconnections.com/pdf/RP-GB-DWC-Connections.pdf
Blanking Dimensions: www.gbconnections.com/pdf/GB-DWC-Blanking-Dimensions.pdf
Connection yield torque rating based on physical testing or extrapolation therefrom

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Notes for GB Connections Performance Properties

Rev. 1 (May, 2018)

ENGINEERING THE RIGHT CONNECTIONS™

1. All dimensions shown are nominal. Plain end weight is calculated in accordance with API TR 5C3. Performance properties are empirical, based on nominal dimensions, minimum material yield and ultimate strengths, and calculated in general accordance with industry standard formula(s) assuming uniaxial loading. All properties are calculated on the basis of materials at room temperature. NOTE: Material properties change with temperature.
2. Joint strength is the lesser of pipe thread strength and minimum coupling tension as calculated in accordance with API TR 5C3. Tensile efficiency is calculated using coupling strength based on ultimate material strength per API TR 5C3 divided by plain end yield strength of the casing. Minimum Coupling Tension based on material *yield* strength is provided *for information only*. Performance values presented for tension do not account for failure by pull-out (which can occur with heavy wall casing), effects of internal and external pressure, thermally induced axial loads, casing curvature (bending), and/or other static and dynamic loads that may occur singularly or in combination during downhole deployment and with subsequent well operations.
3. Drift diameters are based on Standard and Alternate drift sizes per API 5CT. Drift diameters are not specified for API 5L pipe. Drift diameters shown on GB Connection Performance Property Sheets represent the diameter of the drift mandrel used for end-drifting after coupling buck on. When shown, the alternate drift diameter is used for end drifting. Drift testing is performed in accordance with currently applicable API Specifications.
4. Minimum Internal Yield Pressure Performance values for Casing (API 5CT), Line Pipe (API 5L), and mill casing proprietary grades are based on API TR 5C3 formulas and assume 87.5% minimum wall thicknesses. Minimum Internal Yield Pressure efficiency for GB Connections is the lesser of the Minimum Internal Yield Pressure of the coupling and Leak Resistance divided by pipe body Minimum Internal Yield Pressure (all based on API TR 5C3 formulas). GB Connections typically demonstrate pressure resistance exceeding the mating pipe body unless otherwise noted with a pressure efficiency < 100%. Pressure efficiency can only be achieved when connections are properly assembled in strict accordance with GB Connections' Running Procedures (www.gbconnections.com/pdf/RP-GB-DWC-Connections.pdf.
5. Compression efficiency of the Casing/Connection combinations does not consider the axial load that causes pipe body buckling. The compressive load that causes buckling is usually less than the pipe body compressive yield strength and is dependent on a number of factors including, but not limited to, string length (or slenderness ratio; L/D), thermally induced axial loads, and annular clearance that may (or may not) lend side support to the casing string.
6. Bending values assume a constant radius of curvature where the casing is in uniformly intimate contact with the wall of the wellbore (i.e. when the upset at the coupling OD is small compared with wellbore wall irregularities). When the radius of curvature is not constant due to large wellbore wall irregularities, varying trajectory, micro doglegs, wash-outs, rock ledges, and other downhole conditions, unpredictable excessive bending stresses can occur that may be detrimental to casing and connection performance.
7. Fatigue failures are a function of material properties, stress range, and number of stress reversal cycles. API 5CT, API 5L, and mill proprietary casing/coupling materials have a finite fatigue life. Higher stress ranges yield lower fatigue life. So as a general rule of thumb, casing should never be rotated at higher RPMs than needed for task accomplishment. For the same stress range, casing rotated at 25 RPMs will generally last 4 times longer (more rotating hours) than casing rotated at 100 RPMs. However with fatigue, there are opportunities for unexpected higher stress reversal levels associated with vibration, thermally induced axial loads, and bending (see above) in addition to all other stress reversals imparted during running, rotating, reciprocating, pressure testing, pumping, etc. The extent and quality of the cement job is also a factor. Under aggressive, high-volume, multi-stage hydraulic fracturing operations, the casing string (including the connections) is severely taxed such that local stress range(s) and actual number of applied cycles cannot be precisely determined without full string instrumentation.
8. External pressure efficiency (expressed in percent) is the ratio of the lesser of Minimum Internal Yield Pressure and Leak Resistance for coupling (calculated per API TR 5C3) divided by the API collapse rating of the casing. External pressure efficiency has not been verified by testing and does not consider other applied loads. External pressure efficiency does not account for any high collapse rating that may be shown on GB Connection Performance Property Sheets.
9. Maximum Makeup Torque is provided for guidance only. This value is not the same as the Connection Yield Torque shown. Connection Yield Torque is the lesser of yield torque rating for the critical cross-section of pipe body, connector body, and pin nose and the threadform load flank bearing area. Connection Yield Torque does not consider radial buckling of the pipe or connection due to excessive jaw pressure during torque application. Torque in connections can increase or decrease over that applied at makeup (connection tightening/loosening) with rotating and stimulation operations due to slip-stick, shock loads, bending, tight spots, vibration(s), temperature, and other downhole factors that may occur individually or in combination. Due to circumstances beyond the control of GB Connections, User accepts all risks associated with casing and connection related issues that occur during and after rotating operations.
10. **Every** GB Connection requires the proper amount and distribution of thread compound to all pin and coupling threads and careful field make up in strict accordance with GB Connections' Running Procedures to provide expected levels of performance in service.
11. Reactions among water, drilling muds and other fluids, and chemicals introduced by User with downhole formation fluids may result in an environment detrimental to casing and connection performance. User should carefully consider all aspects of the string design including material compatibility with respect to possible corrosion, sour conditions, and other factors that may result in unexpected casing and/or connection failure at or below published ratings.
12. Performance Properties are subject to change without notice. User is advised to obtain the current GB Connection Performance Property Sheet for each application. Please visit **www.gbconnections.com** to download.

Limitations

Data presented in GB Performance Property Sheets and Running Procedures ("GB Information") is provided for informational purposes only and intended to be supplemented by the professional judgment of qualified personnel during design, field handling, deployment, and all subsequent well operations. The use of GB Information is at the User's sole risk.

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GB connections Engineering the Right Connections	**Running Procedure for Casing with GB *Drilling with Casing* Connections**	October 29, 2007
		Rev. 14 (04/09/2020)

OVERVIEW

This field running procedure applies to makeup of **GB *Drilling with Casing*** (GB DwC) Connections which include GB CD, GB CDE, GB RDB, GB EHTQ, and GB RDB WS Connections with GB Butt (Buttress), GB 4P, and GB 3P thread forms. All GBC Connections are suitable for ***Running*** (standard casing applications), ***Rotating*** (to aid string advancement), ***Drilling*** (Drilling with Casing/Drilling with Liners) and ***Driving***. This procedure also applies to the legacy GB Connections known as GB Butt and GB 3P.

Numerous factors impact the makeup torque of Buttress (GB Butt) and Modified Buttress Threads (such as GB 4P and GB 3P). Some of these factors include but are not limited to: allowable threading tolerances, joint characteristics (OD, straightness, hooked ends, and weight), vertical alignment (derrick, top drive, and elevator alignment relative to rotary table), thread compound (type, amount, and distribution), snub line (location and orientation), distance between tongs and backups, temperature/weather, equipment type, efficiencies (electrical, hydraulic and mechanical), grips/dies (type, condition, orientation, location, contact area, and grip distribution), measurement equipment, gauge calibration, personnel, etc. The nature of these types of connections makes it impossible to provide makeup torque values that will yield proper power tight makeup on every rig under all circumstances with the wide variety of existing connection makeup equipment.

This procedure has been designed to determine the ***Running Torque*** required for proper power tight makeup of GB Connections under the circumstances and with the actual equipment, set up conditions, weather, etc. that exist at the time of running. With proper execution of this procedure, GB Connections will be properly and consistently assembled.

LIMITATIONS

This GBC Running Procedure provides the basic recommended practices and is intended to be supplemented by the professional judgment of qualified personnel based on observation of actual makeups throughout the casing run. GB DwC Connections require the proper amount and distribution of thread compound to **all pin and coupling threads** and careful field makeup in strict accordance with GB Connections' Running Procedures to provide expected levels of performance in service.

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DEFINITIONS

1. Minimum Makeup (MU) Torque: Connections must have at least this amount of torque applied and clearly exhibit shoulder engagement.
2. Shoulder Torque: MU torque required to achieve shoulder engagement.
3. Running Torque: Developed at start of casing run per GBC Running Procedure and once established, used for the rest of the joints in the string, using data established with progression of the casing run. The ***Running Torque*** may be adjusted during the casing run as needed to stay within parameters defined here. The ***Running Torque*** will likely vary with each job due to the factors listed in the Overview section.
4. Delta Torque: Difference between ***Shoulder Torque*** and final makeup (or dump) torque.

5. Maximum Makeup (MU) Torque: Final assembly torque including shoulder engagement shall not exceed the ***Maximum MU Torque*** shown on size, weight, and grade-specific GB Performance Property Sheets at the beginning of a casing run when establishing the ***Running Torque***. In the unlikely event that ***Running Torque*** determined by the procedure meets or exceeds the ***Maximum MU Torque***, call GB Connections for assistance.
6. Yield Torque: Torque that causes yielding in the connection (usually yielding of the pin nose). ***Yield Torque*** rating does **NOT** consider the torque that may radially buckle the pipe body at the grip points. ***Yield Torque*** values for the pipe body and connection are based on nominal dimensions and minimum material yield strength.
7. Maximum Operating Torque: The ***Maximum Operating Torque*** shown on the GB Connections Performance Property Sheets includes a 5% safety factor on ***Yield Torque***. As such, it represents the ***limiting torque spike*** that can be applied to the connection during rotating operations. The ***Maximum Operating Torque*** is **NOT** the ***Maximum MU Torque*** and is **NOT** a sustainable rotating torque. Operating at the ***Maximum Operating Torque*** for any length of time may damage connections due to likely random, unexpected torque spikes that occur during rotating operations. USER should carefully consider this value to determine if a higher Safety Factor on ***Yield Torque*** is more suitable for the project-specific application.

   As a general rule of thumb, rotating RPMs and Torque should be *"walked up"* to determine the minimum needed for task accomplishment. Additional information on best practices for rotating casing can be found at http://www.gbconnections.com/pdf/White-Paper-Rotating-Casing.pdf.

KEY INFORMATION

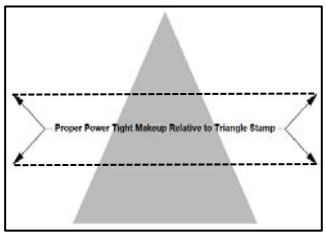
Thread Compound: Best-O-Life 2000, Best-O-Life 2000 Arctic Grade (AG), API Modified, API Modified Hi-Pressure, or any industry recognized equivalent to these products. Thread compound may also be referred to as "dope". User should avoid products that include Metal Free (MF) in the product name. Tool joint compounds are **expressly forbidden** for makeup of any GBC Connections. Thread compound shall be applied to all pin and box threads as described here.

Torque Values: ***Minimum and Maximum MU Torque*** values are provided on individual GB Connections Performance Property Sheets available at the following link: http://www.gbconnectionss.com/connection_selector.php.

Continuous Makeup: Makeup of GB Connections **SHALL START AND CONTINUE WITHOUT STOPPING** until full power tight makeup is achieved.

Makeup Speed: Use of high gear at no more than 20 RPMs is permissible once proper starting thread engagement has occurred. **THE FINAL TWO (2) TURNS, AT A MINIMUM, SHALL BE COMPLETED IN LOW GEAR AT LESS THAN 6 RPMS**.

Pin Nose Engagement: Pin nose engagement is indicated by a spike on an analog torque gauge or a sharp vertical spike on a torque vs. turn plot. As a secondary check, proper power tight makeup is achieved when the coupling covers approximately the **middle third of the API Triangle Stamp** on the pin (see graphic). The triangle will be stamped on the pin member as indicated by a white locator stripe.

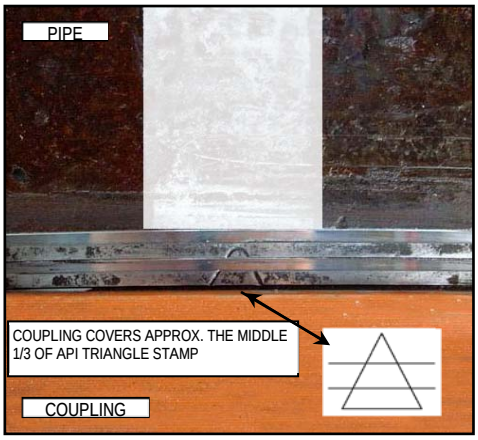


Acceptance Criteria: All GB Connections must exhibit shoulder engagement (achieve pin-to-pin or pin-to-shoulder engagement) with a: (1) ***Delta Torque*** ranging between 10% and 50% of majority of the

Shoulder Torque and (2) final torque not exceeding the ***Running Torque*** as established in this procedure. Outlier joints that require additional attention would be an exception to ***Maximum MU Torque*** limit as discussed under Comments, Troubleshooting.

It is imperative that the following procedure be executed carefully at the beginning of every casing run to determine the ***Running Torque*** (torque to be used for the rest of the string). Torque values established on an individual casing run are never transferrable to other runs.

The ***Running Torque*** is determined while running the first 10 joints after joints assembled with threadlocking compounds are made up. Sometimes more than the first 10 joints will be needed to establish the ***Running Torque*** due to erratic results and/or other run-specific conditions. The ***Running Torque*** may have to be re-established or adjusted during the casing run under certain conditions[1] and observations. Use the size-specific GBC Connections Performance Property Sheets (http://www.gbconnections.com/connection_selector.php) for physical properties for the ***Minimum*** and ***Maximum MU Torque*** values.



Connections shall be made up until shoulder engagement with ***Delta Torque*** between 10% and 50% of the ***Shoulder Torque*** (not to exceed the ***Maximum MU Torque***, see procedure below) using the ***Running Torque*** value established in this procedure. The ***Maximum MU Torque*** at the beginning of the casing run for establishing the ***Running Torque*** shall be limited to the value shown on the applicable GBC Connections Performance Property Sheet. The ***Running Torque*** shall be used thereafter and throughout the run as the limiting makeup torque value. The ***Maximum MU Torque*** on the GBC Performance Property Sheet value is given as a practical limit for avoidance of thread galling, connection damage, and possible tube damage due to excessive jaw pressure that can occur with application of extreme makeup torque. Contact GB Connections if more than the ***Maximum MU Torque*** value is required for shoulder engagement and/or final makeup, or if torque exceeding the ***Maximum Operating Torque*** value is required for the intended service.

PROCEDURE FOR ESTABLISHING ***RUNNING TORQUE***

1. Remove coupling thread protectors only after casing is set in V-Door.
2. ***Always apply fresh thread compound to coupling threads and internal shoulder (where applicable).*** See Comment No. 1 (below) for discussion on proper amount of thread compound.
3. Remove pin thread protectors only after joint is raised in the derrick. Visually inspect pin threads for sufficient thread compound as described in Comment No. 1; ***add fresh compound to pin threads and pin nose***.
4. Fresh thread compound should **NEVER** be added on top of dope contaminated with dust, dirt, and/or debris. Threads observed to have contaminated thread compound shall be thoroughly cleaned and dried before applying fresh thread compound.
5. Stab the pin carefully into the coupling of the joint hanging in the rotary table. A stabbing guide is recommended to protect the pin nose and leading thread from physical damage that may contribute to thread galling. Make up each connection until shoulder engagement plus ***Delta Torque***. Record the ***Shoulder Torque*** observed for the first 10 joints (excluding threadlocked accessory joints). The ***Running Torque*** is (a) the ***Minimum MU Torque*** shown on the GB Connections Performance Property Sheets ***or*** (b) the Maximum ***Shoulder Torque*** recorded from the first 10 makeups + 10%, ***whichever is higher*** (rounded to the next highest 500 ft-lbs.) ***Delta Torque*** should be between 10% and 50% of the ***Shoulder Torque. Running Torque*** shall not exceed the ***Maximum***

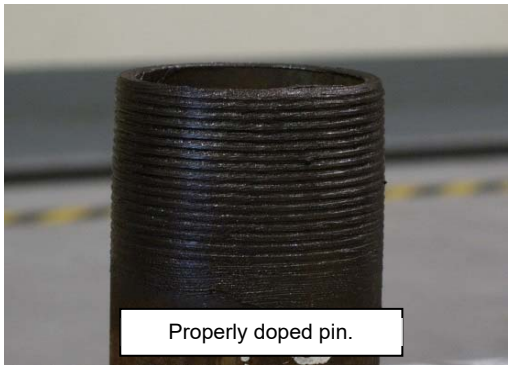
[1] Examples include but are not limited to more than an occasional low or high ***Delta Torque***, string of mixed mills, equipment change, large temperature change, and wobbling or noticeable vibration when joint is turning.

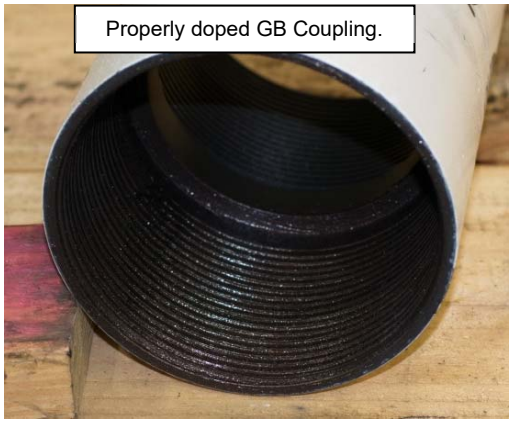
MU Torque. When making up the initial joints for establishing the ***Running Torque*** carefully watch the torque gauge for the ***Shoulder Torque*** and try to manually shut down the tongs before reaching ***Maximum MU Torque*** shown on the GB Connections Performance Property Sheets. Alternately, the dump valve should be set to 80% of the ***Maximum MU Torque*** during this initial process.

6. After the first 10 makeups (more if necessary due to conditions at the time of the run), use the ***"Running Torque"*** established in Step 5 for the remainder of the string. A dump valve is strongly recommended to stop makeup once the established ***Running Torque*** is achieved.
7. All connections made up with the established ***Running Torque*** should achieve shoulder engagement with the small amount of ***Delta Torque***. Carefully watch for the spike on the torque gauge during each make up to verify shoulder engagement. As a ***secondary*** verification, randomly check the makeup position relative to the API Triangle Stamp during the run. Proper power tight makeup position is achieved when the coupling covers the middle 1/3 of the API Triangle Stamp on the pin (see accompanying photo).
8. All connections should achieve shoulder engagement with at least 10% ***Delta Torque*** before the ***Maximum MU Torque*** is achieved.

COMMENTS, TROUBLESHOOTING

1. GB Connections are thread compound friendly. Thread compounds shall be handled, mixed, and applied in strict accordance with the manufacturer's instructions. **THREAD COMPOUND SHALL BE APPLIED TO BOTH PIN AND COUPLING THREADS AND OPPOSING PIN NOSE OR SHOULDER AREA OF EVERY CONNECTION**. Thread compound "transfer" between pin and coupling will not provide proper sealing mechanism for the connection to function properly. Sufficient thread compound has been applied when all threads (pin and coupling), pin nose, and coupling ID surfaces are completely covered **WITH NO GAPS OR BARE SPOTS**. The thread form should be discernible beneath the compound, i.e. when the thread valleys appear half full. Be generous with the thread compound; but avoid over-doping to the point where ***excessive*** amounts are squeezed out during assembly. Use of a mustache brush is the preferred method for applying and distributing thread compounds to GB Connections.


Properly doped pin.

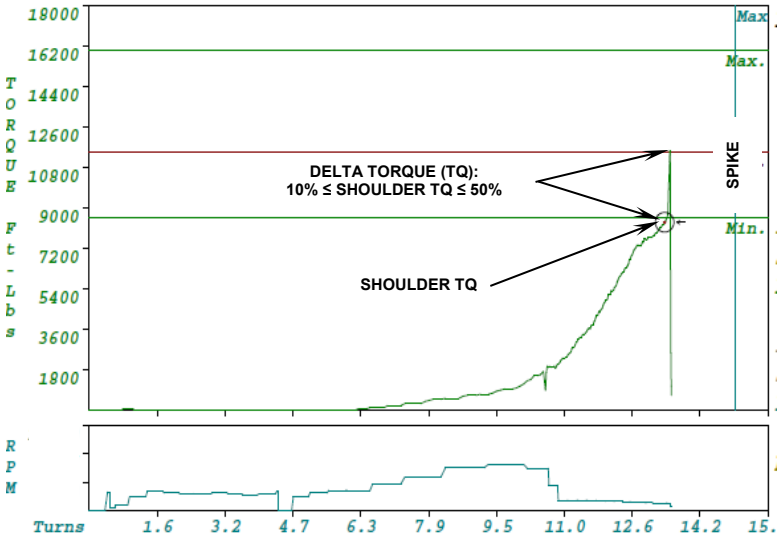

Properly doped GB Coupling.

2. If threads are cleaned on racks, new dope shall be applied in a light, even coat to both pin and coupling threads. See Comment No. 1 above for description of sufficient thread compound. Clean thread protectors shall be re-applied to freshly doped pin and coupling threads unless the casing run is imminent (no more than a few hours) to avoid contaminating exposed thread compound.
3. All connections should achieve shoulder engagement before reaching the "***Running Torque***" value determined by this procedure. Any connection that does not achieve shoulder engagement at the established "***Running Torque"*** value shall be visually inspected for position relative to the API Triangle Stamp.
   a) If the coupling is shy of the API Triangle Stamp Base, the connection shall be broken out, cleaned and inspected visually for thread damage, re-doped, and made-up again (or laid down if threads are damaged). Connections that have not achieved shoulder engagement **SHALL NEVER** be backed up a couple of turns and remade. They shall be completely broken out, cleaned and inspected as described above.

b) If the coupling covers the API Triangle base but does not land in approximately the middle third of the API Triangle Stamp, add additional torque to achieve shouldering and finish the makeup. Except to initiate additional turning, it is common to see high torque (possibly exceeding the ***Maximum MU Torque***) to initiate connection turning. This is acceptable as long as the torque drops off once movement starts and then spikes with shoulder engagement. If acceptable makeup doesn't occur with one additional torque application, the connection shall be broken out (as described in 3a above).

c) Any connection not properly assembled (i.e. not meeting the acceptance criteria) in two (2) attempts (provided threads pass a visual inspection each time) is reject and shall be laid down.

4. At the established ***Running Torque***, the connections will generally shoulder with ***Delta Torque*** between 10% and 50%. High interference connections will tend to have a higher ***Shoulder Torque*** and less ***Delta Torque*** (at least 10% of the ***Shoulder Torque*** is required). Low interference connections will tend to have lower ***Shoulder Torque*** and more ***Delta Torque***. In general, GB Connections makeup consistently but will vary due to any of the factors enumerated in the second paragraph of the Overview section of this procedure. However, wide variability on more than a few joints should be investigated for a root cause and, if necessary, a new ***Running Torque*** should be adjusted as described below.



If a connection appears to have shouldered but doesn't have at least 10% ***Delta Torque***, the position relative to the API Triangle Stamp should be checked. In just about every instance, the position will have covered the triangle base, so additional torque can be added to complete the makeup as discussed in 3.b) above. Expect an instantaneous spike with showing more than 50% ***Delta Torque*** with application of additional torque. Under this condition, this makeup is acceptable.

Similarly, random connections here and there with more than 50% ***Delta Torque*** is generally not cause for concern. However, if overshooting the 50% maximum ***Delta Torque*** target occurs frequently, then the established ***Running Torque*** value should be walked down in 500 ft-lbs. to 1,000 ft-lbs. increments until connection makeup routinely falls in line with the stated acceptance criteria.

5. ***Torque vs. Turn monitoring systems are recommended for field makeup of GB Connections.*** While Torque vs. Turn plots provide good information about makeup, they **SHALL NOT BE SUBSTITUTED FOR DIRECT VISUAL OBSERVATION OF THE CONNECTION DURING ASSEMBLY**. There is no second chance to watch field assembly of a connection. Torque vs. Turn plots can always be viewed for verification purposes once a makeup is finished. When available, torque vs. turn plots shall finish with a clearly defined spike as shown in the graphic to the right. The general character of torque vs. turn plots for good makeups will become evident after the first ten (10) makeups (again, more may be necessary due to rig and/or equipment-specific conditions). Any makeup that results in a plot that is "out-of-character"[2] when compared with most plots from previous good makeups should be checked carefully.

[2] An "out-of-character" plot may initiate with a high torque, show significantly steeper slope from the start of makeup, wide torque undulations as makeup progresses, no clearly defined spike, insufficient/inconsistent turns, etc.

When using Torque vs. Turn monitoring equipment, GB recommends setting a reference torque value of 500 ft-lbs. or 10% of the minimum makeup torque (whichever is lower) to help normalize the turns-to-power-tight variability in the Tq-Tn graphs. Setting a reference torque reduces field stab variability resulting in more consistency in the Tq-Tn data. Plot scales should be set so data spans at least 2/3 of the turns scale on each plot (15 turns will usually be sufficient at the start and can be reduced based on data from the first few joints). **UNDER NO CIRCUMSTANCE SHOULD MAKEUP BE STARTED UNTIL THE MONITORING SYSTEM IS READY TO RECORD DATA**.

6. Occasionally the mill side of a GB Connection may turn during field makeup. When observed, the makeup should continue without stopping per this procedure. It may be helpful to scribe a vertical line across the coupling-pipe interface to aid estimation of mill side turning if it is observed with some frequency. The amount of mill side turn should be carefully observed and estimated. If the mill side turns less than ½ turn and all other aspects of the makeup are good, the connection is acceptable. If the mill side turns more than ½ turn, trouble- shooting should be initiated. Pay particular attention to amount and distribution of thread compound, vertical alignment, weight of joint, hooked end on pipe, and other possible factors that may contribute to possible high torque during field makeup. Counting turns can help to estimate if coupling will need to be stopped to avoid over rotation. It should be noted that mill side turning during field makeup occurs occasionally and should not be concerning. Frequent or persistent mill side turning is a symptom that needs troubleshooting and appropriate corrective action.
7. A double wrap of the pick-up sling should be used when raising casing into the derrick when lifting subs, single joint, side-door, or slip elevators are not being used.
8. Higher torque may be required to achieve shoulder engagement when threadlock compounds are applied. User is advised to carefully follow the manufacturer's instructions with respect to mixing, application, temperature, and time. Torque ranges with threadlock compounds cannot be estimated due to many variables including but not limited to temperature, time, connection tolerances, and surface finish. In these cases, carefully monitor makeup to be sure shouldering occurs. The only exception to the shouldering requirement is with float equipment (float shoe and float collar) that will be assembled with a threadlocking compound. In this case, makeup to a position that covers the base of API Triangle Stamp is considered satisfactory.
9. Manual and automated dump valves can overshoot the established ***Running Torque*** due to several factors. Slightly overshooting the ***Running Torque*** is not cause for concern as long as the final "dump" torque is not excessive, and the equipment used is generally consistent joint-to-joint. Overshooting the ***Running Torque*** with a final makeup speed greater than 10 RPMs is risky and potentially harmful to the connection as discussed below.
10. Attached is a "Worksheet for determining GB Connections ***Running Torque*** at the beginning of a Casing Run" for use at the start of any casing run using GB Connections. GB recommends that this worksheet be filled out and maintained with the casing run records.

MAKEUP SPEED

To reiterate: Use of high gear at no more than 20 RPMs is permissible once proper starting thread engagement has occurred. **THE FINAL TWO (2) FULL TURNS, AT A MINIMUM, SHALL BE COMPLETED IN LOW GEAR AT LESS THAN 6 RPMS**. Be sure that the final 2 turns occur after the tong speed has slowed completely to less than 6 RPMs.

Making up connections at RPM exceeding those listed above may result in unsatisfactory connection performance downhole. Risks associated with excessive makeup RPMs are common for any connection with internal pin nose engagement. High speed makeup can:

1. Impart an unnecessary impulse load at nose contact. Certain materials are more susceptible to cracking under sudden or instantaneously applied loads.
2. Inhibit efficient movement of and trap thread compound under high pressure causing additional and unquantifiable high hoop stresses in the connection.

3. Result in significant overshoot of established dump torque value due to equipment latency between signal and equipment shut down resulting in higher but unknown actual final torque value. Excessive overshoot can result in pin nose yielding.

PROCEDURE SUMMARY

1. Remove coupling protectors after casing is set in V-Door and apply fresh thread compound to coupling threads.
2. Raise joint in derrick, remove pin protectors, and apply fresh thread compound to pin threads and pin nose.
3. Carefully stab pin into coupling and makeup to pin nose engagement. Try to stop makeup without exceeding the ***Maximum MU Torque*** (shown on GB Connections Performance Property Sheets). Carefully watch for and note the ***Shoulder Torque***.
4. Record ***Shoulder Torque*** and Final Torque values, and position relative to API Triangle Stamp for first ten (10) connections, more if necessary due to run/rig-specific conditions.
5. The ***Running Torque*** is (a) the ***Minimum MU Torque*** shown on the GB Connections Performance Property Sheet or (b) the maximum torque required for shoulder engagement + 10% ***Delta Torque*** determined from the first 10 makeups, ***whichever is higher***. Use the attached Worksheet to record this data and determine the ***Running Torque***.
6. Make up the rest of the string at the ***Running Torque*** determined in the previous step verifying each connection has shouldered with between 10% and 50% ***Delta Torque***. Small incremental adjustments to the established Running Torque (500 to 1,000 ft-lbs) are advised if delta torques routinely fall short of the 10% requirement or routinely exceed the 50% requirement.

NOTES:

- *This summary is provided for quick reference and is not a substitute for the comprehensive procedure provided above.*
- *Does not apply to threadlock connections.*

DO's and DONT's

1. **DO** check vertical alignment.
2. **DO** apply thread compound to all pin and coupling threads, pin nose and coupling shoulder area.
3. **DO** establish the ***Running Torque*** in accordance with GB Procedures.
4. **DO** make adjustments to ***Running Torque*** if indicated by inconsistent makeups during the casing run.
5. **DO** check every makeup for a clear indication of shouldering with a minimum ***Delta Torque*** ≥ 10% of the ***Shoulder Torque***.
6. **DO** reject any coupling that is not properly made up after two (2) attempts.
7. **DO** carefully stab pins into coupling (use a stabbing guide for casing smaller than 9 5/8" OD).
8. **DO** finish the makeup with at least two (2) full turns in low gear at 6 RPMs or less.
9. **DO** make up every connection continuously to pin nose engagement without stopping.

10. **DO** make note of anything that occurs with any connection makeup such as backup grips slipped, connection inspected and remade, etc.
11. **Do** check out every connection that appears out of character relative to the population. An example would be a connection that is completed with significantly fewer turns than most others. Check the triangle stamp and record position and take corrective action if needed.
12. **DO** add torque to any connection that appears to achieve pin nose engagement but not 10% delta torque.
13. **DO** adjust the ***Running Torque*** up or down in increments to achieve consistent ***Delta Torque*** between 10% and 50%.
14. **Do** make note of any anomaly during any connection makeup, such as backups slipped, mill side turned, etc.
15. **DO** minimize the weight on the connection, i.e. weight neutral, during break out as much as possible to minimize thread galling.
16. **DO NOT** over dope.
17. **DO NOT** exceed the ***Maximum MU Torque*** as shown on the GB Connections Performance Property Sheets during assembly.
18. **DO NOT** make up any misaligned connection.
19. **DO NOT** exceed 20 RPMs in high gear and 6 RPMs in low gear for the final two (2) full turns.
20. **DO NOT** remove pin thread protectors until pipe is hanging in the derrick.
21. **DO NOT** ever back a connection up a couple of turns and remake. Any connection requiring this type of attention **SHALL** be broken out completely, cleaned, visually inspected, and if OK, re-doped and remade.
22. **DO NOT** hesitate to contact GB Connections with questions before and during any casing run.

RECOMMENDED EQUIPMENT

- Stabbing Guide
- Mustache Brush
- Torque vs. Turn Monitoring Equipment or Dump Valve

Worksheet for determining GB Connection Running Torque at the beginning of a Casing Run

Ignore joints that are assembled with threadlock compounds. See "Addendum Procedure for GB Connections Assembled with Threadlocking Compounds" available at www.gbconnections.com.

Pertinent Excerpt from GB Running Procedure

5. Stab the pin carefully into the coupling of the joint hanging in the rotary table. A stabbing guide is recommended to protect the pin nose and leading thread from physical damage that may contribute to thread galling. Make up each connection until shoulder engagement plus Delta Torque. Record the Shoulder Torque observed for the first 10 joints (excluding threadlocked accessory joints). The Running Torque is (a) the Minimum MU Torque shown on the GB Connections Performance Property Sheets or (b) the Maximum Shoulder Torque recorded from the first 10 makeups + 10%, whichever is higher (rounded to the next highest 500 ft-lbs.) Delta Torque should be between 10% and 50% of the Shoulder Torque. Running Torque shall not exceed the Maximum MU Torque. When making up the initial joints for establishing the Running Torque carefully watch the torque gauge for the Shoulder Torque and try to manually shut down the tongs before reaching Maximum MU Torque shown on the GB Connections Performance Property Sheets. Alternately, the dump valve should be set to **80% of the Maximum MU Torque** during this initial process.

6. After the first 10 makeups (more if necessary due to conditions at the time of the run), use the "Running Torque" established in Step 5 for the remainder of the string. A dump valve is strongly recommended to stop makeup once the established Running Torque is achieved.

Casing Data		Comment
OD (in)		See GBC Performance Property Sheet
Weight (ppf)		See GBC Performance Property Sheet
Grade		See GBC Performance Property Sheet
Min MU Torque (ft-lbs)		See GBC Performance Property Sheet
Max MU Torque (ft-lbs)		See GBC Performance Property Sheet
Max Operating Torque (ft-lbs)		The Maximum Operating Torque is **NOT** the Maximum Makeup Torque and is **NOT** a sustainable rotating torque. Operating at the Maximum Operating Torque for any length of time will likely damage the connection.

Notes	Joint No.	Shoulder Torque (ft-lbs)	Final Torque (ft-lbs)	Triangle Stamp Position Sketch (△)
Required	1			
Required	2			
Required	3			
Required	4			
Required	5			
Required	6			
Required	7			
Required	8			
Required	9			
Required	10			
Optional	11			
Optional	12			
Optional	13			
Optional	14			
Optional	15			
Max. Shoulder Torque				
A Max. Shoulder Torque + 10%				
B Min. Makeup Torque (from GB Conn. Data Sheet)				
Running Torque (ft-lbs)		-	**A** or **B**, whichever is **greater**.	

Optional joints should be added if there is wide variability in shoulder torques recorded during the initial 10 joints. Judgement should be used to determine if more than 10 joints are needed for the purpose of establishing the Running Torque and, if so, how many more should be added.

Wide variations in Shoulder Torque during the first ten (10) joints suggest other issues requiring attention such as poor alignment, improper amount and distribution of thread compound, etc. Refer to 2nd paragraph of GB Running Procedure for possible contributing factors to aid troubleshooting.

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Houston TX 77079
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Fax: 713-984-1529

For Techincal Information, contact:
Gene Mannella
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Qing Lu
qlu@gbconnections.com
Jordan Kies
jkies@gbconnections.com
Jonathan Garrett
jgarrett@gbconnections.com

Casing Design Criteria and Load Case Assumptions

1. Collapse: DF_C=1.125
   a. Full Internal Evacuation: Collapse force equal to the mud gradient in which the casing will be run (0.65 psi/ft). The effects of axial load on collapse will be considered.
   b. Cementing: Collapse force equal to the gradient of planned cement slurries to planned depths and minimum mud gradient in which the casing will be run above that (0.65 psi/ft) and an internal force equal to mud gradient of displacement fluid (0.43 psi/ft)
2. Burst: DF_B=1.125
   a. Pressure Test: psi casing test with an external force equal to the mud gradient in which the casing will be run (0.65 psi/ft), which is a more conservative backup force than pore pressure.
   b. Injection Down Casing: psi surface injection pressure plus an internal pressure gradient of 0.65 psi/ft with an external force equal to the mud gradient in which the casing will be run (0.65 psi/ft), which is a more conservative backup force than pore pressure.
3. Tensile: DF_T=1.4
   a. Overpull: An overpull force of 100,000 lbs is applied at the shoe along with the weight of the casing string utilizing the effects of buoyancy (8.5 ppg).

Surface Casing Program									
Casing Size (in)	**Weight (ppf)**	**Grade**	**Connection**	**ID**	**ID (drift)**	**Collapse (psi)**	**Burst (psi)**	**Tension (1,000 lbs)**	**Capacity (bbl/ft)**
13-3/8”	54.5	J-55	BTC	12.615	12.459	1,130	2,740	909	0.1545
Safety Factors									
	API Rec. SF	**ACTUAL SF**	Case		External Fluids		Internal Fluids		
Collapse	1.125	**3.30**	Lost Circulation		Mud		*None*		
Burst	1.125	**1.46**	Plug Bump		Green Cement + 2ksi surf pressure		Displacement Fluid/Mud		
Tension	1.4	**2.8**	100 klbs Overpull		Mud		Mud		

Buoyed Casing Weight: ***23,755 lbs (assuming 8.4 ppg fluid and 500’ casing-worst case scenario)***

Intermediate Casing Program									
Casing Size (in)	**Weight (ppf)**	**Grade**	**Connection**	**ID**	**ID (drift)**	**Collapse (psi)**	**Burst (psi)**	**Tension (1,000 lbs)**	**Capacity (bbl/ft)**
9-5/8”	36	J-55	BTC	8.921	8.765	2,020	3,520	639	0.0773
Safety Factors									
	API Rec. SF	**ACTUAL SF**	Case		External Fluids		Internal Fluids		
Collapse	1.125	**3.30**	Lost Circulation		Mud		*None*		
Burst	1.125	**1.46**	Plug Bump		Green Cement + 2ksi surf pressure		Displacement Fluid/Mud		
Tension	1.4	**2.8**	100 klbs Overpull		Mud		Mud		

Buoyed Casing Weight: ***40,798 lbs (assuming 8.4 ppg fluid and 1,300’ casing-worst case scenario)***

Production Casing Program									
Casing Size (in)	**Weight (ppf)**	**Grade**	**Connection**	**ID**	**ID (drift)**	**Collapse (psi)**	**Burst (psi)**	**Tension (1,000 lbs)**	**Capacity (bbl/ft)**
7”	32	L-80	GBCD	6.094	5.969	10,400	9,060	745	0.0361
Safety Factors									
	API Rec. SF	**ACTUAL SF**	Case		External Fluids		Internal Fluids		
Collapse	1.125	**3.75**	Lost Circulation		Mud		*None*		
Burst	1.125	**2.47**	Plug Bump		Green Cement + 2ksi surf pressure		Displacement Fluid/Mud		
Tension	1.4	**2.29**	100 klbs Overpull		Mud		Mud		

Buoyed Casing Weight: ***90,662 lbs (assuming 8.4 ppg fluid and 3,250’ TVD-worst case scenario)***

Production Casing Program									
Casing Size (in)	**Weight (ppf)**	**Grade**	**Connection**	**ID**	**ID (drift)**	**Collapse (psi)**	**Burst (psi)**	**Tension (1,000 lbs)**	**Capacity (bbl/ft)**
5-1/2”	20	L-80	GBCD	4.778	4.653	10,630	9,190	466	0.0222
Safety Factors									
	API Rec. SF	**ACTUAL SF**	Case		External Fluids		Internal Fluids		
Collapse	1.125	**3.75**	Lost Circulation		Mud		*None*		
Burst	1.125	**2.47**	Plug Bump		Green Cement + 2ksi surf pressure		Displacement Fluid/Mud		
Tension	1.4	**2.29**	100 klbs Overpull		Mud		Mud		

Buoyed Casing Weight: ***56,664 lbs (assuming 8.4 ppg fluid and 3,250’ TVD-worst case scenario)***

U. S. Steel Tubular Products

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MECHANICAL PROPERTIES	Pipe	BTC	LTC	STC	
Minimum Yield Strength	55,000	--	--	--	psi
Maximum Yield Strength	80,000	--	--	--	psi
Minimum Tensile Strength	75,000	--	--	--	psi
DIMENSIONS	**Pipe**	**BTC**	**LTC**	**STC**	
Outside Diameter	13.375	14.375	--	14.375	in.
Wall Thickness	0.380	--	--	--	in.
Inside Diameter	12.615	12.615	--	12.615	in.
Standard Drift	12.459	12.459	--	12.459	in.
Alternate Drift	--	--	--	--	in.
Nominal Linear Weight, T&C	54.50	--	--	--	lbs/ft
Plain End Weight	52.79	--	--	--	lbs/ft
PERFORMANCE	**Pipe**	**BTC**	**LTC**	**STC**	
Minimum Collapse Pressure	1,130	1,130	--	1,130	psi
Minimum Internal Yield Pressure	2,740	2,740	--	2,740	psi
Minimum Pipe Body Yield Strength	853,000.00	--	--	--	lbs
Joint Strength	--	909	--	514	1000 lbs
Reference Length	--	11,125	--	6,290	ft
MAKE-UP DATA	**Pipe**	**BTC**	**LTC**	**STC**	
Make-Up Loss	--	4.81	--	3.50	in.
Minimum Make-Up Torque	--	--	--	3,860	ft-lbs
Maximum Make-Up Torque	--	--	--	6,430	ft-lbs

U. S. Steel Tubular Products
10343 Sam Houston Park Dr., #120
Houston, TX 77064

1-877-893-9461
connections@uss.com
www.usstubular.com

Casing Design Criteria and Load Case Assumptions

1. Collapse: DF_C=1.125
    a. Full Internal Evacuation: Collapse force equal to the mud gradient in which the casing will be run (0.65 psi/ft). The effects of axial load on collapse will be considered.
    b. Cementing: Collapse force equal to the gradient of planned cement slurries to planned depths and minimum mud gradient in which the casing will be run above that (0.65 psi/ft) and an internal force equal to mud gradient of displacement fluid (0.43 psi/ft)
2. Burst: DF_B=1.125
    a. Pressure Test: psi casing test with an external force equal to the mud gradient in which the casing will be run (0.65 psi/ft), which is a more conservative backup force than pore pressure.
    b. Injection Down Casing: psi surface injection pressure plus an internal pressure gradient of 0.65 psi/ft with an external force equal to the mud gradient in which the casing will be run (0.65 psi/ft), which is a more conservative backup force than pore pressure.
3. Tensile: DF_T=1.4
    a. Overpull: An overpull force of 100,000 lbs is applied at the shoe along with the weight of the casing string utilizing the effects of buoyancy (8.5 ppg).

Surface Casing Program									
Casing Size (in)	**Weight (ppf)**	**Grade**	**Connection**	**ID**	**ID (drift)**	**Collapse (psi)**	**Burst (psi)**	**Tension (1,000 lbs)**	**Capacity (bbl/ft)**
13-3/8”	54.5	J-55	BTC	12.615	12.459	1,130	2,740	909	0.1545
Safety Factors									
	API Rec. SF	**ACTUAL SF**	Case		External Fluids		Internal Fluids		
Collapse	1.125	**3.30**	Lost Circulation		Mud		*None*		
Burst	1.125	**1.46**	Plug Bump		Green Cement + 2ksi surf pressure		Displacement Fluid/Mud		
Tension	1.4	**2.8**	100 klbs Overpull		Mud		Mud		

Buoyed Casing Weight: ***23,755 lbs (assuming 8.4 ppg fluid and 500’ casing-worst case scenario)***

Intermediate Casing Program									
Casing Size (in)	**Weight (ppf)**	**Grade**	**Connection**	**ID**	**ID (drift)**	**Collapse (psi)**	**Burst (psi)**	**Tension (1,000 lbs)**	**Capacity (bbl/ft)**
9-5/8”	36	J-55	BTC	8.921	8.765	2,020	3,520	639	0.0773
Safety Factors									
	API Rec. SF	**ACTUAL SF**	Case		External Fluids		Internal Fluids		
Collapse	1.125	**3.30**	Lost Circulation		Mud		*None*		
Burst	1.125	**1.46**	Plug Bump		Green Cement + 2ksi surf pressure		Displacement Fluid/Mud		
Tension	1.4	**2.8**	100 klbs Overpull		Mud		Mud		

Buoyed Casing Weight: ***40,798 lbs (assuming 8.4 ppg fluid and 1,300’ casing-worst case scenario)***

Production Casing Program									
Casing Size (in)	**Weight (ppf)**	**Grade**	**Connection**	**ID**	**ID (drift)**	**Collapse (psi)**	**Burst (psi)**	**Tension (1,000 lbs)**	**Capacity (bbl/ft)**
7”	32	L-80	GBCD	6.094	5.969	10,400	9,060	745	0.0361
Safety Factors									
	API Rec. SF	**ACTUAL SF**	Case		External Fluids		Internal Fluids		
Collapse	1.125	**3.75**	Lost Circulation		Mud		*None*		
Burst	1.125	**2.47**	Plug Bump		Green Cement + 2ksi surf pressure		Displacement Fluid/Mud		
Tension	1.4	**2.29**	100 klbs Overpull		Mud		Mud		

Buoyed Casing Weight: ***90,662 lbs (assuming 8.4 ppg fluid and 3,250’ TVD-worst case scenario)***

Production Casing Program									
Casing Size (in)	**Weight (ppf)**	**Grade**	**Connection**	**ID**	**ID (drift)**	**Collapse (psi)**	**Burst (psi)**	**Tension (1,000 lbs)**	**Capacity (bbl/ft)**
5-1/2”	20	L-80	GBCD	4.778	4.653	10,630	9,190	466	0.0222
Safety Factors									
	API Rec. SF	**ACTUAL SF**	Case		External Fluids		Internal Fluids		
Collapse	1.125	**3.75**	Lost Circulation		Mud		*None*		
Burst	1.125	**2.47**	Plug Bump		Green Cement + 2ksi surf pressure		Displacement Fluid/Mud		
Tension	1.4	**2.29**	100 klbs Overpull		Mud		Mud		

Buoyed Casing Weight: ***56,664 lbs (assuming 8.4 ppg fluid and 3,250’ TVD-worst case scenario)***

U. S. Steel Tubular Products

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MECHANICAL PROPERTIES	Pipe	BTC	LTC	STC	
Minimum Yield Strength	55,000	--	--	--	psi
Maximum Yield Strength	80,000	--	--	--	psi
Minimum Tensile Strength	75,000	--	--	--	psi
DIMENSIONS	**Pipe**	**BTC**	**LTC**	**STC**	
Outside Diameter	9.625	10.625	10.625	10.625	in.
Wall Thickness	0.352	--	--	--	in.
Inside Diameter	8.921	8.921	8.921	8.921	in.
Standard Drift	8.765	8.765	8.765	8.765	in.
Alternate Drift	--	--	--	--	in.
Nominal Linear Weight, T&C	36.00	--	--	--	lbs/ft
Plain End Weight	34.89	--	--	--	lbs/ft
PERFORMANCE	**Pipe**	**BTC**	**LTC**	**STC**	
Minimum Collapse Pressure	2,020	2,020	2,020	2,020	psi
Minimum Internal Yield Pressure	3,520	3,520	3,520	3,520	psi
Minimum Pipe Body Yield Strength	564,000	--	--	--	lbs
Joint Strength	--	639	453	394	lbs
Reference Length	--	11,835	8,389	7,288	ft
MAKE-UP DATA	**Pipe**	**BTC**	**LTC**	**STC**	
Make-Up Loss	--	4.81	4.75	3.38	in.
Minimum Make-Up Torque	--	--	3,400	2,960	ft-lbs
Maximum Make-Up Torque	--	--	5,660	4,930	ft-lbs

U. S. Steel Tubular Products
10343 Sam Houston Park Dr., #120
Houston, TX 77064

1-877-893-9461
connections@uss.com
www.usstubular.com

Permian Drilling
Hydrogen Sulfide Drilling Operations Plan
BLACK CHERRY FEDERAL COM 110H
DEVELOPMENT

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

1. Escape

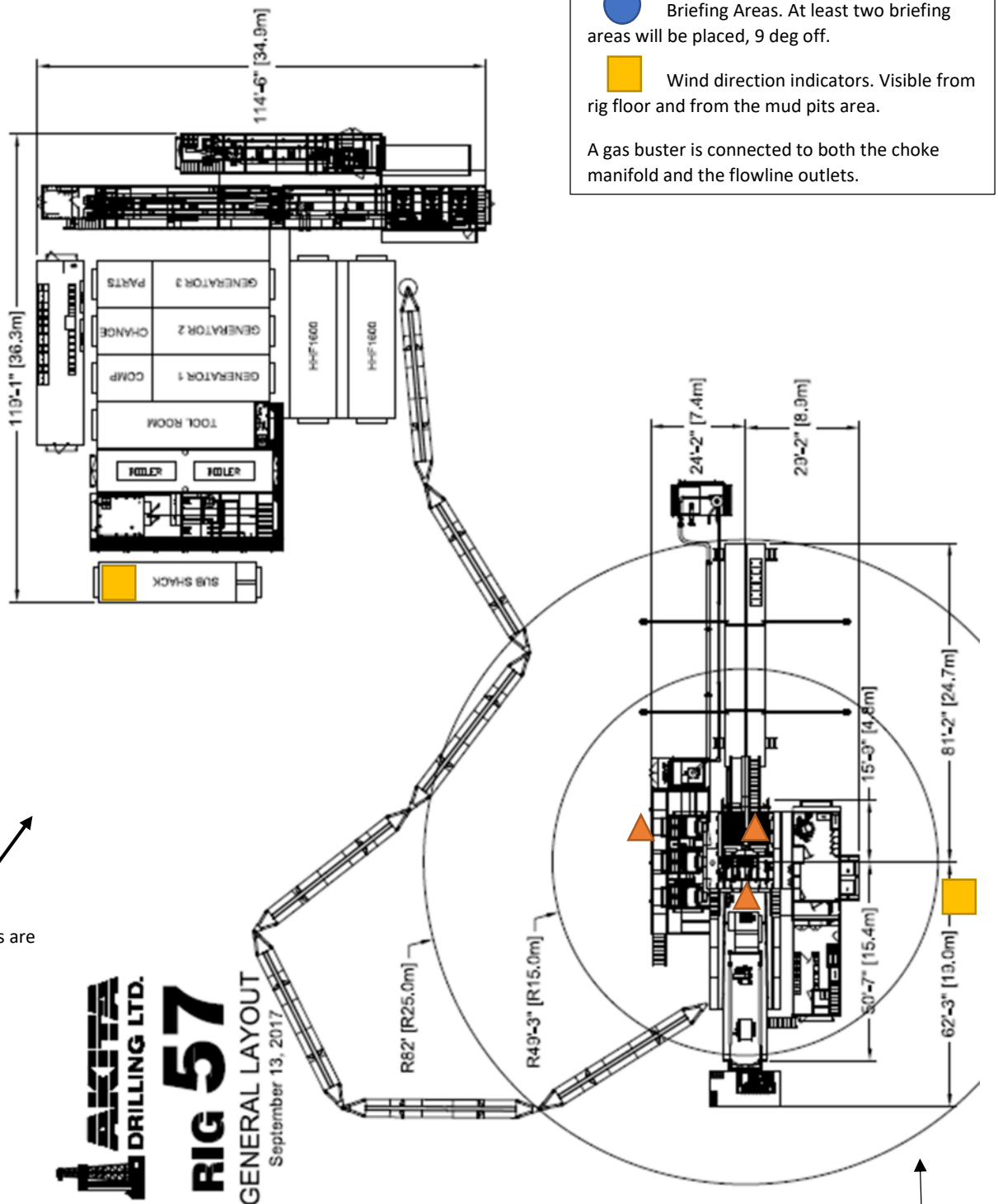
Personnel shall escape upwind of wellbore in the event of an emergency gas release. Escape can take place through the lease road on the Southeast side of the location. Personnel need to move to a safe distance and block the entrance to location. If the primary route is not an option due to the wind direction,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

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

Briefing Areas. At least two briefing areas will be placed, 9 deg off.

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

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



Wind: Prevailing winds are from the Southwest.

AKITA DRILLING LTD. RIG 57

GENERAL LAYOUT

September 13, 2017

N

Primary Briefing Area

Secondary Egress

Secondary Briefing Area

Exit to road. Caution sign placed here.

Spur Energy Partners
New Mexico Operations
Hydrogen Sulfide Operation Plan

A. Introduction:

The Safety of all personnel at Spur Energy Partners Facilities is of utmost importance to the company, and therefor management and employees must take responsibility for their safety and for the safety of all employees and others at a facility. If you have any concerns about the safe operations of the facility, contract personnel, or vendors, please contact the Company's Safety Contact, Superintendent, or Production Foreman immediately.

The objective of this contingency plan is to provide an organized plan of action for alerting, responding to and protecting employees, other workers and the public from H2S exposure in the event of a release of a potentially hazardous volume of H2S to the atmosphere. This plan should be activated immediately if any such release occurs. The Superintendent is responsible for initiating and carrying out the plan.

B. Scope:

Prevent the uncontrolled release of H_2S into the atmosphere. Provide proper procedures and equipment to alert and respond to emergencies.

Provide immediate and adequate medical attention should an injury occur.

To provide Company employees working at actual or potential Hydrogen Sulfide (H2S) facilities with a safe procedure to comply with applicable Federal, State and Company requirements.

This document is intended to provide general policy, procedures and expectations surrounding elevated levels of H2S. The intent is to promote sound and safe operations, while seeking effective communication surrounding operational considerations working around H2S.

This procedure applies to all Company employees and contractors working at facilities that have the potential to release 100 ppm or higher concentrations of H2S.

The plan establishes guidelines for all personnel whose work activity may involve exposure to Hydrogen Sulfide Gas (H_2S).

C. Hydrogen Sulfide Gas (H2S) Characteristics:

1. H2S is a toxic, poisonous gas that could cause death or injury. And it is also flammable.
2. H2S is an irritant and extremely toxic gas that is several times deadlier than carbon monoxide (CO).
3. H2S is heavier than air with a specific gravity of 1.1895 @ 600 F. so it will tend to lie in lower areas. Wind movement or air currents can readily disperse H2S since wind currents can easily overcome the heavier weight. On calm days, with no wind, the H2S will tend to accumulate in dangerous concentrations; however, if the H2S is warmer than the surrounding air it may rise.
4. H2S is colorless.
5. In small concentrations, H2S has the characteristic odor of rotten eggs. It may be detected by smell at a concentration in air of about 2 ppm but may NOT be detected

at high concentrations. DO NOT DEPEND ON THE SENSE OF SMELL TO DETECT H2S! H2S will paralyze the olfactory nerve causing a loss of the sense of smell within 2 – 15 minutes of an exposure in concentrations as low as 100-150 ppm.

6. H2S burns with a blue flame and has an auto ignition temperature of 5000 F. H2S forms an explosive mixture in the range of 4.3% to 45% by volume with air. H2S, when ignited, produces Sulfur Dioxide (SO2). SO2 is another toxic gas but less toxic than H2S.
7. Physiological Effects
    - 1,000-2,000+ ppm: Loss of consciousness and possible death.
    - 100-1,000 ppm: Serious respiratory, central nervous, and cardiovascular system effects.
    - 150-200 ppm: Olfactory fatigue (sense of smell is significantly impaired).
    - 100 ppm: Immediately Dangerous to Life and Health (IDLH concentration).
    - 5-30 ppm: Moderate irritation of the eyes.
    - 5-10 ppm: Relatively minor metabolic changes in exercising individuals during short-term exposures.
    - Less than 5 ppm: Metabolic changes observed in exercising individuals, but not clinically significant.
    - 5 ppm: Increase in anxiety symptoms (single exposure).
    - 5 ppm: Start of the dose-response curve (short-term exposure).
    - 0.032-0.02 ppm: Olfactory threshold (begin to smell).

D. H_2S Training

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

1. The hazards and characteristics of hydrogen sulfide (H2S)
2. The proper use and maintenance of personal protective equipment and life support systems.
3. The proper use of H_2S detectors, alarms, warning systems, briefing areas, evacuation procedures, and prevailing winds.
4. The proper techniques for first aid and rescue procedures.
5. The procedures for operating process equipment.

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

1. Corrective action and shutdown procedures when a release or leak occurs.
2. Notification process

Annual drills will be conducted to utilize the procedures and make improvements as needed. It will also serve as refresher training on the process.

Note: All H_2S safety equipment and systems will be installed, tested, and operational when operation commences.

E. Protective equipment controls:

Any facility that has the potential to emit H2S at 100 ppm or higher will be required to install and utilize the below controls:

1. Where applicable, area air monitors will be installed and function tested and calibrated no less than monthly and set on a quarterly basis PM schedule.
2. Facility operators will use self contained breathing apparatuses (SCBA's) to perform routine operations in areas where H2S may be present.
3. Trigger of 100 PPM or more must be communicated and work proceeding the trigger must use the buddy system.
4. Visible windsocks must be installed at key locations surrounding the facility.
5. H2S warning signs must be placed at the entrance to the facility as well as other key locations.
6. Personal H2S Monitor are required to be worn by all personnel on locations.
7. Stairs and ladders leading to the top of a tank or vessel containing 300 ppm or greater shall be chained or marked to restrict entry.

F. Emergency Procedures

1. Spill or Release of H_2S gas

If a spill or leak releases H_2S the following action must be initiated and completed:

a. Internally – Employee contacts supervisor and HSE Department and performs “d” below.

b. Externally - Someone identifies a possible H_2S emergency and reports it to Company Management, via the listed phone number on posted facility signs.

c. The Company dispatches an employee to investigate possible H_2S emergency and will secure situation or initiate emergency call for backup.

d. If the Radius of Exposure has been breached begin the following:

- Establish safe command center.
- Call for additional personnel and delegate the following:
  - i. Notifying public safety agencies (Sheriff, Fire Department, Department of Public Safety, Hwy. Department).
  - ii. Safeguarding the facility and effected area.
  - iii. Blocking roads as needed.
  - iv. Notifying/evacuating public.
  - v. Notifying regulatory agencies.
  - vi. Gathering additional information about release ie., location, flowrate, quantity, etc.
  - vii. Stopping release if safe to do so (use 2 trained persons)
  - viii. Notifying company management.
  - ix. Cleanup/repair facilities.

e. Facility Standard Operating Procedure

- Evacuate the area, travel crosswind then proceed upwind.
- Gather at muster point. Ensure Primary Muster point is upwind
- Notify managers & appropriate EMS if required.
- Safely shut down (ESD) facility if the facility hasn't already shut in.
- Pick up SCBA (should be a 30 minute - 1 hour pack, located at Muster point.)
- Use buddy system for man down scenario with rescuers assigned.
  - 1 person to mask up to operate facility controls as needed.
  - 1 person for rescue if needed.
  - 1 person for calling EMS and company management
- Investigate area and isolate release of gas if safe to do and ensure closure using 4 gas monitor.
- If venting gas can't be isolated, return to muster point, and re-evaluate path forward.
- Give detailed description where/how gas is being released.
- After isolation verify that area monitors return to 0 and are not in alarm.
- Resume normal operations, once managers agree the ROOT CAUSE has been addressed and corrected.

G. Contacting Authorities

Company personnel must liaison with local and state agencies to ensure a proper response to a major release. Additionally, the NM Emergency Response Commission 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. The following call list of essential and potential responders has been prepared for use during a release. Spur Energy Partners response must be in coordination with the State of New Mexico's 'Hazardous Materials Emergency Response Plan' (HMER).

H. Call List

Spur Energy Partners Emergency Contact List			
Person	**Location**	**Office Phone**	**Cell Phone**
Drilling and Completions Department			
Drilling Manager - Chris Hollis	Houston	832-930-8629	713-380-7754
Completions Manager - Theresa Voss	Houston	832-930-8614	832-849-8635
VP of Operations - Seth Ireland	Houston	832-930-8527	940-704-6375
Senior VP of Operations - John Nabors	Houston	832-930-8526	281-904-8811
Executive VP of Operations - Todd Mucha	Houston	832-930-8515	281-795-2286
HES/Environmental and Regulatory Department			
EHS Manager - Braidy Moulder	Artesia	575-616-5400	713-264-2517
Superintendent - Jerry Mathews	Artesia	575-616-5400	575-748-5234
Asst. Superintendent - Kenny Kidd	Artesia	575-616-5400	575-703-5851
Regulatory Director - Sarah Chapman	Houston	832-930-8613	281-642-5503
Regulatory Agencies			
Bureau of Land Management	Carlsbad	575-886-6544	
Bureau of Land Management	Hobbs	575-393-3612	
Bureau of Land Management	Roswell	575-622-5335	
Bureau of Land Management	Santa Fe	505-954-2000	
DOT Judicial Pipelines - Incident Reporting NM Public Regulation Commission	Santa Fe	505-827-3549 505-490-2375	
EPA Hotline	Dallas	214-665-6444	
Federal OSHA, Area Office	Lubbock	806-472-7681	
National Response Center	Washington, D.C.	800-424-8803	
National Infrastructure Coordinator Center	Washington, D.C.	202-282-2901	
New Mexico Air Quality Bureau	Santa Fe	505-827-1494	
New Mexico Oil Conservation Division	Artesia	575-748-1283 575-370-7545After	
New Mexico Oil Conservation Division	Hobbs	575-393-6161	
New Mexico Oil Conservation Division	Santa Fe	505-476-3770	
New Mexico OCD Environmental Bureau	Santa Fe	505-827-7152 505-476-3470	
New Mexico Environmental Department	Hobbs	575-827-9329	
NM State Emergency Response Center	Santa Fe	505-476-9600	

Medical Facilities		
Artesia General Hospital	Artesia	575-748-3333
Covenant Medical Center	Lubbock	806-725-1011
Covenant Medical Center Lakeside	Lubbock	806-725-6000
Guadalupe County Hospital	Carlsbad	575-887-6633
Lea Regional Hospital	Hobbs	575-492-5000
Medical Center Hospital	Odessa	432-640-4000
Midland Memorial Hospital	Midland	432-685-1111
Nor-Lea General Hospital	Lovington	575-396-6611
Odessa Regional Hospital	Odessa	432-334-8200
Union County General Hospital	Clayton	575-374-2585
University Medical Center	Lubbock	806-725-8200
Law Enforcement - Sheriff		
Ector County Sheriff's Department	Odessa	432-335-3050
Ector County Sheriff's Department	Artesia	575-746-2704
Ector County Sheriff's Department	Carlsbad	575-887-7551
Lea County Sherrif's Department	Eunice	575-384-2020
Lea County Sherrif's Department	Hobbs	575-393-2515
Lea County Sherrif's Department	Lovington	575-396-3611
Lubbock County Sheriff's Department	Abernathy	806-296-2724
Midland County Sheriff's Department	Midland	432-688-1277
Union County Sheriff's Department	Clayton	575-374-2583
Law Enforcement - Police		
Abernathy Police Department	Abernathy	806-298-2545
Artesia City Police	Artesia	575-746-2704
Carlsbad City Police	Carlsbad	575-885-2111
Clayton City Police	Clayton	575-374-2504
Eunice City Police	Eunice	575-394-2112
Hobbs City Police	Hobbs	575-397-9265 575-393-2677
Jal City Police	Jal	575-395-2501
Lovington City Police	Lovington	575-396-2811

Midland City Police	Midland	432-685-7113
Odessa City Police	Odessa	432-335-3378
Law Enforcement - FBI		
FBI	Albuquerque	505-224-2000
FBI	Midland	432-570-0255
Law Enforcement - DPS (911)		
NM State Police	Artesia	575-746-2704
NM State Police	Carlsbad	575-885-3137
NM State Police	Eunice	575-392-5588
NM State Police	Hobbs	575-392-5588
NM State Police	Clayton	575-374-2473
Firefighting and Rescue (911)		
Abernathy	Abernathy	806-298-2022
Amistad/Rosebud	Amistad/Rosebud	575-633-9113
Artesia	Artesia	575-746-5751
Carlsbad	Carlsbad	575-885-3125
Clayton	Clayton	575-374-2435
Eunice	Eunice	575-394-2111
Hobbs	Hobbs	575-397-9308
Jal	Jal	575-395-2221
Lovington	Lovington	575-396-2359
Maljamar	Maljamar	575-676-4100
Midland	Midland	432-685-7346
Nara Visa	Nara Visa	575-461-3300
Odessa	Odessa	432-335-4659
Tucumcari	Tucumcari	911
West Odessa	Odessa	432-381-3033

Ambulance (911)		
Abernathy Ambulance	Abernathy	806-298-2241
Amistad/Rosebud	Amistad/Rosebud	575-633-9113
Artesia Ambulance	Artesia	575-746-2701
Carlsbad Ambulance	Carlsbad	575-885-2111
Clayton Ambulance	Clayton	575-374-2501
Eunice Ambulance	Eunice	575-394-3258
Hobbs Ambulance	Hobbs	575-397-9308
Jal Ambulance	Jal	575-395-3501
Lovington Ambulance	Lovington	575-396-2811
Midland Ambulance	Midland	432-685-7499
Nara Visa Ambulance	Nara Visa	575-461-3300
Odessa Ambulance	Odessa	432-335-3378
Tucumcari Ambulance	Tucumcari	911
Medical Air Ambulance Service		
AEROCARE - Methodist Hospital	Lubbock	800-627-2376
Southwest MediVac	Hobbs	800-242-6199
Odessa Care Star	Odessa	888-624-3571

I. List of Facilities with the potential for 500ppm or higher H2S exposure.

ATTACHMENT 1: SPUR FACILITIES WITH ROE REVIEW

ALASKA 29 FEE TANK BATTERY
ARABIAN 6 FEE TANK BATTERY
ARCO 26 A STATE OIL BATTERY
ARCO B FEDERAL COM NO. 001
ARKANSAS STATE 23 TANK BATTERY
AVALON FEDERAL #001
B&B/ROSS RANCH OIL TANK BATTERY
BC FEDERAL 10 (9-13) TNK BTY
BC FEDERAL 1-8 &14 TNK BTY
BC FEDERAL 42 TNK BTY
BEE FED OIL BATTERY
BEECH 25 FEDERAL #9H BATTERY
BEECH FEDERAL 1
BEECH FEDERAL 2 BATTERY
BERRY A FEDERAL #005 SWB
BERRY A FEDERAL PADD BATTERY
BIG BOY STATE TB
BLUETAIL 8 FEDERAL 2 TANK BATTERY
BONE YARD 11 FEE TANK BATTERY
BOOT HILL 25 1H SWB
BOSE IKARD 4 ST COM 18H BATTERY
BRANTLEY FEDERAL #001
BR-549 STATE BATTERY
BRADLEY 8 FEE #3H-BATTERY
BRADLEY 8 FEE BATTERY
BRAGG 10 FEE 1 BATTERY
BRIGHAM H 2
BRIGHAM H FED (NORTH) BATTERY
BURCH KEELY 13C TK BTY
BURCH KEELY 18A TK BATT
BURCH KEELY 19A OIL BATT
BURCH KEELY 23A TK BATT
BURCH KEELY EAST 18B TANK BAT
BURCH KEELY SEC 13A NORTH BTTY
BURCH KEELY SEC 13B SOUTH BTTY
BURCH KEELY UNIT CTB BTTY
BURCH KEELY UNIT E BATTERY
BURKETT 16 STATE
CADDO FEDERAL BATTERY
CADILLAC ST 4 BATTERY
CALIFORNIA 29 FEE 1
CARMEN 3 FEDERAL BATTERY
CARRINGTON 12 ST 3,4,7 BATTERY
CHASER 8 STATE 2 TANK BATTERY
CHEYENNE FEDERAL TNK BTY
CLYDESDALE 1 FEE #1H BAT
CLYDESDALE 1 FEE 6H - BATTERY
COAL TRAIN FEDERAL COM #1
COFFIN STATE #1
COLLIER 22 STATE COM #43H
COLLIER STATE OIL BATTERY
CONOCO 8 STATE 4 TB
CONTINENTAL A STATE TNK BTY
CONTINENTAL B YESO TANK BTY
CONTINENTAL STATE 15A TNK BTY
CRYPT 30 STATE #1H
DAGGER DRAW FED/FOSTER FED TANK BATTERY
DARNER 9 STATE 1 TANK BATTERY
DARNER 9 STATE 2
DARTER 9 STATE 8 TANK BATTERY
DARNER 9 STATE CTB
DEXTER FEDERAL PAD TNK BTY
DODD 10A OIL BATTERY
DODD 10B TK BTTY
DODD FED #14C TK BATT
DODD FED 11A BATTERY
DODD FED UNIT 980H BATTERY
DODD FEDERAL 14A-TB
DODD FEDERAL UNIT 15A BTTY
DODD FEDERAL UNIT NORTH BTTY
DODD FEDERAL UNIT SOUTH BTTY
DOGWOOD FEDERAL TNK BTY
DORAMI 33 FEDERAL COM 2H.4H.9H TANK BATTERY
EBONY STATE TB
EDWARD STATE TNK BTY
ELECTRA FEDERAL 33 (NORTH) BATTERY
ELECTRA FEDERAL 5 (SWEET) TNK BTY
ELECTRA FEDERAL SOUR TNK BTY
EMPIRE SOUTH DEEP UNIT 21
FALABELLA 31 FEE #1H TK BATT
FALABELLA 31 FEE 8H TK BTY
FAT TIRE 12 COM FEDERAL CTB
FEDERAL BA COM NO. 001
FEDERAL BB NO. 001
FLAT HEAD FED COM 6H TANK BATTERY
FLAT HEAD FED COM 27H TANK BATTERY

ATTACHMENT 1: SPUR FACILITIES WITH ROE REVIEW

FIR FEDERAL TNK BTY
FIRECRACKER STATE TB
FLEMMING STATE OIL BATTERY
FOLK FEDERAL B TNK BTY
FOLK FEDERAL TNK BTY
FOLK STATE TANK BATTERY
FORAN STATE OIL BATTERY
GC FEDERAL 11 TNK BTY
GC FEDERAL 27 TNK BTY
GC FEDERAL TNK BTY
GILLESPIE STATE OIL BATTERY
GISSLER FEDERAL 13H TANK BATT
GJ WEST COOP SOUTH TB
GJ WEST COOP UNIT 092 BTY
GJ WEST COOP UNIT 191 BTY
GJ WEST COOP UNIT 210 BTY
GJ WEST COOP UNIT CENTRAL
GJ WEST COOP UNIT N TNK BTY
GOLD STAR TNK BTY
GOODMAN 22 TANK BATTERY
GRAVE DIGGER FEDERAL COM TANK BATTERY
GRAVE DIGGER ST COM #3H TANK BATTERY
GRAVE DIGGER STATE COM #8H SWB
HALBERD 27 ST 3H BATTERY
HANOVER STATE #3 (YESO)
HARPER STATE TNK BTY
HARVARD FEDERAL TNK BTY
HATFIELD B TB
HEARSE 36 ST COM TANK BATTERY
HOBGOBLIN 7 FED COM 4H TK BAT
HOLDER CB 11 TNK BTY
HOLDER CB FEDERAL 6&7 TNK BTY
HOLIDAY
HOUMA STATE TNK BTY
HT 18 FED 01.05.04 TANK BATTERY
HT 18 FEDERAL 8
HUBER 10,11,12 FEDERAL OIL TANK BATTERY
HUBER 3 FEDERAL OIL TANK BATTERY
HUBER 5 FEDERAL OIL TANK BATTERY
HYDRUS 10 FED 03.07.08.11 TANK BATTERY
HYDRUS 10 FED 04.05 TANK BATTERY
HYDRUS 10 FED 06.09.10.12 TANK BATTERY
IMPERIAL STATE TNK BTY
IVAR THE BONELESS FED 11H - BATTERY
JC FEDERAL 13 TNK BTY
JC FEDERAL 2 (SOUR) TNK BTY
JC FEDERAL 27 TNK BTY
JENKINS B FEDERAL TNK BTY
JG STATE 16 1 TANK BATTERY
JG STATE 16 7 TANK BATTERY
JON BOB 1
JUNIPER STATE TNK BTY
KIOWA OIL BATTERY
KOOL AID STATE
LAKEWOOD NORTH TANK BATTERY
LAKEWOOD SOUTH TANK BATTERY
LARA MICHELLE STATE OIL BTTY
LEAKER CC STATE TB
LEE 3 FEE 6H - TK BATT
LIVE OAK TANK BATTERY
MALCO 23 FEDERAL COM #13H
MAPLE STATE
MARACAS 22 STATE TANK BATTERY
MARY FEDERAL OIL BATTERY
MAYARO 22 STATE TANK BATTERY
MC FEDERAL 14 TANK BATTERY
MC FEDERAL 6 DEVONIAN
MC FEDERAL PADDOCK TNK BTY
MC SOUTHEAST BATTERY
MC STATE OIL BATTERY
MCCOY STATE TB
MCINTYRE A EAST TANK BATTERY
MCINTYRE B 10
MCINTYRE B 4
MCINTYRE B TNK BTY
MCINTYRE DK 15 TNK BTY
MCINTYRE DK FEDERAL 28H SWB
MEADOWHAWK 5 FEDERAL 3
MELROSE FEDERAL TNK BTY
MERAK 7 FEDERAL 8 TANK BATTERY
MESILLA STATE 3 & 5 TNK BTY
MESILLA STATE TNK BTY
MESQUITE STATE TANK BATTERY
MIMOSA STATE TNK BTY
MIRANDA FEDERAL B TNK BTY
MIRANDA FEDERAL TB

