

NATIONAL CONSERVATION
ARTESIA DISTRICT

FEB 15 2016

Form 3160-3
(March 2012)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

APPLICATION FOR PERMIT TO DRILL OR REENTER

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

1a. Type of work: ☒ DRILL ☐ REENTER		5. Lease Serial No. NMNM89055
1b. Type of Well: ☒ Oil Well ☐ Gas Well ☐ Other ☒ Single Zone ☐ Multiple Zone		6. If Indian, Allottee or Tribe Name
2. Name of Operator DEVON ENERGY PRODUCTION COMPANY LP		7. If Unit or CA Agreement, Name and No. NMNM70928X
3a. Address 333 West Sheridan Avenue Oklahoma City OK		8. Lease Name and Well No. COTTON DRAW UNIT 515H 300635
3b. Phone No. (include area code) (405)552-6571		9. API Well No. 30-015-44216
4. Location of Well (Report location clearly and in accordance with any State requirements.) At surface NENE / 485 FNL / 410 FEL / LAT 32.1942688 / LONG -103.7242973 At proposed prod. zone LOT 4 / 200 FSL / 330 FEL / LAT 32.1671358 / LONG -103.7240238		10. Field and Pool, or Exploratory PADUCA / BONE SPRING (OIL)
14. Distance in miles and direction from nearest town or post office*		11. Sec., T. R. M. or Blk. and Survey or Area SEC 25 / T24S / R31E / NMP
15. Distance from proposed* location to nearest property or lease line, ft. (Also to nearest drig. unit line, if any) 200 feet	16. No. of acres in lease 160	12. County or Parish EDDY
17. Spacing Unit dedicated to this well 320	13. State NM	
18. Distance from proposed location* to nearest well, drilling, completed, 700 feet applied for, on this lease, ft.	19. Proposed Depth 9300 feet / 16800 feet	20. BLM/BIA Bond No. on file FED: CO1104
21. Elevations (Show whether DF, KDB, RT, GL, etc.) 3541 feet	22. Approximate date work will start* 04/17/2018	23. Estimated duration 30 days

24. Attachments

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

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

25. Signature (Electronic Submission)	Name (Printed/Typed) Linda Good / Ph: (405)552-6558	Date 08/28/2017
Title Regulatory Compliance Professional		
Approved by (Signature) (Electronic Submission)	Name (Printed/Typed) Cody Layton / Ph: (575)234-5959	Date 02/08/2018
Title Supervisor Multiple Resources		

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

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

(Continued on page 2)

*(Instructions on page 2)

APPROVED WITH CONDITIONS
Approval Date: 02/08/2018

RUP 2-20-18.

INSTRUCTIONS

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

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

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

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

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

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

NOTICES

The Privacy Act of 1974 and regulation in 43 CFR 2.48(d) provide that you be furnished the following information in connection with information required by this application.

AUTHORITY: 30 U.S.C. 181 et seq., 25 U.S.C. 396, 43 CFR 3160

PRINCIPAL PURPOSES: The information will be used to: (1) process and evaluate your application for a permit to drill a new oil, gas, or service well or to reenter a plugged and abandoned well; and (2) document, for administrative use, information for the management, disposal and use of National Resource Lands and resources including (a) analyzing your proposal to discover and extract the Federal or Indian resources encountered; (b) reviewing procedures and equipment and the projected impact on the land involved; and (c) evaluating the effects of the proposed operation on the surface and subsurface water and other environmental impacts.

ROUTINE USE: Information from the record and/or the record will be transferred to appropriate Federal, State, and local or foreign agencies, when relevant to civil, criminal or regulatory investigations or prosecution, in connection with congressional inquiries and for regulatory responsibilities.

EFFECT OF NOT PROVIDING INFORMATION: Filing of this application and disclosure of the information is mandatory only if you elect to initiate a drilling or reentry operation on an oil and gas lease.

The Paperwork Reduction Act of 1995 requires us to inform you that:

The BLM collects this information to allow evaluation of the technical, safety, and environmental factors involved with drilling for oil and/or gas on Federal and Indian oil and gas leases. This information will be used to analyze and approve applications.

Response to this request is mandatory only if the operator elects to initiate drilling or reentry operations on an oil and gas lease.

The BLM would like you to know that you do not have to respond to this or any other Federal agency-sponsored information collection unless it displays a currently valid OMB control number.

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

Additional Operator Remarks

Location of Well

1. SHL: NENE / 485 FNL / 410 FEL / TWSP: 24S / RANGE: 31E / SECTION: 25 / LAT: 32.1942688 / LONG: -103.7242973 (TVD: 0 feet, MD: 0 feet)
PPP: SESE / 0 FSL / 438 FEL / TWSP: 24S / RANGE: 31E / SECTION: 25 / LAT: 32.181062 / LONG: -103.724385 (TVD: 9315 feet, MD: 14200 feet)
PPP: NENE / 330 FNL / 393 FEL / TWSP: 24S / RANGE: 31E / SECTION: 25 / LAT: 32.1942688 / LONG: -103.7242973 (TVD: 9217 feet, MD: 9345 feet)
BHL: LOT 4 / 200 FSL / 330 FEL / TWSP: 24S / RANGE: 31E / SECTION: 36 / LAT: 32.1671358 / LONG: -103.7240238 (TVD: 9300 feet, MD: 16800 feet)

BLM Point of Contact

Name: Priscilla Perez

Title: Legal Instruments Examiner

Phone: 5752345934

Email: pperez@blm.gov

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Review and Appeal Rights

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

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PECOS DISTRICT DRILLING CONDITIONS OF APPROVAL

OPERATOR'S NAME:	Devon Energy Production Company, L.P.
LEASE NO.:	NMNM-89055
WELL NAME & NO.:	Cotton Draw Unit 515H
SURFACE HOLE FOOTAGE:	0485' FNL & 0410' FEL
BOTTOM HOLE FOOTAGE	0200' FSL & 0330' FEL Sec. 36, T. 24 S., R 31 E.
LOCATION:	Section 25, T. 24 S., R 31 E., NMPM
COUNTY:	County, New Mexico

Commercial Well Determination

A commercial well determination shall be submitted after production has been established for at least six months.

Unit Wells

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. 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.

I. DRILLING

A. DRILLING OPERATIONS REQUIREMENTS

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

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

☐ **Eddy County**

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

1. **Although Hydrogen Sulfide has not been reported in the area, it is always a potential hazard. If Hydrogen Sulfide is encountered, report measured amounts and formations to the BLM. Operator has stated that they will have monitoring equipment in place prior to drilling out of the surface shoe.**
2. 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. **If the drilling rig is removed without approval – an Incident of Non-Compliance will be written and will be a “Major” violation.**

3. Floor controls are required for 3M or Greater systems. These controls will be on the rig floor, unobstructed, readily accessible to the driller and will be operational at all times during drilling and/or completion activities. Rig floor is defined as the area immediately around the rotary table; the area immediately above the substructure on which the draw works is located, this does not include the dog house or stairway area.
4. 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.

B. CASING

Changes to the approved APD casing program need prior approval if the items substituted are of lesser grade or different casing size. The Operator can exchange the components of the proposal with that of superior strength (i.e. changing from J-55 to N-80, or from 36# to 40#). Changes to the approved cement program need prior approval if the altered cement plan has less volume or strength or if the changes are substantial (i.e. Multistage tool, ECP, etc.).

Centralizers required on surface casing per Onshore Order 2.III.B.1.f.

Wait on cement (WOC) for Water Basin:

After cementing but before commencing any tests, the casing string shall stand cemented under pressure until both of the following conditions have been met: 1) cement reaches a minimum compressive strength of 500 psi at the shoe, 2) until cement has been in place at least **8 hours**. WOC time will be recorded in the driller's log. See individual casing strings for details regarding lead cement slurry requirements.

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.

No pea gravel permitted for remedial or fall back remedial without prior authorization from the BLM engineer.

Possibility of water flows in the Salado and Castile.

Possibility of lost circulation in the Red Beds, Rustler, and Delaware.

1. The 13-3/8 inch surface casing shall be set at approximately 725 feet (**in a competent bed below the Magenta Dolomite, which is a Member of the Rustler, and if salt is encountered, set casing at least 25 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 is to include the lead cement slurry.**
 - c. Wait on cement (WOC) time for a remedial job will be a minimum of 4 hours after bringing cement to surface or 500 pounds compressive strength, whichever is greater.
 - d. If cement falls back, remedial cementing will be done prior to drilling out that string.

Intermediate casing shall be kept fluid filled while running into hole to meet BLM minimum collapse requirements.

2. The minimum required fill of cement behind the 9-5/8 inch intermediate casing is:

- ☐ Cement to surface. If cement does not circulate see B.1.a, c-d above. **Excess calculates to 24% - Additional cement may be required.**

Centralizers required on horizontal leg, must be type for horizontal service and a minimum of one every other joint.

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

- ☐ Cement should tie-back at least 200 feet into previous casing string. Operator shall provide method of verification.

4. 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.

C. PRESSURE CONTROL

1. All blowout preventer (BOP) and related equipment (BOPE) shall comply with well control requirements as described in Onshore Oil and Gas Order No. 2 and API RP 53 Sec. 17.
2. Variance approved to use flex line from BOP to choke manifold. Check condition of flexible line from BOP to choke manifold, replace if exterior is damaged or if line fails test. Line to be as straight as possible with no hard bends and is to be anchored according to Manufacturer's requirements. The flexible hose can be exchanged with a hose of equal size and equal or greater pressure rating. **Anchor requirements, specification sheet and hydrostatic pressure test certification matching the hose in service, to be onsite for review. These documents shall be posted in the company man's trailer and on the rig floor.** If the BLM inspector questions the straightness of the hose, a BLM engineer will be contacted and will review in the field or via picture supplied by inspector to determine if changes are required (operator shall expect delays if this occurs).

If multibowl wellhead is used:

3. **Operator has proposed a multi-bowl wellhead assembly. This assembly will only be tested when installed on the surface casing. Minimum working pressure of the blowout preventer (BOP) and related equipment (BOPE) required for drilling below the surface casing shoe shall be psi.**
 - a. **Wellhead shall be installed by manufacturer's representatives, submit documentation with subsequent sundry.**
 - b. **If the welding is performed by a third party, the manufacturer's representative shall monitor the temperature to verify that it does not exceed the maximum temperature of the seal.**
 - c. **Manufacturer representative shall install the test plug for the initial BOP test.**
 - d. **Operator shall perform the intermediate casing integrity test to 70% of the casing burst. This will test the multi-bowl seals.**
 - 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.**

If non multibowl well head is used:

4. Minimum working pressure of the blowout preventer (BOP) and related equipment (BOPE) required for drilling below the surface casing shoe shall be psi.
 - a. **For surface casing only:** If the BOP/BOPE is to be tested against casing, the wait on cement (WOC) time for that casing is to be met (see WOC statement at start of casing section). Independent service company required.

5. The appropriate BLM office shall be notified a minimum of hours in advance for a representative to witness the tests.
 - a. In a water basin, for all casing strings utilizing slips, these are to be set as soon as the crew and rig are ready and any fallback cement remediation has been done. The casing cut-off and BOP installation can be initiated four hours after installing the slips, which will be approximately six hours after bumping the plug. For those casing strings not using slips, the minimum wait time before cut-off is eight hours after bumping the plug. BOP/BOPE testing can begin after cut-off or once cement reaches 500 psi compressive strength (including lead when specified), whichever is greater. However, if the float does not hold, cut-off cannot be initiated until cement reaches 500 psi compressive strength (including lead when specified).
 - a. The tests shall be done by an independent service company utilizing a test plug **not a cup or J-packer**. The operator also has the option of utilizing an independent tester to test without a plug (i.e. against the casing) pursuant to Onshore Order 2 with the pressure not to exceed 70% of the burst rating for the casing. Any test against the casing must meet the WOC time for water basin (8 hours) or potash (24 hours) or 500 pounds compressive strength, whichever is greater, prior to initiating the test (see casing segment as lead cement may be critical item).
 - b. 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.
 - c. The results of the test shall be reported to the appropriate BLM office.
 - d. 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.**
 - e. 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.

D. DRILL STEM TEST

If drill stem tests are performed, Onshore Order 2.III.D shall be followed.

E. WASTE MATERIAL AND FLUIDS

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

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

JAM 011318

PECOS DISTRICT SURFACE USE CONDITIONS OF APPROVAL

OPERATOR'S NAME:	DEVON ENERGY PRODUCTION
LEASE NO.:	NMNM89055
WELL NAME & NO.:	515H – COTTON DRAW UNIT
SURFACE HOLE FOOTAGE:	485'/N & 410'/E
BOTTOM HOLE FOOTAGE	200'/S & 330'/E
LOCATION:	Section 25.,T24S., R.31E., NMP
COUNTY:	EDDY County, New Mexico

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

- ☐ **General Provisions**
- ☐ **Permit Expiration**
- ☐ **Archaeology, Paleontology, and Historical Sites**
- ☐ **Noxious Weeds**
- ☒ **Special Requirements**
 - Lesser Prairie-Chicken Timing Stipulations
 - Ground-level Abandoned Well Marker
 - Range
- ☐ **Construction**
 - Notification
 - Topsoil
 - Closed Loop System
 - Federal Mineral Material Pits
 - Well Pads
 - Roads
- ☐ **Road Section Diagram**
- ☒ **Production (Post Drilling)**
 - Well Structures & Facilities
 - Pipelines
 - Electric Lines
- ☐ **Interim Reclamation**
- ☐ **Final Abandonment & Reclamation**

I. GENERAL PROVISIONS

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

II. PERMIT EXPIRATION

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

III. ARCHAEOLOGICAL, PALEONTOLOGY & HISTORICAL SITES

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

IV. NOXIOUS WEEDS

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

V. SPECIAL REQUIREMENT(S)

In May 2008, the Pecos District Special Status Species Resource Management Plan Amendment (RMPA) was approved and is being implemented. In addition to the standard practices that minimize impacts, as listed above, the following COA will apply:

- Timing Limitation Stipulation / Condition of Approval for lesser prairie-chicken, to minimize noise associated impacts which could disrupt breeding and nesting activities.
- Upon abandonment, a low profile abandoned well marker will be installed to prevent raptor perching.
- Devon would need to construct and maintain escape ramps according to the following criteria:
 - Earthen escape ramps would be required to be constructed to sufficiently support livestock at no more than a 30-degree slope and spaced no more than 500 feet apart.
 - If trench is left open under an 8-hour time period, it would not be required to have an escape ramp; however, before the trench is backfilled, Lucid would inspect the trench for wildlife and remove any species that are trapped at a distance of at least 100 yards away from the trench.
- Power lines shall be constructed and designed in accordance to standards outlined in "Suggested Practices for Avian Protection on Power lines: The State of the Art in 2006" Edison Electric Institute, APLIC, and the California Energy Commission 2006. The holder shall assume the burden and expense of proving that pole designs not shown in the above publication deter raptor perching, roosting, and nesting. Such proof shall be provided by a raptor expert approved by the Authorized Officer. The BLM reserves the right to require modification or additions to all power line structures placed on this right-of-way, should they be necessary to ensure the safety of large perching birds. The holder without liability or expense shall make such modifications and/or additions to the United States.

During construction, Devon shall minimize disturbance to existing fences, water lines, troughs, windmills, and other improvements on public lands. Devon is required to promptly repair improvements to at least their former state. Functional use of these improvements will be maintained at all times. The holder will contact the grazing permittee/allottee prior to disturbing any range improvement projects. When necessary to pass through a fence line, the fence shall be braced on both sides of the passageway prior to cutting of the fence. No permanent gates will be allowed unless approved by the Authorized Officer.

VI. CONSTRUCTION

A. NOTIFICATION

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

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

B. TOPSOIL

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

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

C. CLOSED LOOP SYSTEM

Tanks are required for drilling operations: No Pits.

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

D. FEDERAL MINERAL MATERIALS PIT

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

E. WELL PAD SURFACING

Surfacing of the well pad is not required.

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

F. EXCLOSURE FENCING (CELLARS & PITS)

Exclosure Fencing

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

G. ON LEASE ACCESS ROADS**Road Width**

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

Surfacing

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

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

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

Crowning

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

Ditching

Ditching shall be required on both sides of the road.

Turnouts

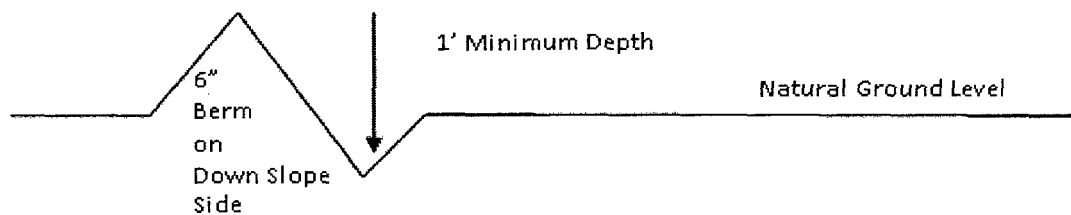
Vehicle turnouts shall be constructed on the road. Turnouts shall be intervisible with interval spacing distance less than 1000 feet. Turnouts shall conform to Figure 1; cross section and plans for typical road construction.

Drainage

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

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

Cross Section of a Typical Lead-off Ditch



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

Formula for Spacing Interval of Lead-off Ditches

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

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

Cattle guards

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

Fence Requirement

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

Public Access

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

Construction Steps

1. Salvage topsoil
2. Construct road

3. Redistribute topsoil
4. Revegetate slopes

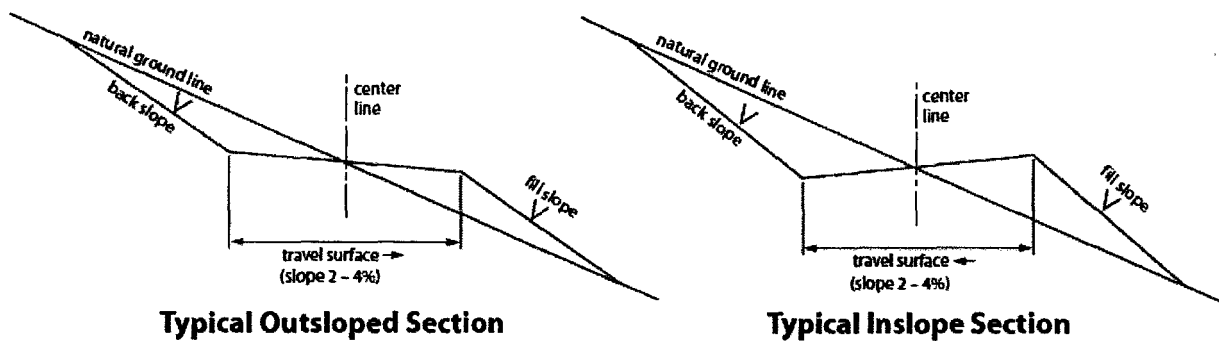
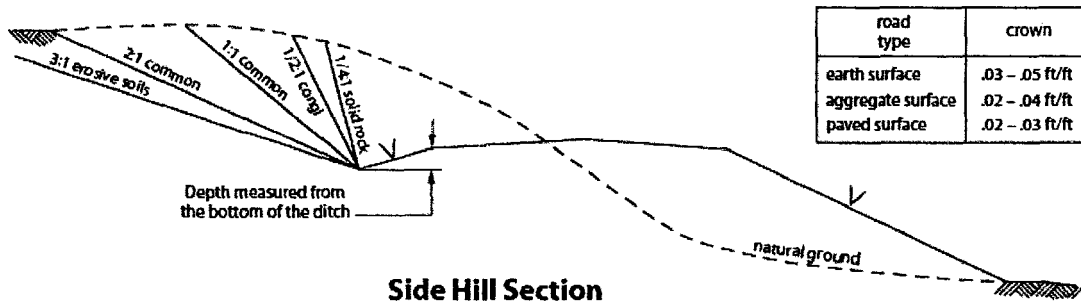
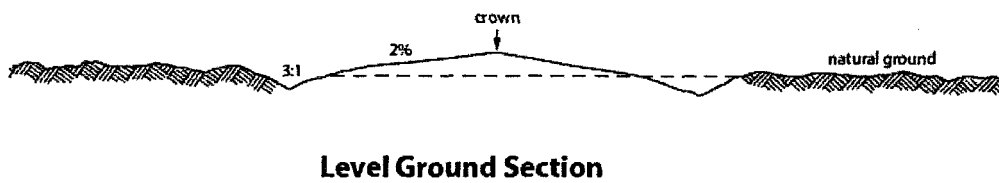
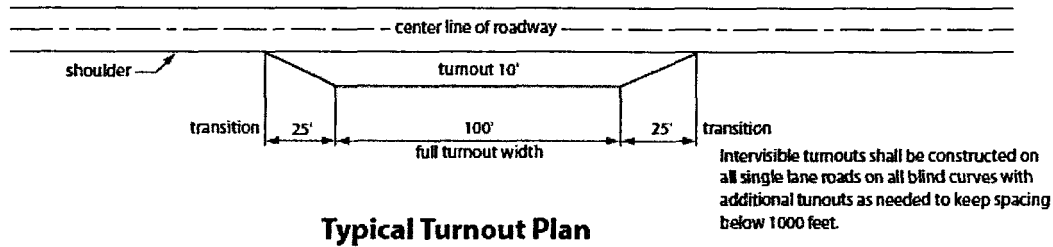


Figure 1. Cross-sections and plans for typical road sections representative of BLM resource or FS local and higher-class roads.

VII. PRODUCTION (POST DRILLING)

A. WELL STRUCTURES & FACILITIES

Placement of Production Facilities

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

Exclosure Netting (Open-top Tanks)

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

Chemical and Fuel Secondary Containment and Exclosure Screening

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

Open-Vent Exhaust Stack Exclosures

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

Containment Structures

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

Painting Requirement

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

B. PIPELINES

STANDARD STIPULATIONS FOR SURFACE INSTALLED PIPELINES

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

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

1. The holder shall indemnify the United States against any liability for damage to life or property arising from the occupancy or use of public lands under this grant.
2. The holder shall comply with all applicable Federal laws and regulations existing or hereafter enacted or promulgated. In any event, the holder shall comply with the Toxic Substances Control Act of 1976 as amended, 15 USC 2601 et seq. (1982) with regards to any toxic substances that are used, generated by or stored on the right-of-way or on facilities authorized under this right-of-way grant. (See 40 CFR, Part 702-799 and especially, provisions on polychlorinated biphenyls, 40 CFR 761.1-761.193.) Additionally, any release of toxic substances (leaks, spills, etc.) in excess of the reportable quantity established by 40 CFR, Part 117 shall be reported as required by the Comprehensive Environmental Response, Compensation, and Liability Act, section 102b. A copy of any report required or requested by any Federal agency or State government as a result of a reportable release or spill of any toxic substances shall be furnished to the authorized officer concurrent with the filing of the reports to the involved Federal agency or State government.
3. The holder agrees to indemnify the United States against any liability arising from the release of any hazardous substance or hazardous waste (as these terms are defined in the Comprehensive Environmental Response, Compensation and Liability Act of 1980, 42 U.S.C. 9601, et seq. or the Resource Conservation and Recovery Act, 42 U.S.C. 6901, et seq.) on the Right-of-Way (unless the release or threatened release is wholly unrelated to activity of the Right-of-Way holder's activity on the Right-of-Way), or resulting from the activity of the Right-of-Way holder on the Right-of-Way. This agreement applies without regard to whether a release is caused by the holder, its agent, or unrelated third parties.

4. The holder shall be liable for damage or injury to the United States to the extent provided by 43 CFR Sec. 2883.1-4. The holder shall be held to a standard of strict liability for damage or injury to the United States resulting from pipe rupture, fire, or spills caused or substantially aggravated by any of the following within the right-of-way or permit area:

- a. Activities of the holder including, but not limited to construction, operation, maintenance, and termination of the facility.
- b. Activities of other parties including, but not limited to:
 - (1) Land clearing.
 - (2) Earth-disturbing and earth-moving work.
 - (3) Blasting.
 - (4) Vandalism and sabotage.
- c. Acts of God.

The maximum limitation for such strict liability damages shall not exceed one million dollars (\$1,000,000) for any one event, and any liability in excess of such amount shall be determined by the ordinary rules of negligence of the jurisdiction in which the damage or injury occurred.

This section shall not impose strict liability for damage or injury resulting primarily from an act of war or from the negligent acts or omissions of the United States.

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

6. All construction and maintenance activity will be confined to the authorized right-of-way width of 20 feet. If the pipeline route follows an existing road or buried pipeline right-of-way, the surface pipeline must be installed no farther than 10 feet from the edge of the road or buried pipeline right-of-way. If existing surface pipelines prevent this distance, the proposed surface pipeline must be installed immediately adjacent to the outer surface pipeline. All construction and maintenance activity will be confined to existing roads or right-of-ways.

7. No blading or clearing of any vegetation will be allowed unless approved in writing by the Authorized Officer.

8. The holder shall install the pipeline on the surface in such a manner that will minimize suspension of the pipeline across low areas in the terrain. In hummocky or dune areas, the pipeline will be "snaked" around hummocks and dunes rather than suspended across these features.

9. The pipeline shall be buried with a minimum of 24 inches under all roads, "two-tracks," and trails. Burial of the pipe will continue for 20 feet on each side of each crossing. The condition of the road, upon completion of construction, shall be returned to at least its former state with no bumps or dips remaining in the road surface.

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

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

12. Excluding the pipe, all above-ground structures not subject to safety requirement shall be painted by the holder to blend with the natural color of the landscape. The paint used shall be a color which simulates "Standard Environmental Colors" – **Shale Green**, Munsell Soil Color No. 5Y 4/2; designated by the Rocky Mountain Five State Interagency Committee.

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

14. The holder shall not use the pipeline route as a road for purposes other than routine maintenance as determined necessary by the Authorized Officer in consultation with the holder. The holder will take whatever steps are necessary to ensure that the pipeline route is not used as a roadway.

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

be responsible for the cost of evaluation and any decision as to proper mitigation measures will be made by the authorized officer after consulting with the holder.

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

17. Surface pipelines must be less than or equal to 4 inches and a working pressure below 125 psi.

18. Special Stipulations:

- a. **Lesser Prairie-Chicken:** Oil and gas activities will not be allowed in lesser prairie-chicken habitat during the period from March 1st through June 15th annually. During that period, other activities that produce noise or involve human activity, such as the maintenance of oil and gas facilities and pipeline, road, and well pad construction, will be allowed except between 3:00 am and 9:00 am. The 3:00 am to 9:00 am restriction will not apply to normal, around-the-clock operations, such as venting, flaring, or pumping, which do not require a human presence during this period. Normal vehicle use on existing roads will not be restricted.

BURIED PIPELINE STIPULATIONS

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

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

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

a reportable release or spill of any toxic substances shall be furnished to the authorized officer concurrent with the filing of the reports to the involved Federal agency or State government.

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

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

5. All construction and maintenance activity will be confined to the authorized right-of-way.
6. The pipeline will be buried with a minimum cover of 36 inches between the top of the pipe and ground level.
7. The maximum allowable disturbance for construction in this right-of-way will be 30 feet:
 - Blading of vegetation within the right-of-way will be allowed: maximum width of blading operations will not exceed 20 feet. The trench is included in this area. (*Blading is defined as the complete removal of brush and ground vegetation.*)
 - Clearing of brush species within the right-of-way will be allowed: maximum width of clearing operations will not exceed 30 feet. The trench and bladed area are included in this area. (*Clearing is defined as the removal of brush while leaving ground vegetation (grasses, weeds, etc.) intact. Clearing is best accomplished by holding the blade 4 to 6 inches above the ground surface.*)
 - The remaining area of the right-of-way (if any) shall only be disturbed by compressing the vegetation. (*Compressing can be caused by vehicle tires, placement of equipment, etc.*)
8. The holder shall stockpile an adequate amount of topsoil where blading is allowed. The topsoil to be stripped is approximately 6 inches in depth. The topsoil will be segregated from other spoil piles from trench construction. The topsoil will be evenly distributed over the bladed area for the preparation of seeding.
9. The holder shall minimize disturbance to existing fences and other improvements on public lands. The holder is required to promptly repair improvements to at least their former state. Functional use of these improvements will be maintained at all times. The holder will contact the owner of any improvements prior to disturbing them. When necessary to pass through a fence line, the fence shall be braced on both sides of the passageway prior to cutting of the fence. No permanent gates will be allowed unless approved by the Authorized Officer.
10. Vegetation, soil, and rocks left as a result of construction or maintenance activity will be randomly scattered on this right-of-way and will not be left in rows, piles, or berms, unless otherwise approved by the Authorized Officer. The entire right-of-way shall be recontoured to match the surrounding landscape. The backfilled soil shall be compacted and a 6 inch berm will be left over the ditch line to allow for settling back to grade.
11. In those areas where erosion control structures are required to stabilize soil conditions, the holder will install such structures as are suitable for the specific soil conditions being encountered and which are in accordance with sound resource management practices.

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

- | | |
|--|--|
| ☐ seed mixture 1 | ☐ seed mixture 3 |
| ☐ seed mixture 2 | ☐ seed mixture 4 |
| ☒ seed mixture 2/LPC | ☐ Aplomado Falcon Mixture |

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

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

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

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

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

18. Escape Ramps - The operator will construct and maintain pipeline/utility trenches that are not otherwise fenced, screened, or netted to prevent livestock, wildlife, and humans from becoming entrapped. At a minimum, the operator will construct and maintain escape ramps, ladders, or

other methods of avian and terrestrial wildlife escape in the trenches according to the following criteria:

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

19. Special Stipulations:

Lesser Prairie-Chicken

Oil and gas activities will not be allowed in lesser prairie-chicken habitat during the period from March 1st through June 15th annually. During that period, other activities that produce noise or involve human activity, such as the maintenance of oil and gas facilities, geophysical exploration other than 3-D operations, and pipeline, road, and well pad construction, will be allowed except between 3:00 am and 9:00 am. The 3:00 am to 9:00 am restriction will not apply to normal, around-the-clock operations, such as venting, flaring, or pumping, which do not require a human presence during this period. Normal vehicle use on existing roads will not be restricted. Exhaust noise from pump jack engines must be muffled or otherwise controlled so as not to exceed 75 db measured at 30 ft. from the source of the noise.

C. ELECTRIC LINES

STANDARD STIPULATIONS FOR OVERHEAD ELECTRIC DISTRIBUTION LINES

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

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

1. The holder shall indemnify the United States against any liability for damage to life or property arising from the occupancy or use of public lands under this grant.
2. The holder shall comply with all applicable Federal laws and regulations existing or hereafter enacted or promulgated. In any event, the holder shall comply with the Toxic Substances Control Act of 1976 as amended, 15 USC 2601 et seq. (1982) with regards to any toxic substances that are used, generated by or stored on the right-of-way or on facilities authorized under this right-of-way grant. (See 40 CFR, Part 702-799 and especially, provisions on polychlorinated biphenyls, 40 CFR 761.1-761.193.)

Additionally, any release of toxic substances (leaks, spills, etc.) in excess of the reportable quantity established by 40 CFR, Part 117 shall be reported as required by the Comprehensive Environmental Response, Compensation, and Liability Act, section 102b. A copy of any report required or requested by any Federal agency or State government as a result of a reportable release or spill of any toxic substances shall be furnished to the authorized officer concurrent with the filing of the reports to the involved Federal agency or State government.

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

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

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

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

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

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

crossing and at the facilities served.

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

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

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

11. Special Stipulations:

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

Timing Limitation Stipulation/Condition of Approval for Lesser Prairie-Chicken:

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

VIII. INTERIM RECLAMATION

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

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

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

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

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

IX. FINAL ABANDONMENT & RECLAMATION

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

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

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

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

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

Seed Mixture for LPC Sand/Shinnery Sites

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

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

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

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

*Pounds of pure live seed:

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

**PECOS DISTRICT
SURFACE USE
CONDITIONS OF APPROVAL**

OPERATOR'S NAME:	DEVON ENERGY PRODUCTION
LEASE NO.:	NMNM89055
WELL NAME & NO.:	515H – COTTON DRAW UNIT
SURFACE HOLE FOOTAGE:	485'N & 410'E
BOTTOM HOLE FOOTAGE	200'S & 330'E
LOCATION:	Section 25., T24S., R.31E., NMP
COUNTY:	EDDY County, New Mexico

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- ☐ **Final Abandonment & Reclamation**

I. GENERAL PROVISIONS

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

II. PERMIT EXPIRATION

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

III. ARCHAEOLOGICAL, PALEONTOLOGY & HISTORICAL SITES

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

IV. NOXIOUS WEEDS

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

V. SPECIAL REQUIREMENT(S)

In May 2008, the Pecos District Special Status Species Resource Management Plan Amendment (RMPA) was approved and is being implemented. In addition to the standard practices that minimize impacts, as listed above, the following COA will apply:

- Timing Limitation Stipulation / Condition of Approval for lesser prairie-chicken, to minimize noise associated impacts which could disrupt breeding and nesting activities.
- Upon abandonment, a low profile abandoned well marker will be installed to prevent raptor perching.
- Devon would need to construct and maintain escape ramps according to the following criteria:
 - Earthen escape ramps would be required to be constructed to sufficiently support livestock at no more than a 30-degree slope and spaced no more than 500 feet apart.
 - If trench is left open under an 8-hour time period, it would not be required to have an escape ramp; however, before the trench is backfilled, Lucid would inspect the trench for wildlife and remove any species that are trapped at a distance of at least 100 yards away from the trench.
- Power lines shall be constructed and designed in accordance to standards outlined in "Suggested Practices for Avian Protection on Power lines: The State of the Art in 2006" Edison Electric Institute, APLIC, and the California Energy Commission 2006. The holder shall assume the burden and expense of proving that pole designs not shown in the above publication deter raptor perching, roosting, and nesting. Such proof shall be provided by a raptor expert approved by the Authorized Officer. The BLM reserves the right to require modification or additions to all power line structures placed on this right-of-way, should they be necessary to ensure the safety of large perching birds. The holder without liability or expense shall make such modifications and/or additions to the United States.

During construction, Devon shall minimize disturbance to existing fences, water lines, troughs, windmills, and other improvements on public lands. Devon is required to promptly repair improvements to at least their former state. Functional use of these improvements will be maintained at all times. The holder will contact the grazing permittee/allottee prior to disturbing any range improvement projects. When necessary to pass through a fence line, the fence shall be braced on both sides of the passageway prior to cutting of the fence. No permanent gates will be allowed unless approved by the Authorized Officer.

VI. CONSTRUCTION

A. NOTIFICATION

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

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

B. TOPSOIL

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

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

C. CLOSED LOOP SYSTEM

Tanks are required for drilling operations: No Pits.

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

D. FEDERAL MINERAL MATERIALS PIT

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

E. WELL PAD SURFACING

Surfacing of the well pad is not required.

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

F. EXCLOSURE FENCING (CELLARS & PITS)

Exclosure Fencing

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

G. ON LEASE ACCESS ROADS**Road Width**

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

Surfacing

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

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

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

Crowning

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

Ditching

Ditching shall be required on both sides of the road.

Turnouts

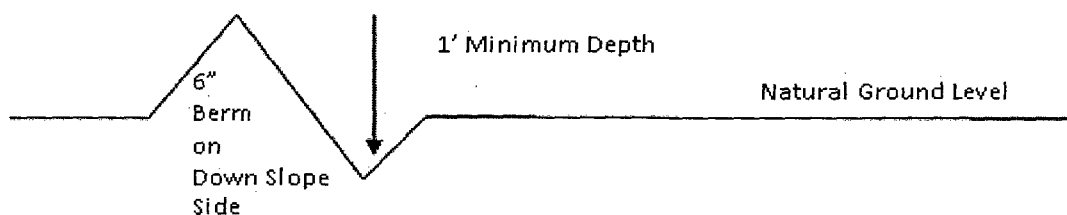
Vehicle turnouts shall be constructed on the road. Turnouts shall be intervisible with interval spacing distance less than 1000 feet. Turnouts shall conform to Figure 1; cross section and plans for typical road construction.

Drainage

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

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

Cross Section of a Typical Lead-off Ditch



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

Formula for Spacing Interval of Lead-off Ditches

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

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

Cattle guards

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

Fence Requirement

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

Public Access

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

Construction Steps

1. Salvage topsoil
2. Construct road

3. Redistribute topsoil
4. Revegetate slopes

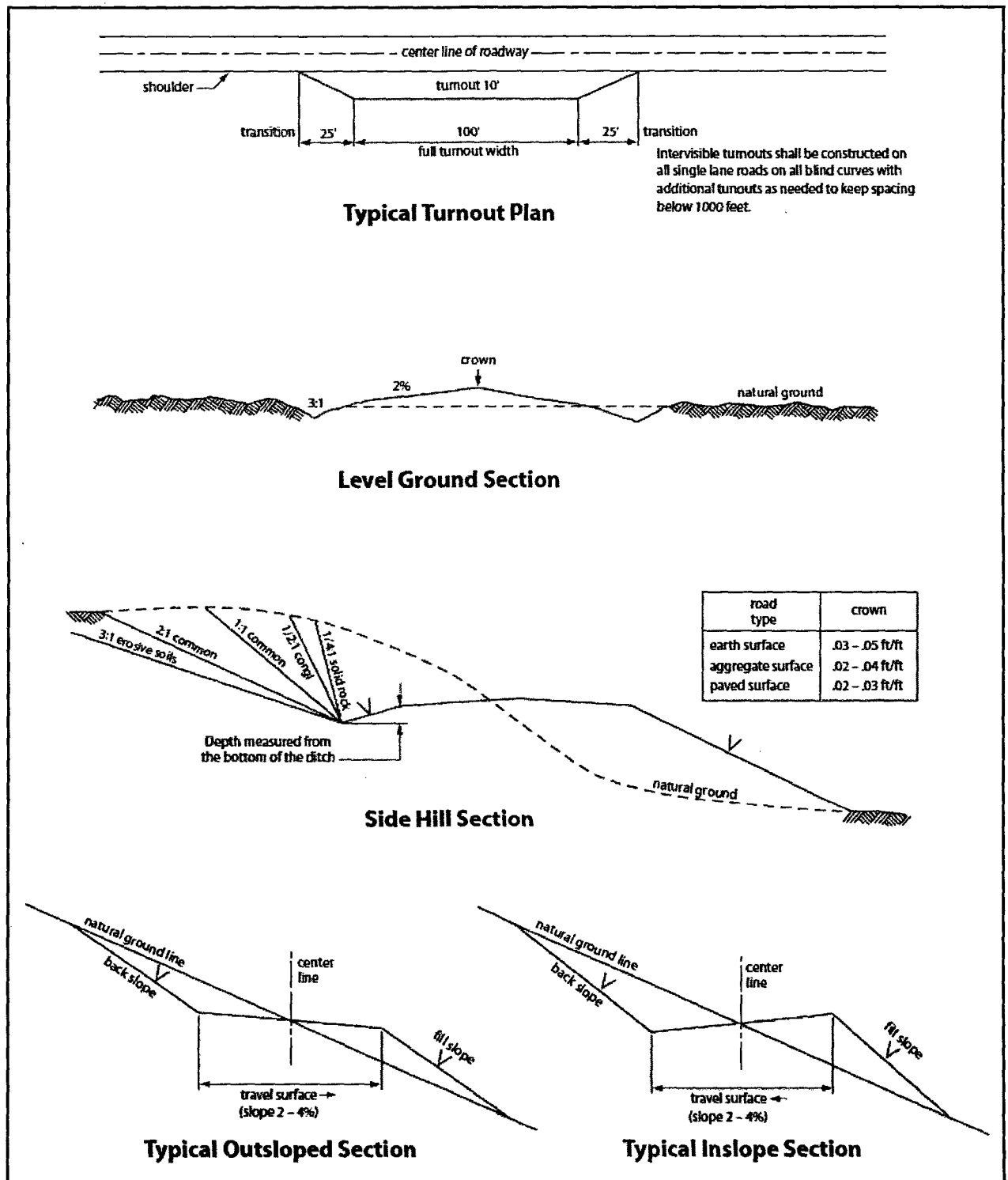


Figure 1. Cross-sections and plans for typical road sections representative of BLM resource or FS local and higher-class roads.

VII. PRODUCTION (POST DRILLING)

A. WELL STRUCTURES & FACILITIES

Placement of Production Facilities

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

Exclosure Netting (Open-top Tanks)

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

Chemical and Fuel Secondary Containment and Exclosure Screening

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

Open-Vent Exhaust Stack Exclosures

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

Containment Structures

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

Painting Requirement

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

B. PIPELINES

STANDARD STIPULATIONS FOR SURFACE INSTALLED PIPELINES

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

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

1. The holder shall indemnify the United States against any liability for damage to life or property arising from the occupancy or use of public lands under this grant.
2. The holder shall comply with all applicable Federal laws and regulations existing or hereafter enacted or promulgated. In any event, the holder shall comply with the Toxic Substances Control Act of 1976 as amended, 15 USC 2601 et seq. (1982) with regards to any toxic substances that are used, generated by or stored on the right-of-way or on facilities authorized under this right-of-way grant. (See 40 CFR, Part 702-799 and especially, provisions on polychlorinated biphenyls, 40 CFR 761.1-761.193.) Additionally, any release of toxic substances (leaks, spills, etc.) in excess of the reportable quantity established by 40 CFR, Part 117 shall be reported as required by the Comprehensive Environmental Response, Compensation, and Liability Act, section 102b. A copy of any report required or requested by any Federal agency or State government as a result of a reportable release or spill of any toxic substances shall be furnished to the authorized officer concurrent with the filing of the reports to the involved Federal agency or State government.
3. The holder agrees to indemnify the United States against any liability arising from the release of any hazardous substance or hazardous waste (as these terms are defined in the Comprehensive Environmental Response, Compensation and Liability Act of 1980, 42 U.S.C. 9601, et seq. or the Resource Conservation and Recovery Act, 42 U.S.C. 6901, et seq.) on the Right-of-Way (unless the release or threatened release is wholly unrelated to activity of the Right-of-Way holder's activity on the Right-of-Way), or resulting from the activity of the Right-of-Way holder on the Right-of-Way. This agreement applies without regard to whether a release is caused by the holder, its agent, or unrelated third parties.

4. The holder shall be liable for damage or injury to the United States to the extent provided by 43 CFR Sec. 2883.1-4. The holder shall be held to a standard of strict liability for damage or injury to the United States resulting from pipe rupture, fire, or spills caused or substantially aggravated by any of the following within the right-of-way or permit area:

- a. Activities of the holder including, but not limited to construction, operation, maintenance, and termination of the facility.
- b. Activities of other parties including, but not limited to:
 - (1) Land clearing.
 - (2) Earth-disturbing and earth-moving work.
 - (3) Blasting.
 - (4) Vandalism and sabotage.
- c. Acts of God.

The maximum limitation for such strict liability damages shall not exceed one million dollars (\$1,000,000) for any one event, and any liability in excess of such amount shall be determined by the ordinary rules of negligence of the jurisdiction in which the damage or injury occurred.

This section shall not impose strict liability for damage or injury resulting primarily from an act of war or from the negligent acts or omissions of the United States.

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

6. All construction and maintenance activity will be confined to the authorized right-of-way width of 20 feet. If the pipeline route follows an existing road or buried pipeline right-of-way, the surface pipeline must be installed no farther than 10 feet from the edge of the road or buried pipeline right-of-way. If existing surface pipelines prevent this distance, the proposed surface pipeline must be installed immediately adjacent to the outer surface pipeline. All construction and maintenance activity will be confined to existing roads or right-of-ways.

7. No blading or clearing of any vegetation will be allowed unless approved in writing by the Authorized Officer.

8. The holder shall install the pipeline on the surface in such a manner that will minimize suspension of the pipeline across low areas in the terrain. In hummocky or dune areas, the pipeline will be "snaked" around hummocks and dunes rather than suspended across these features.

9. The pipeline shall be buried with a minimum of 24 inches under all roads, "two-tracks," and trails. Burial of the pipe will continue for 20 feet on each side of each crossing. The condition of the road, upon completion of construction, shall be returned to at least its former state with no bumps or dips remaining in the road surface.

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

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

12. Excluding the pipe, all above-ground structures not subject to safety requirement shall be painted by the holder to blend with the natural color of the landscape. The paint used shall be a color which simulates "Standard Environmental Colors" – **Shale Green**, Munsell Soil Color No. 5Y 4/2; designated by the Rocky Mountain Five State Interagency Committee.

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

14. The holder shall not use the pipeline route as a road for purposes other than routine maintenance as determined necessary by the Authorized Officer in consultation with the holder. The holder will take whatever steps are necessary to ensure that the pipeline route is not used as a roadway.

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

be responsible for the cost of evaluation and any decision as to proper mitigation measures will be made by the authorized officer after consulting with the holder.

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

17. Surface pipelines must be less than or equal to 4 inches and a working pressure below 125 psi.

18. Special Stipulations:

- a. **Lesser Prairie-Chicken:** Oil and gas activities will not be allowed in lesser prairie-chicken habitat during the period from March 1st through June 15th annually. During that period, other activities that produce noise or involve human activity, such as the maintenance of oil and gas facilities and pipeline, road, and well pad construction, will be allowed except between 3:00 am and 9:00 am. The 3:00 am to 9:00 am restriction will not apply to normal, around-the-clock operations, such as venting, flaring, or pumping, which do not require a human presence during this period. Normal vehicle use on existing roads will not be restricted.

BURIED PIPELINE STIPULATIONS

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

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

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

a reportable release or spill of any toxic substances shall be furnished to the authorized officer concurrent with the filing of the reports to the involved Federal agency or State government.

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

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

5. All construction and maintenance activity will be confined to the authorized right-of-way.
6. The pipeline will be buried with a minimum cover of 36 inches between the top of the pipe and ground level.
7. The maximum allowable disturbance for construction in this right-of-way will be 30 feet:
- Blading of vegetation within the right-of-way will be allowed: maximum width of blading operations will not exceed 20 feet. The trench is included in this area. (*Blading is defined as the complete removal of brush and ground vegetation.*)
 - Clearing of brush species within the right-of-way will be allowed: maximum width of clearing operations will not exceed 30 feet. The trench and bladed area are included in this area. (*Clearing is defined as the removal of brush while leaving ground vegetation (grasses, weeds, etc.) intact. Clearing is best accomplished by holding the blade 4 to 6 inches above the ground surface.*)
 - The remaining area of the right-of-way (if any) shall only be disturbed by compressing the vegetation. (*Compressing can be caused by vehicle tires, placement of equipment, etc.*)
8. The holder shall stockpile an adequate amount of topsoil where blading is allowed. The topsoil to be stripped is approximately 6 inches in depth. The topsoil will be segregated from other spoil piles from trench construction. The topsoil will be evenly distributed over the bladed area for the preparation of seeding.
9. The holder shall minimize disturbance to existing fences and other improvements on public lands. The holder is required to promptly repair improvements to at least their former state. Functional use of these improvements will be maintained at all times. The holder will contact the owner of any improvements prior to disturbing them. When necessary to pass through a fence line, the fence shall be braced on both sides of the passageway prior to cutting of the fence. No permanent gates will be allowed unless approved by the Authorized Officer.
10. Vegetation, soil, and rocks left as a result of construction or maintenance activity will be randomly scattered on this right-of-way and will not be left in rows, piles, or berms, unless otherwise approved by the Authorized Officer. The entire right-of-way shall be recontoured to match the surrounding landscape. The backfilled soil shall be compacted and a 6 inch berm will be left over the ditch line to allow for settling back to grade.
11. In those areas where erosion control structures are required to stabilize soil conditions, the holder will install such structures as are suitable for the specific soil conditions being encountered and which are in accordance with sound resource management practices.

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

- | | |
|--|--|
| ☐ seed mixture 1 | ☐ seed mixture 3 |
| ☐ seed mixture 2 | ☐ seed mixture 4 |
| ☒ seed mixture 2/LPC | ☐ Aplomado Falcon Mixture |

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

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

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

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

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

18. Escape Ramps - The operator will construct and maintain pipeline/utility trenches that are not otherwise fenced, screened, or netted to prevent livestock, wildlife, and humans from becoming entrapped. At a minimum, the operator will construct and maintain escape ramps, ladders, or

other methods of avian and terrestrial wildlife escape in the trenches according to the following criteria:

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

19. Special Stipulations:

Lesser Prairie-Chicken

Oil and gas activities will not be allowed in lesser prairie-chicken habitat during the period from March 1st through June 15th annually. During that period, other activities that produce noise or involve human activity, such as the maintenance of oil and gas facilities, geophysical exploration other than 3-D operations, and pipeline, road, and well pad construction, will be allowed except between 3:00 am and 9:00 am. The 3:00 am to 9:00 am restriction will not apply to normal, around-the-clock operations, such as venting, flaring, or pumping, which do not require a human presence during this period. Normal vehicle use on existing roads will not be restricted. Exhaust noise from pump jack engines must be muffled or otherwise controlled so as not to exceed 75 db measured at 30 ft. from the source of the noise.

C. ELECTRIC LINES

STANDARD STIPULATIONS FOR OVERHEAD ELECTRIC DISTRIBUTION LINES

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

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

1. The holder shall indemnify the United States against any liability for damage to life or property arising from the occupancy or use of public lands under this grant.
2. The holder shall comply with all applicable Federal laws and regulations existing or hereafter enacted or promulgated. In any event, the holder shall comply with the Toxic Substances Control Act of 1976 as amended, 15 USC 2601 et seq. (1982) with regards to any toxic substances that are used, generated by or stored on the right-of-way or on facilities authorized under this right-of-way grant. (See 40 CFR, Part 702-799 and especially, provisions on polychlorinated biphenyls, 40 CFR 761.1-761.193.)

Additionally, any release of toxic substances (leaks, spills, etc.) in excess of the reportable quantity established by 40 CFR, Part 117 shall be reported as required by the Comprehensive Environmental Response, Compensation, and Liability Act, section 102b. A copy of any report required or requested by any Federal agency or State government as a result of a reportable release or spill of any toxic substances shall be furnished to the authorized officer concurrent with the filing of the reports to the involved Federal agency or State government.

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

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

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

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

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

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

crossing and at the facilities served.

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

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

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

11. Special Stipulations:

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

Timing Limitation Stipulation/Condition of Approval for Lesser Prairie-Chicken:

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

VIII. INTERIM RECLAMATION

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

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

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

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

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

IX. FINAL ABANDONMENT & RECLAMATION

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

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

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

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

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

Seed Mixture for LPC Sand/Shinnery Sites

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

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

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

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

*Pounds of pure live seed:

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



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

Operator Certification Data Report

02/08/2018

Operator Certification

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

NAME: Linda Good

Signed on: 08/28/2017

Title: Regulatory Compliance Professional

Street Address: 333 West Sheridan Avenue

City: Oklahoma City

State: OK

Zip: 73102

Phone: (405)552-6558

Email address: Linda.Good@dvni.com

Field Representative

Representative Name: Ray Vaz

Street Address: 6488 Seven Rivers Hwy

City: Artesia

State: NM

Zip: 88210

Phone: (575)748-1871

Email address: ray.vaz@dvni.com



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

Application Data Report

02/08/2018

APD ID: 10400017569

Submission Date: 08/28/2017

Highlighted data
reflects the most
recent changes

Operator Name: DEVON ENERGY PRODUCTION COMPANY LP

Well Name: COTTON DRAW UNIT

Well Number: 515H

[Show Final Text](#)

Well Type: OIL WELL

Well Work Type: Drill

Section 1 - General

APD ID: 10400017569

Tie to previous NOS?

Submission Date: 08/28/2017

BLM Office: CARLSBAD

User: Linda Good

Title: Regulatory Compliance
Professional

Federal/Indian APD: FED

Is the first lease penetrated for production Federal or Indian? FED

Lease number: NMNM89055

Lease Acres: 160

Surface access agreement in place?

Allotted?

Reservation:

Agreement in place? YES

Federal or Indian agreement: FEDERAL

Agreement number: NMNM70928X

Agreement name: COTTON DRAW

Keep application confidential? YES

Permitting Agent? NO

APD Operator: DEVON ENERGY PRODUCTION COMPANY LP

Operator letter of designation:

Operator Info

Operator Organization Name: DEVON ENERGY PRODUCTION COMPANY LP

Operator Address: 333 West Sheridan Avenue

Zip: 73102

Operator PO Box:

Operator City: Oklahoma City State: OK

Operator Phone: (405)552-6571

Operator Internet Address: aletha.dewbre@dvn.com

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: COTTON DRAW UNIT

Well Number: 515H

Well API Number:

Field/Pool or Exploratory? Field and Pool

Field Name: PADUCA

Pool Name: BONE SPRING
(OIL)

Operator Name: DEVON ENERGY PRODUCTION COMPANY LP

Well Name: COTTON DRAW UNIT

Well Number: 515H

Is the proposed well in an area containing other mineral resources? USEABLE WATER

Describe other minerals:

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

Type of Well Pad: MULTIPLE WELL

Multiple Well Pad Name:

Number:

Well Class: HORIZONTAL

COTTON DRAW UNIT

514H/515H/516H/517H

Number of Legs: 1

Well Work Type: Drill

Well Type: OIL WELL

Describe Well Type:

Well sub-Type: APPRAISAL

Describe sub-type:

Distance to town:

Distance to nearest well: 700 FT

Distance to lease line: 200 FT

Reservoir well spacing assigned acres Measurement: 320 Acres

Well plat: CDU_515H_C_102_signed_with_FTP_08-14-2017.pdf

Well work start Date: 04/17/2018

Duration: 30 DAYS

Section 3 - Well Location Table

Survey Type: RECTANGULAR

Describe Survey Type:

Datum: NAD83

Vertical Datum: NAVD88

Survey number: 5333

	NS-Foot	NS Indicator	EW-Foot	EW Indicator	Twsp	Range	Section	Aliquot/Lot/Tract	Latitude	Longitude	County	State	Meridian	Lease Type	Lease Number	Elevation	MD	TVD
SHL Leg #1	485	FNL	410	FEL	24S	31E	25	Aliquot NENE	32.19426 88	- 103.7242 973	EDD Y	NEW MEXI CO	NEW MEXI CO	F	NMNM 89055	354 1	0	0
KOP Leg #1	50	FNL	430	FEL	24S	31E	25	Aliquot NENE	32.19426 88	- 103.7242 973	EDD Y	NEW MEXI CO	NEW MEXI CO	F	NMNM 89055	- 518 2	875 2	872 3
PPP Leg #1	330	FNL	393	FEL	24S	31E	25	Aliquot NENE	32.19426 88	- 103.7242 973	EDD Y	NEW MEXI CO	NEW MEXI CO	F	NMNM 89055	- 567 6	934 5	921 7

Operator Name: DEVON ENERGY PRODUCTION COMPANY LP

Well Name: COTTON DRAW UNIT

Well Number: 515H

	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
PPP Leg #1	0	FSL	438	FEL	24S	31E	25	Aliquot SESE	32.18106 2	- 103.7243 85	EDD Y	NEW MEXI CO	NEW MEXI CO	F	NMNM 012121	- 577 4	142 00	931 5
EXIT Leg #1	200	FSL	330	FEL	24S	31E	36	Lot 4	32.16713 58	- 103.7240 238	EDD Y	NEW MEXI CO	NEW MEXI CO	S	STATE	- 575 9	168 00	930 0
BHL Leg #1	200	FSL	330	FEL	24S	31E	36	Lot 4	32.16713 58	- 103.7240 238	EDD Y	NEW MEXI CO	NEW MEXI CO	S	STATE	- 575 9	168 00	930 0

Operator Name: DEVON ENERGY PRODUCTION COMPANY LP

Well Name: COTTON DRAW UNIT

Well Number: 515H

Pressure Rating (PSI): 3M

Rating Depth: 4350

Equipment: BOP/BOPE will be installed per Onshore Oil & Gas Order #2 requirements prior to drilling below 13-3/8" surface casing, a 13-5/8" BOP/BOPE system with a minimum rating of 3M will be installed on the wellhead system. BOP/BOPE will be tested by an independent service company per Onshore Oil & Gas Order #2 requirements and MASP (Maximum Anticipated Surface Pressure) calculations. If the system is upgraded, all the components installed will be functional and tested.

Requesting Variance? YES

Variance request: A variance is requested for the use of a flexible choke line from the BOP stack to the choke manifold. See attached for specs for hydrostatic test chart.

Testing Procedure: A multi-bowl wellhead may be used. The BOP will be tested per Onshore Order #2 after installation on the surface casing which will cover testing requirements for a maximum of 30 days. If any seal subject to test pressure is broken the system must be tested.

Choke Diagram Attachment:

CDU_515H_3M_BOPE_Ck_08-25-2017.pdf

BOP Diagram Attachment:

CDU_515H_3M_BOPE_Ck_08-25-2017.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	725	0	725			725	H-40	48	STC	1.74	2.45	BUOY	4.13	BUOY	4.13
2	INTERMEDIATE	12.25	9.625	NEW	API	N	0	725	0	725			725	J-55	40	LTC	1.19	1.42	BUOY	3.98	BUOY	3.98
3	PRODUCTION	8.75	5.5	NEW	API	N	0	19390	0	9336			19390	P-110	17	BUTT	2.18	2.7	BUOY	3.21	BUOY	3.21

Casing Attachments

Operator Name: DEVON ENERGY PRODUCTION COMPANY LP

Well Name: COTTON DRAW UNIT

Well Number: 515H

Casing Attachments

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

Inspection Document:

Spec Document:

Tapered String Spec:

Casing Design Assumptions and Worksheet(s):

CDU_515H_SurfCsg_Ass_08-25-2017.pdf

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

Inspection Document:

Spec Document:

Tapered String Spec:

Casing Design Assumptions and Worksheet(s):

CDU_515H_Int_Csg_Ass_08-25-2017.pdf

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

Inspection Document:

Spec Document:

Tapered String Spec:

Casing Design Assumptions and Worksheet(s):

CDU_515H_ProdCasing_Ass_08-25-2017.pdf

Section 4 - Cement

Operator Name: DEVON ENERGY PRODUCTION COMPANY LP

Well Name: COTTON DRAW UNIT

Well Number: 515H

String Type	Lead/Tail	Stage Tool Depth	Top MD	Bottom MD	Quantity(sx)	Yield	Density	Cu Ft	Excess%	Cement type	Additives
SURFACE	Lead		0	725	565	1.34	14.8	755	50	C	1% Calcium Chloride

INTERMEDIATE	Lead		0	3350	737	1.85	12.9	1363	30	C	Poz (Fly Ash): 6% BWOC Bentonite + 5% BWOW Sodium Chloride + 0.125 lbs/sks Poly-E-Flake
INTERMEDIATE	Tail		3350	4350	306	1.33	14.8	407	30	C	0.125 lbs/sks Poly-R-Flake
PRODUCTION	Lead		4150	9200	487	3.27	9	1595	25	TUNED	N/A
PRODUCTION	Tail		9200	19390	2680	1.2	14.5	3215	25	H	Poz (Fly Ash) + 0.5% bwoc HALAD-344 + 0.4% bwoc CFR-3 + 0.2% BWOC HR-601 + 2% bwoc Bentonite

Section 5 - Circulating Medium

Mud System Type: Closed

Will an air or gas system be Used? NO

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

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

Describe what will be on location to control well or mitigate other conditions: Sufficient mud materials to maintain mud properties and meet minimum lost circulation and weight increase requirements will be kept on location at all times.

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

Circulating Medium Table

Top Depth	Bottom Depth	Mud Type	Min Weight (lbs/gal)	Max Weight (lbs/gal)	Density (lbs/cu ft)	Gel Strength (lbs/100 sqft)	PH	Viscosity (CP)	Salinity (ppm)	Filtration (cc)	Additional Characteristics
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Operator Name: DEVON ENERGY PRODUCTION COMPANY LP
Well Name: COTTON DRAW UNIT Well Number: 515H

Top Depth	Bottom Depth	Mud Type	Min Weight (lbs/gal)	Max Weight (lbs/gal)	Density (lbs/cu ft)	Gel Strength (lbs/100 sqft)	PH	Viscosity (CP)	Salinity (ppm)	Filtration (cc)	Additional Characteristics
0	725	OTHER : FRESH WATER GEL	8.5	9							
725	4350	OTHER : SATURATED BRINE	10	11							
4350	19390	OTHER : CUT BRINE	8.5	9.3							

Section 6 - Test, Logging, Coring

List of production tests including testing procedures, equipment and safety measures:
Will run GR/CNL from TD to surface (horizontal well – vertical portion of hole). Stated logs run will be in the Completion Report and submitted to the BLM.
List of open and cased hole logs run in the well:
CBL, DS, MUDLOG
Coring operation description for the well:
N/A

Section 7 - Pressure

Anticipated Bottom Hole Pressure: 4215 Anticipated Surface Pressure: 2165.69
Anticipated Bottom Hole Temperature(F): 138
Anticipated abnormal pressures, temperatures, or potential geologic hazards? NO
Describe:
Contingency Plans geohazards description:
Contingency Plans geohazards attachment:
Hydrogen Sulfide drilling operations plan required? YES
Hydrogen sulfide drilling operations plan:
CDU_515H_H2S_Plan_08-03-2017.pdf

Operator Name: DEVON ENERGY PRODUCTION COMPANY LP

Well Name: COTTON DRAW UNIT

Well Number: 515H

Section 8 - Other Information

Proposed horizontal/directional/multi-lateral plan submission:

CDU_515H_Dir_Plan_08-25-2017.pdf

CDU_515H_Dir_Plan1_08-25-2017.pdf

CDU_515H_Anticollision_08-25-2017.pdf

Other proposed operations facets description:

Drilling Plan

Multi-bowl Wellhead & Verbiage

Closed Loop Design

Other proposed operations facets attachment:

CDU_515H_Drilling_Plan_08-25-2017.pdf

CDU_515H_MB_Verb_08-25-2017.pdf

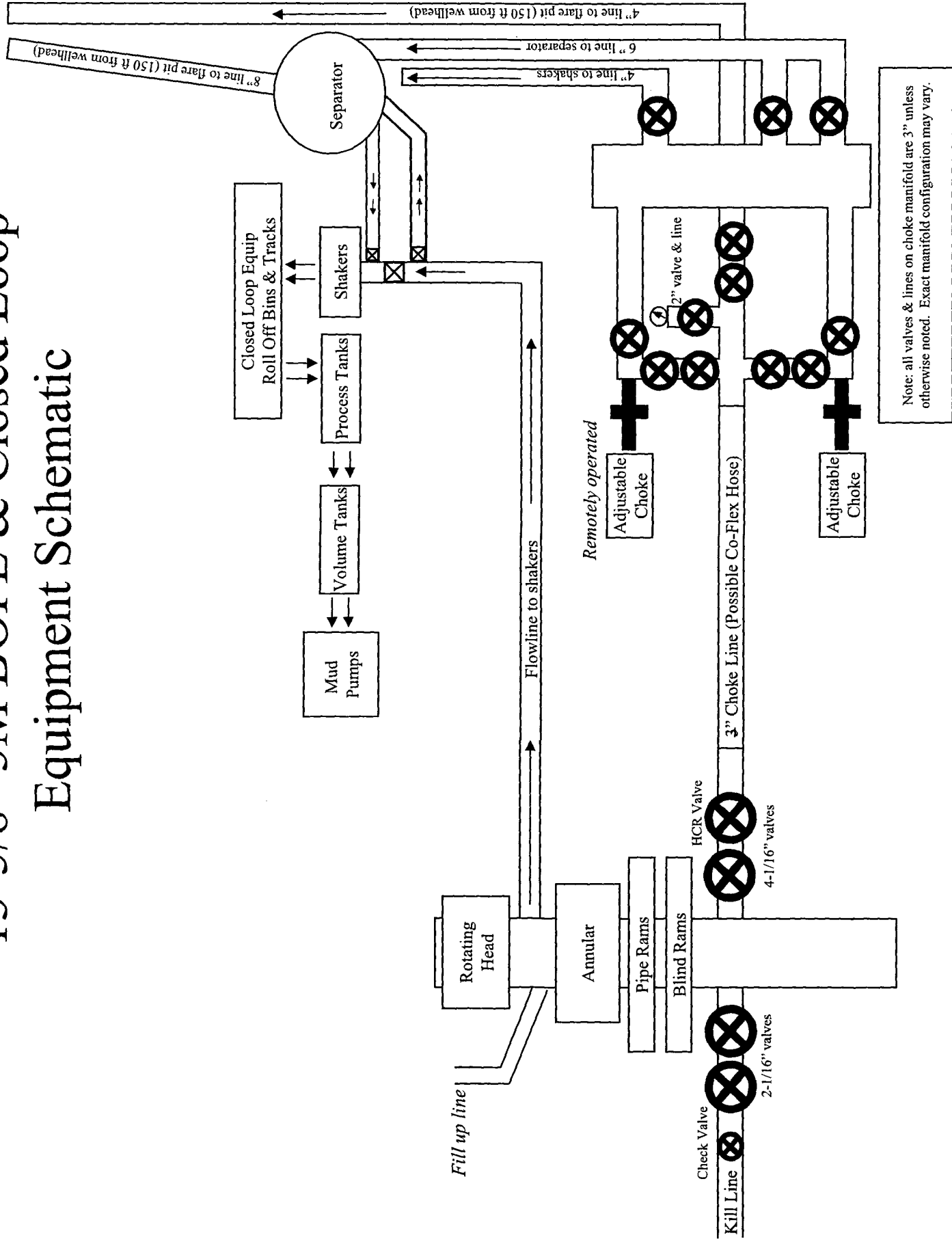
CDU_515H_MB_WellHd_08-25-2017.pdf

CDU_515H_Clsd_Loop_08-25-2017.pdf

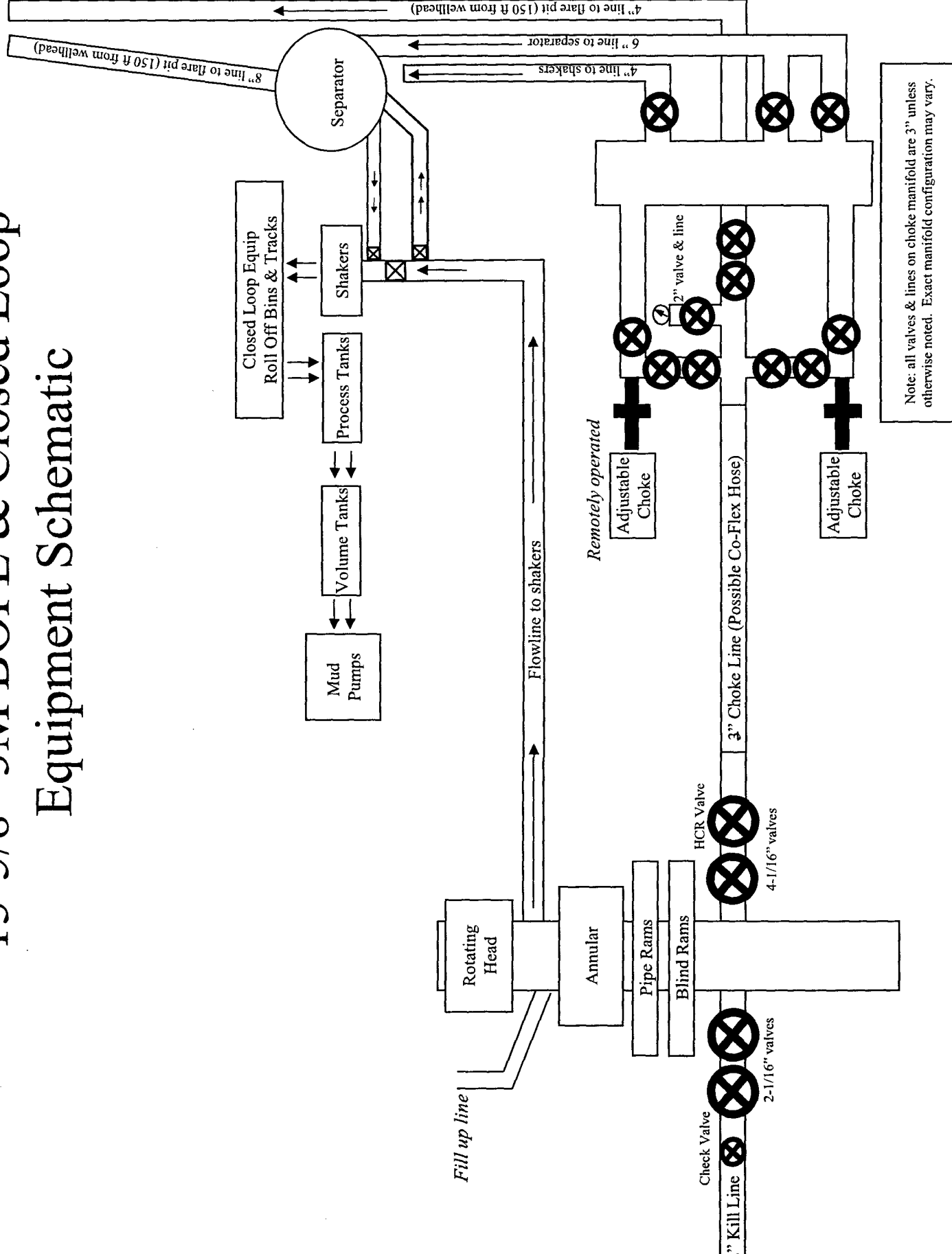
Other Variance attachment:

CDU_515H_Co_flex_08-03-2017.pdf

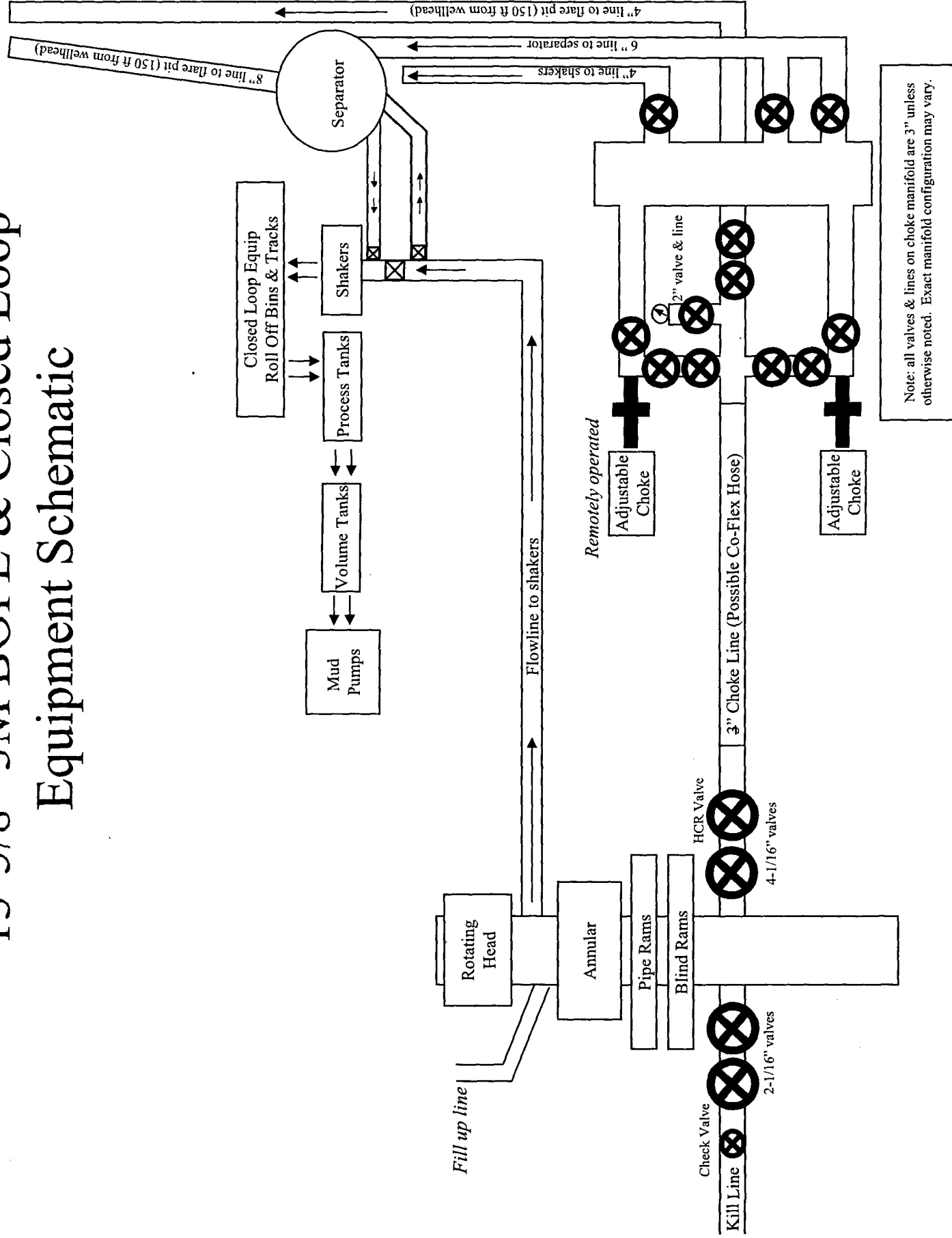
13-5/8" 3M BOPE & Closed Loop Equipment Schematic



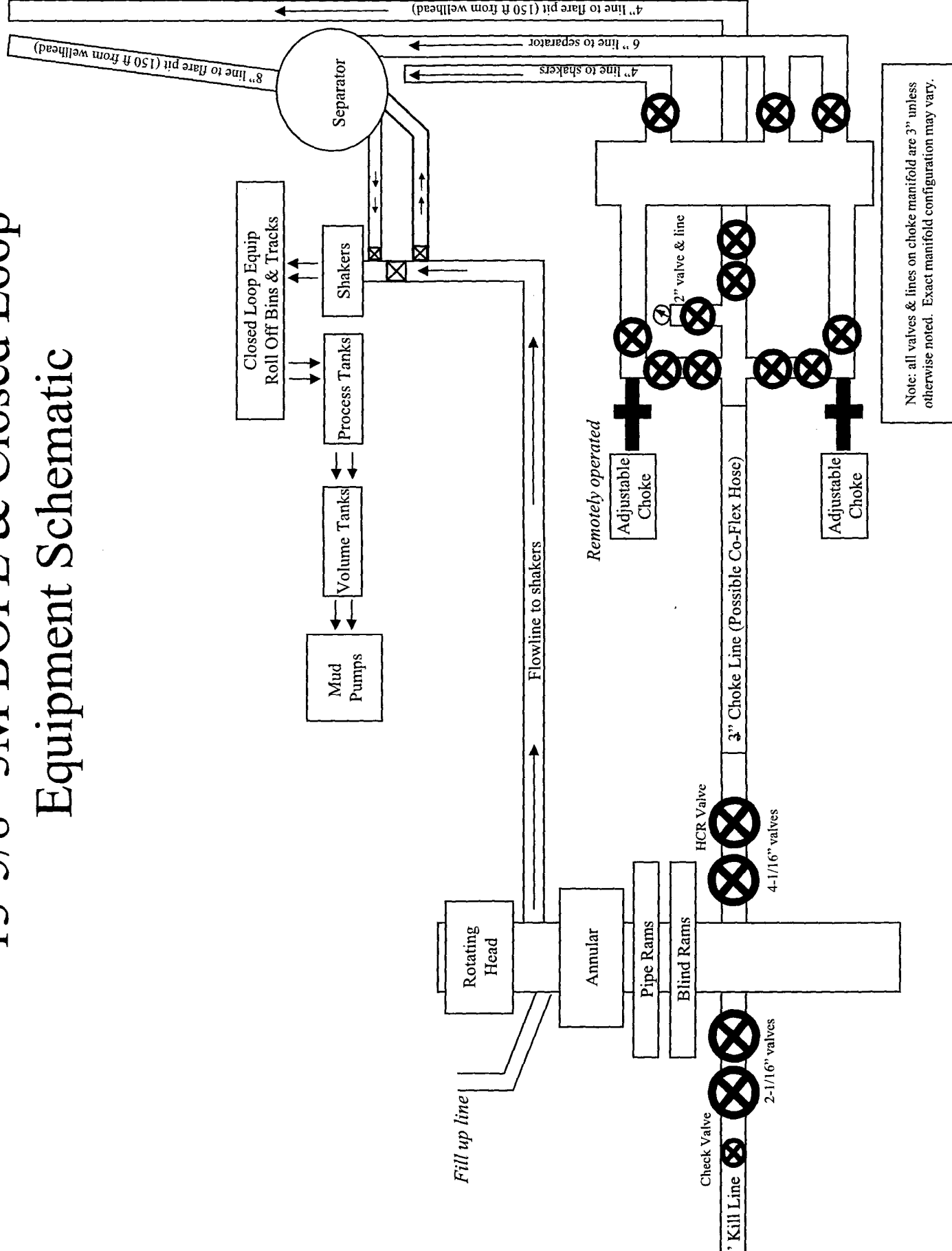
13-5/8" 3M BOPE & Closed Loop Equipment Schematic



15-3/8" 3M BOPE & Closed Loop Equipment Schematic



13-5/8" 3M BOPE & Closed Loop Equipment Schematic



Casing Assumptions and Load Cases

Surface

All casing design assumptions were ran in Stress Check to determine safety factor which meet or exceed both Devon Energy and BLM minimum requirements. All casing strings will be filled while running in hole in order to not exceed collapse rating of the pipe.

Surface Casing Burst Design		
Load Case	External Pressure	Internal Pressure
Pressure Test	Formation Pore Pressure	Max mud weight of next hole-section plus Test psi
Drill Ahead	Formation Pore Pressure	Max mud weight of next hole section
Displace to Gas	Formation Pore Pressure	Dry gas from next casing point

Surface Casing Collapse Design		
Load Case	External Pressure	Internal Pressure
Full Evacuation	Water gradient in cement, mud above TOC	None
Cementing	Wet cement weight	Water (8.33ppg)

Surface Casing Tension Design	
Load Case	Assumptions
Overpull	100kips
Runing in hole	3 ft/s
Service Loads	N/A

Casing Assumptions and Load Cases

Intermediate

All casing design assumptions were ran in Stress Check to determine safety factor which meet or exceed both Devon Energy and BLM minimum requirements. All casing strings will be filled while running in hole in order to not exceed collapse rating of the pipe.

Intermediate Casing Burst Design		
Load Case	External Pressure	Internal Pressure
Pressure Test	Formation Pore Pressure	Max mud weight of next hole-section plus Test psi
Drill Ahead	Formation Pore Pressure	Max mud weight of next hole section
Fracture @ Shoe	Formation Pore Pressure	Dry gas

Intermediate Casing Collapse Design		
Load Case	External Pressure	Internal Pressure
Full Evacuation	Water gradient in cement, mud above TOC	None
Cementing	Wet cement weight	Water (8.33ppg)

Intermediate Casing Tension Design	
Load Case	Assumptions
Overpull	100kips
Runing in hole	2 ft/s
Service Loads	N/A

Casing Assumptions and Load Cases

Production

All casing design assumptions were ran in Stress Check to determine safety factor which meet or exceed both Devon Energy and BLM minimum requirements. All casing strings will be filled while running in hole in order to not exceed collapse rating of the pipe.

Production Casing Burst Design		
Load Case	External Pressure	Internal Pressure
Pressure Test	Formation Pore Pressure	Fluid in hole (water or produced water) + test psi
Tubing Leak	Formation Pore Pressure	Packer @ KOP, leak below surface 8.6 ppg packer fluid
Stimulation	Formation Pore Pressure	Max frac pressure with heaviest frac fluid

Production Casing Collapse Design		
Load Case	External Pressure	Internal Pressure
Full Evacuation	Water gradient in cement, mud above TOC.	None
Cementing	Wet cement weight	Water (8.33ppg)

Production Casing Tension Design	
Load Case	Assumptions
Overpull	100kips
Runing in hole	2 ft/s
Service Loads	N/A



**Devon Energy Center
333 West Sheridan Avenue
Oklahoma City, Oklahoma 73102-5015**

Hydrogen Sulfide (H₂S) Contingency Plan

For

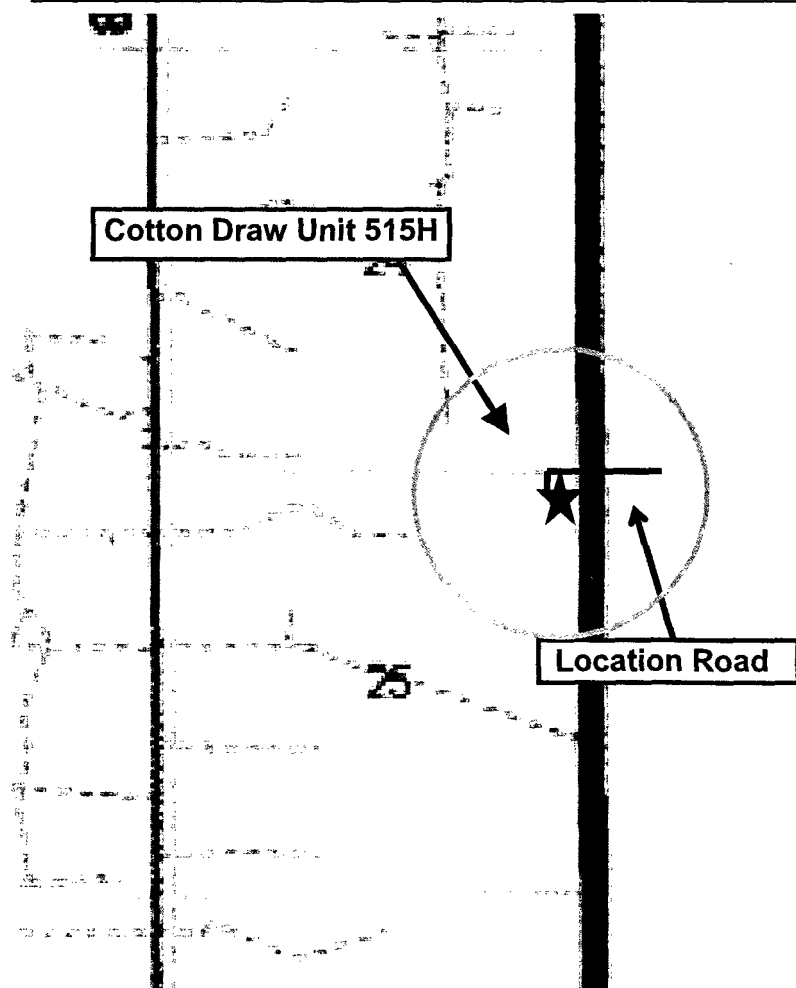
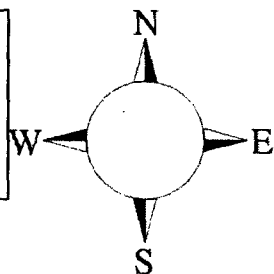
Cotton Draw Unit 515H

**Sec-25 T-24S R-31E
485' FNL & 410 FEL
LAT. = 32.1942688' N (NAD83)
LONG = 103.7242973 W**

Eddy County NM

Cotton Draw Unit 515H

This is an open drilling site. H₂S monitoring equipment and emergency response equipment will be used within 500' of zones known to contain H₂S, including warning signs, wind indicators and H₂S monitor.



Assumed 100 ppm ROE = 3000' (radius of exposure)
100 ppm H₂S concentration shall trigger activation of this plan.

Escape

Crews shall escape upwind of escaping gas in the event of an emergency release of gas. Escape can be facilitated from the location entrance road. Crews should then block the entrance to the location from the lease road so as not to allow anyone traversing into a hazardous area. The blockade should be at a safe distance outside of the ROE. There are no homes or buildings in or near the ROE.

Assumed 100 ppm ROE = 3000'

100 ppm H₂S concentration shall trigger activation of this plan.

Emergency Procedures

In the event of a release of gas containing H₂S, the first responder(s) must

- **Isolate the area and prevent entry by other persons into the 100 ppm ROE.**
- **Evacuate any public places encompassed by the 100 ppm ROE.**
- **Be equipped with H₂S monitors and air packs in order to control the release.**
- **Use the “buddy system” to ensure no injuries occur during the response**
- **Take precautions to avoid personal injury during this operation.**
- **Contact operator and/or local officials to aid in operation. See list of phone numbers attached.**
- **Have received training in the**
 - **Detection of H₂S, and**
 - **Measures for protection against the gas,**
 - **Equipment used for protection and emergency response.**

Ignition of Gas Source

Should control of the well be considered lost and ignition considered, take care to protect against exposure to Sulfur Dioxide (SO₂). Intentional ignition must be coordinated with the NMOCD and local officials. Additionally the NM State Police may become involved. NM State Police shall be the Incident Command on scene of any major release. Take care to protect downwind whenever there is an ignition of the gas

Characteristics of H₂S and SO₂

Common Name	Chemical Formula	Specific Gravity	Threshold Limit	Hazardous Limit	Lethal Concentration
Hydrogen Sulfide	H₂S	1.189 Air = 1	10 ppm	100 ppm/hr	600 ppm
Sulfur Dioxide	SO₂	2.21 Air = 1	2 ppm	N/A	1000 ppm

Contacting Authorities

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

Hydrogen Sulfide Drilling Operation Plan

I. HYDROGEN SULFIDE (H₂S) TRAINING

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

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 H₂S detectors, alarms, warning systems, briefing areas, evacuation procedures, and prevailing winds.
4. The proper techniques for first aid and rescue procedures.

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

1. The effects of H₂S metal components. If high tensile tubulars are to be used, personnel will be trained in their special maintenance requirements.
2. Corrective action and shut-in procedures when drilling or reworking a well and blowout prevention and well control procedures.
3. The contents and requirements of the H₂S Drilling Operations Plan and Public Protection Plan.

There will be an initial training session just prior to encountering a known or probable H₂S zone (within 3 days or 500 feet) and weekly H₂S and well control drills for all personnel in each crew. The initial training session shall include a review of the site specific H₂S Drilling Operations Plan and the Public Protection Plan.

II. HYDROGEN SULFIDE TRAINING

Note: All H₂S safety equipment and systems will be installed, tested, and operational when drilling reaches a depth of 500 feet above, or three days prior to penetrating the first zone containing or reasonably expected to contain H₂S.

1. Well Control Equipment

- A. Flare line
- B. Choke manifold – Remotely Operated
- C. Blind rams and pipe rams to accommodate all pipe sizes with properly sized closing unit
- D. Auxiliary equipment may include if applicable: annular preventer and rotating head.
- E. Mud/Gas Separator

2. Protective equipment for essential personnel:

30-minute SCBA units located at briefing areas, as indicated on well site diagram, with one escape unit available in the top doghouse. As it may be difficult to communicate audibly while wearing these units, hand signals shall be utilized.

3. H₂S detection and monitoring equipment:

Portable H₂S monitors positioned on location for best coverage and response. These units have warning lights which activate when H₂S levels reach 10 ppm and audible sirens which activate at 10 ppm. Sensor locations:

- Bell nipple
- Shale shaker
- Trip tank
- Suction pit
- Rig floor
- Cellar
- Choke manifold
- Living Quarters (usually the company man's trailer stairs.)

Visual warning systems:

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

4. Mud program:

The mud program has been designed to minimize the volume of H₂S circulated to surface. Proper mud weight, safe drilling practices and the use of H₂S scavengers will minimize hazards when penetrating H₂S bearing zones.

5. Metallurgy:

A. All drill strings, casings, tubing, wellhead, blowout preventer, drilling spool, kill lines, choke manifold lines, and valves shall be H₂S trim.

B. All elastomers used for packing and seals shall be H₂S trim.

6. Communication:

A. Company personnel have/use cellular telephones in the field.

B. Land line (telephone) communications at Office

7. Well testing:

A. There will be no drill stem testing.

<u>Devon Energy Corp. Company Call List</u>		
Drilling Supervisor – Basin – Mark Kramer		405-823-4796
Jerry Matthews – Day: 575-748-0161 Cell: 575-748-5234		
EHS Professional – Jason Robison		405-541-2841
<u>Agency Call List</u>		
<u>Lea County (575)</u>	Hobbs	
	Lea County Communication Authority	393-3981
	State Police	392-5588
	City Police	397-9265
	Sheriff's Office	393-2515
	Ambulance	911
	Fire Department	397-9308
	LEPC (Local Emergency Planning Committee)	393-2870
	NMOCD	393-6161
	US Bureau of Land Management	393-3612
<u>Eddy County (575)</u>	Carlsbad	
	State Police	885-3137
	City Police	885-2111
	Sheriff's Office	887-7551
	Ambulance	911
	Fire Department	885-3125
	LEPC (Local Emergency Planning Committee)	887-3798
	US Bureau of Land Management	887-6544
	NM Emergency Response Commission (Santa Fe)	(505) 476-9600
	24 HR	(505) 827-9126
	National Emergency Response Center	(800) 424-8802
	National Pollution Control Center: Direct	(703) 872-6000
	For Oil Spills	(800) 280-7118
	Emergency Services	
	Wild Well Control	(281) 784-4700
	Cudd Pressure Control	(915) 699-0139 (915) 563-3356
	Halliburton	(575) 746-2757
	B. J. Services	(575) 746-3569
<u>Give GPS position:</u>	Native Air – Emergency Helicopter – Hobbs	(575) 392-6429
	Flight For Life - Lubbock, TX	(806) 743-9911
	Aerocare - Lubbock, TX	(806) 747-8923
	Med Flight Air Amb - Albuquerque, NM	(575) 842-4433
	Lifeguard Air Med Svc. Albuquerque, NM	(800) 222-1222
	Poison Control (24/7)	(575) 272-3115
	Oil & Gas Pipeline 24 Hour Service	(800) 364-4366
	NOAA – Website - www.nhc.noaa.gov	

Prepared in conjunction with
Dave Small



devon

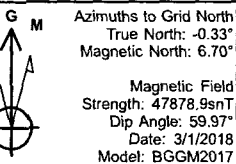
Company: Devon Energy
Site: Cotton Draw Unit
Well: 515H

Project: Eddy County, New Mexico (NAD 83)
Rig: Cactus 126

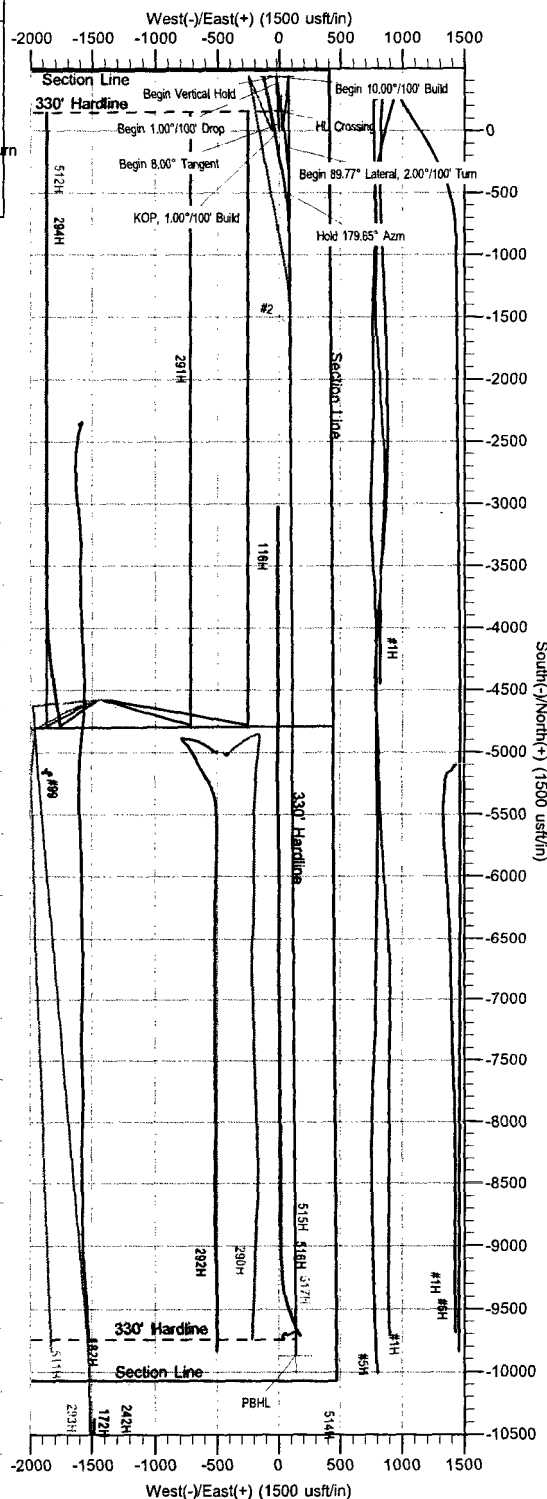
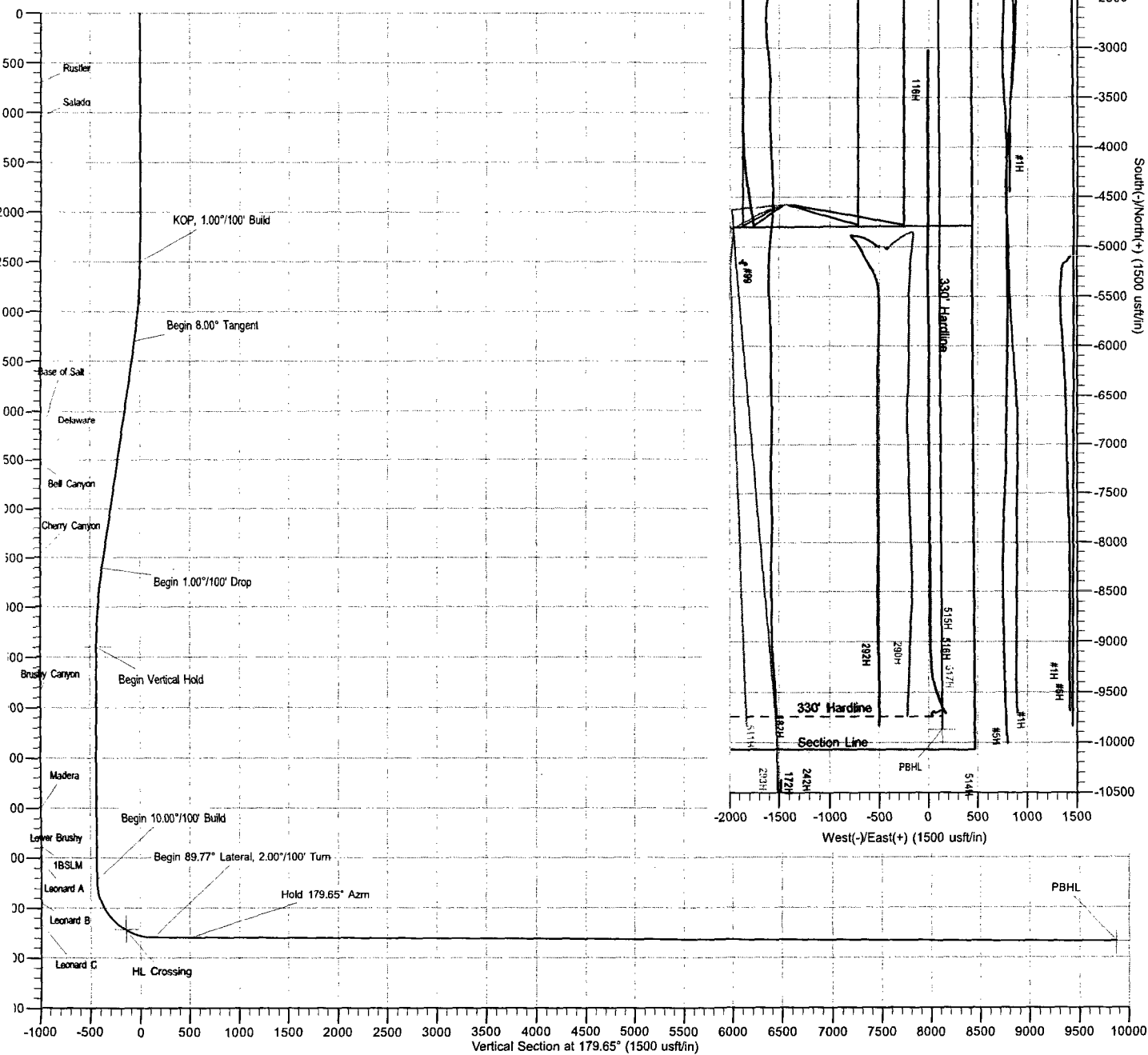
MS Energy Services.
WWW.MSENERGYSERVICES.COM

ANNOTATIONS

MD	Inc	Azi	TVD	+N/-S	+E/-W	Vsect	Departure	Annotation
0.00	0.00	0.00	2500.00	0.00	0.00	0.00	0.00	KOP, 1.00°/100' Build
9.74	8.00	357.01	3297.14	55.65	-2.91	-55.66	55.72	Begin 8.00° Tangent
8.09	8.00	357.01	5602.86	379.15	-19.80	-379.26	379.66	Begin 1.00°/100' Drop
7.83	0.00	0.00	6400.00	434.79	-22.70	-434.93	435.39	Begin Vertical Hold
1.58	0.00	0.00	8723.75	434.79	-22.70	-434.93	435.39	Begin 10.00°/100' Build
9.26	89.77	172.09	9296.70	-130.41	55.85	130.75	1006.02	Begin 89.77° Lateral, 2.00°/100' Turn
7.33	89.77	179.65	9298.24	-507.22	83.08	507.72	1384.09	Hold 179.65° Azm
0.56	89.77	179.65	9336.10	-9870.19	140.52	9870.87	10747.24	PBHL

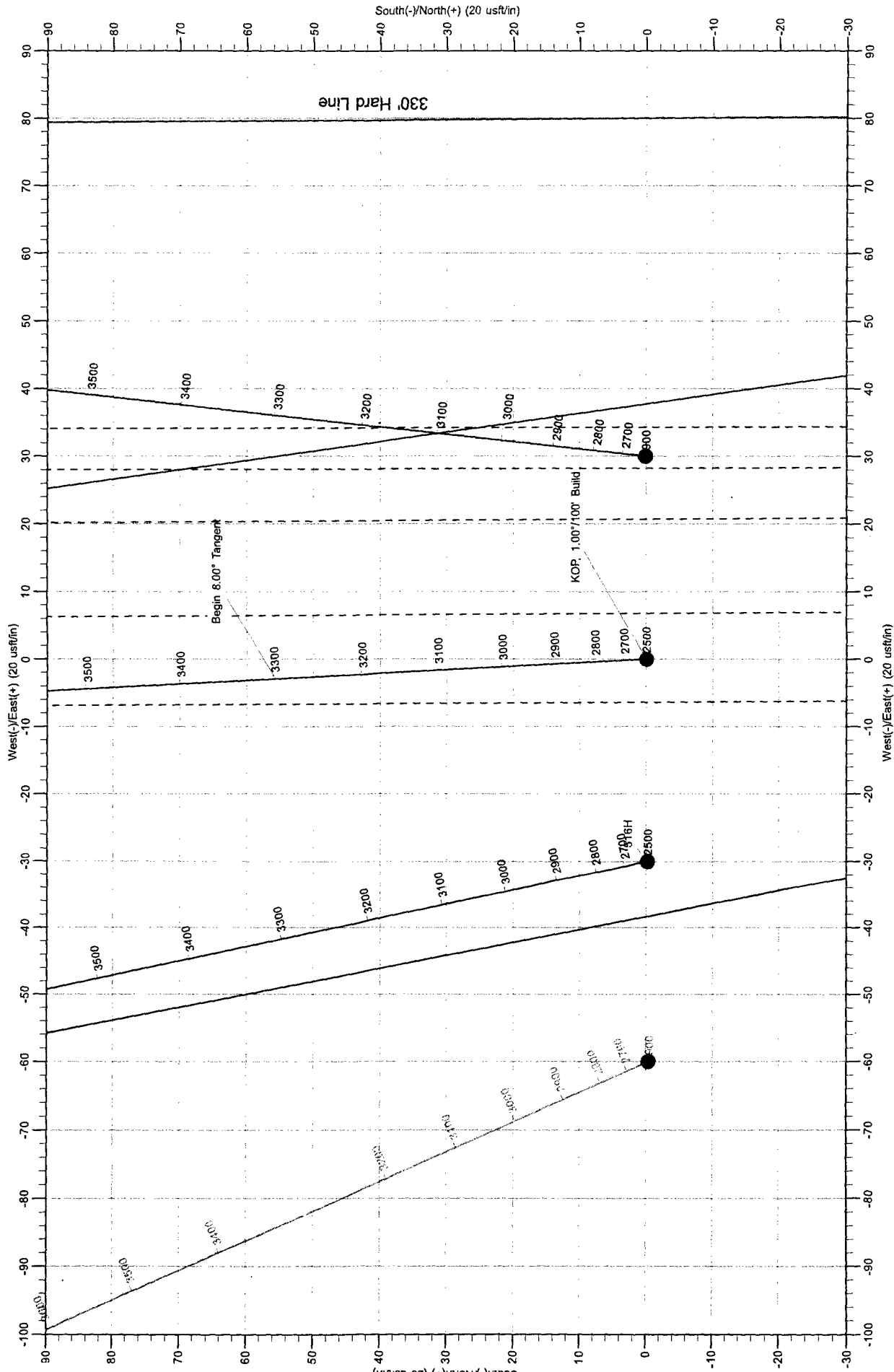


US State Plane 1983
 New Mexico Eastern Zone
 Created By: VLS
 Date: 15/23, August 22 2017
 Plan: Design #1





Company: Devon Energy
Site: Cotton Draw Unit
Well: 515H
Project: Eddy County, New Mexico (NAD 83)
Rig: Cactus 126





Devon Energy

**Eddy County, New Mexico (NAD 83)
Cotton Draw Unit
515H**

Wellbore #1

Plan: Design #1

Standard Planning Report

22 August, 2017



MS Energy Services
Planning Report



Database: EDM 5000.14 Conroe Server
Company: Devon Energy
Project: Eddy County, New Mexico (NAD 83)
Site: Cotton Draw Unit
Well: 515H
Wellbore: Wellbore #1
Design: Design #1

Local Co-ordinate Reference: Well 515H
TVD Reference: Well @ 3566.10usft (Cactus 126)
MD Reference: Well @ 3566.10usft (Cactus 126)
North Reference: Grid
Survey Calculation Method: Minimum Curvature

Project	Eddy County, New Mexico (NAD 83)		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	New Mexico Eastern Zone		

Well	515H				
Well Position	+N/-S	434,942.91 usft	Northing:	434,942.91 usft	Latitude: 32° 11' 39.368 N
	+E/-W	729,733.79 usft	Easting:	729,733.79 usft	Longitude: 103° 43' 27.470 W
Position Uncertainty	0.00 usft		Wellhead Elevation:	Ground Level: 3,541.10 usft	

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	BGGM2017	3/1/2018	7.03	59.97	47,879

Design	Design #1				
Audit Notes:					
Version:	Phase:	PROTOTYPE	Tie On Depth:	0.00	
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)	
	0.00	0.00	0.00	179.65	

Plan Survey Tool Program		Date 8/22/2017			
Depth From (usft)	Depth To (usft)	Survey (Wellbore)	Tool Name	Remarks	
1	0.00	19,390.17	Design #1 (Wellbore #1)	MWD	
				OWSG MWD - Standard	

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	
2,500.00	0.00	0.00	2,500.00	0.00	0.00	0.00	0.00	0.00	0.00	
3,299.74	8.00	357.01	3,297.14	55.65	-2.91	1.00	1.00	0.00	357.01	
5,628.09	8.00	357.01	5,602.86	379.15	-19.80	0.00	0.00	0.00	0.00	
6,427.83	0.00	0.00	6,400.00	434.79	-22.70	1.00	-1.00	0.00	180.00	Vert - CDU 515H
8,751.58	0.00	0.00	8,723.75	434.79	-22.70	0.00	0.00	0.00	0.00	
9,649.26	89.77	172.09	9,296.70	-130.41	55.85	10.00	10.00	0.00	172.09	
10,027.33	89.77	179.65	9,298.24	-507.22	83.08	2.00	0.00	2.00	90.01	
19,390.56	89.77	179.65	9,336.10	-9,870.19	140.52	0.00	0.00	0.00	0.00	PBHL - CDU 515H

Database: EDM 5000.14 Conroe Server
 Company: Devon Energy
 Project: Eddy County, New Mexico (NAD 83)
 Site: Cotton Draw Unit
 Well: 515H
 Wellbore: Wellbore #1
 Design: Design #1

Local Co-ordinate Reference: Well 515H
 TVD Reference: Well @ 3566.10usft (Cactus 126)
 MD Reference: Well @ 3566.10usft (Cactus 126)
 North Reference: Grid
 Survey Calculation Method: Minimum Curvature

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
100.00	0.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00
200.00	0.00	0.00	200.00	0.00	0.00	0.00	0.00	0.00	0.00
300.00	0.00	0.00	300.00	0.00	0.00	0.00	0.00	0.00	0.00
400.00	0.00	0.00	400.00	0.00	0.00	0.00	0.00	0.00	0.00
500.00	0.00	0.00	500.00	0.00	0.00	0.00	0.00	0.00	0.00
600.00	0.00	0.00	600.00	0.00	0.00	0.00	0.00	0.00	0.00
699.10	0.00	0.00	699.10	0.00	0.00	0.00	0.00	0.00	0.00
Rustler									
700.00	0.00	0.00	700.00	0.00	0.00	0.00	0.00	0.00	0.00
800.00	0.00	0.00	800.00	0.00	0.00	0.00	0.00	0.00	0.00
900.00	0.00	0.00	900.00	0.00	0.00	0.00	0.00	0.00	0.00
1,000.00	0.00	0.00	1,000.00	0.00	0.00	0.00	0.00	0.00	0.00
1,043.10	0.00	0.00	1,043.10	0.00	0.00	0.00	0.00	0.00	0.00
Salado									
1,100.00	0.00	0.00	1,100.00	0.00	0.00	0.00	0.00	0.00	0.00
1,200.00	0.00	0.00	1,200.00	0.00	0.00	0.00	0.00	0.00	0.00
1,300.00	0.00	0.00	1,300.00	0.00	0.00	0.00	0.00	0.00	0.00
1,400.00	0.00	0.00	1,400.00	0.00	0.00	0.00	0.00	0.00	0.00
1,500.00	0.00	0.00	1,500.00	0.00	0.00	0.00	0.00	0.00	0.00
1,600.00	0.00	0.00	1,600.00	0.00	0.00	0.00	0.00	0.00	0.00
1,700.00	0.00	0.00	1,700.00	0.00	0.00	0.00	0.00	0.00	0.00
1,800.00	0.00	0.00	1,800.00	0.00	0.00	0.00	0.00	0.00	0.00
1,900.00	0.00	0.00	1,900.00	0.00	0.00	0.00	0.00	0.00	0.00
2,000.00	0.00	0.00	2,000.00	0.00	0.00	0.00	0.00	0.00	0.00
2,100.00	0.00	0.00	2,100.00	0.00	0.00	0.00	0.00	0.00	0.00
2,200.00	0.00	0.00	2,200.00	0.00	0.00	0.00	0.00	0.00	0.00
2,300.00	0.00	0.00	2,300.00	0.00	0.00	0.00	0.00	0.00	0.00
2,400.00	0.00	0.00	2,400.00	0.00	0.00	0.00	0.00	0.00	0.00
2,500.00	0.00	0.00	2,500.00	0.00	0.00	0.00	0.00	0.00	0.00
KOP, 1.00°/100' Build									
2,600.00	1.00	357.01	2,599.99	0.87	-0.05	-0.87	1.00	1.00	0.00
2,700.00	2.00	357.01	2,699.96	3.49	-0.18	-3.49	1.00	1.00	0.00
2,800.00	3.00	357.01	2,799.86	7.84	-0.41	-7.84	1.00	1.00	0.00
2,900.00	4.00	357.01	2,899.68	13.94	-0.73	-13.94	1.00	1.00	0.00
3,000.00	5.00	357.01	2,999.37	21.77	-1.14	-21.78	1.00	1.00	0.00
3,100.00	6.00	357.01	3,098.90	31.34	-1.64	-31.35	1.00	1.00	0.00
3,200.00	7.00	357.01	3,198.26	42.65	-2.23	-42.66	1.00	1.00	0.00
3,299.74	8.00	357.01	3,297.14	55.65	-2.91	-55.66	1.00	1.00	0.00
Begin 8.00° Tangent									
3,400.00	8.00	357.01	3,396.43	69.58	-3.63	-69.60	0.00	0.00	0.00
3,500.00	8.00	357.01	3,495.46	83.47	-4.36	-83.50	0.00	0.00	0.00
3,600.00	8.00	357.01	3,594.49	97.37	-5.08	-97.39	0.00	0.00	0.00
3,700.00	8.00	357.01	3,693.51	111.26	-5.81	-111.29	0.00	0.00	0.00
3,800.00	8.00	357.01	3,792.54	125.15	-6.54	-125.19	0.00	0.00	0.00
3,900.00	8.00	357.01	3,891.57	139.05	-7.26	-139.09	0.00	0.00	0.00
4,000.00	8.00	357.01	3,990.60	152.94	-7.99	-152.99	0.00	0.00	0.00
4,100.00	8.00	357.01	4,089.62	166.83	-8.71	-166.89	0.00	0.00	0.00
4,200.00	8.00	357.01	4,188.65	180.73	-9.44	-180.78	0.00	0.00	0.00
4,284.50	8.00	357.01	4,272.33	192.47	-10.05	-192.53	0.00	0.00	0.00
Base of Salt									
4,300.00	8.00	357.01	4,287.68	194.62	-10.16	-194.68	0.00	0.00	0.00
4,400.00	8.00	357.01	4,386.71	208.52	-10.89	-208.58	0.00	0.00	0.00
4,500.00	8.00	357.01	4,485.73	222.41	-11.61	-222.48	0.00	0.00	0.00



MS Energy Services Planning Report



Database: EDM 5000.14 Conroe Server
Company: Devon Energy
Project: Eddy County, New Mexico (NAD 83)
Site: Cotton Draw Unit
Well: 515H
Wellbore: Wellbore #1
Design: Design #1