ATTACHMENT 1: SPUR FACILITIES WITH ROE REVIEW

MOE FEDERAL OIL BATTERY
MOHAWK FEDERAL TNK BTY
MONCRIEF 3 OIL BATTERY
MOORE STATE OIL BATTERY
MORRIS BOYD 26 FEE COM 1H
MORRIS BOYD TANK BATTERY
MORRIS E & F TANK BATTERY
MUSKEGON SOUTH STATE OIL BATTERY
NAVAHO FEDERAL TNK BTY
NELSON 13.23. TNK BATT
NEWCASTLE 6 FED COM - TANK BATTERY
NIRVANA TANK BATTERY
NOOSE FED 10 TANK BATTERY
NOOSE FED 5 TANK BATTERY
OKLAHOMA 32 TANK BATTERY
OSAGE BOYD 15 FED 09.12.13.14 TANK BATTERY
OSAGE BOYD YESO TANK BATTERY
PAINT 32 FEE OIL BATTERY
PAN CANADIAN A2-B3 TANK BATTERY
PASSION 1 FED PDK 5H TK BATT
PATTON 5 FEE 2H OIL BATTERY
PATTON 5 FEE 8H OIL BATTERY
PAWNEE STATE TNK BTY
PEACEMAKER 25 FEDERAL TANK BATTERY
PERE MARQUETTE 18 FEDERAL 1 TANK BATTERY
PILUM 15 FEE 2H BATTERY
PINTO 36 STATE COM 1H TNK BTY
PINTO 36 STATE COM 4H TNK BTY
PINTO 36 STATE TB
POLARIS B 5-10 TANK BTTY
POSEIDON 3 FEDERAL 4 TANK BATTERY
POSEIDON 3 FEDERAL 05.07.17.18 TANK BATTERY
PUCKETT 13 FEDERAL COM 35H
PUCKETT 13 FEDERAL TB
RAGNAR FED COM 25H - BATTERY
RANDALL FED 3 BATTERY
RED LAKE 32 TANK BATTERY
REDBUD FEDERAL TNK BTY
RINCON STATE TANK BATTERY
RJ UNIT NORTH TANK BATTERY
RJ UNIT SOUTH TANK BATTERY
RONCO FEDERAL #1
ROSE 02.03.04.05.06 TANK BATTERY
ROSE SOUTH TANK BATTERY
ROSS RANCH 09.13.14 BATTERY
SAM ADAMS 12 FED 4H UBB TK BATT
SANDY CROSSING 32 STATE COM 1
SCHLEY FEDERAL TNK BTY
SHAWNEE FEDERAL TNK BTY
SHELBY 23 BATTERY
SHERMAN 4 FEE 4H BATTERY
SHERMAN 4 FEE 6H BATTERY
SHORTY 2 STATE COM TANK BATTERY
SINCLAIR PARKE (PADDOCK) TNK BTY
SKELLY 605 BATTERY
SKELLY 942 BATTERY
SKELLY 968 BATTERY
SKELLY 973 BATTERY
SKELLY 989 BATTERY
SKELLY UNIT 907 CTB BATTERY
SKELLY UNIT 940 BATTERY
SOUTH BOYD FED COM OIL TANK BATTERY
SOUTH EMPIRE STATE COM 1
SPIKETAIL 5 STATE 2 TANK BATTERY
SPRUCE FEDERAL TNK BTY
STATE B GAS COM NO. 001
STATE S-19 YESO (SOUR) TNK BTY
STONEWALL 9 FEE #1H TBAT
STONEWALL 9 FEE 8H BATTERY
SUBMARINE 10 FED COM 2H OIL BAT
TAYLOR D TANK BATTEY
TENNECO STATE TNK BTY
TEX MACK FED
TEXACO BE TNK BTY
TEXAS 32 FEE TANK BATTERY
TEXMACK 36 STATE COM #1
TH STATE #1
THO STATE OIL BATTRY
THORNTAIL 31 FEDERAL 1
THUNDER ROAD FEDERAL OIL BTTY
TUMAK FED 3 BAT
VEGA 9 FED TANK BATTERY
VT 36 STATE #1H
W D MCINTYRE C 10
WAUKEE 36 STATE COME CTB
WD MCINTYRE C 8-9 TNK BTY

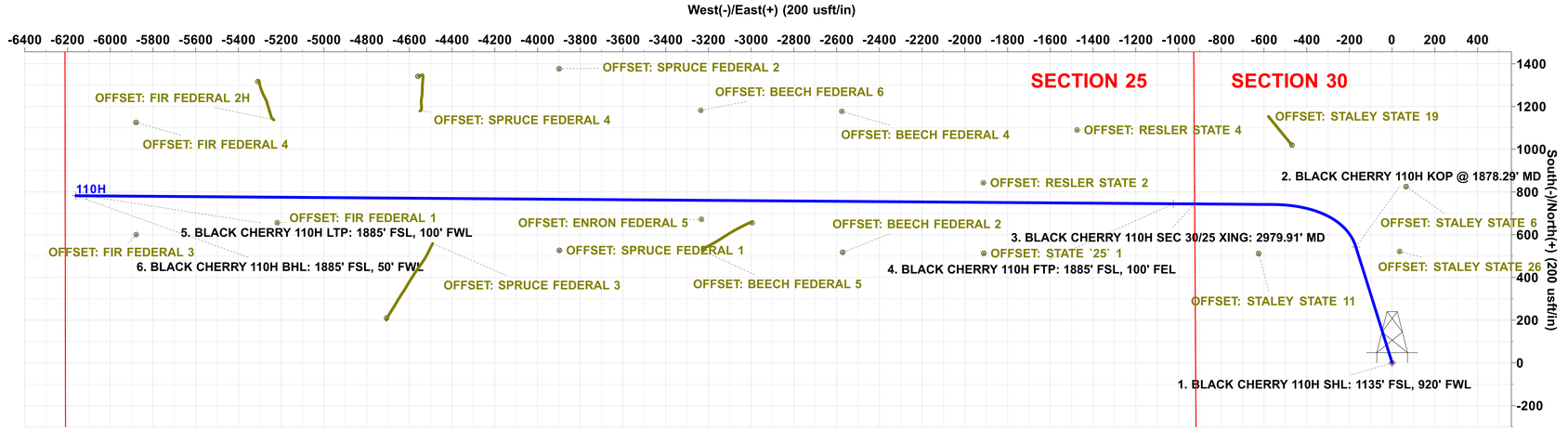
ATTACHMENT 1: SPUR FACILITIES WITH ROE REVIEW

WD MCINTYRE E TNK BTY
WELCH A 28 10.20.50 CTB
WESTERN FEDERAL TNK BTY
WHITE OAK STATE B TB
WHITE OAK STATE TNK BTY
WHITE STAR FEDERAL TNK BTY
WICHITA STATE TNK BTY
WILLOW STATE TNK BTY
YALE B OIL BATTERY
YALE STATE TANK BTY
YUCCA STATE TNK BTY

Project: EDDY COUNTY, NM (NAD 83 - NME)
Site: BLACK CHERRY FEDERAL COM
Well: 110H
Wellbore: OH
Design: PERMIT

PROJECT DETAILS: EDDY COUNTY, NM (NAD 83 - NME)

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



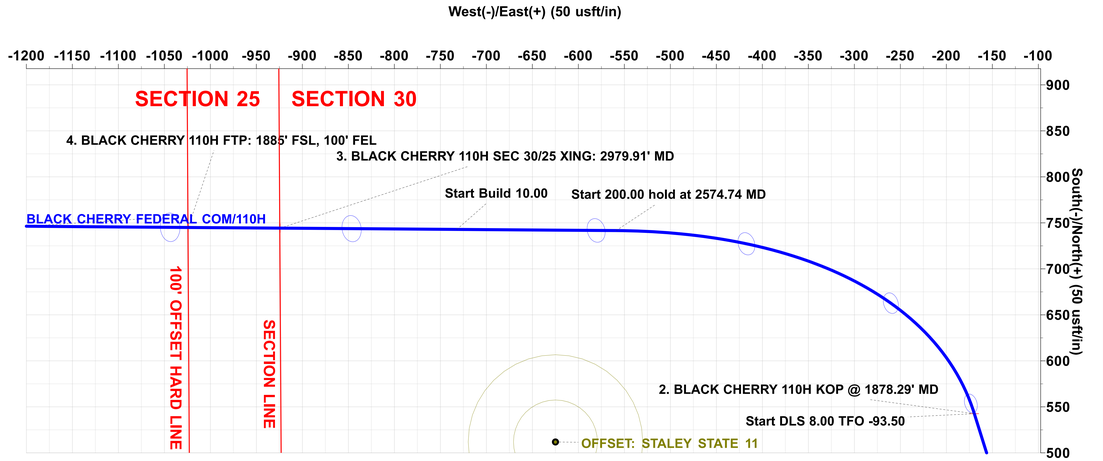
WELL DETAILS: 110H

Rig Name: AKITA 57 RKB = 20' @ 3626.00usft (AKITA 57)
Ground Elevation: 3606.00

+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
0.00	0.00	655123.60	575971.60	32.80091	-104.22062

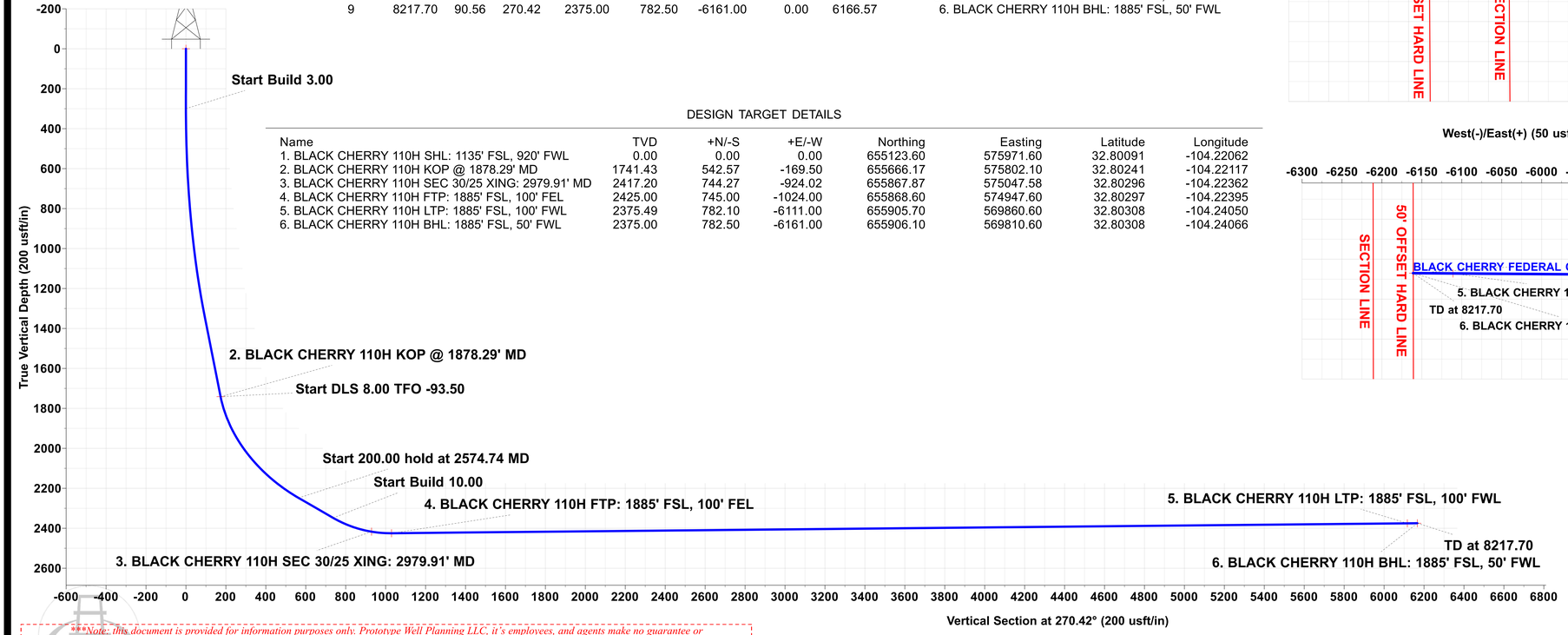
SECTION DETAILS

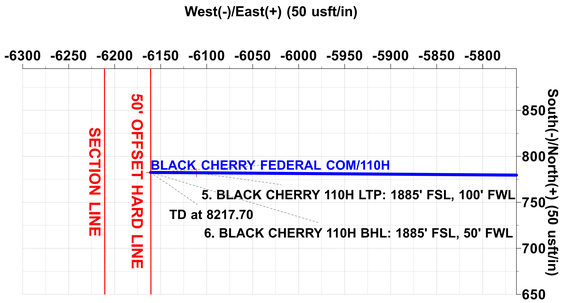
Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	VSect	Target
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
2	300.00	0.00	0.00	300.00	0.00	0.00	0.00	0.00	
3	1399.11	32.97	342.65	1339.44	293.64	-91.74	3.00	93.89	
4	1878.29	32.97	342.65	1741.43	542.57	-169.50	0.00	173.48	
5	2574.74	60.00	270.42	2248.27	741.60	-558.75	8.00	564.17	
6	2774.74	60.00	270.42	2348.27	742.87	-731.95	0.00	737.38	
7	3080.32	90.56	270.42	2425.00	745.00	-1024.00	10.00	1029.43	4. BLACK CHERRY 110H FTP: 1885' FSL, 100' FEL
8	8167.70	90.56	270.42	2375.49	782.13	-6111.00	0.00	6116.57	5. BLACK CHERRY 110H LTP: 1885' FSL, 100' FWL
9	8217.70	90.56	270.42	2375.00	782.50	-6161.00	0.00	6166.57	6. BLACK CHERRY 110H BHL: 1885' FSL, 50' FWL

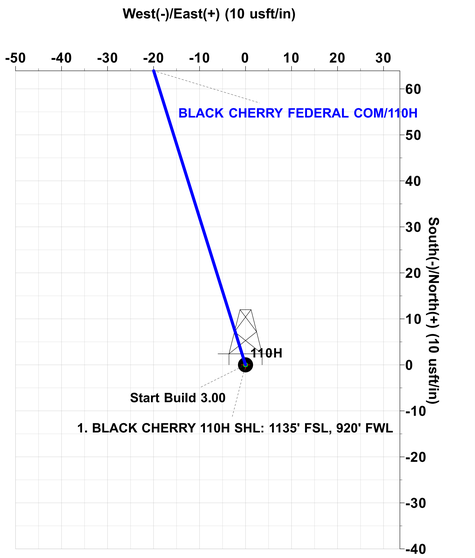


DESIGN TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
1. BLACK CHERRY 110H SHL: 1135' FSL, 920' FWL	0.00	0.00	0.00	655123.60	575971.60	32.80091	-104.22062
2. BLACK CHERRY 110H KOP @ 1878.29' MD	1741.43	542.57	-169.50	655666.17	575802.10	32.80241	-104.22117
3. BLACK CHERRY 110H SEC 30/25 XING: 2979.91' MD	2417.20	744.27	-924.02	655867.87	575047.58	32.80296	-104.22362
4. BLACK CHERRY 110H FTP: 1885' FSL, 100' FEL	2425.00	745.00	-1024.00	655868.60	574947.60	32.80297	-104.22395
5. BLACK CHERRY 110H LTP: 1885' FSL, 100' FWL	2375.49	782.10	-6111.00	655905.70	569860.60	32.80308	-104.24050
6. BLACK CHERRY 110H BHL: 1885' FSL, 50' FWL	2375.00	782.50	-6161.00	655906.10	569810.60	32.80308	-104.24066







Plan: PERMIT (110H/OH)

Created By: PROTOTYPE WELL PLANNING Date: 5:33, December 29 20

SPUR ENERGY PARTNERS, LLC

EDDY COUNTY, NM (NAD 83 - NME)
BLACK CHERRY FEDERAL COM
110H

OH

Plan: PERMIT

Standard Planning Report

29 December, 2025

PROTOTYPE WELL PLANNING
WELL PLANNED. WELL EXECUTED.

SPUR ENERGY PARTNERS

PROTOTYPE
Planning Report

PROTOTYPE WELL PLANNING
WELL PLANNED. WELL EXECUTED.

Database:	EDM 5000.17 Single User Db	**Local Co-ordinate Reference:**	Well 110H
Company:	SPUR ENERGY PARTNERS, LLC	**TVD Reference:**	RKB = 20' @ 3626.00usft (AKITA 57)
Project:	EDDY COUNTY, NM (NAD 83 - NME)	**MD Reference:**	RKB = 20' @ 3626.00usft (AKITA 57)
Site:	BLACK CHERRY FEDERAL COM	**North Reference:**	Grid
Well:	110H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	OH		
Design:	PERMIT		

Project	EDDY COUNTY, NM (NAD 83 - NME)		
Map System:	US State Plane 1983	**System Datum:**	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	New Mexico Eastern Zone		

Well	110H				
Well Position	**+N/-S**	0.00 usft	**Northing:**	655,123.60 usft	**Latitude:** 32.80092
	+E/-W	0.00 usft	**Easting:**	575,971.60 usft	**Longitude:** -104.22062
Position Uncertainty		0.00 usft	**Wellhead Elevation:**	usft	**Ground Level:** 3,606.00 usft
Grid Convergence:		0.06 °			

Design	PERMIT			
Audit Notes:				
Version:	**Phase:**	PLAN	**Tie On Depth:**	0.00

Vertical Section:	**Depth From (TVD) (usft)**	**+N/-S (usft)**	**+E/-W (usft)**	**Direction (°)**
	0.00	0.00	0.00	270.42

Plan Survey Tool Program **Date** 12/22/2025

	Depth From (usft)	Depth To (usft)	Survey (Wellbore)	Tool Name	Remarks
1	0.00	8,217.70	PERMIT (OH)	MWD+IFR1+MS	
				OWSG MWD + IFR1 + Mult	

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	
300.00	0.00	0.00	300.00	0.00	0.00	0.00	0.00	0.00	0.00	
1,399.11	32.97	342.65	1,339.44	293.64	-91.74	3.00	3.00	0.00	342.65	
1,878.29	32.97	342.65	1,741.43	542.57	-169.50	0.00	0.00	0.00	0.00	
2,574.74	60.00	270.42	2,248.27	741.60	-558.75	8.00	3.88	-10.37	-93.50	
2,774.74	60.00	270.42	2,348.27	742.87	-731.95	0.00	0.00	0.00	0.00	
3,080.32	90.56	270.42	2,425.00	745.00	-1,024.00	10.00	10.00	0.00	0.00	4. BLACK CHERRY
8,167.70	90.56	270.42	2,375.49	782.14	-6,111.00	0.00	0.00	0.00	0.00	5. BLACK CHERRY
8,217.70	90.56	270.42	2,375.00	782.50	-6,161.00	0.00	0.00	0.00	0.00	6. BLACK CHERRY

SPUR ENERGY PARTNERS

PROTOTYPE
Planning Report

PROTOTYPE WELL PLANNING
WELL PLANNED. WELL EXECUTED.

Database:	EDM 5000.17 Single User Db	**Local Co-ordinate Reference:**	Well 110H
Company:	SPUR ENERGY PARTNERS, LLC	**TVD Reference:**	RKB = 20' @ 3626.00usft (AKITA 57)
Project:	EDDY COUNTY, NM (NAD 83 - NME)	**MD Reference:**	RKB = 20' @ 3626.00usft (AKITA 57)
Site:	BLACK CHERRY FEDERAL COM	**North Reference:**	Grid
Well:	110H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	OH		
Design:	PERMIT		

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
1. BLACK CHERRY 110H SHL: 1135' FSL, 920' FWL									
100.00	0.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00
200.00	0.00	0.00	200.00	0.00	0.00	0.00	0.00	0.00	0.00
300.00	0.00	0.00	300.00	0.00	0.00	0.00	0.00	0.00	0.00
400.00	3.00	342.65	399.95	2.50	-0.78	0.80	3.00	3.00	0.00
500.00	6.00	342.65	499.63	9.99	-3.12	3.19	3.00	3.00	0.00
600.00	9.00	342.65	598.77	22.44	-7.01	7.18	3.00	3.00	0.00
700.00	12.00	342.65	697.08	39.84	-12.45	12.74	3.00	3.00	0.00
800.00	15.00	342.65	794.31	62.12	-19.41	19.86	3.00	3.00	0.00
900.00	18.00	342.65	890.18	89.22	-27.87	28.53	3.00	3.00	0.00
1,000.00	21.00	342.65	984.43	121.08	-37.83	38.71	3.00	3.00	0.00
1,100.00	24.00	342.65	1,076.81	157.60	-49.24	50.39	3.00	3.00	0.00
1,200.00	27.00	342.65	1,167.06	198.69	-62.07	63.53	3.00	3.00	0.00
1,300.00	30.00	342.65	1,254.93	244.23	-76.30	78.09	3.00	3.00	0.00
1,399.11	32.97	342.65	1,339.44	293.64	-91.74	93.89	3.00	3.00	0.00
1,500.00	32.97	342.65	1,424.08	346.05	-108.11	110.64	0.00	0.00	0.00
1,600.00	32.97	342.65	1,507.97	398.00	-124.34	127.25	0.00	0.00	0.00
1,700.00	32.97	342.65	1,591.86	449.94	-140.57	143.86	0.00	0.00	0.00
1,800.00	32.97	342.65	1,675.75	501.89	-156.80	160.47	0.00	0.00	0.00
1,878.29	32.97	342.65	1,741.43	542.57	-169.50	173.48	0.00	0.00	0.00
2. BLACK CHERRY 110H KOP @ 1878.29' MD									
1,900.00	32.91	339.46	1,759.65	553.73	-173.34	177.39	8.00	-0.30	-14.70
1,950.00	33.07	332.11	1,801.61	578.51	-184.49	188.72	8.00	0.32	-14.69
2,000.00	33.65	324.91	1,843.39	601.91	-198.83	203.24	8.00	1.16	-14.40
2,050.00	34.63	318.00	1,884.79	623.82	-216.31	220.88	8.00	1.97	-13.82
2,100.00	35.99	311.49	1,925.60	644.11	-236.83	241.54	8.00	2.71	-13.03
2,150.00	37.67	305.43	1,965.64	662.71	-260.29	265.14	8.00	3.36	-12.12
2,200.00	39.64	299.85	2,004.70	679.51	-286.58	291.55	8.00	3.94	-11.16
2,250.00	41.85	294.74	2,042.59	694.43	-315.57	320.65	8.00	4.43	-10.22
2,300.00	44.27	290.07	2,079.13	707.41	-347.12	352.30	8.00	4.84	-9.34
2,350.00	46.86	285.81	2,114.14	718.37	-381.08	386.34	8.00	5.19	-8.53
2,400.00	49.60	281.90	2,147.45	727.26	-417.28	422.60	8.00	5.48	-7.82
2,450.00	52.46	278.30	2,178.90	734.05	-455.54	460.91	8.00	5.72	-7.20
2,500.00	55.42	274.97	2,208.33	738.70	-495.68	501.08	8.00	5.92	-6.66
2,550.00	58.47	271.87	2,235.61	741.18	-537.50	542.91	8.00	6.09	-6.19
2,574.74	60.00	270.42	2,248.27	741.60	-558.75	564.17	8.00	6.20	-5.89
2,600.00	60.00	270.42	2,260.89	741.76	-580.62	586.05	0.00	0.00	0.00
2,700.00	60.00	270.42	2,310.89	742.40	-667.22	672.65	0.00	0.00	0.00
2,774.74	60.00	270.42	2,348.27	742.87	-731.95	737.38	0.00	0.00	0.00
2,800.00	62.53	270.42	2,360.41	743.03	-754.10	759.52	10.00	10.00	0.00
2,850.00	67.53	270.42	2,381.51	743.36	-799.40	804.83	10.00	10.00	0.00
2,900.00	72.53	270.42	2,398.59	743.70	-846.38	851.81	10.00	10.00	0.00
2,950.00	77.53	270.42	2,411.50	744.06	-894.67	900.10	10.00	10.00	0.00
2,979.91	80.52	270.42	2,417.20	744.27	-924.02	929.45	10.00	10.00	0.00
3. BLACK CHERRY 110H SEC 30/25 XING: 2979.91' MD									
3,000.00	82.53	270.42	2,420.16	744.42	-943.89	949.32	10.00	10.00	0.00
3,050.00	87.53	270.42	2,424.49	744.78	-993.69	999.12	10.00	10.00	0.00
3,080.32	90.56	270.42	2,425.00	745.00	-1,024.00	1,029.43	10.00	10.00	0.00
4. BLACK CHERRY 110H FTP: 1885' FSL, 100' FEL									
3,100.00	90.56	270.42	2,424.81	745.14	-1,043.68	1,049.11	0.00	0.00	0.00
3,200.00	90.56	270.42	2,423.84	745.87	-1,143.67	1,149.11	0.00	0.00	0.00
3,300.00	90.56	270.42	2,422.86	746.60	-1,243.66	1,249.10	0.00	0.00	0.00
3,400.00	90.56	270.42	2,421.89	747.33	-1,343.66	1,349.10	0.00	0.00	0.00

SPUR ENERGY PARTNERS

PROTOTYPE
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Site:	BLACK CHERRY FEDERAL COM	**North Reference:**	Grid
Well:	110H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	OH		
Design:	PERMIT		

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)
3,500.00	90.56	270.42	2,420.92	748.06	-1,443.65	1,449.09	0.00	0.00	0.00
3,600.00	90.56	270.42	2,419.94	748.79	-1,543.64	1,549.09	0.00	0.00	0.00
3,700.00	90.56	270.42	2,418.97	749.52	-1,643.63	1,649.08	0.00	0.00	0.00
3,800.00	90.56	270.42	2,418.00	750.25	-1,743.63	1,749.08	0.00	0.00	0.00
3,900.00	90.56	270.42	2,417.02	750.98	-1,843.62	1,849.07	0.00	0.00	0.00
4,000.00	90.56	270.42	2,416.05	751.71	-1,943.61	1,949.07	0.00	0.00	0.00
4,100.00	90.56	270.42	2,415.08	752.44	-2,043.60	2,049.06	0.00	0.00	0.00
4,200.00	90.56	270.42	2,414.10	753.17	-2,143.60	2,149.06	0.00	0.00	0.00
4,300.00	90.56	270.42	2,413.13	753.90	-2,243.59	2,249.06	0.00	0.00	0.00
4,400.00	90.56	270.42	2,412.16	754.63	-2,343.58	2,349.05	0.00	0.00	0.00
4,500.00	90.56	270.42	2,411.18	755.36	-2,443.57	2,449.05	0.00	0.00	0.00
4,600.00	90.56	270.42	2,410.21	756.09	-2,543.57	2,549.04	0.00	0.00	0.00
4,700.00	90.56	270.42	2,409.24	756.82	-2,643.56	2,649.04	0.00	0.00	0.00
4,800.00	90.56	270.42	2,408.26	757.55	-2,743.55	2,749.03	0.00	0.00	0.00
4,900.00	90.56	270.42	2,407.29	758.28	-2,843.54	2,849.03	0.00	0.00	0.00
5,000.00	90.56	270.42	2,406.32	759.01	-2,943.54	2,949.02	0.00	0.00	0.00
5,100.00	90.56	270.42	2,405.34	759.74	-3,043.53	3,049.02	0.00	0.00	0.00
5,200.00	90.56	270.42	2,404.37	760.47	-3,143.52	3,149.01	0.00	0.00	0.00
5,300.00	90.56	270.42	2,403.40	761.20	-3,243.52	3,249.01	0.00	0.00	0.00
5,400.00	90.56	270.42	2,402.42	761.93	-3,343.51	3,349.00	0.00	0.00	0.00
5,500.00	90.56	270.42	2,401.45	762.66	-3,443.50	3,449.00	0.00	0.00	0.00
5,600.00	90.56	270.42	2,400.48	763.39	-3,543.49	3,548.99	0.00	0.00	0.00
5,700.00	90.56	270.42	2,399.50	764.12	-3,643.49	3,648.99	0.00	0.00	0.00
5,800.00	90.56	270.42	2,398.53	764.85	-3,743.48	3,748.98	0.00	0.00	0.00
5,900.00	90.56	270.42	2,397.56	765.58	-3,843.47	3,848.98	0.00	0.00	0.00
6,000.00	90.56	270.42	2,396.58	766.31	-3,943.46	3,948.97	0.00	0.00	0.00
6,100.00	90.56	270.42	2,395.61	767.04	-4,043.46	4,048.97	0.00	0.00	0.00
6,200.00	90.56	270.42	2,394.64	767.77	-4,143.45	4,148.97	0.00	0.00	0.00
6,300.00	90.56	270.42	2,393.66	768.50	-4,243.44	4,248.96	0.00	0.00	0.00
6,400.00	90.56	270.42	2,392.69	769.23	-4,343.43	4,348.96	0.00	0.00	0.00
6,500.00	90.56	270.42	2,391.72	769.96	-4,443.43	4,448.95	0.00	0.00	0.00
6,600.00	90.56	270.42	2,390.74	770.69	-4,543.42	4,548.95	0.00	0.00	0.00
6,700.00	90.56	270.42	2,389.77	771.42	-4,643.41	4,648.94	0.00	0.00	0.00
6,800.00	90.56	270.42	2,388.80	772.15	-4,743.40	4,748.94	0.00	0.00	0.00
6,900.00	90.56	270.42	2,387.82	772.88	-4,843.40	4,848.93	0.00	0.00	0.00
7,000.00	90.56	270.42	2,386.85	773.61	-4,943.39	4,948.93	0.00	0.00	0.00
7,100.00	90.56	270.42	2,385.88	774.34	-5,043.38	5,048.92	0.00	0.00	0.00
7,200.00	90.56	270.42	2,384.90	775.07	-5,143.37	5,148.92	0.00	0.00	0.00
7,300.00	90.56	270.42	2,383.93	775.80	-5,243.37	5,248.91	0.00	0.00	0.00
7,400.00	90.56	270.42	2,382.96	776.53	-5,343.36	5,348.91	0.00	0.00	0.00
7,500.00	90.56	270.42	2,381.99	777.26	-5,443.35	5,448.90	0.00	0.00	0.00
7,600.00	90.56	270.42	2,381.01	777.99	-5,543.35	5,548.90	0.00	0.00	0.00
7,700.00	90.56	270.42	2,380.04	778.72	-5,643.34	5,648.89	0.00	0.00	0.00
7,800.00	90.56	270.42	2,379.07	779.45	-5,743.33	5,748.89	0.00	0.00	0.00
7,900.00	90.56	270.42	2,378.09	780.18	-5,843.32	5,848.88	0.00	0.00	0.00
8,000.00	90.56	270.42	2,377.12	780.91	-5,943.32	5,948.88	0.00	0.00	0.00
8,100.00	90.56	270.42	2,376.15	781.64	-6,043.31	6,048.88	0.00	0.00	0.00
8,167.70	90.56	270.42	2,375.49	782.14	-6,111.00	6,116.57	0.00	0.00	0.00
5. BLACK CHERRY 110H LTP: 1885' FSL, 100' FWL									
8,200.00	90.56	270.42	2,375.17	782.37	-6,143.30	6,148.87	0.00	0.00	0.00
8,217.70	90.56	270.42	2,375.00	782.50	-6,161.00	6,166.57	0.00	0.00	0.00
6. BLACK CHERRY 110H BHL: 1885' FSL, 50' FWL									

SPUR ENERGY PARTNERS

PROTOTYPE
Planning Report

PROTOTYPE WELL PLANNING
WELL PLANNED. WELL EXECUTED.

Database:	EDM 5000.17 Single User Db	**Local Co-ordinate Reference:**	Well 110H
Company:	SPUR ENERGY PARTNERS, LLC	**TVD Reference:**	RKB = 20' @ 3626.00usft (AKITA 57)
Project:	EDDY COUNTY, NM (NAD 83 - NME)	**MD Reference:**	RKB = 20' @ 3626.00usft (AKITA 57)
Site:	BLACK CHERRY FEDERAL COM	**North Reference:**	Grid
Well:	110H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	OH		
Design:	PERMIT		

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
1. BLACK CHERRY 1 - plan hits target center - Point	0.00	0.00	0.00	0.00	0.00	655,123.60	575,971.60	32.80092	-104.22062
2. BLACK CHERRY 1 - plan hits target center - Point	0.00	0.00	1,741.43	542.57	-169.50	655,666.17	575,802.10	32.80241	-104.22117
6. BLACK CHERRY 1 - plan hits target center - Point	0.00	0.00	2,375.00	782.50	-6,161.00	655,906.10	569,810.60	32.80308	-104.24067
5. BLACK CHERRY 1 - plan misses target center by 0.04usft at 8167.70usft MD (2375.49 TVD, 782.13 N, -6111.00 E) - Point	0.00	0.00	2,375.49	782.10	-6,111.00	655,905.70	569,860.60	32.80308	-104.24050
3. BLACK CHERRY 1 - plan hits target center - Point	0.00	0.00	2,417.20	744.27	-924.02	655,867.87	575,047.58	32.80296	-104.22362
4. BLACK CHERRY 1 - plan hits target center - Point	0.00	0.00	2,425.00	745.00	-1,024.00	655,868.60	574,947.60	32.80297	-104.22395

SPUR ENERGY PARTNERS, LLC

EDDY COUNTY, NM (NAD 83 - NME)
BLACK CHERRY FEDERAL COM
110H

OH
PERMIT

Anticollision Report

29 December, 2025

PROTOTYPE WELL PLANNING
WELL PLANNED. WELL EXECUTED.

PROTOTYPE
Anticollision Report

Company:	SPUR ENERGY PARTNERS, LLC	**Local Co-ordinate Reference:**	Well 110H
Project:	EDDY COUNTY, NM (NAD 83 - NME)	**TVD Reference:**	RKB = 20' @ 3626.00usft (AKITA 57)
Reference Site:	BLACK CHERRY FEDERAL COM	**MD Reference:**	RKB = 20' @ 3626.00usft (AKITA 57)
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	110H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	OH	**Database:**	EDM 5000.17 Single User Db
Reference Design:	PERMIT	**Offset TVD Reference:**	Reference Datum

Reference PERMIT

Filter type:	NO GLOBAL FILTER: Using user defined selection & filtering criteria		
Interpolation Method:	MD Interval 50.00usft	**Error Model:**	ISCWSA
Depth Range:	Unlimited	**Scan Method:**	Closest Approach 3D
Results Limited by:	Maximum centre distance of 1,900.00usft	**Error Surface:**	Pedal Curve
Warning Levels Evaluated at:	2.00 **Sigma**	**Casing Method:**	Not applied

Survey Tool Program **Date** 12/22/2025

From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
0.00	8,217.70	PERMIT (OH)	MWD+IFR1+MS	OWSG MWD + IFR1 + Multi-Station Correction

Summary

Site Name Offset Well - Wellbore - Design	Reference Measured Depth (usft)	Offset Measured Depth (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Separation Factor	Warning
BLACK CHERRY FEDERAL COM						
OFFSET: ARTESIA UNIT 8 - OH - SURVEYS						Out of range
OFFSET: BEECH FEDERAL 2 - OH - SURVEYS	4,626.31	2,376.20	238.76	162.94	3.149	CC, ES, SF
OFFSET: BEECH FEDERAL 4 - OH - SURVEYS	4,635.11	2,362.16	421.39	343.79	5.430	CC, ES
OFFSET: BEECH FEDERAL 4 - OH - SURVEYS	4,650.00	2,362.01	421.66	343.84	5.419	SF
OFFSET: BEECH FEDERAL 5 - OH - SURVEYS	5,188.53	2,362.00	174.78	131.45	4.034	CC, ES, SF
OFFSET: BEECH FEDERAL 6 - OH - SURVEYS	5,295.32	2,357.76	421.42	340.98	5.239	CC
OFFSET: BEECH FEDERAL 6 - OH - SURVEYS	5,300.00	2,357.71	421.44	340.93	5.235	ES, SF
OFFSET: ENRON FEDERAL 5 - OH - SURVEYS	5,288.56	2,361.47	88.52	6.19	1.075	Level 2, CC, ES, SF
OFFSET: FIR FEDERAL 1 - OH - SURVEYS	7,274.15	2,364.51	119.58	11.84	1.110	Level 2, CC, ES, SF
OFFSET: FIR FEDERAL 2H - OH - SURVEYS	7,327.24	2,402.44	449.34	385.37	7.024	CC, ES
OFFSET: FIR FEDERAL 2H - OH - SURVEYS	7,350.00	2,401.50	449.91	385.61	6.996	SF
OFFSET: FIR FEDERAL 3 - OH - SURVEYS	7,933.97	2,347.81	179.81	72.12	1.670	CC, ES, SF
OFFSET: FIR FEDERAL 4 - OH - SURVEYS	7,938.46	2,339.03	345.33	230.69	3.012	CC
OFFSET: FIR FEDERAL 4 - OH - SURVEYS	7,950.00	2,338.92	345.52	230.68	3.009	ES, SF
OFFSET: RESLER STATE 2 - OH - SURVEYS	3,970.45	2,371.49	92.05	26.35	1.401	Level 3, CC, ES, SF
OFFSET: RESLER STATE 4 - OH - SURVEYS	3,533.57	2,366.64	342.47	278.69	5.370	CC, ES
OFFSET: RESLER STATE 4 - OH - SURVEYS	3,550.00	2,366.48	342.86	278.93	5.363	SF
OFFSET: SPRUCE FEDERAL 1 - OH - SURVEYS	5,952.60	2,366.05	239.19	101.35	1.735	CC, ES, SF
OFFSET: SPRUCE FEDERAL 2 - OH - SURVEYS	5,960.10	2,351.31	612.39	525.90	7.080	CC, ES
OFFSET: SPRUCE FEDERAL 2 - OH - SURVEYS	6,000.00	2,350.92	613.69	526.68	7.053	SF
OFFSET: SPRUCE FEDERAL 3 - OH - SURVEYS	6,702.25	2,432.86	473.78	415.60	8.143	CC, ES, SF
OFFSET: SPRUCE FEDERAL 4 - OH - SURVEYS	6,602.30	2,397.66	471.25	412.89	8.075	CC, ES
OFFSET: SPRUCE FEDERAL 4 - OH - SURVEYS	6,650.00	2,397.84	473.65	414.68	8.032	SF
OFFSET: STALEY STATE 11 - OH - SURVEYS	2,649.04	2,271.37	229.66	175.62	4.250	CC
OFFSET: STALEY STATE 11 - OH - SURVEYS	2,650.00	2,271.84	229.66	175.60	4.248	ES, SF
OFFSET: STALEY STATE 19 - OH - PROPOSED SURV	2,550.00	2,217.67	414.83	393.85	19.769	SF
OFFSET: STALEY STATE 19 - OH - PROPOSED SURV	2,600.00	2,242.96	412.14	391.31	19.781	ES
OFFSET: STALEY STATE 19 - OH - PROPOSED SURV	2,602.25	2,244.08	412.14	391.31	19.787	CC
OFFSET: STALEY STATE 26 - OH - SURVEYS	1,730.50	1,589.47	189.17	153.61	5.321	CC
OFFSET: STALEY STATE 26 - OH - SURVEYS	1,750.00	1,605.83	189.46	153.51	5.269	ES
OFFSET: STALEY STATE 26 - OH - SURVEYS	1,800.00	1,647.77	192.91	155.79	5.196	SF
OFFSET: STALEY STATE 6 - OH - SURVEYS	2,022.00	1,839.85	345.52	305.17	8.564	CC, ES
OFFSET: STALEY STATE 6 - OH - SURVEYS	2,100.00	1,903.87	352.38	310.85	8.484	SF
OFFSET: STATE `25` 1 - OH - SURVEYS	3,966.05	2,388.68	238.53	165.77	3.278	CC, ES, SF

SPUR ENERGY PARTNERS

PROTOTYPE

Anticollision Report

PROTOTYPE WELL PLANNING
WELL PLANNED. WELL EXECUTED.

Company:	SPUR ENERGY PARTNERS, LLC	**Local Co-ordinate Reference:**	Well 110H
Project:	EDDY COUNTY, NM (NAD 83 - NME)	**TVD Reference:**	RKB = 20' @ 3626.00usft (AKITA 57)
Reference Site:	BLACK CHERRY FEDERAL COM	**MD Reference:**	RKB = 20' @ 3626.00usft (AKITA 57)
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	110H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	OH	**Database:**	EDM 5000.17 Single User Db
Reference Design:	PERMIT	**Offset TVD Reference:**	Reference Datum

Offset Design: BLACK CHERRY FEDERAL COM - OFFSET: BEECH FEDERAL 2 - OH - SURVEYS — **Offset Site Error:** 0.00 usft

Survey Program: 396-INC-ONLY — **Rule Assigned:** — **Offset Well Error:** 0.00 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
2,750.00	2,335.89	2,299.76	2,333.56	13.67	44.67	-14.37	517.60	-2,571.62	1,874.66	1,819.99	54.67	34.292	
2,800.00	2,360.41	2,326.65	2,360.41	13.88	45.21	-15.91	517.53	-2,571.62	1,831.46	1,776.14	55.32	33.105	
2,850.00	2,381.51	2,347.75	2,381.51	14.12	45.62	-19.43	517.53	-2,571.62	1,786.55	1,730.67	55.88	31.974	
2,900.00	2,398.59	2,364.83	2,398.59	14.38	45.96	-24.77	517.53	-2,571.62	1,740.00	1,683.67	56.34	30.886	
2,950.00	2,411.50	2,377.74	2,411.50	14.65	46.21	-33.42	517.53	-2,571.62	1,692.18	1,635.49	56.70	29.847	
3,000.00	2,420.16	2,386.40	2,420.16	14.95	46.38	-48.46	517.53	-2,571.62	1,643.46	1,586.51	56.95	28.856	
3,050.00	2,424.49	2,390.73	2,424.49	15.26	46.47	-74.09	517.53	-2,571.62	1,594.21	1,537.10	57.11	27.914	
3,100.00	2,424.81	2,391.05	2,424.81	15.59	46.48	-93.56	517.53	-2,571.62	1,544.80	1,487.63	57.18	27.018	
3,150.00	2,424.32	2,390.56	2,424.32	15.95	46.47	-93.44	517.53	-2,571.62	1,495.43	1,438.20	57.23	26.131	
3,200.00	2,423.84	2,390.08	2,423.84	16.31	46.46	-93.33	517.53	-2,571.62	1,446.09	1,388.81	57.28	25.246	
3,250.00	2,423.35	2,389.59	2,423.35	16.70	46.45	-93.21	517.53	-2,571.62	1,396.80	1,339.45	57.36	24.354	
3,300.00	2,422.86	2,389.10	2,422.86	17.09	46.44	-93.09	517.53	-2,571.62	1,347.57	1,290.16	57.41	23.473	
3,350.00	2,422.38	2,388.62	2,422.38	17.49	46.43	-92.98	517.53	-2,571.62	1,298.39	1,240.92	57.48	22.590	
3,400.00	2,421.89	2,388.13	2,421.89	17.91	46.42	-92.86	517.53	-2,571.62	1,249.28	1,191.71	57.57	21.700	
3,450.00	2,421.40	2,387.64	2,421.40	18.33	46.41	-92.75	517.53	-2,571.62	1,200.24	1,142.58	57.66	20.815	
3,500.00	2,420.92	2,387.16	2,420.92	18.76	46.40	-92.63	517.53	-2,571.62	1,151.29	1,093.52	57.77	19.928	
3,550.00	2,420.43	2,386.67	2,420.43	19.21	46.39	-92.51	517.53	-2,571.62	1,102.43	1,044.53	57.89	19.042	
3,600.00	2,419.94	2,386.18	2,419.94	19.65	46.38	-92.40	517.53	-2,571.62	1,053.67	995.64	58.03	18.156	
3,650.00	2,419.46	2,385.70	2,419.46	20.11	46.37	-92.28	517.53	-2,571.62	1,005.04	946.85	58.19	17.272	
3,700.00	2,418.97	2,385.21	2,418.97	20.56	46.36	-92.16	517.53	-2,571.62	956.55	898.17	58.37	16.387	
3,750.00	2,418.48	2,384.72	2,418.48	21.03	46.35	-92.05	517.53	-2,571.62	908.22	849.64	58.58	15.505	
3,800.00	2,418.00	2,384.24	2,418.00	21.49	46.34	-91.93	517.53	-2,571.62	860.08	801.26	58.81	14.624	
3,850.00	2,417.51	2,383.75	2,417.51	21.97	46.33	-91.81	517.53	-2,571.62	812.16	753.08	59.09	13.745	
3,900.00	2,417.02	2,383.26	2,417.02	22.45	46.32	-91.70	517.53	-2,571.62	764.52	705.11	59.41	12.869	
3,950.00	2,416.54	2,382.78	2,416.54	22.93	46.31	-91.58	517.53	-2,571.62	717.19	657.41	59.78	11.997	
4,000.00	2,416.05	2,382.29	2,416.05	23.41	46.30	-91.46	517.53	-2,571.62	670.25	610.03	60.22	11.130	
4,050.00	2,415.56	2,381.80	2,415.56	23.90	46.29	-91.35	517.53	-2,571.62	623.79	563.05	60.74	10.270	
4,100.00	2,415.08	2,381.32	2,415.08	24.39	46.28	-91.23	517.53	-2,571.62	577.91	516.56	61.36	9.419	
4,150.00	2,414.59	2,380.83	2,414.59	24.89	46.28	-91.11	517.53	-2,571.62	532.78	470.69	62.09	8.580	
4,200.00	2,414.10	2,380.34	2,414.10	25.38	46.27	-91.00	517.53	-2,571.62	488.60	425.62	62.98	7.758	
4,250.00	2,413.62	2,379.86	2,413.62	25.89	46.26	-90.88	517.53	-2,571.62	445.65	381.61	64.04	6.959	
4,300.00	2,413.13	2,379.37	2,413.13	26.39	46.25	-90.76	517.53	-2,571.62	404.32	339.00	65.32	6.190	
4,350.00	2,412.64	2,378.88	2,412.64	26.89	46.24	-90.65	517.53	-2,571.62	365.17	298.32	66.84	5.463	
4,400.00	2,412.16	2,378.40	2,412.16	27.40	46.23	-90.53	517.53	-2,571.62	328.97	260.34	68.62	4.794	
4,450.00	2,411.67	2,377.91	2,411.67	27.91	46.22	-90.41	517.53	-2,571.62	296.80	226.18	70.62	4.203	
4,500.00	2,411.18	2,377.42	2,411.18	28.42	46.21	-90.29	517.53	-2,571.62	270.11	197.44	72.68	3.717	
4,550.00	2,410.70	2,376.94	2,410.70	28.93	46.20	-90.18	517.53	-2,571.62	250.66	176.17	74.49	3.365	
4,600.00	2,410.21	2,376.45	2,410.21	29.45	46.19	-90.06	517.53	-2,571.62	240.21	164.58	75.63	3.176	
4,626.31	2,409.95	2,376.20	2,409.95	29.72	46.18	-90.00	517.53	-2,571.62	238.76	162.94	75.82	3.149	CC, ES, SF
4,650.00	2,409.72	2,375.96	2,409.72	29.97	46.18	-89.94	517.53	-2,571.62	239.93	164.21	75.72	3.169	
4,700.00	2,409.24	2,375.48	2,409.24	30.48	46.17	-89.83	517.53	-2,571.62	249.87	175.12	74.75	3.343	
4,750.00	2,408.75	2,374.99	2,408.75	31.00	46.16	-89.71	517.53	-2,571.62	268.89	195.84	73.05	3.681	
4,800.00	2,408.26	2,374.50	2,408.26	31.52	46.15	-89.59	517.53	-2,571.62	295.25	224.18	71.07	4.154	
4,850.00	2,407.78	2,374.02	2,407.78	32.05	46.14	-89.48	517.53	-2,571.62	327.17	258.05	69.12	4.734	
4,900.00	2,407.29	2,373.53	2,407.29	32.57	46.13	-89.36	517.53	-2,571.62	363.19	295.83	67.36	5.392	
4,950.00	2,406.80	2,373.04	2,406.80	33.10	46.12	-89.24	517.53	-2,571.62	402.21	336.36	65.84	6.109	
5,000.00	2,406.32	2,372.56	2,406.32	33.62	46.11	-89.13	517.53	-2,571.62	443.44	378.87	64.57	6.868	
5,050.00	2,405.83	2,372.07	2,405.83	34.15	46.10	-89.01	517.53	-2,571.62	486.31	422.81	63.50	7.659	
5,100.00	2,405.34	2,371.58	2,405.34	34.68	46.09	-88.89	517.53	-2,571.62	530.44	467.83	62.61	8.472	
5,150.00	2,404.86	2,371.10	2,404.86	35.21	46.08	-88.78	517.53	-2,571.62	575.53	513.66	61.87	9.302	
5,200.00	2,404.37	2,370.61	2,404.37	35.74	46.07	-88.66	517.53	-2,571.62	621.36	560.12	61.25	10.145	
5,250.00	2,403.88	2,370.12	2,403.88	36.27	46.06	-88.54	517.53	-2,571.62	667.80	607.08	60.72	10.997	

CC - Min centre to center distance or covergent point, SF - min separation factor, ES - min ellipse separation

SPUR ENERGY PARTNERS

PROTOTYPE

Anticollision Report

PROTOTYPE WELL PLANNING
WELL PLANNED. WELL EXECUTED.

Company:	SPUR ENERGY PARTNERS, LLC	**Local Co-ordinate Reference:**	Well 110H
Project:	EDDY COUNTY, NM (NAD 83 - NME)	**TVD Reference:**	RKB = 20' @ 3626.00usft (AKITA 57)
Reference Site:	BLACK CHERRY FEDERAL COM	**MD Reference:**	RKB = 20' @ 3626.00usft (AKITA 57)
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	110H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	OH	**Database:**	EDM 5000.17 Single User Db
Reference Design:	PERMIT	**Offset TVD Reference:**	Reference Datum

Offset Design: BLACK CHERRY FEDERAL COM - OFFSET: BEECH FEDERAL 2 - OH - SURVEYS

Offset Site Error: 0.00 usft

Survey Program: 396-INC-ONLY

Offset Well Error: 0.00 usft

Rule Assigned:

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
5,300.00	2,403.40	2,369.64	2,403.40	36.80	46.05	-88.43	517.53	-2,571.62	714.72	654.44	60.28	11.856	
5,350.00	2,402.91	2,369.15	2,402.91	37.34	46.05	-88.31	517.53	-2,571.62	762.02	702.12	59.91	12.720	
5,400.00	2,402.42	2,368.67	2,402.42	37.87	46.04	-88.19	517.53	-2,571.62	809.66	750.07	59.58	13.589	
5,450.00	2,401.94	2,368.18	2,401.94	38.41	46.03	-88.08	517.53	-2,571.62	857.56	798.25	59.31	14.459	
5,500.00	2,401.45	2,367.69	2,401.45	38.94	46.02	-87.96	517.53	-2,571.62	905.68	846.62	59.07	15.332	
5,550.00	2,400.96	2,367.21	2,400.96	39.48	46.01	-87.84	517.53	-2,571.62	954.00	895.14	58.86	16.207	
5,600.00	2,400.48	2,366.72	2,400.48	40.02	46.00	-87.73	517.53	-2,571.62	1,002.49	943.80	58.68	17.083	
5,650.00	2,399.99	2,366.23	2,399.99	40.55	45.99	-87.61	517.53	-2,571.62	1,051.12	992.59	58.53	17.959	
5,700.00	2,399.50	2,365.75	2,399.50	41.09	45.98	-87.49	517.53	-2,571.62	1,099.87	1,041.47	58.39	18.836	
5,750.00	2,399.02	2,365.26	2,399.02	41.63	45.97	-87.38	517.53	-2,571.62	1,148.72	1,090.45	58.27	19.713	
5,800.00	2,398.53	2,364.77	2,398.53	42.17	45.96	-87.26	517.53	-2,571.62	1,197.67	1,139.51	58.17	20.591	
5,850.00	2,398.04	2,364.29	2,398.04	42.71	45.95	-87.14	517.53	-2,571.62	1,246.71	1,188.63	58.07	21.468	
5,900.00	2,397.56	2,363.80	2,397.56	43.25	45.94	-87.03	517.53	-2,571.62	1,295.81	1,237.82	57.99	22.345	
5,950.00	2,397.07	2,363.31	2,397.07	43.80	45.93	-86.91	517.53	-2,571.62	1,344.99	1,287.07	57.92	23.222	
6,000.00	2,396.58	2,362.83	2,396.58	44.34	45.92	-86.80	517.53	-2,571.62	1,394.22	1,336.36	57.85	24.099	
6,050.00	2,396.10	2,362.34	2,396.10	44.88	45.91	-86.68	517.53	-2,571.62	1,443.50	1,385.70	57.80	24.975	
6,100.00	2,395.61	2,361.85	2,395.61	45.42	45.90	-86.56	517.53	-2,571.62	1,492.84	1,435.09	57.75	25.851	
6,150.00	2,395.12	2,361.37	2,395.12	45.97	45.89	-86.45	517.53	-2,571.62	1,542.21	1,484.51	57.70	26.726	
6,200.00	2,394.64	2,360.88	2,394.64	46.51	45.88	-86.33	517.53	-2,571.62	1,591.62	1,533.96	57.67	27.601	
6,250.00	2,394.15	2,360.39	2,394.15	47.06	45.87	-86.21	517.53	-2,571.62	1,641.07	1,583.44	57.63	28.475	
6,300.00	2,393.66	2,359.91	2,393.66	47.60	45.86	-86.10	517.53	-2,571.62	1,690.55	1,632.95	57.60	29.349	
6,350.00	2,393.18	2,359.42	2,393.18	48.15	45.85	-85.98	517.53	-2,571.62	1,740.06	1,682.49	57.58	30.222	
6,400.00	2,392.69	2,358.93	2,392.69	48.69	45.84	-85.86	517.53	-2,571.62	1,789.60	1,732.05	57.55	31.095	
6,450.00	2,392.20	2,358.45	2,392.20	49.24	45.83	-85.75	517.53	-2,571.62	1,839.17	1,781.63	57.53	31.967	
6,500.00	2,391.72	2,357.96	2,391.72	49.78	45.82	-85.63	517.53	-2,571.62	1,888.75	1,831.24	57.52	32.839	

SPUR ENERGY PARTNERS

PROTOTYPE

Anticollision Report

PROTOTYPE WELL PLANNING
WELL PLANNED. WELL EXECUTED.

Company:	SPUR ENERGY PARTNERS, LLC	**Local Co-ordinate Reference:**	Well 110H
Project:	EDDY COUNTY, NM (NAD 83 - NME)	**TVD Reference:**	RKB = 20' @ 3626.00usft (AKITA 57)
Reference Site:	BLACK CHERRY FEDERAL COM	**MD Reference:**	RKB = 20' @ 3626.00usft (AKITA 57)
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	110H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	OH	**Database:**	EDM 5000.17 Single User Db
Reference Design:	PERMIT	**Offset TVD Reference:**	Reference Datum

Offset Design: BLACK CHERRY FEDERAL COM - OFFSET: BEECH FEDERAL 4 - OH - SURVEYS

Offset Site Error: 0.00 usft

Survey Program: 113-INC-ONLY

Offset Well Error: 0.00 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Rule Assigned: Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
2,800.00	2,360.41	2,317.33	2,365.06	13.88	47.12	26.70	1,177.71	-2,575.60	1,872.66	1,814.68	57.98	32.301	
2,850.00	2,381.51	2,333.80	2,381.51	14.12	47.40	31.78	1,177.73	-2,575.60	1,828.54	1,770.14	58.40	31.313	
2,900.00	2,398.59	2,350.87	2,398.59	14.38	47.69	39.01	1,177.73	-2,575.60	1,782.86	1,724.06	58.80	30.323	
2,950.00	2,411.50	2,363.79	2,411.50	14.65	47.90	49.20	1,177.73	-2,575.60	1,735.98	1,676.87	59.10	29.373	
3,000.00	2,420.16	2,372.45	2,420.16	14.95	48.05	63.22	1,177.73	-2,575.60	1,688.26	1,628.95	59.31	28.465	
3,050.00	2,424.49	2,376.78	2,424.49	15.26	48.12	80.78	1,177.73	-2,575.60	1,640.09	1,580.67	59.42	27.600	
3,100.00	2,424.81	2,377.10	2,424.81	15.59	48.13	92.03	1,177.73	-2,575.60	1,591.83	1,532.38	59.45	26.777	
3,150.00	2,424.32	2,376.61	2,424.32	15.95	48.12	91.96	1,177.73	-2,575.60	1,543.67	1,484.22	59.45	25.965	
3,200.00	2,423.84	2,376.12	2,423.84	16.31	48.11	91.90	1,177.73	-2,575.60	1,495.63	1,436.16	59.47	25.148	
3,250.00	2,423.35	2,375.64	2,423.35	16.70	48.11	91.83	1,177.73	-2,575.60	1,447.73	1,388.26	59.48	24.342	
3,300.00	2,422.86	2,375.15	2,422.86	17.09	48.10	91.77	1,177.73	-2,575.60	1,399.97	1,340.44	59.53	23.516	
3,350.00	2,422.38	2,374.66	2,422.38	17.49	48.09	91.70	1,177.73	-2,575.60	1,352.38	1,292.79	59.59	22.694	
3,400.00	2,421.89	2,374.18	2,421.89	17.91	48.08	91.63	1,177.73	-2,575.60	1,304.96	1,245.33	59.64	21.882	
3,450.00	2,421.40	2,373.69	2,421.40	18.33	48.07	91.57	1,177.73	-2,575.60	1,257.75	1,198.03	59.72	21.062	
3,500.00	2,420.92	2,373.20	2,420.92	18.76	48.06	91.50	1,177.73	-2,575.60	1,210.76	1,150.95	59.80	20.246	
3,550.00	2,420.43	2,372.72	2,420.43	19.21	48.06	91.44	1,177.73	-2,575.60	1,164.01	1,104.09	59.92	19.427	
3,600.00	2,419.94	2,372.23	2,419.94	19.65	48.05	91.37	1,177.73	-2,575.60	1,117.55	1,057.50	60.05	18.610	
3,650.00	2,419.46	2,371.74	2,419.46	20.11	48.04	91.30	1,177.73	-2,575.60	1,071.41	1,011.19	60.22	17.791	
3,700.00	2,418.97	2,371.26	2,418.97	20.56	48.03	91.24	1,177.73	-2,575.60	1,025.63	965.21	60.42	16.976	
3,750.00	2,418.48	2,370.77	2,418.48	21.03	48.02	91.17	1,177.73	-2,575.60	980.27	919.60	60.66	16.160	
3,800.00	2,418.00	2,370.28	2,418.00	21.49	48.01	91.10	1,177.73	-2,575.60	935.37	874.42	60.95	15.348	
3,850.00	2,417.51	2,369.80	2,417.51	21.97	48.01	91.04	1,177.73	-2,575.60	891.02	829.73	61.29	14.538	
3,900.00	2,417.02	2,369.31	2,417.02	22.45	48.00	90.97	1,177.73	-2,575.60	847.30	785.60	61.69	13.734	
3,950.00	2,416.54	2,368.82	2,416.54	22.93	47.99	90.91	1,177.73	-2,575.60	804.30	742.13	62.17	12.936	
4,000.00	2,416.05	2,368.34	2,416.05	23.41	47.98	90.84	1,177.73	-2,575.60	762.17	699.43	62.74	12.149	
4,050.00	2,415.56	2,367.85	2,415.56	23.90	47.97	90.77	1,177.73	-2,575.60	721.04	657.64	63.40	11.373	
4,100.00	2,415.08	2,367.36	2,415.08	24.39	47.97	90.71	1,177.73	-2,575.60	681.09	616.93	64.17	10.614	
4,150.00	2,414.59	2,366.88	2,414.59	24.89	47.96	90.64	1,177.73	-2,575.60	642.56	577.50	65.06	9.876	
4,200.00	2,414.10	2,366.39	2,414.10	25.38	47.95	90.58	1,177.73	-2,575.60	605.70	539.62	66.08	9.166	
4,250.00	2,413.62	2,365.90	2,413.62	25.89	47.94	90.51	1,177.73	-2,575.60	570.85	503.61	67.24	8.490	
4,300.00	2,413.13	2,365.42	2,413.13	26.39	47.93	90.44	1,177.73	-2,575.60	538.39	469.86	68.53	7.857	
4,350.00	2,412.64	2,364.93	2,412.64	26.89	47.92	90.38	1,177.73	-2,575.60	508.78	438.83	69.94	7.274	
4,400.00	2,412.16	2,364.44	2,412.16	27.40	47.92	90.31	1,177.73	-2,575.60	482.54	411.10	71.44	6.754	
4,450.00	2,411.67	2,363.96	2,411.67	27.91	47.91	90.24	1,177.73	-2,575.60	460.25	387.28	72.98	6.307	
4,500.00	2,411.18	2,363.47	2,411.18	28.42	47.90	90.18	1,177.73	-2,575.60	442.52	368.04	74.48	5.942	
4,550.00	2,410.70	2,362.98	2,410.70	28.93	47.89	90.11	1,177.73	-2,575.60	429.90	354.05	75.85	5.668	
4,600.00	2,410.21	2,362.50	2,410.21	29.45	47.88	90.05	1,177.73	-2,575.60	422.85	345.87	76.98	5.493	
4,635.11	2,409.87	2,362.16	2,409.87	29.81	47.88	90.00	1,177.73	-2,575.60	421.39	343.79	77.60	5.430	CC, ES
4,650.00	2,409.72	2,362.01	2,409.72	29.97	47.87	89.98	1,177.73	-2,575.60	421.66	343.84	77.81	5.419	SF
4,700.00	2,409.24	2,361.52	2,409.24	30.48	47.87	89.91	1,177.73	-2,575.60	426.36	348.08	78.28	5.446	
4,750.00	2,408.75	2,361.04	2,408.75	31.00	47.86	89.85	1,177.73	-2,575.60	436.77	358.37	78.40	5.571	
4,800.00	2,408.26	2,360.55	2,408.26	31.52	47.85	89.78	1,177.73	-2,575.60	452.50	374.30	78.20	5.786	
4,850.00	2,407.78	2,360.06	2,407.78	32.05	47.84	89.72	1,177.73	-2,575.60	473.02	395.26	77.76	6.083	
4,900.00	2,407.29	2,359.58	2,407.29	32.57	47.83	89.65	1,177.73	-2,575.60	497.73	420.58	77.14	6.452	
4,950.00	2,406.80	2,359.09	2,406.80	33.10	47.83	89.58	1,177.73	-2,575.60	526.04	449.62	76.42	6.883	
5,000.00	2,406.32	2,358.60	2,406.32	33.62	47.82	89.52	1,177.73	-2,575.60	557.41	481.76	75.65	7.368	
5,050.00	2,405.83	2,358.12	2,405.83	34.15	47.81	89.45	1,177.73	-2,575.60	591.34	516.47	74.87	7.898	
5,100.00	2,405.34	2,357.63	2,405.34	34.68	47.80	89.38	1,177.73	-2,575.60	627.43	553.32	74.11	8.466	
5,150.00	2,404.86	2,357.14	2,404.86	35.21	47.79	89.32	1,177.73	-2,575.60	665.32	591.94	73.38	9.067	
5,200.00	2,404.37	2,356.66	2,404.37	35.74	47.78	89.25	1,177.73	-2,575.60	704.73	632.03	72.69	9.695	
5,250.00	2,403.88	2,356.17	2,403.88	36.27	47.78	89.19	1,177.73	-2,575.60	745.40	673.35	72.05	10.346	
5,300.00	2,403.40	2,355.68	2,403.40	36.80	47.77	89.12	1,177.73	-2,575.60	787.15	715.69	71.46	11.016	

CC - Min centre to center distance or covergent point, SF - min separation factor, ES - min ellipse separation

SPUR ENERGY PARTNERS

PROTOTYPE

Anticollision Report

PROTOTYPE WELL PLANNING
WELL PLANNED. WELL EXECUTED.

Company:	SPUR ENERGY PARTNERS, LLC	**Local Co-ordinate Reference:**	Well 110H
Project:	EDDY COUNTY, NM (NAD 83 - NME)	**TVD Reference:**	RKB = 20' @ 3626.00usft (AKITA 57)
Reference Site:	BLACK CHERRY FEDERAL COM	**MD Reference:**	RKB = 20' @ 3626.00usft (AKITA 57)
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	110H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	OH	**Database:**	EDM 5000.17 Single User Db
Reference Design:	PERMIT	**Offset TVD Reference:**	Reference Datum

Offset Design: BLACK CHERRY FEDERAL COM - OFFSET: BEECH FEDERAL 4 - OH - SURVEYS

Offset Site Error: 0.00 usft

Survey Program: 113-INC-ONLY

Offset Well Error: 0.00 usft

Rule Assigned:

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
5,350.00	2,402.91	2,355.20	2,402.91	37.34	47.76	89.05	1,177.73	-2,575.60	829.81	758.90	70.91	11.703	
5,400.00	2,402.42	2,354.71	2,402.42	37.87	47.75	88.99	1,177.73	-2,575.60	873.25	802.85	70.40	12.404	
5,450.00	2,401.94	2,354.22	2,401.94	38.41	47.74	88.92	1,177.73	-2,575.60	917.36	847.42	69.94	13.117	
5,500.00	2,401.45	2,353.74	2,401.45	38.94	47.73	88.86	1,177.73	-2,575.60	962.05	892.54	69.51	13.840	
5,550.00	2,400.96	2,353.25	2,400.96	39.48	47.73	88.79	1,177.73	-2,575.60	1,007.23	938.11	69.12	14.573	
5,600.00	2,400.48	2,352.76	2,400.48	40.02	47.72	88.72	1,177.73	-2,575.60	1,052.85	984.09	68.76	15.313	
5,650.00	2,399.99	2,352.28	2,399.99	40.55	47.71	88.66	1,177.73	-2,575.60	1,098.85	1,030.43	68.42	16.060	
5,700.00	2,399.50	2,351.79	2,399.50	41.09	47.70	88.59	1,177.73	-2,575.60	1,145.19	1,077.07	68.11	16.813	
5,750.00	2,399.02	2,351.30	2,399.02	41.63	47.69	88.53	1,177.73	-2,575.60	1,191.82	1,123.99	67.83	17.570	
5,800.00	2,398.53	2,350.82	2,398.53	42.17	47.69	88.46	1,177.73	-2,575.60	1,238.71	1,171.14	67.57	18.333	
5,850.00	2,398.04	2,350.33	2,398.04	42.71	47.68	88.39	1,177.73	-2,575.60	1,285.84	1,218.51	67.33	19.099	
5,900.00	2,397.56	2,349.84	2,397.56	43.25	47.67	88.33	1,177.73	-2,575.60	1,333.18	1,266.08	67.10	19.868	
5,950.00	2,397.07	2,349.36	2,397.07	43.80	47.66	88.26	1,177.73	-2,575.60	1,380.70	1,313.81	66.89	20.641	
6,000.00	2,396.58	2,348.87	2,396.58	44.34	47.65	88.19	1,177.73	-2,575.60	1,428.40	1,361.70	66.70	21.416	
6,050.00	2,396.10	2,348.38	2,396.10	44.88	47.64	88.13	1,177.73	-2,575.60	1,476.24	1,409.73	66.52	22.194	
6,100.00	2,395.61	2,347.90	2,395.61	45.42	47.64	88.06	1,177.73	-2,575.60	1,524.23	1,457.88	66.35	22.973	
6,150.00	2,395.12	2,347.41	2,395.12	45.97	47.63	88.00	1,177.73	-2,575.60	1,572.34	1,506.15	66.19	23.755	
6,200.00	2,394.64	2,346.92	2,394.64	46.51	47.62	87.93	1,177.73	-2,575.60	1,620.56	1,554.52	66.04	24.538	
6,250.00	2,394.15	2,346.44	2,394.15	47.06	47.61	87.86	1,177.73	-2,575.60	1,668.89	1,602.98	65.91	25.323	
6,300.00	2,393.66	2,345.95	2,393.66	47.60	47.60	87.80	1,177.73	-2,575.60	1,717.31	1,651.54	65.78	26.108	
6,350.00	2,393.18	2,345.46	2,393.18	48.15	47.59	87.73	1,177.73	-2,575.60	1,765.82	1,700.17	65.66	26.895	
6,400.00	2,392.69	2,344.98	2,392.69	48.69	47.59	87.67	1,177.73	-2,575.60	1,814.42	1,748.87	65.54	27.683	
6,450.00	2,392.20	2,344.49	2,392.20	49.24	47.58	87.60	1,177.73	-2,575.60	1,863.08	1,797.65	65.44	28.472	

SPUR ENERGY PARTNERS

PROTOTYPE

Anticollision Report

PROTOTYPE WELL PLANNING
WELL PLANNED. WELL EXECUTED.