Local Co-ordinate Reference: Well 515H
TVD Reference: Well @ 3566.10usft (Cactus 126)
MD Reference: Well @ 3566.10usft (Cactus 126)
North Reference: Grid
Survey Calculation Method: Minimum Curvature

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)
4,533.78	8.00	357.01	4,519.19	227.10	-11.86	-227.17	0.00	0.00	0.00
Delaware									
4,560.02	8.00	357.01	4,545.17	230.75	-12.05	-230.82	0.00	0.00	0.00
Bell Canyon									
4,600.00	8.00	357.01	4,584.76	236.30	-12.34	-236.38	0.00	0.00	0.00
4,700.00	8.00	357.01	4,683.79	250.20	-13.07	-250.27	0.00	0.00	0.00
4,800.00	8.00	357.01	4,782.81	264.09	-13.79	-264.17	0.00	0.00	0.00
4,900.00	8.00	357.01	4,881.84	277.99	-14.52	-278.07	0.00	0.00	0.00
5,000.00	8.00	357.01	4,980.87	291.88	-15.24	-291.97	0.00	0.00	0.00
5,100.00	8.00	357.01	5,079.90	305.77	-15.97	-305.87	0.00	0.00	0.00
5,200.00	8.00	357.01	5,178.92	319.67	-16.69	-319.76	0.00	0.00	0.00
5,300.00	8.00	357.01	5,277.95	333.56	-17.42	-333.66	0.00	0.00	0.00
5,400.00	8.00	357.01	5,376.98	347.46	-18.14	-347.56	0.00	0.00	0.00
5,483.49	8.00	357.01	5,459.66	359.06	-18.75	-359.16	0.00	0.00	0.00
Cherry Canyon									
5,500.00	8.00	357.01	5,476.01	361.35	-18.87	-361.46	0.00	0.00	0.00
5,600.00	8.00	357.01	5,575.03	375.24	-19.59	-375.36	0.00	0.00	0.00
5,628.09	8.00	357.01	5,602.86	379.15	-19.80	-379.26	0.00	0.00	0.00
Begin 1.00°/100' Drop									
5,700.00	7.28	357.01	5,674.12	388.69	-20.30	-388.81	1.00	-1.00	0.00
5,800.00	6.28	357.01	5,773.42	400.48	-20.91	-400.60	1.00	-1.00	0.00
5,900.00	5.28	357.01	5,872.91	410.53	-21.44	-410.65	1.00	-1.00	0.00
6,000.00	4.28	357.01	5,972.56	418.85	-21.87	-418.98	1.00	-1.00	0.00
6,100.00	3.28	357.01	6,072.35	425.43	-22.22	-425.56	1.00	-1.00	0.00
6,200.00	2.28	357.01	6,172.23	430.27	-22.47	-430.40	1.00	-1.00	0.00
6,300.00	1.28	357.01	6,272.18	433.37	-22.63	-433.50	1.00	-1.00	0.00
6,400.00	0.28	357.01	6,372.17	434.73	-22.70	-434.86	1.00	-1.00	0.00
6,427.83	0.00	0.00	6,400.00	434.79	-22.70	-434.93	1.00	-1.00	0.00
Begin Vertical Hold									
6,500.00	0.00	0.00	6,472.17	434.79	-22.70	-434.93	0.00	0.00	0.00
6,600.00	0.00	0.00	6,572.17	434.79	-22.70	-434.93	0.00	0.00	0.00
6,700.00	0.00	0.00	6,672.17	434.79	-22.70	-434.93	0.00	0.00	0.00
6,800.00	0.00	0.00	6,772.17	434.79	-22.70	-434.93	0.00	0.00	0.00
6,867.19	0.00	0.00	6,839.35	434.79	-22.70	-434.93	0.00	0.00	0.00
Brushy Canyon									
6,900.00	0.00	0.00	6,872.17	434.79	-22.70	-434.93	0.00	0.00	0.00
7,000.00	0.00	0.00	6,972.17	434.79	-22.70	-434.93	0.00	0.00	0.00
7,100.00	0.00	0.00	7,072.17	434.79	-22.70	-434.93	0.00	0.00	0.00
7,200.00	0.00	0.00	7,172.17	434.79	-22.70	-434.93	0.00	0.00	0.00
7,300.00	0.00	0.00	7,272.17	434.79	-22.70	-434.93	0.00	0.00	0.00
7,400.00	0.00	0.00	7,372.17	434.79	-22.70	-434.93	0.00	0.00	0.00
7,500.00	0.00	0.00	7,472.17	434.79	-22.70	-434.93	0.00	0.00	0.00
7,600.00	0.00	0.00	7,572.17	434.79	-22.70	-434.93	0.00	0.00	0.00
7,700.00	0.00	0.00	7,672.17	434.79	-22.70	-434.93	0.00	0.00	0.00
7,800.00	0.00	0.00	7,772.17	434.79	-22.70	-434.93	0.00	0.00	0.00
7,900.00	0.00	0.00	7,872.17	434.79	-22.70	-434.93	0.00	0.00	0.00
8,000.00	0.00	0.00	7,972.17	434.79	-22.70	-434.93	0.00	0.00	0.00
8,033.19	0.00	0.00	8,005.35	434.79	-22.70	-434.93	0.00	0.00	0.00
Madera									
8,100.00	0.00	0.00	8,072.17	434.79	-22.70	-434.93	0.00	0.00	0.00
8,150.19	0.00	0.00	8,122.35	434.79	-22.70	-434.93	0.00	0.00	0.00
Lower Brushy									
8,200.00	0.00	0.00	8,172.17	434.79	-22.70	-434.93	0.00	0.00	0.00



MS Energy Services
Planning Report



Database: EDM 5000.14 Conroe Server
Company: Devon Energy
Project: Eddy County, New Mexico (NAD 83)
Site: Cotton Draw Unit
Well: 515H
Wellbore: Wellbore #1
Design: Design #1

Local Co-ordinate Reference: Well 515H
TVD Reference: Well @ 3566.10usft (Cactus 126)
MD Reference: Well @ 3566.10usft (Cactus 126)
North Reference: Grid
Survey Calculation Method: Minimum Curvature

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)
8,300.00	0.00	0.00	8,272.17	434.79	-22.70	-434.93	0.00	0.00	0.00
8,400.00	0.00	0.00	8,372.17	434.79	-22.70	-434.93	0.00	0.00	0.00
8,422.19	0.00	0.00	8,394.35	434.79	-22.70	-434.93	0.00	0.00	0.00
1BSLM									
8,500.00	0.00	0.00	8,472.17	434.79	-22.70	-434.93	0.00	0.00	0.00
8,552.19	0.00	0.00	8,524.35	434.79	-22.70	-434.93	0.00	0.00	0.00
Leonard A									
8,600.00	0.00	0.00	8,572.17	434.79	-22.70	-434.93	0.00	0.00	0.00
8,700.00	0.00	0.00	8,672.17	434.79	-22.70	-434.93	0.00	0.00	0.00
8,751.58	0.00	0.00	8,723.75	434.79	-22.70	-434.93	0.00	0.00	0.00
Begin 10.00°/100' Build									
8,800.00	4.84	172.09	8,772.11	432.77	-22.42	-432.90	10.00	10.00	0.00
8,850.00	9.84	172.09	8,821.68	426.44	-21.54	-426.57	10.00	10.00	0.00
8,900.00	14.84	172.09	8,870.51	415.86	-20.07	-415.98	10.00	10.00	0.00
8,950.00	19.84	172.09	8,918.22	401.10	-18.02	-401.21	10.00	10.00	0.00
8,992.42	24.08	172.09	8,957.55	385.40	-15.84	-385.49	10.00	10.00	0.00
Leonard B									
9,000.00	24.84	172.09	8,964.46	382.28	-15.41	-382.37	10.00	10.00	0.00
9,050.00	29.84	172.09	9,008.86	359.55	-12.25	-359.61	10.00	10.00	0.00
9,100.00	34.84	172.09	9,051.09	333.06	-8.56	-333.11	10.00	10.00	0.00
9,150.00	39.84	172.09	9,090.83	303.03	-4.39	-303.05	10.00	10.00	0.00
9,200.00	44.84	172.09	9,127.77	269.68	0.24	-269.68	10.00	10.00	0.00
9,250.00	49.84	172.09	9,161.64	233.28	5.30	-233.24	10.00	10.00	0.00
9,263.47	51.19	172.09	9,170.21	222.98	6.74	-222.93	10.00	10.00	0.00
Leonard C									
9,300.00	54.84	172.09	9,192.18	194.08	10.75	-194.01	10.00	10.00	0.00
9,350.00	59.84	172.09	9,219.15	152.40	16.55	-152.30	10.00	10.00	0.00
9,400.00	64.84	172.09	9,242.36	108.55	22.64	-108.41	10.00	10.00	0.00
9,450.00	69.84	172.09	9,261.61	62.86	28.99	-62.68	10.00	10.00	0.00
9,500.00	74.84	172.09	9,276.77	15.69	35.55	-15.47	10.00	10.00	0.00
9,550.00	79.84	172.09	9,287.73	-32.62	42.26	32.88	10.00	10.00	0.00
9,600.00	84.84	172.09	9,294.39	-81.69	49.08	81.98	10.00	10.00	0.00
9,649.26	89.77	172.09	9,296.70	-130.41	55.85	130.75	10.00	10.00	0.00
Begin 89.77° Lateral, 2.00°/100' Turn									
9,700.00	89.77	173.10	9,296.91	-180.72	62.39	181.10	2.00	0.00	2.00
9,800.00	89.77	175.10	9,297.31	-280.19	72.67	280.63	2.00	0.00	2.00
9,900.00	89.77	177.10	9,297.72	-379.95	79.47	380.43	2.00	0.00	2.00
10,000.00	89.77	179.10	9,298.12	-479.89	82.78	480.39	2.00	0.00	2.00
10,027.33	89.77	179.65	9,298.24	-507.22	83.08	507.72	2.00	0.00	2.00
Hold 179.65° Azm									
10,100.00	89.77	179.65	9,298.53	-579.89	83.52	580.39	0.00	0.00	0.00
10,200.00	89.77	179.65	9,298.93	-679.88	84.14	680.39	0.00	0.00	0.00
10,300.00	89.77	179.65	9,299.34	-779.88	84.75	780.39	0.00	0.00	0.00
10,400.00	89.77	179.65	9,299.74	-879.88	85.36	880.38	0.00	0.00	0.00
10,500.00	89.77	179.65	9,300.15	-979.87	85.98	980.38	0.00	0.00	0.00
10,600.00	89.77	179.65	9,300.55	-1,079.87	86.59	1,080.38	0.00	0.00	0.00
10,700.00	89.77	179.65	9,300.96	-1,179.87	87.20	1,180.38	0.00	0.00	0.00
10,800.00	89.77	179.65	9,301.36	-1,279.87	87.82	1,280.38	0.00	0.00	0.00
10,900.00	89.77	179.65	9,301.76	-1,379.86	88.43	1,380.38	0.00	0.00	0.00
11,000.00	89.77	179.65	9,302.17	-1,479.86	89.04	1,480.38	0.00	0.00	0.00
11,100.00	89.77	179.65	9,302.57	-1,579.86	89.66	1,580.38	0.00	0.00	0.00
11,200.00	89.77	179.65	9,302.98	-1,679.86	90.27	1,680.38	0.00	0.00	0.00
11,300.00	89.77	179.65	9,303.38	-1,779.85	90.88	1,780.38	0.00	0.00	0.00



MS Energy Services
Planning Report



Database: EDM 5000.14 Conroe Server
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Site: Cotton Draw Unit
Well: 515H
Wellbore: Wellbore #1
Design: Design #1

Local Co-ordinate Reference: Well 515H
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MD Reference: Well @ 3566.10usft (Cactus 126)
North Reference: Grid
Survey Calculation Method: Minimum Curvature

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)
11,400.00	89.77	179.65	9,303.79	-1,879.85	91.50	1,880.38	0.00	0.00	0.00
11,500.00	89.77	179.65	9,304.19	-1,979.85	92.11	1,980.38	0.00	0.00	0.00
11,600.00	89.77	179.65	9,304.60	-2,079.85	92.72	2,080.38	0.00	0.00	0.00
11,700.00	89.77	179.65	9,305.00	-2,179.84	93.34	2,180.37	0.00	0.00	0.00
11,800.00	89.77	179.65	9,305.40	-2,279.84	93.95	2,280.37	0.00	0.00	0.00
11,900.00	89.77	179.65	9,305.81	-2,379.84	94.56	2,380.37	0.00	0.00	0.00
12,000.00	89.77	179.65	9,306.21	-2,479.83	95.18	2,480.37	0.00	0.00	0.00
12,100.00	89.77	179.65	9,306.62	-2,579.83	95.79	2,580.37	0.00	0.00	0.00
12,200.00	89.77	179.65	9,307.02	-2,679.83	96.40	2,680.37	0.00	0.00	0.00
12,300.00	89.77	179.65	9,307.43	-2,779.83	97.02	2,780.37	0.00	0.00	0.00
12,400.00	89.77	179.65	9,307.83	-2,879.82	97.63	2,880.37	0.00	0.00	0.00
12,500.00	89.77	179.65	9,308.23	-2,979.82	98.25	2,980.37	0.00	0.00	0.00
12,600.00	89.77	179.65	9,308.64	-3,079.82	98.86	3,080.37	0.00	0.00	0.00
12,700.00	89.77	179.65	9,309.04	-3,179.82	99.47	3,180.37	0.00	0.00	0.00
12,800.00	89.77	179.65	9,309.45	-3,279.81	100.09	3,280.37	0.00	0.00	0.00
12,900.00	89.77	179.65	9,309.85	-3,379.81	100.70	3,380.36	0.00	0.00	0.00
13,000.00	89.77	179.65	9,310.26	-3,479.81	101.31	3,480.36	0.00	0.00	0.00
13,100.00	89.77	179.65	9,310.66	-3,579.80	101.93	3,580.36	0.00	0.00	0.00
13,200.00	89.77	179.65	9,311.07	-3,679.80	102.54	3,680.36	0.00	0.00	0.00
13,300.00	89.77	179.65	9,311.47	-3,779.80	103.15	3,780.36	0.00	0.00	0.00
13,400.00	89.77	179.65	9,311.87	-3,879.80	103.77	3,880.36	0.00	0.00	0.00
13,500.00	89.77	179.65	9,312.28	-3,979.79	104.38	3,980.36	0.00	0.00	0.00
13,600.00	89.77	179.65	9,312.68	-4,079.79	104.99	4,080.36	0.00	0.00	0.00
13,700.00	89.77	179.65	9,313.09	-4,179.79	105.61	4,180.36	0.00	0.00	0.00
13,800.00	89.77	179.65	9,313.49	-4,279.79	106.22	4,280.36	0.00	0.00	0.00
13,900.00	89.77	179.65	9,313.90	-4,379.78	106.83	4,380.36	0.00	0.00	0.00
14,000.00	89.77	179.65	9,314.30	-4,479.78	107.45	4,480.36	0.00	0.00	0.00
14,100.00	89.77	179.65	9,314.71	-4,579.78	108.06	4,580.35	0.00	0.00	0.00
14,200.00	89.77	179.65	9,315.11	-4,679.78	108.67	4,680.35	0.00	0.00	0.00
14,300.00	89.77	179.65	9,315.51	-4,779.77	109.29	4,780.35	0.00	0.00	0.00
14,400.00	89.77	179.65	9,315.92	-4,879.77	109.90	4,880.35	0.00	0.00	0.00
14,500.00	89.77	179.65	9,316.32	-4,979.77	110.51	4,980.35	0.00	0.00	0.00
14,600.00	89.77	179.65	9,316.73	-5,079.76	111.13	5,080.35	0.00	0.00	0.00
14,700.00	89.77	179.65	9,317.13	-5,179.76	111.74	5,180.35	0.00	0.00	0.00
14,800.00	89.77	179.65	9,317.54	-5,279.76	112.35	5,280.35	0.00	0.00	0.00
14,900.00	89.77	179.65	9,317.94	-5,379.76	112.97	5,380.35	0.00	0.00	0.00
15,000.00	89.77	179.65	9,318.34	-5,479.75	113.58	5,480.35	0.00	0.00	0.00
15,100.00	89.77	179.65	9,318.75	-5,579.75	114.20	5,580.35	0.00	0.00	0.00
15,200.00	89.77	179.65	9,319.15	-5,679.75	114.81	5,680.35	0.00	0.00	0.00
15,300.00	89.77	179.65	9,319.56	-5,779.75	115.42	5,780.34	0.00	0.00	0.00
15,400.00	89.77	179.65	9,319.96	-5,879.74	116.04	5,880.34	0.00	0.00	0.00
15,500.00	89.77	179.65	9,320.37	-5,979.74	116.65	5,980.34	0.00	0.00	0.00
15,600.00	89.77	179.65	9,320.77	-6,079.74	117.26	6,080.34	0.00	0.00	0.00
15,700.00	89.77	179.65	9,321.18	-6,179.73	117.88	6,180.34	0.00	0.00	0.00
15,800.00	89.77	179.65	9,321.58	-6,279.73	118.49	6,280.34	0.00	0.00	0.00
15,900.00	89.77	179.65	9,321.98	-6,379.73	119.10	6,380.34	0.00	0.00	0.00
16,000.00	89.77	179.65	9,322.39	-6,479.73	119.72	6,480.34	0.00	0.00	0.00
16,100.00	89.77	179.65	9,322.79	-6,579.72	120.33	6,580.34	0.00	0.00	0.00
16,200.00	89.77	179.65	9,323.20	-6,679.72	120.94	6,680.34	0.00	0.00	0.00
16,300.00	89.77	179.65	9,323.60	-6,779.72	121.56	6,780.34	0.00	0.00	0.00
16,400.00	89.77	179.65	9,324.01	-6,879.72	122.17	6,880.34	0.00	0.00	0.00
16,500.00	89.77	179.65	9,324.41	-6,979.71	122.78	6,980.34	0.00	0.00	0.00
16,600.00	89.77	179.65	9,324.82	-7,079.71	123.40	7,080.33	0.00	0.00	0.00
16,700.00	89.77	179.65	9,325.22	-7,179.71	124.01	7,180.33	0.00	0.00	0.00

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Local Co-ordinate Reference: Well 515H
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 Survey Calculation Method: Minimum Curvature

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)
16,800.00	89.77	179.65	9,325.62	-7,279.71	124.62	7,280.33	0.00	0.00	0.00
16,900.00	89.77	179.65	9,326.03	-7,379.70	125.24	7,380.33	0.00	0.00	0.00
17,000.00	89.77	179.65	9,326.43	-7,479.70	125.85	7,480.33	0.00	0.00	0.00
17,100.00	89.77	179.65	9,326.84	-7,579.70	126.46	7,580.33	0.00	0.00	0.00
17,200.00	89.77	179.65	9,327.24	-7,679.69	127.08	7,680.33	0.00	0.00	0.00
17,300.00	89.77	179.65	9,327.65	-7,779.69	127.69	7,780.33	0.00	0.00	0.00
17,400.00	89.77	179.65	9,328.05	-7,879.69	128.30	7,880.33	0.00	0.00	0.00
17,500.00	89.77	179.65	9,328.45	-7,979.69	128.92	7,980.33	0.00	0.00	0.00
17,600.00	89.77	179.65	9,328.86	-8,079.68	129.53	8,080.33	0.00	0.00	0.00
17,700.00	89.77	179.65	9,329.26	-8,179.68	130.14	8,180.33	0.00	0.00	0.00
17,800.00	89.77	179.65	9,329.67	-8,279.68	130.76	8,280.32	0.00	0.00	0.00
17,900.00	89.77	179.65	9,330.07	-8,379.68	131.37	8,380.32	0.00	0.00	0.00
18,000.00	89.77	179.65	9,330.48	-8,479.67	131.99	8,480.32	0.00	0.00	0.00
18,100.00	89.77	179.65	9,330.88	-8,579.67	132.60	8,580.32	0.00	0.00	0.00
18,200.00	89.77	179.65	9,331.29	-8,679.67	133.21	8,680.32	0.00	0.00	0.00
18,300.00	89.77	179.65	9,331.69	-8,779.66	133.83	8,780.32	0.00	0.00	0.00
18,400.00	89.77	179.65	9,332.09	-8,879.66	134.44	8,880.32	0.00	0.00	0.00
18,500.00	89.77	179.65	9,332.50	-8,979.66	135.05	8,980.32	0.00	0.00	0.00
18,600.00	89.77	179.65	9,332.90	-9,079.66	135.67	9,080.32	0.00	0.00	0.00
18,700.00	89.77	179.65	9,333.31	-9,179.65	136.28	9,180.32	0.00	0.00	0.00
18,800.00	89.77	179.65	9,333.71	-9,279.65	136.89	9,280.32	0.00	0.00	0.00
18,900.00	89.77	179.65	9,334.12	-9,379.65	137.51	9,380.32	0.00	0.00	0.00
19,000.00	89.77	179.65	9,334.52	-9,479.65	138.12	9,480.31	0.00	0.00	0.00
19,100.00	89.77	179.65	9,334.93	-9,579.64	138.73	9,580.31	0.00	0.00	0.00
19,200.00	89.77	179.65	9,335.33	-9,679.64	139.35	9,680.31	0.00	0.00	0.00
19,300.00	89.77	179.65	9,335.73	-9,779.64	139.96	9,780.31	0.00	0.00	0.00
19,390.56	89.77	179.65	9,336.10	-9,870.19	140.52	9,870.87	0.00	0.00	0.00
PBHL									

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
ert - CDU 515H - plan hits target center - Point	0.00	0.00	6,400.00	434.79	-22.70	435,377.70	729,711.09	32° 11' 43.672 N	103° 43' 27.706 W
IL Crossing - CDU 51 - plan hits target center - Point	0.00	0.00	9,217.62	155.00	16.18	435,097.91	729,749.97	32° 11' 40.901 N	103° 43' 27.272 W
BHL - CDU 515H - plan hits target center - Point	0.00	0.00	9,336.10	-9,870.19	140.52	425,072.72	729,874.31	32° 10' 1.689 N	103° 43' 26.486 W



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Survey Calculation Method: Minimum Curvature

Formations

Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
699.10	699.10	Rustler		0.23	179.65
1,043.10	1,043.10	Salado		0.23	179.65
4,284.50	4,272.33	Base of Salt		0.23	179.65
4,533.78	4,519.19	Delaware		0.23	179.65
4,560.02	4,545.17	Bell Canyon		0.23	179.65
5,483.49	5,459.66	Cherry Canyon		0.23	179.65
6,867.19	6,839.35	Brushy Canyon		0.23	179.65
8,033.19	8,005.35	Madera		0.23	179.65
8,150.19	8,122.35	Lower Brushy		0.23	179.65
8,422.19	8,394.35	1BSLM		0.23	179.65
8,552.19	8,524.35	Leonard A		0.23	179.65
8,992.42	8,957.55	Leonard B		0.23	179.65
9,263.47	9,170.21	Leonard C		0.23	179.65

Plan Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
2,500.00	2,500.00	0.00	0.00	KOP, 1.00°/100' Build
3,299.74	3,297.14	55.65	-2.91	Begin 8.00° Tangent
5,628.09	5,602.86	379.15	-19.80	Begin 1.00°/100' Drop
6,427.83	6,400.00	434.79	-22.70	Begin Vertical Hold
8,751.58	8,723.75	434.79	-22.70	Begin 10.00°/100' Build
9,649.26	9,296.70	-130.41	55.85	Begin 89.77° Lateral, 2.00°/100' Turn
10,027.33	9,298.24	-507.22	83.08	Hold 179.65° Azm
19,390.56	9,336.10	-9,870.19	140.52	PBHL

Devon Energy

Cotton Draw Unit 515H
Eddy County, New Mexico (NAD 83)
North Reference: Grid
KB-MSL: 3566.10
Ground Level: 3541.10
Design #1

MD	INC	AZI	Course Length	TVD	Subsea Depth	N/S	E/W	X	Y	Lat	Long	Dogleg Severity	T.Face	Vert Sec
0.00	0.00	0.00	0.00	0.00	3566.10	0.00	0.00	0.00	729733.79	434942.91	32° 11' 39. 103° 43' 2'	0.00	0.00	0.00
100.00	0.00	0.00	100.00	100.00	3466.10	0.00	0.00	0.00	729733.79	434942.91	32° 11' 39. 103° 43' 2'	0.00	0.00	0.00
200.00	0.00	0.00	100.00	200.00	3366.10	0.00	0.00	0.00	729733.79	434942.91	32° 11' 39. 103° 43' 2'	0.00	0.00	0.00
300.00	0.00	0.00	100.00	300.00	3266.10	0.00	0.00	0.00	729733.79	434942.91	32° 11' 39. 103° 43' 2'	0.00	0.00	0.00
400.00	0.00	0.00	100.00	400.00	3166.10	0.00	0.00	0.00	729733.79	434942.91	32° 11' 39. 103° 43' 2'	0.00	0.00	0.00
500.00	0.00	0.00	100.00	500.00	3066.10	0.00	0.00	0.00	729733.79	434942.91	32° 11' 39. 103° 43' 2'	0.00	0.00	0.00
600.00	0.00	0.00	100.00	600.00	2966.10	0.00	0.00	0.00	729733.79	434942.91	32° 11' 39. 103° 43' 2'	0.00	0.00	0.00
700.00	0.00	0.00	100.00	700.00	2866.10	0.00	0.00	0.00	729733.79	434942.91	32° 11' 39. 103° 43' 2'	0.00	0.00	0.00
800.00	0.00	0.00	100.00	800.00	2766.10	0.00	0.00	0.00	729733.79	434942.91	32° 11' 39. 103° 43' 2'	0.00	0.00	0.00
900.00	0.00	0.00	100.00	900.00	2666.10	0.00	0.00	0.00	729733.79	434942.91	32° 11' 39. 103° 43' 2'	0.00	0.00	0.00
1000.00	0.00	0.00	100.00	1000.00	2566.10	0.00	0.00	0.00	729733.79	434942.91	32° 11' 39. 103° 43' 2'	0.00	0.00	0.00
1100.00	0.00	0.00	100.00	1100.00	2466.10	0.00	0.00	0.00	729733.79	434942.91	32° 11' 39. 103° 43' 2'	0.00	0.00	0.00
1200.00	0.00	0.00	100.00	1200.00	2366.10	0.00	0.00	0.00	729733.79	434942.91	32° 11' 39. 103° 43' 2'	0.00	0.00	0.00
1300.00	0.00	0.00	100.00	1300.00	2266.10	0.00	0.00	0.00	729733.79	434942.91	32° 11' 39. 103° 43' 2'	0.00	0.00	0.00
1400.00	0.00	0.00	100.00	1400.00	2166.10	0.00	0.00	0.00	729733.79	434942.91	32° 11' 39. 103° 43' 2'	0.00	0.00	0.00
1500.00	0.00	0.00	100.00	1500.00	2066.10	0.00	0.00	0.00	729733.79	434942.91	32° 11' 39. 103° 43' 2'	0.00	0.00	0.00
1600.00	0.00	0.00	100.00	1600.00	1966.10	0.00	0.00	0.00	729733.79	434942.91	32° 11' 39. 103° 43' 2'	0.00	0.00	0.00
1700.00	0.00	0.00	100.00	1700.00	1866.10	0.00	0.00	0.00	729733.79	434942.91	32° 11' 39. 103° 43' 2'	0.00	0.00	0.00
1800.00	0.00	0.00	100.00	1800.00	1766.10	0.00	0.00	0.00	729733.79	434942.91	32° 11' 39. 103° 43' 2'	0.00	0.00	0.00
1900.00	0.00	0.00	100.00	1900.00	1666.10	0.00	0.00	0.00	729733.79	434942.91	32° 11' 39. 103° 43' 2'	0.00	0.00	0.00
2000.00	0.00	0.00	100.00	2000.00	1566.10	0.00	0.00	0.00	729733.79	434942.91	32° 11' 39. 103° 43' 2'	0.00	0.00	0.00
2100.00	0.00	0.00	100.00	2100.00	1466.10	0.00	0.00	0.00	729733.79	434942.91	32° 11' 39. 103° 43' 2'	0.00	0.00	0.00
2200.00	0.00	0.00	100.00	2200.00	1366.10	0.00	0.00	0.00	729733.79	434942.91	32° 11' 39. 103° 43' 2'	0.00	0.00	0.00
2300.00	0.00	0.00	100.00	2300.00	1266.10	0.00	0.00	0.00	729733.79	434942.91	32° 11' 39. 103° 43' 2'	0.00	0.00	0.00
2400.00	0.00	0.00	100.00	2400.00	1166.10	0.00	0.00	0.00	729733.79	434942.91	32° 11' 39. 103° 43' 2'	0.00	0.00	0.00
2500.00	0.00	0.00	100.00	2500.00	1066.10	0.00	0.00	0.00	729733.79	434942.91	32° 11' 39. 103° 43' 2'	0.00	0.00	0.00 KOP, 1.00°/100' Build
2600.00	1.00	357.01	100.00	2599.99	966.11	0.87	-0.05	729733.75	434943.78	32° 11' 39. 103° 43' 2'	1.00	357.01	-0.87	
2700.00	2.00	357.01	100.00	2699.96	866.14	3.49	-0.18	729733.61	434946.40	32° 11' 39. 103° 43' 2'	1.00	0.00	-3.49	
2800.00	3.00	357.01	100.00	2799.86	766.24	7.84	-0.41	729733.38	434950.75	32° 11' 39. 103° 43' 2'	1.00	0.00	-7.84	
2900.00	4.00	357.01	100.00	2899.68	666.42	13.94	-0.73	729733.07	434956.85	32° 11' 39. 103° 43' 2'	1.00	0.00	-13.94	
3000.00	5.00	357.01	100.00	2999.37	566.73	21.77	-1.14	729732.66	434964.68	32° 11' 39. 103° 43' 2'	1.00	0.00	-21.78	
3100.00	6.00	357.01	100.00	3098.90	467.20	31.34	-1.64	729732.16	434974.25	32° 11' 39. 103° 43' 2'	1.00	0.00	-31.35	
3200.00	7.00	357.01	100.00	3198.26	367.84	42.65	-2.23	729731.57	434985.56	32° 11' 39. 103° 43' 2'	1.00	0.00	-42.66	
3299.74	8.00	357.01	99.74	3297.14	268.96	55.65	-2.91	729730.89	434998.56	32° 11' 39. 103° 43' 2'	1.00	0.00	-55.66 Begin 8.00° Tangent	
3400.00	8.00	357.01	100.26	3396.43	169.67	69.58	-3.63	729730.16	435012.49	32° 11' 40. 103° 43' 2'	0.00	0.00	-69.60	
3500.00	8.00	357.01	100.00	3495.46	70.64	83.47	-4.36	729729.44	435026.38	32° 11' 40. 103° 43' 2'	0.00	0.00	-83.50	
3600.00	8.00	357.01	100.00	3594.49	-28.39	97.37	-5.08	729728.71	435040.28	32° 11' 40. 103° 43' 2'	0.00	0.00	-97.39	
3700.00	8.00	357.01	100.00	3693.51	-127.41	111.26	-5.81	729727.98	435054.17	32° 11' 40. 103° 43' 2'	0.00	0.00	-111.29	
3800.00	8.00	357.01	100.00	3792.54	-226.44	125.15	-6.54	729727.26	435068.06	32° 11' 40. 103° 43' 2'	0.00	0.00	-125.19	
3900.00	8.00	357.01	100.00	3891.57	-325.47	139.05	-7.26	729726.53	435081.96	32° 11' 40. 103° 43' 2'	0.00	0.00	-139.09	
4000.00	8.00	357.01	100.00	3990.60	-424.50	152.94	-7.99	729725.81	435095.85	32° 11' 40. 103° 43' 2'	0.00	0.00	-152.99	
4100.00	8.00	357.01	100.00	4089.62	-523.52	166.83	-8.71	729725.08	435109.74	32° 11' 41. 103° 43' 2'	0.00	0.00	-166.89	
4200.00	8.00	357.01	100.00	4188.65	-622.55	180.73	-9.44	729724.36	435123.64	32° 11' 41. 103° 43' 2'	0.00	0.00	-180.78	
4300.00	8.00	357.01	100.00	4287.68	-721.58	194.62	-10.16	729723.63	435137.53	32° 11' 41. 103° 43' 2'	0.00	0.00	-194.68	
4400.00	8.00	357.01	100.00	4386.70	-820.60	208.52	-10.89	729722.91	435151.43	32° 11' 41. 103° 43' 2'	0.00	0.00	-208.58	
4500.00	8.00	357.01	100.00	4485.73	-919.63	222.41	-11.61	729722.18	435165.32	32° 11' 41. 103° 43' 2'	0.00	0.00	-222.48	
4600.00	8.00	357.01	100.00	4584.76	-1018.66	236.30	-12.34	729721.45	435179.21	32° 11' 41. 103° 43' 2'	0.00	0.00	-236.38	
4700.00	8.00	357.01	100.00	4683.79	-1117.69	250.20	-13.07	729720.73	435193.11	32° 11' 41. 103° 43' 2'	0.00	0.00	-250.27	
4800.00	8.00	357.01	100.00	4782.81	-1216.71	264.09	-13.79	729720.00	435207.00	32° 11' 41. 103° 43' 2'	0.00	0.00	-264.17	
4900.00	8.00	357.01	100.00	4881.84	-1315.74	277.99	-14.52	729719.28	435220.90	32° 11' 42. 103° 43' 2'	0.00	0.00	-278.07	
5000.00	8.00	357.01	100.00	4980.87	-1414.77	291.88	-15.24	729718.55	435234.79	32° 11' 42. 103° 43' 2'	0.00	0.00	-291.97	
5100.00	8.00	357.01	100.00	5079.90	-1513.80	305.77	-15.97	729717.83	435248.68	32° 11' 42. 103° 43' 2'	0.00	0.00	-305.87	
5200.00	8.00	357.01	100.00	5178.92	-1612.82	319.67	-16.69	729717.10	435262.58	32° 11' 42. 103° 43' 2'	0.00	0.00	-319.76	
5300.00	8.00	357.01	100.00	5277.95	-1711.85	333.56	-17.42	729716.38	435276.47	32° 11' 42. 103° 43' 2'	0.00	0.00	-333.66	
5400.00	8.00	357.01	100.00	5376.98	-1810.88	347.46	-18.14	729715.65	435290.37	32° 11' 42. 103° 43' 2'	0.00	0.00	-347.56	
5500.00	8.00	357.01	100.00	5476.01	-1909.91	361.35	-18.87	729714.93	435304.26	32° 11' 42. 103° 43' 2'	0.00	0.00	-361.46	
5600.00	8.00	357.01	100.00	5575.03	-2008.93	375.24	-19.59	729714.20	435318.15	32° 11' 43. 103° 43' 2'	0.00	0.00	-375.36	
5628.09	8.00	357.01	28.09	5602.86	-2036.76	379.15	-19.80	729714.00	435322.06	32° 11' 43. 103° 43' 2'	0.00	0.00	-379.26 Begin 1.00°/100' Drop	
5700.00	7.28	357.01	71.91	5674.12	-2108.02	388.69	-20.30	729713.50	435331.60	32° 11' 43. 103° 43' 2'	1.00	180.00	-388.81	
5800.00	6.28	357.01	100.00	5773.42	-2207.32	400.48	-20.91	729712.88	435343.39	32° 11' 43. 103° 43' 2'	1.00	180.00	-400.60	
5900.00	5.28	357.01	100.00	5872.91	-2306.81	410.53	-21.44	729712.36	435353.44	32° 11' 43. 103° 43' 2'	1.00	180.00	-410.65	
6000.00	4.28	357.01	100.00	5972.56	-2406.46	418.85	-21.87	729711.92	435361.76	32° 11' 43. 103° 43' 2'	1.00	180.00	-418.98	
6100.00	3.28	357.01	100.00	6072.35	-2506.25	425.43	-22.22	729711.58	435368.34	32° 11' 43. 103° 43' 2'	1.00	180.00	-425.56	
6200.00	2.28	357.01	100.00	6172.23	-2606.13	430.27	-22.47	729711.33	435373.18	32° 11' 43. 103° 43' 2'	1.00	180.00	-430.40	
6300.00	1.28	357.01	100.00	6272.18	-2706.08	433.37	-22.63	729711.16	435376.28	32° 11' 43. 103° 43' 2'	1.00	180.00	-433.50	
6400.00	0.28	357.01	100.00	6372.17	-2806.07	434.73	-22.70	729711.09	435377.64	32° 11' 43. 103° 43' 2'	1.00	180.00	-434.86	
6427.83	0.00	0.00	27.83	6400.00	-2833.90	434.79	-22.70	729711.09	435377.70	32° 11' 43. 103° 43' 2'	1.00	180.00	-434.93 Begin Vertical Hold	
6500.00	0.00	0.00	72.17	6472.17	-2906.07	434.79	-22.70	729711.09	435377.70	32° 11' 43. 103° 43' 2'	0.00	0.00	-434.93	
6600.00	0.00	0.00	100.00	6572.17	-3006.07	434.79	-22.70	729711.09	435377.70	32° 11' 43. 103° 43' 2'				

7700.00	0.00	0.00	100.00	7672.17	-4106.07	434.79	-22.70	729711.09	435377.70	32° 11' 43.103° 43' 2'	0.00	0.00	-434.93
7800.00	0.00	0.00	100.00	7772.17	-4206.07	434.79	-22.70	729711.09	435377.70	32° 11' 43.103° 43' 2'	0.00	0.00	-434.93
7900.00	0.00	0.00	100.00	7872.17	-4306.07	434.79	-22.70	729711.09	435377.70	32° 11' 43.103° 43' 2'	0.00	0.00	-434.93
8000.00	0.00	0.00	100.00	7972.17	-4406.07	434.79	-22.70	729711.09	435377.70	32° 11' 43.103° 43' 2'	0.00	0.00	-434.93
8100.00	0.00	0.00	100.00	8072.17	-4506.07	434.79	-22.70	729711.09	435377.70	32° 11' 43.103° 43' 2'	0.00	0.00	-434.93
8200.00	0.00	0.00	100.00	8172.17	-4606.07	434.79	-22.70	729711.09	435377.70	32° 11' 43.103° 43' 2'	0.00	0.00	-434.93
8300.00	0.00	0.00	100.00	8272.17	-4706.07	434.79	-22.70	729711.09	435377.70	32° 11' 43.103° 43' 2'	0.00	0.00	-434.93
8400.00	0.00	0.00	100.00	8372.17	-4806.07	434.79	-22.70	729711.09	435377.70	32° 11' 43.103° 43' 2'	0.00	0.00	-434.93
8500.00	0.00	0.00	100.00	8472.17	-4906.07	434.79	-22.70	729711.09	435377.70	32° 11' 43.103° 43' 2'	0.00	0.00	-434.93
8600.00	0.00	0.00	100.00	8572.17	-5006.07	434.79	-22.70	729711.09	435377.70	32° 11' 43.103° 43' 2'	0.00	0.00	-434.93
8700.00	0.00	0.00	100.00	8672.17	-5106.07	434.79	-22.70	729711.09	435377.70	32° 11' 43.103° 43' 2'	0.00	0.00	-434.93
8751.58	0.00	0.00	51.58	8723.75	-5157.65	434.79	-22.70	729711.09	435377.70	32° 11' 43.103° 43' 2'	0.00	0.00	-434.93 Begin 10.00°/100' Build
8800.00	4.84	172.09	48.42	8772.11	-5206.01	432.77	-22.42	729711.37	435375.68	32° 11' 43.103° 43' 2'	10.00	172.09	-432.90
8850.00	9.84	172.09	50.00	8821.68	-5255.58	426.44	-21.54	729712.25	435369.35	32° 11' 43.103° 43' 2'	10.00	0.00	-426.57
8900.00	14.84	172.09	50.00	8870.51	-5304.41	415.86	-20.07	729713.72	435358.77	32° 11' 43.103° 43' 2'	10.00	0.00	-415.98
8950.00	19.84	172.09	50.00	8918.22	-5352.12	401.10	-18.02	729715.77	435344.01	32° 11' 43.103° 43' 2'	10.00	0.00	-401.21
9000.00	24.84	172.09	50.00	8964.46	-5398.36	382.28	-15.41	729718.39	435325.19	32° 11' 43.103° 43' 2'	10.00	0.00	-382.37
9050.00	29.84	172.09	50.00	9008.86	-5442.76	359.55	-12.25	729721.55	435302.46	32° 11' 42.103° 43' 2'	10.00	0.00	-359.61
9100.00	34.84	172.09	50.00	9051.09	-5484.99	333.06	-8.56	729725.23	435275.97	32° 11' 42.103° 43' 2'	10.00	0.00	-333.11
9150.00	39.84	172.09	50.00	9090.83	-5524.73	303.03	-4.39	729729.40	435245.94	32° 11' 42.103° 43' 2'	10.00	0.00	-303.05
9200.00	44.84	172.09	50.00	9127.77	-5561.67	269.68	0.24	729734.04	435212.59	32° 11' 42.103° 43' 2'	10.00	0.00	-269.68
9250.00	49.84	172.09	50.00	9161.64	-5595.54	233.28	5.30	729739.10	435176.19	32° 11' 41.103° 43' 2'	10.00	0.00	-233.24
9300.00	54.84	172.09	50.00	9192.18	-5626.08	194.08	10.75	729744.55	435136.99	32° 11' 41.103° 43' 2'	10.00	0.00	-194.01
9350.00	59.84	172.09	50.00	9219.15	-5653.05	152.40	16.55	729750.34	435095.31	32° 11' 40.103° 43' 2'	10.00	0.00	-152.30
9400.00	64.84	172.09	50.00	9242.36	-5676.26	108.55	22.64	729756.43	435051.46	32° 11' 40.103° 43' 2'	10.00	0.00	-108.41
9450.00	69.84	172.09	50.00	9261.61	-5695.51	62.86	28.99	729762.79	435005.77	32° 11' 39.103° 43' 2'	10.00	0.00	-62.68
9500.00	74.84	172.09	50.00	9276.77	-5710.67	15.69	35.55	729769.34	434958.60	32° 11' 39.103° 43' 2'	10.00	0.00	-15.47
9550.00	79.84	172.09	50.00	9287.73	-5721.63	-32.62	42.26	729776.06	434910.29	32° 11' 39.103° 43' 2'	10.00	0.00	32.88
9600.00	84.84	172.09	50.00	9294.39	-5728.29	-81.69	49.08	729782.88	434861.22	32° 11' 38.103° 43' 2'	10.00	0.00	81.98
9649.26	89.77	172.09	49.26	9296.70	-5730.60	-130.41	55.85	729789.65	434812.50	32° 11' 38.103° 43' 2'	10.00	0.00	130.75 Begin 89.77° Lateral, 2.00°/100' Turn
9700.00	89.77	173.10	50.74	9296.91	-5730.81	-180.72	62.39	729796.19	434762.19	32° 11' 37.103° 43' 2'	2.00	90.01	181.10
9800.00	89.77	175.10	100.00	9297.31	-5731.21	-280.19	72.67	729806.46	434662.72	32° 11' 36.103° 43' 2'	2.00	90.01	280.63
9900.00	89.77	177.10	100.00	9297.72	-5731.62	-379.95	79.47	729813.26	434562.96	32° 11' 35.103° 43' 2'	2.00	90.00	380.43
10000.00	89.77	179.10	100.00	9298.12	-5732.02	-479.89	82.78	729816.57	434463.02	32° 11' 34.103° 43' 2'	2.00	89.99	480.39
10027.33	89.77	179.65	27.33	9298.24	-5732.14	-507.22	83.08	729816.87	434435.69	32° 11' 34.103° 43' 2'	2.00	89.98	507.72 Hold 179.65° Azm
10100.00	89.77	179.65	72.67	9298.53	-5732.43	-579.89	83.52	729817.32	434363.02	32° 11' 33.103° 43' 2'	0.00	152.43	580.39
10200.00	89.77	179.65	100.00	9298.93	-5732.83	-679.88	84.14	729817.93	434263.03	32° 11' 32.103° 43' 2'	0.00	0.00	680.39
10300.00	89.77	179.65	100.00	9299.34	-5733.24	-779.88	84.75	729818.54	434163.03	32° 11' 31.103° 43' 2'	0.00	0.00	780.39
10400.00	89.77	179.65	100.00	9299.74	-5733.64	-879.88	85.36	729819.16	434063.03	32° 11' 30.103° 43' 2'	0.00	0.00	880.38
10500.00	89.77	179.65	100.00	9300.15	-5734.05	-979.87	85.98	729819.77	433963.04	32° 11' 29.103° 43' 2'	0.00	0.00	980.38
10600.00	89.77	179.65	100.00	9300.55	-5734.45	-1079.87	86.59	729820.38	433863.04	32° 11' 28.103° 43' 2'	0.00	0.00	1080.38
10700.00	89.77	179.65	100.00	9300.96	-5734.86	-1179.87	87.20	729821.00	433763.04	32° 11' 27.103° 43' 2'	0.00	0.00	1180.38
10800.00	89.77	179.65	100.00	9301.36	-5735.26	-1279.87	87.82	729821.61	433663.04	32° 11' 26.103° 43' 2'	0.00	0.00	1280.38
10900.00	89.77	179.65	100.00	9301.76	-5735.66	-1379.86	88.43	729822.22	433563.05	32° 11' 25.103° 43' 2'	0.00	0.00	1380.38
11000.00	89.77	179.65	100.00	9302.17	-5736.07	-1479.86	89.04	729822.84	433463.05	32° 11' 24.103° 43' 2'	0.00	0.00	1480.38
11100.00	89.77	179.65	100.00	9302.57	-5736.47	-1579.86	89.66	729823.45	433363.05	32° 11' 23.103° 43' 2'	0.00	0.00	1580.38
11200.00	89.77	179.65	100.00	9302.98	-5736.88	-1679.86	90.27	729824.06	433263.05	32° 11' 22.103° 43' 2'	0.00	0.00	1680.38
11300.00	89.77	179.65	100.00	9303.38	-5737.28	-1779.85	90.88	729824.68	433163.06	32° 11' 21.103° 43' 2'	0.00	0.00	1780.38
11400.00	89.77	179.65	100.00	9303.79	-5737.69	-1879.85	91.50	729825.29	433063.06	32° 11' 20.103° 43' 2'	0.00	0.00	1880.38
11500.00	89.77	179.65	100.00	9304.19	-5738.09	-1979.85	92.11	729825.90	432963.06	32° 11' 19.103° 43' 2'	0.00	0.00	1980.38
11600.00	89.77	179.65	100.00	9304.60	-5738.50	-2079.85	92.72	729826.52	432863.06	32° 11' 18.103° 43' 2'	0.00	0.00	2080.37
11700.00	89.77	179.65	100.00	9305.00	-5738.90	-2179.84	93.34	729827.13	432763.07	32° 11' 17.103° 43' 2'	0.00	0.00	2180.37
11800.00	89.77	179.65	100.00	9305.40	-5739.30	-2279.84	93.95	729827.75	432663.07	32° 11' 16.103° 43' 2'	0.00	0.00	2280.37
11900.00	89.77	179.65	100.00	9305.81	-5739.71	-2379.84	94.56	729828.36	432563.07	32° 11' 15.103° 43' 2'	0.00	0.00	2380.37
12000.00	89.77	179.65	100.00	9306.21	-5740.11	-2479.83	95.18	729828.97	432463.08	32° 11' 14.103° 43' 2'	0.00	0.00	2480.37
12100.00	89.77	179.65	100.00	9306.62	-5740.52	-2579.83	95.79	729829.59	432363.08	32° 11' 13.103° 43' 2'	0.00	0.00	2580.37
12200.00	89.77	179.65	100.00	9307.02	-5740.92	-2679.83	96.40	729830.20	432263.08	32° 11' 12.103° 43' 2'	0.00	0.00	2680.37
12300.00	89.77	179.65	100.00	9307.43	-5741.33	-2779.83	97.02	729830.81	432163.08	32° 11' 11.103° 43' 2'	0.00	0.00	2780.37
12400.00	89.77	179.65	100.00	9307.83	-5741.73	-2879.82	97.63	729831.43	432063.09	32° 11' 10.103° 43' 2'	0.00	0.00	2880.37
12500.00	89.77	179.65	100.00	9308.23	-5742.13	-2979.82	98.25	729832.04	431963.09	32° 11' 9.103° 43' 2'	0.00	0.00	2980.37
12600.00	89.77	179.65	100.00	9308.64	-5742.54	-3079.82	98.86	729832.65	431863.09	32° 11' 8.103° 43' 2'	0.00	0.00	3080.37
12700.00	89.77	179.65	100.00	9309.04	-5742.94	-3179.82	99.47	729833.27	431763.09	32° 11' 7.103° 43' 2'	0.00	0.00	3180.37
12800.00	89.77	179.65	100.00	9309.45	-5743.35	-3279.81	100.09	729833.88	431663.10	32° 11' 6.103° 43' 2'	0.00	0.00	3280.37
12900.00	89.77	179.65	100.00	9309.85	-5743.75	-3379.81	100.70	729834.49	431563.10	32° 11' 5.103° 43' 2'	0.00	0.00	3380.36
13000.00	89.77	179.65	100.00	9310.26	-5744.16	-3479.81	101.31	729835.11	431463.10	32° 11' 4.103° 43' 2'	0.00	0.00	3480.36
13100.00	89.77	179.65	100.00	9310.66	-5744.56	-3579.80	101.93	729835.72	431363.11	32° 11' 3.103° 43' 2'	0.00	0.00	3580.36
13200.00	89.77	179.65	100.00	9311.07	-5744.97	-3679.80	102.54	729836.33	431263.11	32° 11' 2.103° 43' 2'	0.00	0.00	3680.36
13300.00	89.77	179.65	100.00	9311.47	-5745.37	-3779.80	103.15	729836.95	431163.11	32° 11' 1.103° 43' 2'	0.00	0.00	3780.36
13400.00	89.77	179.65	100.00	9311.87	-5745.77	-3879.80	103.77	729837.56	431063.11	32° 11' 0.103° 43' 2'	0.00	0.00	3880.36
13500.00	89.77	179.65	100.00										

15700.00	89.77	179.65	100.00	9321.18	-5755.08	-6179.73	117.88	729851.67	428763.18	32° 10' 38. 103° 43' 2ۯ	0.00	0.00	6180.34
15800.00	89.77	179.65	100.00	9321.58	-5755.48	-6279.73	118.49	729852.28	428663.18	32° 10' 37. 103° 43' 2ۯ	0.00	0.00	6280.34
15900.00	89.77	179.65	100.00	9321.98	-5755.88	-6379.73	119.10	729852.90	428563.18	32° 10' 36. 103° 43' 2ۯ	0.00	0.00	6380.34
16000.00	89.77	179.65	100.00	9322.39	-5756.29	-6479.73	119.72	729853.51	428463.18	32° 10' 35. 103° 43' 2ۯ	0.00	0.00	6480.34
16100.00	89.77	179.65	100.00	9322.79	-5756.69	-6579.72	120.33	729854.12	428363.19	32° 10' 34. 103° 43' 2ۯ	0.00	0.00	6580.34
16200.00	89.77	179.65	100.00	9323.20	-5757.10	-6679.72	120.94	729854.74	428263.19	32° 10' 33. 103° 43' 2ۯ	0.00	0.00	6680.34
16300.00	89.77	179.65	100.00	9323.60	-5757.50	-6779.72	121.56	729855.35	428163.19	32° 10' 32. 103° 43' 2ۯ	0.00	0.00	6780.34
16400.00	89.77	179.65	100.00	9324.01	-5757.91	-6879.72	122.17	729855.96	428063.19	32° 10' 31. 103° 43' 2ۯ	0.00	0.00	6880.34
16500.00	89.77	179.65	100.00	9324.41	-5758.31	-6979.71	122.78	729856.58	427963.20	32° 10' 30. 103° 43' 2ۯ	0.00	0.00	6980.33
16600.00	89.77	179.65	100.00	9324.82	-5758.72	-7079.71	123.40	729857.19	427863.20	32° 10' 29. 103° 43' 2ۯ	0.00	0.00	7080.33
16700.00	89.77	179.65	100.00	9325.22	-5759.12	-7179.71	124.01	729857.80	427763.20	32° 10' 28. 103° 43' 2ۯ	0.00	0.00	7180.33
16800.00	89.77	179.65	100.00	9325.62	-5759.52	-7279.70	124.62	729858.42	427663.21	32° 10' 27. 103° 43' 2ۯ	0.00	0.00	7280.33
16900.00	89.77	179.65	100.00	9326.03	-5759.93	-7379.70	125.24	729859.03	427563.21	32° 10' 26. 103° 43' 2ۯ	0.00	0.00	7380.33
17000.00	89.77	179.65	100.00	9326.43	-5760.33	-7479.70	125.85	729859.65	427463.21	32° 10' 25. 103° 43' 2ۯ	0.00	0.00	7480.33
17100.00	89.77	179.65	100.00	9326.84	-5760.74	-7579.70	126.46	729860.26	427363.21	32° 10' 24. 103° 43' 2ۯ	0.00	0.00	7580.33
17200.00	89.77	179.65	100.00	9327.24	-5761.14	-7679.69	127.08	729860.87	427263.22	32° 10' 23. 103° 43' 2ۯ	0.00	0.00	7680.33
17300.00	89.77	179.65	100.00	9327.65	-5761.55	-7779.69	127.69	729861.49	427163.22	32° 10' 22. 103° 43' 2ۯ	0.00	0.00	7780.33
17400.00	89.77	179.65	100.00	9328.05	-5761.95	-7879.69	128.30	729862.10	427063.22	32° 10' 21. 103° 43' 2ۯ	0.00	0.00	7880.33
17500.00	89.77	179.65	100.00	9328.45	-5762.35	-7979.69	128.92	729862.71	426963.22	32° 10' 20. 103° 43' 2ۯ	0.00	0.00	7980.33
17600.00	89.77	179.65	100.00	9328.86	-5762.76	-8079.68	129.53	729863.33	426863.23	32° 10' 19. 103° 43' 2ۯ	0.00	0.00	8080.33
17700.00	89.77	179.65	100.00	9329.26	-5763.16	-8179.68	130.14	729863.94	426763.23	32° 10' 18. 103° 43' 2ۯ	0.00	0.00	8180.33
17800.00	89.77	179.65	100.00	9329.67	-5763.57	-8279.68	130.76	729864.55	426663.23	32° 10' 17. 103° 43' 2ۯ	0.00	0.00	8280.32
17900.00	89.77	179.65	100.00	9330.07	-5763.97	-8379.68	131.37	729865.17	426563.23	32° 10' 16. 103° 43' 2ۯ	0.00	0.00	8380.32
18000.00	89.77	179.65	100.00	9330.48	-5764.38	-8479.67	131.99	729865.78	426463.24	32° 10' 15. 103° 43' 2ۯ	0.00	0.00	8480.32
18100.00	89.77	179.65	100.00	9330.88	-5764.78	-8579.67	132.60	729866.39	426363.24	32° 10' 14. 103° 43' 2ۯ	0.00	0.00	8580.32
18200.00	89.77	179.65	100.00	9331.29	-5765.19	-8679.67	133.21	729867.01	426263.24	32° 10' 13. 103° 43' 2ۯ	0.00	0.00	8680.32
18300.00	89.77	179.65	100.00	9331.69	-5765.59	-8779.66	133.83	729867.62	426163.25	32° 10' 12. 103° 43' 2ۯ	0.00	0.00	8780.32
18400.00	89.77	179.65	100.00	9332.09	-5765.99	-8879.66	134.44	729868.23	426063.25	32° 10' 11. 103° 43' 2ۯ	0.00	0.00	8880.32
18500.00	89.77	179.65	100.00	9332.50	-5766.40	-8979.66	135.05	729868.85	425963.25	32° 10' 10. 103° 43' 2ۯ	0.00	0.00	8980.32
18600.00	89.77	179.65	100.00	9332.90	-5766.80	-9079.66	135.67	729869.46	425863.25	32° 10' 9.5 103° 43' 2ۯ	0.00	0.00	9080.32
18700.00	89.77	179.65	100.00	9333.31	-5767.21	-9179.65	136.28	729870.07	425763.26	32° 10' 8.5 103° 43' 2ۯ	0.00	0.00	9180.32
18800.00	89.77	179.65	100.00	9333.71	-5767.61	-9279.65	136.89	729870.69	425663.26	32° 10' 7.5 103° 43' 2ۯ	0.00	0.00	9280.32
18900.00	89.77	179.65	100.00	9334.12	-5768.02	-9379.65	137.51	729871.30	425563.26	32° 10' 6.5 103° 43' 2ۯ	0.00	0.00	9380.32
19000.00	89.77	179.65	100.00	9334.52	-5768.42	-9479.65	138.12	729871.91	425463.26	32° 10' 5.5 103° 43' 2ۯ	0.00	0.00	9480.31
19100.00	89.77	179.65	100.00	9334.92	-5768.82	-9579.64	138.73	729872.53	425363.27	32° 10' 4.5 103° 43' 2ۯ	0.00	0.00	9580.31
19200.00	89.77	179.65	100.00	9335.33	-5769.23	-9679.64	139.35	729873.14	425263.27	32° 10' 3.5 103° 43' 2ۯ	0.00	0.00	9680.31
19300.00	89.77	179.65	100.00	9335.73	-5769.63	-9779.64	139.96	729873.75	425163.27	32° 10' 2.5 103° 43' 2ۯ	0.00	0.00	9780.31
19390.56	89.77	179.65	90.56	9336.10	-5770.00	-9870.19	140.52	729874.31	425072.72	32° 10' 1.6 103° 43' 2ۯ	0.00	0.00	9870.87 PBHL



Devon Energy

Eddy County, New Mexico (NAD 83)

Cotton Draw Unit

515H

Wellbore #1

Design #1

Anticollision Report

22 August, 2017



MS Energy Services

Anticollision Report



Company: Devon Energy
Project: Eddy County, New Mexico (NAD 83)
Reference Site: Cotton Draw Unit
Site Error: 0.00 usft
Reference Well: 515H
Well Error: 0.00 usft
Reference Wellbore: Wellbore #1
Reference Design: Design #1

Local Co-ordinate Reference: Well 515H
TVD Reference: Well @ 3566.10usft (Cactus 126)
MD Reference: Well @ 3566.10usft (Cactus 126)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: 5000.1 Conroe DB
Offset TVD Reference: Offset Datum

Reference Design #1

Filter type: NO GLOBAL FILTER: Using user defined selection & filtering criteria
Interpolation Method: MD + Stations Interval 100.00usft
Depth Range: Unlimited
Results Limited by: Maximum center-center distance of 10,000.00 u
Warning Levels Evaluated at: 2.00 Sigma

Error Model: ISCWSA
Scan Method: Closest Approach 3D
Error Surface: Pedal Curve
Casing Method: Not applied

Survey Tool Program Date 8/22/2017

From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
0.00	19,390.56	Design #1 (Wellbore #1)	MWD	OWSG MWD - Standard

Summary						
Site Name	Reference Measured Depth (usft)	Offset Measured Depth (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Separation Factor	Warning
Offset Well - Wellbore - Design						
BTBN 25 FED						
#2 - Wellbore #1 - Surveys	11,116.91	9,263.60	1.21	-75.34	0.016	Level 1, CC, ES, SF
Cotton Draw						
#99 - Wellbore #1 - Surveys	14,686.90	9,273.68	1,951.99	1,835.35	16.734	CC
#99 - Wellbore #1 - Surveys	14,700.00	9,273.62	1,952.04	1,835.20	16.707	ES
#99 - Wellbore #1 - Surveys	15,000.00	9,272.27	1,976.94	1,856.75	16.448	SF
Cotton Draw Unit						
111H - Wellbore #1 - Surveys	14,885.48	8,290.00	3,254.44	3,133.19	26.839	CC
111H - Wellbore #1 - Surveys	14,900.00	8,290.00	3,254.48	3,133.00	26.792	ES
111H - Wellbore #1 - Surveys	15,600.00	8,290.00	3,331.96	3,202.11	25.661	SF
116H - Wellbore #1 - Surveys	12,548.42	14,738.75	971.27	884.56	11.201	CC, ES
116H - Wellbore #1 - Surveys	18,700.00	8,627.00	996.55	903.73	10.737	SF
167H - Wellbore #1 - Surveys	16,055.77	11,914.02	2,910.63	2,738.18	16.879	CC
167H - Wellbore #1 - Surveys	17,000.00	17,000.00	2,949.00	2,684.38	11.144	ES
167H - Wellbore #1 - Surveys	19,390.56	15,098.00	2,959.62	2,687.77	10.887	SF
167H - Wellbore #2 - Surveys	12,292.13	8,175.00	3,065.17	2,996.66	44.744	CC
167H - Wellbore #2 - Surveys	17,200.00	17,200.00	3,107.32	2,835.52	11.432	SF
167H - Wellbore #2 - Surveys	18,900.00	14,732.00	3,090.77	2,831.51	11.922	ES
172H - Wellbore #1 - Surveys	19,390.56	12,827.00	2,052.64	1,836.00	9.475	CC, ES, SF
182H - Wellbore #1 - Surveys	13,898.51	10,058.92	1,976.48	1,864.70	17.682	CC
182H - Wellbore #1 - Surveys	19,235.13	15,400.00	1,993.97	1,737.00	7.759	ES
182H - Wellbore #1 - Surveys	19,390.56	15,400.00	2,000.02	1,741.56	7.738	SF
242H - Wellbore #1 - Surveys	19,390.56	17,847.00	2,076.10	1,823.30	8.212	CC, ES, SF
290H - Wellbore #1 - Surveys	14,381.65	9,308.33	266.18	150.45	2.300	CC, ES, SF
291H - Wellbore #1 - Design #2	14,298.18	9,329.83	825.29	704.30	6.821	CC
291H - Wellbore #1 - Design #2	14,300.00	9,329.84	825.29	704.28	6.820	ES, SF
292H - Wellbore #1 - Surveys	14,407.93	9,304.42	893.58	771.95	7.347	CC, ES
292H - Wellbore #1 - Surveys	19,350.41	14,999.00	1,071.15	888.96	5.879	SF
293H - Wellbore #1 - Design #2	19,390.56	15,669.50	2,051.63	1,823.11	8.978	CC, ES, SF
294H - Wellbore #1 - Design #2	14,296.05	9,305.76	1,875.67	1,755.36	15.590	CC
294H - Wellbore #1 - Design #2	14,300.00	9,305.77	1,875.68	1,755.31	15.583	ES
294H - Wellbore #1 - Design #2	14,600.00	9,306.99	1,900.14	1,776.31	15.345	SF
511H - Wellbore #1 - Surveys	14,309.72	9,322.52	2,110.96	2,006.80	20.265	CC
511H - Wellbore #1 - Surveys	19,337.30	15,067.00	2,141.76	1,903.60	8.993	ES
511H - Wellbore #1 - Surveys	19,390.56	15,067.00	2,142.42	1,903.65	8.973	SF
512H - Wellbore #1 - Design #2	14,297.99	9,308.84	1,980.56	1,860.13	16.446	CC

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



MS Energy Services
Anticollision Report



Company: Devon Energy
Project: Eddy County, New Mexico (NAD 83)
Reference Site: Cotton Draw Unit
Site Error: 0.00 usft
Reference Well: 515H
Well Error: 0.00 usft
Reference Wellbore: Wellbore #1
Reference Design: Design #1

Local Co-ordinate Reference: Well 515H
TVD Reference: Well @ 3566.10usft (Cactus 126)
MD Reference: Well @ 3566.10usft (Cactus 126)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at: 2.00 sigma
Database: 5000.1 Conroe DB
Offset TVD Reference: Offset Datum

Summary

Site Name	Reference Measured Depth (usft)	Offset Measured Depth (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Separation Factor	Warning
Cotton Draw Unit						
512H - Wellbore #1 - Design #2	14,300.00	9,308.84	1,980.56	1,860.10	16.442	ES
512H - Wellbore #1 - Design #2	14,600.00	9,310.06	2,003.45	1,879.39	16.149	SF
513H - Wellbore #1 - Design #2	14,298.26	9,382.17	360.39	238.68	2.961	CC
513H - Wellbore #1 - Design #2	14,300.00	9,382.18	360.39	238.67	2.961	ES, SF
514H - Wellbore #1 - Design #1	2,500.00	2,499.80	30.01	12.53	1.717	CC
514H - Wellbore #1 - Design #1	2,800.00	2,799.62	31.26	11.64	1.593	ES
514H - Wellbore #1 - Design #1	2,900.00	2,899.55	32.24	11.90	1.585	SF
516H - Wellbore #1 - Design #1	2,500.00	2,500.40	29.98	12.50	1.715	CC
516H - Wellbore #1 - Design #1	2,800.00	2,800.08	31.21	11.59	1.591	ES
516H - Wellbore #1 - Design #1	8,800.00	8,800.97	100.29	36.57	1.574	SF
517H - Wellbore #1 - Design #1	2,500.00	2,500.30	59.97	42.49	3.431	CC
517H - Wellbore #1 - Design #1	2,600.00	2,599.89	60.27	42.08	3.313	ES
517H - Wellbore #1 - Design #1	2,900.00	2,898.60	64.81	44.48	3.189	SF
King Tut Federal						
#1H - Wellbore #1 - Surveys	0.00	0.00	796.68			
#1H - Wellbore #1 - Surveys	7,806.07	7,779.38	816.63	761.41	14.790	ES
#1H - Wellbore #1 - Surveys	19,300.00	18,083.00	1,222.16	977.70	5.000	SF
Redhead 31 Federal						
#1H - Wellbore #1 - Surveys	14,683.61	9,320.26	1,271.42	1,161.64	11.581	CC
#1H - Wellbore #1 - Surveys	14,700.00	9,320.49	1,271.53	1,161.48	11.554	ES
#1H - Wellbore #1 - Surveys	19,300.00	14,760.00	1,742.07	1,543.63	8.779	SF
Windward Federal						
#1H - Wellbore #1 - Surveys	9,363.55	9,241.10	840.84	776.18	13.004	CC, ES
#1H - Wellbore #1 - Surveys	14,100.00	14,872.00	1,396.57	1,284.37	12.447	SF
#5H - Wellbore #1 - Surveys	17,993.55	17,723.05	647.94	362.76	2.272	CC
#5H - Wellbore #1 - Surveys	18,900.00	18,609.15	658.35	344.55	2.098	ES
#5H - Wellbore #1 - Surveys	19,300.00	18,990.29	674.61	349.52	2.075	SF
#6H - Wellbore #1 - Design #1	4,554.86	4,538.26	981.74	962.19	50.232	CC
#6H - Wellbore #1 - Design #1	4,800.00	4,781.01	982.33	961.66	47.528	ES
#6H - Wellbore #1 - Design #1	19,390.56	19,220.87	1,327.11	1,080.19	5.375	SF

Offset Design BTBN 25 FED - #2 - Wellbore #1 - Surveys												Offset Site Error:	0.00 usft
Survey Program: 237-MWD												Offset Well Error:	0.00 usft
Reference	Offset	Semi Major Axis		Distance		Minimum		Separation		Warning			
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference	Offset	Azimuth from North (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
0.00	0.00	0.00	0.00	0.00	0.00	177.13	-1,814.64	90.97	1,817.40				
100.00	100.00	62.05	62.05	0.13	0.11	177.13	-1,814.56	90.97	1,816.85	1,816.60	0.25	7,388.403	
200.00	200.00	169.20	169.20	0.49	0.30	177.13	-1,814.11	90.97	1,816.42	1,815.63	0.80	2,280.543	
300.00	300.00	274.57	274.56	0.85	0.56	177.13	-1,813.27	90.97	1,815.62	1,814.21	1.41	1,286.514	
400.00	400.00	376.85	376.84	1.21	0.93	177.13	-1,812.26	90.97	1,814.64	1,812.50	2.14	849.385	
500.00	500.00	479.13	479.11	1.57	1.29	177.12	-1,811.13	90.97	1,813.53	1,810.67	2.86	633.760	
600.00	600.00	581.40	581.38	1.93	1.66	177.12	-1,809.87	90.97	1,812.30	1,808.72	3.59	505.291	
700.00	700.00	685.60	685.57	2.29	2.03	177.12	-1,808.40	90.97	1,810.90	1,806.58	4.32	419.299	
800.00	800.00	789.99	789.94	2.64	2.41	177.12	-1,806.67	90.97	1,809.25	1,804.19	5.05	358.153	
900.00	900.00	894.37	894.30	3.00	2.78	177.11	-1,804.70	90.97	1,807.35	1,801.57	5.78	312.464	
1,000.00	1,000.00	999.06	998.97	3.36	3.16	177.11	-1,802.45	90.97	1,805.21	1,798.70	6.52	276.960	
1,100.00	1,100.00	1,104.41	1,104.29	3.72	3.54	177.11	-1,799.90	90.97	1,802.79	1,795.54	7.25	248.520	

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



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Local Co-ordinate Reference: Well 515H
TVD Reference: Well @ 3566.10usft (Cactus 126)
MD Reference: Well @ 3566.10usft (Cactus 126)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: 5000.1 Conroe DB
Offset TVD Reference: Offset Datum

BTBN 25 FED - #2 - Wellbore #1 - Surveys													Offset Site Error:	0.00 usft
Survey Program: 237-MWD													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis			Distance							
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Azimuth from North (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning	
1,200.00	1,200.00	1,209.74	1,209.58	4.08	3.92	177.10	-1,797.03	90.97	1,800.07	1,792.08	7.99	225.287		
1,300.00	1,300.00	1,311.82	1,311.62	4.44	4.28	177.10	-1,793.98	90.97	1,797.08	1,788.37	8.71	206.215		
1,400.00	1,400.00	1,409.04	1,408.80	4.79	4.63	177.09	-1,791.14	90.97	1,794.17	1,784.75	9.42	190.423		
1,500.00	1,500.00	1,506.27	1,505.99	5.15	4.98	177.09	-1,788.45	90.97	1,791.41	1,781.28	10.13	176.850		
1,600.00	1,600.00	1,600.37	1,600.05	5.51	5.32	177.08	-1,786.04	90.97	1,788.85	1,778.02	10.83	165.237		
1,700.00	1,700.00	1,691.80	1,691.46	5.87	5.65	177.08	-1,784.10	90.97	1,786.73	1,775.22	11.51	155.195		
1,800.00	1,800.00	1,783.24	1,782.89	6.23	5.98	177.08	-1,782.60	90.97	1,785.09	1,772.89	12.20	146.325		
1,900.00	1,900.00	1,882.86	1,882.50	6.59	6.34	177.08	-1,781.26	90.97	1,783.75	1,770.83	12.92	138.112		
2,000.00	2,000.00	1,984.43	1,984.07	6.95	6.70	177.07	-1,779.81	90.97	1,782.33	1,768.69	13.64	130.689		
2,100.00	2,100.00	2,086.01	2,085.63	7.30	7.07	177.07	-1,778.27	90.97	1,780.81	1,766.45	14.36	124.007		
2,200.00	2,200.00	2,187.58	2,187.19	7.66	7.43	177.07	-1,776.64	90.97	1,779.21	1,764.13	15.08	117.960		
2,300.00	2,300.00	2,289.15	2,288.74	8.02	7.79	177.07	-1,774.92	90.97	1,777.52	1,761.71	15.81	112.460		
2,400.00	2,400.00	2,386.49	2,386.07	8.38	8.14	177.06	-1,773.29	90.97	1,775.85	1,759.34	16.51	107.540		
2,500.00	2,500.00	2,483.43	2,483.00	8.74	8.49	177.06	-1,771.84	90.97	1,774.35	1,757.13	17.22	103.043		
2,573.79	2,573.79	2,554.97	2,554.53	9.00	8.75	177.06	-1,770.87	90.97	1,773.83	1,756.09	17.74	99.987		
2,600.00	2,599.99	2,580.38	2,579.94	9.10	8.84	177.06	-1,770.55	90.97	1,773.89	1,755.97	17.93	98.959		
2,700.00	2,699.96	2,677.32	2,676.88	9.45	9.19	177.06	-1,769.42	90.97	1,775.35	1,756.72	18.63	95.287		
2,800.00	2,799.86	2,774.21	2,773.76	9.81	9.53	177.06	-1,768.47	90.97	1,778.73	1,759.39	19.34	91.984		
2,900.00	2,899.68	2,874.90	2,874.44	10.17	9.89	177.05	-1,767.56	90.97	1,783.93	1,763.88	20.06	88.945		
3,000.00	2,999.37	2,976.24	2,975.78	10.53	10.26	177.05	-1,766.55	90.97	1,790.79	1,770.01	20.78	86.188		
3,100.00	3,098.90	3,077.46	3,076.99	10.89	10.62	177.05	-1,765.46	90.97	1,799.30	1,777.80	21.50	83.695		
3,200.00	3,198.26	3,178.53	3,178.06	11.25	10.98	177.05	-1,764.28	90.97	1,809.46	1,787.25	22.22	81.442		
3,299.74	3,297.14	3,279.16	3,278.68	11.61	11.34	177.05	-1,763.02	90.97	1,821.24	1,798.30	22.93	79.409		
3,300.00	3,297.40	3,279.43	3,278.94	11.61	11.34	177.05	-1,763.01	90.97	1,821.27	1,798.33	22.94	79.404		
3,400.00	3,396.43	3,378.79	3,378.30	11.98	11.70	177.04	-1,761.71	90.97	1,833.89	1,810.24	23.65	77.543		
3,500.00	3,495.46	3,478.00	3,477.50	12.36	12.06	177.04	-1,760.41	90.97	1,846.51	1,822.14	24.36	75.792		
3,600.00	3,594.49	3,577.20	3,576.69	12.73	12.41	177.04	-1,759.12	90.97	1,859.12	1,834.05	25.08	74.138		
3,700.00	3,693.51	3,676.40	3,675.88	13.11	12.77	177.04	-1,757.82	90.97	1,871.74	1,845.95	25.79	72.575		
3,800.00	3,792.54	3,775.60	3,775.07	13.49	13.12	177.03	-1,756.52	90.97	1,884.36	1,857.85	26.51	71.093		
3,900.00	3,891.57	3,877.87	3,877.33	13.87	13.49	177.03	-1,755.11	90.97	1,896.91	1,869.67	27.23	69.657		
4,000.00	3,990.60	3,980.70	3,980.16	14.25	13.86	177.03	-1,753.50	90.97	1,909.27	1,881.31	27.96	68.281		
4,100.00	4,089.62	4,083.59	4,083.02	14.64	14.23	177.03	-1,751.69	90.97	1,921.44	1,892.75	28.69	66.968		
4,200.00	4,188.65	4,186.52	4,185.94	15.02	14.60	177.02	-1,749.69	90.97	1,933.43	1,904.01	29.42	65.711		
4,300.00	4,287.68	4,289.50	4,288.89	15.41	14.97	177.02	-1,747.49	90.97	1,945.23	1,915.07	30.15	64.508		
4,400.00	4,386.71	4,392.52	4,391.89	15.80	15.34	177.02	-1,745.10	90.97	1,956.84	1,925.95	30.89	63.355		
4,500.00	4,485.73	4,495.59	4,494.93	16.19	15.71	177.01	-1,742.51	90.97	1,968.26	1,936.64	31.62	62.248		
4,600.00	4,584.76	4,600.05	4,599.35	16.59	16.09	177.01	-1,739.65	90.97	1,979.46	1,947.10	32.36	61.174		
4,700.00	4,683.79	4,704.64	4,703.89	16.98	16.46	177.00	-1,736.51	90.97	1,990.40	1,957.31	33.10	60.138		
4,800.00	4,782.81	4,809.28	4,808.47	17.37	16.84	177.00	-1,733.10	90.97	2,001.08	1,967.25	33.84	59.139		
4,900.00	4,881.84	4,912.85	4,911.97	17.77	17.21	176.99	-1,729.47	90.97	2,011.52	1,976.95	34.57	58.182		
5,000.00	4,980.87	5,015.76	5,014.81	18.17	17.58	176.99	-1,725.68	90.97	2,021.79	1,986.48	35.31	57.263		
5,100.00	5,079.90	5,118.70	5,117.68	18.56	17.95	176.98	-1,721.72	90.97	2,031.88	1,995.84	36.04	56.376		
5,200.00	5,178.92	5,221.16	5,220.06	18.96	18.33	176.98	-1,717.61	90.97	2,041.82	2,005.04	36.77	55.523		
5,300.00	5,277.95	5,323.67	5,322.48	19.36	18.70	176.97	-1,713.35	90.97	2,051.61	2,014.10	37.51	54.698		
5,400.00	5,376.98	5,426.22	5,424.94	19.76	19.07	176.96	-1,708.94	90.97	2,061.25	2,023.01	38.24	53.900		
5,500.00	5,476.01	5,521.85	5,520.48	20.16	19.41	176.96	-1,704.86	90.97	2,070.94	2,031.99	38.95	53.167		
5,600.00	5,575.03	5,618.02	5,616.57	20.56	19.76	176.95	-1,700.91	90.97	2,080.78	2,041.12	39.66	52.462		
5,628.09	5,602.86	5,645.03	5,643.56	20.68	19.86	176.95	-1,699.83	90.97	2,083.57	2,043.71	39.86	52.269		
5,700.00	5,674.12	5,714.20	5,712.67	20.96	20.11	176.95	-1,697.12	90.97	2,090.33	2,049.96	40.37	51.775		
5,800.00	5,773.42	5,810.49	5,808.90	21.36	20.45	176.94	-1,693.48	90.97	2,098.37	2,057.29	41.08	51.075		
5,900.00	5,872.91	5,906.89	5,905.23	21.74	20.80	176.94	-1,689.98	90.97	2,104.84	2,063.04	41.79	50.363		
6,000.00	5,972.56	6,003.27	6,001.55	22.12	21.15	176.93	-1,686.65	90.97	2,109.72	2,067.22	42.50	49.639		

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



MS Energy Services Anticollision Report



Company: Devon Energy
Project: Eddy County, New Mexico (NAD 83)
Reference Site: Cotton Draw Unit
Site Error: 0.00 usft
Reference Well: 515H
Well Error: 0.00 usft
Reference Wellbore: Wellbore #1
Reference Design: Design #1

Local Co-ordinate Reference: Well 515H
TVD Reference: Well @ 3566.10usft (Cactus 126)
MD Reference: Well @ 3566.10usft (Cactus 126)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: 5000.1 Conroe DB
Offset TVD Reference: Offset Datum

Offset Design BTBN 25 FED - #2 - Wellbore #1 - Surveys													Offset Site Error:
Survey Program: 237-MWD													Offset Well Error:
Reference		Offset		Semi Major Axis		Azimuth from North (°)	Offset Wellbore Centre		Distance		Minimum Separation (usft)	Separation Factor	Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)			
6,100.00	6,072.35	6,099.67	6,097.90	22.49	21.50	176.93	-1,683.48	90.97	2,113.03	2,069.82	43.21	48.903	
6,200.00	6,172.23	6,196.10	6,194.28	22.86	21.85	176.92	-1,680.47	90.97	2,114.76	2,070.85	43.91	48.158	
6,300.00	6,272.18	6,292.54	6,290.68	23.21	22.19	176.92	-1,677.62	90.97	2,114.91	2,070.30	44.62	47.403	
6,400.00	6,372.17	6,388.98	6,387.08	23.56	22.54	176.92	-1,674.93	90.97	2,113.49	2,068.17	45.32	46.638	
6,427.83	6,400.00	6,458.97	6,413.13	23.66	22.79	176.91	-1,674.23	90.97	2,112.81	2,067.14	45.67	46.266	
6,500.00	6,472.17	6,487.17	6,485.24	23.90	22.89	176.91	-1,672.34	90.97	2,110.92	2,064.90	46.02	45.867	
6,600.00	6,572.17	6,587.14	6,585.18	24.25	23.25	176.91	-1,669.73	90.97	2,108.31	2,061.57	46.74	45.111	
6,700.00	6,672.17	6,687.11	6,685.11	24.59	23.61	176.90	-1,667.11	90.97	2,105.69	2,058.25	47.45	44.378	
6,800.00	6,772.17	6,785.94	6,783.90	24.93	23.97	176.90	-1,664.54	90.97	2,103.10	2,054.94	48.16	43.671	
6,900.00	6,872.17	6,883.77	6,881.70	25.28	24.32	176.90	-1,662.08	90.97	2,100.59	2,051.72	48.86	42.989	
7,000.00	6,972.17	6,981.60	6,979.51	25.62	24.67	176.89	-1,659.72	90.97	2,098.18	2,048.61	49.57	42.329	
7,100.00	7,072.17	7,079.44	7,077.32	25.97	25.03	176.89	-1,657.46	90.97	2,095.87	2,045.60	50.27	41.690	
7,200.00	7,172.17	7,177.29	7,175.14	26.31	25.38	176.89	-1,655.30	90.97	2,093.67	2,042.69	50.98	41.070	
7,300.00	7,272.17	7,273.10	7,270.94	26.66	25.72	176.88	-1,653.34	90.97	2,091.63	2,039.95	51.68	40.477	
7,400.00	7,372.17	7,369.33	7,367.15	27.00	26.07	176.88	-1,651.55	90.97	2,089.76	2,037.39	52.37	39.901	
7,500.00	7,472.17	7,465.57	7,463.37	27.35	26.41	176.88	-1,649.92	90.97	2,088.08	2,035.01	53.07	39.344	
7,600.00	7,572.17	7,561.81	7,559.60	27.69	26.76	176.88	-1,648.47	90.97	2,086.57	2,032.80	53.77	38.805	
7,700.00	7,672.17	7,663.48	7,661.27	28.04	27.12	176.87	-1,647.07	90.97	2,085.20	2,030.70	54.49	38.266	
7,800.00	7,772.17	7,773.45	7,771.23	28.39	27.52	176.87	-1,645.16	90.97	2,083.46	2,028.21	55.25	37.712	
7,900.00	7,872.17	7,883.41	7,881.15	28.74	27.91	176.87	-1,642.72	90.97	2,081.24	2,025.24	56.00	37.165	
8,000.00	7,972.17	7,993.33	7,991.03	29.08	28.31	176.86	-1,639.75	90.97	2,078.55	2,021.80	56.75	36.625	
8,100.00	8,072.17	8,103.22	8,100.87	29.43	28.70	176.86	-1,636.26	90.97	2,075.38	2,017.87	57.50	36.091	
8,200.00	8,172.17	8,207.87	8,205.45	29.78	29.08	176.85	-1,632.55	90.97	2,071.83	2,013.60	58.24	35.577	
8,300.00	8,272.17	8,311.56	8,309.07	30.13	29.46	176.85	-1,628.67	90.97	2,068.10	2,009.14	58.96	35.074	
8,400.00	8,372.17	8,415.24	8,412.67	30.48	29.83	176.84	-1,624.61	90.97	2,064.19	2,004.50	59.69	34.581	
8,500.00	8,472.17	8,518.91	8,516.25	30.83	30.21	176.83	-1,620.36	90.97	2,060.10	1,999.68	60.42	34.096	
8,600.00	8,572.17	8,622.56	8,619.80	31.18	30.58	176.83	-1,615.93	90.97	2,055.83	1,994.68	61.15	33.621	
8,700.00	8,672.17	8,713.58	8,710.75	31.52	30.91	176.82	-1,612.16	90.97	2,051.69	1,989.86	61.83	33.182	
8,751.58	8,723.75	8,760.87	8,758.01	31.70	31.08	176.82	-1,610.35	90.97	2,049.72	1,987.53	62.18	32.982	
8,800.00	8,772.11	8,805.15	8,802.26	31.86	31.24	176.82	-1,608.74	90.97	2,045.93	1,983.42	62.51	32.732	
8,850.00	8,821.68	8,850.43	8,847.50	32.00	31.40	176.83	-1,607.18	90.97	2,037.87	1,975.05	62.82	32.439	
8,900.00	8,870.51	8,894.92	8,891.98	32.12	31.56	176.86	-1,605.74	90.97	2,025.64	1,962.52	63.13	32.089	
8,950.00	8,918.22	8,938.33	8,935.36	32.24	31.72	176.89	-1,604.42	90.97	2,009.35	1,945.93	63.42	31.684	
9,000.00	8,964.46	8,980.32	8,977.34	32.34	31.87	176.93	-1,603.22	90.97	1,989.11	1,925.41	63.70	31.228	
9,050.00	9,008.86	9,020.60	9,017.61	32.43	32.02	176.99	-1,602.14	90.97	1,965.05	1,901.10	63.96	30.725	
9,100.00	9,051.09	9,058.88	9,055.87	32.51	32.16	177.05	-1,601.18	90.97	1,937.36	1,873.16	64.20	30.178	
9,150.00	9,090.83	9,094.87	9,091.86	32.58	32.29	177.13	-1,600.33	90.97	1,906.24	1,841.82	64.42	29.591	
9,200.00	9,127.77	9,129.23	9,126.21	32.65	32.41	177.22	-1,599.58	90.97	1,871.90	1,807.28	64.62	28.967	
9,250.00	9,161.64	9,161.78	9,158.75	32.71	32.53	177.32	-1,598.87	90.97	1,834.57	1,769.76	64.81	28.308	
9,300.00	9,192.18	9,191.01	9,187.97	32.78	32.63	177.44	-1,598.25	90.97	1,794.53	1,729.56	64.97	27.622	
9,350.00	9,219.15	9,216.70	9,213.66	32.85	32.72	177.57	-1,597.71	90.97	1,752.08	1,686.97	65.10	26.912	
9,400.00	9,242.36	9,238.65	9,235.60	32.92	32.80	177.71	-1,597.26	90.97	1,707.54	1,642.32	65.22	26.182	
9,450.00	9,261.61	9,256.69	9,253.64	32.99	32.87	177.86	-1,596.88	90.97	1,661.25	1,595.94	65.31	25.437	
9,500.00	9,276.77	9,270.68	9,267.63	33.08	32.92	178.03	-1,596.60	90.97	1,613.57	1,548.20	65.38	24.681	
9,550.00	9,287.73	9,280.51	9,277.45	33.17	32.95	178.22	-1,596.40	90.97	1,564.86	1,499.44	65.42	23.919	
9,600.00	9,294.39	9,286.10	9,283.04	33.27	32.97	178.42	-1,596.28	90.97	1,515.49	1,450.04	65.45	23.154	
9,649.26	9,296.70	9,287.41	9,284.35	33.37	32.98	178.63	-1,596.26	90.97	1,466.57	1,401.10	65.47	22.402	
9,700.00	9,296.91	9,286.60	9,283.54	33.49	32.98	178.84	-1,596.27	90.97	1,416.13	1,350.66	65.47	21.630	
9,800.00	9,297.31	9,285.01	9,281.95	33.80	32.97	179.20	-1,596.31	90.97	1,316.52	1,251.04	65.48	20.106	
9,900.00	9,297.72	9,283.40	9,280.34	34.17	32.96	179.46	-1,596.34	90.97	1,216.69	1,151.21	65.49	18.579	
10,000.00	9,298.12	9,281.79	9,278.73	34.62	32.96	179.58	-1,596.37	90.97	1,116.74	1,051.25	65.49	17.051	
10,027.33	9,298.24	9,281.35	9,278.29	34.75	32.96	179.58	-1,596.38	90.97	1,089.42	1,023.92	65.49	16.634	

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

Company: Devon Energy
 Project: Eddy County, New Mexico (NAD 83)
 Reference Site: Cotton Draw Unit
 Site Error: 0.00 usft
 Reference Well: 515H
 Well Error: 0.00 usft
 Reference Wellbore: Wellbore #1
 Reference Design: Design #1

Local Co-ordinate Reference: Well 515H
 TVD Reference: Well @ 3566.10usft (Cactus 126)
 MD Reference: Well @ 3566.10usft (Cactus 126)
 North Reference: Grid
 Survey Calculation Method: Minimum Curvature
 Output errors are at: 2.00 sigma
 Database: 5000.1 Conroe DB
 Offset TVD Reference: Offset Datum

Offset Design BTBN 25 FED - #2 - Wellbore #1 - Surveys													Offset Site Error: 0.00 usft
Survey Program: 237-MWD													Offset Well Error: 0.00 usft
Reference		Offset		Semi Major Axis		Distance		Minimum Separation		Separation Factor		Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Azimuth from North (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centras (usft)	Between Ellipses (usft)	Minimum Separation (usft)		
10,100.00	9,298.53	9,280.18	9,277.12	35.13	32.95	179.58	-1,596.40	90.97	1,016.76	951.26	65.50	15.524	
10,200.00	9,298.93	9,278.56	9,275.50	35.71	32.95	179.57	-1,596.44	90.97	916.77	851.27	65.50	13.996	
10,300.00	9,299.34	9,276.94	9,273.88	36.35	32.94	179.56	-1,596.47	90.97	816.78	751.28	65.51	12.469	
10,400.00	9,299.74	9,275.32	9,272.26	37.06	32.93	179.55	-1,596.50	90.97	716.80	651.28	65.51	10.941	
10,500.00	9,300.15	9,273.69	9,270.63	37.83	32.93	179.54	-1,596.54	90.97	616.81	551.29	65.52	9.414	
10,600.00	9,300.55	9,272.06	9,269.01	38.65	32.92	179.51	-1,596.57	90.97	516.82	451.29	65.53	7.887	
10,700.00	9,300.96	9,270.43	9,267.37	39.53	32.92	179.48	-1,596.60	90.97	416.84	351.30	65.54	6.360	
10,800.00	9,301.36	9,268.80	9,265.74	40.45	32.91	179.43	-1,596.64	90.97	316.85	251.30	65.55	4.834	
10,900.00	9,301.76	9,267.16	9,264.10	41.42	32.91	179.33	-1,596.67	90.97	216.87	151.31	65.56	3.308	
11,000.00	9,302.17	9,265.52	9,262.46	42.44	32.90	179.06	-1,596.70	90.97	116.88	51.32	65.56	1.783	
11,100.00	9,302.57	9,263.88	9,260.82	43.49	32.89	175.56	-1,596.74	90.97	16.93	-48.62	65.55	0.258 Level 1	
11,116.91	9,302.64	9,263.60	9,260.54	43.68	32.89	88.93	-1,596.74	90.97	1.21	-75.34	76.55	0.016 Level 1, CC, ES, SF	
11,200.00	9,302.98	9,262.23	9,259.17	44.58	32.89	0.48	-1,596.77	90.97	83.11	17.48	65.63	1.266 Level 3	
11,300.00	9,303.38	9,260.58	9,257.52	45.71	32.88	0.03	-1,596.80	90.97	183.09	117.46	65.63	2.790	
11,400.00	9,303.79	9,258.93	9,255.87	46.86	32.88	-0.11	-1,596.84	90.97	283.07	217.43	65.64	4.312	
11,500.00	9,304.19	9,257.27	9,254.22	48.05	32.87	-0.17	-1,596.87	90.97	383.06	317.40	65.66	5.834	
11,600.00	9,304.60	9,255.61	9,252.56	49.26	32.86	-0.21	-1,596.91	90.97	483.04	417.37	65.68	7.355	
11,700.00	9,305.00	9,253.95	9,250.90	50.50	32.86	-0.23	-1,596.94	90.97	583.03	517.33	65.70	8.875	
11,800.00	9,305.40	9,252.29	9,249.24	51.76	32.85	-0.25	-1,596.97	90.97	683.02	617.30	65.72	10.393	
11,900.00	9,305.81	9,250.62	9,247.57	53.05	32.85	-0.26	-1,597.01	90.97	783.00	717.27	65.74	11.911	
12,000.00	9,306.21	9,248.95	9,245.90	54.35	32.84	-0.27	-1,597.04	90.97	882.99	817.23	65.76	13.427	
12,100.00	9,306.62	9,247.28	9,244.23	55.67	32.83	-0.28	-1,597.08	90.97	982.98	917.19	65.78	14.943	
12,200.00	9,307.02	9,245.61	9,242.55	57.01	32.83	-0.29	-1,597.11	90.97	1,082.96	1,017.15	65.81	16.457	
12,300.00	9,307.43	9,243.93	9,240.88	58.37	32.82	-0.29	-1,597.15	90.97	1,182.95	1,117.11	65.83	17.969	
12,400.00	9,307.83	9,242.25	9,239.19	59.74	32.82	-0.30	-1,597.18	90.97	1,282.93	1,217.07	65.86	19.480	
12,500.00	9,308.23	9,240.56	9,237.51	61.13	32.81	-0.30	-1,597.22	90.97	1,382.92	1,317.03	65.89	20.990	
12,600.00	9,308.64	9,238.87	9,235.82	62.53	32.80	-0.30	-1,597.25	90.97	1,482.91	1,416.99	65.91	22.497	
12,700.00	9,309.04	9,237.18	9,234.13	63.94	32.80	-0.31	-1,597.29	90.97	1,582.89	1,516.95	65.94	24.004	
12,800.00	9,309.45	9,235.49	9,232.44	65.36	32.79	-0.31	-1,597.32	90.97	1,682.88	1,616.90	65.97	25.508	
12,900.00	9,309.85	9,233.79	9,230.74	66.80	32.79	-0.31	-1,597.36	90.97	1,782.86	1,716.86	66.00	27.011	
13,000.00	9,310.26	9,232.09	9,229.04	68.24	32.78	-0.31	-1,597.39	90.97	1,882.85	1,816.81	66.04	28.512	
13,100.00	9,310.66	9,230.39	9,227.34	69.69	32.77	-0.32	-1,597.43	90.97	1,982.84	1,916.77	66.07	30.011	
3,200.00	9,311.07	9,228.68	9,225.63	71.16	32.77	-0.32	-1,597.46	90.97	2,082.82	2,016.72	66.10	31.508	
3,300.00	9,311.47	9,226.97	9,223.93	72.63	32.76	-0.32	-1,597.50	90.97	2,182.81	2,116.67	66.14	33.003	
3,400.00	9,311.87	9,225.26	9,222.21	74.11	32.75	-0.32	-1,597.53	90.97	2,282.79	2,216.62	66.17	34.497	
3,500.00	9,312.28	9,223.55	9,220.50	75.59	32.75	-0.32	-1,597.57	90.97	2,382.78	2,316.57	66.21	35.987	
3,600.00	9,312.68	9,221.83	9,218.78	77.09	32.74	-0.32	-1,597.61	90.97	2,482.77	2,416.52	66.25	37.476	
3,700.00	9,313.09	9,220.11	9,217.06	78.59	32.74	-0.32	-1,597.64	90.97	2,582.75	2,516.46	66.29	38.963	
3,800.00	9,313.49	9,218.38	9,215.34	80.09	32.73	-0.33	-1,597.68	90.97	2,682.74	2,616.41	66.33	40.447	
3,900.00	9,313.90	9,216.66	9,213.61	81.60	32.72	-0.33	-1,597.71	90.97	2,782.72	2,716.36	66.37	41.929	
4,000.00	9,314.30	9,214.93	9,211.88	83.12	32.72	-0.33	-1,597.75	90.97	2,882.71	2,816.30	66.41	43.408	
4,100.00	9,314.71	9,213.19	9,210.15	84.64	32.71	-0.33	-1,597.79	90.97	2,982.69	2,916.24	66.45	44.885	
4,200.00	9,315.11	9,211.45	9,208.41	86.17	32.71	-0.33	-1,597.82	90.97	3,082.68	3,016.19	66.49	46.360	
4,300.00	9,315.51	9,209.71	9,206.67	87.70	32.70	-0.33	-1,597.86	90.97	3,182.67	3,116.13	66.54	47.832	
4,400.00	9,315.92	9,207.97	9,204.93	89.24	32.69	-0.33	-1,597.90	90.97	3,282.65	3,216.07	66.58	49.301	
4,500.00	9,316.32	9,206.23	9,203.18	90.78	32.69	-0.33	-1,597.93	90.97	3,382.64	3,316.01	66.63	50.768	
4,600.00	9,316.73	9,204.48	9,201.43	92.33	32.68	-0.33	-1,597.97	90.97	3,482.62	3,415.95	66.68	52.232	
4,700.00	9,317.13	9,215.95	9,212.91	93.88	32.72	-0.33	-1,597.91	90.97	3,582.45	3,515.70	66.74	53.674	
4,800.00	9,317.54	9,214.37	9,211.33	95.43	32.72	-0.33	-1,597.94	90.97	3,682.44	3,615.65	66.79	55.131	
4,900.00	9,317.94	9,212.77	9,209.72	96.99	32.71	-0.33	-1,597.97	90.97	3,782.43	3,715.59	66.84	56.586	
5,000.00	9,318.34	9,211.15	9,208.10	98.55	32.71	-0.33	-1,597.99	90.97	3,882.42	3,815.53	66.89	58.038	
5,100.00	9,318.75	9,209.51	9,206.47	100.11	32.70	-0.33	-1,598.02	90.97	3,982.41	3,915.47	66.95	59.487	



MS Energy Services
Anticollision Report



Company: Devon Energy
Project: Eddy County, New Mexico (NAD 83)
Reference Site: Cotton Draw Unit
Site Error: 0.00 usft
Reference Well: 515H
Well Error: 0.00 usft
Reference Wellbore: Wellbore #1
Reference Design: Design #1

Local Co-ordinate Reference: Well 515H
TVD Reference: Well @ 3566.10usft (Cactus 126)
MD Reference: Well @ 3566.10usft (Cactus 126)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at: 2.00 sigma
Database: 5000.1 Conroe DB
Offset TVD Reference: Offset Datum

Offset Design BTBN 25 FED - #2 - Wellbore #1 - Surveys													Offset Site Error: 0.00 usft
Survey Program: 237-MWD													Offset Well Error: 0.00 usft
Reference		Offset		Semi Major Axis		Azimuth from North (°)	Offset Wellbore Centre		Distance		Minimum Separation (usft)	Separation Factor	Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)			
15,200.00	9,319.15	9,207.85	9,204.81	101.68	32.69	-0.33	-1,598.05	90.97	4,082.40	4,015.41	67.00	60.933	
15,300.00	9,319.56	9,206.18	9,203.14	103.24	32.69	-0.34	-1,598.08	90.97	4,182.39	4,115.34	67.05	62.376	
15,400.00	9,319.96	9,204.49	9,201.45	104.82	32.68	-0.34	-1,598.11	90.97	4,282.39	4,215.28	67.11	63.815	
15,500.00	9,320.37	9,202.78	9,199.74	106.39	32.68	-0.34	-1,598.14	90.97	4,382.38	4,315.22	67.16	65.252	
15,600.00	9,320.77	9,201.06	9,198.02	107.97	32.67	-0.34	-1,598.17	90.97	4,482.37	4,415.15	67.22	66.686	
15,700.00	9,321.18	9,199.31	9,196.27	109.55	32.66	-0.34	-1,598.21	90.97	4,582.36	4,515.08	67.27	68.116	
15,800.00	9,321.58	9,197.54	9,194.50	111.13	32.66	-0.34	-1,598.24	90.97	4,682.35	4,615.02	67.33	69.543	
15,900.00	9,321.98	9,195.76	9,192.72	112.71	32.65	-0.34	-1,598.27	90.97	4,782.34	4,714.95	67.39	70.967	
16,000.00	9,322.39	9,193.95	9,190.91	114.30	32.64	-0.34	-1,598.30	90.97	4,882.33	4,814.88	67.45	72.387	
16,100.00	9,322.79	9,192.13	9,189.09	115.88	32.64	-0.34	-1,598.34	90.97	4,982.32	4,914.81	67.51	73.805	
16,200.00	9,323.20	9,190.28	9,187.24	117.47	32.63	-0.34	-1,598.37	90.97	5,082.31	5,014.74	67.57	75.218	
16,300.00	9,323.60	9,188.41	9,185.38	119.07	32.62	-0.34	-1,598.41	90.97	5,182.30	5,114.67	67.63	76.629	
16,400.00	9,324.01	9,186.53	9,183.49	120.66	32.62	-0.34	-1,598.44	90.97	5,282.28	5,214.59	67.69	78.036	
16,500.00	9,324.41	9,184.62	9,181.58	122.25	32.61	-0.34	-1,598.48	90.97	5,382.27	5,314.52	67.75	79.437	
16,600.00	9,324.82	9,182.68	9,179.65	123.85	32.60	-0.34	-1,598.51	90.97	5,482.26	5,414.45	67.82	80.839	
16,700.00	9,325.22	9,180.73	9,177.69	125.45	32.60	-0.34	-1,598.55	90.97	5,582.25	5,514.37	67.88	82.236	
16,800.00	9,325.62	9,178.75	9,175.72	127.05	32.59	-0.34	-1,598.59	90.97	5,682.24	5,614.29	67.95	83.629	
16,900.00	9,326.03	9,176.75	9,173.72	128.65	32.58	-0.34	-1,598.62	90.97	5,782.23	5,714.22	68.01	85.018	
17,000.00	9,326.43	9,174.73	9,171.69	130.25	32.57	-0.34	-1,598.66	90.97	5,882.22	5,814.14	68.08	86.403	
17,100.00	9,326.84	9,172.68	9,169.64	131.86	32.57	-0.34	-1,598.70	90.97	5,982.21	5,914.06	68.15	87.785	
17,200.00	9,327.24	9,170.61	9,167.57	133.46	32.56	-0.34	-1,598.74	90.97	6,082.20	6,013.98	68.21	89.164	
17,300.00	9,327.65	9,168.51	9,165.47	135.07	32.55	-0.34	-1,598.78	90.97	6,182.18	6,113.90	68.28	90.538	
17,400.00	9,328.05	9,166.38	9,163.35	136.68	32.54	-0.34	-1,598.82	90.97	6,282.17	6,213.82	68.35	91.909	
17,500.00	9,328.45	9,164.23	9,161.20	138.29	32.54	-0.34	-1,598.87	90.97	6,382.16	6,313.74	68.42	93.277	
17,600.00	9,328.86	9,162.06	9,159.03	139.90	32.53	-0.34	-1,598.91	90.97	6,482.15	6,413.65	68.49	94.640	
17,700.00	9,329.26	9,159.86	9,156.82	141.51	32.52	-0.34	-1,598.95	90.97	6,582.14	6,513.57	68.56	95.999	
17,800.00	9,329.67	9,157.63	9,154.59	143.12	32.51	-0.34	-1,599.00	90.97	6,682.12	6,613.49	68.64	97.355	
17,900.00	9,330.07	9,155.37	9,152.34	144.73	32.50	-0.34	-1,599.04	90.97	6,782.11	6,713.40	68.71	98.707	
18,000.00	9,330.48	9,153.08	9,150.05	146.35	32.50	-0.34	-1,599.09	90.97	6,882.10	6,813.31	68.78	100.055	
18,100.00	9,330.88	9,150.77	9,147.74	147.96	32.49	-0.34	-1,599.13	90.97	6,982.08	6,913.23	68.86	101.399	
18,200.00	9,331.29	9,148.42	9,145.39	149.58	32.48	-0.34	-1,599.18	90.97	7,082.07	7,013.14	68.93	102.739	
18,300.00	9,331.69	9,146.05	9,143.02	151.20	32.47	-0.34	-1,599.23	90.97	7,182.06	7,113.05	69.01	104.076	
18,400.00	9,332.09	9,143.64	9,140.61	152.81	32.46	-0.34	-1,599.28	90.97	7,282.04	7,212.96	69.08	105.408	
18,500.00	9,332.50	9,141.21	9,138.18	154.43	32.45	-0.34	-1,599.33	90.97	7,382.03	7,312.87	69.16	106.737	
18,600.00	9,332.90	9,138.74	9,135.71	156.05	32.44	-0.34	-1,599.38	90.97	7,482.02	7,412.78	69.24	108.061	
18,700.00	9,333.31	9,136.24	9,133.21	157.67	32.44	-0.34	-1,599.43	90.97	7,582.00	7,512.69	69.32	109.382	
18,800.00	9,333.71	9,133.70	9,130.68	159.30	32.43	-0.34	-1,599.49	90.97	7,681.99	7,612.59	69.40	110.698	
18,900.00	9,334.12	9,131.13	9,128.11	160.92	32.42	-0.34	-1,599.54	90.97	7,781.97	7,712.50	69.48	112.011	
19,000.00	9,334.52	9,128.53	9,125.51	162.54	32.41	-0.34	-1,599.59	90.97	7,881.96	7,812.40	69.56	113.319	
19,100.00	9,334.93	9,125.89	9,122.87	164.16	32.40	-0.34	-1,599.65	90.97	7,981.95	7,912.31	69.64	114.624	
19,200.00	9,335.33	9,123.22	9,120.20	165.79	32.39	-0.34	-1,599.71	90.97	8,081.93	8,012.21	69.72	115.924	
19,300.00	9,335.73	9,120.51	9,117.49	167.41	32.38	-0.34	-1,599.77	90.97	8,181.91	8,112.12	69.80	117.221	
19,390.56	9,336.10	9,118.03	9,115.00	168.88	32.37	-0.34	-1,599.82	90.97	8,272.46	8,202.58	69.87	118.391	



MS Energy Services

Anticollision Report



Company: Devon Energy
Project: Eddy County, New Mexico (NAD 83)
Reference Site: Cotton Draw Unit
Site Error: 0.00 usft
Reference Well: 515H
Well Error: 0.00 usft
Reference Wellbore: Wellbore #1
Reference Design: Design #1

Local Co-ordinate Reference: Well 515H
TVD Reference: Well @ 3566.10usft (Cactus 126)
MD Reference: Well @ 3566.10usft (Cactus 126)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: 5000.1 Conroe DB
Offset TVD Reference: Offset Datum

Offset Design Cotton Draw - #99 - Wellbore #1 - Surveys													Offset Site Error:	0.00 usft
Survey Program: 52-GYRO-NS, 4310-MWD													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Azimuth from North (°)	Distance		Minimum Separation (usft)	Separation Factor	Warning			
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		Offset Wellbore Centre +N/S (usft)	+E/W (usft)						
0.00	0.00	0.00	0.00	0.00	0.00	-160.01	-5,135.79	-1,868.71	5,465.30					
100.00	100.00	42.55	42.55	0.13	0.04	-160.01	-5,135.91	-1,868.68	5,465.35	5,465.18	0.17	N/A		
200.00	200.00	121.34	121.33	0.49	0.29	-160.01	-5,136.48	-1,868.64	5,466.02	5,465.23	0.78	6,964.353		
300.00	300.00	235.06	235.05	0.85	0.69	-160.01	-5,137.21	-1,869.26	5,466.82	5,465.28	1.54	3,547.119		
400.00	400.00	347.30	347.28	1.21	1.08	-159.99	-5,137.22	-1,870.79	5,467.29	5,465.00	2.29	2,382.617		
500.00	500.00	402.71	402.69	1.57	1.28	-159.98	-5,137.42	-1,871.67	5,468.12	5,465.27	2.85	1,920.079		
600.00	600.00	468.84	468.80	1.93	1.51	-159.98	-5,138.16	-1,872.56	5,469.63	5,466.19	3.44	1,590.931		
700.00	700.00	555.30	555.25	2.29	1.81	-159.98	-5,139.80	-1,873.25	5,471.67	5,467.57	4.10	1,334.966		
800.00	800.00	658.21	658.13	2.64	2.18	-159.97	-5,141.42	-1,874.41	5,473.52	5,468.71	4.82	1,136.222		
900.00	900.00	736.38	736.29	3.00	2.45	-159.97	-5,143.01	-1,875.18	5,475.77	5,470.32	5.45	1,004.842		
1,000.00	1,000.00	899.97	899.84	3.36	3.02	-159.96	-5,145.90	-1,876.99	5,477.95	5,471.57	6.38	858.431		
1,100.00	1,100.00	984.60	984.45	3.72	3.32	-159.95	-5,146.79	-1,877.91	5,479.31	5,472.28	7.04	778.736		
1,200.00	1,200.00	1,106.99	1,106.84	4.08	3.75	-159.95	-5,148.00	-1,879.20	5,480.60	5,472.78	7.82	700.546		
1,300.00	1,300.00	1,194.81	1,194.64	4.44	4.05	-159.94	-5,148.91	-1,879.86	5,481.83	5,473.34	8.49	645.740		
1,400.00	1,400.00	1,305.45	1,305.28	4.79	4.44	-159.95	-5,150.26	-1,880.13	5,483.06	5,473.82	9.24	593.695		
1,500.00	1,500.00	1,425.22	1,425.04	5.15	4.86	-159.95	-5,151.44	-1,880.34	5,484.05	5,474.04	10.01	547.676		
1,600.00	1,600.00	1,529.18	1,529.00	5.51	5.22	-159.94	-5,151.78	-1,881.41	5,484.70	5,473.97	10.74	510.902		
1,700.00	1,700.00	1,631.92	1,631.73	5.87	5.58	-159.93	-5,152.14	-1,882.55	5,485.41	5,473.96	11.45	478.947		
1,800.00	1,800.00	1,754.83	1,754.63	6.23	6.01	-159.92	-5,152.25	-1,883.88	5,485.88	5,473.64	12.24	448.166		
1,900.00	1,900.00	1,835.41	1,835.21	6.59	6.30	-159.91	-5,152.39	-1,884.48	5,486.30	5,473.42	12.88	425.925		
2,000.00	2,000.00	1,937.08	1,936.88	6.95	6.65	-159.91	-5,152.86	-1,884.95	5,486.89	5,473.29	13.60	403.586		
2,100.00	2,100.00	2,033.72	2,033.52	7.30	6.99	-159.90	-5,153.25	-1,885.52	5,487.47	5,473.18	14.29	383.952		
2,200.00	2,200.00	2,137.21	2,137.00	7.66	7.35	-159.90	-5,153.66	-1,886.15	5,488.05	5,473.04	15.01	365.560		
2,300.00	2,300.00	2,240.94	2,240.72	8.02	7.72	-159.89	-5,153.78	-1,887.34	5,488.55	5,472.82	15.73	348.839		
2,400.00	2,400.00	2,337.17	2,336.94	8.38	8.05	-159.87	-5,153.75	-1,888.88	5,489.08	5,472.65	16.43	334.120		
2,500.00	2,500.00	2,433.62	2,433.38	8.74	8.39	-159.86	-5,153.78	-1,890.38	5,489.64	5,472.51	17.12	320.581		
2,600.00	2,599.99	2,521.98	2,521.74	9.10	8.70	-159.86	-5,154.22	-1,891.07	5,491.18	5,473.39	17.79	308.639		
2,700.00	2,699.96	2,623.74	2,623.49	9.45	9.06	-159.86	-5,154.93	-1,891.60	5,494.42	5,475.91	18.51	296.892		
2,800.00	2,799.86	2,722.78	2,722.52	9.81	9.41	-159.87	-5,155.35	-1,892.52	5,499.14	5,479.93	19.21	286.247		
2,900.00	2,899.68	2,797.63	2,797.37	10.17	9.67	-159.90	-5,156.10	-1,892.76	5,505.81	5,485.98	19.83	277.641		
3,000.00	2,999.37	2,894.05	2,893.78	10.53	10.00	-159.94	-5,157.51	-1,892.51	5,514.30	5,493.77	20.53	268.648		
3,100.00	3,098.90	2,977.73	2,977.45	10.89	10.30	-159.99	-5,158.92	-1,892.21	5,524.58	5,503.40	21.18	260.884		
3,200.00	3,198.26	3,084.84	3,084.55	11.25	10.67	-160.03	-5,160.55	-1,892.57	5,536.54	5,514.63	21.91	252.699		
3,299.74	3,297.14	3,196.26	3,195.95	11.61	11.06	-160.08	-5,161.75	-1,893.40	5,549.77	5,527.11	22.66	244.941		
3,300.00	3,297.40	3,196.48	3,196.17	11.61	11.06	-160.08	-5,161.75	-1,893.41	5,549.80	5,527.14	22.66	244.924		
3,400.00	3,396.43	3,311.35	3,311.04	11.98	11.47	-160.14	-5,163.14	-1,893.90	5,563.92	5,540.50	23.42	237.567		
3,500.00	3,495.46	3,483.95	3,483.63	12.36	12.07	-160.18	-5,162.72	-1,895.43	5,576.66	5,552.28	24.38	228.716		
3,600.00	3,594.49	3,571.36	3,571.03	12.73	12.37	-160.23	-5,162.41	-1,895.85	5,589.30	5,564.26	25.05	223.158		
3,700.00	3,693.51	3,689.24	3,688.90	13.11	12.78	-160.26	-5,161.36	-1,897.33	5,601.71	5,575.89	25.82	216.969		
3,800.00	3,792.54	3,782.20	3,781.85	13.49	13.11	-160.30	-5,160.33	-1,898.91	5,614.08	5,587.58	26.50	211.822		
3,900.00	3,891.57	3,877.82	3,877.45	13.87	13.44	-160.34	-5,159.63	-1,899.95	5,626.59	5,599.39	27.20	206.865		
4,000.00	3,990.60	4,127.49	4,126.93	14.25	14.31	-160.48	-5,158.34	-1,891.31	5,637.84	5,609.41	28.43	198.302		
4,100.00	4,089.62	4,183.71	4,183.06	14.64	14.50	-160.56	-5,157.94	-1,888.03	5,648.10	5,619.10	29.00	194.795		
4,200.00	4,188.65	4,252.14	4,251.34	15.02	14.72	-160.66	-5,158.11	-1,883.59	5,659.04	5,629.46	29.58	191.318		
4,300.00	4,287.68	4,310.00	4,309.08	15.41	14.82	-160.75	-5,158.56	-1,879.96	5,670.60	5,640.55	30.05	188.732		
4,400.00	4,386.71	4,370.05	4,369.04	15.80	14.83	-160.83	-5,159.30	-1,876.71	5,682.86	5,652.45	30.42	186.844		
4,500.00	4,485.73	4,430.00	4,428.92	16.19	14.83	-160.91	-5,160.30	-1,873.99	5,695.84	5,665.05	30.78	185.033		
4,600.00	4,584.76	4,670.18	4,668.70	16.59	14.89	-161.10	-5,162.42	-1,860.56	5,707.52	5,676.31	31.22	182.829		
4,700.00	4,683.79	4,731.25	4,729.65	16.98	14.92	-161.19	-5,162.59	-1,856.79	5,718.72	5,687.11	31.61	180.927		
4,800.00	4,782.81	4,785.22	4,783.55	17.37	14.94	-161.27	-5,162.92	-1,854.19	5,730.67	5,698.68	32.00	179.103		
4,900.00	4,881.84	4,866.32	4,864.62	17.77	14.98	-161.34	-5,163.51	-1,851.66	5,743.28	5,710.87	32.40	177.249		
5,000.00	4,980.87	4,963.08	4,961.36	18.17	15.03	-161.41	-5,163.84	-1,849.89	5,755.95	5,723.12	32.82	175.359		

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



MS Energy Services Anticollision Report



Company: Devon Energy
Project: Eddy County, New Mexico (NAD 83)
Reference Site: Cotton Draw Unit
Site Error: 0.00 usft
Reference Well: 515H
Well Error: 0.00 usft
Reference Wellbore: Wellbore #1
Reference Design: Design #1

Local Co-ordinate Reference: Well 515H
TVD Reference: Well @ 3566.10usft (Cactus 126)
MD Reference: Well @ 3566.10usft (Cactus 126)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at: 2.00 sigma
Database: 5000.1 Conroe DB
Offset TVD Reference: Offset Datum

Offset Design Cotton Draw - #99 - Wellbore #1 - Surveys													Offset Site Error:	0.00 usft
Survey Program: 62-GYRO-NS, 4310-MWD													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Distance		Minimum		Separation		Warning		
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Azimuth from North (°)	Offset Wellbore Centre +N-S (usft)	Offset Wellbore Centre +E-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Separation (usft)			
5,100.00	5,079.90	5,071.74	5,070.01	18.56	15.10	-161.47	-5,163.90	-1,848.76	5,768.62	5,735.36	33.26	173.429		
5,200.00	5,178.92	5,168.79	5,167.06	18.96	15.17	-161.53	-5,163.79	-1,847.84	5,781.16	5,747.46	33.70	171.546		
5,300.00	5,277.95	5,284.00	5,282.26	19.36	15.27	-161.59	-5,163.60	-1,846.70	5,793.65	5,759.49	34.16	169.587		
5,400.00	5,376.98	5,359.66	5,357.92	19.76	15.33	-161.65	-5,163.52	-1,845.90	5,806.18	5,771.59	34.60	167.824		
5,500.00	5,476.01	5,458.69	5,456.94	20.16	15.43	-161.71	-5,163.65	-1,844.89	5,818.95	5,783.89	35.06	165.970		
5,600.00	5,575.03	5,549.19	5,547.43	20.56	15.52	-161.77	-5,163.74	-1,844.12	5,831.74	5,796.22	35.52	164.177		
5,628.09	5,602.86	5,575.41	5,573.66	20.68	15.55	-161.78	-5,163.77	-1,843.97	5,835.37	5,799.72	35.65	163.673		
5,700.00	5,674.12	5,648.24	5,646.49	20.96	15.63	-161.82	-5,163.88	-1,843.47	5,844.23	5,808.23	36.00	162.347		
5,800.00	5,773.42	5,759.07	5,757.32	21.36	15.76	-161.87	-5,163.94	-1,842.64	5,855.06	5,818.56	36.50	160.425		
5,900.00	5,872.91	5,854.24	5,852.48	21.74	15.88	-161.91	-5,163.86	-1,842.15	5,864.21	5,827.23	36.98	158.573		
6,000.00	5,972.56	5,960.14	5,958.38	22.12	16.02	-161.95	-5,163.79	-1,841.47	5,871.72	5,834.23	37.49	156.638		
6,100.00	6,072.35	6,061.85	6,060.09	22.49	16.16	-161.98	-5,163.72	-1,840.57	5,877.53	5,839.54	37.99	154.714		
6,200.00	6,172.23	6,164.39	6,162.63	22.86	16.31	-162.00	-5,163.55	-1,839.92	5,881.71	5,843.21	38.50	152.776		
6,300.00	6,272.18	6,261.22	6,259.45	23.21	16.45	-162.02	-5,163.33	-1,839.21	5,884.17	5,845.16	39.00	150.865		
6,400.00	6,372.17	6,345.62	6,343.84	23.56	16.59	-162.03	-5,163.35	-1,838.73	5,885.27	5,845.78	39.49	149.041		
6,427.83	6,400.00	6,375.62	6,373.85	23.66	16.64	-162.03	-5,163.37	-1,838.58	5,885.31	5,845.67	39.63	148.488		
6,500.00	6,472.17	6,444.17	6,442.40	23.90	16.75	-162.03	-5,163.40	-1,838.21	5,885.22	5,845.22	40.00	147.126		
6,517.03	6,489.20	6,458.11	6,456.34	23.96	16.77	-162.03	-5,163.42	-1,838.13	5,885.22	5,845.13	40.08	146.822		
6,600.00	6,572.17	6,532.19	6,530.41	24.25	16.90	-162.04	-5,163.68	-1,837.62	5,885.31	5,844.81	40.50	145.316		
6,700.00	6,672.17	6,647.56	6,645.78	24.59	17.10	-162.05	-5,163.99	-1,836.78	5,885.34	5,844.29	41.06	143.343		
6,800.00	6,772.17	6,744.73	6,742.95	24.93	17.27	-162.05	-5,164.01	-1,836.20	5,885.18	5,843.59	41.59	141.519		
6,818.49	6,790.66	6,759.64	6,757.86	25.00	17.30	-162.05	-5,164.02	-1,836.14	5,885.17	5,843.50	41.68	141.207		
6,900.00	6,872.17	6,825.79	6,824.00	25.28	17.42	-162.06	-5,164.19	-1,835.90	5,885.28	5,843.20	42.09	139.843		
7,000.00	6,972.17	6,915.75	6,913.96	25.62	17.59	-162.06	-5,164.76	-1,835.34	5,885.68	5,843.08	42.61	138.142		
7,100.00	7,072.17	7,027.59	7,025.80	25.97	17.81	-162.07	-5,165.37	-1,834.56	5,885.99	5,842.81	43.18	136.315		
7,200.00	7,172.17	7,123.97	7,122.18	26.31	18.00	-162.08	-5,165.81	-1,833.92	5,886.21	5,842.49	43.72	134.619		
7,300.00	7,272.17	7,209.23	7,207.43	26.66	18.18	-162.09	-5,166.33	-1,833.43	5,886.62	5,842.37	44.25	133.037		
7,400.00	7,372.17	7,298.42	7,296.63	27.00	18.36	-162.09	-5,167.02	-1,833.26	5,887.30	5,842.51	44.78	131.468		
7,500.00	7,472.17	7,399.60	7,397.80	27.35	18.57	-162.09	-5,167.81	-1,833.10	5,887.99	5,842.64	45.34	129.850		
7,600.00	7,572.17	7,493.32	7,491.52	27.69	18.76	-162.10	-5,168.60	-1,832.96	5,888.74	5,842.85	45.90	128.308		
7,700.00	7,672.17	7,580.18	7,578.37	28.04	18.95	-162.10	-5,169.45	-1,832.81	5,889.64	5,843.20	46.43	126.841		
7,800.00	7,772.17	7,662.46	7,660.64	28.39	19.13	-162.10	-5,170.55	-1,832.71	5,890.86	5,843.90	46.96	125.436		
7,900.00	7,872.17	7,770.37	7,768.54	28.74	19.37	-162.11	-5,172.14	-1,832.20	5,892.12	5,844.56	47.56	123.885		
8,000.00	7,972.17	7,874.38	7,872.54	29.08	19.61	-162.12	-5,173.61	-1,831.61	5,893.29	5,845.13	48.16	122.382		
8,100.00	8,072.17	7,963.60	7,961.75	29.43	19.82	-162.13	-5,174.78	-1,831.34	5,894.45	5,845.73	48.71	121.002		
8,200.00	8,172.17	8,104.44	8,102.58	29.78	20.14	-162.13	-5,176.68	-1,831.38	5,895.87	5,846.47	49.40	119.343		
8,300.00	8,272.17	8,216.52	8,214.65	30.13	20.40	-162.13	-5,177.01	-1,832.02	5,896.32	5,846.30	50.02	117.891		
8,400.00	8,372.17	8,318.95	8,317.08	30.48	20.64	-162.13	-5,177.28	-1,832.42	5,896.69	5,846.08	50.61	116.516		
8,500.00	8,472.17	8,400.00	8,398.13	30.83	20.83	-162.13	-5,177.69	-1,832.59	5,897.23	5,846.08	51.15	115.285		
8,600.00	8,572.17	8,484.83	8,482.96	31.18	21.04	-162.13	-5,178.34	-1,832.88	5,898.06	5,846.35	51.71	114.057		
8,700.00	8,672.17	8,625.51	8,623.64	31.52	21.38	-162.12	-5,178.97	-1,833.57	5,898.63	5,846.21	52.42	112.535		
8,751.58	8,723.75	8,682.01	8,680.14	31.70	21.51	-162.12	-5,178.96	-1,834.01	5,898.75	5,846.01	52.74	111.853		
8,800.00	8,772.11	8,721.87	8,719.99	31.86	21.61	-162.11	-5,178.95	-1,834.37	5,897.03	5,844.03	52.99	111.279		
8,850.00	8,821.68	8,762.21	8,760.33	32.00	21.71	-162.08	-5,179.02	-1,834.69	5,891.48	5,838.24	53.24	110.657		
8,900.00	8,870.51	8,801.46	8,799.57	32.12	21.81	-162.03	-5,179.16	-1,834.99	5,882.14	5,828.66	53.48	109.989		
8,950.00	8,918.22	8,839.49	8,837.61	32.24	21.90	-161.96	-5,179.33	-1,835.35	5,869.09	5,815.38	53.71	109.280		
9,000.00	8,964.46	8,877.88	8,875.99	32.34	22.00	-161.88	-5,179.55	-1,835.80	5,852.43	5,798.50	53.93	108.527		
9,050.00	9,008.86	8,929.08	8,927.19	32.43	22.12	-161.77	-5,179.80	-1,836.49	5,832.21	5,778.04	54.17	107.664		
9,100.00	9,051.09	8,981.09	8,979.19	32.51	22.26	-161.65	-5,179.98	-1,837.24	5,808.54	5,754.14	54.41	106.762		
9,150.00	9,090.83	9,041.24	9,039.34	32.58	22.41	-161.51	-5,180.05	-1,837.98	5,781.57	5,726.91	54.65	105.784		
9,200.00	9,127.77	9,092.37	9,090.47	32.65	22.54	-161.36	-5,179.97	-1,838.50	5,751.50	5,696.63	54.87	104.824		
9,250.00	9,161.64	9,136.46	9,134.55	32.71	22.65	-161.18	-5,179.79	-1,839.04	5,718.64	5,663.59	55.05	103.874		

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

Company: Devon Energy
Project: Eddy County, New Mexico (NAD 83)
Reference Site: Cotton Draw Unit
Site Error: 0.00 usft
Reference Well: 515H
Well Error: 0.00 usft
Reference Wellbore: Wellbore #1
Reference Design: Design #1

Local Co-ordinate Reference: Well 515H
TVD Reference: Well @ 3566.10usft (Cactus 126)
MD Reference: Well @ 3566.10usft (Cactus 126)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: 5000.1 Conroe DB
Offset TVD Reference: Offset Datum

Offset Design Cotton Draw - #99 - Wellbore #1 - Surveys												Offset Site Error:	0.00 usft
Survey Program: 52-GYRO-NS, 4310-MWD												Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Azimuth from North (°)	Offset Wellbore Centre		Distance		Minimum Separation (usft)	Separation Factor	Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N-S (usft)	+E-W (usft)	Between Centres (usft)	Between Ellipses (usft)			
9,300.00	9,192.18	9,179.59	9,177.68	32.78	22.76	-161.00	-5,179.50	-1,839.62	5,683.27	5,628.04	55.23	102.906	
9,350.00	9,219.15	9,221.05	9,219.14	32.85	22.86	-160.80	-5,179.17	-1,840.00	5,645.66	5,590.27	55.39	101.926	
9,400.00	9,242.36	9,256.56	9,254.64	32.92	22.95	-160.59	-5,178.85	-1,840.16	5,606.13	5,550.60	55.53	100.958	
9,450.00	9,261.61	9,271.11	9,269.19	32.99	22.99	-160.37	-5,178.71	-1,840.24	5,565.05	5,509.44	55.61	100.077	
9,500.00	9,276.77	9,283.97	9,282.05	33.08	23.02	-160.14	-5,178.58	-1,840.33	5,522.75	5,467.07	55.68	99.190	
9,550.00	9,287.73	9,293.07	9,291.15	33.17	23.05	-159.90	-5,178.49	-1,840.41	5,479.57	5,423.84	55.74	98.312	
9,600.00	9,294.39	9,298.38	9,296.46	33.27	23.06	-159.66	-5,178.43	-1,840.46	5,435.84	5,380.06	55.78	97.444	
9,649.26	9,296.70	9,299.88	9,297.96	33.37	23.07	-159.41	-5,178.41	-1,840.48	5,392.55	5,336.73	55.82	96.601	
9,700.00	9,296.91	9,299.53	9,297.61	33.49	23.06	-159.16	-5,178.42	-1,840.47	5,347.80	5,291.94	55.86	95.734	
9,800.00	9,297.31	9,298.87	9,296.94	33.80	23.06	-158.67	-5,178.42	-1,840.47	5,258.69	5,202.74	55.95	93.987	
9,900.00	9,297.72	9,298.23	9,296.31	34.17	23.06	-158.19	-5,178.43	-1,840.46	5,168.42	5,112.36	56.06	92.201	
10,000.00	9,298.12	9,297.63	9,295.71	34.62	23.06	-157.74	-5,178.44	-1,840.45	5,077.02	5,020.84	56.17	90.381	
10,027.33	9,298.24	9,297.48	9,295.55	34.75	23.06	-157.62	-5,178.44	-1,840.45	5,051.85	4,995.64	56.21	89.878	
10,100.00	9,298.53	9,297.06	9,295.14	35.13	23.06	-157.30	-5,178.44	-1,840.45	4,984.90	4,928.60	56.30	88.538	
10,200.00	9,298.93	9,296.49	9,294.57	35.71	23.06	-156.84	-5,178.45	-1,840.44	4,893.05	4,836.60	56.45	86.678	
10,300.00	9,299.34	9,295.92	9,294.00	36.35	23.06	-156.36	-5,178.46	-1,840.44	4,801.52	4,744.90	56.62	84.800	
10,400.00	9,299.74	9,295.36	9,293.43	37.06	23.05	-155.87	-5,178.46	-1,840.43	4,710.33	4,653.51	56.82	82.903	
10,500.00	9,300.15	9,294.79	9,292.87	37.83	23.05	-155.35	-5,178.47	-1,840.43	4,619.51	4,562.47	57.04	80.988	
10,600.00	9,300.55	9,294.24	9,292.31	38.65	23.05	-154.82	-5,178.47	-1,840.42	4,529.07	4,471.78	57.29	79.055	
10,700.00	9,300.96	9,293.68	9,291.76	39.53	23.05	-154.26	-5,178.48	-1,840.42	4,439.05	4,381.48	57.57	77.103	
10,800.00	9,301.36	9,293.13	9,291.21	40.45	23.05	-153.68	-5,178.49	-1,840.41	4,349.46	4,291.57	57.89	75.135	
10,900.00	9,301.76	9,292.58	9,290.66	41.42	23.05	-153.08	-5,178.49	-1,840.41	4,260.33	4,202.09	58.24	73.151	
11,000.00	9,302.17	9,292.03	9,290.11	42.44	23.05	-152.45	-5,178.50	-1,840.40	4,171.70	4,113.07	58.63	71.152	
11,100.00	9,302.57	9,291.49	9,289.56	43.49	23.04	-151.79	-5,178.50	-1,840.39	4,083.59	4,024.53	59.06	69.139	
11,200.00	9,302.98	9,290.94	9,289.02	44.58	23.04	-151.11	-5,178.51	-1,840.39	3,996.04	3,936.50	59.54	67.114	
11,300.00	9,303.38	9,290.41	9,288.49	45.71	23.04	-150.39	-5,178.51	-1,840.38	3,909.09	3,849.03	60.07	65.079	
11,400.00	9,303.79	9,289.87	9,287.95	46.86	23.04	-149.64	-5,178.52	-1,840.38	3,822.78	3,762.14	60.64	63.037	
11,500.00	9,304.19	9,289.34	9,287.42	48.05	23.04	-148.86	-5,178.53	-1,840.38	3,737.15	3,675.88	61.28	60.989	
11,600.00	9,304.60	9,288.81	9,286.89	49.26	23.04	-148.04	-5,178.53	-1,840.37	3,652.25	3,590.28	61.97	58.940	
11,700.00	9,305.00	9,288.28	9,286.36	50.50	23.04	-147.18	-5,178.54	-1,840.37	3,568.13	3,505.41	62.72	56.891	
11,800.00	9,305.40	9,287.76	9,285.83	51.76	23.03	-146.28	-5,178.54	-1,840.36	3,484.85	3,421.32	63.54	54.847	
11,900.00	9,305.81	9,287.23	9,285.31	53.05	23.03	-145.34	-5,178.55	-1,840.36	3,402.48	3,338.05	64.43	52.812	
12,000.00	9,306.21	9,286.71	9,284.79	54.35	23.03	-144.35	-5,178.55	-1,840.35	3,321.07	3,255.68	65.39	50.790	
12,100.00	9,306.62	9,286.20	9,284.28	55.67	23.03	-143.31	-5,178.56	-1,840.35	3,240.70	3,174.27	66.43	48.785	
12,200.00	9,307.02	9,285.68	9,283.76	57.01	23.03	-142.22	-5,178.56	-1,840.34	3,161.45	3,093.90	67.55	46.802	
12,300.00	9,307.43	9,285.17	9,283.25	58.37	23.03	-141.07	-5,178.57	-1,840.34	3,083.41	3,014.65	68.76	44.845	
12,400.00	9,307.83	9,284.66	9,282.74	59.74	23.03	-139.87	-5,178.57	-1,840.34	3,006.66	2,936.61	70.05	42.921	
12,500.00	9,308.23	9,284.16	9,282.23	61.13	23.03	-138.60	-5,178.58	-1,840.33	2,931.32	2,859.89	71.44	41.033	
12,600.00	9,308.64	9,283.65	9,281.73	62.53	23.02	-137.26	-5,178.58	-1,840.33	2,857.50	2,784.58	72.92	39.186	
12,700.00	9,309.04	9,283.15	9,281.23	63.94	23.02	-135.86	-5,178.59	-1,840.32	2,785.31	2,710.81	74.50	37.387	
12,800.00	9,309.45	9,282.65	9,280.73	65.36	23.02	-134.38	-5,178.59	-1,840.32	2,714.88	2,638.70	76.18	35.639	
12,900.00	9,309.85	9,282.15	9,280.23	66.80	23.02	-132.82	-5,178.60	-1,840.32	2,646.35	2,568.40	77.95	33.948	
13,000.00	9,310.26	9,281.66	9,279.74	68.24	23.02	-131.18	-5,178.60	-1,840.31	2,579.89	2,500.06	79.83	32.318	
13,100.00	9,310.66	9,281.17	9,279.25	69.69	23.02	-129.46	-5,178.61	-1,840.31	2,515.64	2,433.84	81.80	30.754	
13,200.00	9,311.07	9,280.68	9,278.76	71.16	23.02	-127.65	-5,178.61	-1,840.30	2,453.79	2,369.92	83.86	29.259	
13,300.00	9,311.47	9,280.19	9,278.27	72.63	23.01	-125.74	-5,178.62	-1,840.30	2,394.52	2,308.50	86.02	27.837	
13,400.00	9,311.87	9,279.71	9,277.79	74.11	23.01	-123.75	-5,178.62	-1,840.30	2,338.02	2,249.77	88.25	26.492	
13,500.00	9,312.28	9,279.23	9,277.31	75.59	23.01	-121.65	-5,178.63	-1,840.29	2,284.50	2,193.94	90.56	25.226	
13,600.00	9,312.68	9,278.75	9,276.83	77.09	23.01	-119.46	-5,178.63	-1,840.29	2,234.19	2,141.26	92.93	24.042	
13,700.00	9,313.09	9,278.27	9,276.35	78.59	23.01	-117.17	-5,178.64	-1,840.29	2,187.28	2,091.95	95.34	22.943	
13,800.00	9,313.49	9,277.80	9,275.88	80.09	23.01	-114.79	-5,178.64	-1,840.28	2,144.02	2,046.25	97.77	21.928	
13,900.00	9,313.90	9,277.32	9,275.40	81.60	23.01	-112.31	-5,178.65	-1,840.28	2,104.63	2,004.41	100.21	21.001	

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



MS Energy Services Anticollision Report



Company: Devon Energy
Project: Eddy County, New Mexico (NAD 83)
Reference Site: Cotton Draw Unit
Site Error: 0.00 usft
Reference Well: 515H
Well Error: 0.00 usft
Reference Wellbore: Wellbore #1
Reference Design: Design #1

Local Co-ordinate Reference: Well 515H
TVD Reference: Well @ 3566.10usft (Cactus 126)
MD Reference: Well @ 3566.10usft (Cactus 126)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: 5000.1 Conroe DB
Offset TVD Reference: Offset Datum

Offset Design Cotton Draw - #99 - Wellbore #1 - Surveys													Offset Site Error:	0.00 usft
Survey Program: 52-GYRO-NS, 4310-MWD													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis			Distance							Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Azimuth from North (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor		
14,000.00	9,314.30	9,276.85	9,274.93	83.12	23.01	-109.74	-5,178.65	-1,840.28	2,069.32	1,966.68	102.64	20.161		
14,100.00	9,314.71	9,276.38	9,274.46	84.64	23.01	-107.09	-5,178.66	-1,840.27	2,038.31	1,933.30	105.02	19.410		
14,200.00	9,315.11	9,275.92	9,274.00	86.17	23.00	-104.36	-5,178.66	-1,840.27	2,011.80	1,904.48	107.32	18.745		
14,300.00	9,315.51	9,275.46	9,273.54	87.70	23.00	-101.56	-5,178.67	-1,840.27	1,989.97	1,880.44	109.53	18.168		
14,400.00	9,315.92	9,274.99	9,273.07	89.24	23.00	-98.71	-5,178.67	-1,840.26	1,972.96	1,861.35	111.61	17.678		
14,500.00	9,316.32	9,274.54	9,272.62	90.78	23.00	-95.82	-5,178.68	-1,840.26	1,960.92	1,847.39	113.53	17.272		
14,600.00	9,316.73	9,274.08	9,272.16	92.33	23.00	-92.90	-5,178.68	-1,840.26	1,953.93	1,838.64	115.28	16.949		
14,686.90	9,317.08	9,273.68	9,271.76	93.68	23.00	-90.35	-5,178.68	-1,840.25	1,951.99	1,835.35	116.65	16.734 CC		
14,700.00	9,317.13	9,273.62	9,271.70	93.88	23.00	-89.97	-5,178.69	-1,840.25	1,952.04	1,835.20	116.84	16.707 ES		
14,800.00	9,317.54	9,273.17	9,271.25	95.43	23.00	-87.04	-5,178.69	-1,840.25	1,955.27	1,837.09	118.18	16.545		
14,900.00	9,317.94	9,272.72	9,270.80	96.99	23.00	-84.12	-5,178.69	-1,840.25	1,963.59	1,844.29	119.30	16.459		
15,000.00	9,318.34	9,272.27	9,270.35	98.55	22.99	-81.24	-5,178.70	-1,840.25	1,976.94	1,856.75	120.20	16.448 SF		
15,100.00	9,318.75	9,271.83	9,269.91	100.11	22.99	-78.40	-5,178.70	-1,840.24	1,995.23	1,874.36	120.87	16.507		
15,200.00	9,319.15	9,271.38	9,269.46	101.68	22.99	-75.63	-5,178.71	-1,840.24	2,018.30	1,896.97	121.33	16.635		
15,300.00	9,319.56	9,270.94	9,269.02	103.24	22.99	-72.92	-5,178.71	-1,840.24	2,046.01	1,924.43	121.58	16.829		
15,400.00	9,319.96	9,270.50	9,268.58	104.82	22.99	-70.28	-5,178.72	-1,840.23	2,078.17	1,956.53	121.64	17.085		
15,500.00	9,320.37	9,270.06	9,268.14	106.39	22.99	-67.74	-5,178.72	-1,840.23	2,114.57	1,993.05	121.52	17.401		
15,600.00	9,320.77	9,269.63	9,267.71	107.97	22.99	-65.28	-5,178.72	-1,840.23	2,155.00	2,033.75	121.25	17.773		
15,700.00	9,321.18	9,269.19	9,267.27	109.55	22.99	-62.92	-5,178.73	-1,840.23	2,199.23	2,078.39	120.84	18.199		
15,800.00	9,321.58	9,268.76	9,266.84	111.13	22.99	-60.66	-5,178.73	-1,840.22	2,247.05	2,126.74	120.31	18.677		
15,900.00	9,321.98	9,268.33	9,266.41	112.71	22.98	-58.49	-5,178.74	-1,840.22	2,298.23	2,178.54	119.69	19.202		
16,000.00	9,322.39	9,267.90	9,265.98	114.30	22.98	-56.42	-5,178.74	-1,840.22	2,352.54	2,233.56	118.98	19.773		
16,100.00	9,322.79	9,267.48	9,265.56	115.88	22.98	-54.45	-5,178.75	-1,840.22	2,409.79	2,291.58	118.21	20.386		
16,200.00	9,323.20	9,267.05	9,265.13	117.47	22.98	-52.57	-5,178.75	-1,840.22	2,469.76	2,352.37	117.38	21.040		
16,300.00	9,323.60	9,266.63	9,264.71	119.07	22.98	-50.78	-5,178.75	-1,840.21	2,532.25	2,415.73	116.52	21.733		
16,400.00	9,324.01	9,266.21	9,264.29	120.66	22.98	-49.08	-5,178.76	-1,840.21	2,597.10	2,481.47	115.63	22.461		
16,500.00	9,324.41	9,265.79	9,263.88	122.25	22.98	-47.47	-5,178.76	-1,840.21	2,664.12	2,549.40	114.72	23.222		
16,600.00	9,324.82	9,265.38	9,263.46	123.85	22.98	-45.93	-5,178.77	-1,840.21	2,733.16	2,619.35	113.81	24.016		
16,700.00	9,325.22	9,264.96	9,263.04	125.45	22.98	-44.47	-5,178.77	-1,840.20	2,804.06	2,691.17	112.89	24.839		
16,800.00	9,325.62	9,264.55	9,262.63	127.05	22.97	-43.08	-5,178.77	-1,840.20	2,876.69	2,764.72	111.97	25.691		
16,900.00	9,326.03	9,264.14	9,262.22	128.65	22.97	-41.77	-5,178.78	-1,840.20	2,950.93	2,839.86	111.07	26.568		
17,000.00	9,326.43	9,271.62	9,269.70	130.25	22.99	-40.51	-5,178.71	-1,840.19	3,026.62	2,916.43	110.19	27.467		
17,100.00	9,326.84	9,270.93	9,269.01	131.86	22.99	-39.32	-5,178.71	-1,840.19	3,103.72	2,994.41	109.31	28.393		
17,200.00	9,327.24	9,270.24	9,268.32	133.46	22.99	-38.19	-5,178.72	-1,840.19	3,182.09	3,073.63	108.46	29.340		
17,300.00	9,327.65	9,269.55	9,267.63	135.07	22.99	-37.11	-5,178.73	-1,840.19	3,261.64	3,154.02	107.62	30.308		
17,400.00	9,328.05	9,268.87	9,266.95	136.68	22.99	-36.09	-5,178.73	-1,840.19	3,342.29	3,235.49	106.80	31.295		
17,500.00	9,328.45	9,268.19	9,266.27	138.29	22.98	-35.11	-5,178.74	-1,840.19	3,423.96	3,317.96	106.01	32.299		
17,600.00	9,328.86	9,267.51	9,265.59	139.90	22.98	-34.18	-5,178.75	-1,840.18	3,506.59	3,401.35	105.24	33.321		
17,700.00	9,329.26	9,266.84	9,264.92	141.51	22.98	-33.29	-5,178.75	-1,840.18	3,590.09	3,485.60	104.49	34.359		
17,800.00	9,329.67	9,266.18	9,264.26	143.12	22.98	-32.44	-5,178.76	-1,840.18	3,674.42	3,570.66	103.77	35.411		
17,900.00	9,330.07	9,265.51	9,263.59	144.73	22.98	-31.63	-5,178.77	-1,840.18	3,759.52	3,656.45	103.07	36.477		
18,000.00	9,330.48	9,264.86	9,262.94	146.35	22.97	-30.86	-5,178.77	-1,840.18	3,845.33	3,742.94	102.39	37.556		
18,100.00	9,330.88	9,264.20	9,262.28	147.96	22.97	-30.12	-5,178.78	-1,840.18	3,931.82	3,830.08	101.74	38.647		
18,200.00	9,331.29	9,263.55	9,261.63	149.58	22.97	-29.41	-5,178.78	-1,840.18	4,018.93	3,917.83	101.11	39.750		
18,300.00	9,331.69	9,262.90	9,260.98	151.20	22.97	-28.73	-5,178.79	-1,840.18	4,106.63	4,006.13	100.50	40.863		
18,400.00	9,332.09	9,262.26	9,260.34	152.81	22.97	-28.08	-5,178.80	-1,840.18	4,194.88	4,094.97	99.91	41.987		
18,500.00	9,332.50	9,261.62	9,259.70	154.43	22.97	-27.46	-5,178.80	-1,840.18	4,283.65	4,184.30	99.34	43.119		
18,600.00	9,332.90	9,260.98	9,259.07	156.05	22.97	-26.86	-5,178.81	-1,840.17	4,372.90	4,274.10	98.80	44.260		
18,700.00	9,333.31	9,260.35	9,258.43	157.67	22.96	-26.29	-5,178.81	-1,840.17	4,462.61	4,364.33	98.27	45.410		
18,800.00	9,333.71	9,259.72	9,257.80	159.30	22.96	-25.74	-5,178.82	-1,840.17	4,552.74	4,454.97	97.77	46.567		
18,900.00	9,334.12	9,259.10	9,257.18	160.92	22.96	-25.21	-5,178.83	-1,840.17	4,643.28	4,546.00	97.28	47.731		
19,000.00	9,334.52	9,258.48	9,256.56	162.54	22.96	-24.70	-5,178.83	-1,840.17	4,734.20	4,637.39	96.81	48.902		

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



MS Energy Services
Anticollision Report



Company: Devon Energy
Project: Eddy County, New Mexico (NAD 83)
Reference Site: Cotton Draw Unit
Site Error: 0.00 usft
Reference Well: 515H
Well Error: 0.00 usft
Reference Wellbore: Wellbore #1
Reference Design: Design #1

Local Co-ordinate Reference: Well 515H
TVD Reference: Well @ 3566.10usft (Cactus 126)
MD Reference: Well @ 3566.10usft (Cactus 126)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at: 2.00 sigma
Database: 5000.1 Conroe DB
Offset TVD Reference: Offset Datum

Offset Design Cotton Draw - #99 - Wellbore #1 - Surveys													Offset Site Error: 0.00 usft
Survey Program: 52-GYRO-NS, 4310-MWD													Offset Well Error: 0.00 usft
Reference		Offset		Semi Major Axis			Distance						Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Azimuth from North (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	
19,100.00	9,334.93	9,257.86	9,255.94	164.16	22.96	-24.21	-5,178.84	-1,840.17	4,825.48	4,729.12	96.36	50.079	
19,200.00	9,335.33	9,257.25	9,255.33	165.79	22.96	-23.74	-5,178.84	-1,840.17	4,917.10	4,821.18	95.92	51.261	
19,300.00	9,335.73	9,256.64	9,254.72	167.41	22.95	-23.29	-5,178.85	-1,840.16	5,009.04	4,913.53	95.50	52.449	
19,390.56	9,336.10	9,256.08	9,254.17	168.88	22.95	-22.89	-5,178.86	-1,840.16	5,092.56	4,997.42	95.14	53.529	



MS Energy Services Anticollision Report



Company: Devon Energy
Project: Eddy County, New Mexico (NAD 83)
Reference Site: Cotton Draw Unit
Site Error: 0.00 usft
Reference Well: 515H
Well Error: 0.00 usft
Reference Wellbore: Wellbore #1
Reference Design: Design #1

Local Co-ordinate Reference: Well 515H
TVD Reference: Well @ 3566.10usft (Cactus 126)
MD Reference: Well @ 3566.10usft (Cactus 126)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: 5000.1 Conroe DB
Offset TVD Reference: Offset Datum

Offset Design Cotton Draw Unit - 111H - Wellbore #1 - Surveys													Offset Site Error: 0.00 usft
Survey Program: 100-GYRO-NS													Offset Well Error: 0.00 usft
Reference	Offset		Semi Major Axis		Distance		Minimum Separation		Warning				
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Azimuth from North (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	
0.00	0.00	0.00	0.00	0.00	0.00	-152.41	-5,487.34	-2,867.46	6,191.57				
100.00	100.00	113.97	113.96	0.13	0.17	-152.41	-5,486.72	-2,867.39	6,191.12	6,190.81	0.31	N/A	
200.00	200.00	207.29	207.29	0.49	0.53	-152.40	-5,485.80	-2,867.34	6,190.22	6,189.20	1.02	6,063.760	
300.00	300.00	309.55	309.54	0.85	0.89	-152.40	-5,484.73	-2,867.34	6,189.30	6,187.56	1.74	3,561.809	
400.00	400.00	415.76	415.73	1.21	1.26	-152.39	-5,483.37	-2,867.58	6,188.26	6,185.80	2.47	2,506.445	
500.00	500.00	497.96	497.92	1.57	1.55	-152.38	-5,482.07	-2,868.47	6,187.36	6,184.24	3.12	1,984.896	
600.00	600.00	566.38	566.31	1.93	1.79	-152.36	-5,480.96	-2,869.85	6,186.85	6,183.13	3.72	1,663.582	
700.00	700.00	652.24	652.15	2.29	2.10	-152.34	-5,479.71	-2,872.14	6,186.79	6,182.41	4.38	1,411.535	
800.00	800.00	755.71	755.56	2.64	2.47	-152.31	-5,478.17	-2,874.96	6,186.74	6,181.63	5.11	1,211.014	
900.00	900.00	859.31	859.11	3.00	2.83	-152.28	-5,476.57	-2,877.77	6,186.64	6,180.80	5.83	1,060.559	
1,000.00	1,000.00	955.95	955.70	3.36	3.17	-152.25	-5,475.07	-2,880.36	6,186.51	6,179.98	6.53	947.042	
1,100.00	1,100.00	1,052.70	1,052.40	3.72	3.51	-152.22	-5,473.65	-2,883.00	6,186.48	6,179.25	7.23	855.517	
1,200.00	1,200.00	1,152.92	1,152.58	4.08	3.86	-152.20	-5,472.16	-2,885.75	6,186.45	6,178.51	7.94	778.962	
1,300.00	1,300.00	1,254.24	1,253.85	4.44	4.22	-152.17	-5,470.65	-2,888.56	6,186.42	6,177.76	8.66	714.686	
1,400.00	1,400.00	1,361.03	1,360.58	4.79	4.60	-152.13	-5,468.96	-2,891.55	6,186.33	6,176.94	9.39	658.862	
1,500.00	1,500.00	1,458.93	1,458.43	5.15	4.94	-152.10	-5,467.33	-2,894.26	6,186.16	6,176.07	10.09	613.019	
1,600.00	1,600.00	1,555.99	1,555.44	5.51	5.28	-152.08	-5,465.82	-2,896.97	6,186.08	6,175.29	10.79	573.318	
1,700.00	1,700.00	1,656.47	1,655.87	5.87	5.63	-152.05	-5,464.25	-2,899.75	6,186.00	6,174.50	11.50	537.895	
1,800.00	1,800.00	1,758.64	1,757.99	6.23	5.99	-152.02	-5,462.66	-2,902.55	6,185.91	6,173.69	12.22	506.355	
1,900.00	1,900.00	1,858.67	1,857.97	6.59	6.34	-151.99	-5,461.05	-2,905.30	6,185.78	6,172.86	12.93	478.586	
2,000.00	2,000.00	1,955.95	1,955.21	6.95	6.68	-151.96	-5,459.57	-2,907.90	6,185.69	6,172.07	13.62	454.035	
2,100.00	2,100.00	2,057.17	2,056.38	7.30	7.03	-151.93	-5,458.09	-2,910.53	6,185.63	6,171.29	14.34	431.473	
2,200.00	2,200.00	2,157.36	2,156.52	7.66	7.38	-151.90	-5,456.60	-2,913.10	6,185.52	6,170.48	15.04	411.146	
2,300.00	2,300.00	2,253.80	2,252.92	8.02	7.72	-151.88	-5,455.24	-2,915.52	6,185.46	6,169.72	15.74	392.980	
2,400.00	2,400.00	2,358.20	2,357.29	8.38	8.09	-151.85	-5,453.82	-2,918.10	6,185.42	6,168.96	16.46	375.719	
2,500.00	2,500.00	2,456.82	2,455.87	8.74	8.43	-151.83	-5,452.40	-2,920.47	6,185.29	6,168.12	17.17	360.330	
2,504.87	2,504.87	2,461.23	2,460.27	8.76	8.45	-151.82	-5,452.34	-2,920.58	6,185.29	6,168.09	17.20	359.642	
2,600.00	2,599.99	2,548.86	2,547.87	9.10	8.75	-151.81	-5,451.20	-2,922.68	6,186.03	6,168.18	17.85	346.651	
2,700.00	2,699.96	2,644.60	2,643.58	9.45	9.09	-151.80	-5,450.12	-2,924.89	6,188.36	6,169.82	18.54	333.826	
2,800.00	2,799.86	2,747.51	2,746.46	9.81	9.45	-151.79	-5,448.97	-2,927.27	6,192.20	6,172.95	19.25	321.595	
2,900.00	2,899.68	2,852.39	2,851.30	10.17	9.81	-151.80	-5,447.74	-2,929.61	6,197.44	6,177.46	19.98	310.204	
3,000.00	2,999.37	2,951.36	2,950.23	10.53	10.16	-151.81	-5,446.48	-2,931.93	6,204.14	6,183.46	20.68	299.976	
3,100.00	3,098.90	3,052.34	3,051.18	10.89	10.51	-151.83	-5,445.15	-2,934.43	6,212.35	6,190.95	21.39	290.391	
3,200.00	3,198.26	3,157.35	3,156.14	11.25	10.88	-151.86	-5,443.66	-2,937.06	6,221.97	6,199.85	22.12	281.301	
3,299.74	3,297.14	3,262.32	3,261.07	11.61	11.25	-151.89	-5,442.09	-2,939.64	6,232.95	6,210.11	22.84	272.852	
3,300.00	3,297.40	3,262.59	3,261.34	11.61	11.25	-151.89	-5,442.09	-2,939.65	6,232.98	6,210.14	22.85	272.830	
3,400.00	3,396.43	3,361.23	3,359.93	11.98	11.60	-151.93	-5,440.55	-2,942.05	6,244.68	6,221.13	23.55	265.163	
3,500.00	3,495.46	3,460.78	3,459.45	12.36	11.94	-151.97	-5,439.06	-2,944.45	6,256.41	6,232.15	24.26	257.899	
3,600.00	3,594.49	3,565.89	3,564.52	12.73	12.31	-152.01	-5,437.51	-2,946.80	6,268.09	6,243.10	24.99	250.839	
3,700.00	3,693.51	3,681.03	3,679.63	13.11	12.72	-152.05	-5,436.00	-2,948.62	6,279.61	6,253.86	25.75	243.832	
3,800.00	3,792.54	3,778.54	3,777.13	13.49	13.06	-152.11	-5,434.97	-2,949.38	6,290.98	6,264.52	26.46	237.773	
3,900.00	3,891.57	3,874.44	3,873.03	13.87	13.39	-152.16	-5,434.04	-2,950.10	6,302.42	6,275.26	27.16	232.071	
4,000.00	3,990.60	3,962.16	3,960.74	14.25	13.70	-152.22	-5,433.33	-2,950.65	6,313.96	6,286.13	27.83	226.888	
4,100.00	4,089.62	4,048.32	4,046.90	14.64	14.00	-152.28	-5,432.99	-2,950.93	6,325.73	6,297.23	28.49	221.997	
4,200.00	4,188.65	4,217.84	4,216.42	15.02	14.60	-152.34	-5,432.13	-2,951.01	6,337.42	6,307.96	29.46	215.150	
4,300.00	4,287.68	4,312.41	4,310.99	15.41	14.93	-152.40	-5,430.89	-2,951.17	6,348.32	6,318.17	30.15	210.529	
4,400.00	4,386.71	4,402.65	4,401.21	15.80	15.24	-152.45	-5,429.58	-2,951.62	6,359.25	6,328.42	30.84	206.216	
4,500.00	4,485.73	4,498.81	4,497.36	16.19	15.58	-152.51	-5,428.17	-2,952.30	6,370.27	6,338.73	31.54	201.956	
4,600.00	4,584.76	4,599.63	4,598.16	16.59	15.93	-152.56	-5,426.69	-2,953.03	6,381.31	6,349.04	32.27	197.778	
4,700.00	4,683.79	4,702.15	4,700.67	16.98	16.29	-152.61	-5,425.15	-2,953.77	6,392.31	6,359.32	32.99	193.743	
4,800.00	4,782.81	4,801.52	4,800.03	17.37	16.64	-152.66	-5,423.61	-2,954.50	6,403.29	6,369.58	33.71	189.942	
4,900.00	4,881.84	4,892.45	4,890.94	17.77	16.96	-152.71	-5,422.26	-2,955.21	6,414.34	6,379.94	34.40	186.461	

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



MS Energy Services Anticollision Report



Company: Devon Energy
Project: Eddy County, New Mexico (NAD 83)
Reference Site: Cotton Draw Unit
Site Error: 0.00 usft
Reference Well: 515H
Well Error: 0.00 usft
Reference Wellbore: Wellbore #1
Reference Design: Design #1

Local Co-ordinate Reference: Well 515H
TVD Reference: Well @ 3566.10usft (Cactus 126)
MD Reference: Well @ 3566.10usft (Cactus 126)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at: 2.00 sigma
Database: 5000.1 Conroe DB
Offset TVD Reference: Offset Datum

Offset Design Cotton Draw Unit - 111H - Wellbore #1 - Surveys													Offset Site Error:	0.00 usft
Survey Program: 100-GYRO-NS													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Azimuth from North (°)	Offset Wellbore Centre		Distance		Minimum Separation (usft)	Separation Factor	Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)				
5,000.00	4,980.87	4,993.81	4,992.29	18.17	17.32	-152.76	-5,420.79	-2,956.02	6,425.45	6,390.33	35.13	182.924		
5,100.00	5,079.90	5,101.36	5,099.82	18.56	17.69	-152.81	-5,419.14	-2,956.87	6,436.48	6,400.61	35.87	179.414		
5,200.00	5,178.92	5,194.29	5,192.74	18.96	18.02	-152.86	-5,417.68	-2,957.63	6,447.50	6,410.93	36.57	176.297		
5,300.00	5,277.95	5,285.42	5,283.86	19.36	18.34	-152.91	-5,416.34	-2,958.43	6,458.63	6,421.37	37.26	173.329		
5,400.00	5,376.98	5,391.65	5,390.07	19.76	18.71	-152.96	-5,414.80	-2,959.35	6,469.79	6,431.78	38.01	170.225		
5,500.00	5,476.01	5,485.57	5,483.97	20.16	19.04	-153.01	-5,413.40	-2,960.18	6,480.92	6,442.21	38.71	167.430		
5,600.00	5,575.03	5,578.43	5,576.82	20.56	19.37	-153.06	-5,412.11	-2,961.02	6,492.15	6,452.74	39.41	164.752		
5,628.09	5,602.86	5,604.84	5,603.23	20.68	19.46	-153.07	-5,411.77	-2,961.24	6,495.32	6,455.72	39.60	164.012		
5,700.00	5,674.12	5,676.33	5,674.71	20.96	19.71	-153.11	-5,410.84	-2,961.85	6,503.06	6,462.94	40.12	162.087		
5,800.00	5,773.42	5,772.31	5,770.68	21.36	20.05	-153.15	-5,409.59	-2,962.75	6,512.56	6,471.73	40.83	159.518		
5,900.00	5,872.91	5,881.44	5,879.80	21.74	20.43	-153.18	-5,408.14	-2,963.78	6,520.54	6,478.96	41.58	156.828		
6,000.00	5,972.56	5,981.98	5,980.32	22.12	20.78	-153.20	-5,406.70	-2,964.65	6,526.89	6,484.59	42.29	154.319		
6,100.00	6,072.35	6,079.33	6,077.66	22.49	21.12	-153.22	-5,405.34	-2,965.52	6,531.76	6,488.76	43.00	151.909		
6,200.00	6,172.23	6,169.89	6,168.20	22.86	21.44	-153.23	-5,404.13	-2,966.36	6,535.19	6,491.52	43.67	149.639		
6,300.00	6,272.18	6,275.11	6,273.41	23.21	21.81	-153.23	-5,402.85	-2,967.29	6,537.20	6,492.80	44.40	147.241		
6,400.00	6,372.17	6,370.31	6,368.60	23.56	22.14	-153.22	-5,401.62	-2,968.10	6,537.62	6,492.53	45.08	145.011		
6,427.83	6,400.00	6,395.37	6,393.66	23.66	22.23	-153.22	-5,401.32	-2,968.32	6,537.49	6,492.22	45.27	144.416		
6,500.00	6,472.17	6,474.74	6,473.02	23.90	22.51	-153.21	-5,400.33	-2,969.04	6,536.98	6,491.18	45.80	142.728		
6,600.00	6,572.17	6,568.64	6,566.91	24.25	22.84	-153.20	-5,399.11	-2,969.89	6,536.23	6,489.75	46.48	140.629		
6,700.00	6,672.17	6,667.20	6,665.46	24.59	23.18	-153.19	-5,397.97	-2,970.78	6,535.60	6,488.43	47.17	138.542		
6,800.00	6,772.17	6,765.61	6,763.86	24.93	23.53	-153.18	-5,396.81	-2,971.65	6,534.95	6,487.08	47.87	136.516		
6,900.00	6,872.17	6,857.05	6,855.29	25.28	23.85	-153.16	-5,395.79	-2,972.51	6,534.38	6,485.84	48.54	134.620		
7,000.00	6,972.17	6,945.25	6,943.47	25.62	24.16	-153.15	-5,394.94	-2,973.39	6,533.97	6,484.78	49.20	132.811		
7,100.00	7,072.17	7,037.11	7,035.33	25.97	24.48	-153.14	-5,394.20	-2,974.39	6,533.74	6,483.88	49.87	131.018		
7,200.00	7,172.17	7,136.91	7,135.12	26.31	24.83	-153.13	-5,393.42	-2,975.54	6,533.56	6,482.99	50.57	129.199		
7,300.00	7,272.17	7,238.39	7,236.59	26.66	25.19	-153.12	-5,392.58	-2,976.75	6,533.37	6,482.09	51.28	127.414		
7,400.00	7,372.17	7,339.40	7,337.59	27.00	25.54	-153.11	-5,391.74	-2,977.93	6,533.15	6,481.16	51.98	125.680		
7,500.00	7,472.17	7,436.43	7,434.61	27.35	25.88	-153.09	-5,390.95	-2,979.03	6,532.94	6,480.27	52.67	124.028		
7,600.00	7,572.17	7,530.16	7,528.34	27.69	26.21	-153.08	-5,390.28	-2,980.08	6,532.81	6,479.45	53.35	122.446		
7,666.02	7,638.18	7,590.90	7,589.07	27.92	26.42	-153.08	-5,389.89	-2,980.78	6,532.78	6,478.98	53.80	121.435		
7,700.00	7,672.17	7,623.90	7,622.07	28.04	26.54	-153.07	-5,389.70	-2,981.18	6,532.78	6,478.75	54.03	120.907		
7,800.00	7,772.17	7,722.08	7,720.24	28.39	26.88	-153.06	-5,389.10	-2,982.40	6,532.81	6,478.08	54.73	119.371		
7,900.00	7,872.17	7,815.45	7,813.59	28.74	27.21	-153.05	-5,388.56	-2,983.64	6,532.89	6,477.49	55.40	117.912		
8,000.00	7,972.17	7,902.44	7,900.58	29.08	27.51	-153.04	-5,388.19	-2,984.84	6,533.14	6,477.08	56.06	116.540		
8,100.00	8,072.17	7,991.69	7,989.82	29.43	27.83	-153.03	-5,387.98	-2,986.09	6,533.56	6,476.84	56.72	115.186		
8,200.00	8,172.17	8,092.48	8,090.60	29.78	28.18	-153.02	-5,387.89	-2,987.40	6,534.08	6,476.65	57.43	113.780		
8,300.00	8,272.17	8,171.98	8,170.09	30.13	28.46	-153.01	-5,387.95	-2,988.40	6,534.72	6,476.66	58.05	112.564		
8,400.00	8,372.17	8,265.11	8,263.21	30.48	28.78	-153.00	-5,388.18	-2,989.82	6,535.62	6,476.89	58.73	111.282		
8,500.00	8,472.17	8,290.00	8,288.10	30.83	28.87	-153.00	-5,388.24	-2,990.20	6,536.97	6,477.82	59.15	110.514		
8,600.00	8,572.17	8,290.00	8,288.10	31.18	28.87	-153.00	-5,388.24	-2,990.20	6,539.80	6,480.33	59.47	109.972		
8,700.00	8,672.17	8,290.00	8,288.10	31.52	28.87	-153.00	-5,388.24	-2,990.20	6,544.15	6,484.38	59.77	109.481		
8,751.58	8,723.75	8,290.00	8,288.10	31.70	28.87	-153.00	-5,388.24	-2,990.20	6,547.00	6,487.07	59.93	109.247		
8,800.00	8,772.11	8,290.00	8,288.10	31.86	28.87	-152.99	-5,388.24	-2,990.20	6,548.36	6,488.30	60.06	109.033		
8,850.00	8,821.68	8,290.00	8,288.10	32.00	28.87	-152.95	-5,388.24	-2,990.20	6,546.62	6,486.44	60.17	108.793		
8,900.00	8,870.51	8,290.00	8,288.10	32.12	28.87	-152.90	-5,388.24	-2,990.20	6,541.69	6,481.40	60.28	108.520		
8,950.00	8,918.22	8,290.00	8,288.10	32.24	28.87	-152.82	-5,388.24	-2,990.20	6,533.60	6,473.22	60.38	108.214		
9,000.00	8,964.46	8,290.00	8,288.10	32.34	28.87	-152.73	-5,388.24	-2,990.20	6,522.41	6,461.95	60.46	107.879		
9,050.00	9,008.86	8,290.00	8,288.10	32.43	28.87	-152.61	-5,388.24	-2,990.20	6,508.18	6,447.64	60.53	107.513		
9,100.00	9,051.09	8,290.00	8,288.10	32.51	28.87	-152.47	-5,388.24	-2,990.20	6,491.00	6,430.40	60.60	107.119		
9,150.00	9,090.83	8,290.00	8,288.10	32.58	28.87	-152.32	-5,388.24	-2,990.20	6,470.98	6,410.33	60.65	106.696		
9,200.00	9,127.77	8,290.00	8,288.10	32.65	28.87	-152.14	-5,388.24	-2,990.20	6,448.24	6,387.55	60.69	106.244		
9,250.00	9,161.64	8,290.00	8,288.10	32.71	28.87	-151.95	-5,388.24	-2,990.20	6,422.94	6,362.21	60.73	105.764		

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



MS Energy Services
Anticollision Report



Company: Devon Energy
Project: Eddy County, New Mexico (NAD 83)
Reference Site: Cotton Draw Unit
Site Error: 0.00 usft
Reference Well: 515H
Well Error: 0.00 usft
Reference Wellbore: Wellbore #1
Reference Design: Design #1

Local Co-ordinate Reference: Well 515H
TVD Reference: Well @ 3566.10usft (Cactus 126)
MD Reference: Well @ 3566.10usft (Cactus 126)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: 5000.1 Conroe DB
Offset TVD Reference: Offset Datum

Offset Design Cotton Draw Unit - 111H - Wellbore #1 - Surveys													Offset Site Error: 0.00 usft
Survey Program: 100-GYRO-NS													Offset Well Error: 0.00 usft
Reference		Offset		Semi Major Axis			Distance						Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Azimuth from North (°)	Offset Wellbore Centre +N-S (usft)	+E-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	
9,300.00	9,192.18	8,290.00	8,288.10	32.78	28.87	-151.74	-5,388.24	-2,990.20	6,395.23	6,334.47	60.76	105.256	
9,350.00	9,219.15	8,290.00	8,288.10	32.85	28.87	-151.51	-5,388.24	-2,990.20	6,365.30	6,304.52	60.78	104.719	
9,400.00	9,242.36	8,290.00	8,288.10	32.92	28.87	-151.27	-5,388.24	-2,990.20	6,333.34	6,272.53	60.81	104.153	
9,450.00	9,261.61	8,290.00	8,288.10	32.99	28.87	-151.02	-5,388.24	-2,990.20	6,299.57	6,238.74	60.83	103.559	
9,500.00	9,276.77	8,290.00	8,288.10	33.08	28.87	-150.75	-5,388.24	-2,990.20	6,264.21	6,203.36	60.85	102.938	
9,550.00	9,287.73	8,290.00	8,288.10	33.17	28.87	-150.48	-5,388.24	-2,990.20	6,227.52	6,166.64	60.88	102.290	
9,600.00	9,294.39	8,290.00	8,288.10	33.27	28.87	-150.20	-5,388.24	-2,990.20	6,189.75	6,128.83	60.91	101.617	
9,649.26	9,296.70	8,290.00	8,288.10	33.37	28.87	-149.91	-5,388.24	-2,990.20	6,151.74	6,090.79	60.95	100.932	
9,700.00	9,296.91	8,290.00	8,288.10	33.49	28.87	-149.62	-5,388.24	-2,990.20	6,112.09	6,051.09	60.99	100.208	
9,800.00	9,297.31	8,290.00	8,288.10	33.80	28.87	-149.05	-5,388.24	-2,990.20	6,032.84	5,971.74	61.10	98.731	
9,900.00	9,297.72	8,290.00	8,288.10	34.17	28.87	-148.50	-5,388.24	-2,990.20	5,952.18	5,890.94	61.24	97.194	
10,000.00	9,298.12	8,290.00	8,288.10	34.62	28.87	-147.95	-5,388.24	-2,990.20	5,870.13	5,808.74	61.40	95.607	
10,027.33	9,298.24	8,290.00	8,288.10	34.75	28.87	-147.80	-5,388.24	-2,990.20	5,847.48	5,786.03	61.45	95.164	
10,100.00	9,298.53	8,290.00	8,288.10	35.13	28.87	-147.41	-5,388.24	-2,990.20	5,787.24	5,725.66	61.58	93.980	
10,200.00	9,298.93	8,290.00	8,288.10	35.71	28.87	-146.86	-5,388.24	-2,990.20	5,704.83	5,643.04	61.79	92.323	
10,300.00	9,299.34	8,290.00	8,288.10	36.35	28.87	-146.29	-5,388.24	-2,990.20	5,622.99	5,560.95	62.04	90.634	
10,400.00	9,299.74	8,290.00	8,288.10	37.06	28.87	-145.70	-5,388.24	-2,990.20	5,541.74	5,479.42	62.33	88.915	
10,500.00	9,300.15	8,290.00	8,288.10	37.83	28.87	-145.09	-5,388.24	-2,990.20	5,461.12	5,398.47	62.65	87.165	
10,600.00	9,300.55	8,290.00	8,288.10	38.65	28.87	-144.47	-5,388.24	-2,990.20	5,381.14	5,318.12	63.02	85.388	
10,700.00	9,300.96	8,290.00	8,288.10	39.53	28.87	-143.82	-5,388.24	-2,990.20	5,301.85	5,238.42	63.43	83.585	
10,800.00	9,301.36	8,290.00	8,288.10	40.45	28.87	-143.16	-5,388.24	-2,990.20	5,223.27	5,159.38	63.89	81.758	
10,900.00	9,301.76	8,290.00	8,288.10	41.42	28.87	-142.47	-5,388.24	-2,990.20	5,145.43	5,081.04	64.39	79.909	
11,000.00	9,302.17	8,290.00	8,288.10	42.44	28.87	-141.77	-5,388.24	-2,990.20	5,068.37	5,003.42	64.94	78.043	
11,100.00	9,302.57	8,290.00	8,288.10	43.49	28.87	-141.04	-5,388.24	-2,990.20	4,992.12	4,926.57	65.55	76.161	
11,200.00	9,302.98	8,290.00	8,288.10	44.58	28.87	-140.28	-5,388.24	-2,990.20	4,916.72	4,850.52	66.20	74.269	
11,300.00	9,303.38	8,290.00	8,288.10	45.71	28.87	-139.51	-5,388.24	-2,990.20	4,842.22	4,775.30	66.91	72.368	
11,400.00	9,303.79	8,290.00	8,288.10	46.86	28.87	-138.70	-5,388.24	-2,990.20	4,768.64	4,700.97	67.67	70.464	
11,500.00	9,304.19	8,290.00	8,288.10	48.05	28.87	-137.88	-5,388.24	-2,990.20	4,696.05	4,627.55	68.49	68.561	
11,600.00	9,304.60	8,290.00	8,288.10	49.26	28.87	-137.02	-5,388.24	-2,990.20	4,624.47	4,555.10	69.37	66.663	
11,700.00	9,305.00	8,290.00	8,288.10	50.50	28.87	-136.14	-5,388.24	-2,990.20	4,553.97	4,483.67	70.31	64.774	
11,800.00	9,305.40	8,290.00	8,288.10	51.76	28.87	-135.22	-5,388.24	-2,990.20	4,484.59	4,413.29	71.30	62.898	
11,900.00	9,305.81	8,290.00	8,288.10	53.05	28.87	-134.28	-5,388.24	-2,990.20	4,416.39	4,344.04	72.35	61.041	
12,000.00	9,306.21	8,290.00	8,288.10	54.35	28.87	-133.31	-5,388.24	-2,990.20	4,349.41	4,275.95	73.46	59.206	
12,100.00	9,306.62	8,290.00	8,288.10	55.67	28.87	-132.30	-5,388.24	-2,990.20	4,283.72	4,209.09	74.63	57.397	
12,200.00	9,307.02	8,290.00	8,288.10	57.01	28.87	-131.27	-5,388.24	-2,990.20	4,219.38	4,143.52	75.86	55.618	
12,300.00	9,307.43	8,290.00	8,288.10	58.37	28.87	-130.19	-5,388.24	-2,990.20	4,156.45	4,079.30	77.15	53.873	
12,400.00	9,307.83	8,290.00	8,288.10	59.74	28.87	-129.09	-5,388.24	-2,990.20	4,095.00	4,016.50	78.50	52.166	
12,500.00	9,308.23	8,290.00	8,288.10	61.13	28.87	-127.95	-5,388.24	-2,990.20	4,035.08	3,955.18	79.90	50.499	
12,600.00	9,308.64	8,290.00	8,288.10	62.53	28.87	-126.77	-5,388.24	-2,990.20	3,976.78	3,895.42	81.36	48.877	
12,700.00	9,309.04	8,290.00	8,288.10	63.94	28.87	-125.56	-5,388.24	-2,990.20	3,920.17	3,837.29	82.88	47.301	
12,800.00	9,309.45	8,290.00	8,288.10	65.36	28.87	-124.30	-5,388.24	-2,990.20	3,865.31	3,780.87	84.44	45.775	
12,900.00	9,309.85	8,290.00	8,288.10	66.80	28.87	-123.02	-5,388.24	-2,990.20	3,812.29	3,726.23	86.06	44.299	
13,000.00	9,310.26	8,290.00	8,288.10	68.24	28.87	-121.69	-5,388.24	-2,990.20	3,761.17	3,673.45	87.72	42.877	
13,100.00	9,310.66	8,290.00	8,288.10	69.69	28.87	-120.32	-5,388.24	-2,990.20	3,712.05	3,622.63	89.42	41.510	
13,200.00	9,311.07	8,290.00	8,288.10	71.16	28.87	-118.92	-5,388.24	-2,990.20	3,665.00	3,573.83	91.17	40.200	
13,300.00	9,311.47	8,290.00	8,288.10	72.63	28.87	-117.47	-5,388.24	-2,990.20	3,620.10	3,527.15	92.95	38.946	
13,400.00	9,311.87	8,290.00	8,288.10	74.11	28.87	-115.99	-5,388.24	-2,990.20	3,577.44	3,482.67	94.76	37.751	
13,500.00	9,312.28	8,290.00	8,288.10	75.59	28.87	-114.47	-5,388.24	-2,990.20	3,537.08	3,440.48	96.60	36.615	
13,600.00	9,312.68	8,290.00	8,288.10	77.09	28.87	-112.92	-5,388.24	-2,990.20	3,499.12	3,400.66	98.46	35.538	
13,700.00	9,313.09	8,290.00	8,288.10	78.59	28.87	-111.32	-5,388.24	-2,990.20	3,463.63	3,363.30	100.33	34.521	
13,800.00	9,313.49	8,290.00	8,288.10	80.09	28.87	-109.70	-5,388.24	-2,990.20	3,430.69	3,328.48	102.22	33.563	
13,900.00	9,313.90	8,290.00	8,288.10	81.60	28.87	-108.04	-5,388.24	-2,990.20	3,400.38	3,296.28	104.10	32.664	

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



MS Energy Services Anticollision Report



Company: Devon Energy
Project: Eddy County, New Mexico (NAD 83)
Reference Site: Cotton Draw Unit
Site Error: 0.00 usft
Reference Well: 515H
Well Error: 0.00 usft
Reference Wellbore: Wellbore #1
Reference Design: Design #1

Local Co-ordinate Reference: Well 515H
TVD Reference: Well @ 3566.10usft (Cactus 126)
MD Reference: Well @ 3566.10usft (Cactus 126)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at: 2.00 sigma
Database: 5000.1 Conroe DB
Offset TVD Reference: Offset Datum

Offset Design Cotton Draw Unit - 111H - Wellbore #1 - Surveys													Offset Site Error:	0.00 usft
Survey Program: 100-GYRO-NS													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Azimuth from North (°)	Offset Wellbore Centre		Distance		Minimum Separation (usft)	Separation Factor	Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)				
14,000.00	9,314.30	8,290.00	8,288.10	83.12	28.87	-106.34	-5,388.24	-2,990.20	3,372.75	3,266.77	105.98	31.824		
14,100.00	9,314.71	8,290.00	8,288.10	84.64	28.87	-104.62	-5,388.24	-2,990.20	3,347.89	3,240.04	107.85	31.043		
14,200.00	9,315.11	8,290.00	8,288.10	86.17	28.87	-102.88	-5,388.24	-2,990.20	3,325.85	3,216.16	109.69	30.319		
14,300.00	9,315.51	8,290.00	8,288.10	87.70	28.87	-101.11	-5,388.24	-2,990.20	3,306.69	3,195.17	111.51	29.653		
14,400.00	9,315.92	8,290.00	8,288.10	89.24	28.87	-99.31	-5,388.24	-2,990.20	3,290.45	3,177.15	113.30	29.042		
14,500.00	9,316.32	8,290.00	8,288.10	90.78	28.87	-97.50	-5,388.24	-2,990.20	3,277.19	3,162.15	115.04	28.486		
14,600.00	9,316.73	8,290.00	8,288.10	92.33	28.87	-95.68	-5,388.24	-2,990.20	3,266.94	3,150.20	116.74	27.985		
14,700.00	9,317.13	8,290.00	8,288.10	93.88	28.87	-93.84	-5,388.24	-2,990.20	3,259.72	3,141.34	118.38	27.536		
14,800.00	9,317.54	8,290.00	8,288.10	95.43	28.87	-92.00	-5,388.24	-2,990.20	3,255.57	3,135.61	119.96	27.139		
14,885.48	9,317.88	8,290.00	8,288.10	96.76	28.87	-90.42	-5,388.24	-2,990.20	3,254.44	3,133.19	121.26	26.839 CC		
14,900.00	9,317.94	8,290.00	8,288.10	96.99	28.87	-90.16	-5,388.24	-2,990.20	3,254.48	3,133.00	121.47	26.792 ES		
15,000.00	9,318.34	8,290.00	8,288.10	98.55	28.87	-88.31	-5,388.24	-2,990.20	3,256.46	3,133.55	122.91	26.494		
15,100.00	9,318.75	8,290.00	8,288.10	100.11	28.87	-86.47	-5,388.24	-2,990.20	3,261.51	3,137.23	124.27	26.244		
15,200.00	9,319.15	8,290.00	8,288.10	101.68	28.87	-84.64	-5,388.24	-2,990.20	3,269.61	3,144.05	125.56	26.041		
15,300.00	9,319.56	8,290.00	8,288.10	103.24	28.87	-82.81	-5,388.24	-2,990.20	3,280.74	3,153.98	126.76	25.882		
15,400.00	9,319.96	8,290.00	8,288.10	104.82	28.87	-81.01	-5,388.24	-2,990.20	3,294.86	3,166.99	127.87	25.767		
15,500.00	9,320.37	8,290.00	8,288.10	106.39	28.87	-79.22	-5,388.24	-2,990.20	3,311.95	3,183.05	128.90	25.694		
15,600.00	9,320.77	8,290.00	8,288.10	107.97	28.87	-77.45	-5,388.24	-2,990.20	3,331.96	3,202.11	129.84	25.661 SF		
15,700.00	9,321.18	8,290.00	8,288.10	109.55	28.87	-75.71	-5,388.24	-2,990.20	3,354.82	3,224.12	130.70	25.668		
15,800.00	9,321.58	8,290.00	8,288.10	111.13	28.87	-74.00	-5,388.24	-2,990.20	3,380.50	3,249.03	131.47	25.713		
15,900.00	9,321.98	8,290.00	8,288.10	112.71	28.87	-72.31	-5,388.24	-2,990.20	3,408.91	3,276.75	132.15	25.795		
16,000.00	9,322.39	8,290.00	8,288.10	114.30	28.87	-70.66	-5,388.24	-2,990.20	3,439.99	3,307.24	132.76	25.912		
16,100.00	9,322.79	8,290.00	8,288.10	115.88	28.87	-69.04	-5,388.24	-2,990.20	3,473.68	3,340.40	133.28	26.062		
16,200.00	9,323.20	8,290.00	8,288.10	117.47	28.87	-67.46	-5,388.24	-2,990.20	3,509.90	3,376.16	133.73	26.246		
16,300.00	9,323.60	8,290.00	8,288.10	119.07	28.87	-65.91	-5,388.24	-2,990.20	3,548.56	3,414.45	134.11	26.461		
16,400.00	9,324.01	8,290.00	8,288.10	120.66	28.87	-64.40	-5,388.24	-2,990.20	3,589.59	3,455.18	134.41	26.706		
16,500.00	9,324.41	8,290.00	8,288.10	122.25	28.87	-62.92	-5,388.24	-2,990.20	3,632.92	3,498.26	134.65	26.980		
16,600.00	9,324.82	8,290.00	8,288.10	123.85	28.87	-61.49	-5,388.24	-2,990.20	3,678.45	3,543.62	134.83	27.282		
16,700.00	9,325.22	8,290.00	8,288.10	125.45	28.87	-60.09	-5,388.24	-2,990.20	3,726.11	3,591.16	134.95	27.611		
16,800.00	9,325.62	8,290.00	8,288.10	127.05	28.87	-58.73	-5,388.24	-2,990.20	3,775.82	3,640.80	135.02	27.965		
16,900.00	9,326.03	8,290.00	8,288.10	128.65	28.87	-57.41	-5,388.24	-2,990.20	3,827.49	3,692.46	135.04	28.344		
17,000.00	9,326.43	8,290.00	8,288.10	130.25	28.87	-56.13	-5,388.24	-2,990.20	3,881.06	3,746.05	135.01	28.747		
17,100.00	9,326.84	8,290.00	8,288.10	131.86	28.87	-54.89	-5,388.24	-2,990.20	3,936.43	3,801.49	134.94	29.172		
17,200.00	9,327.24	8,290.00	8,288.10	133.46	28.87	-53.68	-5,388.24	-2,990.20	3,993.55	3,858.71	134.83	29.619		
17,300.00	9,327.65	8,290.00	8,288.10	135.07	28.87	-52.51	-5,388.24	-2,990.20	4,052.32	3,917.63	134.69	30.086		
17,400.00	9,328.05	8,290.00	8,288.10	136.68	28.87	-51.38	-5,388.24	-2,990.20	4,112.69	3,978.17	134.52	30.574		
17,500.00	9,328.45	8,290.00	8,288.10	138.29	28.87	-50.28	-5,388.24	-2,990.20	4,174.58	4,040.27	134.32	31.080		
17,600.00	9,328.86	8,290.00	8,288.10	139.90	28.87	-49.22	-5,388.24	-2,990.20	4,237.93	4,103.84	134.09	31.605		
17,700.00	9,329.26	8,290.00	8,288.10	141.51	28.87	-48.18	-5,388.24	-2,990.20	4,302.67	4,168.83	133.84	32.148		
17,800.00	9,329.67	8,290.00	8,288.10	143.12	28.87	-47.19	-5,388.24	-2,990.20	4,368.73	4,235.16	133.57	32.707		
17,900.00	9,330.07	8,290.00	8,288.10	144.73	28.87	-46.22	-5,388.24	-2,990.20	4,436.07	4,302.79	133.29	33.282		
18,000.00	9,330.48	8,290.00	8,288.10	146.35	28.87	-45.28	-5,388.24	-2,990.20	4,504.63	4,371.64	132.99	33.873		
18,100.00	9,330.88	8,290.00	8,288.10	147.96	28.87	-44.38	-5,388.24	-2,990.20	4,574.34	4,441.66	132.67	34.478		
18,200.00	9,331.29	8,290.00	8,288.10	149.58	28.87	-43.50	-5,388.24	-2,990.20	4,645.15	4,512.81	132.35	35.098		
18,300.00	9,331.69	8,290.00	8,288.10	151.20	28.87	-42.65	-5,388.24	-2,990.20	4,717.03	4,585.01	132.01	35.731		
18,400.00	9,332.09	8,290.00	8,288.10	152.81	28.87	-41.83	-5,388.24	-2,990.20	4,789.91	4,658.24	131.67	36.377		
18,500.00	9,332.50	8,290.00	8,288.10	154.43	28.87	-41.03	-5,388.24	-2,990.20	4,863.76	4,732.43	131.33	37.036		
18,600.00	9,332.90	8,290.00	8,288.10	156.05	28.87	-40.26	-5,388.24	-2,990.20	4,938.53	4,807.56	130.97	37.706		
18,700.00	9,333.31	8,290.00	8,288.10	157.67	28.87	-39.51	-5,388.24	-2,990.20	5,014.18	4,883.56	130.62	38.388		
18,800.00	9,333.71	8,290.00	8,288.10	159.30	28.87	-38.78	-5,388.24	-2,990.20	5,090.67	4,960.41	130.26	39.081		
18,900.00	9,334.12	8,290.00	8,288.10	160.92	28.87	-38.08	-5,388.24	-2,990.20	5,167.96	5,038.06	129.90	39.784		
19,000.00	9,334.52	8,290.00	8,288.10	162.54	28.87	-37.40	-5,388.24	-2,990.20	5,246.02	5,116.48	129.54	40.497		

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



MS Energy Services
Anticollision Report



Company: Devon Energy
Project: Eddy County, New Mexico (NAD 83)
Reference Site: Cotton Draw Unit
Site Error: 0.00 usft
Reference Well: 515H
Well Error: 0.00 usft
Reference Wellbore: Wellbore #1
Reference Design: Design #1

Local Co-ordinate Reference: Well 515H
TVD Reference: Well @ 3566.10usft (Cactus 126)
MD Reference: Well @ 3566.10usft (Cactus 126)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at: 2.00 sigma
Database: 5000.1 Conroe DB
Offset TVD Reference: Offset Datum

Offset Design Cotton Draw Unit - 111H - Wellbore #1 - Surveys												Offset Site Error:	0.00 usft
Survey Program: 100-GYRO-NS												Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Azimuth from North (°)	Offset Wellbore Centre		Distance		Minimum Separation (usft)	Separation Factor	Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)			
19,100.00	9,334.93	8,290.00	8,288.10	164.16	28.87	-36.74	-5,388.24	-2,990.20	5,324.81	5,195.63	129.18	41.220	
19,200.00	9,335.33	8,290.00	8,288.10	165.79	28.87	-36.10	-5,388.24	-2,990.20	5,404.30	5,275.48	128.82	41.952	
19,300.00	9,335.73	8,290.00	8,288.10	167.41	28.87	-35.48	-5,388.24	-2,990.20	5,484.47	5,356.00	128.46	42.692	
19,390.56	9,336.10	8,290.00	8,288.10	168.88	28.87	-34.93	-5,388.24	-2,990.20	5,557.62	5,429.48	128.14	43.371	



MS Energy Services Anticollision Report



Company: Devon Energy
Project: Eddy County, New Mexico (NAD 83)
Reference Site: Cotton Draw Unit
Site Error: 0.00 usft
Reference Well: 515H
Well Error: 0.00 usft
Reference Wellbore: Wellbore #1
Reference Design: Design #1

Local Co-ordinate Reference: Well 515H
TVD Reference: Well @ 3566.10usft (Cactus 126)
MD Reference: Well @ 3566.10usft (Cactus 126)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: 5000.1 Conroe DB
Offset TVD Reference: Offset Datum

Offset Design Cotton Draw Unit - 116H - Wellbore #1 - Surveys														Offset Site Error:	0.00 usft
Survey Program: 77-VESSEL_GYRO_DROP, 7685-MWD														Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Azimuth from North (°)	Offset Wellbore Centre		Distance		Minimum Separation (usft)	Separation Factor	Warning		
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)					
0.00	0.00	14,732.00	8,284.12	0.00	111.69	-179.81	-3,029.95	-10.03	8,876.38						
100.00	100.00	14,732.00	8,284.12	0.13	111.69	-179.81	-3,029.95	-10.03	8,782.45	8,729.98	52.47	167.382			
200.00	200.00	14,732.00	8,284.12	0.49	111.69	-179.81	-3,029.95	-10.03	8,688.66	8,636.24	52.41	165.772			
300.00	300.00	14,732.00	8,284.12	0.85	111.69	-179.81	-3,029.95	-10.03	8,595.01	8,542.64	52.37	164.129			
400.00	400.00	14,732.00	8,284.12	1.21	111.69	-179.81	-3,029.95	-10.03	8,501.50	8,449.17	52.33	162.455			
500.00	500.00	14,732.00	8,284.12	1.57	111.69	-179.81	-3,029.95	-10.03	8,408.14	8,355.83	52.31	160.749			
600.00	600.00	14,732.00	8,284.12	1.93	111.69	-179.81	-3,029.95	-10.03	8,314.94	8,262.65	52.29	159.016			
700.00	700.00	14,732.00	8,284.12	2.29	111.69	-179.81	-3,029.95	-10.03	8,221.89	8,169.61	52.28	157.257			
800.00	800.00	14,732.00	8,284.12	2.64	111.69	-179.81	-3,029.95	-10.03	8,129.02	8,076.73	52.29	155.475			
900.00	900.00	14,732.00	8,284.12	3.00	111.69	-179.81	-3,029.95	-10.03	8,036.31	7,984.01	52.30	153.672			
1,000.00	1,000.00	14,732.00	8,284.12	3.36	111.69	-179.81	-3,029.95	-10.03	7,943.78	7,891.47	52.31	151.853			
1,100.00	1,100.00	14,732.00	8,284.12	3.72	111.69	-179.81	-3,029.95	-10.03	7,851.43	7,799.09	52.34	150.018			
1,200.00	1,200.00	14,732.00	8,284.12	4.08	111.69	-179.81	-3,029.95	-10.03	7,759.27	7,706.91	52.37	148.172			
1,300.00	1,300.00	14,732.00	8,284.12	4.44	111.69	-179.81	-3,029.95	-10.03	7,667.31	7,614.91	52.40	146.317			
1,400.00	1,400.00	14,732.00	8,284.12	4.79	111.69	-179.81	-3,029.95	-10.03	7,575.55	7,523.11	52.44	144.454			
1,500.00	1,500.00	14,732.00	8,284.12	5.15	111.69	-179.81	-3,029.95	-10.03	7,484.01	7,431.52	52.49	142.587			
1,600.00	1,600.00	14,732.00	8,284.12	5.51	111.69	-179.81	-3,029.95	-10.03	7,392.68	7,340.15	52.54	140.717			
1,700.00	1,700.00	14,732.00	8,284.12	5.87	111.69	-179.81	-3,029.95	-10.03	7,301.58	7,248.99	52.59	138.846			
1,800.00	1,800.00	14,732.00	8,284.12	6.23	111.69	-179.81	-3,029.95	-10.03	7,210.72	7,158.08	52.64	136.976			
1,900.00	1,900.00	14,732.00	8,284.12	6.59	111.69	-179.81	-3,029.95	-10.03	7,120.10	7,067.40	52.70	135.107			
2,000.00	2,000.00	14,732.00	8,284.12	6.95	111.69	-179.81	-3,029.95	-10.03	7,029.73	6,976.97	52.76	133.242			
2,100.00	2,100.00	14,732.00	8,284.12	7.30	111.69	-179.81	-3,029.95	-10.03	6,939.63	6,886.81	52.82	131.381			
2,200.00	2,200.00	14,732.00	8,284.12	7.66	111.69	-179.81	-3,029.95	-10.03	6,849.81	6,796.92	52.88	129.527			
2,300.00	2,300.00	14,732.00	8,284.12	8.02	111.69	-179.81	-3,029.95	-10.03	6,760.27	6,707.32	52.95	127.679			
2,400.00	2,400.00	14,732.00	8,284.12	8.38	111.69	-179.81	-3,029.95	-10.03	6,671.03	6,618.01	53.01	125.839			
2,500.00	2,500.00	14,732.00	8,284.12	8.74	111.69	-179.81	-3,029.95	-10.03	6,582.09	6,529.01	53.08	124.007			
2,600.00	2,599.99	14,732.00	8,284.12	9.10	111.69	-179.81	-3,029.95	-10.03	6,493.89	6,440.75	53.14	122.202			
2,700.00	2,699.96	14,732.00	8,284.12	9.45	111.69	-179.81	-3,029.95	-10.03	6,406.89	6,353.69	53.20	120.432			
2,800.00	2,799.86	14,732.00	8,284.12	9.81	111.69	-179.82	-3,029.95	-10.03	6,321.16	6,267.90	53.26	118.690			
2,900.00	2,899.68	14,732.00	8,284.12	10.17	111.69	-179.82	-3,029.95	-10.03	6,236.79	6,183.47	53.32	116.979			
3,000.00	2,999.37	14,732.00	8,284.12	10.53	111.69	-179.83	-3,029.95	-10.03	6,153.85	6,100.48	53.37	115.301			
3,100.00	3,098.90	14,732.00	8,284.12	10.89	111.69	-179.84	-3,029.95	-10.03	6,072.43	6,019.01	53.43	113.658			
3,200.00	3,198.26	14,732.00	8,284.12	11.25	111.69	-179.85	-3,029.95	-10.03	5,992.63	5,939.15	53.48	112.054			
3,299.74	3,297.14	14,732.00	8,284.12	11.61	111.69	-179.87	-3,029.95	-10.03	5,914.72	5,861.18	53.53	110.493			
3,300.00	3,297.40	14,732.00	8,284.12	11.61	111.69	-179.87	-3,029.95	-10.03	5,914.51	5,860.98	53.53	110.489			
3,400.00	3,396.43	14,732.00	8,284.12	11.98	111.69	-179.88	-3,029.95	-10.03	5,837.62	5,784.04	53.58	108.949			
3,500.00	3,495.46	14,732.00	8,284.12	12.36	111.69	-179.90	-3,029.95	-10.03	5,761.44	5,707.81	53.63	107.426			
3,600.00	3,594.49	14,732.00	8,284.12	12.73	111.69	-179.91	-3,029.95	-10.03	5,686.00	5,632.32	53.68	105.926			
3,700.00	3,693.51	14,732.00	8,284.12	13.11	111.69	-179.92	-3,029.95	-10.03	5,611.33	5,557.61	53.72	104.451			
3,800.00	3,792.54	14,732.00	8,284.12	13.49	111.69	-179.94	-3,029.95	-10.03	5,537.45	5,483.69	53.76	103.001			
3,900.00	3,891.57	14,732.00	8,284.12	13.87	111.69	-179.95	-3,029.95	-10.03	5,464.41	5,410.61	53.79	101.579			
4,000.00	3,990.60	14,732.00	8,284.12	14.25	111.69	-179.96	-3,029.95	-10.03	5,392.23	5,338.41	53.82	100.186			
4,100.00	4,089.62	14,732.00	8,284.12	14.64	111.69	-179.98	-3,029.95	-10.03	5,320.95	5,267.11	53.84	98.822			
4,200.00	4,188.65	14,732.00	8,284.12	15.02	111.69	-179.99	-3,029.95	-10.03	5,250.61	5,196.75	53.86	97.489			
4,300.00	4,287.68	14,732.00	8,284.12	15.41	111.69	180.00	-3,029.95	-10.03	5,181.25	5,127.38	53.87	96.188			
4,400.00	4,386.71	14,732.00	8,284.12	15.80	111.69	179.98	-3,029.95	-10.03	5,112.89	5,059.03	53.87	94.920			
4,500.00	4,485.73	14,732.00	8,284.12	16.19	111.69	179.97	-3,029.95	-10.03	5,045.60	4,991.74	53.86	93.687			
4,600.00	4,584.76	14,732.00	8,284.12	16.59	111.69	179.96	-3,029.95	-10.03	4,979.40	4,925.57	53.84	92.490			
4,700.00	4,683.79	14,732.00	8,284.12	16.98	111.69	179.95	-3,029.95	-10.03	4,914.35	4,860.54	53.81	91.331			
4,800.00	4,782.81	14,732.00	8,284.12	17.37	111.69	179.93	-3,029.95	-10.03	4,850.49	4,796.72	53.77	90.210			
4,900.00	4,881.84	14,732.00	8,284.12	17.77	111.69	179.92	-3,029.95	-10.03	4,787.86	4,734.14	53.72	89.130			
5,000.00	4,980.87	14,732.00	8,284.12	18.17	111.69	179.91	-3,029.95	-10.03	4,726.52	4,672.86	53.65	88.091			

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



MS Energy Services Anticollision Report



Company: Devon Energy
Project: Eddy County, New Mexico (NAD 83)
Reference Site: Cotton Draw Unit
Site Error: 0.00 usft
Reference Well: 515H
Well Error: 0.00 usft
Reference Wellbore: Wellbore #1
Reference Design: Design #1

Local Co-ordinate Reference: Well 515H
TVD Reference: Well @ 3566.10usft (Cactus 126)
MD Reference: Well @ 3566.10usft (Cactus 126)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: 5000.1 Conroe DB
Offset TVD Reference: Offset Datum

Offset Design Cotton Draw Unit - 116H - Wellbore #1 - Surveys													Offset Site Error:	0.00 usft
Survey Program: 77-VESSEI_GYRO_DROP, 7885-MWD													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Azimuth from North (°)	Distance		Minimum Separation (usft)	Separation Factor	Warning			
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		Between Centres (usft)	Between Ellipses (usft)						
5,100.00	5,079.90	14,732.00	8,284.12	18.56	111.69	179.90	-3,029.95	-10.03	4,666.52	4,612.94	53.58	87.096		
5,200.00	5,178.92	14,732.00	8,284.12	18.96	111.69	179.89	-3,029.95	-10.03	4,607.90	4,554.41	53.49	86.145		
5,300.00	5,277.95	14,732.00	8,284.12	19.36	111.69	179.87	-3,029.95	-10.03	4,550.73	4,497.34	53.39	85.241		
5,400.00	5,376.98	14,732.00	8,284.12	19.76	111.69	179.86	-3,029.95	-10.03	4,495.05	4,441.79	53.27	84.384		
5,500.00	5,476.01	14,732.00	8,284.12	20.16	111.69	179.85	-3,029.95	-10.03	4,440.93	4,387.80	53.14	83.577		
5,600.00	5,575.03	14,732.00	8,284.12	20.56	111.69	179.84	-3,029.95	-10.03	4,388.43	4,335.44	52.99	82.820		
5,628.09	5,602.86	14,732.00	8,284.12	20.68	111.69	179.84	-3,029.95	-10.03	4,373.97	4,321.03	52.94	82.617		
5,700.00	5,674.12	14,732.00	8,284.12	20.96	111.69	179.83	-3,029.95	-10.03	4,337.20	4,284.37	52.82	82.107		
5,800.00	5,773.42	14,732.00	8,284.12	21.36	111.69	179.82	-3,029.95	-10.03	4,286.23	4,233.59	52.65	81.415		
5,900.00	5,872.91	14,732.00	8,284.12	21.74	111.69	179.81	-3,029.95	-10.03	4,235.50	4,183.04	52.46	80.745		
6,000.00	5,972.56	14,732.00	8,284.12	22.12	111.69	179.80	-3,029.95	-10.03	4,185.02	4,132.77	52.25	80.099		
6,100.00	6,072.35	14,732.00	8,284.12	22.49	111.69	179.80	-3,029.95	-10.03	4,134.81	4,082.79	52.03	79.475		
6,200.00	6,172.23	14,732.00	8,284.12	22.86	111.69	179.79	-3,029.95	-10.03	4,084.91	4,033.12	51.79	78.874		
6,300.00	6,272.18	14,732.00	8,284.12	23.21	111.69	179.79	-3,029.95	-10.03	4,035.34	3,983.80	51.54	78.297		
6,400.00	6,372.17	14,732.00	8,284.12	23.56	111.69	179.79	-3,029.95	-10.03	3,986.13	3,934.85	51.27	77.741		
6,427.83	6,400.00	14,732.00	8,284.12	23.66	111.69	179.79	-3,029.95	-10.03	3,972.49	3,921.30	51.20	77.589		
6,500.00	6,472.17	14,732.00	8,284.12	23.90	111.69	179.79	-3,029.95	-10.03	3,937.70	3,886.70	51.00	77.216		
6,600.00	6,572.17	14,732.00	8,284.12	24.25	111.69	179.79	-3,029.95	-10.03	3,891.17	3,840.47	50.70	76.746		
6,700.00	6,672.17	14,732.00	8,284.12	24.59	111.69	179.79	-3,029.95	-10.03	3,846.69	3,796.29	50.40	76.329		
6,800.00	6,772.17	14,732.00	8,284.12	24.93	111.69	179.79	-3,029.95	-10.03	3,804.32	3,754.24	50.08	75.964		
6,900.00	6,872.17	14,732.00	8,284.12	25.28	111.69	179.79	-3,029.95	-10.03	3,764.12	3,714.36	49.76	75.650		
7,000.00	6,972.17	14,732.00	8,284.12	25.62	111.69	179.79	-3,029.95	-10.03	3,726.18	3,676.75	49.43	75.383		
7,100.00	7,072.17	14,732.00	8,284.12	25.97	111.69	179.79	-3,029.95	-10.03	3,690.55	3,641.45	49.10	75.160		
7,200.00	7,172.17	14,732.00	8,284.12	26.31	111.69	179.79	-3,029.95	-10.03	3,657.32	3,608.54	48.78	74.976		
7,300.00	7,272.17	14,732.00	8,284.12	26.66	111.69	179.79	-3,029.95	-10.03	3,626.54	3,578.07	48.47	74.824		
7,400.00	7,372.17	14,732.00	8,284.12	27.00	111.69	179.79	-3,029.95	-10.03	3,598.27	3,550.10	48.17	74.695		
7,500.00	7,472.17	14,732.00	8,284.12	27.35	111.69	179.79	-3,029.95	-10.03	3,572.58	3,524.68	47.90	74.580		
7,600.00	7,572.17	14,732.00	8,284.12	27.69	111.69	179.79	-3,029.95	-10.03	3,549.53	3,501.86	47.67	74.465		
7,700.00	7,672.17	14,732.00	8,284.12	28.04	111.69	179.79	-3,029.95	-10.03	3,529.15	3,481.68	47.47	74.339		
7,800.00	7,772.17	14,732.00	8,284.12	28.39	111.69	179.79	-3,029.95	-10.03	3,511.51	3,464.18	47.33	74.185		
7,900.00	7,872.17	14,732.00	8,284.12	28.74	111.69	179.79	-3,029.95	-10.03	3,496.64	3,449.38	47.26	73.989		
8,000.00	7,972.17	14,732.00	8,284.12	29.08	111.69	179.79	-3,029.95	-10.03	3,484.58	3,437.32	47.26	73.737		
8,100.00	8,072.17	14,732.00	8,284.12	29.43	111.69	179.79	-3,029.95	-10.03	3,475.35	3,428.01	47.34	73.417		
8,200.00	8,172.17	14,732.00	8,284.12	29.78	111.69	179.79	-3,029.95	-10.03	3,468.99	3,421.48	47.51	73.019		
8,300.00	8,272.17	14,732.00	8,284.12	30.13	111.69	179.79	-3,029.95	-10.03	3,465.49	3,417.72	47.77	72.542		
8,371.06	8,343.22	14,732.00	8,284.12	30.38	111.69	179.79	-3,029.95	-10.03	3,464.77	3,416.75	48.02	72.153		
8,400.00	8,372.17	14,732.00	8,284.12	30.48	111.69	179.79	-3,029.95	-10.03	3,464.89	3,416.75	48.13	71.984		
8,500.00	8,472.17	14,732.00	8,284.12	30.83	111.69	179.79	-3,029.95	-10.03	3,467.16	3,418.57	48.59	71.354		
8,600.00	8,572.17	14,732.00	8,284.12	31.18	111.69	179.79	-3,029.95	-10.03	3,472.32	3,423.18	49.14	70.663		
8,700.00	8,672.17	14,732.00	8,284.12	31.52	111.69	179.79	-3,029.95	-10.03	3,480.35	3,430.57	49.77	69.926		
8,751.58	8,723.75	14,732.00	8,284.12	31.70	111.69	179.79	-3,029.95	-10.03	3,485.60	3,435.47	50.13	69.534		
8,800.00	8,772.11	14,732.00	8,284.12	31.86	111.69	179.79	-3,029.95	-10.03	3,489.20	3,438.73	50.47	69.134		
8,850.00	8,821.68	14,732.00	8,284.12	32.00	111.69	179.81	-3,029.95	-10.03	3,489.37	3,438.54	50.83	68.648		
8,900.00	8,870.51	14,732.00	8,284.12	32.12	111.69	179.83	-3,029.95	-10.03	3,485.93	3,434.73	51.20	68.082		
8,950.00	8,918.22	14,732.00	8,284.12	32.24	111.69	179.87	-3,029.95	-10.03	3,478.91	3,427.33	51.58	67.442		
9,000.00	8,964.46	14,732.00	8,284.12	32.34	111.69	179.91	-3,029.95	-10.03	3,468.33	3,416.36	51.97	66.738		
9,050.00	9,008.86	14,732.00	8,284.12	32.43	111.69	179.96	-3,029.95	-10.03	3,454.24	3,401.88	52.36	65.975		
9,100.00	9,051.09	14,732.00	8,284.12	32.51	111.69	-179.98	-3,029.95	-10.03	3,436.70	3,383.96	52.74	65.161		
9,150.00	9,090.83	14,732.00	8,284.12	32.58	111.69	-179.90	-3,029.95	-10.03	3,415.80	3,362.68	53.12	64.302		
9,200.00	9,127.77	14,732.00	8,284.12	32.65	111.69	-179.82	-3,029.95	-10.03	3,391.64	3,338.14	53.49	63.405		
9,250.00	9,161.64	14,732.00	8,284.12	32.71	111.69	-179.73	-3,029.95	-10.03	3,364.32	3,310.47	53.85	62.474		
9,300.00	9,192.18	14,732.00	8,284.12	32.78	111.69	-179.63	-3,029.95	-10.03	3,334.00	3,279.80	54.20	61.517		

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



MS Energy Services

Anticollision Report



Company: Devon Energy
Project: Eddy County, New Mexico (NAD 83)
Reference Site: Cotton Draw Unit
Site Error: 0.00 usft
Reference Well: 515H
Well Error: 0.00 usft
Reference Wellbore: Wellbore #1
Reference Design: Design #1

Local Co-ordinate Reference: Well 515H
TVD Reference: Well @ 3566.10usft (Cactus 126)
MD Reference: Well @ 3566.10usft (Cactus 126)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: 5000.1 Conroe DB
Offset TVD Reference: Offset Datum

Offset Design Cotton Draw Unit - 116H - Wellbore #1 - Surveys													Offset Site Error:	0.00 usft
Survey Program: 77-VESSL_GYRO_DROP, 7685-MWD													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Azimuth from North (°)	Offset Wellbore Centre		Distance		Minimum Separation (usft)	Separation Factor	Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)				
9,350.00	9,219.15	14,732.00	8,284.12	32.85	111.69	-179.52	-3,029.95	-10.03	3,300.80	3,246.28	54.52	60.538		
9,400.00	9,242.36	14,732.00	8,284.12	32.92	111.69	-179.40	-3,029.95	-10.03	3,264.92	3,210.08	54.83	59.542		
9,450.00	9,261.61	14,732.00	8,284.12	32.99	111.69	-179.28	-3,029.95	-10.03	3,226.52	3,171.40	55.12	58.534		
9,500.00	9,276.77	14,732.00	8,284.12	33.08	111.69	-179.14	-3,029.95	-10.03	3,185.83	3,130.44	55.39	57.518		
9,550.00	9,287.73	14,732.00	8,284.12	33.17	111.69	-179.00	-3,029.95	-10.03	3,143.06	3,087.43	55.63	56.499		
9,600.00	9,294.39	14,732.00	8,284.12	33.27	111.69	-178.85	-3,029.95	-10.03	3,098.46	3,042.62	55.85	55.481		
9,649.26	9,296.70	14,732.00	8,284.12	33.37	111.69	-178.70	-3,029.95	-10.03	3,053.00	2,996.96	56.03	54.484		
9,700.00	9,296.91	14,732.00	8,284.12	33.49	111.69	-178.54	-3,029.95	-10.03	3,005.47	2,949.26	56.21	53.466		
9,800.00	9,297.31	14,732.00	8,284.12	33.80	111.69	-178.28	-3,029.95	-10.03	2,911.75	2,855.19	56.56	51.477		
9,900.00	9,297.72	14,732.00	8,284.12	34.17	111.69	-178.07	-3,029.95	-10.03	2,818.08	2,761.16	56.91	49.515		
10,000.00	9,298.12	14,732.00	8,284.12	34.62	111.69	-177.92	-3,029.95	-10.03	2,724.56	2,667.31	57.26	47.584		
10,027.33	9,298.24	14,732.00	8,284.12	34.75	111.69	-177.89	-3,029.95	-10.03	2,699.05	2,641.70	57.35	47.062		
10,100.00	9,298.53	14,732.00	8,284.12	35.13	111.69	-177.81	-3,029.95	-10.03	2,631.38	2,573.78	57.60	45.680		
10,200.00	9,298.93	14,732.00	8,284.12	35.71	111.69	-177.71	-3,029.95	-10.03	2,538.71	2,480.73	57.98	43.786		
10,300.00	9,299.34	14,732.00	8,284.12	36.35	111.69	-177.59	-3,029.95	-10.03	2,446.62	2,388.23	58.39	41.901		
10,400.00	9,299.74	14,732.00	8,284.12	37.06	111.69	-177.46	-3,029.95	-10.03	2,355.17	2,296.33	58.84	40.026		
10,500.00	9,300.15	14,732.00	8,284.12	37.83	111.69	-177.32	-3,029.95	-10.03	2,264.45	2,205.11	59.33	38.165		
10,600.00	9,300.55	14,732.00	8,284.12	38.65	111.69	-177.16	-3,029.95	-10.03	2,174.54	2,114.66	59.88	36.318		
10,700.00	9,300.96	14,732.00	8,284.12	39.53	111.69	-176.99	-3,029.95	-10.03	2,085.55	2,025.07	60.47	34.488		
10,800.00	9,301.36	14,732.00	8,284.12	40.45	111.69	-176.80	-3,029.95	-10.03	1,997.60	1,936.47	61.13	32.679		
10,900.00	9,301.76	14,732.00	8,284.12	41.42	111.69	-176.59	-3,029.95	-10.03	1,910.83	1,848.98	61.85	30.894		
11,000.00	9,302.17	14,732.00	8,284.12	42.44	111.69	-176.34	-3,029.95	-10.03	1,825.42	1,762.77	62.65	29.137		
11,100.00	9,302.57	14,732.00	8,284.12	43.49	111.69	-176.07	-3,029.95	-10.03	1,741.57	1,678.03	63.53	27.412		
11,200.00	9,302.98	14,732.00	8,284.12	44.58	111.69	-175.75	-3,029.95	-10.03	1,659.50	1,594.99	64.51	25.725		
11,300.00	9,303.38	14,732.00	8,284.12	45.71	111.69	-175.38	-3,029.95	-10.03	1,579.50	1,513.91	65.59	24.082		
11,400.00	9,303.79	14,732.00	8,284.12	46.86	111.69	-174.96	-3,029.95	-10.03	1,501.90	1,435.12	66.79	22.489		
11,500.00	9,304.19	14,732.00	8,284.12	48.05	111.69	-174.44	-3,029.95	-10.03	1,427.10	1,358.99	68.11	20.954		
11,600.00	9,304.60	14,732.00	8,284.12	49.26	111.69	-173.83	-3,029.95	-10.03	1,355.54	1,285.98	69.56	19.486		
11,700.00	9,305.00	14,732.00	8,284.12	50.50	111.69	-173.07	-3,029.95	-10.03	1,287.78	1,216.62	71.16	18.096		
11,800.00	9,305.40	14,732.00	8,284.12	51.76	111.69	-172.11	-3,029.95	-10.03	1,224.45	1,151.54	72.91	16.794		
11,900.00	9,305.81	14,732.00	8,284.12	53.05	111.69	-170.86	-3,029.95	-10.03	1,166.26	1,091.47	74.79	15.593		
12,000.00	9,306.21	14,732.00	8,284.12	54.35	111.69	-169.17	-3,029.95	-10.03	1,114.02	1,037.23	76.79	14.507		
12,100.00	9,306.62	14,732.00	8,284.12	55.67	111.69	-166.77	-3,029.95	-10.03	1,068.61	989.75	78.86	13.550		
12,200.00	9,307.02	14,732.00	8,284.12	57.01	111.69	-163.09	-3,029.95	-10.03	1,030.93	949.99	80.94	12.737		
12,300.00	9,307.43	14,732.00	8,284.12	58.37	111.69	-156.83	-3,029.95	-10.03	1,001.85	918.93	82.92	12.082		
12,400.00	9,307.83	14,732.00	8,284.12	59.74	111.69	-144.35	-3,029.95	-10.03	982.14	897.45	84.68	11.598		
12,500.00	9,308.23	14,732.00	8,284.12	61.13	111.69	-114.84	-3,029.95	-10.03	972.36	886.25	86.11	11.292		
12,548.42	9,308.43	14,738.75	8,284.16	61.80	111.80	-87.34	-3,023.20	-10.01	971.27	884.56	86.71	11.201 CC, ES		
12,600.00	9,308.64	14,687.17	8,283.90	62.53	110.96	-87.35	-3,074.78	-10.16	971.78	885.11	86.68	11.212		
12,700.00	9,309.04	14,599.87	8,283.07	63.94	109.53	-80.83	-3,162.08	-10.40	973.26	886.53	86.74	11.221		
12,800.00	9,309.45	14,508.21	8,280.85	65.36	108.02	-76.72	-3,253.71	-10.54	976.14	889.40	86.74	11.253		
12,900.00	9,309.85	14,392.83	8,278.43	66.80	106.13	-84.52	-3,369.05	-11.43	978.82	892.27	86.55	11.309		
13,000.00	9,310.26	14,301.76	8,277.36	68.24	104.65	-80.23	-3,460.09	-13.17	980.70	894.07	86.63	11.320		
13,100.00	9,310.66	14,181.27	8,275.98	69.69	102.67	-90.38	-3,580.57	-13.81	982.43	896.03	86.39	11.372		
13,200.00	9,311.07	14,064.60	8,277.50	71.16	100.76	-98.58	-3,697.23	-12.93	981.44	895.30	86.14	11.393		
13,300.00	9,311.47	13,974.43	8,278.55	72.63	99.28	-93.76	-3,787.39	-12.23	980.66	894.47	86.20	11.377		
13,334.37	9,311.61	13,943.00	8,278.73	73.13	98.76	-92.30	-3,818.81	-12.07	980.61	894.40	86.21	11.375		
13,400.00	9,311.87	13,880.96	8,278.85	74.11	97.74	-90.53	-3,880.86	-11.86	980.77	894.55	86.22	11.375		
13,500.00	9,312.28	13,776.13	8,278.99	75.59	96.03	-92.90	-3,985.68	-11.82	981.11	894.97	86.14	11.390		
13,600.00	9,312.68	13,666.50	8,280.40	77.09	94.23	-97.56	-4,095.31	-11.84	980.29	894.28	86.01	11.397		
13,700.00	9,313.09	13,562.47	8,282.27	78.59	92.53	-99.43	-4,199.32	-12.06	979.01	893.05	85.96	11.389		
13,800.00	9,313.49	13,464.82	8,284.25	80.09	90.93	-98.24	-4,296.95	-12.23	977.50	891.52	85.98	11.369		

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



MS Energy Services Anticollision Report



Company: Devon Energy
Project: Eddy County, New Mexico (NAD 83)
Reference Site: Cotton Draw Unit
Site Error: 0.00 usft
Reference Well: 515H
Well Error: 0.00 usft
Reference Wellbore: Wellbore #1
Reference Design: Design #1

Local Co-ordinate Reference: Well 515H
TVD Reference: Well @ 3566.10usft (Cactus 126)
MD Reference: Well @ 3566.10usft (Cactus 126)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: 5000.1 Conroe DB
Offset TVD Reference: Offset Datum