Company:	SPUR ENERGY PARTNERS, LLC	**Local Co-ordinate Reference:**	Well 110H
Project:	EDDY COUNTY, NM (NAD 83 - NME)	**TVD Reference:**	RKB = 20' @ 3626.00usft (AKITA 57)
Reference Site:	BLACK CHERRY FEDERAL COM	**MD Reference:**	RKB = 20' @ 3626.00usft (AKITA 57)
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	110H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	OH	**Database:**	EDM 5000.17 Single User Db
Reference Design:	PERMIT	**Offset TVD Reference:**	Reference Datum

Offset Design: BLACK CHERRY FEDERAL COM - OFFSET: BEECH FEDERAL 5 - OH - SURVEYS

Offset Site Error: 0.00 usft

Survey Program: 100-GYRO-NS

Offset Well Error: 0.00 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Rule Assigned: Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
3,300.00	2,422.86	2,092.89	2,121.85	17.09	7.61	-27.47	612.95	-3,090.74	1,876.21	1,857.22	18.98	98.828	
3,350.00	2,422.38	2,100.11	2,128.96	17.49	7.64	-28.18	612.30	-3,091.85	1,826.94	1,807.87	19.07	95.806	
3,400.00	2,421.89	2,107.32	2,136.05	17.91	7.67	-28.91	611.64	-3,092.96	1,777.69	1,758.52	19.16	92.776	
3,450.00	2,421.40	2,114.53	2,143.14	18.33	7.71	-29.68	610.98	-3,094.06	1,728.44	1,709.19	19.25	89.784	
3,500.00	2,420.92	2,121.72	2,150.22	18.76	7.74	-30.47	610.31	-3,095.17	1,679.22	1,659.87	19.35	86.801	
3,550.00	2,420.43	2,128.91	2,157.29	19.21	7.77	-31.30	609.64	-3,096.27	1,630.00	1,610.56	19.44	83.846	
3,600.00	2,419.94	2,135.58	2,163.86	19.65	7.80	-32.09	609.02	-3,097.29	1,580.81	1,561.27	19.54	80.902	
3,650.00	2,419.46	2,142.27	2,170.44	20.11	7.83	-32.92	608.39	-3,098.32	1,531.64	1,512.00	19.64	77.982	
3,700.00	2,418.97	2,148.99	2,177.04	20.56	7.87	-33.79	607.76	-3,099.36	1,482.49	1,462.74	19.75	75.076	
3,750.00	2,418.48	2,155.74	2,183.68	21.03	7.90	-34.69	607.12	-3,100.40	1,433.36	1,413.51	19.85	72.192	
3,800.00	2,418.00	2,162.51	2,190.34	21.49	7.93	-35.63	606.48	-3,101.45	1,384.26	1,364.29	19.97	69.323	
3,850.00	2,417.51	2,169.31	2,197.03	21.97	7.96	-36.61	605.84	-3,102.50	1,335.19	1,315.11	20.09	66.475	
3,900.00	2,417.02	2,176.14	2,203.74	22.45	7.99	-37.63	605.20	-3,103.56	1,286.16	1,265.95	20.21	63.643	
3,950.00	2,416.54	2,182.99	2,210.48	22.93	8.02	-38.70	604.55	-3,104.63	1,237.16	1,216.82	20.34	60.831	
4,000.00	2,416.05	2,189.88	2,217.25	23.41	8.05	-39.82	603.89	-3,105.71	1,188.21	1,167.73	20.47	58.035	
4,050.00	2,415.56	2,196.79	2,224.05	23.90	8.09	-40.98	603.23	-3,106.79	1,139.30	1,118.68	20.62	55.259	
4,100.00	2,415.08	2,203.74	2,230.87	24.39	8.12	-42.20	602.57	-3,107.87	1,090.44	1,069.67	20.77	52.500	
4,150.00	2,414.59	2,210.71	2,237.73	24.89	8.15	-43.47	601.91	-3,108.97	1,041.64	1,020.71	20.93	49.759	
4,200.00	2,414.10	2,217.71	2,244.61	25.38	8.18	-44.80	601.24	-3,110.07	992.91	971.80	21.11	47.036	
4,250.00	2,413.62	2,223.00	2,249.81	25.89	8.21	-45.84	600.73	-3,110.90	944.26	922.96	21.31	44.314	
4,300.00	2,413.13	2,231.65	2,258.31	26.39	8.25	-47.61	599.89	-3,112.26	895.70	874.19	21.51	41.641	
4,350.00	2,412.64	2,238.63	2,265.17	26.89	8.28	-49.10	599.22	-3,113.37	847.25	825.51	21.74	38.970	
4,400.00	2,412.16	2,245.63	2,272.05	27.40	8.31	-50.65	598.53	-3,114.48	798.92	776.92	22.00	36.318	
4,450.00	2,411.67	2,252.67	2,278.96	27.91	8.35	-52.27	597.83	-3,115.59	750.75	728.46	22.29	33.685	
4,500.00	2,411.18	2,259.74	2,285.90	28.42	8.38	-53.95	597.13	-3,116.72	702.75	680.13	22.62	31.073	
4,550.00	2,410.70	2,266.84	2,292.88	28.93	8.41	-55.71	596.42	-3,117.85	654.97	631.98	22.99	28.484	
4,600.00	2,410.21	2,273.97	2,299.88	29.45	8.45	-57.53	595.70	-3,118.99	607.46	584.03	23.44	25.919	
4,650.00	2,409.72	2,281.14	2,306.92	29.97	8.48	-59.42	594.97	-3,120.14	560.29	536.34	23.96	23.385	
4,700.00	2,409.24	2,288.34	2,313.99	30.48	8.51	-61.38	594.23	-3,121.30	513.56	488.97	24.59	20.886	
4,750.00	2,408.75	2,295.57	2,321.09	31.00	8.55	-63.41	593.49	-3,122.46	467.38	442.02	25.35	18.434	
4,800.00	2,408.26	2,302.84	2,328.22	31.52	8.58	-65.51	592.73	-3,123.63	421.94	395.64	26.30	16.041	
4,850.00	2,407.78	2,310.13	2,335.38	32.05	8.62	-67.66	591.96	-3,124.81	377.51	350.02	27.50	13.729	
4,900.00	2,407.29	2,318.00	2,343.10	32.57	8.65	-70.04	591.13	-3,126.08	334.50	305.48	29.01	11.528	
4,950.00	2,406.80	2,325.30	2,350.26	33.10	8.69	-72.29	590.36	-3,127.26	293.50	262.55	30.96	9.481	
5,000.00	2,406.32	2,333.11	2,357.92	33.62	8.73	-74.74	589.54	-3,128.52	255.50	222.08	33.42	7.644	
5,050.00	2,405.83	2,340.85	2,365.52	34.15	8.76	-77.20	588.74	-3,129.77	222.04	185.61	36.43	6.095	
5,100.00	2,405.34	2,348.54	2,373.06	34.68	8.80	-79.67	587.94	-3,131.00	195.47	155.77	39.70	4.923	
5,150.00	2,404.86	2,356.16	2,380.55	35.21	8.83	-82.13	587.16	-3,132.21	178.88	136.47	42.41	4.218	
5,188.53	2,404.48	2,362.00	2,386.28	35.62	8.86	-84.02	586.56	-3,133.14	174.78	131.45	43.33	4.034	CC, ES, SF
5,200.00	2,404.37	2,363.73	2,387.98	35.74	8.87	-84.58	586.38	-3,133.42	175.15	131.81	43.34	4.042	
5,250.00	2,403.88	2,371.23	2,395.35	36.27	8.91	-87.01	585.62	-3,134.60	185.05	143.04	42.01	4.405	
5,300.00	2,403.40	2,378.68	2,402.66	36.80	8.94	-89.41	584.88	-3,135.78	206.64	167.36	39.28	5.261	
5,350.00	2,402.91	2,386.06	2,409.92	37.34	8.98	-91.78	584.14	-3,136.94	236.74	200.45	36.29	6.523	
5,400.00	2,402.42	2,393.40	2,417.13	37.87	9.01	-94.10	583.41	-3,138.09	272.55	238.88	33.67	8.095	
5,450.00	2,401.94	2,400.67	2,424.28	38.41	9.04	-96.37	582.69	-3,139.22	312.12	280.56	31.56	9.891	
5,500.00	2,401.45	2,407.89	2,431.37	38.94	9.08	-98.59	581.99	-3,140.34	354.18	324.27	29.91	11.840	
5,550.00	2,400.96	2,415.05	2,438.41	39.48	9.11	-100.75	581.29	-3,141.45	397.95	369.30	28.65	13.889	
5,600.00	2,400.48	2,422.01	2,445.26	40.02	9.14	-102.80	580.62	-3,142.52	442.93	415.26	27.67	16.005	
5,650.00	2,399.99	2,428.67	2,451.81	40.55	9.17	-104.72	579.99	-3,143.54	488.78	461.88	26.90	18.168	
5,700.00	2,399.50	2,435.18	2,458.22	41.09	9.20	-106.56	579.37	-3,144.53	535.29	509.00	26.30	20.354	
5,750.00	2,399.02	2,441.56	2,464.49	41.63	9.23	-108.31	578.78	-3,145.48	582.31	556.49	25.82	22.552	
5,800.00	2,398.53	2,447.80	2,470.64	42.17	9.26	-109.98	578.20	-3,146.41	629.71	604.27	25.44	24.755	

CC - Min centre to center distance or covergent point, SF - min separation factor, ES - min ellipse separation

SPUR ENERGY PARTNERS

PROTOTYPE
Anticollision Report

PROTOTYPE WELL PLANNING
WELL PLANNED. WELL EXECUTED.

Company:	SPUR ENERGY PARTNERS, LLC	**Local Co-ordinate Reference:**	Well 110H
Project:	EDDY COUNTY, NM (NAD 83 - NME)	**TVD Reference:**	RKB = 20' @ 3626.00usft (AKITA 57)
Reference Site:	BLACK CHERRY FEDERAL COM	**MD Reference:**	RKB = 20' @ 3626.00usft (AKITA 57)
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	110H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	OH	**Database:**	EDM 5000.17 Single User Db
Reference Design:	PERMIT	**Offset TVD Reference:**	Reference Datum

Offset Design: BLACK CHERRY FEDERAL COM - OFFSET: BEECH FEDERAL 5 - OH - SURVEYS

Offset Site Error: 0.00 usft

Survey Program: 100-GYRO-NS

Offset Well Error: 0.00 usft

Rule Assigned:

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
5,850.00	2,398.04	2,453.92	2,476.67	42.71	9.28	-111.58	577.65	-3,147.30	677.42	652.29	25.13	26.955	
5,900.00	2,397.56	2,459.91	2,482.57	43.25	9.31	-113.10	577.11	-3,148.18	725.39	700.50	24.88	29.151	
5,950.00	2,397.07	2,465.78	2,488.35	43.80	9.34	-114.55	576.59	-3,149.02	773.56	748.87	24.68	31.340	
6,000.00	2,396.58	2,471.53	2,494.02	44.34	9.36	-115.94	576.08	-3,149.84	821.90	797.38	24.52	33.520	
6,050.00	2,396.10	2,477.17	2,499.58	44.88	9.39	-117.25	575.59	-3,150.64	870.38	846.00	24.39	35.691	
6,100.00	2,395.61	2,482.69	2,505.03	45.42	9.41	-118.51	575.11	-3,151.41	918.99	894.72	24.28	37.852	
6,150.00	2,395.12	2,488.11	2,510.38	45.97	9.43	-119.71	574.65	-3,152.17	967.71	943.52	24.19	40.003	
6,200.00	2,394.64	2,493.43	2,515.62	46.51	9.46	-120.86	574.21	-3,152.90	1,016.51	992.39	24.12	42.144	
6,250.00	2,394.15	2,498.64	2,520.77	47.06	9.48	-121.95	573.77	-3,153.61	1,065.40	1,041.33	24.06	44.274	
6,300.00	2,393.66	2,503.75	2,525.82	47.60	9.50	-122.99	573.35	-3,154.30	1,114.35	1,090.33	24.02	46.395	
6,350.00	2,393.18	2,513.00	2,534.95	48.15	9.54	-124.81	572.60	-3,155.53	1,163.38	1,139.28	24.10	48.273	
6,400.00	2,392.69	2,513.88	2,535.82	48.69	9.55	-124.98	572.53	-3,155.65	1,212.44	1,188.48	23.96	50.598	
6,450.00	2,392.20	2,520.02	2,541.89	49.24	9.57	-126.13	572.03	-3,156.46	1,261.56	1,237.58	23.98	52.616	
6,500.00	2,391.72	2,526.17	2,547.96	49.78	9.60	-127.24	571.54	-3,157.27	1,310.71	1,286.72	24.00	54.618	
6,550.00	2,391.23	2,532.31	2,554.03	50.33	9.62	-128.32	571.05	-3,158.09	1,359.90	1,335.88	24.03	56.602	
6,600.00	2,390.74	2,538.46	2,560.11	50.88	9.65	-129.36	570.56	-3,158.90	1,409.12	1,385.06	24.06	58.572	
6,650.00	2,390.26	2,544.61	2,566.18	51.43	9.67	-130.37	570.06	-3,159.72	1,458.37	1,434.27	24.10	60.524	
6,700.00	2,389.77	2,550.76	2,572.26	51.97	9.70	-131.34	569.57	-3,160.53	1,507.64	1,483.50	24.14	62.462	
6,750.00	2,389.28	2,556.92	2,578.34	52.52	9.72	-132.28	569.08	-3,161.35	1,556.93	1,532.75	24.18	64.383	
6,800.00	2,388.80	2,563.07	2,584.42	53.07	9.75	-133.18	568.59	-3,162.16	1,606.25	1,582.02	24.23	66.290	
6,850.00	2,388.31	2,569.23	2,590.50	53.62	9.78	-134.06	568.10	-3,162.98	1,655.58	1,631.30	24.28	68.182	
6,900.00	2,387.82	2,575.38	2,596.58	54.17	9.80	-134.91	567.62	-3,163.79	1,704.93	1,680.59	24.34	70.059	
6,950.00	2,387.34	2,581.54	2,602.67	54.72	9.83	-135.73	567.13	-3,164.61	1,754.29	1,729.90	24.39	71.922	
7,000.00	2,386.85	2,587.70	2,608.75	55.27	9.85	-136.52	566.64	-3,165.43	1,803.67	1,779.22	24.45	73.770	
7,050.00	2,386.36	2,593.86	2,614.84	55.82	9.88	-137.29	566.15	-3,166.24	1,853.06	1,828.55	24.51	75.604	

SPUR ENERGY PARTNERS

PROTOTYPE

Anticollision Report

PROTOTYPE WELL PLANNING
WELL PLANNED. WELL EXECUTED.

Company:	SPUR ENERGY PARTNERS, LLC	**Local Co-ordinate Reference:**	Well 110H
Project:	EDDY COUNTY, NM (NAD 83 - NME)	**TVD Reference:**	RKB = 20' @ 3626.00usft (AKITA 57)
Reference Site:	BLACK CHERRY FEDERAL COM	**MD Reference:**	RKB = 20' @ 3626.00usft (AKITA 57)
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	110H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	OH	**Database:**	EDM 5000.17 Single User Db
Reference Design:	PERMIT	**Offset TVD Reference:**	Reference Datum

Offset Design: BLACK CHERRY FEDERAL COM - OFFSET: BEECH FEDERAL 6 - OH - SURVEYS

Offset Site Error: 0.00 usft

Survey Program: 141-INC-ONLY

Offset Well Error: 0.00 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Rule Assigned: Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
3,450.00	2,421.40	2,376.43	2,424.33	18.33	44.21	92.84	1,182.46	-3,235.78	1,892.74	1,837.45	55.29	34.235	
3,500.00	2,420.92	2,375.93	2,423.82	18.76	44.20	92.77	1,182.46	-3,235.78	1,844.03	1,788.74	55.29	33.352	
3,550.00	2,420.43	2,375.42	2,423.31	19.21	44.19	92.70	1,182.46	-3,235.78	1,795.39	1,740.08	55.31	32.462	
3,600.00	2,419.94	2,374.91	2,422.81	19.65	44.17	92.63	1,182.47	-3,235.78	1,746.83	1,691.51	55.32	31.575	
3,650.00	2,419.46	2,374.41	2,422.30	20.11	44.16	92.56	1,182.47	-3,235.78	1,698.35	1,643.00	55.35	30.682	
3,700.00	2,418.97	2,373.90	2,421.79	20.56	44.15	92.49	1,182.47	-3,235.78	1,649.96	1,594.58	55.39	29.790	
3,750.00	2,418.48	2,373.39	2,421.29	21.03	44.14	92.43	1,182.48	-3,235.78	1,601.68	1,546.24	55.43	28.895	
3,800.00	2,418.00	2,372.89	2,420.78	21.49	44.13	92.36	1,182.48	-3,235.78	1,553.50	1,498.01	55.48	27.999	
3,850.00	2,417.51	2,372.38	2,420.27	21.97	44.12	92.29	1,182.48	-3,235.78	1,505.43	1,449.88	55.55	27.099	
3,900.00	2,417.02	2,371.87	2,419.77	22.45	44.11	92.22	1,182.49	-3,235.78	1,457.50	1,401.87	55.63	26.199	
3,950.00	2,416.54	2,371.37	2,419.26	22.93	44.10	92.15	1,182.49	-3,235.78	1,409.72	1,353.98	55.73	25.295	
4,000.00	2,416.05	2,370.86	2,418.76	23.41	44.09	92.08	1,182.49	-3,235.78	1,362.09	1,306.24	55.84	24.391	
4,050.00	2,415.56	2,370.36	2,418.25	23.90	44.08	92.01	1,182.50	-3,235.78	1,314.63	1,258.65	55.98	23.483	
4,100.00	2,415.08	2,369.85	2,417.74	24.39	44.07	91.94	1,182.50	-3,235.78	1,267.37	1,211.23	56.14	22.575	
4,150.00	2,414.59	2,369.34	2,417.24	24.89	44.06	91.88	1,182.50	-3,235.78	1,220.34	1,164.00	56.33	21.663	
4,200.00	2,414.10	2,368.84	2,416.73	25.38	44.05	91.81	1,182.50	-3,235.78	1,173.54	1,116.99	56.55	20.752	
4,250.00	2,413.62	2,368.33	2,416.23	25.89	44.04	91.74	1,182.51	-3,235.78	1,127.02	1,070.21	56.81	19.838	
4,300.00	2,413.13	2,367.83	2,415.72	26.39	44.03	91.67	1,182.51	-3,235.78	1,080.81	1,023.70	57.11	18.926	
4,350.00	2,412.64	2,367.32	2,415.21	26.89	44.02	91.60	1,182.51	-3,235.78	1,034.95	977.50	57.46	18.012	
4,400.00	2,412.16	2,366.81	2,414.71	27.40	44.01	91.53	1,182.52	-3,235.78	989.50	931.64	57.86	17.101	
4,450.00	2,411.67	2,366.31	2,414.20	27.91	44.00	91.46	1,182.52	-3,235.78	944.50	886.17	58.33	16.192	
4,500.00	2,411.18	2,365.80	2,413.70	28.42	43.98	91.39	1,182.52	-3,235.78	900.03	841.17	58.87	15.289	
4,550.00	2,410.70	2,365.30	2,413.19	28.93	43.97	91.33	1,182.53	-3,235.78	856.18	796.68	59.49	14.391	
4,600.00	2,410.21	2,364.79	2,412.68	29.45	43.96	91.26	1,182.53	-3,235.78	813.03	752.82	60.21	13.503	
4,650.00	2,409.72	2,364.28	2,412.18	29.97	43.95	91.19	1,182.53	-3,235.78	770.71	709.67	61.03	12.628	
4,700.00	2,409.24	2,363.78	2,411.67	30.48	43.94	91.12	1,182.53	-3,235.78	729.36	667.38	61.97	11.769	
4,750.00	2,408.75	2,363.27	2,411.17	31.00	43.93	91.05	1,182.54	-3,235.78	689.16	626.11	63.05	10.931	
4,800.00	2,408.26	2,362.77	2,410.66	31.52	43.92	90.98	1,182.54	-3,235.78	650.31	586.05	64.26	10.120	
4,850.00	2,407.78	2,362.26	2,410.15	32.05	43.91	90.91	1,182.54	-3,235.78	613.09	547.46	65.63	9.342	
4,900.00	2,407.29	2,361.75	2,409.65	32.57	43.90	90.84	1,182.55	-3,235.78	577.80	510.65	67.15	8.604	
4,950.00	2,406.80	2,361.25	2,409.14	33.10	43.89	90.78	1,182.55	-3,235.78	544.82	475.98	68.83	7.915	
5,000.00	2,406.32	2,360.74	2,408.64	33.62	43.88	90.71	1,182.55	-3,235.78	514.58	443.94	70.64	7.284	
5,050.00	2,405.83	2,360.24	2,408.13	34.15	43.87	90.64	1,182.55	-3,235.78	487.61	415.06	72.55	6.721	
5,100.00	2,405.34	2,359.73	2,407.63	34.68	43.86	90.57	1,182.56	-3,235.78	464.48	389.98	74.49	6.235	
5,150.00	2,404.86	2,359.23	2,407.12	35.21	43.85	90.50	1,182.56	-3,235.78	445.77	369.39	76.38	5.836	
5,200.00	2,404.37	2,358.72	2,406.62	35.74	43.84	90.43	1,182.56	-3,235.78	432.06	353.98	78.09	5.533	
5,250.00	2,403.88	2,358.22	2,406.11	36.27	43.83	90.36	1,182.56	-3,235.78	423.85	344.35	79.50	5.332	
5,295.32	2,403.44	2,357.76	2,405.65	36.75	43.82	90.30	1,182.57	-3,235.78	421.42	340.98	80.43	5.239	CC
5,300.00	2,403.40	2,357.71	2,405.60	36.80	43.82	90.29	1,182.57	-3,235.78	421.44	340.93	80.51	5.235	ES, SF
5,350.00	2,402.91	2,357.20	2,405.10	37.34	43.81	90.23	1,182.57	-3,235.78	424.95	343.89	81.06	5.242	
5,400.00	2,402.42	2,356.70	2,404.59	37.87	43.80	90.16	1,182.57	-3,235.78	434.22	353.07	81.15	5.351	
5,450.00	2,401.94	2,356.19	2,404.09	38.41	43.78	90.09	1,182.58	-3,235.78	448.90	368.08	80.83	5.554	
5,500.00	2,401.45	2,355.69	2,403.58	38.94	43.77	90.02	1,182.58	-3,235.78	468.49	388.31	80.18	5.843	
5,550.00	2,400.96	2,355.18	2,403.08	39.48	43.76	89.95	1,182.58	-3,235.78	492.39	413.09	79.30	6.209	
5,600.00	2,400.48	2,354.68	2,402.57	40.02	43.75	89.88	1,182.58	-3,235.78	520.01	441.73	78.29	6.642	
5,650.00	2,399.99	2,354.17	2,402.07	40.55	43.74	89.81	1,182.59	-3,235.78	550.80	473.59	77.21	7.134	
5,700.00	2,399.50	2,353.67	2,401.56	41.09	43.73	89.74	1,182.59	-3,235.78	584.24	508.12	76.12	7.675	
5,750.00	2,399.02	2,353.16	2,401.06	41.63	43.72	89.68	1,182.59	-3,235.78	619.92	544.87	75.06	8.260	
5,800.00	2,398.53	2,352.66	2,400.55	42.17	43.71	89.61	1,182.59	-3,235.78	657.47	583.43	74.04	8.880	
5,850.00	2,398.04	2,352.15	2,400.05	42.71	43.70	89.54	1,182.60	-3,235.78	696.59	623.50	73.08	9.532	
5,900.00	2,397.56	2,351.65	2,399.54	43.25	43.69	89.47	1,182.60	-3,235.78	737.02	664.83	72.19	10.209	
5,950.00	2,397.07	2,351.14	2,399.04	43.80	43.68	89.40	1,182.60	-3,235.78	778.56	707.20	71.36	10.910	

CC - Min centre to center distance or covergent point, SF - min separation factor, ES - min ellipse separation

SPUR ENERGY PARTNERS

PROTOTYPE

Anticollision Report

PROTOTYPE WELL PLANNING
WELL PLANNED. WELL EXECUTED.

Company:	SPUR ENERGY PARTNERS, LLC	**Local Co-ordinate Reference:**	Well 110H
Project:	EDDY COUNTY, NM (NAD 83 - NME)	**TVD Reference:**	RKB = 20' @ 3626.00usft (AKITA 57)
Reference Site:	BLACK CHERRY FEDERAL COM	**MD Reference:**	RKB = 20' @ 3626.00usft (AKITA 57)
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	110H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	OH	**Database:**	EDM 5000.17 Single User Db
Reference Design:	PERMIT	**Offset TVD Reference:**	Reference Datum

Offset Design: BLACK CHERRY FEDERAL COM - OFFSET: BEECH FEDERAL 6 - OH - SURVEYS

Offset Site Error: 0.00 usft

Survey Program: 141-INC-ONLY

Offset Well Error: 0.00 usft

Rule Assigned:

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
6,000.00	2,396.58	2,350.64	2,398.53	44.34	43.67	89.33	1,182.60	-3,235.78	821.05	750.45	70.60	11.630	
6,050.00	2,396.10	2,350.13	2,398.03	44.88	43.66	89.26	1,182.60	-3,235.78	864.34	794.44	69.90	12.366	
6,100.00	2,395.61	2,349.63	2,397.52	45.42	43.65	89.20	1,182.61	-3,235.78	908.32	839.07	69.25	13.116	
6,150.00	2,395.12	2,349.12	2,397.02	45.97	43.64	89.13	1,182.61	-3,235.78	952.89	884.23	68.66	13.879	
6,200.00	2,394.64	2,348.62	2,396.51	46.51	43.63	89.06	1,182.61	-3,235.78	997.98	929.87	68.11	14.653	
6,250.00	2,394.15	2,348.11	2,396.01	47.06	43.62	88.99	1,182.61	-3,235.78	1,043.51	975.91	67.61	15.435	
6,300.00	2,393.66	2,347.61	2,395.50	47.60	43.61	88.92	1,182.62	-3,235.78	1,089.44	1,022.30	67.14	16.226	
6,350.00	2,393.18	2,347.10	2,395.00	48.15	43.60	88.85	1,182.62	-3,235.78	1,135.71	1,068.99	66.71	17.024	
6,400.00	2,392.69	2,346.60	2,394.49	48.69	43.59	88.78	1,182.62	-3,235.78	1,182.28	1,115.96	66.32	17.827	
6,450.00	2,392.20	2,346.09	2,393.99	49.24	43.57	88.72	1,182.62	-3,235.78	1,229.12	1,163.17	65.95	18.637	
6,500.00	2,391.72	2,345.59	2,393.48	49.78	43.56	88.65	1,182.63	-3,235.78	1,276.21	1,210.59	65.61	19.451	
6,550.00	2,391.23	2,345.08	2,392.98	50.33	43.55	88.58	1,182.63	-3,235.78	1,323.50	1,258.21	65.30	20.269	
6,600.00	2,390.74	2,344.58	2,392.47	50.88	43.54	88.51	1,182.63	-3,235.78	1,370.99	1,305.99	65.01	21.090	
6,650.00	2,390.26	2,344.07	2,391.97	51.43	43.53	88.44	1,182.63	-3,235.78	1,418.65	1,353.92	64.73	21.916	
6,700.00	2,389.77	2,343.57	2,391.46	51.97	43.52	88.37	1,182.63	-3,235.78	1,466.47	1,401.99	64.48	22.743	
6,750.00	2,389.28	2,343.06	2,390.96	52.52	43.51	88.30	1,182.64	-3,235.78	1,514.42	1,450.18	64.24	23.574	
6,800.00	2,388.80	2,342.56	2,390.46	53.07	43.50	88.24	1,182.64	-3,235.78	1,562.51	1,498.49	64.02	24.406	
6,850.00	2,388.31	2,342.06	2,389.95	53.62	43.49	88.17	1,182.64	-3,235.78	1,610.71	1,546.90	63.81	25.241	
6,900.00	2,387.82	2,341.55	2,389.45	54.17	43.48	88.10	1,182.64	-3,235.78	1,659.02	1,595.40	63.62	26.077	
6,950.00	2,387.34	2,341.05	2,388.94	54.72	43.47	88.03	1,182.64	-3,235.78	1,707.42	1,643.99	63.44	26.915	
7,000.00	2,386.85	2,340.54	2,388.44	55.27	43.46	87.96	1,182.65	-3,235.78	1,755.92	1,692.65	63.27	27.755	
7,050.00	2,386.36	2,340.04	2,387.93	55.82	43.45	87.89	1,182.65	-3,235.78	1,804.49	1,741.39	63.11	28.595	
7,100.00	2,385.88	2,339.53	2,387.43	56.37	43.44	87.82	1,182.65	-3,235.78	1,853.14	1,790.19	62.95	29.436	

SPUR ENERGY PARTNERS

PROTOTYPE

Anticollision Report

PROTOTYPE WELL PLANNING
WELL PLANNED. WELL EXECUTED.

Company:	SPUR ENERGY PARTNERS, LLC	**Local Co-ordinate Reference:**	Well 110H
Project:	EDDY COUNTY, NM (NAD 83 - NME)	**TVD Reference:**	RKB = 20' @ 3626.00usft (AKITA 57)
Reference Site:	BLACK CHERRY FEDERAL COM	**MD Reference:**	RKB = 20' @ 3626.00usft (AKITA 57)
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	110H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	OH	**Database:**	EDM 5000.17 Single User Db
Reference Design:	PERMIT	**Offset TVD Reference:**	Reference Datum

Offset Design: BLACK CHERRY FEDERAL COM - OFFSET: ENRON FEDERAL 5 - OH - SURVEYS — **Offset Site Error:** 0.00 usft

Survey Program: 534-INC-ONLY — **Offset Well Error:** 0.00 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Rule Assigned: Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
3,400.00	2,421.89	2,379.85	2,421.72	17.91	46.11	-101.62	672.56	-3,232.72	1,890.54	1,833.66	56.88	33.237	
3,450.00	2,421.40	2,379.36	2,421.23	18.33	46.10	-101.32	672.56	-3,232.72	1,840.60	1,783.71	56.89	32.353	
3,500.00	2,420.92	2,378.88	2,420.74	18.76	46.09	-101.01	672.56	-3,232.72	1,790.66	1,733.76	56.91	31.468	
3,550.00	2,420.43	2,378.39	2,420.26	19.21	46.08	-100.71	672.56	-3,232.72	1,740.73	1,683.81	56.92	30.583	
3,600.00	2,419.94	2,377.90	2,419.77	19.65	46.08	-100.40	672.56	-3,232.72	1,690.80	1,633.86	56.93	29.697	
3,650.00	2,419.46	2,377.42	2,419.28	20.11	46.07	-100.10	672.56	-3,232.72	1,640.87	1,583.92	56.95	28.812	
3,700.00	2,418.97	2,376.93	2,418.80	20.56	46.06	-99.79	672.56	-3,232.72	1,590.95	1,533.98	56.97	27.926	
3,750.00	2,418.48	2,376.44	2,418.31	21.03	46.05	-99.49	672.57	-3,232.72	1,541.03	1,484.04	56.99	27.040	
3,800.00	2,418.00	2,375.96	2,417.82	21.49	46.04	-99.18	672.57	-3,232.72	1,491.12	1,434.10	57.01	26.153	
3,850.00	2,417.51	2,375.47	2,417.34	21.97	46.03	-98.88	672.57	-3,232.72	1,441.21	1,384.17	57.04	25.267	
3,900.00	2,417.02	2,374.98	2,416.85	22.45	46.02	-98.57	672.57	-3,232.72	1,391.31	1,334.25	57.07	24.380	
3,950.00	2,416.54	2,374.50	2,416.36	22.93	46.01	-98.26	672.57	-3,232.72	1,341.42	1,284.32	57.10	23.494	
4,000.00	2,416.05	2,374.01	2,415.88	23.41	46.00	-97.95	672.57	-3,232.72	1,291.54	1,234.41	57.13	22.607	
4,050.00	2,415.56	2,373.52	2,415.39	23.90	45.99	-97.64	672.57	-3,232.72	1,241.66	1,184.49	57.17	21.720	
4,100.00	2,415.08	2,373.04	2,414.90	24.39	45.98	-97.33	672.57	-3,232.72	1,191.80	1,134.59	57.21	20.833	
4,150.00	2,414.59	2,372.55	2,414.42	24.89	45.97	-97.02	672.57	-3,232.72	1,141.94	1,084.69	57.25	19.945	
4,200.00	2,414.10	2,372.06	2,413.93	25.38	45.96	-96.71	672.58	-3,232.72	1,092.10	1,034.80	57.30	19.058	
4,250.00	2,413.62	2,371.58	2,413.44	25.89	45.96	-96.40	672.58	-3,232.72	1,042.28	984.92	57.36	18.170	
4,300.00	2,413.13	2,371.09	2,412.96	26.39	45.95	-96.09	672.58	-3,232.72	992.47	935.04	57.43	17.283	
4,350.00	2,412.64	2,370.60	2,412.47	26.89	45.94	-95.78	672.58	-3,232.72	942.68	885.18	57.50	16.395	
4,400.00	2,412.16	2,370.12	2,411.98	27.40	45.93	-95.47	672.58	-3,232.72	892.92	835.34	57.58	15.507	
4,450.00	2,411.67	2,369.63	2,411.50	27.91	45.92	-95.15	672.58	-3,232.72	843.18	785.50	57.68	14.619	
4,500.00	2,411.18	2,369.14	2,411.01	28.42	45.91	-94.84	672.58	-3,232.72	793.48	735.69	57.79	13.731	
4,550.00	2,410.70	2,368.66	2,410.52	28.93	45.90	-94.53	672.58	-3,232.72	743.81	685.90	57.91	12.844	
4,600.00	2,410.21	2,368.17	2,410.04	29.45	45.89	-94.22	672.58	-3,232.72	694.19	636.13	58.06	11.956	
4,650.00	2,409.72	2,367.68	2,409.55	29.97	45.88	-93.90	672.58	-3,232.72	644.64	586.39	58.24	11.068	
4,700.00	2,409.24	2,367.20	2,409.06	30.48	45.87	-93.59	672.59	-3,232.72	595.15	536.69	58.46	10.181	
4,750.00	2,408.75	2,366.71	2,408.58	31.00	45.86	-93.28	672.59	-3,232.72	545.76	487.04	58.73	9.294	
4,800.00	2,408.26	2,366.22	2,408.09	31.52	45.85	-92.96	672.59	-3,232.72	496.49	437.44	59.06	8.407	
4,850.00	2,407.78	2,365.74	2,407.60	32.05	45.84	-92.65	672.59	-3,232.72	447.38	387.91	59.48	7.522	
4,900.00	2,407.29	2,365.25	2,407.12	32.57	45.84	-92.33	672.59	-3,232.72	398.50	338.47	60.03	6.639	
4,950.00	2,406.80	2,364.76	2,406.63	33.10	45.83	-92.02	672.59	-3,232.72	349.93	289.17	60.76	5.759	
5,000.00	2,406.32	2,364.28	2,406.14	33.62	45.82	-91.70	672.59	-3,232.72	301.82	240.05	61.77	4.886	
5,050.00	2,405.83	2,363.79	2,405.66	34.15	45.81	-91.39	672.59	-3,232.72	254.44	191.23	63.22	4.025	
5,100.00	2,405.34	2,363.30	2,405.17	34.68	45.80	-91.08	672.59	-3,232.72	208.30	142.93	65.37	3.186	
5,150.00	2,404.86	2,362.82	2,404.68	35.21	45.79	-90.76	672.59	-3,232.72	164.42	95.72	68.70	2.393	
5,200.00	2,404.37	2,362.33	2,404.20	35.74	45.78	-90.45	672.60	-3,232.72	125.21	51.38	73.83	1.696	
5,250.00	2,403.88	2,361.84	2,403.71	36.27	45.77	-90.13	672.60	-3,232.72	96.56	16.34	80.22	1.204	Level 2
5,288.56	2,403.51	2,361.47	2,403.33	36.68	45.76	-89.89	672.60	-3,232.72	88.52	6.19	82.33	1.075	Level 2, CC, ES, SF
5,300.00	2,403.40	2,361.36	2,403.22	36.80	45.76	-89.82	672.60	-3,232.72	89.26	7.42	81.85	1.091	Level 2
5,350.00	2,402.91	2,360.87	2,402.74	37.34	45.75	-89.50	672.60	-3,232.72	107.76	32.25	75.50	1.427	Level 3
5,400.00	2,402.42	2,360.38	2,402.25	37.87	45.74	-89.19	672.60	-3,232.72	142.32	73.51	68.81	2.068	
5,450.00	2,401.94	2,359.90	2,401.76	38.41	45.73	-88.87	672.60	-3,232.72	184.11	119.66	64.46	2.856	
5,500.00	2,401.45	2,359.41	2,401.28	38.94	45.72	-88.56	672.60	-3,232.72	229.21	167.40	61.81	3.708	
5,550.00	2,400.96	2,358.92	2,400.79	39.48	45.71	-88.24	672.60	-3,232.72	276.01	215.83	60.18	4.587	
5,600.00	2,400.48	2,358.44	2,400.30	40.02	45.71	-87.93	672.60	-3,232.72	323.76	264.63	59.13	5.475	
5,650.00	2,399.99	2,357.95	2,399.82	40.55	45.70	-87.61	672.60	-3,232.72	372.11	313.67	58.44	6.367	
5,700.00	2,399.50	2,357.46	2,399.33	41.09	45.69	-87.30	672.60	-3,232.72	420.84	362.87	57.97	7.260	
5,750.00	2,399.02	2,356.98	2,398.84	41.63	45.68	-86.98	672.61	-3,232.72	469.83	412.19	57.64	8.151	
5,800.00	2,398.53	2,356.49	2,398.36	42.17	45.67	-86.67	672.61	-3,232.72	519.02	461.61	57.41	9.041	
5,850.00	2,398.04	2,356.00	2,397.87	42.71	45.66	-86.36	672.61	-3,232.72	568.35	511.11	57.24	9.929	
5,900.00	2,397.56	2,355.52	2,397.39	43.25	45.65	-86.04	672.61	-3,232.72	617.79	560.67	57.12	10.816	

CC - Min centre to center distance or covergent point, SF - min separation factor, ES - min ellipse separation

SPUR ENERGY PARTNERS

PROTOTYPE
Anticollision Report

PROTOTYPE WELL PLANNING
WELL PLANNED. WELL EXECUTED.

Company:	SPUR ENERGY PARTNERS, LLC	**Local Co-ordinate Reference:**	Well 110H
Project:	EDDY COUNTY, NM (NAD 83 - NME)	**TVD Reference:**	RKB = 20' @ 3626.00usft (AKITA 57)
Reference Site:	BLACK CHERRY FEDERAL COM	**MD Reference:**	RKB = 20' @ 3626.00usft (AKITA 57)
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	110H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	OH	**Database:**	EDM 5000.17 Single User Db
Reference Design:	PERMIT	**Offset TVD Reference:**	Reference Datum

Offset Design: BLACK CHERRY FEDERAL COM - OFFSET: ENRON FEDERAL 5 - OH - SURVEYS

Offset Site Error: 0.00 usft

Survey Program: 534-INC-ONLY

Offset Well Error: 0.00 usft

Rule Assigned:

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
5,950.00	2,397.07	2,355.03	2,396.90	43.80	45.64	-85.73	672.61	-3,232.72	667.31	610.28	57.03	11.701	
6,000.00	2,396.58	2,354.54	2,396.41	44.34	45.63	-85.42	672.61	-3,232.72	716.89	659.93	56.96	12.585	
6,050.00	2,396.10	2,354.06	2,395.93	44.88	45.62	-85.10	672.61	-3,232.72	766.53	709.62	56.92	13.468	
6,100.00	2,395.61	2,353.57	2,395.44	45.42	45.61	-84.79	672.61	-3,232.72	816.22	759.34	56.88	14.350	
6,150.00	2,395.12	2,353.09	2,394.95	45.97	45.60	-84.48	672.61	-3,232.72	865.94	809.08	56.86	15.230	
6,200.00	2,394.64	2,352.60	2,394.47	46.51	45.59	-84.17	672.61	-3,232.72	915.69	858.85	56.84	16.110	
6,250.00	2,394.15	2,352.11	2,393.98	47.06	45.59	-83.86	672.61	-3,232.72	965.46	908.63	56.83	16.989	
6,300.00	2,393.66	2,351.63	2,393.49	47.60	45.58	-83.54	672.62	-3,232.72	1,015.26	958.43	56.82	17.866	
6,350.00	2,393.18	2,351.14	2,393.01	48.15	45.57	-83.23	672.62	-3,232.72	1,065.08	1,008.25	56.82	18.743	
6,400.00	2,392.69	2,350.65	2,392.52	48.69	45.56	-82.92	672.62	-3,232.72	1,114.91	1,058.08	56.83	19.620	
6,450.00	2,392.20	2,350.17	2,392.03	49.24	45.55	-82.61	672.62	-3,232.72	1,164.75	1,107.92	56.83	20.495	
6,500.00	2,391.72	2,349.68	2,391.55	49.78	45.54	-82.30	672.62	-3,232.72	1,214.61	1,157.77	56.84	21.369	
6,550.00	2,391.23	2,349.19	2,391.06	50.33	45.53	-81.99	672.62	-3,232.72	1,264.48	1,207.63	56.85	22.243	
6,600.00	2,390.74	2,348.71	2,390.57	50.88	45.52	-81.69	672.62	-3,232.72	1,314.36	1,257.50	56.86	23.116	
6,650.00	2,390.26	2,348.22	2,390.09	51.43	45.51	-81.38	672.62	-3,232.72	1,364.25	1,307.38	56.87	23.988	
6,700.00	2,389.77	2,347.73	2,389.60	51.97	45.50	-81.07	672.62	-3,232.72	1,414.15	1,357.26	56.89	24.860	
6,750.00	2,389.28	2,347.25	2,389.12	52.52	45.49	-80.76	672.62	-3,232.72	1,464.05	1,407.15	56.90	25.730	
6,800.00	2,388.80	2,346.76	2,388.63	53.07	45.48	-80.46	672.62	-3,232.72	1,513.96	1,457.04	56.91	26.600	
6,850.00	2,388.31	2,346.28	2,388.14	53.62	45.47	-80.15	672.62	-3,232.72	1,563.87	1,506.94	56.93	27.470	
6,900.00	2,387.82	2,345.79	2,387.66	54.17	45.46	-79.85	672.63	-3,232.72	1,613.79	1,556.85	56.95	28.338	
6,950.00	2,387.34	2,345.30	2,387.17	54.72	45.46	-79.54	672.63	-3,232.72	1,663.72	1,606.75	56.97	29.206	
7,000.00	2,386.85	2,344.82	2,386.68	55.27	45.45	-79.24	672.63	-3,232.72	1,713.65	1,656.66	56.98	30.073	
7,050.00	2,386.36	2,344.33	2,386.20	55.82	45.44	-78.93	672.63	-3,232.72	1,763.58	1,706.58	57.00	30.939	
7,100.00	2,385.88	2,343.84	2,385.71	56.37	45.43	-78.63	672.63	-3,232.72	1,813.52	1,756.50	57.02	31.805	
7,150.00	2,385.39	2,343.36	2,385.23	56.92	45.42	-78.33	672.63	-3,232.72	1,863.46	1,806.42	57.04	32.669	

SPUR ENERGY PARTNERS

PROTOTYPE

Anticollision Report

PROTOTYPE WELL PLANNING
WELL PLANNED. WELL EXECUTED.

Company:	SPUR ENERGY PARTNERS, LLC	**Local Co-ordinate Reference:**	Well 110H
Project:	EDDY COUNTY, NM (NAD 83 - NME)	**TVD Reference:**	RKB = 20' @ 3626.00usft (AKITA 57)
Reference Site:	BLACK CHERRY FEDERAL COM	**MD Reference:**	RKB = 20' @ 3626.00usft (AKITA 57)
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	110H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	OH	**Database:**	EDM 5000.17 Single User Db
Reference Design:	PERMIT	**Offset TVD Reference:**	Reference Datum

Offset Design: BLACK CHERRY FEDERAL COM - OFFSET: FIR FEDERAL 1 - OH - SURVEYS — **Offset Site Error:** 0.00 usft

Survey Program: 262-INC-ONLY — **Offset Well Error:** 0.00 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Rule Assigned: Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
5,400.00	2,402.42	2,382.75	2,402.42	37.87	49.99	-98.67	656.04	-5,218.37	1,877.85	1,815.85	62.00	30.286	
5,450.00	2,401.94	2,382.26	2,401.94	38.41	49.98	-98.44	656.04	-5,218.37	1,827.96	1,765.90	62.06	29.457	
5,500.00	2,401.45	2,381.77	2,401.45	38.94	49.97	-98.22	656.04	-5,218.37	1,778.07	1,715.96	62.11	28.627	
5,550.00	2,400.96	2,381.29	2,400.96	39.48	49.96	-97.99	656.04	-5,218.37	1,728.19	1,666.02	62.17	27.798	
5,600.00	2,400.48	2,380.80	2,400.48	40.02	49.94	-97.76	656.04	-5,218.37	1,678.31	1,616.08	62.23	26.968	
5,650.00	2,399.99	2,380.31	2,399.99	40.55	49.93	-97.53	656.04	-5,218.37	1,628.45	1,566.15	62.30	26.138	
5,700.00	2,399.50	2,379.83	2,399.50	41.09	49.92	-97.30	656.04	-5,218.37	1,578.59	1,516.22	62.37	25.309	
5,750.00	2,399.02	2,379.34	2,399.02	41.63	49.91	-97.07	656.04	-5,218.37	1,528.74	1,466.29	62.45	24.479	
5,800.00	2,398.53	2,378.85	2,398.53	42.17	49.90	-96.84	656.04	-5,218.37	1,478.90	1,416.36	62.54	23.649	
5,850.00	2,398.04	2,378.37	2,398.04	42.71	49.88	-96.61	656.04	-5,218.37	1,429.07	1,366.45	62.63	22.819	
5,900.00	2,397.56	2,377.88	2,397.56	43.25	49.87	-96.38	656.04	-5,218.37	1,379.26	1,316.53	62.73	21.989	
5,950.00	2,397.07	2,377.40	2,397.07	43.80	49.86	-96.15	656.04	-5,218.37	1,329.45	1,266.62	62.83	21.159	
6,000.00	2,396.58	2,376.91	2,396.58	44.34	49.85	-95.92	656.04	-5,218.37	1,279.67	1,216.72	62.95	20.329	
6,050.00	2,396.10	2,376.42	2,396.10	44.88	49.84	-95.69	656.04	-5,218.37	1,229.90	1,166.82	63.08	19.498	
6,100.00	2,395.61	2,375.94	2,395.61	45.42	49.82	-95.46	656.04	-5,218.37	1,180.15	1,116.93	63.22	18.668	
6,150.00	2,395.12	2,375.45	2,395.12	45.97	49.81	-95.23	656.04	-5,218.37	1,130.42	1,067.04	63.37	17.838	
6,200.00	2,394.64	2,374.96	2,394.64	46.51	49.80	-95.00	656.04	-5,218.37	1,080.71	1,017.17	63.54	17.007	
6,250.00	2,394.15	2,374.48	2,394.15	47.06	49.79	-94.76	656.04	-5,218.37	1,031.04	967.30	63.74	16.177	
6,300.00	2,393.66	2,373.99	2,393.66	47.60	49.78	-94.53	656.04	-5,218.37	981.39	917.44	63.95	15.346	
6,350.00	2,393.18	2,373.50	2,393.18	48.15	49.76	-94.30	656.04	-5,218.37	931.79	867.60	64.19	14.516	
6,400.00	2,392.69	2,373.02	2,392.69	48.69	49.75	-94.07	656.04	-5,218.37	882.23	817.76	64.46	13.686	
6,450.00	2,392.20	2,372.53	2,392.20	49.24	49.74	-93.84	656.04	-5,218.37	832.72	767.94	64.78	12.855	
6,500.00	2,391.72	2,372.04	2,391.72	49.78	49.73	-93.61	656.04	-5,218.37	783.27	718.14	65.13	12.026	
6,550.00	2,391.23	2,371.56	2,391.23	50.33	49.72	-93.37	656.04	-5,218.37	733.90	668.35	65.55	11.196	
6,600.00	2,390.74	2,371.07	2,390.74	50.88	49.70	-93.14	656.04	-5,218.37	684.62	618.59	66.03	10.368	
6,650.00	2,390.26	2,370.58	2,390.26	51.43	49.69	-92.91	656.04	-5,218.37	635.45	568.85	66.60	9.541	
6,700.00	2,389.77	2,370.10	2,389.77	51.97	49.68	-92.68	656.04	-5,218.37	586.42	519.14	67.29	8.715	
6,750.00	2,389.28	2,369.61	2,389.28	52.52	49.67	-92.44	656.04	-5,218.37	537.57	469.46	68.11	7.893	
6,800.00	2,388.80	2,369.12	2,388.80	53.07	49.66	-92.21	656.04	-5,218.37	488.95	419.83	69.12	7.074	
6,850.00	2,388.31	2,368.64	2,388.31	53.62	49.64	-91.98	656.04	-5,218.37	440.64	370.27	70.37	6.261	
6,900.00	2,387.82	2,368.15	2,387.82	54.17	49.63	-91.74	656.04	-5,218.37	392.76	320.79	71.96	5.458	
6,950.00	2,387.34	2,367.66	2,387.34	54.72	49.62	-91.51	656.04	-5,218.37	345.47	271.45	74.02	4.667	
7,000.00	2,386.85	2,367.18	2,386.85	55.27	49.61	-91.28	656.04	-5,218.37	299.06	222.34	76.72	3.898	
7,050.00	2,386.36	2,366.69	2,386.36	55.82	49.60	-91.05	656.04	-5,218.37	254.02	173.65	80.38	3.160	
7,100.00	2,385.88	2,366.20	2,385.88	56.37	49.58	-90.81	656.04	-5,218.37	211.23	125.85	85.37	2.474	
7,150.00	2,385.39	2,365.72	2,385.39	56.92	49.57	-90.58	656.04	-5,218.37	172.35	80.22	92.13	1.871	
7,200.00	2,384.90	2,365.23	2,384.90	57.47	49.56	-90.35	656.04	-5,218.37	140.69	40.30	100.39	1.401	Level 3
7,250.00	2,384.42	2,364.74	2,384.42	58.02	49.55	-90.11	656.04	-5,218.37	121.99	14.97	107.02	1.140	Level 2
7,274.15	2,384.18	2,364.51	2,384.18	58.29	49.54	-90.00	656.04	-5,218.37	119.58	11.84	107.74	1.110	Level 2, CC, ES, SF
7,300.00	2,383.93	2,364.26	2,383.93	58.57	49.54	-89.88	656.04	-5,218.37	122.34	16.28	106.06	1.153	Level 2
7,350.00	2,383.45	2,363.77	2,383.45	59.12	49.52	-89.65	656.04	-5,218.37	141.61	43.57	98.04	1.444	Level 3
7,400.00	2,382.96	2,363.28	2,382.96	59.68	49.51	-89.41	656.04	-5,218.37	173.61	84.49	89.12	1.948	
7,450.00	2,382.47	2,362.80	2,382.47	60.23	49.50	-89.18	656.04	-5,218.37	212.66	130.56	82.11	2.590	
7,500.00	2,381.99	2,362.31	2,381.99	60.78	49.49	-88.95	656.04	-5,218.37	255.56	178.51	77.05	3.317	
7,550.00	2,381.50	2,361.82	2,381.50	61.33	49.48	-88.71	656.04	-5,218.37	300.66	227.23	73.43	4.095	
7,600.00	2,381.01	2,361.34	2,381.01	61.88	49.46	-88.48	656.04	-5,218.37	347.10	276.30	70.80	4.902	
7,650.00	2,380.53	2,360.85	2,380.53	62.44	49.45	-88.25	656.04	-5,218.37	394.42	325.55	68.87	5.727	
7,700.00	2,380.04	2,360.36	2,380.04	62.99	49.44	-88.01	656.04	-5,218.37	442.32	374.91	67.41	6.562	
7,750.00	2,379.55	2,359.88	2,379.55	63.54	49.43	-87.78	656.04	-5,218.37	490.64	424.35	66.29	7.401	
7,800.00	2,379.07	2,359.39	2,379.07	64.10	49.42	-87.55	656.04	-5,218.37	539.27	473.84	65.43	8.242	
7,850.00	2,378.58	2,358.90	2,378.58	64.65	49.40	-87.32	656.04	-5,218.37	588.13	523.37	64.75	9.082	
7,900.00	2,378.09	2,358.42	2,378.09	65.20	49.39	-87.08	656.04	-5,218.37	637.16	572.95	64.22	9.922	

CC - Min centre to center distance or covergent point, SF - min separation factor, ES - min ellipse separation

SPUR ENERGY PARTNERS

PROTOTYPE
Anticollision Report

PROTOTYPE WELL PLANNING
WELL PLANNED. WELL EXECUTED.

Company:	SPUR ENERGY PARTNERS, LLC	**Local Co-ordinate Reference:**	Well 110H
Project:	EDDY COUNTY, NM (NAD 83 - NME)	**TVD Reference:**	RKB = 20' @ 3626.00usft (AKITA 57)
Reference Site:	BLACK CHERRY FEDERAL COM	**MD Reference:**	RKB = 20' @ 3626.00usft (AKITA 57)
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	110H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	OH	**Database:**	EDM 5000.17 Single User Db
Reference Design:	PERMIT	**Offset TVD Reference:**	Reference Datum

Offset Design: BLACK CHERRY FEDERAL COM - OFFSET: FIR FEDERAL 1 - OH - SURVEYS — **Offset Site Error:** 0.00 usft

Survey Program: 262-INC-ONLY — **Rule Assigned:** — **Offset Well Error:** 0.00 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
7,950.00	2,377.61	2,357.93	2,377.61	65.76	49.38	-86.85	656.04	-5,218.37	686.34	622.55	63.79	10.759	
8,000.00	2,377.12	2,357.44	2,377.12	66.31	49.37	-86.62	656.04	-5,218.37	735.62	672.18	63.44	11.595	
8,050.00	2,376.63	2,356.96	2,376.63	66.87	49.36	-86.39	656.04	-5,218.37	785.00	721.83	63.16	12.428	
8,100.00	2,376.15	2,356.47	2,376.15	67.42	49.34	-86.15	656.04	-5,218.37	834.44	771.51	62.94	13.259	
8,150.00	2,375.66	2,355.98	2,375.66	67.97	49.33	-85.92	656.04	-5,218.37	883.96	821.21	62.75	14.087	
8,200.00	2,375.17	2,355.50	2,375.17	68.53	49.32	-85.69	656.04	-5,218.37	933.52	870.92	62.60	14.914	
8,217.70	2,375.00	2,355.32	2,375.00	68.72	49.32	-85.61	656.04	-5,218.37	951.07	888.53	62.55	15.206	

SPUR ENERGY PARTNERS

PROTOTYPE

Anticollision Report

PROTOTYPE WELL PLANNING
WELL PLANNED. WELL EXECUTED.

Company:	SPUR ENERGY PARTNERS, LLC	**Local Co-ordinate Reference:**	Well 110H
Project:	EDDY COUNTY, NM (NAD 83 - NME)	**TVD Reference:**	RKB = 20' @ 3626.00usft (AKITA 57)
Reference Site:	BLACK CHERRY FEDERAL COM	**MD Reference:**	RKB = 20' @ 3626.00usft (AKITA 57)
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	110H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	OH	**Database:**	EDM 5000.17 Single User Db
Reference Design:	PERMIT	**Offset TVD Reference:**	Reference Datum

Offset Design: BLACK CHERRY FEDERAL COM - OFFSET: FIR FEDERAL 2H - OH - SURVEYS

Offset Site Error: 0.00 usft

Survey Program: 100-MWD

Offset Well Error: 0.00 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Rule Assigned: Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
5,500.00	2,401.45	2,471.83	2,497.18	38.94	6.73	104.46	1,216.24	-5,265.75	1,880.29	1,862.17	18.12	103.756	
5,550.00	2,400.96	2,470.02	2,495.38	39.48	6.72	104.23	1,216.41	-5,265.80	1,831.81	1,813.51	18.30	100.116	
5,600.00	2,400.48	2,468.20	2,493.57	40.02	6.72	104.00	1,216.60	-5,265.85	1,783.41	1,764.93	18.49	96.455	
5,650.00	2,399.99	2,466.37	2,491.75	40.55	6.72	103.78	1,216.78	-5,265.90	1,735.11	1,716.40	18.70	92.767	
5,700.00	2,399.50	2,464.55	2,489.94	41.09	6.71	103.55	1,216.96	-5,265.95	1,686.90	1,667.96	18.94	89.066	
5,750.00	2,399.02	2,462.72	2,488.12	41.63	6.71	103.32	1,217.14	-5,266.00	1,638.79	1,619.59	19.20	85.345	
5,800.00	2,398.53	2,460.88	2,486.29	42.17	6.70	103.09	1,217.32	-5,266.05	1,590.80	1,571.31	19.49	81.619	
5,850.00	2,398.04	2,459.00	2,484.42	42.71	6.70	102.85	1,217.51	-5,266.10	1,542.94	1,523.13	19.81	77.884	
5,900.00	2,397.56	2,459.00	2,484.42	43.25	6.70	102.85	1,217.51	-5,266.10	1,495.21	1,475.07	20.14	74.228	
5,950.00	2,397.07	2,455.48	2,480.92	43.80	6.69	102.41	1,217.86	-5,266.20	1,447.64	1,427.09	20.55	70.444	
6,000.00	2,396.58	2,453.69	2,479.14	44.34	6.68	102.18	1,218.03	-5,266.25	1,400.23	1,379.25	20.98	66.747	
6,050.00	2,396.10	2,451.89	2,477.34	44.88	6.68	101.96	1,218.21	-5,266.30	1,353.00	1,331.55	21.45	63.073	
6,100.00	2,395.61	2,450.07	2,475.54	45.42	6.67	101.73	1,218.39	-5,266.36	1,305.98	1,284.01	21.97	59.437	
6,150.00	2,395.12	2,448.25	2,473.73	45.97	6.67	101.50	1,218.57	-5,266.41	1,259.19	1,236.64	22.55	55.844	
6,200.00	2,394.64	2,446.42	2,471.90	46.51	6.66	101.27	1,218.76	-5,266.46	1,212.65	1,189.46	23.18	52.308	
6,250.00	2,394.15	2,444.58	2,470.07	47.06	6.66	101.04	1,218.94	-5,266.51	1,166.39	1,142.50	23.88	48.836	
6,300.00	2,393.66	2,442.73	2,468.23	47.60	6.65	100.80	1,219.12	-5,266.57	1,120.45	1,095.79	24.66	45.442	
6,350.00	2,393.18	2,440.87	2,466.38	48.15	6.65	100.57	1,219.31	-5,266.62	1,074.87	1,049.36	25.51	42.134	
6,400.00	2,392.69	2,439.00	2,464.52	48.69	6.65	100.33	1,219.49	-5,266.67	1,029.69	1,003.24	26.45	38.926	
6,450.00	2,392.20	2,437.12	2,462.65	49.24	6.64	100.09	1,219.68	-5,266.73	984.98	957.49	27.49	35.825	
6,500.00	2,391.72	2,435.23	2,460.77	49.78	6.64	99.85	1,219.87	-5,266.78	940.80	912.15	28.64	32.844	
6,550.00	2,391.23	2,433.33	2,458.88	50.33	6.63	99.61	1,220.06	-5,266.84	897.22	867.31	29.92	29.992	
6,600.00	2,390.74	2,431.42	2,456.98	50.88	6.63	99.37	1,220.25	-5,266.89	854.34	823.02	31.32	27.279	
6,650.00	2,390.26	2,429.50	2,455.07	51.43	6.62	99.13	1,220.44	-5,266.95	812.28	779.41	32.87	24.712	
6,700.00	2,389.77	2,427.56	2,453.15	51.97	6.62	98.88	1,220.63	-5,267.01	771.15	736.57	34.58	22.301	
6,750.00	2,389.28	2,425.62	2,451.22	52.52	6.61	98.63	1,220.82	-5,267.07	731.13	694.67	36.46	20.053	
6,800.00	2,388.80	2,423.67	2,449.28	53.07	6.61	98.39	1,221.01	-5,267.12	692.40	653.88	38.52	17.973	
6,850.00	2,388.31	2,421.71	2,447.33	53.62	6.60	98.14	1,221.21	-5,267.18	655.19	614.41	40.78	16.067	
6,900.00	2,387.82	2,419.74	2,445.37	54.17	6.60	97.89	1,221.40	-5,267.24	619.78	576.56	43.22	14.339	
6,950.00	2,387.34	2,417.76	2,443.40	54.72	6.59	97.63	1,221.60	-5,267.30	586.49	540.65	45.84	12.793	
7,000.00	2,386.85	2,415.76	2,441.41	55.27	6.59	97.38	1,221.80	-5,267.36	555.70	507.09	48.62	11.431	
7,050.00	2,386.36	2,413.76	2,439.42	55.82	6.58	97.13	1,222.00	-5,267.42	527.86	476.38	51.48	10.253	
7,100.00	2,385.88	2,411.74	2,437.42	56.37	6.58	96.87	1,222.20	-5,267.48	503.44	449.08	54.36	9.261	
7,150.00	2,385.39	2,409.72	2,435.40	56.92	6.57	96.61	1,222.40	-5,267.55	482.97	425.83	57.14	8.452	
7,200.00	2,384.90	2,407.68	2,433.37	57.47	6.57	96.35	1,222.60	-5,267.61	466.98	407.30	59.67	7.826	
7,250.00	2,384.42	2,405.63	2,431.34	58.02	6.56	96.09	1,222.80	-5,267.67	455.92	394.12	61.80	7.377	
7,300.00	2,383.93	2,403.57	2,429.29	58.57	6.56	95.83	1,223.01	-5,267.73	450.16	386.78	63.38	7.103	
7,327.24	2,383.67	2,402.44	2,428.17	58.87	6.55	95.68	1,223.12	-5,267.77	449.34	385.37	63.97	7.024	CC, ES
7,350.00	2,383.45	2,401.50	2,427.23	59.12	6.55	95.56	1,223.21	-5,267.80	449.91	385.61	64.31	6.996	SF
7,400.00	2,382.96	2,399.92	2,425.65	59.68	6.55	95.36	1,223.37	-5,267.85	455.18	390.64	64.54	7.052	
7,450.00	2,382.47	2,397.53	2,423.28	60.23	6.54	95.06	1,223.61	-5,267.92	465.78	401.63	64.15	7.260	
7,500.00	2,381.99	2,395.09	2,420.85	60.78	6.53	94.75	1,223.85	-5,268.00	481.35	418.14	63.22	7.614	
7,550.00	2,381.50	2,392.59	2,418.36	61.33	6.53	94.43	1,224.10	-5,268.08	501.44	439.57	61.87	8.105	
7,600.00	2,381.01	2,390.03	2,415.82	61.88	6.52	94.10	1,224.35	-5,268.16	525.52	465.28	60.24	8.724	
7,650.00	2,380.53	2,387.41	2,413.21	62.44	6.52	93.77	1,224.60	-5,268.25	553.07	494.63	58.44	9.463	
7,700.00	2,380.04	2,384.73	2,410.55	62.99	6.51	93.43	1,224.86	-5,268.34	583.61	527.02	56.59	10.313	
7,750.00	2,379.55	2,381.98	2,407.81	63.54	6.50	93.08	1,225.12	-5,268.43	616.68	561.94	54.74	11.266	
7,800.00	2,379.07	2,379.16	2,405.01	64.10	6.49	92.72	1,225.39	-5,268.53	651.90	598.97	52.94	12.315	
7,850.00	2,378.58	2,376.28	2,402.14	64.65	6.49	92.35	1,225.66	-5,268.63	688.95	637.73	51.22	13.451	
7,900.00	2,378.09	2,373.32	2,399.20	65.20	6.48	91.98	1,225.94	-5,268.73	727.53	677.94	49.60	14.669	
7,950.00	2,377.61	2,370.28	2,396.18	65.76	6.47	91.59	1,226.22	-5,268.84	767.43	719.35	48.08	15.962	
8,000.00	2,377.12	2,367.17	2,393.08	66.31	6.46	91.20	1,226.51	-5,268.96	808.44	761.78	46.66	17.325	

CC - Min centre to center distance or covergent point, SF - min separation factor, ES - min ellipse separation

SPUR ENERGY PARTNERS

PROTOTYPE
Anticollision Report

PROTOTYPE WELL PLANNING
WELL PLANNED. WELL EXECUTED.

Company:	SPUR ENERGY PARTNERS, LLC	**Local Co-ordinate Reference:**	Well 110H
Project:	EDDY COUNTY, NM (NAD 83 - NME)	**TVD Reference:**	RKB = 20' @ 3626.00usft (AKITA 57)
Reference Site:	BLACK CHERRY FEDERAL COM	**MD Reference:**	RKB = 20' @ 3626.00usft (AKITA 57)
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	110H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	OH	**Database:**	EDM 5000.17 Single User Db
Reference Design:	PERMIT	**Offset TVD Reference:**	Reference Datum

Offset Design: BLACK CHERRY FEDERAL COM - OFFSET: FIR FEDERAL 2H - OH - SURVEYS

Offset Site Error: 0.00 usft

Survey Program: 100-MWD

Rule Assigned:

Offset Well Error: 0.00 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
8,050.00	2,376.63	2,363.97	2,389.90	66.87	6.45	90.79	1,226.80	-5,269.07	850.41	805.05	45.35	18.751	
8,100.00	2,376.15	2,360.69	2,386.63	67.42	6.45	90.38	1,227.10	-5,269.20	893.19	849.05	44.14	20.236	
8,150.00	2,375.66	2,357.32	2,383.28	67.97	6.44	89.95	1,227.40	-5,269.33	936.68	893.66	43.02	21.776	
8,200.00	2,375.17	2,353.86	2,379.83	68.53	6.43	89.52	1,227.71	-5,269.47	980.78	938.81	41.98	23.366	
8,217.70	2,375.00	2,352.61	2,378.59	68.72	6.43	89.36	1,227.82	-5,269.51	996.53	954.90	41.63	23.940	

SPUR ENERGY PARTNERS

PROTOTYPE

Anticollision Report

PROTOTYPE WELL PLANNING
WELL PLANNED. WELL EXECUTED.

Company:	SPUR ENERGY PARTNERS, LLC	**Local Co-ordinate Reference:**	Well 110H
Project:	EDDY COUNTY, NM (NAD 83 - NME)	**TVD Reference:**	RKB = 20' @ 3626.00usft (AKITA 57)
Reference Site:	BLACK CHERRY FEDERAL COM	**MD Reference:**	RKB = 20' @ 3626.00usft (AKITA 57)
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	110H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	OH	**Database:**	EDM 5000.17 Single User Db
Reference Design:	PERMIT	**Offset TVD Reference:**	Reference Datum

Offset Design: BLACK CHERRY FEDERAL COM - OFFSET: FIR FEDERAL 3 - OH - SURVEYS — **Offset Site Error:** 0.00 usft

Survey Program: 139-INC-ONLY — **Rule Assigned:** — **Offset Well Error:** 0.00 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
6,050.00	2,396.10	2,366.15	2,396.10	44.88	42.53	-95.82	600.62	-5,878.60	1,892.44	1,836.72	55.72	33.964	
6,100.00	2,395.61	2,365.66	2,395.61	45.42	42.52	-95.67	600.62	-5,878.60	1,842.67	1,786.85	55.82	33.008	
6,150.00	2,395.12	2,365.17	2,395.12	45.97	42.51	-95.52	600.62	-5,878.60	1,792.92	1,736.99	55.94	32.053	
6,200.00	2,394.64	2,364.69	2,394.64	46.51	42.50	-95.36	600.62	-5,878.60	1,743.18	1,687.13	56.06	31.097	
6,250.00	2,394.15	2,364.20	2,394.15	47.06	42.50	-95.21	600.62	-5,878.60	1,693.46	1,637.28	56.18	30.142	
6,300.00	2,393.66	2,363.71	2,393.66	47.60	42.49	-95.05	600.62	-5,878.60	1,643.75	1,587.44	56.32	29.187	
6,350.00	2,393.18	2,363.23	2,393.18	48.15	42.48	-94.90	600.62	-5,878.60	1,594.07	1,537.60	56.46	28.232	
6,400.00	2,392.69	2,362.74	2,392.69	48.69	42.47	-94.75	600.62	-5,878.60	1,544.40	1,487.78	56.62	27.277	
6,450.00	2,392.20	2,362.25	2,392.20	49.24	42.46	-94.59	600.62	-5,878.60	1,494.75	1,437.96	56.79	26.322	
6,500.00	2,391.72	2,361.77	2,391.72	49.78	42.45	-94.44	600.62	-5,878.60	1,445.13	1,388.16	56.97	25.367	
6,550.00	2,391.23	2,361.28	2,391.23	50.33	42.44	-94.28	600.62	-5,878.60	1,395.53	1,338.37	57.17	24.412	
6,600.00	2,390.74	2,360.79	2,390.74	50.88	42.43	-94.13	600.62	-5,878.60	1,345.97	1,288.59	57.38	23.458	
6,650.00	2,390.26	2,360.31	2,390.26	51.43	42.42	-93.98	600.62	-5,878.60	1,296.44	1,238.83	57.61	22.504	
6,700.00	2,389.77	2,359.82	2,389.77	51.97	42.42	-93.82	600.62	-5,878.60	1,246.94	1,189.08	57.86	21.550	
6,750.00	2,389.28	2,359.33	2,389.28	52.52	42.41	-93.67	600.62	-5,878.60	1,197.49	1,139.35	58.14	20.597	
6,800.00	2,388.80	2,358.85	2,388.80	53.07	42.40	-93.51	600.62	-5,878.60	1,148.08	1,089.64	58.44	19.644	
6,850.00	2,388.31	2,358.36	2,388.31	53.62	42.39	-93.36	600.62	-5,878.60	1,098.73	1,039.95	58.78	18.692	
6,900.00	2,387.82	2,357.87	2,387.82	54.17	42.38	-93.20	600.62	-5,878.60	1,049.44	990.29	59.15	17.741	
6,950.00	2,387.34	2,357.39	2,387.34	54.72	42.37	-93.05	600.62	-5,878.60	1,000.22	940.65	59.57	16.792	
7,000.00	2,386.85	2,356.90	2,386.85	55.27	42.36	-92.89	600.62	-5,878.60	951.08	891.05	60.03	15.844	
7,050.00	2,386.36	2,356.42	2,386.36	55.82	42.35	-92.74	600.62	-5,878.60	902.03	841.48	60.55	14.898	
7,100.00	2,385.88	2,355.93	2,385.88	56.37	42.35	-92.58	600.62	-5,878.60	853.09	791.96	61.13	13.955	
7,150.00	2,385.39	2,355.44	2,385.39	56.92	42.34	-92.43	600.62	-5,878.60	804.29	742.49	61.80	13.014	
7,200.00	2,384.90	2,354.96	2,384.90	57.47	42.33	-92.27	600.62	-5,878.60	755.64	693.08	62.56	12.078	
7,250.00	2,384.42	2,354.47	2,384.42	58.02	42.32	-92.12	600.62	-5,878.60	707.18	643.74	63.44	11.148	
7,300.00	2,383.93	2,353.98	2,383.93	58.57	42.31	-91.97	600.62	-5,878.60	658.95	594.49	64.45	10.223	
7,350.00	2,383.45	2,353.50	2,383.45	59.12	42.30	-91.81	600.62	-5,878.60	611.00	545.36	65.64	9.308	
7,400.00	2,382.96	2,353.01	2,382.96	59.68	42.29	-91.66	600.62	-5,878.60	563.41	496.37	67.04	8.404	
7,450.00	2,382.47	2,352.52	2,382.47	60.23	42.28	-91.50	600.62	-5,878.60	516.27	447.56	68.71	7.514	
7,500.00	2,381.99	2,352.04	2,381.99	60.78	42.27	-91.35	600.62	-5,878.60	469.73	399.02	70.71	6.643	
7,550.00	2,381.50	2,351.55	2,381.50	61.33	42.27	-91.19	600.62	-5,878.60	423.97	350.84	73.13	5.797	
7,600.00	2,381.01	2,351.06	2,381.01	61.88	42.26	-91.04	600.62	-5,878.60	379.28	303.18	76.10	4.984	
7,650.00	2,380.53	2,350.58	2,380.53	62.44	42.25	-90.88	600.62	-5,878.60	336.10	256.34	79.76	4.214	
7,700.00	2,380.04	2,350.09	2,380.04	62.99	42.24	-90.73	600.62	-5,878.60	295.07	210.81	84.27	3.502	
7,750.00	2,379.55	2,349.60	2,379.55	63.54	42.23	-90.57	600.62	-5,878.60	257.24	167.51	89.73	2.867	
7,800.00	2,379.07	2,349.12	2,379.07	64.10	42.22	-90.42	600.62	-5,878.60	224.23	128.21	96.01	2.335	
7,850.00	2,378.58	2,348.63	2,378.58	64.65	42.21	-90.26	600.62	-5,878.60	198.45	96.12	102.34	1.939	
7,900.00	2,378.09	2,348.14	2,378.09	65.20	42.20	-90.11	600.62	-5,878.60	182.99	76.15	106.85	1.713	
7,933.97	2,377.76	2,347.81	2,377.76	65.58	42.20	-90.00	600.62	-5,878.60	179.81	72.12	107.69	1.670	CC, ES, SF
7,950.00	2,377.61	2,347.66	2,377.61	65.76	42.20	-89.95	600.62	-5,878.60	180.53	73.21	107.32	1.682	
8,000.00	2,377.12	2,347.17	2,377.12	66.31	42.19	-89.80	600.62	-5,878.60	191.55	88.22	103.34	1.854	
8,050.00	2,376.63	2,346.68	2,376.63	66.87	42.18	-89.64	600.62	-5,878.60	214.00	117.14	96.86	2.209	
8,100.00	2,376.15	2,346.20	2,376.15	67.42	42.17	-89.49	600.62	-5,878.60	244.74	154.67	90.07	2.717	
8,150.00	2,375.66	2,345.71	2,375.66	67.97	42.16	-89.33	600.62	-5,878.60	281.07	197.01	84.06	3.344	
8,200.00	2,375.17	2,345.22	2,375.17	68.53	42.15	-89.18	600.62	-5,878.60	321.09	242.00	79.09	4.060	
8,217.70	2,375.00	2,345.05	2,375.00	68.72	42.15	-89.12	600.62	-5,878.60	335.90	258.33	77.57	4.330	

CC - Min centre to center distance or covergent point, SF - min separation factor, ES - min ellipse separation

SPUR ENERGY PARTNERS

PROTOTYPE

Anticollision Report

PROTOTYPE WELL PLANNING
WELL PLANNED. WELL EXECUTED.

Company:	SPUR ENERGY PARTNERS, LLC	**Local Co-ordinate Reference:**	Well 110H
Project:	EDDY COUNTY, NM (NAD 83 - NME)	**TVD Reference:**	RKB = 20' @ 3626.00usft (AKITA 57)
Reference Site:	BLACK CHERRY FEDERAL COM	**MD Reference:**	RKB = 20' @ 3626.00usft (AKITA 57)
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	110H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	OH	**Database:**	EDM 5000.17 Single User Db
Reference Design:	PERMIT	**Offset TVD Reference:**	Reference Datum

Offset Design: BLACK CHERRY FEDERAL COM - OFFSET: FIR FEDERAL 4 - OH - SURVEYS — **Offset Site Error:** 0.00 usft

Survey Program: 115-INC-ONLY — **Offset Well Error:** 0.00 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Rule Assigned: Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
6,100.00	2,395.61	2,357.00	2,395.68	45.42	49.46	92.97	1,126.61	-5,879.26	1,870.69	1,808.95	61.74	30.302	
6,150.00	2,395.12	2,356.50	2,395.19	45.97	49.45	92.89	1,126.61	-5,879.26	1,821.58	1,759.70	61.88	29.438	
6,200.00	2,394.64	2,356.01	2,394.70	46.51	49.44	92.81	1,126.61	-5,879.26	1,772.51	1,710.48	62.03	28.573	
6,250.00	2,394.15	2,355.52	2,394.20	47.06	49.43	92.73	1,126.61	-5,879.26	1,723.51	1,661.30	62.21	27.706	
6,300.00	2,393.66	2,355.03	2,393.71	47.60	49.42	92.65	1,126.61	-5,879.26	1,674.56	1,612.16	62.40	26.836	
6,350.00	2,393.18	2,354.54	2,393.22	48.15	49.41	92.56	1,126.61	-5,879.26	1,625.67	1,563.06	62.61	25.965	
6,400.00	2,392.69	2,354.04	2,392.73	48.69	49.40	92.48	1,126.61	-5,879.26	1,576.86	1,514.01	62.84	25.092	
6,450.00	2,392.20	2,353.55	2,392.24	49.24	49.39	92.40	1,126.61	-5,879.26	1,528.12	1,465.02	63.10	24.217	
6,500.00	2,391.72	2,353.06	2,391.74	49.78	49.38	92.32	1,126.61	-5,879.26	1,479.47	1,416.08	63.39	23.340	
6,550.00	2,391.23	2,352.57	2,391.25	50.33	49.37	92.24	1,126.61	-5,879.26	1,430.90	1,367.20	63.70	22.462	
6,600.00	2,390.74	2,352.08	2,390.76	50.88	49.36	92.16	1,126.61	-5,879.26	1,382.44	1,318.39	64.05	21.582	
6,650.00	2,390.26	2,351.58	2,390.27	51.43	49.35	92.08	1,126.61	-5,879.26	1,334.10	1,269.65	64.44	20.702	
6,700.00	2,389.77	2,351.09	2,389.78	51.97	49.34	92.00	1,126.61	-5,879.26	1,285.88	1,221.00	64.87	19.821	
6,750.00	2,389.28	2,350.60	2,389.29	52.52	49.33	91.91	1,126.61	-5,879.26	1,237.80	1,172.44	65.35	18.940	
6,800.00	2,388.80	2,350.11	2,388.79	53.07	49.32	91.83	1,126.61	-5,879.26	1,189.88	1,123.99	65.89	18.059	
6,850.00	2,388.31	2,349.62	2,388.31	53.62	49.31	91.76	1,125.78	-5,879.26	1,141.88	1,075.42	66.45	17.183	
6,900.00	2,387.82	2,349.13	2,387.82	54.17	49.30	91.68	1,125.78	-5,879.26	1,094.33	1,027.21	67.11	16.306	
6,950.00	2,387.34	2,348.65	2,387.34	54.72	49.29	91.60	1,125.78	-5,879.26	1,047.00	979.15	67.85	15.431	
7,000.00	2,386.85	2,348.16	2,386.85	55.27	49.28	91.52	1,125.78	-5,879.26	999.94	931.27	68.67	14.561	
7,050.00	2,386.36	2,347.67	2,386.36	55.82	49.27	91.43	1,125.78	-5,879.26	953.17	883.58	69.59	13.696	
7,100.00	2,385.88	2,347.19	2,385.88	56.37	49.26	91.35	1,125.78	-5,879.26	906.75	836.12	70.63	12.838	
7,150.00	2,385.39	2,346.70	2,385.39	56.92	49.25	91.27	1,125.78	-5,879.26	860.73	788.94	71.79	11.990	
7,200.00	2,384.90	2,346.21	2,384.90	57.47	49.24	91.19	1,125.78	-5,879.26	815.18	742.09	73.10	11.152	
7,250.00	2,384.42	2,345.73	2,384.42	58.02	49.23	91.11	1,125.78	-5,879.26	770.18	695.61	74.57	10.328	
7,300.00	2,383.93	2,345.24	2,383.93	58.57	49.22	91.03	1,125.78	-5,879.26	725.84	649.60	76.24	9.521	
7,350.00	2,383.45	2,344.76	2,383.45	59.12	49.21	90.95	1,125.78	-5,879.26	682.28	604.16	78.12	8.734	
7,400.00	2,382.96	2,344.27	2,382.96	59.68	49.20	90.87	1,125.78	-5,879.26	639.66	559.41	80.25	7.971	
7,450.00	2,382.47	2,343.78	2,382.47	60.23	49.19	90.79	1,125.78	-5,879.26	598.18	515.53	82.66	7.237	
7,500.00	2,381.99	2,343.30	2,381.99	60.78	49.18	90.71	1,125.78	-5,879.26	558.10	472.73	85.37	6.537	
7,550.00	2,381.50	2,342.81	2,381.50	61.33	49.17	90.63	1,125.78	-5,879.26	519.75	431.33	88.42	5.878	
7,600.00	2,381.01	2,342.32	2,381.01	61.88	49.16	90.55	1,125.78	-5,879.26	483.52	391.72	91.81	5.267	
7,650.00	2,380.53	2,341.84	2,380.53	62.44	49.15	90.47	1,125.78	-5,879.26	449.95	354.43	95.52	4.711	
7,700.00	2,380.04	2,341.35	2,380.04	62.99	49.14	90.39	1,125.78	-5,879.26	419.65	320.17	99.48	4.219	
7,750.00	2,379.55	2,340.86	2,379.55	63.54	49.13	90.30	1,125.78	-5,879.26	393.40	289.86	103.54	3.799	
7,800.00	2,379.07	2,340.38	2,379.07	64.10	49.12	90.22	1,125.78	-5,879.26	372.05	264.59	107.46	3.462	
7,850.00	2,378.58	2,339.89	2,378.58	64.65	49.11	90.14	1,125.78	-5,879.26	356.48	245.58	110.90	3.214	
7,900.00	2,378.09	2,339.40	2,378.09	65.20	49.10	90.06	1,125.78	-5,879.26	347.46	234.00	113.46	3.062	
7,938.46	2,377.72	2,339.03	2,377.72	65.63	49.09	90.00	1,125.78	-5,879.26	345.33	230.69	114.63	3.012 CC	
7,950.00	2,377.61	2,338.92	2,377.61	65.76	49.09	89.98	1,125.78	-5,879.26	345.52	230.68	114.84	3.009 ES, SF	
8,000.00	2,377.12	2,338.43	2,377.12	66.31	49.08	89.90	1,125.78	-5,879.26	350.77	235.87	114.90	3.053	
8,050.00	2,376.63	2,337.94	2,376.63	66.87	49.07	89.82	1,125.78	-5,879.26	362.89	249.14	113.76	3.190	
8,100.00	2,376.15	2,337.46	2,376.15	67.42	49.06	89.74	1,125.78	-5,879.26	381.24	269.55	111.69	3.413	
8,150.00	2,375.66	2,336.97	2,375.66	67.97	49.05	89.66	1,125.78	-5,879.26	404.96	295.92	109.04	3.714	
8,200.00	2,375.17	2,336.48	2,375.17	68.53	49.04	89.58	1,125.78	-5,879.26	433.18	327.06	106.12	4.082	
8,217.70	2,375.00	2,336.31	2,375.00	68.72	49.04	89.55	1,125.78	-5,879.26	444.09	339.03	105.07	4.227	

CC - Min centre to center distance or covergent point, SF - min separation factor, ES - min ellipse separation

SPUR ENERGY PARTNERS

PROTOTYPE

Anticollision Report

PROTOTYPE WELL PLANNING
WELL PLANNED. WELL EXECUTED.

Company:	SPUR ENERGY PARTNERS, LLC	**Local Co-ordinate Reference:**	Well 110H
Project:	EDDY COUNTY, NM (NAD 83 - NME)	**TVD Reference:**	RKB = 20' @ 3626.00usft (AKITA 57)
Reference Site:	BLACK CHERRY FEDERAL COM	**MD Reference:**	RKB = 20' @ 3626.00usft (AKITA 57)
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	110H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	OH	**Database:**	EDM 5000.17 Single User Db
Reference Design:	PERMIT	**Offset TVD Reference:**	Reference Datum

Offset Design: BLACK CHERRY FEDERAL COM - OFFSET: RESLER STATE 2 - OH - SURVEYS

Offset Site Error: 0.00 usft

Survey Program: 544-INC-ONLY

Offset Well Error: 0.00 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Rule Assigned: Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
1,450.00	1,382.13	1,337.36	1,382.35	8.61	23.58	-61.01	843.30	-1,913.37	1,887.35	1,857.40	29.96	63.005	
1,500.00	1,424.08	1,379.48	1,424.47	8.81	24.34	-61.66	843.28	-1,913.37	1,872.49	1,841.65	30.84	60.717	
1,550.00	1,466.02	1,421.58	1,466.57	9.01	25.10	-62.31	843.24	-1,913.37	1,857.90	1,826.17	31.73	58.559	
1,600.00	1,507.97	1,463.66	1,508.65	9.20	25.86	-62.96	843.18	-1,913.37	1,843.59	1,810.98	32.61	56.530	
1,650.00	1,549.91	1,505.72	1,550.71	9.41	26.61	-63.63	843.11	-1,913.37	1,829.57	1,796.07	33.50	54.609	
1,700.00	1,591.86	1,546.88	1,591.86	9.61	27.36	-64.29	843.04	-1,913.37	1,815.86	1,781.48	34.38	52.818	
1,750.00	1,633.81	1,588.82	1,633.81	9.82	28.13	-64.97	843.04	-1,913.37	1,802.47	1,767.18	35.29	51.081	
1,800.00	1,675.75	1,630.77	1,675.75	10.03	28.90	-65.65	843.04	-1,913.37	1,789.39	1,753.20	36.19	49.441	
1,850.00	1,717.70	1,672.72	1,717.70	10.24	29.67	-66.35	843.04	-1,913.37	1,776.64	1,739.55	37.09	47.901	
1,900.00	1,759.65	1,714.67	1,759.65	10.45	30.44	-64.16	843.04	-1,913.37	1,763.92	1,725.94	37.98	46.438	
1,950.00	1,801.61	1,756.63	1,801.61	10.66	31.21	-58.12	843.04	-1,913.37	1,749.00	1,710.05	38.95	44.904	
2,000.00	1,843.39	1,798.42	1,843.40	10.87	31.98	-52.07	843.60	-1,913.37	1,731.49	1,691.57	39.92	43.379	
2,050.00	1,884.79	1,839.98	1,884.96	11.08	32.74	-46.20	843.58	-1,913.37	1,711.23	1,670.36	40.87	41.866	
2,100.00	1,925.60	1,880.92	1,925.90	11.29	33.49	-40.56	843.53	-1,913.37	1,688.36	1,646.54	41.82	40.371	
2,150.00	1,965.64	1,921.05	1,966.03	11.49	34.23	-35.22	843.46	-1,913.37	1,662.93	1,620.18	42.75	38.898	
2,200.00	2,004.70	1,960.19	2,005.16	11.69	34.95	-30.15	843.36	-1,913.37	1,635.02	1,591.36	43.66	37.447	
2,250.00	2,042.59	1,998.14	2,043.11	11.88	35.64	-25.33	843.24	-1,913.37	1,604.71	1,560.16	44.55	36.021	
2,300.00	2,079.13	2,034.72	2,079.69	12.06	36.31	-20.68	843.10	-1,913.37	1,572.11	1,526.71	45.41	34.624	
2,350.00	2,114.14	2,069.18	2,114.14	12.24	36.96	-16.09	843.04	-1,913.37	1,537.35	1,491.13	46.23	33.256	
2,400.00	2,147.45	2,102.49	2,147.45	12.41	37.58	-11.44	843.04	-1,913.37	1,500.57	1,453.54	47.03	31.909	
2,450.00	2,178.90	2,133.94	2,178.90	12.58	38.17	-6.58	843.04	-1,913.37	1,461.90	1,414.12	47.78	30.597	
2,500.00	2,208.33	2,163.37	2,208.33	12.74	38.73	-1.34	843.04	-1,913.37	1,421.53	1,373.05	48.48	29.320	
2,550.00	2,235.61	2,190.64	2,235.61	12.92	39.24	4.50	843.04	-1,913.37	1,379.64	1,330.51	49.13	28.081	
2,600.00	2,260.89	2,215.93	2,260.89	13.07	39.72	7.82	843.04	-1,913.37	1,336.59	1,286.87	49.72	26.882	
2,650.00	2,285.89	2,240.93	2,285.89	13.27	40.19	8.08	843.04	-1,913.37	1,293.39	1,243.09	50.30	25.714	
2,700.00	2,310.89	2,265.93	2,310.89	13.46	40.66	8.35	843.04	-1,913.37	1,250.20	1,199.33	50.88	24.573	
2,750.00	2,335.89	2,290.93	2,335.89	13.67	41.13	8.65	843.04	-1,913.37	1,207.02	1,155.57	51.46	23.457	
2,800.00	2,360.41	2,315.47	2,360.43	13.88	41.59	9.76	843.59	-1,913.37	1,163.63	1,111.59	52.04	22.362	
2,850.00	2,381.51	2,336.61	2,381.57	14.12	41.98	12.20	843.58	-1,913.37	1,118.46	1,065.91	52.56	21.280	
2,900.00	2,398.59	2,353.71	2,398.67	14.38	42.31	16.03	843.57	-1,913.37	1,071.65	1,018.67	52.99	20.225	
2,950.00	2,411.50	2,366.65	2,411.61	14.65	42.55	22.70	843.56	-1,913.37	1,023.55	970.24	53.31	19.200	
3,000.00	2,420.16	2,375.32	2,420.28	14.95	42.71	36.13	843.55	-1,913.37	974.53	921.01	53.53	18.207	
3,050.00	2,424.49	2,379.66	2,424.62	15.26	42.79	66.72	843.54	-1,913.37	924.97	871.33	53.64	17.245	
3,100.00	2,424.81	2,379.98	2,424.94	15.59	42.80	95.34	843.54	-1,913.37	875.24	821.59	53.65	16.315	
3,150.00	2,424.32	2,379.49	2,424.45	15.95	42.79	95.04	843.54	-1,913.37	825.54	771.90	53.64	15.391	
3,200.00	2,423.84	2,379.00	2,423.96	16.31	42.78	94.74	843.54	-1,913.37	775.87	722.24	53.63	14.467	
3,250.00	2,423.35	2,378.52	2,423.48	16.70	42.77	94.43	843.54	-1,913.37	726.25	672.64	53.62	13.545	
3,300.00	2,422.86	2,378.03	2,422.99	17.09	42.76	94.13	843.54	-1,913.37	676.69	623.06	53.63	12.619	
3,350.00	2,422.38	2,377.54	2,422.50	17.49	42.75	93.83	843.54	-1,913.37	627.19	573.55	53.64	11.693	
3,400.00	2,421.89	2,377.05	2,422.01	17.91	42.75	93.53	843.54	-1,913.37	577.78	524.14	53.64	10.771	
3,450.00	2,421.40	2,376.56	2,421.52	18.33	42.74	93.23	843.54	-1,913.37	528.48	474.82	53.67	9.848	
3,500.00	2,420.92	2,376.08	2,421.04	18.76	42.73	92.92	843.54	-1,913.37	479.33	425.63	53.70	8.926	
3,550.00	2,420.43	2,375.59	2,420.55	19.21	42.72	92.62	843.54	-1,913.37	430.37	376.60	53.77	8.004	
3,600.00	2,419.94	2,375.10	2,420.06	19.65	42.71	92.32	843.55	-1,913.37	381.68	327.80	53.87	7.085	
3,650.00	2,419.46	2,374.61	2,419.57	20.11	42.70	92.01	843.55	-1,913.37	333.37	279.32	54.05	6.167	
3,700.00	2,418.97	2,374.13	2,419.08	20.56	42.69	91.71	843.55	-1,913.37	285.65	231.30	54.36	5.255	
3,750.00	2,418.48	2,373.64	2,418.60	21.03	42.68	91.41	843.55	-1,913.37	238.87	183.97	54.90	4.351	
3,800.00	2,418.00	2,373.15	2,418.11	21.49	42.67	91.10	843.55	-1,913.37	193.69	137.82	55.87	3.467	
3,850.00	2,417.51	2,372.66	2,417.62	21.97	42.66	90.80	843.55	-1,913.37	151.58	93.89	57.68	2.628	
3,900.00	2,417.02	2,372.17	2,417.13	22.45	42.65	90.50	843.55	-1,913.37	115.90	55.03	60.87	1.904	
3,950.00	2,416.54	2,371.69	2,416.65	22.93	42.64	90.19	843.55	-1,913.37	94.29	29.49	64.80	1.455	Level 3
3,970.45	2,416.34	2,371.49	2,416.45	23.13	42.64	90.07	843.55	-1,913.37	92.05	26.35	65.71	1.401	Level 3, CC, ES, SF

CC - Min centre to center distance or covergent point, SF - min separation factor, ES - min ellipse separation

SPUR ENERGY PARTNERS

PROTOTYPE

Anticollision Report

PROTOTYPE WELL PLANNING
WELL PLANNED. WELL EXECUTED.

Company:	SPUR ENERGY PARTNERS, LLC	**Local Co-ordinate Reference:**	Well 110H
Project:	EDDY COUNTY, NM (NAD 83 - NME)	**TVD Reference:**	RKB = 20' @ 3626.00usft (AKITA 57)
Reference Site:	BLACK CHERRY FEDERAL COM	**MD Reference:**	RKB = 20' @ 3626.00usft (AKITA 57)
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	110H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	OH	**Database:**	EDM 5000.17 Single User Db
Reference Design:	PERMIT	**Offset TVD Reference:**	Reference Datum

Offset Design: BLACK CHERRY FEDERAL COM - OFFSET: RESLER STATE 2 - OH - SURVEYS — **Offset Site Error:** 0.00 usft

Survey Program: 544-INC-ONLY — **Rule Assigned:** — **Offset Well Error:** 0.00 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
4,000.00	2,416.05	2,371.20	2,416.16	23.41	42.64	89.89	843.55	-1,913.37	96.69	31.15	65.54	1.475	Level 3
4,050.00	2,415.56	2,370.71	2,415.67	23.90	42.63	89.58	843.55	-1,913.37	121.68	58.79	62.89	1.935	
4,100.00	2,415.08	2,370.22	2,415.18	24.39	42.62	89.28	843.55	-1,913.37	158.94	98.64	60.30	2.636	
4,150.00	2,414.59	2,369.73	2,414.69	24.89	42.61	88.98	843.55	-1,913.37	201.79	143.23	58.55	3.446	
4,200.00	2,414.10	2,369.25	2,414.21	25.38	42.60	88.67	843.55	-1,913.37	247.33	189.90	57.43	4.306	
4,250.00	2,413.62	2,368.76	2,413.72	25.89	42.59	88.37	843.55	-1,913.37	294.33	237.64	56.69	5.192	
4,300.00	2,413.13	2,368.27	2,413.23	26.39	42.58	88.07	843.55	-1,913.37	342.17	286.00	56.18	6.091	
4,350.00	2,412.64	2,367.78	2,412.74	26.89	42.57	87.76	843.55	-1,913.37	390.56	334.75	55.81	6.999	
4,400.00	2,412.16	2,367.30	2,412.26	27.40	42.56	87.46	843.55	-1,913.37	439.31	383.77	55.53	7.911	
4,450.00	2,411.67	2,366.81	2,411.77	27.91	42.55	87.16	843.56	-1,913.37	488.31	432.98	55.32	8.827	
4,500.00	2,411.18	2,366.32	2,411.28	28.42	42.54	86.86	843.56	-1,913.37	537.49	482.33	55.16	9.745	
4,550.00	2,410.70	2,365.83	2,410.79	28.93	42.53	86.55	843.56	-1,913.37	586.81	531.78	55.03	10.664	
4,600.00	2,410.21	2,365.34	2,410.30	29.45	42.53	86.25	843.56	-1,913.37	636.24	581.32	54.92	11.584	
4,650.00	2,409.72	2,364.86	2,409.82	29.97	42.52	85.95	843.56	-1,913.37	685.75	630.91	54.83	12.506	
4,700.00	2,409.24	2,364.37	2,409.33	30.48	42.51	85.65	843.56	-1,913.37	735.32	680.56	54.76	13.427	
4,750.00	2,408.75	2,363.88	2,408.84	31.00	42.50	85.35	843.56	-1,913.37	784.95	730.25	54.70	14.350	
4,800.00	2,408.26	2,363.39	2,408.35	31.52	42.49	85.04	843.56	-1,913.37	834.63	779.97	54.65	15.272	
4,850.00	2,407.78	2,362.91	2,407.87	32.05	42.48	84.74	843.56	-1,913.37	884.34	829.73	54.61	16.194	
4,900.00	2,407.29	2,362.42	2,407.38	32.57	42.47	84.44	843.56	-1,913.37	934.08	879.50	54.57	17.117	
4,950.00	2,406.80	2,361.93	2,406.89	33.10	42.46	84.14	843.56	-1,913.37	983.84	929.30	54.54	18.039	
5,000.00	2,406.32	2,361.44	2,406.40	33.62	42.45	83.84	843.56	-1,913.37	1,033.63	979.12	54.51	18.962	
5,050.00	2,405.83	2,360.95	2,405.91	34.15	42.44	83.54	843.56	-1,913.37	1,083.44	1,028.95	54.49	19.884	
5,100.00	2,405.34	2,360.47	2,405.43	34.68	42.43	83.24	843.56	-1,913.37	1,133.26	1,078.80	54.47	20.806	
5,150.00	2,404.86	2,359.98	2,404.94	35.21	42.42	82.94	843.56	-1,913.37	1,183.10	1,128.65	54.45	21.728	
5,200.00	2,404.37	2,359.49	2,404.45	35.74	42.42	82.64	843.56	-1,913.37	1,232.96	1,178.52	54.44	22.649	
5,250.00	2,403.88	2,359.00	2,403.96	36.27	42.41	82.35	843.56	-1,913.37	1,282.82	1,228.39	54.43	23.570	
5,300.00	2,403.40	2,358.52	2,403.48	36.80	42.40	82.05	843.56	-1,913.37	1,332.69	1,278.28	54.41	24.491	
5,350.00	2,402.91	2,358.03	2,402.99	37.34	42.39	81.75	843.56	-1,913.37	1,382.58	1,328.17	54.41	25.412	
5,400.00	2,402.42	2,357.54	2,402.50	37.87	42.38	81.45	843.56	-1,913.37	1,432.47	1,378.07	54.40	26.332	
5,450.00	2,401.94	2,357.05	2,402.01	38.41	42.37	81.16	843.57	-1,913.37	1,482.36	1,427.97	54.39	27.252	
5,500.00	2,401.45	2,356.56	2,401.52	38.94	42.36	80.86	843.57	-1,913.37	1,532.27	1,477.88	54.39	28.172	
5,550.00	2,400.96	2,356.08	2,401.04	39.48	42.35	80.57	843.57	-1,913.37	1,582.18	1,527.79	54.39	29.091	
5,600.00	2,400.48	2,355.59	2,400.55	40.02	42.34	80.27	843.57	-1,913.37	1,632.09	1,577.71	54.39	30.010	
5,650.00	2,399.99	2,355.10	2,400.06	40.55	42.33	79.98	843.57	-1,913.37	1,682.01	1,627.63	54.39	30.928	
5,700.00	2,399.50	2,354.61	2,399.57	41.09	42.32	79.68	843.57	-1,913.37	1,731.94	1,677.55	54.39	31.846	
5,750.00	2,399.02	2,354.13	2,399.09	41.63	42.31	79.39	843.57	-1,913.37	1,781.87	1,727.48	54.39	32.763	
5,800.00	2,398.53	2,353.64	2,398.60	42.17	42.31	79.10	843.57	-1,913.37	1,831.80	1,777.41	54.39	33.680	
5,850.00	2,398.04	2,353.15	2,398.11	42.71	42.30	78.80	843.57	-1,913.37	1,881.74	1,827.35	54.39	34.596	

SPUR ENERGY PARTNERS

PROTOTYPE

Anticollision Report

PROTOTYPE WELL PLANNING
WELL PLANNED. WELL EXECUTED.

Company:	SPUR ENERGY PARTNERS, LLC	**Local Co-ordinate Reference:**	Well 110H
Project:	EDDY COUNTY, NM (NAD 83 - NME)	**TVD Reference:**	RKB = 20' @ 3626.00usft (AKITA 57)
Reference Site:	BLACK CHERRY FEDERAL COM	**MD Reference:**	RKB = 20' @ 3626.00usft (AKITA 57)
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	110H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	OH	**Database:**	EDM 5000.17 Single User Db
Reference Design:	PERMIT	**Offset TVD Reference:**	Reference Datum

Offset Design: BLACK CHERRY FEDERAL COM - OFFSET: RESLER STATE 4 - OH - SURVEYS

Offset Site Error: 0.00 usft

Survey Program: 475-INC-ONLY

Offset Well Error: 0.00 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Rule Assigned: Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
0.00	0.00	0.00	55.00	0.00	0.00	-53.53	1,090.04	-1,474.72	1,834.67				
50.00	50.00	0.00	55.00	0.92	0.00	-53.53	1,090.04	-1,474.72	1,833.85	1,832.93	0.92	1,984.218	
68.52	68.52	13.52	68.52	0.92	0.23	-53.53	1,090.04	-1,474.72	1,833.84	1,832.69	1.16	1,583.410	
100.00	100.00	45.00	100.00	0.92	0.78	-53.53	1,090.04	-1,474.72	1,833.84	1,832.14	1.70	1,076.831	
150.00	150.00	95.00	150.00	1.23	1.64	-53.53	1,090.04	-1,474.72	1,833.84	1,830.98	2.87	639.110	
200.00	200.00	145.00	200.00	1.53	2.51	-53.53	1,090.04	-1,474.72	1,833.84	1,829.81	4.04	454.401	
250.00	250.00	195.00	250.00	1.74	3.37	-53.53	1,090.04	-1,474.72	1,833.84	1,828.73	5.11	358.526	
300.00	300.00	245.00	300.00	1.95	4.24	-53.53	1,090.04	-1,474.72	1,833.84	1,827.65	6.19	296.060	
350.00	349.99	294.99	349.99	2.38	5.11	-36.20	1,090.04	-1,474.72	1,833.32	1,825.94	7.38	248.369	
400.00	399.95	344.95	399.95	2.84	5.97	-36.27	1,090.04	-1,474.72	1,831.73	1,823.10	8.63	212.195	
450.00	449.85	394.85	449.85	3.18	6.83	-36.37	1,090.04	-1,474.72	1,829.10	1,819.31	9.78	186.963	
500.00	499.63	444.63	499.63	3.54	7.70	-36.52	1,090.04	-1,474.72	1,825.41	1,814.47	10.94	166.925	
550.00	549.29	494.29	549.29	3.85	8.58	-36.72	1,090.04	-1,474.72	1,820.68	1,808.61	12.07	150.808	
600.00	598.77	543.77	598.77	4.16	9.48	-36.96	1,090.04	-1,474.72	1,814.92	1,801.68	13.24	137.081	
650.00	648.04	593.05	648.04	4.45	10.39	-37.24	1,090.04	-1,474.72	1,808.13	1,793.75	14.38	125.703	
700.00	697.08	642.08	697.08	4.74	11.29	-37.57	1,090.04	-1,474.72	1,800.33	1,784.80	15.52	115.973	
750.00	745.85	690.85	745.85	5.02	12.19	-37.95	1,090.04	-1,474.72	1,791.52	1,774.88	16.65	107.624	
800.00	794.31	739.31	794.31	5.30	13.08	-38.38	1,090.04	-1,474.72	1,781.73	1,763.97	17.76	100.313	
850.00	842.43	787.82	842.81	5.57	13.97	-38.85	1,090.32	-1,474.72	1,771.13	1,752.26	18.87	93.860	
900.00	890.18	835.96	890.95	5.85	14.85	-39.38	1,090.29	-1,474.72	1,759.41	1,739.44	19.97	88.105	
950.00	937.52	883.67	938.67	6.11	15.73	-39.96	1,090.25	-1,474.72	1,746.74	1,725.68	21.05	82.962	
1,000.00	984.43	930.94	985.94	6.38	16.60	-40.60	1,090.18	-1,474.72	1,733.15	1,711.03	22.13	78.321	
1,050.00	1,030.87	977.72	1,032.71	6.64	17.46	-41.29	1,090.10	-1,474.72	1,718.68	1,695.49	23.19	74.116	
1,100.00	1,076.81	1,021.83	1,076.81	6.90	18.28	-42.02	1,090.04	-1,474.72	1,703.36	1,679.15	24.21	70.350	
1,150.00	1,122.22	1,067.24	1,122.22	7.16	19.16	-42.82	1,090.04	-1,474.72	1,687.25	1,661.97	25.29	66.725	
1,200.00	1,167.06	1,112.08	1,167.06	7.42	20.03	-43.69	1,090.04	-1,474.72	1,670.35	1,644.00	26.35	63.401	
1,250.00	1,211.31	1,156.33	1,211.31	7.67	20.89	-44.61	1,090.04	-1,474.72	1,652.69	1,625.30	27.39	60.340	
1,300.00	1,254.93	1,199.95	1,254.93	7.93	21.74	-45.60	1,090.04	-1,474.72	1,634.31	1,605.89	28.42	57.512	
1,350.00	1,297.90	1,242.92	1,297.90	8.17	22.57	-46.65	1,090.04	-1,474.72	1,615.25	1,585.82	29.43	54.892	
1,400.00	1,340.18	1,285.73	1,340.70	8.42	23.40	-47.73	1,090.86	-1,474.72	1,595.96	1,565.53	30.43	52.451	
1,450.00	1,382.13	1,328.52	1,383.49	8.61	24.23	-48.42	1,090.81	-1,474.72	1,576.04	1,544.65	31.39	50.204	
1,500.00	1,424.08	1,371.25	1,426.22	8.81	25.06	-49.12	1,090.71	-1,474.72	1,556.33	1,523.97	32.35	48.102	
1,550.00	1,466.02	1,413.92	1,468.89	9.01	25.88	-49.83	1,090.56	-1,474.72	1,536.82	1,503.50	33.32	46.126	
1,600.00	1,507.97	1,456.54	1,511.50	9.20	26.71	-50.56	1,090.37	-1,474.72	1,517.54	1,483.26	34.28	44.272	
1,650.00	1,549.91	1,499.09	1,554.05	9.41	27.54	-51.31	1,090.13	-1,474.72	1,498.49	1,463.25	35.24	42.523	
1,700.00	1,591.86	1,536.93	1,591.86	9.61	28.27	-51.98	1,090.04	-1,474.72	1,479.76	1,443.64	36.12	40.967	
1,750.00	1,633.81	1,578.87	1,633.81	9.82	29.09	-52.74	1,090.04	-1,474.72	1,461.34	1,424.26	37.08	39.410	
1,800.00	1,675.75	1,620.82	1,675.75	10.03	29.91	-53.51	1,090.04	-1,474.72	1,443.20	1,405.17	38.04	37.942	
1,850.00	1,717.70	1,662.77	1,717.70	10.24	30.73	-54.30	1,090.04	-1,474.72	1,425.35	1,386.37	38.99	36.560	
1,900.00	1,759.65	1,704.72	1,759.65	10.45	31.55	-52.00	1,090.04	-1,474.72	1,407.56	1,367.63	39.93	35.248	
1,950.00	1,801.61	1,746.68	1,801.61	10.66	32.37	-45.53	1,090.04	-1,474.72	1,387.94	1,347.01	40.93	33.911	
2,000.00	1,843.39	1,788.99	1,843.92	10.87	33.20	-38.97	1,090.79	-1,474.72	1,366.34	1,324.40	41.94	32.580	
2,050.00	1,884.79	1,830.91	1,885.84	11.08	34.02	-32.50	1,090.72	-1,474.72	1,342.24	1,299.30	42.94	31.257	
2,100.00	1,925.60	1,872.20	1,927.13	11.29	34.83	-26.15	1,090.61	-1,474.72	1,315.95	1,272.02	43.94	29.952	
2,150.00	1,965.64	1,912.66	1,967.58	11.49	35.62	-19.97	1,090.45	-1,474.72	1,287.56	1,242.64	44.92	28.666	
2,200.00	2,004.70	1,952.09	2,007.02	11.69	36.39	-13.91	1,090.25	-1,474.72	1,257.13	1,211.26	45.88	27.401	
2,250.00	2,042.59	1,987.70	2,042.59	11.88	37.09	-7.89	1,090.04	-1,474.72	1,224.80	1,178.02	46.77	26.185	
2,300.00	2,079.13	2,024.24	2,079.13	12.06	37.83	-1.86	1,090.04	-1,474.72	1,190.75	1,143.04	47.71	24.960	
2,350.00	2,114.14	2,059.25	2,114.14	12.24	38.53	4.33	1,090.04	-1,474.72	1,155.07	1,106.47	48.60	23.766	
2,400.00	2,147.45	2,092.56	2,147.45	12.41	39.21	10.79	1,090.04	-1,474.72	1,117.94	1,068.48	49.46	22.603	
2,450.00	2,178.90	2,124.01	2,178.90	12.58	39.84	17.63	1,090.04	-1,474.72	1,079.56	1,029.29	50.27	21.474	
2,500.00	2,208.33	2,153.44	2,208.33	12.74	40.44	24.92	1,090.04	-1,474.72	1,040.18	989.14	51.04	20.380	

CC - Min centre to center distance or covergent point, SF - min separation factor, ES - min ellipse separation

SPUR ENERGY PARTNERS

PROTOTYPE

Anticollision Report

PROTOTYPE WELL PLANNING
WELL PLANNED. WELL EXECUTED.

Company:	SPUR ENERGY PARTNERS, LLC	**Local Co-ordinate Reference:**	Well 110H
Project:	EDDY COUNTY, NM (NAD 83 - NME)	**TVD Reference:**	RKB = 20' @ 3626.00usft (AKITA 57)
Reference Site:	BLACK CHERRY FEDERAL COM	**MD Reference:**	RKB = 20' @ 3626.00usft (AKITA 57)
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	110H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	OH	**Database:**	EDM 5000.17 Single User Db
Reference Design:	PERMIT	**Offset TVD Reference:**	Reference Datum

Offset Design: BLACK CHERRY FEDERAL COM - OFFSET: RESLER STATE 4 - OH - SURVEYS — **Offset Site Error:** 0.00 usft

Survey Program: 475-INC-ONLY — **Offset Well Error:** 0.00 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Rule Assigned: Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
2,550.00	2,235.61	2,180.71	2,235.61	12.92	40.99	32.67	1,090.04	-1,474.72	1,000.05	948.29	51.75	19.323	
2,600.00	2,260.89	2,206.00	2,260.89	13.07	41.50	37.32	1,090.04	-1,474.72	959.53	907.12	52.42	18.306	
2,650.00	2,285.89	2,231.00	2,285.89	13.27	42.01	38.69	1,090.04	-1,474.72	919.20	866.12	53.08	17.316	
2,700.00	2,310.89	2,256.01	2,310.90	13.46	42.51	40.23	1,090.92	-1,474.72	879.50	825.74	53.76	16.359	
2,750.00	2,335.89	2,281.23	2,336.12	13.67	43.02	41.80	1,090.91	-1,474.72	839.78	785.33	54.46	15.421	
2,800.00	2,360.41	2,305.96	2,360.84	13.88	43.52	45.79	1,090.89	-1,474.72	800.19	745.04	55.15	14.509	
2,850.00	2,381.51	2,327.24	2,382.13	14.12	43.95	52.96	1,090.85	-1,474.72	759.48	703.68	55.80	13.611	
2,900.00	2,398.59	2,344.46	2,399.35	14.38	44.30	61.15	1,090.82	-1,474.72	717.84	661.48	56.37	12.735	
2,950.00	2,411.50	2,357.49	2,412.37	14.65	44.56	69.95	1,090.79	-1,474.72	675.79	618.93	56.86	11.885	
3,000.00	2,420.16	2,366.22	2,421.10	14.95	44.74	78.70	1,090.77	-1,474.72	633.83	576.55	57.28	11.066	
3,050.00	2,424.49	2,370.59	2,425.47	15.26	44.83	86.68	1,090.75	-1,474.72	592.53	534.89	57.64	10.281	
3,100.00	2,424.81	2,370.91	2,425.79	15.59	44.83	90.87	1,090.75	-1,474.72	552.49	494.53	57.96	9.533	
3,150.00	2,424.32	2,370.42	2,425.30	15.95	44.82	90.79	1,090.75	-1,474.72	514.19	455.86	58.34	8.814	
3,200.00	2,423.84	2,369.92	2,424.81	16.31	44.81	90.71	1,090.76	-1,474.72	478.06	419.23	58.82	8.127	
3,250.00	2,423.35	2,369.43	2,424.32	16.70	44.80	90.62	1,090.76	-1,474.72	444.62	385.23	59.39	7.487	
3,300.00	2,422.86	2,368.94	2,423.82	17.09	44.79	90.54	1,090.76	-1,474.72	414.53	354.40	60.12	6.895	
3,350.00	2,422.38	2,368.45	2,423.33	17.49	44.78	90.46	1,090.76	-1,474.72	388.56	327.62	60.94	6.376	
3,400.00	2,421.89	2,367.96	2,422.84	17.91	44.77	90.38	1,090.76	-1,474.72	367.59	305.80	61.79	5.949	
3,450.00	2,421.40	2,367.47	2,422.35	18.33	44.76	90.29	1,090.76	-1,474.72	352.51	289.87	62.64	5.628	
3,500.00	2,420.92	2,366.97	2,421.86	18.76	44.75	90.21	1,090.76	-1,474.72	344.11	280.73	63.38	5.430	
3,533.57	2,420.59	2,366.64	2,421.53	19.06	44.75	90.16	1,090.77	-1,474.72	342.47	278.69	63.78	5.370	CC, ES
3,550.00	2,420.43	2,366.48	2,421.37	19.21	44.75	90.13	1,090.77	-1,474.72	342.86	278.93	63.93	5.363	SF
3,600.00	2,419.94	2,365.99	2,420.87	19.65	44.74	90.05	1,090.77	-1,474.72	348.85	284.62	64.24	5.431	
3,650.00	2,419.46	2,365.50	2,420.38	20.11	44.73	89.97	1,090.77	-1,474.72	361.72	297.42	64.30	5.626	
3,700.00	2,418.97	2,365.01	2,419.89	20.56	44.72	89.88	1,090.77	-1,474.72	380.76	316.62	64.15	5.936	
3,750.00	2,418.48	2,364.51	2,419.40	21.03	44.71	89.80	1,090.77	-1,474.72	405.12	341.26	63.86	6.344	
3,800.00	2,418.00	2,364.02	2,418.91	21.49	44.70	89.72	1,090.77	-1,474.72	433.89	370.40	63.49	6.834	
3,850.00	2,417.51	2,363.53	2,418.42	21.97	44.69	89.64	1,090.77	-1,474.72	466.27	403.18	63.09	7.390	
3,900.00	2,417.02	2,363.04	2,417.92	22.45	44.68	89.55	1,090.77	-1,474.72	501.54	438.85	62.69	8.001	
3,950.00	2,416.54	2,362.55	2,417.43	22.93	44.67	89.47	1,090.78	-1,474.72	539.15	476.85	62.30	8.654	
4,000.00	2,416.05	2,362.06	2,416.94	23.41	44.66	89.39	1,090.78	-1,474.72	578.64	516.70	61.94	9.341	
4,050.00	2,415.56	2,361.56	2,416.45	23.90	44.65	89.31	1,090.78	-1,474.72	619.65	558.03	61.61	10.057	
4,100.00	2,415.08	2,361.07	2,415.96	24.39	44.64	89.23	1,090.78	-1,474.72	661.89	600.58	61.32	10.795	
4,150.00	2,414.59	2,360.58	2,415.47	24.89	44.63	89.14	1,090.78	-1,474.72	705.15	644.11	61.05	11.551	
4,200.00	2,414.10	2,360.09	2,414.97	25.38	44.62	89.06	1,090.78	-1,474.72	749.25	688.45	60.81	12.322	
4,250.00	2,413.62	2,359.60	2,414.48	25.89	44.61	88.98	1,090.78	-1,474.72	794.05	733.46	60.59	13.106	
4,300.00	2,413.13	2,359.11	2,413.99	26.39	44.60	88.90	1,090.79	-1,474.72	839.43	779.04	60.39	13.900	
4,350.00	2,412.64	2,358.61	2,413.50	26.89	44.59	88.81	1,090.79	-1,474.72	885.32	825.10	60.22	14.702	
4,400.00	2,412.16	2,358.12	2,413.01	27.40	44.58	88.73	1,090.79	-1,474.72	931.62	871.56	60.06	15.512	
4,450.00	2,411.67	2,357.63	2,412.52	27.91	44.57	88.65	1,090.79	-1,474.72	978.29	918.38	59.92	16.328	
4,500.00	2,411.18	2,357.14	2,412.02	28.42	44.56	88.57	1,090.79	-1,474.72	1,025.28	965.49	59.79	17.149	
4,550.00	2,410.70	2,356.65	2,411.53	28.93	44.55	88.49	1,090.79	-1,474.72	1,072.53	1,012.86	59.67	17.975	
4,600.00	2,410.21	2,356.16	2,411.04	29.45	44.54	88.40	1,090.79	-1,474.72	1,120.03	1,060.47	59.56	18.805	
4,650.00	2,409.72	2,355.66	2,410.55	29.97	44.53	88.32	1,090.79	-1,474.72	1,167.73	1,108.27	59.46	19.638	
4,700.00	2,409.24	2,355.17	2,410.06	30.48	44.52	88.24	1,090.79	-1,474.72	1,215.62	1,156.24	59.37	20.474	
4,750.00	2,408.75	2,354.68	2,409.57	31.00	44.51	88.16	1,090.80	-1,474.72	1,263.67	1,204.38	59.29	21.313	
4,800.00	2,408.26	2,354.19	2,409.07	31.52	44.50	88.07	1,090.80	-1,474.72	1,311.86	1,252.65	59.22	22.154	
4,850.00	2,407.78	2,353.70	2,408.58	32.05	44.49	87.99	1,090.80	-1,474.72	1,360.19	1,301.04	59.15	22.996	
4,900.00	2,407.29	2,353.21	2,408.09	32.57	44.48	87.91	1,090.80	-1,474.72	1,408.63	1,349.55	59.08	23.841	
4,950.00	2,406.80	2,352.71	2,407.60	33.10	44.47	87.83	1,090.80	-1,474.72	1,457.18	1,398.16	59.03	24.687	
5,000.00	2,406.32	2,352.22	2,407.11	33.62	44.46	87.75	1,090.80	-1,474.72	1,505.83	1,446.85	58.97	25.535	
5,050.00	2,405.83	2,351.73	2,406.62	34.15	44.45	87.66	1,090.80	-1,474.72	1,554.55	1,495.63	58.92	26.383	

CC - Min centre to center distance or covergent point, SF - min separation factor, ES - min ellipse separation

SPUR ENERGY PARTNERS

PROTOTYPE
Anticollision Report

PROTOTYPE WELL PLANNING
WELL PLANNED. WELL EXECUTED.

Company:	SPUR ENERGY PARTNERS, LLC	**Local Co-ordinate Reference:**	Well 110H
Project:	EDDY COUNTY, NM (NAD 83 - NME)	**TVD Reference:**	RKB = 20' @ 3626.00usft (AKITA 57)
Reference Site:	BLACK CHERRY FEDERAL COM	**MD Reference:**	RKB = 20' @ 3626.00usft (AKITA 57)
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	110H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	OH	**Database:**	EDM 5000.17 Single User Db
Reference Design:	PERMIT	**Offset TVD Reference:**	Reference Datum

Offset Design: BLACK CHERRY FEDERAL COM - OFFSET: RESLER STATE 4 - OH - SURVEYS

Offset Site Error: 0.00 usft

Survey Program: 475-INC-ONLY

Offset Well Error: 0.00 usft

Rule Assigned:

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
5,100.00	2,405.34	2,351.24	2,406.12	34.68	44.44	87.58	1,090.80	-1,474.72	1,603.36	1,544.49	58.88	27.233	
5,150.00	2,404.86	2,350.75	2,405.63	35.21	44.43	87.50	1,090.81	-1,474.72	1,652.24	1,593.41	58.83	28.083	
5,200.00	2,404.37	2,350.26	2,405.14	35.74	44.42	87.42	1,090.81	-1,474.72	1,701.18	1,642.39	58.79	28.935	
5,250.00	2,403.88	2,349.77	2,404.65	36.27	44.41	87.34	1,090.81	-1,474.72	1,750.19	1,691.43	58.76	29.787	
5,300.00	2,403.40	2,349.27	2,404.16	36.80	44.40	87.25	1,090.81	-1,474.72	1,799.24	1,740.52	58.72	30.639	
5,350.00	2,402.91	2,348.78	2,403.67	37.34	44.39	87.17	1,090.81	-1,474.72	1,848.35	1,789.66	58.69	31.492	
5,400.00	2,402.42	2,348.29	2,403.18	37.87	44.38	87.09	1,090.81	-1,474.72	1,897.51	1,838.84	58.66	32.346	

SPUR ENERGY PARTNERS

PROTOTYPE

Anticollision Report

PROTOTYPE WELL PLANNING
WELL PLANNED. WELL EXECUTED.

Company:	SPUR ENERGY PARTNERS, LLC	**Local Co-ordinate Reference:**	Well 110H
Project:	EDDY COUNTY, NM (NAD 83 - NME)	**TVD Reference:**	RKB = 20' @ 3626.00usft (AKITA 57)
Reference Site:	BLACK CHERRY FEDERAL COM	**MD Reference:**	RKB = 20' @ 3626.00usft (AKITA 57)
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	110H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	OH	**Database:**	EDM 5000.17 Single User Db
Reference Design:	PERMIT	**Offset TVD Reference:**	Reference Datum

Offset Design: BLACK CHERRY FEDERAL COM - OFFSET: SPRUCE FEDERAL 1 - OH - SURVEYS — **Offset Site Error:** 0.00 usft

Survey Program: 400-UNKNOWN — **Offset Well Error:** 0.00 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Rule Assigned: Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
4,100.00	2,415.08	2,384.08	2,415.08	24.39	94.84	-94.31	526.78	-3,897.82	1,867.90	1,761.43	106.47	17.544	
4,150.00	2,414.59	2,383.59	2,414.59	24.89	94.82	-94.19	526.78	-3,897.82	1,818.32	1,711.79	106.53	17.068	
4,200.00	2,414.10	2,383.10	2,414.10	25.38	94.80	-94.08	526.78	-3,897.82	1,768.77	1,662.17	106.60	16.592	
4,250.00	2,413.62	2,382.62	2,413.62	25.89	94.78	-93.96	526.78	-3,897.82	1,719.25	1,612.57	106.68	16.116	
4,300.00	2,413.13	2,382.13	2,413.13	26.39	94.77	-93.85	526.78	-3,897.82	1,669.75	1,562.99	106.76	15.640	
4,350.00	2,412.64	2,381.64	2,412.64	26.89	94.75	-93.73	526.78	-3,897.82	1,620.28	1,513.43	106.85	15.164	
4,400.00	2,412.16	2,381.16	2,412.16	27.40	94.73	-93.61	526.78	-3,897.82	1,570.85	1,463.90	106.95	14.687	
4,450.00	2,411.67	2,380.67	2,411.67	27.91	94.71	-93.50	526.78	-3,897.82	1,521.46	1,414.39	107.06	14.211	
4,500.00	2,411.18	2,380.18	2,411.18	28.42	94.69	-93.38	526.78	-3,897.82	1,472.10	1,364.92	107.18	13.735	
4,550.00	2,410.70	2,379.70	2,410.70	28.93	94.67	-93.27	526.78	-3,897.82	1,422.79	1,315.48	107.31	13.258	
4,600.00	2,410.21	2,379.21	2,410.21	29.45	94.65	-93.15	526.78	-3,897.82	1,373.53	1,266.07	107.46	12.782	
4,650.00	2,409.72	2,378.72	2,409.72	29.97	94.63	-93.03	526.78	-3,897.82	1,324.33	1,216.71	107.62	12.306	
4,700.00	2,409.24	2,378.24	2,409.24	30.48	94.61	-92.92	526.78	-3,897.82	1,275.18	1,167.39	107.79	11.830	
4,750.00	2,408.75	2,377.75	2,408.75	31.00	94.59	-92.80	526.78	-3,897.82	1,226.11	1,118.12	107.99	11.354	
4,800.00	2,408.26	2,377.26	2,408.26	31.52	94.57	-92.69	526.78	-3,897.82	1,177.11	1,068.91	108.20	10.879	
4,850.00	2,407.78	2,376.78	2,407.78	32.05	94.55	-92.57	526.78	-3,897.82	1,128.20	1,019.76	108.44	10.404	
4,900.00	2,407.29	2,376.29	2,407.29	32.57	94.53	-92.45	526.78	-3,897.82	1,079.39	970.69	108.71	9.929	
4,950.00	2,406.80	2,375.80	2,406.80	33.10	94.51	-92.34	526.78	-3,897.82	1,030.70	921.69	109.01	9.455	
5,000.00	2,406.32	2,375.32	2,406.32	33.62	94.49	-92.22	526.78	-3,897.82	982.13	872.79	109.34	8.982	
5,050.00	2,405.83	2,374.83	2,405.83	34.15	94.47	-92.10	526.78	-3,897.82	933.72	824.00	109.72	8.510	
5,100.00	2,405.34	2,374.34	2,405.34	34.68	94.45	-91.99	526.78	-3,897.82	885.48	775.33	110.15	8.039	
5,150.00	2,404.86	2,373.86	2,404.86	35.21	94.43	-91.87	526.78	-3,897.82	837.45	726.81	110.64	7.569	
5,200.00	2,404.37	2,373.37	2,404.37	35.74	94.41	-91.75	526.78	-3,897.82	789.67	678.47	111.20	7.101	
5,250.00	2,403.88	2,372.88	2,403.88	36.27	94.40	-91.64	526.78	-3,897.82	742.17	630.34	111.84	6.636	
5,300.00	2,403.40	2,372.40	2,403.40	36.80	94.38	-91.52	526.78	-3,897.82	695.03	582.45	112.58	6.174	
5,350.00	2,402.91	2,371.91	2,402.91	37.34	94.36	-91.40	526.78	-3,897.82	648.32	534.88	113.44	5.715	
5,400.00	2,402.42	2,371.42	2,402.42	37.87	94.34	-91.29	526.78	-3,897.82	602.13	487.69	114.44	5.262	
5,450.00	2,401.94	2,370.94	2,401.94	38.41	94.32	-91.17	526.78	-3,897.82	556.60	440.99	115.61	4.815	
5,500.00	2,401.45	2,370.45	2,401.45	38.94	94.30	-91.06	526.78	-3,897.82	511.91	394.92	116.99	4.376	
5,550.00	2,400.96	2,369.96	2,400.96	39.48	94.28	-90.94	526.78	-3,897.82	468.28	349.67	118.62	3.948	
5,600.00	2,400.48	2,369.48	2,400.48	40.02	94.26	-90.82	526.78	-3,897.82	426.07	305.52	120.54	3.535	
5,650.00	2,399.99	2,368.99	2,399.99	40.55	94.24	-90.71	526.78	-3,897.82	385.71	262.90	122.81	3.141	
5,700.00	2,399.50	2,368.50	2,399.50	41.09	94.22	-90.59	526.78	-3,897.82	347.88	222.42	125.46	2.773	
5,750.00	2,399.02	2,368.02	2,399.02	41.63	94.20	-90.47	526.78	-3,897.82	313.46	185.02	128.44	2.440	
5,800.00	2,398.53	2,367.53	2,398.53	42.17	94.18	-90.36	526.78	-3,897.82	283.72	152.09	131.63	2.155	
5,850.00	2,398.04	2,367.04	2,398.04	42.71	94.16	-90.24	526.78	-3,897.82	260.27	125.60	134.67	1.933	
5,900.00	2,397.56	2,366.56	2,397.56	43.25	94.14	-90.12	526.78	-3,897.82	244.91	107.94	136.97	1.788	
5,950.00	2,397.07	2,366.07	2,397.07	43.80	94.12	-90.01	526.78	-3,897.82	239.21	101.36	137.85	1.735	
5,952.60	2,397.05	2,366.05	2,397.05	43.82	94.12	-90.00	526.78	-3,897.82	239.19	101.35	137.85	1.735	CC, ES, SF
6,000.00	2,396.58	2,365.58	2,396.58	44.34	94.10	-89.89	526.78	-3,897.82	243.84	106.85	136.99	1.780	
6,050.00	2,396.10	2,365.10	2,396.10	44.88	94.08	-89.77	526.78	-3,897.82	258.26	123.58	134.68	1.918	
6,100.00	2,395.61	2,364.61	2,395.61	45.42	94.06	-89.66	526.78	-3,897.82	280.95	149.38	131.58	2.135	
6,150.00	2,395.12	2,364.12	2,395.12	45.97	94.04	-89.54	526.78	-3,897.82	310.12	181.82	128.30	2.417	
6,200.00	2,394.64	2,363.64	2,394.64	46.51	94.03	-89.42	526.78	-3,897.82	344.11	218.89	125.22	2.748	
6,250.00	2,394.15	2,363.15	2,394.15	47.06	94.01	-89.31	526.78	-3,897.82	381.64	259.14	122.50	3.115	
6,300.00	2,393.66	2,362.66	2,393.66	47.60	93.99	-89.19	526.78	-3,897.82	421.76	301.60	120.16	3.510	
6,350.00	2,393.18	2,362.18	2,393.18	48.15	93.97	-89.07	526.78	-3,897.82	463.81	345.63	118.18	3.925	
6,400.00	2,392.69	2,361.69	2,392.69	48.69	93.95	-88.96	526.78	-3,897.82	507.30	390.79	116.51	4.354	
6,450.00	2,392.20	2,361.20	2,392.20	49.24	93.93	-88.84	526.78	-3,897.82	551.90	436.79	115.10	4.795	
6,500.00	2,391.72	2,360.72	2,391.72	49.78	93.91	-88.72	526.78	-3,897.82	597.35	483.43	113.91	5.244	
6,550.00	2,391.23	2,360.23	2,391.23	50.33	93.89	-88.61	526.78	-3,897.82	643.47	530.57	112.90	5.699	
6,600.00	2,390.74	2,359.74	2,390.74	50.88	93.87	-88.49	526.78	-3,897.82	690.14	578.10	112.04	6.160	

CC - Min centre to center distance or covergent point, SF - min separation factor, ES - min ellipse separation

SPUR ENERGY PARTNERS

PROTOTYPE

Anticollision Report

PROTOTYPE WELL PLANNING
WELL PLANNED. WELL EXECUTED.

Company:	SPUR ENERGY PARTNERS, LLC	**Local Co-ordinate Reference:**	Well 110H
Project:	EDDY COUNTY, NM (NAD 83 - NME)	**TVD Reference:**	RKB = 20' @ 3626.00usft (AKITA 57)
Reference Site:	BLACK CHERRY FEDERAL COM	**MD Reference:**	RKB = 20' @ 3626.00usft (AKITA 57)
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	110H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	OH	**Database:**	EDM 5000.17 Single User Db
Reference Design:	PERMIT	**Offset TVD Reference:**	Reference Datum

Offset Design: BLACK CHERRY FEDERAL COM - OFFSET: SPRUCE FEDERAL 1 - OH - SURVEYS

Offset Site Error: 0.00 usft

Survey Program: 400-UNKNOWN

Rule Assigned:

Offset Well Error: 0.00 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
6,650.00	2,390.26	2,359.26	2,390.26	51.43	93.85	-88.37	526.78	-3,897.82	737.24	625.94	111.30	6.624	
6,700.00	2,389.77	2,358.77	2,389.77	51.97	93.83	-88.26	526.78	-3,897.82	784.70	674.03	110.67	7.091	
6,750.00	2,389.28	2,358.28	2,389.28	52.52	93.81	-88.14	526.78	-3,897.82	832.46	722.34	110.12	7.560	
6,800.00	2,388.80	2,357.80	2,388.80	53.07	93.79	-88.03	526.78	-3,897.82	880.47	770.83	109.64	8.031	
6,850.00	2,388.31	2,357.31	2,388.31	53.62	93.77	-87.91	526.78	-3,897.82	928.68	819.46	109.22	8.503	
6,900.00	2,387.82	2,356.82	2,387.82	54.17	93.75	-87.79	526.78	-3,897.82	977.08	868.22	108.86	8.976	
6,950.00	2,387.34	2,356.34	2,387.34	54.72	93.73	-87.68	526.78	-3,897.82	1,025.63	917.09	108.54	9.450	
7,000.00	2,386.85	2,355.85	2,386.85	55.27	93.71	-87.56	526.78	-3,897.82	1,074.31	966.06	108.25	9.924	
7,050.00	2,386.36	2,355.36	2,386.36	55.82	93.69	-87.44	526.78	-3,897.82	1,123.11	1,015.11	108.00	10.399	
7,100.00	2,385.88	2,354.88	2,385.88	56.37	93.68	-87.33	526.78	-3,897.82	1,172.01	1,064.23	107.78	10.874	
7,150.00	2,385.39	2,354.39	2,385.39	56.92	93.66	-87.21	526.78	-3,897.82	1,220.99	1,113.42	107.58	11.350	
7,200.00	2,384.90	2,353.90	2,384.90	57.47	93.64	-87.09	526.78	-3,897.82	1,270.06	1,162.66	107.40	11.825	
7,250.00	2,384.42	2,353.42	2,384.42	58.02	93.62	-86.98	526.78	-3,897.82	1,319.20	1,211.95	107.24	12.301	
7,300.00	2,383.93	2,352.93	2,383.93	58.57	93.60	-86.86	526.78	-3,897.82	1,368.40	1,261.30	107.10	12.777	
7,350.00	2,383.45	2,352.45	2,383.45	59.12	93.58	-86.75	526.78	-3,897.82	1,417.65	1,310.68	106.97	13.252	
7,400.00	2,382.96	2,351.96	2,382.96	59.68	93.56	-86.63	526.78	-3,897.82	1,466.96	1,360.10	106.86	13.728	
7,450.00	2,382.47	2,351.47	2,382.47	60.23	93.54	-86.51	526.78	-3,897.82	1,516.31	1,409.55	106.76	14.203	
7,500.00	2,381.99	2,350.99	2,381.99	60.78	93.52	-86.40	526.78	-3,897.82	1,565.70	1,459.04	106.66	14.679	
7,550.00	2,381.50	2,350.50	2,381.50	61.33	93.50	-86.28	526.78	-3,897.82	1,615.13	1,508.55	106.58	15.154	
7,600.00	2,381.01	2,350.01	2,381.01	61.88	93.48	-86.17	526.78	-3,897.82	1,664.59	1,558.09	106.50	15.630	
7,650.00	2,380.53	2,349.53	2,380.53	62.44	93.46	-86.05	526.78	-3,897.82	1,714.08	1,607.65	106.43	16.105	
7,700.00	2,380.04	2,349.04	2,380.04	62.99	93.44	-85.93	526.78	-3,897.82	1,763.61	1,657.23	106.37	16.580	
7,750.00	2,379.55	2,348.55	2,379.55	63.54	93.42	-85.82	526.78	-3,897.82	1,813.15	1,706.84	106.32	17.054	
7,800.00	2,379.07	2,348.07	2,379.07	64.10	93.40	-85.70	526.78	-3,897.82	1,862.73	1,756.46	106.27	17.529	

SPUR ENERGY PARTNERS

PROTOTYPE

Anticollision Report

PROTOTYPE WELL PLANNING
WELL PLANNED. WELL EXECUTED.

Company:	SPUR ENERGY PARTNERS, LLC	**Local Co-ordinate Reference:**	Well 110H
Project:	EDDY COUNTY, NM (NAD 83 - NME)	**TVD Reference:**	RKB = 20' @ 3626.00usft (AKITA 57)
Reference Site:	BLACK CHERRY FEDERAL COM	**MD Reference:**	RKB = 20' @ 3626.00usft (AKITA 57)
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	110H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	OH	**Database:**	EDM 5000.17 Single User Db
Reference Design:	PERMIT	**Offset TVD Reference:**	Reference Datum

Offset Design: BLACK CHERRY FEDERAL COM - OFFSET: SPRUCE FEDERAL 2 - OH - SURVEYS

Offset Site Error: 0.00 usft

Survey Program: 139-INC-ONLY

Offset Well Error: 0.00 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Rule Assigned: Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
4,200.00	2,414.10	2,368.59	2,414.52	25.38	43.01	91.64	1,378.39	-3,899.09	1,863.50	1,808.33	55.18	33.772	
4,250.00	2,413.62	2,368.10	2,414.03	25.89	43.00	91.60	1,378.39	-3,899.09	1,816.36	1,761.02	55.33	32.825	
4,300.00	2,413.13	2,367.61	2,413.54	26.39	42.99	91.55	1,378.39	-3,899.09	1,769.37	1,713.86	55.51	31.877	
4,350.00	2,412.64	2,367.12	2,413.05	26.89	42.98	91.50	1,378.39	-3,899.09	1,722.55	1,666.85	55.70	30.925	
4,400.00	2,412.16	2,366.63	2,412.56	27.40	42.97	91.46	1,378.39	-3,899.09	1,675.91	1,620.00	55.92	29.972	
4,450.00	2,411.67	2,366.14	2,412.07	27.91	42.96	91.41	1,378.39	-3,899.09	1,629.47	1,573.32	56.16	29.016	
4,500.00	2,411.18	2,365.65	2,411.58	28.42	42.95	91.37	1,378.39	-3,899.09	1,583.25	1,526.83	56.43	28.059	
4,550.00	2,410.70	2,365.16	2,411.09	28.93	42.94	91.32	1,378.39	-3,899.09	1,537.27	1,480.54	56.73	27.100	
4,600.00	2,410.21	2,364.66	2,410.60	29.45	42.93	91.27	1,378.39	-3,899.09	1,491.54	1,434.49	57.06	26.142	
4,650.00	2,409.72	2,364.17	2,410.11	29.97	42.92	91.23	1,378.39	-3,899.09	1,446.10	1,388.67	57.42	25.183	
4,700.00	2,409.24	2,363.68	2,409.62	30.48	42.92	91.18	1,378.39	-3,899.09	1,400.97	1,343.14	57.83	24.226	
4,750.00	2,408.75	2,363.19	2,409.12	31.00	42.91	91.14	1,378.39	-3,899.09	1,356.17	1,297.90	58.28	23.271	
4,800.00	2,408.26	2,362.70	2,408.63	31.52	42.90	91.09	1,378.39	-3,899.09	1,311.76	1,252.99	58.77	22.320	
4,850.00	2,407.78	2,362.21	2,408.14	32.05	42.89	91.04	1,378.39	-3,899.09	1,267.76	1,208.44	59.32	21.373	
4,900.00	2,407.29	2,361.72	2,407.65	32.57	42.88	91.00	1,378.39	-3,899.09	1,224.22	1,164.30	59.91	20.433	
4,950.00	2,406.80	2,361.23	2,407.16	33.10	42.87	90.95	1,378.39	-3,899.09	1,181.19	1,120.62	60.57	19.501	
5,000.00	2,406.32	2,360.74	2,406.67	33.62	42.86	90.91	1,378.39	-3,899.09	1,138.73	1,077.44	61.29	18.579	
5,050.00	2,405.83	2,360.25	2,406.18	34.15	42.85	90.86	1,378.39	-3,899.09	1,096.91	1,034.83	62.08	17.668	
5,100.00	2,405.34	2,359.75	2,405.69	34.68	42.84	90.82	1,378.39	-3,899.09	1,055.80	992.85	62.95	16.773	
5,150.00	2,404.86	2,359.26	2,405.20	35.21	42.83	90.77	1,378.39	-3,899.09	1,015.49	951.60	63.89	15.895	
5,200.00	2,404.37	2,358.77	2,404.71	35.74	42.83	90.72	1,378.39	-3,899.09	976.07	911.16	64.91	15.037	
5,250.00	2,403.88	2,358.28	2,404.22	36.27	42.82	90.68	1,378.39	-3,899.09	937.66	871.64	66.02	14.202	
5,300.00	2,403.40	2,357.79	2,403.72	36.80	42.81	90.63	1,378.39	-3,899.09	900.39	833.16	67.23	13.393	
5,350.00	2,402.91	2,357.30	2,403.23	37.34	42.80	90.59	1,378.39	-3,899.09	864.41	795.89	68.52	12.615	
5,400.00	2,402.42	2,356.81	2,402.74	37.87	42.79	90.54	1,378.39	-3,899.09	829.88	759.97	69.91	11.871	
5,450.00	2,401.94	2,356.32	2,402.25	38.41	42.78	90.49	1,378.39	-3,899.09	796.99	725.61	71.38	11.165	
5,500.00	2,401.45	2,355.83	2,401.76	38.94	42.77	90.45	1,378.39	-3,899.09	765.96	693.01	72.94	10.501	
5,550.00	2,400.96	2,355.34	2,401.27	39.48	42.76	90.40	1,378.40	-3,899.09	737.01	662.44	74.57	9.884	
5,600.00	2,400.48	2,354.85	2,400.78	40.02	42.75	90.36	1,378.40	-3,899.09	710.41	634.16	76.24	9.317	
5,650.00	2,399.99	2,354.36	2,400.29	40.55	42.74	90.31	1,378.40	-3,899.09	686.42	608.47	77.95	8.806	
5,700.00	2,399.50	2,353.86	2,399.80	41.09	42.74	90.26	1,378.40	-3,899.09	665.33	585.70	79.63	8.355	
5,750.00	2,399.02	2,353.37	2,399.31	41.63	42.73	90.22	1,378.40	-3,899.09	647.42	566.15	81.27	7.966	
5,800.00	2,398.53	2,352.88	2,398.82	42.17	42.72	90.17	1,378.40	-3,899.09	632.97	550.16	82.81	7.644	
5,850.00	2,398.04	2,352.39	2,398.33	42.71	42.71	90.13	1,378.40	-3,899.09	622.21	538.02	84.19	7.390	
5,900.00	2,397.56	2,351.90	2,397.83	43.25	42.70	90.08	1,378.40	-3,899.09	615.33	529.95	85.38	7.207	
5,950.00	2,397.07	2,351.41	2,397.34	43.80	42.69	90.03	1,378.40	-3,899.09	612.48	526.15	86.33	7.095	
5,960.10	2,396.97	2,351.31	2,397.24	43.91	42.69	90.03	1,378.40	-3,899.09	612.39	525.90	86.49	7.080	CC, ES
6,000.00	2,396.58	2,350.92	2,396.85	44.34	42.68	89.99	1,378.40	-3,899.09	613.69	526.68	87.02	7.053	SF
6,050.00	2,396.10	2,350.43	2,396.36	44.88	42.67	89.94	1,378.40	-3,899.09	618.96	531.53	87.43	7.080	
6,100.00	2,395.61	2,349.94	2,395.87	45.42	42.66	89.90	1,378.40	-3,899.09	628.17	540.60	87.57	7.174	
6,150.00	2,395.12	2,349.45	2,395.38	45.97	42.66	89.85	1,378.40	-3,899.09	641.16	553.71	87.45	7.331	
6,200.00	2,394.64	2,348.96	2,394.89	46.51	42.65	89.81	1,378.40	-3,899.09	657.70	570.58	87.12	7.549	
6,250.00	2,394.15	2,348.47	2,394.40	47.06	42.64	89.76	1,378.40	-3,899.09	677.54	590.93	86.61	7.823	
6,300.00	2,393.66	2,347.97	2,393.91	47.60	42.63	89.71	1,378.40	-3,899.09	700.39	614.44	85.95	8.149	
6,350.00	2,393.18	2,347.48	2,393.42	48.15	42.62	89.67	1,378.40	-3,899.09	725.97	640.78	85.19	8.522	
6,400.00	2,392.69	2,346.99	2,392.93	48.69	42.61	89.62	1,378.40	-3,899.09	754.01	669.65	84.36	8.938	
6,450.00	2,392.20	2,346.50	2,392.44	49.24	42.60	89.58	1,378.40	-3,899.09	784.23	700.75	83.48	9.394	
6,500.00	2,391.72	2,346.01	2,391.94	49.78	42.59	89.53	1,378.40	-3,899.09	816.39	733.81	82.58	9.886	
6,550.00	2,391.23	2,345.52	2,391.45	50.33	42.58	89.48	1,378.40	-3,899.09	850.28	768.60	81.68	10.410	
6,600.00	2,390.74	2,345.03	2,390.96	50.88	42.57	89.44	1,378.40	-3,899.09	885.70	804.91	80.80	10.962	
6,650.00	2,390.26	2,344.54	2,390.47	51.43	42.57	89.39	1,378.40	-3,899.09	922.47	842.54	79.93	11.541	
6,700.00	2,389.77	2,344.05	2,389.98	51.97	42.56	89.35	1,378.40	-3,899.09	960.44	881.34	79.09	12.143	

CC - Min centre to center distance or covergent point, SF - min separation factor, ES - min ellipse separation

SPUR ENERGY PARTNERS

PROTOTYPE
Anticollision Report

PROTOTYPE WELL PLANNING
WELL PLANNED. WELL EXECUTED.

Company:	SPUR ENERGY PARTNERS, LLC	**Local Co-ordinate Reference:**	Well 110H
Project:	EDDY COUNTY, NM (NAD 83 - NME)	**TVD Reference:**	RKB = 20' @ 3626.00usft (AKITA 57)
Reference Site:	BLACK CHERRY FEDERAL COM	**MD Reference:**	RKB = 20' @ 3626.00usft (AKITA 57)
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	110H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	OH	**Database:**	EDM 5000.17 Single User Db
Reference Design:	PERMIT	**Offset TVD Reference:**	Reference Datum

Offset Design: BLACK CHERRY FEDERAL COM - OFFSET: SPRUCE FEDERAL 2 - OH - SURVEYS

Offset Site Error: 0.00 usft

Survey Program: 139-INC-ONLY

Offset Well Error: 0.00 usft

Rule Assigned:

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
6,750.00	2,389.28	2,343.56	2,389.49	52.52	42.55	89.30	1,378.40	-3,899.09	999.46	921.17	78.29	12.766	
6,800.00	2,388.80	2,343.07	2,389.00	53.07	42.54	89.25	1,378.40	-3,899.09	1,039.42	961.91	77.52	13.409	
6,850.00	2,388.31	2,342.58	2,388.51	53.62	42.53	89.21	1,378.40	-3,899.09	1,080.23	1,003.44	76.79	14.068	
6,900.00	2,387.82	2,342.09	2,388.02	54.17	42.52	89.16	1,378.40	-3,899.09	1,121.77	1,045.68	76.09	14.743	
6,950.00	2,387.34	2,341.59	2,387.53	54.72	42.51	89.12	1,378.40	-3,899.09	1,163.98	1,088.55	75.43	15.432	
7,000.00	2,386.85	2,341.10	2,387.04	55.27	42.50	89.07	1,378.40	-3,899.09	1,206.79	1,131.98	74.80	16.133	
7,050.00	2,386.36	2,340.61	2,386.55	55.82	42.49	89.02	1,378.40	-3,899.09	1,250.12	1,175.91	74.21	16.845	
7,100.00	2,385.88	2,340.12	2,386.06	56.37	42.48	88.98	1,378.40	-3,899.09	1,293.94	1,220.29	73.65	17.568	
7,150.00	2,385.39	2,339.63	2,385.57	56.92	42.48	88.93	1,378.40	-3,899.09	1,338.20	1,265.07	73.12	18.301	
7,200.00	2,384.90	2,339.14	2,385.07	57.47	42.47	88.89	1,378.40	-3,899.09	1,382.84	1,310.22	72.62	19.041	
7,250.00	2,384.42	2,338.65	2,384.58	58.02	42.46	88.84	1,378.40	-3,899.09	1,427.84	1,355.69	72.15	19.790	
7,300.00	2,383.93	2,338.16	2,384.09	58.57	42.45	88.80	1,378.40	-3,899.09	1,473.16	1,401.46	71.70	20.545	
7,350.00	2,383.45	2,337.67	2,383.60	59.12	42.44	88.75	1,378.40	-3,899.09	1,518.78	1,447.50	71.28	21.307	
7,400.00	2,382.96	2,337.18	2,383.11	59.68	42.43	88.70	1,378.40	-3,899.09	1,564.66	1,493.78	70.88	22.074	
7,450.00	2,382.47	2,336.69	2,382.62	60.23	42.42	88.66	1,378.40	-3,899.09	1,610.79	1,540.29	70.50	22.847	
7,500.00	2,381.99	2,336.20	2,382.13	60.78	42.41	88.61	1,378.40	-3,899.09	1,657.14	1,587.00	70.14	23.625	
7,550.00	2,381.50	2,335.71	2,381.64	61.33	42.40	88.57	1,378.40	-3,899.09	1,703.70	1,633.90	69.80	24.407	
7,600.00	2,381.01	2,335.22	2,381.15	61.88	42.39	88.52	1,378.40	-3,899.09	1,750.45	1,680.97	69.48	25.193	
7,650.00	2,380.53	2,334.73	2,380.66	62.44	42.39	88.47	1,378.40	-3,899.09	1,797.37	1,728.20	69.18	25.983	
7,700.00	2,380.04	2,334.23	2,380.17	62.99	42.38	88.43	1,378.40	-3,899.09	1,844.46	1,775.57	68.88	26.776	
7,750.00	2,379.55	2,333.74	2,379.68	63.54	42.37	88.38	1,378.40	-3,899.09	1,891.69	1,823.08	68.61	27.572	

SPUR ENERGY PARTNERS

PROTOTYPE

Anticollision Report

PROTOTYPE WELL PLANNING
WELL PLANNED. WELL EXECUTED.