Offset Design Cotton Draw Unit - 116H - Wellbore #1 - Surveys													Offset Site Error:	0.00 usft
Survey Program: 77-VESSEI_GYRO_DROP_7685-MWD													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis			Distance							
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Azimuth from North (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning	
13,900.00	9,313.90	13,371.77	8,285.55	81.60	89.41	-94.91	-4,389.99	-11.97	976.55	890.51	86.04	11.350		
13,944.78	9,314.08	13,332.55	8,285.86	82.28	88.77	-92.24	-4,429.21	-11.73	976.39	890.30	86.09	11.341		
14,000.00	9,314.30	13,290.29	8,285.71	83.12	88.08	-85.99	-4,471.47	-11.23	976.76	890.55	86.20	11.331		
14,100.00	9,314.71	13,192.96	8,283.93	84.64	86.48	-84.64	-4,568.76	-9.29	978.80	892.64	86.16	11.361		
14,200.00	9,315.11	13,077.52	8,283.47	86.17	84.59	-92.17	-4,684.19	-7.88	979.51	893.56	85.95	11.396		
14,300.00	9,315.51	12,972.21	8,284.29	87.70	82.87	-94.74	-4,789.49	-7.89	979.20	893.31	85.90	11.400		
14,400.00	9,315.92	12,874.90	8,285.20	89.24	81.29	-93.40	-4,886.80	-8.29	978.80	892.86	85.95	11.388		
14,415.67	9,315.98	12,861.61	8,285.29	89.48	81.07	-92.25	-4,900.09	-8.30	978.78	892.81	85.98	11.384		
14,500.00	9,316.32	12,792.46	8,285.02	90.78	79.94	-84.92	-4,969.24	-7.87	979.44	893.31	86.12	11.372		
14,600.00	9,316.73	12,679.75	8,284.13	92.33	78.10	-91.05	-5,081.93	-6.71	980.61	894.64	85.97	11.407		
14,700.00	9,317.13	12,568.98	8,284.93	93.88	76.29	-96.28	-5,192.70	-5.89	980.27	894.42	85.85	11.419		
14,800.00	9,317.54	12,472.12	8,286.32	95.43	74.71	-94.76	-5,289.54	-5.14	979.24	893.35	85.89	11.402		
14,819.77	9,317.62	12,457.48	8,286.41	95.74	74.48	-92.27	-5,304.18	-4.99	979.19	893.25	85.94	11.394		
14,900.00	9,317.94	12,399.07	8,285.97	96.99	73.52	-81.66	-5,362.58	-4.15	980.04	893.89	86.15	11.376		
15,000.00	9,318.34	12,289.27	8,284.35	98.55	71.73	-86.35	-5,472.35	-2.40	981.80	895.77	86.03	11.413		
15,100.00	9,318.75	12,166.46	8,284.33	100.11	69.73	-97.66	-5,595.15	-0.29	982.14	896.38	85.76	11.453		
15,200.00	9,319.15	12,068.98	8,286.36	101.68	68.15	-96.47	-5,692.59	1.53	980.35	894.57	85.77	11.429		
15,229.04	9,319.27	12,048.15	8,286.49	102.13	67.81	-92.34	-5,713.41	1.97	980.23	894.36	85.86	11.416		
15,300.00	9,319.56	11,979.64	8,286.18	103.24	66.69	-91.10	-5,781.90	3.57	980.68	894.81	85.87	11.421		
15,400.00	9,319.96	11,871.11	8,287.04	104.82	64.93	-95.54	-5,890.39	6.29	980.04	894.29	85.75	11.429		
15,500.00	9,320.37	11,747.87	8,288.94	106.39	62.93	-107.36	-6,013.59	8.40	978.92	893.44	85.48	11.452		
15,600.00	9,320.77	11,661.67	8,291.64	107.97	61.54	-100.36	-6,099.74	7.83	976.39	890.66	85.72	11.390		
15,700.00	9,321.18	11,567.19	8,293.27	109.55	60.02	-97.41	-6,194.20	6.69	975.27	889.38	85.89	11.355		
15,762.04	9,321.43	11,515.01	8,293.94	110.53	59.18	-92.35	-6,246.37	6.21	974.86	888.81	86.05	11.329		
15,800.00	9,321.58	11,485.88	8,293.97	111.13	58.72	-87.85	-6,275.51	6.03	975.03	888.86	86.17	11.315		
15,900.00	9,321.98	11,410.96	8,292.74	112.71	57.51	-75.49	-6,350.41	5.84	977.18	890.71	86.47	11.301		
16,000.00	9,322.39	11,332.42	8,289.31	114.30	56.26	-65.93	-6,428.87	5.88	981.93	895.24	86.70	11.326		
16,100.00	9,322.79	11,235.41	8,283.97	115.88	54.71	-64.85	-6,525.74	5.37	987.92	901.13	86.79	11.383		
16,200.00	9,323.20	11,112.78	8,278.60	117.47	52.76	-75.04	-6,648.23	3.10	993.02	906.27	86.75	11.447		
16,300.00	9,323.60	10,986.13	8,276.54	119.07	50.75	-87.66	-6,774.84	2.04	995.17	908.54	86.64	11.487		
16,400.00	9,324.01	10,875.51	8,276.50	120.66	48.98	-92.77	-6,885.46	3.53	995.52	908.93	86.59	11.497		
16,500.00	9,324.41	10,765.32	8,276.96	122.25	47.23	-97.74	-6,995.62	5.66	995.39	908.85	86.54	11.502		
16,600.00	9,324.82	10,633.70	8,281.59	123.85	45.14	-112.53	-7,127.11	9.13	991.87	905.65	86.22	11.504		
16,700.00	9,325.22	10,532.51	8,286.26	125.45	43.54	-113.37	-7,228.15	11.90	987.44	901.16	86.28	11.445		
16,800.00	9,325.62	10,436.87	8,290.56	127.05	42.03	-111.71	-7,323.68	14.15	983.18	896.75	86.43	11.376		
16,900.00	9,326.03	10,358.50	8,293.30	128.65	40.81	-101.45	-7,401.98	15.20	980.08	893.27	86.81	11.290		
17,000.00	9,326.43	10,272.06	8,294.39	130.25	39.46	-94.48	-7,488.41	14.64	979.32	892.18	87.13	11.239		
17,080.69	9,326.76	10,195.46	8,295.06	131.55	38.28	-92.36	-7,565.01	14.28	979.04	891.72	87.32	11.212		
17,100.00	9,326.84	10,178.50	8,295.12	131.86	38.02	-91.16	-7,581.97	14.27	979.07	891.68	87.38	11.205		
17,200.00	9,327.24	10,074.23	8,295.11	133.46	36.42	-93.33	-7,686.24	14.65	979.53	892.01	87.52	11.192		
17,300.00	9,327.65	9,974.47	8,296.06	135.07	34.90	-93.21	-7,786.00	15.14	979.00	891.29	87.71	11.162		
17,317.07	9,327.72	9,959.08	8,296.12	135.34	34.66	-92.35	-7,801.38	15.33	978.99	891.23	87.76	11.156		
17,400.00	9,328.05	9,882.37	8,296.08	136.68	33.50	-89.17	-7,878.08	16.56	979.27	891.31	87.96	11.133		
17,500.00	9,328.45	9,790.76	8,295.38	138.29	32.12	-84.84	-7,969.67	18.14	980.30	892.09	88.21	11.113		
17,600.00	9,328.86	9,669.34	8,294.63	139.90	30.31	-95.95	-8,091.07	20.26	981.30	893.09	88.22	11.124		
17,700.00	9,329.26	9,547.66	8,297.41	141.51	28.53	-106.96	-8,212.71	21.83	979.32	891.07	88.25	11.097		
17,800.00	9,329.67	9,453.19	8,300.71	143.12	27.17	-104.20	-8,307.11	22.31	976.29	887.69	88.60	11.019		
17,869.83	9,329.95	9,406.20	8,301.47	144.25	26.51	-92.42	-8,354.09	22.46	975.47	886.44	89.03	10.957		
17,900.00	9,330.07	9,378.00	8,301.39	144.73	26.11	-91.38	-8,382.30	22.55	975.67	886.53	89.14	10.945		
18,000.00	9,330.48	9,303.73	8,300.16	146.35	25.08	-78.08	-8,456.55	22.50	977.64	887.98	89.66	10.904		
18,100.00	9,330.88	9,211.86	8,297.56	147.96	23.83	-74.21	-8,548.38	21.99	980.98	890.91	90.07	10.891		
18,200.00	9,331.29	9,128.89	8,294.22	149.58	22.73	-66.53	-8,631.29	21.81	985.48	894.95	90.53	10.885		

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



MS Energy Services
Anticollision Report



Company: Devon Energy
Project: Eddy County, New Mexico (NAD 83)
Reference Site: Cotton Draw Unit
Site Error: 0.00 usft
Reference Well: 515H
Well Error: 0.00 usft
Reference Wellbore: Wellbore #1
Reference Design: Design #1

Local Co-ordinate Reference: Well 515H
TVD Reference: Well @ 3566.10usft (Cactus 126)
MD Reference: Well @ 3566.10usft (Cactus 126)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at: 2.00 sigma
Database: 5000.1 Conroe DB
Offset TVD Reference: Offset Datum

Offset Design: Cotton Draw Unit - 116H - Wellbore #1 - Surveys													Offset Site Error:	0.00 usft
Survey Program: 77-VESSI_GYRO_DROP, 7685-MWD													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Azimuth from North (')	Offset Wellbore Centre		Distance		Minimum Separation (usft)	Separation Factor	Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)				
18,300.00	9,331.69	9,012.22	8,289.07	151.20	21.24	-74.08	-8,747.84	22.24	990.34	899.50	90.84	10.902		
18,400.00	9,332.09	8,885.19	8,286.93	152.81	19.70	-87.54	-8,874.85	22.74	992.39	901.27	91.12	10.891		
18,500.00	9,332.50	8,781.29	8,286.82	154.43	18.52	-89.54	-8,978.75	22.79	992.94	901.35	91.59	10.841		
18,600.00	9,332.90	8,686.85	8,286.43	156.05	17.52	-86.69	-9,073.19	23.68	993.73	901.60	92.13	10.786		
18,700.00	9,333.31	8,627.00	8,284.95	157.67	16.93	-67.17	-9,132.98	25.43	996.55	903.73	92.81	10.737 SF		
18,800.00	9,333.71	8,596.00	8,282.60	159.30	16.63	-43.51	-9,163.85	26.97	1,004.78	911.40	93.39	10.759		
18,900.00	9,334.12	8,548.65	8,276.00	160.92	16.20	-32.45	-9,210.63	30.04	1,018.90	925.19	93.71	10.873		
19,000.00	9,334.52	8,501.00	8,266.18	162.54	15.79	-25.03	-9,257.06	34.18	1,038.71	944.86	93.85	11.068		
19,100.00	9,334.93	8,470.00	8,258.34	164.16	15.54	-19.09	-9,286.88	37.40	1,063.61	969.90	93.71	11.350		
19,200.00	9,335.33	8,427.20	8,245.34	165.79	15.21	-15.30	-9,327.26	42.97	1,093.70	1,000.23	93.47	11.701		
19,300.00	9,335.73	8,390.52	8,232.44	167.41	14.95	-12.33	-9,361.15	48.47	1,128.65	1,035.60	93.05	12.130		
19,390.56	9,336.10	8,363.47	8,221.56	168.88	14.77	-10.21	-9,385.46	53.18	1,164.70	1,072.23	92.47	12.596		



MS Energy Services Anticollision Report



Company: Devon Energy
Project: Eddy County, New Mexico (NAD 83)
Reference Site: Cotton Draw Unit
Site Error: 0.00 usft
Reference Well: 515H
Well Error: 0.00 usft
Reference Wellbore: Wellbore #1
Reference Design: Design #1

Local Co-ordinate Reference: Well 515H
TVD Reference: Well @ 3566.10usft (Cactus 126)
MD Reference: Well @ 3566.10usft (Cactus 126)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: 5000.1 Conroe DB
Offset TVD Reference: Offset Datum

Offset Design Cotton Draw Unit - 167H - Wellbore #1 - Surveys													Offset Site Error:	0.00 usft
Survey Program: 40-VESSI_GYROFLEX, 7581-MWD													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Distance							Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Azimuth from North (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor		
0.00	0.00	0.00	0.00	0.00	0.00	-133.26	-2,501.00	-2,657.43	3,649.27					
100.00	100.00	101.55	101.55	0.13	0.12	-133.27	-2,501.12	-2,657.00	3,649.05	3,648.79	0.26	N/A		
200.00	200.00	206.70	206.69	0.49	0.31	-133.28	-2,501.13	-2,656.14	3,648.45	3,647.65	0.80	4,563.111		
300.00	300.00	289.57	289.56	0.85	0.46	-133.29	-2,501.41	-2,655.38	3,648.03	3,646.72	1.30	2,800.049		
323.18	323.18	307.69	307.68	0.93	0.49	-133.29	-2,501.55	-2,655.23	3,648.01	3,646.59	1.42	2,573.511		
400.00	400.00	380.73	380.72	1.21	0.62	-133.31	-2,502.27	-2,654.65	3,648.09	3,646.27	1.82	2,004.526		
500.00	500.00	474.58	474.55	1.57	0.78	-133.33	-2,503.25	-2,653.92	3,648.24	3,645.90	2.34	1,558.088		
600.00	600.00	572.57	572.54	1.93	0.96	-133.34	-2,504.29	-2,653.41	3,648.59	3,645.72	2.87	1,271.147		
700.00	700.00	657.62	657.58	2.29	1.11	-133.35	-2,504.94	-2,653.30	3,649.03	3,645.66	3.38	1,080.622		
800.00	800.00	748.32	748.28	2.64	1.27	-133.36	-2,506.01	-2,653.52	3,650.01	3,646.12	3.89	937.484		
900.00	900.00	849.83	849.79	3.00	1.45	-133.37	-2,507.19	-2,653.71	3,650.94	3,646.51	4.43	824.260		
1,000.00	1,000.00	956.67	956.62	3.36	1.63	-133.39	-2,508.53	-2,653.78	3,651.86	3,646.88	4.97	734.042		
1,100.00	1,100.00	1,056.41	1,056.34	3.72	1.81	-133.40	-2,509.59	-2,653.77	3,652.58	3,647.07	5.51	663.097		
1,200.00	1,200.00	1,154.41	1,154.34	4.08	1.99	-133.41	-2,510.74	-2,653.77	3,653.38	3,647.35	6.04	604.980		
1,300.00	1,300.00	1,262.64	1,262.56	4.44	2.18	-133.43	-2,511.90	-2,653.77	3,654.12	3,647.53	6.59	554.712		
1,400.00	1,400.00	1,362.87	1,362.79	4.79	2.36	-133.44	-2,512.88	-2,653.66	3,654.71	3,647.59	7.12	513.171		
1,500.00	1,500.00	1,457.22	1,457.14	5.15	2.52	-133.45	-2,513.86	-2,653.61	3,655.39	3,647.75	7.65	478.078		
1,600.00	1,600.00	1,567.48	1,567.39	5.51	2.72	-133.46	-2,514.79	-2,653.61	3,655.96	3,647.76	8.20	445.935		
1,700.00	1,700.00	1,664.45	1,664.36	5.87	2.89	-133.47	-2,515.48	-2,653.64	3,656.48	3,647.76	8.73	418.961		
1,800.00	1,800.00	1,767.51	1,767.41	6.23	3.07	-133.48	-2,516.17	-2,653.74	3,657.01	3,647.74	9.27	394.601		
1,900.00	1,900.00	1,874.49	1,874.40	6.59	3.26	-133.48	-2,516.53	-2,653.94	3,657.38	3,647.56	9.81	372.635		
2,000.00	2,000.00	1,978.09	1,978.00	6.95	3.44	-133.47	-2,516.52	-2,654.25	3,657.59	3,647.23	10.36	353.195		
2,100.00	2,100.00	2,082.85	2,082.75	7.30	3.62	-133.47	-2,516.41	-2,654.54	3,657.72	3,646.82	10.90	335.646		
2,200.00	2,200.00	2,188.62	2,188.53	7.66	3.80	-133.46	-2,516.10	-2,654.78	3,657.68	3,646.24	11.44	319.738		
2,300.00	2,300.00	2,285.05	2,284.95	8.02	3.96	-133.46	-2,515.82	-2,654.93	3,657.60	3,645.63	11.97	305.683		
2,307.91	2,307.91	2,292.51	2,292.42	8.05	3.97	-133.46	-2,515.81	-2,654.95	3,657.60	3,645.59	12.01	304.632		
2,400.00	2,400.00	2,365.03	2,364.93	8.38	4.10	-133.46	-2,515.86	-2,655.13	3,657.82	3,645.36	12.46	293.489		
2,500.00	2,500.00	2,465.31	2,465.21	8.74	4.27	-133.46	-2,516.59	-2,655.37	3,658.49	3,645.49	13.00	281.459		
2,600.00	2,599.99	2,566.46	2,566.36	9.10	4.45	-133.49	-2,517.49	-2,655.15	3,659.52	3,645.98	13.53	270.391		
2,700.00	2,699.96	2,664.74	2,664.63	9.45	4.63	-133.53	-2,518.66	-2,654.75	3,661.74	3,647.68	14.06	260.356		
2,800.00	2,799.86	2,752.18	2,752.06	9.81	4.78	-133.60	-2,519.87	-2,654.43	3,665.27	3,650.69	14.58	251.466		
2,900.00	2,899.68	2,840.47	2,840.34	10.17	4.94	-133.69	-2,521.36	-2,654.28	3,670.29	3,655.20	15.09	243.253		
3,000.00	2,999.37	2,931.10	2,930.95	10.53	5.10	-133.81	-2,523.03	-2,654.35	3,676.73	3,661.12	15.61	235.599		
3,100.00	3,098.90	3,025.44	3,025.27	10.89	5.27	-133.93	-2,524.67	-2,654.77	3,684.52	3,668.39	16.13	228.411		
3,200.00	3,198.26	3,121.08	3,120.90	11.25	5.44	-134.08	-2,526.35	-2,655.31	3,693.56	3,676.90	16.66	221.705		
3,299.74	3,297.14	3,249.27	3,249.07	11.61	5.67	-134.24	-2,528.23	-2,655.96	3,703.54	3,686.29	17.25	214.712		
3,300.00	3,297.40	3,249.64	3,249.45	11.61	5.67	-134.24	-2,528.23	-2,655.97	3,703.56	3,686.31	17.25	214.693		
3,400.00	3,396.43	3,345.67	3,345.47	11.98	5.84	-134.41	-2,529.25	-2,656.21	3,713.67	3,695.89	17.78	208.825		
3,500.00	3,495.46	3,422.28	3,422.07	12.36	5.97	-134.58	-2,530.41	-2,656.44	3,724.15	3,705.86	18.28	203.698		
3,600.00	3,594.49	3,501.53	3,501.31	12.73	6.11	-134.76	-2,532.00	-2,656.90	3,735.20	3,716.41	18.79	198.810		
3,700.00	3,693.51	3,590.01	3,589.75	13.11	6.27	-134.93	-2,534.00	-2,657.73	3,746.72	3,727.41	19.31	194.016		
3,800.00	3,792.54	3,708.52	3,708.22	13.49	6.48	-135.11	-2,536.90	-2,658.51	3,758.23	3,738.33	19.89	188.920		
3,900.00	3,891.57	3,832.32	3,831.99	13.87	6.70	-135.30	-2,539.90	-2,658.02	3,768.98	3,748.50	20.48	183.988		
4,000.00	3,990.60	3,930.20	3,929.81	14.25	6.87	-135.50	-2,542.77	-2,656.78	3,779.55	3,758.52	21.03	179.733		
4,100.00	4,089.62	4,027.59	4,027.12	14.64	7.05	-135.72	-2,546.41	-2,654.71	3,790.14	3,768.57	21.57	175.696		
4,200.00	4,188.65	4,113.26	4,112.69	15.02	7.20	-135.93	-2,550.09	-2,652.60	3,800.97	3,778.87	22.09	172.033		
4,300.00	4,287.68	4,190.00	4,189.30	15.41	7.33	-136.15	-2,554.01	-2,650.67	3,812.36	3,789.76	22.60	168.688		
4,400.00	4,386.71	4,268.99	4,268.13	15.80	7.47	-136.37	-2,558.60	-2,648.70	3,824.34	3,801.23	23.11	165.483		
4,500.00	4,485.73	4,396.95	4,395.86	16.19	7.70	-136.63	-2,565.53	-2,645.71	3,836.22	3,812.51	23.72	161.755		
4,600.00	4,484.76	4,498.22	4,497.02	16.59	7.88	-136.84	-2,570.02	-2,643.91	3,847.83	3,823.56	24.27	158.535		
4,700.00	4,683.79	4,631.90	4,630.61	16.98	8.12	-137.05	-2,574.34	-2,641.96	3,858.82	3,833.93	24.89	155.039		
4,800.00	4,782.81	4,744.22	4,742.89	17.37	8.32	-137.25	-2,577.14	-2,640.22	3,869.28	3,843.81	25.47	151.938		

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



MS Energy Services Anticollision Report



Company: Devon Energy
Project: Eddy County, New Mexico (NAD 83)
Reference Site: Cotton Draw Unit
Site Error: 0.00 usft
Reference Well: 515H
Well Error: 0.00 usft
Reference Wellbore: Wellbore #1
Reference Design: Design #1

Local Co-ordinate Reference: Well 515H
TVD Reference: Well @ 3566.10usft (Cactus 126)
MD Reference: Well @ 3566.10usft (Cactus 126)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: 5000.1 Conroe DB
Offset TVD Reference: Offset Datum

Offset Design Cotton Draw Unit - 167H - Wellbore #1 - Surveys														Offset Site Error:	0.00 usft
Survey Program: 40-VESSL_GYROFLEX, 7581-MWD														Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Distance		Warning							
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Azimuth from North (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor			
4,900.00	4,881.84	4,829.02	4,827.65	17.77	8.47	-137.43	-2,579.21	-2,638.95	3,879.78	3,853.79	25.99	149.274			
5,000.00	4,980.87	4,918.98	4,917.57	18.17	8.63	-137.61	-2,581.49	-2,637.98	3,890.67	3,864.14	26.53	146.672			
5,100.00	5,079.90	5,020.51	5,019.08	18.56	8.81	-137.79	-2,583.91	-2,637.17	3,901.67	3,874.58	27.08	144.054			
5,200.00	5,178.92	5,142.62	5,141.16	18.96	9.02	-137.97	-2,586.20	-2,636.26	3,912.38	3,884.70	27.68	141.325			
5,300.00	5,277.95	5,249.49	5,248.01	19.36	9.21	-138.13	-2,587.68	-2,635.36	3,922.69	3,894.44	28.25	138.845			
5,400.00	5,376.98	5,351.80	5,350.32	19.76	9.40	-138.29	-2,588.62	-2,634.83	3,932.90	3,904.09	28.81	136.498			
5,500.00	5,476.01	5,449.62	5,448.14	20.16	9.57	-138.44	-2,589.27	-2,634.46	3,943.04	3,913.68	29.37	134.276			
5,600.00	5,575.03	5,540.47	5,538.98	20.56	9.73	-138.59	-2,589.82	-2,634.45	3,953.42	3,923.51	29.91	132.199			
5,628.09	5,602.86	5,568.65	5,567.16	20.68	9.78	-138.63	-2,589.95	-2,634.53	3,956.36	3,926.29	30.06	131.606			
5,700.00	5,674.12	5,640.50	5,639.01	20.96	9.91	-138.73	-2,590.16	-2,634.83	3,963.55	3,933.09	30.46	130.111			
5,800.00	5,773.42	5,767.34	5,765.85	21.36	10.13	-138.85	-2,590.55	-2,634.97	3,972.35	3,941.29	31.07	127.860			
5,900.00	5,872.91	5,867.68	5,866.19	21.74	10.30	-138.95	-2,590.27	-2,634.78	3,979.25	3,947.64	31.61	125.870			
6,000.00	5,972.56	5,970.01	5,968.52	22.12	10.47	-139.02	-2,589.79	-2,634.99	3,985.03	3,952.87	32.16	123.912			
6,100.00	6,072.35	6,050.77	6,049.28	22.49	10.61	-139.08	-2,589.44	-2,635.29	3,989.69	3,957.03	32.66	122.153			
6,200.00	6,172.23	6,152.31	6,150.81	22.86	10.78	-139.12	-2,589.21	-2,635.96	3,993.45	3,960.25	33.20	120.286			
6,300.00	6,272.18	6,265.59	6,264.09	23.21	10.97	-139.14	-2,588.76	-2,636.45	3,995.67	3,961.91	33.76	118.370			
6,400.00	6,372.17	6,346.09	6,344.59	23.56	11.11	-139.15	-2,588.53	-2,636.80	3,996.71	3,962.47	34.24	116.714			
6,427.83	6,400.00	6,373.49	6,371.99	23.66	11.16	-139.15	-2,588.55	-2,636.91	3,996.86	3,962.47	34.39	116.226			
6,500.00	6,472.17	6,458.71	6,457.21	23.90	11.31	-139.15	-2,588.66	-2,636.98	3,996.96	3,962.17	34.79	114.880			
6,593.07	6,565.24	6,551.65	6,550.15	24.22	11.47	-139.15	-2,588.76	-2,636.87	3,996.96	3,961.68	35.28	113.298			
6,600.00	6,572.17	6,557.49	6,556.00	24.25	11.48	-139.15	-2,588.76	-2,636.86	3,996.96	3,961.65	35.31	113.189			
6,700.00	6,672.17	6,651.52	6,650.02	24.59	11.85	-139.16	-2,588.96	-2,636.82	3,997.09	3,961.27	35.82	111.575			
6,800.00	6,772.17	6,777.75	6,776.26	24.93	11.86	-139.16	-2,588.77	-2,636.69	3,996.91	3,960.51	36.40	109.814			
6,900.00	6,872.17	6,877.35	6,875.85	25.28	12.03	-139.15	-2,588.25	-2,636.38	3,996.31	3,959.39	36.92	108.251			
7,000.00	6,972.17	6,971.26	6,969.75	25.62	12.19	-139.15	-2,587.69	-2,636.56	3,995.98	3,958.55	37.43	106.766			
7,100.00	7,072.17	7,061.62	7,060.11	25.97	12.35	-139.14	-2,587.16	-2,636.74	3,995.67	3,957.74	37.93	105.338			
7,114.65	7,086.82	7,072.83	7,071.32	26.02	12.37	-139.14	-2,587.15	-2,636.75	3,995.67	3,957.66	38.00	105.144			
7,200.00	7,172.17	7,139.32	7,137.81	26.31	12.48	-139.14	-2,587.40	-2,636.71	3,995.88	3,957.46	38.41	104.025			
7,300.00	7,272.17	7,219.91	7,218.41	26.66	12.62	-139.14	-2,587.82	-2,637.11	3,996.60	3,957.70	38.90	102.740			
7,400.00	7,372.17	7,303.06	7,301.54	27.00	12.77	-139.14	-2,588.58	-2,637.72	3,997.77	3,958.37	39.39	101.485			
7,500.00	7,472.17	7,395.52	7,393.99	27.35	12.93	-139.15	-2,589.78	-2,638.41	3,999.24	3,959.33	39.90	100.219			
7,600.00	7,572.17	7,501.07	7,499.53	27.69	13.12	-139.15	-2,591.19	-2,639.21	4,000.74	3,960.29	40.44	98.920			
7,700.00	7,672.17	7,593.46	7,591.91	28.04	13.22	-139.16	-2,592.51	-2,639.89	4,002.30	3,961.40	40.89	97.875			
7,800.00	7,772.17	7,625.19	7,623.64	28.39	13.22	-139.16	-2,593.13	-2,640.19	4,004.65	3,963.44	41.22	97.155			
7,900.00	7,872.17	7,644.00	7,642.43	28.74	13.22	-139.16	-2,593.89	-2,640.56	4,008.99	3,967.45	41.53	96.527			
8,000.00	7,972.17	7,657.17	7,655.56	29.08	13.23	-139.17	-2,594.71	-2,640.90	4,015.41	3,973.58	41.83	95.988			
8,100.00	8,072.17	7,675.00	7,673.31	29.43	13.23	-139.17	-2,596.35	-2,641.45	4,024.00	3,981.88	42.12	95.525			
8,200.00	8,172.17	7,675.00	7,673.31	29.78	13.23	-139.17	-2,596.35	-2,641.45	4,034.76	3,992.37	42.39	95.183			
8,300.00	8,272.17	7,706.00	7,703.95	30.13	13.24	-139.21	-2,600.92	-2,642.32	4,047.65	4,004.97	42.68	94.845			
8,400.00	8,372.17	7,706.00	7,703.95	30.48	13.24	-139.21	-2,600.92	-2,642.32	4,062.51	4,019.60	42.92	94.661			
8,500.00	8,472.17	7,722.39	7,719.99	30.83	13.24	-139.24	-2,604.27	-2,642.64	4,079.54	4,036.38	43.17	94.507			
8,600.00	8,572.17	7,738.00	7,735.15	31.18	13.25	-139.27	-2,607.99	-2,642.87	4,098.62	4,055.21	43.41	94.427			
8,700.00	8,672.17	7,752.21	7,748.83	31.52	13.25	-139.30	-2,611.79	-2,643.00	4,119.68	4,076.05	43.63	94.415			
8,751.58	8,723.75	7,769.00	7,764.88	31.70	13.26	-139.35	-2,616.73	-2,643.08	4,131.36	4,087.59	43.76	94.401			
8,800.00	8,772.11	7,769.00	7,764.88	31.86	13.26	-139.33	-2,616.73	-2,643.08	4,141.35	4,097.51	43.84	94.458			
8,850.00	8,821.68	7,769.00	7,764.88	32.00	13.26	-139.26	-2,616.73	-2,643.08	4,149.42	4,105.51	43.91	94.508			
8,900.00	8,870.51	7,787.59	7,782.46	32.12	13.27	-139.20	-2,622.77	-2,643.00	4,154.92	4,110.93	43.99	94.443			
8,950.00	8,918.22	7,801.00	7,795.01	32.24	13.28	-139.09	-2,627.50	-2,642.80	4,157.99	4,113.93	44.06	94.367			
9,000.00	8,964.46	7,801.00	7,795.01	32.34	13.28	-138.88	-2,627.50	-2,642.80	4,158.55	4,114.46	44.09	94.313			
9,050.00	9,008.86	7,801.00	7,795.01	32.43	13.28	-138.63	-2,627.50	-2,642.80	4,156.71	4,112.60	44.11	94.227			
9,100.00	9,051.09	7,832.00	7,823.52	32.51	13.29	-138.46	-2,639.65	-2,642.11	4,152.31	4,108.11	44.20	93.952			
9,150.00	9,090.83	7,832.00	7,823.52	32.58	13.29	-138.13	-2,639.65	-2,642.11	4,145.35	4,101.15	44.20	93.782			

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

Company: Devon Energy
Project: Eddy County, New Mexico (NAD 83)
Reference Site: Cotton Draw Unit
Site Error: 0.00 usft
Reference Well: 515H
Well Error: 0.00 usft
Reference Wellbore: Wellbore #1
Reference Design: Design #1

Local Co-ordinate Reference: Well 515H
TVD Reference: Well @ 3566.10usft (Cactus 126)
MD Reference: Well @ 3566.10usft (Cactus 126)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: 5000.1 Conroe DB
Offset TVD Reference: Offset Datum

Offset Design Cotton Draw Unit - 167H - Wellbore #1 - Surveys														Offset Site Error: 0.00 usft
Survey Program: 40-VESSI_GYROFLEX, 7581-MWD														Offset Well Error: 0.00 usft
Reference	Offset	Semi Major Axis		Distance		Warning								
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Azimuth from North (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor		
9,200.00	9,127.77	7,832.00	7,823.52	32.65	13.29	-137.75	-2,639.65	-2,642.11	4,136.08	4,091.88	44.20	93.570		
9,250.00	9,161.64	7,832.00	7,823.52	32.71	13.29	-137.34	-2,639.65	-2,642.11	4,124.54	4,080.34	44.20	93.315		
9,300.00	9,192.18	7,832.00	7,823.52	32.78	13.29	-136.89	-2,639.65	-2,642.11	4,110.81	4,066.61	44.20	93.013		
9,350.00	9,219.15	7,863.00	7,851.27	32.85	13.31	-136.55	-2,653.44	-2,641.60	4,094.81	4,050.53	44.27	92.493		
9,400.00	9,242.36	7,863.00	7,851.27	32.92	13.31	-136.03	-2,653.44	-2,641.60	4,076.64	4,032.37	44.27	92.079		
9,450.00	9,261.61	7,863.00	7,851.27	32.99	13.31	-135.49	-2,653.44	-2,641.60	4,056.59	4,012.31	44.28	91.611		
9,500.00	9,276.77	7,863.00	7,851.27	33.08	13.31	-134.91	-2,653.44	-2,641.60	4,034.78	3,990.49	44.30	91.088		
9,550.00	9,287.73	7,863.00	7,851.27	33.17	13.31	-134.32	-2,653.44	-2,641.60	4,011.35	3,967.03	44.32	90.508		
9,600.00	9,294.39	7,863.00	7,851.27	33.27	13.31	-133.71	-2,653.44	-2,641.60	3,986.45	3,942.10	44.36	89.873		
9,649.26	9,296.70	7,863.00	7,851.27	33.37	13.31	-133.09	-2,653.44	-2,641.60	3,960.64	3,916.24	44.40	89.194		
9,700.00	9,296.91	7,863.00	7,851.27	33.49	13.31	-132.44	-2,653.44	-2,641.60	3,933.35	3,888.88	44.47	88.456		
9,800.00	9,297.31	7,895.00	7,879.06	33.80	13.34	-131.35	-2,669.29	-2,641.91	3,878.72	3,834.00	44.72	86.731		
9,900.00	9,297.72	7,895.00	7,879.06	34.17	13.34	-130.07	-2,669.29	-2,641.91	3,823.06	3,778.13	44.94	85.075		
10,000.00	9,298.12	7,895.00	7,879.06	34.62	13.34	-128.78	-2,669.29	-2,641.91	3,766.62	3,721.41	45.20	83.327		
10,027.33	9,298.24	7,895.00	7,879.06	34.75	13.34	-128.43	-2,669.29	-2,641.91	3,751.05	3,705.77	45.28	82.835		
10,100.00	9,298.53	7,895.00	7,879.06	35.13	13.34	-127.47	-2,669.29	-2,641.91	3,710.08	3,664.56	45.52	81.508		
10,200.00	9,298.93	7,907.83	7,889.93	35.71	13.35	-126.21	-2,676.10	-2,642.30	3,655.16	3,609.22	45.94	79.567		
10,300.00	9,299.34	7,926.00	7,905.03	36.35	13.36	-124.95	-2,686.17	-2,643.00	3,602.18	3,555.73	46.44	77.560		
10,400.00	9,299.74	7,926.00	7,905.03	37.06	13.36	-123.51	-2,686.17	-2,643.00	3,550.90	3,503.94	46.96	75.611		
10,500.00	9,300.15	7,939.02	7,915.67	37.83	13.37	-122.12	-2,693.66	-2,643.56	3,501.64	3,454.05	47.60	73.570		
10,600.00	9,300.55	7,958.00	7,930.94	38.65	13.38	-120.75	-2,704.91	-2,644.32	3,454.31	3,405.99	48.32	71.487		
10,700.00	9,300.96	7,980.42	7,948.61	39.53	13.40	-119.39	-2,718.67	-2,645.08	3,408.88	3,359.75	49.13	69.383		
10,800.00	9,301.36	8,003.61	7,966.45	40.45	13.43	-118.00	-2,733.49	-2,645.63	3,365.35	3,315.34	50.02	67.285		
10,900.00	9,301.76	8,020.00	7,978.69	41.42	13.46	-116.52	-2,744.39	-2,645.84	3,323.84	3,272.89	50.95	65.241		
11,000.00	9,302.17	8,052.00	8,001.66	42.44	13.55	-115.20	-2,766.66	-2,645.96	3,284.40	3,232.40	52.00	63.157		
11,100.00	9,302.57	8,069.89	8,014.01	43.49	13.60	-113.68	-2,779.61	-2,645.92	3,247.07	3,193.99	53.08	61.178		
11,200.00	9,302.98	8,099.95	8,034.12	44.58	13.70	-112.30	-2,801.94	-2,645.75	3,211.82	3,157.56	54.26	59.195		
11,300.00	9,303.38	8,128.88	8,052.93	45.71	13.80	-110.88	-2,823.92	-2,645.58	3,178.58	3,123.08	55.50	57.272		
11,400.00	9,303.79	8,146.00	8,063.82	46.86	13.87	-109.28	-2,837.13	-2,645.56	3,147.57	3,090.82	56.75	55.467		
11,500.00	9,304.19	8,177.00	8,082.84	48.05	14.00	-107.85	-2,861.60	-2,645.56	3,118.72	3,060.61	58.11	53.669		
11,600.00	9,304.60	8,209.00	8,101.35	49.26	14.16	-106.44	-2,887.71	-2,645.48	3,092.11	3,032.58	59.53	51.942		
11,700.00	9,305.00	8,240.00	8,118.25	50.50	14.32	-105.00	-2,913.69	-2,645.42	3,067.76	3,006.76	60.99	50.297		
11,800.00	9,305.40	8,271.00	8,134.45	51.76	14.50	-103.55	-2,940.12	-2,645.50	3,045.59	2,983.09	62.50	48.729		
11,900.00	9,305.81	8,303.00	8,150.57	53.05	14.70	-102.11	-2,967.76	-2,645.73	3,025.53	2,961.48	64.05	47.234		
12,000.00	9,306.21	8,346.87	8,170.76	54.35	15.00	-100.88	-3,006.70	-2,646.06	3,007.70	2,941.98	65.72	45.763		
12,100.00	9,306.62	8,421.85	8,201.23	55.67	15.57	-100.24	-3,075.19	-2,645.40	2,991.22	2,923.56	67.66	44.208		
12,200.00	9,307.02	8,460.00	8,214.05	57.01	15.89	-98.94	-3,111.10	-2,644.55	2,976.54	2,907.16	69.37	42.905		
12,300.00	9,307.43	8,477.15	8,218.82	58.37	16.05	-97.23	-3,127.56	-2,644.18	2,964.22	2,893.29	70.94	41.786		
12,400.00	9,307.83	8,491.00	8,222.23	59.74	16.17	-95.44	-3,140.98	-2,643.91	2,954.55	2,882.08	72.47	40.770		
12,500.00	9,308.23	8,523.00	8,228.65	61.13	16.47	-94.02	-3,172.33	-2,643.78	2,947.55	2,873.40	74.15	39.750		
12,600.00	9,308.64	8,537.67	8,230.93	62.53	16.62	-92.23	-3,186.82	-2,643.98	2,943.28	2,867.61	75.67	38.895		
12,700.00	9,309.04	8,566.34	8,234.05	63.94	16.90	-90.74	-3,215.30	-2,644.50	2,941.63	2,864.33	77.31	38.052		
12,723.56	9,309.14	8,575.55	8,234.66	64.27	17.00	-90.44	-3,224.49	-2,644.64	2,941.57	2,863.86	77.71	37.852		
12,800.00	9,309.45	8,651.36	8,235.45	65.36	17.81	-90.43	-3,300.28	-2,644.56	2,941.75	2,862.26	79.49	37.008		
12,900.00	9,309.85	8,818.97	8,230.33	66.80	19.76	-91.84	-3,467.70	-2,639.06	2,940.43	2,857.85	82.59	35.605		
13,000.00	9,310.26	8,960.09	8,232.63	68.24	21.56	-92.70	-3,608.68	-2,633.21	2,936.39	2,850.79	85.59	34.306		
13,100.00	9,310.66	9,016.00	8,233.17	69.69	22.29	-91.78	-3,664.55	-2,631.35	2,933.57	2,845.89	87.67	33.461		
13,200.00	9,311.07	9,053.53	8,233.14	71.16	22.80	-90.47	-3,702.08	-2,630.68	2,932.53	2,843.00	89.53	32.754		
13,202.09	9,311.07	9,054.41	8,233.14	71.19	22.81	-90.44	-3,702.95	-2,630.67	2,932.53	2,842.96	89.57	32.740		
13,300.00	9,311.47	9,110.00	8,232.65	72.63	23.56	-89.55	-3,758.54	-2,630.83	2,933.56	2,841.94	91.62	32.020		
13,400.00	9,311.87	9,173.88	8,231.59	74.11	24.44	-88.80	-3,822.40	-2,631.74	2,935.99	2,842.19	93.81	31.298		
13,500.00	9,312.28	9,265.72	8,229.58	75.59	25.73	-88.63	-3,914.22	-2,632.99	2,938.77	2,842.38	96.39	30.489		



MS Energy Services Anticollision Report



Company: Devon Energy
Project: Eddy County, New Mexico (NAD 83)
Reference Site: Cotton Draw Unit
Site Error: 0.00 usft
Reference Well: 515H
Well Error: 0.00 usft
Reference Wellbore: Wellbore #1
Reference Design: Design #1

Local Co-ordinate Reference: Well 515H
TVD Reference: Well @ 3566.10usft (Cactus 126)
MD Reference: Well @ 3566.10usft (Cactus 126)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: 5000.1 Conroe DB
Offset TVD Reference: Offset Datum

Offset Design Cotton Draw Unit - 167H - Wellbore #1 - Surveys													Offset Site Error: 0.00 usft
Survey Program: 40-VESSEL_GYROFLEX, 7581-MWD													Offset Well Error: 0.00 usft
Reference		Offset		Semi Major Axis		Distance		Minimum Separation		Warning			
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Azimuth from North (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	
13,600.00	9,312.68	9,410.99	8,228.39	77.09	27.80	-89.57	-4,059.46	-2,635.01	2,941.15	2,841.38	99.77	29.480	
13,700.00	9,313.09	9,502.08	8,229.75	78.59	29.13	-89.39	-4,150.53	-2,636.32	2,942.67	2,840.23	102.44	28.726	
13,800.00	9,313.49	9,579.09	8,231.47	80.09	30.27	-88.91	-4,227.50	-2,638.13	2,944.77	2,839.84	104.93	28.063	
13,900.00	9,313.90	9,710.87	8,231.90	81.60	32.24	-89.57	-4,359.25	-2,639.70	2,946.40	2,838.16	108.24	27.221	
14,000.00	9,314.30	9,789.31	8,230.98	83.12	33.43	-89.12	-4,437.68	-2,640.21	2,948.16	2,837.39	110.77	26.616	
14,100.00	9,314.71	14,100.00	8,229.49	84.64	99.46	-89.69	-4,564.91	-2,641.47	2,950.32	2,776.00	174.33	16.924	
14,200.00	9,315.11	10,081.41	8,230.26	86.17	37.91	-91.04	-4,729.74	-2,639.59	2,949.39	2,831.52	117.88	25.021	
14,300.00	9,315.51	10,148.00	8,230.00	87.70	38.95	-90.35	-4,796.32	-2,638.75	2,949.05	2,828.75	120.30	24.514	
14,331.02	9,315.64	10,223.29	8,228.96	88.18	40.12	-91.27	-4,871.59	-2,637.37	2,948.95	2,827.11	121.83	24.205	
14,400.00	9,315.92	10,303.69	8,227.83	89.24	41.39	-91.51	-4,951.94	-2,634.83	2,947.74	2,823.75	124.00	23.773	
14,500.00	9,316.32	10,426.21	8,225.86	90.78	43.32	-91.98	-5,074.37	-2,630.49	2,945.78	2,818.56	127.22	23.155	
14,600.00	9,316.73	10,475.37	8,224.42	92.33	44.10	-90.91	-5,123.47	-2,628.62	2,944.09	2,814.67	129.42	22.749	
14,641.15	9,316.89	10,494.00	8,223.68	92.97	44.40	-90.44	-5,142.08	-2,628.11	2,943.93	2,813.64	130.29	22.596	
14,700.00	9,317.13	10,526.00	8,222.16	93.88	44.90	-89.88	-5,174.04	-2,627.49	2,944.26	2,812.67	131.60	22.373	
14,800.00	9,317.54	10,588.11	8,218.90	95.43	45.89	-89.09	-5,236.06	-2,626.90	2,945.95	2,812.02	133.92	21.998	
14,900.00	9,317.94	10,714.02	8,213.30	96.99	47.88	-89.63	-5,361.84	-2,626.56	2,948.15	2,810.93	137.22	21.485	
15,000.00	9,318.34	10,862.46	8,213.43	98.55	50.25	-90.64	-5,510.25	-2,624.73	2,947.22	2,806.29	140.93	20.913	
15,021.10	9,318.43	10,874.39	8,213.62	98.88	50.44	-90.45	-5,522.18	-2,624.69	2,947.18	2,805.76	141.42	20.840	
15,100.00	9,318.75	10,904.00	8,214.13	100.11	50.92	-89.41	-5,551.78	-2,624.78	2,947.71	2,804.69	143.01	20.611	
15,200.00	9,319.15	10,964.11	8,214.87	101.68	51.87	-88.58	-5,611.87	-2,625.84	2,949.78	2,804.41	145.37	20.292	
15,300.00	9,319.56	11,025.66	8,215.13	103.24	52.85	-87.78	-5,673.39	-2,628.08	2,953.63	2,805.91	147.72	19.995	
15,400.00	9,319.96	11,356.57	8,218.67	104.82	58.16	-92.59	-6,004.07	-2,629.49	2,955.05	2,800.73	154.31	19.150	
15,500.00	9,320.37	11,708.79	8,216.83	106.39	63.92	-97.86	-6,354.06	-2,593.62	2,944.40	2,784.31	160.09	18.392	
15,600.00	9,320.77	11,753.00	8,217.18	107.97	64.84	-96.71	-6,397.94	-2,588.28	2,933.46	2,770.94	162.52	18.050	
15,700.00	9,321.18	11,783.37	8,217.38	109.55	65.14	-95.25	-6,428.16	-2,585.29	2,924.59	2,759.83	164.75	17.751	
15,800.00	9,321.58	11,819.71	8,217.67	111.13	65.74	-93.91	-6,464.40	-2,582.50	2,917.89	2,750.90	166.99	17.473	
15,900.00	9,321.98	11,847.00	8,217.92	112.71	66.18	-92.37	-6,491.64	-2,580.98	2,913.41	2,744.36	169.05	17.234	
16,000.00	9,322.39	11,893.35	8,218.19	114.30	66.94	-91.24	-6,537.96	-2,579.42	2,911.01	2,739.71	171.29	16.994	
16,055.77	9,322.61	11,914.02	8,218.20	115.18	67.27	-90.49	-6,558.63	-2,579.11	2,910.63	2,738.18	172.45	16.879 CC	
16,100.00	9,322.79	11,941.00	8,218.09	115.88	67.71	-90.12	-6,585.61	-2,579.06	2,910.86	2,737.35	173.51	16.776	
16,200.00	9,323.20	11,986.03	8,217.66	117.47	68.44	-88.96	-6,630.64	-2,579.49	2,912.54	2,736.91	175.63	16.583	
16,300.00	9,323.60	12,172.08	8,218.60	119.07	71.46	-90.78	-6,816.63	-2,579.74	2,912.97	2,732.90	180.06	16.178	
16,327.91	9,323.71	12,184.06	8,218.81	119.51	71.66	-90.44	-6,828.61	-2,579.69	2,912.89	2,732.22	180.67	16.123	
16,400.00	9,324.01	12,224.00	8,219.13	120.66	72.31	-89.76	-6,868.54	-2,579.91	2,913.43	2,731.08	182.35	15.977	
16,500.00	9,324.41	12,254.88	8,219.12	122.25	72.81	-88.30	-6,899.42	-2,580.54	2,915.83	2,731.62	184.21	15.828	
16,600.00	9,324.82	12,318.00	8,218.73	123.85	73.83	-87.52	-6,962.47	-2,583.41	2,920.60	2,734.01	186.59	15.652	
16,700.00	9,325.22	12,354.69	8,218.58	125.45	74.41	-86.19	-6,999.08	-2,585.78	2,926.80	2,738.37	188.43	15.532	
16,800.00	9,325.62	12,432.08	8,219.38	127.05	75.65	-85.72	-7,076.27	-2,591.36	2,933.88	2,742.82	191.06	15.356	
16,900.00	9,326.03	12,481.77	8,218.89	128.65	76.45	-84.67	-7,125.79	-2,595.33	2,942.38	2,749.32	193.07	15.240	
17,000.00	9,326.43	17,000.00	8,215.85	130.25	149.83	-88.83	-7,423.88	-2,611.72	2,949.00	2,684.38	264.62	11.144 ES	
17,100.00	9,326.84	12,911.64	8,217.68	131.86	83.40	-89.48	-7,555.05	-2,613.72	2,950.48	2,746.91	203.57	14.494	
17,200.00	9,327.24	13,059.88	8,218.44	133.46	85.82	-90.49	-7,703.28	-2,615.06	2,952.15	2,744.73	207.42	14.233	
17,300.00	9,327.65	13,241.80	8,219.07	135.07	88.81	-92.21	-7,885.07	-2,608.94	2,948.74	2,737.09	211.65	13.932	
17,400.00	9,328.05	13,306.45	8,217.89	136.68	89.87	-91.47	-7,949.67	-2,606.43	2,946.52	2,732.34	214.17	13.758	
17,500.00	9,328.45	13,380.56	8,215.87	138.29	91.09	-90.92	-8,023.71	-2,604.17	2,945.38	2,728.58	216.80	13.586	
17,600.00	9,328.86	13,498.57	8,212.28	139.90	93.03	-91.30	-8,141.59	-2,600.12	2,944.01	2,723.98	220.03	13.380	
17,700.00	9,329.26	13,576.78	8,211.77	141.51	94.32	-90.84	-8,219.78	-2,598.45	2,943.00	2,720.25	222.75	13.212	
17,789.49	9,329.63	13,647.33	8,211.94	142.95	95.48	-90.44	-8,290.32	-2,597.73	2,942.71	2,717.51	225.20	13.067	
17,800.00	9,329.67	13,654.00	8,211.96	143.12	95.59	-90.36	-8,297.00	-2,597.69	2,942.72	2,717.26	225.46	13.052	
17,900.00	9,330.07	13,717.26	8,211.85	144.73	96.63	-89.59	-8,360.26	-2,597.65	2,943.45	2,715.52	227.93	12.914	
18,000.00	9,330.48	13,789.32	8,211.24	146.35	97.80	-89.01	-8,432.31	-2,598.37	2,945.39	2,714.88	230.51	12.777	
18,100.00	9,330.88	13,871.66	8,210.59	147.96	99.15	-88.64	-8,514.64	-2,599.80	2,948.02	2,714.75	233.27	12.638	

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



MS Energy Services
Anticollision Report



Company: Devon Energy
Project: Eddy County, New Mexico (NAD 83)
Reference Site: Cotton Draw Unit
Site Error: 0.00 usft
Reference Well: 515H
Well Error: 0.00 usft
Reference Wellbore: Wellbore #1
Reference Design: Design #1

Local Co-ordinate Reference: Well 515H
TVD Reference: Well @ 3566.10usft (Cactus 126)
MD Reference: Well @ 3566.10usft (Cactus 126)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: 5000.1 Conroe DB
Offset TVD Reference: Offset Datum

Offset Design Cotton Draw Unit - 167H - Wellbore #1 - Surveys													Offset Site Error: 0.00 usft
Survey Program: 40-VESSI_GYROFLEX, 7581-MWD													Offset Well Error: 0.00 usft
Reference		Offset		Semi Major Axis		Distance							
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Azimuth from North (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
18,200.00	9,331.29	13,957.09	8,209.88	149.58	100.55	-88.33	-8,600.04	-2,601.83	2,951.24	2,715.17	236.07	12.502	
18,300.00	9,331.69	14,092.20	8,209.59	151.20	102.75	-89.07	-8,735.10	-2,605.25	2,954.50	2,714.73	239.78	12.322	
18,400.00	9,332.09	14,342.66	8,218.78	152.81	106.87	-92.21	-8,985.31	-2,603.87	2,952.06	2,706.71	245.35	12.032	
18,500.00	9,332.50	14,408.00	8,218.40	154.43	107.95	-91.49	-9,050.61	-2,601.57	2,949.76	2,701.84	247.92	11.898	
18,600.00	9,332.90	14,474.66	8,216.56	156.05	109.05	-90.79	-9,117.21	-2,599.48	2,948.61	2,698.16	250.45	11.773	
18,700.00	9,333.31	14,577.72	8,213.43	157.67	110.75	-90.85	-9,220.19	-2,597.04	2,948.28	2,694.80	253.48	11.631	
18,800.00	9,333.71	14,682.46	8,212.43	159.30	112.47	-90.95	-9,324.91	-2,594.92	2,947.48	2,690.89	256.59	11.487	
18,900.00	9,334.12	14,780.46	8,212.58	160.92	114.09	-90.91	-9,422.89	-2,593.39	2,946.69	2,687.07	259.63	11.350	
18,947.04	9,334.31	14,805.48	8,212.65	161.68	114.50	-90.45	-9,447.91	-2,593.11	2,946.50	2,685.76	260.74	11.301	
19,000.00	9,334.52	14,831.06	8,212.68	162.54	114.92	-89.87	-9,473.50	-2,593.05	2,946.75	2,684.82	261.93	11.250	
19,100.00	9,334.93	14,879.00	8,212.59	164.16	115.71	-88.78	-9,521.43	-2,593.57	2,948.55	2,684.44	264.12	11.164	
19,200.00	9,335.33	14,946.31	8,212.82	165.79	116.81	-88.10	-9,588.71	-2,595.49	2,951.79	2,685.18	266.61	11.071	
19,300.00	9,335.73	15,041.99	8,214.56	167.41	118.37	-88.01	-9,684.28	-2,599.64	2,955.84	2,686.16	269.69	10.960	
19,390.56	9,336.10	15,098.00	8,215.86	168.88	119.28	-87.29	-9,740.22	-2,602.11	2,959.62	2,687.77	271.85	10.887 SF	



MS Energy Services Anticollision Report



Company: Devon Energy
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Well Error: 0.00 usft
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Local Co-ordinate Reference: Well 515H
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Output errors are at 2.00 sigma
Database: 5000.1 Conroe DB
Offset TVD Reference: Offset Datum

Offset Design Cotton Draw Unit - 167H - Wellbore #2 - Surveys													Offset Site Error:	0.00 usft
Survey Program: 40-VESL_GYROFLEX, 7532-MWD													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Azimuth from North (°)	Distance		Minimum Separation (usft)	Separation Factor	Warning			
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N/-S (usft)	+E/-W (usft)				Between Centres (usft)	Between Ellipses (usft)	
0.00	0.00	0.00	0.00	0.00	0.00	-133.26	-2,501.00	-2,657.43	3,649.27					
100.00	100.00	101.55	101.55	0.13	0.12	-133.27	-2,501.12	-2,657.00	3,649.05	3,648.79	0.26	N/A		
200.00	200.00	206.70	206.69	0.49	0.31	-133.28	-2,501.13	-2,656.14	3,648.45	3,647.65	0.80	4,563.111		
300.00	300.00	289.57	289.56	0.85	0.46	-133.29	-2,501.41	-2,655.38	3,648.03	3,646.72	1.30	2,800.049		
323.18	323.18	307.69	307.68	0.93	0.49	-133.29	-2,501.55	-2,655.23	3,648.01	3,646.59	1.42	2,573.511		
400.00	400.00	380.73	380.72	1.21	0.62	-133.31	-2,502.27	-2,654.65	3,648.09	3,646.27	1.82	2,004.526		
500.00	500.00	474.58	474.55	1.57	0.78	-133.33	-2,503.25	-2,653.92	3,648.24	3,645.90	2.34	1,558.088		
600.00	600.00	572.57	572.54	1.93	0.96	-133.34	-2,504.29	-2,653.41	3,648.59	3,645.72	2.87	1,271.147		
700.00	700.00	657.62	657.58	2.29	1.11	-133.35	-2,504.94	-2,653.30	3,649.03	3,645.66	3.38	1,080.622		
800.00	800.00	748.32	748.28	2.64	1.27	-133.36	-2,506.01	-2,653.52	3,650.01	3,646.12	3.89	937.484		
900.00	900.00	849.83	849.79	3.00	1.45	-133.37	-2,507.19	-2,653.71	3,650.94	3,646.51	4.43	824.260		
1,000.00	1,000.00	956.67	956.62	3.36	1.63	-133.39	-2,508.53	-2,653.78	3,651.86	3,646.88	4.97	734.042		
1,100.00	1,100.00	1,056.41	1,056.34	3.72	1.81	-133.40	-2,509.59	-2,653.77	3,652.58	3,647.07	5.51	663.097		
1,200.00	1,200.00	1,154.41	1,154.34	4.08	1.99	-133.41	-2,510.74	-2,653.77	3,653.38	3,647.35	6.04	604.980		
1,300.00	1,300.00	1,262.64	1,262.56	4.44	2.18	-133.43	-2,511.90	-2,653.77	3,654.12	3,647.53	6.59	554.712		
1,400.00	1,400.00	1,362.87	1,362.79	4.79	2.36	-133.44	-2,512.88	-2,653.66	3,654.71	3,647.59	7.12	513.171		
1,500.00	1,500.00	1,457.22	1,457.14	5.15	2.52	-133.45	-2,513.86	-2,653.61	3,655.39	3,647.75	7.65	478.078		
1,600.00	1,600.00	1,567.48	1,567.39	5.51	2.72	-133.46	-2,514.79	-2,653.61	3,655.96	3,647.76	8.20	445.935		
1,700.00	1,700.00	1,664.45	1,664.36	5.87	2.89	-133.47	-2,515.48	-2,653.64	3,656.48	3,647.76	8.73	418.961		
1,800.00	1,800.00	1,767.51	1,767.41	6.23	3.07	-133.48	-2,516.17	-2,653.74	3,657.01	3,647.74	9.27	394.601		
1,900.00	1,900.00	1,874.49	1,874.40	6.59	3.26	-133.48	-2,516.53	-2,653.94	3,657.38	3,647.56	9.81	372.635		
2,000.00	2,000.00	1,978.09	1,978.00	6.95	3.44	-133.47	-2,516.52	-2,654.25	3,657.59	3,647.23	10.36	353.195		
2,100.00	2,100.00	2,082.85	2,082.75	7.30	3.62	-133.47	-2,516.41	-2,654.54	3,657.72	3,646.82	10.90	335.646		
2,200.00	2,200.00	2,188.62	2,188.53	7.66	3.80	-133.46	-2,516.10	-2,654.78	3,657.68	3,646.24	11.44	319.738		
2,300.00	2,300.00	2,285.05	2,284.95	8.02	3.96	-133.46	-2,515.82	-2,654.93	3,657.60	3,645.63	11.97	305.683		
2,307.91	2,307.91	2,292.51	2,292.42	8.05	3.97	-133.46	-2,515.81	-2,654.95	3,657.60	3,645.59	12.01	304.632		
2,400.00	2,400.00	2,365.03	2,364.93	8.38	4.10	-133.46	-2,515.86	-2,655.13	3,657.82	3,645.36	12.46	293.489		
2,500.00	2,500.00	2,465.31	2,465.21	8.74	4.27	-133.46	-2,516.59	-2,655.37	3,658.49	3,645.49	13.00	281.459		
2,600.00	2,599.99	2,566.46	2,566.36	9.10	4.45	-133.49	-2,517.49	-2,655.15	3,659.52	3,645.98	13.53	270.391		
2,700.00	2,699.96	2,664.74	2,664.63	9.45	4.63	-133.53	-2,518.66	-2,654.75	3,661.74	3,647.68	14.06	260.356		
2,800.00	2,799.86	2,752.18	2,752.06	9.81	4.78	-133.60	-2,519.87	-2,654.43	3,665.27	3,650.69	14.58	251.466		
2,900.00	2,899.68	2,840.47	2,840.34	10.17	4.94	-133.69	-2,521.36	-2,654.28	3,670.29	3,655.20	15.09	243.253		
3,000.00	2,999.37	2,931.10	2,930.95	10.53	5.10	-133.81	-2,523.03	-2,654.35	3,676.73	3,661.12	15.61	235.599		
3,100.00	3,098.90	3,025.44	3,025.27	10.89	5.27	-133.93	-2,524.67	-2,654.77	3,684.52	3,668.39	16.13	228.411		
3,200.00	3,198.26	3,121.08	3,120.90	11.25	5.44	-134.08	-2,526.35	-2,655.31	3,693.56	3,676.90	16.66	221.705		
3,299.74	3,297.14	3,249.27	3,249.07	11.61	5.67	-134.24	-2,528.23	-2,655.96	3,703.54	3,686.29	17.25	214.712		
3,300.00	3,297.40	3,249.64	3,249.45	11.61	5.67	-134.24	-2,528.23	-2,655.97	3,703.56	3,686.31	17.25	214.693		
3,400.00	3,396.43	3,345.67	3,345.47	11.98	5.84	-134.41	-2,529.25	-2,656.21	3,713.67	3,695.89	17.78	208.825		
3,500.00	3,495.46	3,422.28	3,422.07	12.36	5.97	-134.58	-2,530.41	-2,656.44	3,724.15	3,705.86	18.28	203.698		
3,600.00	3,594.49	3,501.53	3,501.31	12.73	6.11	-134.76	-2,532.00	-2,656.90	3,735.20	3,716.41	18.79	198.810		
3,700.00	3,693.51	3,590.01	3,589.75	13.11	6.27	-134.93	-2,534.00	-2,657.73	3,746.72	3,727.41	19.31	194.016		
3,800.00	3,792.54	3,708.52	3,708.22	13.49	6.48	-135.11	-2,536.90	-2,658.51	3,758.23	3,738.33	19.89	188.920		
3,900.00	3,891.57	3,832.32	3,831.99	13.87	6.70	-135.30	-2,539.90	-2,658.02	3,768.98	3,748.50	20.48	183.988		
4,000.00	3,990.60	3,930.20	3,929.81	14.25	6.87	-135.50	-2,542.77	-2,656.78	3,779.55	3,758.52	21.03	179.733		
4,100.00	4,089.62	4,027.59	4,027.12	14.64	7.05	-135.72	-2,546.41	-2,654.71	3,790.14	3,768.57	21.57	175.696		
4,200.00	4,188.65	4,113.26	4,112.69	15.02	7.20	-135.93	-2,550.09	-2,652.60	3,800.97	3,778.87	22.09	172.033		
4,300.00	4,287.68	4,190.00	4,189.30	15.41	7.33	-136.15	-2,554.01	-2,650.67	3,812.36	3,789.76	22.60	168.688		
4,400.00	4,386.71	4,268.99	4,268.13	15.80	7.47	-136.37	-2,558.60	-2,648.70	3,824.34	3,801.23	23.11	165.483		
4,500.00	4,485.73	4,396.95	4,395.86	16.19	7.70	-136.63	-2,565.53	-2,645.71	3,836.22	3,812.51	23.72	161.755		
4,600.00	4,584.76	4,498.22	4,497.02	16.59	7.88	-136.84	-2,570.02	-2,643.91	3,847.83	3,823.56	24.27	158.535		
4,700.00	4,683.79	4,631.90	4,630.61	16.98	8.12	-137.05	-2,574.34	-2,641.96	3,858.82	3,833.93	24.89	155.039		
4,800.00	4,782.81	4,744.22	4,742.89	17.37	8.32	-137.25	-2,577.14	-2,640.22	3,869.28	3,843.81	25.47	151.938		

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



MS Energy Services Anticollision Report



Company: Devon Energy
Project: Eddy County, New Mexico (NAD 83)
Reference Site: Cotton Draw Unit
Site Error: 0.00 usft
Reference Well: 515H
Well Error: 0.00 usft
Reference Wellbore: Wellbore #1
Reference Design: Design #1

Local Co-ordinate Reference: Well 515H
TVD Reference: Well @ 3566.10usft (Cactus 126)
MD Reference: Well @ 3566.10usft (Cactus 126)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at
Database: 5000.1 Conroe DB
Offset TVD Reference: Offset Datum

Offset Design Cotton Draw Unit - 167H - Wellbore #2 - Surveys														Offset Site Error:	0.00 usft
Survey Program: 40-VESSI_GYROFLEX, 7532-MWD														Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Azimuth from North (°)	Distance		Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning		
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)							
4,900.00	4,881.84	4,829.02	4,827.65	17.77	8.47	-137.43	-2,579.21	-2,638.95	3,879.78	3,853.79	25.99	149.274			
5,000.00	4,980.87	4,918.98	4,917.57	18.17	8.63	-137.61	-2,581.49	-2,637.98	3,890.67	3,864.14	26.53	146.672			
5,100.00	5,079.90	5,020.51	5,019.08	18.56	8.81	-137.79	-2,583.91	-2,637.17	3,901.67	3,874.58	27.08	144.054			
5,200.00	5,178.92	5,142.62	5,141.16	18.96	9.02	-137.97	-2,586.20	-2,636.26	3,912.38	3,884.70	27.68	141.325			
5,300.00	5,277.95	5,249.49	5,248.01	19.36	9.21	-138.13	-2,587.68	-2,635.36	3,922.69	3,894.44	28.25	138.845			
5,400.00	5,376.98	5,351.80	5,350.32	19.76	9.40	-138.29	-2,588.62	-2,634.83	3,932.90	3,904.09	28.81	136.498			
5,500.00	5,476.01	5,449.62	5,448.14	20.16	9.57	-138.44	-2,589.27	-2,634.46	3,943.04	3,913.68	29.37	134.276			
5,600.00	5,575.03	5,540.47	5,538.98	20.56	9.73	-138.59	-2,589.82	-2,634.45	3,953.42	3,923.51	29.91	132.199			
5,628.09	5,602.86	5,568.65	5,567.16	20.68	9.78	-138.63	-2,589.95	-2,634.53	3,956.36	3,926.29	30.06	131.606			
5,700.00	5,674.12	5,640.50	5,639.01	20.96	9.91	-138.73	-2,590.16	-2,634.83	3,963.55	3,933.09	30.46	130.111			
5,800.00	5,773.42	5,767.34	5,765.85	21.36	10.13	-138.85	-2,590.55	-2,634.97	3,972.35	3,941.29	31.07	127.860			
5,900.00	5,872.91	5,867.68	5,866.19	21.74	10.30	-138.95	-2,590.27	-2,634.78	3,979.25	3,947.64	31.61	125.870			
6,000.00	5,972.56	5,970.01	5,968.52	22.12	10.47	-139.02	-2,589.79	-2,634.99	3,985.03	3,952.87	32.16	123.912			
6,100.00	6,072.35	6,050.77	6,049.28	22.49	10.61	-139.08	-2,589.44	-2,635.29	3,989.69	3,957.03	32.66	122.153			
6,200.00	6,172.23	6,152.31	6,150.81	22.86	10.78	-139.12	-2,589.21	-2,635.96	3,993.45	3,960.25	33.20	120.286			
6,300.00	6,272.18	6,265.59	6,264.09	23.21	10.97	-139.14	-2,588.76	-2,636.45	3,995.67	3,961.91	33.76	118.370			
6,400.00	6,372.17	6,346.09	6,344.59	23.56	11.11	-139.15	-2,588.53	-2,636.80	3,996.71	3,962.47	34.24	116.714			
6,427.83	6,400.00	6,373.49	6,371.99	23.66	11.16	-139.15	-2,588.55	-2,636.91	3,996.86	3,962.47	34.39	116.226			
6,500.00	6,472.17	6,458.71	6,457.21	23.90	11.31	-139.15	-2,588.66	-2,636.98	3,996.96	3,962.17	34.79	114.880			
6,593.07	6,565.24	6,551.65	6,550.15	24.22	11.47	-139.15	-2,588.76	-2,636.87	3,996.96	3,961.68	35.28	113.298			
6,600.00	6,572.17	6,557.49	6,556.00	24.25	11.48	-139.15	-2,588.76	-2,636.86	3,996.96	3,961.65	35.31	113.189			
6,700.00	6,672.17	6,651.52	6,650.02	24.59	11.65	-139.16	-2,588.96	-2,636.82	3,997.09	3,961.27	35.82	111.575			
6,800.00	6,772.17	6,777.75	6,776.26	24.93	11.86	-139.16	-2,588.77	-2,636.69	3,996.91	3,960.51	36.40	109.814			
6,900.00	6,872.17	6,877.35	6,875.85	25.28	12.03	-139.15	-2,588.25	-2,636.38	3,996.31	3,959.39	36.92	108.251			
7,000.00	6,972.17	6,971.26	6,969.75	25.62	12.19	-139.15	-2,587.69	-2,636.56	3,995.98	3,958.55	37.43	106.766			
7,100.00	7,072.17	7,061.62	7,060.11	25.97	12.35	-139.14	-2,587.16	-2,636.74	3,995.67	3,957.74	37.93	105.338			
7,114.65	7,086.82	7,072.83	7,071.32	26.02	12.37	-139.14	-2,587.15	-2,636.75	3,995.67	3,957.66	38.00	105.144			
7,200.00	7,172.17	7,139.32	7,137.81	26.31	12.48	-139.14	-2,587.40	-2,636.71	3,995.88	3,957.46	38.41	104.025			
7,300.00	7,272.17	7,219.91	7,218.41	26.66	12.62	-139.14	-2,587.82	-2,637.11	3,996.60	3,957.70	38.90	102.740			
7,400.00	7,372.17	7,303.06	7,301.54	27.00	12.77	-139.14	-2,588.58	-2,637.72	3,997.77	3,958.37	39.39	101.485			
7,500.00	7,472.17	7,395.52	7,393.99	27.35	12.93	-139.15	-2,589.78	-2,638.41	3,999.24	3,959.33	39.90	100.219			
7,600.00	7,572.17	7,501.07	7,499.53	27.69	13.12	-139.15	-2,591.19	-2,639.21	4,000.74	3,960.29	40.44	98.920			
7,700.00	7,672.17	7,532.00	7,530.46	28.04	13.18	-139.15	-2,591.63	-2,639.45	4,002.82	3,961.99	40.83	98.047			
7,800.00	7,772.17	7,532.00	7,530.46	28.39	13.18	-139.15	-2,591.63	-2,639.45	4,007.21	3,966.09	41.13	97.433			
7,900.00	7,872.17	7,603.94	7,602.33	28.74	13.25	-139.15	-2,593.73	-2,641.43	4,011.78	3,970.25	41.53	96.600			
8,000.00	7,972.17	7,676.00	7,674.11	29.08	13.32	-139.14	-2,597.90	-2,646.16	4,019.90	3,977.97	41.92	95.885			
8,100.00	8,072.17	7,676.00	7,674.11	29.43	13.32	-139.14	-2,597.90	-2,646.16	4,028.16	3,985.97	42.20	95.465			
8,200.00	8,172.17	7,676.00	7,674.11	29.78	13.32	-139.14	-2,597.90	-2,646.16	4,038.89	3,996.44	42.45	95.140			
8,300.00	8,272.17	7,708.00	7,705.86	30.13	13.32	-139.13	-2,600.66	-2,649.04	4,051.54	4,008.81	42.73	94.810			
8,400.00	8,372.17	7,723.81	7,721.50	30.48	13.32	-139.13	-2,602.41	-2,650.58	4,066.17	4,023.18	42.99	94.590			
8,500.00	8,472.17	7,739.00	7,736.48	30.83	13.33	-139.14	-2,604.41	-2,652.08	4,082.78	4,039.55	43.23	94.442			
8,600.00	8,572.17	7,757.21	7,754.37	31.18	13.33	-139.14	-2,607.27	-2,653.91	4,101.35	4,057.89	43.47	94.351			
8,700.00	8,672.17	7,771.00	7,767.86	31.52	13.34	-139.15	-2,609.79	-2,655.30	4,121.90	4,078.20	43.69	94.341			
8,751.58	8,723.75	7,783.77	7,780.30	31.70	13.34	-139.16	-2,612.33	-2,656.62	4,133.23	4,089.41	43.81	94.338			
8,800.00	8,772.11	7,802.00	7,798.00	31.86	13.35	-139.15	-2,616.21	-2,658.62	4,143.04	4,099.11	43.92	94.322			
8,850.00	8,821.68	7,802.00	7,798.00	32.00	13.35	-139.08	-2,616.21	-2,658.62	4,150.70	4,106.72	43.98	94.367			
8,900.00	8,870.51	7,802.00	7,798.00	32.12	13.35	-138.97	-2,616.21	-2,658.62	4,156.04	4,112.01	44.03	94.382			
8,950.00	8,918.22	7,817.38	7,812.86	32.24	13.35	-138.82	-2,619.75	-2,660.45	4,158.82	4,114.71	44.10	94.295			
9,000.00	8,964.46	7,833.00	7,827.85	32.34	13.36	-138.63	-2,623.61	-2,662.48	4,159.24	4,115.07	44.17	94.173			
9,050.00	9,008.86	7,833.00	7,827.85	32.43	13.36	-138.38	-2,623.61	-2,662.48	4,157.09	4,112.90	44.19	94.083			
9,100.00	9,051.09	7,833.00	7,827.85	32.51	13.36	-138.09	-2,623.61	-2,662.48	4,152.57	4,108.37	44.20	93.959			
9,150.00	9,090.83	7,833.00	7,827.85	32.58	13.36	-137.75	-2,623.61	-2,662.48	4,145.70	4,101.51	44.20	93.797			

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



MS Energy Services Anticollision Report



Company: Devon Energy
Project: Eddy County, New Mexico (NAD 83)
Reference Site: Cotton Draw Unit
Site Error: 0.00 usft
Reference Well: 515H
Well Error: 0.00 usft
Reference Wellbore: Wellbore #1
Reference Design: Design #1

Local Co-ordinate Reference: Well 515H
TVD Reference: Well @ 3566.10usft (Cactus 126)
MD Reference: Well @ 3566.10usft (Cactus 126)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: 5000.1 Conroe DB
Offset TVD Reference: Offset Datum

Offset Design Cotton Draw Unit - 167H - Wellbore #2 - Surveys												Offset Site Error:	0.00 usft
Survey Program: 40-VESSI_GYROFLEX, 7532-MWD												Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Azimuth		Offset Wellbore Centre		Distance		Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	from North (°)		+N/-S (usft)	+E/-W (usft)	Between Centras (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor
9,200.00	9,127.77	7,849.59	7,843.66	32.65	13.37	-137.40		-2,628.08	-2,664.80	4,136.29	4,092.05	44.24	93.505
9,250.00	9,161.64	7,865.00	7,858.21	32.71	13.37	-137.00		-2,632.63	-2,667.08	4,124.78	4,080.51	44.27	93.177
9,300.00	9,192.18	7,865.00	7,858.21	32.78	13.37	-136.55		-2,632.63	-2,667.08	4,110.89	4,066.63	44.26	92.875
9,350.00	9,219.15	7,865.00	7,858.21	32.85	13.37	-136.06		-2,632.63	-2,667.08	4,094.93	4,050.67	44.26	92.522
9,400.00	9,242.36	7,865.00	7,858.21	32.92	13.37	-135.54		-2,632.63	-2,667.08	4,076.99	4,032.73	44.26	92.118
9,450.00	9,261.61	7,865.00	7,858.21	32.99	13.37	-134.99		-2,632.63	-2,667.08	4,057.18	4,012.92	44.26	91.659
9,500.00	9,276.77	7,882.00	7,874.11	33.08	13.38	-134.45		-2,638.04	-2,669.68	4,035.43	3,991.11	44.32	91.046
9,550.00	9,287.73	7,896.00	7,887.10	33.17	13.39	-133.88		-2,642.78	-2,671.86	4,012.23	3,967.84	44.39	90.396
9,600.00	9,294.39	7,896.00	7,887.10	33.27	13.39	-133.27		-2,642.78	-2,671.86	3,987.45	3,943.03	44.42	89.763
9,649.26	9,296.70	7,896.00	7,887.10	33.37	13.39	-132.65		-2,642.78	-2,671.86	3,961.81	3,917.34	44.47	89.087
9,700.00	9,296.91	7,896.00	7,887.10	33.49	13.39	-132.00		-2,642.78	-2,671.86	3,934.71	3,890.18	44.53	88.352
9,800.00	9,297.31	7,896.00	7,887.10	33.80	13.39	-130.72		-2,642.78	-2,671.86	3,880.66	3,835.96	44.70	86.816
9,900.00	9,297.72	7,896.00	7,887.10	34.17	13.39	-129.44		-2,642.78	-2,671.86	3,825.77	3,780.85	44.92	85.172
10,000.00	9,298.12	7,909.95	7,899.91	34.62	13.40	-128.18		-2,647.81	-2,674.09	3,769.90	3,724.67	45.23	83.352
10,027.33	9,298.24	7,911.30	7,901.15	34.75	13.40	-127.83		-2,648.32	-2,674.31	3,754.50	3,709.19	45.32	82.853
10,100.00	9,298.53	7,928.00	7,916.25	35.13	13.41	-126.93		-2,654.88	-2,677.12	3,714.14	3,668.54	45.60	81.443
10,200.00	9,298.93	7,928.00	7,916.25	35.71	13.41	-125.57		-2,654.88	-2,677.12	3,659.83	3,613.84	45.99	79.578
10,300.00	9,299.34	7,928.00	7,916.25	36.35	13.41	-124.17		-2,654.88	-2,677.12	3,607.47	3,561.02	46.45	77.670
10,400.00	9,299.74	7,928.00	7,916.25	37.06	13.41	-122.72		-2,654.88	-2,677.12	3,557.15	3,510.18	46.97	75.729
10,500.00	9,300.15	7,940.68	7,927.56	37.83	13.42	-121.28		-2,660.14	-2,679.35	3,508.85	3,461.23	47.61	73.697
10,600.00	9,300.55	7,959.00	7,943.72	38.65	13.44	-119.83		-2,668.09	-2,682.71	3,462.75	3,414.41	48.34	71.627
10,700.00	9,300.96	7,959.00	7,943.72	39.53	13.44	-118.25		-2,668.09	-2,682.71	3,418.70	3,369.61	49.09	69.648
10,800.00	9,301.36	7,959.00	7,943.72	40.45	13.44	-116.61		-2,668.09	-2,682.71	3,377.03	3,327.13	49.90	67.681
10,900.00	9,301.76	7,973.67	7,956.48	41.42	13.45	-115.02		-2,674.76	-2,685.54	3,337.66	3,286.83	50.83	65.664
11,000.00	9,302.17	7,991.00	7,971.31	42.44	13.47	-113.42		-2,683.01	-2,689.04	3,300.83	3,249.00	51.84	63.678
11,100.00	9,302.57	7,991.00	7,971.31	43.49	13.47	-111.65		-2,683.01	-2,689.04	3,266.40	3,213.55	52.84	61.815
11,200.00	9,302.98	8,004.55	7,982.73	44.58	13.48	-109.95		-2,689.73	-2,691.87	3,234.58	3,180.62	53.96	59.948
11,300.00	9,303.38	8,022.00	7,997.22	45.71	13.50	-108.25		-2,698.73	-2,695.55	3,205.36	3,150.22	55.14	58.132
11,400.00	9,303.79	8,022.00	7,997.22	46.86	13.50	-106.37		-2,698.73	-2,695.55	3,178.84	3,122.54	56.30	56.464
11,500.00	9,304.19	8,053.00	8,022.26	48.05	13.54	-104.75		-2,715.74	-2,702.24	3,154.96	3,097.33	57.63	54.742
11,600.00	9,304.60	8,053.00	8,022.26	49.26	13.54	-102.82		-2,715.74	-2,702.24	3,133.86	3,074.99	58.87	53.235
11,700.00	9,305.00	8,084.00	8,046.29	50.50	13.60	-101.19		-2,734.08	-2,709.09	3,115.50	3,055.22	60.28	51.686
11,800.00	9,305.40	8,084.00	8,046.29	51.76	13.60	-99.20		-2,734.08	-2,709.09	3,099.99	3,038.43	61.56	50.356
11,900.00	9,305.81	8,116.00	8,070.02	53.05	13.68	-97.59		-2,754.21	-2,716.52	3,087.31	3,024.28	63.03	48.983
12,000.00	9,306.21	8,116.00	8,070.02	54.35	13.68	-95.57		-2,754.21	-2,716.52	3,077.50	3,013.17	64.33	47.836
12,100.00	9,306.62	8,144.00	8,089.92	55.67	13.76	-93.91		-2,772.66	-2,723.44	3,070.52	3,004.72	65.81	46.659
12,200.00	9,307.02	8,160.46	8,101.19	57.01	13.81	-92.11		-2,783.89	-2,727.63	3,066.41	2,999.20	67.22	45.620
12,292.13	9,307.39	8,175.00	8,110.84	58.26	13.86	-90.45		-2,794.08	-2,731.43	3,065.17	2,996.66	68.50	44.744 CC
12,300.00	9,307.43	8,175.00	8,110.84	58.37	13.86	-90.29		-2,794.08	-2,731.43	3,065.18	2,996.57	68.60	44.679
12,400.00	9,307.83	8,195.53	8,123.85	59.74	13.94	-88.57		-2,808.99	-2,736.94	3,066.78	2,996.75	70.03	43.793
12,500.00	9,308.23	8,207.00	8,130.74	61.13	13.99	-86.73		-2,817.60	-2,740.07	3,071.25	2,999.88	71.37	43.034
12,600.00	9,308.64	8,719.16	8,224.61	62.53	17.95	-94.47		-3,304.68	-2,775.56	3,074.83	2,998.05	76.79	40.044
12,700.00	9,309.04	8,746.92	8,225.45	63.94	18.26	-93.04		-3,332.39	-2,774.12	3,069.47	2,990.96	78.51	39.097
12,800.00	9,309.45	8,778.51	8,225.82	65.36	18.60	-91.68		-3,363.96	-2,772.96	3,066.33	2,986.08	80.25	38.209
12,891.68	9,309.82	8,808.00	8,225.59	66.68	18.93	-90.44		-3,393.44	-2,772.34	3,065.41	2,983.57	81.84	37.456
12,900.00	9,309.85	8,808.00	8,225.59	66.80	18.93	-90.27		-3,393.44	-2,772.34	3,065.42	2,983.46	81.96	37.403
13,000.00	9,310.26	8,869.05	8,224.19	68.24	19.64	-89.49		-3,454.47	-2,771.87	3,066.26	2,982.25	84.01	36.500
13,100.00	9,310.66	8,932.45	8,222.12	69.69	20.41	-88.76		-3,517.83	-2,772.12	3,068.45	2,982.36	86.10	35.639
13,200.00	9,311.07	9,043.29	8,220.04	71.16	21.80	-88.98		-3,628.63	-2,774.13	3,071.58	2,982.79	88.80	34.592
13,300.00	9,311.47	9,173.19	8,222.49	72.63	23.51	-89.58		-3,758.48	-2,776.09	3,072.92	2,981.10	91.83	33.464
13,400.00	9,311.87	13,400.00	8,226.37	74.11	82.87	-91.45		-3,952.42	-2,775.02	3,072.06	2,922.17	149.89	20.495
13,500.00	9,312.28	9,440.46	8,226.38	75.59	27.24	-90.91		-4,025.65	-2,773.19	3,070.55	2,972.39	98.16	31.281

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



MS Energy Services

Anticollision Report



Company: Devon Energy
Project: Eddy County, New Mexico (NAD 83)
Reference Site: Cotton Draw Unit
Site Error: 0.00 usft
Reference Well: 515H
Well Error: 0.00 usft
Reference Wellbore: Wellbore #1
Reference Design: Design #1

Local Co-ordinate Reference: Well 515H
TVD Reference: Well @ 3566.10usft (Cactus 126)
MD Reference: Well @ 3566.10usft (Cactus 126)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: 5000.1 Conroe DB
Offset TVD Reference: Offset Datum

Offset Design Cotton Draw Unit - 167H - Wellbore #2 - Surveys													Offset Site Error:	0.00 usft
Survey Program: 40-VESSI_GYROFLEX, 7532-MWD													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis			Distance						Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Azimuth from North (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor		
13,552.42	9,312.49	9,469.00	8,226.05	76.37	27.64	-90.44	-4,054.19	-2,772.72	3,070.33	2,971.03	99.30	30.920		
13,600.00	9,312.68	9,498.69	8,225.63	77.09	28.07	-90.08	-4,083.87	-2,772.42	3,070.47	2,970.08	100.39	30.587		
13,700.00	9,313.09	9,563.00	8,224.84	78.59	29.00	-89.37	-4,148.18	-2,772.51	3,071.70	2,969.00	102.70	29.910		
13,800.00	9,313.49	9,633.56	8,224.00	80.09	30.04	-88.79	-4,218.74	-2,773.41	3,073.99	2,968.89	105.10	29.248		
13,900.00	9,313.90	9,695.89	8,223.13	81.60	30.96	-88.04	-4,281.04	-2,774.74	3,077.24	2,969.85	107.39	28.654		
14,000.00	9,314.30	9,752.96	8,222.17	83.12	31.81	-87.19	-4,338.07	-2,776.77	3,081.87	2,972.27	109.60	28.119		
14,100.00	9,314.71	10,012.19	8,221.44	84.64	35.73	-90.35	-4,597.20	-2,782.23	3,084.75	2,969.95	114.80	26.871		
14,200.00	9,315.11	10,092.12	8,222.38	86.17	36.95	-89.95	-4,677.12	-2,782.17	3,085.03	2,967.60	117.43	26.271		
14,300.00	9,315.51	10,156.57	8,223.11	87.70	37.94	-89.24	-4,741.56	-2,782.88	3,086.39	2,966.55	119.84	25.753		
14,400.00	9,315.92	10,223.00	8,223.35	89.24	38.97	-88.58	-4,807.98	-2,784.30	3,088.96	2,966.68	122.28	25.262		
14,500.00	9,316.32	10,490.39	8,227.35	90.78	43.14	-91.89	-5,075.26	-2,786.42	3,090.90	2,963.25	127.65	24.213		
14,600.00	9,316.73	10,603.23	8,226.18	92.33	44.92	-92.14	-5,187.99	-2,781.91	3,088.22	2,957.45	130.77	23.616		
14,700.00	9,317.13	10,705.25	8,222.86	93.88	46.53	-92.18	-5,289.84	-2,776.85	3,085.43	2,951.71	133.72	23.074		
14,800.00	9,317.54	10,790.00	8,220.02	95.43	47.87	-91.88	-5,374.42	-2,772.36	3,082.42	2,945.97	136.45	22.591		
14,900.00	9,317.94	10,845.51	8,218.07	96.99	48.76	-91.00	-5,429.85	-2,769.96	3,080.52	2,941.74	138.79	22.196		
14,936.63	9,318.09	10,861.25	8,217.47	97.56	49.01	-90.58	-5,445.56	-2,769.52	3,080.31	2,940.74	139.58	22.069		
15,000.00	9,318.34	10,897.94	8,216.06	98.55	49.59	-90.05	-5,482.22	-2,768.87	3,080.52	2,939.46	141.06	21.838		
15,100.00	9,318.75	11,006.63	8,215.21	100.11	51.32	-90.22	-5,590.89	-2,768.02	3,080.77	2,936.60	144.17	21.369		
15,200.00	9,319.15	11,077.85	8,215.67	101.68	52.46	-89.65	-5,662.11	-2,768.30	3,081.61	2,934.86	146.75	20.999		
15,300.00	9,319.56	11,176.84	8,217.02	103.24	54.04	-89.63	-5,761.09	-2,769.46	3,082.94	2,933.18	149.76	20.585		
15,400.00	9,319.96	11,310.64	8,217.08	104.82	56.19	-90.30	-5,894.88	-2,769.75	3,083.90	2,930.61	153.28	20.119		
15,458.39	9,320.20	11,373.91	8,217.77	105.74	57.21	-90.40	-5,958.14	-2,769.46	3,083.82	2,928.69	155.12	19.880		
15,500.00	9,320.37	11,396.16	8,217.87	106.39	57.56	-90.01	-5,980.40	-2,769.41	3,083.98	2,927.88	156.10	19.757		
15,600.00	9,320.77	11,451.00	8,217.15	107.97	58.45	-89.12	-6,035.23	-2,769.58	3,085.43	2,927.01	158.42	19.476		
15,700.00	9,321.18	11,589.77	8,217.61	109.55	60.68	-89.89	-6,173.99	-2,770.04	3,086.09	2,924.04	162.05	19.044		
15,800.00	9,321.58	11,639.00	8,217.49	111.13	61.47	-88.88	-6,223.21	-2,770.35	3,087.66	2,923.36	164.29	18.793		
15,900.00	9,321.98	11,706.22	8,216.20	112.71	62.56	-88.23	-6,290.41	-2,771.32	3,090.51	2,923.73	166.78	18.530		
16,000.00	9,322.39	16,000.00	8,214.33	114.30	131.77	-88.38	-6,397.77	-2,773.83	3,094.02	2,860.08	233.94	13.226		
16,100.00	9,322.79	11,898.66	8,214.71	115.88	65.66	-88.08	-6,482.76	-2,776.21	3,097.27	2,924.53	172.73	17.931		
16,200.00	9,323.20	16,200.00	8,216.81	117.47	135.22	-89.23	-6,640.95	-2,781.86	3,101.26	2,860.87	240.38	12.901		
16,300.00	9,323.60	12,201.00	8,220.59	119.07	70.55	-90.10	-6,784.89	-2,783.50	3,101.94	2,921.38	180.56	17.180		
16,400.00	9,324.01	12,298.14	8,220.09	120.66	72.13	-90.05	-6,882.03	-2,783.19	3,102.55	2,918.98	183.56	16.902		
16,500.00	9,324.41	12,376.93	8,218.66	122.25	73.41	-89.63	-6,960.80	-2,782.88	3,103.53	2,917.25	186.27	16.661		
16,600.00	9,324.82	12,474.39	8,216.50	123.85	74.99	-89.58	-7,058.24	-2,782.81	3,104.96	2,915.70	189.26	16.406		
16,700.00	9,325.22	12,547.90	8,214.92	125.45	76.19	-89.05	-7,131.73	-2,783.03	3,106.73	2,914.85	191.88	16.191		
16,800.00	9,325.62	12,755.76	8,215.57	127.05	79.58	-91.18	-7,339.55	-2,782.49	3,106.91	2,910.34	196.57	15.805		
16,900.00	9,326.03	12,827.67	8,216.77	128.65	80.75	-90.63	-7,411.45	-2,781.72	3,106.08	2,906.82	199.26	15.588		
16,928.02	9,326.14	12,846.21	8,216.93	129.10	81.05	-90.44	-7,429.98	-2,781.61	3,106.03	2,906.05	199.98	15.532		
17,000.00	9,326.43	12,902.59	8,217.19	130.25	81.98	-90.13	-7,486.36	-2,781.47	3,106.26	2,904.29	201.96	15.380		
17,100.00	9,326.84	12,990.96	8,217.76	131.86	83.42	-89.90	-7,574.73	-2,781.68	3,106.97	2,902.10	204.87	15.166		
17,200.00	9,327.24	17,200.00	8,220.16	133.46	152.24	-90.56	-7,707.96	-2,782.06	3,107.32	2,835.52	271.80	11.432 SF		
17,257.64	9,327.47	13,175.85	8,221.04	134.39	86.44	-90.44	-7,759.59	-2,781.74	3,107.08	2,896.89	210.19	14.783		
17,300.00	9,327.65	13,191.82	8,221.05	135.07	86.70	-89.92	-7,775.56	-2,781.70	3,107.26	2,896.16	211.09	14.720		
17,400.00	9,328.05	13,526.00	8,219.68	136.68	92.18	-94.53	-8,109.19	-2,768.07	3,104.20	2,887.10	217.10	14.299		
17,500.00	9,328.45	13,659.53	8,220.50	138.29	94.39	-95.20	-8,242.25	-2,756.96	3,096.88	2,876.41	220.47	14.046		
17,600.00	9,328.86	13,716.00	8,221.42	139.90	95.32	-94.34	-8,298.52	-2,752.29	3,089.52	2,866.41	223.11	13.848		
17,700.00	9,329.26	13,754.31	8,221.83	141.51	95.95	-93.12	-8,336.74	-2,749.74	3,083.94	2,858.46	225.49	13.677		
17,800.00	9,329.67	13,810.00	8,221.02	143.12	96.87	-92.24	-8,392.39	-2,747.72	3,081.12	2,853.13	227.99	13.514		
17,890.63	9,330.03	13,810.00	8,221.02	144.58	96.87	-90.44	-8,392.39	-2,747.72	3,079.79	2,850.26	229.53	13.418		
17,900.00	9,330.07	13,810.00	8,221.02	144.73	96.87	-90.25	-8,392.39	-2,747.72	3,079.80	2,850.12	229.68	13.409		
18,000.00	9,330.48	13,867.96	8,219.50	146.35	97.82	-89.42	-8,450.32	-2,747.23	3,080.72	2,848.65	232.07	13.275		
18,100.00	9,330.88	13,954.69	8,218.05	147.96	99.24	-89.15	-8,537.04	-2,748.14	3,082.96	2,848.04	234.92	13.124		

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



MS Energy Services

Anticollision Report



devon

Company: Devon Energy
Project: Eddy County, New Mexico (NAD 83)
Reference Site: Cotton Draw Unit
Site Error: 0.00 usft
Reference Well: 515H
Well Error: 0.00 usft
Reference Wellbore: Wellbore #1
Reference Design: Design #1

Local Co-ordinate Reference: Well 515H
TVD Reference: Well @ 3566.10usft (Cactus 126)
MD Reference: Well @ 3566.10usft (Cactus 126)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: 5000.1 Conroe DB
Offset TVD Reference: Offset Datum

Offset Design Cotton Draw Unit - 167H - Wellbore #2 - Surveys													Offset Site Error:	0.00 usft
Survey Program: 40-VESS_GYROFLEX, 7532-MWD													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Azimuth from North (°)	Offset Wellbore Centre		Distance		Minimum Separation (usft)	Separation Factor	Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)				
18,200.00	9,331.29	14,079.49	8,218.87	149.58	101.28	-89.65	-8,661.82	-2,749.63	3,084.53	2,846.10	238.43	12.937		
18,300.00	9,331.69	14,181.66	8,220.70	151.20	102.95	-89.69	-8,763.97	-2,750.90	3,085.77	2,844.17	241.60	12.772		
18,400.00	9,332.09	14,253.15	8,221.29	152.81	104.12	-89.12	-8,835.44	-2,751.84	3,087.43	2,843.18	244.25	12.641		
18,500.00	9,332.50	14,399.82	8,219.93	154.43	106.53	-90.05	-8,982.10	-2,752.52	3,088.95	2,840.89	248.06	12.453		
18,600.00	9,332.90	14,504.05	8,219.78	156.05	108.24	-90.13	-9,086.33	-2,752.69	3,089.89	2,838.68	251.21	12.300		
18,700.00	9,333.31	14,625.65	8,219.38	157.67	110.24	-90.56	-9,207.92	-2,751.19	3,089.47	2,834.85	254.61	12.134		
18,726.67	9,333.42	14,646.22	8,219.09	158.11	110.58	-90.44	-9,228.48	-2,750.90	3,089.44	2,834.10	255.34	12.099		
18,800.00	9,333.71	14,716.04	8,217.82	159.30	111.73	-90.37	-9,298.28	-2,749.96	3,089.52	2,831.99	257.52	11.997		
18,900.00	9,334.12	14,732.00	8,217.53	160.92	111.99	-88.70	-9,314.24	-2,749.74	3,090.77	2,831.51	259.26	11.922 ES		
19,000.00	9,334.52	14,732.00	8,217.53	162.54	111.99	-86.72	-9,314.24	-2,749.74	3,095.22	2,834.72	260.50	11.882		
19,100.00	9,334.93	14,732.00	8,217.53	164.16	111.99	-84.75	-9,314.24	-2,749.74	3,102.89	2,841.40	261.49	11.866		
19,200.00	9,335.33	14,732.00	8,217.53	165.79	111.99	-82.79	-9,314.24	-2,749.74	3,113.75	2,851.54	262.21	11.875		
19,300.00	9,335.73	14,732.00	8,217.53	167.41	111.99	-80.85	-9,314.24	-2,749.74	3,127.77	2,865.09	262.67	11.907		
19,390.56	9,336.10	14,732.00	8,217.53	168.88	111.99	-79.11	-9,314.24	-2,749.74	3,143.16	2,880.28	262.88	11.957		



MS Energy Services Anticollision Report



Company: Devon Energy
Project: Eddy County, New Mexico (NAD 83)
Reference Site: Cotton Draw Unit
Site Error: 0.00 usft
Reference Well: 515H
Well Error: 0.00 usft
Reference Wellbore: Wellbore #1
Reference Design: Design #1

Local Co-ordinate Reference: Well 515H
TVD Reference: Well @ 3566.10usft (Cactus 126)
MD Reference: Well @ 3566.10usft (Cactus 126)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at
Database: 5000.1 Conroe DB
Offset TVD Reference: Offset Datum

Offset Design Cotton Draw Unit - 172H - Wellbore #1 - Surveys														Offset Site Error:	0.00 usft
Survey Program: 101-VESSI_GYRO_DROP, 4445-MWD														Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Distance									
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Azimuth from North (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning		
10,200.00	9,298.93	12,827.00	8,150.86	35.71	83.22	-170.66	-10,402.85	-1,515.54	9,909.72	9,848.02	61.69	160.628			
10,300.00	9,299.34	12,827.00	8,150.86	36.35	83.22	-170.56	-10,402.85	-1,515.54	9,811.77	9,749.93	61.83	158.681			
10,400.00	9,299.74	12,827.00	8,150.86	37.06	83.22	-170.46	-10,402.85	-1,515.54	9,713.86	9,651.88	61.98	156.726			
10,500.00	9,300.15	12,827.00	8,150.86	37.83	83.22	-170.35	-10,402.85	-1,515.54	9,615.99	9,553.86	62.13	154.763			
10,600.00	9,300.55	12,827.00	8,150.86	38.65	83.22	-170.25	-10,402.85	-1,515.54	9,518.17	9,455.88	62.30	152.792			
10,700.00	9,300.96	12,827.00	8,150.86	39.53	83.22	-170.14	-10,402.85	-1,515.54	9,420.40	9,357.93	62.46	150.813			
10,800.00	9,301.36	12,827.00	8,150.86	40.45	83.22	-170.03	-10,402.85	-1,515.54	9,322.67	9,260.03	62.64	148.827			
10,900.00	9,301.76	12,827.00	8,150.86	41.42	83.22	-169.92	-10,402.85	-1,515.54	9,224.99	9,162.16	62.83	146.833			
11,000.00	9,302.17	12,827.00	8,150.86	42.44	83.22	-169.81	-10,402.85	-1,515.54	9,127.36	9,064.34	63.02	144.832			
11,100.00	9,302.57	12,827.00	8,150.86	43.49	83.22	-169.69	-10,402.85	-1,515.54	9,029.78	8,966.56	63.22	142.824			
11,200.00	9,302.98	12,827.00	8,150.86	44.58	83.22	-169.57	-10,402.85	-1,515.54	8,932.26	8,868.82	63.44	140.809			
11,300.00	9,303.38	12,827.00	8,150.86	45.71	83.22	-169.45	-10,402.85	-1,515.54	8,834.79	8,771.13	63.66	138.787			
11,400.00	9,303.79	12,827.00	8,150.86	46.86	83.22	-169.32	-10,402.85	-1,515.54	8,737.38	8,673.49	63.89	136.758			
11,500.00	9,304.19	12,827.00	8,150.86	48.05	83.22	-169.19	-10,402.85	-1,515.54	8,640.03	8,575.89	64.13	134.723			
11,600.00	9,304.60	12,827.00	8,150.86	49.26	83.22	-169.06	-10,402.85	-1,515.54	8,542.74	8,478.35	64.39	132.681			
11,700.00	9,305.00	12,827.00	8,150.86	50.50	83.22	-168.93	-10,402.85	-1,515.54	8,445.51	8,380.86	64.65	130.634			
11,800.00	9,305.40	12,827.00	8,150.86	51.76	83.22	-168.79	-10,402.85	-1,515.54	8,348.35	8,283.42	64.93	128.580			
11,900.00	9,305.81	12,827.00	8,150.86	53.05	83.22	-168.65	-10,402.85	-1,515.54	8,251.25	8,186.03	65.22	126.521			
12,000.00	9,306.21	12,827.00	8,150.86	54.35	83.22	-168.51	-10,402.85	-1,515.54	8,154.23	8,088.71	65.52	124.457			
12,100.00	9,306.62	12,827.00	8,150.86	55.67	83.22	-168.36	-10,402.85	-1,515.54	8,057.28	7,991.44	65.83	122.388			
12,200.00	9,307.02	12,827.00	8,150.86	57.01	83.22	-168.21	-10,402.85	-1,515.54	7,960.40	7,894.24	66.16	120.314			
12,300.00	9,307.43	12,827.00	8,150.86	58.37	83.22	-168.06	-10,402.85	-1,515.54	7,863.60	7,797.09	66.51	118.236			
12,400.00	9,307.83	12,827.00	8,150.86	59.74	83.22	-167.90	-10,402.85	-1,515.54	7,766.89	7,700.02	66.87	116.154			
12,500.00	9,308.23	12,827.00	8,150.86	61.13	83.22	-167.73	-10,402.85	-1,515.54	7,670.25	7,603.01	67.24	114.069			
12,600.00	9,308.64	12,827.00	8,150.86	62.53	83.22	-167.57	-10,402.85	-1,515.54	7,573.71	7,506.07	67.63	111.981			
12,700.00	9,309.04	12,827.00	8,150.86	63.94	83.22	-167.40	-10,402.85	-1,515.54	7,477.25	7,409.21	68.04	109.890			
12,800.00	9,309.45	12,827.00	8,150.86	65.36	83.22	-167.22	-10,402.85	-1,515.54	7,380.89	7,312.42	68.47	107.797			
12,900.00	9,309.85	12,827.00	8,150.86	66.80	83.22	-167.04	-10,402.85	-1,515.54	7,284.63	7,215.72	68.92	105.702			
13,000.00	9,310.26	12,827.00	8,150.86	68.24	83.22	-166.85	-10,402.85	-1,515.54	7,188.47	7,119.09	69.38	103.607			
13,100.00	9,310.66	12,827.00	8,150.86	69.69	83.22	-166.66	-10,402.85	-1,515.54	7,092.42	7,022.55	69.87	101.511			
13,200.00	9,311.07	12,827.00	8,150.86	71.16	83.22	-166.47	-10,402.85	-1,515.54	6,996.48	6,926.10	70.38	99.415			
13,300.00	9,311.47	12,827.00	8,150.86	72.63	83.22	-166.27	-10,402.85	-1,515.54	6,900.65	6,829.74	70.91	97.321			
13,400.00	9,311.87	12,827.00	8,150.86	74.11	83.22	-166.06	-10,402.85	-1,515.54	6,804.94	6,733.48	71.46	95.227			
13,500.00	9,312.28	12,827.00	8,150.86	75.59	83.22	-165.85	-10,402.85	-1,515.54	6,709.36	6,637.32	72.04	93.137			
13,600.00	9,312.68	12,827.00	8,150.86	77.09	83.22	-165.63	-10,402.85	-1,515.54	6,613.91	6,541.27	72.64	91.049			
13,700.00	9,313.09	12,827.00	8,150.86	78.59	83.22	-165.40	-10,402.85	-1,515.54	6,518.59	6,445.32	73.27	88.965			
13,800.00	9,313.49	12,827.00	8,150.86	80.09	83.22	-165.17	-10,402.85	-1,515.54	6,423.42	6,349.49	73.93	86.885			
13,900.00	9,313.90	12,827.00	8,150.86	81.60	83.22	-164.92	-10,402.85	-1,515.54	6,328.40	6,253.78	74.62	84.811			
14,000.00	9,314.30	12,827.00	8,150.86	83.12	83.22	-164.68	-10,402.85	-1,515.54	6,233.53	6,158.19	75.34	82.744			
14,100.00	9,314.71	12,827.00	8,150.86	84.64	83.22	-164.42	-10,402.85	-1,515.54	6,138.82	6,062.74	76.09	80.683			
14,200.00	9,315.11	12,827.00	8,150.86	86.17	83.22	-164.16	-10,402.85	-1,515.54	6,044.29	5,967.42	76.87	78.631			
14,300.00	9,315.51	12,827.00	8,150.86	87.70	83.22	-163.88	-10,402.85	-1,515.54	5,949.93	5,872.25	77.69	76.588			
14,400.00	9,315.92	12,827.00	8,150.86	89.24	83.22	-163.60	-10,402.85	-1,515.54	5,855.76	5,777.22	78.54	74.556			
14,500.00	9,316.32	12,827.00	8,150.86	90.78	83.22	-163.31	-10,402.85	-1,515.54	5,761.79	5,682.36	79.44	72.534			
14,600.00	9,316.73	12,827.00	8,150.86	92.33	83.22	-163.01	-10,402.85	-1,515.54	5,668.03	5,587.66	80.37	70.525			
14,700.00	9,317.13	12,827.00	8,150.86	93.88	83.22	-162.70	-10,402.85	-1,515.54	5,574.48	5,493.13	81.34	68.529			
14,800.00	9,317.54	12,827.00	8,150.86	95.43	83.22	-162.37	-10,402.85	-1,515.54	5,481.16	5,398.79	82.36	66.548			
14,900.00	9,317.94	12,827.00	8,150.86	96.99	83.22	-162.04	-10,402.85	-1,515.54	5,388.07	5,304.64	83.43	64.583			
15,000.00	9,318.34	12,827.00	8,150.86	98.55	83.22	-161.69	-10,402.85	-1,515.54	5,295.24	5,210.70	84.54	62.634			
15,100.00	9,318.75	12,827.00	8,150.86	100.11	83.22	-161.33	-10,402.85	-1,515.54	5,202.68	5,116.97	85.71	60.703			
15,200.00	9,319.15	12,827.00	8,150.86	101.68	83.22	-160.96	-10,402.85	-1,515.54	5,110.40	5,023.47	86.92	58.792			
15,300.00	9,319.56	12,827.00	8,150.86	103.24	83.22	-160.57	-10,402.85	-1,515.54	5,018.41	4,930.21	88.20	56.900			

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



MS Energy Services Anticollision Report



Company: Devon Energy
Project: Eddy County, New Mexico (NAD 83)
Reference Site: Cotton Draw Unit
Site Error: 0.00 usft
Reference Well: 515H
Well Error: 0.00 usft
Reference Wellbore: Wellbore #1
Reference Design: Design #1

Local Co-ordinate Reference: Well 515H
TVD Reference: Well @ 3566.10usft (Cactus 126)
MD Reference: Well @ 3566.10usft (Cactus 126)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: 5000.1 Conroe DB
Offset TVD Reference: Offset Datum

Offset Design Cotton Draw Unit - 172H - Wellbore #1 - Surveys														Offset Site Error:	0.00 usft
Survey Program: 101-VESSL_GYRO_DROP, 4445-MWD														Offset Well Error:	0.00 usft
Reference	Offset			Semi Major Axis		Azimuth		Offset Wellbore Centre		Distance				Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	from North (°)		+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor		
15,400.00	9,319.96	12,827.00	8,150.86	104.82	83.22	-160.16		-10,402.85	-1,515.54	4,926.73	4,837.21	89.53	55.031		
15,500.00	9,320.37	12,827.00	8,150.86	106.39	83.22	-159.75		-10,402.85	-1,515.54	4,835.39	4,744.47	90.92	53.184		
15,600.00	9,320.77	12,827.00	8,150.86	107.97	83.22	-159.31		-10,402.85	-1,515.54	4,744.39	4,652.02	92.37	51.361		
15,700.00	9,321.18	12,827.00	8,150.86	109.55	83.22	-158.85		-10,402.85	-1,515.54	4,653.76	4,559.87	93.90	49.563		
15,800.00	9,321.58	12,827.00	8,150.86	111.13	83.22	-158.38		-10,402.85	-1,515.54	4,563.53	4,468.04	95.49	47.792		
15,900.00	9,321.98	12,827.00	8,150.86	112.71	83.22	-157.89		-10,402.85	-1,515.54	4,473.71	4,376.56	97.15	46.048		
16,000.00	9,322.39	12,827.00	8,150.86	114.30	83.22	-157.37		-10,402.85	-1,515.54	4,384.33	4,285.43	98.89	44.333		
16,100.00	9,322.79	12,827.00	8,150.86	115.88	83.22	-156.83		-10,402.85	-1,515.54	4,295.42	4,194.70	100.72	42.648		
16,200.00	9,323.20	12,827.00	8,150.86	117.47	83.22	-156.27		-10,402.85	-1,515.54	4,207.00	4,104.38	102.62	40.994		
16,300.00	9,323.60	12,827.00	8,150.86	119.07	83.22	-155.68		-10,402.85	-1,515.54	4,119.12	4,014.50	104.62	39.373		
16,400.00	9,324.01	12,827.00	8,150.86	120.66	83.22	-155.07		-10,402.85	-1,515.54	4,031.80	3,925.10	106.71	37.784		
16,500.00	9,324.41	12,827.00	8,150.86	122.25	83.22	-154.42		-10,402.85	-1,515.54	3,945.09	3,836.20	108.89	36.230		
16,600.00	9,324.82	12,827.00	8,150.86	123.85	83.22	-153.75		-10,402.85	-1,515.54	3,859.01	3,747.84	111.17	34.712		
16,700.00	9,325.22	12,827.00	8,150.86	125.45	83.22	-153.04		-10,402.85	-1,515.54	3,773.63	3,660.07	113.56	33.230		
16,800.00	9,325.62	12,827.00	8,150.86	127.05	83.22	-152.29		-10,402.85	-1,515.54	3,688.97	3,572.92	116.06	31.785		
16,900.00	9,326.03	12,827.00	8,150.86	128.65	83.22	-151.51		-10,402.85	-1,515.54	3,605.11	3,486.44	118.67	30.379		
17,000.00	9,326.43	12,827.00	8,150.86	130.25	83.22	-150.69		-10,402.85	-1,515.54	3,522.08	3,400.68	121.40	29.012		
17,100.00	9,326.84	12,827.00	8,150.86	131.86	83.22	-149.82		-10,402.85	-1,515.54	3,439.96	3,315.71	124.25	27.685		
17,200.00	9,327.24	12,827.00	8,150.86	133.46	83.22	-148.90		-10,402.85	-1,515.54	3,358.81	3,231.58	127.23	26.400		
17,300.00	9,327.65	12,827.00	8,150.86	135.07	83.22	-147.94		-10,402.85	-1,515.54	3,278.70	3,148.36	130.34	25.155		
17,400.00	9,328.05	12,827.00	8,150.86	136.68	83.22	-146.92		-10,402.85	-1,515.54	3,199.71	3,066.13	133.58	23.954		
17,500.00	9,328.45	12,827.00	8,150.86	138.29	83.22	-145.84		-10,402.85	-1,515.54	3,121.93	2,984.97	136.96	22.795		
17,600.00	9,328.86	12,827.00	8,150.86	139.90	83.22	-144.70		-10,402.85	-1,515.54	3,045.44	2,904.97	140.47	21.680		
17,700.00	9,329.26	12,827.00	8,150.86	141.51	83.22	-143.49		-10,402.85	-1,515.54	2,970.35	2,826.22	144.13	20.609		
17,800.00	9,329.67	12,827.00	8,150.86	143.12	83.22	-142.21		-10,402.85	-1,515.54	2,896.77	2,748.84	147.93	19.583		
17,900.00	9,330.07	12,827.00	8,150.86	144.73	83.22	-140.85		-10,402.85	-1,515.54	2,824.81	2,672.95	151.86	18.602		
18,000.00	9,330.48	12,827.00	8,150.86	146.35	83.22	-139.41		-10,402.85	-1,515.54	2,754.60	2,598.67	155.93	17.666		
18,100.00	9,330.88	12,827.00	8,150.86	147.96	83.22	-137.89		-10,402.85	-1,515.54	2,686.28	2,526.16	160.12	16.777		
18,200.00	9,331.29	12,827.00	8,150.86	149.58	83.22	-136.26		-10,402.85	-1,515.54	2,619.99	2,455.56	164.44	15.933		
18,300.00	9,331.69	12,827.00	8,150.86	151.20	83.22	-134.54		-10,402.85	-1,515.54	2,555.90	2,387.04	168.86	15.136		
18,400.00	9,332.09	12,827.00	8,150.86	152.81	83.22	-132.71		-10,402.85	-1,515.54	2,494.17	2,320.80	173.37	14.386		
18,500.00	9,332.50	12,827.00	8,150.86	154.43	83.22	-130.77		-10,402.85	-1,515.54	2,434.99	2,257.03	177.96	13.682		
18,600.00	9,332.90	12,827.00	8,150.86	156.05	83.22	-128.71		-10,402.85	-1,515.54	2,378.54	2,195.94	182.60	13.026		
18,700.00	9,333.31	12,827.00	8,150.86	157.67	83.22	-126.52		-10,402.85	-1,515.54	2,325.02	2,137.76	187.26	12.416		
18,800.00	9,333.71	12,827.00	8,150.86	159.30	83.22	-124.20		-10,402.85	-1,515.54	2,274.64	2,082.73	191.91	11.853		
18,900.00	9,334.12	12,827.00	8,150.86	160.92	83.22	-121.76		-10,402.85	-1,515.54	2,227.61	2,031.11	196.50	11.336		
19,000.00	9,334.52	12,827.00	8,150.86	162.54	83.22	-119.17		-10,402.85	-1,515.54	2,184.16	1,983.16	201.00	10.867		
19,100.00	9,334.93	12,827.00	8,150.86	164.16	83.22	-116.46		-10,402.85	-1,515.54	2,144.48	1,939.14	205.35	10.443		
19,200.00	9,335.33	12,827.00	8,150.86	165.79	83.22	-113.61		-10,402.85	-1,515.54	2,108.81	1,899.32	209.49	10.066		
19,300.00	9,335.73	12,827.00	8,150.86	167.41	83.22	-110.63		-10,402.85	-1,515.54	2,077.34	1,863.96	213.39	9.735		
19,390.56	9,336.10	12,827.00	8,150.86	168.88	83.22	-107.83		-10,402.85	-1,515.54	2,052.64	1,836.00	216.64	9.475 CC, ES, SF		