Company:	SPUR ENERGY PARTNERS, LLC	**Local Co-ordinate Reference:**	Well 110H
Project:	EDDY COUNTY, NM (NAD 83 - NME)	**TVD Reference:**	RKB = 20' @ 3626.00usft (AKITA 57)
Reference Site:	BLACK CHERRY FEDERAL COM	**MD Reference:**	RKB = 20' @ 3626.00usft (AKITA 57)
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	110H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	OH	**Database:**	EDM 5000.17 Single User Db
Reference Design:	PERMIT	**Offset TVD Reference:**	Reference Datum

Offset Design: BLACK CHERRY FEDERAL COM - OFFSET: SPRUCE FEDERAL 3 - OH - SURVEYS

Offset Site Error: 0.00 usft

Survey Program: 100-MWD

Offset Well Error: 0.00 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Rule Assigned: Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
4,900.00	2,407.29	2,581.14	2,590.57	32.57	6.36	-113.86	317.64	-4,639.06	1,857.86	1,837.41	20.45	90.846	
4,950.00	2,406.80	2,575.81	2,585.29	33.10	6.34	-113.27	317.03	-4,639.45	1,809.72	1,789.00	20.72	87.342	
5,000.00	2,406.32	2,570.57	2,580.10	33.62	6.32	-112.69	316.42	-4,639.82	1,761.67	1,740.66	21.01	83.858	
5,050.00	2,405.83	2,565.42	2,574.99	34.15	6.31	-112.12	315.83	-4,640.19	1,713.72	1,692.40	21.32	80.399	
5,100.00	2,405.34	2,560.36	2,569.98	34.68	6.29	-111.55	315.24	-4,640.55	1,665.88	1,644.23	21.64	76.966	
5,150.00	2,404.86	2,555.38	2,565.04	35.21	6.28	-110.99	314.67	-4,640.89	1,618.15	1,596.16	22.00	73.563	
5,200.00	2,404.37	2,550.48	2,560.19	35.74	6.26	-110.43	314.11	-4,641.23	1,570.56	1,548.19	22.37	70.195	
5,250.00	2,403.88	2,545.67	2,555.42	36.27	6.25	-109.88	313.55	-4,641.56	1,523.11	1,500.33	22.78	66.864	
5,300.00	2,403.40	2,540.93	2,550.72	36.80	6.23	-109.34	313.01	-4,641.88	1,475.81	1,452.60	23.21	63.574	
5,350.00	2,402.91	2,538.00	2,547.82	37.34	6.22	-109.01	312.67	-4,642.08	1,428.69	1,405.01	23.68	60.329	
5,400.00	2,402.42	2,533.27	2,543.13	37.87	6.21	-108.46	312.12	-4,642.40	1,381.75	1,357.57	24.18	57.133	
5,450.00	2,401.94	2,529.79	2,539.68	38.41	6.20	-108.06	311.72	-4,642.63	1,335.03	1,310.31	24.73	53.991	
5,500.00	2,401.45	2,526.28	2,536.21	38.94	6.18	-107.65	311.32	-4,642.87	1,288.55	1,263.24	25.31	50.907	
5,550.00	2,400.96	2,522.74	2,532.70	39.48	6.17	-107.24	310.92	-4,643.11	1,242.33	1,216.39	25.94	47.886	
5,600.00	2,400.48	2,519.18	2,529.17	40.02	6.16	-106.82	310.51	-4,643.36	1,196.40	1,169.77	26.63	44.933	
5,650.00	2,399.99	2,515.58	2,525.60	40.55	6.15	-106.40	310.10	-4,643.61	1,150.80	1,123.43	27.37	42.053	
5,700.00	2,399.50	2,511.95	2,522.01	41.09	6.14	-105.98	309.68	-4,643.86	1,105.56	1,077.40	28.17	39.251	
5,750.00	2,399.02	2,508.29	2,518.38	41.63	6.13	-105.55	309.26	-4,644.11	1,060.74	1,031.71	29.04	36.533	
5,800.00	2,398.53	2,504.61	2,514.73	42.17	6.12	-105.11	308.84	-4,644.37	1,016.39	986.42	29.98	33.904	
5,850.00	2,398.04	2,500.89	2,511.04	42.71	6.11	-104.67	308.42	-4,644.63	972.58	941.57	31.00	31.370	
5,900.00	2,397.56	2,497.13	2,507.32	43.25	6.10	-104.23	307.99	-4,644.90	929.37	897.25	32.12	28.936	
5,950.00	2,397.07	2,493.35	2,503.57	43.80	6.08	-103.78	307.56	-4,645.17	886.86	853.53	33.33	26.608	
6,000.00	2,396.58	2,489.53	2,499.79	44.34	6.07	-103.33	307.13	-4,645.44	845.15	810.50	34.65	24.392	
6,050.00	2,396.10	2,485.68	2,495.98	44.88	6.06	-102.87	306.69	-4,645.71	804.36	768.28	36.08	22.295	
6,100.00	2,395.61	2,481.80	2,492.13	45.42	6.05	-102.41	306.25	-4,645.99	764.65	727.02	37.63	20.320	
6,150.00	2,395.12	2,477.88	2,488.24	45.97	6.04	-101.94	305.81	-4,646.28	726.20	686.89	39.31	18.476	
6,200.00	2,394.64	2,473.93	2,484.33	46.51	6.02	-101.47	305.36	-4,646.57	689.20	648.09	41.11	16.766	
6,250.00	2,394.15	2,469.94	2,480.38	47.06	6.01	-100.99	304.91	-4,646.86	653.91	610.88	43.03	15.198	
6,300.00	2,393.66	2,465.92	2,476.39	47.60	6.00	-100.51	304.46	-4,647.15	620.61	575.56	45.05	13.775	
6,350.00	2,393.18	2,461.86	2,472.37	48.15	5.99	-100.02	304.00	-4,647.45	589.66	542.50	47.16	12.503	
6,400.00	2,392.69	2,457.77	2,468.31	48.69	5.98	-99.53	303.54	-4,647.76	561.42	512.12	49.30	11.387	
6,450.00	2,392.20	2,453.63	2,464.22	49.24	5.96	-99.03	303.08	-4,648.06	536.34	484.92	51.42	10.431	
6,500.00	2,391.72	2,449.47	2,460.09	49.78	5.95	-98.53	302.61	-4,648.38	514.87	461.45	53.42	9.638	
6,550.00	2,391.23	2,445.26	2,455.92	50.33	5.94	-98.02	302.14	-4,648.69	497.49	442.28	55.20	9.012	
6,600.00	2,390.74	2,442.00	2,452.69	50.88	5.93	-97.63	301.78	-4,648.94	484.62	427.95	56.67	8.552	
6,650.00	2,390.26	2,437.04	2,447.77	51.43	5.91	-97.03	301.22	-4,649.31	476.63	418.96	57.67	8.264	
6,700.00	2,389.77	2,433.04	2,443.81	51.97	5.90	-96.55	300.77	-4,649.62	473.78	415.61	58.17	8.145	
6,702.25	2,389.75	2,432.86	2,443.64	52.00	5.90	-96.53	300.75	-4,649.63	473.78	415.60	58.18	8.143	CC, ES, SF
6,750.00	2,389.28	2,429.07	2,439.88	52.52	5.89	-96.07	300.32	-4,649.91	476.16	418.05	58.11	8.194	
6,800.00	2,388.80	2,425.12	2,435.97	53.07	5.88	-95.60	299.87	-4,650.21	483.69	426.17	57.53	8.408	
6,850.00	2,388.31	2,421.20	2,432.08	53.62	5.87	-95.13	299.43	-4,650.50	496.14	439.66	56.47	8.786	
6,900.00	2,387.82	2,417.31	2,428.23	54.17	5.86	-94.66	298.98	-4,650.79	513.14	458.09	55.05	9.321	
6,950.00	2,387.34	2,413.44	2,424.39	54.72	5.84	-94.19	298.54	-4,651.07	534.27	480.89	53.37	10.010	
7,000.00	2,386.85	2,409.60	2,420.59	55.27	5.83	-93.73	298.10	-4,651.36	559.05	507.51	51.54	10.847	
7,050.00	2,386.36	2,405.78	2,416.81	55.82	5.82	-93.27	297.65	-4,651.64	587.03	537.39	49.64	11.825	
7,100.00	2,385.88	2,401.98	2,413.05	56.37	5.81	-92.82	297.21	-4,651.92	617.77	570.02	47.75	12.938	
7,150.00	2,385.39	2,398.22	2,409.31	56.92	5.80	-92.36	296.77	-4,652.19	650.88	604.97	45.90	14.180	
7,200.00	2,384.90	2,394.47	2,405.61	57.47	5.79	-91.92	296.34	-4,652.46	686.01	641.88	44.13	15.544	
7,250.00	2,384.42	2,390.75	2,401.92	58.02	5.78	-91.47	295.90	-4,652.73	722.88	680.41	42.47	17.023	
7,300.00	2,383.93	2,387.05	2,398.26	58.57	5.77	-91.03	295.46	-4,653.00	761.23	720.32	40.90	18.611	
7,350.00	2,383.45	2,383.38	2,394.62	59.12	5.76	-90.59	295.03	-4,653.26	800.84	761.39	39.45	20.301	
7,400.00	2,382.96	2,379.73	2,391.01	59.68	5.75	-90.16	294.60	-4,653.52	841.55	803.45	38.10	22.088	

CC - Min centre to center distance or covergent point, SF - min separation factor, ES - min ellipse separation

SPUR ENERGY PARTNERS

PROTOTYPE
Anticollision Report

PROTOTYPE WELL PLANNING
WELL PLANNED. WELL EXECUTED.

Company:	SPUR ENERGY PARTNERS, LLC	**Local Co-ordinate Reference:**	Well 110H
Project:	EDDY COUNTY, NM (NAD 83 - NME)	**TVD Reference:**	RKB = 20' @ 3626.00usft (AKITA 57)
Reference Site:	BLACK CHERRY FEDERAL COM	**MD Reference:**	RKB = 20' @ 3626.00usft (AKITA 57)
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	110H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	OH	**Database:**	EDM 5000.17 Single User Db
Reference Design:	PERMIT	**Offset TVD Reference:**	Reference Datum

Offset Design: BLACK CHERRY FEDERAL COM - OFFSET: SPRUCE FEDERAL 3 - OH - SURVEYS

Offset Site Error: 0.00 usft

Survey Program: 100-MWD

Offset Well Error: 0.00 usft

Rule Assigned:

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
7,450.00	2,382.47	2,376.10	2,387.42	60.23	5.74	-89.73	294.17	-4,653.78	883.19	846.34	36.85	23.965	
7,500.00	2,381.99	2,372.50	2,383.85	60.78	5.73	-89.30	293.73	-4,654.04	925.64	889.94	35.70	25.928	
7,550.00	2,381.50	2,368.92	2,380.30	61.33	5.71	-88.87	293.31	-4,654.29	968.81	934.17	34.64	27.969	
7,600.00	2,381.01	2,365.36	2,376.78	61.88	5.70	-88.45	292.88	-4,654.54	1,012.58	978.92	33.66	30.084	
7,650.00	2,380.53	2,361.83	2,373.28	62.44	5.69	-88.04	292.45	-4,654.79	1,056.90	1,024.14	32.75	32.267	
7,700.00	2,380.04	2,358.31	2,369.80	62.99	5.68	-87.62	292.03	-4,655.04	1,101.69	1,069.77	31.92	34.515	
7,750.00	2,379.55	2,354.82	2,366.34	63.54	5.67	-87.21	291.60	-4,655.28	1,146.89	1,115.75	31.15	36.822	
7,800.00	2,379.07	2,347.00	2,358.60	64.10	5.65	-86.30	290.65	-4,655.83	1,192.48	1,162.09	30.39	39.237	
7,850.00	2,378.58	2,347.00	2,358.60	64.65	5.65	-86.30	290.65	-4,655.83	1,238.38	1,208.62	29.76	41.609	
7,900.00	2,378.09	2,344.14	2,355.77	65.20	5.64	-85.97	290.30	-4,656.02	1,284.59	1,255.43	29.15	44.061	
7,950.00	2,377.61	2,340.28	2,351.94	65.76	5.63	-85.52	289.82	-4,656.29	1,331.06	1,302.47	28.58	46.570	
8,000.00	2,377.12	2,336.43	2,348.13	66.31	5.62	-85.08	289.36	-4,656.55	1,377.76	1,349.71	28.05	49.120	
8,050.00	2,376.63	2,332.59	2,344.33	66.87	5.61	-84.63	288.89	-4,656.82	1,424.68	1,397.12	27.55	51.706	
8,100.00	2,376.15	2,328.77	2,340.54	67.42	5.60	-84.19	288.42	-4,657.08	1,471.79	1,444.70	27.09	54.327	
8,150.00	2,375.66	2,324.95	2,336.76	67.97	5.59	-83.76	287.96	-4,657.34	1,519.07	1,492.41	26.66	56.979	
8,200.00	2,375.17	2,321.15	2,333.00	68.53	5.58	-83.32	287.50	-4,657.60	1,566.52	1,540.26	26.26	59.661	
8,217.70	2,375.00	2,319.80	2,331.67	68.72	5.58	-83.17	287.34	-4,657.70	1,583.35	1,557.23	26.12	60.616	

SPUR ENERGY PARTNERS

PROTOTYPE

Anticollision Report

PROTOTYPE WELL PLANNING
WELL PLANNED. WELL EXECUTED.

Company:	SPUR ENERGY PARTNERS, LLC	**Local Co-ordinate Reference:**	Well 110H
Project:	EDDY COUNTY, NM (NAD 83 - NME)	**TVD Reference:**	RKB = 20' @ 3626.00usft (AKITA 57)
Reference Site:	BLACK CHERRY FEDERAL COM	**MD Reference:**	RKB = 20' @ 3626.00usft (AKITA 57)
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	110H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	OH	**Database:**	EDM 5000.17 Single User Db
Reference Design:	PERMIT	**Offset TVD Reference:**	Reference Datum

Offset Design: BLACK CHERRY FEDERAL COM - OFFSET: SPRUCE FEDERAL 4 - OH - SURVEYS

Offset Site Error: 0.00 usft

Survey Program: 100-GYRO-NS

Offset Well Error: 0.00 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
4,800.00	2,408.26	2,390.90	2,421.85	31.52	8.38	93.79	1,240.96	-4,542.55	1,862.87	1,842.68	20.19	92.276	
4,850.00	2,407.78	2,391.09	2,422.03	32.05	8.38	93.81	1,240.95	-4,542.56	1,814.54	1,794.22	20.32	89.283	
4,900.00	2,407.29	2,391.28	2,422.22	32.57	8.38	93.83	1,240.93	-4,542.56	1,766.30	1,745.83	20.47	86.274	
4,950.00	2,406.80	2,391.47	2,422.41	33.10	8.38	93.85	1,240.92	-4,542.56	1,718.17	1,697.53	20.64	83.239	
5,000.00	2,406.32	2,391.65	2,422.59	33.62	8.38	93.88	1,240.90	-4,542.56	1,670.14	1,649.31	20.83	80.189	
5,050.00	2,405.83	2,391.84	2,422.78	34.15	8.38	93.90	1,240.89	-4,542.57	1,622.24	1,601.20	21.04	77.117	
5,100.00	2,405.34	2,392.03	2,422.97	34.68	8.38	93.92	1,240.87	-4,542.57	1,574.46	1,553.19	21.27	74.034	
5,150.00	2,404.86	2,392.22	2,423.15	35.21	8.38	93.95	1,240.86	-4,542.57	1,526.82	1,505.30	21.52	70.934	
5,200.00	2,404.37	2,392.40	2,423.34	35.74	8.38	93.97	1,240.84	-4,542.58	1,479.35	1,457.54	21.81	67.829	
5,250.00	2,403.88	2,392.59	2,423.53	36.27	8.38	93.99	1,240.83	-4,542.58	1,432.04	1,409.91	22.13	64.715	
5,300.00	2,403.40	2,392.78	2,423.71	36.80	8.38	94.01	1,240.81	-4,542.58	1,384.92	1,362.44	22.48	61.604	
5,350.00	2,402.91	2,392.97	2,423.90	37.34	8.38	94.04	1,240.80	-4,542.58	1,338.01	1,315.14	22.87	58.495	
5,400.00	2,402.42	2,393.15	2,424.09	37.87	8.38	94.06	1,240.78	-4,542.59	1,291.34	1,268.03	23.31	55.400	
5,450.00	2,401.94	2,393.34	2,424.28	38.41	8.39	94.08	1,240.77	-4,542.59	1,244.92	1,221.13	23.79	52.320	
5,500.00	2,401.45	2,393.53	2,424.46	38.94	8.39	94.11	1,240.75	-4,542.59	1,198.79	1,174.46	24.33	49.270	
5,550.00	2,400.96	2,393.72	2,424.65	39.48	8.39	94.13	1,240.74	-4,542.59	1,152.98	1,128.06	24.93	46.252	
5,600.00	2,400.48	2,393.90	2,424.84	40.02	8.39	94.15	1,240.72	-4,542.60	1,107.54	1,081.95	25.59	43.279	
5,650.00	2,399.99	2,394.09	2,425.02	40.55	8.39	94.17	1,240.71	-4,542.60	1,062.51	1,036.18	26.33	40.359	
5,700.00	2,399.50	2,394.28	2,425.21	41.09	8.39	94.20	1,240.69	-4,542.60	1,017.93	990.79	27.14	37.504	
5,750.00	2,399.02	2,394.47	2,425.40	41.63	8.39	94.22	1,240.68	-4,542.60	973.89	945.84	28.05	34.722	
5,800.00	2,398.53	2,394.65	2,425.58	42.17	8.39	94.24	1,240.66	-4,542.61	930.45	901.40	29.05	32.026	
5,850.00	2,398.04	2,394.84	2,425.77	42.71	8.39	94.27	1,240.65	-4,542.61	887.70	857.53	30.17	29.426	
5,900.00	2,397.56	2,395.03	2,425.96	43.25	8.39	94.29	1,240.63	-4,542.61	845.74	814.34	31.40	26.935	
5,950.00	2,397.07	2,395.22	2,426.14	43.80	8.39	94.31	1,240.62	-4,542.62	804.71	771.94	32.76	24.561	
6,000.00	2,396.58	2,395.40	2,426.33	44.34	8.39	94.33	1,240.60	-4,542.62	764.74	730.47	34.27	22.317	
6,050.00	2,396.10	2,395.59	2,426.52	44.88	8.39	94.36	1,240.59	-4,542.62	726.01	690.09	35.92	20.210	
6,100.00	2,395.61	2,395.78	2,426.71	45.42	8.39	94.38	1,240.57	-4,542.62	688.74	651.01	37.73	18.253	
6,150.00	2,395.12	2,395.97	2,426.89	45.97	8.39	94.40	1,240.56	-4,542.63	653.17	613.47	39.71	16.451	
6,200.00	2,394.64	2,396.15	2,427.08	46.51	8.40	94.42	1,240.54	-4,542.63	619.60	577.78	41.83	14.813	
6,250.00	2,394.15	2,396.34	2,427.27	47.06	8.40	94.45	1,240.53	-4,542.63	588.37	544.28	44.09	13.345	
6,300.00	2,393.66	2,396.53	2,427.45	47.60	8.40	94.47	1,240.51	-4,542.63	559.87	513.42	46.45	12.053	
6,350.00	2,393.18	2,396.72	2,427.64	48.15	8.40	94.49	1,240.50	-4,542.64	534.53	485.67	48.86	10.940	
6,400.00	2,392.69	2,396.90	2,427.83	48.69	8.40	94.52	1,240.48	-4,542.64	512.83	461.59	51.24	10.008	
6,450.00	2,392.20	2,397.09	2,428.01	49.24	8.40	94.54	1,240.47	-4,542.64	495.24	441.75	53.50	9.258	
6,500.00	2,391.72	2,397.28	2,428.20	49.78	8.40	94.56	1,240.45	-4,542.64	482.22	426.72	55.50	8.689	
6,550.00	2,391.23	2,397.47	2,428.39	50.33	8.40	94.58	1,240.44	-4,542.65	474.14	417.00	57.14	8.298	
6,600.00	2,390.74	2,397.65	2,428.57	50.88	8.40	94.61	1,240.42	-4,542.65	471.25	412.93	58.32	8.081	
6,602.30	2,390.72	2,397.66	2,428.58	50.90	8.40	94.61	1,240.42	-4,542.65	471.25	412.89	58.36	8.075	CC, ES
6,650.00	2,390.26	2,397.84	2,428.76	51.43	8.40	94.63	1,240.41	-4,542.65	473.65	414.68	58.97	8.032	SF
6,700.00	2,389.77	2,398.03	2,428.95	51.97	8.40	94.65	1,240.39	-4,542.66	481.27	422.17	59.10	8.143	
6,750.00	2,389.28	2,398.22	2,429.13	52.52	8.40	94.68	1,240.38	-4,542.66	493.85	435.11	58.75	8.407	
6,800.00	2,388.80	2,398.40	2,429.32	53.07	8.40	94.70	1,240.36	-4,542.66	511.04	453.05	57.98	8.813	
6,850.00	2,388.31	2,398.59	2,429.51	53.62	8.40	94.72	1,240.35	-4,542.66	532.38	475.46	56.92	9.353	
6,900.00	2,387.82	2,398.78	2,429.69	54.17	8.40	94.74	1,240.33	-4,542.67	557.41	501.76	55.64	10.017	
6,950.00	2,387.34	2,398.96	2,429.88	54.72	8.41	94.77	1,240.32	-4,542.67	585.64	531.39	54.25	10.795	
7,000.00	2,386.85	2,399.15	2,430.07	55.27	8.41	94.79	1,240.30	-4,542.67	616.64	563.84	52.80	11.679	
7,050.00	2,386.36	2,399.34	2,430.25	55.82	8.41	94.81	1,240.29	-4,542.67	650.01	598.66	51.35	12.658	
7,100.00	2,385.88	2,399.53	2,430.44	56.37	8.41	94.84	1,240.27	-4,542.68	685.41	635.47	49.94	13.725	
7,150.00	2,385.39	2,399.71	2,430.63	56.92	8.41	94.86	1,240.26	-4,542.68	722.53	673.95	48.58	14.873	
7,200.00	2,384.90	2,399.90	2,430.81	57.47	8.41	94.88	1,240.24	-4,542.68	761.13	713.84	47.29	16.094	
7,250.00	2,384.42	2,400.09	2,431.00	58.02	8.41	94.90	1,240.23	-4,542.68	801.00	754.91	46.08	17.382	
7,300.00	2,383.93	2,400.28	2,431.19	58.57	8.41	94.93	1,240.21	-4,542.69	841.94	796.99	44.95	18.731	

CC - Min centre to center distance or covergent point, SF - min separation factor, ES - min ellipse separation

SPUR ENERGY PARTNERS

PROTOTYPE
Anticollision Report

PROTOTYPE WELL PLANNING
WELL PLANNED. WELL EXECUTED.

Company:	SPUR ENERGY PARTNERS, LLC	**Local Co-ordinate Reference:**	Well 110H
Project:	EDDY COUNTY, NM (NAD 83 - NME)	**TVD Reference:**	RKB = 20' @ 3626.00usft (AKITA 57)
Reference Site:	BLACK CHERRY FEDERAL COM	**MD Reference:**	RKB = 20' @ 3626.00usft (AKITA 57)
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	110H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	OH	**Database:**	EDM 5000.17 Single User Db
Reference Design:	PERMIT	**Offset TVD Reference:**	Reference Datum

Offset Design: BLACK CHERRY FEDERAL COM - OFFSET: SPRUCE FEDERAL 4 - OH - SURVEYS

Offset Site Error: 0.00 usft

Survey Program: 100-GYRO-NS

Offset Well Error: 0.00 usft

Rule Assigned:

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
7,350.00	2,383.45	2,400.46	2,431.38	59.12	8.41	94.95	1,240.20	-4,542.69	883.82	839.92	43.90	20.135	
7,400.00	2,382.96	2,400.65	2,431.56	59.68	8.41	94.97	1,240.18	-4,542.69	926.50	883.58	42.92	21.589	
7,450.00	2,382.47	2,400.84	2,431.75	60.23	8.41	94.99	1,240.17	-4,542.69	969.88	927.88	42.01	23.089	
7,500.00	2,381.99	2,401.03	2,431.94	60.78	8.41	95.02	1,240.15	-4,542.70	1,013.87	972.71	41.16	24.630	
7,550.00	2,381.50	2,401.21	2,432.12	61.33	8.41	95.04	1,240.14	-4,542.70	1,058.40	1,018.02	40.38	26.210	
7,600.00	2,381.01	2,401.40	2,432.31	61.88	8.41	95.06	1,240.12	-4,542.70	1,103.40	1,063.74	39.66	27.823	
7,650.00	2,380.53	2,401.59	2,432.50	62.44	8.41	95.09	1,240.11	-4,542.71	1,148.80	1,109.82	38.98	29.468	
7,700.00	2,380.04	2,401.78	2,432.68	62.99	8.42	95.11	1,240.09	-4,542.71	1,194.58	1,156.22	38.36	31.142	
7,750.00	2,379.55	2,401.96	2,432.87	63.54	8.42	95.13	1,240.08	-4,542.71	1,240.68	1,202.90	37.78	32.841	
7,800.00	2,379.07	2,402.15	2,433.06	64.10	8.42	95.15	1,240.06	-4,542.71	1,287.07	1,249.83	37.24	34.563	
7,850.00	2,378.58	2,402.34	2,433.24	64.65	8.42	95.18	1,240.05	-4,542.72	1,333.73	1,296.99	36.74	36.306	
7,900.00	2,378.09	2,402.52	2,433.43	65.20	8.42	95.20	1,240.03	-4,542.72	1,380.61	1,344.35	36.27	38.069	
7,950.00	2,377.61	2,402.71	2,433.62	65.76	8.42	95.22	1,240.02	-4,542.72	1,427.71	1,391.89	35.83	39.849	
8,000.00	2,377.12	2,402.90	2,433.80	66.31	8.42	95.25	1,240.00	-4,542.72	1,475.00	1,439.58	35.42	41.645	
8,050.00	2,376.63	2,403.09	2,433.99	66.87	8.42	95.27	1,239.99	-4,542.73	1,522.47	1,487.43	35.04	43.454	
8,100.00	2,376.15	2,403.27	2,434.18	67.42	8.42	95.29	1,239.97	-4,542.73	1,570.09	1,535.41	34.68	45.277	
8,150.00	2,375.66	2,403.46	2,434.36	67.97	8.42	95.31	1,239.96	-4,542.73	1,617.85	1,583.51	34.34	47.111	
8,200.00	2,375.17	2,403.65	2,434.55	68.53	8.42	95.34	1,239.94	-4,542.73	1,665.75	1,631.72	34.03	48.956	
8,217.70	2,375.00	2,403.71	2,434.61	68.72	8.42	95.34	1,239.94	-4,542.74	1,682.73	1,648.81	33.92	49.612	

SPUR ENERGY PARTNERS

PROTOTYPE

Anticollision Report

PROTOTYPE WELL PLANNING
WELL PLANNED. WELL EXECUTED.

Company:	SPUR ENERGY PARTNERS, LLC	**Local Co-ordinate Reference:**	Well 110H
Project:	EDDY COUNTY, NM (NAD 83 - NME)	**TVD Reference:**	RKB = 20' @ 3626.00usft (AKITA 57)
Reference Site:	BLACK CHERRY FEDERAL COM	**MD Reference:**	RKB = 20' @ 3626.00usft (AKITA 57)
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	110H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	OH	**Database:**	EDM 5000.17 Single User Db
Reference Design:	PERMIT	**Offset TVD Reference:**	Reference Datum

Offset Design: BLACK CHERRY FEDERAL COM - OFFSET: STALEY STATE 11 - OH - SURVEYS

Offset Site Error: 0.00 usft

Survey Program: 445-INC-ONLY

Offset Well Error: 0.00 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Rule Assigned: Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
0.00	0.00	0.00	14.00	0.00	0.00	-50.68	511.84	-624.84	807.84				
50.00	50.00	36.00	50.00	0.92	0.65	-50.68	511.84	-624.84	807.72	806.14	1.57	513.414	
100.00	100.00	86.00	100.00	0.92	1.55	-50.68	511.84	-624.84	807.72	805.24	2.47	326.396	
150.00	150.00	136.00	150.00	1.23	2.45	-50.68	511.84	-624.84	807.72	804.04	3.68	219.661	
200.00	200.00	186.00	200.00	1.53	3.35	-50.68	511.84	-624.84	807.72	802.84	4.88	165.530	
250.00	250.00	236.00	250.00	1.74	4.25	-50.68	511.84	-624.84	807.72	801.72	5.99	134.735	
300.00	300.00	286.00	300.00	1.95	5.16	-50.68	511.84	-624.84	807.72	800.61	7.11	113.600	
350.00	349.99	335.99	349.99	2.38	6.06	-33.36	511.84	-624.84	807.17	798.82	8.34	96.726	
400.00	399.95	385.95	399.95	2.84	6.96	-33.47	511.84	-624.84	805.53	795.89	9.64	83.528	
450.00	449.85	435.85	449.85	3.18	7.86	-33.64	511.84	-624.84	802.80	791.97	10.84	74.071	
500.00	499.63	485.64	499.63	3.54	8.75	-33.89	511.84	-624.84	798.99	786.96	12.03	66.402	
550.00	549.29	535.29	549.29	3.85	9.65	-34.20	511.84	-624.84	794.11	780.93	13.19	60.209	
600.00	598.77	584.77	598.77	4.16	10.54	-34.60	511.84	-624.84	788.18	773.83	14.34	54.956	
650.00	648.04	634.05	648.04	4.45	11.43	-35.07	511.84	-624.84	781.19	765.72	15.47	50.496	
700.00	697.08	683.09	697.08	4.74	12.31	-35.62	511.84	-624.84	773.18	756.59	16.59	46.599	
750.00	745.85	732.18	746.17	5.02	13.20	-36.24	512.36	-624.84	764.49	746.79	17.70	43.188	
800.00	794.31	781.03	795.02	5.30	14.08	-36.97	512.31	-624.84	754.47	735.67	18.80	40.128	
850.00	842.43	829.50	843.49	5.57	14.95	-37.81	512.21	-624.84	743.48	723.59	19.88	37.392	
900.00	890.18	877.58	891.57	5.85	15.82	-38.76	512.07	-624.84	731.56	710.60	20.95	34.915	
950.00	937.52	925.22	939.21	6.11	16.67	-39.81	511.90	-624.84	718.75	696.74	22.00	32.665	
1,000.00	984.43	970.45	984.43	6.38	17.48	-40.94	511.84	-624.84	705.18	682.18	22.99	30.668	
1,050.00	1,030.87	1,016.89	1,030.87	6.64	18.29	-42.21	511.84	-624.84	690.88	666.89	23.99	28.800	
1,100.00	1,076.81	1,062.83	1,076.81	6.90	19.11	-43.62	511.84	-624.84	675.87	650.91	24.96	27.073	
1,150.00	1,122.22	1,108.23	1,122.22	7.16	19.91	-45.17	511.84	-624.84	660.23	634.31	25.92	25.472	
1,200.00	1,167.06	1,153.07	1,167.06	7.42	20.70	-46.86	511.84	-624.84	644.02	617.17	26.85	23.983	
1,250.00	1,211.31	1,197.32	1,211.31	7.67	21.48	-48.71	511.84	-624.84	627.36	599.60	27.76	22.598	
1,300.00	1,254.93	1,241.02	1,255.00	7.93	22.25	-50.71	512.13	-624.84	610.46	581.81	28.65	21.310	
1,350.00	1,297.90	1,284.07	1,298.05	8.17	23.01	-52.90	512.11	-624.84	593.19	563.68	29.50	20.106	
1,400.00	1,340.18	1,326.41	1,340.39	8.42	23.75	-55.25	512.08	-624.84	575.81	545.49	30.33	18.987	
1,450.00	1,382.13	1,368.40	1,382.38	8.61	24.49	-57.30	512.03	-624.84	558.85	527.74	31.11	17.965	
1,500.00	1,424.08	1,410.37	1,424.35	8.81	25.23	-59.44	511.97	-624.84	542.71	510.84	31.88	17.025	
1,550.00	1,466.02	1,452.32	1,466.30	9.01	25.97	-61.69	511.89	-624.84	527.50	494.86	32.64	16.160	
1,600.00	1,507.97	1,493.99	1,507.97	9.20	26.72	-64.01	511.84	-624.84	513.29	479.88	33.40	15.367	
1,650.00	1,549.91	1,535.94	1,549.91	9.41	27.47	-66.44	511.84	-624.84	500.17	465.99	34.18	14.634	
1,700.00	1,591.86	1,577.88	1,591.86	9.61	28.23	-68.96	511.84	-624.84	488.21	453.26	34.95	13.969	
1,750.00	1,633.81	1,619.83	1,633.81	9.82	28.99	-71.57	511.84	-624.84	477.51	441.78	35.73	13.365	
1,800.00	1,675.75	1,661.78	1,675.75	10.03	29.74	-74.26	511.84	-624.84	468.15	431.64	36.51	12.822	
1,850.00	1,717.70	1,703.72	1,717.70	10.24	30.50	-77.03	511.84	-624.84	460.21	422.91	37.30	12.339	
1,900.00	1,759.65	1,745.67	1,759.65	10.45	31.26	-77.09	512.11	-624.84	453.42	415.32	38.10	11.901	
1,950.00	1,801.61	1,787.60	1,801.58	10.66	32.01	-73.63	512.10	-624.84	445.33	406.32	39.02	11.414	
2,000.00	1,843.39	1,829.33	1,843.31	10.87	32.77	-70.38	512.07	-624.84	435.38	395.42	39.96	10.896	
2,050.00	1,884.79	1,870.67	1,884.65	11.08	33.51	-67.51	512.03	-624.84	423.55	382.64	40.91	10.353	
2,100.00	1,925.60	1,911.42	1,925.40	11.29	34.25	-65.20	511.97	-624.84	409.90	368.02	41.88	9.787	
2,150.00	1,965.64	1,951.37	1,965.35	11.49	34.97	-63.57	511.90	-624.84	394.51	351.65	42.86	9.205	
2,200.00	2,004.70	1,990.73	2,004.70	11.69	35.69	-62.74	511.84	-624.84	377.53	333.66	43.87	8.606	
2,250.00	2,042.59	2,028.62	2,042.59	11.88	36.40	-62.71	511.84	-624.84	359.15	314.24	44.91	7.997	
2,300.00	2,079.13	2,065.16	2,079.13	12.06	37.09	-63.56	511.84	-624.84	339.66	293.69	45.97	7.388	
2,350.00	2,114.14	2,100.17	2,114.14	12.24	37.75	-65.31	511.84	-624.84	319.49	272.42	47.07	6.788	
2,400.00	2,147.45	2,133.48	2,147.45	12.41	38.38	-67.92	511.84	-624.84	299.15	250.95	48.20	6.207	
2,450.00	2,178.90	2,164.93	2,178.90	12.58	38.97	-71.33	511.84	-624.84	279.36	229.98	49.38	5.658	
2,500.00	2,208.33	2,194.37	2,208.33	12.74	39.52	-75.38	511.84	-624.84	261.05	210.45	50.60	5.159	
2,550.00	2,235.61	2,221.64	2,235.61	12.92	40.04	-79.81	511.84	-624.84	245.41	193.57	51.84	4.734	

CC - Min centre to center distance or covergent point, SF - min separation factor, ES - min ellipse separation

SPUR ENERGY PARTNERS

PROTOTYPE

Anticollision Report

PROTOTYPE WELL PLANNING
WELL PLANNED. WELL EXECUTED.

Company:	SPUR ENERGY PARTNERS, LLC	**Local Co-ordinate Reference:**	Well 110H
Project:	EDDY COUNTY, NM (NAD 83 - NME)	**TVD Reference:**	RKB = 20' @ 3626.00usft (AKITA 57)
Reference Site:	BLACK CHERRY FEDERAL COM	**MD Reference:**	RKB = 20' @ 3626.00usft (AKITA 57)
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	110H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	OH	**Database:**	EDM 5000.17 Single User Db
Reference Design:	PERMIT	**Offset TVD Reference:**	Reference Datum

Offset Design: BLACK CHERRY FEDERAL COM - OFFSET: STALEY STATE 11 - OH - SURVEYS — **Offset Site Error:** 0.00 usft

Survey Program: 445-INC-ONLY — **Rule Assigned:** — **Offset Well Error:** 0.00 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
2,600.00	2,260.89	2,246.93	2,260.89	13.07	40.52	-84.72	511.84	-624.84	234.14	181.14	53.00	4.418	
2,649.04	2,285.41	2,271.37	2,285.33	13.26	40.98	-89.97	512.42	-624.84	229.66	175.62	54.04	4.250	CC
2,650.00	2,285.89	2,271.84	2,285.81	13.27	40.99	-90.08	512.42	-624.84	229.66	175.60	54.06	4.248	ES, SF
2,700.00	2,310.89	2,296.75	2,310.71	13.46	41.46	-95.44	512.41	-624.84	233.86	178.96	54.90	4.260	
2,750.00	2,335.89	2,321.66	2,335.62	13.67	41.92	-100.71	512.38	-624.84	245.75	190.22	55.53	4.426	
2,800.00	2,360.41	2,346.08	2,360.04	13.88	42.39	-104.66	512.35	-624.84	264.42	208.47	55.96	4.725	
2,850.00	2,381.51	2,367.11	2,381.07	14.12	42.78	-106.25	512.31	-624.84	289.58	233.36	56.21	5.151	
2,900.00	2,398.59	2,384.12	2,398.08	14.38	43.10	-106.15	512.28	-624.84	320.37	264.04	56.33	5.687	
2,950.00	2,411.50	2,396.98	2,410.95	14.65	43.34	-104.19	512.25	-624.84	355.73	299.38	56.34	6.314	
3,000.00	2,420.16	2,405.61	2,419.57	14.95	43.51	-100.15	512.23	-624.84	394.60	338.33	56.27	7.013	
3,050.00	2,424.49	2,409.93	2,423.89	15.26	43.59	-93.83	512.22	-624.84	436.04	379.93	56.12	7.770	
3,100.00	2,424.81	2,410.24	2,424.20	15.59	43.59	-88.83	512.22	-624.84	479.25	423.35	55.90	8.574	
3,150.00	2,424.32	2,409.75	2,423.72	15.95	43.59	-88.71	512.22	-624.84	523.67	467.99	55.68	9.404	
3,200.00	2,423.84	2,409.27	2,423.23	16.31	43.58	-88.59	512.22	-624.84	569.02	513.51	55.51	10.251	
3,250.00	2,423.35	2,408.78	2,422.75	16.70	43.57	-88.47	512.22	-624.84	615.08	559.76	55.32	11.118	
3,300.00	2,422.86	2,408.30	2,422.26	17.09	43.56	-88.34	512.22	-624.84	661.72	606.51	55.22	11.984	
3,350.00	2,422.38	2,407.81	2,421.77	17.49	43.55	-88.22	512.22	-624.84	708.82	653.71	55.11	12.862	
3,400.00	2,421.89	2,407.33	2,421.29	17.91	43.54	-88.10	512.22	-624.84	756.29	701.30	54.99	13.754	
3,450.00	2,421.40	2,406.84	2,420.80	18.33	43.53	-87.98	512.22	-624.84	804.06	749.17	54.90	14.646	
3,500.00	2,420.92	2,406.35	2,420.32	18.76	43.52	-87.86	512.23	-624.84	852.10	797.29	54.81	15.546	
3,550.00	2,420.43	2,405.87	2,419.83	19.21	43.51	-87.74	512.23	-624.84	900.34	845.60	54.74	16.448	
3,600.00	2,419.94	2,405.38	2,419.35	19.65	43.50	-87.62	512.23	-624.84	948.77	894.10	54.67	17.355	
3,650.00	2,419.46	2,404.90	2,418.86	20.11	43.49	-87.50	512.23	-624.84	997.35	942.74	54.61	18.263	
3,700.00	2,418.97	2,404.41	2,418.37	20.56	43.49	-87.38	512.23	-624.84	1,046.06	991.51	54.55	19.175	
3,750.00	2,418.48	2,403.93	2,417.89	21.03	43.48	-87.26	512.23	-624.84	1,094.89	1,040.39	54.51	20.087	
3,800.00	2,418.00	2,403.44	2,417.40	21.49	43.47	-87.14	512.23	-624.84	1,143.83	1,089.36	54.46	21.003	
3,850.00	2,417.51	2,402.95	2,416.92	21.97	43.46	-87.02	512.23	-624.84	1,192.85	1,138.42	54.42	21.919	
3,900.00	2,417.02	2,402.47	2,416.43	22.45	43.45	-86.89	512.24	-624.84	1,241.94	1,187.56	54.38	22.837	
3,950.00	2,416.54	2,401.98	2,415.95	22.93	43.44	-86.77	512.24	-624.84	1,291.11	1,236.76	54.35	23.755	
4,000.00	2,416.05	2,401.50	2,415.46	23.41	43.43	-86.65	512.24	-624.84	1,340.34	1,286.02	54.32	24.675	
4,050.00	2,415.56	2,401.01	2,414.97	23.90	43.42	-86.53	512.24	-624.84	1,389.62	1,335.33	54.29	25.595	
4,100.00	2,415.08	2,400.53	2,414.49	24.39	43.41	-86.41	512.24	-624.84	1,438.95	1,384.69	54.27	26.517	
4,150.00	2,414.59	2,400.04	2,414.00	24.89	43.40	-86.29	512.24	-624.84	1,488.33	1,434.09	54.24	27.438	
4,200.00	2,414.10	2,399.55	2,413.52	25.38	43.39	-86.17	512.24	-624.84	1,537.75	1,483.53	54.22	28.361	
4,250.00	2,413.62	2,399.07	2,413.03	25.89	43.38	-86.05	512.24	-624.84	1,587.20	1,533.00	54.20	29.283	
4,300.00	2,413.13	2,398.58	2,412.55	26.39	43.38	-85.93	512.25	-624.84	1,636.69	1,582.50	54.18	30.206	
4,350.00	2,412.64	2,398.10	2,412.06	26.89	43.37	-85.81	512.25	-624.84	1,686.20	1,632.04	54.17	31.129	
4,400.00	2,412.16	2,397.61	2,411.57	27.40	43.36	-85.69	512.25	-624.84	1,735.75	1,681.60	54.15	32.052	
4,450.00	2,411.67	2,397.13	2,411.09	27.91	43.35	-85.57	512.25	-624.84	1,785.32	1,731.18	54.14	32.975	
4,500.00	2,411.18	2,396.64	2,410.60	28.42	43.34	-85.45	512.25	-624.84	1,834.91	1,780.78	54.13	33.899	
4,550.00	2,410.70	2,396.15	2,410.12	28.93	43.33	-85.33	512.25	-624.84	1,884.53	1,830.41	54.12	34.822	

SPUR ENERGY PARTNERS

PROTOTYPE

Anticollision Report

PROTOTYPE WELL PLANNING
WELL PLANNED. WELL EXECUTED.

Company:	SPUR ENERGY PARTNERS, LLC	**Local Co-ordinate Reference:**	Well 110H
Project:	EDDY COUNTY, NM (NAD 83 - NME)	**TVD Reference:**	RKB = 20' @ 3626.00usft (AKITA 57)
Reference Site:	BLACK CHERRY FEDERAL COM	**MD Reference:**	RKB = 20' @ 3626.00usft (AKITA 57)
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	110H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	OH	**Database:**	EDM 5000.17 Single User Db
Reference Design:	PERMIT	**Offset TVD Reference:**	Reference Datum

Offset Design: BLACK CHERRY FEDERAL COM - OFFSET: STALEY STATE 19 - OH - PROPOSED SURVEY

Offset Site Error: 0.00 usft

Survey Program: 100-MWD

Offset Well Error: 0.00 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Rule Assigned: Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
0.00	0.00	0.00	31.00	0.00	0.00	-24.71	1,019.11	-469.02	1,122.29				
50.00	50.00	19.00	50.00	0.92	0.19	-24.71	1,019.11	-469.02	1,121.86	1,120.74	1.12	1,003.304	
100.00	100.00	69.00	100.00	0.92	0.70	-24.71	1,019.11	-469.02	1,121.86	1,120.23	1.63	688.852	
150.00	150.00	119.00	150.00	1.23	1.13	-24.71	1,019.11	-469.02	1,121.86	1,119.50	2.35	476.645	
200.00	200.00	169.00	200.00	1.53	1.41	-24.71	1,019.11	-469.02	1,121.86	1,118.92	2.94	381.877	
250.00	250.00	219.00	250.00	1.74	1.67	-24.71	1,019.11	-469.02	1,121.86	1,118.45	3.41	329.380	
300.00	300.00	269.00	300.00	1.95	1.87	-24.71	1,019.11	-469.02	1,121.86	1,118.03	3.83	293.115	
350.00	349.99	318.99	349.99	2.38	2.07	-7.37	1,019.11	-469.02	1,121.21	1,116.77	4.44	252.774	
400.00	399.95	368.95	399.95	2.84	2.24	-7.39	1,019.11	-469.02	1,119.26	1,114.19	5.07	220.859	
450.00	449.85	418.85	449.85	3.18	2.39	-7.42	1,019.11	-469.02	1,116.02	1,110.46	5.56	200.675	
500.00	499.63	468.63	499.63	3.54	2.49	-7.47	1,019.11	-469.02	1,111.48	1,105.47	6.02	184.775	
550.00	549.29	500.00	531.00	3.85	2.53	-7.52	1,019.19	-469.09	1,105.91	1,099.55	6.36	173.946	
600.00	598.77	542.63	573.63	4.16	2.72	-7.60	1,019.73	-469.53	1,099.60	1,092.74	6.86	160.322	
650.00	648.04	578.74	609.72	4.45	2.90	-7.68	1,020.56	-470.21	1,092.64	1,085.31	7.33	149.130	
700.00	697.08	614.82	645.77	4.74	3.08	-7.78	1,021.75	-471.18	1,085.00	1,077.21	7.79	139.251	
750.00	745.85	650.89	681.78	5.02	3.24	-7.90	1,023.29	-472.44	1,076.69	1,068.46	8.23	130.870	
800.00	794.31	700.00	730.77	5.30	3.46	-8.08	1,025.95	-474.61	1,067.81	1,059.09	8.72	122.434	
850.00	842.43	722.93	753.62	5.57	3.55	-8.20	1,027.41	-475.81	1,058.05	1,048.95	9.09	116.336	
900.00	890.18	758.91	789.44	5.85	3.71	-8.37	1,029.99	-477.92	1,047.73	1,038.20	9.52	110.016	
950.00	937.52	800.00	830.30	6.11	3.89	-8.59	1,033.36	-480.68	1,036.77	1,026.79	9.97	103.967	
1,000.00	984.43	830.75	860.84	6.38	4.02	-8.79	1,036.19	-482.99	1,025.11	1,014.74	10.38	98.784	
1,050.00	1,030.87	866.61	896.39	6.64	4.18	-9.03	1,039.80	-485.94	1,012.83	1,002.03	10.80	93.754	
1,100.00	1,076.81	900.00	929.44	6.90	4.32	-9.28	1,043.47	-488.94	999.91	988.69	11.22	89.116	
1,150.00	1,122.22	938.19	967.17	7.16	4.49	-9.58	1,048.03	-492.67	986.34	974.68	11.66	84.599	
1,200.00	1,167.06	973.90	1,002.38	7.42	4.65	-9.90	1,052.65	-496.45	972.14	960.05	12.09	80.417	
1,250.00	1,211.31	1,010.33	1,038.23	7.67	4.80	-10.26	1,057.71	-500.59	957.31	944.80	12.52	76.492	
1,300.00	1,254.93	1,048.78	1,075.98	7.93	4.95	-10.66	1,063.34	-505.20	941.77	928.83	12.94	72.803	
1,350.00	1,297.90	1,087.09	1,113.53	8.17	5.09	-11.10	1,069.23	-510.01	925.47	912.12	13.35	69.310	
1,400.00	1,340.18	1,130.73	1,156.23	8.42	5.25	-11.63	1,076.17	-515.69	908.35	894.56	13.79	65.885	
1,450.00	1,382.13	1,176.97	1,201.48	8.61	5.42	-12.11	1,083.55	-521.72	890.72	876.55	14.17	62.863	
1,500.00	1,424.08	1,228.27	1,251.70	8.81	5.62	-12.66	1,091.67	-528.36	873.08	858.51	14.57	59.905	
1,550.00	1,466.02	1,284.24	1,306.59	9.01	5.83	-13.28	1,100.09	-535.26	855.04	840.04	15.00	56.991	
1,600.00	1,507.97	1,342.00	1,363.39	9.20	6.07	-13.95	1,108.24	-541.92	836.49	821.05	15.44	54.171	
1,650.00	1,549.91	1,400.00	1,420.57	9.41	6.31	-14.65	1,115.75	-548.07	817.33	801.45	15.88	51.455	
1,700.00	1,591.86	1,457.30	1,477.20	9.61	6.54	-15.38	1,122.52	-553.60	797.55	781.24	16.31	48.892	
1,750.00	1,633.81	1,513.89	1,533.25	9.82	6.77	-16.13	1,128.55	-558.53	777.18	760.45	16.74	46.440	
1,800.00	1,675.75	1,569.76	1,588.70	10.03	7.00	-16.91	1,133.87	-562.89	756.23	739.09	17.14	44.114	
1,850.00	1,717.70	1,624.90	1,643.51	10.24	7.21	-17.73	1,138.51	-566.68	734.72	717.18	17.53	41.905	
1,900.00	1,759.65	1,679.32	1,697.69	10.45	7.43	-15.04	1,142.49	-569.93	712.58	694.68	17.91	39.796	
1,950.00	1,801.61	1,733.08	1,751.27	10.66	7.63	-7.39	1,145.83	-572.67	689.26	670.98	18.28	37.715	
2,000.00	1,843.39	1,785.90	1,803.97	10.87	7.82	0.65	1,148.55	-574.89	664.67	646.03	18.64	35.658	
2,050.00	1,884.79	1,837.49	1,855.49	11.08	8.00	8.97	1,150.66	-576.61	638.93	619.94	18.99	33.641	
2,100.00	1,925.60	1,887.58	1,905.54	11.29	8.18	17.49	1,152.19	-577.86	612.25	592.91	19.34	31.658	
2,150.00	1,965.64	1,935.91	1,953.86	11.49	8.32	26.18	1,153.18	-578.68	584.87	565.21	19.66	29.753	
2,200.00	2,004.70	1,982.27	2,000.21	11.69	8.45	34.96	1,153.69	-579.09	557.17	537.21	19.96	27.916	
2,250.00	2,042.59	2,023.25	2,041.19	11.88	8.54	43.58	1,153.83	-579.20	529.67	509.43	20.24	26.173	
2,300.00	2,079.13	2,060.51	2,078.45	12.06	8.60	51.90	1,153.88	-579.25	503.22	482.72	20.49	24.555	
2,350.00	2,114.14	2,096.14	2,114.08	12.24	8.65	59.91	1,153.90	-579.27	478.51	457.79	20.72	23.095	
2,400.00	2,147.45	2,129.51	2,147.45	12.41	8.69	67.42	1,153.91	-579.27	456.36	435.47	20.89	21.848	
2,450.00	2,178.90	2,160.96	2,178.90	12.58	8.72	74.33	1,153.91	-579.27	437.70	416.71	21.00	20.846	
2,500.00	2,208.33	2,190.40	2,208.33	12.74	8.75	80.54	1,153.91	-579.27	423.54	402.51	21.03	20.138	
2,550.00	2,235.61	2,217.67	2,235.61	12.92	8.77	85.98	1,153.91	-579.27	414.83	393.85	20.98	19.769 SF	

CC - Min centre to center distance or covergent point, SF - min separation factor, ES - min ellipse separation

SPUR ENERGY PARTNERS

PROTOTYPE

Anticollision Report

PROTOTYPE WELL PLANNING
WELL PLANNED. WELL EXECUTED.

Company:	SPUR ENERGY PARTNERS, LLC	**Local Co-ordinate Reference:**	Well 110H
Project:	EDDY COUNTY, NM (NAD 83 - NME)	**TVD Reference:**	RKB = 20' @ 3626.00usft (AKITA 57)
Reference Site:	BLACK CHERRY FEDERAL COM	**MD Reference:**	RKB = 20' @ 3626.00usft (AKITA 57)
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	110H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	OH	**Database:**	EDM 5000.17 Single User Db
Reference Design:	PERMIT	**Offset TVD Reference:**	Reference Datum

Offset Design: BLACK CHERRY FEDERAL COM - OFFSET: STALEY STATE 19 - OH - PROPOSED SURVEY

Offset Site Error: 0.00 usft

Survey Program: 100-MWD

Offset Well Error: 0.00 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Rule Assigned: Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
2,600.00	2,260.89	2,242.96	2,260.89	13.07	8.80	89.88	1,153.91	-579.27	412.14	391.31	20.84	19.781	ES
2,602.25	2,262.02	2,244.08	2,262.02	13.08	8.80	90.02	1,153.91	-579.27	412.14	391.31	20.83	19.787	CC
2,650.00	2,285.89	2,267.96	2,285.89	13.27	8.82	92.89	1,153.91	-579.27	414.24	393.58	20.66	20.055	
2,700.00	2,310.89	2,292.96	2,310.89	13.46	8.84	95.88	1,153.91	-579.27	420.80	400.37	20.43	20.596	
2,750.00	2,335.89	2,317.96	2,335.89	13.67	8.87	98.84	1,153.91	-579.27	431.63	411.43	20.20	21.367	
2,800.00	2,360.41	2,342.47	2,360.41	13.88	8.89	100.89	1,153.91	-579.27	446.52	426.55	19.97	22.355	
2,850.00	2,381.51	2,363.57	2,381.51	14.12	8.91	101.39	1,153.91	-579.27	465.84	446.06	19.78	23.551	
2,900.00	2,398.59	2,380.65	2,398.59	14.38	8.93	100.89	1,153.91	-579.27	489.50	469.87	19.63	24.937	
2,950.00	2,411.50	2,393.56	2,411.50	14.65	8.94	99.30	1,153.91	-579.27	517.16	497.63	19.53	26.486	
3,000.00	2,420.16	2,402.22	2,420.16	14.95	8.95	96.51	1,153.91	-579.27	548.30	528.83	19.47	28.168	
3,050.00	2,424.49	2,406.56	2,424.49	15.26	8.95	92.47	1,153.91	-579.27	582.35	562.91	19.44	29.958	
3,100.00	2,424.81	2,406.87	2,424.81	15.59	8.95	89.38	1,153.91	-579.27	618.68	599.24	19.43	31.835	
3,150.00	2,424.32	2,406.38	2,424.32	15.95	8.95	89.31	1,153.91	-579.27	656.81	637.35	19.46	33.743	
3,200.00	2,423.84	2,405.90	2,423.84	16.31	8.95	89.24	1,153.91	-579.27	696.45	676.96	19.48	35.747	
3,250.00	2,423.35	2,405.41	2,423.35	16.70	8.95	89.17	1,153.91	-579.27	737.34	717.78	19.56	37.698	
3,300.00	2,422.86	2,404.92	2,422.86	17.09	8.95	89.11	1,153.91	-579.27	779.30	759.74	19.57	39.828	
3,350.00	2,422.38	2,404.44	2,422.38	17.49	8.95	89.04	1,153.91	-579.27	822.16	802.56	19.60	41.947	
3,400.00	2,421.89	2,403.95	2,421.89	17.91	8.95	88.97	1,153.91	-579.27	865.79	846.12	19.66	44.033	
3,450.00	2,421.40	2,403.46	2,421.40	18.33	8.95	88.90	1,153.91	-579.27	910.07	890.36	19.71	46.182	
3,500.00	2,420.92	2,402.98	2,420.92	18.76	8.95	88.83	1,153.91	-579.27	954.91	935.15	19.76	48.329	
3,550.00	2,420.43	2,402.49	2,420.43	19.21	8.95	88.77	1,153.91	-579.27	1,000.25	980.44	19.80	50.510	
3,600.00	2,419.94	2,402.00	2,419.94	19.65	8.95	88.70	1,153.91	-579.27	1,046.01	1,026.15	19.85	52.694	
3,650.00	2,419.46	2,401.52	2,419.46	20.11	8.95	88.63	1,153.91	-579.27	1,092.14	1,072.24	19.89	54.900	
3,700.00	2,418.97	2,401.03	2,418.97	20.56	8.95	88.56	1,153.91	-579.27	1,138.59	1,118.66	19.94	57.109	
3,750.00	2,418.48	2,400.54	2,418.48	21.03	8.95	88.50	1,153.91	-579.27	1,185.34	1,165.36	19.98	59.334	
3,800.00	2,418.00	2,400.06	2,418.00	21.49	8.95	88.43	1,153.91	-579.27	1,232.34	1,212.32	20.02	61.562	
3,850.00	2,417.51	2,399.57	2,417.51	21.97	8.95	88.36	1,153.91	-579.27	1,279.57	1,259.51	20.06	63.802	
3,900.00	2,417.02	2,399.08	2,417.02	22.45	8.95	88.29	1,153.91	-579.27	1,327.00	1,306.91	20.09	66.044	
3,950.00	2,416.54	2,398.60	2,416.54	22.93	8.95	88.23	1,153.91	-579.27	1,374.61	1,354.48	20.13	68.295	
4,000.00	2,416.05	2,398.11	2,416.05	23.41	8.95	88.16	1,153.91	-579.27	1,422.39	1,402.23	20.16	70.547	
4,050.00	2,415.56	2,397.62	2,415.56	23.90	8.95	88.09	1,153.91	-579.27	1,470.31	1,450.12	20.20	72.806	
4,100.00	2,415.08	2,397.14	2,415.08	24.39	8.95	88.02	1,153.91	-579.27	1,518.37	1,498.14	20.23	75.064	
4,150.00	2,414.59	2,396.65	2,414.59	24.89	8.95	87.96	1,153.91	-579.27	1,566.55	1,546.29	20.26	77.328	
4,200.00	2,414.10	2,396.16	2,414.10	25.38	8.94	87.89	1,153.91	-579.27	1,614.84	1,594.55	20.29	79.592	
4,250.00	2,413.62	2,395.68	2,413.62	25.89	8.94	87.82	1,153.91	-579.27	1,663.23	1,642.91	20.32	81.859	
4,300.00	2,413.13	2,395.19	2,413.13	26.39	8.94	87.75	1,153.91	-579.27	1,711.71	1,691.37	20.35	84.125	
4,350.00	2,412.64	2,394.71	2,412.64	26.89	8.94	87.69	1,153.91	-579.27	1,760.28	1,739.91	20.38	86.393	
4,400.00	2,412.16	2,394.22	2,412.16	27.40	8.94	87.62	1,153.91	-579.27	1,808.93	1,788.52	20.40	88.660	
4,450.00	2,411.67	2,393.73	2,411.67	27.91	8.94	87.55	1,153.91	-579.27	1,857.64	1,837.21	20.43	90.929	

SPUR ENERGY PARTNERS

PROTOTYPE

Anticollision Report

PROTOTYPE WELL PLANNING
WELL PLANNED. WELL EXECUTED.

Company:	SPUR ENERGY PARTNERS, LLC	**Local Co-ordinate Reference:**	Well 110H
Project:	EDDY COUNTY, NM (NAD 83 - NME)	**TVD Reference:**	RKB = 20' @ 3626.00usft (AKITA 57)
Reference Site:	BLACK CHERRY FEDERAL COM	**MD Reference:**	RKB = 20' @ 3626.00usft (AKITA 57)
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	110H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	OH	**Database:**	EDM 5000.17 Single User Db
Reference Design:	PERMIT	**Offset TVD Reference:**	Reference Datum

Offset Design: BLACK CHERRY FEDERAL COM - OFFSET: STALEY STATE 26 - OH - SURVEYS — **Offset Site Error:** 0.00 usft

Survey Program: 254-INC-ONLY — **Offset Well Error:** 0.00 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Rule Assigned: Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
0.00	0.00	0.00	28.00	0.00	0.00	3.84	521.74	35.05	523.67				
50.00	50.00	22.00	50.00	0.92	0.39	3.84	521.74	35.05	522.92	521.60	1.32	397.147	
100.00	100.00	72.00	100.00	0.92	1.28	3.84	521.74	35.05	522.92	520.71	2.21	236.803	
150.00	150.00	122.00	150.00	1.23	2.18	3.84	521.74	35.05	522.92	519.52	3.40	153.762	
200.00	200.00	172.00	200.00	1.53	3.07	3.84	521.74	35.05	522.92	518.32	4.59	113.841	
250.00	250.00	222.00	250.00	1.74	3.96	3.84	521.74	35.05	522.92	517.22	5.70	91.759	
300.00	300.00	272.00	300.00	1.95	4.85	3.84	521.74	35.05	522.92	516.11	6.80	76.875	
350.00	349.99	322.00	349.99	2.38	5.73	21.23	521.74	35.05	522.31	514.21	8.10	64.478	
400.00	399.95	371.96	399.95	2.84	6.62	21.32	521.74	35.05	520.48	511.09	9.39	55.427	
450.00	449.85	421.85	449.85	3.18	7.50	21.49	521.74	35.05	517.43	506.83	10.60	48.807	
500.00	499.63	471.64	499.63	3.54	8.38	21.72	521.74	35.05	513.18	501.37	11.81	43.454	
550.00	549.29	521.29	549.29	3.85	9.26	22.03	521.74	35.05	507.72	494.74	12.98	39.117	
600.00	598.77	570.77	598.77	4.16	10.14	22.41	521.74	35.05	501.06	486.92	14.14	35.425	
650.00	648.04	620.05	648.04	4.45	11.01	22.88	521.74	35.05	493.23	477.95	15.29	32.269	
700.00	697.08	669.21	697.21	4.74	11.88	23.43	522.23	35.05	484.72	468.30	16.42	29.518	
750.00	745.85	718.14	746.13	5.02	12.75	24.09	522.21	35.05	474.56	457.02	17.54	27.057	
800.00	794.31	766.75	794.74	5.30	13.61	24.86	522.17	35.05	463.26	444.62	18.65	24.843	
850.00	842.43	815.01	843.00	5.57	14.47	25.74	522.11	35.05	450.86	431.12	19.74	22.841	
900.00	890.18	862.88	890.88	5.85	15.32	26.77	522.05	35.05	437.37	416.56	20.82	21.010	
950.00	937.52	910.34	938.34	6.11	16.16	27.96	521.96	35.05	422.86	400.98	21.88	19.328	
1,000.00	984.43	957.35	985.35	6.38	16.99	29.33	521.86	35.05	407.35	384.43	22.92	17.772	
1,050.00	1,030.87	1,003.88	1,031.87	6.64	17.81	30.91	521.75	35.05	390.93	366.98	23.94	16.328	
1,100.00	1,076.81	1,048.82	1,076.81	6.90	18.70	32.69	521.74	35.05	373.76	348.75	25.02	14.940	
1,150.00	1,122.22	1,094.22	1,122.22	7.16	19.61	34.79	521.74	35.05	355.86	329.77	26.09	13.640	
1,200.00	1,167.06	1,139.07	1,167.06	7.42	20.50	37.21	521.74	35.05	337.33	310.20	27.13	12.435	
1,250.00	1,211.31	1,183.31	1,211.31	7.67	21.38	40.03	521.74	35.05	318.32	290.19	28.13	11.317	
1,300.00	1,254.93	1,226.94	1,254.93	7.93	22.25	43.29	521.74	35.05	299.02	269.94	29.08	10.283	
1,350.00	1,297.90	1,269.91	1,297.90	8.17	23.11	47.09	521.74	35.05	279.68	249.70	29.97	9.332	
1,400.00	1,340.18	1,312.19	1,340.18	8.42	23.95	51.47	521.74	35.05	260.64	229.84	30.79	8.464	
1,450.00	1,382.13	1,354.14	1,382.13	8.61	24.79	55.96	521.74	35.05	242.71	211.18	31.53	7.699	
1,500.00	1,424.08	1,396.08	1,424.08	8.81	25.62	60.98	521.74	35.05	226.63	194.43	32.21	7.037	
1,550.00	1,466.02	1,438.03	1,466.02	9.01	26.46	66.54	521.74	35.05	212.84	179.98	32.85	6.478	
1,600.00	1,507.97	1,479.98	1,507.97	9.20	27.29	72.61	521.74	35.05	201.79	168.30	33.49	6.025	
1,650.00	1,549.91	1,521.93	1,549.92	9.41	28.13	79.01	522.18	35.05	194.17	159.99	34.18	5.681	
1,700.00	1,591.86	1,563.88	1,591.87	9.61	28.96	85.80	522.18	35.05	189.89	154.92	34.98	5.429	
1,730.50	1,617.45	1,589.47	1,617.46	9.74	29.47	90.01	522.17	35.05	189.17	153.61	35.55	5.321	CC
1,750.00	1,633.81	1,605.83	1,633.82	9.82	29.80	92.70	522.17	35.05	189.46	153.51	35.96	5.269	ES
1,800.00	1,675.75	1,647.77	1,675.76	10.03	30.64	99.54	522.15	35.05	192.91	155.79	37.13	5.196	SF
1,850.00	1,717.70	1,689.71	1,717.70	10.24	31.47	106.11	522.13	35.05	200.05	161.62	38.43	5.205	
1,900.00	1,759.65	1,731.64	1,759.63	10.45	32.31	115.11	522.10	35.05	210.77	170.97	39.81	5.295	
1,950.00	1,801.61	1,773.57	1,801.56	10.66	33.14	127.33	522.07	35.05	226.68	185.44	41.23	5.498	
2,000.00	1,843.39	1,815.32	1,843.31	10.87	33.98	138.82	522.03	35.05	247.15	204.57	42.58	5.805	
2,050.00	1,884.79	1,856.68	1,884.67	11.08	34.80	149.39	521.98	35.05	271.20	227.37	43.83	6.188	
2,100.00	1,925.60	1,897.46	1,925.45	11.29	35.61	158.96	521.93	35.05	298.07	253.07	45.00	6.624	
2,150.00	1,965.64	1,937.45	1,965.44	11.49	36.41	167.52	521.88	35.05	327.20	281.11	46.09	7.099	
2,200.00	2,004.70	1,976.46	2,004.45	11.69	37.19	175.16	521.82	35.05	358.21	311.09	47.12	7.602	
2,250.00	2,042.59	2,014.31	2,042.29	11.88	37.94	-178.01	521.75	35.05	390.84	342.75	48.09	8.128	
2,300.00	2,079.13	2,051.29	2,079.13	12.06	38.77	-171.87	521.74	35.05	424.89	375.79	49.09	8.655	
2,350.00	2,114.14	2,086.30	2,114.14	12.24	39.57	-166.27	521.74	35.05	460.25	410.20	50.04	9.197	
2,400.00	2,147.45	2,119.61	2,147.45	12.41	40.34	-161.06	521.74	35.05	496.83	445.90	50.93	9.755	
2,450.00	2,178.90	2,151.06	2,178.90	12.58	41.06	-156.11	521.74	35.05	534.56	482.81	51.75	10.330	
2,500.00	2,208.33	2,180.49	2,208.33	12.74	41.74	-151.30	521.74	35.05	573.36	520.87	52.49	10.923	

CC - Min centre to center distance or covergent point, SF - min separation factor, ES - min ellipse separation

SPUR ENERGY PARTNERS

PROTOTYPE
Anticollision Report

PROTOTYPE WELL PLANNING
WELL PLANNED. WELL EXECUTED.

Company:	SPUR ENERGY PARTNERS, LLC	**Local Co-ordinate Reference:**	Well 110H
Project:	EDDY COUNTY, NM (NAD 83 - NME)	**TVD Reference:**	RKB = 20' @ 3626.00usft (AKITA 57)
Reference Site:	BLACK CHERRY FEDERAL COM	**MD Reference:**	RKB = 20' @ 3626.00usft (AKITA 57)
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	110H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	OH	**Database:**	EDM 5000.17 Single User Db
Reference Design:	PERMIT	**Offset TVD Reference:**	Reference Datum

Offset Design: BLACK CHERRY FEDERAL COM - OFFSET: STALEY STATE 26 - OH - SURVEYS

Offset Site Error: 0.00 usft

Survey Program: 254-INC-ONLY

Offset Well Error: 0.00 usft

Rule Assigned:

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
2,550.00	2,235.61	2,207.77	2,235.61	12.92	42.37	-146.50	521.74	35.05	613.16	559.99	53.17	11.532	
2,600.00	2,260.89	2,233.05	2,260.89	13.07	42.95	-145.07	521.74	35.05	653.81	600.04	53.77	12.159	
2,650.00	2,285.89	2,258.05	2,285.89	13.27	43.53	-146.87	521.74	35.05	694.84	640.46	54.38	12.778	
2,700.00	2,310.89	2,282.96	2,310.77	13.46	44.10	-148.72	523.50	35.05	735.60	680.62	54.98	13.379	
2,750.00	2,335.89	2,307.67	2,335.48	13.67	44.67	-150.20	523.48	35.05	777.14	721.54	55.60	13.978	
2,800.00	2,360.41	2,331.90	2,359.71	13.88	45.23	-149.58	523.42	35.05	819.13	762.92	56.21	14.572	
2,850.00	2,381.51	2,352.76	2,380.56	14.12	45.71	-146.13	523.34	35.05	862.97	806.22	56.76	15.204	
2,900.00	2,398.59	2,369.63	2,397.44	14.38	46.10	-140.98	523.26	35.05	908.58	851.38	57.20	15.885	
2,950.00	2,411.50	2,382.40	2,410.20	14.65	46.39	-133.04	523.19	35.05	955.59	898.08	57.52	16.615	
3,000.00	2,420.16	2,390.95	2,418.76	14.95	46.59	-120.51	523.13	35.05	1,003.64	945.93	57.71	17.390	
3,050.00	2,424.49	2,395.23	2,423.04	15.26	46.69	-101.36	523.11	35.05	1,052.35	994.56	57.79	18.209	
3,100.00	2,424.81	2,395.54	2,423.35	15.59	46.69	-86.80	523.10	35.05	1,101.34	1,043.58	57.76	19.067	
3,150.00	2,424.32	2,395.06	2,422.86	15.95	46.68	-86.67	523.11	35.05	1,150.43	1,092.72	57.70	19.937	
3,200.00	2,423.84	2,394.58	2,422.38	16.31	46.67	-86.54	523.11	35.05	1,199.59	1,141.93	57.66	20.805	
3,250.00	2,423.35	2,394.09	2,421.90	16.70	46.66	-86.41	523.11	35.05	1,248.81	1,191.21	57.60	21.681	
3,300.00	2,422.86	2,393.61	2,421.41	17.09	46.65	-86.28	523.12	35.05	1,298.10	1,240.52	57.57	22.547	
3,350.00	2,422.38	2,393.13	2,420.93	17.49	46.64	-86.15	523.12	35.05	1,347.43	1,289.89	57.54	23.416	
3,400.00	2,421.89	2,392.64	2,420.45	17.91	46.63	-86.03	523.12	35.05	1,396.82	1,339.32	57.50	24.293	
3,450.00	2,421.40	2,392.16	2,419.96	18.33	46.62	-85.90	523.13	35.05	1,446.24	1,388.78	57.47	25.166	
3,500.00	2,420.92	2,391.68	2,419.48	18.76	46.60	-85.77	523.13	35.05	1,495.71	1,438.27	57.43	26.042	
3,550.00	2,420.43	2,391.19	2,419.00	19.21	46.59	-85.64	523.13	35.05	1,545.21	1,487.80	57.41	26.917	
3,600.00	2,419.94	2,390.71	2,418.51	19.65	46.58	-85.51	523.14	35.05	1,594.74	1,537.36	57.38	27.793	
3,650.00	2,419.46	2,390.23	2,418.03	20.11	46.57	-85.38	523.14	35.05	1,644.30	1,586.94	57.35	28.669	
3,700.00	2,418.97	2,389.74	2,417.55	20.56	46.56	-85.25	523.14	35.05	1,693.88	1,636.55	57.33	29.547	
3,750.00	2,418.48	2,389.26	2,417.06	21.03	46.55	-85.13	523.14	35.05	1,743.49	1,686.18	57.31	30.423	
3,800.00	2,418.00	2,388.78	2,416.58	21.49	46.54	-85.00	523.15	35.05	1,793.12	1,735.83	57.29	31.301	
3,850.00	2,417.51	2,388.30	2,416.10	21.97	46.53	-84.87	523.15	35.05	1,842.77	1,785.50	57.27	32.178	
3,900.00	2,417.02	2,387.81	2,415.62	22.45	46.52	-84.74	523.15	35.05	1,892.43	1,835.18	57.25	33.056	

SPUR ENERGY PARTNERS

PROTOTYPE

Anticollision Report

PROTOTYPE WELL PLANNING
WELL PLANNED. WELL EXECUTED.

Company:	SPUR ENERGY PARTNERS, LLC	**Local Co-ordinate Reference:**	Well 110H
Project:	EDDY COUNTY, NM (NAD 83 - NME)	**TVD Reference:**	RKB = 20' @ 3626.00usft (AKITA 57)
Reference Site:	BLACK CHERRY FEDERAL COM	**MD Reference:**	RKB = 20' @ 3626.00usft (AKITA 57)
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	110H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	OH	**Database:**	EDM 5000.17 Single User Db
Reference Design:	PERMIT	**Offset TVD Reference:**	Reference Datum

Offset Design: BLACK CHERRY FEDERAL COM - OFFSET: STALEY STATE 6 - OH - SURVEYS — **Offset Site Error:** 0.00 usft

Survey Program: 939-INC-ONLY — **Offset Well Error:** 0.00 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Rule Assigned: Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
0.00	0.00	0.00	22.00	0.00	0.00	4.53	825.21	65.37	828.09				
50.00	50.00	28.00	50.00	0.92	0.49	4.53	825.21	65.37	827.80	826.38	1.41	585.236	
100.00	100.00	78.00	100.00	0.92	1.37	4.53	825.21	65.37	827.80	825.51	2.29	361.493	
150.00	150.00	128.00	150.00	1.23	2.24	4.53	825.21	65.37	827.80	824.33	3.47	238.802	
200.00	200.00	178.00	200.00	1.53	3.12	4.53	825.21	65.37	827.80	823.15	4.64	178.291	
250.00	250.00	228.00	250.00	1.74	3.99	4.53	825.21	65.37	827.80	822.06	5.73	144.409	
300.00	300.00	278.00	300.00	1.95	4.87	4.53	825.21	65.37	827.80	820.97	6.82	121.348	
350.00	349.99	327.99	349.99	2.38	5.74	21.90	825.21	65.37	827.19	819.08	8.11	102.015	
400.00	399.95	377.95	399.95	2.84	6.62	21.97	825.21	65.37	825.37	815.98	9.39	87.941	
450.00	449.85	427.85	449.85	3.18	7.49	22.09	825.21	65.37	822.33	811.75	10.59	77.684	
500.00	499.63	477.63	499.63	3.54	8.36	22.26	825.21	65.37	818.10	806.31	11.78	69.431	
550.00	549.29	527.29	549.29	3.85	9.23	22.48	825.21	65.37	812.66	799.71	12.94	62.789	
600.00	598.77	576.77	598.77	4.16	10.10	22.75	825.21	65.37	806.02	791.92	14.10	57.173	
650.00	648.04	626.04	648.04	4.45	10.96	23.08	825.21	65.37	798.21	782.98	15.23	52.410	
700.00	697.08	675.08	697.08	4.74	11.82	23.47	825.21	65.37	789.22	772.86	16.36	48.251	
750.00	745.85	723.85	745.85	5.02	12.67	23.91	825.21	65.37	779.07	761.61	17.47	44.606	
800.00	794.31	772.31	794.31	5.30	13.52	24.43	825.21	65.37	767.79	749.22	18.57	41.351	
850.00	842.43	820.43	842.43	5.57	14.37	25.01	825.21	65.37	755.38	735.73	19.65	38.434	
900.00	890.18	868.18	890.18	5.85	15.20	25.68	825.21	65.37	741.87	721.14	20.73	35.785	
950.00	937.52	915.52	937.52	6.11	16.03	26.42	825.21	65.37	727.29	705.49	21.79	33.371	
1,000.00	984.43	962.44	984.43	6.38	16.86	27.26	825.21	65.37	711.65	688.80	22.85	31.144	
1,050.00	1,030.87	1,008.87	1,030.87	6.64	17.68	28.20	825.21	65.37	695.00	671.11	23.89	29.086	
1,100.00	1,076.81	1,054.81	1,076.81	6.90	18.49	29.25	825.21	65.37	677.37	652.45	24.93	27.175	
1,150.00	1,122.22	1,100.22	1,122.22	7.16	19.30	30.42	825.21	65.37	658.81	632.87	25.94	25.398	
1,200.00	1,167.06	1,145.06	1,167.06	7.42	20.09	31.73	825.21	65.37	639.35	612.41	26.94	23.736	
1,250.00	1,211.31	1,189.31	1,211.31	7.67	20.88	33.18	825.21	65.37	619.06	591.15	27.91	22.180	
1,300.00	1,254.93	1,232.97	1,254.97	7.93	21.65	34.80	825.52	65.37	598.30	569.44	28.87	20.727	
1,350.00	1,297.90	1,276.13	1,298.12	8.17	22.41	36.62	825.51	65.37	576.54	546.75	29.80	19.349	
1,400.00	1,340.18	1,318.58	1,340.57	8.42	23.17	38.64	825.49	65.37	554.17	523.46	30.70	18.050	
1,450.00	1,382.13	1,360.67	1,382.66	8.61	23.91	40.36	825.45	65.37	531.74	500.19	31.55	16.855	
1,500.00	1,424.08	1,402.74	1,424.74	8.81	24.66	42.21	825.40	65.37	509.78	477.39	32.38	15.743	
1,550.00	1,466.02	1,444.80	1,466.79	9.01	25.40	44.21	825.33	65.37	488.33	455.13	33.21	14.706	
1,600.00	1,507.97	1,486.84	1,508.83	9.20	26.15	46.36	825.25	65.37	467.48	433.47	34.01	13.743	
1,650.00	1,549.91	1,527.92	1,549.91	9.41	26.88	48.62	825.21	65.37	447.36	412.55	34.81	12.853	
1,700.00	1,591.86	1,569.87	1,591.86	9.61	27.64	51.09	825.21	65.37	428.06	392.46	35.60	12.025	
1,750.00	1,633.81	1,611.82	1,633.81	9.82	28.39	53.75	825.21	65.37	409.66	373.29	36.37	11.263	
1,800.00	1,675.75	1,653.76	1,675.75	10.03	29.15	56.61	825.21	65.37	392.29	355.17	37.12	10.567	
1,850.00	1,717.70	1,695.71	1,717.70	10.24	29.90	59.67	825.21	65.37	376.09	338.24	37.85	9.936	
1,900.00	1,759.65	1,737.66	1,759.65	10.45	30.65	65.82	825.21	65.37	361.50	322.95	38.55	9.378	
1,950.00	1,801.61	1,779.69	1,801.68	10.66	31.41	75.82	825.47	65.37	351.30	312.01	39.29	8.942	
2,000.00	1,843.39	1,821.55	1,843.54	10.87	32.16	85.73	825.45	65.37	346.08	306.06	40.02	8.647	
2,022.00	1,861.66	1,839.85	1,861.85	10.96	32.49	89.99	825.43	65.37	345.52	305.17	40.35	8.564	CC, ES
2,050.00	1,884.79	1,863.01	1,885.00	11.08	32.91	95.30	825.41	65.37	346.39	305.62	40.77	8.497	
2,100.00	1,925.60	1,903.87	1,925.86	11.29	33.65	104.39	825.36	65.37	352.38	310.85	41.53	8.484	SF
2,150.00	1,965.64	1,943.94	1,965.93	11.49	34.37	112.89	825.29	65.37	363.99	321.65	42.34	8.597	
2,200.00	2,004.70	1,983.02	2,005.01	11.69	35.07	120.76	825.22	65.37	380.92	337.74	43.18	8.822	
2,250.00	2,042.59	2,020.61	2,042.59	11.88	35.77	127.95	825.21	65.37	402.77	358.71	44.06	9.142	
2,300.00	2,079.13	2,057.15	2,079.13	12.06	36.45	134.57	825.21	65.37	428.99	384.04	44.95	9.545	
2,350.00	2,114.14	2,092.16	2,114.14	12.24	37.11	140.66	825.21	65.37	459.06	413.24	45.82	10.019	
2,400.00	2,147.45	2,125.47	2,147.45	12.41	37.73	146.31	825.21	65.37	492.49	445.82	46.66	10.555	
2,450.00	2,178.90	2,156.92	2,178.90	12.58	38.32	151.62	825.21	65.37	528.82	481.37	47.46	11.143	
2,500.00	2,208.33	2,186.35	2,208.33	12.74	38.87	156.70	825.21	65.37	567.68	519.48	48.20	11.778	

CC - Min centre to center distance or covergent point, SF - min separation factor, ES - min ellipse separation

SPUR ENERGY PARTNERS

PROTOTYPE

Anticollision Report

PROTOTYPE WELL PLANNING
WELL PLANNED. WELL EXECUTED.

Company:	SPUR ENERGY PARTNERS, LLC	**Local Co-ordinate Reference:**	Well 110H
Project:	EDDY COUNTY, NM (NAD 83 - NME)	**TVD Reference:**	RKB = 20' @ 3626.00usft (AKITA 57)
Reference Site:	BLACK CHERRY FEDERAL COM	**MD Reference:**	RKB = 20' @ 3626.00usft (AKITA 57)
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	110H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	OH	**Database:**	EDM 5000.17 Single User Db
Reference Design:	PERMIT	**Offset TVD Reference:**	Reference Datum

Offset Design: BLACK CHERRY FEDERAL COM - OFFSET: STALEY STATE 6 - OH - SURVEYS

Offset Site Error: 0.00 usft

Survey Program: 939-INC-ONLY

Offset Well Error: 0.00 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Rule Assigned: Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
2,550.00	2,235.61	2,213.63	2,235.61	12.92	39.38	161.71	825.21	65.37	608.69	559.82	48.87	12.454	
2,600.00	2,260.89	2,238.91	2,260.89	13.07	39.85	164.63	825.76	65.37	651.43	601.95	49.48	13.164	
2,650.00	2,285.89	2,263.95	2,285.93	13.27	40.32	165.56	825.76	65.37	694.35	644.28	50.08	13.866	
2,700.00	2,310.89	2,288.99	2,310.96	13.46	40.79	166.38	825.74	65.37	737.32	686.65	50.67	14.552	
2,750.00	2,335.89	2,314.02	2,336.00	13.67	41.25	167.12	825.71	65.37	780.32	729.06	51.26	15.223	
2,800.00	2,360.41	2,338.57	2,360.55	13.88	41.71	166.80	825.67	65.37	823.62	771.78	51.85	15.886	
2,850.00	2,381.51	2,359.71	2,381.69	14.12	42.11	165.00	825.63	65.37	868.68	816.30	52.38	16.584	
2,900.00	2,398.59	2,376.81	2,398.78	14.38	42.43	162.08	825.60	65.37	915.42	862.60	52.82	17.329	
2,950.00	2,411.50	2,389.74	2,411.72	14.65	42.67	156.89	825.56	65.37	963.49	910.32	53.17	18.122	
3,000.00	2,420.16	2,398.41	2,420.39	14.95	42.83	146.05	825.54	65.37	1,012.52	959.11	53.41	18.959	
3,050.00	2,424.49	2,402.75	2,424.73	15.26	42.91	117.43	825.53	65.37	1,062.13	1,008.59	53.54	19.838	
3,100.00	2,424.81	2,403.06	2,425.04	15.59	42.92	83.20	825.53	65.37	1,111.96	1,058.38	53.58	20.754	
3,150.00	2,424.32	2,402.58	2,424.55	15.95	42.91	82.89	825.53	65.37	1,161.80	1,108.21	53.59	21.678	
3,200.00	2,423.84	2,402.09	2,424.06	16.31	42.90	82.57	825.53	65.37	1,211.66	1,158.06	53.61	22.603	
3,250.00	2,423.35	2,401.60	2,423.58	16.70	42.89	82.26	825.53	65.37	1,261.53	1,207.91	53.63	23.525	
3,300.00	2,422.86	2,401.11	2,423.09	17.09	42.88	81.95	825.53	65.37	1,311.41	1,257.78	53.63	24.452	
3,350.00	2,422.38	2,400.62	2,422.60	17.49	42.87	81.64	825.53	65.37	1,361.30	1,307.66	53.64	25.378	
3,400.00	2,421.89	2,400.13	2,422.11	17.91	42.86	81.33	825.54	65.37	1,411.19	1,357.54	53.65	26.302	
3,450.00	2,421.40	2,399.65	2,421.62	18.33	42.85	81.03	825.54	65.37	1,461.10	1,407.43	53.66	27.227	
3,500.00	2,420.92	2,399.16	2,421.13	18.76	42.84	80.72	825.54	65.37	1,511.01	1,457.33	53.67	28.152	
3,550.00	2,420.43	2,398.67	2,420.65	19.21	42.83	80.41	825.54	65.37	1,560.92	1,507.24	53.68	29.077	
3,600.00	2,419.94	2,398.18	2,420.16	19.65	42.83	80.10	825.54	65.37	1,610.84	1,557.15	53.69	30.002	
3,650.00	2,419.46	2,397.69	2,419.67	20.11	42.82	79.80	825.54	65.37	1,660.76	1,607.07	53.70	30.927	
3,700.00	2,418.97	2,397.20	2,419.18	20.56	42.81	79.49	825.54	65.37	1,710.69	1,656.99	53.71	31.852	
3,750.00	2,418.48	2,396.72	2,418.69	21.03	42.80	79.19	825.54	65.37	1,760.63	1,706.91	53.72	32.777	
3,800.00	2,418.00	2,396.23	2,418.20	21.49	42.79	78.88	825.55	65.37	1,810.56	1,756.84	53.72	33.701	
3,850.00	2,417.51	2,395.74	2,417.72	21.97	42.78	78.58	825.55	65.37	1,860.50	1,806.77	53.73	34.626	

SPUR ENERGY PARTNERS

PROTOTYPE

Anticollision Report

PROTOTYPE WELL PLANNING
WELL PLANNED. WELL EXECUTED.

Company:	SPUR ENERGY PARTNERS, LLC	**Local Co-ordinate Reference:**	Well 110H
Project:	EDDY COUNTY, NM (NAD 83 - NME)	**TVD Reference:**	RKB = 20' @ 3626.00usft (AKITA 57)
Reference Site:	BLACK CHERRY FEDERAL COM	**MD Reference:**	RKB = 20' @ 3626.00usft (AKITA 57)
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	110H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	OH	**Database:**	EDM 5000.17 Single User Db
Reference Design:	PERMIT	**Offset TVD Reference:**	Reference Datum

Offset Design: BLACK CHERRY FEDERAL COM - OFFSET: STATE `25` 1 - OH - SURVEYS — **Offset Site Error:** 0.00 usft

Survey Program: 298-INC-ONLY — **Offset Well Error:** 0.00 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Rule Assigned: Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
1,100.00	1,076.81	1,048.88	1,076.81	6.90	21.13	-63.95	512.94	-1,911.40	1,895.76	1,869.76	26.00	72.910	
1,150.00	1,122.22	1,094.29	1,122.22	7.16	22.09	-64.75	512.94	-1,911.40	1,885.98	1,858.87	27.11	69.580	
1,200.00	1,167.06	1,139.42	1,167.33	7.42	23.05	-65.56	514.03	-1,911.40	1,876.02	1,847.82	28.20	66.523	
1,250.00	1,211.31	1,184.11	1,212.02	7.67	24.00	-66.45	513.95	-1,911.40	1,865.54	1,836.26	29.29	63.700	
1,300.00	1,254.93	1,228.10	1,256.01	7.93	24.93	-67.38	513.81	-1,911.40	1,854.79	1,824.44	30.35	61.108	
1,350.00	1,297.90	1,271.35	1,299.25	8.17	25.85	-68.35	513.60	-1,911.40	1,843.82	1,812.42	31.40	58.712	
1,400.00	1,340.18	1,313.83	1,341.73	8.42	26.76	-69.35	513.34	-1,911.40	1,832.68	1,800.25	32.44	56.501	
1,450.00	1,382.13	1,355.89	1,383.79	8.61	27.65	-70.05	513.02	-1,911.40	1,821.65	1,788.20	33.45	54.456	
1,500.00	1,424.08	1,396.23	1,424.08	8.81	28.48	-70.72	512.94	-1,911.40	1,811.00	1,776.59	34.41	52.633	
1,550.00	1,466.02	1,438.17	1,466.02	9.01	29.34	-71.42	512.94	-1,911.40	1,800.70	1,765.30	35.39	50.876	
1,600.00	1,507.97	1,480.12	1,507.97	9.20	30.20	-72.12	512.94	-1,911.40	1,790.75	1,754.37	36.38	49.224	
1,650.00	1,549.91	1,522.07	1,549.91	9.41	31.05	-72.84	512.94	-1,911.40	1,781.17	1,743.80	37.37	47.661	
1,700.00	1,591.86	1,564.01	1,591.86	9.61	31.91	-73.55	512.94	-1,911.40	1,771.95	1,733.59	38.36	46.188	
1,750.00	1,633.81	1,605.96	1,633.81	9.82	32.77	-74.28	512.94	-1,911.40	1,763.11	1,723.74	39.36	44.794	
1,800.00	1,675.75	1,647.92	1,675.76	10.03	33.63	-74.97	514.01	-1,911.40	1,754.64	1,714.28	40.36	43.475	
1,850.00	1,717.70	1,689.83	1,717.66	10.24	34.49	-75.71	513.93	-1,911.40	1,746.54	1,705.20	41.35	42.240	
1,900.00	1,759.65	1,731.66	1,759.50	10.45	35.34	-73.68	513.79	-1,911.40	1,738.52	1,696.19	42.33	41.069	
1,950.00	1,801.61	1,773.43	1,801.27	10.66	36.19	-68.00	513.59	-1,911.40	1,728.13	1,684.73	43.40	39.818	
2,000.00	1,843.39	1,814.97	1,842.80	10.87	37.04	-62.39	513.33	-1,911.40	1,714.86	1,670.39	44.46	38.567	
2,050.00	1,884.79	1,856.07	1,883.89	11.08	37.88	-57.01	513.02	-1,911.40	1,698.71	1,653.19	45.52	37.321	
2,100.00	1,925.60	1,897.81	1,925.60	11.29	38.79	-51.96	512.94	-1,911.40	1,679.70	1,633.07	46.63	36.022	
2,150.00	1,965.64	1,937.85	1,965.64	11.49	39.68	-47.29	512.94	-1,911.40	1,657.89	1,610.17	47.72	34.744	
2,200.00	2,004.70	1,976.91	2,004.70	11.69	40.54	-43.02	512.94	-1,911.40	1,633.33	1,584.56	48.78	33.485	
2,250.00	2,042.59	2,014.80	2,042.59	11.88	41.38	-39.14	512.94	-1,911.40	1,606.11	1,556.30	49.81	32.244	
2,300.00	2,079.13	2,051.34	2,079.13	12.06	42.18	-35.62	512.94	-1,911.40	1,576.32	1,525.51	50.81	31.024	
2,350.00	2,114.14	2,086.35	2,114.14	12.24	42.96	-32.39	512.94	-1,911.40	1,544.05	1,492.28	51.77	29.826	
2,400.00	2,147.45	2,119.55	2,147.33	12.41	43.69	-29.36	513.71	-1,911.40	1,509.31	1,456.63	52.68	28.650	
2,450.00	2,178.90	2,150.81	2,178.59	12.58	44.38	-26.50	513.68	-1,911.40	1,472.45	1,418.90	53.54	27.500	
2,500.00	2,208.33	2,180.05	2,207.84	12.74	45.02	-23.71	513.62	-1,911.40	1,433.50	1,379.15	54.35	26.376	
2,550.00	2,235.61	2,207.15	2,234.94	12.92	45.62	-20.86	513.55	-1,911.40	1,392.63	1,337.54	55.10	25.276	
2,600.00	2,260.89	2,232.28	2,260.06	13.07	46.18	-19.69	513.47	-1,911.40	1,350.22	1,294.44	55.78	24.207	
2,650.00	2,285.89	2,257.13	2,284.91	13.27	46.73	-20.30	513.37	-1,911.40	1,307.63	1,251.19	56.44	23.167	
2,700.00	2,310.89	2,281.97	2,309.75	13.46	47.28	-20.95	513.25	-1,911.40	1,265.10	1,207.99	57.11	22.151	
2,750.00	2,335.89	2,306.81	2,334.59	13.67	47.82	-21.64	513.12	-1,911.40	1,222.63	1,164.84	57.78	21.159	
2,800.00	2,360.41	2,331.17	2,358.95	13.88	48.36	-24.05	512.97	-1,911.40	1,179.95	1,121.50	58.45	20.187	
2,850.00	2,381.51	2,353.82	2,381.51	14.12	48.89	-29.34	512.94	-1,911.40	1,135.62	1,076.49	59.13	19.205	
2,900.00	2,398.59	2,370.89	2,398.59	14.38	49.30	-36.76	512.94	-1,911.40	1,089.73	1,030.05	59.68	18.259	
2,950.00	2,411.50	2,383.81	2,411.50	14.65	49.61	-47.41	512.94	-1,911.40	1,042.67	982.55	60.12	17.342	
3,000.00	2,420.16	2,392.46	2,420.16	14.95	49.82	-62.22	512.94	-1,911.40	994.81	934.36	60.46	16.455	
3,050.00	2,424.49	2,396.80	2,424.49	15.26	49.92	-80.59	512.94	-1,911.40	946.54	885.86	60.68	15.598	
3,100.00	2,424.81	2,397.11	2,424.81	15.59	49.93	-92.02	512.94	-1,911.40	898.25	837.44	60.81	14.771	
3,150.00	2,424.32	2,396.63	2,424.32	15.95	49.91	-91.91	512.94	-1,911.40	850.16	789.21	60.95	13.949	
3,200.00	2,423.84	2,396.14	2,423.84	16.31	49.90	-91.79	512.94	-1,911.40	802.29	741.19	61.09	13.132	
3,250.00	2,423.35	2,395.65	2,423.35	16.70	49.89	-91.67	512.94	-1,911.40	754.70	693.39	61.30	12.311	
3,300.00	2,422.86	2,395.17	2,422.86	17.09	49.88	-91.56	512.94	-1,911.40	707.44	645.94	61.50	11.504	
3,350.00	2,422.38	2,394.68	2,422.38	17.49	49.87	-91.44	512.94	-1,911.40	660.59	598.84	61.75	10.698	
3,400.00	2,421.89	2,394.19	2,421.89	17.91	49.86	-91.32	512.94	-1,911.40	614.23	552.14	62.08	9.894	
3,450.00	2,421.40	2,393.71	2,421.40	18.33	49.85	-91.21	512.94	-1,911.40	568.48	506.02	62.47	9.100	
3,500.00	2,420.92	2,393.22	2,420.92	18.76	49.83	-91.09	512.94	-1,911.40	523.52	460.57	62.95	8.316	
3,550.00	2,420.43	2,392.73	2,420.43	19.21	49.82	-90.97	512.94	-1,911.40	479.56	416.02	63.54	7.547	
3,600.00	2,419.94	2,392.25	2,419.94	19.65	49.81	-90.86	512.94	-1,911.40	436.89	372.62	64.27	6.798	
3,650.00	2,419.46	2,391.76	2,419.46	20.11	49.80	-90.74	512.94	-1,911.40	395.94	330.78	65.16	6.076	

CC - Min centre to center distance or covergent point, SF - min separation factor, ES - min ellipse separation

SPUR ENERGY PARTNERS

PROTOTYPE

Anticollision Report

PROTOTYPE WELL PLANNING
WELL PLANNED. WELL EXECUTED.

Company:	SPUR ENERGY PARTNERS, LLC	**Local Co-ordinate Reference:**	Well 110H
Project:	EDDY COUNTY, NM (NAD 83 - NME)	**TVD Reference:**	RKB = 20' @ 3626.00usft (AKITA 57)
Reference Site:	BLACK CHERRY FEDERAL COM	**MD Reference:**	RKB = 20' @ 3626.00usft (AKITA 57)
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	110H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	OH	**Database:**	EDM 5000.17 Single User Db
Reference Design:	PERMIT	**Offset TVD Reference:**	Reference Datum

Offset Design: BLACK CHERRY FEDERAL COM - OFFSET: STATE `25` 1 - OH - SURVEYS — **Offset Site Error:** 0.00 usft

Survey Program: 298-INC-ONLY — **Rule Assigned:** — **Offset Well Error:** 0.00 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
3,700.00	2,418.97	2,391.27	2,418.97	20.56	49.79	-90.62	512.94	-1,911.40	357.31	291.06	66.25	5.393	
3,750.00	2,418.48	2,390.79	2,418.48	21.03	49.78	-90.51	512.94	-1,911.40	321.82	254.28	67.54	4.765	
3,800.00	2,418.00	2,390.30	2,418.00	21.49	49.76	-90.39	512.94	-1,911.40	290.63	221.62	69.01	4.212	
3,850.00	2,417.51	2,389.81	2,417.51	21.97	49.75	-90.27	512.94	-1,911.40	265.26	194.73	70.53	3.761	
3,900.00	2,417.02	2,389.33	2,417.02	22.45	49.74	-90.15	512.94	-1,911.40	247.51	175.65	71.85	3.445	
3,950.00	2,416.54	2,388.84	2,416.54	22.93	49.73	-90.04	512.94	-1,911.40	239.07	166.41	72.66	3.290	
3,966.05	2,416.38	2,388.68	2,416.38	23.08	49.73	-90.00	512.94	-1,911.40	238.53	165.77	72.76	3.278	CC, ES, SF
4,000.00	2,416.05	2,388.35	2,416.05	23.41	49.72	-89.92	512.94	-1,911.40	240.94	168.24	72.69	3.314	
4,050.00	2,415.56	2,387.87	2,415.56	23.90	49.71	-89.80	512.94	-1,911.40	252.87	180.88	71.99	3.513	
4,100.00	2,415.08	2,387.38	2,415.08	24.39	49.69	-89.69	512.94	-1,911.40	273.57	202.76	70.81	3.863	
4,150.00	2,414.59	2,386.89	2,414.59	24.89	49.68	-89.57	512.94	-1,911.40	301.22	231.75	69.47	4.336	
4,200.00	2,414.10	2,386.41	2,414.10	25.38	49.67	-89.45	512.94	-1,911.40	334.11	265.94	68.17	4.901	
4,250.00	2,413.62	2,385.92	2,413.62	25.89	49.66	-89.34	512.94	-1,911.40	370.84	303.83	67.01	5.534	
4,300.00	2,413.13	2,385.43	2,413.13	26.39	49.65	-89.22	512.94	-1,911.40	410.38	344.37	66.01	6.217	
4,350.00	2,412.64	2,384.95	2,412.64	26.89	49.64	-89.10	512.94	-1,911.40	452.00	386.82	65.18	6.934	
4,400.00	2,412.16	2,384.46	2,412.16	27.40	49.62	-88.99	512.94	-1,911.40	495.17	430.68	64.49	7.678	
4,450.00	2,411.67	2,383.97	2,411.67	27.91	49.61	-88.87	512.94	-1,911.40	539.53	475.61	63.91	8.441	
4,500.00	2,411.18	2,383.49	2,411.18	28.42	49.60	-88.75	512.94	-1,911.40	584.79	521.36	63.43	9.219	
4,550.00	2,410.70	2,383.00	2,410.70	28.93	49.59	-88.64	512.94	-1,911.40	630.77	567.74	63.03	10.007	
4,600.00	2,410.21	2,382.51	2,410.21	29.45	49.58	-88.52	512.94	-1,911.40	677.32	614.62	62.69	10.804	
4,650.00	2,409.72	2,382.03	2,409.72	29.97	49.57	-88.40	512.94	-1,911.40	724.33	661.92	62.41	11.606	
4,700.00	2,409.24	2,381.54	2,409.24	30.48	49.56	-88.28	512.94	-1,911.40	771.71	709.55	62.16	12.414	
4,750.00	2,408.75	2,381.05	2,408.75	31.00	49.54	-88.17	512.94	-1,911.40	819.41	757.45	61.95	13.226	
4,800.00	2,408.26	2,380.57	2,408.26	31.52	49.53	-88.05	512.94	-1,911.40	867.36	805.59	61.77	14.041	
4,850.00	2,407.78	2,380.08	2,407.78	32.05	49.52	-87.93	512.94	-1,911.40	915.53	853.91	61.62	14.858	
4,900.00	2,407.29	2,379.59	2,407.29	32.57	49.51	-87.82	512.94	-1,911.40	963.89	902.41	61.48	15.678	
4,950.00	2,406.80	2,379.11	2,406.80	33.10	49.50	-87.70	512.94	-1,911.40	1,012.41	951.05	61.36	16.498	
5,000.00	2,406.32	2,378.62	2,406.32	33.62	49.49	-87.58	512.94	-1,911.40	1,061.07	999.81	61.26	17.321	
5,050.00	2,405.83	2,378.13	2,405.83	34.15	49.47	-87.47	512.94	-1,911.40	1,109.84	1,048.67	61.17	18.144	
5,100.00	2,405.34	2,377.65	2,405.34	34.68	49.46	-87.35	512.94	-1,911.40	1,158.72	1,097.63	61.09	18.968	
5,150.00	2,404.86	2,377.16	2,404.86	35.21	49.45	-87.23	512.94	-1,911.40	1,207.69	1,146.67	61.02	19.793	
5,200.00	2,404.37	2,376.67	2,404.37	35.74	49.44	-87.12	512.94	-1,911.40	1,256.74	1,195.79	60.95	20.618	
5,250.00	2,403.88	2,376.19	2,403.88	36.27	49.43	-87.00	512.94	-1,911.40	1,305.86	1,244.97	60.90	21.444	
5,300.00	2,403.40	2,375.70	2,403.40	36.80	49.42	-86.88	512.94	-1,911.40	1,355.05	1,294.20	60.85	22.270	
5,350.00	2,402.91	2,375.21	2,402.91	37.34	49.40	-86.77	512.94	-1,911.40	1,404.30	1,343.49	60.80	23.096	
5,400.00	2,402.42	2,374.73	2,402.42	37.87	49.39	-86.65	512.94	-1,911.40	1,453.59	1,392.83	60.76	23.922	
5,450.00	2,401.94	2,374.24	2,401.94	38.41	49.38	-86.54	512.94	-1,911.40	1,502.93	1,442.21	60.73	24.749	
5,500.00	2,401.45	2,373.75	2,401.45	38.94	49.37	-86.42	512.94	-1,911.40	1,552.32	1,491.62	60.70	25.575	
5,550.00	2,400.96	2,373.27	2,400.96	39.48	49.36	-86.30	512.94	-1,911.40	1,601.74	1,541.07	60.67	26.401	
5,600.00	2,400.48	2,372.78	2,400.48	40.02	49.35	-86.19	512.94	-1,911.40	1,651.20	1,590.55	60.64	27.228	
5,650.00	2,399.99	2,372.29	2,399.99	40.55	49.33	-86.07	512.94	-1,911.40	1,700.69	1,640.06	60.62	28.054	
5,700.00	2,399.50	2,371.81	2,399.50	41.09	49.32	-85.95	512.94	-1,911.40	1,750.20	1,689.60	60.60	28.880	
5,750.00	2,399.02	2,371.32	2,399.02	41.63	49.31	-85.84	512.94	-1,911.40	1,799.75	1,739.16	60.59	29.705	
5,800.00	2,398.53	2,370.83	2,398.53	42.17	49.30	-85.72	512.94	-1,911.40	1,849.32	1,788.74	60.57	30.531	
5,850.00	2,398.04	2,370.35	2,398.04	42.71	49.29	-85.60	512.94	-1,911.40	1,898.91	1,838.35	60.56	31.356	

CC - Min centre to center distance or covergent point, SF - min separation factor, ES - min ellipse separation

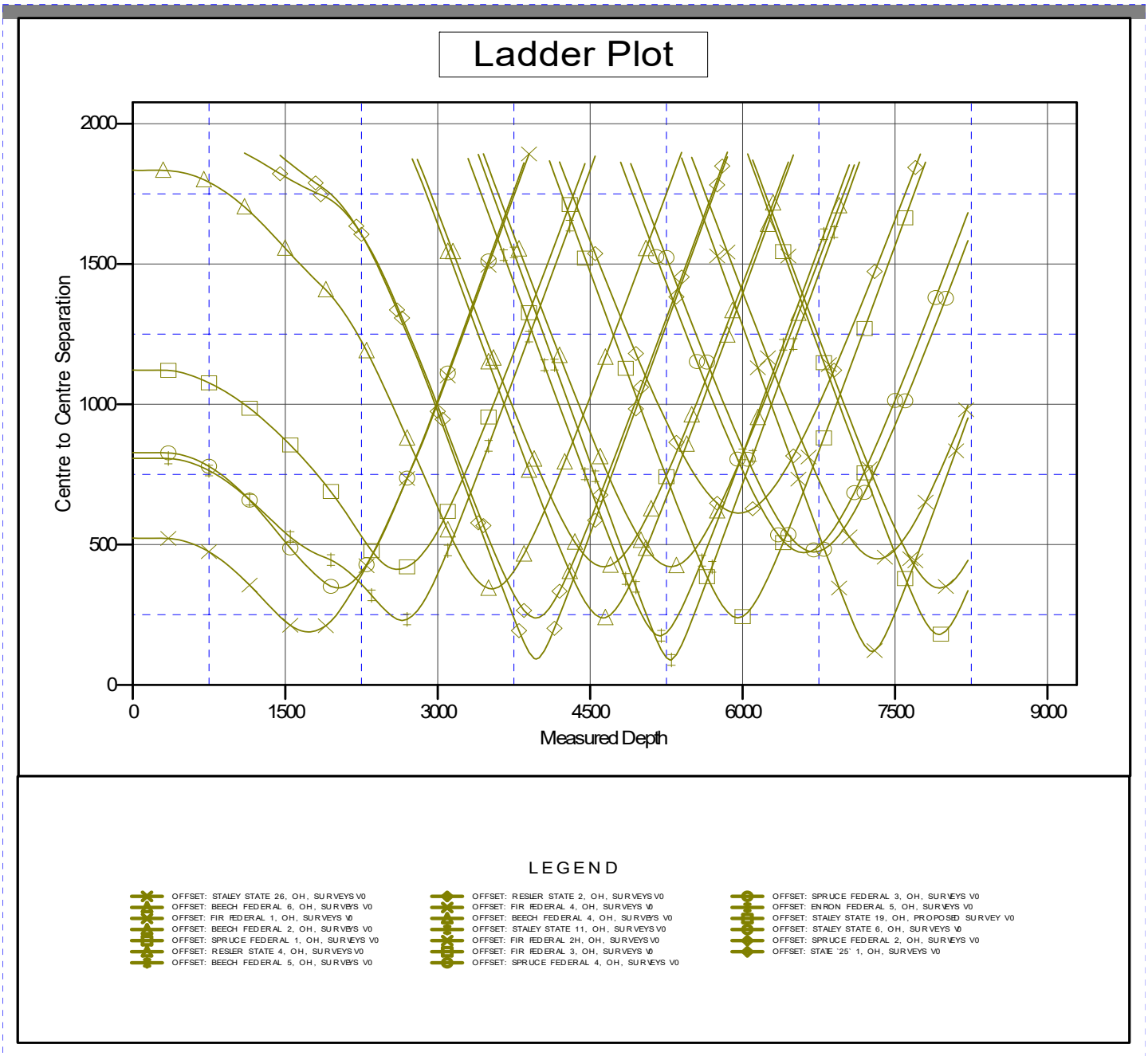
SPUR ENERGY PARTNERS

PROTOTYPE
Anticollision Report

PROTOTYPE WELL PLANNING
WELL PLANNED. WELL EXECUTED.

Company:	SPUR ENERGY PARTNERS, LLC	**Local Co-ordinate Reference:**	Well 110H
Project:	EDDY COUNTY, NM (NAD 83 - NME)	**TVD Reference:**	RKB = 20' @ 3626.00usft (AKITA 57)
Reference Site:	BLACK CHERRY FEDERAL COM	**MD Reference:**	RKB = 20' @ 3626.00usft (AKITA 57)
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	110H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	OH	**Database:**	EDM 5000.17 Single User Db
Reference Design:	PERMIT	**Offset TVD Reference:**	Reference Datum

Reference Depths are relative to RKB = 20' @ 3626.00usft (AKITA 57)
Offset Depths are relative to Offset Datum
Central Meridian is -104.33334
Coordinates are relative to: 110H
Coordinate System is US State Plane 1983, New Mexico Eastern Zone
Grid Convergence at Surface is: 0.06°



SPUR ENERGY PARTNERS

PROTOTYPE
Anticollision Report

PROTOTYPE WELL PLANNING
WELL PLANNED. WELL EXECUTED.

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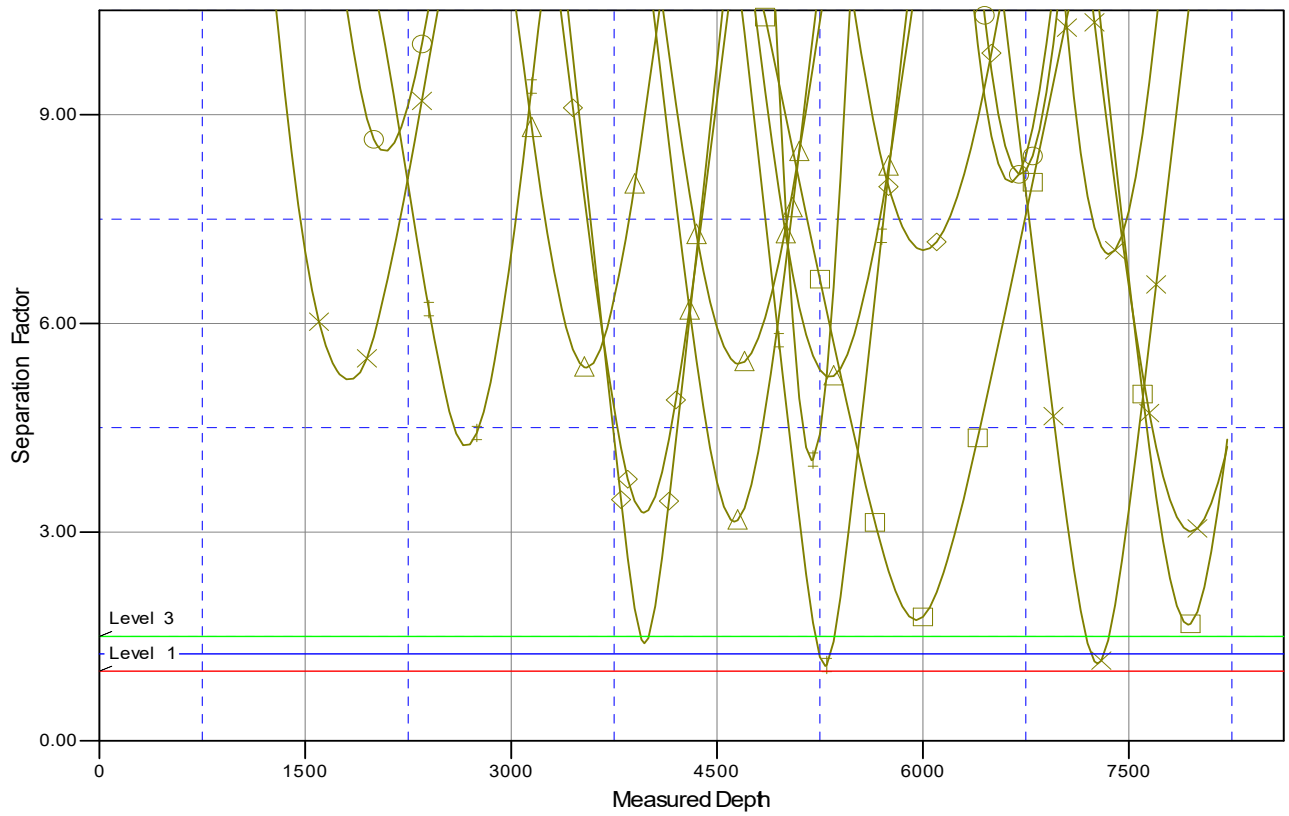
Reference Depths are relative to RKB = 20' @ 3626.00usft (AKITA 57)
Offset Depths are relative to Offset Datum
Central Meridian is -104.33334

Coordinates are relative to: 110H
Coordinate System is US State Plane 1983, New Mexico Eastern Zone
Grid Convergence at Surface is: 0.06°

Separation Factor Plot



LEGEND

OFFSET: STALEY STATE 26, OH, SURVEYS V0
OFFSET: BEECH FEDERAL 6, OH, SURVEYS V0
OFFSET: FIR FEDERAL 1, OH, SURVEYS V0
OFFSET: BEECH FEDERAL 2, OH, SURVEYS V0
OFFSET: SPRUCE FEDERAL 1, OH, SURVEYS V0
OFFSET: RESLER STATE 4, OH, SURVEYS V0
OFFSET: BEECH FEDERAL 5, OH, SURVEYS V0
OFFSET: RESLER STATE 2, OH, SURVEYS V0
OFFSET: FIR FEDERAL 4, OH, SURVEYS V0
OFFSET: BEECH FEDERAL 4, OH, SURVEYS V0
OFFSET: STALEY STATE 11, OH, SURVEYS V0
OFFSET: FIR FEDERAL 2H, OH, SURVEYS V0
OFFSET: FIR FEDERAL 3, OH, SURVEYS V0
OFFSET: SPRUCE FEDERAL 4, OH, SURVEYS V0
OFFSET: SPRUCE FEDERAL 3, OH, SURVEYS V0
OFFSET: ENRON FEDERAL 5, OH, SURVEYS V0
OFFSET: STALEY STATE 19, OH, PROPOSED SURVEY V0
OFFSET: STALEY STATE 6, OH, SURVEYS V0
OFFSET: SPRUCE FEDERAL 2, OH, SURVEYS V0
OFFSET: STATE '25' 1, OH, SURVEYS V0

Spur Energy Partners LLC – Black Cherry Federal Com 110H

1. Geologic Formations

TVD of Target	2,375'
MD at TD	8,218'

Formation	Depth	Lithology	Expected Fluids
Quaternary	0'	Dolomite, other: Caliche	Useable Water
Tansill	175'	Sandstone, Dolomite	None
Yates	265'	Dolomite, Limestone, Shale, Siltstone	None
Seven Rivers	495'	Dolomite, Limestone	Natural Gas, Oil
Queen	1025'	Anhydrite, Dolomite, Sandstone	Natural Gas, Oil
Penrose	1245'	Anhydrite, Dolomite, Sandstone	Natural Gas, Oil
Grayburg	1475'	Dolomite, Sandstone	Natural Gas, Oil
San Andres	1775'	Dolomite, Limestone	Natural Gas, Oil
Glorieta	3145'	Dolomite, Siltstone	Natural Gas, Oil

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

2. Casing Program

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

Casing Formation Set Interval	Hole Size (in)	Casing Interval		Csg. Size (in)	Weight	Grade	Conn.	SF	SF Burst	Body SF	Joint SF
		From (ft)	To (ft)		(lbs)			Collapse		Tension	Tension
Yates	17.5	0	450	13.375	54.5	J-55	BTC	1.125	1.2	1.4	1.4
Penrose	12.25	0	1450	9.625	36	J-55	BTC	1.125	1.2	1.4	1.4
N/A	8.75	0	2850	7	32	L-80	GBCD	1.125	1.2	1.4	1.4
San Andres	8.75	2850	8218	5.5	20	L-80	GBCD	1.125	1.2	1.4	1.4
								SF Values will meet or Exceed			

Spur Energy Partners LLC – Black Cherry Federal Com 110H

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

3. Cementing Program

Casing String	Top (ft)	Bottom (ft)	% Excess
Surface Tail	0	450	100%
Intermediate (Lead)	0	450	50%
Intermediate (Tail)	450	1450	100%
Production (Lead)	0	1850	0%
Production (Tail)	1850	8218	50%

Casing String	# Sks	Wt. (lb/gal)	Yld (ft3/sack)	H20 (gal/sk)	500# Comp. Strength (hours)	Slurry Description
Surface Tail	278	13.2	2.32	9.92	6:59	Clas C Premium Plus Cement
Intermediate (Lead)	89	12.2	1.84	13.48	8:12	Clas C Premium Plus Cement
Intermediate (Tail)	278	13.2	2.32	9.92	6:59	Clas C Premium Plus Cement
Production (Lead)	367	11.8	2.54	15.29	N/A	Clas C Premium Plus Cement
Production (Tail)	1254	13.2	1.81	9.81	N/A	Clas C Premium Plus Cement

Spur Energy Partners LLC – Black Cherry Federal Com 110H

4. Pressure Control Equipment

Spur Energy Partners LLC variance for flex hose

Spur requests a variance to use a flex line from the BOP to the choke manifold. Documentation will be attached in the APD and be readily available. No external damage to flex line. Flex line to be installed as straight as possible (no bends).

BOP installed and tested before drilling which hole?	Size?	Min. Required WP	Type	✓	Tested to:
12.25" Hole	13-5/8”	5M	Annular	✓	70% of working pressure
		5M	Blind Ram	✓	250 psi / 3000 psi
			Pipe Ram	✓	
			Double Ram		
			Other*		
8.75" Hole	13-5/8”	5M	Annular	✓	70% of working pressure
		5M	Blind Ram	✓	250 psi / 3000 psi
			Pipe Ram	✓	
			Double Ram		
			Other*		

Spur Energy Partners LLC will be utilizing a 5M BOP

Condition	Specify what type and where?
BH Pressure at deepest TVD	1123 psi
Abnormal Temperature	No
BH Temperature at deepest TVD	100°F

*Specify if additional ram is utilized.

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

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

	Formation integrity test will be performed per Onshore Order #2.

	On Exploratory wells or on that portion of any well approved for a 5M BOPE system or greater, a pressure integrity test of each casing shoe shall be performed. Will be tested in accordance with Onshore Oil and Gas Order #2 III.B.1.i.
	Y Are anchors required by manufacturer?
	A conventional wellhead system will be employed. The wellhead and connection to the BOPE will meet all API 6A requirements. The BOP will be tested per Onshore Order #2 after installation on the surface casing which will cover testing requirements for a maximum of 30 days. See attached schematics.

5. BOP Break Testing Request

Spur Energy Partners LLC requests permission to adjust the BOP break testing requirements as follows:

BOP break test under the following conditions:

- After a full BOP test is conducted
- When skidding to drill the production section, where the surface casing point is shallower than the 3 Bone Spring or 10,000 TVD.
- When skidding to drill a production section that does not penetrate the 3rd Bone Spring or deeper.

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

1) The void between the wellhead and the spool (this consists of two tests)
2) The spool between the kill lines and the choke manifold (this consists of two tests)

If the kill line is not broken prior to skid, two tests will be performed.

1) The void between the wellhead and the pipe rams

6. Mud Program

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

Depth		Type	Weight (ppg)	Viscosity	Water Loss
From (ft)	To (ft)				
0	450	Water-Based Mud	8.6-8.9	32-36	N/C
450	1450	Brine	9.0-10.0	32-36	N/C
1450	8218	Brine	9.0-10.0	32-36	20-30

What will be used to monitor the loss or gain of fluid?	PVT/PASON/Visual Monitoring

Spur Energy Partners LLC – Black Cherry Federal Com 110H

7. Logging and Testing Procedures

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

Additional logs planned		**Interval**
No	Resistivity	
No	Density	
No	CBL	
Yes	Mud log	ICP - TD
No	PEX	

8. Drilling Conditions

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

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

Total estimated cuttings volume: 786.2 bbls**.**

Spur Energy Partners LLC – Black Cherry Federal Com 110H

9. Other facets of operation

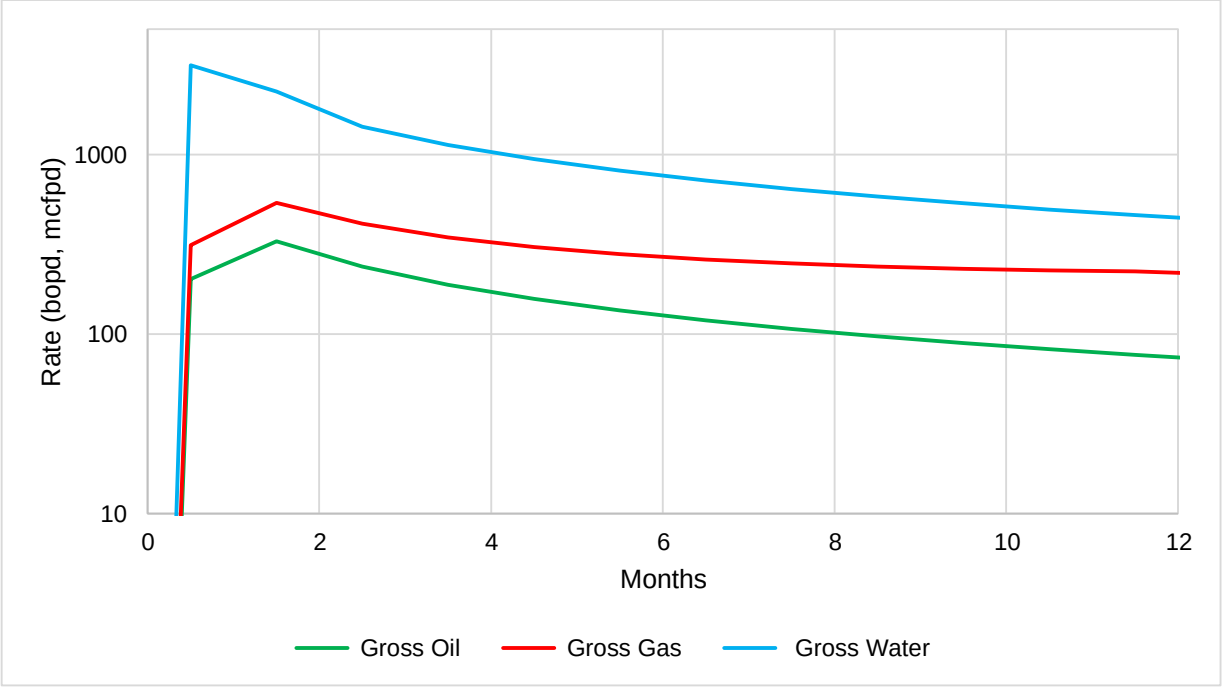
	Yes/No
Will more than one drilling rig be used for drilling operations? If yes, describe. Spur Energy Partners LLC. requests the option to contract a Surface Rig to drill, set surface/intermediate casing, and cement for this well. If the timing between rigs is such that Spur Energy Partners LLC. would not be able to preset surface, the Primary Rig will MIRU and drill the well in its entirety per the APD. Please see the attached document for information on the spudder rig.	Yes

Attachments
_x__ Directional Plan
_x__ H2S Contingency Plan
_x__ Akita 57 Attachments
_x__ BOP Schematics
_x__ Transcend Spudder Rig Attachments

10. Company Personnel

Name	Title	Office Phone	Mobile Phone
Christopher Hollis	Drilling & Completions Manager	832-930-8629	713-380-7754
Ryan Barber	Sr. Drilling & Completion Engineer	832-930-8547	832-544-9267
Johnny Nabors	Executive Vice President Operations	832-930-8502	281-904-8811

Loco Hills San Andres Type Curve



State of New Mexico
Energy, Minerals and Natural Resources Department

Submit Electronically
Via E-permitting

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

NATURAL GAS MANAGEMENT PLAN

This Natural Gas Management Plan must be submitted with each Application for Permit to Drill (APD) for a new or recompleted well.

Section 1 – Plan Description
Effective May 25, 2021

I. Operator: SPUR ENERGY PARTNERS LLC **OGRID:** 328947 **Date:** 01 / 13 / 2026

II. Type: ☒ Original ☐ Amendment due to ☐ 19.15.27.9.D(6)(a) NMAC ☐ 19.15.27.9.D(6)(b) NMAC ☐ Other.

If Other, please describe: _____

III. Well(s): Provide the following information for each new or recompleted well or set of wells proposed to be drilled or proposed to be recompleted from a single well pad or connected to a central delivery point.

Well Name	API	ULSTR	Footages	Anticipated Oil BBL/D	Anticipated Gas MCF/D	Anticipated Produced Water BBL/D
Black Cherry Federal Com 110H 30-015		M-30-17S-28E	1135' FSL 920' FWL	316 BBL/D	548 MCF/D	1897 BBL/D

IV. Central Delivery Point Name: SMITHDALE 29 FEDERAL COM TANK BATTERY [See 19.15.27.9(D)(1) NMAC]

V. Anticipated Schedule: Provide the following information for each new or recompleted well or set of wells proposed to be drilled or proposed to be recompleted from a single well pad or connected to a central delivery point.

Well Name	API	Spud Date	TD Reached Date	Completion Commencement Date	Initial Flow Back Date	First Production Date
Black Cherry Federal Com	110H 30-015	07/16/2026	07/21/2026	08/09/2026	08/13/2026	08/18/2026

VI. Separation Equipment: ☒ Attach a complete description of how Operator will size separation equipment to optimize gas capture.

VII. Operational Practices: ☒ Attach a complete description of the actions Operator will take to comply with the requirements of Subsection A through F of 19.15.27.8 NMAC.

VIII. Best Management Practices: ☒ Attach a complete description of Operator's best management practices to minimize venting during active and planned maintenance.

Section 2 – Enhanced Plan

EFFECTIVE APRIL 1, 2022

Beginning April 1, 2022, an operator that is not in compliance with its statewide natural gas capture requirement for the applicable reporting area must complete this section.

☒ Operator certifies that it is not required to complete this section because Operator is in compliance with its statewide natural gas capture requirement for the applicable reporting area.

IX. Anticipated Natural Gas Production:

Well	API	Anticipated Average Natural Gas Rate MCF/D	Anticipated Volume of Natural Gas for the First Year MCF

X. Natural Gas Gathering System (NGGS):

Operator	System	ULSTR of Tie-in	Anticipated Gathering Start Date	Available Maximum Daily Capacity of System Segment Tie-in

XI. Map. ☐ Attach an accurate and legible map depicting the location of the well(s), the anticipated pipeline route(s) connecting the production operations to the existing or planned interconnect of the natural gas gathering system(s), and the maximum daily capacity of the segment or portion of the natural gas gathering system(s) to which the well(s) will be connected.

XII. Line Capacity. The natural gas gathering system ☐ will ☐ will not have capacity to gather 100% of the anticipated natural gas production volume from the well prior to the date of first production.

XIII. Line Pressure. Operator ☐ does ☐ does not anticipate that its existing well(s) connected to the same segment, or portion, of the natural gas gathering system(s) described above will continue to meet anticipated increases in line pressure caused by the new well(s).

☐ Attach Operator's plan to manage production in response to the increased line pressure.

XIV. Confidentiality: ☒ Operator asserts confidentiality pursuant to Section 71-2-8 NMSA 1978 for the information provided in Section 2 as provided in Paragraph (2) of Subsection D of 19.15.27.9 NMAC, and attaches a full description of the specific information for which confidentiality is asserted and the basis for such assertion.

Section 3 - Certifications

Effective May 25, 2021

Operator certifies that, after reasonable inquiry and based on the available information at the time of submittal:

☒ Operator will be able to connect the well(s) to a natural gas gathering system in the general area with sufficient capacity to transport one hundred percent of the anticipated volume of natural gas produced from the well(s) commencing on the date of first production, taking into account the current and anticipated volumes of produced natural gas from other wells connected to the pipeline gathering system; or

☐ Operator will not be able to connect to a natural gas gathering system in the general area with sufficient capacity to transport one hundred percent of the anticipated volume of natural gas produced from the well(s) commencing on the date of first production, taking into account the current and anticipated volumes of produced natural gas from other wells connected to the pipeline gathering system.
If Operator checks this box, Operator will select one of the following:

Well Shut-In. ☐ Operator will shut-in and not produce the well until it submits the certification required by Paragraph (4) of Subsection D of 19.15.27.9 NMAC; or

Venting and Flaring Plan. ☐ Operator has attached a venting and flaring plan that evaluates and selects one or more of the potential alternative beneficial uses for the natural gas until a natural gas gathering system is available, including:

- **(a)** power generation on lease;
- **(b)** power generation for grid;
- **(c)** compression on lease;
- **(d)** liquids removal on lease;
- **(e)** reinjection for underground storage;
- **(f)** reinjection for temporary storage;
- **(g)** reinjection for enhanced oil recovery;
- **(h)** fuel cell production; and
- **(i)** other alternative beneficial uses approved by the division.

Section 4 - Notices

1. If, at any time after Operator submits this Natural Gas Management Plan and before the well is spud:

(a) Operator becomes aware that the natural gas gathering system it planned to connect the well(s) to has become unavailable or will not have capacity to transport one hundred percent of the production from the well(s), no later than 20 days after becoming aware of such information, Operator shall submit for OCD's approval a new or revised venting and flaring plan containing the information specified in Paragraph (5) of Subsection D of 19.15.27.9 NMAC; or

(b) Operator becomes aware that it has, cumulatively for the year, become out of compliance with its baseline natural gas capture rate or natural gas capture requirement, no later than 20 days after becoming aware of such information, Operator shall submit for OCD's approval a new or revised Natural Gas Management Plan for each well it plans to spud during the next 90 days containing the information specified in Paragraph (2) of Subsection D of 19.15.27.9 NMAC, and shall file an update for each Natural Gas Management Plan until Operator is back in compliance with its baseline natural gas capture rate or natural gas capture requirement.

2. OCD may deny or conditionally approve an APD if Operator does not make a certification, fails to submit an adequate venting and flaring plan which includes alternative beneficial uses for the anticipated volume of natural gas produced, or if OCD determines that Operator will not have adequate natural gas takeaway capacity at the time a well will be spud.

I certify that, after reasonable inquiry, the statements in and attached to this Natural Gas Management Plan are true and correct to the best of my knowledge and acknowledge that a false statement may be subject to civil and criminal penalties under the Oil and Gas Act.

Signature:	Sarah Savino
Printed Name:	SARAH SAVINO
Title:	REGULATORY DIRECTOR
E-mail Address:	SSAVINO@SPURENERGY.COM
Date:	01/13/2026
Phone:	832-960-8613

OIL CONSERVATION DIVISION

(Only applicable when submitted as a standalone form)

Approved By:	
Title:	
Approval Date:	
Conditions of Approval:	

Natural Gas Management Plan – Attachment

VI. Separation equipment will be sized by construction engineering staff based on anticipated daily production to ensure adequate capacity.

VII. Spur Energy Partners LLC ("Spur") will take the following actions to comply with the regulations listed in 19.15.27.8:

A. Spur will maximize the recovery of natural gas by minimizing waste, as defined by 19.15.2 NMAC, of natural gas through venting and flaring. Spur will ensure that our wells will be connected to a natural gas gathering system with sufficient capacity to transport natural gas.

B. All drilling operations will be equipped with a rig flare at least 100 feet from the nearest surface hole location. Rig flare will be utilized to combust any natural gas that is brought to surface during normal operations. In the case of emergency, flaring volumes will be reported appropriately.

C. During completion operations any natural gas brought to surface will be flared. Immediately following completion operations, wells will flow to permanent separation equipment. Produced natural gas from separation equipment will be sent to sales. If natural gas does not meet gathering pipeline specifications, Spur will flare for 60 days or until natural gas meets the pipeline specifications. Spur will ensure flare is properly sized and is equipped with an automatic igniter or continuous pilot. Gas samples will be taken twice per week and natural gas will be routed into a gathering system as soon as the pipeline specifications are met.

D. Natural gas will not be flared with the exception of 19.15.27.8(D)(1-4). If there is no adequate takeaway for the separator gas, wells will be shut-in until that natural gas gathering system is available with exception of emergency or malfunction situations. Volumes will be reported appropriately.

E. Spur will comply with performance standards pursuant to 19.15.27.8(E)(1-8). All equipment will be designed and sized to handle maximum pressures to minimize waste. Storage tanks constructed after May 25, 2021 will be equipped with an automatic gauging system that reduces venting of natural gas. Flare stacks installed or replaced after May 25, 2021 will be equipped with an automatic ignitor or continuous pilot. Spur will conduct AVO inspections as described in 19.15.27.8(E)(5)(a) with frequencies specified in 19.15.27.8(E)(5)(b) and (c). All emergencies or malfunctions will be resolved as quickly and safely as possible to minimize waste.

F. The volume of natural gas that is vented or flared as the result of an emergency or malfunction during drilling and/or completion operations will be estimated and reported accordingly. The volume of natural gas that is vented, flared or beneficially used during production operations, will be measured and reported accordingly. Spur will install equipment to measure the volume of natural gas flared from existing piping or a flowline piped from equipment such as high-pressure separators, heater treaters, or VRUs associated with a well or facility associated with a well authorized by an APD after May 25, 2021 that has an average daily production of less than 60,000 cubic feet of natural gas. If metering is not practicable due to circumstances such as low flow rate or low pressure venting or flaring, Spur will estimate the volume of flared or vented natural gas. Measuring equipment will conform to industry standards and will not be equipped with a manifold

that allows the diversion of natural gas around the metering element except for the sole purpose of inspecting and servicing equipment.

VIII. For maintenance activities involving production equipment and compression, venting be limited to the depressurization of the subject equipment to ensure safe working conditions. For maintenance of production equipment, the associated producing wells will be shut-in to eliminate venting. For maintenance of VRUs, all natural gas normally routed to the VRU will be routed to flare.

TRANSCEND RIG 4	Contractor Specification
Make	Schram
Model	TXD 130
Year of Manufacture	2006
Truck Mounted	YES
Rated Drilling Depth	130,000# hook load
Rated Depth with Tubing	
Derrick Height	69’ 9’’
Derrick Type	Telescoping Hydraulic
Derrick Capacity	130,000#
Elevators	N/A
Drawworks	760 HP Detroit
Wire Diameter	Hydraulic
Workfloor Max Height	8’
Tongs	Hydraulic Iron Roughneck
Slips	Manual Slips
Included Tubing Handling Tools	• 13 3/8’’ handling tools
Included Rod Handling Tools	85jts of 4.5’’ drill pipe
BOP Class Compatibility	
Weight Indicator	Hydraulic
Rig Safety Equipment	Eye wash station, fire extengushers, wind sock
Pad Size Requirements/Limitations	60’ x 60’
Guy Line Spacing	N/A
Other Supplied Rig Equipment 1- F800 pump 1- Pill pit 80bbl 1- 400 bbl mud mix 1- Shaker 150mesh 1- 500 bbl fresh water frac tank	Standard Rig Hand Tools: • (2) 36” pipe wrenches • (2) 24” pipe wrenches • (2) 18” pipe wrenches • (1) 24” crescent wrench • (2) 12” crescent wrenches • (1) 4 lb shop hammer • (1) 12 lb sledge hammer • (1) 4 foot pry bar • Vehicles for Contractor personnel • Air Impact Wrench with Sockets • Mud Scales (as needed)

RIG # 57 1,150 HP Double Mast Drilling Rig

SUBSTRUCTURE
One Piece Step Down
Floor Height: 18' 9" (on 4' pony sub moving system)
Clear Height (beneath rotary beams): 15' 5"
Rotary Capacity: 400,000 lbf
Max Pipe Setback: 400,000 lbf
Note: All floor heights above are based on the substructure sitting on 6" mats & 4' pony sub moving system

MAST
106' telescoping, Drill Line: 1-1/8"
Static Hook Load: 440,000 lbf
Racking Capacity: 18,000' of 4" DP, 12,500' of 5" DP

DRAWWORKS
TSM 850 425,000lbs w/ 10 Lines
Input Power: 1,150 hp AC traction motor
Main Brake: 1,150 hp AC traction motor (Dynamic)
Aux Parking Brake: Eaton brake & drum / band brake system

TOP DRIVE
Tesco EXI 600 AC 350 Ton: Max speed 220 rpm,
Continuous Drill Torque: 30,000 ft-lbs
Max Torque (Make / Break): 45,000 ft-lbs
600 hp AC induction motor & drive system with PLC
250 Ton 5 x 36" Becket Block Assembly

IRON ROUGHNECK
NOV ST-80C Conn Range: 4 ½" to 8 ½"
Spin Speed: 75 rpm nominal on 5" drill pipe
Spin Torque: 1,750 ft-lbs
Maximum Make-up torque: 60,000 ft-lbs
Maximum Break-out torque: 80,000 ft-lbs

ROTARY TABLE
National 27 ½" 500 Ton with hydraulic drive to position tools only
27 ½" Diameter opening

POWER SYSTEM
VFD, MCC, Eaton Drives, Current Power Systems Controls, three Caterpillar C32 gen sets, 1220 BHP.

MUD PUMP #1
HHF1600 Triplex Rated Power: 1600 hp
Stroke: 12"
Input Power: 1500 hp AC traction motor
Pressure Rating: 5000 psi

MUD PUMP #2
HHF1600 Triplex Rated Power: 1600 hp
Stroke: 12"
Input Power: 1500 hp AC traction motor
Pressure Rating: 5000 psi

MUD TANKS
Two Tank system w/ 1200 bbls total capacity
Shakers: Three MI Swaco Mongoose 4 panel dual motion
Mud Gas Separator: MI Swaco 4' OD x 12' tall
Pill Tank: 54 bbls

MUD SYSTEM
5000 psi Max Pressure
5" Main plumbing and standpipe

SCALPING TANK
Main Tank: 186 bbls capacity
Trip Tank: 24 bbls capacity
Shakers: Three NOV Venom shakers dual motion

BOP (NACE)
11" x 5000 psi WP Spherical Annular
11" x 5000 psi WP Double Ram
11" x 5000 psi WP Single Ram (Optional)

MANIFOLD
3-1/8" 5,000 psi c/w two 3 1/8" manual chokes

ACCUMULATOR
CTI: 160 gal 6 station 3000 psi, c/w N2 Backup & electric triplex pump

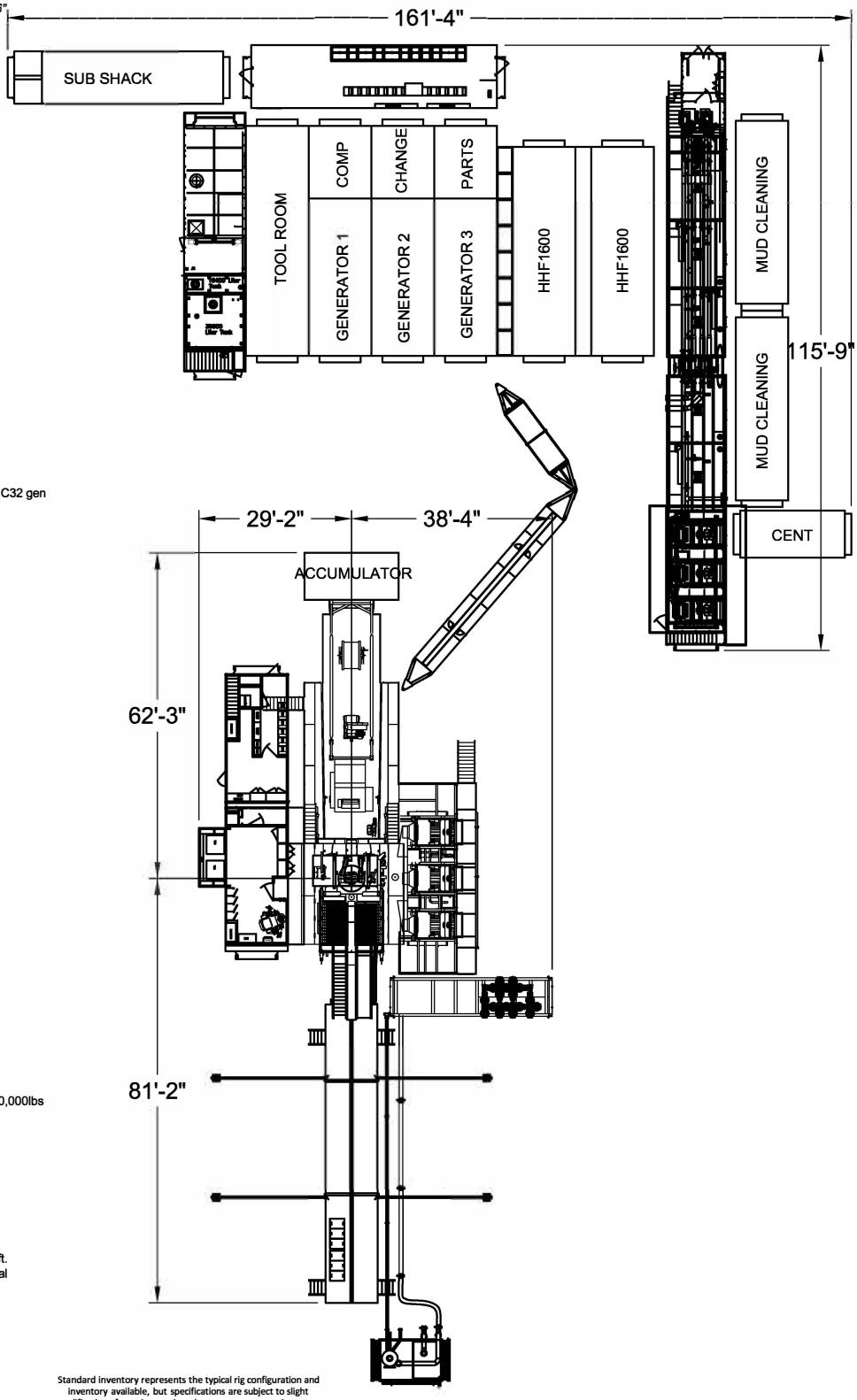
CATWALK
Ja-co Power Catwalk, tubular max length 47' 6", max OD 13 ⅝", max weight 10,000lbs

TUBULARS
Drill Pipe: Supplied as needed, per availability
Drill Collars & heaviwate: Supplied as needed, per availability

MISC.
Water Tank: 409 bbls; Fuel Tank 189 bbls; Screw Compressor
Boiler: 125 hp with Full Winterization

MOVING SYSTEM:
Walking beam hydraulic pony sub moving system for linear motion & side shift. 350' of Utility Suitcase style [50' lengths] connection for hydraulic and electrical supply.

TOOL/ STORAGE/ CAMP
Parts Storage Room and Tool House Room
Rig Manage Trailer: 14' x 44' skid mounted



Standard inventory represents the typical rig configuration and inventory available, but specifications are subject to slight modifications from time to time due to customer requirements.

All ratings quoted herin are manufacturer specifications. AKITA's normal operating parameters are 90% of manufacturer mast ratings and 80% of mud pump manufacturer pressure rating. Operation of rig equipment beyond these parameters requires approval from AKITA field office management.

POWERING PROGRESS™

MTR DATA BOOK

CL2013

CUSTOMER: GATES CANADA INC
DATE: 12/19/2017
Purchase Order: D235455 (PO 45750)
Sales Order #: 509128
Product Description: 5K 3 1/2 in. 17 FT. Fire Rated Choke & Kill Gates Hose Assembly c/w 3 1/8 5K Flange with Safety Clamps & Slings Attached

Hose S/N: H-121917-14
PART NUMBER: FR5K3.517.0CK31/85KFLG S/C

CONTENTS INCLUDED

GMCO FITTINGS

17-309-1	INSERT STEM
15-095-1A	FERRULE

3 1/8 in. 5K FIXED FLANGE X 3 1/8 in. 5K FLOAT FLANGE

V4131	FIXED FLANGE
V5054	FLOAT FLANGE

WELDING SPECIFICATIONS
Certification and Procedure for welding

NDE RESULTS
1622371-03/1622371-01 Ultrasonic Test Results and Imaging

Safey Clamps
34145/34144

TEST CHART
Chart Recording of Hydrostatic Test

TEST CERTIFICATE
Document Product Details & Positive Results of Hydrostatic Testing

CERTIFICATE OF CONFORMANCE
A Declaration of the conformity with the type approval

IMAGES
Images of the product prior to shipping.

PACKING LIST
Details of Shipping Contents, Dimensions and Weights

BLACK GOLD®

GATES ENGINEERING & SERVICES NORTH AMERICA
7603 Prairie Oak Dr. Suite 190
Houston, TX. 77086

PHONE: +1 (281) 602-4100
FAX: +1 (281) 602-4147
EMAIL: gesna.quality@gates.com
WEB: www.gates.com/oilandgas

PRESSURE TEST CERTIFICATE

Customer:	GATES CANADA INC	Test Date:	12/19/2017
Customer Ref.:	D235455 (PO 45750)	Hose Serial No.:	H-121917-14
Invoice No.:	509128	Created By:	Cristian Rivera

Product Description:	5K 3 1/2 in. 17 FT. Fire Rated Choke & Kill c/w 3 1/8 5K Flange with Safety Clamps & Slings Attached

End Fitting 1:	3 1/8 in. 5K FIXED FLG	End Fitting 2:	3 1/8 in. 5K FLOAT FLG
Oracle Star No.:	68903550-9725917	Assembly Code:	15M5019042016H-121917-14
CUSTOMER P/N:	FR5K3.517.0CK31/85KFLG S/C	Test Pressure:	7,500 psi.
		Working Pressure:	5,000 psi.

Gates Engineering & Services North America certifies that:

The following hose assembly has successfully passed all pressure testing requirements set forth in Gates specifications: GTS-04-052 (for 5K assemblies) or GTS-04-053 (10K assemblies) or GTS-04-048 (15K assemblies), which include reference to Specification API 16C (2nd Edition); sections 7.5.4, 7.5.9, and 10.8.7. A test graph will accompany this test certificate to illustrate conformity to test requirements. This hose assembly was pressure tested using equipment and instrumentation that has been calibrated in accordance with the requirements set-forth in the GESNA management system.

Quality:	QUALITY	Production:	PRODUCTION
Date :	8/5/2021	Date :	8/5/2021
Signature :		Signature :	

F-PRD-005B

Revision 6_05032021

BLACK GOLD®

GATES ENGINEERING & SERVICES NORTH AMERICA
7603 Prairie Oak Dr.
Houston, TX. 77086

PHONE: +1 (281) 602-4100
FAX: +1 (281) 602-4147
EMAIL: gesna.quality@gates.com
WEB: www.gates.com/oilandgas

CERTIFICATE OF CONFORMANCE

This is to certify that all parts and materials included in this shipment have manufactured and/or processed in accordance with various Gates and API assembly and test specifications. Records of required tests are on-file and subject to examination. Test reports and subsequent test graphs have been made available with this shipment. Additional supporting documentation related to materials, welding, weld inspections, and heat-treatment activities are available upon request.