MS Energy Services
Anticollision Report



Company: Devon Energy
Project: Eddy County, New Mexico (NAD 83)
Reference Site: Cotton Draw Unit
Site Error: 0.00 usft
Reference Well: 515H
Well Error: 0.00 usft
Reference Wellbore: Wellbore #1
Reference Design: Design #1

Local Co-ordinate Reference: Well 515H
TVD Reference: Well @ 3566.10usft (Cactus 126)
MD Reference: Well @ 3566.10usft (Cactus 126)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at: 2.00 sigma
Database: 5000.1 Conroe DB
Offset TVD Reference: Offset Datum

Offset Design Cotton Draw Unit - 182H - Wellbore #1 - Surveys													Offset Site Error: 0.00 usft
Survey Program: 172-MWD													Offset Well Error: 0.00 usft
Reference		Offset		Semi Major Axis		Azimuth from North (°)	Offset Wellbore Centre		Distance		Minimum Separation (usft)	Separation Factor	Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)			
0.00	0.00	0.00	0.00	0.00	0.00	-145.83	-2,364.76	-1,605.26	2,858.17				
100.00	100.00	87.75	87.75	0.13	0.13	-145.83	-2,364.71	-1,605.34	2,858.14	2,857.88	0.27	N/A	
200.00	200.00	187.57	187.57	0.49	0.28	-145.82	-2,364.55	-1,605.60	2,858.15	2,857.37	0.78	3,681.661	
300.00	300.00	269.55	269.55	0.85	0.61	-145.81	-2,364.64	-1,606.17	2,858.61	2,857.15	1.46	1,959.560	
400.00	400.00	367.61	367.61	1.21	0.95	-145.81	-2,365.08	-1,606.79	2,859.33	2,857.16	2.16	1,321.120	
500.00	500.00	478.58	478.57	1.57	1.35	-145.80	-2,365.17	-1,607.58	2,859.79	2,856.88	2.92	980.517	
600.00	600.00	572.30	572.28	1.93	1.68	-145.78	-2,365.08	-1,608.44	2,860.23	2,856.62	3.61	792.325	
700.00	700.00	667.01	666.99	2.29	2.02	-145.77	-2,365.26	-1,609.26	2,860.88	2,856.57	4.31	664.194	
800.00	800.00	764.84	764.81	2.64	2.37	-145.75	-2,365.46	-1,610.34	2,861.67	2,856.65	5.02	570.521	
900.00	900.00	865.89	865.86	3.00	2.74	-145.75	-2,365.89	-1,611.13	2,862.46	2,856.72	5.74	499.086	
1,000.00	1,000.00	971.66	971.63	3.36	3.10	-145.75	-2,366.50	-1,611.53	2,863.15	2,856.68	6.46	443.041	
1,100.00	1,100.00	1,078.84	1,078.80	3.72	3.48	-145.77	-2,367.64	-1,610.70	2,863.59	2,856.40	7.19	398.186	
1,200.00	1,200.00	1,200.00	1,232.45	4.08	3.88	-145.81	-2,366.85	-1,607.64	2,861.55	2,853.59	7.96	359.615	
1,300.00	1,300.00	1,361.00	1,360.86	4.44	4.43	-145.82	-2,364.04	-1,605.55	2,858.64	2,849.78	8.86	322.657	
1,400.00	1,400.00	1,429.89	1,429.72	4.79	4.67	-145.79	-2,362.08	-1,605.83	2,856.55	2,847.09	9.46	301.991	
1,500.00	1,500.00	1,489.27	1,489.08	5.15	4.88	-145.76	-2,360.79	-1,606.87	2,855.76	2,845.73	10.03	284.816	
1,502.67	1,502.67	1,490.76	1,490.57	5.16	4.88	-145.76	-2,360.77	-1,606.90	2,855.76	2,845.72	10.04	284.396	
1,600.00	1,600.00	1,553.00	1,552.78	5.51	5.10	-145.73	-2,360.38	-1,608.43	2,856.51	2,845.90	10.61	269.234	
1,700.00	1,700.00	1,623.45	1,623.21	5.87	5.35	-145.71	-2,360.97	-1,610.06	2,858.43	2,847.22	11.22	254.844	
1,800.00	1,800.00	1,739.84	1,739.57	6.23	5.76	-145.73	-2,363.51	-1,610.74	2,860.59	2,848.61	11.98	238.715	
1,900.00	1,900.00	1,900.00	1,897.10	6.59	6.31	-145.78	-2,364.63	-1,608.30	2,859.75	2,846.86	12.89	221.806	
2,000.00	2,000.00	2,026.26	2,025.93	6.95	6.75	-145.79	-2,363.37	-1,606.90	2,858.16	2,844.47	13.69	208.816	
2,100.00	2,100.00	2,103.36	2,103.01	7.30	7.01	-145.76	-2,361.93	-1,607.74	2,857.23	2,842.92	14.31	199.606	
2,156.30	2,156.30	2,142.75	2,142.38	7.51	7.15	-145.73	-2,361.19	-1,608.64	2,857.09	2,842.43	14.65	194.966	
2,200.00	2,200.00	2,171.21	2,170.83	7.66	7.25	-145.72	-2,360.84	-1,609.32	2,857.23	2,842.32	14.91	191.617	
2,300.00	2,300.00	2,236.34	2,235.95	8.02	7.48	-145.69	-2,360.72	-1,610.89	2,858.44	2,842.94	15.50	184.445	
2,400.00	2,400.00	2,311.00	2,310.57	8.38	7.75	-145.67	-2,361.76	-1,612.69	2,860.89	2,844.77	16.12	177.514	
2,500.00	2,500.00	2,449.11	2,448.64	8.74	8.23	-145.69	-2,364.93	-1,613.67	2,863.28	2,846.32	16.96	168.828	
2,600.00	2,599.99	2,628.04	2,627.49	9.10	8.85	-145.80	-2,367.74	-1,609.70	2,864.06	2,846.13	17.94	159.682	
2,654.64	2,654.63	2,730.27	2,729.68	9.29	9.20	-145.85	-2,366.94	-1,606.85	2,863.82	2,845.35	18.48	154.989	
2,700.00	2,699.96	2,750.97	2,750.38	9.45	9.27	-145.87	-2,366.71	-1,606.64	2,863.99	2,845.28	18.72	153.021	
2,800.00	2,799.86	2,841.40	2,840.79	9.81	9.58	-145.92	-2,364.99	-1,605.92	2,865.46	2,846.07	19.39	147.788	
2,900.00	2,899.68	2,916.75	2,916.11	10.17	9.85	-145.96	-2,363.15	-1,606.53	2,868.79	2,848.78	20.01	143.356	
3,000.00	2,999.37	2,976.00	2,975.34	10.53	10.05	-146.02	-2,362.01	-1,607.79	2,874.70	2,854.12	20.58	139.698	
3,100.00	3,098.90	3,051.44	3,050.76	10.89	10.32	-146.10	-2,361.51	-1,609.51	2,883.10	2,861.90	21.20	135.999	
3,200.00	3,198.26	3,121.75	3,121.05	11.25	10.57	-146.23	-2,362.30	-1,610.53	2,893.90	2,872.10	21.80	132.741	
3,299.74	3,297.14	3,257.36	3,256.61	11.61	11.04	-146.42	-2,365.73	-1,610.61	2,906.65	2,884.01	22.64	128.402	
3,300.00	3,297.40	3,258.01	3,257.26	11.61	11.04	-146.42	-2,365.74	-1,610.60	2,906.68	2,884.04	22.64	128.385	
3,400.00	3,396.43	3,414.52	3,413.72	11.98	11.58	-146.65	-2,367.21	-1,607.15	2,917.21	2,893.66	23.55	123.886	
3,500.00	3,495.46	3,508.71	3,507.91	12.36	11.91	-146.81	-2,366.46	-1,606.71	2,927.51	2,903.28	24.24	120.783	
3,600.00	3,594.49	3,585.44	3,584.62	12.73	12.18	-146.94	-2,365.22	-1,607.77	2,938.18	2,913.31	24.87	118.147	
3,700.00	3,693.51	3,650.40	3,649.57	13.11	12.41	-147.09	-2,365.06	-1,608.60	2,949.94	2,924.48	25.46	115.877	
3,800.00	3,792.54	3,715.05	3,714.21	13.49	12.63	-147.24	-2,365.95	-1,609.21	2,962.86	2,936.82	26.04	113.772	
3,900.00	3,891.57	3,900.83	3,899.93	13.87	13.28	-147.47	-2,369.57	-1,607.42	2,975.59	2,948.52	27.07	109.926	
4,000.00	3,990.60	4,004.12	4,003.19	14.25	13.64	-147.67	-2,370.00	-1,604.84	2,985.93	2,958.14	27.80	107.420	
4,100.00	4,089.62	4,091.61	4,090.66	14.64	13.94	-147.80	-2,369.02	-1,605.36	2,996.67	2,968.20	28.47	105.258	
4,200.00	4,188.65	4,148.40	4,147.43	15.02	14.14	-147.92	-2,368.13	-1,606.79	3,008.17	2,979.14	29.03	103.618	
4,300.00	4,287.68	4,206.00	4,205.01	15.41	14.34	-148.07	-2,369.08	-1,607.59	3,021.48	2,991.89	29.59	102.108	
4,400.00	4,386.71	4,317.26	4,316.22	15.80	14.73	-148.26	-2,372.48	-1,607.61	3,035.53	3,005.18	30.35	100.005	
4,500.00	4,485.73	4,498.47	4,497.39	16.19	15.36	-148.47	-2,375.15	-1,605.45	3,047.65	3,016.28	31.37	97.143	
4,600.00	4,584.76	4,637.10	4,635.99	16.59	15.85	-148.64	-2,373.93	-1,603.13	3,057.44	3,025.22	32.23	94.870	
4,700.00	4,683.79	4,741.21	4,740.07	16.98	16.21	-148.81	-2,372.53	-1,600.96	3,066.72	3,033.76	32.96	93.039	

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

Company: Devon Energy
Project: Eddy County, New Mexico (NAD 83)
Reference Site: Cotton Draw Unit
Site Error: 0.00 usft
Reference Well: 515H
Well Error: 0.00 usft
Reference Wellbore: Wellbore #1
Reference Design: Design #1

Local Co-ordinate Reference: Well 515H
TVD Reference: Well @ 3566.10usft (Cactus 126)
MD Reference: Well @ 3566.10usft (Cactus 126)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at: 2.00 sigma
Database: 5000.1 Conroe DB
Offset TVD Reference: Offset Datum

Offset Design Cotton Draw Unit - 182H - Wellbore #1 - Surveys												Offset Site Error: 0.00 usft	
Survey Program: 172-MWD												Offset Well Error: 0.00 usft	
Reference		Offset		Semi Major Axis		Distance						Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Azimuth from North (°)	Offset Wellbore Centre +N/S (usft)	+E/W (usft)	Between Centras (usft)	Between Ellipses (usft)	Minimum Separation (usft)		Separation Factor
4,800.00	4,782.81	4,834.35	4,833.19	17.37	16.53	-148.97	-2,371.20	-1,599.32	3,076.13	3,042.47	33.66	91.393	
4,900.00	4,881.84	4,924.87	4,923.69	17.77	16.84	-149.12	-2,370.03	-1,597.95	3,085.80	3,051.45	34.35	89.843	
5,000.00	4,980.87	5,014.96	5,013.76	18.17	17.16	-149.28	-2,369.20	-1,596.52	3,095.77	3,060.74	35.03	88.367	
5,100.00	5,079.90	5,118.39	5,117.18	18.56	17.52	-149.44	-2,368.40	-1,594.87	3,105.90	3,070.13	35.77	86.834	
5,200.00	5,178.92	5,225.77	5,224.54	18.96	17.89	-149.60	-2,367.18	-1,593.31	3,115.80	3,079.28	36.52	85.323	
5,300.00	5,277.95	5,317.02	5,315.78	19.36	18.21	-149.74	-2,366.04	-1,592.14	3,125.71	3,088.50	37.21	84.001	
5,400.00	5,376.98	5,408.36	5,407.11	19.76	18.53	-149.89	-2,365.07	-1,591.14	3,135.90	3,098.00	37.90	82.734	
5,500.00	5,476.01	5,516.98	5,515.72	20.16	18.91	-150.03	-2,363.83	-1,590.06	3,146.10	3,107.44	38.66	81.379	
5,600.00	5,575.03	5,627.07	5,625.78	20.56	19.30	-150.17	-2,362.15	-1,588.97	3,155.98	3,116.56	39.42	80.058	
5,628.09	5,602.86	5,651.43	5,650.14	20.68	19.38	-150.21	-2,361.77	-1,588.74	3,158.75	3,119.14	39.61	79.742	
5,700.00	5,674.12	5,721.02	5,719.72	20.96	19.63	-150.31	-2,360.65	-1,588.10	3,165.47	3,125.34	40.12	78.891	
5,800.00	5,773.42	5,818.13	5,816.81	21.36	19.97	-150.42	-2,359.10	-1,587.32	3,173.64	3,132.80	40.84	77.715	
5,900.00	5,872.91	5,916.04	5,914.71	21.74	20.31	-150.51	-2,357.43	-1,586.84	3,180.41	3,138.86	41.55	76.545	
6,000.00	5,972.56	6,012.14	6,010.79	22.12	20.65	-150.58	-2,355.64	-1,586.76	3,185.79	3,143.53	42.25	75.399	
6,100.00	6,072.35	6,103.16	6,101.80	22.49	20.97	-150.62	-2,354.09	-1,586.86	3,189.91	3,146.98	42.93	74.298	
6,200.00	6,172.23	6,194.70	6,193.33	22.86	21.29	-150.66	-2,352.76	-1,587.03	3,192.84	3,149.23	43.61	73.208	
6,300.00	6,272.18	6,288.27	6,286.89	23.21	21.62	-150.67	-2,351.66	-1,587.20	3,194.53	3,150.23	44.30	72.116	
6,400.00	6,372.17	6,382.53	6,381.14	23.56	21.95	-150.68	-2,350.79	-1,587.33	3,194.93	3,149.95	44.98	71.030	
6,427.83	6,400.00	6,409.76	6,408.37	23.66	22.04	-150.68	-2,350.57	-1,587.36	3,194.81	3,149.64	45.17	70.723	
6,500.00	6,472.17	6,480.36	6,478.97	23.90	22.29	-150.67	-2,349.99	-1,587.50	3,194.36	3,148.69	45.67	69.938	
6,600.00	6,572.17	6,579.58	6,578.19	24.25	22.64	-150.66	-2,349.21	-1,587.75	3,193.80	3,147.43	46.37	68.871	
6,700.00	6,672.17	6,683.82	6,682.42	24.59	23.01	-150.65	-2,348.37	-1,587.89	3,193.17	3,146.07	47.09	67.805	
6,800.00	6,772.17	6,779.06	6,777.66	24.93	23.34	-150.64	-2,347.60	-1,587.87	3,192.46	3,144.68	47.78	66.818	
6,900.00	6,872.17	6,864.51	6,863.11	25.28	23.64	-150.63	-2,347.11	-1,588.28	3,192.18	3,143.76	48.43	65.920	
7,000.00	6,972.17	6,963.84	6,962.43	25.62	23.99	-150.62	-2,346.63	-1,588.96	3,192.10	3,142.97	49.12	64.979	
7,100.00	7,072.17	7,062.17	7,060.76	25.97	24.33	-150.60	-2,346.18	-1,589.65	3,192.04	3,142.22	49.82	64.070	
7,118.02	7,090.19	7,079.50	7,078.09	26.03	24.40	-150.60	-2,346.10	-1,589.78	3,192.04	3,142.09	49.94	63.911	
7,200.00	7,172.17	7,158.32	7,156.91	26.31	24.67	-150.58	-2,345.77	-1,590.45	3,192.08	3,141.57	50.51	63.199	
7,300.00	7,272.17	7,251.51	7,250.09	26.66	25.00	-150.57	-2,345.44	-1,591.35	3,192.25	3,141.07	51.18	62.368	
7,400.00	7,372.17	7,338.61	7,337.19	27.00	25.30	-150.56	-2,345.54	-1,592.10	3,192.77	3,140.93	51.83	61.596	
7,500.00	7,472.17	7,427.17	7,425.75	27.35	25.61	-150.55	-2,346.14	-1,592.67	3,193.68	3,141.19	52.49	60.845	
7,600.00	7,572.17	7,522.97	7,521.54	27.69	25.94	-150.55	-2,347.14	-1,593.17	3,194.84	3,141.67	53.17	60.087	
7,700.00	7,672.17	7,631.28	7,629.84	28.04	26.31	-150.56	-2,348.30	-1,593.56	3,195.95	3,142.05	53.90	59.293	
7,800.00	7,772.17	7,656.00	7,654.56	28.39	26.40	-150.56	-2,348.68	-1,593.69	3,197.94	3,143.65	54.29	58.902	
7,900.00	7,872.17	7,688.00	7,686.54	28.74	26.51	-150.57	-2,349.86	-1,593.89	3,202.03	3,147.34	54.69	58.546	
8,000.00	7,972.17	7,719.00	7,717.44	29.08	26.61	-150.58	-2,352.25	-1,594.14	3,208.72	3,153.65	55.07	58.267	
8,100.00	8,072.17	7,719.00	7,717.44	29.43	26.61	-150.58	-2,352.25	-1,594.14	3,217.83	3,162.56	55.27	58.223	
8,200.00	8,172.17	7,751.00	7,749.19	29.78	26.72	-150.61	-2,356.21	-1,594.57	3,229.44	3,173.84	55.60	58.082	
8,300.00	8,272.17	7,751.00	7,749.19	30.13	26.72	-150.61	-2,356.21	-1,594.57	3,243.68	3,187.95	55.73	58.202	
8,400.00	8,372.17	7,783.00	7,780.70	30.48	26.83	-150.65	-2,361.70	-1,595.28	3,260.22	3,204.20	56.02	58.197	
8,500.00	8,472.17	7,783.00	7,780.70	30.83	26.83	-150.65	-2,361.70	-1,595.28	3,279.47	3,223.38	56.09	58.471	
8,600.00	8,572.17	7,815.00	7,811.91	31.18	26.94	-150.69	-2,368.66	-1,596.53	3,300.91	3,244.58	56.33	58.595	
8,700.00	8,672.17	7,815.00	7,811.91	31.52	26.94	-150.69	-2,368.66	-1,596.53	3,325.00	3,268.66	56.34	59.013	
8,751.58	8,723.75	7,846.00	7,841.76	31.70	27.04	-150.73	-2,376.80	-1,598.32	3,338.31	3,281.76	56.56	59.027	
8,800.00	8,772.11	7,846.00	7,841.76	31.86	27.04	-150.71	-2,376.80	-1,598.32	3,349.68	3,293.14	56.53	59.252	
8,850.00	8,821.68	7,846.00	7,841.76	32.00	27.04	-150.64	-2,376.80	-1,598.32	3,358.73	3,302.25	56.48	59.464	
8,900.00	8,870.51	7,846.00	7,841.76	32.12	27.04	-150.53	-2,376.80	-1,598.32	3,365.03	3,308.61	56.42	59.643	
8,950.00	8,918.22	7,863.54	7,858.45	32.24	27.10	-150.39	-2,382.07	-1,599.52	3,368.21	3,311.73	56.47	59.643	
9,000.00	8,964.46	7,878.00	7,872.07	32.34	27.15	-150.21	-2,386.81	-1,600.60	3,368.64	3,312.15	56.49	59.629	
9,050.00	9,008.86	7,878.00	7,872.07	32.43	27.15	-149.96	-2,386.81	-1,600.60	3,366.04	3,309.65	56.39	59.692	
9,100.00	9,051.09	7,878.00	7,872.07	32.51	27.15	-149.66	-2,386.81	-1,600.60	3,360.65	3,304.37	56.27	59.718	
9,150.00	9,090.83	7,895.41	7,888.32	32.58	27.21	-149.35	-2,392.90	-1,602.03	3,352.24	3,295.95	56.29	59.551	



MS Energy Services Anticollision Report



Company: Devon Energy
Project: Eddy County, New Mexico (NAD 83)
Reference Site: Cotton Draw Unit
Site Error: 0.00 usft
Reference Well: 515H
Well Error: 0.00 usft
Reference Wellbore: Wellbore #1
Reference Design: Design #1

Local Co-ordinate Reference: Well 515H
TVD Reference: Well @ 3566.10usft (Cactus 126)
MD Reference: Well @ 3566.10usft (Cactus 126)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at
Database: 5000.1 Conroe DB
Offset TVD Reference: Offset Datum

Offset Design Cotton Draw Unit - 182H - Wellbore #1 - Surveys													Offset Site Error:	0.00 usft
Survey Program: 172-MWD													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Distance							Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Azimuth from North (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor		
9,200.00	9,127.77	7,910.00	7,901.82	32.65	27.26	-148.99	-2,398.25	-1,603.34	3,341.08	3,284.80	56.28	59.365		
9,250.00	9,161.64	7,910.00	7,901.82	32.71	27.26	-148.56	-2,398.25	-1,603.34	3,327.08	3,270.93	56.15	59.256		
9,300.00	9,192.18	7,910.00	7,901.82	32.78	27.26	-148.09	-2,398.25	-1,603.34	3,310.50	3,254.49	56.01	59.103		
9,350.00	9,219.15	7,910.00	7,901.82	32.85	27.26	-147.58	-2,398.25	-1,603.34	3,291.42	3,235.55	55.88	58.903		
9,400.00	9,242.36	7,925.27	7,915.80	32.92	27.31	-147.07	-2,404.20	-1,604.89	3,269.64	3,213.76	55.88	58.510		
9,450.00	9,261.61	7,941.00	7,929.96	32.99	27.36	-146.53	-2,410.80	-1,606.72	3,245.89	3,189.98	55.90	58.063		
9,500.00	9,276.77	7,941.00	7,929.96	33.08	27.36	-145.91	-2,410.80	-1,606.72	3,219.68	3,163.88	55.80	57.702		
9,550.00	9,287.73	7,941.00	7,929.96	33.17	27.36	-145.26	-2,410.80	-1,606.72	3,191.51	3,135.80	55.71	57.289		
9,600.00	9,294.39	7,941.00	7,929.96	33.27	27.36	-144.59	-2,410.80	-1,606.72	3,161.53	3,105.89	55.64	56.823		
9,649.26	9,296.70	7,941.00	7,929.96	33.37	27.36	-143.91	-2,410.80	-1,606.72	3,130.40	3,074.81	55.59	56.312		
9,700.00	9,296.91	7,941.00	7,929.96	33.49	27.36	-143.19	-2,410.80	-1,606.72	3,097.55	3,041.99	55.55	55.757		
9,800.00	9,297.31	7,954.49	7,941.92	33.80	27.41	-141.81	-2,416.81	-1,608.39	3,032.42	2,976.79	55.63	54.508		
9,900.00	9,297.72	7,973.00	7,958.08	34.17	27.47	-140.44	-2,425.54	-1,610.67	2,967.05	2,911.25	55.80	53.176		
10,000.00	9,298.12	7,973.00	7,958.08	34.62	27.47	-138.96	-2,425.54	-1,610.67	2,901.17	2,845.36	55.81	51.980		
10,027.33	9,298.24	7,973.00	7,958.08	34.75	27.47	-138.56	-2,425.54	-1,610.67	2,883.14	2,827.32	55.82	51.648		
10,100.00	9,298.53	7,973.00	7,958.08	35.13	27.47	-137.45	-2,425.54	-1,610.67	2,835.71	2,779.85	55.86	50.764		
10,200.00	9,298.93	8,005.00	7,985.40	35.71	27.57	-136.04	-2,441.73	-1,614.60	2,771.92	2,715.63	56.29	49.246		
10,300.00	9,299.34	8,005.00	7,985.40	36.35	27.57	-134.36	-2,441.73	-1,614.60	2,710.04	2,653.59	56.45	48.005		
10,400.00	9,299.74	8,019.45	7,997.46	37.06	27.62	-132.89	-2,449.48	-1,616.37	2,650.30	2,593.47	56.83	46.632		
10,500.00	9,300.15	8,036.00	8,011.03	37.83	27.68	-130.95	-2,458.73	-1,618.42	2,592.83	2,535.52	57.31	45.241		
10,600.00	9,300.55	8,047.12	8,020.00	38.65	27.72	-129.07	-2,465.16	-1,619.79	2,537.66	2,479.85	57.81	43.897		
10,700.00	9,300.96	8,068.00	8,036.54	39.53	27.79	-127.21	-2,477.68	-1,622.21	2,484.89	2,426.40	58.49	42.483		
10,800.00	9,301.36	8,085.97	8,050.45	40.45	27.85	-125.23	-2,488.88	-1,624.17	2,434.60	2,375.37	59.22	41.108		
10,900.00	9,301.76	8,100.00	8,061.11	41.42	27.90	-123.11	-2,497.88	-1,625.64	2,386.92	2,326.91	60.00	39.781		
11,000.00	9,302.17	8,132.00	8,084.66	42.44	28.02	-121.18	-2,519.33	-1,628.63	2,341.78	2,280.73	61.05	38.361		
11,100.00	9,302.57	8,163.00	8,106.40	43.49	28.13	-119.19	-2,541.29	-1,631.11	2,299.44	2,237.28	62.16	36.994		
11,200.00	9,302.98	8,195.00	8,127.94	44.58	28.25	-117.18	-2,564.84	-1,633.40	2,259.80	2,196.45	63.35	35.671		
11,300.00	9,303.38	8,233.50	8,153.06	45.71	28.40	-115.24	-2,593.90	-1,635.92	2,222.63	2,157.95	64.68	34.361		
11,400.00	9,303.79	8,259.00	8,169.03	46.86	28.50	-113.00	-2,613.74	-1,637.26	2,188.05	2,122.09	65.96	33.172		
11,500.00	9,304.19	8,290.00	8,187.09	48.05	28.63	-110.85	-2,638.90	-1,638.48	2,156.46	2,089.12	67.34	32.023		
11,600.00	9,304.60	8,322.00	8,203.62	49.26	28.76	-108.70	-2,666.27	-1,639.50	2,128.42	2,059.65	68.76	30.952		
11,700.00	9,305.00	8,335.02	8,209.64	50.50	28.82	-106.03	-2,677.80	-1,639.84	2,103.64	2,033.57	70.07	30.021		
11,800.00	9,305.40	8,354.00	8,217.63	51.76	28.90	-103.46	-2,695.02	-1,640.13	2,082.42	2,010.97	71.45	29.144		
11,900.00	9,305.81	8,385.00	8,228.56	53.05	29.03	-101.22	-2,724.01	-1,640.18	2,064.55	1,991.62	72.93	28.310		
12,000.00	9,306.21	8,417.00	8,236.89	54.35	29.17	-99.01	-2,754.89	-1,639.92	2,050.35	1,975.96	74.39	27.563		
12,100.00	9,306.62	8,428.00	8,239.02	55.67	29.22	-96.11	-2,765.69	-1,639.83	2,039.85	1,964.13	75.72	26.938		
12,200.00	9,307.02	8,460.00	8,243.12	57.01	29.36	-93.87	-2,797.41	-1,639.62	2,033.20	1,956.06	77.14	26.357		
12,300.00	9,307.43	12,300.00	8,252.15	58.37	51.35	-97.28	-2,999.72	-1,624.37	2,024.79	1,927.13	97.65	20.734		
12,400.00	9,307.83	8,768.74	8,255.75	59.74	31.07	-97.49	-3,104.53	-1,612.30	2,013.94	1,933.04	80.90	24.894		
12,500.00	9,308.23	8,824.65	8,256.62	61.13	31.47	-96.04	-3,160.10	-1,606.18	2,004.53	1,922.03	82.50	24.298		
12,600.00	9,308.64	8,872.00	8,256.74	62.53	31.80	-94.28	-3,207.25	-1,601.83	1,997.44	1,913.38	84.06	23.763		
12,700.00	9,309.04	8,908.21	8,256.34	63.94	32.09	-92.14	-3,243.38	-1,599.44	1,993.29	1,907.71	85.57	23.293		
12,771.99	9,309.33	8,931.70	8,255.81	64.96	32.27	-90.51	-3,266.84	-1,598.57	1,992.40	1,905.76	86.64	22.997		
12,800.00	9,309.45	8,967.00	8,254.59	65.36	32.55	-90.75	-3,302.11	-1,598.27	1,993.05	1,905.84	87.21	22.854		
12,807.67	9,309.48	8,967.00	8,254.59	65.47	32.55	-90.49	-3,302.11	-1,598.27	1,993.03	1,905.73	87.31	22.828		
12,900.00	9,309.85	8,983.66	8,253.90	66.80	32.69	-87.94	-3,318.76	-1,598.42	1,995.09	1,906.53	88.56	22.528		
13,000.00	9,310.26	9,068.48	8,250.31	68.24	33.40	-87.43	-3,403.50	-1,599.66	1,999.28	1,908.87	90.41	22.114		
13,100.00	9,310.66	9,272.43	8,245.50	69.69	35.30	-90.92	-3,607.32	-1,602.41	2,003.61	1,910.25	93.36	21.461		
13,200.00	9,311.07	9,435.28	8,251.44	71.16	36.97	-93.03	-3,770.03	-1,599.33	2,000.46	1,904.29	96.17	20.802		
13,300.00	9,311.47	9,532.09	8,256.01	72.63	38.03	-92.93	-3,866.70	-1,597.08	1,996.73	1,898.27	98.46	20.280		
13,400.00	9,311.87	9,650.73	8,260.04	74.11	39.37	-93.55	-3,985.19	-1,592.88	1,992.68	1,891.72	100.96	19.738		
13,500.00	9,312.28	9,714.65	8,260.71	75.59	40.12	-92.34	-4,049.05	-1,590.26	1,989.24	1,886.28	102.96	19.321		



MS Energy Services Anticollision Report



Company: Devon Energy
Project: Eddy County, New Mexico (NAD 83)
Reference Site: Cotton Draw Unit
Site Error: 0.00 usft
Reference Well: 515H
Well Error: 0.00 usft
Reference Wellbore: Wellbore #1
Reference Design: Design #1

Local Co-ordinate Reference: Well 515H
TVD Reference: Well @ 3566.10usft (Cactus 126)
MD Reference: Well @ 3566.10usft (Cactus 126)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: 5000.1 Conroe DB
Offset TVD Reference: Offset Datum

Offset Design Cotton Draw Unit - 182H - Wellbore #1 - Surveys													Offset Site Error:	0.00 usft
Survey Program: 172-MWD													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis			Distance							
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Azimuth from North (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning	
13,600.00	9,312.68	9,855.36	8,259.71	77.09	41.80	-93.72	-4,189.52	-1,582.16	1,985.43	1,879.82	105.61	18.799		
13,700.00	9,313.09	9,941.91	8,259.90	78.59	42.87	-93.27	-4,275.89	-1,576.70	1,980.72	1,872.88	107.84	18.367		
13,800.00	9,313.49	10,012.00	8,259.71	80.09	43.75	-92.25	-4,345.91	-1,573.49	1,977.60	1,867.66	109.94	17.989		
13,898.51	9,313.89	10,058.92	8,259.38	81.58	44.35	-90.50	-4,392.81	-1,572.36	1,976.48	1,864.70	111.78	17.682	CC	
13,900.00	9,313.90	10,059.75	8,259.38	81.60	44.36	-90.47	-4,393.64	-1,572.35	1,976.48	1,864.67	111.81	17.678		
14,000.00	9,314.30	10,132.11	8,259.22	83.12	45.28	-89.53	-4,466.00	-1,572.67	1,977.58	1,863.62	113.96	17.354		
14,100.00	9,314.71	10,241.27	8,260.98	84.64	46.70	-89.84	-4,575.14	-1,573.64	1,978.16	1,861.55	116.61	16.964		
14,200.00	9,315.11	10,308.56	8,261.86	86.17	47.58	-88.73	-4,642.40	-1,575.02	1,979.95	1,861.20	118.75	16.673		
14,300.00	9,315.51	10,376.15	8,262.48	87.70	48.47	-87.63	-4,709.95	-1,577.55	1,983.39	1,862.50	120.90	16.406		
14,400.00	9,315.92	10,439.24	8,263.00	89.24	49.31	-86.38	-4,772.93	-1,581.14	1,988.55	1,865.57	122.97	16.170		
14,500.00	9,316.32	10,487.00	8,263.37	90.78	49.95	-84.63	-4,820.55	-1,584.79	1,995.69	1,870.91	124.78	15.994		
14,600.00	9,316.73	10,551.89	8,263.06	92.33	50.81	-83.48	-4,885.15	-1,590.90	2,004.90	1,878.06	126.84	15.807		
14,700.00	9,317.13	10,619.12	8,261.86	93.88	51.48	-89.06	-5,151.64	-1,608.00	2,011.60	1,879.41	132.18	15.218		
14,800.00	9,317.54	10,693.98	8,262.29	95.43	55.54	-88.23	-5,226.46	-1,610.17	2,014.47	1,879.96	134.51	14.976		
14,900.00	9,317.94	11,171.79	8,261.26	96.99	59.54	-94.14	-5,504.05	-1,605.45	2,014.83	1,875.61	139.22	14.473		
15,000.00	9,318.34	11,225.51	8,262.06	98.55	60.33	-92.60	-5,557.70	-1,602.78	2,010.54	1,869.14	141.40	14.219		
15,100.00	9,318.75	11,299.40	8,261.86	100.11	61.42	-91.73	-5,631.54	-1,600.10	2,008.25	1,864.50	143.74	13.971		
15,200.00	9,319.15	11,393.46	8,261.18	101.68	62.81	-91.53	-5,725.55	-1,597.10	2,006.64	1,860.33	146.31	13.715		
15,300.00	9,319.56	11,512.53	8,261.45	103.24	64.58	-92.17	-5,844.57	-1,593.65	2,004.81	1,855.62	149.19	13.438		
15,400.00	9,319.96	11,600.69	8,261.80	104.82	65.90	-91.78	-5,932.67	-1,590.63	2,002.43	1,850.70	151.73	13.197		
15,500.00	9,320.37	11,674.61	8,261.71	106.39	67.00	-90.90	-6,006.57	-1,588.78	2,001.13	1,847.03	154.10	12.986		
15,541.56	9,320.53	11,704.04	8,261.63	107.05	67.45	-90.49	-6,036.00	-1,588.38	2,001.00	1,845.93	155.07	12.904		
15,600.00	9,320.77	11,749.47	8,261.46	107.97	68.13	-90.06	-6,081.42	-1,588.08	2,001.22	1,844.74	156.48	12.789		
15,700.00	9,321.18	11,835.45	8,260.97	109.55	69.42	-89.59	-6,167.41	-1,588.11	2,002.27	1,843.26	159.00	12.593		
15,800.00	9,321.58	11,927.08	8,259.60	111.13	70.81	-89.30	-6,259.02	-1,588.03	2,003.72	1,842.14	161.58	12.401		
15,900.00	9,321.98	11,997.70	8,257.95	112.71	71.88	-88.32	-6,329.62	-1,588.48	2,006.22	1,842.37	163.85	12.245		
16,000.00	9,322.39	12,218.00	8,258.01	114.30	75.25	-92.36	-6,549.81	-1,584.14	2,003.83	1,835.67	168.16	11.916		
16,100.00	9,322.79	12,284.63	8,258.75	115.88	76.28	-91.23	-6,616.40	-1,581.98	2,001.44	1,830.94	170.51	11.738		
16,150.34	9,323.00	12,313.00	8,258.48	116.68	76.72	-90.49	-6,644.76	-1,581.41	2,001.19	1,829.60	171.59	11.662		
16,200.00	9,323.20	12,349.31	8,257.90	117.47	77.28	-90.05	-6,681.07	-1,580.93	2,001.40	1,828.64	172.76	11.585		
16,300.00	9,323.60	12,427.39	8,256.65	119.07	78.48	-89.31	-6,759.13	-1,580.57	2,002.59	1,827.42	175.17	11.433		
16,400.00	9,324.01	12,504.00	8,255.10	120.66	79.67	-88.52	-6,835.73	-1,581.11	2,004.98	1,827.44	177.54	11.293		
16,500.00	9,324.41	12,596.88	8,253.16	122.25	81.10	-88.28	-6,928.55	-1,582.57	2,008.15	1,827.98	180.17	11.146		
16,600.00	9,324.82	12,683.29	8,251.62	123.85	82.43	-87.83	-7,014.95	-1,584.55	2,011.76	1,829.04	182.72	11.010		
16,700.00	9,325.22	12,768.28	8,250.06	125.45	83.75	-87.33	-7,099.88	-1,587.16	2,016.08	1,830.84	185.24	10.883		
16,800.00	9,325.62	12,945.53	8,248.37	127.05	86.50	-89.91	-7,277.07	-1,591.04	2,019.42	1,830.14	189.28	10.669		
16,900.00	9,326.03	13,124.37	8,249.74	128.65	89.31	-92.55	-7,455.86	-1,588.16	2,018.42	1,825.34	193.08	10.454		
17,000.00	9,326.43	13,229.26	8,251.86	130.25	90.97	-92.71	-7,560.65	-1,583.97	2,014.67	1,818.74	195.93	10.283		
17,100.00	9,326.84	13,318.25	8,253.49	131.86	92.38	-92.34	-7,649.59	-1,581.26	2,011.82	1,813.20	198.62	10.129		
17,200.00	9,327.24	13,394.73	8,254.76	133.46	93.59	-91.56	-7,726.03	-1,579.14	2,009.41	1,808.25	201.16	9.989		
17,276.86	9,327.55	13,440.01	8,255.30	134.70	94.30	-90.50	-7,771.30	-1,578.66	2,008.81	1,805.89	202.92	9.899		
17,300.00	9,327.65	13,455.00	8,255.44	135.07	94.54	-90.22	-7,786.29	-1,578.67	2,008.86	1,805.40	203.46	9.873		
17,400.00	9,328.05	13,530.68	8,255.79	136.68	95.73	-89.41	-7,861.96	-1,579.18	2,009.92	1,803.97	205.95	9.759		
17,500.00	9,328.45	13,593.84	8,255.62	138.29	96.73	-88.17	-7,925.12	-1,580.31	2,012.36	1,804.17	208.19	9.666		
17,600.00	9,328.86	13,659.11	8,254.97	139.90	97.75	-87.01	-7,990.34	-1,582.82	2,016.81	1,806.39	210.43	9.584		
17,700.00	9,329.26	13,856.35	8,253.42	141.51	100.86	-90.26	-8,187.46	-1,587.79	2,020.62	1,805.72	214.90	9.403		
17,800.00	9,329.67	13,942.46	8,253.07	143.12	102.23	-89.80	-8,273.57	-1,587.47	2,021.27	1,803.76	217.51	9.293		
17,900.00	9,330.07	14,016.75	8,252.46	144.73	103.41	-88.94	-8,347.86	-1,587.91	2,022.94	1,803.00	219.93	9.198		
18,000.00	9,330.48	14,161.30	8,250.04	146.35	105.72	-90.42	-8,492.38	-1,587.28	2,024.20	1,800.87	223.33	9.064		
18,081.03	9,330.80	14,244.53	8,248.37	147.66	107.05	-90.50	-8,575.56	-1,585.27	2,023.99	1,798.44	225.54	8.974		
18,100.00	9,330.88	14,258.28	8,248.07	147.96	107.27	-90.32	-8,589.31	-1,584.98	2,024.01	1,798.02	225.99	8.956		
18,200.00	9,331.29	14,340.46	8,246.02	149.58	108.59	-89.73	-8,671.46	-1,583.87	2,024.88	1,796.42	228.45	8.863		

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



MS Energy Services

Anticollision Report



Company: Devon Energy
Project: Eddy County, New Mexico (NAD 83)
Reference Site: Cotton Draw Unit
Site Error: 0.00 usft
Reference Well: 515H
Well Error: 0.00 usft
Reference Wellbore: Wellbore #1
Reference Design: Design #1

Local Co-ordinate Reference: Well 515H
TVD Reference: Well @ 3566.10usft (Cactus 126)
MD Reference: Well @ 3566.10usft (Cactus 126)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: 5000.1 Conroe DB
Offset TVD Reference: Offset Datum

Offset Design Cotton Draw Unit - 182H - Wellbore #1 - Surveys											Offset Site Error: 0.00 usft		
Survey Program: 172-MWD											Offset Well Error: 0.00 usft		
Reference		Offset		Semi Major Axis		Azimuth from North (°)	Offset Wellbore Centre		Distance		Minimum Separation (usft)	Separation Factor	Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)			
18,300.00	9,331.69	14,499.13	8,244.59	151.20	111.13	-91.68	-8,830.10	-1,581.97	2,025.37	1,793.39	231.98	8.731	
18,400.00	9,332.09	14,579.18	8,245.17	152.81	112.41	-91.02	-8,910.13	-1,580.43	2,024.10	1,789.54	234.56	8.629	
18,455.88	9,332.32	14,619.46	8,245.22	153.72	113.06	-90.50	-8,950.41	-1,579.91	2,023.86	1,787.93	235.93	8.578	
18,500.00	9,332.50	14,649.45	8,244.92	154.43	113.54	-90.02	-8,980.39	-1,579.58	2,024.01	1,787.05	236.96	8.542	
18,600.00	9,332.90	14,918.04	8,241.74	156.05	117.88	-95.66	-9,248.50	-1,566.75	2,022.65	1,781.61	241.04	8.391	
18,700.00	9,333.31	15,015.98	8,242.48	157.67	119.47	-95.61	-9,346.01	-1,557.61	2,015.09	1,771.44	243.65	8.270	
18,800.00	9,333.71	15,094.32	8,243.37	159.30	120.75	-94.89	-9,424.04	-1,550.68	2,007.82	1,761.61	246.21	8.155	
18,900.00	9,334.12	15,148.12	8,243.92	160.92	121.62	-93.33	-9,477.72	-1,547.17	2,002.51	1,753.91	248.60	8.055	
19,000.00	9,334.52	15,232.99	8,244.66	162.54	123.00	-92.82	-9,562.50	-1,543.39	1,998.98	1,747.75	251.23	7.957	
19,100.00	9,334.93	15,308.56	8,245.22	164.16	124.22	-91.99	-9,638.00	-1,540.38	1,996.01	1,742.26	253.75	7.866	
19,200.00	9,335.33	15,397.51	8,245.56	165.79	125.66	-91.61	-9,726.93	-1,538.02	1,994.28	1,737.87	256.41	7.778	
19,235.13	9,335.47	15,400.00	8,245.57	166.36	125.70	-90.50	-9,729.41	-1,537.95	1,993.97	1,737.00	256.97	7.759 ES	
19,300.00	9,335.73	15,400.00	8,245.57	167.41	125.70	-88.29	-9,729.41	-1,537.95	1,995.03	1,737.26	257.77	7.739	
19,390.56	9,336.10	15,400.00	8,245.57	168.88	125.70	-85.21	-9,729.41	-1,537.95	2,000.02	1,741.56	258.46	7.738 SF	

MS Energy Services

Anticollision Report

Company: Devon Energy
Project: Eddy County, New Mexico (NAD 83)
Reference Site: Cotton Draw Unit
Site Error: 0.00 usft
Reference Well: 515H
Well Error: 0.00 usft
Reference Wellbore: Wellbore #1
Reference Design: Design #1

Local Co-ordinate Reference: Well 515H
TVD Reference: Well @ 3566.10usft (Cactus 126)
MD Reference: Well @ 3566.10usft (Cactus 126)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: 5000.1 Conroe DB
Offset TVD Reference: Offset Datum

Offset Design Cotton Draw Unit - 242H - Wellbore #1 - Surveys														Offset Site Error:	0.00 usft
Survey Program: 165-MWD														Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Azimuth from North (°)	Offset Wellbore Centre		Distance		Minimum Separation (usft)	Separation Factor	Warning		
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference	Offset		+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)					
10,100.00	9,298.53	17,847.00	10,409.33	35.13	134.25	-170.91	-10,374.19	-1,484.23	9,994.68	9,919.16	75.51	132.358			
10,200.00	9,298.93	17,847.00	10,409.33	35.71	134.25	-170.81	-10,374.19	-1,484.23	9,896.75	9,821.10	75.65	130.824			
10,300.00	9,299.34	17,847.00	10,409.33	36.35	134.25	-170.71	-10,374.19	-1,484.23	9,798.87	9,723.07	75.79	129.284			
10,400.00	9,299.74	17,847.00	10,409.33	37.06	134.25	-170.61	-10,374.19	-1,484.23	9,701.03	9,625.08	75.94	127.738			
10,500.00	9,300.15	17,847.00	10,409.33	37.83	134.25	-170.51	-10,374.19	-1,484.23	9,603.23	9,527.13	76.10	126.186			
10,600.00	9,300.55	17,847.00	10,409.33	38.65	134.25	-170.41	-10,374.19	-1,484.23	9,505.48	9,429.21	76.27	124.627			
10,700.00	9,300.96	17,847.00	10,409.33	39.53	134.25	-170.30	-10,374.19	-1,484.23	9,407.78	9,331.33	76.45	123.062			
10,800.00	9,301.36	17,847.00	10,409.33	40.45	134.25	-170.19	-10,374.19	-1,484.23	9,310.12	9,233.49	76.63	121.491			
10,900.00	9,301.76	17,847.00	10,409.33	41.42	134.25	-170.08	-10,374.19	-1,484.23	9,212.52	9,135.69	76.83	119.914			
11,000.00	9,302.17	17,847.00	10,409.33	42.44	134.25	-169.97	-10,374.19	-1,484.23	9,114.97	9,037.94	77.03	118.330			
11,100.00	9,302.57	17,847.00	10,409.33	43.49	134.25	-169.85	-10,374.19	-1,484.23	9,017.47	8,940.23	77.24	116.741			
11,200.00	9,302.98	17,847.00	10,409.33	44.58	134.25	-169.74	-10,374.19	-1,484.23	8,920.03	8,842.56	77.47	115.146			
11,300.00	9,303.38	17,847.00	10,409.33	45.71	134.25	-169.61	-10,374.19	-1,484.23	8,822.64	8,744.94	77.70	113.545			
11,400.00	9,303.79	17,847.00	10,409.33	46.86	134.25	-169.49	-10,374.19	-1,484.23	8,725.32	8,647.37	77.95	111.938			
11,500.00	9,304.19	17,847.00	10,409.33	48.05	134.25	-169.36	-10,374.19	-1,484.23	8,628.05	8,549.85	78.20	110.326			
11,600.00	9,304.60	17,847.00	10,409.33	49.26	134.25	-169.24	-10,374.19	-1,484.23	8,530.85	8,452.37	78.47	108.709			
11,700.00	9,305.00	17,847.00	10,409.33	50.50	134.25	-169.10	-10,374.19	-1,484.23	8,433.71	8,354.96	78.76	107.086			
11,800.00	9,305.40	17,847.00	10,409.33	51.76	134.25	-168.97	-10,374.19	-1,484.23	8,336.64	8,257.59	79.05	105.459			
11,900.00	9,305.81	17,847.00	10,409.33	53.05	134.25	-168.83	-10,374.19	-1,484.23	8,239.64	8,160.28	79.36	103.826			
12,000.00	9,306.21	17,847.00	10,409.33	54.35	134.25	-168.69	-10,374.19	-1,484.23	8,142.72	8,063.03	79.68	102.189			
12,100.00	9,306.62	17,847.00	10,409.33	55.67	134.25	-168.54	-10,374.19	-1,484.23	8,045.87	7,965.85	80.02	100.547			
12,200.00	9,307.02	17,847.00	10,409.33	57.01	134.25	-168.39	-10,374.19	-1,484.23	7,949.09	7,868.72	80.37	98.900			
12,300.00	9,307.43	17,847.00	10,409.33	58.37	134.25	-168.24	-10,374.19	-1,484.23	7,852.40	7,771.66	80.74	97.250			
12,400.00	9,307.83	17,847.00	10,409.33	59.74	134.25	-168.08	-10,374.19	-1,484.23	7,755.79	7,674.66	81.13	95.596			
12,500.00	9,308.23	17,847.00	10,409.33	61.13	134.25	-167.92	-10,374.19	-1,484.23	7,659.27	7,577.74	81.53	93.939			
12,600.00	9,308.64	17,847.00	10,409.33	62.53	134.25	-167.76	-10,374.19	-1,484.23	7,562.84	7,480.89	81.96	92.278			
12,700.00	9,309.04	17,847.00	10,409.33	63.94	134.25	-167.59	-10,374.19	-1,484.23	7,466.51	7,384.11	82.40	90.614			
12,800.00	9,309.45	17,847.00	10,409.33	65.36	134.25	-167.41	-10,374.19	-1,484.23	7,370.27	7,287.41	82.86	88.948			
12,900.00	9,309.85	17,847.00	10,409.33	66.80	134.25	-167.23	-10,374.19	-1,484.23	7,274.13	7,190.79	83.34	87.280			
13,000.00	9,310.26	17,847.00	10,409.33	68.24	134.25	-167.05	-10,374.19	-1,484.23	7,178.10	7,094.25	83.85	85.610			
13,100.00	9,310.66	17,847.00	10,409.33	69.69	134.25	-166.88	-10,374.19	-1,484.23	7,082.17	6,997.80	84.37	83.938			
13,200.00	9,311.07	17,847.00	10,409.33	71.16	134.25	-166.67	-10,374.19	-1,484.23	6,986.37	6,901.44	84.92	82.265			
13,300.00	9,311.47	17,847.00	10,409.33	72.63	134.25	-166.47	-10,374.19	-1,484.23	6,890.68	6,805.18	85.50	80.592			
13,400.00	9,311.87	17,847.00	10,409.33	74.11	134.25	-166.26	-10,374.19	-1,484.23	6,795.11	6,709.01	86.10	78.919			
13,500.00	9,312.28	17,847.00	10,409.33	75.59	134.25	-166.05	-10,374.19	-1,484.23	6,699.68	6,612.95	86.73	77.246			
13,600.00	9,312.68	17,847.00	10,409.33	77.09	134.25	-165.83	-10,374.19	-1,484.23	6,604.38	6,516.99	87.39	75.574			
13,700.00	9,313.09	17,847.00	10,409.33	78.59	134.25	-165.61	-10,374.19	-1,484.23	6,509.22	6,421.14	88.08	73.904			
13,800.00	9,313.49	17,847.00	10,409.33	80.09	134.25	-165.37	-10,374.19	-1,484.23	6,414.21	6,325.41	88.80	72.236			
13,900.00	9,313.90	17,847.00	10,409.33	81.60	134.25	-165.14	-10,374.19	-1,484.23	6,319.35	6,229.80	89.55	70.570			
14,000.00	9,314.30	17,847.00	10,409.33	83.12	134.25	-164.89	-10,374.19	-1,484.23	6,224.65	6,134.32	90.33	68.908			
14,100.00	9,314.71	17,847.00	10,409.33	84.64	134.25	-164.63	-10,374.19	-1,484.23	6,130.12	6,038.97	91.15	67.250			
14,200.00	9,315.11	17,847.00	10,409.33	86.17	134.25	-164.37	-10,374.19	-1,484.23	6,035.77	5,943.76	92.01	65.597			
14,300.00	9,315.51	17,847.00	10,409.33	87.70	134.25	-164.10	-10,374.19	-1,484.23	5,941.60	5,848.69	92.91	63.949			
14,400.00	9,315.92	17,847.00	10,409.33	89.24	134.25	-163.82	-10,374.19	-1,484.23	5,847.63	5,753.78	93.85	62.307			
14,500.00	9,316.32	17,847.00	10,409.33	90.78	134.25	-163.53	-10,374.19	-1,484.23	5,753.86	5,659.03	94.83	60.673			
14,600.00	9,316.73	17,847.00	10,409.33	92.33	134.25	-163.23	-10,374.19	-1,484.23	5,660.30	5,564.44	95.86	59.046			
14,700.00	9,317.13	17,847.00	10,409.33	93.88	134.25	-162.92	-10,374.19	-1,484.23	5,566.97	5,470.03	96.94	57.428			
14,800.00	9,317.54	17,847.00	10,409.33	95.43	134.25	-162.60	-10,374.19	-1,484.23	5,473.87	5,375.81	98.06	55.820			
14,900.00	9,317.94	17,847.00	10,409.33	96.99	134.25	-162.27	-10,374.19	-1,484.23	5,381.02	5,281.78	99.24	54.222			
15,000.00	9,318.34	17,847.00	10,409.33	98.55	134.25	-161.92	-10,374.19	-1,484.23	5,288.43	5,187.96	100.47	52.635			
15,100.00	9,318.75	17,847.00	10,409.33	100.11	134.25	-161.56	-10,374.19	-1,484.23	5,196.12	5,094.35	101.76	51.060			
15,200.00	9,319.15	17,847.00	10,409.33	101.68	134.25	-161.19	-10,374.19	-1,484.23	5,104.09	5,000.98	103.11	49.499			

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



MS Energy Services

Anticollision Report



Company: Devon Energy
Project: Eddy County, New Mexico (NAD 83)
Reference Site: Cotton Draw Unit
Site Error: 0.00 usft
Reference Well: 515H
Well Error: 0.00 usft
Reference Wellbore: Wellbore #1
Reference Design: Design #1

Local Co-ordinate Reference: Well 515H
TVD Reference: Well @ 3566.10usft (Cactus 126)
MD Reference: Well @ 3566.10usft (Cactus 126)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: 5000.1 Conroe DB
Offset TVD Reference: Offset Datum

Offset Design Cotton Draw Unit - 242H - Wellbore #1 - Surveys													Offset Site Error:	0.00 usft
Survey Program: 165-MWD													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Azimuth from North (°)	Distance		Minimum Separation	Separation Factor	Warning			
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		Between Centres (usft)	Between Ellipses (usft)				Offset	Well	Site
15,300.00	9,319.56	17,847.00	10,409.33	103.24	134.25	-160.80	-10,374.19	-1,484.23	5,012.37	4,907.84	104.53	47.952		
15,400.00	9,319.96	17,847.00	10,409.33	104.82	134.25	-160.40	-10,374.19	-1,484.23	4,920.98	4,814.97	106.01	46.420		
15,500.00	9,320.37	17,847.00	10,409.33	106.39	134.25	-159.98	-10,374.19	-1,484.23	4,829.92	4,722.36	107.56	44.904		
15,600.00	9,320.77	17,847.00	10,409.33	107.97	134.25	-159.55	-10,374.19	-1,484.23	4,739.22	4,630.04	109.18	43.406		
15,700.00	9,321.18	17,847.00	10,409.33	109.55	134.25	-159.10	-10,374.19	-1,484.23	4,648.91	4,538.02	110.89	41.925		
15,800.00	9,321.58	17,847.00	10,409.33	111.13	134.25	-158.62	-10,374.19	-1,484.23	4,559.00	4,446.33	112.67	40.464		
15,900.00	9,321.98	17,847.00	10,409.33	112.71	134.25	-158.13	-10,374.19	-1,484.23	4,469.52	4,354.99	114.53	39.023		
16,000.00	9,322.39	17,847.00	10,409.33	114.30	134.25	-157.62	-10,374.19	-1,484.23	4,380.49	4,264.00	116.49	37.604		
16,100.00	9,322.79	17,847.00	10,409.33	115.88	134.25	-157.08	-10,374.19	-1,484.23	4,291.95	4,173.41	118.54	36.207		
16,200.00	9,323.20	17,847.00	10,409.33	117.47	134.25	-156.52	-10,374.19	-1,484.23	4,203.92	4,083.24	120.69	34.833		
16,300.00	9,323.60	17,847.00	10,409.33	119.07	134.25	-155.93	-10,374.19	-1,484.23	4,116.44	3,993.50	122.94	33.484		
16,400.00	9,324.01	17,847.00	10,409.33	120.66	134.25	-155.31	-10,374.19	-1,484.23	4,029.54	3,904.25	125.30	32.160		
16,500.00	9,324.41	17,847.00	10,409.33	122.25	134.25	-154.67	-10,374.19	-1,484.23	3,943.27	3,815.50	127.77	30.863		
16,600.00	9,324.82	17,847.00	10,409.33	123.85	134.25	-153.99	-10,374.19	-1,484.23	3,857.65	3,727.30	130.36	29.593		
16,700.00	9,325.22	17,847.00	10,409.33	125.45	134.25	-153.28	-10,374.19	-1,484.23	3,772.74	3,639.68	133.07	28.352		
16,800.00	9,325.62	17,847.00	10,409.33	127.05	134.25	-152.53	-10,374.19	-1,484.23	3,688.59	3,552.68	135.91	27.140		
16,900.00	9,326.03	17,847.00	10,409.33	128.65	134.25	-151.74	-10,374.19	-1,484.23	3,605.25	3,466.37	138.88	25.959		
17,000.00	9,326.43	17,847.00	10,409.33	130.25	134.25	-150.91	-10,374.19	-1,484.23	3,522.78	3,380.78	142.00	24.809		
17,100.00	9,326.84	17,847.00	10,409.33	131.86	134.25	-150.04	-10,374.19	-1,484.23	3,441.23	3,295.98	145.25	23.691		
17,200.00	9,327.24	17,847.00	10,409.33	133.46	134.25	-149.12	-10,374.19	-1,484.23	3,360.68	3,212.02	148.66	22.606		
17,300.00	9,327.65	17,847.00	10,409.33	135.07	134.25	-148.15	-10,374.19	-1,484.23	3,281.21	3,128.98	152.23	21.555		
17,400.00	9,328.05	17,847.00	10,409.33	136.68	134.25	-147.12	-10,374.19	-1,484.23	3,202.88	3,046.93	155.95	20.538		
17,500.00	9,328.45	17,847.00	10,409.33	138.29	134.25	-146.03	-10,374.19	-1,484.23	3,125.79	2,965.96	159.83	19.557		
17,600.00	9,328.86	17,847.00	10,409.33	139.90	134.25	-144.88	-10,374.19	-1,484.23	3,050.03	2,886.15	163.88	18.612		
17,700.00	9,329.26	17,847.00	10,409.33	141.51	134.25	-143.66	-10,374.19	-1,484.23	2,975.70	2,807.61	168.09	17.703		
17,800.00	9,329.67	17,847.00	10,409.33	143.12	134.25	-142.37	-10,374.19	-1,484.23	2,902.92	2,730.44	172.47	16.831		
17,900.00	9,330.07	17,847.00	10,409.33	144.73	134.25	-140.99	-10,374.19	-1,484.23	2,831.79	2,654.77	177.02	15.997		
18,000.00	9,330.48	17,847.00	10,409.33	146.35	134.25	-139.53	-10,374.19	-1,484.23	2,762.46	2,580.73	181.72	15.201		
18,100.00	9,330.88	17,847.00	10,409.33	147.96	134.25	-137.98	-10,374.19	-1,484.23	2,695.05	2,508.46	186.59	14.444		
18,200.00	9,331.29	17,847.00	10,409.33	149.58	134.25	-136.33	-10,374.19	-1,484.23	2,629.72	2,438.13	191.59	13.726		
18,300.00	9,331.69	17,847.00	10,409.33	151.20	134.25	-134.58	-10,374.19	-1,484.23	2,566.62	2,369.89	196.73	13.046		
18,400.00	9,332.09	17,847.00	10,409.33	152.81	134.25	-132.72	-10,374.19	-1,484.23	2,505.92	2,303.94	201.98	12.407		
18,500.00	9,332.50	17,847.00	10,409.33	154.43	134.25	-130.74	-10,374.19	-1,484.23	2,447.81	2,240.49	207.32	11.807		
18,600.00	9,332.90	17,847.00	10,409.33	156.05	134.25	-128.63	-10,374.19	-1,484.23	2,392.47	2,179.73	212.73	11.246		
18,700.00	9,333.31	17,847.00	10,409.33	157.67	134.25	-126.40	-10,374.19	-1,484.23	2,340.09	2,121.92	218.17	10.726		
18,800.00	9,333.71	17,847.00	10,409.33	159.30	134.25	-124.03	-10,374.19	-1,484.23	2,290.88	2,067.27	223.61	10.245		
18,900.00	9,334.12	17,847.00	10,409.33	160.92	134.25	-121.52	-10,374.19	-1,484.23	2,245.05	2,016.06	228.99	9.804		
19,000.00	9,334.52	17,847.00	10,409.33	162.54	134.25	-118.87	-10,374.19	-1,484.23	2,202.81	1,968.54	234.27	9.403		
19,100.00	9,334.93	17,847.00	10,409.33	164.16	134.25	-116.08	-10,374.19	-1,484.23	2,164.37	1,924.98	239.39	9.041		
19,200.00	9,335.33	17,847.00	10,409.33	165.79	134.25	-113.16	-10,374.19	-1,484.23	2,129.94	1,885.64	244.29	8.719		
19,300.00	9,335.73	17,847.00	10,409.33	167.41	134.25	-110.11	-10,374.19	-1,484.23	2,099.70	1,850.79	248.92	8.435		
19,390.56	9,336.10	17,847.00	10,409.33	168.88	134.25	-107.23	-10,374.19	-1,484.23	2,076.10	1,823.30	252.81	8.212 CC, ES, SF		



MS Energy Services Anticollision Report



Company: Devon Energy
Project: Eddy County, New Mexico (NAD 83)
Reference Site: Cotton Draw Unit
Site Error: 0.00 usft
Reference Well: 515H
Well Error: 0.00 usft
Reference Wellbore: Wellbore #1
Reference Design: Design #1

Local Co-ordinate Reference: Well 515H
TVD Reference: Well @ 3566.10usft (Cactus 126)
MD Reference: Well @ 3566.10usft (Cactus 126)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at: 2.00 sigma
Database: 5000.1 Conroe DB
Offset TVD Reference: Offset Datum

Offset Design Cotton Draw Unit - 290H - Wellbore #1 - Surveys													Offset Site Error:	0.00 usft
Survey Program: 205-MWD, 7500-GYRO-NS, 9902-MWD													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Azimuth from North (°)	Offset Wellbore Centre		Distance				Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor		
0.00	0.00	0.00	0.00	0.00	0.00	-174.86	-4,997.48	-449.87	5,017.75					
100.00	100.00	58.29	58.29	0.13	0.09	-174.86	-4,997.58	-449.85	5,017.81	5,017.59	0.23	N/A		
200.00	200.00	136.11	136.11	0.49	0.21	-174.86	-4,998.02	-449.75	5,018.36	5,017.66	0.71	7,116.204		
300.00	300.00	216.42	216.41	0.85	0.36	-174.86	-4,998.84	-449.57	5,019.36	5,018.14	1.21	4,141.827		
400.00	400.00	317.22	317.21	1.21	0.72	-174.87	-5,000.07	-449.01	5,020.52	5,018.59	1.93	2,599.342		
500.00	500.00	417.88	417.85	1.57	1.08	-174.88	-5,001.31	-448.44	5,021.70	5,019.05	2.65	1,894.426		
600.00	600.00	524.27	524.24	1.93	1.47	-174.88	-5,002.44	-448.07	5,022.72	5,019.33	3.39	1,481.338		
700.00	700.00	625.66	625.63	2.29	1.83	-174.89	-5,003.49	-447.74	5,023.72	5,019.61	4.11	1,221.525		
800.00	800.00	738.90	738.86	2.64	2.24	-174.89	-5,004.49	-447.35	5,024.57	5,019.69	4.88	1,030.232		
900.00	900.00	846.08	846.03	3.00	2.62	-174.90	-5,005.22	-446.91	5,025.22	5,019.60	5.62	894.341		
1,000.00	1,000.00	953.26	953.21	3.36	3.00	-174.90	-5,005.81	-446.41	5,025.72	5,019.36	6.36	790.119		
1,100.00	1,100.00	1,060.15	1,060.10	3.72	3.39	-174.91	-5,006.24	-445.87	5,026.08	5,018.98	7.10	707.904		
1,200.00	1,200.00	1,167.04	1,166.99	4.08	3.77	-174.92	-5,006.53	-445.36	5,026.31	5,018.47	7.84	641.184		
1,300.00	1,300.00	1,265.91	1,265.86	4.44	4.12	-174.92	-5,006.75	-444.97	5,026.49	5,017.94	8.55	587.888		
1,400.00	1,400.00	1,367.62	1,367.57	4.79	4.48	-174.93	-5,006.96	-444.65	5,026.67	5,017.40	9.27	542.211		
1,500.00	1,500.00	1,471.85	1,471.79	5.15	4.85	-174.93	-5,007.10	-444.24	5,026.77	5,016.77	10.00	502.701		
1,600.00	1,600.00	1,569.80	1,569.74	5.51	5.20	-174.94	-5,007.19	-443.78	5,026.82	5,016.12	10.71	469.550		
1,700.00	1,700.00	1,661.92	1,661.86	5.87	5.53	-174.94	-5,007.38	-443.53	5,027.00	5,015.61	11.39	441.327		
1,800.00	1,800.00	1,759.82	1,759.77	6.23	5.87	-174.94	-5,007.70	-443.43	5,027.31	5,015.22	12.10	415.594		
1,900.00	1,900.00	1,864.61	1,864.55	6.59	6.25	-174.94	-5,008.00	-443.05	5,027.57	5,014.74	12.83	391.928		
2,000.00	2,000.00	1,963.70	1,963.64	6.95	6.60	-174.95	-5,008.24	-442.48	5,027.76	5,014.22	13.54	371.353		
2,100.00	2,100.00	2,059.64	2,059.57	7.30	6.94	-174.95	-5,008.52	-442.17	5,028.03	5,013.79	14.24	353.109		
2,200.00	2,200.00	2,157.98	2,157.92	7.66	7.29	-174.96	-5,008.86	-442.09	5,028.36	5,013.41	14.95	336.408		
2,300.00	2,300.00	2,257.56	2,257.50	8.02	7.64	-174.96	-5,009.20	-442.10	5,028.70	5,013.04	15.66	321.137		
2,400.00	2,400.00	2,364.67	2,364.61	8.38	8.02	-174.96	-5,009.51	-442.11	5,028.99	5,012.60	16.40	306.711		
2,500.00	2,500.00	2,474.24	2,474.17	8.74	8.41	-174.96	-5,009.64	-442.00	5,029.10	5,011.96	17.14	293.373		
2,600.00	2,599.99	2,562.00	2,561.93	9.10	8.72	-174.96	-5,009.78	-441.80	5,030.10	5,012.29	17.81	282.376		
2,700.00	2,699.96	2,649.96	2,649.89	9.45	9.04	-174.97	-5,010.14	-441.50	5,033.07	5,014.59	18.49	272.275		
2,800.00	2,799.86	2,745.55	2,745.48	9.81	9.38	-174.98	-5,010.71	-441.01	5,037.94	5,018.76	19.19	262.589		
2,900.00	2,899.68	2,842.37	2,842.30	10.17	9.73	-175.00	-5,011.37	-440.24	5,044.60	5,024.71	19.89	253.620		
3,000.00	2,999.37	2,942.42	2,942.34	10.53	10.08	-175.02	-5,012.09	-439.35	5,053.00	5,032.40	20.61	245.214		
3,100.00	3,098.90	3,042.72	3,042.63	10.89	10.44	-175.05	-5,012.78	-438.68	5,063.12	5,041.79	21.32	237.447		
3,200.00	3,198.26	3,148.14	3,148.05	11.25	10.82	-175.07	-5,013.42	-438.04	5,074.88	5,052.82	22.06	230.071		
3,299.74	3,297.14	3,253.28	3,253.19	11.61	11.20	-175.10	-5,013.94	-437.29	5,088.20	5,065.41	22.79	223.264		
3,300.00	3,297.40	3,253.56	3,253.47	11.61	11.20	-175.10	-5,013.94	-437.29	5,088.24	5,065.45	22.79	223.247		
3,400.00	3,396.43	3,359.75	3,359.66	11.98	11.58	-175.13	-5,014.33	-436.53	5,102.32	5,078.79	23.53	216.865		
3,500.00	3,495.46	3,460.69	3,460.59	12.36	11.94	-175.16	-5,014.57	-435.86	5,116.28	5,092.03	24.24	211.025		
3,600.00	3,594.49	3,553.81	3,553.71	12.73	12.27	-175.19	-5,014.85	-435.28	5,130.31	5,105.37	24.93	205.749		
3,700.00	3,693.51	3,646.55	3,646.44	13.11	12.60	-175.22	-5,015.23	-434.77	5,144.45	5,118.83	25.62	200.768		
3,800.00	3,792.54	3,738.62	3,738.51	13.49	12.93	-175.24	-5,015.72	-434.40	5,158.73	5,132.41	26.31	196.065		
3,900.00	3,891.57	3,833.92	3,833.81	13.87	13.27	-175.27	-5,016.33	-434.16	5,173.12	5,146.11	27.01	191.519		
4,000.00	3,990.60	3,936.79	3,936.68	14.25	13.64	-175.29	-5,016.98	-433.67	5,187.50	5,159.76	27.74	187.012		
4,100.00	4,089.62	4,035.63	4,035.51	14.64	13.99	-175.32	-5,017.58	-432.85	5,201.82	5,173.36	28.45	182.823		
4,200.00	4,188.65	4,129.58	4,129.46	15.02	14.33	-175.35	-5,018.23	-431.91	5,216.20	5,187.05	29.15	178.946		
4,300.00	4,287.68	4,222.78	4,222.65	15.41	14.67	-175.39	-5,018.97	-430.88	5,230.69	5,200.85	29.84	175.268		
4,400.00	4,386.71	4,315.10	4,314.96	15.80	15.00	-175.42	-5,019.81	-429.91	5,245.30	5,214.77	30.54	171.777		
4,500.00	4,485.73	4,407.50	4,407.35	16.19	15.33	-175.45	-5,020.76	-429.06	5,260.03	5,228.81	31.23	168.442		
4,600.00	4,584.76	4,501.05	4,500.89	16.59	15.66	-175.48	-5,021.83	-428.32	5,274.89	5,242.96	31.92	165.232		
4,700.00	4,683.79	4,603.45	4,603.28	16.98	16.03	-175.51	-5,023.00	-427.60	5,289.75	5,257.10	32.65	161.993		
4,800.00	4,782.81	4,706.00	4,705.83	17.37	16.40	-175.53	-5,024.09	-426.93	5,304.55	5,271.16	33.39	158.889		
4,900.00	4,881.84	4,808.93	4,808.75	17.77	16.77	-175.56	-5,025.12	-426.12	5,319.28	5,285.16	34.12	155.908		
5,000.00	4,980.87	4,913.96	4,913.77	18.17	17.15	-175.59	-5,026.11	-425.07	5,333.92	5,299.06	34.86	153.014		

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



MS Energy Services
Anticollision Report



Company: Devon Energy
Project: Eddy County, New Mexico (NAD 83)
Reference Site: Cotton Draw Unit
Site Error: 0.00 usft
Reference Well: 515H
Well Error: 0.00 usft
Reference Wellbore: Wellbore #1
Reference Design: Design #1

Local Co-ordinate Reference: Well 515H
TVD Reference: Well @ 3566.10usft (Cactus 126)
MD Reference: Well @ 3566.10usft (Cactus 126)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: 5000.1 Conroe DB
Offset TVD Reference: Offset Datum

Offset Design Cotton Draw Unit - 290H - Wellbore #1 - Surveys											Offset Site Error: 0.00 usft
Survey Program: 205-MWD, 7500-GYRO-NS, 9902-MWD											Offset Well Error: 0.00 usft
Reference		Offset		Semi Major Axis		Distance		Minimum Separation		Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Azimuth from North (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Ellipses (usft)	Separation Factor
5,100.00	5,079.90	5,022.07	5,021.87	18.56	17.53	-175.63	-5,026.95	-423.95	5,348.41	5,312.80	35.61
5,200.00	5,178.92	5,187.29	5,187.07	18.96	18.12	-175.67	-5,027.29	-421.90	5,362.39	5,325.82	36.57
5,300.00	5,277.95	5,409.39	5,409.08	19.36	18.89	-175.74	-5,023.81	-416.90	5,374.52	5,336.81	37.71
5,400.00	5,376.98	5,723.90	5,722.95	19.76	19.96	-175.88	-5,008.88	-404.06	5,383.03	5,343.90	39.13
5,500.00	5,476.01	5,863.18	5,861.60	20.16	20.43	-175.98	-4,999.15	-395.26	5,389.36	5,349.40	39.96
5,600.00	5,575.03	5,949.14	5,947.16	20.56	20.73	-176.06	-4,993.10	-389.52	5,395.72	5,355.09	40.63
5,628.09	5,602.86	5,973.29	5,971.20	20.68	20.81	-176.08	-4,991.44	-387.92	5,397.55	5,356.73	40.82
5,700.00	5,674.12	6,041.66	6,039.26	20.96	21.04	-176.14	-4,986.81	-383.40	5,401.87	5,360.55	41.32
5,800.00	5,773.42	6,150.11	6,147.20	21.36	21.42	-176.22	-4,979.39	-375.91	5,406.30	5,364.24	42.06
5,900.00	5,872.91	6,260.61	6,257.12	21.74	21.81	-176.32	-4,971.68	-367.76	5,408.85	5,366.04	42.81
6,000.00	5,972.56	6,372.77	6,368.64	22.12	22.20	-176.42	-4,963.64	-358.78	5,409.45	5,365.89	43.56
6,100.00	6,072.35	6,480.75	6,475.93	22.49	22.59	-176.52	-4,955.74	-349.52	5,408.13	5,363.83	44.30
6,200.00	6,172.23	6,587.89	6,582.34	22.86	22.97	-176.62	-4,947.77	-339.88	5,404.95	5,359.91	45.04
6,300.00	6,272.18	6,661.61	6,655.57	23.21	23.23	-176.69	-4,942.44	-333.24	5,400.24	5,354.58	45.66
6,400.00	6,372.17	6,737.64	6,731.13	23.56	23.51	-176.76	-4,937.24	-326.61	5,394.25	5,347.95	46.30
6,427.83	6,400.00	6,758.80	6,752.17	23.66	23.58	-176.78	-4,935.86	-324.80	5,392.35	5,345.88	46.47
6,500.00	6,472.17	6,815.13	6,808.18	23.90	23.79	-176.83	-4,932.27	-320.09	5,387.41	5,340.48	46.93
6,600.00	6,572.17	6,893.82	6,886.48	24.25	24.07	-176.89	-4,927.50	-313.82	5,380.91	5,333.34	47.57
6,700.00	6,672.17	6,973.74	6,966.04	24.59	24.36	-176.95	-4,922.95	-307.80	5,374.79	5,326.58	48.21
6,800.00	6,772.17	7,060.30	7,052.25	24.93	24.67	-177.02	-4,918.25	-301.67	5,368.98	5,320.11	48.88
6,900.00	6,872.17	7,146.93	7,138.57	25.28	24.98	-177.08	-4,913.73	-295.90	5,363.43	5,313.88	49.54
7,000.00	6,972.17	7,325.18	7,315.88	25.62	25.63	-177.23	-4,903.57	-280.88	5,357.31	5,306.79	50.53
7,100.00	7,072.17	7,433.83	7,423.65	25.97	25.87	-177.36	-4,896.54	-268.99	5,350.29	5,299.18	51.11
7,200.00	7,172.17	7,522.92	7,512.00	26.31	26.00	-177.46	-4,890.76	-259.15	5,343.28	5,291.69	51.60
7,300.00	7,272.17	7,589.30	7,577.88	26.66	26.01	-177.53	-4,886.77	-251.98	5,336.77	5,284.80	51.97
7,400.00	7,372.17	7,658.58	7,646.66	27.00	26.03	-177.61	-4,883.01	-244.64	5,330.86	5,278.52	52.34
7,500.00	7,472.17	7,729.47	7,717.07	27.35	26.05	-177.69	-4,879.55	-237.15	5,325.52	5,272.80	52.72
7,600.00	7,572.17	7,800.00	7,787.18	27.69	26.07	-177.76	-4,876.45	-230.11	5,320.71	5,267.62	53.10
7,700.00	7,672.17	7,863.21	7,850.06	28.04	26.09	-177.83	-4,874.04	-224.17	5,316.53	5,263.06	53.47
7,800.00	7,772.17	7,936.74	7,923.27	28.39	26.11	-177.90	-4,871.73	-217.65	5,313.03	5,259.18	53.85
7,900.00	7,872.17	8,035.79	8,021.94	28.74	26.14	-177.98	-4,868.81	-209.54	5,309.78	5,255.54	54.24
8,000.00	7,972.17	8,219.55	8,204.98	29.08	26.22	-178.14	-4,862.19	-194.70	5,306.05	5,251.39	54.66
8,100.00	8,072.17	8,264.10	8,249.36	29.43	26.24	-178.18	-4,860.53	-191.14	5,301.86	5,246.82	55.04
8,200.00	8,172.17	8,325.60	8,310.65	29.78	26.27	-178.23	-4,858.57	-186.46	5,298.42	5,242.99	55.43
8,300.00	8,272.17	8,400.00	8,384.84	30.13	26.30	-178.28	-4,856.72	-181.28	5,295.69	5,239.87	55.82
8,400.00	8,372.17	8,451.70	8,436.43	30.48	26.33	-178.32	-4,855.79	-178.02	5,293.62	5,237.42	56.20
8,500.00	8,472.17	8,513.67	8,498.29	30.83	26.36	-178.36	-4,855.08	-174.48	5,292.29	5,235.71	56.58
8,600.00	8,572.17	8,577.18	8,561.73	31.18	26.40	-178.39	-4,854.77	-171.34	5,291.87	5,234.70	56.97
8,667.11	8,639.27	8,629.67	8,614.17	31.41	26.43	-178.41	-4,854.79	-169.15	5,291.61	5,234.38	57.23
8,700.00	8,672.17	8,660.96	8,645.44	31.52	26.45	-178.43	-4,854.83	-168.00	5,291.62	5,234.25	57.37
8,751.58	8,723.75	8,700.00	8,684.46	31.70	26.47	-178.44	-4,854.88	-166.74	5,291.66	5,234.08	57.57
8,800.00	8,772.11	8,735.81	8,720.25	31.86	26.49	-178.45	-4,855.01	-165.70	5,289.79	5,232.04	57.75
8,850.00	8,821.68	8,765.99	8,750.42	32.00	26.51	-178.45	-4,855.24	-164.86	5,283.83	5,225.91	57.92
8,900.00	8,870.51	8,800.00	8,784.42	32.12	26.53	-178.44	-4,855.64	-163.96	5,273.81	5,215.73	58.08
8,950.00	8,918.22	8,831.62	8,816.02	32.24	26.55	-178.42	-4,856.09	-163.17	5,259.77	5,201.53	58.23
9,000.00	8,964.46	8,867.53	8,851.92	32.34	26.57	-178.39	-4,856.68	-162.31	5,241.75	5,183.37	58.38
9,050.00	9,008.86	8,903.12	8,887.50	32.43	26.60	-178.36	-4,857.33	-161.52	5,219.90	5,161.38	58.52
9,100.00	9,051.09	8,951.03	8,935.39	32.51	26.63	-178.32	-4,858.22	-160.53	5,194.29	5,135.63	58.66
9,150.00	9,090.83	8,996.16	8,980.50	32.58	26.66	-178.28	-4,859.01	-159.70	5,165.08	5,106.29	58.79
9,200.00	9,127.77	9,046.03	9,030.36	32.65	26.70	-178.22	-4,859.80	-158.91	5,132.46	5,073.55	58.91
9,250.00	9,161.64	9,092.34	9,076.67	32.71	26.73	-178.16	-4,860.42	-158.36	5,096.67	5,037.65	59.02
9,300.00	9,192.18	9,124.74	9,109.06	32.78	26.76	-178.09	-4,860.80	-158.04	5,058.03	4,998.93	59.10

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



MS Energy Services Anticollision Report



Company: Devon Energy
Project: Eddy County, New Mexico (NAD 83)
Reference Site: Cotton Draw Unit
Site Error: 0.00 usft
Reference Well: 515H
Well Error: 0.00 usft
Reference Wellbore: Wellbore #1
Reference Design: Design #1

Local Co-ordinate Reference: Well 515H
TVD Reference: Well @ 3566.10usft (Cactus 126)
MD Reference: Well @ 3566.10usft (Cactus 126)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: 5000.1 Conroe DB
Offset TVD Reference: Offset Datum

Offset Design Cotton Draw Unit - 290H - Wellbore #1 - Surveys													Offset Site Error:	0.00 usft
Survey Program: 205-MWD, 7500-GYRO-NS, 9802-MWD													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis			Distance							Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Azimuth from North (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor		
9,350.00	9,219.15	9,151.60	9,135.92	32.85	26.78	-178.01	-4,861.12	-157.77	5,016.88	4,957.71	59.17	84.790		
9,400.00	9,242.36	9,174.83	9,159.14	32.92	26.80	-177.92	-4,861.40	-157.55	4,973.55	4,914.33	59.22	83.980		
9,450.00	9,261.61	9,194.23	9,178.54	32.99	26.81	-177.83	-4,861.63	-157.35	4,928.36	4,869.09	59.27	83.156		
9,500.00	9,276.77	9,209.66	9,193.97	33.08	26.83	-177.74	-4,861.82	-157.20	4,881.65	4,822.35	59.30	82.323		
9,550.00	9,287.73	9,221.00	9,205.31	33.17	26.84	-177.64	-4,861.96	-157.09	4,833.79	4,774.47	59.32	81.483		
9,600.00	9,294.39	9,228.16	9,212.47	33.27	26.84	-177.53	-4,862.04	-157.03	4,785.14	4,725.80	59.34	80.641		
9,649.26	9,296.70	9,231.07	9,215.37	33.37	26.84	-177.42	-4,862.08	-157.00	4,736.79	4,677.44	59.35	79.812		
9,700.00	9,296.91	9,231.93	9,216.24	33.49	26.85	-177.32	-4,862.09	-156.99	4,686.84	4,627.48	59.36	78.958		
9,800.00	9,297.31	9,233.61	9,217.92	33.80	26.85	-177.13	-4,862.11	-156.98	4,588.00	4,528.62	59.38	77.270		
9,900.00	9,297.72	9,235.27	9,219.57	34.17	26.85	-176.98	-4,862.13	-156.96	4,488.73	4,429.33	59.39	75.575		
10,000.00	9,298.12	9,236.89	9,221.20	34.62	26.85	-176.87	-4,862.15	-156.95	4,389.12	4,329.71	59.41	73.877		
10,027.33	9,298.24	9,237.33	9,221.64	34.75	26.85	-176.85	-4,862.16	-156.95	4,361.85	4,302.44	59.42	73.413		
10,100.00	9,298.53	9,238.50	9,222.81	35.13	26.85	-176.79	-4,862.17	-156.94	4,289.33	4,229.90	59.43	72.179		
10,200.00	9,298.93	9,240.11	9,224.41	35.71	26.85	-176.70	-4,862.19	-156.92	4,189.54	4,130.10	59.44	70.481		
10,300.00	9,299.34	9,241.71	9,226.02	36.35	26.85	-176.61	-4,862.21	-156.91	4,089.76	4,030.30	59.46	68.781		
10,400.00	9,299.74	9,243.32	9,227.63	37.06	26.85	-176.52	-4,862.23	-156.89	3,989.99	3,930.51	59.48	67.080		
10,500.00	9,300.15	9,244.93	9,229.24	37.83	26.86	-176.42	-4,862.25	-156.88	3,890.23	3,830.73	59.50	65.378		
10,600.00	9,300.55	9,246.54	9,230.85	38.65	26.86	-176.32	-4,862.27	-156.86	3,790.49	3,730.96	59.53	63.676		
10,700.00	9,300.96	9,248.15	9,232.46	39.53	26.86	-176.21	-4,862.29	-156.85	3,690.75	3,631.20	59.56	61.972		
10,800.00	9,301.36	9,249.77	9,234.07	40.45	26.86	-176.09	-4,862.31	-156.84	3,591.04	3,531.45	59.58	60.268		
10,900.00	9,301.76	9,251.38	9,235.68	41.42	26.86	-175.97	-4,862.33	-156.82	3,491.33	3,431.72	59.62	58.562		
11,000.00	9,302.17	9,252.99	9,237.30	42.44	26.86	-175.84	-4,862.35	-156.81	3,391.65	3,331.99	59.65	56.857		
11,100.00	9,302.57	9,254.61	9,238.91	43.49	26.86	-175.71	-4,862.37	-156.80	3,291.98	3,232.29	59.69	55.150		
11,200.00	9,302.98	9,256.23	9,240.53	44.58	26.87	-175.56	-4,862.39	-156.78	3,192.33	3,132.59	59.73	53.443		
11,300.00	9,303.38	9,257.85	9,242.15	45.71	26.87	-175.41	-4,862.41	-156.77	3,092.70	3,032.92	59.78	51.735		
11,400.00	9,303.79	9,259.47	9,243.77	46.86	26.87	-175.24	-4,862.43	-156.75	2,993.10	2,933.27	59.83	50.026		
11,500.00	9,304.19	9,261.09	9,245.39	48.05	26.87	-175.07	-4,862.45	-156.74	2,893.52	2,833.63	59.89	48.317		
11,600.00	9,304.60	9,262.71	9,247.01	49.26	26.87	-174.88	-4,862.47	-156.73	2,793.97	2,734.03	59.95	46.607		
11,700.00	9,305.00	9,264.33	9,248.63	50.50	26.87	-174.67	-4,862.49	-156.71	2,694.46	2,634.44	60.01	44.897		
11,800.00	9,305.40	9,265.96	9,250.26	51.76	26.87	-174.46	-4,862.51	-156.70	2,594.98	2,534.89	60.09	43.185		
11,900.00	9,305.81	9,267.58	9,251.88	53.05	26.88	-174.22	-4,862.53	-156.69	2,495.54	2,435.37	60.17	41.474		
12,000.00	9,306.21	9,269.21	9,253.51	54.35	26.88	-173.97	-4,862.55	-156.67	2,396.15	2,335.89	60.26	39.761		
12,100.00	9,306.62	9,270.84	9,255.14	55.67	26.88	-173.69	-4,862.57	-156.66	2,296.81	2,236.44	60.37	38.048		
12,200.00	9,307.02	9,272.46	9,256.77	57.01	26.88	-173.39	-4,862.59	-156.65	2,197.53	2,137.04	60.48	36.333		
12,300.00	9,307.43	9,274.09	9,258.40	58.37	26.88	-173.06	-4,862.61	-156.64	2,098.31	2,037.70	60.61	34.618		
12,400.00	9,307.83	9,275.73	9,260.03	59.74	26.88	-172.69	-4,862.63	-156.62	1,999.17	1,938.41	60.76	32.901		
12,500.00	9,308.23	9,277.36	9,261.66	61.13	26.88	-172.29	-4,862.65	-156.61	1,900.12	1,839.19	60.93	31.184		
12,600.00	9,308.64	9,278.99	9,263.29	62.53	26.88	-171.85	-4,862.67	-156.60	1,801.18	1,740.05	61.13	29.464		
12,700.00	9,309.04	9,280.63	9,264.93	63.94	26.89	-171.35	-4,862.69	-156.58	1,702.35	1,640.99	61.36	27.743		
12,800.00	9,309.45	9,282.26	9,266.56	65.36	26.89	-170.79	-4,862.71	-156.57	1,603.67	1,542.04	61.63	26.020		
12,900.00	9,309.85	9,283.90	9,268.20	66.80	26.89	-170.16	-4,862.73	-156.56	1,505.16	1,443.21	61.95	24.295		
13,000.00	9,310.26	9,285.54	9,269.84	68.24	26.89	-169.44	-4,862.76	-156.55	1,406.87	1,344.52	62.34	22.567		
13,100.00	9,310.66	9,287.18	9,271.48	69.69	26.89	-168.61	-4,862.78	-156.53	1,308.82	1,246.01	62.81	20.837		
13,200.00	9,311.07	9,288.82	9,273.12	71.16	26.89	-167.65	-4,862.80	-156.52	1,211.10	1,147.70	63.39	19.105		
13,300.00	9,311.47	9,290.46	9,274.76	72.63	26.89	-166.52	-4,862.82	-156.51	1,113.77	1,049.65	64.12	17.370		
13,400.00	9,311.87	9,292.10	9,276.40	74.11	26.90	-165.17	-4,862.84	-156.50	1,016.96	951.92	65.04	15.635		
13,500.00	9,312.28	9,293.75	9,278.05	75.59	26.90	-163.54	-4,862.86	-156.49	920.83	854.60	66.24	13.902		
13,600.00	9,312.68	9,295.39	9,279.69	77.09	26.90	-161.54	-4,862.88	-156.47	825.62	757.81	67.82	12.174		
13,700.00	9,313.09	9,297.04	9,281.34	78.59	26.90	-159.01	-4,862.90	-156.46	731.69	661.75	69.94	10.462		
13,800.00	9,313.49	9,298.68	9,282.98	80.09	26.90	-155.75	-4,862.92	-156.45	639.59	566.73	72.85	8.779		
13,900.00	9,313.90	9,300.33	9,284.63	81.60	26.90	-151.41	-4,862.94	-156.44	550.25	473.31	76.93	7.152		
14,000.00	9,314.30	9,301.98	9,286.28	83.12	26.90	-145.45	-4,862.96	-156.43	465.26	382.56	82.69	5.626		

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



MS Energy Services

Anticollision Report



Company: Devon Energy
Project: Eddy County, New Mexico (NAD 83)
Reference Site: Cotton Draw Unit
Site Error: 0.00 usft
Reference Well: 515H
Well Error: 0.00 usft
Reference Wellbore: Wellbore #1
Reference Design: Design #1

Local Co-ordinate Reference: Well 515H
TVD Reference: Well @ 3566.10usft (Cactus 126)
MD Reference: Well @ 3566.10usft (Cactus 126)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at
Database: 5000.1 Conroe DB
Offset TVD Reference: Offset Datum

Offset Design Cotton Draw Unit - 290H - Wellbore #1 - Surveys												Offset Site Error:	0.00 usft
Survey Program: 205-MWD, 7500-GYRO-NS, 9902-MWD												Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Distance		Minimum Separation		Warning			
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Azimuth from North (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Separation Factor		
14,100.00	9,314.71	9,303.63	9,287.93	84.64	26.91	-136.96	-4,862.98	-156.41	387.50	296.76	90.74	4.270	
14,200.00	9,315.11	9,305.29	9,289.59	86.17	26.91	-124.65	-4,863.00	-156.40	322.24	221.08	101.16	3.186	
14,300.00	9,315.51	9,306.94	9,291.24	87.70	26.91	-107.40	-4,863.02	-156.39	278.42	166.84	111.57	2.495	
14,381.65	9,315.84	9,308.33	9,292.63	88.96	26.91	-90.35	-4,863.04	-156.38	266.18	150.45	115.73	2.300 CC, ES, SF	
14,400.00	9,315.92	9,308.64	9,292.94	89.24	26.91	-86.41	-4,863.05	-156.38	266.81	151.07	115.74	2.305	
14,500.00	9,316.32	9,310.37	9,294.66	90.78	26.91	-66.38	-4,863.07	-156.36	291.30	180.95	110.35	2.640	
14,600.00	9,316.73	9,312.11	9,296.41	92.33	26.91	-50.99	-4,863.09	-156.35	344.26	243.70	100.56	3.424	
14,700.00	9,317.13	9,313.88	9,298.18	93.88	26.91	-40.25	-4,863.12	-156.34	414.93	323.45	91.49	4.536	
14,800.00	9,317.54	9,315.67	9,299.97	95.43	26.92	-32.82	-4,863.14	-156.33	495.80	411.26	84.54	5.864	
14,900.00	9,317.94	9,317.48	9,301.78	96.99	26.92	-27.53	-4,863.17	-156.31	582.63	503.14	79.50	7.329	
15,000.00	9,318.34	9,319.32	9,303.62	98.55	26.92	-23.64	-4,863.19	-156.30	673.12	597.28	75.84	8.875	
15,100.00	9,318.75	9,321.18	9,305.48	100.11	26.92	-20.68	-4,863.22	-156.29	765.98	692.82	73.16	10.469	
15,200.00	9,319.15	9,323.06	9,307.36	101.68	26.92	-18.37	-4,863.24	-156.28	860.43	789.27	71.17	12.090	
15,300.00	9,319.56	9,324.97	9,309.27	103.24	26.92	-16.51	-4,863.27	-156.26	956.01	886.36	69.65	13.726	
15,400.00	9,319.96	9,326.91	9,311.20	104.82	26.93	-15.00	-4,863.30	-156.25	1,052.41	983.93	68.48	15.368	
15,500.00	9,320.37	9,328.87	9,313.16	106.39	26.93	-13.74	-4,863.32	-156.23	1,149.42	1,081.86	67.57	17.012	
15,600.00	9,320.77	9,330.85	9,315.15	107.97	26.93	-12.67	-4,863.35	-156.22	1,246.90	1,180.06	66.84	18.655	
15,700.00	9,321.18	11,648.62	10,562.13	109.55	34.34	-93.52	-6,199.05	-196.48	1,304.64	1,222.16	82.47	15.819	
15,800.00	9,321.58	11,726.79	10,561.04	111.13	35.13	-89.54	-6,277.18	-198.72	1,303.74	1,220.16	83.58	15.599	
15,802.70	9,321.59	11,728.87	10,561.03	111.17	35.15	-89.43	-6,279.26	-198.80	1,303.74	1,220.13	83.61	15.594	
15,900.00	9,321.98	11,804.00	10,561.11	112.71	35.93	-85.48	-6,354.33	-201.84	1,304.58	1,219.87	84.70	15.402	
16,000.00	9,322.39	11,933.78	10,560.55	114.30	37.35	-90.73	-6,483.91	-208.86	1,305.30	1,218.76	86.54	15.083	
16,100.00	9,322.79	12,044.36	10,558.01	115.88	38.60	-92.51	-6,594.37	-213.22	1,303.79	1,215.64	88.14	14.792	
16,200.00	9,323.20	12,139.81	10,556.70	117.47	39.72	-91.71	-6,689.79	-215.37	1,302.80	1,213.27	89.53	14.551	
16,300.00	9,323.60	12,270.46	10,554.70	119.07	41.31	-96.90	-6,820.41	-214.53	1,301.01	1,209.81	91.20	14.265	
16,400.00	9,324.01	12,365.95	10,552.62	120.66	42.52	-96.18	-6,915.81	-210.92	1,297.71	1,205.28	92.42	14.041	
16,500.00	9,324.41	12,448.19	10,551.77	122.25	43.57	-93.17	-6,997.97	-207.25	1,295.34	1,201.84	93.50	13.854	
16,600.00	9,324.82	12,554.16	10,551.28	123.85	44.96	-94.23	-7,103.86	-203.30	1,293.73	1,198.89	94.83	13.642	
16,700.00	9,325.22	12,634.94	10,550.79	125.45	46.03	-90.86	-7,184.60	-201.07	1,292.24	1,196.28	95.96	13.466	
16,800.00	9,325.62	12,752.60	10,550.69	127.05	47.61	-93.99	-7,302.23	-198.54	1,291.45	1,193.94	97.51	13.245	
16,900.00	9,326.03	12,867.04	10,548.52	128.65	49.18	-96.56	-7,416.62	-195.52	1,288.69	1,189.66	99.03	13.013	
17,000.00	9,326.43	12,959.81	10,546.87	130.25	50.47	-95.31	-7,509.34	-193.11	1,286.07	1,185.73	100.34	12.817	
17,100.00	9,326.84	13,079.60	10,543.87	131.86	52.15	-98.91	-7,628.97	-187.93	1,282.26	1,180.40	101.85	12.589	
17,200.00	9,327.24	13,174.45	10,541.33	133.46	53.51	-98.05	-7,723.72	-184.30	1,278.47	1,175.32	103.16	12.393	
17,300.00	9,327.65	13,268.33	10,538.99	135.07	54.85	-96.99	-7,817.50	-180.62	1,274.86	1,170.41	104.45	12.205	
17,400.00	9,328.05	13,350.46	10,537.82	136.68	56.04	-93.72	-7,899.55	-177.32	1,272.29	1,166.67	105.62	12.046	
17,500.00	9,328.45	13,437.24	10,538.10	138.29	57.31	-91.24	-7,986.26	-173.87	1,271.34	1,164.54	106.80	11.903	
17,600.00	9,328.86	13,572.66	10,535.63	139.90	59.30	-97.96	-8,121.60	-170.21	1,268.50	1,159.87	108.63	11.677	
17,700.00	9,329.26	13,677.01	10,532.43	141.51	60.84	-98.81	-8,225.88	-168.01	1,264.78	1,154.63	110.15	11.482	
17,800.00	9,329.67	13,786.85	10,528.80	143.12	62.47	-100.73	-8,335.60	-164.38	1,260.54	1,148.87	111.67	11.288	
17,900.00	9,330.07	13,887.19	10,524.44	144.73	63.97	-100.80	-8,435.83	-163.14	1,255.78	1,142.56	113.22	11.091	
18,000.00	9,330.48	13,962.75	10,521.37	146.35	65.10	-96.10	-8,511.31	-164.25	1,251.95	1,137.36	114.60	10.925	
18,100.00	9,330.88	14,047.16	10,519.40	147.96	66.36	-93.07	-8,595.68	-166.24	1,249.97	1,133.87	116.10	10.766	
18,200.00	9,331.29	14,144.05	10,517.39	149.58	67.81	-92.42	-8,692.47	-170.10	1,248.67	1,130.78	117.89	10.592	
18,282.77	9,331.62	14,211.14	10,515.90	150.92	68.81	-89.44	-8,759.43	-173.94	1,247.90	1,128.68	119.23	10.467	
18,300.00	9,331.69	14,222.40	10,515.80	151.20	68.98	-88.33	-8,770.68	-174.57	1,247.94	1,128.49	119.45	10.447	
18,400.00	9,332.09	14,290.62	10,516.44	152.81	70.01	-82.55	-8,838.81	-177.90	1,249.79	1,129.04	120.75	10.350	
18,500.00	9,332.50	14,371.71	10,518.82	154.43	71.23	-79.29	-8,919.77	-181.74	1,253.59	1,131.35	122.24	10.255	
18,600.00	9,332.90	14,485.02	10,522.72	156.05	72.95	-81.73	-9,032.93	-185.97	1,257.84	1,133.35	124.29	10.118	
18,700.00	9,333.31	14,629.87	10,525.61	157.67	75.17	-89.66	-9,177.72	-188.47	1,259.97	1,133.22	126.75	9.941	
18,800.00	9,333.71	14,777.91	10,521.10	159.30	77.45	-97.95	-9,325.62	-192.29	1,257.22	1,127.87	129.35	9.720	
18,900.00	9,334.12	14,865.99	10,517.00	160.92	78.80	-95.78	-9,413.49	-196.61	1,253.80	1,122.58	131.22	9.555	

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



MS Energy Services
Anticollision Report



Company: Devon Energy
Project: Eddy County, New Mexico (NAD 83)
Reference Site: Cotton Draw Unit
Site Error: 0.00 usft
Reference Well: 515H
Well Error: 0.00 usft
Reference Wellbore: Wellbore #1
Reference Design: Design #1

Local Co-ordinate Reference: Well 515H
TVD Reference: Well @ 3566.10usft (Cactus 126)
MD Reference: Well @ 3566.10usft (Cactus 126)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at: 2.00 sigma
Database: 5000.1 Conroe DB
Offset TVD Reference: Offset Datum

Offset Design Cotton Draw Unit - 290H - Wellbore #1 - Surveys														Offset Site Error:	0.00 usft
Survey Program: 205-MWD, 7500-GYRO-NS, 9902-MWD														Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Azimuth from North (°)	Offset Wellbore Centre		Distance		Minimum Separation (usft)	Separation Factor	Warning		
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)					
19,000.00	9,334.52	14,952.44	10,513.78	162.54	80.12	-93.39	-9,499.76	-201.18	1,251.41	1,118.33	133.08	9.404			
19,100.00	9,334.93	15,036.87	10,511.82	164.16	81.42	-90.74	-9,584.08	-205.10	1,250.21	1,115.36	134.85	9.271			
19,200.00	9,335.33	15,131.45	10,510.33	165.79	82.88	-89.82	-9,678.53	-209.81	1,249.86	1,113.03	136.83	9.135			
19,263.26	9,335.59	15,196.28	10,509.31	166.82	83.89	-90.06	-9,743.26	-213.22	1,249.70	1,111.51	138.19	9.043			
19,300.00	9,335.73	15,191.00	10,509.40	167.41	83.80	-83.27	-9,737.99	-212.94	1,250.32	1,112.20	138.12	9.052			
19,390.56	9,336.10	15,191.00	10,509.40	168.88	83.80	-69.49	-9,737.99	-212.94	1,256.41	1,118.61	137.80	9.118			



MS Energy Services

Anticollision Report



Company: Devon Energy
Project: Eddy County, New Mexico (NAD 83)
Reference Site: Cotton Draw Unit
Site Error: 0.00 usft
Reference Well: 515H
Well Error: 0.00 usft
Reference Wellbore: Wellbore #1
Reference Design: Design #1

Local Co-ordinate Reference: Well 515H
TVD Reference: Well @ 3566.10usft (Cactus 126)
MD Reference: Well @ 3566.10usft (Cactus 126)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: 5000.1 Conroe DB
Offset TVD Reference: Offset Datum

Offset Design Cotton Draw Unit - 291H - Wellbore #1 - Design #2													Offset Site Error:	0.00 usft
Survey Program: 26-MWD, 700-MWD													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Azimuth from North (°)	Offset Wellbore Centre		Distance		Minimum Separation (usft)	Separation Factor	Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N-S (usft)	+E-W (usft)	Between Centres (usft)	Between Ellipses (usft)				
0.00	0.00	0.00	0.00	0.00	0.00	-162.89	-4,572.93	-1,407.66	4,784.76					
100.00	100.00	87.77	87.77	0.13	0.22	-162.89	-4,572.85	-1,407.63	4,784.61	4,784.26	0.36	N/A		
200.00	200.00	175.36	175.36	0.49	0.53	-162.89	-4,572.56	-1,407.54	4,784.29	4,783.27	1.02	4,676.497		
204.54	204.54	178.24	178.24	0.51	0.54	-162.89	-4,572.55	-1,407.55	4,784.29	4,783.24	1.05	4,559.376		
300.00	300.00	243.45	243.45	0.85	0.77	-162.89	-4,572.70	-1,407.90	4,784.63	4,783.01	1.62	2,958.546		
400.00	400.00	336.40	336.40	1.21	1.09	-162.88	-4,573.24	-1,408.30	4,785.31	4,783.01	2.30	2,084.429		
500.00	500.00	417.00	416.99	1.57	1.37	-162.88	-4,573.95	-1,408.80	4,786.32	4,783.39	2.94	1,630.217		
600.00	600.00	526.82	526.80	1.93	1.76	-162.88	-4,575.09	-1,409.27	4,787.45	4,783.77	3.68	1,300.462		
700.00	700.00	633.31	633.29	2.29	2.13	-162.88	-4,576.09	-1,409.35	4,788.37	4,783.95	4.42	1,084.237		
800.00	800.00	732.79	732.76	2.64	2.49	-162.88	-4,576.87	-1,409.49	4,789.16	4,784.04	5.13	933.926		
900.00	900.00	873.73	873.70	3.00	2.98	-162.88	-4,577.58	-1,409.87	4,789.78	4,783.80	5.98	800.976		
1,000.00	1,000.00	973.73	973.70	3.36	3.32	-162.88	-4,577.58	-1,409.87	4,789.78	4,783.10	6.68	717.059		
1,100.00	1,100.00	1,073.73	1,073.70	3.72	3.66	-162.88	-4,577.58	-1,409.87	4,789.78	4,782.39	7.38	648.793		
1,200.00	1,200.00	1,173.73	1,173.70	4.08	4.01	-162.88	-4,577.58	-1,409.87	4,789.78	4,781.69	8.09	592.213		
1,300.00	1,300.00	1,273.73	1,273.70	4.44	4.36	-162.88	-4,577.58	-1,409.87	4,789.78	4,780.98	8.80	544.593		
1,400.00	1,400.00	1,373.73	1,373.70	4.79	4.71	-162.88	-4,577.58	-1,409.87	4,789.78	4,780.27	9.50	503.984		
1,500.00	1,500.00	1,473.73	1,473.70	5.15	5.06	-162.88	-4,577.58	-1,409.87	4,789.78	4,779.56	10.21	468.957		
1,600.00	1,600.00	1,574.40	1,574.37	5.51	5.41	-162.89	-4,577.72	-1,409.41	4,789.77	4,778.85	10.92	438.461		
1,700.00	1,700.00	1,675.27	1,675.22	5.87	5.76	-162.91	-4,578.34	-1,407.30	4,789.75	4,778.12	11.63	411.747		
1,800.00	1,800.00	1,776.04	1,775.90	6.23	6.11	-162.96	-4,579.47	-1,403.50	4,789.71	4,777.37	12.34	388.084		
1,900.00	1,900.00	1,876.63	1,876.33	6.59	6.47	-163.03	-4,581.09	-1,398.01	4,789.66	4,776.61	13.05	366.937		
2,000.00	2,000.00	1,976.99	1,976.41	6.95	6.82	-163.12	-4,583.21	-1,390.85	4,789.60	4,775.84	13.77	347.920		
2,100.00	2,100.00	2,077.06	2,076.05	7.30	7.18	-163.23	-4,585.82	-1,382.03	4,789.55	4,775.07	14.48	330.710		
2,200.00	2,200.00	2,176.75	2,175.15	7.66	7.54	-163.36	-4,588.91	-1,371.61	4,789.51	4,774.31	15.20	315.061		
2,300.00	2,300.00	2,276.07	2,273.80	8.02	7.90	-163.50	-4,592.18	-1,360.56	4,789.49	4,773.57	15.92	300.757		
2,307.78	2,307.78	2,283.81	2,281.48	8.05	7.93	-163.51	-4,592.43	-1,359.70	4,789.49	4,773.51	15.98	299.697		
2,400.00	2,400.00	2,375.40	2,372.46	8.38	8.27	-163.63	-4,595.45	-1,349.52	4,789.50	4,772.85	16.65	287.642		
2,500.00	2,500.00	2,474.73	2,471.12	8.74	8.64	-163.77	-4,598.72	-1,338.47	4,789.54	4,772.16	17.38	275.578		
2,600.00	2,599.99	2,574.01	2,569.73	9.10	9.02	-163.91	-4,601.99	-1,327.43	4,790.44	4,772.32	18.11	264.497		
2,700.00	2,699.96	2,673.20	2,668.25	9.45	9.39	-164.06	-4,605.25	-1,316.40	4,793.01	4,774.16	18.84	254.340		
2,800.00	2,799.86	2,772.26	2,766.64	9.81	9.77	-164.22	-4,608.51	-1,305.39	4,797.26	4,777.69	19.58	245.012		
2,900.00	2,899.68	2,871.16	2,864.88	10.17	10.15	-164.38	-4,611.77	-1,294.39	4,803.21	4,782.89	20.32	236.431		
3,000.00	2,999.37	2,969.88	2,962.93	10.53	10.52	-164.54	-4,615.02	-1,283.42	4,810.84	4,789.79	21.05	228.523		
3,100.00	3,098.90	3,068.38	3,060.76	10.89	10.90	-164.71	-4,618.26	-1,272.47	4,820.16	4,798.37	21.79	221.223		
3,200.00	3,198.26	3,166.62	3,158.35	11.25	11.28	-164.89	-4,621.50	-1,261.54	4,831.18	4,808.65	22.53	214.475		
3,299.74	3,297.14	3,264.34	3,255.40	11.61	11.66	-165.07	-4,624.71	-1,250.68	4,843.86	4,820.60	23.26	208.242		
3,300.00	3,297.40	3,264.59	3,255.65	11.61	11.66	-165.07	-4,624.72	-1,250.65	4,843.89	4,820.63	23.26	208.226		
3,400.00	3,396.43	3,362.41	3,352.82	11.98	12.04	-165.26	-4,627.94	-1,239.77	4,857.47	4,833.47	24.00	202.394		
3,500.00	3,495.46	3,460.24	3,449.98	12.36	12.42	-165.44	-4,631.16	-1,228.89	4,871.10	4,846.36	24.74	196.902		
3,600.00	3,594.49	3,558.06	3,547.14	12.73	12.81	-165.62	-4,634.38	-1,218.02	4,884.78	4,859.30	25.48	191.718		
3,700.00	3,693.51	3,655.88	3,644.30	13.11	13.19	-165.80	-4,637.60	-1,207.14	4,898.51	4,872.29	26.22	186.818		
3,800.00	3,792.54	3,753.70	3,741.46	13.49	13.57	-165.98	-4,640.82	-1,196.26	4,912.29	4,885.33	26.96	182.181		
3,900.00	3,891.57	3,851.52	3,838.62	13.87	13.96	-166.16	-4,644.04	-1,185.39	4,926.12	4,898.41	27.71	177.787		
4,000.00	3,990.60	3,949.34	3,935.78	14.25	14.34	-166.34	-4,647.26	-1,174.51	4,939.99	4,911.54	28.45	173.618		
4,100.00	4,089.62	4,047.16	4,032.94	14.64	14.73	-166.52	-4,650.48	-1,163.63	4,953.92	4,924.72	29.20	169.657		
4,200.00	4,188.65	4,144.98	4,130.11	15.02	15.11	-166.69	-4,653.70	-1,152.76	4,967.89	4,937.95	29.95	165.891		
4,300.00	4,287.68	4,242.81	4,227.27	15.41	15.50	-166.87	-4,656.92	-1,141.88	4,981.91	4,951.22	30.69	162.305		
4,400.00	4,386.71	4,340.63	4,324.43	15.80	15.88	-167.04	-4,660.14	-1,131.00	4,995.98	4,964.54	31.44	158.888		
4,500.00	4,485.73	4,438.45	4,421.59	16.19	16.27	-167.22	-4,663.36	-1,120.13	5,010.09	4,977.90	32.19	155.628		
4,600.00	4,584.76	4,536.27	4,518.75	16.59	16.66	-167.39	-4,666.59	-1,109.25	5,024.25	4,991.31	32.94	152.515		
4,700.00	4,683.79	4,634.09	4,615.91	16.98	17.05	-167.56	-4,669.81	-1,098.37	5,038.46	5,004.76	33.69	149.539		
4,800.00	4,782.81	4,731.91	4,713.07	17.37	17.44	-167.73	-4,673.03	-1,087.50	5,052.71	5,018.26	34.44	146.692		