CUSTOMER:	GATES CANADA INC
CUSTOMER P.O.#:	D235455 (PO 45750)
PART DESCRIPTION:	FR5K3.517.0CK31/85KFLG S/C
PART DESCRIPTION:	5K 3 1/2 in. 17 FT. Fire Rated Choke & Kill c/w 3 1/8 5K Flange with Safety Clamps & Slings Attached
SALES ORDER #:	509128
QUANTITY:	1
SERIAL #:	H-121917-14

SIGNATURE: O Rivera

TITLE: QUALITY ASSURANCE

DATE: 8/5/2021

Gates E&S

North America

7603 Prairie Oak dr.

Houston,TX

Hydrostatic Test

Customer= GATES CANADA

Date of test= 12/19/17

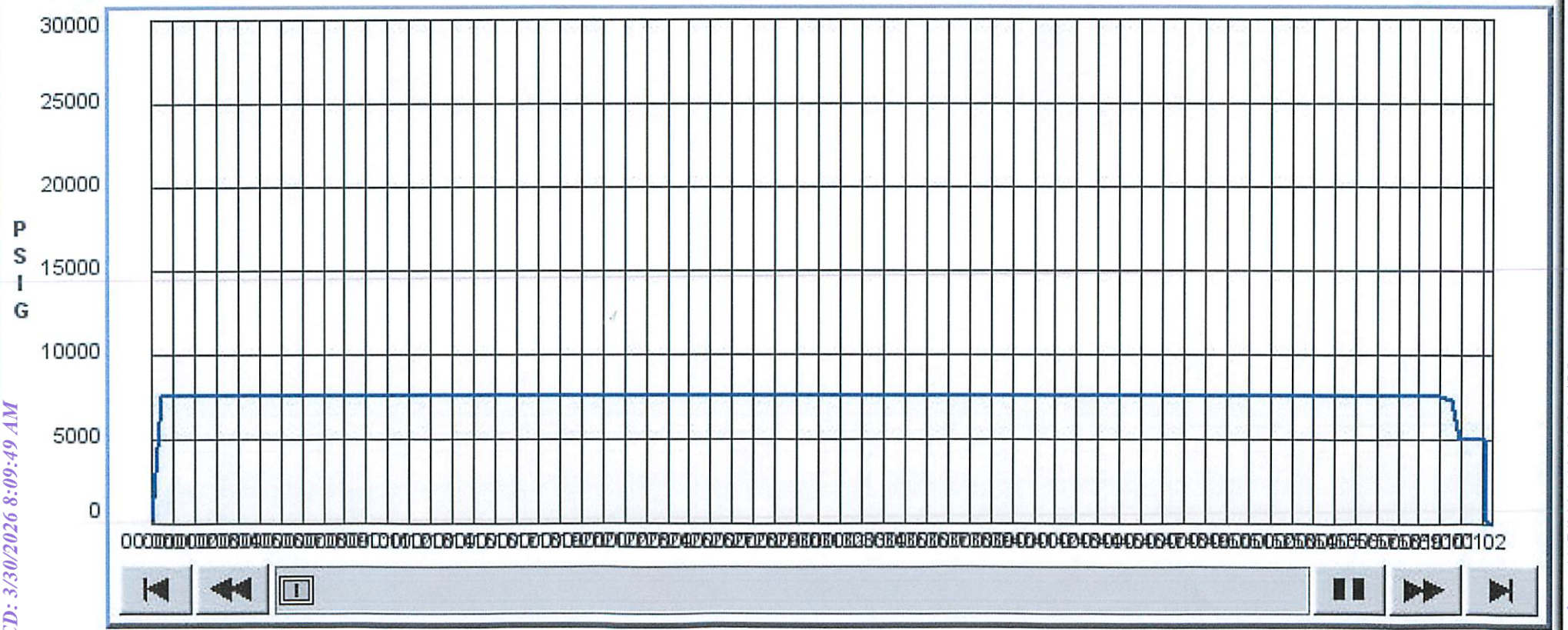
Serial # = H-121917-13,-14

Description = 3.5 5K 3 1/8 FLG 5K

Technician= CHRIS OLIVO

12/19/2017 16:53:26

17:55:52



Edwards Fabrication

1385 Hwy. 35 Bypass S.
P.O. Box 2350
Rockport, TX 78381

O: (361) 790-7910
F: (361) 790-7927

tedwards@edwardsfabrication.com
www.edwardsfabrication.com

CERTIFICATE OF TEST

Client:
Gates E & S North America
134 44th Street
Corpus Christi, TX 78405

Purchase Order: 1592198/0

Certificate Number				Date of Examination
34145				04/27/17
ID#	**Part Number**	**Description**	**SWL***	**Proofload**
34145	E3.5S	3.5" E Safety Clamp	6016 lbs.	12031 lbs.

The Safety Clamp unit identified on this certificate has been load tested completely assembled; including the clamp body, (2) 3/4" shackles, 5/8" x 48" wire rope sling and anchor tab. Thus, all components are tested at the "Proof" load. Do not disassemble. Do not interchange any part or parts of this tested unit with parts of other Safety Clamp units. DO NOT WELD, CUT, ADD-TO, TAKE AWAY ANY COMPONENTS OR MAKE ANY MODIFICATION TO THIS CLAMP UNIT. Doing so voids this test certificate.

Cutting/Removing either one or both stainless steel Tamper-proof hardware cables renders this Test Certificate VOID.

** Safe Work Load*

THIS PRODUCT IS MANUFACTURED IN THE U.S.A.

We hereby verify that the above information is correct
as contained in the records of Edwards Fabrication L.L.C.

ISO 9001:2008
BUREAU VERITAS
Certification

Edwards Fabrication L.L.C. is certified as having a Quality Management System.

Thomas F. Edwards
President
Edwards Fabrication L.L.C.

Edwards Fabrication...

1385 Hwy. 35 Bypass S.
P.O. Box 2350
Rockport, TX 78381

O: (361) 790-7910
F: (361) 790-7927

tedwards@edwardsfabrication.com
www.edwardsfabrication.com

CERTIFICATE OF TEST

Client:
Gates E & S North America
134 44th Street
Corpus Christi, TX 78405

Purchase Order: 1592198/0

Certificate Number				Date of Examination
34144				04/27/17
ID#	**Part Number**	**Description**	**SWL***	**Proofload**
34144	E3.5S	3.5" E Safety Clamp	6014 lbs.	12027 lbs.

The Safety Clamp unit identified on this certificate has been load tested completely assembled; including the clamp body, (2) 3/4" shackles, 5/8" x 48" wire rope sling and anchor tab. Thus, all components are tested at the "Proof" load. Do not disassemble. Do not interchange any part or parts of this tested unit with parts of other Safety Clamp units. DO NOT WELD, CUT, ADD-TO, TAKE AWAY ANY COMPONENTS OR MAKE ANY MODIFICATION TO THIS CLAMP UNIT. Doing so voids this test certificate.

Cutting/Removing either one or both stainless steel Tamper-proof hardware cables renders this Test Certificate VOID.

** Safe Work Load*

THIS PRODUCT IS MANUFACTURED IN THE U.S.A.

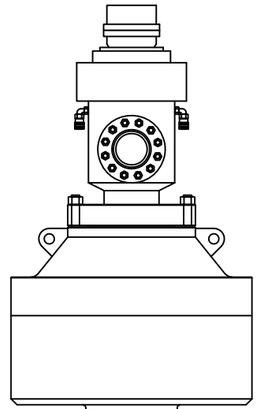
We hereby verify that the above information is correct
as contained in the records of Edwards Fabrication L.L.C.

ISO 9001:2008
BUREAU VERITAS
Certification

Edwards Fabrication L.L.C. is certified as having a Quality Management System.

Thomas F. Edwards
President
Edwards Fabrication L.L.C.

ANNULAR
13 5/8" 5,000 psi SHAFFER STYLE



DOUBLE GATE
13 5/8" 5,000 psi SHAFFER LWS STYLE

PIPE RAM

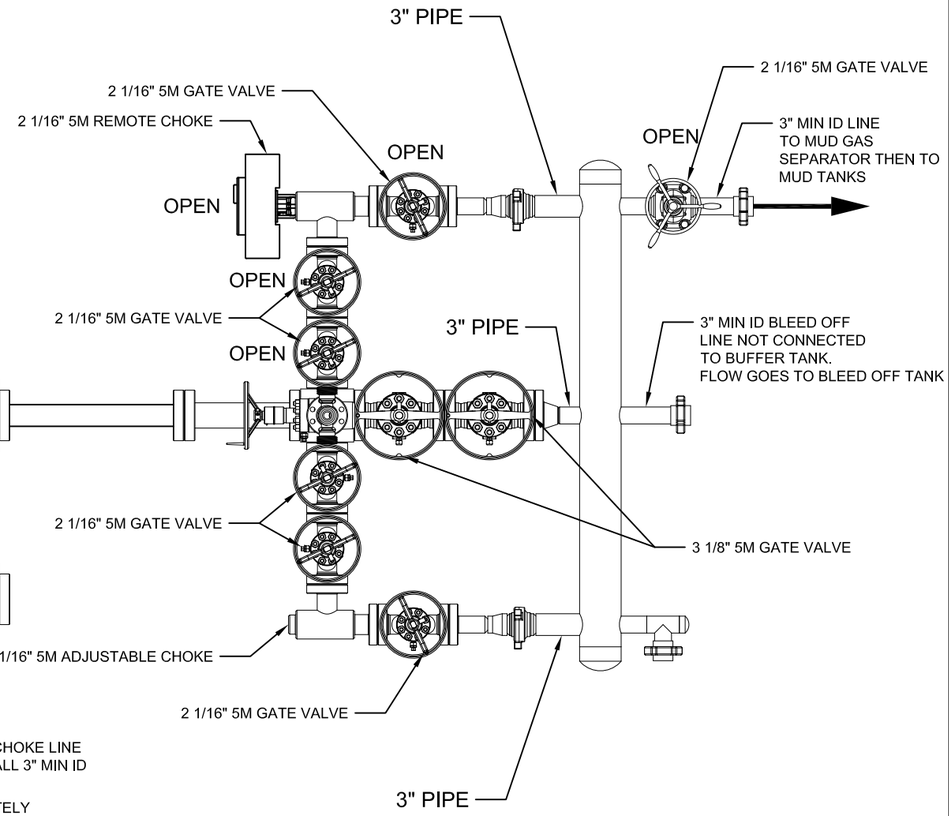
BLIND RAM

MUD CROSS
13 5/8" 5,000 psi, 3 1/8" 5M OUTLETS

CHOKE LINE
ALL 3" MIN ID

3 1/8" 5M REMOTELY
OPERATED VALVE

3 1/8" 5M GATE VALVE



Notes
-
-
-
-

No.	Revision	Date

AKITA DRILLING LTD.
2302 8th Street, Nisku Alberta
T9E 7Z2 Tel: (780) 955-6700

Date	Scale
5-6-2021	NTS
Dwn / Chk'd By: BG	File Name: R57 13 5M dou..
Project: R57	

RIG 57 BOP SCHEMATIC

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

SUPO Data Report
03/30/2026

APD ID: 10400109646
Submission Date: 01/21/2026
Operator Name: SPUR ENERGY PARTNERS LLC
Well Name: BLACK CHERRY FEDERAL COM
Well Number: 110H
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:

Black_Cherry_Federal_Com_110H_Exist_Roads_20260116091903.pdf

Existing Road Purpose: ACCESS

Row(s) Exist? NO

ROW ID(s)

ID:

Do the existing roads need to be improved? NO

Existing Road Improvement Description:

Existing Road Improvement Attachment:

Section 2 - New or Reconstructed Access Roads

Will new roads be needed? YES

New Road Map:

Black_Cherry_Federal_Com_110H_New_Road_20260116092116.pdf

New road type: RESOURCE

Length: 881.14 Feet

Width (ft.): 30

Max slope (%): 0

Max grade (%): 3

Army Corp of Engineers (ACOE) permit required? N

ACOE Permit Number(s):

New road travel width: 24

New road access erosion control: Crowned and ditched.

New road access plan or profile prepared? N

New road access plan

Operator Name: SPUR ENERGY PARTNERS LLC

Well Name: BLACK CHERRY FEDERAL COM **Well Number:** 110H

Access road engineering design? N

Access road engineering design

Turnout? N

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: Grader

Access other construction information:

Access miscellaneous information:

Number of access turnouts:

Access turnout map:

Drainage Control

New road drainage crossing: OTHER

Other Description: Borrow ditches will turn out. No new road drainage crossing is needed.

Drainage Control comments: Crowned and ditched.

Road Drainage Control Structures (DCS) description: None.

Road Drainage Control Structures (DCS) attachment:

Access Additional Attachments

Section 3 - Location of Existing Wells

Existing Wells Map? YES

Existing Well map Attachment:

Black_Cherry_Federal_Com_110H_Exist_Wells_20260116092128.pdf

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

Submit or defer a Proposed Production Facilities plan? SUBMIT

Production Facilities description: a. In the event the well is found to be productive, the existing Smithdale 29 Federal Com Tank Battery would be utilized and the necessary production equipment will be installed at the existing tank battery. See proposed facilities layout diagram. b. The flowlines will follow a route approved by the BLM. Each well will have two (2) 4 surface flowlines operating at less than 125 psi. The flowlines will be routed to the Smithdale 29 Federal Com Tank Battery. The wells will produce into this battery at any given time. A strip of land 30 feet wide, being 4,515 feet in length, lying in Section 30, Township 17 South, Range

Operator Name: SPUR ENERGY PARTNERS LLC

Well Name: BLACK CHERRY FEDERAL COM **Well Number:** 110H

28 East, N.M.P.M., Eddy County, New Mexico being 15 feet left and 15 feet right of the described survey of a centerline across the lands of COG Operating LLC & Concho Oil & Gas LLC., according to a deed filed for record in Book 1012, Page 370 of the Deed Records of Eddy County, New Mexico. Traffic control plan for the planned Road Bore crossing U.S. Hwy 82 (Lovington Hwy) can be found here within. c. The overhead electric line will follow a route approved by the BLM. Survey a strip of land 30 feet wide, being 66.36 feet in length, lying in Section 30, Township 17 South, Range 28 East, N.M.P.M., Eddy County, New Mexico being 15 feet left and 15 feet right of the described survey of a centerline across the lands of COG Operating LLC & Concho Oil & Gas LLC., according to a deed filed for record in Book 1012, Page 370 of the Deed Records of Eddy County, New Mexico. If Spur is unable to energize the CVE meter, we will install natural gas generators to power the wells to the facility. A strip of land 30 feet wide, being 996.10 feet in length lying in Section 30, Township 17 South, Range 28 East, N.M.P.M., Eddy County, New Mexico being 15 feet left and 15 feet right of the described survey of a centerline across the lands of COG Operating LLC & Concho Oil & Gas LLC., according to a deed filed for record in Book 1012, Page 370 of the Deed Records of Eddy County, New Mexico. d. See attached for additional information on the Smithdale 29 Federal Com Tank Battery.

Production Facilities map:

Black_Cherry_Federal_Com_110H_Facility_PLEL_20260224132655.pdf

Section 5 - Location and Types of Water Supply

Water Source Table

Water source type: GW WELL

Water source use type: DUST CONTROL

SURFACE CASING

INTERMEDIATE/PRODUCTION CASING

STIMULATION

Source latitude: 32.79633 **Source longitude:** -104.126

Source datum: NAD83

City:

Water source permit type: PRIVATE CONTRACT

Water source transport method: TRUCKING

Source land ownership: PRIVATE

Source transportation land ownership: FEDERAL

Water source volume (barrels): 10999 **Source volume (acre-feet):** 1.41769517

Source volume (gal): 461958

Water source and transportation

Water_Source_Aerial_20260121101957.pdf

Water source comments: Water for the Black Cherry Federal Com 110H well will be trucked from The Hub (previously known as the Ramirez) Frac Pond owned by Spur located in Unit B NW4/NE4 Section 36, Township 17 South, Range 27 East, Eddy County, NM. Private Surface (32.79633889, -104.126000).
New water well? N

Operator Name: SPUR ENERGY PARTNERS LLC

Well Name: BLACK CHERRY FEDERAL COM **Well Number:** 110H

New Water Well Info

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

Using any construction materials: YES

Construction Materials description: All caliche for the drilling pad and proposed access road will be obtained from an existing BLM/State/Fee approved pit from prevailing deposits found on location. Spur will utilize an existing caliche pit located in Unit H SE4/NE4, Section 18, Township 18 South, Range 30 East, Eddy County, NM. (32.75009, -104.20823).

Construction Materials source location

Caliche_Source_Aerial_20260121102032.pdf

Section 7 - Methods for Handling

Waste type: SEWAGE

Waste content description: Black and grey matter,

Amount of waste: 5 barrels

Waste disposal frequency : Daily

Safe containment description: Plastic holding tanks and chemical toilets.

Safe containmant attachment:

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

Disposal type description: Public

Disposal location description: Artesia wastewater treatment plant.

Operator Name: SPUR ENERGY PARTNERS LLC

Well Name: BLACK CHERRY FEDERAL COM **Well Number:** 110H

Waste type: DRILLING

Waste content description: Drill cuttings, mud, salts, and other chemicals.

Amount of waste: 786.2 barrels

Waste disposal frequency : Daily

Safe containment description: Steel mud tanks.

Safe containmant attachment:

Waste disposal type: HAUL TO COMMERCIAL FACILITY **Disposal location ownership:** PRIVATE

Disposal type description:

Disposal location description: Mud tanks will be hauled to R360's state approved (NM-01-0006) disposal site in Halfway, New Mexico.

Waste type: GARBAGE

Waste content description: Trash

Amount of waste: 10 barrels

Waste disposal frequency : Daily

Safe containment description: Portable trash cans.

Safe containmant attachment:

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

Disposal type description: Public

Disposal location description: Eddy 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

Cuttings Area

Cuttings Area being used? NO

Are you storing cuttings on location? N

Operator Name: SPUR ENERGY PARTNERS LLC

Well Name: BLACK CHERRY FEDERAL COM **Well Number:** 110H

Description of cuttings location

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?

Cuttings area liner

Cuttings area liner specifications and installation description

Section 8 - Ancillary

Are you requesting any Ancillary Facilities?: N

Ancillary Facilities

Comments:

Section 9 - Well Site

Well Site Layout Diagram:

Black_Cherry_Federal_Com_110H_Well_Site_Plan_20260224132733.pdf

Comments: V-Door: Southeast CL Tanks: Southeast Pad: 355 X 340 1 well pad

Section 10 - Plans for Surface

Type of disturbance: New Surface Disturbance **Multiple Well Pad Name:**

Multiple Well Pad Number:

Recontouring

Black_Cherry_Federal_Com_110H_Site_Plan_20260224132712.pdf

Drainage/Erosion control construction: Crowned and ditched.

Drainage/Erosion control reclamation: Harrowed on the contour.

Well pad proposed disturbance (acres): 2.77089	**Well pad interim reclamation (acres):** 0	**Well pad long term disturbance (acres):** 2.77089
Road proposed disturbance (acres): 0.607	**Road interim reclamation (acres):** 0	**Road long term disturbance (acres):** 0.607
Powerline proposed disturbance (acres): 0.046	**Powerline interim reclamation (acres):** 0.046	**Powerline long term disturbance (acres):** 0
Pipeline proposed disturbance (acres): 3.109	**Pipeline interim reclamation (acres):** 3.1	**Pipeline long term disturbance (acres):** 0.09
Other proposed disturbance (acres): 0.686	**Other interim reclamation (acres):** 0.686	**Other long term disturbance (acres):** 0

Operator Name: SPUR ENERGY PARTNERS LLC

Well Name: BLACK CHERRY FEDERAL COM **Well Number:** 110H

Total proposed disturbance: 7.21889 **Total interim reclamation:** 3.832 **Total long term disturbance:** 3.4678899999999997

Disturbance Comments:

Reconstruction method: Reclaim will be completed within 6 months of wells coming online.

Topsoil redistribution: Soil and brush will be evenly spread over disturbed areas and harrowed on the contour. Disturbed areas will be seeded in accordance with BLM's requirements.

Soil treatment: None.

Existing Vegetation at the well pad: Mesquite and/or Creosote brush.

Existing Vegetation at the well pad

Existing Vegetation Community at the road: Mesquite and/or Creosote brush.

Existing Vegetation Community at the road

Existing Vegetation Community at the pipeline: N/A

Existing Vegetation Community at the pipeline

Existing Vegetation Community at other disturbances: Mesquite and/or Creosote brush.

Existing Vegetation Community at other disturbances

Non native seed used? N

Non native seed description:

Seedling transplant description:

Will seedlings be transplanted for this project? N

Seedling transplant description attachment:

Will seed be harvested for use in site reclamation? N

Seed harvest description:

Seed harvest description attachment:

Seed

Seed Table

Seed Summary

Total pounds/Acre:

Seed Type	Pounds/Acre

Operator Name: SPUR ENERGY PARTNERS LLC

Well Name: BLACK CHERRY FEDERAL COM **Well Number:** 110H

Seed reclamation

Operator Contact/Responsible Official

First Name: **Last Name:**

Phone: **Email:**

Seedbed prep:

Seed BMP:

Seed method:

Existing invasive species? N

Existing invasive species treatment description:

Existing invasive species treatment

Weed treatment plan description: To BLM standards.

Weed treatment plan

Monitoring plan description: To BLM standards.

Monitoring plan

Success standards: To BLM standards.

Pit closure description: No pit.

Pit closure attachment:

Section 11 - Surface

Disturbance type: WELL PAD

Describe:

Surface Owner: PRIVATE OWNERSHIP

Other surface owner description:

BIA Local Office:

BOR Local Office:

COE Local Office:

DOD Local Office:

NPS Local Office:

State Local Office:

Military Local Office:

USFWS Local Office:

Other Local Office:

USFS Region:

Operator Name: SPUR ENERGY PARTNERS LLC

Well Name: BLACK CHERRY FEDERAL COM **Well Number:** 110H

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

Surface use plan certification: NO

Surface use plan certification document:

Surface access agreement or bond: AGREEMENT

Surface Access Agreement Need description: SUA with COG in place.

Surface Access Bond BLM or Forest Service:

BLM Surface Access Bond number:

USFS Surface access bond number:

Disturbance type: EXISTING ACCESS ROAD

Describe:

Surface Owner: PRIVATE OWNERSHIP

Other surface owner description:

BIA Local Office:

BOR Local Office:

COE Local Office:

DOD Local Office:

NPS Local Office:

State Local Office:

Military Local Office:

USFWS Local Office:

Other Local Office:

USFS Region:

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

Operator Name: SPUR ENERGY PARTNERS LLC

Well Name: BLACK CHERRY FEDERAL COM **Well Number:** 110H

Surface use plan certification: NO

Surface use plan certification document:

Surface access agreement or bond: AGREEMENT

Surface Access Agreement Need description: SUA with Pulitzer in place.

Surface Access Bond BLM or Forest Service:

BLM Surface Access Bond number:

USFS Surface access bond number:

Disturbance type: NEW ACCESS ROAD

Describe:

Surface Owner: PRIVATE OWNERSHIP

Other surface owner description:

BIA Local Office:

BOR Local Office:

COE Local Office:

DOD Local Office:

NPS Local Office:

State Local Office:

Military Local Office:

USFWS Local Office:

Other Local Office:

USFS Region:

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

Operator Name: SPUR ENERGY PARTNERS LLC

Well Name: BLACK CHERRY FEDERAL COM **Well Number:** 110H

Surface use plan certification: NO

Surface use plan certification document:

Surface access agreement or bond: AGREEMENT

Surface Access Agreement Need description: SUA with COG in place.

Surface Access Bond BLM or Forest Service:

BLM Surface Access Bond number:

USFS Surface access bond number:

Disturbance type: OTHER

Describe: SWD LINE

Surface Owner: PRIVATE OWNERSHIP

Other surface owner description:

BIA Local Office:

BOR Local Office:

COE Local Office:

DOD Local Office:

NPS Local Office:

State Local Office:

Military Local Office:

USFWS Local Office:

Other Local Office:

USFS Region:

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

Operator Name: SPUR ENERGY PARTNERS LLC

Well Name: BLACK CHERRY FEDERAL COM **Well Number:** 110H

Surface use plan certification: NO

Surface use plan certification document:

Surface access agreement or bond: AGREEMENT

Surface Access Agreement Need description: SUA with COG in place.

Surface Access Bond BLM or Forest Service:

BLM Surface Access Bond number:

USFS Surface access bond number:

Disturbance type: OTHER

Describe: ELECTRIC LINE

Surface Owner: PRIVATE OWNERSHIP

Other surface owner description:

BIA Local Office:

BOR Local Office:

COE Local Office:

DOD Local Office:

NPS Local Office:

State Local Office:

Military Local Office:

USFWS Local Office:

Other Local Office:

USFS Region:

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

Operator Name: SPUR ENERGY PARTNERS LLC

Well Name: BLACK CHERRY FEDERAL COM **Well Number:** 110H

Surface use plan certification: NO

Surface use plan certification document:

Surface access agreement or bond: AGREEMENT

Surface Access Agreement Need description: SUA with COG in place.

Surface Access Bond BLM or Forest Service:

BLM Surface Access Bond number:

USFS Surface access bond number:

Section 12 - Other

Right of Way needed? N **Use APD as ROW?**

ROW Type(s):

ROW

SUPO Additional Information: Lessee of record for backbuild will be notified prior to spud.

Use a previously conducted onsite? N

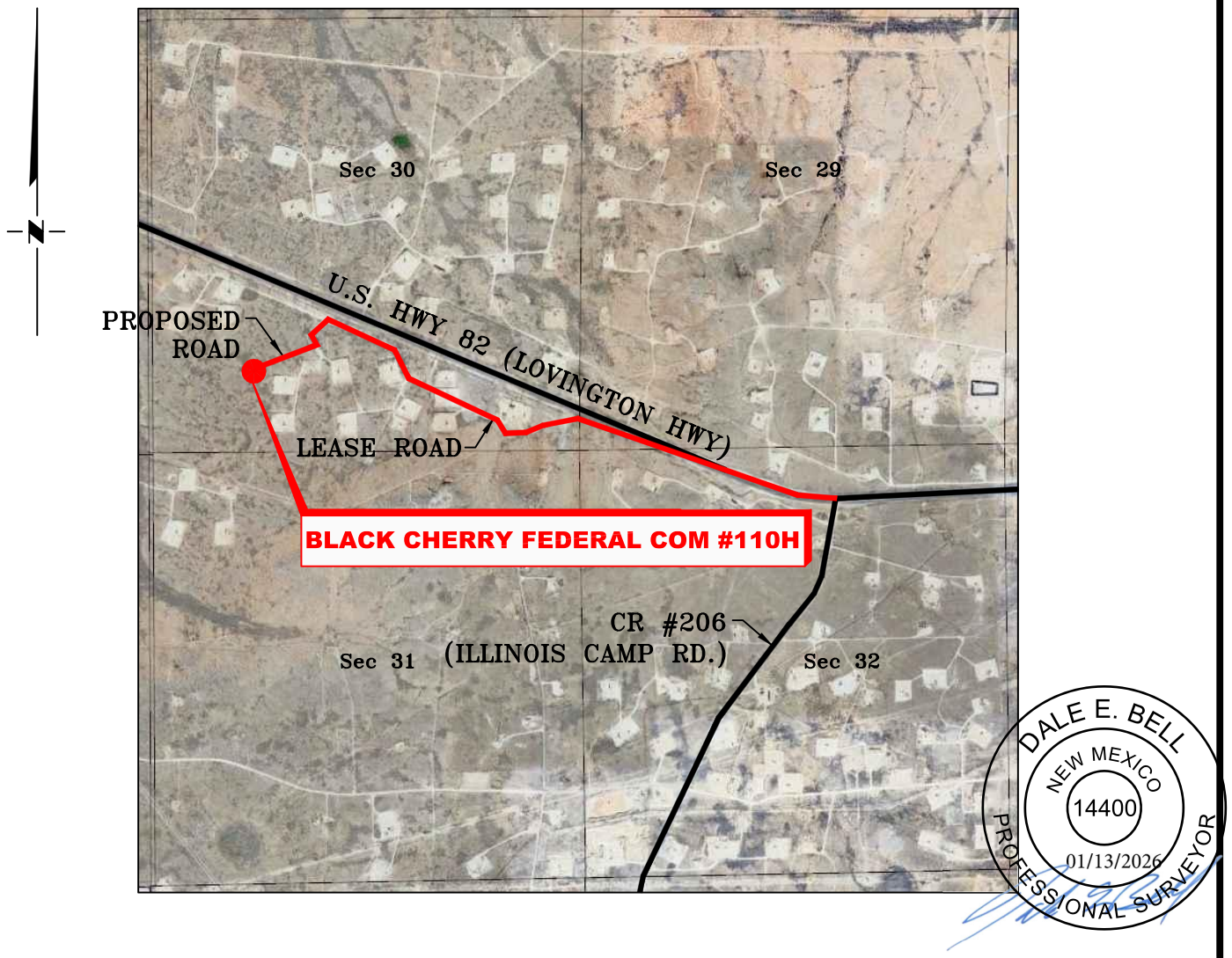
Previous Onsite information:

Other SUPO

Black_Cherry_Federal_Com_110H_LVM_20260116092934.pdf
Black_Cherry_Federal_Com_110H_WMP_20260116092934.pdf
Black_Cherry_Federal_Com_110H_SUPO_20260121102919.pdf

VICINITY MAP

NOT TO SCALE



SECTION 30, TWP. 17 SOUTH, RGE. 28 EAST,
N. M. P. M., EDDY CO., NEW MEXICO

OPERATOR: Spur Energy Partners LLC.
LEASE: Black Cherry Federal Com
WELL NO.: 110H

LOCATION: 1135' FSL & 920' FWL
ELEVATION: 3606'

NO.	REVISION	DATE

JOB NO.: LS25060528
DWG. NO.: 25060528-4

RRC ENERGY SERVICES, LLC.
701 S. CECIL ST., HOBBS, NM 88240 (575) 964-8200

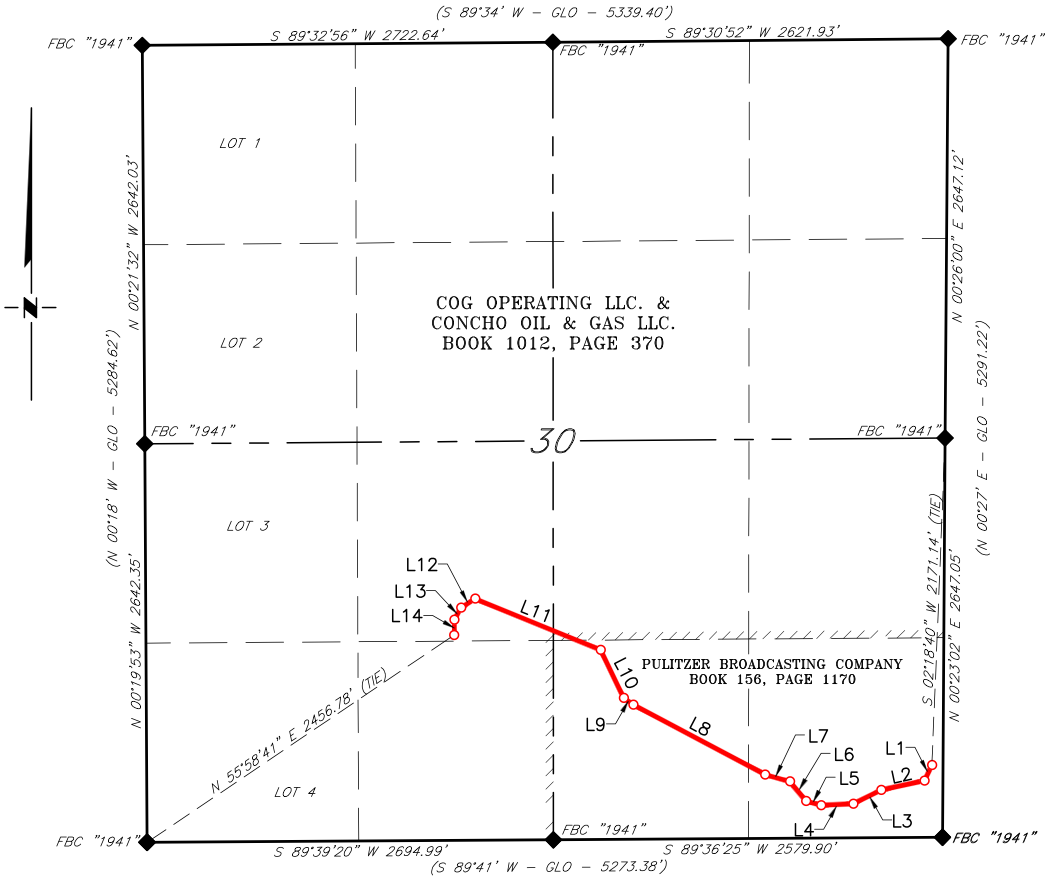
SCALE: N. T. S.
DATE: 06/26/2025
SURVEYED BY: RG/JA
DRAWN BY: RQ
APPROVED BY: DEB
SHEET: 1 OF 1

SPUR ENERGY PARTNERS LLC.

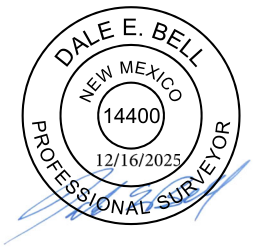
SURVEY OF AN EXISTING LEASE ROAD FOR THE BLACK CHERRY FED COM #110H

SECTION 30, T17S, R28E

N. M. P. M., EDDY COUNTY, NEW MEXICO



LINE TABLE		
LINE	BEARING	LENGTH
L1	N 25°45'57" E	114.41'
L2	S 78°02'36" W	292.31'
L3	S 63°26'54" W	207.06'
L4	N 87°20'43" E	213.70'
L5	N 74°19'41" W	104.37'
L6	N 39°31'58" W	168.34'
L7	N 74°21'44" W	170.36'
L8	N 62°05'37" W	988.83'
L9	N 55°21'59" W	78.38'
L10	N 25°36'32" W	354.13'
L11	N 67°49'18" W	898.88'
L12	S 57°06'03" W	109.55'
L13	S 29°35'23" W	92.72'
L14	S 00°38'23" W	100.69'



LEGEND

( ) RECORD DATA – GLO

◆ FOUND MONUMENT AS NOTED

EXISTING ROAD

SCALE: 1" = 1000'

0 500' 1000'

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

NO.	REVISION	DATE

JOB NO.: LS25060532

DWG. NO.: 25060532–1

RRC ENERGY SERVICES, LLC.

701 S. CECIL ST., HOBBS, NM 88240 (575) 964–8200

SCALE: 1" = 1000'

DATE: 12/01/2025

SURVEYED BY: RG/JA

DRAWN BY: RQ

APPROVED BY: DEB

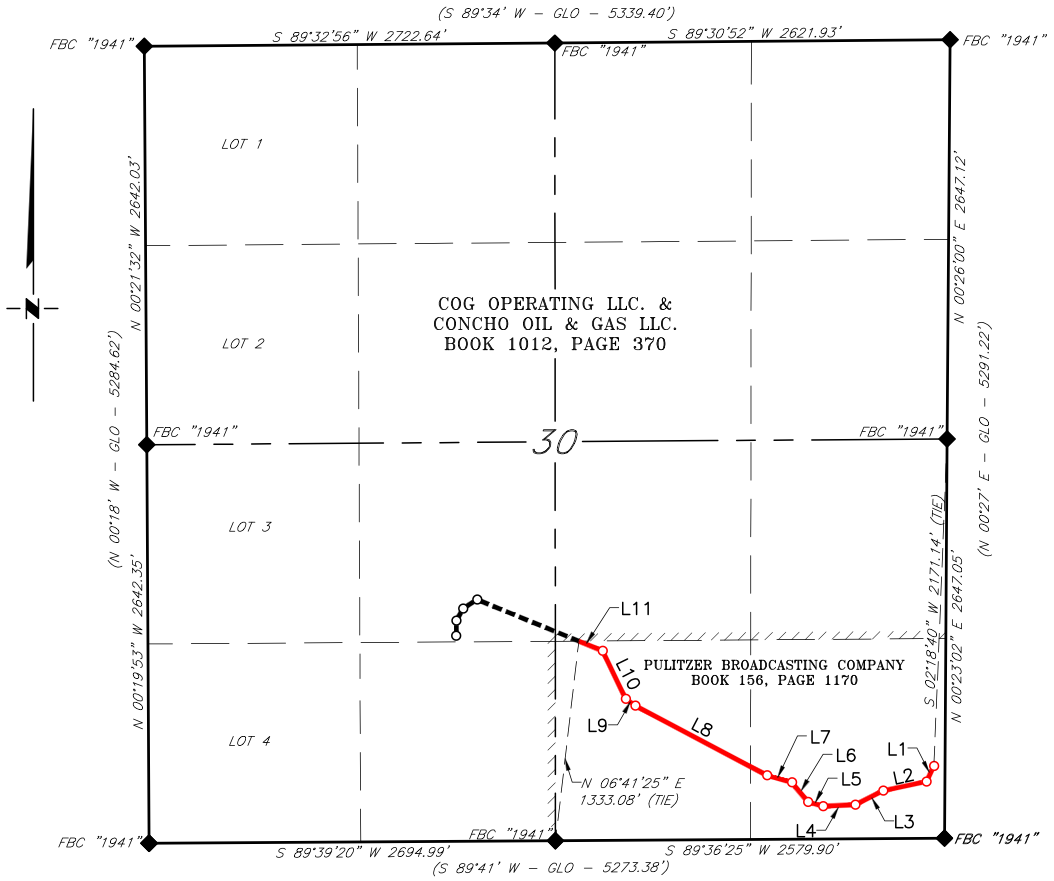
SHEET: 1 OF 5

SPUR ENERGY PARTNERS LLC.

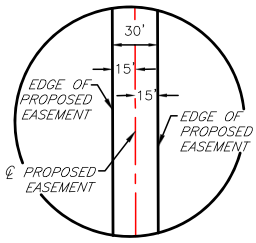
SURVEY OF AN EXISTING LEASE ROAD FOR THE BLACK CHERRY FED COM #110H

SECTION 30, T17S, R28E

N. M. P. M., EDDY COUNTY, NEW MEXICO



LINE TABLE		
LINE	BEARING	LENGTH
L1	N 25°45'57" E	114.41'
L2	S 78°02'36" W	292.31'
L3	S 63°26'54" W	207.06'
L4	N 87°20'43" E	213.70'
L5	N 74°19'41" W	104.37'
L6	N 39°31'58" W	168.34'
L7	N 74°21'44" W	170.36'
L8	N 62°05'37" W	988.83'
L9	N 55°21'59" W	78.38'
L10	N 25°36'32" W	354.13'
L11	N 67°49'18" W	169.80'



DETAIL "A"

N. T. S.

SCALE: 1" = 1000'

0 500' 1000'

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

LEGEND

( ) RECORD DATA – GLO

FOUND MONUMENT AS NOTED

EXISTING ROAD

I, Dale E. Bell, New Mexico Professional Surveyor No. 14400, do hereby certify that this Plat and the actual survey on the ground upon which it is based were performed by me or under my direct supervision; that I am responsible for this survey, said survey and plat meets the Minimum Standards for Land Surveying in the State of New Mexico and that it is true and correct to the best of my knowledge and belief.

Dale E. Bell NM PS 14400

DALE E. BELL
NEW MEXICO
14400
12/16/2025
PROFESSIONAL SURVEYOR

NO.	REVISION	DATE

JOB NO.: LS25060532

DWG. NO.: 25060532-2

RRC ENERGY SERVICES, LLC.

701 S. CECIL ST., HOBBS, NM 88240 (575) 964-8200

SCALE: 1" = 1000'

DATE: 12/01/2025

SURVEYED BY: RG/JA

DRAWN BY: RQ

APPROVED BY: DEB

SHEET: 2 OF 5

SPUR ENERGY PARTNERS LLC.

SURVEY OF AN EXISTING LEASE ROAD FOR THE BLACK CHERRY FED COM #110H

SECTION 30, T17S, R28E

N. M. P. M., EDDY COUNTY, NEW MEXICO

DESCRIPTION

A strip of land 30 feet wide, being 2,861.69 feet or 173.436 rods in length, lying in Section 30, Township 17 South, Range 28 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 the lands of Pulitzer Broadcasting Company, according to a deed filed for record in Book 156, Page 1170 of the Deed Records of Eddy County, New Mexico:

BEGINNING at a point in the Southeast quarter of Section 30, which bears, S 02°18'40" W, 2,171.14 feet, from a brass cap, stamped "1941", found for the East quarter corner of Section 30;

Thence N 25°45'57" E, 114.41 feet, to a point;

Thence S 78°02'36" W, 292.31 feet, to a point;

Thence S 63°26'54" W, 207.06 feet, to a point;

Thence N 87°20'43" E, 213.70 feet, to a point;

Thence N 74°19'41" W, 104.37 feet, to a point;

Thence N 39°31'58" W, 168.34 feet, to a point;

Thence N 74°21'44" W, 170.36 feet, to a point;

Thence N 62°05'37" W, 988.83 feet, to a point;

Thence N 55°21'59" W, 78.38 feet, to a point;

Thence N 25°36'32" W, 354.13 feet, to a point;

Thence N 67°49'18" W, 169.80 feet, to a point on the North line of the South half of the Southeast quarter of Section 30, which bears, N 06°41'25" E, 1,333.08 feet from a brass cap, stamped "1941", found for the South quarter corner of Section 30.

Said strip of land contains 1.971 acres, more or less, and is allocated by forties as follows:

SE 1/4 SE 1/4	84.724 Rods	0.963 Acres
SW 1/4 SE 1/4	88.712 Rods	1.008 Acres

NO.	REVISION	DATE

JOB NO.: LS25060532

DWG. NO.: 25060532-3

RRC ENERGY SERVICES, LLC.

701 S. CECIL ST., HOBBS, NM 88240 (575) 964-8200

SCALE: 1" = 1000'

DATE: 12/01/2025

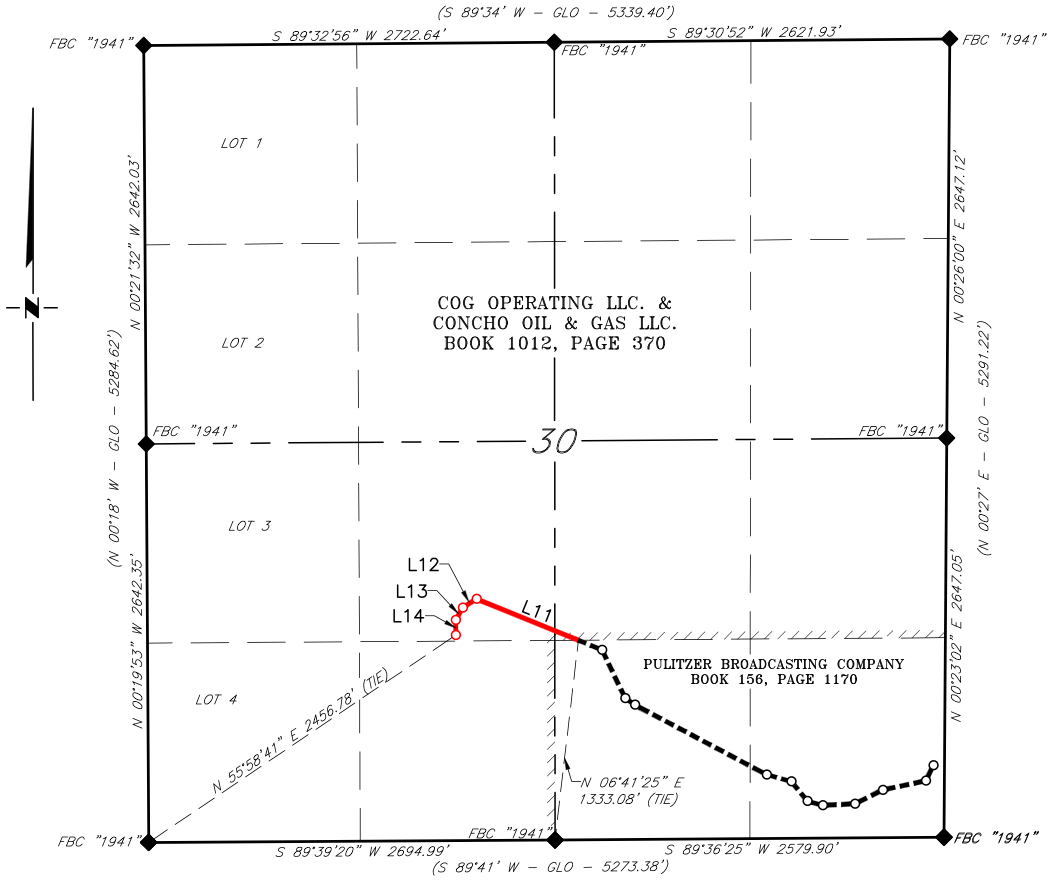
SURVEYED BY: RG/JA

DRAWN BY: RQ

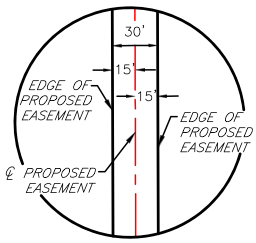
APPROVED BY: DEB

SHEET: 3 OF 5

SPUR ENERGY PARTNERS LLC.
SURVEY OF AN EXISTING LEASE ROAD FOR THE
BLACK CHERRY FED COM #110H
SECTION 30, T17S, R28E
N. M. P. M., EDDY COUNTY, NEW MEXICO



LINE TABLE		
LINE	BEARING	LENGTH
L11	N 67°49'18" W	729.08'
L12	S 57°06'03" W	109.55'
L13	S 29°35'23" W	92.72'
L14	S 00°38'23" W	100.69'



DETAIL "A"
N. T. S.

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

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

LEGEND
( ) RECORD DATA – GLO
FOUND MONUMENT AS NOTED
EXISTING ROAD

I, Dale E. Bell, New Mexico Professional Surveyor No. 14400, do hereby certify that this Plat and the actual survey on the ground upon which it is based were performed by me or under my direct supervision; that I am responsible for this survey, said survey and plat meets the Minimum Standards for Land Surveying in the State of New Mexico and that it is true and correct to the best of my knowledge and belief.

Dale E. Bell NM PS 14400

DALE E. BELL
NEW MEXICO
14400
12/16/2025
PROFESSIONAL SURVEYOR

NO.	REVISION	DATE

JOB NO.: LS25060532
DWG. NO.: 25060532–4

RRC ENERGY SERVICES, LLC.
701 S. CECIL ST., HOBBS, NM 88240 (575) 964–8200

SCALE: 1" = 1000'
DATE: 12/01/2025
SURVEYED BY: RG/JA
DRAWN BY: RQ
APPROVED BY: DEB
SHEET: 4 OF 5

SPUR ENERGY PARTNERS LLC.
SURVEY OF AN EXISTING LEASE ROAD FOR THE
BLACK CHERRY FED COM #110H
SECTION 30, T17S, R28E
N. M. P. M., EDDY COUNTY, NEW MEXICO

DESCRIPTION

A strip of land 30 feet wide, being 1,032.04 feet or 62.548 rods in length, lying in Section 30, Township 17 South, Range 28 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 the lands of COG Operating LLC. & Concho Oil & Gas LLC., according to a deed filed for record in Book 1012, Page 370 of the Deed Records of Eddy County, New Mexico:

BEGINNING at a point on the South line of the North half of the Southeast quarter of Section 30, which bears, S 06°41'25" W, 1,333.08 feet, from a brass cap, stamped "1941", found for the South quarter corner of Section 30;

Thence N 67°49'18" W, 729.08 feet, to a point;

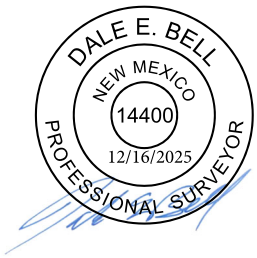
Thence S 57°06'03" W, 109.55 feet, to a point;

Thence S 29°35'23" W, 92.72 feet, to a point;

Thence S 00°38'23" W, 100.69 feet, the End of Survey, a point in Section 30, which bears, N 55°58'41" E, 2,456.78 feet from a brass cap, stamped "1941", found for the Southwest corner of Section 30.

Said strip of land contains 0.711 acres, more or less, and is allocated by forties as follows:

NW 1/4 SE 1/4	10.238 Rods	0.116 Acres
NE 1/4 SW 1/4	52.310 Rods	0.595 Acres



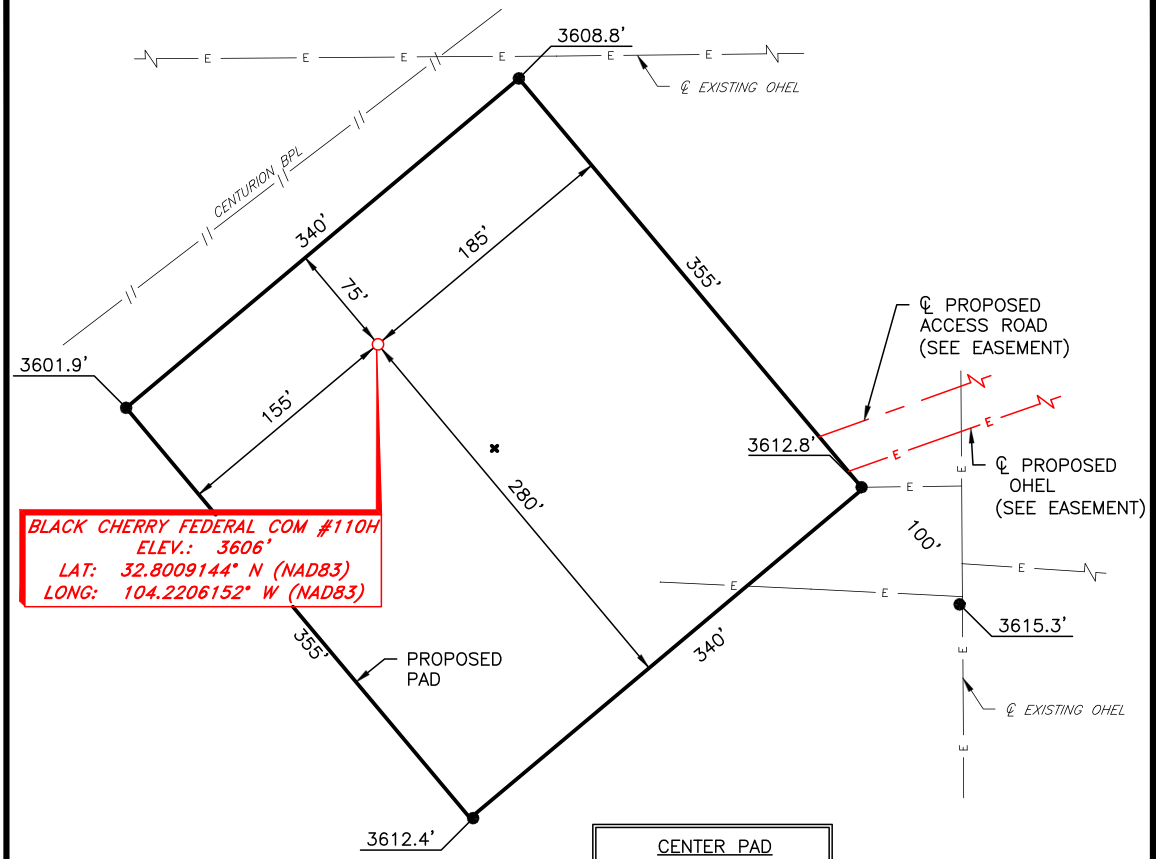
NO.	REVISION	DATE

JOB NO.: LS25060532
DWG. NO.: 25060532-5

RRC ENERGY SERVICES, LLC.
701 S. CECIL ST., HOBBS, NM 88240 (575) 964-8200

SCALE: 1" = 1000'
DATE: 12/01/2025
SURVEYED BY: RG/JA
DRAWN BY: RQ
APPROVED BY: DEB
SHEET: 5 OF 5

SPUR ENERGY PARTNERS LLC.
BLACK CHERRY FEDERAL COM #110H
(1135' FSL & 920' FWL)
SECTION 30, T17S, R28E
N. M. P. M., EDDY CO., NEW MEXICO



CENTER PAD
LAT: 32.8007248° N
LONG: 104.2203639° W

DIRECTIONS TO LOCATION

From the intersection of U.S. Hwy 82 (Lovington Hwy) & CR #206 (Illinois Camp Rd.);

Go Northwest on U.S. Hwy 82 approx. 0.6 miles to a lease road on the left;

Turn left and go West approx. 0.7 miles to a lease road on the left:

Turn left and go South approx. 310 feet to a proposed road on the right;

Turn right and go Southwest approx. 0.2 miles to location on the right.

SCALE: 1" = 100'
0 50 100

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

I, Dale E. Bell, New Mexico Professional Surveyor No. 14400, do hereby certify that this Plat and the actual survey on the ground upon which it is based were performed by me or under my direct supervision; that I am responsible for this survey, said survey and plat meets the Minimum Standards for Land Surveying in the State of New Mexico and that it is true and correct to the best of my knowledge and belief.

Dale E. Bell NM PS 14400

DALE E. BELL
NEW MEXICO
14400
01/13/2026
PROFESSIONAL SURVEYOR

NO.	REVISION	DATE
1	REMOVE BATTERY	1/13/26

JOB NO.: LS25060528R1
DWG. NO.: 25060528R1–5

RRC ENERGY SERVICES, LLC.
701 S. CECIL ST., HOBBS, NM 88240 (575) 964–8200

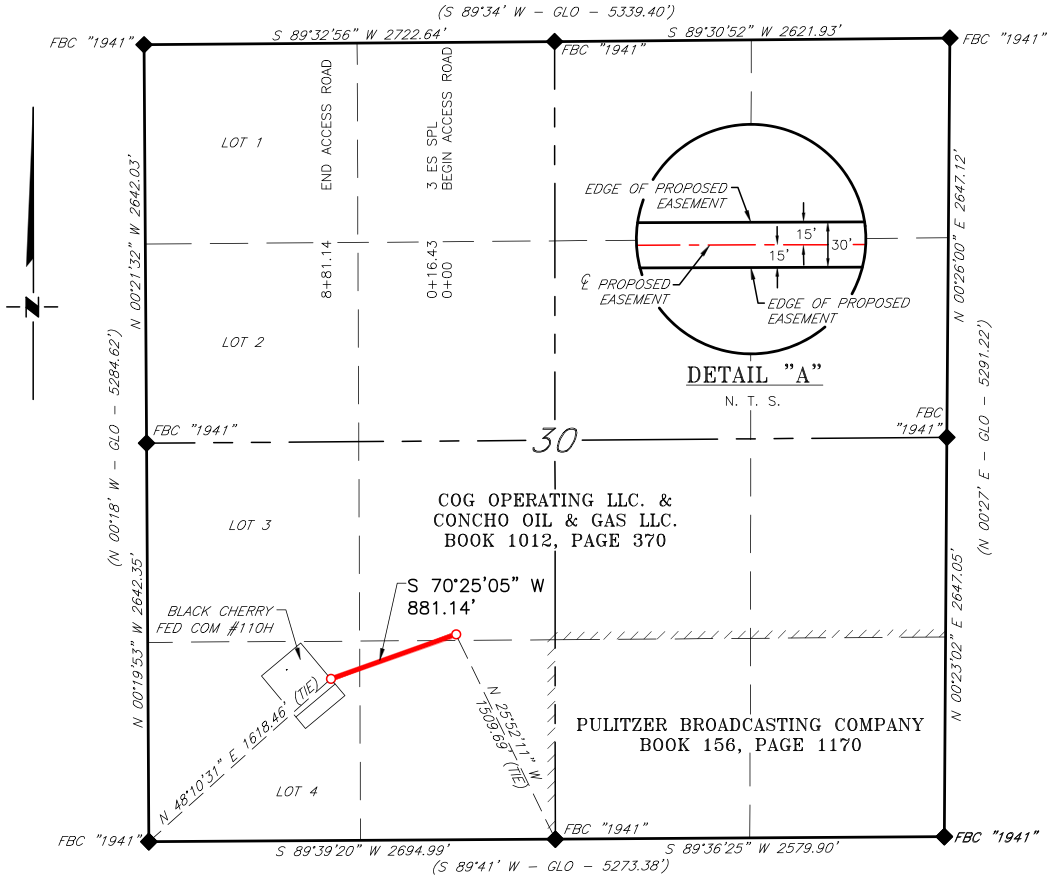
SCALE: 1" = 100'
DATE: 06/26/2025
SURVEYED BY: RG/JA
DRAWN BY: RQ
APPROVED BY: DEB
SHEET: 1 OF 1

SPUR ENERGY PARTNERS LLC.

ACCESS ROAD FOR THE BLACK CHERRY FED COM #110H

SECTION 30, T17S, R28E

N. M. P. M., EDDY COUNTY, NEW MEXICO



DESCRIPTION

A strip of land 30 feet wide, being 881.14 feet or 53.402 rods in length, lying in Section 30, Township 17 South, Range 28 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 the lands of COG Operating LLC. & Concho Oil & Gas LLC., according to a deed filed for record in Book 1012, Page 370 of the Deed Records of Eddy County, New Mexico:

BEGINNING at Engr. Sta. 0+00, a point in the Southwest quarter of Section 30, which bears, N 25°52'11" W, 1,509.69 feet, from a brass cap, stamped "1941", found for the South quarter corner of Section 30;

Thence S 70°25'05" W, 881.14 feet, to Engr. Sta. 8+81.14, the End of Survey, a point in Lot 4, Section 30, which bears, N 48°10'31" E, 1,618.46 feet from a brass cap, stamped "1941", found for the Southwest corner of Section 30.

Said strip of land contains 0.607 acres, more or less, and is allocated by forties as follows:

NE 1/4 SW 1/4	7.347 Rods	0.083 Acres
SE 1/4 SW 1/4	33.687 Rods	0.383 Acres
LOT 4	12.368 Rods	0.141 Acres

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

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

LEGEND

( ) RECORD DATA – GLO

◆ FOUND MONUMENT AS NOTED

PROPOSED ACCESS ROAD

I, Dale E. Bell, New Mexico Professional Surveyor No. 14400, do hereby certify that this Plat and the actual survey on the ground upon which it is based were performed by me or under my direct supervision; that I am responsible for this survey, said survey and plat meets the Minimum Standards for Land Surveying in the State of New Mexico and that it is true and correct to the best of my knowledge and belief.

Dale E. Bell NM PS 14400

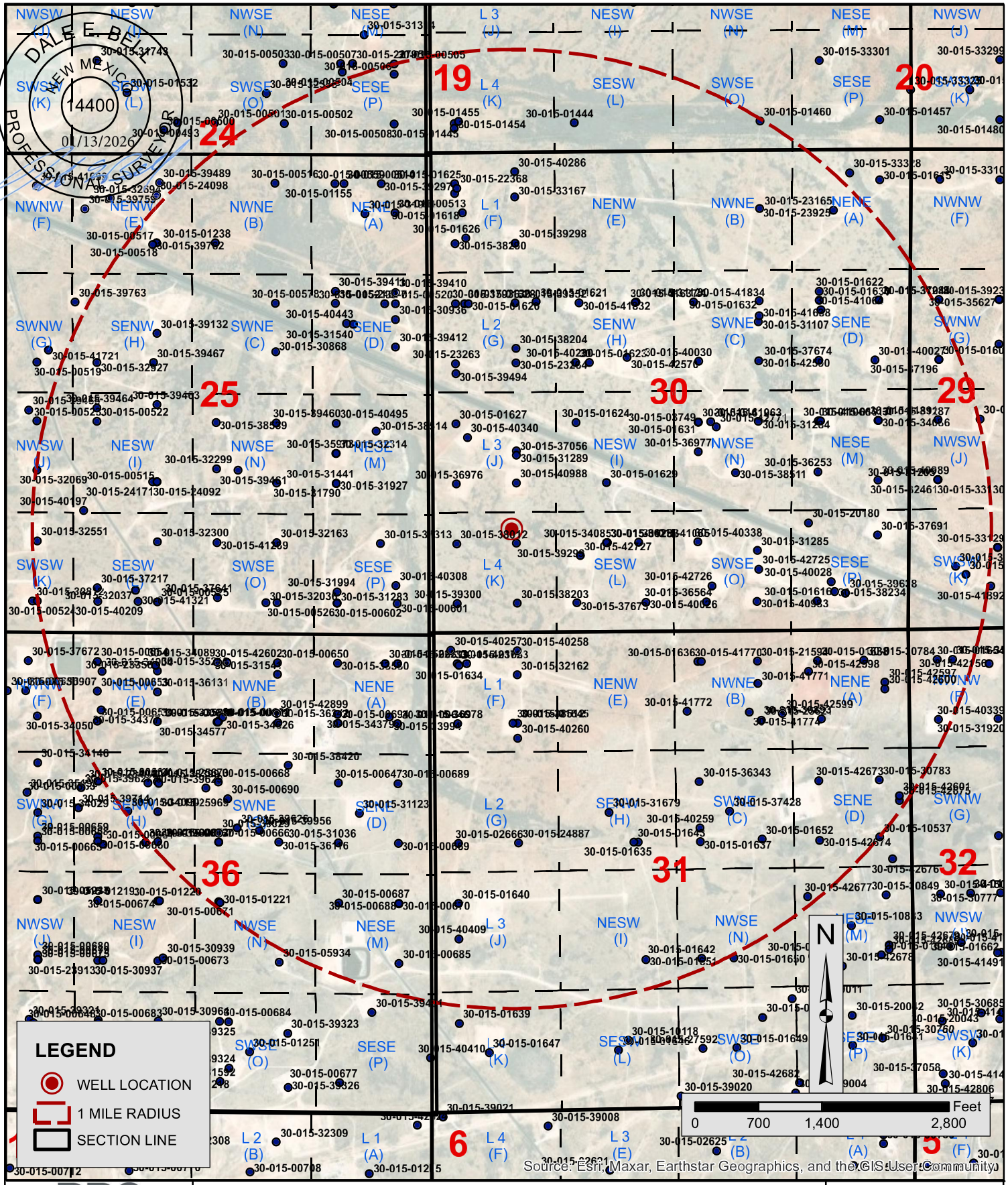
DALE E. BELL
NEW MEXICO
14400
12/16/2025
PROFESSIONAL SURVEYOR

NO.	REVISION	DATE

JOB NO.: LS25060532
DWG. NO.: 25060532–1

RRC ENERGY SERVICES, LLC.
701 S. CECIL ST., HOBBS, NM 88240 (575) 964–8200

SCALE: 1" = 1000'
DATE: 12/01/2025
SURVEYED BY: RG/JA
DRAWN BY: RQ
APPROVED BY: DEB
SHEET: 1 OF 1



RRC ENERGY SERVICES, LLC.
701 S. CECIL ST. HOBBS, NM 88240
(575) 964-8200

BLACK CHERRY FEDERAL COM #110H
(1135' FSL & 920' FWL)
Section 30, Township 17 South, Range 28 East,
N. M. P. M., Eddy County, New Mexico

SPUR ENERGY PARTNERS

Date: 12/01/2025	**ONE MILE RADIUS MAP**		Approved By: DEB
Surveyed By: RG/JH	Job No. LS25060528	Dwg. No. 1-MILE (5,280 Ft.) - RADIUS	Drawn By: RQ

Black Cherry Federal Com 110H

CTB Site:

The Black Cherry Fed Com 110H well will have the ability to be routed to the Smithdale 29 Federal Com Tank Battery.

Production Flowlines:

The Black Cherry Fed Com 110H well will have two (2) 4" buried flowlines operating at less than 125 psi. The flowlines for the Black Cherry Fed Com 110H will be routed to the Smithdale 29 Federal Com Tank Battery. The well will produce into this battery at any given time.

Frac Water System:

Water for the Black Cherry Fed Com 110H will be hauled from Spur's Hub Produced/Recycling Pit located in NE4 Section 36, Township 17 South, Range 28 East, Eddy County, New Mexico. Private surface (32.795556, -104.123056). Permit No. 2RF-211.

Gas Sales:

Once gas arrives at the Smithdale 29 Federal Com Tank Battery, it will be sold through an existing Kinetik gas meter.

Oil Sales:

Once oil arrives at the Smithdale 29 Federal Com Tank Battery, it will be trucked or pumped into a pipeline and sold through a LACT.

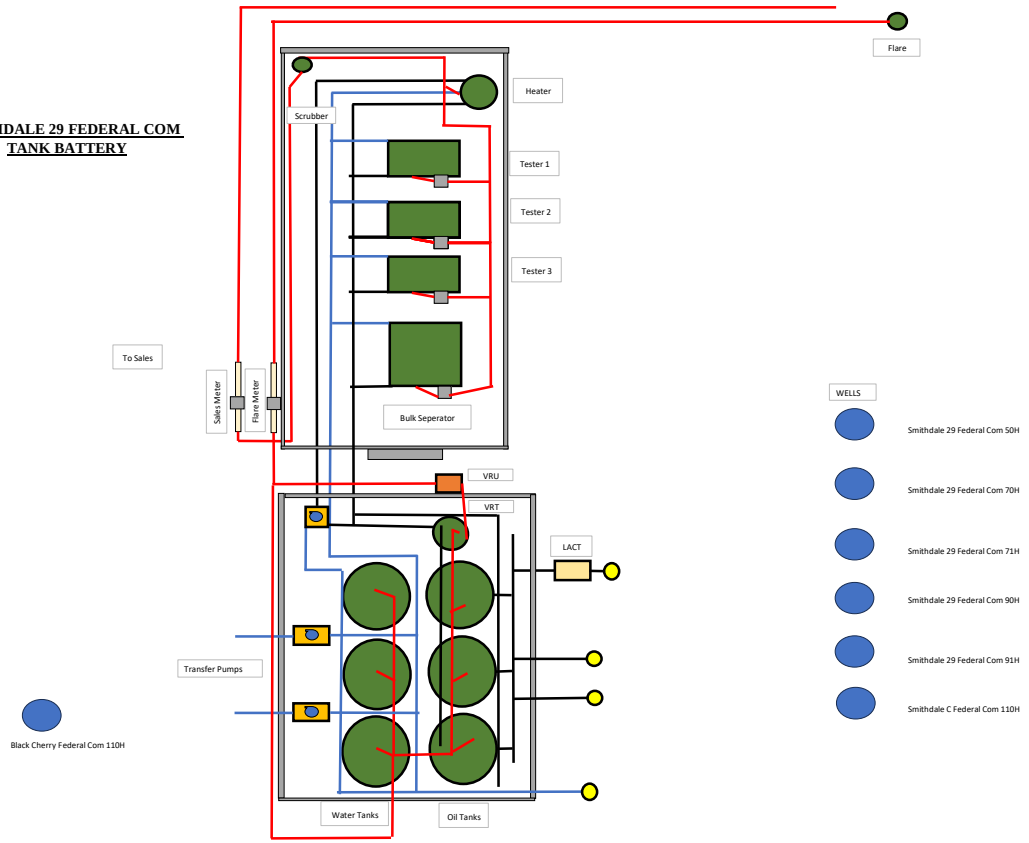
Salt Water Disposal:

Once water arrives at the Smithdale 29 Federal Com Tank Battery, it will connect to the existing water line that connects to Spur's SWD system to be disposed of into a Spur operated SWD.

Electrical System:

3-phase electric lines will be constructed from existing Eddy Co. lines per the survey plats to the Black Cherry Federal Com 110H well pad. If we are unable to energize the CVE meter, we will install natural gas generators on location to run the wells, fueled with residue gas from the Kinetik plant by one (1) 4" surface flowline operating at less than 125 psi.

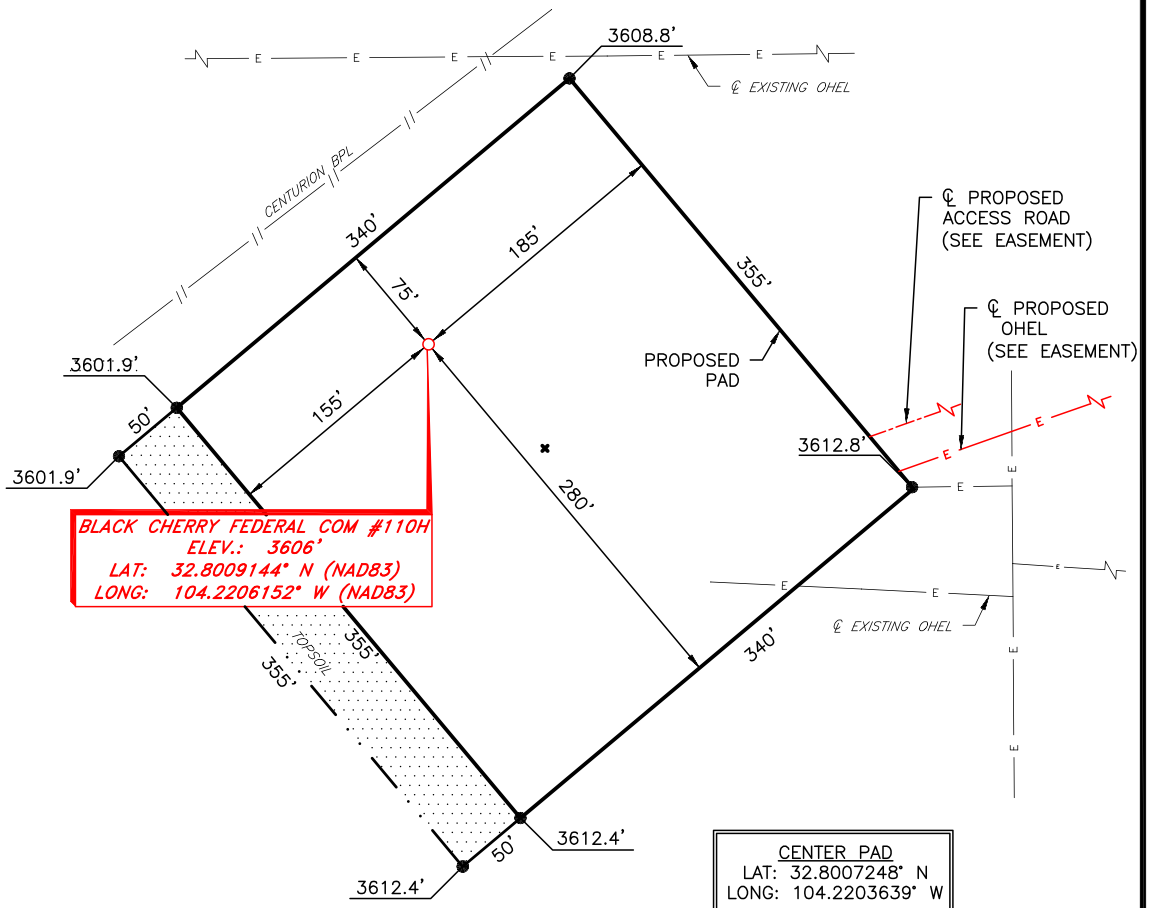
SMITHDALE 29 FEDERAL COM
TANK BATTERY



6 Well Fcility General Inventory List		
Type	**Count**	**Location**
OIL TANK	3	RIGHT SET OF TANKS
WATER TANK	3	LEFT SET OF TANKS
VAPOR RECOVERY TOWER	1	ABOVE THE OIL TANKS, IN THE SAME CONTAINMENT
CENTRIFUGAL PRODUCED WATER TRANSFER PUMPS	2	TO THE LEFT OF THE WATER TANKS, IN THE SAME CONTAINMENT
CENTRIFUGAL CIRCULATION PUMP	1	TOP LEFT CORNER OF TANKS CONTAINMENT, IN THE SAME CONTAINMENT
VAPOR RECOVERY UNIT	1	ABOVE THE VRT UNIT, OUTSIDE OF TANK CONTAINMENT
LACT	1	TO THE RIGHT OF OIL TANKS, OUTSIDE TANK CONTAINMENT
TEST SEPERATOR	3	ABOVE BULK SEPERATOR, IN ITS OWN CONTAINMENT
BULK SEPERATOR	1	BELOW TEST SEPERATOR, IN THE SAME CONTAINMENT
HEATER TREATER	1	TOP RIGHT CORNER OF SEPERATOR CONTAINMENT, IN THE SAME CONTAINMENT
SCRUBBER	1	TO THE LEFT OF THE HEATER TREATER, IN THE SAME CONTAINMENT
GAS SALES METER RUN	1	RIGHT SIDE OF BATTERY, TO LEFT OF BULK SEPERATOR, OUTSIDE CONTAINMENT
GAS FLARE METER RUN	1	RIGHT SIDE OF BATTERY ADJACENT TO SALES METER RUN, OUTSIDE CONTAINMENT
FLARE	1	ON SEPERATOR SIDE OF FACILITY, APPROXIMATELY 150 FT AWAY

6 WELLS TO THE RIGHT OF THE BATTERY
Black Cherry Federal Com 110H coming from SW via flowline

SPUR ENERGY PARTNERS LLC.
BLACK CHERRY FEDERAL COM #110H
(1135' FSL & 920' FWL)
SECTION 30, T17S, R28E
N. M. P. M., EDDY CO., NEW MEXICO



DIRECTIONS TO LOCATION

From the intersection of U.S. Hwy 82 (Lovington Hwy) & CR #206 (Illinois Camp Rd.);

Go Northwest on U.S. Hwy 82 approx. 0.6 miles to a lease road on the left;

Turn left and go West approx. 0.7 miles to a lease road on the left:

Turn left and go South approx. 310 feet to a proposed road on the right;

Turn right and go Southwest approx. 0.2 miles to location on the right.

SCALE: 1" = 100'
0 50 100

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

I, Dale E. Bell, New Mexico Professional Surveyor No. 14400, do hereby certify that this Plat and the actual survey on the ground upon which it is based were performed by me or under my direct supervision; that I am responsible for this survey, said survey and plat meets the Minimum Standards for Land Surveying in the State of New Mexico and that it is true and correct to the best of my knowledge and belief.