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



MS Energy Services Anticollision Report



Company: Devon Energy
Project: Eddy County, New Mexico (NAD 83)
Reference Site: Cotton Draw Unit
Site Error: 0.00 usft
Reference Well: 515H
Well Error: 0.00 usft
Reference Wellbore: Wellbore #1
Reference Design: Design #1

Local Co-ordinate Reference: Well 515H
TVD Reference: Well @ 3566.10usft (Cactus 126)
MD Reference: Well @ 3566.10usft (Cactus 126)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: 5000.1 Conroe DB
Offset TVD Reference: Offset Datum

Offset Design Cotton Draw Unit - 291H - Wellbore #1 - Design #2													Offset Site Error: 0.00 usft
Survey Program: 26-MWD, 700-MWD													Offset Well Error: 0.00 usft
Reference		Offset		Semi Major Axis		Azimuth from North (°)	Offset Wellbore Centre		Distance				Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	
4,900.00	4,881.84	4,829.73	4,810.24	17.77	17.82	-167.90	-4,676.25	-1,076.62	5,067.00	5,031.81	35.20	143.966	
5,000.00	4,980.87	4,927.55	4,907.40	18.17	18.21	-168.07	-4,679.47	-1,065.74	5,081.34	5,045.40	35.95	141.354	
5,100.00	5,079.90	5,025.38	5,004.56	18.56	18.60	-168.24	-4,682.69	-1,054.87	5,095.73	5,059.03	36.70	138.848	
5,200.00	5,178.92	5,123.20	5,101.72	18.96	18.99	-168.40	-4,685.91	-1,043.99	5,110.16	5,072.70	37.45	136.443	
5,300.00	5,277.95	5,221.02	5,198.88	19.36	19.38	-168.57	-4,689.13	-1,033.11	5,124.63	5,086.42	38.21	134.133	
5,400.00	5,376.98	5,318.84	5,296.04	19.76	19.77	-168.73	-4,692.35	-1,022.24	5,139.14	5,100.18	38.96	131.912	
5,500.00	5,476.01	5,416.66	5,393.20	20.16	20.16	-168.90	-4,695.57	-1,011.36	5,153.70	5,113.99	39.71	129.776	
5,600.00	5,575.03	5,512.76	5,489.38	20.56	20.56	-169.07	-4,698.79	-1,000.48	5,168.24	5,128.88	40.36	127.728	
5,628.09	5,602.86	5,532.76	5,509.38	20.68	20.68	-169.14	-4,701.99	-989.60	5,182.70	5,143.88	40.82	125.866	
5,700.00	5,674.12	5,602.76	5,579.38	20.96	20.96	-169.21	-4,705.19	-978.72	5,197.16	5,158.88	41.28	124.088	
5,800.00	5,773.42	5,700.76	5,676.38	21.36	21.36	-169.28	-4,708.39	-967.84	5,211.62	5,173.88	41.74	122.386	
5,900.00	5,872.91	5,800.76	5,776.38	21.74	21.74	-169.35	-4,711.59	-956.96	5,226.08	5,188.88	42.20	120.754	
6,000.00	5,972.56	5,900.76	5,876.38	22.12	22.12	-169.42	-4,714.79	-946.08	5,240.54	5,203.88	42.66	119.186	
6,100.00	6,072.35	5,999.76	5,976.38	22.49	22.49	-169.49	-4,717.99	-935.20	5,255.00	5,218.88	43.12	117.682	
6,200.00	6,172.23	5,998.76	5,975.38	22.86	22.86	-169.56	-4,721.19	-924.32	5,269.46	5,233.88	43.58	116.242	
6,300.00	6,272.18	5,997.76	5,974.38	23.21	23.21	-169.63	-4,724.39	-913.44	5,283.92	5,248.88	44.04	114.866	
6,400.00	6,372.17	5,996.76	5,973.38	23.56	23.56	-169.70	-4,727.59	-902.56	5,298.38	5,263.88	44.50	113.554	
6,427.83	6,400.00	5,995.76	5,972.38	23.66	23.66	-169.77	-4,730.79	-891.68	5,312.84	5,278.88	44.96	112.306	
6,500.00	6,472.17	5,994.76	5,971.38	23.90	23.90	-169.84	-4,733.99	-880.80	5,327.30	5,293.88	45.42	111.114	
6,600.00	6,572.17	5,993.76	5,970.38	24.25	24.25	-169.91	-4,737.19	-869.92	5,341.76	5,308.88	45.88	110.000	
6,700.00	6,672.17	5,992.76	5,969.38	24.59	24.59	-170.00	-4,740.39	-859.04	5,356.22	5,323.88	46.34	108.954	
6,800.00	6,772.17	5,991.76	5,968.38	24.93	24.93	-170.07	-4,743.59	-848.16	5,370.68	5,338.88	46.80	107.974	
6,900.00	6,872.17	5,990.76	5,967.38	25.28	25.28	-170.14	-4,746.79	-837.28	5,385.14	5,353.88	47.26	107.054	
7,000.00	6,972.17	5,989.76	5,966.38	25.62	25.62	-170.21	-4,749.99	-826.40	5,399.60	5,368.88	47.72	106.194	
7,100.00	7,072.17	5,988.76	5,965.38	25.97	25.97	-170.28	-4,753.19	-815.52	5,414.06	5,383.88	48.18	105.394	
7,200.00	7,172.17	5,987.76	5,964.38	26.31	26.31	-170.35	-4,756.39	-804.64	5,428.52	5,398.88	48.64	104.654	
7,300.00	7,272.17	5,986.76	5,963.38	26.66	26.66	-170.42	-4,759.59	-793.76	5,442.98	5,413.88	49.10	103.974	
7,400.00	7,372.17	5,985.76	5,962.38	27.00	27.00	-170.49	-4,762.79	-782.88	5,457.44	5,428.88	49.56	103.354	
7,500.00	7,472.17	5,984.76	5,961.38	27.35	27.35	-170.56	-4,765.99	-772.00	5,471.90	5,443.88	50.02	102.794	
7,600.00	7,572.17	5,983.76	5,960.38	27.69	27.69	-170.63	-4,769.19	-761.12	5,486.36	5,458.88	50.48	102.294	
7,700.00	7,672.17	5,982.76	5,959.38	28.04	28.04	-170.70	-4,772.39	-750.24	5,500.82	5,473.88	50.94	101.854	
7,800.00	7,772.17	5,981.76	5,958.38	28.39	28.39	-170.77	-4,775.59	-739.36	5,515.28	5,488.88	51.40	101.474	
7,900.00	7,872.17	5,980.76	5,957.38	28.74	28.74	-170.84	-4,778.79	-728.48	5,529.74	5,503.88	51.86	101.154	
8,000.00	7,972.17	5,979.76	5,956.38	29.08	29.08	-170.91	-4,781.99	-717.60	5,544.20	5,518.88	52.32	100.894	
8,100.00	8,072.17	5,978.76	5,955.38	29.43	29.43	-170.98	-4,785.19	-706.72	5,558.66	5,533.88	52.78	100.694	
8,200.00	8,172.17	5,977.76	5,954.38	29.78	29.78	-171.05	-4,788.39	-695.84	5,573.12	5,548.88	53.24	100.554	
8,300.00	8,272.17	5,976.76	5,953.38	30.13	30.13	-171.12	-4,791.59	-684.96	5,587.58	5,563.88	53.70	100.474	
8,400.00	8,372.17	5,975.76	5,952.38	30.48	30.48	-171.19	-4,794.79	-674.08	5,602.04	5,578.88	54.16	100.454	
8,500.00	8,472.17	5,974.76	5,951.38	30.83	30.83	-171.26	-4,797.99	-663.20	5,616.50	5,593.88	54.62	100.494	
8,600.00	8,572.17	5,973.76	5,950.38	31.18	31.18	-171.33	-4,801.19	-652.32	5,630.96	5,608.88	55.08	100.594	
8,700.00	8,672.17	5,972.76	5,949.38	31.52	31.52	-171.40	-4,804.39	-641.44	5,645.42	5,623.88	55.54	100.754	
8,751.58	8,723.75	5,971.76	5,948.38	31.70	31.70	-171.47	-4,807.59	-630.56	5,659.88	5,638.88	56.00	100.974	
8,800.00	8,772.11	5,970.76	5,947.38	31.86	31.86	-171.54	-4,810.79	-619.68	5,674.34	5,653.88	56.46	101.254	
8,850.00	8,821.68	5,969.76	5,946.38	32.00	32.00	-171.61	-4,813.99	-608.80	5,688.80	5,668.88	56.92	101.594	
8,900.00	8,870.51	5,968.76	5,945.38	32.12	32.12	-171.68	-4,817.19	-597.92	5,703.26	5,683.88	57.38	101.994	
8,950.00	8,918.22	5,967.76	5,944.38	32.24	32.24	-171.75	-4,820.39	-587.04	5,717.72	5,698.88	57.84	102.454	
9,000.00	8,964.46	5,966.76	5,943.38	32.34	32.34	-171.82	-4,823.59	-576.16	5,732.18	5,713.88	58.30	102.974	
9,050.00	9,008.86	5,965.76	5,942.38	32.43	32.43	-171.89	-4,826.79	-565.28	5,746.64	5,728.88	58.76	103.554	
9,100.00	9,051.09	5,964.76	5,941.38	32.51	32.51	-171.96	-4,829.99	-554.40	5,761.10	5,743.88	59.22	104.194	
9,150.00	9,090.83	5,963.76	5,940.38	32.58	32.58	-172.03	-4,833.19	-543.52	5,775.56	5,758.88	59.68	104.894	
9,200.00	9,127.77	5,962.76	5,939.38	32.65	32.65	-172.10	-4,836.39	-532.64	5,790.02	5,773.88	60.14	105.654	
9,250.00	9,161.64	5,961.76	5,938.38	32.71	32.71	-172.17	-4,839.59	-521.76	5,804.48	5,788.88	60.60	106.474	

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



MS Energy Services

Anticollision Report



Company: Devon Energy
Project: Eddy County, New Mexico (NAD 83)
Reference Site: Cotton Draw Unit
Site Error: 0.00 usft
Reference Well: 515H
Well Error: 0.00 usft
Reference Wellbore: Wellbore #1
Reference Design: Design #1

Local Co-ordinate Reference: Well 515H
TVD Reference: Well @ 3566.10usft (Cactus 126)
MD Reference: Well @ 3566.10usft (Cactus 126)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at
Database: 5000.1 Conroe DB
Offset TVD Reference: Offset Datum

Offset Design Cotton Draw Unit - 291H - Wellbore #1 - Design #2												Offset Site Error:	0.00 usft
Survey Program: 26-MWD, 700-MWD												Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Distance		Minimum Separation		Warning			
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Azimuth from North (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Separation Factor		
9,300.00	9,192.18	15,322.76	10,599.38	32.78	87.76	-93.38	151.12	-715.99	1,607.77	1,529.45	78.32	20.528	
9,350.00	9,219.15	15,309.31	10,599.24	32.85	87.56	-91.15	137.67	-715.99	1,585.80	1,506.78	79.02	20.069	
9,400.00	9,242.36	15,265.71	10,598.78	32.92	86.91	-91.12	94.07	-715.99	1,567.71	1,488.42	79.30	19.770	
9,450.00	9,261.61	15,220.22	10,598.31	32.99	86.24	-91.10	48.59	-715.99	1,553.37	1,473.86	79.51	19.537	
9,500.00	9,276.77	15,173.21	10,597.81	33.08	85.54	-91.08	1.58	-715.99	1,542.84	1,463.19	79.65	19.371	
9,550.00	9,287.73	15,125.02	10,597.31	33.17	84.83	-91.06	-46.61	-715.99	1,536.14	1,456.44	79.71	19.273	
9,600.00	9,294.39	15,076.03	10,596.80	33.27	84.10	-91.04	-95.60	-715.99	1,533.30	1,453.61	79.69	19.242	
9,612.04	9,295.34	15,064.16	10,596.67	33.29	83.93	-91.04	-107.47	-715.99	1,533.19	1,453.52	79.67	19.244	
9,649.26	9,296.70	15,027.33	10,596.29	33.37	83.39	-91.03	-144.30	-715.99	1,534.25	1,454.66	79.59	19.278	
9,700.00	9,296.91	14,977.02	10,595.76	33.49	82.65	-91.02	-194.60	-715.99	1,536.91	1,457.48	79.43	19.349	
9,800.00	9,297.31	14,877.57	10,594.72	33.80	81.19	-91.01	-294.05	-715.99	1,540.90	1,461.83	79.08	19.487	
9,900.00	9,297.72	14,777.81	10,593.67	34.17	79.74	-91.00	-393.80	-715.99	1,543.15	1,464.49	78.65	19.620	
10,000.00	9,298.12	14,677.89	10,592.63	34.62	78.29	-90.99	-493.72	-715.99	1,543.62	1,465.45	78.17	19.747	
10,027.33	9,298.24	14,650.56	10,592.34	34.75	77.90	-90.99	-521.05	-715.99	1,543.43	1,465.40	78.03	19.781	
10,100.00	9,298.53	14,577.90	10,591.58	35.13	76.85	-90.99	-593.70	-715.99	1,542.76	1,465.10	77.65	19.867	
10,200.00	9,298.93	14,477.91	10,590.53	35.71	75.42	-90.99	-693.68	-715.99	1,541.84	1,464.65	77.18	19.976	
10,300.00	9,299.34	14,377.92	10,589.49	36.35	74.00	-90.99	-793.67	-715.99	1,540.91	1,464.15	76.76	20.074	
10,400.00	9,299.74	14,277.94	10,588.44	37.06	72.59	-90.98	-893.65	-715.99	1,539.99	1,463.61	76.38	20.162	
10,500.00	9,300.15	14,177.95	10,587.39	37.83	71.19	-90.98	-993.63	-715.99	1,539.07	1,463.03	76.04	20.240	
10,600.00	9,300.55	14,077.96	10,586.34	38.65	69.80	-90.98	-1,093.61	-715.99	1,538.15	1,462.41	75.75	20.307	
10,700.00	9,300.96	13,977.97	10,585.30	39.53	68.42	-90.98	-1,193.60	-715.99	1,537.24	1,461.75	75.49	20.364	
10,800.00	9,301.36	13,877.99	10,584.25	40.45	67.05	-90.98	-1,293.58	-715.99	1,536.32	1,461.05	75.27	20.411	
10,900.00	9,301.76	13,778.00	10,583.20	41.42	65.70	-90.98	-1,393.56	-715.99	1,535.40	1,460.32	75.09	20.449	
11,000.00	9,302.17	13,678.01	10,582.16	42.44	64.36	-90.97	-1,493.54	-715.99	1,534.49	1,459.55	74.94	20.477	
11,100.00	9,302.57	13,578.02	10,581.11	43.49	63.04	-90.97	-1,593.52	-715.99	1,533.58	1,458.75	74.82	20.496	
11,200.00	9,302.98	13,478.04	10,580.06	44.58	61.73	-90.97	-1,693.51	-715.99	1,532.66	1,457.92	74.74	20.506	
11,300.00	9,303.38	13,378.05	10,579.02	45.71	60.44	-90.97	-1,793.49	-715.99	1,531.75	1,457.06	74.69	20.508	
11,400.00	9,303.79	13,278.06	10,577.97	46.86	59.17	-90.97	-1,893.47	-715.99	1,530.84	1,456.17	74.67	20.501	
11,500.00	9,304.19	13,178.07	10,576.92	48.05	57.91	-90.96	-1,993.45	-715.99	1,529.93	1,455.25	74.68	20.486	
11,600.00	9,304.60	13,078.09	10,575.87	49.26	56.68	-90.96	-2,093.43	-715.99	1,529.03	1,454.31	74.72	20.477	
11,700.00	9,305.00	12,978.10	10,574.83	50.50	55.47	-90.96	-2,193.42	-715.99	1,528.12	1,453.33	74.79	20.432	
11,800.00	9,305.40	12,878.11	10,573.78	51.76	54.28	-90.96	-2,293.40	-715.99	1,527.21	1,452.32	74.89	20.393	
11,900.00	9,305.81	12,778.12	10,572.73	53.05	53.12	-90.96	-2,393.38	-715.99	1,526.31	1,451.29	75.02	20.346	
12,000.00	9,306.21	12,678.13	10,571.69	54.35	51.98	-90.96	-2,493.36	-715.99	1,525.41	1,450.23	75.18	20.291	
12,100.00	9,306.62	12,578.15	10,570.64	55.67	50.87	-90.95	-2,593.34	-715.99	1,524.50	1,449.14	75.36	20.229	
12,200.00	9,307.02	12,478.16	10,569.59	57.01	49.79	-90.95	-2,693.33	-715.99	1,523.60	1,448.02	75.58	20.159	
12,300.00	9,307.43	12,378.17	10,568.55	58.37	48.74	-90.95	-2,793.31	-715.99	1,522.70	1,446.88	75.83	20.082	
12,400.00	9,307.83	12,278.18	10,567.50	59.74	47.73	-90.95	-2,893.29	-715.99	1,521.80	1,445.70	76.10	19.996	
12,500.00	9,308.23	12,178.20	10,566.45	61.13	46.75	-90.95	-2,993.27	-715.99	1,520.90	1,444.49	76.41	19.904	
12,600.00	9,308.64	12,078.21	10,565.40	62.53	45.81	-90.94	-3,093.26	-715.99	1,520.01	1,443.25	76.75	19.804	
12,700.00	9,309.04	11,978.22	10,564.36	63.94	44.92	-90.94	-3,193.24	-715.99	1,519.11	1,441.98	77.13	19.696	
12,800.00	9,309.45	11,878.23	10,563.31	65.36	44.06	-90.94	-3,293.22	-715.99	1,518.22	1,440.68	77.54	19.581	
12,900.00	9,309.85	11,778.25	10,562.26	66.80	43.25	-90.94	-3,393.20	-715.99	1,517.32	1,439.34	77.98	19.458	
13,000.00	9,310.26	11,678.26	10,561.22	68.24	42.49	-90.94	-3,493.18	-715.99	1,516.43	1,437.97	78.46	19.328	
13,100.00	9,310.66	9,324.99	9,284.36	69.69	34.85	-145.79	-4,783.02	-715.99	1,454.89	1,371.16	83.73	17.376	
13,200.00	9,311.07	9,325.39	9,284.77	71.16	34.85	-143.43	-4,783.02	-715.99	1,373.71	1,287.75	85.96	15.981	
13,300.00	9,311.47	9,325.80	9,285.17	72.63	34.85	-140.77	-4,783.02	-715.99	1,295.16	1,206.68	88.48	14.637	
13,400.00	9,311.87	9,326.20	9,285.57	74.11	34.85	-137.77	-4,783.02	-715.99	1,219.76	1,128.44	91.32	13.357	
13,500.00	9,312.28	9,326.61	9,285.98	75.59	34.85	-134.39	-4,783.02	-715.99	1,148.12	1,053.65	94.47	12.153	
13,600.00	9,312.68	9,327.01	9,286.38	77.09	34.86	-130.58	-4,783.02	-715.99	1,080.99	983.06	97.93	11.038	
13,700.00	9,313.09	9,327.41	9,286.79	78.59	34.86	-126.29	-4,783.02	-715.99	1,019.27	917.61	101.66	10.026	
13,800.00	9,313.49	9,327.82	9,287.19	80.09	34.86	-121.47	-4,783.02	-715.99	963.99	858.42	105.57	9.131	

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



MS Energy Services Anticollision Report



Company: Devon Energy
Project: Eddy County, New Mexico (NAD 83)
Reference Site: Cotton Draw Unit
Site Error: 0.00 usft
Reference Well: 515H
Well Error: 0.00 usft
Reference Wellbore: Wellbore #1
Reference Design: Design #1

Local Co-ordinate Reference: Well 515H
TVD Reference: Well @ 3566.10usft (Cactus 126)
MD Reference: Well @ 3566.10usft (Cactus 126)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: 5000.1 Conroe DB
Offset TVD Reference: Offset Datum

Offset Design Cotton Draw Unit - 291H - Wellbore #1 - Design #2													Offset Site Error: 0.00 usft
Survey Program: 26-MWD, 700-MWD													Offset Well Error: 0.00 usft
Reference		Offset		Semi Major Axis		Azimuth from North (°)	Offset Wellbore Centre		Distance				Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N/S (usft)	+E/W (usft)	Between Centras (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	
13,900.00	9,313.90	9,328.22	9,287.60	81.60	34.86	-116.11	-4,783.02	-715.99	916.32	806.81	109.51	8.367	
14,000.00	9,314.30	9,328.63	9,288.00	83.12	34.86	-110.22	-4,783.02	-715.99	877.50	764.21	113.29	7.746	
14,100.00	9,314.71	9,329.03	9,288.41	84.64	34.86	-103.85	-4,783.02	-715.99	848.75	732.11	116.63	7.277	
14,200.00	9,315.11	9,329.44	9,288.81	86.17	34.86	-97.14	-4,783.02	-715.99	831.11	711.82	119.28	6.968	
14,298.18	9,315.51	9,329.83	9,289.21	87.68	34.86	-90.35	-4,783.02	-715.99	825.29	704.30	120.98	6.821 CC	
14,300.00	9,315.51	9,329.84	9,289.21	87.70	34.86	-90.23	-4,783.02	-715.99	825.29	704.28	121.01	6.820 ES, SF	
14,400.00	9,315.92	9,330.25	9,289.62	89.24	34.87	-83.32	-4,783.02	-715.99	831.54	709.85	121.69	6.833	
14,500.00	9,316.32	9,330.65	9,290.02	90.78	34.87	-76.61	-4,783.02	-715.99	849.60	728.26	121.35	7.001	
14,600.00	9,316.73	9,331.05	9,290.43	92.33	34.87	-70.26	-4,783.02	-715.99	878.74	758.62	120.13	7.315	
14,700.00	9,317.13	9,331.46	9,290.83	93.88	34.87	-64.39	-4,783.02	-715.99	917.91	799.67	118.24	7.763	
14,800.00	9,317.54	9,331.86	9,291.24	95.43	34.87	-59.05	-4,783.02	-715.99	965.87	849.97	115.91	8.333	
14,900.00	9,317.94	9,332.27	9,291.64	96.99	34.87	-54.25	-4,783.02	-715.99	1,021.41	908.06	113.35	9.011	
15,000.00	9,318.34	9,332.67	9,292.04	98.55	34.87	-49.97	-4,783.02	-715.99	1,083.35	972.62	110.73	9.784	
15,100.00	9,318.75	9,333.08	9,292.45	100.11	34.87	-46.18	-4,783.02	-715.99	1,150.65	1,042.51	108.15	10.640	
15,200.00	9,319.15	9,333.48	9,292.85	101.68	34.88	-42.81	-4,783.02	-715.99	1,222.44	1,116.76	105.68	11.568	
15,300.00	9,319.56	9,333.89	9,293.26	103.24	34.88	-39.83	-4,783.02	-715.99	1,297.97	1,194.60	103.36	12.557	
15,400.00	9,319.96	9,334.29	9,293.66	104.82	34.88	-37.19	-4,783.02	-715.99	1,376.62	1,275.40	101.22	13.600	
15,500.00	9,320.37	9,334.69	9,294.07	106.39	34.88	-34.83	-4,783.02	-715.99	1,457.89	1,358.63	99.25	14.688	
15,600.00	9,320.77	9,335.10	9,294.47	107.97	34.88	-32.72	-4,783.02	-715.99	1,541.36	1,443.90	97.46	15.816	
15,700.00	9,321.18	9,335.50	9,294.88	109.55	34.88	-30.84	-4,783.02	-715.99	1,626.70	1,530.88	95.82	16.976	
15,800.00	9,321.58	9,335.91	9,295.28	111.13	34.88	-29.14	-4,783.02	-715.99	1,713.63	1,619.29	94.34	18.164	
15,900.00	9,321.98	9,336.31	9,295.68	112.71	34.89	-27.61	-4,783.02	-715.99	1,801.91	1,708.92	92.99	19.377	
16,000.00	9,322.39	9,336.72	9,296.09	114.30	34.89	-26.22	-4,783.02	-715.99	1,891.36	1,799.59	91.77	20.610	
16,100.00	9,322.79	9,337.12	9,296.49	115.88	34.89	-24.96	-4,783.02	-715.99	1,981.81	1,891.16	90.66	21.860	
16,200.00	9,323.20	9,337.52	9,296.90	117.47	34.89	-23.81	-4,783.02	-715.99	2,073.15	1,983.50	89.65	23.125	
16,300.00	9,323.60	9,337.93	9,297.30	119.07	34.89	-22.76	-4,783.02	-715.99	2,165.25	2,076.52	88.73	24.402	
16,400.00	9,324.01	9,338.33	9,297.71	120.66	34.89	-21.79	-4,783.02	-715.99	2,258.02	2,170.13	87.89	25.690	
16,500.00	9,324.41	9,338.74	9,298.11	122.25	34.89	-20.90	-4,783.02	-715.99	2,351.39	2,264.25	87.13	26.987	
16,600.00	9,324.82	9,339.14	9,298.52	123.85	34.89	-20.08	-4,783.02	-715.99	2,445.28	2,358.84	86.44	28.290	
16,700.00	9,325.22	9,339.55	9,298.92	125.45	34.90	-19.31	-4,783.02	-715.99	2,539.63	2,453.83	85.80	29.600	
16,800.00	9,325.62	9,339.95	9,299.32	127.05	34.90	-18.61	-4,783.02	-715.99	2,634.40	2,549.19	85.22	30.914	
16,900.00	9,326.03	9,340.36	9,299.73	128.65	34.90	-17.95	-4,783.02	-715.99	2,729.55	2,644.87	84.68	32.233	
17,000.00	9,326.43	9,340.76	9,300.13	130.25	34.90	-17.34	-4,783.02	-715.99	2,825.03	2,740.84	84.19	33.554	
17,100.00	9,326.84	9,341.16	9,300.54	131.86	34.90	-16.76	-4,783.02	-715.99	2,920.81	2,837.07	83.74	34.878	
17,200.00	9,327.24	9,341.57	9,300.94	133.46	34.90	-16.23	-4,783.02	-715.99	3,016.87	2,933.54	83.33	36.204	
17,300.00	9,327.65	9,341.97	9,301.35	135.07	34.90	-15.72	-4,783.02	-715.99	3,113.17	3,030.22	82.95	37.531	
17,400.00	9,328.05	9,342.38	9,301.75	136.68	34.91	-15.25	-4,783.02	-715.99	3,209.71	3,127.11	82.60	38.858	
17,500.00	9,328.45	9,342.78	9,302.15	138.29	34.91	-14.81	-4,783.02	-715.99	3,306.44	3,224.16	82.28	40.186	
17,600.00	9,328.86	9,343.19	9,302.56	139.90	34.91	-14.39	-4,783.02	-715.99	3,403.37	3,321.39	81.98	41.513	
17,700.00	9,329.26	9,343.59	9,302.96	141.51	34.91	-13.99	-4,783.02	-715.99	3,500.47	3,418.76	81.71	42.840	
17,800.00	9,329.67	9,344.00	9,303.37	143.12	34.91	-13.61	-4,783.02	-715.99	3,597.72	3,516.27	81.46	44.166	
17,900.00	9,330.07	9,344.40	9,303.77	144.73	34.91	-13.26	-4,783.02	-715.99	3,695.13	3,613.90	81.23	45.491	
18,000.00	9,330.48	9,344.80	9,304.18	146.35	34.91	-12.92	-4,783.02	-715.99	3,792.67	3,711.65	81.01	46.815	
18,100.00	9,330.88	9,345.21	9,304.58	147.96	34.91	-12.60	-4,783.02	-715.99	3,890.33	3,809.51	80.82	48.137	
18,200.00	9,331.29	9,345.61	9,304.99	149.58	34.92	-12.29	-4,783.02	-715.99	3,988.11	3,907.47	80.64	49.458	
18,300.00	9,331.69	9,346.02	9,305.39	151.20	34.92	-12.00	-4,783.02	-715.99	4,086.00	4,005.53	80.47	50.776	
18,400.00	9,332.09	9,346.42	9,305.79	152.81	34.92	-11.73	-4,783.02	-715.99	4,183.98	4,103.67	80.32	52.092	
18,500.00	9,332.50	9,346.83	9,306.20	154.43	34.92	-11.46	-4,783.02	-715.99	4,282.06	4,201.89	80.18	53.407	
18,600.00	9,332.90	9,347.23	9,306.60	156.05	34.92	-11.21	-4,783.02	-715.99	4,380.23	4,300.18	80.05	54.718	
18,700.00	9,333.31	9,347.63	9,307.01	157.67	34.92	-10.97	-4,783.02	-715.99	4,478.48	4,398.55	79.93	56.028	
18,800.00	9,333.71	9,348.04	9,307.41	159.30	34.92	-10.74	-4,783.02	-715.99	4,576.80	4,496.98	79.83	57.334	
18,900.00	9,334.12	9,348.44	9,307.82	160.92	34.92	-10.52	-4,783.02	-715.99	4,675.20	4,595.47	79.73	58.638	

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



MS Energy Services
Anticollision Report



Company: Devon Energy
Project: Eddy County, New Mexico (NAD 83)
Reference Site: Cotton Draw Unit
Site Error: 0.00 usft
Reference Well: 515H
Well Error: 0.00 usft
Reference Wellbore: Wellbore #1
Reference Design: Design #1

Local Co-ordinate Reference: Well 515H
TVD Reference: Well @ 3566.10usft (Cactus 126)
MD Reference: Well @ 3566.10usft (Cactus 126)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: 5000.1 Conroe DB
Offset TVD Reference: Offset Datum

Offset Design Cotton Draw Unit - 291H - Wellbore #1 - Design #2												Offset Site Error:	0.00 usft
Survey Program: 26-MWD, 700-MWD												Offset Well Error:	0.00 usft
Reference *		Offset		Semi Major Axis		Azimuth from North (°)	Offset Wellbore Centre		Distance		Minimum Separation (usft)	Separation Factor	Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)			
19,000.00	9,334.52	9,348.85	9,308.22	162.54	34.93	-10.31	-4,783.02	-715.99	4,773.66	4,694.02	79.64	59.939	
19,100.00	9,334.93	9,349.25	9,308.63	164.16	34.93	-10.10	-4,783.02	-715.99	4,872.18	4,792.62	79.56	61.237	
19,200.00	9,335.33	9,349.66	9,309.03	165.79	34.93	-9.91	-4,783.02	-715.99	4,970.77	4,891.28	79.49	62.533	
19,300.00	9,335.73	9,350.06	9,309.43	167.41	34.93	-9.72	-4,783.02	-715.99	5,069.40	4,989.98	79.43	63.825	
19,390.56	9,336.10	9,350.43	9,309.80	168.88	34.93	-9.56	-4,783.02	-715.99	5,158.77	5,079.40	79.38	64.992	



MS Energy Services Anticollision Report



Company: Devon Energy
Project: Eddy County, New Mexico (NAD 83)
Reference Site: Cotton Draw Unit
Site Error: 0.00 usft
Reference Well: 515H
Well Error: 0.00 usft
Reference Wellbore: Wellbore #1
Reference Design: Design #1

Local Co-ordinate Reference: Well 515H
TVD Reference: Well @ 3566.10usft (Cactus 126)
MD Reference: Well @ 3566.10usft (Cactus 126)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: 5000.1 Conroe DB
Offset TVD Reference: Offset Datum

Offset Design Cotton Draw Unit - 292H - Wellbore #1 - Surveys													Offset Site Error:	0.00 usft
Survey Program: 205-MWD													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Azimuth from North (°)	Offset Wellbore Centre		Distance		Minimum Separation (usft)	Separation Factor	Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)				
0.00	0.00	0.00	0.00	0.00	0.00	-174.29	-4,997.76	-499.87	5,022.76					
100.00	100.00	73.15	73.15	0.13	0.11	-174.29	-4,997.76	-499.89	5,022.70	5,022.45	0.25	N/A		
200.00	200.00	172.13	172.13	0.49	0.27	-174.29	-4,997.78	-499.99	5,022.73	5,021.97	0.76	6,601.995		
300.00	300.00	280.99	280.99	0.85	0.58	-174.29	-4,997.75	-500.03	5,022.71	5,021.27	1.43	3,506.148		
341.60	341.60	315.50	315.50	1.00	0.70	-174.29	-4,997.74	-499.99	5,022.69	5,020.99	1.70	2,956.282		
400.00	400.00	373.37	373.37	1.21	0.90	-174.29	-4,997.76	-499.93	5,022.70	5,020.59	2.11	2,381.660		
500.00	500.00	480.99	480.99	1.57	1.28	-174.29	-4,997.68	-500.12	5,022.65	5,019.80	2.85	1,765.131		
600.00	600.00	577.68	577.68	1.93	1.62	-174.28	-4,997.51	-500.37	5,022.50	5,018.95	3.55	1,416.184		
700.00	700.00	675.37	675.37	2.29	1.97	-174.28	-4,997.43	-500.49	5,022.43	5,018.18	4.25	1,181.190		
719.33	719.33	693.22	693.22	2.35	2.03	-174.28	-4,997.42	-500.51	5,022.42	5,018.04	4.38	1,145.477		
800.00	800.00	774.86	774.86	2.64	2.32	-174.28	-4,997.43	-500.57	5,022.44	5,017.48	4.96	1,012.757		
900.00	900.00	882.32	882.32	3.00	2.69	-174.28	-4,997.37	-500.17	5,022.35	5,016.66	5.69	882.622		
1,000.00	1,000.00	983.17	983.16	3.36	3.04	-174.29	-4,997.25	-499.52	5,022.17	5,015.77	6.40	785.060		
1,100.00	1,100.00	1,083.81	1,083.80	3.72	3.38	-174.30	-4,997.12	-498.97	5,021.98	5,014.87	7.10	706.963		
1,200.00	1,200.00	1,191.08	1,191.07	4.08	3.76	-174.30	-4,996.88	-498.49	5,021.71	5,013.87	7.84	640.641		
1,300.00	1,300.00	1,296.29	1,296.29	4.44	4.13	-174.31	-4,996.48	-498.13	5,021.30	5,012.73	8.57	586.114		
1,400.00	1,400.00	1,396.76	1,396.75	4.79	4.49	-174.31	-4,996.04	-498.03	5,020.85	5,011.57	9.28	540.997		
1,500.00	1,500.00	1,494.00	1,493.99	5.15	4.83	-174.31	-4,995.58	-498.18	5,020.40	5,010.42	9.98	502.911		
1,600.00	1,600.00	1,586.41	1,586.39	5.51	5.16	-174.30	-4,995.26	-498.41	5,020.08	5,009.41	10.67	470.613		
1,700.00	1,700.00	1,680.12	1,680.11	5.87	5.48	-174.30	-4,995.07	-498.67	5,019.90	5,008.55	11.35	442.125		
1,800.00	1,800.00	1,776.31	1,776.30	6.23	5.82	-174.30	-4,994.97	-498.84	5,019.82	5,007.77	12.05	416.729		
1,863.09	1,863.09	1,837.00	1,836.99	6.45	6.03	-174.30	-4,994.95	-498.86	5,019.80	5,007.32	12.48	402.159		
1,900.00	1,900.00	1,870.93	1,870.92	6.59	6.14	-174.30	-4,994.96	-498.87	5,019.81	5,007.08	12.73	394.296		
2,000.00	2,000.00	1,962.86	1,962.85	6.95	6.46	-174.30	-4,995.08	-498.92	5,019.95	5,006.55	13.41	374.472		
2,100.00	2,100.00	2,059.47	2,059.45	7.30	6.79	-174.30	-4,995.35	-499.03	5,020.24	5,006.14	14.10	356.130		
2,200.00	2,200.00	2,166.87	2,166.85	7.66	7.16	-174.30	-4,995.58	-499.04	5,020.45	5,005.62	14.83	338.605		
2,300.00	2,300.00	2,266.71	2,266.69	8.02	7.51	-174.30	-4,995.70	-498.92	5,020.56	5,005.03	15.53	323.250		
2,400.00	2,400.00	2,359.93	2,359.91	8.38	7.83	-174.30	-4,995.90	-498.89	5,020.77	5,004.56	16.21	309.662		
2,500.00	2,500.00	2,452.31	2,452.30	8.74	8.16	-174.30	-4,996.22	-498.95	5,021.12	5,004.23	16.89	297.219		
2,600.00	2,599.99	2,543.84	2,543.82	9.10	8.48	-174.30	-4,996.69	-499.03	5,022.50	5,004.93	17.57	285.836		
2,700.00	2,699.96	2,643.40	2,643.38	9.45	8.82	-174.30	-4,997.32	-499.15	5,025.73	5,007.46	18.28	274.965		
2,800.00	2,799.86	2,754.10	2,754.08	9.81	9.21	-174.31	-4,997.86	-499.30	5,030.54	5,011.52	19.02	264.433		
2,900.00	2,899.68	2,851.27	2,851.25	10.17	9.55	-174.32	-4,998.22	-499.46	5,036.96	5,017.23	19.72	255.384		
3,000.00	2,999.37	2,942.63	2,942.61	10.53	9.87	-174.33	-4,998.68	-499.66	5,045.24	5,024.83	20.40	247.296		
3,100.00	3,098.90	3,045.48	3,045.46	10.89	10.24	-174.34	-4,999.29	-499.87	5,055.33	5,034.20	21.12	239.354		
3,200.00	3,198.26	3,155.23	3,155.20	11.25	10.62	-174.36	-4,999.78	-499.89	5,066.95	5,045.09	21.86	231.748		
3,299.74	3,297.14	3,267.46	3,267.43	11.61	11.01	-174.39	-5,000.02	-499.75	5,080.03	5,057.41	22.61	224.662		
3,300.00	3,297.40	3,267.75	3,267.73	11.61	11.01	-174.39	-5,000.02	-499.75	5,080.06	5,057.45	22.61	224.644		
3,400.00	3,396.43	3,380.59	3,380.56	11.98	11.41	-174.41	-4,999.96	-499.62	5,093.75	5,070.39	23.36	218.016		
3,500.00	3,495.46	3,467.78	3,467.75	12.36	11.71	-174.44	-4,999.95	-499.54	5,107.48	5,083.45	24.03	212.590		
3,600.00	3,594.49	3,560.07	3,560.05	12.73	12.03	-174.46	-5,000.05	-499.48	5,121.34	5,096.63	24.70	207.302		
3,700.00	3,693.51	3,656.86	3,656.83	13.11	12.37	-174.48	-5,000.22	-499.59	5,135.28	5,109.88	25.40	202.154		
3,800.00	3,792.54	3,752.92	3,752.90	13.49	12.71	-174.50	-5,000.40	-499.97	5,149.27	5,123.17	26.10	197.296		
3,900.00	3,891.57	3,845.53	3,845.50	13.87	13.04	-174.52	-5,000.66	-500.43	5,163.35	5,136.57	26.78	192.780		
4,000.00	3,990.60	3,938.24	3,938.21	14.25	13.36	-174.54	-5,001.03	-500.92	5,177.56	5,150.09	27.47	188.486		
4,100.00	4,089.62	4,032.03	4,032.00	14.64	13.69	-174.56	-5,001.52	-501.30	5,191.87	5,163.71	28.16	184.371		
4,200.00	4,188.65	4,125.82	4,125.79	15.02	14.02	-174.58	-5,002.12	-501.47	5,206.28	5,177.43	28.85	180.453		
4,300.00	4,287.68	4,219.91	4,219.88	15.41	14.36	-174.60	-5,002.83	-501.52	5,220.79	5,191.25	29.54	176.710		
4,400.00	4,386.71	4,313.13	4,313.09	15.80	14.69	-174.62	-5,003.62	-501.52	5,235.39	5,205.16	30.23	173.158		
4,500.00	4,485.73	4,404.10	4,404.06	16.19	15.01	-174.64	-5,004.51	-501.62	5,250.13	5,219.21	30.92	169.812		
4,600.00	4,584.76	4,679.00	4,678.86	16.59	15.98	-174.61	-5,003.97	-506.46	5,264.90	5,232.63	32.26	163.195		
4,700.00	4,683.79	4,907.50	4,906.77	16.98	16.77	-174.48	-4,994.19	-519.53	5,274.67	5,241.26	33.41	157.869		

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



MS Energy Services

Anticollision Report



Company: Devon Energy
Project: Eddy County, New Mexico (NAD 83)
Reference Site: Cotton Draw Unit
Site Error: 0.00 usft
Reference Well: 515H
Well Error: 0.00 usft
Reference Wellbore: Wellbore #1
Reference Design: Design #1

Local Co-ordinate Reference: Well 515H
TVD Reference: Well @ 3566.10usft (Cactus 126)
MD Reference: Well @ 3566.10usft (Cactus 126)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: 5000.1 Conroe DB
Offset TVD Reference: Offset Datum

Offset Design Cotton Draw Unit - 292H - Wellbore #1 - Surveys													Offset Site Error:	0.00 usft
Survey Program: 205-MWD													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis			Distance		Between		Minimum Separation (usft)	Separation Factor	Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Azimuth from North (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)				
4,800.00	4,782.81	5,001.87	5,000.80	17.37	17.09	-174.43	-4,989.18	-525.65	5,283.79	5,249.69	34.11	154.924		
4,900.00	4,881.84	5,119.34	5,117.86	17.77	17.51	-174.37	-4,982.93	-533.23	5,292.92	5,258.04	34.88	151.747		
5,000.00	4,980.87	5,272.34	5,270.18	18.17	18.04	-174.26	-4,973.49	-544.17	5,301.26	5,265.48	35.77	148.184		
5,100.00	5,079.90	5,335.14	5,332.69	18.56	18.27	-174.23	-4,969.63	-548.73	5,309.57	5,273.20	36.37	145.994		
5,200.00	5,178.92	5,409.84	5,407.07	18.96	18.53	-174.19	-4,965.34	-554.03	5,318.34	5,281.34	37.00	143.735		
5,300.00	5,277.95	5,495.20	5,492.11	19.36	18.83	-174.15	-4,960.80	-559.99	5,327.51	5,289.84	37.67	141.421		
5,400.00	5,376.98	5,587.01	5,583.56	19.76	19.16	-174.10	-4,956.03	-566.63	5,336.85	5,298.48	38.36	139.109		
5,500.00	5,476.01	5,676.76	5,672.94	20.16	19.48	-174.04	-4,951.49	-573.38	5,346.35	5,307.30	39.05	136.904		
5,600.00	5,575.03	5,764.83	5,760.63	20.56	19.80	-173.99	-4,947.18	-580.27	5,356.06	5,316.32	39.73	134.797		
5,628.09	5,602.86	5,789.56	5,785.26	20.68	19.89	-173.97	-4,946.00	-582.25	5,358.82	5,318.90	39.93	134.219		
5,700.00	5,674.12	5,855.20	5,850.60	20.96	20.12	-173.93	-4,942.92	-587.60	5,365.53	5,325.10	40.43	132.726		
5,800.00	5,773.42	5,949.19	5,944.16	21.36	20.46	-173.86	-4,938.58	-595.40	5,373.48	5,332.35	41.13	130.646		
5,900.00	5,872.91	6,038.28	6,032.85	21.74	20.78	-173.79	-4,934.56	-602.88	5,379.84	5,338.03	41.82	128.655		
6,000.00	5,972.56	6,118.78	6,113.01	22.12	21.08	-173.73	-4,931.20	-609.48	5,384.80	5,342.33	42.47	126.792		
6,100.00	6,072.35	6,199.38	6,193.30	22.49	21.37	-173.67	-4,928.14	-615.85	5,388.39	5,345.27	43.12	124.958		
6,200.00	6,172.23	6,292.48	6,286.06	22.86	21.71	-173.60	-4,924.86	-623.04	5,390.52	5,346.70	43.82	123.019		
6,300.00	6,272.18	6,385.59	6,378.84	23.21	22.04	-173.53	-4,921.69	-630.21	5,391.05	5,346.53	44.51	121.110		
6,400.00	6,372.17	6,491.01	6,483.88	23.56	22.43	-173.44	-4,918.11	-638.32	5,389.88	5,344.63	45.25	119.104		
6,427.83	6,400.00	6,520.46	6,513.24	23.66	22.54	-173.41	-4,917.09	-640.60	5,389.23	5,343.77	45.46	118.550		
6,500.00	6,472.17	6,596.83	6,589.33	23.90	22.81	-173.35	-4,914.39	-646.52	5,387.34	5,341.35	45.99	117.133		
6,600.00	6,572.17	6,668.64	6,660.87	24.25	23.08	-173.29	-4,912.05	-652.18	5,384.99	5,338.39	46.61	115.540		
6,700.00	6,672.17	6,745.11	6,737.07	24.59	23.36	-173.22	-4,909.86	-658.32	5,383.08	5,335.85	47.24	113.957		
6,800.00	6,772.17	6,824.38	6,816.05	24.93	23.65	-173.15	-4,907.91	-664.73	5,381.60	5,333.72	47.88	112.400		
6,900.00	6,872.17	6,905.02	6,896.43	25.28	23.94	-173.08	-4,906.24	-671.04	5,380.48	5,331.95	48.53	110.880		
7,000.00	6,972.17	6,996.98	6,988.11	25.62	24.28	-173.00	-4,904.67	-678.02	5,379.69	5,330.48	49.22	109.310		
7,100.00	7,072.17	7,112.98	7,103.74	25.97	24.70	-172.90	-4,902.47	-687.05	5,378.76	5,328.76	50.00	107.578		
7,200.00	7,172.17	7,208.70	7,199.12	26.31	25.05	-172.82	-4,900.46	-694.76	5,377.67	5,326.97	50.70	106.059		
7,300.00	7,272.17	7,294.93	7,285.06	26.66	25.37	-172.74	-4,898.84	-701.71	5,376.82	5,325.44	51.37	104.659		
7,400.00	7,372.17	7,376.55	7,366.40	27.00	25.67	-172.67	-4,897.53	-708.23	5,376.24	5,324.22	52.03	103.338		
7,486.06	7,458.22	7,442.47	7,432.12	27.30	25.91	-172.62	-4,896.75	-713.26	5,376.08	5,323.51	52.57	102.268		
7,500.00	7,472.17	7,453.15	7,442.78	27.35	25.95	-172.61	-4,896.65	-714.06	5,376.09	5,323.43	52.66	102.097		
7,600.00	7,572.17	7,531.00	7,520.43	27.69	26.24	-172.55	-4,896.15	-719.65	5,376.37	5,323.07	53.29	100.886		
7,700.00	7,672.17	7,624.12	7,613.32	28.04	26.58	-172.48	-4,895.83	-726.06	5,376.92	5,322.94	53.99	99.599		
7,800.00	7,772.17	7,718.73	7,707.72	28.39	26.92	-172.42	-4,895.61	-732.41	5,377.58	5,322.90	54.69	98.336		
7,900.00	7,872.17	7,806.30	7,795.10	28.74	27.24	-172.36	-4,895.58	-738.11	5,378.41	5,323.06	55.36	97.158		
8,000.00	7,972.17	7,893.72	7,882.35	29.08	27.56	-172.30	-4,895.78	-743.58	5,379.48	5,323.45	56.03	96.014		
8,100.00	8,072.17	8,073.39	8,061.71	29.43	28.21	-172.19	-4,895.32	-754.19	5,380.10	5,323.03	57.06	94.284		
8,200.00	8,172.17	8,223.16	8,211.23	29.78	28.76	-172.10	-4,893.00	-762.32	5,379.28	5,321.30	57.97	92.788		
8,300.00	8,272.17	8,331.21	8,319.13	30.13	29.15	-172.04	-4,890.70	-767.70	5,377.84	5,319.12	58.72	91.579		
8,400.00	8,372.17	8,408.48	8,396.29	30.48	29.43	-171.99	-4,889.28	-771.43	5,376.70	5,317.34	59.36	90.583		
8,500.00	8,472.17	8,485.84	8,473.56	30.83	29.71	-171.95	-4,888.20	-775.11	5,375.98	5,315.99	59.99	89.616		
8,600.00	8,572.17	8,564.24	8,551.88	31.18	30.00	-171.92	-4,887.47	-778.53	5,375.67	5,315.04	60.62	88.674		
8,626.88	8,599.04	8,585.32	8,572.94	31.27	30.07	-171.91	-4,887.34	-779.36	5,375.65	5,314.86	60.79	88.425		
8,700.00	8,672.17	8,642.68	8,630.27	31.52	30.28	-171.89	-4,887.13	-781.43	5,375.76	5,314.50	61.26	87.759		
8,751.58	8,723.75	8,671.00	8,658.57	31.70	30.38	-171.88	-4,887.10	-782.36	5,375.98	5,314.45	61.54	87.364		
8,800.00	8,772.11	8,713.11	8,700.67	31.86	30.53	-171.86	-4,887.21	-783.53	5,374.34	5,312.49	61.84	86.905		
8,850.00	8,821.68	8,745.84	8,733.39	32.00	30.64	-171.83	-4,887.43	-784.25	5,368.69	5,306.59	62.10	86.448		
8,900.00	8,870.51	8,778.16	8,765.70	32.12	30.76	-171.80	-4,887.79	-784.78	5,359.07	5,296.72	62.36	85.944		
8,950.00	8,918.22	8,809.84	8,797.38	32.24	30.87	-171.75	-4,888.25	-785.14	5,345.54	5,282.94	62.60	85.395		
9,000.00	8,964.46	8,840.69	8,828.21	32.34	30.97	-171.69	-4,888.82	-785.33	5,328.18	5,265.35	62.83	84.808		
9,050.00	9,008.86	8,887.99	8,875.51	32.43	31.14	-171.62	-4,889.84	-785.37	5,307.10	5,243.99	63.11	84.097		
9,100.00	9,051.09	8,963.63	8,951.13	32.51	31.39	-171.54	-4,891.17	-785.21	5,282.17	5,218.68	63.48	83.208		

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



MS Energy Services Anticollision Report



Company: Devon Energy
Project: Eddy County, New Mexico (NAD 83)
Reference Site: Cotton Draw Unit
Site Error: 0.00 usft
Reference Well: 515H
Well Error: 0.00 usft
Reference Wellbore: Wellbore #1
Reference Design: Design #1

Local Co-ordinate Reference: Well 515H
TVD Reference: Well @ 3566.10usft (Cactus 126)
MD Reference: Well @ 3566.10usft (Cactus 126)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: 5000.1 Conroe DB
Offset TVD Reference: Offset Datum

Offset Design Cotton Draw Unit - 292H - Wellbore #1 - Surveys													Offset Site Error:	0.00 usft
Survey Program: 205-MWD													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis			Distance							Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Azimuth from North (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor		
9,150.00	9,090.83	9,034.43	9,021.93	32.58	31.63	-171.46	-4,892.02	-784.87	5,253.52	5,189.70	63.83	82.311		
9,200.00	9,127.77	9,085.05	9,072.54	32.65	31.80	-171.36	-4,892.41	-784.54	5,221.49	5,157.40	64.08	81.481		
9,250.00	9,161.64	9,127.09	9,114.59	32.71	31.94	-171.24	-4,892.65	-784.30	5,186.42	5,122.13	64.30	80.665		
9,300.00	9,192.18	9,164.90	9,152.39	32.78	32.07	-171.12	-4,892.81	-784.10	5,148.63	5,084.15	64.48	79.843		
9,350.00	9,219.15	9,198.19	9,185.68	32.85	32.18	-170.98	-4,892.90	-783.95	5,108.41	5,043.77	64.65	79.020		
9,400.00	9,242.36	9,226.72	9,214.22	32.92	32.28	-170.84	-4,892.94	-783.84	5,066.10	5,001.31	64.78	78.199		
9,450.00	9,261.61	9,250.31	9,237.81	32.99	32.36	-170.69	-4,892.96	-783.76	5,022.02	4,957.12	64.90	77.384		
9,500.00	9,276.77	9,268.81	9,256.31	33.08	32.42	-170.52	-4,892.95	-783.70	4,976.54	4,911.55	64.99	76.577		
9,550.00	9,287.73	9,263.93	9,251.42	33.17	32.40	-170.36	-4,892.99	-783.72	4,930.07	4,865.08	64.99	75.859		
9,600.00	9,294.39	9,268.64	9,256.14	33.27	32.42	-170.18	-4,893.00	-783.70	4,882.87	4,817.85	65.02	75.093		
9,649.26	9,296.70	9,270.37	9,257.86	33.37	32.42	-170.00	-4,893.01	-783.70	4,836.05	4,771.00	65.05	74.346		
9,700.00	9,296.91	9,270.64	9,258.13	33.49	32.42	-169.82	-4,893.01	-783.70	4,787.66	4,722.59	65.07	73.579		
9,800.00	9,297.31	9,271.17	9,258.66	33.80	32.43	-169.48	-4,893.01	-783.69	4,691.66	4,626.55	65.11	72.054		
9,900.00	9,297.72	9,271.70	9,259.19	34.17	32.43	-169.17	-4,893.01	-783.69	4,594.88	4,529.72	65.16	70.515		
10,000.00	9,298.12	9,272.22	9,259.72	34.62	32.43	-168.89	-4,893.02	-783.69	4,497.40	4,432.19	65.21	68.965		
10,027.33	9,298.24	9,272.37	9,259.86	34.75	32.43	-168.82	-4,893.02	-783.69	4,470.64	4,405.42	65.23	68.540		
10,100.00	9,298.53	9,272.75	9,260.25	35.13	32.43	-168.63	-4,893.02	-783.69	4,399.47	4,334.20	65.27	67.409		
10,200.00	9,298.93	9,273.29	9,260.79	35.71	32.43	-168.36	-4,893.02	-783.69	4,301.60	4,236.28	65.32	65.850		
10,300.00	9,299.34	9,273.84	9,261.33	36.35	32.44	-168.08	-4,893.02	-783.69	4,203.84	4,138.45	65.39	64.288		
10,400.00	9,299.74	9,274.39	9,261.88	37.06	32.44	-167.78	-4,893.02	-783.69	4,106.18	4,040.71	65.47	62.721		
10,500.00	9,300.15	9,274.94	9,262.44	37.83	32.44	-167.47	-4,893.03	-783.68	4,008.64	3,943.09	65.55	61.151		
10,600.00	9,300.55	9,275.51	9,263.00	38.65	32.44	-167.14	-4,893.03	-783.68	3,911.22	3,845.57	65.65	59.576		
10,700.00	9,300.96	9,276.08	9,263.58	39.53	32.44	-166.80	-4,893.03	-783.68	3,813.94	3,748.18	65.76	57.998		
10,800.00	9,301.36	9,276.66	9,264.16	40.45	32.45	-166.44	-4,893.03	-783.68	3,716.80	3,650.91	65.88	56.415		
10,900.00	9,301.76	9,277.25	9,264.74	41.42	32.45	-166.06	-4,893.03	-783.68	3,619.81	3,553.79	66.02	54.828		
11,000.00	9,302.17	9,277.85	9,265.34	42.44	32.45	-165.66	-4,893.04	-783.68	3,523.00	3,456.82	66.18	53.236		
11,100.00	9,302.57	9,278.45	9,265.94	43.49	32.45	-165.23	-4,893.04	-783.67	3,426.36	3,360.01	66.35	51.640		
11,200.00	9,302.98	9,279.06	9,266.56	44.58	32.45	-164.78	-4,893.04	-783.67	3,329.93	3,263.38	66.55	50.040		
11,300.00	9,303.38	9,279.68	9,267.18	45.71	32.46	-164.31	-4,893.04	-783.67	3,233.71	3,166.95	66.76	48.435		
11,400.00	9,303.79	9,280.31	9,267.81	46.86	32.46	-163.80	-4,893.05	-783.67	3,137.73	3,070.72	67.01	46.825		
11,500.00	9,304.19	9,280.95	9,268.45	48.05	32.46	-163.27	-4,893.05	-783.67	3,042.01	2,974.72	67.28	45.211		
11,600.00	9,304.60	9,281.60	9,269.09	49.26	32.46	-162.70	-4,893.05	-783.67	2,946.57	2,878.98	67.59	43.593		
11,700.00	9,305.00	9,282.26	9,269.75	50.50	32.46	-162.09	-4,893.05	-783.66	2,851.44	2,783.50	67.94	41.971		
11,800.00	9,305.40	9,282.92	9,270.42	51.76	32.47	-161.44	-4,893.06	-783.66	2,756.66	2,688.33	68.33	40.345		
11,900.00	9,305.81	9,283.60	9,271.09	53.05	32.47	-160.74	-4,893.06	-783.66	2,662.26	2,593.50	68.76	38.715		
12,000.00	9,306.21	9,284.28	9,271.78	54.35	32.47	-159.99	-4,893.06	-783.66	2,568.29	2,499.03	69.26	37.083		
12,100.00	9,306.62	9,284.98	9,272.47	55.67	32.47	-159.18	-4,893.07	-783.66	2,474.78	2,404.97	69.81	35.450		
12,200.00	9,307.02	9,285.68	9,273.18	57.01	32.48	-158.32	-4,893.07	-783.65	2,381.80	2,311.37	70.44	33.815		
12,300.00	9,307.43	9,286.40	9,273.89	58.37	32.48	-157.38	-4,893.07	-783.65	2,289.42	2,218.28	71.14	32.182		
12,400.00	9,307.83	9,287.13	9,274.62	59.74	32.48	-156.36	-4,893.08	-783.65	2,197.70	2,125.77	71.94	30.551		
12,500.00	9,308.23	9,287.86	9,275.36	61.13	32.48	-155.25	-4,893.08	-783.65	2,106.74	2,033.90	72.84	28.925		
12,600.00	9,308.64	9,288.61	9,276.11	62.53	32.49	-154.05	-4,893.08	-783.65	2,016.63	1,942.77	73.85	27.306		
12,700.00	9,309.04	9,289.37	9,276.87	63.94	32.49	-152.73	-4,893.09	-783.64	1,927.49	1,852.49	75.00	25.699		
12,800.00	9,309.45	9,290.15	9,277.64	65.36	32.49	-151.29	-4,893.09	-783.64	1,839.48	1,763.17	76.30	24.107		
12,900.00	9,309.85	9,290.93	9,278.42	66.80	32.49	-149.70	-4,893.09	-783.64	1,752.74	1,674.97	77.78	22.535		
13,000.00	9,310.26	9,291.73	9,279.22	68.24	32.50	-147.95	-4,893.10	-783.64	1,667.50	1,588.06	79.44	20.990		
13,100.00	9,310.66	9,292.53	9,280.03	69.69	32.50	-146.01	-4,893.10	-783.64	1,583.98	1,502.65	81.32	19.477		
13,200.00	9,311.07	9,293.36	9,280.85	71.16	32.50	-143.86	-4,893.11	-783.63	1,502.47	1,419.03	83.45	18.005		
13,300.00	9,311.47	9,294.19	9,281.68	72.63	32.50	-141.46	-4,893.11	-783.63	1,423.33	1,337.50	85.83	16.583		
13,400.00	9,311.87	9,295.04	9,282.53	74.11	32.51	-138.79	-4,893.12	-783.63	1,346.96	1,258.47	88.49	15.221		
13,500.00	9,312.28	9,295.90	9,283.39	75.59	32.51	-135.81	-4,893.12	-783.63	1,273.86	1,182.41	91.45	13.930		
13,600.00	9,312.68	9,296.78	9,284.27	77.09	32.51	-132.47	-4,893.13	-783.63	1,204.64	1,109.94	94.70	12.720		

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



MS Energy Services Anticollision Report



Company: Devon Energy
Project: Eddy County, New Mexico (NAD 83)
Reference Site: Cotton Draw Unit
Site Error: 0.00 usft
Reference Well: 515H
Well Error: 0.00 usft
Reference Wellbore: Wellbore #1
Reference Design: Design #1

Local Co-ordinate Reference: Well 515H
TVD Reference: Well @ 3566.10usft (Cactus 126)
MD Reference: Well @ 3566.10usft (Cactus 126)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: 5000.1 Conroe DB
Offset TVD Reference: Offset Datum

Offset Design Cotton Draw Unit - 292H - Wellbore #1 - Surveys													Offset Site Error:	0.00 usft
Survey Program: 205-MWD													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Azimuth from North (")	Offset Wellbore Centre		Distance		Minimum Separation (usft)	Separation Factor	Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)				
13,700.00	9,313.09	9,297.67	9,285.16	78.59	32.52	-128.74	-4,893.13	-783.62	1,140.00	1,041.76	98.24	11.605		
13,800.00	9,313.49	9,298.57	9,286.07	80.09	32.52	-124.58	-4,893.14	-783.62	1,080.75	978.75	102.00	10.596		
13,900.00	9,313.90	9,299.49	9,286.99	81.60	32.52	-119.96	-4,893.14	-783.62	1,027.83	921.93	105.90	9.706		
14,000.00	9,314.30	9,300.43	9,287.92	83.12	32.53	-114.89	-4,893.15	-783.62	982.28	872.46	109.81	8.945		
14,100.00	9,314.71	9,301.38	9,288.88	84.64	32.53	-109.36	-4,893.15	-783.61	945.14	831.58	113.55	8.323		
14,200.00	9,315.11	9,302.35	9,289.85	86.17	32.53	-103.45	-4,893.16	-783.61	917.45	800.55	116.90	7.848		
14,300.00	9,315.51	9,303.34	9,290.83	87.70	32.54	-97.24	-4,893.16	-783.61	900.07	780.45	119.62	7.525		
14,400.00	9,315.92	9,304.34	9,291.83	89.24	32.54	-90.86	-4,893.17	-783.61	893.61	772.10	121.52	7.354		
14,407.93	9,315.95	9,304.42	9,291.91	89.36	32.54	-90.35	-4,893.17	-783.61	893.58	771.95	121.63	7.347	CC, ES	
14,500.00	9,316.32	9,305.36	9,292.85	90.78	32.54	-84.47	-4,893.18	-783.60	898.31	775.83	122.48	7.334		
14,600.00	9,316.73	9,306.40	9,293.89	92.33	32.55	-78.22	-4,893.18	-783.60	913.98	791.49	122.50	7.461		
14,700.00	9,317.13	9,307.46	9,294.95	93.88	32.55	-72.25	-4,893.19	-783.60	940.09	818.43	121.66	7.727		
14,800.00	9,317.54	9,308.53	9,296.03	95.43	32.55	-66.66	-4,893.20	-783.60	975.80	855.66	120.14	8.122		
14,900.00	9,317.94	9,309.63	9,297.12	96.99	32.56	-61.51	-4,893.20	-783.60	1,020.09	901.97	118.12	8.636		
15,000.00	9,318.34	9,310.75	9,298.24	98.55	32.56	-56.82	-4,893.21	-783.59	1,071.91	956.11	115.80	9.257		
15,100.00	9,318.75	10,703.56	10,225.00	100.11	36.99	-85.98	-5,536.52	-500.32	1,117.49	1,022.84	94.64	11.807		
15,200.00	9,319.15	10,843.83	10,228.10	101.68	37.66	-89.72	-5,676.74	-498.96	1,118.49	1,022.25	96.24	11.622		
15,300.00	9,319.56	10,971.21	10,226.65	103.24	38.37	-92.27	-5,804.09	-499.19	1,117.67	1,019.67	98.00	11.405		
15,400.00	9,319.96	11,064.22	10,223.46	104.82	38.97	-91.60	-5,897.02	-501.30	1,116.04	1,016.35	99.70	11.194		
15,500.00	9,320.37	11,161.77	10,219.49	106.39	39.64	-91.36	-5,994.44	-504.36	1,114.40	1,012.85	101.55	10.974		
15,556.41	9,320.59	11,203.61	10,218.13	107.28	39.94	-90.01	-6,036.24	-505.88	1,114.03	1,011.59	102.45	10.874		
15,600.00	9,320.77	11,235.96	10,217.45	107.97	40.18	-88.97	-6,068.55	-507.17	1,114.25	1,011.12	103.13	10.804		
15,700.00	9,321.18	11,332.29	10,216.33	109.55	40.92	-88.64	-6,164.80	-510.98	1,115.52	1,010.53	104.99	10.625		
15,800.00	9,321.58	11,446.85	10,215.44	111.13	41.87	-89.96	-6,279.32	-513.74	1,116.26	1,009.23	107.03	10.430		
15,900.00	9,321.98	11,554.93	10,214.30	112.71	42.85	-90.69	-6,387.38	-514.81	1,115.97	1,007.00	108.97	10.241		
16,000.00	9,322.39	11,659.80	10,213.24	114.30	43.84	-91.13	-6,492.26	-514.55	1,115.01	1,004.18	110.83	10.061		
16,100.00	9,322.79	11,760.21	10,211.66	115.88	44.83	-91.17	-6,592.64	-514.82	1,113.89	1,001.16	112.72	9.882		
16,200.00	9,323.20	11,862.67	10,210.09	117.47	45.89	-91.39	-6,695.10	-514.87	1,112.68	998.02	114.66	9.704		
16,300.00	9,323.60	11,966.89	10,208.85	119.07	47.00	-91.77	-6,799.30	-513.78	1,111.12	994.55	116.57	9.532		
16,400.00	9,324.01	12,065.25	10,207.27	120.66	48.09	-91.62	-6,897.65	-512.99	1,109.36	990.89	118.47	9.364		
16,500.00	9,324.41	12,162.67	10,205.26	122.25	49.19	-91.38	-6,995.04	-513.36	1,107.91	987.44	120.47	9.196		
16,600.00	9,324.82	12,252.33	10,203.50	123.85	50.22	-90.45	-7,084.68	-514.23	1,106.90	984.47	122.42	9.042		
16,700.00	9,325.22	12,349.94	10,203.57	125.45	51.38	-90.23	-7,182.29	-513.93	1,106.80	982.46	124.34	8.901		
16,791.76	9,325.59	12,439.38	10,203.62	126.92	52.46	-90.02	-7,271.72	-513.47	1,106.59	980.49	126.10	8.775		
16,800.00	9,325.62	12,447.05	10,203.63	127.05	52.55	-89.97	-7,279.39	-513.46	1,106.59	980.34	126.26	8.765		
16,900.00	9,326.03	12,536.66	10,203.83	128.65	53.65	-89.04	-7,369.00	-513.84	1,107.06	978.93	128.13	8.640		
17,000.00	9,326.43	12,646.25	10,204.33	130.25	55.02	-89.90	-7,478.59	-514.88	1,108.04	977.69	130.35	8.500		
17,100.00	9,326.84	12,760.81	10,204.89	131.86	56.48	-91.20	-7,593.13	-512.82	1,107.42	974.98	132.44	8.362		
17,200.00	9,327.24	12,855.76	10,205.56	133.46	57.72	-90.75	-7,688.03	-510.23	1,106.43	972.21	134.22	8.243		
17,300.00	9,327.65	12,950.65	10,206.14	135.07	58.97	-90.29	-7,782.91	-508.54	1,105.93	969.86	136.07	8.127		
17,400.00	9,328.05	13,076.02	10,204.68	136.68	60.65	-92.57	-7,908.26	-507.16	1,104.33	965.83	138.50	7.974		
17,500.00	9,328.45	13,177.37	10,201.56	138.29	62.02	-92.69	-8,009.56	-506.71	1,101.58	960.83	140.76	7.826		
17,600.00	9,328.86	13,272.96	10,198.23	139.90	63.32	-92.28	-8,105.09	-507.35	1,099.15	956.10	143.05	7.684		
17,700.00	9,329.26	13,367.57	10,194.64	141.51	64.62	-91.79	-8,199.62	-508.81	1,096.99	951.57	145.42	7.544		
17,800.00	9,329.67	13,455.69	10,192.40	143.12	65.85	-90.72	-8,287.70	-510.03	1,095.76	948.14	147.62	7.423		
17,900.00	9,330.07	13,548.90	10,192.19	144.73	67.15	-90.11	-8,380.90	-509.88	1,095.51	945.82	149.69	7.319		
18,000.00	9,330.48	13,650.23	10,192.46	146.35	68.58	-90.23	-8,482.23	-508.98	1,095.23	943.43	151.80	7.215		
18,028.96	9,330.59	13,676.96	10,192.50	146.82	68.96	-90.03	-8,508.96	-508.85	1,095.20	942.81	152.39	7.187		
18,100.00	9,330.88	13,744.77	10,192.61	147.96	69.92	-89.74	-8,576.77	-508.90	1,095.34	941.45	153.89	7.118		
18,200.00	9,331.29	13,839.95	10,192.69	149.58	71.28	-89.31	-8,671.95	-509.37	1,095.74	939.70	156.04	7.022		
18,300.00	9,331.69	13,936.35	10,193.35	151.20	72.67	-88.99	-8,768.34	-510.39	1,096.93	938.70	158.23	6.932		
18,400.00	9,332.09	14,053.69	10,194.17	152.81	74.37	-90.54	-8,865.68	-509.63	1,097.14	936.51	160.63	6.830		

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



MS Energy Services
Anticollision Report



Company: Devon Energy
Project: Eddy County, New Mexico (NAD 83)
Reference Site: Cotton Draw Unit
Site Error: 0.00 usft
Reference Well: 515H
Well Error: 0.00 usft
Reference Wellbore: Wellbore #1
Reference Design: Design #1

Local Co-ordinate Reference: Well 515H
TVD Reference: Well @ 3566.10usft (Cactus 126)
MD Reference: Well @ 3566.10usft (Cactus 126)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at: 2.00 sigma
Database: 5000.1 Conroe DB
Offset TVD Reference: Offset Datum

Offset Design Cotton Draw Unit - 292H - Wellbore #1 - Surveys													Offset Site Error: 0.00 usft
Survey Program: 205-MWD													Offset Well Error: 0.00 usft
Reference		Offset		Semi Major Axis		Azimuth from North (°)	Offset Wellbore Centre		Distance				Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	
18,500.00	9,332.50	14,192.73	10,192.60	154.43	76.41	-94.01	-9,024.67	-506.94	1,095.23	931.96	163.27	6.708	
18,600.00	9,332.90	14,305.17	10,188.78	156.05	78.07	-95.13	-9,136.99	-503.19	1,090.55	924.99	165.56	6.587	
18,700.00	9,333.31	14,400.52	10,184.51	157.67	79.49	-94.72	-9,232.19	-500.34	1,085.22	917.44	167.78	6.468	
18,800.00	9,333.71	14,474.09	10,182.60	159.30	80.59	-92.35	-9,305.71	-498.45	1,081.64	911.98	169.66	6.375	
18,900.00	9,334.12	14,561.34	10,181.82	160.92	81.90	-91.20	-9,392.94	-496.82	1,079.85	908.21	171.64	6.292	
19,000.00	9,334.52	14,663.43	10,181.11	162.54	83.43	-91.39	-9,495.02	-495.57	1,078.61	904.74	173.87	6.204	
19,100.00	9,334.93	14,763.89	10,179.77	164.16	84.94	-91.43	-9,595.47	-494.99	1,077.22	901.04	176.18	6.114	
19,200.00	9,335.33	14,876.95	10,176.80	165.79	86.64	-92.60	-9,708.49	-494.99	1,075.12	896.26	178.86	6.011	
19,300.00	9,335.73	14,981.34	10,172.96	167.41	88.22	-92.99	-9,812.80	-494.99	1,072.19	890.70	181.49	5.908	
19,350.41	9,335.94	14,999.00	10,172.28	168.23	88.49	-90.04	-9,830.46	-494.99	1,071.15	888.96	182.19	5.879 SF	
19,390.56	9,336.10	14,999.00	10,172.28	168.88	88.49	-86.42	-9,830.46	-494.99	1,071.90	889.59	182.31	5.880	



MS Energy Services
Anticollision Report



Company: Devon Energy
Project: Eddy County, New Mexico (NAD 83)
Reference Site: Cotton Draw Unit
Site Error: 0.00 usft
Reference Well: 515H
Well Error: 0.00 usft
Reference Wellbore: Wellbore #1
Reference Design: Design #1

Local Co-ordinate Reference: Well 515H
TVD Reference: Well @ 3566.10usft (Cactus 126)
MD Reference: Well @ 3566.10usft (Cactus 126)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at: 2.00 sigma
Database: 5000.1 Conroe DB
Offset TVD Reference: Offset Datum

Offset Design Cotton Draw Unit - 293H - Wellbore #1 - Design #2													Offset Site Error: 0.00 usft
Survey Program: 26-MWD, 698-MWD													Offset Well Error: 0.00 usft
Reference		Offset		Semi Major Axis		Azimuth from North (°)	Offset Wellbore Centre		Distance		Minimum Separation (usft)	Separation Factor	Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N-S (usft)	+E-W (usft)	Between Centres (usft)	Between Ellipses (usft)			
0.00	0.00	0.00	0.00	0.00	0.00	-162.55	-4,573.23	-1,437.59	4,793.94				
100.00	100.00	100.00	93.38	0.13	0.27	-162.55	-4,572.96	-1,437.49	4,793.61	4,793.21	0.40	N/A	
166.80	166.80	139.21	139.21	0.37	0.40	-162.55	-4,572.73	-1,437.58	4,793.38	4,792.61	0.78	6,171.463	
200.00	200.00	160.01	160.01	0.49	0.47	-162.55	-4,572.73	-1,437.69	4,793.43	4,792.46	0.97	4,956.003	
300.00	300.00	261.37	261.37	0.85	0.83	-162.54	-4,572.77	-1,437.99	4,793.55	4,791.87	1.68	2,855.813	
400.00	400.00	369.92	369.92	1.21	1.21	-162.54	-4,572.87	-1,438.45	4,793.77	4,791.36	2.42	1,983.240	
490.09	490.09	462.59	462.59	1.53	1.53	-162.54	-4,572.86	-1,438.08	4,793.65	4,790.59	3.06	1,566.076	
500.00	500.00	467.77	467.76	1.57	1.55	-162.54	-4,572.88	-1,438.02	4,793.66	4,790.54	3.11	1,539.246	
600.00	600.00	535.31	535.29	1.93	1.78	-162.55	-4,573.57	-1,437.23	4,794.22	4,790.52	3.71	1,293.646	
700.00	700.00	651.65	651.62	2.29	2.19	-162.58	-4,574.89	-1,435.48	4,794.85	4,790.38	4.47	1,072.560	
800.00	800.00	735.43	735.38	2.64	2.48	-162.59	-4,575.79	-1,434.46	4,795.51	4,790.38	5.12	935.898	
900.00	900.00	857.53	857.47	3.00	2.91	-162.61	-4,577.05	-1,433.15	4,796.19	4,790.28	5.91	811.292	
1,000.00	1,000.00	972.56	972.50	3.36	3.31	-162.62	-4,577.14	-1,433.04	4,796.23	4,789.56	6.67	718.961	
1,100.00	1,100.00	1,072.56	1,072.50	3.72	3.66	-162.62	-4,577.14	-1,433.04	4,796.23	4,788.86	7.38	650.015	
1,200.00	1,200.00	1,172.56	1,172.50	4.08	4.01	-162.62	-4,577.14	-1,433.04	4,796.23	4,788.15	8.09	593.014	
1,300.00	1,300.00	1,272.56	1,272.50	4.44	4.36	-162.62	-4,577.14	-1,433.04	4,796.23	4,787.44	8.80	545.126	
1,400.00	1,400.00	1,372.56	1,372.50	4.79	4.72	-162.62	-4,577.14	-1,433.04	4,796.23	4,786.72	9.51	504.342	
1,500.00	1,500.00	1,472.56	1,472.50	5.15	5.07	-162.62	-4,577.14	-1,433.04	4,796.23	4,786.01	10.22	469.201	
1,600.00	1,600.00	1,572.56	1,572.50	5.51	5.42	-162.62	-4,577.14	-1,433.04	4,796.23	4,785.30	10.93	438.613	
1,700.00	1,700.00	1,672.56	1,672.50	5.87	5.78	-162.62	-4,577.14	-1,433.04	4,796.23	4,784.59	11.65	411.752	
1,800.00	1,800.00	1,772.56	1,772.50	6.23	6.13	-162.62	-4,577.14	-1,433.04	4,796.23	4,783.87	12.36	387.977	
1,900.00	1,900.00	1,872.56	1,872.50	6.59	6.49	-162.62	-4,577.14	-1,433.04	4,796.23	4,783.16	13.08	366.789	
2,000.00	2,000.00	1,972.56	1,972.50	6.95	6.85	-162.62	-4,577.14	-1,433.04	4,796.23	4,782.44	13.79	347.787	
2,100.00	2,100.00	2,072.56	2,072.50	7.30	7.20	-162.62	-4,577.14	-1,433.04	4,796.23	4,781.73	14.51	330.652	
2,200.00	2,200.00	2,172.56	2,172.50	7.66	7.56	-162.62	-4,577.14	-1,433.04	4,796.23	4,781.01	15.22	315.121	
2,300.00	2,300.00	2,272.56	2,272.50	8.02	7.91	-162.62	-4,577.14	-1,433.04	4,796.23	4,780.30	15.94	300.980	
2,400.00	2,400.00	2,372.56	2,372.50	8.38	8.27	-162.62	-4,577.14	-1,433.04	4,796.23	4,779.58	16.65	288.052	
2,500.00	2,500.00	2,472.56	2,472.50	8.74	8.63	-162.62	-4,577.14	-1,433.04	4,796.23	4,778.87	17.37	276.185	
2,600.00	2,599.99	2,572.56	2,572.49	9.10	8.99	-162.62	-4,577.14	-1,433.04	4,797.05	4,778.97	18.08	265.302	
2,700.00	2,699.96	2,672.52	2,672.46	9.45	9.34	-162.63	-4,577.14	-1,433.04	4,799.51	4,780.71	18.80	255.335	
2,800.00	2,799.86	2,772.42	2,772.36	9.81	9.70	-162.65	-4,577.14	-1,433.04	4,803.60	4,784.08	19.51	246.186	
2,900.00	2,899.68	2,872.24	2,872.18	10.17	10.06	-162.67	-4,577.14	-1,433.04	4,809.32	4,789.09	20.23	237.769	
3,000.00	2,999.37	2,971.93	2,971.87	10.53	10.41	-162.71	-4,577.14	-1,433.04	4,816.68	4,795.74	20.94	230.010	
3,100.00	3,098.90	3,054.20	3,054.13	10.89	10.70	-162.74	-4,577.17	-1,433.30	4,825.80	4,804.21	21.59	223.532	
3,200.00	3,198.26	3,129.50	3,129.42	11.25	10.96	-162.78	-4,577.27	-1,434.50	4,837.02	4,814.81	22.21	217.812	
3,299.74	3,297.14	3,200.00	3,199.90	11.61	11.21	-162.81	-4,577.45	-1,436.52	4,850.33	4,827.52	22.80	212.693	
3,300.00	3,297.40	3,204.58	3,204.48	11.61	11.22	-162.80	-4,577.46	-1,436.68	4,850.36	4,827.54	22.82	212.535	
3,400.00	3,396.43	3,279.50	3,279.33	11.98	11.48	-162.83	-4,577.74	-1,439.83	4,865.00	4,841.57	23.44	207.594	
3,500.00	3,495.46	3,354.31	3,354.02	12.36	11.74	-162.84	-4,578.10	-1,443.95	4,880.13	4,856.08	24.05	202.926	
3,600.00	3,594.49	3,428.99	3,428.53	12.73	12.00	-162.84	-4,578.54	-1,449.03	4,895.74	4,871.08	24.66	198.507	
3,700.00	3,693.51	3,500.00	3,499.30	13.11	12.25	-162.83	-4,579.04	-1,454.76	4,911.84	4,886.58	25.26	194.421	
3,800.00	3,792.54	3,577.87	3,576.83	13.49	12.52	-162.81	-4,579.68	-1,462.04	4,928.43	4,902.54	25.89	190.345	
3,900.00	3,891.57	3,652.01	3,650.54	13.87	12.78	-162.78	-4,580.37	-1,469.95	4,945.50	4,919.00	26.51	186.571	
4,000.00	3,990.60	3,741.07	3,738.99	14.25	13.10	-162.72	-4,581.29	-1,480.39	4,962.97	4,935.79	27.18	182.588	
4,100.00	4,089.62	3,839.35	3,836.57	14.64	13.45	-162.66	-4,582.30	-1,491.98	4,980.49	4,952.59	27.89	178.555	
4,200.00	4,188.65	3,937.62	3,934.15	15.02	13.81	-162.59	-4,583.31	-1,503.57	4,998.01	4,969.40	28.61	174.706	
4,300.00	4,287.68	4,035.89	4,031.73	15.41	14.16	-162.52	-4,584.33	-1,515.17	5,015.54	4,986.21	29.33	171.029	
4,400.00	4,386.71	4,134.17	4,129.32	15.80	14.52	-162.45	-4,585.34	-1,526.76	5,033.07	5,003.03	30.05	167.514	
4,500.00	4,485.73	4,232.44	4,226.90	16.19	14.89	-162.39	-4,586.36	-1,538.35	5,050.61	5,019.84	30.77	164.152	
4,600.00	4,584.76	4,330.71	4,324.48	16.59	15.25	-162.32	-4,587.37	-1,549.94	5,068.16	5,036.67	31.49	160.933	
4,700.00	4,683.79	4,428.99	4,422.06	16.98	15.61	-162.25	-4,588.39	-1,561.53	5,085.72	5,053.50	32.22	157.849	
4,800.00	4,782.81	4,527.26	4,519.64	17.37	15.98	-162.19	-4,589.40	-1,573.12	5,103.28	5,070.33	32.95	154.893	

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



MS Energy Services Anticollision Report



Company: Devon Energy
Project: Eddy County, New Mexico (NAD 83)
Reference Site: Cotton Draw Unit
Site Error: 0.00 usft
Reference Well: 515H
Well Error: 0.00 usft
Reference Wellbore: Wellbore #1
Reference Design: Design #1

Local Co-ordinate Reference: Well 515H
TVD Reference: Well @ 3566.10usft (Cactus 126)
MD Reference: Well @ 3566.10usft (Cactus 126)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: 5000.1 Conroe DB
Offset TVD Reference: Offset Datum

Offset Design Cotton Draw Unit - 293H - Wellbore #1 - Design #2														Offset Site Error:	0.00 usft
Survey Program: 26-MWD, 698-MWD														Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Azimuth from North (°)	Offset Wellbore Centre		Distance		Minimum Separation (usft)	Separation Factor	Warning		
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference	Offset		+N-S (usft)	+E-W (usft)	Between Centres (usft)	Between Ellipses (usft)					
4,900.00	4,881.84	4,625.53	4,617.22	17.77	16.35	-162.12	-4,590.41	-1,584.72	5,120.85	5,087.17	33.68	152.058			
5,000.00	4,980.87	4,723.80	4,714.81	18.17	16.72	-162.06	-4,591.43	-1,596.31	5,138.42	5,104.01	34.41	149.335			
5,100.00	5,079.90	4,822.08	4,812.39	18.56	17.09	-162.00	-4,592.44	-1,607.90	5,156.00	5,120.86	35.14	146.720			
5,200.00	5,178.92	4,920.35	4,909.97	18.96	17.46	-161.93	-4,593.46	-1,619.49	5,173.59	5,137.72	35.88	144.206			
5,300.00	5,277.95	5,018.62	5,007.55	19.36	17.84	-161.87	-4,594.47	-1,631.08	5,191.19	5,154.57	36.61	141.788			
5,400.00	5,376.98	5,116.90	5,105.13	19.76	18.21	-161.81	-4,595.48	-1,642.67	5,208.79	5,171.44	37.35	139.461			
5,500.00	5,476.01	5,215.17	5,202.71	20.16	18.59	-161.74	-4,596.50	-1,654.27	5,226.39	5,188.31	38.09	137.220			
5,600.00	5,575.03	5,313.44	5,300.30	20.56	18.96	-161.68	-4,597.51	-1,665.86	5,244.01	5,205.18	38.83	135.060			
5,628.09	5,602.86	5,341.05	5,327.71	20.68	19.07	-161.67	-4,597.80	-1,669.11	5,248.96	5,209.92	39.04	134.467			
5,700.00	5,674.12	5,411.78	5,397.94	20.96	19.34	-161.62	-4,598.53	-1,677.46	5,261.21	5,221.65	39.57	132.968			
5,800.00	5,773.42	5,510.33	5,495.80	21.36	19.72	-161.55	-4,599.54	-1,689.08	5,276.89	5,236.58	40.31	130.914			
5,900.00	5,872.91	5,609.08	5,593.85	21.74	20.10	-161.47	-4,600.56	-1,700.73	5,290.97	5,249.92	41.05	128.896			
6,000.00	5,972.56	5,707.99	5,692.07	22.12	20.48	-161.39	-4,601.58	-1,712.40	5,303.46	5,261.67	41.79	126.912			
6,100.00	6,072.35	5,807.05	5,790.43	22.49	20.87	-161.30	-4,602.61	-1,724.08	5,314.34	5,271.81	42.53	124.962			
6,200.00	6,172.23	5,906.21	5,888.89	22.86	21.25	-161.20	-4,603.63	-1,735.78	5,323.63	5,280.36	43.27	123.045			
6,300.00	6,272.18	6,005.44	5,987.43	23.21	21.64	-161.10	-4,604.65	-1,747.48	5,331.32	5,287.32	44.00	121.161			
6,400.00	6,372.17	6,104.72	6,086.01	23.56	22.02	-160.99	-4,605.68	-1,759.19	5,337.41	5,292.68	44.74	119.307			
6,427.83	6,400.00	6,132.36	6,113.45	23.66	22.13	-160.96	-4,605.96	-1,762.45	5,338.83	5,293.89	44.94	118.797			
6,500.00	6,472.17	6,204.02	6,184.61	23.90	22.41	-160.88	-4,606.70	-1,770.90	5,342.33	5,296.86	45.47	117.491			
6,600.00	6,572.17	6,303.31	6,283.20	24.25	22.80	-160.76	-4,607.73	-1,782.62	5,347.21	5,301.01	46.20	115.731			
6,700.00	6,672.17	6,402.61	6,381.80	24.59	23.19	-160.65	-4,608.75	-1,794.33	5,352.11	5,305.17	46.94	114.024			
6,800.00	6,772.17	6,501.91	6,480.40	24.93	23.58	-160.53	-4,609.78	-1,806.04	5,357.04	5,309.36	47.67	112.370			
6,900.00	6,872.17	6,601.20	6,579.00	25.28	23.97	-160.42	-4,610.80	-1,817.75	5,361.98	5,313.57	48.41	110.765			
7,000.00	6,972.17	6,700.50	6,677.60	25.62	24.36	-160.30	-4,611.83	-1,829.47	5,366.94	5,317.80	49.14	109.208			
7,100.00	7,072.17	6,800.20	6,776.19	25.97	24.75	-160.19	-4,612.85	-1,841.18	5,371.93	5,322.05	49.88	107.692			
7,200.00	7,172.17	6,900.91	6,874.79	26.31	25.14	-160.07	-4,613.88	-1,852.89	5,376.94	5,326.32	50.62	106.213			
7,300.00	7,272.17	7,001.61	6,973.39	26.66	25.54	-159.96	-4,614.90	-1,864.60	5,381.97	5,330.60	51.37	104.776			
7,400.00	7,372.17	7,097.69	7,071.99	27.00	25.92	-159.85	-4,615.93	-1,876.32	5,387.02	5,334.93	52.09	103.415			
7,500.00	7,472.17	7,196.98	7,170.59	27.35	26.31	-159.73	-4,616.95	-1,888.03	5,392.09	5,339.26	52.83	102.067			
7,600.00	7,572.17	7,303.72	7,269.18	27.69	26.73	-159.62	-4,617.97	-1,899.74	5,397.19	5,343.59	53.60	100.702			
7,700.00	7,672.17	7,404.43	7,367.78	28.04	27.13	-159.51	-4,619.00	-1,911.45	5,402.30	5,347.96	54.34	99.418			
7,800.00	7,772.17	7,505.13	7,466.38	28.39	27.53	-159.40	-4,620.02	-1,923.16	5,407.44	5,352.35	55.08	98.169			
7,900.00	7,872.17	7,605.83	7,564.98	28.74	27.93	-159.28	-4,621.05	-1,934.88	5,412.59	5,356.77	55.83	96.952			
8,000.00	7,972.17	7,693.46	7,663.58	29.08	28.27	-159.17	-4,622.07	-1,946.59	5,417.77	5,361.25	56.52	95.854			
8,100.00	8,072.17	7,837.43	7,806.64	29.43	28.84	-159.02	-4,623.47	-1,962.58	5,422.71	5,365.26	57.45	94.389			
8,200.00	8,172.17	8,008.35	7,976.94	29.78	29.49	-158.88	-4,624.74	-1,977.04	5,426.46	5,367.98	58.48	92.797			
8,300.00	8,272.17	8,180.00	8,148.32	30.13	30.12	-158.79	-4,625.56	-1,986.46	5,428.89	5,369.41	59.48	91.278			
8,400.00	8,372.17	8,352.06	8,320.32	30.48	30.72	-158.75	-4,625.94	-1,990.77	5,430.00	5,369.55	60.45	89.827			
8,500.00	8,472.17	8,476.41	8,444.67	30.83	31.14	-158.75	-4,625.97	-1,991.07	5,430.08	5,368.85	61.23	88.682			
8,600.00	8,572.17	8,576.41	8,544.67	31.18	31.48	-158.75	-4,625.97	-1,991.07	5,430.08	5,368.15	61.92	87.690			
8,700.00	8,672.17	8,676.41	8,644.67	31.52	31.81	-158.75	-4,625.97	-1,991.07	5,430.08	5,367.46	62.62	86.719			
8,751.58	8,723.75	8,727.99	8,696.25	31.70	31.99	-158.75	-4,625.97	-1,991.07	5,430.08	5,367.10	62.97	86.227			
8,800.00	8,772.11	8,776.35	8,744.61	31.86	32.15	-158.74	-4,625.97	-1,991.07	5,428.29	5,364.99	63.30	85.757			
8,850.00	8,821.68	8,825.93	8,794.18	32.00	32.32	-158.70	-4,625.97	-1,991.07	5,422.72	5,359.10	63.82	85.241			
8,900.00	8,870.51	8,874.75	8,843.01	32.12	32.48	-158.65	-4,625.97	-1,991.07	5,413.39	5,349.47	63.92	84.684			
8,950.00	8,918.22	8,922.47	8,890.72	32.24	32.64	-158.57	-4,625.97	-1,991.07	5,400.40	5,336.18	64.22	84.094			
9,000.00	8,964.46	8,968.70	8,936.96	32.34	32.80	-158.47	-4,625.97	-1,991.07	5,383.85	5,319.35	64.50	83.473			
9,050.00	9,008.86	9,013.10	8,981.36	32.43	32.95	-158.35	-4,625.97	-1,991.07	5,363.87	5,299.10	64.76	82.826			
9,100.00	9,051.09	9,055.33	9,023.59	32.51	33.09	-158.21	-4,625.97	-1,991.07	5,340.62	5,275.62	65.00	82.158			
9,150.00	9,090.83	9,104.93	9,063.33	32.58	33.26	-158.05	-4,625.97	-1,991.07	5,314.31	5,249.05	65.26	81.429			
9,200.00	9,127.77	9,132.01	9,100.27	32.65	33.35	-157.87	-4,625.97	-1,991.07	5,285.14	5,219.71	65.43	80.771			
9,250.00	9,161.64	9,165.88	9,134.14	32.71	33.46	-157.67	-4,625.97	-1,991.07	5,253.35	5,187.73	65.62	80.060			

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



MS Energy Services
Anticollision Report



Company: Devon Energy
Project: Eddy County, New Mexico (NAD 83)
Reference Site: Cotton Draw Unit
Site Error: 0.00 usft
Reference Well: 515H
Well Error: 0.00 usft
Reference Wellbore: Wellbore #1
Reference Design: Design #1

Local Co-ordinate Reference: Well 515H
TVD Reference: Well @ 3566.10usft (Cactus 126)
MD Reference: Well @ 3566.10usft (Cactus 126)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at: 2.00 sigma
Database: 5000.1 Conroe DB
Offset TVD Reference: Offset Datum

Offset Design Cotton Draw Unit - 293H - Wellbore #1 - Design #2													Offset Site Error: 0.00 usft
Survey Program: 26-MWD, 698-MWD													Offset Well Error: 0.00 usft
Reference		Offset		Semi Major Axis			Distance						Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Azimuth from North (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	
9,300.00	9,192.18	9,203.58	9,164.68	32.78	33.59	-157.45	-4,625.97	-1,991.07	5,219.21	5,153.40	65.81	79.312	
9,350.00	9,219.15	9,223.39	9,191.65	32.85	33.66	-157.21	-4,625.97	-1,991.07	5,182.98	5,117.05	65.93	78.618	
9,400.00	9,242.36	9,246.60	9,214.86	32.92	33.74	-156.96	-4,625.97	-1,991.07	5,144.96	5,078.91	66.05	77.894	
9,450.00	9,261.61	9,265.85	9,234.11	32.99	33.80	-156.69	-4,625.97	-1,991.07	5,105.46	5,039.30	66.16	77.172	
9,500.00	9,276.77	9,281.02	9,249.27	33.08	33.85	-156.41	-4,625.97	-1,991.07	5,064.79	4,998.54	66.25	76.454	
9,550.00	9,287.73	9,308.03	9,260.23	33.17	33.95	-156.12	-4,625.97	-1,991.07	5,023.27	4,956.90	66.37	75.682	
9,600.00	9,294.39	9,301.37	9,266.89	33.27	33.92	-155.82	-4,625.97	-1,991.07	4,981.23	4,914.85	66.39	75.034	
9,649.26	9,296.70	9,300.95	9,269.20	33.37	33.92	-155.52	-4,625.97	-1,991.07	4,939.63	4,873.20	66.42	74.368	
9,700.00	9,296.91	9,301.15	9,269.41	33.49	33.92	-155.21	-4,625.97	-1,991.07	4,896.62	4,830.15	66.46	73.673	
9,800.00	9,297.31	9,301.56	9,269.81	33.80	33.92	-154.60	-4,625.97	-1,991.07	4,810.90	4,744.34	66.57	72.271	
9,900.00	9,297.72	9,301.96	9,270.22	34.17	33.92	-154.00	-4,625.97	-1,991.07	4,723.96	4,657.26	66.69	70.832	
10,000.00	9,298.12	9,302.37	9,270.62	34.62	33.93	-153.43	-4,625.97	-1,991.07	4,635.81	4,568.98	66.84	69.362	
10,027.33	9,298.24	9,302.48	9,270.74	34.75	33.93	-153.27	-4,625.97	-1,991.07	4,611.52	4,544.65	66.86	68.954	
10,100.00	9,298.53	9,302.77	9,271.03	35.13	33.93	-152.85	-4,625.97	-1,991.07	4,546.94	4,479.95	67.00	67.869	
10,200.00	9,298.93	9,303.18	9,271.43	35.71	33.93	-152.26	-4,625.97	-1,991.07	4,458.48	4,391.30	67.18	66.363	
10,300.00	9,299.34	9,303.58	9,271.84	36.35	33.93	-151.64	-4,625.97	-1,991.07	4,370.51	4,303.11	67.40	64.843	
10,400.00	9,299.74	9,303.98	9,272.24	37.06	33.93	-151.00	-4,625.97	-1,991.07	4,283.08	4,215.42	67.65	63.310	
10,500.00	9,300.15	9,304.39	9,272.65	37.83	33.93	-150.33	-4,625.97	-1,991.07	4,196.20	4,128.26	67.94	61.764	
10,600.00	9,300.55	9,304.79	9,273.05	38.65	33.93	-149.63	-4,625.97	-1,991.07	4,109.92	4,041.65	68.27	60.205	
10,700.00	9,300.96	9,305.20	9,273.46	39.53	33.94	-148.91	-4,625.97	-1,991.07	4,024.27	3,955.64	68.63	58.635	
10,800.00	9,301.36	9,305.60	9,273.86	40.45	33.94	-148.15	-4,625.97	-1,991.07	3,939.31	3,870.26	69.05	57.053	
10,900.00	9,301.76	9,306.01	9,274.26	41.42	33.94	-147.36	-4,625.97	-1,991.07	3,855.06	3,785.55	69.51	55.463	
11,000.00	9,302.17	9,306.41	9,274.67	42.44	33.94	-146.53	-4,625.97	-1,991.07	3,771.58	3,701.56	70.02	53.864	
11,100.00	9,302.57	9,306.82	9,275.07	43.49	33.94	-145.66	-4,625.97	-1,991.07	3,688.93	3,618.34	70.59	52.260	
11,200.00	9,302.98	9,307.22	9,275.48	44.58	33.94	-144.76	-4,625.97	-1,991.07	3,607.15	3,535.93	71.22	50.651	
11,300.00	9,303.38	9,307.62	9,275.88	45.71	33.94	-143.81	-4,625.97	-1,991.07	3,526.31	3,454.41	71.91	49.041	
11,400.00	9,303.79	9,308.03	9,276.29	46.86	33.95	-142.82	-4,625.97	-1,991.07	3,446.48	3,373.82	72.66	47.433	
11,500.00	9,304.19	9,308.43	9,276.69	48.05	33.95	-141.79	-4,625.97	-1,991.07	3,367.72	3,294.24	73.49	45.828	
11,600.00	9,304.60	9,308.84	9,277.10	49.26	33.95	-140.70	-4,625.97	-1,991.07	3,290.12	3,215.74	74.38	44.232	
11,700.00	9,305.00	9,309.24	9,277.50	50.50	33.95	-139.56	-4,625.97	-1,991.07	3,213.76	3,138.40	75.36	42.646	
11,800.00	9,305.40	9,309.65	9,277.90	51.76	33.95	-138.37	-4,625.97	-1,991.07	3,138.73	3,062.31	76.41	41.076	
11,900.00	9,305.81	9,310.05	9,278.31	53.05	33.95	-137.12	-4,625.97	-1,991.07	3,065.12	2,987.57	77.55	39.525	
12,000.00	9,306.21	9,310.46	9,278.71	54.35	33.95	-135.81	-4,625.97	-1,991.07	2,993.04	2,914.27	78.77	37.997	
12,100.00	9,306.62	9,310.86	9,279.12	55.67	33.96	-134.44	-4,625.97	-1,991.07	2,922.61	2,842.53	80.08	36.496	
12,200.00	9,307.02	9,311.26	9,279.52	57.01	33.96	-132.99	-4,625.97	-1,991.07	2,853.94	2,772.47	81.48	35.028	
12,300.00	9,307.43	9,311.67	9,279.93	58.37	33.96	-131.48	-4,625.97	-1,991.07	2,787.17	2,704.21	82.96	33.596	
12,400.00	9,307.83	9,312.07	9,280.33	59.74	33.96	-129.90	-4,625.97	-1,991.07	2,722.44	2,637.90	84.54	32.204	
12,500.00	9,308.23	9,312.48	9,280.73	61.13	33.96	-128.23	-4,625.97	-1,991.07	2,659.89	2,573.69	86.20	30.858	
12,600.00	9,308.64	9,312.88	9,281.14	62.53	33.96	-126.49	-4,625.97	-1,991.07	2,599.68	2,511.74	87.95	29.560	
12,700.00	9,309.04	9,313.29	9,281.54	63.94	33.96	-124.67	-4,625.97	-1,991.07	2,541.99	2,452.21	89.77	28.316	
12,800.00	9,309.45	9,313.69	9,281.95	65.36	33.96	-122.77	-4,625.97	-1,991.07	2,486.98	2,395.30	91.68	27.127	
12,900.00	9,309.85	9,314.09	9,282.35	66.80	33.97	-120.78	-4,625.97	-1,991.07	2,434.83	2,341.18	93.65	25.999	
13,000.00	9,310.26	9,314.50	9,282.76	68.24	33.97	-118.71	-4,625.97	-1,991.07	2,385.73	2,290.05	95.68	24.934	
13,100.00	9,310.66	9,314.90	9,283.16	69.69	33.97	-116.56	-4,625.97	-1,991.07	2,339.89	2,242.13	97.76	23.935	
13,200.00	9,311.07	9,315.31	9,283.57	71.16	33.97	-114.32	-4,625.97	-1,991.07	2,297.48	2,197.60	99.88	23.003	
13,300.00	9,311.47	9,315.71	9,283.97	72.63	33.97	-112.00	-4,625.97	-1,991.07	2,258.71	2,156.69	102.01	22.142	
13,400.00	9,311.87	9,316.12	9,284.37	74.11	33.97	-109.61	-4,625.97	-1,991.07	2,223.76	2,119.61	104.15	21.352	
13,500.00	9,312.28	9,316.52	9,284.78	75.59	33.97	-107.14	-4,625.97	-1,991.07	2,192.81	2,086.54	106.27	20.634	
13,600.00	9,312.68	9,316.93	9,285.18	77.09	33.98	-104.60	-4,625.97	-1,991.07	2,166.05	2,057.70	108.36	19.990	
13,700.00	9,313.09	9,317.33	9,285.59	78.59	33.98	-102.01	-4,625.97	-1,991.07	2,143.62	2,033.24	110.38	19.420	
13,800.00	9,313.49	9,317.73	9,285.99	80.09	33.98	-99.37	-4,625.97	-1,991.07	2,125.67	2,013.33	112.33	18.923	
13,900.00	9,313.90	9,318.14	9,286.40	81.60	33.98	-96.69	-4,625.97	-1,991.07	2,112.30	1,998.11	114.18	18.499	



MS Energy Services

Anticollision Report



Company: Devon Energy
Project: Eddy County, New Mexico (NAD 83)
Reference Site: Cotton Draw Unit
Site Error: 0.00 usft
Reference Well: 515H
Well Error: 0.00 usft
Reference Wellbore: Wellbore #1
Reference Design: Design #1

Local Co-ordinate Reference: Well 515H
TVD Reference: Well @ 3566.10usft (Cactus 126)
MD Reference: Well @ 3566.10usft (Cactus 126)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at: 2.00 sigma
Database: 5000.1 Conroe DB
Offset TVD Reference: Offset Datum

Offset Design Cotton Draw Unit - 293H - Wellbore #1 - Design #2														Offset Site Error:	0.00 usft
Survey Program: 26-MWD, 698-MWD														Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Azimuth from North (°)	Offset Wellbore Centre		Distance		Minimum Separation (usft)	Separation Factor	Warning		
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)					
14,000.00	9,314.30	9,318.54	9,286.80	83.12	33.98	-93.98	-4,625.97	-1,991.07	2,103.60	1,987.68	115.92	18.148			
14,100.00	9,314.71	9,318.95	9,287.21	84.64	33.98	-91.26	-4,625.97	-1,991.07	2,099.64	1,982.12	117.52	17.867			
14,133.31	9,314.84	9,319.08	9,287.34	85.15	33.98	-90.35	-4,625.97	-1,991.07	2,099.37	1,981.36	118.02	17.789			
14,200.00	9,315.11	9,319.35	9,287.61	86.17	33.98	-88.53	-4,625.97	-1,991.07	2,100.43	1,981.47	118.96	17.658			
14,300.00	9,315.51	9,319.76	9,288.01	87.70	33.99	-85.81	-4,625.97	-1,991.07	2,105.98	1,985.72	120.25	17.513			
14,400.00	9,315.92	9,320.16	9,288.42	89.24	33.99	-83.11	-4,625.97	-1,991.07	2,116.24	1,994.87	121.38	17.435			
14,500.00	9,316.32	9,320.57	9,288.82	90.78	33.99	-80.44	-4,625.97	-1,991.07	2,131.16	2,008.83	122.33	17.422			
14,600.00	9,316.73	9,320.97	9,289.23	92.33	33.99	-77.82	-4,625.97	-1,991.07	2,150.62	2,027.51	123.11	17.470			
14,700.00	9,317.13	9,321.37	9,289.63	93.88	33.99	-75.25	-4,625.97	-1,991.07	2,174.51	2,050.79	123.72	17.576			
14,800.00	9,317.54	9,321.78	9,290.04	95.43	33.99	-72.73	-4,625.97	-1,991.07	2,202.69	2,078.52	124.17	17.740			
14,900.00	9,317.94	9,322.18	9,290.44	96.99	33.99	-70.29	-4,625.97	-1,991.07	2,234.99	2,110.52	124.46	17.957			
15,000.00	9,318.34	9,322.59	9,290.84	98.55	33.99	-67.92	-4,625.97	-1,991.07	2,271.23	2,146.61	124.62	18.225			
15,100.00	9,318.75	9,322.99	9,291.25	100.11	34.00	-65.63	-4,625.97	-1,991.07	2,311.24	2,186.60	124.64	18.543			
15,200.00	9,319.15	11,561.24	10,512.76	101.68	43.07	-95.11	-5,858.51	-1,884.13	2,349.21	2,221.44	127.77	18.387			
15,300.00	9,319.56	11,660.91	10,512.33	103.24	43.91	-95.11	-5,957.81	-1,875.51	2,341.92	2,212.12	129.80	18.043			
15,400.00	9,319.96	11,760.59	10,511.90	104.82	44.79	-95.11	-6,057.11	-1,866.89	2,334.63	2,202.76	131.87	17.704			
15,500.00	9,320.37	11,860.26	10,511.46	106.39	45.72	-95.11	-6,156.41	-1,858.28	2,327.34	2,193.36	133.99	17.370			
15,600.00	9,320.77	11,959.93	10,511.03	107.97	46.69	-95.11	-6,255.71	-1,849.66	2,320.06	2,183.93	136.14	17.042			
15,700.00	9,321.18	12,059.61	10,510.60	109.55	47.70	-95.11	-6,355.01	-1,841.05	2,312.79	2,174.47	138.32	16.720			
15,800.00	9,321.58	12,159.28	10,510.16	111.13	48.74	-95.11	-6,454.31	-1,832.43	2,305.52	2,164.98	140.54	16.405			
15,900.00	9,321.98	12,258.95	10,509.73	112.71	49.83	-95.11	-6,553.61	-1,823.82	2,298.26	2,155.47	142.79	16.095			
16,000.00	9,322.39	12,358.63	10,509.30	114.30	50.94	-95.11	-6,652.91	-1,815.20	2,291.00	2,145.93	145.07	15.793			
16,100.00	9,322.79	12,458.30	10,508.86	115.88	52.08	-95.12	-6,752.21	-1,806.58	2,283.75	2,136.38	147.37	15.497			
16,200.00	9,323.20	12,557.97	10,508.43	117.47	53.26	-95.12	-6,851.51	-1,797.97	2,276.50	2,126.81	149.69	15.208			
16,300.00	9,323.60	12,657.65	10,508.00	119.07	54.46	-95.12	-6,950.81	-1,789.35	2,269.26	2,117.22	152.04	14.925			
16,400.00	9,324.01	12,757.32	10,507.56	120.66	55.68	-95.12	-7,050.10	-1,780.74	2,262.02	2,107.61	154.41	14.650			
16,500.00	9,324.41	12,856.99	10,507.13	122.25	56.93	-95.12	-7,149.40	-1,772.12	2,254.79	2,098.00	156.79	14.381			
16,600.00	9,324.82	12,956.67	10,506.70	123.85	58.20	-95.12	-7,248.70	-1,763.51	2,247.57	2,088.37	159.20	14.118			
16,700.00	9,325.22	13,056.34	10,506.26	125.45	59.49	-95.12	-7,348.00	-1,754.89	2,240.35	2,078.74	161.61	13.862			
16,800.00	9,325.62	13,156.01	10,505.83	127.05	60.79	-95.12	-7,447.30	-1,746.27	2,233.14	2,069.09	164.04	13.613			
16,900.00	9,326.03	13,255.69	10,505.40	128.65	62.12	-95.12	-7,546.60	-1,737.66	2,225.93	2,059.44	166.49	13.370			
17,000.00	9,326.43	13,355.36	10,504.96	130.25	63.47	-95.12	-7,645.90	-1,729.04	2,218.73	2,049.79	168.94	13.133			
17,100.00	9,326.84	13,455.03	10,504.53	131.86	64.82	-95.12	-7,745.20	-1,720.43	2,211.54	2,040.13	171.41	12.902			
17,200.00	9,327.24	13,554.71	10,504.10	133.46	66.20	-95.12	-7,844.50	-1,711.81	2,204.35	2,030.47	173.88	12.677			
17,300.00	9,327.65	13,654.38	10,503.67	135.07	67.59	-95.12	-7,943.80	-1,703.20	2,197.17	2,020.80	176.37	12.458			
17,400.00	9,328.05	13,754.05	10,503.23	136.68	68.99	-95.12	-8,043.10	-1,694.58	2,189.99	2,011.13	178.86	12.244			
17,500.00	9,328.45	13,853.73	10,502.80	138.29	70.40	-95.12	-8,142.40	-1,685.96	2,182.82	2,001.47	181.35	12.036			
17,600.00	9,328.86	13,953.40	10,502.37	139.90	71.83	-95.12	-8,241.70	-1,677.35	2,175.66	1,991.80	183.86	11.833			
17,700.00	9,329.26	14,053.07	10,501.93	141.51	73.26	-95.12	-8,341.00	-1,668.73	2,168.50	1,982.14	186.36	11.636			
17,800.00	9,329.67	14,152.75	10,501.50	143.12	74.71	-95.12	-8,440.30	-1,660.12	2,161.35	1,972.47	188.88	11.443			
17,900.00	9,330.07	14,252.42	10,501.07	144.73	76.17	-95.13	-8,539.59	-1,651.50	2,154.21	1,962.81	191.39	11.256			
18,000.00	9,330.48	14,352.09	10,500.63	146.35	77.63	-95.13	-8,638.89	-1,642.89	2,147.07	1,953.16	193.91	11.073			
18,100.00	9,330.88	14,451.77	10,500.20	147.96	79.10	-95.13	-8,738.19	-1,634.27	2,139.94	1,943.51	196.43	10.894			
18,200.00	9,331.29	14,551.44	10,499.77	149.58	80.59	-95.13	-8,837.49	-1,625.66	2,132.81	1,933.86	198.95	10.720			
18,300.00	9,331.69	14,651.11	10,499.33	151.20	82.07	-95.13	-8,936.79	-1,617.04	2,125.70	1,924.22	201.48	10.550			
18,400.00	9,332.09	14,750.79	10,498.90	152.81	83.57	-95.13	-9,036.09	-1,608.42	2,118.59	1,914.58	204.00	10.385			
18,500.00	9,332.50	14,850.46	10,498.47	154.43	85.08	-95.13	-9,135.39	-1,599.81	2,111.48	1,904.95	206.53	10.224			
18,600.00	9,332.90	14,950.13	10,498.03	156.05	86.59	-95.13	-9,234.69	-1,591.19	2,104.39	1,895.33	209.06	10.066			
18,700.00	9,333.31	15,049.81	10,497.60	157.67	88.10	-95.13	-9,333.99	-1,582.58	2,097.30	1,885.72	211.58	9.912			
18,800.00	9,333.71	15,149.48	10,497.17	159.30	89.62	-95.13	-9,433.29	-1,573.96	2,090.22	1,876.11	214.11	9.763			
18,900.00	9,334.12	15,249.15	10,496.73	160.92	91.15	-95.13	-9,532.59	-1,565.35	2,083.14	1,866.51	216.63	9.616			
19,000.00	9,334.52	15,348.83	10,496.30	162.54	92.69	-95.13	-9,631.89	-1,556.73	2,076.07	1,856.92	219.15	9.473			

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



MS Energy Services
Anticollision Report



Company: Devon Energy
Project: Eddy County, New Mexico (NAD 83)
Reference Site: Cotton Draw Unit
Site Error: 0.00 usft
Reference Well: 515H
Well Error: 0.00 usft
Reference Wellbore: Wellbore #1
Reference Design: Design #1

Local Co-ordinate Reference: Well 515H
TVD Reference: Well @ 3566.10usft (Cactus 126)
MD Reference: Well @ 3566.10usft (Cactus 126)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: 5000.1 Conroe DB
Offset TVD Reference: Offset Datum

Offset Design Cotton Draw Unit - 293H - Wellbore #1 - Design #2													Offset Site Error: 0.00 usft
Survey Program: 26-MWD, 698-MWD													Offset Well Error: 0.00 usft
Reference		Offset		Semi Major Axis		Azimuth from North (°)	Offset Wellbore Centre		Distance		Minimum Separation (usft)	Separation Factor	Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N-S (usft)	+E-W (usft)	Between Centres (usft)	Between Ellipses (usft)			
19,100.00	9,334.93	15,448.50	10,495.87	164.16	94.22	-95.13	-9,731.19	-1,548.11	2,069.01	1,847.34	221.67	9.334	
19,200.00	9,335.33	15,548.17	10,495.43	165.79	95.77	-95.13	-9,830.49	-1,539.50	2,061.96	1,837.77	224.19	9.197	
19,300.00	9,335.73	15,612.76	10,495.17	167.41	96.77	-93.94	-9,894.88	-1,534.52	2,055.72	1,829.24	226.48	9.077	
19,390.56	9,336.10	15,669.50	10,494.96	168.88	97.64	-92.79	-9,951.53	-1,531.34	2,051.63	1,823.11	228.52	8.978 CC, ES, SF	



MS Energy Services Anticollision Report



Company: Devon Energy
Project: Eddy County, New Mexico (NAD 83)
Reference Site: Cotton Draw Unit
Site Error: 0.00 usft
Reference Well: 515H
Well Error: 0.00 usft
Reference Wellbore: Wellbore #1
Reference Design: Design #1

Local Co-ordinate Reference: Well 515H
TVD Reference: Well @ 3566.10usft (Cactus 126)
MD Reference: Well @ 3566.10usft (Cactus 126)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: 5000.1 Conroe DB
Offset TVD Reference: Offset Datum

Offset Design Cotton Draw Unit - 294H - Wellbore #1 - Design #2														Offset Site Error:	0.00 usft
Survey Program: 28-MWD, 728-MWD														Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Azimuth from North (°)	Offset Wellbore Centre		Distance		Minimum Separation (usft)	Separation Factor	Warning		
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N/S (usft)	+E/W (usft)	Between Centres (usft)	Between Ellipses (usft)					
0.00	0.00	0.00	0.00	0.00	0.00	-162.21	-4,573.34	-1,467.66	4,803.15						
100.00	100.00	60.75	60.75	0.13	0.12	-162.21	-4,573.39	-1,467.65	4,803.12	4,802.87	0.26	N/A			
200.00	200.00	175.67	175.67	0.49	0.52	-162.21	-4,573.71	-1,467.64	4,803.41	4,802.40	1.02	4,726.204			
208.22	208.22	180.22	180.22	0.52	0.54	-162.21	-4,573.71	-1,467.64	4,803.41	4,802.35	1.06	4,524.490			
300.00	300.00	236.24	236.24	0.85	0.74	-162.21	-4,573.92	-1,467.69	4,803.77	4,802.18	1.59	3,025.717			
400.00	400.00	351.30	351.29	1.21	1.14	-162.22	-4,574.74	-1,467.30	4,804.34	4,801.98	2.35	2,042.644			
500.00	500.00	449.77	449.76	1.57	1.49	-162.23	-4,575.53	-1,466.62	4,804.89	4,801.83	3.06	1,570.036			
600.00	600.00	539.80	539.78	1.93	1.81	-162.24	-4,576.32	-1,465.54	4,805.36	4,801.63	3.74	1,285.101			
700.00	700.00	630.11	630.07	2.29	2.14	-162.26	-4,577.55	-1,464.47	4,806.28	4,801.86	4.42	1,087.353			
800.00	800.00	717.52	717.47	2.64	2.45	-162.28	-4,578.55	-1,463.18	4,806.98	4,801.88	5.09	944.195			
900.00	900.00	800.83	800.76	3.00	2.75	-162.29	-4,580.09	-1,462.37	4,808.41	4,802.66	5.75	836.544			
1,000.00	1,000.00	972.09	972.00	3.36	3.35	-162.31	-4,581.71	-1,461.54	4,809.17	4,802.47	6.71	716.929			
1,100.00	1,100.00	1,072.09	1,072.00	3.72	3.69	-162.31	-4,581.71	-1,461.54	4,809.17	4,801.77	7.40	649.624			
1,200.00	1,200.00	1,172.09	1,172.00	4.08	4.03	-162.31	-4,581.71	-1,461.54	4,809.17	4,801.07	8.10	593.614			
1,300.00	1,300.00	1,272.09	1,272.00	4.44	4.37	-162.31	-4,581.71	-1,461.54	4,809.17	4,800.37	8.80	546.312			
1,400.00	1,400.00	1,372.09	1,372.00	4.79	4.71	-162.31	-4,581.71	-1,461.54	4,809.17	4,799.67	9.51	505.869			
1,500.00	1,500.00	1,472.09	1,472.00	5.15	5.06	-162.31	-4,581.71	-1,461.54	4,809.17	4,798.96	10.21	470.916			
1,600.00	1,600.00	1,572.09	1,572.00	5.51	5.41	-162.31	-4,581.71	-1,461.54	4,809.17	4,798.25	10.92	440.422			
1,700.00	1,700.00	1,672.09	1,672.00	5.87	5.76	-162.31	-4,581.71	-1,461.54	4,809.17	4,797.55	11.63	413.593			
1,800.00	1,800.00	1,772.09	1,772.00	6.23	6.11	-162.31	-4,581.71	-1,461.54	4,809.17	4,796.84	12.34	389.814			
1,900.00	1,900.00	1,872.09	1,872.00	6.59	6.46	-162.31	-4,581.71	-1,461.54	4,809.17	4,796.13	13.05	368.597			
2,000.00	2,000.00	1,972.09	1,972.00	6.95	6.81	-162.31	-4,581.71	-1,461.54	4,809.17	4,795.42	13.76	349.552			
2,100.00	2,100.00	2,043.46	2,043.37	7.30	7.06	-162.31	-4,581.80	-1,461.67	4,809.39	4,795.02	14.37	334.776			
2,200.00	2,200.00	2,100.00	2,099.91	7.66	7.26	-162.30	-4,582.20	-1,462.26	4,810.40	4,795.48	14.92	322.412			
2,300.00	2,300.00	2,164.00	2,163.89	8.02	7.48	-162.29	-4,583.02	-1,463.48	4,812.23	4,796.73	15.50	310.535			
2,400.00	2,400.00	2,224.22	2,224.07	8.38	7.69	-162.28	-4,584.16	-1,465.17	4,814.89	4,798.83	16.06	299.820			
2,500.00	2,500.00	2,284.39	2,284.19	8.74	7.89	-162.26	-4,585.65	-1,467.39	4,818.37	4,801.75	16.62	289.893			
2,600.00	2,599.99	2,344.48	2,344.18	9.10	8.10	-162.23	-4,587.50	-1,470.12	4,823.50	4,806.32	17.18	280.724			
2,700.00	2,699.96	2,400.00	2,399.59	9.45	8.29	-162.22	-4,589.51	-1,473.11	4,831.08	4,813.35	17.73	272.542			
2,800.00	2,799.86	2,464.20	2,463.60	9.81	8.52	-162.20	-4,592.22	-1,477.12	4,841.10	4,822.80	18.30	264.536			
2,900.00	2,899.68	2,523.73	2,522.91	10.17	8.73	-162.19	-4,595.08	-1,481.37	4,853.56	4,834.70	18.86	257.400			
3,000.00	2,999.37	2,582.98	2,581.89	10.53	8.94	-162.18	-4,598.28	-1,486.10	4,868.44	4,849.03	19.41	250.831			
3,100.00	3,098.90	2,670.07	2,668.50	10.89	9.25	-162.16	-4,603.36	-1,493.63	4,885.53	4,865.46	20.07	243.460			
3,200.00	3,198.26	2,768.27	2,766.16	11.25	9.60	-162.13	-4,609.10	-1,502.14	4,904.26	4,883.49	20.77	236.143			
3,299.74	3,297.14	2,865.91	2,863.27	11.61	9.96	-162.11	-4,614.80	-1,510.60	4,924.53	4,903.06	21.47	229.391			
3,300.00	3,297.40	2,866.17	2,863.53	11.61	9.96	-162.11	-4,614.82	-1,510.62	4,924.58	4,903.12	21.47	229.374			
3,400.00	3,396.43	2,963.90	2,960.73	11.98	10.32	-162.09	-4,620.53	-1,519.09	4,945.70	4,923.53	22.17	223.063			
3,500.00	3,495.46	3,061.64	3,057.93	12.36	10.67	-162.08	-4,626.24	-1,527.56	4,966.82	4,943.94	22.88	217.124			
3,600.00	3,594.49	3,159.37	3,155.13	12.73	11.04	-162.06	-4,631.96	-1,536.03	4,987.94	4,964.35	23.58	211.519			
3,700.00	3,693.51	3,257.11	3,252.33	13.11	11.40	-162.05	-4,637.67	-1,544.50	5,009.05	4,984.76	24.29	206.223			
3,800.00	3,792.54	3,354.85	3,349.53	13.49	11.76	-162.03	-4,643.38	-1,552.97	5,030.17	5,005.17	25.00	201.211			
3,900.00	3,891.57	3,452.58	3,446.73	13.87	12.13	-162.02	-4,649.10	-1,561.44	5,051.29	5,025.58	25.71	196.464			
4,000.00	3,990.60	3,550.32	3,543.93	14.25	12.50	-162.00	-4,654.81	-1,569.91	5,072.41	5,045.99	26.42	191.961			
4,100.00	4,089.62	3,648.05	3,641.13	14.64	12.86	-161.99	-4,660.52	-1,578.38	5,093.53	5,066.39	27.14	187.685			
4,200.00	4,188.65	3,745.79	3,738.33	15.02	13.23	-161.97	-4,666.23	-1,586.85	5,114.65	5,086.79	27.85	183.619			
4,300.00	4,287.68	3,843.52	3,835.53	15.41	13.61	-161.96	-4,671.95	-1,595.32	5,135.77	5,107.20	28.57	179.749			
4,400.00	4,386.71	3,941.26	3,932.73	15.80	13.98	-161.94	-4,677.66	-1,603.79	5,156.89	5,127.60	29.29	176.062			
4,500.00	4,485.73	4,039.00	4,029.93	16.19	14.35	-161.93	-4,683.37	-1,612.26	5,178.01	5,148.00	30.01	172.545			
4,600.00	4,584.76	4,136.73	4,127.13	16.59	14.72	-161.92	-4,689.08	-1,620.73	5,199.13	5,168.40	30.73	169.187			
4,700.00	4,683.79	4,234.47	4,224.33	16.98	15.10	-161.90	-4,694.80	-1,629.20	5,220.25	5,188.80	31.45	165.979			
4,800.00	4,782.81	4,332.20	4,321.53	17.37	15.47	-161.89	-4,700.51	-1,637.67	5,241.37	5,209.20	32.17	162.909			
4,900.00	4,881.84	4,429.94	4,418.73	17.77	15.85	-161.87	-4,706.22	-1,646.14	5,262.49	5,229.60	32.90	159.971			

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



MS Energy Services
Anticollision Report



Company: Devon Energy
Project: Eddy County, New Mexico (NAD 83)
Reference Site: Cotton Draw Unit
Site Error: 0.00 usft
Reference Well: 515H
Well Error: 0.00 usft
Reference Wellbore: Wellbore #1
Reference Design: Design #1

Local Co-ordinate Reference: Well 515H
TVD Reference: Well @ 3566.10usft (Cactus 126)
MD Reference: Well @ 3566.10usft (Cactus 126)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: 5000.1 Conroe DB
Offset TVD Reference: Offset Datum

Offset Design Cotton Draw Unit - 294H - Wellbore #1 - Design #2													Offset Site Error:	0.00 usft
Survey Program: 26-MWD, 728-MWD													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Azimuth from North (°)	Distance		Minimum Separation (usft)	Separation Factor	Warning			
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		Between Centres (usft)	Between Ellipses (usft)						
5,000.00	4,980.87	4,527.67	4,515.93	18.17	16.22	-161.86	-4,711.94	-1,654.61	5,283.62	5,250.00	33.62	157.155		
5,100.00	5,079.90	4,625.41	4,613.13	18.56	16.60	-161.85	-4,717.65	-1,663.08	5,304.74	5,270.39	34.34	154.455		
5,200.00	5,178.92	4,723.15	4,710.33	18.96	16.98	-161.83	-4,723.36	-1,671.55	5,325.86	5,290.79	35.07	151.863		
5,300.00	5,277.95	4,820.88	4,807.53	19.36	17.35	-161.82	-4,729.07	-1,680.02	5,346.98	5,311.19	35.80	149.374		
5,400.00	5,376.98	4,918.62	4,904.73	19.76	17.73	-161.81	-4,734.79	-1,688.49	5,368.11	5,331.59	36.52	146.981		
5,500.00	5,476.01	5,016.35	5,001.93	20.16	18.11	-161.79	-4,740.50	-1,696.95	5,389.23	5,351.98	37.25	144.679		
5,600.00	5,575.03	15,283.47	10,572.72	20.56	87.43	-97.09	145.00	-1,871.22	5,360.88	5,300.40	60.48	88.638		
5,628.09	5,602.86	15,283.47	10,572.72	20.68	87.43	-97.21	145.00	-1,871.22	5,334.91	5,274.28	60.63	87.994		
5,700.00	5,674.12	15,283.47	10,572.72	20.96	87.43	-97.50	145.00	-1,871.22	5,268.46	5,207.45	61.01	86.350		
5,800.00	5,773.42	15,283.47	10,572.72	21.36	87.43	-97.86	145.00	-1,871.22	5,176.07	5,114.51	61.56	84.078		
5,900.00	5,872.91	15,283.47	10,572.72	21.74	87.43	-98.17	145.00	-1,871.22	5,083.74	5,021.60	62.13	81.823		
6,000.00	5,972.56	15,283.47	10,572.72	22.12	87.43	-98.42	145.00	-1,871.22	4,991.48	4,928.77	62.72	79.586		
6,100.00	6,072.35	15,283.47	10,572.72	22.49	87.43	-98.62	145.00	-1,871.22	4,899.35	4,836.03	63.32	77.370		
6,200.00	6,172.23	15,283.47	10,572.72	22.86	87.43	-98.77	145.00	-1,871.22	4,807.37	4,743.42	63.95	75.174		
6,300.00	6,272.18	15,283.47	10,572.72	23.21	87.43	-98.87	145.00	-1,871.22	4,715.58	4,650.99	64.60	73.000		
6,400.00	6,372.17	15,283.47	10,572.72	23.56	87.43	-98.91	145.00	-1,871.22	4,624.03	4,558.76	65.27	70.848		
6,427.83	6,400.00	15,283.47	10,572.72	23.66	87.43	-98.91	145.00	-1,871.22	4,598.59	4,533.13	65.46	70.254		
6,500.00	6,472.17	15,283.47	10,572.72	23.90	87.43	-98.91	145.00	-1,871.22	4,532.76	4,466.80	65.96	68.720		
6,600.00	6,572.17	15,283.47	10,572.72	24.25	87.43	-98.91	145.00	-1,871.22	4,441.87	4,375.19	66.68	66.614		
6,700.00	6,672.17	15,283.47	10,572.72	24.59	87.43	-98.91	145.00	-1,871.22	4,351.38	4,283.95	67.43	64.530		
6,800.00	6,772.17	15,283.47	10,572.72	24.93	87.43	-98.91	145.00	-1,871.22	4,261.32	4,193.10	68.21	62.470		
6,900.00	6,872.17	15,283.47	10,572.72	25.28	87.43	-98.91	145.00	-1,871.22	4,171.70	4,102.67	69.03	60.435		
7,000.00	6,972.17	15,283.47	10,572.72	25.62	87.43	-98.91	145.00	-1,871.22	4,082.57	4,012.69	69.88	58.425		
7,100.00	7,072.17	15,283.47	10,572.72	25.97	87.43	-98.91	145.00	-1,871.22	3,993.96	3,923.19	70.76	56.441		
7,200.00	7,172.17	15,283.47	10,572.72	26.31	87.43	-98.91	145.00	-1,871.22	3,905.89	3,834.20	71.69	54.485		
7,300.00	7,272.17	15,283.47	10,572.72	26.66	87.43	-98.91	145.00	-1,871.22	3,818.41	3,745.76	72.65	52.557		
7,400.00	7,372.17	15,283.47	10,572.72	27.00	87.43	-98.91	145.00	-1,871.22	3,731.56	3,657.90	73.66	50.659		
7,500.00	7,472.17	15,283.47	10,572.72	27.35	87.43	-98.91	145.00	-1,871.22	3,645.39	3,570.67	74.71	48.791		
7,600.00	7,572.17	15,283.47	10,572.72	27.69	87.43	-98.91	145.00	-1,871.22	3,559.93	3,484.12	75.82	46.955		
7,700.00	7,672.17	15,283.47	10,572.72	28.04	87.43	-98.91	145.00	-1,871.22	3,475.26	3,398.29	76.97	45.153		
7,800.00	7,772.17	15,283.47	10,572.72	28.39	87.43	-98.91	145.00	-1,871.22	3,391.42	3,313.25	78.17	43.385		
7,900.00	7,872.17	15,283.47	10,572.72	28.74	87.43	-98.91	145.00	-1,871.22	3,308.47	3,229.04	79.43	41.653		
8,000.00	7,972.17	15,283.47	10,572.72	29.08	87.43	-98.91	145.00	-1,871.22	3,226.50	3,145.75	80.74	39.959		
8,100.00	8,072.17	15,283.47	10,572.72	29.43	87.43	-98.91	145.00	-1,871.22	3,145.56	3,063.44	82.12	38.304		
8,200.00	8,172.17	15,283.47	10,572.72	29.78	87.43	-98.91	145.00	-1,871.22	3,065.76	2,982.20	83.56	36.690		
8,300.00	8,272.17	15,283.47	10,572.72	30.13	87.43	-98.91	145.00	-1,871.22	2,987.16	2,902.10	85.06	35.118		
8,400.00	8,372.17	15,283.47	10,572.72	30.48	87.43	-98.91	145.00	-1,871.22	2,909.89	2,823.26	86.63	33.591		
8,500.00	8,472.17	15,283.47	10,572.72	30.83	87.43	-98.91	145.00	-1,871.22	2,834.03	2,745.77	88.26	32.109		
8,600.00	8,572.17	15,283.47	10,572.72	31.18	87.43	-98.91	145.00	-1,871.22	2,759.71	2,669.75	89.96	30.676		
8,700.00	8,672.17	15,283.47	10,572.72	31.52	87.43	-98.91	145.00	-1,871.22	2,687.06	2,595.33	91.73	29.292		
8,751.58	8,723.75	15,283.47	10,572.72	31.70	87.43	-98.91	145.00	-1,871.22	2,650.28	2,557.61	92.67	28.598		
8,800.00	8,772.11	15,283.47	10,572.72	31.86	87.43	-98.85	145.00	-1,871.22	2,616.23	2,522.67	93.56	27.962		
8,850.00	8,821.68	15,283.47	10,572.72	32.00	87.43	-98.65	145.00	-1,871.22	2,581.76	2,487.27	94.49	27.323		
8,900.00	8,870.51	15,283.47	10,572.72	32.12	87.43	-98.32	145.00	-1,871.22	2,548.28	2,452.86	95.42	26.707		
8,950.00	8,918.22	15,283.47	10,572.72	32.24	87.43	-97.87	145.00	-1,871.22	2,516.09	2,419.76	96.34	26.118		
9,000.00	8,964.46	15,283.47	10,572.72	32.34	87.43	-97.29	145.00	-1,871.22	2,485.50	2,388.26	97.24	25.560		
9,050.00	9,008.86	15,283.47	10,572.72	32.43	87.43	-96.58	145.00	-1,871.22	2,456.80	2,358.67	98.13	25.037		
9,100.00	9,051.09	15,283.47	10,572.72	32.51	87.43	-95.77	145.00	-1,871.22	2,430.27	2,331.29	98.98	24.554		
9,150.00	9,090.83	15,283.47	10,572.72	32.58	87.43	-94.84	145.00	-1,871.22	2,406.20	2,306.42	99.79	24.113		
9,200.00	9,127.77	15,283.47	10,572.72	32.65	87.43	-93.81	145.00	-1,871.22	2,384.85	2,284.30	100.55	23.719		
9,250.00	9,161.64	15,283.47	10,572.72	32.71	87.43	-92.69	145.00	-1,871.22	2,366.45	2,265.20	101.25	23.373		
9,300.00	9,192.18	15,283.47	10,572.72	32.78	87.43	-91.49	145.00	-1,871.22	2,351.22	2,249.33	101.88	23.078		

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



MS Energy Services Anticollision Report



Company: Devon Energy
Project: Eddy County, New Mexico (NAD 83)
Reference Site: Cotton Draw Unit
Site Error: 0.00 usft
Reference Well: 515H
Well Error: 0.00 usft
Reference Wellbore: Wellbore #1
Reference Design: Design #1

Local Co-ordinate Reference: Well 515H
TVD Reference: Well @ 3566.10usft (Cactus 126)
MD Reference: Well @ 3566.10usft (Cactus 126)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at: 2.00 sigma
Database: 5000.1 Conroe DB
Offset TVD Reference: Offset Datum

Offset Design Cotton Draw Unit - 294H - Wellbore #1 - Design #2													Offset Site Error:	0.00 usft
Survey Program: 26-MWD, 728-MWD													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Azimuth from North (°)	Offset Wellbore Centre		Distance				Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor		
9,350.00	9,219.15	15,277.80	10,572.67	32.85	87.35	-90.40	139.32	-1,871.22	2,339.32	2,236.94	102.38	22.849		
9,400.00	9,242.36	15,234.17	10,572.25	32.92	86.70	-90.39	95.70	-1,871.22	2,330.40	2,228.02	102.38	22.762		
9,450.00	9,261.61	15,188.66	10,571.82	32.99	86.02	-90.38	50.20	-1,871.22	2,324.17	2,221.88	102.29	22.721		
9,500.00	9,276.77	15,141.63	10,571.38	33.08	85.32	-90.38	3.17	-1,871.22	2,320.60	2,218.49	102.11	22.725		
9,543.32	9,286.51	15,100.07	10,570.98	33.15	84.70	-90.37	-38.53	-1,871.22	2,319.63	2,217.74	101.89	22.765		
9,550.00	9,287.73	15,106.57	10,570.92	33.17	84.79	-90.37	-45.03	-1,871.22	2,319.66	2,217.63	102.02	22.737		
9,600.00	9,294.39	15,044.43	10,570.46	33.27	83.87	-90.37	-94.03	-1,871.22	2,321.27	2,219.76	101.51	22.867		
9,649.26	9,296.70	15,004.27	10,570.00	33.37	83.28	-90.37	-142.73	-1,871.22	2,325.32	2,224.11	101.21	22.975		
9,700.00	9,296.91	14,945.42	10,569.52	33.49	82.41	-90.36	-193.03	-1,871.22	2,330.37	2,229.72	100.65	23.153		
9,800.00	9,297.31	14,845.97	10,568.58	33.80	80.94	-90.36	-292.49	-1,871.22	2,338.15	2,238.37	99.78	23.434		
9,900.00	9,297.72	14,746.21	10,567.64	34.17	79.48	-90.36	-392.24	-1,871.22	2,343.06	2,244.12	98.93	23.683		
10,000.00	9,298.12	14,646.28	10,566.69	34.62	78.02	-90.36	-492.16	-1,871.22	2,345.07	2,246.95	98.12	23.901		
10,027.33	9,298.24	14,618.96	10,566.43	34.75	77.62	-90.36	-519.49	-1,871.22	2,345.11	2,247.21	97.90	23.955		
10,100.00	9,298.53	14,546.29	10,565.74	35.13	76.57	-90.36	-592.14	-1,871.22	2,344.94	2,247.60	97.34	24.091		
10,200.00	9,298.93	14,446.30	10,564.80	35.71	75.13	-90.36	-692.13	-1,871.22	2,344.71	2,248.08	96.63	24.266		
10,300.00	9,299.34	14,346.32	10,563.85	36.35	73.70	-90.36	-792.11	-1,871.22	2,344.47	2,248.49	95.98	24.427		
10,400.00	9,299.74	14,246.33	10,562.90	37.06	72.27	-90.36	-892.10	-1,871.22	2,344.24	2,248.85	95.39	24.574		
10,500.00	9,300.15	14,146.34	10,561.96	37.83	70.86	-90.36	-992.08	-1,871.22	2,344.01	2,249.14	94.87	24.708		
10,600.00	9,300.55	14,046.35	10,561.01	38.65	69.46	-90.36	-1,092.07	-1,871.22	2,343.78	2,249.38	94.40	24.828		
10,700.00	9,300.96	13,946.36	10,560.06	39.53	68.07	-90.36	-1,192.05	-1,871.22	2,343.55	2,249.56	93.99	24.935		
10,800.00	9,301.36	13,846.37	10,559.12	40.45	66.69	-90.36	-1,292.04	-1,871.22	2,343.32	2,249.69	93.63	25.029		
10,900.00	9,301.76	13,746.38	10,558.17	41.42	65.32	-90.36	-1,392.02	-1,871.22	2,343.09	2,249.78	93.32	25.109		
11,000.00	9,302.17	13,646.39	10,557.23	42.44	63.97	-90.35	-1,492.01	-1,871.22	2,342.87	2,249.81	93.05	25.178		
11,100.00	9,302.57	13,546.40	10,556.28	43.49	62.63	-90.35	-1,591.99	-1,871.22	2,342.64	2,249.80	92.84	25.234		
11,200.00	9,302.98	13,446.41	10,555.33	44.58	61.31	-90.35	-1,691.97	-1,871.22	2,342.41	2,249.75	92.67	25.278		
11,300.00	9,303.38	13,346.43	10,554.39	45.71	60.00	-90.35	-1,791.96	-1,871.22	2,342.19	2,249.65	92.54	25.310		
11,400.00	9,303.79	13,246.44	10,553.44	46.86	58.71	-90.35	-1,891.94	-1,871.22	2,341.97	2,249.51	92.46	25.330		
11,500.00	9,304.19	13,146.45	10,552.49	48.05	57.44	-90.35	-1,991.93	-1,871.22	2,341.74	2,249.33	92.42	25.339		
11,600.00	9,304.60	13,046.46	10,551.55	49.26	56.19	-90.35	-2,091.91	-1,871.22	2,341.52	2,249.11	92.42	25.336		
11,700.00	9,305.00	12,946.47	10,550.60	50.50	54.96	-90.35	-2,191.90	-1,871.22	2,341.30	2,248.84	92.46	25.323		
11,800.00	9,305.40	12,846.48	10,549.65	51.76	53.76	-90.35	-2,291.88	-1,871.22	2,341.08	2,248.54	92.54	25.298		
11,900.00	9,305.81	12,746.49	10,548.71	53.05	52.58	-90.35	-2,391.87	-1,871.22	2,340.86	2,248.20	92.66	25.262		
12,000.00	9,306.21	12,646.50	10,547.76	54.35	51.42	-90.35	-2,491.85	-1,871.22	2,340.65	2,247.82	92.83	25.215		
12,100.00	9,306.62	12,546.51	10,546.82	55.67	50.29	-90.35	-2,591.84	-1,871.22	2,340.43	2,247.40	93.03	25.157		
12,200.00	9,307.02	12,446.52	10,545.87	57.01	49.20	-90.35	-2,691.82	-1,871.22	2,340.21	2,246.93	93.28	25.088		
12,300.00	9,307.43	12,346.54	10,544.92	58.37	48.13	-90.35	-2,791.80	-1,871.22	2,340.00	2,246.43	93.57	25.008		
12,400.00	9,307.83	12,246.55	10,543.98	59.74	47.10	-90.35	-2,891.79	-1,871.22	2,339.78	2,245.88	93.90	24.917		
12,500.00	9,308.23	12,146.56	10,543.03	61.13	46.10	-90.35	-2,991.77	-1,871.22	2,339.57	2,245.29	94.28	24.814		
12,600.00	9,308.64	12,046.57	10,542.08	62.53	45.14	-90.35	-3,091.76	-1,871.22	2,339.36	2,244.65	94.71	24.701		
12,700.00	9,309.04	11,946.58	10,541.14	63.94	44.23	-90.35	-3,191.74	-1,871.22	2,339.15	2,243.96	95.18	24.575		
12,800.00	9,309.45	11,846.59	10,540.19	65.36	43.35	-90.35	-3,291.73	-1,871.22	2,338.94	2,243.23	95.71	24.439		
12,900.00	9,309.85	9,300.11	9,281.85	66.80	33.01	-127.01	-4,787.32	-1,766.38	2,338.18	2,247.82	90.36	25.878		
13,000.00	9,310.26	9,300.52	9,282.26	68.24	33.01	-124.99	-4,787.32	-1,766.38	2,279.88	2,187.45	92.43	24.665		
13,100.00	9,310.66	9,300.92	9,282.66	69.69	33.02	-122.88	-4,787.32	-1,766.38	2,224.56	2,129.96	94.60	23.516		
13,200.00	9,311.07	9,301.33	9,283.07	71.16	33.02	-120.65	-4,787.32	-1,766.38	2,172.43	2,075.59	96.83	22.435		
13,300.00	9,311.47	9,301.73	9,283.47	72.63	33.02	-118.32	-4,787.32	-1,766.38	2,123.73	2,024.60	99.13	21.424		
13,400.00	9,311.87	9,302.13	9,283.87	74.11	33.02	-115.89	-4,787.32	-1,766.38	2,078.71	1,977.24	101.47	20.486		
13,500.00	9,312.28	9,302.54	9,284.28	75.59	33.02	-113.35	-4,787.32	-1,766.38	2,037.60	1,933.77	103.83	19.624		
13,600.00	9,312.68	9,302.94	9,284.68	77.09	33.02	-110.71	-4,787.32	-1,766.38	2,000.66	1,894.46	106.19	18.840		
13,700.00	9,313.09	9,303.35	9,285.09	78.59	33.02	-107.98	-4,787.32	-1,766.38	1,968.10	1,859.58	108.52	18.135		
13,800.00	9,313.49	9,303.75	9,285.49	80.09	33.03	-105.16	-4,787.32	-1,766.38	1,940.16	1,829.35	110.80	17.510		
13,900.00	9,313.90	9,304.16	9,285.90	81.60	33.03	-102.27	-4,787.32	-1,766.38	1,917.03	1,804.03	113.00	16.965		

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



MS Energy Services Anticollision Report



Company: Devon Energy
Project: Eddy County, New Mexico (NAD 83)
Reference Site: Cotton Draw Unit
Site Error: 0.00 usft
Reference Well: 515H
Well Error: 0.00 usft
Reference Wellbore: Wellbore #1
Reference Design: Design #1

Local Co-ordinate Reference: Well 515H
TVD Reference: Well @ 3566.10usft (Cactus 126)
MD Reference: Well @ 3566.10usft (Cactus 126)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: 5000.1 Conroe DB
Offset TVD Reference: Offset Datum

Offset Design Cotton Draw Unit - 294H - Wellbore #1 - Design #2														Offset Site Error: 0.00 usft
Survey Program: 26-MWD, 728-MWD														Offset Well Error: 0.00 usft
Reference		Offset		Semi Major Axis		Azimuth from North (°)	Distance		Minimum Separation (usft)	Separation Factor	Warning			
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)				Between Centres (usft)	Between Ellipses (usft)	
14,000.00	9,314.30	9,304.56	9,286.30	83.12	33.03	-99.32	-4,787.32	-1,766.38	1,898.89	1,783.81	115.08	16.501		
14,100.00	9,314.71	9,304.96	9,286.71	84.64	33.03	-96.32	-4,787.32	-1,766.38	1,885.89	1,768.87	117.02	16.116		
14,200.00	9,315.11	9,305.37	9,287.11	86.17	33.03	-93.28	-4,787.32	-1,766.38	1,878.13	1,759.34	118.79	15.811		
14,296.05	9,315.50	9,305.76	9,287.50	87.64	33.03	-90.35	-4,787.32	-1,766.38	1,875.67	1,755.36	120.31	15.590 CC		
14,300.00	9,315.51	9,305.77	9,287.51	87.70	33.03	-90.23	-4,787.32	-1,766.38	1,875.68	1,755.31	120.37	15.583 ES		
14,400.00	9,315.92	9,306.18	9,287.92	89.24	33.03	-87.18	-4,787.32	-1,766.38	1,878.55	1,756.81	121.74	15.431		
14,500.00	9,316.32	9,306.58	9,288.32	90.78	33.04	-84.15	-4,787.32	-1,766.38	1,886.73	1,763.83	122.90	15.352		
14,600.00	9,316.73	9,306.99	9,288.73	92.33	33.04	-81.15	-4,787.32	-1,766.38	1,900.14	1,776.31	123.83	15.345 SF		
14,700.00	9,317.13	9,307.39	9,289.13	93.88	33.04	-78.20	-4,787.32	-1,766.38	1,918.68	1,794.14	124.54	15.406		
14,800.00	9,317.54	9,307.80	9,289.54	95.43	33.04	-75.31	-4,787.32	-1,766.38	1,942.19	1,817.16	125.03	15.534		
14,900.00	9,317.94	9,308.20	9,289.94	96.99	33.04	-72.50	-4,787.32	-1,766.38	1,970.51	1,845.19	125.31	15.725		
15,000.00	9,318.34	9,308.60	9,290.34	98.55	33.04	-69.78	-4,787.32	-1,766.38	2,003.42	1,878.01	125.41	15.975		
15,100.00	9,318.75	9,309.01	9,290.75	100.11	33.04	-67.15	-4,787.32	-1,766.38	2,040.71	1,915.38	125.33	16.283		
15,200.00	9,319.15	9,309.41	9,291.15	101.68	33.04	-64.62	-4,787.32	-1,766.38	2,082.13	1,957.04	125.09	16.645		
15,300.00	9,319.56	9,309.82	9,291.56	103.24	33.05	-62.19	-4,787.32	-1,766.38	2,127.45	2,002.73	124.72	17.058		
15,400.00	9,319.96	9,310.22	9,291.96	104.82	33.05	-59.87	-4,787.32	-1,766.38	2,176.43	2,052.19	124.24	17.518		
15,500.00	9,320.37	9,310.63	9,292.37	106.39	33.05	-57.66	-4,787.32	-1,766.38	2,228.82	2,105.16	123.65	18.025		
15,600.00	9,320.77	9,311.03	9,292.77	107.97	33.05	-55.54	-4,787.32	-1,766.38	2,284.39	2,161.39	122.99	18.573		
15,700.00	9,321.18	9,311.44	9,293.18	109.55	33.05	-53.54	-4,787.32	-1,766.38	2,342.91	2,220.64	122.27	19.162		
15,800.00	9,321.58	9,311.84	9,293.58	111.13	33.05	-51.63	-4,787.32	-1,766.38	2,404.16	2,282.66	121.50	19.788		
15,900.00	9,321.98	9,312.24	9,293.98	112.71	33.05	-49.82	-4,787.32	-1,766.38	2,467.95	2,347.26	120.69	20.449		
16,000.00	9,322.39	9,312.65	9,294.39	114.30	33.06	-48.10	-4,787.32	-1,766.38	2,534.08	2,414.22	119.86	21.142		
16,100.00	9,322.79	9,313.05	9,294.79	115.88	33.06	-46.47	-4,787.32	-1,766.38	2,602.37	2,483.36	119.01	21.866		
16,200.00	9,323.20	9,313.46	9,295.20	117.47	33.06	-44.92	-4,787.32	-1,766.38	2,672.66	2,554.50	118.16	22.619		
16,300.00	9,323.60	9,313.86	9,295.60	119.07	33.06	-43.46	-4,787.32	-1,766.38	2,744.80	2,627.49	117.31	23.398		
16,400.00	9,324.01	9,314.27	9,296.01	120.66	33.06	-42.07	-4,787.32	-1,766.38	2,818.64	2,702.17	116.46	24.202		
16,500.00	9,324.41	9,314.67	9,296.41	122.25	33.06	-40.75	-4,787.32	-1,766.38	2,894.04	2,778.41	115.63	25.029		
16,600.00	9,324.82	9,315.07	9,296.82	123.85	33.06	-39.50	-4,787.32	-1,766.38	2,970.90	2,856.10	114.81	25.877		
16,700.00	9,325.22	9,315.48	9,297.22	125.45	33.07	-38.31	-4,787.32	-1,766.38	3,049.11	2,935.11	114.00	26.746		
16,800.00	9,325.62	9,315.88	9,297.62	127.05	33.07	-37.19	-4,787.32	-1,766.38	3,128.55	3,015.34	113.21	27.634		
16,900.00	9,326.03	9,316.29	9,298.03	128.65	33.07	-36.12	-4,787.32	-1,766.38	3,209.15	3,096.70	112.45	28.539		
17,000.00	9,326.43	9,316.69	9,298.43	130.25	33.07	-35.10	-4,787.32	-1,766.38	3,290.81	3,179.10	111.70	29.460		
17,100.00	9,326.84	9,317.10	9,298.84	131.86	33.07	-34.13	-4,787.32	-1,766.38	3,373.45	3,262.47	110.98	30.397		
17,200.00	9,327.24	9,317.50	9,299.24	133.46	33.07	-33.21	-4,787.32	-1,766.38	3,457.02	3,346.74	110.28	31.348		
17,300.00	9,327.65	9,317.91	9,299.65	135.07	33.07	-32.33	-4,787.32	-1,766.38	3,541.43	3,431.83	109.60	32.312		
17,400.00	9,328.05	9,318.31	9,300.05	136.68	33.08	-31.50	-4,787.32	-1,766.38	3,626.64	3,517.69	108.95	33.288		
17,500.00	9,328.45	9,318.71	9,300.45	138.29	33.08	-30.70	-4,787.32	-1,766.38	3,712.59	3,604.27	108.31	34.276		
17,600.00	9,328.86	9,319.12	9,300.86	139.90	33.08	-29.94	-4,787.32	-1,766.38	3,799.22	3,691.52	107.71	35.274		
17,700.00	9,329.26	9,319.52	9,301.26	141.51	33.08	-29.21	-4,787.32	-1,766.38	3,886.50	3,779.38	107.12	36.283		
17,800.00	9,329.67	9,319.93	9,301.67	143.12	33.08	-28.51	-4,787.32	-1,766.38	3,974.37	3,867.82	106.55	37.300		
17,900.00	9,330.07	9,320.33	9,302.07	144.73	33.08	-27.85	-4,787.32	-1,766.38	4,062.81	3,956.80	106.01	38.326		
18,000.00	9,330.48	9,320.74	9,302.48	146.35	33.08	-27.21	-4,787.32	-1,766.38	4,151.77	4,046.29	105.48	39.360		
18,100.00	9,330.88	9,321.14	9,302.88	147.96	33.09	-26.60	-4,787.32	-1,766.38	4,241.22	4,136.25	104.98	40.402		
18,200.00	9,331.29	9,321.55	9,303.29	149.58	33.09	-26.01	-4,787.32	-1,766.38	4,331.14	4,226.65	104.49	41.450		
18,300.00	9,331.69	9,321.95	9,303.69	151.20	33.09	-25.45	-4,787.32	-1,766.38	4,421.49	4,317.46	104.02	42.505		
18,400.00	9,332.09	9,322.35	9,304.09	152.81	33.09	-24.91	-4,787.32	-1,766.38	4,512.24	4,408.67	103.57	43.566		
18,500.00	9,332.50	9,322.76	9,304.50	154.43	33.09	-24.40	-4,787.32	-1,766.38	4,603.38	4,500.24	103.14	44.632		
18,600.00	9,332.90	9,323.16	9,304.90	156.05	33.09	-23.90	-4,787.32	-1,766.38	4,694.88	4,592.15	102.73	45.703		
18,700.00	9,333.31	9,323.57	9,305.31	157.67	33.09	-23.42	-4,787.32	-1,766.38	4,786.72	4,684.39	102.33	46.779		
18,800.00	9,333.71	9,323.97	9,305.71	159.30	33.10	-22.96	-4,787.32	-1,766.38	4,878.88	4,776.93	101.94	47.859		
18,900.00	9,334.12	9,324.38	9,306.12	160.92	33.10	-22.52	-4,787.32	-1,766.38	4,971.34	4,869.76	101.57	48.943		
19,000.00	9,334.52	9,324.78	9,306.52	162.54	33.10	-22.09	-4,787.32	-1,766.38	5,064.09	4,962.87	101.22	50.031		



MS Energy Services
Anticollision Report



Company: Devon Energy
Project: Eddy County, New Mexico (NAD 83)
Reference Site: Cotton Draw Unit
Site Error: 0.00 usft
Reference Well: 515H
Well Error: 0.00 usft
Reference Wellbore: Wellbore #1
Reference Design: Design #1

Local Co-ordinate Reference: Well 515H
TVD Reference: Well @ 3566.10usft (Cactus 126)
MD Reference: Well @ 3566.10usft (Cactus 126)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at: 2.00 sigma
Database: 5000.1 Conroe DB
Offset TVD Reference: Offset Datum

Offset Design Cotton Draw Unit - 294H - Wellbore #1 - Design #2													Offset Site Error: 0.00 usft
Survey Program: 26-MWD, 728-MWD													Offset Well Error: 0.00 usft
Reference		Offset		Semi Major Axis			Distance						Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Azimuth from North (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	
19,100.00	9,334.93	9,325.18	9,306.93	164.16	33.10	-21.68	-4,787.32	-1,766.38	5,157.11	5,056.23	100.88	51.122	
19,200.00	9,335.33	9,325.59	9,307.33	165.79	33.10	-21.28	-4,787.32	-1,766.38	5,250.38	5,149.83	100.55	52.216	
19,300.00	9,335.73	9,325.99	9,307.73	167.41	33.10	-20.90	-4,787.32	-1,766.38	5,343.90	5,243.67	100.24	53.313	
19,390.56	9,336.10	9,326.36	9,308.10	168.88	33.10	-20.56	-4,787.32	-1,766.38	5,428.79	5,328.83	99.96	54.308	



MS Energy Services Anticollision Report



Company: Devon Energy
Project: Eddy County, New Mexico (NAD 83)
Reference Site: Cotton Draw Unit
Site Error: 0.00 usft
Reference Well: 515H
Well Error: 0.00 usft
Reference Wellbore: Wellbore #1
Reference Design: Design #1

Local Co-ordinate Reference: Well 515H
TVD Reference: Well @ 3566.10usft (Cactus 126)
MD Reference: Well @ 3566.10usft (Cactus 126)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: 5000.1 Conroe DB
Offset TVD Reference: Offset Datum

Offset Design Cotton Draw Unit - 511H - Wellbore #1 - Surveys												Offset Site Error:	0.00 usft
Survey Program: 143-VESI_GYRO_DROP, 9907-MWD												Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Distance							
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Azimuth from North (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
0.00	0.00	0.00	0.00	0.00	0.00	-161.53	-4,573.76	-1,527.53	4,822.18				
100.00	100.00	104.43	104.43	0.13	0.08	-161.53	-4,573.51	-1,527.17	4,821.86	4,821.65	0.21	N/A	
200.00	200.00	207.87	207.86	0.49	0.22	-161.54	-4,572.93	-1,526.20	4,821.03	4,820.32	0.71	6,765.997	
300.00	300.00	294.04	294.03	0.85	0.37	-161.55	-4,572.71	-1,525.19	4,820.41	4,819.19	1.22	3,943.499	
400.00	400.00	374.58	374.56	1.21	0.52	-161.57	-4,572.80	-1,524.19	4,820.13	4,818.41	1.72	2,799.505	
412.34	412.34	384.06	384.04	1.25	0.53	-161.57	-4,572.84	-1,524.06	4,820.13	4,818.35	1.78	2,704.001	
500.00	500.00	451.71	451.68	1.57	0.85	-161.58	-4,573.30	-1,523.14	4,820.31	4,818.10	2.21	2,176.456	
600.00	600.00	530.16	530.12	1.93	0.79	-161.59	-4,574.15	-1,522.17	4,820.96	4,818.25	2.71	1,779.018	
700.00	700.00	614.70	614.64	2.29	0.94	-161.61	-4,575.33	-1,521.38	4,821.98	4,818.76	3.22	1,499.743	
800.00	800.00	718.86	718.80	2.64	1.12	-161.62	-4,576.83	-1,520.65	4,823.12	4,819.37	3.75	1,284.466	
900.00	900.00	795.47	795.39	3.00	1.26	-161.63	-4,578.05	-1,520.28	4,824.48	4,820.24	4.25	1,135.929	
1,000.00	1,000.00	887.83	887.74	3.36	1.42	-161.64	-4,579.74	-1,520.13	4,826.16	4,821.40	4.77	1,012.358	
1,100.00	1,100.00	960.32	960.21	3.72	1.55	-161.64	-4,581.18	-1,520.35	4,828.16	4,822.90	5.25	919.179	
1,200.00	1,200.00	1,023.58	1,023.45	4.08	1.66	-161.64	-4,582.73	-1,520.99	4,830.82	4,825.09	5.72	844.278	
1,300.00	1,300.00	1,090.88	1,090.70	4.44	1.78	-161.63	-4,584.82	-1,522.34	4,834.34	4,828.15	6.20	779.993	
1,400.00	1,400.00	1,162.49	1,162.24	4.79	1.91	-161.62	-4,587.31	-1,524.45	4,838.51	4,831.83	6.68	724.111	
1,500.00	1,500.00	1,239.60	1,239.24	5.15	2.04	-161.59	-4,589.99	-1,527.43	4,843.05	4,835.87	7.18	674.875	
1,600.00	1,600.00	1,302.22	1,301.75	5.51	2.16	-161.57	-4,592.32	-1,530.52	4,848.17	4,840.53	7.64	634.219	
1,700.00	1,700.00	1,351.15	1,350.54	5.87	2.25	-161.54	-4,594.48	-1,533.44	4,854.26	4,846.18	8.09	600.255	
1,800.00	1,800.00	1,448.90	1,447.92	6.23	2.43	-161.48	-4,599.21	-1,540.51	4,861.15	4,852.53	8.62	563.830	
1,900.00	1,900.00	1,550.94	1,549.51	6.59	2.62	-161.40	-4,603.41	-1,549.06	4,867.72	4,858.56	9.17	531.046	
2,000.00	2,000.00	1,643.34	1,641.47	6.95	2.79	-161.32	-4,607.16	-1,557.24	4,874.42	4,864.72	9.69	502.895	
2,100.00	2,100.00	1,746.94	1,744.59	7.30	2.98	-161.24	-4,611.48	-1,566.26	4,881.18	4,870.94	10.24	476.688	
2,200.00	2,200.00	1,862.08	1,859.22	7.66	3.19	-161.15	-4,616.06	-1,576.14	4,887.73	4,876.92	10.81	452.227	
2,300.00	2,300.00	1,966.75	1,963.42	8.02	3.38	-161.06	-4,620.03	-1,585.10	4,894.10	4,882.75	11.36	430.968	
2,400.00	2,400.00	2,074.80	2,071.01	8.38	3.58	-160.98	-4,623.93	-1,594.28	4,900.30	4,888.39	11.91	411.438	
2,500.00	2,500.00	2,181.40	2,177.16	8.74	3.77	-160.89	-4,627.65	-1,603.40	4,906.40	4,893.94	12.46	393.743	
2,600.00	2,599.99	2,269.24	2,264.62	9.10	3.93	-160.82	-4,630.62	-1,610.87	4,913.22	4,900.24	12.98	378.633	
2,700.00	2,699.96	2,345.64	2,340.65	9.45	4.07	-160.77	-4,633.47	-1,617.88	4,922.18	4,908.71	13.47	365.426	
2,800.00	2,799.86	2,445.22	2,439.66	9.81	4.25	-160.69	-4,637.00	-1,627.94	4,932.91	4,918.90	14.01	352.143	
2,900.00	2,899.68	2,536.38	2,530.28	10.17	4.42	-160.63	-4,640.30	-1,637.22	4,945.34	4,930.81	14.53	340.356	
3,000.00	2,999.37	2,625.09	2,618.48	10.53	4.58	-160.58	-4,643.70	-1,646.17	4,959.55	4,944.50	15.05	329.631	
3,100.00	3,098.90	2,716.98	2,709.80	10.89	4.75	-160.53	-4,647.37	-1,655.70	4,975.59	4,960.02	15.57	319.620	
3,200.00	3,198.26	2,843.37	2,835.49	11.25	4.98	-160.46	-4,652.15	-1,668.12	4,992.82	4,978.66	16.16	309.049	
3,299.74	3,297.14	2,938.23	2,929.85	11.61	5.15	-160.44	-4,655.72	-1,677.05	5,011.46	4,994.78	16.68	300.442	
3,300.00	3,297.40	2,938.47	2,930.09	11.61	5.15	-160.44	-4,655.73	-1,677.08	5,011.51	4,994.83	16.68	300.420	
3,400.00	3,396.43	3,032.95	3,024.07	11.98	5.32	-160.41	-4,659.31	-1,686.17	5,031.07	5,013.87	17.21	292.393	
3,500.00	3,495.46	3,135.54	3,126.09	12.36	5.50	-160.38	-4,663.13	-1,696.24	5,050.65	5,032.90	17.75	284.578	
3,600.00	3,594.49	3,218.55	3,208.66	12.73	5.65	-160.37	-4,666.26	-1,704.21	5,070.20	5,051.95	18.25	277.805	
3,700.00	3,693.51	3,294.47	3,284.16	13.11	5.79	-160.37	-4,669.59	-1,711.45	5,090.27	5,071.53	18.74	271.627	
3,800.00	3,792.54	3,417.18	3,406.21	13.49	6.01	-160.32	-4,675.00	-1,722.93	5,110.35	5,091.02	19.32	264.456	
3,900.00	3,891.57	3,556.66	3,545.06	13.87	6.25	-160.28	-4,680.39	-1,735.04	5,129.66	5,109.72	19.94	257.229	
4,000.00	3,990.60	3,625.24	3,613.34	14.25	6.37	-160.29	-4,683.03	-1,740.85	5,148.90	5,128.48	20.42	252.177	
4,100.00	4,089.62	3,721.92	3,709.61	14.64	6.55	-160.28	-4,687.30	-1,748.85	5,168.53	5,147.58	20.95	246.703	
4,200.00	4,188.65	3,853.41	3,840.62	15.02	6.78	-160.26	-4,692.94	-1,758.24	5,187.79	5,166.24	21.55	240.689	
4,300.00	4,287.68	3,910.33	3,897.35	15.41	6.88	-160.29	-4,695.56	-1,762.18	5,207.16	5,185.16	22.01	236.623	
4,400.00	4,386.71	3,980.45	3,967.21	15.80	7.00	-160.31	-4,699.22	-1,767.05	5,227.14	5,204.65	22.48	232.474	
4,500.00	4,485.73	4,050.33	4,036.79	16.19	7.12	-160.33	-4,703.05	-1,772.31	5,247.59	5,224.62	22.96	228.527	
4,600.00	4,584.76	4,111.53	4,097.67	16.59	7.23	-160.35	-4,706.69	-1,777.31	5,268.66	5,245.24	23.42	224.949	
4,700.00	4,683.79	4,185.06	4,170.76	16.98	7.36	-160.36	-4,711.39	-1,783.73	5,290.33	5,266.42	23.91	221.290	
4,800.00	4,782.81	4,287.48	4,272.55	17.37	7.55	-160.35	-4,718.08	-1,793.03	5,312.25	5,287.79	24.46	217.222	
4,900.00	4,881.84	4,397.50	4,381.87	17.77	7.74	-160.32	-4,724.80	-1,803.35	5,333.88	5,308.86	25.02	213.171	

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



MS Energy Services

Anticollision Report



Company: Devon Energy
Project: Eddy County, New Mexico (NAD 83)
Reference Site: Cotton Draw Unit
Site Error: 0.00 usft
Reference Well: 515H
Well Error: 0.00 usft
Reference Wellbore: Wellbore #1
Reference Design: Design #1

Local Co-ordinate Reference: Well 515H
TVD Reference: Well @ 3566.10usft (Cactus 126)
MD Reference: Well @ 3566.10usft (Cactus 126)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at: 2.00 sigma
Database: 5000.1 Conroe DB
Offset TVD Reference: Offset Datum

Offset Design Cotton Draw Unit - 511H - Wellbore #1 - Surveys

Survey Program: 143-VESSL_GYRO_DROP_9907-MWD

Offset Site Error: 0.00 usft

Offset Well Error: 0.00 usft

Reference		Offset		Semi Major Axis		Azimuth from North (°)	Offset Wellbore Centre		Distance		Minimum Separation (usft)	Separation Factor	Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N-S (usft)	+E-W (usft)	Between Centres (usft)	Ellipses (usft)			
5,000.00	4,980.87	4,547.00	4,530.49	18.17	8.01	-160.27	-4,732.56	-1,817.61	5,354.60	5,328.92	25.68	208.553	
5,100.00	5,079.90	4,620.85	4,603.86	18.56	8.14	-160.26	-4,736.25	-1,825.04	5,375.42	5,349.26	26.16	205.457	
5,200.00	5,178.92	4,702.23	4,684.71	18.96	8.29	-160.25	-4,740.61	-1,833.34	5,396.64	5,369.97	26.67	202.363	
5,300.00	5,277.95	4,814.90	4,796.62	19.36	8.49	-160.21	-4,746.49	-1,844.97	5,417.76	5,390.51	27.24	198.868	
5,400.00	5,376.98	4,904.79	4,885.91	19.76	8.65	-160.20	-4,751.26	-1,854.14	5,438.93	5,411.16	27.77	195.876	
5,500.00	5,476.01	5,027.05	5,007.36	20.16	8.87	-160.15	-4,757.50	-1,866.83	5,459.99	5,431.62	28.36	192.494	
5,600.00	5,575.03	5,129.52	5,109.22	20.56	9.05	-160.13	-4,762.50	-1,876.76	5,480.59	5,451.67	28.92	189.527	
5,628.09	5,602.86	5,152.60	5,132.17	20.68	9.10	-160.13	-4,763.68	-1,878.93	5,486.41	5,457.35	29.06	188.798	
5,700.00	5,674.12	5,218.92	5,198.11	20.96	9.21	-160.12	-4,767.17	-1,885.07	5,500.97	5,471.53	29.44	186.854	
5,800.00	5,773.42	5,323.59	5,302.20	21.36	9.40	-160.09	-4,772.73	-1,894.59	5,519.87	5,489.87	30.00	184.023	
5,900.00	5,872.91	5,455.04	5,432.95	21.74	9.63	-160.04	-4,779.27	-1,906.45	5,536.86	5,506.25	30.61	180.886	
6,000.00	5,972.56	5,572.44	5,549.82	22.12	9.84	-160.00	-4,784.79	-1,916.10	5,551.72	5,520.53	31.19	177.997	
6,100.00	6,072.35	5,682.74	5,659.62	22.49	10.03	-159.95	-4,789.68	-1,925.36	5,564.81	5,533.06	31.75	175.257	
6,200.00	6,172.23	5,804.89	5,781.26	22.86	10.25	-159.89	-4,794.69	-1,935.39	5,575.94	5,543.60	32.34	172.423	
6,300.00	6,272.18	5,907.31	5,883.27	23.21	10.43	-159.84	-4,798.72	-1,943.57	5,585.23	5,552.35	32.88	169.874	
6,400.00	6,372.17	6,035.06	6,010.53	23.56	10.66	-159.77	-4,803.58	-1,953.55	5,592.77	5,559.30	33.47	167.088	
6,427.83	6,400.00	6,095.59	6,070.84	23.66	10.76	-159.73	-4,805.45	-1,958.37	5,594.41	5,560.72	33.69	166.052	
6,500.00	6,472.17	6,181.28	6,156.27	23.90	10.91	-159.68	-4,807.91	-1,964.50	5,598.15	5,564.05	34.10	164.159	
6,600.00	6,572.17	6,300.00	6,275.62	24.25	11.64	-159.60	-4,812.96	-1,974.31	5,602.70	5,567.48	35.22	159.071	
6,700.00	6,672.17	6,430.34	6,404.90	24.59	11.69	-159.56	-4,816.17	-1,979.37	5,603.81	5,568.15	35.67	157.112	
6,800.00	6,772.17	6,533.64	6,508.19	24.93	11.87	-159.56	-4,816.63	-1,980.03	5,604.45	5,568.25	36.20	154.816	
6,900.00	6,872.17	6,631.49	6,606.04	25.28	12.04	-159.55	-4,817.06	-1,980.73	5,605.11	5,568.39	36.72	152.631	
7,000.00	6,972.17	6,722.18	6,696.73	25.62	12.20	-159.55	-4,817.52	-1,981.37	5,605.83	5,568.60	37.23	150.563	
7,100.00	7,072.17	6,805.50	6,780.05	25.97	12.34	-159.55	-4,818.16	-1,981.99	5,606.82	5,569.09	37.73	148.613	
7,200.00	7,172.17	6,883.50	6,858.04	26.31	12.48	-159.54	-4,818.98	-1,982.69	5,608.13	5,569.92	38.21	146.762	
7,300.00	7,272.17	6,967.01	6,941.48	26.66	13.03	-159.52	-4,818.32	-1,984.39	5,607.25	5,568.11	39.15	143.230	
7,400.00	7,372.17	7,051.18	7,025.61	27.00	13.18	-159.51	-4,813.97	-1,984.09	5,604.82	5,565.16	39.66	141.331	
7,500.00	7,472.17	7,139.34	7,113.76	27.35	13.31	-159.50	-4,812.17	-1,984.01	5,602.62	5,562.48	40.14	139.582	
7,600.00	7,572.17	7,227.51	7,201.71	27.69	13.43	-159.50	-4,810.83	-1,984.12	5,600.92	5,560.31	40.61	137.928	
7,700.00	7,672.17	7,315.78	7,289.98	28.04	13.56	-159.49	-4,809.83	-1,984.26	5,599.74	5,558.66	41.09	136.288	
7,800.00	7,772.17	7,404.95	7,379.35	28.39	13.69	-159.49	-4,809.09	-1,984.46	5,598.95	5,557.38	41.57	134.676	
7,900.00	7,872.17	7,494.47	7,468.86	28.74	13.82	-159.48	-4,808.53	-1,984.85	5,598.45	5,556.40	42.05	133.127	
7,962.58	7,934.75	7,584.06	7,558.45	28.95	13.91	-159.48	-4,808.33	-1,985.23	5,598.38	5,556.02	42.35	132.181	
8,000.00	7,972.17	7,673.21	7,647.60	29.08	13.96	-159.48	-4,808.25	-1,985.48	5,598.40	5,555.86	42.54	131.613	
8,100.00	8,072.17	7,762.65	7,736.03	29.43	14.11	-159.47	-4,808.26	-1,986.17	5,598.68	5,555.64	43.04	130.081	
8,200.00	8,172.17	7,852.14	7,826.51	29.78	14.44	-159.47	-4,807.45	-1,986.00	5,598.33	5,554.59	43.74	127.984	
8,300.00	8,272.17	7,941.66	7,916.03	30.13	14.59	-159.46	-4,806.11	-1,986.22	5,597.03	5,552.78	44.25	126.497	
8,400.00	8,372.17	8,031.18	8,005.55	30.48	14.72	-159.45	-4,805.22	-1,986.64	5,596.09	5,551.37	44.72	125.136	
8,495.52	8,467.69	8,120.69	8,095.06	30.81	14.82	-159.45	-4,804.82	-1,987.17	5,595.77	5,550.62	45.15	123.931	
8,500.00	8,472.17	8,210.18	8,184.55	30.83	14.82	-159.45	-4,804.81	-1,987.20	5,595.77	5,550.60	45.17	123.875	
8,600.00	8,572.17	8,300.69	8,275.06	31.18	14.95	-159.44	-4,804.69	-1,988.18	5,596.10	5,550.46	45.64	122.610	
8,700.00	8,672.17	8,390.20	8,364.57	31.52	15.12	-159.42	-4,804.75	-1,990.06	5,596.82	5,550.65	46.17	121.223	
8,751.58	8,723.75	8,480.71	8,455.08	31.70	15.23	-159.41	-4,804.67	-1,991.03	5,597.05	5,550.60	46.46	120.481	
8,800.00	8,772.17	8,570.22	8,544.59	31.86	15.30	-159.40	-4,804.72	-1,991.53	5,595.51	5,548.82	46.69	119.855	
8,850.00	8,821.68	8,660.73	8,635.10	32.00	15.37	-159.36	-4,804.89	-1,991.87	5,590.23	5,543.32	46.91	119.172	
8,900.00	8,870.51	8,750.24	8,724.61	32.12	15.45	-159.31	-4,805.10	-1,992.26	5,581.21	5,534.08	47.13	118.421	
8,950.00	8,918.22	8,840.75	8,815.12	32.24	15.53	-159.23	-4,805.29	-1,992.80	5,568.53	5,521.18	47.34	117.625	
9,000.00	8,964.46	8,930.26	8,904.63	32.34	15.60	-159.13	-4,805.43	-1,993.45	5,552.28	5,504.75	47.53	116.805	
9,050.00	9,008.86	9,020.77	8,995.14	32.43	15.67	-159.01	-4,805.54	-1,994.25	5,532.62	5,484.91	47.71	115.952	
9,100.00	9,051.09	9,110.28	9,084.65	32.51	15.76	-158.86	-4,805.63	-1,995.44	5,509.67	5,461.77	47.90	115.015	
9,150.00	9,090.83	9,200.79	9,175.26	32.58	15.85	-158.69	-4,805.57	-1,996.77	5,483.53	5,435.44	48.09	114.031	
9,200.00	9,127.77	9,290.30	9,264.67	32.65	16.04	-158.49	-4,804.49	-1,999.96	5,454.25	5,405.88	48.36	112.773	

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



MS Energy Services
Anticollision Report



Company: Devon Energy
Project: Eddy County, New Mexico (NAD 83)
Reference Site: Cotton Draw Unit
Site Error: 0.00 usft
Reference Well: 515H
Well Error: 0.00 usft
Reference Wellbore: Wellbore #1
Reference Design: Design #1

Local Co-ordinate Reference: Well 515H
TVD Reference: Well @ 3566.10usft (Cactus 126)
MD Reference: Well @ 3566.10usft (Cactus 126)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at: 2.00 sigma
Database: 5000.1 Conroe DB
Offset TVD Reference: Offset Datum

Offset Design Cotton Draw Unit - 511H - Wellbore #1 - Surveys													Offset Site Error: 0.00 usft
Survey Program: 143-VESSEL_GYRO_DROP, 9907-MWD													Offset Well Error: 0.00 usft
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Azimuth from North (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
9,250.00	9,161.64	9,198.37	9,172.56	32.71	16.11	-158.28	-4,803.74	-2,001.12	5,422.06	5,373.55	48.52	111.758	
9,300.00	9,192.18	9,241.36	9,215.54	32.78	16.19	-158.07	-4,803.16	-2,001.59	5,387.45	5,338.79	48.65	110.729	
9,350.00	9,219.15	9,265.96	9,240.14	32.85	16.23	-157.84	-4,802.88	-2,001.65	5,350.74	5,301.98	48.75	109.755	
9,400.00	9,242.36	9,286.10	9,260.29	32.92	16.26	-157.60	-4,802.69	-2,001.65	5,312.26	5,263.43	48.83	108.781	
9,450.00	9,261.61	9,302.86	9,277.04	32.99	16.29	-157.35	-4,802.54	-2,001.62	5,272.33	5,223.42	48.91	107.803	
9,500.00	9,276.77	9,316.06	9,290.24	33.08	16.32	-157.08	-4,802.45	-2,001.58	5,231.26	5,182.29	48.97	106.825	
9,550.00	9,287.73	9,325.58	9,299.76	33.17	16.33	-156.81	-4,802.38	-2,001.54	5,189.35	5,140.33	49.03	105.849	
9,600.00	9,294.39	9,331.31	9,305.49	33.27	16.34	-156.52	-4,802.35	-2,001.51	5,146.95	5,097.88	49.08	104.879	
9,649.26	9,296.70	9,333.16	9,307.34	33.37	16.34	-156.23	-4,802.33	-2,001.50	5,105.01	5,055.89	49.12	103.931	
9,700.00	9,296.91	9,333.11	9,307.29	33.49	16.34	-155.94	-4,802.33	-2,001.50	5,061.67	5,012.50	49.17	102.951	
9,800.00	9,297.31	9,332.99	9,307.17	33.80	16.34	-155.36	-4,802.34	-2,001.50	4,975.29	4,926.01	49.27	100.970	
9,900.00	9,297.72	9,332.86	9,307.03	34.17	16.34	-154.80	-4,802.34	-2,001.50	4,887.67	4,838.27	49.40	98.933	
10,000.00	9,298.12	9,332.70	9,306.88	34.62	16.34	-154.26	-4,802.34	-2,001.51	4,798.87	4,749.32	49.55	96.849	
10,027.33	9,298.24	9,332.65	9,306.83	34.75	16.34	-154.11	-4,802.34	-2,001.51	4,774.40	4,724.81	49.59	96.272	
10,100.00	9,298.53	9,332.52	9,306.70	35.13	16.34	-153.72	-4,802.34	-2,001.51	4,709.33	4,659.62	49.71	94.732	
10,200.00	9,298.93	9,332.35	9,306.53	35.71	16.34	-153.16	-4,802.34	-2,001.51	4,620.16	4,570.26	49.90	92.589	
10,300.00	9,299.34	9,332.17	9,306.35	36.35	16.34	-152.59	-4,802.34	-2,001.51	4,531.43	4,481.32	50.12	90.419	
10,400.00	9,299.74	9,331.99	9,306.17	37.06	16.34	-151.99	-4,802.34	-2,001.51	4,443.19	4,392.83	50.36	88.221	
10,500.00	9,300.15	9,331.80	9,305.98	37.83	16.34	-151.36	-4,802.34	-2,001.51	4,355.46	4,304.81	50.65	85.997	
10,600.00	9,300.55	9,331.62	9,305.80	38.65	16.34	-150.71	-4,802.34	-2,001.51	4,268.26	4,217.30	50.97	83.748	
10,700.00	9,300.96	9,331.43	9,305.61	39.53	16.34	-150.03	-4,802.34	-2,001.51	4,181.64	4,130.32	51.32	81.475	
10,800.00	9,301.36	9,331.24	9,305.42	40.45	16.34	-149.33	-4,802.35	-2,001.51	4,095.63	4,043.91	51.73	79.180	
10,900.00	9,301.76	9,331.05	9,305.23	41.42	16.34	-148.59	-4,802.35	-2,001.51	4,010.27	3,958.10	52.17	76.865	
11,000.00	9,302.17	9,330.85	9,305.03	42.44	16.34	-147.82	-4,802.35	-2,001.52	3,925.60	3,872.93	52.67	74.534	
11,100.00	9,302.57	9,330.65	9,304.83	43.49	16.34	-147.02	-4,802.35	-2,001.52	3,841.66	3,788.45	53.22	72.188	
11,200.00	9,302.98	9,330.45	9,304.63	44.58	16.34	-146.18	-4,802.35	-2,001.52	3,758.52	3,704.70	53.82	69.833	
11,300.00	9,303.38	9,330.25	9,304.43	45.71	16.34	-145.31	-4,802.35	-2,001.52	3,676.21	3,621.72	54.48	67.473	
11,400.00	9,303.79	9,330.04	9,304.22	46.86	16.34	-144.39	-4,802.35	-2,001.52	3,594.80	3,539.59	55.21	65.111	
11,500.00	9,304.19	9,329.83	9,304.01	48.05	16.34	-143.43	-4,802.35	-2,001.52	3,514.35	3,458.34	56.00	62.754	
11,600.00	9,304.60	9,329.62	9,303.80	49.26	16.34	-142.43	-4,802.36	-2,001.52	3,434.92	3,378.06	56.86	60.407	
11,700.00	9,305.00	9,329.41	9,303.59	50.50	16.34	-141.38	-4,802.36	-2,001.52	3,356.60	3,298.80	57.80	58.075	
11,800.00	9,305.40	9,329.19	9,303.37	51.76	16.34	-140.28	-4,802.36	-2,001.52	3,279.45	3,220.64	58.81	55.765	
11,900.00	9,305.81	9,328.97	9,303.15	53.05	16.34	-139.13	-4,802.36	-2,001.52	3,203.57	3,143.67	59.90	53.483	
12,000.00	9,306.21	9,328.74	9,302.92	54.35	16.34	-137.93	-4,802.36	-2,001.53	3,129.04	3,067.97	61.07	51.236	
12,100.00	9,306.62	9,328.52	9,302.70	55.67	16.34	-136.66	-4,802.36	-2,001.53	3,055.97	2,993.65	62.33	49.030	
12,200.00	9,307.02	9,328.29	9,302.47	57.01	16.34	-135.33	-4,802.36	-2,001.53	2,984.47	2,920.79	63.67	46.872	
12,300.00	9,307.43	9,328.05	9,302.23	58.37	16.34	-133.94	-4,802.37	-2,001.53	2,914.64	2,849.53	65.11	44.767	
12,400.00	9,307.83	9,327.82	9,301.99	59.74	16.34	-132.49	-4,802.37	-2,001.53	2,846.60	2,779.98	66.63	42.723	
12,500.00	9,308.23	9,327.58	9,301.75	61.13	16.34	-130.96	-4,802.37	-2,001.53	2,780.51	2,712.27	68.24	40.746	
12,600.00	9,308.64	9,327.33	9,301.51	62.53	16.33	-129.36	-4,802.37	-2,001.53	2,716.48	2,646.54	69.94	38.840	
12,700.00	9,309.04	9,327.08	9,301.26	63.94	16.33	-127.68	-4,802.37	-2,001.53	2,654.68	2,582.95	71.73	37.010	
12,800.00	9,309.45	9,326.83	9,301.01	65.36	16.33	-125.92	-4,802.37	-2,001.54	2,595.26	2,521.66	73.60	35.262	
12,900.00	9,309.85	9,326.58	9,300.76	66.80	16.33	-124.09	-4,802.37	-2,001.54	2,538.40	2,462.85	75.55	33.600	
13,000.00	9,310.26	9,326.32	9,300.50	68.24	16.33	-122.17	-4,802.38	-2,001.54	2,484.25	2,406.68	77.57	32.026	
13,100.00	9,310.66	9,326.05	9,300.23	69.69	16.33	-120.17	-4,802.38	-2,001.54	2,433.02	2,353.36	79.65	30.545	
13,200.00	9,311.07	9,325.79	9,299.97	71.16	16.33	-118.08	-4,802.38	-2,001.54	2,384.87	2,303.08	81.79	29.158	
13,300.00	9,311.47	9,325.52	9,299.70	72.63	16.33	-115.91	-4,802.38	-2,001.54	2,340.02	2,256.05	83.97	27.868	
13,400.00	9,311.87	9,325.24	9,299.42	74.11	16.33	-113.66	-4,802.38	-2,001.54	2,298.64	2,212.47	86.17	26.675	
13,500.00	9,312.28	9,324.96	9,299.14	75.59	16.33	-111.34	-4,802.39	-2,001.54	2,260.93	2,172.54	88.39	25.580	
13,600.00	9,312.68	9,324.68	9,298.86	77.09	16.33	-108.93	-4,802.39	-2,001.55	2,227.07	2,136.48	90.59	24.584	
13,700.00	9,313.09	9,324.39	9,298.57	78.59	16.33	-106.46	-4,802.39	-2,001.55	2,197.25	2,104.49	92.77	23.686	
13,800.00	9,313.49	9,324.09	9,298.27	80.09	16.33	-103.93	-4,802.39	-2,001.55	2,171.63	2,076.74	94.89	22.886	



MS Energy Services
Anticollision Report



Company: Devon Energy
Project: Eddy County, New Mexico (NAD 83)
Reference Site: Cotton Draw Unit
Site Error: 0.00 usft
Reference Well: 515H
Well Error: 0.00 usft
Reference Wellbore: Wellbore #1
Reference Design: Design #1

Local Co-ordinate Reference: Well 515H
TVD Reference: Well @ 3566.10usft (Cactus 126)
MD Reference: Well @ 3566.10usft (Cactus 126)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: 5000.1 Conroe DB
Offset TVD Reference: Offset Datum

Offset Design Cotton Draw Unit - 511H - Wellbore #1 - Surveys													Offset Site Error: 0.00 usft
Survey Program: 143-VESI_GYRO_DROP_9907-MWD													Offset Well Error: 0.00 usft
Reference		Offset		Semi Major Axis		Azimuth from North (°)	Distance		Minimum Separation (usft)	Separation Factor	Warning		
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		Offset Wellbore Centre +N-S (usft)	+E-W (usft)					
13,900.00	9,313.90	9,323.80	9,297.98	81.60	16.33	-101.33	-4,802.39	-2,001.55	2,150.36	2,053.41	96.94	22.182	
14,000.00	9,314.30	9,323.49	9,297.67	83.12	16.33	-98.70	-4,802.39	-2,001.55	2,133.56	2,034.66	98.90	21.572	
14,100.00	9,314.71	9,323.19	9,297.36	84.64	16.33	-96.02	-4,802.40	-2,001.55	2,121.35	2,020.61	100.75	21.056	
14,200.00	9,315.11	9,322.87	9,297.05	86.17	16.33	-93.33	-4,802.40	-2,001.55	2,113.81	2,011.35	102.46	20.631	
14,300.00	9,315.51	9,322.55	9,296.73	87.70	16.33	-90.61	-4,802.40	-2,001.56	2,110.99	2,006.96	104.02	20.293	
14,309.72	9,315.55	9,322.52	9,296.70	87.85	16.33	-90.35	-4,802.40	-2,001.56	2,110.96	2,006.80	104.17	20.265 CC	
14,400.00	9,315.92	9,322.23	9,296.41	89.24	16.33	-87.90	-4,802.40	-2,001.56	2,112.89	2,007.47	105.42	20.042	
14,500.00	9,316.32	9,321.90	9,296.08	90.78	16.33	-85.20	-4,802.41	-2,001.56	2,119.52	2,012.87	106.65	19.873	
14,600.00	9,316.73	9,321.56	9,295.74	92.33	16.32	-82.52	-4,802.41	-2,001.56	2,130.83	2,023.13	107.70	19.784	
14,700.00	9,317.13	9,321.22	9,295.40	93.88	16.32	-79.88	-4,802.41	-2,001.56	2,146.74	2,038.17	108.57	19.772	
14,800.00	9,317.54	9,320.88	9,295.06	95.43	16.32	-77.28	-4,802.41	-2,001.56	2,167.15	2,057.89	109.26	19.834	
14,900.00	9,317.94	9,320.52	9,294.70	96.99	16.32	-74.73	-4,802.41	-2,001.56	2,191.94	2,082.16	109.78	19.966	
15,000.00	9,318.34	9,320.16	9,294.34	98.55	16.32	-72.24	-4,802.42	-2,001.57	2,220.96	2,110.82	110.13	20.166	
15,100.00	9,318.75	9,319.80	9,293.98	100.11	16.32	-69.83	-4,802.42	-2,001.57	2,254.04	2,143.71	110.33	20.430	
15,200.00	9,319.15	11,003.96	10,185.97	101.68	23.37	-92.36	-5,766.20	-1,979.56	2,279.28	2,160.95	118.33	19.262	
15,300.00	9,319.56	11,093.85	10,183.52	103.24	24.39	-92.09	-5,856.02	-1,977.04	2,276.03	2,155.28	120.75	18.849	
15,400.00	9,319.96	11,179.41	10,183.24	104.82	25.41	-91.69	-5,941.53	-1,974.34	2,273.41	2,150.27	123.14	18.462	
15,500.00	9,320.37	11,267.57	10,182.93	106.39	26.49	-91.37	-6,029.66	-1,972.15	2,271.38	2,145.78	125.60	18.084	
15,600.00	9,320.77	11,372.39	10,182.23	107.97	27.83	-91.50	-6,134.46	-1,970.02	2,269.68	2,141.36	128.31	17.689	
15,700.00	9,321.18	11,468.55	10,182.27	109.55	29.09	-91.40	-6,230.58	-1,967.32	2,267.52	2,136.58	130.94	17.317	
15,800.00	9,321.58	11,540.88	10,182.28	111.13	30.06	-90.64	-6,302.90	-1,965.94	2,266.21	2,132.92	133.29	17.002	
15,838.75	9,321.74	11,565.65	10,182.26	111.74	30.40	-90.25	-6,327.67	-1,965.75	2,266.09	2,131.93	134.16	16.891	
15,900.00	9,321.98	11,605.00	10,182.20	112.71	30.93	-89.65	-6,367.02	-1,965.81	2,266.38	2,130.86	135.53	16.723	
16,000.00	9,322.39	11,808.49	10,180.31	114.30	33.78	-92.49	-6,570.44	-1,962.40	2,264.69	2,124.94	139.75	16.205	
16,100.00	9,322.79	11,929.52	10,179.31	115.88	35.53	-93.08	-6,691.37	-1,957.54	2,261.17	2,118.34	142.83	15.831	
16,200.00	9,323.20	12,050.16	10,177.44	117.47	37.30	-93.65	-6,811.79	-1,950.47	2,255.45	2,109.52	145.93	15.456	
16,300.00	9,323.60	12,133.25	10,175.72	119.07	38.53	-93.18	-6,894.76	-1,946.27	2,250.39	2,101.80	148.59	15.145	
16,400.00	9,324.01	12,229.56	10,173.59	120.66	39.97	-93.08	-6,990.95	-1,942.04	2,245.89	2,094.45	151.44	14.830	
16,500.00	9,324.41	12,319.27	10,173.44	122.25	41.32	-92.80	-7,080.53	-1,937.35	2,241.43	2,087.25	154.18	14.538	
16,600.00	9,324.82	12,400.66	10,173.19	123.85	42.56	-92.29	-7,161.85	-1,933.86	2,237.77	2,080.95	156.82	14.270	
16,700.00	9,325.22	12,485.54	10,172.64	125.45	43.85	-91.87	-7,246.67	-1,931.04	2,234.86	2,075.34	159.52	14.010	
16,800.00	9,325.62	12,607.18	10,171.49	127.05	45.72	-92.47	-7,368.27	-1,927.57	2,232.38	2,069.62	162.76	13.716	
16,900.00	9,326.03	12,725.88	10,171.57	128.65	47.56	-93.00	-7,486.80	-1,921.36	2,227.92	2,062.00	165.92	13.428	
17,000.00	9,326.43	12,823.97	10,171.62	130.25	49.09	-92.95	-7,584.76	-1,916.28	2,223.58	2,054.77	168.81	13.172	
17,100.00	9,326.84	12,919.05	10,170.99	131.86	50.57	-92.81	-7,679.73	-1,911.76	2,219.36	2,047.66	171.89	12.926	
17,200.00	9,327.24	13,021.32	10,168.91	133.46	52.18	-92.88	-7,781.89	-1,907.61	2,215.23	2,040.52	174.71	12.679	
17,300.00	9,327.65	13,110.98	10,167.34	135.07	53.59	-92.59	-7,871.46	-1,903.98	2,211.23	2,033.67	177.55	12.454	
17,400.00	9,328.05	13,191.46	10,166.88	136.68	54.86	-92.04	-7,951.88	-1,900.90	2,207.90	2,027.65	180.25	12.249	
17,500.00	9,328.45	13,266.28	10,165.43	138.29	56.36	-91.89	-8,046.66	-1,898.40	2,205.27	2,022.09	183.18	12.039	
17,600.00	9,328.86	13,372.46	10,164.08	139.90	57.72	-91.50	-8,132.80	-1,896.32	2,202.85	2,016.87	185.99	11.844	
17,700.00	9,329.26	13,456.34	10,164.03	141.51	59.05	-91.05	-8,216.66	-1,894.51	2,201.25	2,012.52	188.72	11.664	
17,800.00	9,329.67	13,543.16	10,163.92	143.12	60.43	-90.67	-8,303.47	-1,893.26	2,200.28	2,008.76	191.51	11.489	
17,900.00	9,330.07	13,642.29	10,163.73	144.73	62.01	-90.65	-8,402.60	-1,892.39	2,199.79	2,005.28	194.51	11.309	
18,000.00	9,330.48	13,831.02	10,163.01	146.35	65.03	-93.16	-8,591.21	-1,886.62	2,197.32	1,998.51	198.82	11.052	
18,100.00	9,330.88	13,939.65	10,161.62	147.96	66.78	-93.41	-8,699.68	-1,880.77	2,192.27	1,990.32	201.94	10.856	
18,200.00	9,331.29	14,038.43	10,159.18	149.58	68.37	-93.38	-8,798.31	-1,876.00	2,187.26	1,982.28	204.98	10.671	
18,300.00	9,331.69	14,126.07	10,156.46	151.20	69.79	-93.03	-8,885.82	-1,872.15	2,182.42	1,974.53	207.88	10.498	
18,400.00	9,332.09	14,208.85	10,155.28	152.81	71.13	-92.54	-8,968.52	-1,868.65	2,178.37	1,967.69	210.68	10.339	
18,500.00	9,332.50	14,296.95	10,153.90	154.43	72.55	-92.20	-9,056.55	-1,865.65	2,175.02	1,961.45	213.57	10.184	
18,600.00	9,332.90	14,395.13	10,154.14	156.05	74.14	-92.15	-9,154.66	-1,861.89	2,172.00	1,955.45	216.54	10.030	
18,700.00	9,333.31	14,506.36	10,153.93	157.67	75.95	-92.47	-9,265.81	-1,857.56	2,168.75	1,949.04	219.72	9.871	
800.00	9,333.71	14,612.13	10,152.83	159.30	77.67	-92.64	-9,371.48	-1,853.21	2,164.96	1,942.13	222.84	9.715	

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



MS Energy Services
Anticollision Report



Company: Devon Energy
Project: Eddy County, New Mexico (NAD 83)
Reference Site: Cotton Draw Unit
Site Error: 0.00 usft
Reference Well: 515H
Well Error: 0.00 usft
Reference Wellbore: Wellbore #1
Reference Design: Design #1

Local Co-ordinate Reference: Well 515H
TVD Reference: Well @ 3566.10usft (Cactus 126)
MD Reference: Well @ 3566.10usft (Cactus 126)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: 5000.1 Conroe DB
Offset TVD Reference: Offset Datum

Offset Design Cotton Draw Unit - 511H - Wellbore #1 - Surveys												Offset Site Error:	0.00 usft
Survey Program: 143-VESSEL_GYRO_DROP, 9907-MWD												Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Azimuth from North (°)	Offset Wellbore Centre		Distance		Minimum Separation (usft)	Separation Factor	Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)			
18,900.00	9,334.12	14,721.67	10,151.99	160.92	79.45	-92.92	-9,480.91	-1,848.32	2,160.97	1,934.97	226.00	9.562	
19,000.00	9,334.52	14,832.41	10,149.36	162.54	81.25	-93.23	-9,591.51	-1,843.49	2,156.43	1,927.21	229.22	9.408	
19,100.00	9,334.93	14,943.71	10,145.14	164.16	83.07	-93.56	-9,702.62	-1,838.64	2,151.33	1,918.84	232.50	9.253	
19,200.00	9,335.33	15,043.52	10,140.78	165.79	84.70	-93.55	-9,802.25	-1,834.29	2,146.03	1,910.38	235.65	9.107	
19,300.00	9,335.73	15,067.00	10,139.76	167.41	85.08	-91.34	-9,825.68	-1,833.27	2,142.08	1,904.44	237.65	9.014	
19,337.30	9,335.88	15,067.00	10,139.76	168.02	85.08	-90.25	-9,825.68	-1,833.27	2,141.76	1,903.60	238.16	8.993 ES	
19,390.56	9,336.10	15,067.00	10,139.76	168.88	85.08	-88.71	-9,825.68	-1,833.27	2,142.42	1,903.65	238.77	8.973 SF	



MS Energy Services Anticollision Report



Company: Devon Energy
Project: Eddy County, New Mexico (NAD 83)
Reference Site: Cotton Draw Unit
Site Error: 0.00 usft
Reference Well: 515H
Well Error: 0.00 usft
Reference Wellbore: Wellbore #1
Reference Design: Design #1

Local Co-ordinate Reference: Well 515H
TVD Reference: Well @ 3566.10usft (Cactus 126)
MD Reference: Well @ 3566.10usft (Cactus 126)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: 5000.1 Conroe DB
Offset TVD Reference: Offset Datum

Offset Design Cotton Draw Unit - 512H - Wellbore #1 - Design #2													Offset Site Error:	0.00 usft
Survey Program: 26-MWD, 738-MWD													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Azimuth from North (°)	Offset Wellbore Centre		Distance		Minimum Separation (usft)	Separation Factor	Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)				
0.00	0.00	0.00	0.00	0.00	0.00	-161.87	-4,573.58	-1,497.54	4,812.59					
100.00	100.00	78.34	78.34	0.13	0.19	-161.87	-4,573.59	-1,497.40	4,812.48	4,812.16	0.32	N/A		
200.00	200.00	182.05	182.04	0.49	0.55	-161.88	-4,573.65	-1,496.43	4,812.24	4,811.20	1.05	4,602.825		
239.20	239.20	211.01	211.00	0.63	0.66	-161.89	-4,573.68	-1,496.22	4,812.19	4,810.90	1.29	3,733.646		
300.00	300.00	250.83	250.82	0.85	0.80	-161.89	-4,573.86	-1,496.03	4,812.35	4,810.71	1.65	2,922.170		
400.00	400.00	332.98	332.97	1.21	1.08	-161.90	-4,574.56	-1,495.61	4,813.00	4,810.70	2.29	2,097.506		
500.00	500.00	438.21	438.19	1.57	1.46	-161.91	-4,575.66	-1,494.79	4,813.75	4,810.72	3.03	1,589.994		
600.00	600.00	506.48	506.45	1.93	1.70	-161.92	-4,576.48	-1,494.47	4,814.75	4,811.12	3.63	1,326.947		
700.00	700.00	584.22	584.19	2.29	1.98	-161.92	-4,577.65	-1,494.42	4,816.20	4,811.94	4.26	1,130.146		
800.00	800.00	693.18	693.13	2.64	2.37	-161.93	-4,579.68	-1,494.23	4,817.92	4,812.91	5.01	962.226		
900.00	900.00	811.04	810.97	3.00	2.79	-161.94	-4,581.50	-1,494.03	4,819.33	4,813.54	5.79	832.985		
1,000.00	1,000.00	971.87	971.80	3.36	3.35	-161.94	-4,582.43	-1,493.92	4,819.79	4,813.09	6.70	719.025		
1,100.00	1,100.00	1,071.87	1,071.80	3.72	3.68	-161.94	-4,582.43	-1,493.92	4,819.79	4,812.40	7.40	651.474		
1,200.00	1,200.00	1,171.87	1,171.80	4.08	4.02	-161.94	-4,582.43	-1,493.92	4,819.79	4,811.70	8.10	595.253		
1,300.00	1,300.00	1,271.87	1,271.80	4.44	4.36	-161.94	-4,582.43	-1,493.92	4,819.79	4,811.00	8.80	547.783		
1,400.00	1,400.00	1,371.87	1,371.80	4.79	4.71	-161.94	-4,582.43	-1,493.92	4,819.79	4,810.29	9.50	507.203		
1,500.00	1,500.00	1,471.87	1,471.80	5.15	5.06	-161.94	-4,582.43	-1,493.92	4,819.79	4,809.59	10.21	472.137		
1,600.00	1,600.00	1,544.54	1,544.46	5.51	5.31	-161.94	-4,582.51	-1,494.07	4,820.00	4,809.18	10.82	445.504		
1,700.00	1,700.00	1,600.00	1,599.92	5.87	5.50	-161.94	-4,582.85	-1,494.68	4,820.97	4,809.60	11.37	424.029		
1,800.00	1,800.00	1,668.42	1,668.32	6.23	5.74	-161.92	-4,583.62	-1,496.08	4,822.71	4,810.75	11.96	403.115		
1,900.00	1,900.00	1,730.30	1,730.17	6.59	5.95	-161.91	-4,584.66	-1,497.97	4,825.25	4,812.72	12.53	384.952		
2,000.00	2,000.00	1,800.00	1,799.79	6.95	6.20	-161.88	-4,586.21	-1,500.80	4,828.59	4,815.46	13.13	367.660		
2,100.00	2,100.00	1,853.90	1,853.61	7.30	6.39	-161.85	-4,587.69	-1,503.49	4,832.70	4,819.03	13.68	353.373		
2,200.00	2,200.00	1,915.59	1,915.15	7.66	6.60	-161.82	-4,589.69	-1,507.12	4,837.61	4,823.37	14.25	339.590		
2,300.00	2,300.00	1,977.18	1,976.55	8.02	6.82	-161.78	-4,592.00	-1,511.32	4,843.31	4,828.50	14.81	326.929		
2,400.00	2,400.00	2,038.65	2,037.79	8.38	7.04	-161.74	-4,594.62	-1,516.09	4,849.80	4,834.42	15.38	315.270		
2,500.00	2,500.00	2,100.28	2,099.10	8.74	7.26	-161.69	-4,597.56	-1,521.44	4,857.09	4,841.14	15.95	304.492		
2,600.00	2,599.99	2,200.32	2,197.97	9.10	7.62	-161.61	-4,602.57	-1,530.54	4,865.57	4,848.91	16.66	291.965		
2,700.00	2,699.96	2,301.02	2,296.72	9.45	7.99	-161.54	-4,607.57	-1,539.63	4,875.69	4,858.31	17.38	280.487		
2,800.00	2,799.86	2,401.86	2,395.34	9.81	8.37	-161.47	-4,612.56	-1,548.71	4,887.42	4,869.32	18.10	269.983		
2,900.00	2,899.68	2,502.87	2,493.79	10.17	8.74	-161.42	-4,617.54	-1,557.77	4,900.77	4,881.95	18.82	260.344		
3,000.00	2,999.37	2,604.08	2,592.03	10.53	9.12	-161.37	-4,622.51	-1,566.81	4,915.73	4,896.19	19.55	251.479		
3,100.00	3,098.90	2,705.52	2,690.05	10.89	9.50	-161.33	-4,627.47	-1,575.83	4,932.30	4,912.02	20.27	243.305		
3,200.00	3,198.26	2,807.23	2,787.81	11.25	9.88	-161.30	-4,632.42	-1,584.83	4,950.45	4,929.46	21.00	235.752		
3,299.74	3,297.14	2,909.48	2,885.03	11.61	10.27	-161.27	-4,637.34	-1,593.77	4,970.15	4,948.42	21.73	228.755		
3,300.00	3,297.40	2,909.22	2,885.28	11.61	10.27	-161.27	-4,637.35	-1,593.80	4,970.20	4,948.47	21.73	228.758		
3,400.00	3,396.43	2,988.63	2,982.60	11.98	10.57	-161.25	-4,642.28	-1,602.75	4,990.74	4,968.37	22.37	223.070		
3,500.00	3,495.46	3,086.49	3,079.92	12.36	10.95	-161.23	-4,647.20	-1,611.71	5,011.28	4,988.19	23.09	217.053		
3,600.00	3,594.49	3,184.34	3,177.24	12.73	11.32	-161.21	-4,652.13	-1,620.67	5,031.81	5,008.01	23.80	211.382		
3,700.00	3,693.51	3,282.19	3,274.55	13.11	11.69	-161.19	-4,657.05	-1,629.62	5,052.35	5,027.83	24.52	206.030		
3,800.00	3,792.54	3,380.04	3,371.87	13.49	12.07	-161.17	-4,661.98	-1,638.58	5,072.89	5,047.65	25.24	200.971		
3,900.00	3,891.57	3,477.90	3,469.19	13.87	12.45	-161.16	-4,666.90	-1,647.54	5,093.43	5,067.47	25.96	196.182		
4,000.00	3,990.60	3,575.75	3,566.51	14.25	12.82	-161.14	-4,671.83	-1,656.49	5,113.97	5,087.28	26.68	191.643		
4,100.00	4,089.62	3,673.60	3,663.82	14.64	13.20	-161.12	-4,676.75	-1,665.45	5,134.51	5,107.10	27.41	187.336		
4,200.00	4,188.65	3,771.46	3,761.14	15.02	13.58	-161.10	-4,681.68	-1,674.41	5,155.05	5,126.92	28.13	183.244		
4,300.00	4,287.68	3,869.31	3,858.46	15.41	13.96	-161.08	-4,686.60	-1,683.36	5,175.59	5,146.74	28.86	179.351		
4,400.00	4,386.71	3,967.16	3,955.78	15.80	14.34	-161.06	-4,691.53	-1,692.32	5,196.14	5,166.55	29.58	175.643		
4,500.00	4,485.73	4,065.01	4,053.09	16.19	14.72	-161.04	-4,696.45	-1,701.27	5,216.68	5,186.37	30.31	172.109		
4,600.00	4,584.76	4,162.87	4,150.41	16.59	15.10	-161.02	-4,701.38	-1,710.23	5,237.22	5,206.18	31.04	168.736		
4,700.00	4,683.79	4,260.72	4,247.73	16.98	15.48	-161.01	-4,706.30	-1,719.19	5,257.77	5,226.00	31.77	165.513		
4,800.00	4,782.81	4,358.57	4,345.05	17.37	15.86	-160.99	-4,711.23	-1,728.14	5,278.31	5,245.81	32.50	162.432		
4,900.00	4,881.84	4,456.43	4,442.36	17.77	16.24	-160.97	-4,716.15	-1,737.10	5,298.85	5,265.63	33.23	159.483		

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



MS Energy Services
Anticollision Report



Company: Devon Energy
Project: Eddy County, New Mexico (NAD 83)
Reference Site: Cotton Draw Unit
Site Error: 0.00 usft
Reference Well: 515H
Well Error: 0.00 usft
Reference Wellbore: Wellbore #1
Reference Design: Design #1

Local Co-ordinate Reference: Well 515H
TVD Reference: Well @ 3566.10usft (Cactus 126)
MD Reference: Well @ 3566.10usft (Cactus 126)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: 5000.1 Conroe DB
Offset TVD Reference: Offset Datum

Offset Design Cotton Draw Unit - 512H - Wellbore #1 - Design #2													Offset Site Error: 0.00 usft
Survey Program: 26-MWD, 738-MWD													Offset Well Error: 0.00 usft
Reference		Offset		Semi Major Axis		Azimuth from North (°)	Distance		Minimum Separation (usft)	Separation Factor	Warning		
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)					
5,000.00	4,980.87	4,554.28	4,539.68	18.17	16.62	-160.95	-4,721.08	-1,746.06	5,319.40	5,285.44	33.96	156.657	
5,100.00	5,079.90	4,652.13	4,637.00	18.56	17.01	-160.93	-4,726.00	-1,755.01	5,339.95	5,305.26	34.69	153.949	
5,200.00	5,178.92	4,749.98	4,734.32	18.96	17.39	-160.92	-4,730.93	-1,763.97	5,360.49	5,325.07	35.42	151.349	
5,300.00	5,277.95	4,833.27	4,818.00	19.36	17.77	-95.81	145.00	-1,871.22	5,291.87	5,232.53	59.35	89.168	
5,400.00	5,376.98	4,933.27	4,918.00	19.76	18.16	-96.23	145.00	-1,871.22	5,199.57	5,139.69	59.88	86.838	
5,500.00	5,476.01	4,933.27	4,918.00	20.16	18.56	-96.66	145.00	-1,871.22	5,107.55	5,047.13	60.43	84.527	
5,600.00	5,575.03	4,933.27	4,918.00	20.56	18.96	-97.09	145.00	-1,871.22	5,015.85	4,954.85	60.99	82.235	
5,628.09	5,602.86	4,933.27	4,918.00	20.68	19.08	-97.21	145.00	-1,871.22	4,990.14	4,928.98	61.16	81.594	
5,700.00	5,674.12	4,933.27	4,918.00	20.96	19.36	-97.50	145.00	-1,871.22	4,924.39	4,862.80	61.59	79.961	
5,800.00	5,773.42	4,933.27	4,918.00	21.36	19.76	-97.86	145.00	-1,871.22	4,833.02	4,770.82	62.20	77.704	
5,900.00	5,872.91	4,933.27	4,918.00	21.74	20.14	-98.17	145.00	-1,871.22	4,741.77	4,678.93	62.83	75.467	
6,000.00	5,972.56	4,933.27	4,918.00	22.12	20.52	-98.42	145.00	-1,871.22	4,650.65	4,587.17	63.49	73.251	
6,100.00	6,072.35	4,933.27	4,918.00	22.49	20.89	-98.62	145.00	-1,871.22	4,559.73	4,495.56	64.17	71.056	
6,200.00	6,172.23	4,933.27	4,918.00	22.86	21.26	-98.77	145.00	-1,871.22	4,469.02	4,404.15	64.88	68.885	
6,300.00	6,272.18	4,933.27	4,918.00	23.21	21.61	-98.87	145.00	-1,871.22	4,378.58	4,312.98	65.61	66.738	
6,400.00	6,372.17	4,933.27	4,918.00	23.56	21.96	-98.91	145.00	-1,871.22	4,288.46	4,222.09	66.37	64.617	
6,427.83	6,400.00	4,933.27	4,918.00	23.66	22.06	-98.91	145.00	-1,871.22	4,263.43	4,196.85	66.58	64.031	
6,500.00	6,472.17	4,933.27	4,918.00	23.90	22.30	-98.91	145.00	-1,871.22	4,198.71	4,131.55	67.16	62.521	
6,600.00	6,572.17	4,933.27	4,918.00	24.25	22.65	-98.91	145.00	-1,871.22	4,109.43	4,041.45	67.98	60.452	
6,700.00	6,672.17	4,933.27	4,918.00	24.59	22.99	-98.91	145.00	-1,871.22	4,020.65	3,951.81	68.84	58.408	
6,800.00	6,772.17	4,933.27	4,918.00	24.93	23.33	-98.91	145.00	-1,871.22	3,932.42	3,862.68	69.73	56.392	
6,900.00	6,872.17	4,933.27	4,918.00	25.28	23.68	-98.91	145.00	-1,871.22	3,844.76	3,774.09	70.67	54.405	
7,000.00	6,972.17	4,933.27	4,918.00	25.62	24.02	-98.91	145.00	-1,871.22	3,757.71	3,686.06	71.65	52.447	
7,100.00	7,072.17	4,933.27	4,918.00	25.97	24.37	-98.91	145.00	-1,871.22	3,671.33	3,598.66	72.67	50.521	
7,200.00	7,172.17	4,933.27	4,918.00	26.31	24.71	-98.91	145.00	-1,871.22	3,585.65	3,511.91	73.74	48.626	
7,300.00	7,272.17	4,933.27	4,918.00	26.66	25.06	-98.91	145.00	-1,871.22	3,500.74	3,425.88	74.86	46.766	
7,400.00	7,372.17	4,933.27	4,918.00	27.00	25.40	-98.91	145.00	-1,871.22	3,416.64	3,340.61	76.03	44.940	
7,500.00	7,472.17	4,933.27	4,918.00	27.35	25.75	-98.91	145.00	-1,871.22	3,333.41	3,256.16	77.25	43.151	
7,600.00	7,572.17	4,933.27	4,918.00	27.69	26.09	-98.91	145.00	-1,871.22	3,251.14	3,172.61	78.53	41.400	
7,700.00	7,672.17	4,933.27	4,918.00	28.04	26.44	-98.91	145.00	-1,871.22	3,169.88	3,090.01	79.87	39.688	
7,800.00	7,772.17	4,933.27	4,918.00	28.39	26.79	-98.91	145.00	-1,871.22	3,089.73	3,008.46	81.27	38.018	
7,900.00	7,872.17	4,933.27	4,918.00	28.74	27.14	-98.91	145.00	-1,871.22	3,010.76	2,928.02	82.73	36.391	
8,000.00	7,972.17	4,933.27	4,918.00	29.08	27.48	-98.91	145.00	-1,871.22	2,933.07	2,848.81	84.26	34.809	
8,100.00	8,072.17	4,933.27	4,918.00	29.43	27.83	-98.91	145.00	-1,871.22	2,856.77	2,770.92	85.86	33.274	
8,200.00	8,172.17	4,933.27	4,918.00	29.78	28.18	-98.91	145.00	-1,871.22	2,781.98	2,694.46	87.52	31.787	
8,300.00	8,272.17	4,933.27	4,918.00	30.13	28.53	-98.91	145.00	-1,871.22	2,708.81	2,619.56	89.25	30.351	
8,400.00	8,372.17	4,933.27	4,918.00	30.48	28.88	-98.91	145.00	-1,871.22	2,637.41	2,546.36	91.05	28.968	
8,500.00	8,472.17	4,933.27	4,918.00	30.83	29.23	-98.91	145.00	-1,871.22	2,567.91	2,475.00	92.91	27.639	
8,600.00	8,572.17	4,933.27	4,918.00	31.18	29.58	-98.91	145.00	-1,871.22	2,500.48	2,405.65	94.83	26.367	
8,700.00	8,672.17	4,933.27	4,918.00	31.52	29.92	-98.91	145.00	-1,871.22	2,435.30	2,338.48	96.81	25.154	
8,751.58	8,723.75	4,933.27	4,918.00	31.70	30.10	-98.91	145.00	-1,871.22	2,402.61	2,304.75	97.86	24.552	
8,800.00	8,772.11	4,933.27	4,918.00	31.86	30.26	-98.85	145.00	-1,871.22	2,372.54	2,273.70	98.84	24.004	
8,850.00	8,821.68	4,933.27	4,918.00	32.00	30.40	-98.65	145.00	-1,871.22	2,342.31	2,242.46	99.85	23.457	
8,900.00	8,870.51	4,933.27	4,918.00	32.12	30.52	-98.32	145.00	-1,871.22	2,313.18	2,212.31	100.87	22.933	
8,950.00	8,918.22	4,933.27	4,918.00	32.24	30.64	-97.87	145.00	-1,871.22	2,285.40	2,183.54	101.86	22.436	
9,000.00	8,964.46	4,933.27	4,918.00	32.34	30.74	-97.29	145.00	-1,871.22	2,259.26	2,156.42	102.84	21.969	
9,050.00	9,008.86	4,933.27	4,918.00	32.43	30.83	-96.58	145.00	-1,871.22	2,235.00	2,131.22	103.78	21.536	
9,100.00	9,051.09	4,933.27	4,918.00	32.51	30.91	-95.77	145.00	-1,871.22	2,212.88	2,108.20	104.68	21.140	
9,150.00	9,090.83	4,933.27	4,918.00	32.58	30.98	-94.84	145.00	-1,871.22	2,193.13	2,087.61	105.52	20.783	
9,200.00	9,127.77	4,933.27	4,918.00	32.65	31.05	-93.81	145.00	-1,871.22	2,175.97	2,069.66	106.31	20.469	
9,250.00	9,161.64	4,933.27	4,918.00	32.71	31.11	-92.69	145.00	-1,871.22	2,161.59	2,054.57	107.02	20.199	
9,300.00	9,192.18	4,933.27	4,918.00	32.78	31.18	-91.49	145.00	-1,871.22	2,150.16	2,042.51	107.65	19.974	

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



MS Energy Services Anticollision Report



Company: Devon Energy
Project: Eddy County, New Mexico (NAD 83)
Reference Site: Cotton Draw Unit
Site Error: 0.00 usft
Reference Well: 515H
Well Error: 0.00 usft
Reference Wellbore: Wellbore #1
Reference Design: Design #1

Local Co-ordinate Reference: Well 515H
TVD Reference: Well @ 3566.10usft (Cactus 126)
MD Reference: Well @ 3566.10usft (Cactus 126)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at: 2.00 sigma
Database: 5000.1 Conroe DB
Offset TVD Reference: Offset Datum