Dale E. Bell NM PS 14400

DALE E. BELL
NEW MEXICO
14400
02/19/2026
PROFESSIONAL SURVEYOR

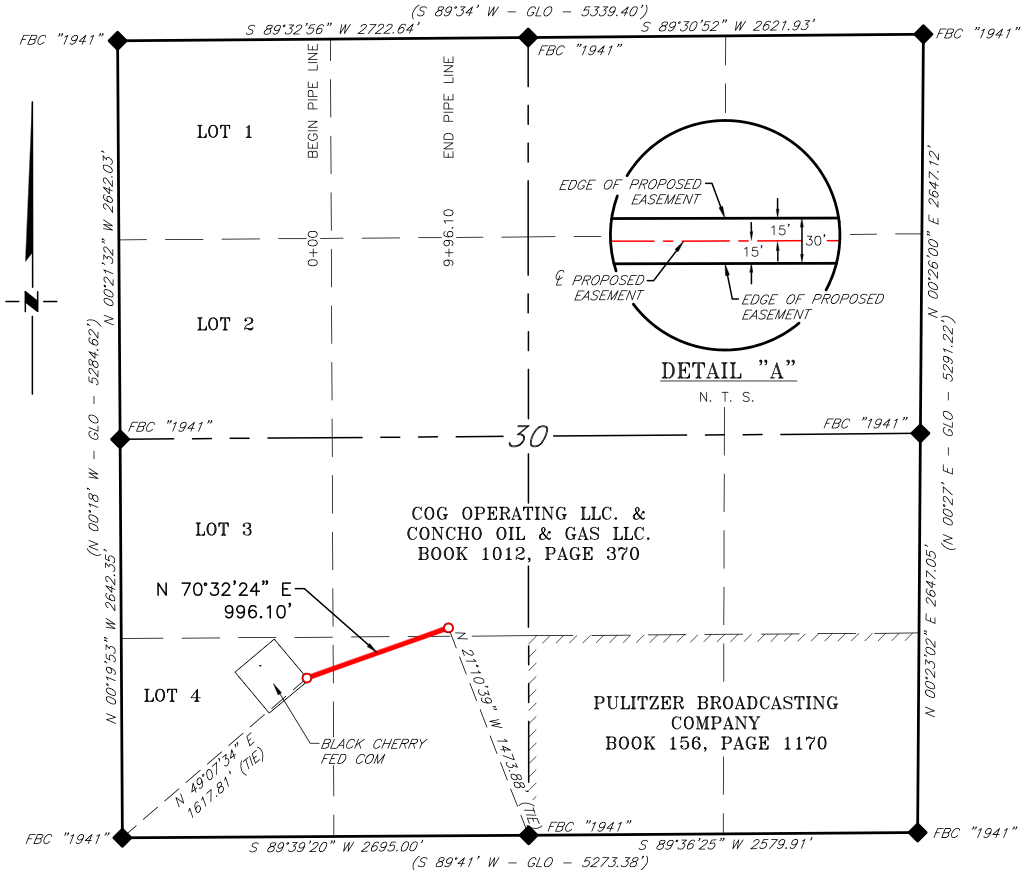
NO.	REVISION	DATE
2	ADD TOPSOIL	2/19/26
1	REMOVE BATTERY	1/13/26

JOB NO.: LS25060528D1
DWG. NO.: 25060528D1–5

RRC ENERGY SERVICES, LLC.
701 S. CECIL ST., HOBBS, NM 88240 (575) 964–8200

SCALE: 1" = 100'
DATE: 06/26/2025
SURVEYED BY: RG/JA
DRAWN BY: RQ
APPROVED BY: DEB
SHEET: 1 OF 1

SPUR ENERGY PARTNERS LLC.
BLACK CHERRY RESIDUE
SECTION 30, T17S, R28E
N. M. P. M., EDDY COUNTY, NEW MEXICO



DESCRIPTION

A strip of land 30 feet wide, being 996.10 feet or 60.370 rods in length, lying in Section 30, Township 17, South, Range 28 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 the land of COG Operating LLC. & Concho oil & gas LLC., according to a deed filed for record in Book 1012, Page 370, of the Deed Records of Eddy County, New Mexico:

BEGINNING at Engr. Sta. 0+00, a point in the Southwest quarter of Section 30, which bears, N 49°07'34" E 1,617.81 feet from a brass cap, stamped "1941", found for the Southwest corner of Section 30;

Thence N 70°32'24" E, 996.10 feet, to Engr. Sta. 9+96.10, the End of Survey, a point in the Southwest quarter of Section 30, which bears, N 21°10'39" W, 1,473.88 feet, from a brass cap, stamped "1941", found for the South quarter corner of Section 30.

Said strip of land contains 0.686 acres, more or less, and is allocated by forties as follows:

NE 1/4 SW 1/4	10.192 Rods	0.116 acres
SE 1/4 SW 1/4	38.920 Rods	0.442 acres
SW 1/4 SW 1/4	11.258 Rods	0.128 acres

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

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

LEGEND
( ) RECORD DATA – GLO
◆ FOUND MONUMENT AS NOTED
PROPOSED PIPE LINE

I, Dale E. Bell, New Mexico Professional Surveyor No. 14400, do hereby certify that this Plat and the actual survey on the ground upon which it is based were performed by me or under my direct supervision; that I am responsible for this survey, said survey and plat meets the Minimum Standards for Land Surveying in the State of New Mexico and that it is true and correct to the best of my knowledge and belief.

Dale E. Bell NM PS 14400

DALE E. BELL
NEW MEXICO
14400
01/19/2026
PROFESSIONAL SURVEYOR

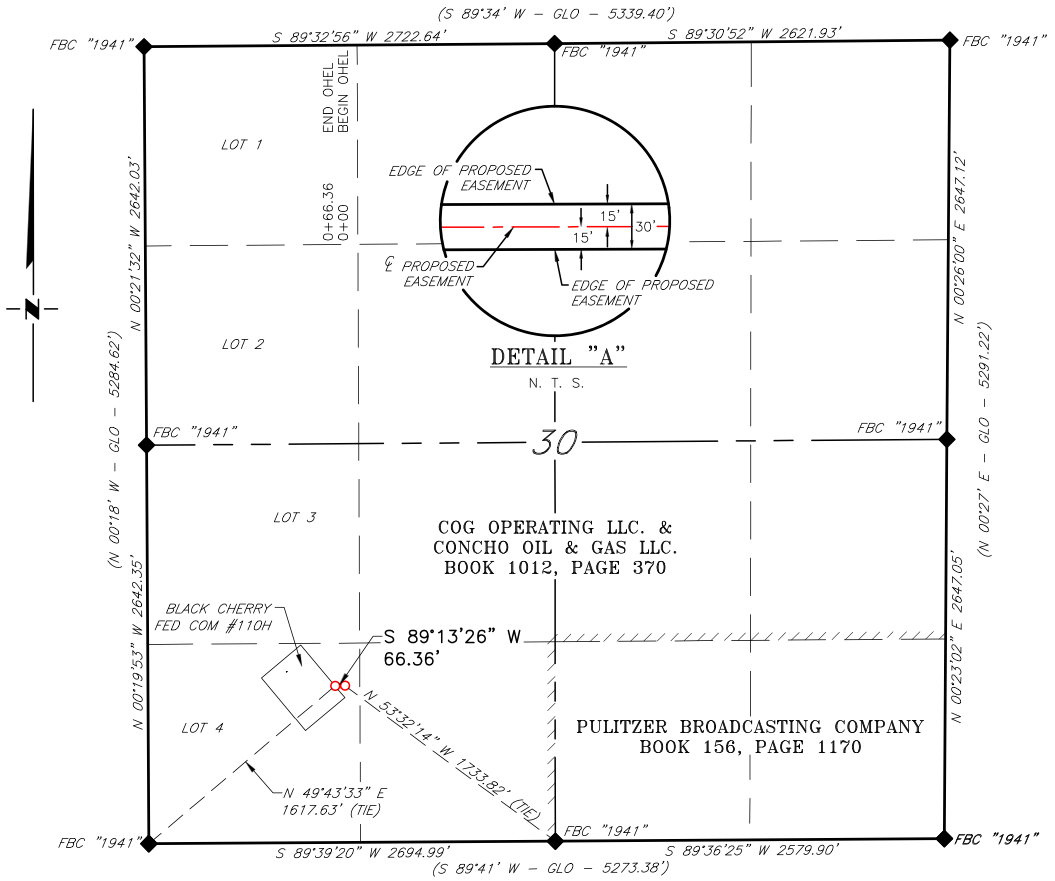
NO.	REVISION	DATE

JOB NO.: LS26010038
DWG. NO.: 26010038–1

RRC ENERGY SERVICES, LLC.
701 S. CECIL ST., HOBBS, NM 88240 (575) 964–8200

SCALE: 1" = 1000'
DATE: 01/15/2026
SURVEYED BY: JH/IW
DRAWN BY: NC
APPROVED BY: DEB
SHEET: 1 OF 1

SPUR ENERGY PARTNERS LLC.
OHEL FOR THE BLACK CHERRY FED COM #110H
SECTION 30, T17S, R28E
N. M. P. M., EDDY COUNTY, NEW MEXICO



DESCRIPTION

A strip of land 30 feet wide, being 66.36 feet or 4.022 rods in length, lying in Section 30, Township 17 South, Range 28 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 the lands of COG Operating LLC. & Concho Oil & Gas LLC., according to a deed filed for record in Book 1012, Page 370 of the Deed Records of Eddy County, New Mexico:

BEGINNING at Engr. Sta. 0+00, a point in Lot 4, Section 30, which bears, N 53°32'14" W, 1,733.82 feet, from a brass cap, stamped "1941", found for the South quarter corner of Section 30;

Thence S 89°13'26" W, 66.36 feet, to Engr. Sta. 0+66.36, the End of Survey, a point in Lot 4, Section 30, which bears, N 49°43'33" E, 1,617.63 feet from a brass cap, stamped "1941", found for the Southwest corner of Section 30.

Said strip of land contains 0.046 acres, more or less, and is allocated by forties as follows:

Lot 4	4.022 Rods	0.046 Acres

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

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

LEGEND
( ) RECORD DATA – GLO
◆ FOUND MONUMENT AS NOTED
PROPOSED OHEL

I, Dale E. Bell, New Mexico Professional Surveyor No. 14400, do hereby certify that this Plat and the actual survey on the ground upon which it is based were performed by me or under my direct supervision; that I am responsible for this survey, said survey and plat meets the Minimum Standards for Land Surveying in the State of New Mexico and that it is true and correct to the best of my knowledge and belief.

Dale E. Bell NM PS 14400

DALE E. BELL
NEW MEXICO
14400
12/16/2025
PROFESSIONAL SURVEYOR

NO.	REVISION	DATE

JOB NO.: LS25060531
DWG. NO.: 25060531–1

RRC ENERGY SERVICES, LLC.
701 S. CECIL ST., HOBBS, NM 88240 (575) 964–8200

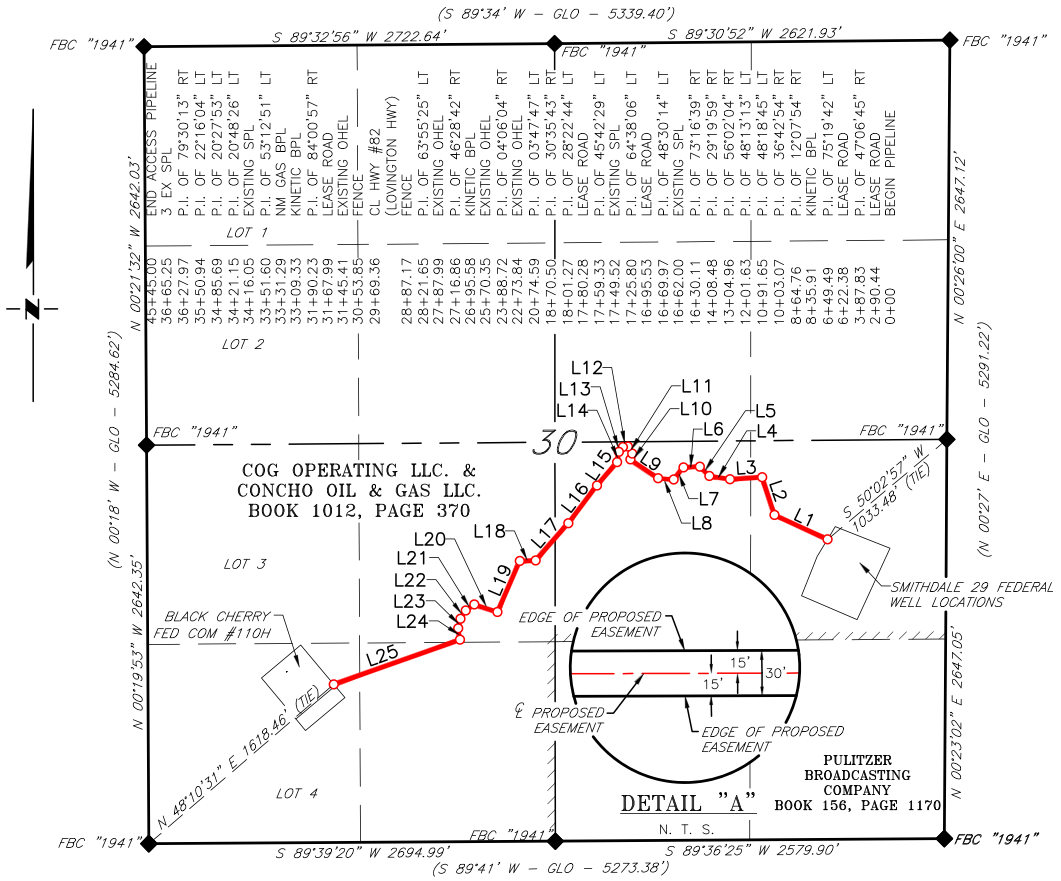
SCALE: 1" = 1000'
DATE: 12/01/2025
SURVEYED BY: RG/JA
DRAWN BY: RQ
APPROVED BY: DEB
SHEET: 1 OF 1

SPUR ENERGY PARTNERS LLC.

FLOWLINE FOR THE BLACK CHERRY FED COM #110H

SECTION 30, T17S, R28E

N. M. P. M., EDDY COUNTY, NEW MEXICO



LINE TABLE		
LINE	BEARING	LENGTH
L1	N 65°12'06" W	387.83'
L2	N 18°05'21" W	261.66'
L3	S 86°34'57" W	215.27'
L4	N 81°17'09" W	138.31'
L5	N 44°34'15" W	88.58'
L6	S 87°07'00" W	109.67'
L7	S 38°53'48" W	103.64'
L8	N 85°04'08" W	103.52'
L9	N 55°44'09" W	221.63'
L10	N 17°32'30" E	39.86'
L11	N 30°57'44" W	55.83'
L12	S 84°24'10" W	33.53'
L13	S 38°41'41" W	41.94'

LINE TABLE		
LINE	BEARING	LENGTH
L14	S 10°18'57" W	69.23'
L15	S 40°54'40" W	204.09'
L16	S 37°06'53" W	314.13'
L17	S 41°12'57" W	328.14'
L18	S 87°41'39" W	104.79'
L19	S 23°46'14" W	368.58'
L20	N 72°12'49" W	161.37'
L21	S 54°34'20" W	69.55'
L22	S 33°45'54" W	64.54'
L23	S 13°18'01" W	65.25'
L24	S 08°58'03" E	77.03'
L25	S 70°32'10" W	887.03

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

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

LEGEND

( ) RECORD DATA – GLO

◆ FOUND MONUMENT AS NOTED

PROPOSED PIPELINE

I, Dale E. Bell, New Mexico Professional Surveyor No. 14400, do hereby certify that this Plat and the actual survey on the ground upon which it is based were performed by me or under my direct supervision; that I am responsible for this survey, said survey and plat meets the Minimum Standards for Land Surveying in the State of New Mexico and that it is true and correct to the best of my knowledge and belief.

Dale E. Bell NM PS 14400

DALE E. BELL
NEW MEXICO
14400
12/16/2025
PROFESSIONAL SURVEYOR

NO.	REVISION	DATE

JOB NO.: LS25110957
DWG. NO.: 25110957–1

RRC ENERGY SERVICES, LLC.
701 S. CECIL ST., HOBBS, NM 88240 (575) 964–8200

SCALE: 1" = 1000'
DATE: 12/01/2025
SURVEYED BY: RG/JA
DRAWN BY: RQ
APPROVED BY: DEB
SHEET: 1 OF 2

SPUR ENERGY PARTNERS LLC.

FLOWLINE FOR THE BLACK CHERRY FED COM #110H

SECTION 30, T17S, R28E

N. M. P. M., EDDY COUNTY, NEW MEXICO

DESCRIPTION

A strip of land 30 feet wide, being 4,515 feet or 273.636 rods in length, lying in Section 30, Township 17 South, Range 28 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 the lands of COG Operating LLC. & Concho Oil & Gas LLC., according to a deed filed for record in Book 1012, Page 370 of the Deed Records of Eddy County, New Mexico:

BEGINNING at Engr. Sta. 0+00, a point in Southeast quarter of Section 30, which bears, S 50°02'57" W, 1,033.48 feet, from a brass cap, stamped "1941", found for the East quarter corner of Section 30;

Thence N 65°12'06" W, 387.83 feet, to Engr. Sta. 3+87.83, a P. I. of 47°06'45" right;

Thence N 18°05'21" W, 261.66 feet, to Engr. Sta. 6+49.49, a P. I. of 75°19'42" left;

Thence S 86°34'57" W, 215.27 feet, to Engr. Sta. 8+64.76, a P. I. of 12°07'54" right;

Thence N 81°17'09" W, 138.31 feet, to Engr. Sta. 10+03.07, a P. I. of 36°42'54" right;

Thence N 44°34'15" W, 88.58 feet, to Engr. Sta. 10+91.65, a P. I. of 48°18'45" left;

Thence S 87°07'00" W, 109.67 feet, to Engr. Sta. 12+01.32, a P. I. of 48°13'13" left;

Thence S 38°53'48" W, 103.64 feet, to Engr. Sta. 13+04.96, a P. I. of 56°02'04" right;

Thence N 85°04'08" W, 103.52 feet, to Engr. Sta. 14+08.48, a P. I. of 29°19'59" right;

Thence N 55°44'09" W, 221.63 feet, to Engr. Sta. 16+30.11, a P. I. of 73°16'39" right;

Thence N 17°32'30" E, 39.86 feet, to Engr. Sta. 16+69.97, a P. I. of 48°30'14" left;

Thence N 30°57'44" W, 55.83 feet, to Engr. Sta. 17+25.80, a P. I. of 64°38'06" left;

Thence S 84°24'10" W, 33.53 feet, to Engr. Sta. 17+59.33, a P. I. of 45°42'29" left;

Thence S 38°41'41" W, 41.94 feet, to Engr. Sta. 18+01.27, a P. I. of 28°22'44" left;

Thence S 10°18'57" W, 69.23 feet, to Engr. Sta. 18+70.50, a P. I. of 30°35'43" right;

Thence S 40°54'40" W, 204.09 feet, to Engr. Sta. 20+74.59, a P. I. of 03°47'47" left;

Thence S 37°06'53" W, 314.13 feet, to Engr. Sta. 23+88.72, a P. I. of 04°06'04" right;

Thence S 41°12'57" W, 328.14 feet, to Engr. Sta. 27+16.86, a P. I. of 46°28'42" right;

Thence S 87°41'39" W, 104.79 feet, to Engr. Sta. 28+21.65, a P. I. of 63°55'25" left;

Thence S 23°46'14" W, 368.58 feet, to Engr. Sta. 31+90.23, a P. I. of 84°00'57" right;

Thence N 72°12'49" W, 161.37 feet, to Engr. Sta. 33+51.60, a P. I. of 53°12'51" left;

Thence S 54°34'20" W, 69.55 feet, to Engr. Sta. 34+21.15, a P. I. of 20°48'26" left;

Thence S 33°45'54" W, 64.54 feet, to Engr. Sta. 34+85.69, a P. I. of 20°27'53" left;

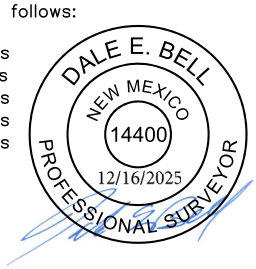
Thence S 13°18'01" W, 65.25 feet, to Engr. Sta. 35+50.94, a P. I. of 22°16'04" left;

Thence S 08°58'03" E, 77.03 feet, to Engr. Sta. 36+27.97, a P. I. of 79°30'13" right;

Thence S 70°32'10" W, 887.03 feet, to Engr. Sta. 45+15.00, the End of Survey, a point in Lot 4, Section 30, which bears, N 48°10'31" E, 1,618.46 feet from a brass cap, stamped "1941", found for the Southwest corner of Section 30.

Said strip of land contains 3.109 acres, more or less, and is allocated by forties as follows:

NE 1/4 SE 1/4	43.917 Rods	0.499 Acres
NW 1/4 SE 1/4	108.862 Rods	1.237 Acres
NE 1/4 SW 1/4	70.227 Rods	0.798 Acres
SE 1/4 SW 1/4	39.505 Rods	0.449 Acres
SW 1/4 SW 1/4	11.125 Rods	0.126 Acres

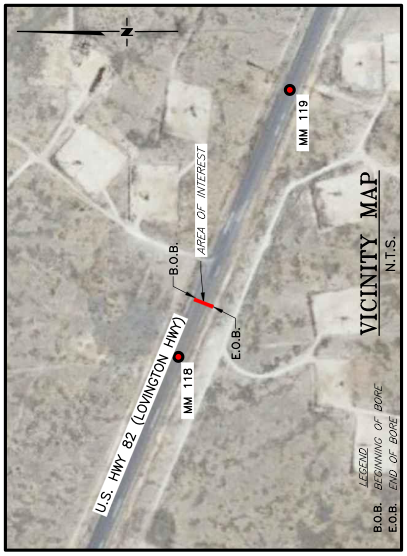


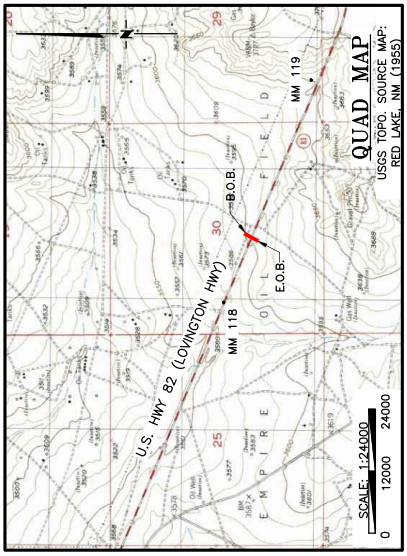
NO.	REVISION	DATE

JOB NO.: LS25110957
DWG. NO.: 25110957-2

RRC ENERGY SERVICES, LLC.
701 S. CECIL ST., HOBBS, NM 88240 (575) 964-8200

SCALE: 1" = 1000'
DATE: 12/01/2025
SURVEYED BY: RG/JA
DRAWN BY: RQ
APPROVED BY: DEB
SHEET: 2 OF 2



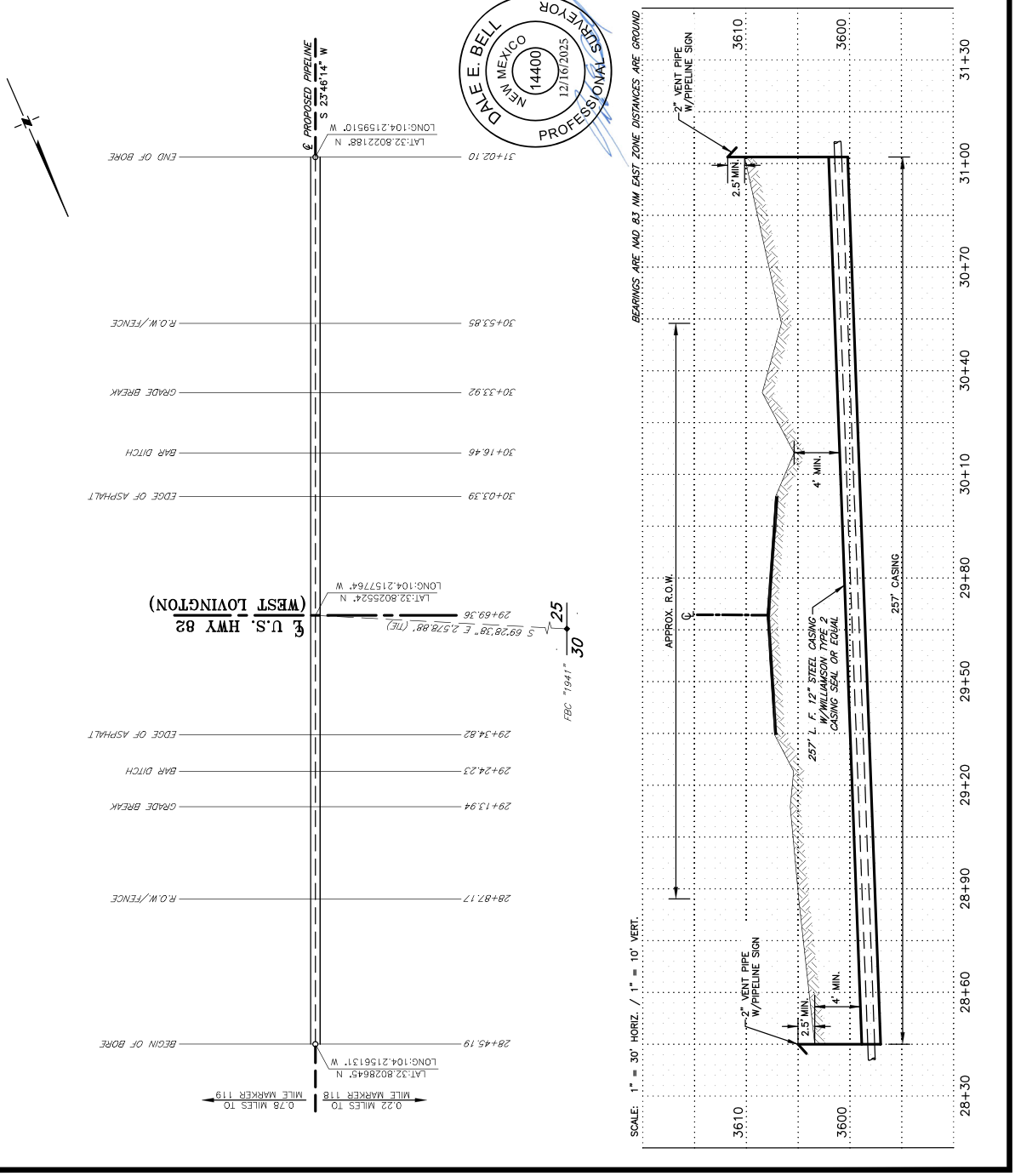


SPUR ENERGY PATRNERS, LLC.

FLOWLINE FOR THE BLACK CHERRY FED COM #110H
CROSSING U. S. HWY 82 (LOVINGTON HIGHWAY)
Section 30, T17S, R28E,
N. M. P. M., Eddy County, New Mexico.

RRC
ENERGY SERVICES, LLC.
701 S. CECIL ST., HOBBS, NM 88240 (575) 964-8200

DATE:12/01/2025	SURVEYED BY:RG/JA	
DWG. NO.:25110957	DRAWN BY: RQ	SCALE: SEE PROFILE
JOB NO.:LS25110957	APPR. BY:DEB	SHEET:1 OF 1



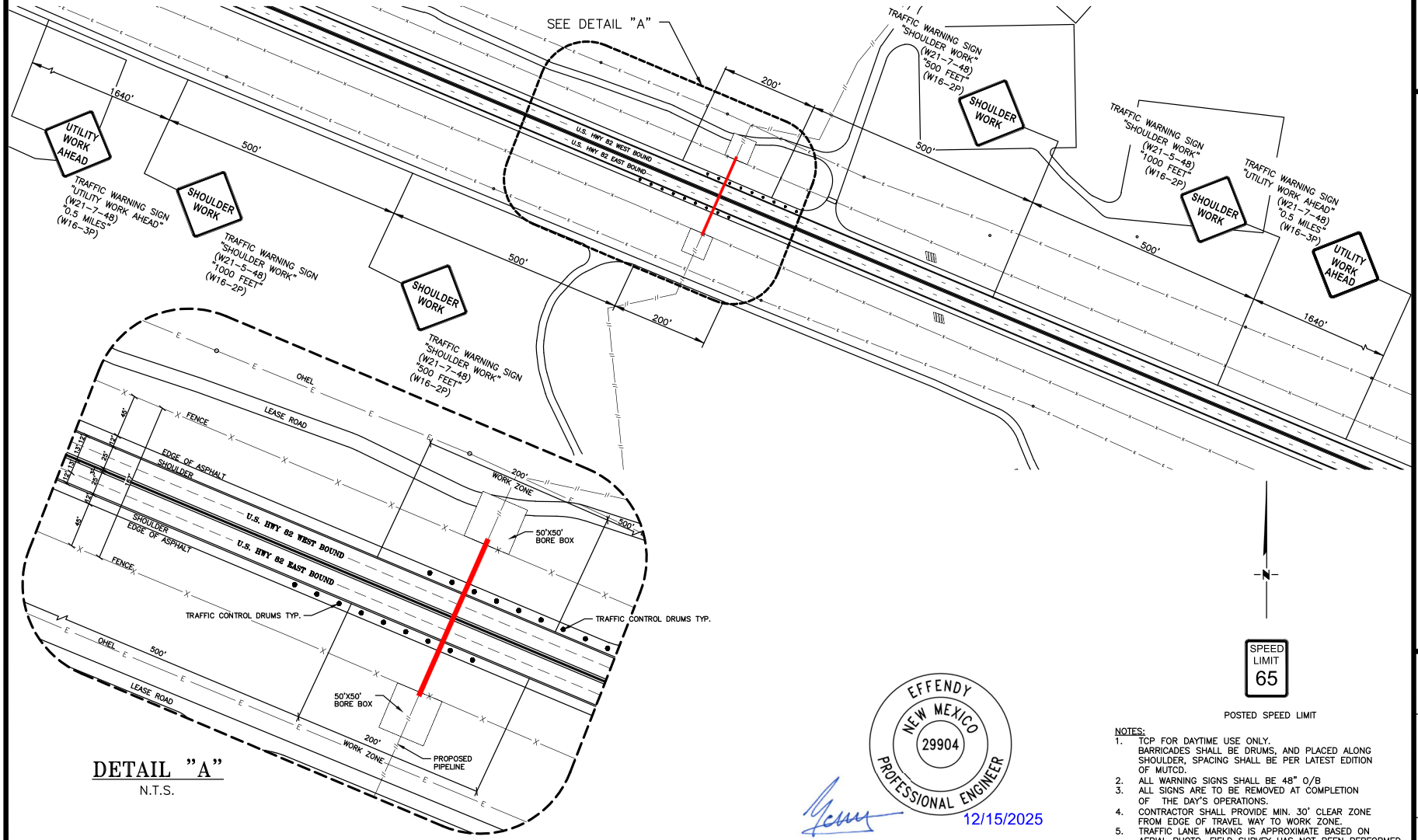
SPUR ENERGY PARTNERS, LLC.

TRAFFIC CONTROL PLAN

FLOWLINE FOR THE BLACK CHERRY FED COM #110H (BORE) CROSSING U.S. HWY 82 (LOVINGTON HWY)

SECTION 30, T17S, R28E

N. M. P. M., EDDY COUNTY, NEW MEXICO



DETAIL "A"

N.T.S.

EFFENDY NEW MEXICO 29904 PROFESSIONAL ENGINEER

12/15/2025

NOTES:

1. TCP FOR DAYTIME USE ONLY. BARRICADES SHALL BE DRUMS, AND PLACED ALONG SHOULDER, SPACING SHALL BE PER LATEST EDITION OF MUTCD.
2. ALL WARNING SIGNS SHALL BE 48" O/B
3. ALL SIGNS ARE TO BE REMOVED AT COMPLETION OF THE DAY'S OPERATIONS.
4. CONTRACTOR SHALL PROVIDE MIN. 30' CLEAR ZONE FROM EDGE OF TRAVEL WAY TO WORK ZONE.
5. TRAFFIC LANE MARKING IS APPROXIMATE BASED ON AERIAL PHOTO. FIELD SURVEY HAS NOT BEEN PERFORMED.

SCALE: N.T.S.
DATE: 12/01/2025
REVIEWED BY: RG/JA
DRAWN BY: RQ
APPROVED BY: DEB
SHEET: 1 OF 1

RRC ENERGY SERVICES, LLC.
701 S. CECIL ST., HOBBS, NM 88240 (575) 964-8200

NO.	REVISION	DATE

JOB NO.: LS25110957
DWG. NO.: 25110957-X2

Black Cherry Federal Com 110H developement - SEP Permian

Water Source Aerial

Well location: SWSW Section 30 T17S R30E

Hub Recycle Pit: NENE Section 36 T17S R30E

5.5 miles 32.79633889, -104.126000

Legend

- BLACK CHERRY FEDERAL COM 110H WELL LOCATION
- New Mexico
- Private
- US

Black Cherry Well Location

SEP HUB Recycle Pit

N

1 mi

Black Cherry Federal Com 110H developement - SEP Permian

Caliche Source Aerial

Well location: SWSW Section 30 T17S R30E

Caliche Pit: SENE Section 18 T18S R30E

3.5 miles 32.75009, -104.20823

Legend

- BLACK CHERRY FEDERAL COM 110H WELL LOCATION
- New Mexico
- Private
- US

Black Cherry Well Location

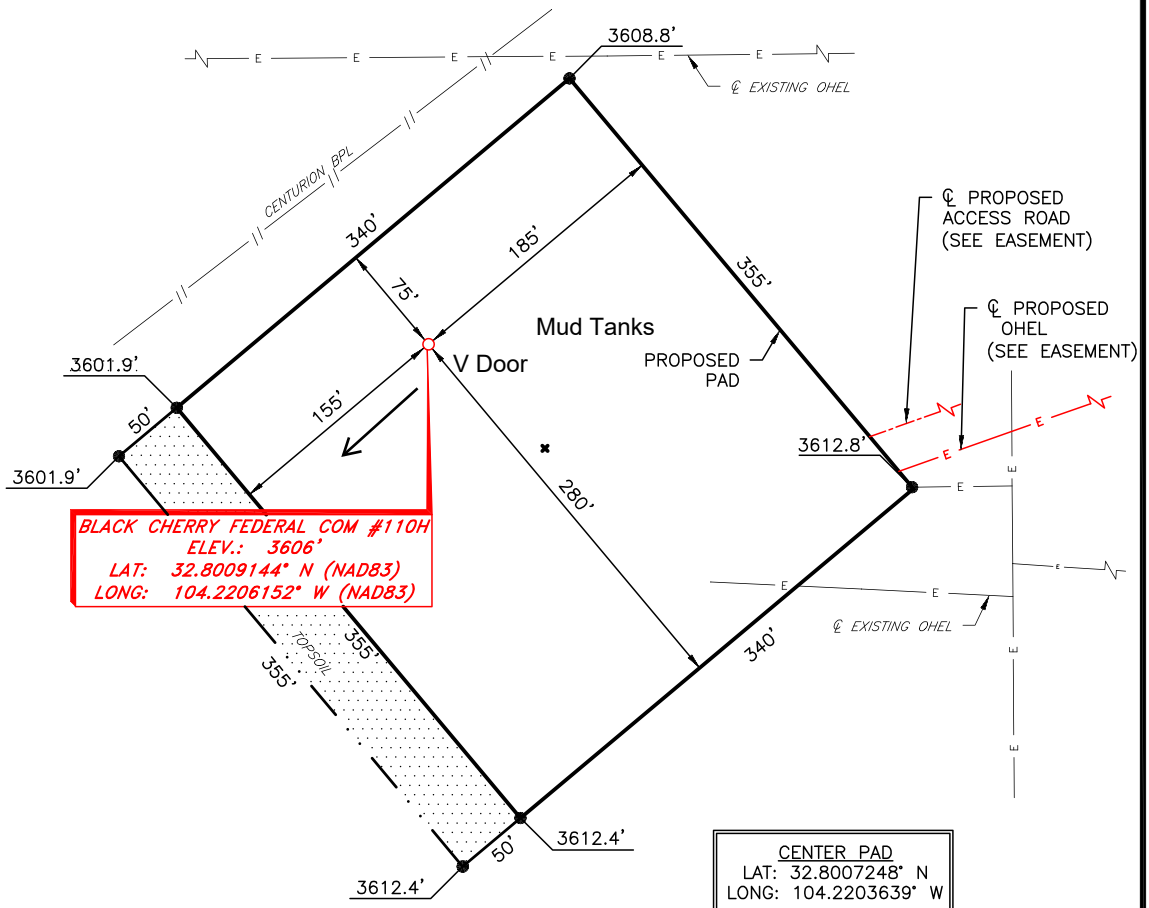
Artesia Natural Gas Plant

Caliche Source Pit

1 mi

N

SPUR ENERGY PARTNERS LLC.
BLACK CHERRY FEDERAL COM #110H
(1135' FSL & 920' FWL)
SECTION 30, T17S, R28E
N. M. P. M., EDDY CO., NEW MEXICO



DIRECTIONS TO LOCATION

From the intersection of U.S. Hwy 82 (Lovington Hwy) & CR #206 (Illinois Camp Rd.);

Go Northwest on U.S. Hwy 82 approx. 0.6 miles to a lease road on the left;

Turn left and go West approx. 0.7 miles to a lease road on the left:

Turn left and go South approx. 310 feet to a proposed road on the right;

Turn right and go Southwest approx. 0.2 miles to location on the right.

SCALE: 1" = 100'
0 50 100

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

I, Dale E. Bell, New Mexico Professional Surveyor No. 14400, do hereby certify that this Plat and the actual survey on the ground upon which it is based were performed by me or under my direct supervision; that I am responsible for this survey, said survey and plat meets the Minimum Standards for Land Surveying in the State of New Mexico and that it is true and correct to the best of my knowledge and belief.

Dale E. Bell NM PS 14400

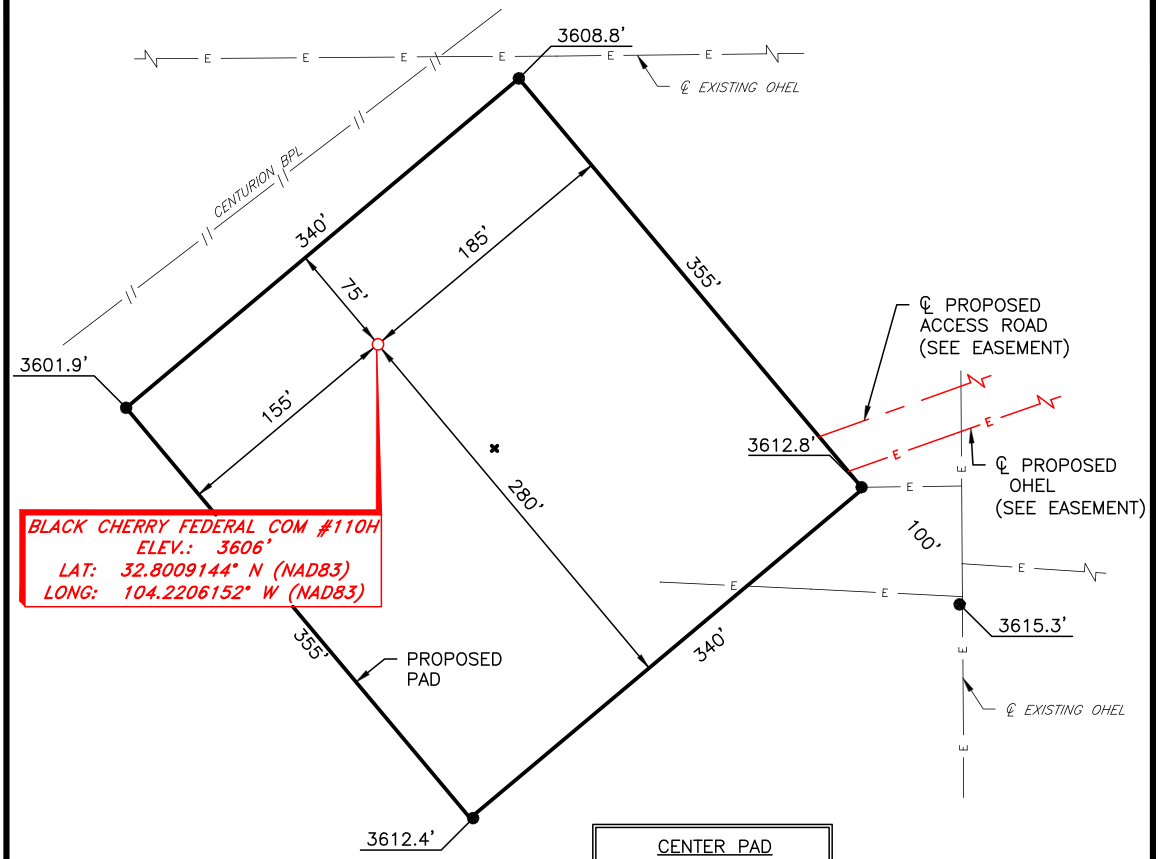
DALE E. BELL
NEW MEXICO
14400
02/19/2026
PROFESSIONAL SURVEYOR

NO.	REVISION	DATE
2	ADD TOPSOIL	2/19/26
1	REMOVE BATTERY	1/13/26
JOB NO.: LS25060528D1		
DWG. NO.: 25060528D1-5		

RRC ENERGY SERVICES, LLC.
701 S. CECIL ST., HOBBS, NM 88240 (575) 964-8200

SCALE:	1" = 100'
DATE:	06/26/2025
SURVEYED BY:	RG/JA
DRAWN BY:	RQ
APPROVED BY:	DEB
SHEET:	1 OF 1

SPUR ENERGY PARTNERS LLC.
BLACK CHERRY FEDERAL COM #110H
(1135' FSL & 920' FWL)
SECTION 30, T17S, R28E
N. M. P. M., EDDY CO., NEW MEXICO



CENTER PAD
LAT: 32.8007248° N
LONG: 104.2203639° W

DIRECTIONS TO LOCATION

From the intersection of U.S. Hwy 82 (Lovington Hwy) & CR #206 (Illinois Camp Rd.);

Go Northwest on U.S. Hwy 82 approx. 0.6 miles to a lease road on the left;

Turn left and go West approx. 0.7 miles to a lease road on the left:

Turn left and go South approx. 310 feet to a proposed road on the right;

Turn right and go Southwest approx. 0.2 miles to location on the right.

SCALE: 1" = 100'
0 50 100

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

I, Dale E. Bell, New Mexico Professional Surveyor No. 14400, do hereby certify that this Plat and the actual survey on the ground upon which it is based were performed by me or under my direct supervision; that I am responsible for this survey, said survey and plat meets the Minimum Standards for Land Surveying in the State of New Mexico and that it is true and correct to the best of my knowledge and belief.

Dale E. Bell NM PS 14400

DALE E. BELL
NEW MEXICO
14400
01/13/2026
PROFESSIONAL SURVEYOR

NO.	REVISION	DATE
1	REMOVE BATTERY	1/13/26

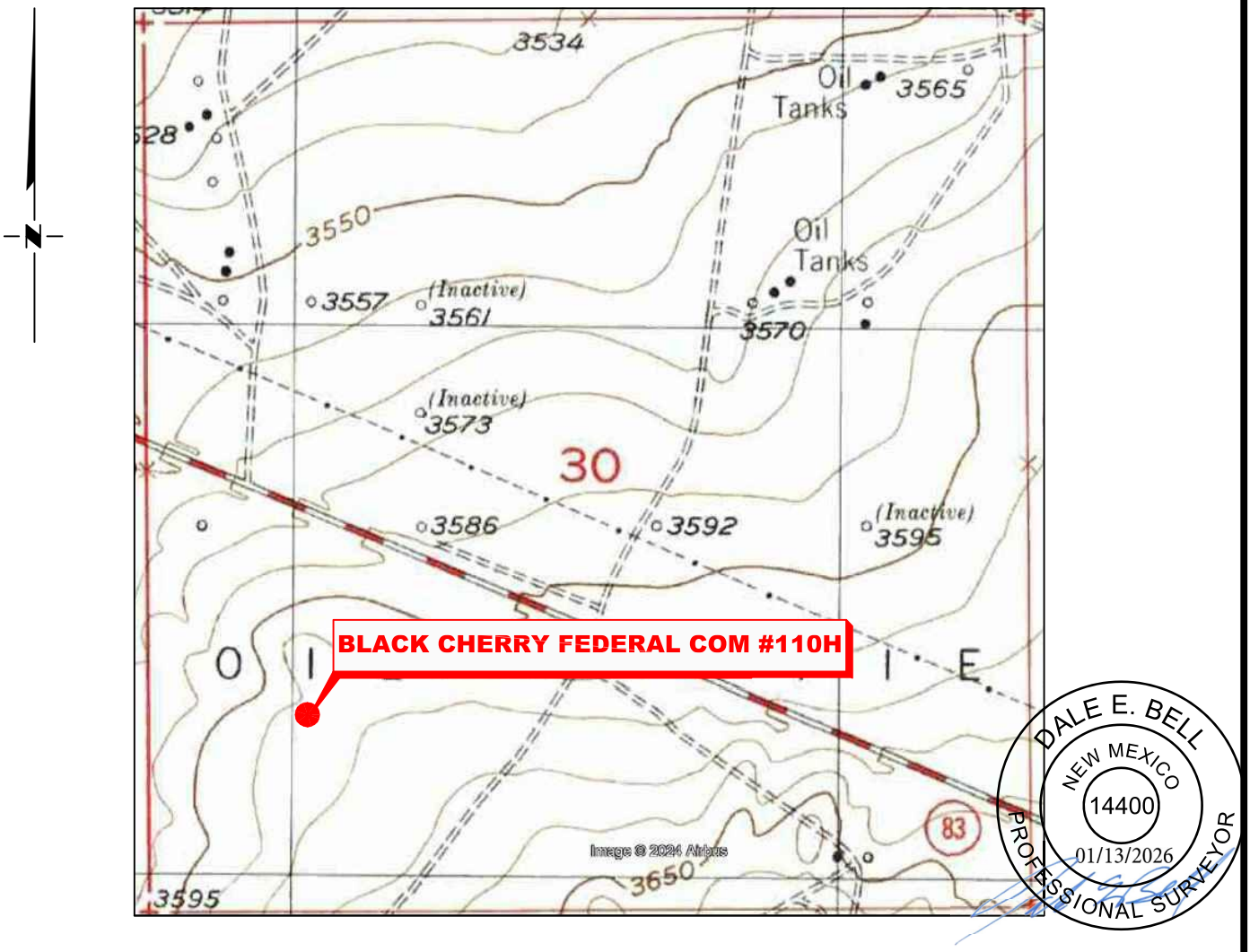
JOB NO.: LS25060528R1
DWG. NO.: 25060528R1–5

RRC ENERGY SERVICES, LLC.
701 S. CECIL ST., HOBBS, NM 88240 (575) 964–8200

SCALE: 1" = 100'
DATE: 06/26/2025
SURVEYED BY: RG/JA
DRAWN BY: RQ
APPROVED BY: DEB
SHEET: 1 OF 1

LOCATION VERIFICATION MAP

NOT TO SCALE



SECTION 30, TWP. 17 SOUTH, RGE. 28 EAST, N. M. P. M., EDDY CO., NEW MEXICO

OPERATOR: Spur Energy Partners LLC.
LEASE: Black Cherry Federal Com
WELL NO.: 110H
ELEVATION: 3606'

LOCATION: 1135' FSL & 920' FWL
CONTOUR INTERVAL: 10'
USGS TOPO. SOURCE MAP:
Red Lake, NM (1955)

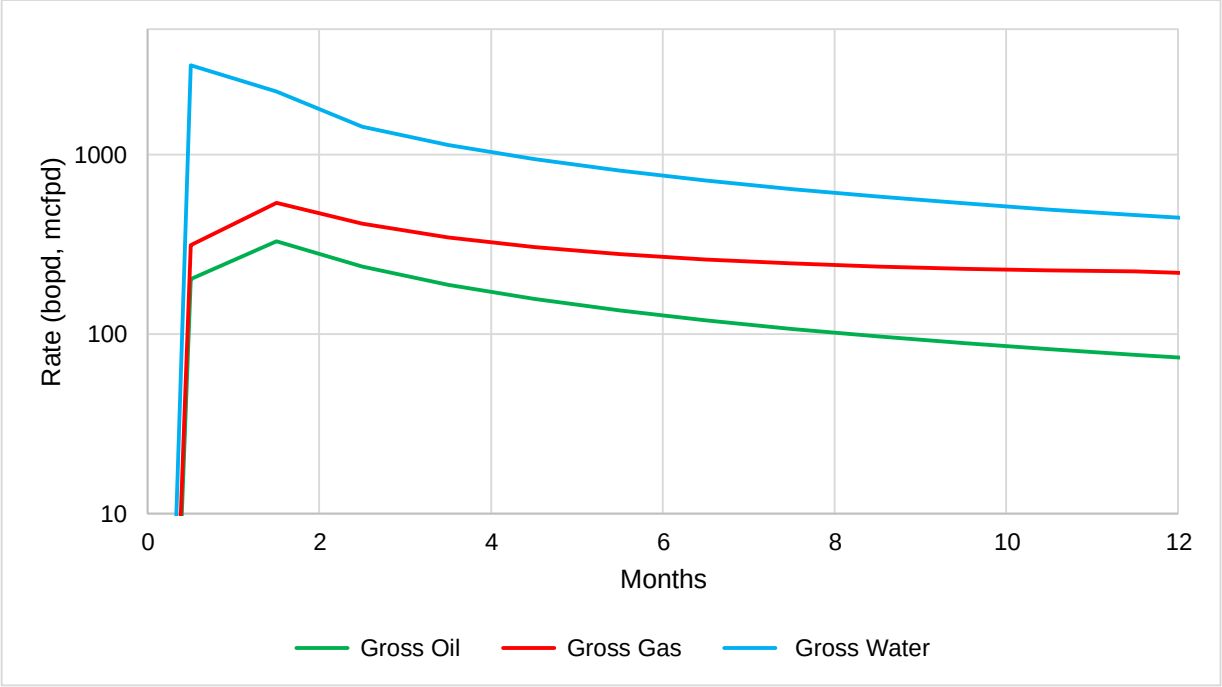
NO.	REVISION	DATE

JOB NO.: LS25060528
DWG. NO.: 25060528-3

RRC ENERGY SERVICES, LLC.
701 S. CECIL ST., HOBBS, NM 88240 (575) 964-8200

SCALE: N. T. S.
DATE: 06/26/2025
SURVEYED BY: RG/JA
DRAWN BY: RQ
APPROVED BY: DEB
SHEET: 1 OF 1

Loco Hills San Andres Type Curve



State of New Mexico
Energy, Minerals and Natural Resources Department

Submit Electronically
Via E-permitting

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

NATURAL GAS MANAGEMENT PLAN

This Natural Gas Management Plan must be submitted with each Application for Permit to Drill (APD) for a new or recompleted well.

Section 1 – Plan Description
Effective May 25, 2021

I. Operator: SPUR ENERGY PARTNERS LLC **OGRID:** 328947 **Date:** 01 / 13 / 2026

II. Type: ☒ Original ☐ Amendment due to ☐ 19.15.27.9.D(6)(a) NMAC ☐ 19.15.27.9.D(6)(b) NMAC ☐ Other.

If Other, please describe: _____

III. Well(s): Provide the following information for each new or recompleted well or set of wells proposed to be drilled or proposed to be recompleted from a single well pad or connected to a central delivery point.

Well Name	API	ULSTR	Footages	Anticipated Oil BBL/D	Anticipated Gas MCF/D	Anticipated Produced Water BBL/D
Black Cherry Federal Com 110H 30-015		M-30-17S-28E	1135' FSL 920' FWL	316 BBL/D	548 MCF/D	1897 BBL/D

IV. Central Delivery Point Name: SMITHDALE 29 FEDERAL COM TANK BATTERY [See 19.15.27.9(D)(1) NMAC]

V. Anticipated Schedule: Provide the following information for each new or recompleted well or set of wells proposed to be drilled or proposed to be recompleted from a single well pad or connected to a central delivery point.

Well Name	API	Spud Date	TD Reached Date	Completion Commencement Date	Initial Flow Back Date	First Production Date
Black Cherry Federal Com	110H 30-015	07/16/2026	07/21/2026	08/09/2026	08/13/2026	08/18/2026

VI. Separation Equipment: ☒ Attach a complete description of how Operator will size separation equipment to optimize gas capture.

VII. Operational Practices: ☒ Attach a complete description of the actions Operator will take to comply with the requirements of Subsection A through F of 19.15.27.8 NMAC.

VIII. Best Management Practices: ☒ Attach a complete description of Operator's best management practices to minimize venting during active and planned maintenance.

Section 2 – Enhanced Plan

EFFECTIVE APRIL 1, 2022

Beginning April 1, 2022, an operator that is not in compliance with its statewide natural gas capture requirement for the applicable reporting area must complete this section.

☒ Operator certifies that it is not required to complete this section because Operator is in compliance with its statewide natural gas capture requirement for the applicable reporting area.

IX. Anticipated Natural Gas Production:

Well	API	Anticipated Average Natural Gas Rate MCF/D	Anticipated Volume of Natural Gas for the First Year MCF

X. Natural Gas Gathering System (NGGS):

Operator	System	ULSTR of Tie-in	Anticipated Gathering Start Date	Available Maximum Daily Capacity of System Segment Tie-in

XI. Map. ☐ Attach an accurate and legible map depicting the location of the well(s), the anticipated pipeline route(s) connecting the production operations to the existing or planned interconnect of the natural gas gathering system(s), and the maximum daily capacity of the segment or portion of the natural gas gathering system(s) to which the well(s) will be connected.

XII. Line Capacity. The natural gas gathering system ☐ will ☐ will not have capacity to gather 100% of the anticipated natural gas production volume from the well prior to the date of first production.

XIII. Line Pressure. Operator ☐ does ☐ does not anticipate that its existing well(s) connected to the same segment, or portion, of the natural gas gathering system(s) described above will continue to meet anticipated increases in line pressure caused by the new well(s).

☐ Attach Operator's plan to manage production in response to the increased line pressure.

XIV. Confidentiality: ☒ Operator asserts confidentiality pursuant to Section 71-2-8 NMSA 1978 for the information provided in Section 2 as provided in Paragraph (2) of Subsection D of 19.15.27.9 NMAC, and attaches a full description of the specific information for which confidentiality is asserted and the basis for such assertion.

Section 3 - Certifications

Effective May 25, 2021

Operator certifies that, after reasonable inquiry and based on the available information at the time of submittal:

☒ Operator will be able to connect the well(s) to a natural gas gathering system in the general area with sufficient capacity to transport one hundred percent of the anticipated volume of natural gas produced from the well(s) commencing on the date of first production, taking into account the current and anticipated volumes of produced natural gas from other wells connected to the pipeline gathering system; or

☐ Operator will not be able to connect to a natural gas gathering system in the general area with sufficient capacity to transport one hundred percent of the anticipated volume of natural gas produced from the well(s) commencing on the date of first production, taking into account the current and anticipated volumes of produced natural gas from other wells connected to the pipeline gathering system. ***If Operator checks this box, Operator will select one of the following:***

Well Shut-In. ☐ Operator will shut-in and not produce the well until it submits the certification required by Paragraph (4) of Subsection D of 19.15.27.9 NMAC; or

Venting and Flaring Plan. ☐ Operator has attached a venting and flaring plan that evaluates and selects one or more of the potential alternative beneficial uses for the natural gas until a natural gas gathering system is available, including:

- **(a)** power generation on lease;
- **(b)** power generation for grid;
- **(c)** compression on lease;
- **(d)** liquids removal on lease;
- **(e)** reinjection for underground storage;
- **(f)** reinjection for temporary storage;
- **(g)** reinjection for enhanced oil recovery;
- **(h)** fuel cell production; and
- **(i)** other alternative beneficial uses approved by the division.

Section 4 - Notices

1. If, at any time after Operator submits this Natural Gas Management Plan and before the well is spud:

(a) Operator becomes aware that the natural gas gathering system it planned to connect the well(s) to has become unavailable or will not have capacity to transport one hundred percent of the production from the well(s), no later than 20 days after becoming aware of such information, Operator shall submit for OCD's approval a new or revised venting and flaring plan containing the information specified in Paragraph (5) of Subsection D of 19.15.27.9 NMAC; or

(b) Operator becomes aware that it has, cumulatively for the year, become out of compliance with its baseline natural gas capture rate or natural gas capture requirement, no later than 20 days after becoming aware of such information, Operator shall submit for OCD's approval a new or revised Natural Gas Management Plan for each well it plans to spud during the next 90 days containing the information specified in Paragraph (2) of Subsection D of 19.15.27.9 NMAC, and shall file an update for each Natural Gas Management Plan until Operator is back in compliance with its baseline natural gas capture rate or natural gas capture requirement.

2. OCD may deny or conditionally approve an APD if Operator does not make a certification, fails to submit an adequate venting and flaring plan which includes alternative beneficial uses for the anticipated volume of natural gas produced, or if OCD determines that Operator will not have adequate natural gas takeaway capacity at the time a well will be spud.

I certify that, after reasonable inquiry, the statements in and attached to this Natural Gas Management Plan are true and correct to the best of my knowledge and acknowledge that a false statement may be subject to civil and criminal penalties under the Oil and Gas Act.

Signature:	Sarah Savino
Printed Name:	SARAH SAVINO
Title:	REGULATORY DIRECTOR
E-mail Address:	SSAVINO@SPURENERGY.COM
Date:	01/13/2026
Phone:	832-960-8613

OIL CONSERVATION DIVISION

(Only applicable when submitted as a standalone form)

Approved By:	
Title:	
Approval Date:	
Conditions of Approval:	

Natural Gas Management Plan – Attachment

VI. Separation equipment will be sized by construction engineering staff based on anticipated daily production to ensure adequate capacity.

VII. Spur Energy Partners LLC ("Spur") will take the following actions to comply with the regulations listed in 19.15.27.8:

A. Spur will maximize the recovery of natural gas by minimizing waste, as defined by 19.15.2 NMAC, of natural gas through venting and flaring. Spur will ensure that our wells will be connected to a natural gas gathering system with sufficient capacity to transport natural gas.

B. All drilling operations will be equipped with a rig flare at least 100 feet from the nearest surface hole location. Rig flare will be utilized to combust any natural gas that is brought to surface during normal operations. In the case of emergency, flaring volumes will be reported appropriately.

C. During completion operations any natural gas brought to surface will be flared. Immediately following completion operations, wells will flow to permanent separation equipment. Produced natural gas from separation equipment will be sent to sales. If natural gas does not meet gathering pipeline specifications, Spur will flare for 60 days or until natural gas meets the pipeline specifications. Spur will ensure flare is properly sized and is equipped with an automatic igniter or continuous pilot. Gas samples will be taken twice per week and natural gas will be routed into a gathering system as soon as the pipeline specifications are met.

D. Natural gas will not be flared with the exception of 19.15.27.8(D)(1-4). If there is no adequate takeaway for the separator gas, wells will be shut-in until that natural gas gathering system is available with exception of emergency or malfunction situations. Volumes will be reported appropriately.

E. Spur will comply with performance standards pursuant to 19.15.27.8(E)(1-8). All equipment will be designed and sized to handle maximum pressures to minimize waste. Storage tanks constructed after May 25, 2021 will be equipped with an automatic gauging system that reduces venting of natural gas. Flare stacks installed or replaced after May 25, 2021 will be equipped with an automatic ignitor or continuous pilot. Spur will conduct AVO inspections as described in 19.15.27.8(E)(5)(a) with frequencies specified in 19.15.27.8(E)(5)(b) and (c). All emergencies or malfunctions will be resolved as quickly and safely as possible to minimize waste.

F. The volume of natural gas that is vented or flared as the result of an emergency or malfunction during drilling and/or completion operations will be estimated and reported accordingly. The volume of natural gas that is vented, flared or beneficially used during production operations, will be measured and reported accordingly. Spur will install equipment to measure the volume of natural gas flared from existing piping or a flowline piped from equipment such as high-pressure separators, heater treaters, or VRUs associated with a well or facility associated with a well authorized by an APD after May 25, 2021 that has an average daily production of less than 60,000 cubic feet of natural gas. If metering is not practicable due to circumstances such as low flow rate or low pressure venting or flaring, Spur will estimate the volume of flared or vented natural gas. Measuring equipment will conform to industry standards and will not be equipped with a manifold

that allows the diversion of natural gas around the metering element except for the sole purpose of inspecting and servicing equipment.

VIII. For maintenance activities involving production equipment and compression, venting be limited to the depressurization of the subject equipment to ensure safe working conditions. For maintenance of production equipment, the associated producing wells will be shut-in to eliminate venting. For maintenance of VRUs, all natural gas normally routed to the VRU will be routed to flare.

Surface Use Plan of Operations

Operator Name/Number: Spur energy Partners LLC – 328947

Lease Name/Well Number: Black Cherry Federal Com 110H

Pool Name/Number: Red Lake; Queen-Grayburg-San Andres (51300)

Surface Location: 1135' FSL 7920' FWL SWSW (M) Sec 30 T17S R28E – FEE SURFACE

Bottom Location: 1885' FSL 50' FWL NWSW (L) Sec 25 T17S R27E – NMNM094593

1. **Existing Roads**
    a. A copy of the Vicinity Map is attached showing the proposed location. The well location is spotted on the map, which shows the existing road system.
    b. This well was staked by Dale Bell, Certificate No. 14400 on June 26, 2025, certified on January 13, 2026.
    c. Directions to location: From the intersection of U.S. Hwy 82 (Lovington Hwy) & CR #206 (Illinois Comp Rd.); go northwest on U.S. Hwy 82 approx. 0.6 miles to a lease road on the left; turn left and go west approx. 0.7 miles to a lease road on the left; turn left and go south approx. 310 feet to a proposed road on the right; turn right and go southwest approx. 0.2 miles to location on the right.
2. **New or Reconstructed Access Roads**
    a. One new access road will be built as follows: A strip of land 30 feet wide, being 881.14 feet in length, lying in Section 30, Township 17 South, Range 28 East, N.M.P.M., Eddy County, New Mexico being 15 feet left and 15 feet right of the described survey of a centerline across the lands of COG Operating LLC & Concho Oil & Gas LLC., according to a deed filed for record in Book 1012, Page 370 of the Deed Records of Eddy County, New Mexico.
    b. The maximum width of the road will be 14'. It will be crowned and made up of 6" compacted caliche. Water will be deflected as necessary, to avoid accumulation and prevent surface erosion.
    c. Surface material will be native caliche obtained from a BLM approved pit nearest proximity to the location. The maximum grade will be 2%.
    d. No cattle guards will be required.
    e. Blade, water, and repair existing caliche roads when necessary.
3. **Location of Existing Wells**
    a. Existing wells within one-mile radius of proposed well are shown on attached plat.
4. **Location of Proposed Facilities**
    a. In the event the well is found to be productive, the existing Smithdale 29 Federal Com Tank Battery would be utilized and the necessary production equipment will be installed at the existing tank battery. See proposed facilities layout diagram.
    b. The flowlines will follow a route approved by the BLM. Each well will have two (2) 4" surface flowlines operating at less than 125 psi. The flowlines will be routed to the Smithdale 29 Federal Com Tank Battery. The wells will produce into this battery at any given time. A strip of land 30 feet wide, being 4,515 feet in length, lying in Section 30, Township 17 South, Range 28 East, N.M.P.M., Eddy County, New Mexico being 15 feet left and 15 feet right of the described survey of a centerline across the lands of COG Operating LLC & Concho Oil & Gas LLC., according to a deed filed for record in Book 1012, Page 370 of the Deed Records of Eddy County, New Mexico. Traffic control plan for the planned Road Bore crossing U.S. Hwy 82 (Lovington Hwy) can be found here within.

c. The overhead electric line will follow a route approved by the BLM. Survey a strip of land 30 feet wide, being 66.36 feet in length, lying in Section 30, Township 17 South, Range 28 East, N.M.P.M., Eddy County, New Mexico being 15 feet left and 15 feet right of the described survey of a centerline across the lands of COG Operating LLC & Concho Oil & Gas LLC., according to a deed filed for record in Book 1012, Page 370 of the Deed Records of Eddy County, New Mexico. If Spur is unable to energize the CVE meter, we will install natural gas generators to power the wells to the facility. A strip of land 30 feet wide, being 996.10 feet in length lying in Section 30, Township 17 South, Range 28 East, N.M.P.M., Eddy County, New Mexico being 15 feet left and 15 feet right of the described survey of a centerline across the lands of COG Operating LLC & Concho Oil & Gas LLC., according to a deed filed for record in Book 1012, Page 370 of the Deed Records of Eddy County, New Mexico.

d. See attached for additional information on the Smithdale 29 Federal Com Tank Battery.

5. Location and types of Water Supply

a. Water for the Black Cherry Federal Com 110H well will be trucked from The Hub (previously known as the Ramirez) Frac Pond owned by Spur located in Unit B NW4/NE4 Section 36, Township 17 South, Range 27 East, Eddy County, NM. Private Surface (32.79633889, -104.126000).

6. Construction Materials

a. All caliche for the drilling pad and proposed access road will be obtained from an existing BLM/State/Fee approved pit from prevailing deposits found on location. Spur will utilize an existing caliche pit located in Unit H SE4/NE4, Section 18, Township 18 South, Range 30 East, Eddy County, NM. (32.75009, -104.20823).

7. Methods of Handling Waste Material

a. A closed loop system will be utilized consisting of above ground steel tanks and haul-off bins. Disposal of drilling fluids and cuttings will be disposed of at an approved facility. Solids and Liquids – R360.

b. All trash, junk and other waste material will be contained in trash cans or bins to prevent scattering. When the job is completed, all contents will be removed and disposed of in an approved sanitary landfill.

c. The supplier, including broken sacks, will pick up remaining slats after the completion of the well.

d. A port-a-potty will be provided for the rig crews. The equipment will be properly maintained during the drilling and completion operations and removed when the operations are complete.

e. Disposal of fluids will be transported by the following companies:

i. Mulholland
ii. R360
iii. AR Services

8. Ancillary Facilities: None needed

9. Well-Site Layout

V-Door: Southeast CL Tanks: Southeast Pad: 355’ X 340’ – 1 well pad

10. Plans for Surface Reclamation

a. After concluding drilling and/or completion operations, if the well is non-commercial, the caliche will be removed from the pad and transported to the original caliche pit or used for other drilling locations. The road will be reclaimed as directed by the BLM COAs. The original topsoil will again be returned to the pad and contoured, as close as possible to the original topography, and the area will be seeded with an approved BLM mixture to re-establish vegetation.

b. If the well is deemed commercially productive, caliche from the areas of the pad site not required for operations will be reclaimed. The original topsoil will be returned to the area of the drill pad not necessary to operate the well. The unused areas of the drill pad will be re-contoured as close as possible to the original topography, and the area will be seeded with an approved BLM mixture to re-establish vegetation.

11. Surface Ownership

a. The surface is owned by the COG Operating LLC c/o ConocoPhillips Attn: Brian Hall, Staff Surface Land Negotiator, Company Owned Surface, 600 W. Illinois Ave., Suite 1CC-934, Midland, Texas 79701 (432) 688-6913. They will be notified of our intention to drill prior to any activity.

12. Other Information

a. The vegetation cover is generally sparse consisting of mesquite, yucca, shinery oak, sandsage and perennial native range grass. The topsoil is sandy in nature. Wildlife in the area is also sparse consisting of deer, coyotes, rabbits, reptiles, dove and quail.

b. There is no permanent or live water in the general proximity of the location.

c. There are no dwellings within one mile of the proposed well site.

13. Bond Information

a. Bond coverage is individual – NMB001783

14. Operator Representatives

JP Hermes
Superintendent of Operations
2407 Pecos Avenue
Artesia, NM 88210
Cellular: 575-748-5234

John Nabors
Executive VP of Operations
9655 Katy Freeway, Suite 500
Houston, TX 77024
Cellular: 281-904-8811
Office: 832-930-8526

Nash Bell
VP Land
9655 Katy Freeway, Suite 500
Houston, TX 77024
Cellular: 512-461-1874
Office: 832-930-8582

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

PWD Data Report
03/30/2026

APD ID: 10400109646 **Submission Date:** 01/21/2026

Operator Name: SPUR ENERGY PARTNERS LLC

Well Name: BLACK CHERRY FEDERAL COM **Well Number:** 110H

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

Section 1 - General

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

Section 2 - Lined

Would you like to utilize Lined Pit PWD options? N

Produced Water Disposal (PWD) Location:

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

Other PWD Surface Owner Description:

Lined pit PWD on or off channel:

Lined pit PWD discharge volume (bbl/day):

Lined pit

Pit liner description:

Pit liner manufacturers

Precipitated solids disposal:

Decribe precipitated solids disposal:

Precipitated solids disposal

Lined pit precipitated solids disposal schedule:

Lined pit precipitated solids disposal schedule

Lined pit reclamation description:

Lined pit reclamation

Leak detection system description:

Leak detection system

Operator Name: SPUR ENERGY PARTNERS LLC

Well Name: BLACK CHERRY FEDERAL COM **Well Number:** 110H

Lined pit Monitor description:

Lined pit Monitor

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

Section 3 - Unlined

Would you like to utilize Unlined Pit PWD options? N

Produced Water Disposal (PWD) Location:

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

Other PWD Surface Owner Description:

Unlined pit PWD on or off channel:

Unlined pit PWD discharge volume (bbl/day):

Unlined pit

Precipitated solids disposal:

Decribe precipitated solids disposal:

Precipitated solids disposal

Unlined pit precipitated solids disposal schedule:

Unlined pit precipitated solids disposal schedule

Unlined pit reclamation description:

Unlined pit reclamation

Unlined pit Monitor description:

Unlined pit Monitor

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

Beneficial use user

Estimated depth of the shallowest aquifer (feet):

Precipitated Solids Permit

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

Operator Name: SPUR ENERGY PARTNERS LLC

Well Name: BLACK CHERRY FEDERAL COM **Well Number:** 110H

State

Unlined Produced Water Pit Estimated

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

Section 4 -

Would you like to utilize Injection PWD options? N

Produced Water Disposal (PWD) Location:

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

Other PWD Surface Owner Description:

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

Underground Injection Control (UIC) Permit?

UIC Permit

Section 5 - Surface

Would you like to utilize Surface Discharge PWD options? N

Produced Water Disposal (PWD) Location:

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

Other PWD Surface Owner Description :

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:

Operator Name: SPUR ENERGY PARTNERS LLC

Well Name: BLACK CHERRY FEDERAL COM **Well Number:** 110H

Section 6 -

Would you like to utilize Other PWD options? N

Produced Water Disposal (PWD) Location:

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

PWD Surface Owner Description:

Other PWD discharge volume (bbl/day):

Other PWD type description:

Other PWD type

Have other regulatory requirements been met?

Other regulatory requirements

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

Bond Info Data
03/30/2026

APD ID: 10400109646
Submission Date: 01/21/2026
Operator Name: SPUR ENERGY PARTNERS LLC
Well Name: BLACK CHERRY FEDERAL COM
Well Number: 110H
Well Type: OIL WELL
Well Work Type: Drill

Highlighted data reflects the most recent changes
Show Final Text

Bond

Federal/Indian APD: FED

BLM Bond number: NMB001783

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 amount:

Reclamation bond rider amount:

Additional reclamation bond information attachment:

Sante Fe Main Office
Phone: (505) 476-3441

General Information
Phone: (505) 629-6116

Online Phone Directory
https://www.emnrd.nm.gov/ocd/contact-us

State of New Mexico
Energy, Minerals and Natural Resources
Oil Conservation Division
1220 S. St Francis Dr.
Santa Fe, NM 87505

ACKNOWLEDGMENTS

Operator: Spur Energy Partners LLC 9655 Katy Freeway Houston, TX 77024	OGRID: 328947
	Action Number: 568712
	Action Type: [C-101] BLM - Federal/Indian Land Lease (Form 3160-3)

ACKNOWLEDGMENTS

☑	I hereby certify that no additives containing PFAS chemicals will be added to the completion or recompletion of this well.

Sante Fe Main Office
Phone: (505) 476-3441

General Information
Phone: (505) 629-6116

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State of New Mexico
Energy, Minerals and Natural Resources
Oil Conservation Division
1220 S. St Francis Dr.
Santa Fe, NM 87505

CONDITIONS

Action 568712

CONDITIONS

Operator: Spur Energy Partners LLC 9655 Katy Freeway Houston, TX 77024	OGRID: 328947
	Action Number: 568712
	Action Type: [C-101] BLM - Federal/Indian Land Lease (Form 3160-3)

CONDITIONS

Created By	Condition	Condition Date
schapman01	Cement is required to circulate on both surface and intermediate1 strings of casing.	3/30/2026
schapman01	If cement does not circulate on any string, a Cement Bond Log (CBL) is required for that string of casing.	3/30/2026
ward.rikala	Notify the OCD 24 hours prior to casing & cement.	4/17/2026
ward.rikala	File As Drilled C-102 and a directional Survey with C-104 completion packet.	4/17/2026
ward.rikala	Once the well is spud, to prevent ground water contamination through whole or partial conduits from the surface, the operator shall drill without interruption through the fresh water zone or zones and shall immediately set in cement the water protection string.	4/17/2026
ward.rikala	Oil base muds are not to be used until fresh water zones are cased and cemented providing isolation from the oil or diesel. This includes synthetic oils. Oil based mud, drilling fluids and solids must be contained in a steel closed loop system.	4/17/2026
ward.rikala	If the method of isolation was not by circulation, a CBL must be performed; if strata isolation is not achieved, then remediation will be required before further operations.	4/17/2026