Offset Design Cotton Draw Unit - 512H - Wellbore #1 - Design #2													Offset Site Error: 0.00 usft
Survey Program: 26-MWD, 738-MWD													Offset Well Error: 0.00 usft
Reference		Offset		Semi Major Axis		Azimuth from North (°)	Offset Wellbore Centre		Distance		Minimum Separation (usft)	Separation Factor	Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)			
9,350.00	9,219.15	14,935.91	10,202.72	32.85	86.72	-90.14	147.64	-1,871.22	2,141.81	2,033.59	108.22	19.791	
9,400.00	9,242.36	14,892.17	10,202.52	32.92	86.06	-90.14	103.90	-1,871.22	2,136.26	2,028.10	108.15	19.752	
9,450.00	9,261.81	14,846.57	10,202.30	32.99	85.37	-90.14	58.31	-1,871.22	2,132.97	2,024.99	107.99	19.752	
9,500.00	9,276.77	14,800.53	10,202.08	33.08	84.68	-90.13	11.20	-1,871.22	2,131.89	2,024.15	107.74	19.787	
9,500.14	9,276.81	14,800.66	10,202.08	33.08	84.68	-90.13	11.07	-1,871.22	2,131.89	2,024.14	107.75	19.786	
9,550.00	9,287.73	14,751.21	10,201.85	33.17	83.94	-90.13	-37.05	-1,871.22	2,132.94	2,025.55	107.39	19.862	
9,600.00	9,294.39	14,702.18	10,201.62	33.27	83.21	-90.13	-86.08	-1,871.22	2,136.03	2,029.06	106.97	19.968	
9,649.26	9,296.70	14,653.47	10,201.39	33.37	82.48	-90.13	-134.80	-1,871.22	2,141.01	2,034.52	106.49	20.105	
9,700.00	9,296.91	14,603.16	10,201.15	33.49	81.74	-90.13	-185.11	-1,871.22	2,146.70	2,040.74	105.97	20.258	
9,800.00	9,297.31	14,503.69	10,200.69	33.80	80.26	-90.13	-284.57	-1,871.22	2,155.59	2,050.62	104.97	20.535	
9,900.00	9,297.72	14,403.93	10,200.22	34.17	78.79	-90.13	-384.33	-1,871.22	2,161.34	2,057.32	104.02	20.778	
10,000.00	9,298.12	14,304.00	10,199.74	34.62	77.32	-90.13	-484.26	-1,871.22	2,163.96	2,060.84	103.11	20.986	
10,027.33	9,298.24	14,276.67	10,199.62	34.75	76.92	-90.13	-511.59	-1,871.22	2,164.12	2,061.25	102.87	21.037	
10,100.00	9,298.53	14,204.00	10,199.27	35.13	75.86	-90.13	-584.25	-1,871.22	2,164.25	2,062.00	102.26	21.165	
10,200.00	9,298.93	14,104.01	10,198.80	35.71	74.40	-90.13	-684.25	-1,871.22	2,164.43	2,062.96	101.47	21.330	
10,300.00	9,299.34	14,004.02	10,198.33	36.35	72.96	-90.13	-784.24	-1,871.22	2,164.61	2,063.86	100.76	21.484	
10,400.00	9,299.74	13,904.02	10,197.86	37.06	71.52	-90.13	-884.23	-1,871.23	2,164.79	2,064.69	100.10	21.625	
10,500.00	9,300.15	13,804.03	10,197.39	37.83	70.10	-90.13	-984.23	-1,871.23	2,164.97	2,065.45	99.52	21.755	
10,600.00	9,300.55	13,704.03	10,196.92	38.65	68.68	-90.13	-1,084.22	-1,871.23	2,165.15	2,066.16	98.99	21.872	
10,700.00	9,300.96	13,604.04	10,196.45	39.53	67.27	-90.13	-1,184.21	-1,871.23	2,165.33	2,066.81	98.52	21.978	
10,800.00	9,301.36	13,504.04	10,195.98	40.45	65.88	-90.13	-1,284.21	-1,871.23	2,165.52	2,067.41	98.11	22.072	
10,900.00	9,301.76	13,404.05	10,195.50	41.42	64.50	-90.13	-1,384.20	-1,871.23	2,165.70	2,067.95	97.75	22.156	
11,000.00	9,302.17	13,304.06	10,195.03	42.44	63.13	-90.13	-1,484.19	-1,871.23	2,165.88	2,068.44	97.44	22.227	
11,100.00	9,302.57	13,204.06	10,194.56	43.49	61.78	-90.13	-1,584.19	-1,871.23	2,166.06	2,068.88	97.18	22.289	
11,200.00	9,302.98	13,104.07	10,194.09	44.58	60.44	-90.13	-1,684.18	-1,871.23	2,166.25	2,069.28	96.97	22.339	
11,300.00	9,303.38	13,004.07	10,193.62	45.71	59.12	-90.13	-1,784.17	-1,871.23	2,166.43	2,069.63	96.81	22.379	
11,400.00	9,303.79	12,904.08	10,193.15	46.86	57.81	-90.13	-1,884.16	-1,871.23	2,166.62	2,069.93	96.69	22.409	
11,500.00	9,304.19	12,804.08	10,192.68	48.05	56.52	-90.13	-1,984.16	-1,871.23	2,166.80	2,070.19	96.61	22.428	
11,600.00	9,304.60	12,704.09	10,192.21	49.26	55.25	-90.13	-2,084.15	-1,871.23	2,166.99	2,070.41	96.58	22.438	
11,700.00	9,305.00	12,604.10	10,191.73	50.50	54.01	-90.13	-2,184.14	-1,871.23	2,167.18	2,070.59	96.59	22.437	
11,800.00	9,305.40	12,504.10	10,191.26	51.76	52.78	-90.13	-2,284.14	-1,871.23	2,167.36	2,070.72	96.64	22.427	
11,900.00	9,305.81	12,404.11	10,190.79	53.05	51.58	-90.13	-2,384.13	-1,871.23	2,167.55	2,070.81	96.74	22.406	
12,000.00	9,306.21	12,304.11	10,190.32	54.35	50.41	-90.12	-2,484.12	-1,871.23	2,167.74	2,070.86	96.88	22.376	
12,100.00	9,306.62	12,204.12	10,189.85	55.67	49.26	-90.12	-2,584.12	-1,871.23	2,167.93	2,070.87	97.06	22.336	
12,200.00	9,307.02	12,104.12	10,189.38	57.01	48.14	-90.12	-2,684.11	-1,871.23	2,168.12	2,070.83	97.29	22.286	
12,300.00	9,307.43	12,004.13	10,188.91	58.37	47.05	-90.12	-2,784.10	-1,871.23	2,168.31	2,070.75	97.56	22.225	
12,400.00	9,307.83	11,904.14	10,188.44	59.74	46.00	-90.12	-2,884.10	-1,871.23	2,168.50	2,070.62	97.88	22.155	
12,500.00	9,308.23	11,804.14	10,187.96	61.13	44.98	-90.12	-2,984.09	-1,871.24	2,168.69	2,070.44	98.24	22.075	
12,600.00	9,308.64	11,704.15	10,187.49	62.53	44.00	-90.12	-3,084.08	-1,871.24	2,168.88	2,070.22	98.66	21.984	
12,700.00	9,309.04	11,604.15	10,187.02	63.94	43.07	-90.12	-3,184.08	-1,871.24	2,169.07	2,069.95	99.12	21.882	
12,800.00	9,309.45	11,504.16	10,186.55	65.36	42.17	-90.12	-3,284.07	-1,871.24	2,169.26	2,069.62	99.64	21.770	
12,900.00	9,309.85	11,404.16	10,186.08	66.80	41.33	-90.12	-3,384.06	-1,871.24	2,169.46	2,069.24	100.22	21.647	
13,000.00	9,310.26	11,304.17	10,185.61	68.24	40.53	-90.12	-3,484.06	-1,871.24	2,169.65	2,068.80	100.85	21.514	
13,100.00	9,310.66	11,204.18	10,185.14	69.69	39.78	-90.12	-3,584.05	-1,871.24	2,169.84	2,068.30	101.54	21.369	
13,200.00	9,311.07	11,104.18	10,184.67	71.16	39.09	-90.12	-3,684.04	-1,871.24	2,170.04	2,067.75	102.29	21.214	
13,300.00	9,311.47	11,004.19	10,184.19	72.63	38.46	-90.12	-3,784.04	-1,871.24	2,170.23	2,067.12	103.11	21.048	
13,400.00	9,311.87	10,904.19	10,183.72	74.11	37.88	-90.12	-3,884.03	-1,871.24	2,170.43	2,066.44	103.99	20.871	
13,500.00	9,312.28	9,305.61	9,284.08	75.59	33.28	-112.30	-4,789.92	-1,871.24	2,135.27	2,030.97	104.30	20.473	
13,600.00	9,312.68	9,306.01	9,284.48	77.09	33.28	-109.76	-4,789.92	-1,871.24	2,099.95	1,993.36	106.59	19.702	
13,700.00	9,313.09	9,306.42	9,284.89	78.59	33.28	-107.15	-4,789.92	-1,871.24	2,068.86	1,960.01	108.85	19.007	
3,800.00	9,313.49	9,306.82	9,285.29	80.09	33.28	-104.47	-4,789.92	-1,871.24	2,042.20	1,931.15	111.06	18.389	
3,900.00	9,313.90	9,307.23	9,285.70	81.60	33.29	-101.71	-4,789.92	-1,871.24	2,020.15	1,906.96	113.19	17.847	

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



MS Energy Services
Anticollision Report



Company: Devon Energy
Project: Eddy County, New Mexico (NAD 83)
Reference Site: Cotton Draw Unit
Site Error: 0.00 usft
Reference Well: 515H
Well Error: 0.00 usft
Reference Wellbore: Wellbore #1
Reference Design: Design #1

Local Co-ordinate Reference: Well 515H
TVD Reference: Well @ 3566.10usft (Cactus 126)
MD Reference: Well @ 3566.10usft (Cactus 126)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: 5000.1 Conroe DB
Offset TVD Reference: Offset Datum

Offset Design Cotton Draw Unit - 512H - Wellbore #1 - Design #2													Offset Site Error: 0.00 usft
Survey Program: 26-MWD, 738-MWD													Offset Well Error: 0.00 usft
Reference		Offset		Semi Major Axis		Azimuth from North (°)	Offset Wellbore Centre		Distance		Minimum Separation (usft)	Separation Factor	Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)			
14,000.00	9,314.30	9,307.63	9,286.10	83.12	33.29	-98.91	-4,789.92	-1,871.24	2,002.85	1,887.63	115.22	17.383	
14,100.00	9,314.71	9,308.04	9,286.51	84.64	33.29	-96.06	-4,789.92	-1,871.24	1,990.43	1,873.31	117.12	16.995	
14,200.00	9,315.11	9,308.44	9,286.91	86.17	33.29	-93.18	-4,789.92	-1,871.24	1,982.98	1,864.11	118.87	16.682	
14,297.99	9,315.51	9,308.84	9,287.31	87.67	33.29	-90.35	-4,789.92	-1,871.24	1,980.56	1,860.13	120.43	16.446 CC	
14,300.00	9,315.51	9,308.84	9,287.31	87.70	33.29	-90.29	-4,789.92	-1,871.24	1,980.56	1,860.10	120.46	16.442 ES	
14,400.00	9,315.92	9,309.25	9,287.72	89.24	33.29	-87.40	-4,789.92	-1,871.24	1,983.18	1,861.33	121.85	16.275	
14,500.00	9,316.32	9,309.65	9,288.12	90.78	33.29	-84.53	-4,789.92	-1,871.24	1,990.83	1,867.77	123.06	16.178	
14,600.00	9,316.73	9,310.06	9,288.53	92.33	33.29	-81.68	-4,789.92	-1,871.24	2,003.45	1,879.39	124.06	16.149 SF	
14,700.00	9,317.13	9,310.46	9,288.93	93.88	33.30	-78.88	-4,789.92	-1,871.24	2,020.94	1,896.08	124.86	16.185	
14,800.00	9,317.54	9,310.87	9,289.34	95.43	33.30	-76.13	-4,789.92	-1,871.24	2,043.19	1,917.72	125.46	16.285	
14,900.00	9,317.94	9,311.27	9,289.74	96.99	33.30	-73.44	-4,789.92	-1,871.24	2,070.03	1,944.15	125.88	16.445	
15,000.00	9,318.34	9,311.68	9,290.14	98.55	33.30	-70.83	-4,789.92	-1,871.24	2,101.29	1,975.18	126.11	16.662	
15,100.00	9,318.75	9,312.08	9,290.55	100.11	33.30	-68.31	-4,789.92	-1,871.24	2,136.77	2,010.60	126.18	16.935	
15,200.00	9,319.15	9,312.48	9,290.95	101.68	33.30	-65.87	-4,789.92	-1,871.24	2,176.28	2,050.19	126.09	17.260	
15,300.00	9,319.56	9,312.89	9,291.36	103.24	33.30	-63.52	-4,789.92	-1,871.24	2,219.60	2,093.72	125.87	17.634	
15,400.00	9,319.96	9,313.29	9,291.76	104.82	33.31	-61.26	-4,789.92	-1,871.24	2,266.50	2,140.96	125.54	18.054	
15,500.00	9,320.37	9,313.70	9,292.17	106.39	33.31	-59.10	-4,789.92	-1,871.24	2,316.76	2,191.66	125.10	18.519	
15,600.00	9,320.77	9,314.10	9,292.57	107.97	33.31	-57.03	-4,789.92	-1,871.24	2,370.19	2,245.61	124.58	19.025	
15,700.00	9,321.18	9,314.51	9,292.98	109.55	33.31	-55.06	-4,789.92	-1,871.24	2,426.56	2,302.57	123.99	19.571	
15,800.00	9,321.58	9,314.91	9,293.38	111.13	33.31	-53.18	-4,789.92	-1,871.24	2,485.68	2,362.34	123.34	20.153	
15,900.00	9,321.98	9,315.31	9,293.78	112.71	33.31	-51.38	-4,789.92	-1,871.24	2,547.35	2,424.70	122.65	20.770	
16,000.00	9,322.39	9,315.72	9,294.19	114.30	33.31	-49.68	-4,789.92	-1,871.24	2,611.39	2,489.47	121.92	21.418	
16,100.00	9,322.79	9,316.12	9,294.59	115.88	33.32	-48.05	-4,789.92	-1,871.24	2,677.64	2,556.47	121.17	22.098	
16,200.00	9,323.20	9,316.53	9,295.00	117.47	33.32	-46.51	-4,789.92	-1,871.24	2,745.94	2,625.53	120.41	22.805	
16,300.00	9,323.60	9,316.93	9,295.40	119.07	33.32	-45.04	-4,789.92	-1,871.24	2,816.13	2,696.49	119.63	23.540	
16,400.00	9,324.01	9,317.34	9,295.81	120.66	33.32	-43.65	-4,789.92	-1,871.24	2,888.07	2,769.22	118.86	24.299	
16,500.00	9,324.41	9,317.74	9,296.21	122.25	33.32	-42.32	-4,789.92	-1,871.24	2,961.65	2,843.57	118.08	25.082	
16,600.00	9,324.82	9,318.15	9,296.62	123.85	33.32	-41.06	-4,789.92	-1,871.24	3,036.73	2,919.42	117.31	25.886	
16,700.00	9,325.22	9,318.55	9,297.02	125.45	33.32	-39.86	-4,789.92	-1,871.24	3,113.22	2,996.67	116.55	26.711	
16,800.00	9,325.62	9,318.95	9,297.42	127.05	33.33	-38.72	-4,789.92	-1,871.24	3,191.01	3,075.20	115.80	27.555	
16,900.00	9,326.03	9,319.36	9,297.83	128.65	33.33	-37.63	-4,789.92	-1,871.24	3,270.00	3,154.93	115.07	28.417	
17,000.00	9,326.43	9,319.76	9,298.23	130.25	33.33	-36.59	-4,789.92	-1,871.24	3,350.12	3,235.77	114.36	29.296	
17,100.00	9,326.84	9,320.17	9,298.64	131.86	33.33	-35.61	-4,789.92	-1,871.24	3,431.28	3,317.63	113.66	30.190	
17,200.00	9,327.24	9,320.57	9,299.04	133.46	33.33	-34.66	-4,789.92	-1,871.24	3,513.42	3,400.44	112.98	31.099	
17,300.00	9,327.65	9,320.98	9,299.45	135.07	33.33	-33.77	-4,789.92	-1,871.24	3,596.46	3,484.14	112.31	32.021	
17,400.00	9,328.05	9,321.38	9,299.85	136.68	33.33	-32.91	-4,789.92	-1,871.24	3,680.34	3,568.67	111.67	32.957	
17,500.00	9,328.45	9,321.79	9,300.25	138.29	33.33	-32.09	-4,789.92	-1,871.24	3,765.01	3,653.96	111.05	33.904	
17,600.00	9,328.86	9,322.19	9,300.66	139.90	33.34	-31.31	-4,789.92	-1,871.24	3,850.41	3,739.96	110.45	34.862	
17,700.00	9,329.26	9,322.59	9,301.06	141.51	33.34	-30.56	-4,789.92	-1,871.24	3,936.50	3,826.64	109.86	35.831	
17,800.00	9,329.67	9,323.00	9,301.47	143.12	33.34	-29.84	-4,789.92	-1,871.24	4,023.24	3,913.94	109.30	36.810	
17,900.00	9,330.07	9,323.40	9,301.87	144.73	33.34	-29.16	-4,789.92	-1,871.24	4,110.58	4,001.82	108.75	37.797	
18,000.00	9,330.48	9,323.81	9,302.28	146.35	33.34	-28.50	-4,789.92	-1,871.24	4,198.48	4,090.25	108.23	38.794	
18,100.00	9,330.88	9,324.21	9,302.68	147.96	33.34	-27.87	-4,789.92	-1,871.24	4,286.91	4,179.19	107.72	39.798	
18,200.00	9,331.29	9,324.62	9,303.09	149.58	33.34	-27.26	-4,789.92	-1,871.24	4,375.84	4,268.62	107.23	40.809	
18,300.00	9,331.69	9,325.02	9,303.49	151.20	33.35	-26.68	-4,789.92	-1,871.24	4,465.24	4,358.49	106.75	41.828	
18,400.00	9,332.09	9,325.42	9,303.89	152.81	33.35	-26.12	-4,789.92	-1,871.24	4,555.08	4,448.79	106.30	42.853	
18,500.00	9,332.50	9,325.83	9,304.30	154.43	33.35	-25.59	-4,789.92	-1,871.24	4,645.34	4,539.48	105.86	43.884	
18,600.00	9,332.90	9,326.23	9,304.70	156.05	33.35	-25.07	-4,789.92	-1,871.24	4,735.99	4,630.55	105.43	44.920	
18,700.00	9,333.31	9,326.64	9,305.11	157.67	33.35	-24.58	-4,789.92	-1,871.24	4,827.00	4,721.98	105.02	45.961	
18,800.00	9,333.71	9,327.04	9,305.51	159.30	33.35	-24.10	-4,789.92	-1,871.24	4,918.37	4,813.74	104.63	47.008	
18,900.00	9,334.12	9,327.45	9,305.92	160.92	33.35	-23.64	-4,789.92	-1,871.24	5,010.06	4,905.81	104.25	48.059	
19,000.00	9,334.52	9,327.85	9,306.32	162.54	33.36	-23.19	-4,789.92	-1,871.24	5,102.07	4,998.18	103.88	49.113	

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



MS Energy Services
Anticollision Report



Company: Devon Energy
Project: Eddy County, New Mexico (NAD 83)
Reference Site: Cotton Draw Unit
Site Error: 0.00 usft
Reference Well: 515H
Well Error: 0.00 usft
Reference Wellbore: Wellbore #1
Reference Design: Design #1

Local Co-ordinate Reference: Well 515H
TVD Reference: Well @ 3566.10usft (Cactus 126)
MD Reference: Well @ 3566.10usft (Cactus 126)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: 5000.1 Conroe DB
Offset TVD Reference: Offset Datum

Offset Design Cotton Draw Unit - 512H - Wellbore #1 - Design #2														Offset Site Error:	0.00 usft
Survey Program: 26-MWD, 738-MWD														Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Azimuth from North (°)	Offset Wellbore Centre		Distance		Minimum Separation (usft)	Separation Factor	Warning		
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)					
19,100.00	9,334.93	9,328.26	9,306.73	164.16	33.36	-22.77	-4,789.92	-1,871.24	5,194.37	5,090.84	103.53	50.172			
19,200.00	9,335.33	9,328.66	9,307.13	165.79	33.36	-22.35	-4,789.92	-1,871.24	5,286.95	5,183.76	103.19	51.234			
19,300.00	9,335.73	9,329.06	9,307.53	167.41	33.36	-21.95	-4,789.92	-1,871.24	5,379.80	5,276.94	102.87	52.299			
19,390.56	9,336.10	9,329.43	9,307.90	168.88	33.36	-21.60	-4,789.92	-1,871.24	5,464.10	5,361.52	102.58	53.267			



MS Energy Services Anticollision Report



Company: Devon Energy
Project: Eddy County, New Mexico (NAD 83)
Reference Site: Cotton Draw Unit
Site Error: 0.00 usft
Reference Well: 515H
Well Error: 0.00 usft
Reference Wellbore: Wellbore #1
Reference Design: Design #1

Local Co-ordinate Reference: Well 515H
TVD Reference: Well @ 3566.10usft (Cactus 126)
MD Reference: Well @ 3566.10usft (Cactus 126)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: 5000.1 Conroe DB
Offset TVD Reference: Offset Datum

Offset Design Cotton Draw Unit - 513H - Wellbore #1 - Design #2													Offset Site Error:	0.00 usft
Survey Program: 2B-MWD, 700-MWD													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Azimuth from North (°)	Offset Wellbore Centre		Distance		Minimum Separation (usft)	Separation Factor	Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)				
0.00	0.00	0.00	0.00	0.00	0.00	-163.24	-4,572.86	-1,377.57	4,775.92					
100.00	100.00	87.85	87.85	0.13	0.22	-163.24	-4,572.78	-1,377.53	4,775.78	4,775.42	0.36	N/A		
200.00	200.00	175.46	175.46	0.49	0.53	-163.24	-4,572.49	-1,377.45	4,775.46	4,774.43	1.02	4,666.251		
204.56	204.56	178.36	178.36	0.51	0.54	-163.24	-4,572.48	-1,377.46	4,775.46	4,774.41	1.05	4,548.802		
300.00	300.00	243.74	243.74	0.85	0.77	-163.23	-4,572.63	-1,377.81	4,775.80	4,774.18	1.62	2,951.235		
400.00	400.00	336.55	336.55	1.21	1.09	-163.23	-4,573.17	-1,378.21	4,776.47	4,774.18	2.30	2,080.099		
500.00	500.00	417.00	416.99	1.57	1.37	-163.23	-4,573.88	-1,378.71	4,777.49	4,774.55	2.94	1,627.205		
600.00	600.00	526.91	526.89	1.93	1.76	-163.22	-4,575.02	-1,379.18	4,778.62	4,774.93	3.68	1,297.946		
700.00	700.00	633.33	633.31	2.29	2.13	-163.23	-4,576.02	-1,379.25	4,779.53	4,775.11	4.42	1,082.220		
800.00	800.00	723.89	723.86	2.64	2.45	-163.23	-4,576.82	-1,379.34	4,780.41	4,775.32	5.10	938.027		
900.00	900.00	873.83	873.80	3.00	2.98	-163.23	-4,577.86	-1,379.73	4,781.26	4,775.28	5.98	799.413		
1,000.00	1,000.00	973.83	973.80	3.36	3.32	-163.23	-4,577.86	-1,379.73	4,781.26	4,774.58	6.68	715.713		
1,100.00	1,100.00	1,081.67	1,081.63	3.72	3.69	-163.23	-4,577.96	-1,379.16	4,781.20	4,773.79	7.41	645.230		
1,200.00	1,200.00	1,192.22	1,192.15	4.08	4.08	-163.27	-4,578.43	-1,376.56	4,780.92	4,772.77	8.15	586.442		
1,300.00	1,300.00	1,302.63	1,302.46	4.44	4.46	-163.32	-4,579.27	-1,371.87	4,780.43	4,771.54	8.90	537.291		
1,400.00	1,400.00	1,412.82	1,412.43	4.79	4.85	-163.40	-4,580.48	-1,365.10	4,779.73	4,770.08	9.64	495.566		
1,500.00	1,500.00	1,522.70	1,521.94	5.15	5.25	-163.51	-4,582.06	-1,356.28	4,778.82	4,768.42	10.40	459.618		
1,600.00	1,600.00	1,632.19	1,630.88	5.51	5.64	-163.64	-4,584.01	-1,345.44	4,777.72	4,766.56	11.15	428.335		
1,700.00	1,700.00	1,741.23	1,739.13	5.87	6.05	-163.80	-4,586.31	-1,332.60	4,776.43	4,764.52	11.92	400.808		
1,800.00	1,800.00	1,849.73	1,846.58	6.23	6.46	-163.98	-4,588.96	-1,317.83	4,774.99	4,762.30	12.69	376.362		
1,900.00	1,900.00	1,957.61	1,953.13	6.59	6.88	-164.18	-4,591.95	-1,301.15	4,773.39	4,759.93	13.47	354.501		
2,000.00	2,000.00	2,057.39	2,051.47	6.95	7.28	-164.38	-4,594.92	-1,284.58	4,771.74	4,757.51	14.22	335.521		
2,100.00	2,100.00	2,155.95	2,148.62	7.30	7.68	-164.58	-4,597.86	-1,268.20	4,770.14	4,755.16	14.98	318.448		
2,200.00	2,200.00	2,254.51	2,245.77	7.66	8.08	-164.78	-4,600.80	-1,251.82	4,768.60	4,752.86	15.74	302.933		
2,300.00	2,300.00	2,353.08	2,342.92	8.02	8.49	-164.98	-4,603.73	-1,235.44	4,767.12	4,750.61	16.51	288.783		
2,400.00	2,400.00	2,451.64	2,440.07	8.38	8.90	-165.18	-4,606.67	-1,219.05	4,765.70	4,748.42	17.28	275.836		
2,500.00	2,500.00	2,550.21	2,537.22	8.74	9.31	-165.38	-4,609.61	-1,202.67	4,764.34	4,746.29	18.05	263.952		
2,577.16	2,577.16	2,626.24	2,612.16	9.01	9.63	-165.53	-4,611.87	-1,190.03	4,763.83	4,745.18	18.65	255.463		
2,600.00	2,599.99	2,648.73	2,634.33	9.10	9.73	-165.58	-4,612.54	-1,186.30	4,763.87	4,745.05	18.83	253.059		
2,700.00	2,699.96	2,747.16	2,731.34	9.45	10.15	-165.79	-4,615.48	-1,169.94	4,765.13	4,745.53	19.60	243.092		
2,800.00	2,799.86	2,845.46	2,828.23	9.81	10.57	-166.00	-4,618.41	-1,153.60	4,768.12	4,747.74	20.38	233.953		
2,900.00	2,899.68	2,943.61	2,924.97	10.17	10.99	-166.22	-4,621.33	-1,137.29	4,772.86	4,751.70	21.16	225.559		
3,000.00	2,999.37	3,041.56	3,021.52	10.53	11.41	-166.45	-4,624.25	-1,121.00	4,779.33	4,757.39	21.94	217.834		
3,100.00	3,098.90	3,139.30	3,117.86	10.89	11.83	-166.68	-4,627.17	-1,104.76	4,787.55	4,764.83	22.72	210.714		
3,200.00	3,198.26	3,236.80	3,213.95	11.25	12.26	-166.91	-4,630.07	-1,088.56	4,797.52	4,774.02	23.50	204.141		
3,299.74	3,297.14	3,333.76	3,309.52	11.61	12.68	-167.15	-4,632.96	-1,072.44	4,809.20	4,784.92	24.28	198.078		
3,300.00	3,297.40	3,334.02	3,309.77	11.61	12.68	-167.15	-4,632.97	-1,072.40	4,809.24	4,784.96	24.28	198.063		
3,400.00	3,396.43	3,431.09	3,405.45	11.98	13.10	-167.39	-4,635.86	-1,056.26	4,821.87	4,796.81	25.06	192.398		
3,500.00	3,495.46	3,528.16	3,501.13	12.36	13.53	-167.63	-4,638.75	-1,040.13	4,834.59	4,808.75	25.84	187.070		
3,600.00	3,594.49	3,625.23	3,596.80	12.73	13.95	-167.87	-4,641.65	-1,024.00	4,847.40	4,820.77	26.63	182.047		
3,700.00	3,693.51	3,722.30	3,692.48	13.11	14.38	-168.10	-4,644.54	-1,007.86	4,860.29	4,832.87	27.41	177.306		
3,800.00	3,792.54	3,819.37	3,788.16	13.49	14.80	-168.34	-4,647.43	-991.73	4,873.26	4,845.06	28.20	172.825		
3,900.00	3,891.57	3,916.44	3,883.83	13.87	15.23	-168.57	-4,650.33	-975.60	4,886.32	4,857.33	28.98	168.583		
4,000.00	3,990.60	4,013.51	3,979.51	14.25	15.66	-168.80	-4,653.22	-959.46	4,899.46	4,869.69	29.77	164.563		
4,100.00	4,089.62	4,110.58	4,075.19	14.64	16.08	-169.03	-4,656.11	-943.33	4,912.68	4,882.12	30.56	160.748		
4,200.00	4,188.65	4,207.65	4,170.87	15.02	16.51	-169.26	-4,659.01	-927.19	4,925.99	4,894.64	31.35	157.124		
4,300.00	4,287.68	4,304.73	4,266.54	15.41	16.94	-169.49	-4,661.90	-911.06	4,939.38	4,907.24	32.14	153.677		
4,400.00	4,386.71	4,401.80	4,362.22	15.80	17.37	-169.72	-4,664.79	-894.93	4,952.84	4,919.91	32.93	150.395		
4,500.00	4,485.73	4,501.13	4,457.90	16.19	17.81	-169.94	-4,667.69	-878.79	4,966.39	4,932.66	33.73	147.223		
4,600.00	4,584.76	4,604.06	4,553.57	16.59	18.27	-170.17	-4,670.58	-862.66	4,980.02	4,945.46	34.55	144.132		
4,700.00	4,683.79	4,706.99	4,649.25	16.98	18.72	-170.39	-4,673.47	-846.53	4,993.72	4,958.35	35.37	141.184		
4,800.00	4,782.81	4,809.92	4,744.93	17.37	19.18	-170.61	-4,676.36	-830.39	5,007.50	4,971.31	36.19	138.370		

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



MS Energy Services Anticollision Report



Company: Devon Energy
Project: Eddy County, New Mexico (NAD 83)
Reference Site: Cotton Draw Unit
Site Error: 0.00 usft
Reference Well: 515H
Well Error: 0.00 usft
Reference Wellbore: Wellbore #1
Reference Design: Design #1

Local Co-ordinate Reference: Well 515H
TVD Reference: Well @ 3566.10usft (Cactus 126)
MD Reference: Well @ 3566.10usft (Cactus 126)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: 5000.1 Conroe DB
Offset TVD Reference: Offset Datum

Offset Design Cotton Draw Unit - 513H - Wellbore #1 - Design #2													Offset Site Error: 0.00 usft
Survey Program: 26-MWD, 700-MWD													Offset Well Error: 0.00 usft
Reference		Offset		Semi Major Axis		Azimuth from North (°)	Offset Wellbore Centre		Distance		Minimum Separation (usft)	Separation Factor	Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N/-S (usft)	+E/-W (usft)	Between Centras (usft)	Between Ellipses (usft)			
4,900.00	4,881.84	4,887.15	4,840.60	17.77	19.52	-170.84	-4,679.26	-814.26	5,021.36	4,984.47	36.89	136.101	
5,000.00	4,980.87	4,984.22	4,936.28	18.17	19.95	-171.06	-4,682.15	-798.12	5,035.30	4,997.61	37.69	133.606	
5,100.00	5,079.90	5,081.29	5,031.96	18.56	20.38	-171.27	-4,685.04	-781.99	5,049.31	5,010.83	38.48	131.214	
5,200.00	5,178.92	5,178.36	5,127.63	18.96	20.82	-171.49	-4,687.94	-765.86	5,063.40	5,024.12	39.28	128.920	
5,300.00	5,277.95	5,046.81	10,232.83	19.36	88.25	-127.60	153.58	-251.10	4,989.80	4,937.37	52.43	95.163	
5,400.00	5,376.98	15,046.81	10,232.83	19.76	88.25	-129.77	153.58	-251.10	4,891.45	4,838.82	52.63	92.941	
5,500.00	5,476.01	15,046.81	10,232.83	20.16	88.25	-131.82	153.58	-251.10	4,793.16	4,740.33	52.83	90.730	
5,600.00	5,575.03	15,046.81	10,232.83	20.56	88.25	-133.76	153.58	-251.10	4,694.95	4,641.92	53.03	88.530	
5,628.09	5,602.86	15,046.81	10,232.83	20.68	88.25	-134.28	153.58	-251.10	4,667.37	4,614.28	53.09	87.914	
5,700.00	5,674.12	15,046.81	10,232.83	20.96	88.25	-135.53	153.58	-251.10	4,596.73	4,543.49	53.24	86.339	
5,800.00	5,773.42	15,046.81	10,232.83	21.36	88.25	-137.01	153.58	-251.10	4,498.29	4,444.84	53.45	84.153	
5,900.00	5,872.91	15,046.81	10,232.83	21.74	88.25	-138.21	153.58	-251.10	4,399.64	4,345.97	53.67	81.976	
6,000.00	5,972.56	15,046.81	10,232.83	22.12	88.25	-139.17	153.58	-251.10	4,300.78	4,246.89	53.89	79.808	
6,100.00	6,072.35	15,046.81	10,232.83	22.49	88.25	-139.90	153.58	-251.10	4,201.74	4,147.63	54.11	77.649	
6,200.00	6,172.23	15,046.81	10,232.83	22.86	88.25	-140.43	153.58	-251.10	4,102.54	4,048.20	54.34	75.502	
6,300.00	6,272.18	15,046.81	10,232.83	23.21	88.25	-140.77	153.58	-251.10	4,003.18	3,948.62	54.56	73.366	
6,400.00	6,372.17	15,046.81	10,232.83	23.56	88.25	-140.91	153.58	-251.10	3,903.71	3,848.91	54.80	71.241	
6,427.83	6,400.00	15,046.81	10,232.83	23.66	88.25	-140.92	153.58	-251.10	3,876.00	3,821.14	54.86	70.651	
6,500.00	6,472.17	15,046.81	10,232.83	23.90	88.25	-140.92	153.58	-251.10	3,804.15	3,749.12	55.03	69.129	
6,600.00	6,572.17	15,046.81	10,232.83	24.25	88.25	-140.92	153.58	-251.10	3,704.62	3,649.35	55.27	67.030	
6,700.00	6,672.17	15,046.81	10,232.83	24.59	88.25	-140.92	153.58	-251.10	3,605.11	3,549.60	55.51	64.943	
6,800.00	6,772.17	15,046.81	10,232.83	24.93	88.25	-140.92	153.58	-251.10	3,505.63	3,449.87	55.76	62.870	
6,900.00	6,872.17	15,046.81	10,232.83	25.28	88.25	-140.92	153.58	-251.10	3,406.18	3,350.17	56.01	60.809	
7,000.00	6,972.17	15,046.81	10,232.83	25.62	88.25	-140.92	153.58	-251.10	3,306.77	3,250.49	56.27	58.762	
7,100.00	7,072.17	15,046.81	10,232.83	25.97	88.25	-140.92	153.58	-251.10	3,207.39	3,150.85	56.54	56.728	
7,200.00	7,172.17	15,046.81	10,232.83	26.31	88.25	-140.92	153.58	-251.10	3,108.05	3,051.24	56.81	54.707	
7,300.00	7,272.17	15,046.81	10,232.83	26.66	88.25	-140.92	153.58	-251.10	3,008.75	2,951.66	57.09	52.700	
7,400.00	7,372.17	15,046.81	10,232.83	27.00	88.25	-140.92	153.58	-251.10	2,909.51	2,852.13	57.38	50.707	
7,500.00	7,472.17	15,046.81	10,232.83	27.35	88.25	-140.92	153.58	-251.10	2,810.31	2,752.64	57.67	48.728	
7,600.00	7,572.17	15,046.81	10,232.83	27.69	88.25	-140.92	153.58	-251.10	2,711.18	2,653.20	57.98	46.763	
7,700.00	7,672.17	15,046.81	10,232.83	28.04	88.25	-140.92	153.58	-251.10	2,612.11	2,553.82	58.29	44.812	
7,800.00	7,772.17	15,046.81	10,232.83	28.39	88.25	-140.92	153.58	-251.10	2,513.11	2,454.50	58.61	42.876	
7,900.00	7,872.17	15,046.81	10,232.83	28.74	88.25	-140.92	153.58	-251.10	2,414.20	2,355.25	58.95	40.954	
8,000.00	7,972.17	15,046.81	10,232.83	29.08	88.25	-140.92	153.58	-251.10	2,315.38	2,256.08	59.30	39.047	
8,100.00	8,072.17	15,046.81	10,232.83	29.43	88.25	-140.92	153.58	-251.10	2,216.67	2,157.01	59.66	37.155	
8,200.00	8,172.17	15,046.81	10,232.83	29.78	88.25	-140.92	153.58	-251.10	2,118.08	2,058.04	60.04	35.278	
8,300.00	8,272.17	15,046.81	10,232.83	30.13	88.25	-140.92	153.58	-251.10	2,019.62	1,959.18	60.44	33.417	
8,400.00	8,372.17	15,046.81	10,232.83	30.48	88.25	-140.92	153.58	-251.10	1,921.33	1,860.47	60.86	31.571	
8,500.00	8,472.17	15,046.81	10,232.83	30.83	88.25	-140.92	153.58	-251.10	1,823.22	1,761.92	61.30	29.741	
8,600.00	8,572.17	15,046.81	10,232.83	31.18	88.25	-140.92	153.58	-251.10	1,725.33	1,663.55	61.78	27.927	
8,700.00	8,672.17	15,046.81	10,232.83	31.52	88.25	-140.92	153.58	-251.10	1,627.69	1,565.40	62.29	26.130	
8,751.58	8,723.75	15,046.81	10,232.83	31.70	88.25	-140.92	153.58	-251.10	1,577.44	1,514.87	62.57	25.209	
8,800.00	8,772.11	15,046.81	10,232.83	31.86	88.25	-140.88	153.58	-251.10	1,530.09	1,467.24	62.85	24.345	
8,850.00	8,821.68	15,046.81	10,232.83	32.00	88.25	-139.93	153.58	-251.10	1,480.92	1,417.76	63.15	23.449	
8,900.00	8,870.51	15,046.81	10,232.83	32.12	88.25	-138.62	153.58	-251.10	1,431.83	1,368.36	63.47	22.558	
8,950.00	8,918.22	15,046.81	10,232.83	32.24	88.25	-136.72	153.58	-251.10	1,383.24	1,319.43	63.81	21.676	
9,000.00	8,964.46	15,046.81	10,232.83	32.34	88.25	-134.14	153.58	-251.10	1,335.58	1,271.40	64.18	20.810	
9,050.00	9,008.86	15,046.81	10,232.83	32.43	88.25	-130.77	153.58	-251.10	1,289.34	1,224.76	64.58	19.965	
9,100.00	9,051.09	15,046.81	10,232.83	32.51	88.25	-126.50	153.58	-251.10	1,245.06	1,180.03	65.02	19.147	
9,150.00	9,090.83	15,046.81	10,232.83	32.58	88.25	-121.21	153.58	-251.10	1,203.29	1,137.77	65.52	18.364	
9,200.00	9,127.77	15,046.81	10,232.83	32.65	88.25	-114.79	153.58	-251.10	1,164.65	1,098.56	66.09	17.623	
9,250.00	9,161.64	15,046.81	10,232.83	32.71	88.25	-107.27	153.58	-251.10	1,129.76	1,063.03	66.73	16.931	

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



MS Energy Services
Anticollision Report



Company: Devon Energy
Project: Eddy County, New Mexico (NAD 83)
Reference Site: Cotton Draw Unit
Site Error: 0.00 usft
Reference Well: 515H
Well Error: 0.00 usft
Reference Wellbore: Wellbore #1
Reference Design: Design #1

Local Co-ordinate Reference: Well 515H
TVD Reference: Well @ 3566.10usft (Cactus 126)
MD Reference: Well @ 3566.10usft (Cactus 126)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: 5000.1 Conroe DB
Offset TVD Reference: Offset Datum

Offset Design Cotton Draw Unit - 513H - Wellbore #1 - Design #2												Offset Site Error:	0.00 usft
Survey Program: 26-MWD, 700-MWD												Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Azimuth from North (°)	Distance		Minimum Separation (usft)	Separation Factor	Warning		
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		Between Centres (usft)	Between Ellipses (usft)					
9,300.00	9,192.18	15,046.81	10,232.83	32.78	88.25	-98.79	153.58	-251.10	1,099.26	1,031.81	67.45	16.297	
9,350.00	9,219.15	15,043.82	10,232.83	32.85	88.20	-90.39	150.58	-251.10	1,073.77	1,005.55	68.22	15.740	
9,400.00	9,242.36	15,000.01	10,232.75	32.92	87.55	-90.37	106.77	-251.10	1,052.81	984.34	68.47	15.376	
9,450.00	9,261.61	14,954.35	10,232.67	32.99	86.88	-90.36	61.12	-251.10	1,035.85	967.15	68.70	15.079	
9,500.00	9,276.77	14,907.20	10,232.59	33.08	86.18	-90.34	13.97	-251.10	1,023.00	954.11	68.89	14.850	
9,550.00	9,287.73	14,858.92	10,232.50	33.17	85.47	-90.33	-34.31	-251.10	1,014.33	945.29	69.04	14.692	
9,600.00	9,294.39	14,809.86	10,232.42	33.27	84.75	-90.32	-83.37	-251.10	1,009.88	940.73	69.14	14.605	
9,627.67	9,296.21	14,782.52	10,232.37	33.32	84.35	-90.32	-110.71	-251.10	1,009.23	940.05	69.18	14.589	
9,649.26	9,296.70	14,761.14	10,232.33	33.37	84.04	-90.31	-132.09	-251.10	1,009.62	940.43	69.19	14.592	
9,700.00	9,296.91	14,710.83	10,232.24	33.49	83.30	-90.31	-182.40	-251.10	1,011.35	942.16	69.19	14.617	
9,800.00	9,297.31	14,611.37	10,232.07	33.80	81.86	-90.30	-281.86	-251.10	1,014.04	944.94	69.10	14.876	
9,900.00	9,297.72	14,511.60	10,231.90	34.17	80.41	-90.29	-381.63	-251.10	1,015.68	946.80	68.88	14.746	
10,000.00	9,298.12	14,411.67	10,231.72	34.62	78.97	-90.29	-481.56	-251.10	1,016.21	947.68	68.54	14.827	
10,027.33	9,298.24	14,384.34	10,231.67	34.75	78.58	-90.29	-508.89	-251.10	1,016.16	947.74	68.42	14.851	
10,100.00	9,298.53	14,311.67	10,231.55	35.13	77.54	-90.29	-581.56	-251.10	1,015.91	947.79	68.12	14.914	
10,200.00	9,298.93	14,211.67	10,231.37	35.71	76.12	-90.29	-681.56	-251.10	1,015.57	947.83	67.73	14.994	
10,300.00	9,299.34	14,111.68	10,231.20	36.35	74.70	-90.29	-781.55	-251.10	1,015.22	947.84	67.39	15.066	
10,400.00	9,299.74	14,011.68	10,231.02	37.06	73.30	-90.28	-881.55	-251.10	1,014.88	947.81	67.07	15.131	
10,500.00	9,300.15	13,911.68	10,230.85	37.83	71.91	-90.28	-981.55	-251.10	1,014.54	947.74	66.79	15.189	
10,600.00	9,300.55	13,811.69	10,230.67	38.65	70.53	-90.28	-1,081.54	-251.10	1,014.20	947.65	66.55	15.240	
10,700.00	9,300.96	13,711.69	10,230.50	39.53	69.16	-90.28	-1,181.54	-251.10	1,013.85	947.52	66.34	15.284	
10,800.00	9,301.36	13,611.70	10,230.33	40.45	67.80	-90.28	-1,281.53	-251.10	1,013.51	947.36	66.15	15.321	
10,900.00	9,301.76	13,511.70	10,230.15	41.42	66.46	-90.28	-1,381.53	-251.10	1,013.17	947.18	66.00	15.352	
11,000.00	9,302.17	13,411.70	10,229.98	42.44	65.13	-90.28	-1,481.53	-251.10	1,012.83	946.96	65.87	15.376	
11,100.00	9,302.57	13,311.71	10,229.80	43.49	63.82	-90.28	-1,581.52	-251.10	1,012.50	946.73	65.77	15.395	
11,200.00	9,302.98	13,211.71	10,229.63	44.58	62.52	-90.28	-1,681.52	-251.10	1,012.16	946.46	65.70	15.407	
11,300.00	9,303.38	13,111.71	10,229.45	45.71	61.24	-90.28	-1,781.52	-251.10	1,011.82	946.17	65.65	15.413	
11,400.00	9,303.79	13,011.72	10,229.28	46.86	59.98	-90.28	-1,881.51	-251.10	1,011.48	945.86	65.62	15.414	
11,500.00	9,304.19	12,911.72	10,229.10	48.05	58.74	-90.28	-1,981.51	-251.10	1,011.15	945.52	65.62	15.409	
11,600.00	9,304.60	12,811.72	10,228.93	49.26	57.52	-90.28	-2,081.50	-251.10	1,010.81	945.17	65.64	15.398	
11,700.00	9,305.00	12,711.73	10,228.75	50.50	56.32	-90.28	-2,181.50	-251.10	1,010.47	944.78	65.69	15.382	
11,800.00	9,305.40	12,611.73	10,228.58	51.76	55.14	-90.28	-2,281.50	-251.10	1,010.14	944.38	65.76	15.361	
11,900.00	9,305.81	12,511.73	10,228.41	53.05	53.99	-90.27	-2,381.49	-251.10	1,009.80	943.95	65.85	15.335	
12,000.00	9,306.21	12,411.74	10,228.23	54.35	52.87	-90.27	-2,481.49	-251.10	1,009.47	943.50	65.97	15.303	
12,100.00	9,306.62	12,311.74	10,228.06	55.67	51.78	-90.27	-2,581.49	-251.10	1,009.14	943.03	66.10	15.266	
12,200.00	9,307.02	12,211.75	10,227.88	57.01	50.71	-90.27	-2,681.48	-251.10	1,008.81	942.54	66.27	15.224	
12,300.00	9,307.43	12,111.75	10,227.71	58.37	49.68	-90.27	-2,781.48	-251.10	1,008.47	942.02	66.45	15.177	
12,400.00	9,307.83	12,011.75	10,227.53	59.74	48.69	-90.27	-2,881.47	-251.10	1,008.14	941.48	66.66	15.124	
12,500.00	9,308.23	11,911.76	10,227.36	61.13	47.73	-90.27	-2,981.47	-251.10	1,007.81	940.92	66.89	15.067	
12,600.00	9,308.64	11,811.76	10,227.18	62.53	46.82	-90.27	-3,081.47	-251.10	1,007.48	940.33	67.15	15.004	
12,700.00	9,309.04	11,711.76	10,227.01	63.94	45.95	-90.27	-3,181.46	-251.10	1,007.15	939.72	67.43	14.936	
12,800.00	9,309.45	11,611.77	10,226.83	65.36	45.12	-90.27	-3,281.46	-251.10	1,006.82	939.09	67.74	14.863	
12,900.00	9,309.85	11,511.77	10,226.66	66.80	44.35	-90.27	-3,381.46	-251.10	1,006.50	938.42	68.07	14.785	
13,000.00	9,310.26	11,411.77	10,226.49	68.24	43.63	-90.27	-3,481.45	-251.10	1,006.17	937.73	68.44	14.702	
13,100.00	9,310.66	11,311.78	10,226.31	69.69	42.97	-90.27	-3,581.45	-251.10	1,005.84	937.01	68.83	14.614	
13,200.00	9,311.07	11,211.78	10,226.14	71.16	42.37	-90.27	-3,681.44	-251.10	1,005.51	936.26	69.25	14.520	
13,300.00	9,311.47	11,111.78	10,225.96	72.63	41.85	-90.27	-3,781.44	-251.10	1,005.19	935.49	69.70	14.421	
13,400.00	9,311.87	9,378.54	9,285.67	74.11	37.95	-158.49	-4,780.24	-251.10	967.85	887.88	80.17	12.072	
13,500.00	9,312.28	9,378.94	9,286.08	75.59	37.95	-158.05	-4,780.24	-251.10	875.83	793.63	82.21	10.654	
13,600.00	9,312.68	9,379.34	9,286.48	77.09	37.95	-153.05	-4,780.24	-251.10	785.77	700.95	84.82	9.264	
13,700.00	9,313.09	9,379.75	9,286.89	78.59	37.96	-149.29	-4,780.24	-251.10	698.42	610.23	88.19	7.919	
13,800.00	9,313.49	9,380.15	9,287.29	80.09	37.96	-144.47	-4,780.24	-251.10	614.93	522.39	92.54	6.645	



MS Energy Services Anticollision Report



Company: Devon Energy
Project: Eddy County, New Mexico (NAD 83)
Reference Site: Cotton Draw Unit
Site Error: 0.00 usft
Reference Well: 515H
Well Error: 0.00 usft
Reference Wellbore: Wellbore #1
Reference Design: Design #1

Local Co-ordinate Reference: Well 515H
TVD Reference: Well @ 3566.10usft (Cactus 126)
MD Reference: Well @ 3566.10usft (Cactus 126)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: 5000.1 Conroe DB
Offset TVD Reference: Offset Datum

Offset Design Cotton Draw Unit - 513H - Wellbore #1 - Design #2													Offset Site Error: 0.00 usft
Survey Program: 28-MWD, 700-MWD													Offset Well Error: 0.00 usft
Reference		Offset		Semi Major Axis		Azimuth from North (°)	Offset Wellbore Centre		Distance		Minimum Separation (usft)	Separation Factor	Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)			
13,900.00	9,313.90	9,380.56	9,287.70	81.60	37.96	-138.21	-4,780.24	-251.10	537.11	439.04	98.07	5.477	
14,000.00	9,314.30	9,380.96	9,288.10	83.12	37.96	-129.96	-4,780.24	-251.10	467.80	362.98	104.82	4.463	
14,100.00	9,314.71	9,381.37	9,288.51	84.64	37.96	-119.17	-4,780.24	-251.10	411.32	299.06	112.26	3.664	
14,200.00	9,315.11	9,381.77	9,288.91	86.17	37.96	-105.60	-4,780.24	-251.10	373.54	254.80	118.74	3.146	
14,298.26	9,315.51	9,382.17	9,289.31	87.68	37.96	-90.35	-4,780.24	-251.10	360.39	238.68	121.71	2.961 CC	
14,300.00	9,315.51	9,382.18	9,289.31	87.70	37.96	-90.07	-4,780.24	-251.10	360.39	238.67	121.72	2.961 ES, SF	
14,400.00	9,315.92	9,382.58	9,289.72	89.24	37.96	-74.59	-4,780.24	-251.10	374.47	254.64	119.83	3.125	
14,500.00	9,316.32	9,382.98	9,290.12	90.78	37.97	-61.11	-4,780.24	-251.10	413.01	298.58	114.44	3.609	
14,600.00	9,316.73	9,383.39	9,290.53	92.33	37.97	-50.41	-4,780.24	-251.10	470.03	362.09	107.94	4.355	
14,700.00	9,317.13	9,383.79	9,290.93	93.88	37.97	-42.25	-4,780.24	-251.10	539.70	437.80	101.90	5.296	
14,800.00	9,317.54	9,384.20	9,291.34	95.43	37.97	-36.04	-4,780.24	-251.10	617.75	520.91	96.84	6.379	
14,900.00	9,317.94	9,384.60	9,291.74	96.99	37.97	-31.27	-4,780.24	-251.10	701.40	608.61	92.79	7.559	
15,000.00	9,318.34	9,385.01	9,292.14	98.55	37.97	-27.53	-4,780.24	-251.10	788.87	699.28	89.59	8.806	
15,100.00	9,318.75	9,385.41	9,292.55	100.11	37.97	-24.56	-4,780.24	-251.10	879.01	791.96	87.05	10.097	
15,200.00	9,319.15	9,385.81	9,292.95	101.68	37.97	-22.14	-4,780.24	-251.10	971.08	886.05	85.04	11.419	
15,300.00	9,319.56	9,386.22	9,293.36	103.24	37.98	-20.14	-4,780.24	-251.10	1,064.59	981.17	83.42	12.761	
15,400.00	9,319.96	9,386.62	9,293.76	104.82	37.98	-18.46	-4,780.24	-251.10	1,159.18	1,077.06	82.12	14.116	
15,500.00	9,320.37	9,387.03	9,294.17	106.39	37.98	-17.04	-4,780.24	-251.10	1,254.61	1,173.55	81.05	15.479	
15,600.00	9,320.77	9,387.43	9,294.57	107.97	37.98	-15.83	-4,780.24	-251.10	1,350.70	1,270.52	80.18	16.847	
15,700.00	9,321.18	9,387.84	9,294.98	109.55	37.98	-14.77	-4,780.24	-251.10	1,447.32	1,367.87	79.45	18.217	
15,800.00	9,321.58	9,388.24	9,295.38	111.13	37.98	-13.85	-4,780.24	-251.10	1,544.37	1,465.52	78.85	19.587	
15,900.00	9,321.98	9,388.65	9,295.78	112.71	37.98	-13.03	-4,780.24	-251.10	1,641.77	1,563.43	78.34	20.958	
16,000.00	9,322.39	9,389.05	9,296.19	114.30	37.98	-12.31	-4,780.24	-251.10	1,739.47	1,661.56	77.91	22.327	
16,100.00	9,322.79	9,389.45	9,296.59	115.88	37.98	-11.66	-4,780.24	-251.10	1,837.42	1,759.87	77.55	23.694	
16,200.00	9,323.20	9,389.86	9,297.00	117.47	37.99	-11.08	-4,780.24	-251.10	1,935.57	1,858.33	77.24	25.059	
16,300.00	9,323.60	9,409.74	9,297.40	119.07	38.05	-10.56	-4,780.24	-251.10	2,033.91	1,956.87	77.04	26.401	
16,400.00	9,324.01	9,409.33	9,297.81	120.66	38.04	-10.08	-4,780.24	-251.10	2,132.40	2,055.58	76.82	27.760	
16,500.00	9,324.41	9,408.93	9,298.21	122.25	38.04	-9.65	-4,780.24	-251.10	2,231.02	2,154.40	76.62	29.116	
16,600.00	9,324.82	9,408.52	9,298.62	123.85	38.04	-9.25	-4,780.24	-251.10	2,329.77	2,253.30	76.46	30.470	
16,700.00	9,325.22	9,408.12	9,299.02	125.45	38.04	-8.89	-4,780.24	-251.10	2,428.61	2,352.29	76.32	31.820	
16,800.00	9,325.62	9,407.72	9,299.42	127.05	38.04	-8.55	-4,780.24	-251.10	2,527.55	2,451.34	76.21	33.167	
16,900.00	9,326.03	9,407.31	9,299.83	128.65	38.04	-8.24	-4,780.24	-251.10	2,626.56	2,550.45	76.11	34.511	
17,000.00	9,326.43	9,406.91	9,300.23	130.25	38.04	-7.95	-4,780.24	-251.10	2,725.65	2,649.62	76.03	35.851	
17,100.00	9,326.84	9,406.50	9,300.64	131.86	38.04	-7.68	-4,780.24	-251.10	2,824.80	2,748.84	75.96	37.189	
17,200.00	9,327.24	9,406.10	9,301.04	133.46	38.03	-7.43	-4,780.24	-251.10	2,924.01	2,848.11	75.90	38.522	
17,300.00	9,327.65	9,405.69	9,301.45	135.07	38.03	-7.20	-4,780.24	-251.10	3,023.27	2,947.41	75.86	39.853	
17,400.00	9,328.05	9,405.29	9,301.85	136.68	38.03	-6.98	-4,780.24	-251.10	3,122.58	3,046.76	75.83	41.180	
17,500.00	9,328.45	9,404.88	9,302.25	138.29	38.03	-6.77	-4,780.24	-251.10	3,221.93	3,146.13	75.80	42.504	
17,600.00	9,328.86	9,404.48	9,302.66	139.90	38.03	-6.58	-4,780.24	-251.10	3,321.33	3,245.54	75.79	43.824	
17,700.00	9,329.26	9,404.08	9,303.06	141.51	38.03	-6.40	-4,780.24	-251.10	3,420.75	3,344.97	75.78	45.141	
17,800.00	9,329.67	9,403.67	9,303.47	143.12	38.03	-6.23	-4,780.24	-251.10	3,520.21	3,444.43	75.78	46.455	
17,900.00	9,330.07	9,403.27	9,303.87	144.73	38.03	-6.07	-4,780.24	-251.10	3,619.70	3,543.92	75.78	47.765	
18,000.00	9,330.48	9,402.86	9,304.28	146.35	38.02	-5.91	-4,780.24	-251.10	3,719.21	3,643.42	75.79	49.072	
18,100.00	9,330.88	9,402.46	9,304.68	147.96	38.02	-5.77	-4,780.24	-251.10	3,818.75	3,742.95	75.81	50.375	
18,200.00	9,331.29	9,402.05	9,305.09	149.58	38.02	-5.63	-4,780.24	-251.10	3,918.32	3,842.49	75.83	51.674	
18,300.00	9,331.69	9,401.65	9,305.49	151.20	38.02	-5.50	-4,780.24	-251.10	4,017.90	3,942.05	75.85	52.971	
18,400.00	9,332.09	9,401.24	9,305.89	152.81	38.02	-5.37	-4,780.24	-251.10	4,117.51	4,041.63	75.88	54.263	
18,500.00	9,332.50	9,400.84	9,306.30	154.43	38.02	-5.25	-4,780.24	-251.10	4,217.13	4,141.22	75.91	55.552	
18,600.00	9,332.90	9,400.44	9,306.70	156.05	38.02	-5.14	-4,780.24	-251.10	4,316.78	4,240.83	75.95	56.838	
8,700.00	9,333.31	9,400.03	9,307.11	157.67	38.02	-5.03	-4,780.24	-251.10	4,416.43	4,340.45	75.99	58.120	
8,800.00	9,333.71	9,400.37	9,307.51	159.30	38.02	-4.93	-4,780.24	-251.10	4,516.11	4,440.07	76.03	59.397	
3,900.00	9,334.12	9,400.78	9,307.92	160.92	38.02	-4.83	-4,780.24	-251.10	4,615.79	4,539.71	76.08	60.670	

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



MS Energy Services
Anticollision Report



Company: Devon Energy
Project: Eddy County, New Mexico (NAD 83)
Reference Site: Cotton Draw Unit
Site Error: 0.00 usft
Reference Well: 515H
Well Error: 0.00 usft
Reference Wellbore: Wellbore #1
Reference Design: Design #1

Local Co-ordinate Reference: Well 515H
TVD Reference: Well @ 3566.10usft (Cactus 126)
MD Reference: Well @ 3566.10usft (Cactus 126)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: 5000.1 Conroe DB
Offset TVD Reference: Offset Datum

Offset Design Cotton Draw Unit - 513H - Wellbore #1 - Design #2													Offset Site Error: 0.00 usft
Survey Program: 26-MWD, 700-MWD													Offset Well Error: 0.00 usft
Reference		Offset		Semi Major Axis		Azimuth from North (°)	Offset Wellbore Centre		Distance		Minimum Separation (usft)	Separation Factor	Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)			
19,000.00	9,334.52	9,401.18	9,308.32	162.54	38.02	-4.73	-4,780.24	-251.10	4,715.50	4,639.36	76.13	61.939	
19,100.00	9,334.93	9,401.59	9,308.73	164.16	38.02	-4.64	-4,780.24	-251.10	4,815.21	4,739.02	76.18	63.205	
19,200.00	9,335.33	9,401.99	9,309.13	165.79	38.02	-4.56	-4,780.24	-251.10	4,914.93	4,838.69	76.24	64.467	
19,300.00	9,335.73	9,402.40	9,309.53	167.41	38.02	-4.47	-4,780.24	-251.10	5,014.67	4,938.37	76.30	65.725	
19,390.56	9,336.10	9,402.76	9,309.90	168.88	38.02	-4.40	-4,780.24	-251.10	5,104.99	5,028.64	76.35	66.861	



MS Energy Services Anticollision Report



Company: Devon Energy
Project: Eddy County, New Mexico (NAD 83)
Reference Site: Cotton Draw Unit
Site Error: 0.00 usft
Reference Well: 515H
Well Error: 0.00 usft
Reference Wellbore: Wellbore #1
Reference Design: Design #1

Local Co-ordinate Reference: Well 515H
TVD Reference: Well @ 3566.10usft (Cactus 126)
MD Reference: Well @ 3566.10usft (Cactus 126)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: 5000.1 Conroe DB
Offset TVD Reference: Offset Datum

Offset Design Cotton Draw Unit - 514H - Wellbore #1 - Design #1													Offset Site Error:	0.00 usft
Survey Program: 0-MVD													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Azimuth from North (°)	Offset Wellbore Centre		Distance				Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N-S (usft)	+E-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor		
0.00	0.00	0.20	-0.20	0.00	0.00	89.75	0.13	30.01	30.01					
100.00	100.00	100.20	99.80	0.13	0.14	89.75	0.13	30.01	30.01	29.74	0.27	111.312		
200.00	200.00	200.20	199.80	0.49	0.49	89.75	0.13	30.01	30.01	29.02	0.99	30.417		
300.00	300.00	300.20	299.80	0.85	0.85	89.75	0.13	30.01	30.01	28.30	1.70	17.615		
400.00	400.00	400.20	399.80	1.21	1.21	89.75	0.13	30.01	30.01	27.59	2.42	12.397		
500.00	500.00	500.20	499.80	1.57	1.57	89.75	0.13	30.01	30.01	26.87	3.14	9.564		
600.00	600.00	600.20	599.80	1.93	1.93	89.75	0.13	30.01	30.01	26.15	3.85	7.785		
700.00	700.00	700.20	699.80	2.29	2.29	89.75	0.13	30.01	30.01	25.44	4.57	6.564		
800.00	800.00	800.20	799.80	2.64	2.64	89.75	0.13	30.01	30.01	24.72	5.29	5.674		
900.00	900.00	900.20	899.80	3.00	3.00	89.75	0.13	30.01	30.01	24.00	6.01	4.997		
1,000.00	1,000.00	1,000.20	999.80	3.36	3.36	89.75	0.13	30.01	30.01	23.28	6.72	4.464		
1,100.00	1,100.00	1,100.20	1,099.80	3.72	3.72	89.75	0.13	30.01	30.01	22.57	7.44	4.034		
1,200.00	1,200.00	1,200.20	1,199.80	4.08	4.08	89.75	0.13	30.01	30.01	21.85	8.16	3.679		
1,300.00	1,300.00	1,300.20	1,299.80	4.44	4.44	89.75	0.13	30.01	30.01	21.13	8.87	3.382		
1,400.00	1,400.00	1,400.20	1,399.80	4.79	4.80	89.75	0.13	30.01	30.01	20.42	9.59	3.129		
1,500.00	1,500.00	1,500.20	1,499.80	5.15	5.15	89.75	0.13	30.01	30.01	19.70	10.31	2.911		
1,600.00	1,600.00	1,600.20	1,599.80	5.51	5.51	89.75	0.13	30.01	30.01	18.98	11.02	2.722		
1,700.00	1,700.00	1,700.20	1,699.80	5.87	5.87	89.75	0.13	30.01	30.01	18.27	11.74	2.556		
1,800.00	1,800.00	1,800.20	1,799.80	6.23	6.23	89.75	0.13	30.01	30.01	17.55	12.46	2.409		
1,900.00	1,900.00	1,900.20	1,899.80	6.59	6.59	89.75	0.13	30.01	30.01	16.83	13.17	2.278		
2,000.00	2,000.00	2,000.20	1,999.80	6.95	6.95	89.75	0.13	30.01	30.01	16.12	13.89	2.160		
2,100.00	2,100.00	2,100.20	2,099.80	7.30	7.30	89.75	0.13	30.01	30.01	15.40	14.61	2.054		
2,200.00	2,200.00	2,200.20	2,199.80	7.66	7.66	89.75	0.13	30.01	30.01	14.68	15.33	1.958		
2,300.00	2,300.00	2,300.20	2,299.80	8.02	8.02	89.75	0.13	30.01	30.01	13.96	16.04	1.870		
2,400.00	2,400.00	2,400.20	2,399.80	8.38	8.38	89.75	0.13	30.01	30.01	13.25	16.76	1.790		
2,500.00	2,500.00	2,499.80	2,499.80	8.74	8.74	89.75	0.13	30.01	30.01	12.53	17.47	1.717 CC		
2,600.00	2,599.99	2,599.74	2,599.74	9.10	9.10	89.77	0.99	30.10	30.15	11.95	18.19	1.657		
2,700.00	2,699.96	2,699.68	2,699.64	9.45	9.45	89.81	3.59	30.38	30.56	11.66	18.91	1.617		
2,800.00	2,799.86	2,799.62	2,799.48	9.81	9.81	89.86	7.92	30.85	31.26	11.64	19.62	1.593 ES		
2,900.00	2,899.68	2,899.55	2,899.23	10.17	10.17	89.94	13.97	31.51	32.24	11.90	20.33	1.585 SF		
3,000.00	2,999.37	2,999.48	2,998.85	10.53	10.53	90.02	21.76	32.36	33.50	12.44	21.05	1.591		
3,100.00	3,098.90	3,099.41	3,098.31	10.89	10.88	90.12	31.27	33.39	35.03	13.26	21.77	1.609		
3,200.00	3,198.26	3,199.32	3,197.59	11.25	11.25	90.22	42.51	34.61	36.84	14.35	22.49	1.638		
3,299.74	3,297.14	3,301.09	3,296.39	11.61	11.62	90.33	55.42	36.01	38.92	15.70	23.23	1.676		
3,300.00	3,297.40	3,300.83	3,296.64	11.61	11.62	90.33	55.46	36.02	38.93	15.70	23.23	1.676		
3,400.00	3,396.43	3,400.79	3,395.65	11.98	11.98	90.40	69.29	37.52	41.16	17.19	23.97	1.717		
3,500.00	3,495.46	3,500.82	3,494.65	12.36	12.36	90.46	83.12	39.02	43.39	18.68	24.71	1.756		
3,600.00	3,594.49	3,600.84	3,593.65	12.73	12.73	90.51	96.96	40.53	45.62	20.16	25.46	1.792		
3,700.00	3,693.51	3,700.87	3,692.65	13.11	13.11	90.56	110.79	42.03	47.85	21.64	26.21	1.825		
3,800.00	3,792.54	3,800.89	3,791.65	13.49	13.49	90.61	124.62	43.53	50.08	23.11	26.97	1.857		
3,900.00	3,891.57	3,900.92	3,890.66	13.87	13.87	90.65	138.46	45.04	52.31	24.57	27.73	1.886		
4,000.00	3,990.60	4,000.94	3,989.66	14.25	14.25	90.69	152.29	46.54	54.53	26.04	28.50	1.914		
4,100.00	4,089.62	4,100.97	4,088.66	14.64	14.64	90.72	166.12	48.04	56.76	27.49	29.27	1.939		
4,200.00	4,188.65	4,200.99	4,187.66	15.02	15.03	90.75	179.95	49.55	58.99	28.95	30.04	1.964		
4,300.00	4,287.68	4,301.02	4,286.67	15.41	15.41	90.78	193.79	51.05	61.22	30.40	30.82	1.986		
4,400.00	4,386.71	4,401.04	4,385.67	15.80	15.80	90.81	207.62	52.55	63.45	31.85	31.60	2.008		
4,500.00	4,485.73	4,501.07	4,484.67	16.19	16.20	90.84	221.45	54.06	65.68	33.30	32.38	2.028		
4,600.00	4,584.76	4,601.09	4,583.67	16.59	16.59	90.86	235.29	55.56	67.91	34.74	33.17	2.048		
4,700.00	4,683.79	4,701.11	4,682.67	16.98	16.98	90.88	249.12	57.06	70.14	36.19	33.95	2.066		
4,800.00	4,782.81	4,801.14	4,781.68	17.37	17.38	90.90	262.95	58.56	72.37	37.63	34.74	2.083		
4,900.00	4,881.84	4,901.16	4,880.68	17.77	17.77	90.92	276.78	60.07	74.60	39.07	35.53	2.099		
5,000.00	4,980.87	5,001.19	4,979.68	18.17	18.17	90.94	290.62	61.57	76.83	40.50	36.33	2.115		

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



MS Energy Services
Anticollision Report



Company: Devon Energy
Project: Eddy County, New Mexico (NAD 83)
Reference Site: Cotton Draw Unit
Site Error: 0.00 usft
Reference Well: 515H
Well Error: 0.00 usft
Reference Wellbore: Wellbore #1
Reference Design: Design #1

Local Co-ordinate Reference: Well 515H
TVD Reference: Well @ 3566.10usft (Cactus 126)
MD Reference: Well @ 3566.10usft (Cactus 126)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: 5000.1 Conroe DB
Offset TVD Reference: Offset Datum

Offset Design Cotton Draw Unit - 514H - Wellbore #1 - Design #1													Offset Site Error: 0.00 usft
Survey Program: 0-MWD													Offset Well Error: 0.00 usft
Reference		Offset		Semi Major Axis		Azimuth from North (°)	Offset Wellbore Centre		Distance		Minimum Separation (usft)	Separation Factor	Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)			
5,100.00	5,079.90	5,101.21	5,078.68	18.56	18.57	90.96	304.45	63.07	79.06	41.94	37.12	2.130	
5,200.00	5,178.92	5,201.24	5,177.68	18.96	18.96	90.98	318.28	64.58	81.29	43.37	37.92	2.144	
5,300.00	5,277.95	5,301.26	5,276.69	19.36	19.36	90.99	332.12	66.08	83.52	44.80	38.71	2.157	
5,400.00	5,376.98	5,401.29	5,375.69	19.76	19.76	91.01	345.95	67.58	85.75	46.23	39.51	2.170	
5,500.00	5,476.01	5,501.31	5,474.69	20.16	20.16	91.02	359.78	69.09	87.98	47.66	40.31	2.182	
5,600.00	5,575.03	5,601.34	5,573.69	20.56	20.56	91.03	373.62	70.59	90.21	49.09	41.12	2.194	
5,628.09	5,602.86	5,626.75	5,601.51	20.68	20.67	91.04	377.50	71.01	90.83	49.50	41.33	2.198	
5,700.00	5,674.12	5,698.72	5,672.81	20.96	20.95	90.92	387.20	72.07	92.38	50.48	41.90	2.205	
5,800.00	5,773.42	5,798.85	5,772.21	21.36	21.35	90.74	399.25	73.37	94.30	51.61	42.69	2.209	
5,900.00	5,872.91	5,899.00	5,871.82	21.74	21.74	90.57	409.57	74.50	95.94	52.48	43.47	2.207	
6,000.00	5,972.56	5,999.16	5,971.60	22.12	22.12	90.40	418.16	75.43	97.31	53.08	44.23	2.200	
6,100.00	6,072.35	6,099.33	6,071.53	22.49	22.49	90.24	425.02	76.17	98.39	53.42	44.97	2.188	
6,200.00	6,172.23	6,199.51	6,171.57	22.86	22.86	90.08	430.14	76.73	99.20	53.50	45.70	2.171	
6,300.00	6,272.18	6,299.69	6,271.70	23.21	23.21	89.92	433.52	77.10	99.73	53.32	46.41	2.149	
6,400.00	6,372.17	6,399.89	6,371.88	23.56	23.56	89.75	435.15	77.28	99.98	52.87	47.11	2.122	
6,427.83	6,400.00	6,427.78	6,399.77	23.66	23.66	89.71	435.30	77.29	100.00	52.70	47.30	2.114	
6,500.00	6,472.17	6,500.03	6,471.97	23.90	23.91	89.70	435.32	77.29	100.00	52.20	47.80	2.092	
6,600.00	6,572.17	6,600.03	6,571.97	24.25	24.25	89.70	435.32	77.29	100.00	51.52	48.48	2.063	
6,700.00	6,672.17	6,700.03	6,671.97	24.59	24.59	89.70	435.32	77.29	100.00	50.83	49.17	2.034	
6,800.00	6,772.17	6,800.03	6,771.97	24.93	24.94	89.70	435.32	77.29	100.00	50.14	49.86	2.006	
6,900.00	6,872.17	6,900.03	6,871.97	25.28	25.28	89.70	435.32	77.29	100.00	49.46	50.54	1.978	
7,000.00	6,972.17	7,000.03	6,971.97	25.62	25.62	89.70	435.32	77.29	100.00	48.77	51.23	1.952	
7,100.00	7,072.17	7,100.03	7,071.97	25.97	25.97	89.70	435.32	77.29	100.00	48.08	51.92	1.926	
7,200.00	7,172.17	7,200.03	7,171.97	26.31	26.31	89.70	435.32	77.29	100.00	47.39	52.61	1.901	
7,300.00	7,272.17	7,300.03	7,271.97	26.66	26.66	89.70	435.32	77.29	100.00	46.70	53.30	1.876	
7,400.00	7,372.17	7,400.03	7,371.97	27.00	27.01	89.70	435.32	77.29	100.00	46.00	54.00	1.852	
7,500.00	7,472.17	7,500.03	7,471.97	27.35	27.35	89.70	435.32	77.29	100.00	45.31	54.69	1.829	
7,600.00	7,572.17	7,600.03	7,571.97	27.69	27.70	89.70	435.32	77.29	100.00	44.62	55.38	1.806	
7,700.00	7,672.17	7,700.03	7,671.97	28.04	28.04	89.70	435.32	77.29	100.00	43.93	56.07	1.783	
7,800.00	7,772.17	7,800.03	7,771.97	28.39	28.39	89.70	435.32	77.29	100.00	43.23	56.77	1.762	
7,900.00	7,872.17	7,900.03	7,871.97	28.74	28.74	89.70	435.32	77.29	100.00	42.54	57.46	1.740	
8,000.00	7,972.17	8,000.03	7,971.97	29.08	29.09	89.70	435.32	77.29	100.00	41.84	58.16	1.719	
8,100.00	8,072.17	8,100.03	8,071.97	29.43	29.43	89.70	435.32	77.29	100.00	41.15	58.85	1.699	
8,200.00	8,172.17	8,200.03	8,171.97	29.78	29.78	89.70	435.32	77.29	100.00	40.45	59.55	1.679	
8,300.00	8,272.17	8,300.03	8,271.97	30.13	30.13	89.70	435.32	77.29	100.00	39.75	60.25	1.660	
8,400.00	8,372.17	8,400.03	8,371.97	30.48	30.48	89.70	435.32	77.29	100.00	39.05	60.95	1.641	
8,500.00	8,472.17	8,499.97	8,471.97	30.83	30.83	89.70	435.32	77.29	100.00	38.36	61.64	1.622	
8,503.53	8,475.70	8,503.50	8,475.50	30.84	30.84	89.70	435.32	77.29	100.00	38.33	61.67	1.622	
8,600.00	8,572.17	8,599.03	8,570.56	31.18	31.12	94.37	427.15	77.34	100.35	38.07	62.28	1.611	
8,700.00	8,672.17	8,692.60	8,661.11	31.52	31.35	107.11	403.95	77.49	105.39	42.93	62.46	1.687	
8,751.58	8,723.75	8,737.35	8,702.79	31.70	31.44	115.15	387.72	77.59	112.72	50.75	61.97	1.819	
8,800.00	8,772.11	8,777.55	8,739.06	31.86	31.51	121.92	370.39	77.69	122.45	61.42	61.03	2.006	
8,850.00	8,821.68	8,818.11	8,774.32	32.00	31.58	127.43	350.38	77.82	133.72	74.02	59.70	2.240	
8,900.00	8,870.51	8,857.79	8,807.38	32.12	31.64	131.73	328.44	77.95	145.64	87.55	58.09	2.507	
8,950.00	8,918.22	8,896.70	8,838.24	32.24	31.69	135.07	304.75	78.10	157.76	101.48	56.29	2.803	
9,000.00	8,964.46	8,934.93	8,866.92	32.34	31.74	137.66	279.49	78.25	169.74	115.41	54.33	3.124	
9,050.00	9,008.86	8,972.55	8,893.44	32.43	31.79	139.65	252.82	78.41	181.34	129.06	52.27	3.469	
9,100.00	9,051.09	9,009.64	8,917.82	32.51	31.83	141.15	224.88	78.59	192.37	142.21	50.15	3.835	
9,150.00	9,090.83	9,046.26	8,940.07	32.58	31.88	142.21	195.80	78.76	202.68	154.68	48.01	4.222	
9,200.00	9,127.77	9,082.46	8,960.20	32.65	31.92	142.88	165.71	78.95	212.18	166.31	45.87	4.626	
9,250.00	9,161.64	9,118.31	8,978.21	32.71	31.96	143.16	134.73	79.14	220.76	176.99	43.77	5.044	
9,300.00	9,192.18	9,153.85	8,994.12	32.78	32.01	143.03	102.96	79.33	228.37	186.61	41.76	5.468	

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



MS Energy Services Anticollision Report



Company: Devon Energy
Project: Eddy County, New Mexico (NAD 83)
Reference Site: Cotton Draw Unit
Site Error: 0.00 usft
Reference Well: 515H
Well Error: 0.00 usft
Reference Wellbore: Wellbore #1
Reference Design: Design #1

Local Co-ordinate Reference: Well 515H
TVD Reference: Well @ 3566.10usft (Cactus 126)
MD Reference: Well @ 3566.10usft (Cactus 126)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: 5000.1 Conroe DB
Offset TVD Reference: Offset Datum

Offset Design Cotton Draw Unit - 514H - Wellbore #1 - Design #1														Offset Site Error:	0.00 usft
Survey Program: 0-MWD														Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Azimuth from North (°)	Offset Wellbore Centre		Distance				Warning		
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor			
9,350.00	9,219.15	9,189.12	9,007.94	32.85	32.06	142.43	70.51	79.53	234.95	195.06	39.89	5.890			
9,400.00	9,242.36	9,224.17	9,019.67	32.92	32.11	141.22	37.48	79.73	240.44	202.25	38.19	6.296			
9,450.00	9,261.61	9,259.05	9,029.31	32.99	32.17	139.13	3.98	79.94	244.82	208.10	36.72	6.668			
9,500.00	9,276.77	9,293.78	9,036.87	33.08	32.22	135.64	-29.92	80.15	248.05	212.52	35.53	6.982			
9,550.00	9,287.73	9,328.41	9,042.35	33.17	32.28	129.58	-64.11	80.36	250.11	215.44	34.67	7.214			
9,600.00	9,294.39	9,362.97	9,045.74	33.27	32.35	118.10	-98.50	80.57	250.99	216.82	34.18	7.344			
9,649.26	9,296.70	9,407.09	9,047.07	33.37	32.44	90.64	-130.69	80.77	250.67	216.55	34.12	7.347			
9,700.00	9,296.91	9,445.55	9,047.16	33.49	32.53	90.97	-181.04	81.08	250.25	216.17	34.08	7.342			
9,800.00	9,297.31	9,545.08	9,047.33	33.80	32.81	92.39	-280.56	81.69	249.95	215.65	34.30	7.287			
9,814.96	9,297.37	9,559.99	9,047.36	33.85	32.86	92.79	-295.48	81.78	249.94	215.59	34.36	7.275			
9,900.00	9,297.72	9,644.88	9,047.50	34.17	33.17	98.33	-380.37	82.30	250.03	215.30	34.74	7.198			
10,000.00	9,298.12	9,744.84	9,047.68	34.62	33.61	162.92	-480.32	82.91	250.25	214.96	35.29	7.091			
10,027.33	9,298.24	9,772.17	9,047.72	34.75	33.75	179.70	-507.65	83.08	250.31	214.86	35.45	7.060			
10,100.00	9,298.53	9,844.84	9,047.85	35.13	34.13	179.70	-580.32	83.52	250.48	214.57	35.91	6.975			
10,200.00	9,298.93	9,944.84	9,048.02	35.71	34.72	179.71	-680.32	84.14	250.71	214.12	36.59	6.851			
10,300.00	9,299.34	10,044.84	9,048.19	36.35	35.37	179.71	-780.31	84.75	250.94	213.62	37.33	6.723			
10,400.00	9,299.74	10,144.84	9,048.37	37.06	36.09	179.72	-880.31	85.36	251.18	213.06	38.11	6.590			
10,500.00	9,300.15	10,244.83	9,048.54	37.83	36.87	179.72	-980.31	85.98	251.41	212.46	38.95	6.455			
10,600.00	9,300.55	10,344.83	9,048.71	38.65	37.70	179.72	-1,080.31	86.59	251.64	211.82	39.82	6.319			
10,700.00	9,300.96	10,444.83	9,048.88	39.53	38.59	179.73	-1,180.30	87.21	251.87	211.13	40.74	6.182			
10,800.00	9,301.36	10,544.83	9,049.06	40.45	39.53	179.73	-1,280.30	87.82	252.10	210.40	41.70	6.046			
10,900.00	9,301.76	10,644.83	9,049.23	41.42	40.52	179.74	-1,380.30	88.43	252.33	209.64	42.69	5.911			
11,000.00	9,302.17	10,744.83	9,049.40	42.44	41.54	179.74	-1,480.30	89.05	252.57	208.85	43.72	5.777			
11,100.00	9,302.57	10,844.83	9,049.58	43.49	42.61	179.75	-1,580.30	89.66	252.80	208.02	44.78	5.646			
11,200.00	9,302.98	10,944.83	9,049.75	44.58	43.71	179.75	-1,680.29	90.27	253.03	207.16	45.87	5.517			
11,300.00	9,303.38	11,044.83	9,049.92	45.71	44.85	179.75	-1,780.29	90.89	253.26	206.28	46.98	5.391			
11,400.00	9,303.79	11,144.83	9,050.09	46.86	46.02	179.76	-1,880.29	91.50	253.49	205.37	48.12	5.268			
11,500.00	9,304.19	11,244.83	9,050.27	48.05	47.22	179.76	-1,980.29	92.11	253.72	204.44	49.29	5.148			
11,600.00	9,304.60	11,344.83	9,050.44	49.26	48.45	179.77	-2,080.28	92.73	253.96	203.48	50.47	5.032			
11,700.00	9,305.00	11,444.83	9,050.61	50.50	49.70	179.77	-2,180.28	93.34	254.19	202.51	51.68	4.919			
11,800.00	9,305.40	11,544.83	9,050.79	51.76	50.97	179.77	-2,280.28	93.95	254.42	201.52	52.90	4.809			
11,900.00	9,305.81	11,644.83	9,050.96	53.05	52.27	179.78	-2,380.28	94.57	254.65	200.50	54.15	4.703			
12,000.00	9,306.21	11,744.83	9,051.13	54.35	53.59	179.78	-2,480.27	95.18	254.88	199.47	55.41	4.600			
12,100.00	9,306.62	11,844.83	9,051.30	55.67	54.92	179.79	-2,580.27	95.79	255.11	198.43	56.68	4.501			
12,200.00	9,307.02	11,944.83	9,051.48	57.01	56.27	179.79	-2,680.27	96.41	255.35	197.37	57.97	4.405			
12,300.00	9,307.43	12,044.83	9,051.65	58.37	57.64	179.80	-2,780.27	97.02	255.58	196.30	59.28	4.312			
12,400.00	9,307.83	12,144.83	9,051.82	59.74	59.02	179.80	-2,880.27	97.63	255.81	195.22	60.59	4.222			
12,500.00	9,308.23	12,244.83	9,052.00	61.13	60.42	179.80	-2,980.26	98.25	256.04	194.12	61.92	4.135			
12,600.00	9,308.64	12,344.83	9,052.17	62.53	61.83	179.81	-3,080.26	98.86	256.27	193.01	63.26	4.051			
12,700.00	9,309.04	12,444.83	9,052.34	63.94	63.25	179.81	-3,180.26	99.47	256.50	191.90	64.61	3.970			
12,800.00	9,309.45	12,544.83	9,052.51	65.36	64.68	179.82	-3,280.26	100.09	256.74	190.77	65.97	3.892			
12,900.00	9,309.85	12,644.83	9,052.69	66.80	66.13	179.82	-3,380.25	100.70	256.97	189.63	67.33	3.816			
13,000.00	9,310.26	12,744.83	9,052.86	68.24	67.58	179.82	-3,480.25	101.31	257.20	188.49	68.71	3.743			
13,100.00	9,310.66	12,844.83	9,053.03	69.69	69.04	179.83	-3,580.25	101.93	257.43	187.33	70.10	3.673			
13,200.00	9,311.07	12,944.83	9,053.20	71.16	70.51	179.83	-3,680.25	102.54	257.66	186.17	71.49	3.604			
13,300.00	9,311.47	13,044.83	9,053.38	72.63	71.99	179.84	-3,780.25	103.15	257.89	185.00	72.89	3.538			
13,400.00	9,311.87	13,144.83	9,053.55	74.11	73.48	179.84	-3,880.24	103.77	258.12	183.83	74.30	3.474			
13,500.00	9,312.28	13,244.83	9,053.72	75.59	74.97	179.85	-3,980.24	104.38	258.36	182.65	75.71	3.413			
13,600.00	9,312.68	13,344.83	9,053.90	77.09	76.47	179.85	-4,080.24	104.99	258.59	181.46	77.13	3.353			
13,700.00	9,313.09	13,444.83	9,054.07	78.59	77.98	179.85	-4,180.24	105.61	258.82	180.27	78.55	3.295			
3,800.00	9,313.49	13,544.83	9,054.24	80.09	79.49	179.86	-4,280.23	106.22	259.05	179.07	79.98	3.239			
3,900.00	9,313.90	13,644.83	9,054.41	81.60	81.01	179.86	-4,380.23	106.83	259.28	177.87	81.42	3.185			

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



MS Energy Services

Anticollision Report



Company: Devon Energy
Project: Eddy County, New Mexico (NAD 83)
Reference Site: Cotton Draw Unit
Site Error: 0.00 usft
Reference Well: 515H
Well Error: 0.00 usft
Reference Wellbore: Wellbore #1
Reference Design: Design #1

Local Co-ordinate Reference: Well 515H
TVD Reference: Well @ 3566.10usft (Cactus 126)
MD Reference: Well @ 3566.10usft (Cactus 126)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: 5000.1 Conroe DB
Offset TVD Reference: Offset Datum

Offset Design Cotton Draw Unit - 514H - Wellbore #1 - Design #1												Offset Site Error:	0.00 usft
Survey Program: 0-MWD												Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Azimuth from North (°)	Offset Wellbore Centre		Distance		Minimum Separation (usft)	Separation Factor	Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N-S (usft)	+E-W (usft)	Between Centres (usft)	Between Ellipses (usft)			
14,000.00	9,314.30	13,744.83	9,054.59	83.12	82.54	179.87	-4,480.23	107.45	259.51	176.66	82.86	3.132	
14,100.00	9,314.71	13,844.83	9,054.76	84.64	84.07	179.87	-4,580.23	108.06	259.75	175.44	84.30	3.081	
14,200.00	9,315.11	13,944.82	9,054.93	86.17	85.60	179.87	-4,680.22	108.67	259.98	174.23	85.75	3.032	
14,300.00	9,315.51	14,044.82	9,055.11	87.70	87.14	179.88	-4,780.22	109.29	260.21	173.00	87.20	2.984	
14,400.00	9,315.92	14,144.82	9,055.28	89.24	88.68	179.88	-4,880.22	109.90	260.44	171.78	88.66	2.937	
14,500.00	9,316.32	14,244.82	9,055.45	90.78	90.23	179.89	-4,980.22	110.52	260.67	170.55	90.12	2.892	
14,600.00	9,316.73	14,344.82	9,055.62	92.33	91.78	179.89	-5,080.22	111.13	260.90	169.32	91.59	2.849	
14,700.00	9,317.13	14,444.82	9,055.80	93.88	93.33	179.89	-5,180.21	111.74	261.14	168.08	93.06	2.806	
14,800.00	9,317.54	14,544.82	9,055.97	95.43	94.89	179.90	-5,280.21	112.36	261.37	166.84	94.53	2.765	
14,900.00	9,317.94	14,644.82	9,056.14	96.99	96.45	179.90	-5,380.21	112.97	261.60	165.60	96.00	2.725	
15,000.00	9,318.34	14,744.82	9,056.31	98.55	98.02	179.91	-5,480.21	113.58	261.83	164.35	97.48	2.686	
15,100.00	9,318.75	14,844.82	9,056.49	100.11	99.58	179.91	-5,580.20	114.20	262.06	163.10	98.96	2.648	
15,200.00	9,319.15	14,944.82	9,056.66	101.68	101.15	179.91	-5,680.20	114.81	262.29	161.85	100.44	2.611	
15,300.00	9,319.56	15,044.82	9,056.83	103.24	102.73	179.92	-5,780.20	115.42	262.53	160.60	101.93	2.576	
15,400.00	9,319.96	15,144.82	9,057.01	104.82	104.30	179.92	-5,880.20	116.04	262.76	159.34	103.42	2.541	
15,500.00	9,320.37	15,244.82	9,057.18	106.39	105.88	179.93	-5,980.19	116.65	262.99	158.08	104.91	2.507	
15,600.00	9,320.77	15,344.82	9,057.35	107.97	107.46	179.93	-6,080.19	117.26	263.22	156.82	106.40	2.474	
15,700.00	9,321.18	15,444.82	9,057.52	109.55	109.05	179.93	-6,180.19	117.88	263.45	155.56	107.89	2.442	
15,800.00	9,321.58	15,544.82	9,057.70	111.13	110.63	179.94	-6,280.19	118.49	263.68	154.29	109.39	2.410	
15,900.00	9,321.98	15,644.82	9,057.87	112.71	112.22	179.94	-6,380.19	119.10	263.92	153.03	110.89	2.380	
16,000.00	9,322.39	15,744.82	9,058.04	114.30	113.81	179.94	-6,480.18	119.72	264.15	151.76	112.39	2.350	
16,100.00	9,322.79	15,844.82	9,058.22	115.88	115.40	179.95	-6,580.18	120.33	264.38	150.49	113.89	2.321	
16,200.00	9,323.20	15,944.82	9,058.39	117.47	116.99	179.95	-6,680.18	120.94	264.61	149.21	115.40	2.293	
16,300.00	9,323.60	16,044.82	9,058.56	119.07	118.59	179.96	-6,780.18	121.56	264.84	147.94	116.90	2.265	
16,400.00	9,324.01	16,144.82	9,058.73	120.66	120.18	179.96	-6,880.17	122.17	265.07	146.66	118.41	2.239	
16,500.00	9,324.41	16,244.82	9,058.91	122.25	121.78	179.96	-6,980.17	122.78	265.30	145.38	119.92	2.212	
16,600.00	9,324.82	16,344.82	9,059.08	123.85	123.38	179.97	-7,080.17	123.40	265.54	144.10	121.43	2.187	
16,700.00	9,325.22	16,444.82	9,059.25	125.45	124.98	179.97	-7,180.17	124.01	265.77	142.82	122.94	2.162	
16,800.00	9,325.62	16,544.82	9,059.42	127.05	126.58	179.98	-7,280.16	124.62	266.00	141.54	124.46	2.137	
16,900.00	9,326.03	16,644.82	9,059.60	128.65	128.19	179.98	-7,380.16	125.24	266.23	140.26	125.97	2.113	
17,000.00	9,326.43	16,744.82	9,059.77	130.25	129.79	179.98	-7,480.16	125.85	266.46	138.97	127.49	2.090	
17,100.00	9,326.84	16,844.82	9,059.94	131.86	131.40	179.99	-7,580.16	126.46	266.69	137.69	129.01	2.067	
17,200.00	9,327.24	16,944.82	9,060.12	133.46	133.01	179.99	-7,680.16	127.08	266.93	136.40	130.53	2.045	
17,300.00	9,327.65	17,044.82	9,060.29	135.07	134.62	179.99	-7,780.15	127.69	267.16	135.11	132.05	2.023	
17,400.00	9,328.05	17,144.82	9,060.46	136.68	136.23	180.00	-7,880.15	128.30	267.39	133.82	133.57	2.002	
17,500.00	9,328.45	17,244.82	9,060.63	138.29	137.84	-180.00	-7,980.15	128.92	267.62	132.53	135.09	1.981	
17,600.00	9,328.86	17,344.82	9,060.81	139.90	139.45	-179.99	-8,080.15	129.53	267.85	131.24	136.61	1.961	
17,700.00	9,329.26	17,444.82	9,060.98	141.51	141.07	-179.99	-8,180.14	130.14	268.08	129.95	138.14	1.941	
17,800.00	9,329.67	17,544.82	9,061.15	143.12	142.68	-179.99	-8,280.14	130.76	268.32	128.65	139.66	1.921	
17,900.00	9,330.07	17,644.82	9,061.33	144.73	144.30	-179.98	-8,380.14	131.37	268.55	127.36	141.19	1.902	
18,000.00	9,330.48	17,744.81	9,061.50	146.35	145.91	-179.98	-8,480.14	131.99	268.78	126.06	142.72	1.883	
18,100.00	9,330.88	17,844.81	9,061.67	147.96	147.53	-179.98	-8,580.13	132.60	269.01	124.76	144.25	1.865	
18,200.00	9,331.29	17,944.81	9,061.84	149.58	149.15	-179.97	-8,680.13	133.21	269.24	123.47	145.78	1.847	
18,300.00	9,331.69	18,044.81	9,062.02	151.20	150.77	-179.97	-8,780.13	133.83	269.47	122.17	147.31	1.829	
18,400.00	9,332.09	18,144.81	9,062.19	152.81	152.39	-179.96	-8,880.13	134.44	269.71	120.87	148.84	1.812	
18,500.00	9,332.50	18,244.81	9,062.36	154.43	154.01	-179.96	-8,980.13	135.05	269.94	119.57	150.37	1.795	
18,600.00	9,332.90	18,344.81	9,062.54	156.05	155.63	-179.96	-9,080.12	135.67	270.17	118.27	151.90	1.779	
18,700.00	9,333.31	18,444.81	9,062.71	157.67	157.25	-179.95	-9,180.12	136.28	270.40	116.97	153.43	1.762	
18,800.00	9,333.71	18,544.81	9,062.88	159.30	158.88	-179.95	-9,280.12	136.89	270.63	115.66	154.97	1.746	
18,900.00	9,334.12	18,644.81	9,063.05	160.92	160.50	-179.95	-9,380.12	137.51	270.86	114.36	156.50	1.731	
19,000.00	9,334.52	18,744.81	9,063.23	162.54	162.13	-179.94	-9,480.11	138.12	271.10	113.06	158.04	1.715	
19,100.00	9,334.93	18,844.81	9,063.40	164.16	163.75	-179.94	-9,580.11	138.73	271.33	111.75	159.57	1.700	



MS Energy Services
Anticollision Report



Company: Devon Energy
Project: Eddy County, New Mexico (NAD 83)
Reference Site: Cotton Draw Unit
Site Error: 0.00 usft
Reference Well: 515H
Well Error: 0.00 usft
Reference Wellbore: Wellbore #1
Reference Design: Design #1

Local Co-ordinate Reference: Well 515H
TVD Reference: Well @ 3566.10usft (Cactus 126)
MD Reference: Well @ 3566.10usft (Cactus 126)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: 5000.1 Conroe DB
Offset TVD Reference: Offset Datum

Offset Design Cotton Draw Unit - 514H - Wellbore #1 - Design #1													Offset Site Error: 0.00 usft
Survey Program: 0-MWD													Offset Well Error: 0.00 usft
Reference		Offset		Semi Major Axis		Azimuth from North (°)	Offset Wellbore Centre		Distance				Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	
19,200.00	9,335.33	18,944.81	9,063.57	165.79	165.38	-179.93	-9,680.11	139.35	271.56	110.45	161.11	1.686	
19,300.00	9,335.73	19,044.81	9,063.74	167.41	167.00	-179.93	-9,780.11	139.96	271.79	109.14	162.65	1.671	
19,390.56	9,336.10	19,135.37	9,063.90	168.88	168.48	-179.93	-9,870.66	140.52	272.00	107.96	164.04	1.658	



MS Energy Services
Anticollision Report



Company: Devon Energy
Project: Eddy County, New Mexico (NAD 83)
Reference Site: Cotton Draw Unit
Site Error: 0.00 usft
Reference Well: 515H
Well Error: 0.00 usft
Reference Wellbore: Wellbore #1
Reference Design: Design #1

Local Co-ordinate Reference: Well 515H
TVD Reference: Well @ 3566.10usft (Cactus 126)
MD Reference: Well @ 3566.10usft (Cactus 126)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: 5000.1 Conroe DB
Offset TVD Reference: Offset Datum

Offset Design Cotton Draw Unit - 516H - Wellbore #1 - Design #1													Offset Site Error: 0.00 usft
Survey Program: 0-MWD													Offset Well Error: 0.00 usft
Reference													Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Azimuth from North (°)	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	
0.00	0.00	0.40	0.40	0.00	0.00	-90.35	-0.18	-29.98	29.98				
100.00	100.00	100.40	100.40	0.13	0.14	-90.35	-0.18	-29.98	29.98	29.71	0.27	110.903	
200.00	200.00	200.40	200.40	0.49	0.49	-90.35	-0.18	-29.98	29.98	28.99	0.99	30.363	
300.00	300.00	300.40	300.40	0.85	0.85	-90.35	-0.18	-29.98	29.98	28.27	1.70	17.590	
400.00	400.00	400.40	400.40	1.21	1.21	-90.35	-0.18	-29.98	29.98	27.55	2.42	12.381	
500.00	500.00	500.40	500.40	1.57	1.57	-90.35	-0.18	-29.98	29.98	26.84	3.14	9.552	
600.00	600.00	600.40	600.40	1.93	1.93	-90.35	-0.18	-29.98	29.98	26.12	3.86	7.776	
700.00	700.00	700.40	700.40	2.29	2.29	-90.35	-0.18	-29.98	29.98	25.40	4.57	6.556	
800.00	800.00	800.40	800.40	2.64	2.65	-90.35	-0.18	-29.98	29.98	24.69	5.29	5.668	
900.00	900.00	900.40	900.40	3.00	3.00	-90.35	-0.18	-29.98	29.98	23.97	6.01	4.991	
1,000.00	1,000.00	1,000.40	1,000.40	3.36	3.36	-90.35	-0.18	-29.98	29.98	23.25	6.72	4.459	
1,100.00	1,100.00	1,100.40	1,100.40	3.72	3.72	-90.35	-0.18	-29.98	29.98	22.54	7.44	4.029	
1,200.00	1,200.00	1,200.40	1,200.40	4.08	4.08	-90.35	-0.18	-29.98	29.98	21.82	8.16	3.675	
1,300.00	1,300.00	1,300.40	1,300.40	4.44	4.44	-90.35	-0.18	-29.98	29.98	21.10	8.87	3.378	
1,400.00	1,400.00	1,400.40	1,400.40	4.79	4.80	-90.35	-0.18	-29.98	29.98	20.39	9.59	3.126	
1,500.00	1,500.00	1,500.40	1,500.40	5.15	5.15	-90.35	-0.18	-29.98	29.98	19.67	10.31	2.908	
1,600.00	1,600.00	1,600.40	1,600.40	5.51	5.51	-90.35	-0.18	-29.98	29.98	18.95	11.02	2.719	
1,700.00	1,700.00	1,700.40	1,700.40	5.87	5.87	-90.35	-0.18	-29.98	29.98	18.23	11.74	2.553	
1,800.00	1,800.00	1,800.40	1,800.40	6.23	6.23	-90.35	-0.18	-29.98	29.98	17.52	12.46	2.406	
1,900.00	1,900.00	1,900.40	1,900.40	6.59	6.59	-90.35	-0.18	-29.98	29.98	16.80	13.18	2.275	
2,000.00	2,000.00	2,000.40	2,000.40	6.95	6.95	-90.35	-0.18	-29.98	29.98	16.08	13.89	2.158	
2,100.00	2,100.00	2,100.40	2,100.40	7.30	7.31	-90.35	-0.18	-29.98	29.98	15.37	14.61	2.052	
2,200.00	2,200.00	2,200.40	2,200.40	7.66	7.66	-90.35	-0.18	-29.98	29.98	14.65	15.33	1.956	
2,300.00	2,300.00	2,300.40	2,300.40	8.02	8.02	-90.35	-0.18	-29.98	29.98	13.93	16.04	1.868	
2,400.00	2,400.00	2,400.40	2,400.40	8.38	8.38	-90.35	-0.18	-29.98	29.98	13.22	16.76	1.789	
2,500.00	2,500.00	2,500.40	2,500.40	8.74	8.74	-90.35	-0.18	-29.98	29.98	12.50	17.48	1.715 CC	
2,600.00	2,599.99	2,600.29	2,600.29	9.10	9.10	-90.37	0.68	-30.16	30.11	11.92	18.19	1.655	
2,700.00	2,699.96	2,700.19	2,700.15	9.45	9.45	-90.47	3.24	-30.70	30.52	11.62	18.91	1.614	
2,800.00	2,799.86	2,800.08	2,799.94	9.81	9.81	-90.63	7.50	-31.61	31.21	11.59	19.62	1.591 ES	
2,900.00	2,899.68	2,899.96	2,899.64	10.17	10.17	-90.84	13.46	-32.89	32.17	11.83	20.33	1.582	
3,000.00	2,999.37	2,999.85	2,999.21	10.53	10.53	-91.11	21.13	-34.52	33.40	12.35	21.05	1.587	
3,100.00	3,098.90	3,098.72	3,098.63	10.89	10.89	-91.41	30.48	-36.52	34.90	13.13	21.77	1.603	
3,200.00	3,198.26	3,199.59	3,197.85	11.25	11.25	-91.74	41.53	-38.88	36.68	14.19	22.49	1.631	
3,299.74	3,297.14	3,300.93	3,296.60	11.61	11.62	-92.09	54.24	-41.59	38.72	15.50	23.22	1.667	
3,300.00	3,297.40	3,300.67	3,296.86	11.61	11.62	-92.09	54.27	-41.60	38.73	15.50	23.22	1.668	
3,400.00	3,396.43	3,400.57	3,395.86	11.98	11.99	-92.38	67.88	-44.50	40.92	16.96	23.96	1.708	
3,500.00	3,495.46	3,500.60	3,494.87	12.36	12.36	-92.63	81.49	-47.41	43.11	18.40	24.70	1.745	
3,600.00	3,594.49	3,600.62	3,593.87	12.73	12.73	-92.87	95.10	-50.31	45.30	19.84	25.45	1.780	
3,700.00	3,693.51	3,700.64	3,692.87	13.11	13.11	-93.08	108.71	-53.22	47.49	21.28	26.21	1.812	
3,800.00	3,792.54	3,800.67	3,791.88	13.49	13.49	-93.27	122.32	-56.12	49.68	22.71	26.97	1.842	
3,900.00	3,891.57	3,900.69	3,890.88	13.87	13.87	-93.45	135.93	-59.03	51.87	24.14	27.73	1.871	
4,000.00	3,990.60	4,000.72	3,989.88	14.25	14.26	-93.61	149.53	-61.93	54.06	25.57	28.50	1.897	
4,100.00	4,089.62	4,100.74	4,088.88	14.64	14.64	-93.76	163.14	-64.83	56.26	26.99	29.27	1.922	
4,200.00	4,188.65	4,200.76	4,187.89	15.02	15.03	-93.90	176.75	-67.74	58.45	28.41	30.04	1.946	
4,300.00	4,287.68	4,300.79	4,286.89	15.41	15.42	-94.03	190.36	-70.64	60.64	29.82	30.82	1.968	
4,400.00	4,386.71	4,400.81	4,385.89	15.80	15.81	-94.15	203.97	-73.55	62.84	31.24	31.60	1.989	
4,500.00	4,485.73	4,500.84	4,484.89	16.19	16.20	-94.26	217.58	-76.45	65.03	32.65	32.38	2.008	
4,600.00	4,584.76	4,600.86	4,583.90	16.59	16.59	-94.37	231.18	-79.36	67.23	34.06	33.17	2.027	
4,700.00	4,683.79	4,700.88	4,682.90	16.98	16.99	-94.47	244.79	-82.26	69.42	35.47	33.95	2.045	
4,800.00	4,782.81	4,800.91	4,781.90	17.37	17.38	-94.56	258.40	-85.17	71.61	36.87	34.74	2.061	
4,900.00	4,881.84	4,900.93	4,880.91	17.77	17.78	-94.64	272.01	-88.07	73.81	38.28	35.53	2.077	
5,000.00	4,980.87	5,000.96	4,979.91	18.17	18.18	-94.73	285.62	-90.98	76.01	39.68	36.33	2.092	

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



MS Energy Services Anticollision Report



Company: Devon Energy
Project: Eddy County, New Mexico (NAD 83)
Reference Site: Cotton Draw Unit
Site Error: 0.00 usft
Reference Well: 515H
Well Error: 0.00 usft
Reference Wellbore: Wellbore #1
Reference Design: Design #1

Local Co-ordinate Reference: Well 515H
TVD Reference: Well @ 3566.10usft (Cactus 126)
MD Reference: Well @ 3566.10usft (Cactus 126)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: 5000.1 Conroe DB
Offset TVD Reference: Offset Datum

Offset Design Cotton Draw Unit - 516H - Wellbore #1 - Design #1														Offset Site Error:	0.00 usft
Survey Program: 0-MWD														Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Azimuth from North (°)	Offset Wellbore Centre		Distance				Warning		
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N-S (usft)	+E-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor			
5,100.00	5,079.90	5,100.98	5,078.91	18.56	18.57	-94.80	299.23	-93.88	78.20	41.08	37.12	2.107			
5,200.00	5,178.92	5,201.01	5,177.91	18.96	18.97	-94.88	312.84	-96.79	80.40	42.48	37.92	2.120			
5,300.00	5,277.95	5,301.03	5,276.92	19.36	19.37	-94.94	326.44	-99.69	82.59	43.88	38.72	2.133			
5,400.00	5,376.98	5,401.05	5,375.92	19.76	19.77	-95.01	340.05	-102.59	84.79	45.27	39.52	2.146			
5,500.00	5,476.01	5,501.08	5,474.92	20.16	20.17	-95.07	353.66	-105.50	86.98	46.67	40.32	2.158			
5,600.00	5,575.03	5,601.10	5,573.92	20.56	20.58	-95.13	367.27	-108.40	89.18	48.06	41.12	2.169			
5,628.09	5,602.86	5,626.99	5,601.74	20.68	20.68	-95.15	371.09	-109.22	89.80	48.46	41.34	2.172			
5,700.00	5,674.12	5,698.89	5,672.94	20.96	20.97	-94.91	380.87	-111.31	91.36	49.45	41.91	2.180			
5,800.00	5,773.42	5,799.08	5,772.29	21.36	21.37	-94.27	393.52	-114.01	93.37	50.67	42.70	2.187			
5,900.00	5,872.91	5,899.29	5,871.88	21.74	21.76	-93.66	404.46	-116.34	95.11	51.63	43.48	2.188			
6,000.00	5,972.56	5,999.53	5,971.67	22.12	22.14	-93.05	413.71	-118.32	96.59	52.35	44.24	2.183			
6,100.00	6,072.35	6,099.79	6,071.63	22.49	22.52	-92.45	421.24	-119.92	97.80	52.82	44.98	2.174			
6,200.00	6,172.23	6,200.08	6,171.74	22.86	22.89	-91.86	427.07	-121.17	98.76	53.04	45.71	2.160			
6,300.00	6,272.18	6,300.39	6,271.96	23.21	23.25	-91.26	431.18	-122.04	99.44	53.02	46.42	2.142			
6,400.00	6,372.17	6,400.72	6,372.26	23.56	23.61	-90.66	433.58	-122.56	99.86	52.74	47.12	2.119			
6,427.83	6,400.00	6,428.64	6,400.18	23.66	23.70	-90.49	433.94	-122.63	99.93	52.62	47.31	2.112			
6,500.00	6,472.17	6,501.03	6,472.57	23.90	23.95	-90.30	434.26	-122.70	100.00	52.19	47.81	2.092			
6,600.00	6,572.17	6,601.03	6,572.57	24.25	24.29	-90.30	434.26	-122.70	100.00	51.51	48.49	2.062			
6,700.00	6,672.17	6,701.03	6,672.57	24.59	24.64	-90.30	434.26	-122.70	100.00	50.82	49.18	2.033			
6,800.00	6,772.17	6,801.03	6,772.57	24.93	24.98	-90.30	434.26	-122.70	100.00	50.14	49.86	2.005			
6,900.00	6,872.17	6,901.03	6,872.57	25.28	25.32	-90.30	434.26	-122.70	100.00	49.45	50.55	1.978			
7,000.00	6,972.17	7,001.03	6,972.57	25.62	25.67	-90.30	434.26	-122.70	100.00	48.76	51.24	1.952			
7,100.00	7,072.17	7,101.03	7,072.57	25.97	26.01	-90.30	434.26	-122.70	100.00	48.07	51.93	1.926			
7,200.00	7,172.17	7,201.03	7,172.57	26.31	26.36	-90.30	434.26	-122.70	100.00	47.38	52.62	1.900			
7,300.00	7,272.17	7,301.03	7,272.57	26.66	26.70	-90.30	434.26	-122.70	100.00	46.69	53.31	1.876			
7,400.00	7,372.17	7,401.03	7,372.57	27.00	27.05	-90.30	434.26	-122.70	100.00	46.00	54.00	1.852			
7,500.00	7,472.17	7,501.03	7,472.57	27.35	27.39	-90.30	434.26	-122.70	100.00	45.30	54.70	1.828			
7,600.00	7,572.17	7,601.03	7,572.57	27.69	27.74	-90.30	434.26	-122.70	100.00	44.61	55.39	1.805			
7,700.00	7,672.17	7,701.03	7,672.57	28.04	28.08	-90.30	434.26	-122.70	100.00	43.92	56.08	1.783			
7,800.00	7,772.17	7,801.03	7,772.57	28.39	28.43	-90.30	434.26	-122.70	100.00	43.22	56.78	1.761			
7,900.00	7,872.17	7,901.03	7,872.57	28.74	28.78	-90.30	434.26	-122.70	100.00	42.53	57.47	1.740			
8,000.00	7,972.17	8,001.03	7,972.57	29.08	29.12	-90.30	434.26	-122.70	100.00	41.83	58.17	1.719			
8,100.00	8,072.17	8,101.03	8,072.57	29.43	29.47	-90.30	434.26	-122.70	100.00	41.14	58.86	1.699			
8,200.00	8,172.17	8,201.03	8,172.57	29.78	29.82	-90.30	434.26	-122.70	100.00	40.44	59.56	1.679			
8,300.00	8,272.17	8,301.03	8,272.57	30.13	30.17	-90.30	434.26	-122.70	100.00	39.75	60.25	1.660			
8,400.00	8,372.17	8,401.03	8,372.57	30.48	30.52	-90.30	434.26	-122.70	100.00	39.05	60.95	1.641			
8,500.00	8,472.17	8,501.03	8,472.57	30.83	30.86	-90.30	434.26	-122.70	100.00	38.35	61.65	1.622			
8,600.00	8,572.17	8,601.03	8,572.57	31.18	31.21	-90.30	434.26	-122.70	100.00	37.65	62.35	1.604			
8,700.00	8,672.17	8,701.03	8,672.57	31.52	31.56	-90.30	434.26	-122.70	100.00	36.95	63.05	1.586			
8,751.58	8,723.75	8,752.61	8,724.15	31.70	31.74	-90.30	434.26	-122.70	100.00	36.59	63.41	1.577			
8,800.00	8,772.11	8,800.97	8,772.51	31.86	31.91	-89.15	434.26	-122.70	100.29	36.57	63.72	1.574 SF			
8,850.00	8,821.68	8,850.54	8,822.08	32.00	32.08	-85.58	434.26	-122.70	101.46	37.46	64.00	1.585			
8,900.00	8,870.51	8,900.63	8,870.91	32.12	32.26	-79.83	434.26	-122.70	104.27	40.02	64.24	1.623			
8,950.00	8,918.22	8,947.09	8,918.62	32.24	32.42	-72.42	434.26	-122.70	109.81	45.39	64.42	1.705			
9,000.00	8,964.46	9,006.68	8,964.86	32.34	32.63	-64.15	434.26	-122.70	119.22	54.62	64.60	1.846			
9,050.00	9,008.86	9,037.72	9,009.26	32.43	32.74	-55.92	434.26	-122.70	133.36	68.69	64.66	2.062			
9,100.00	9,051.09	9,079.95	9,051.49	32.51	32.89	-48.44	434.26	-122.70	152.54	87.77	64.78	2.355			
9,150.00	9,090.83	9,119.69	9,091.23	32.58	33.03	-42.04	434.26	-122.70	176.69	111.79	64.90	2.723			
9,200.00	9,127.77	9,156.63	9,128.17	32.65	33.15	-36.76	434.26	-122.70	205.43	140.40	65.03	3.159			
9,250.00	9,161.64	9,209.50	9,162.04	32.71	33.34	-32.49	434.26	-122.70	238.29	173.06	65.23	3.653			
9,300.00	9,192.18	9,221.04	9,192.58	32.78	33.38	-29.06	434.26	-122.70	274.77	209.48	65.29	4.208			
9,350.00	9,219.15	9,248.01	9,219.55	32.85	33.47	-26.29	434.26	-122.70	314.38	248.98	65.41	4.807			

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



MS Energy Services
Anticollision Report



Company: Devon Energy
Project: Eddy County, New Mexico (NAD 83)
Reference Site: Cotton Draw Unit
Site Error: 0.00 usft
Reference Well: 515H
Well Error: 0.00 usft
Reference Wellbore: Wellbore #1
Reference Design: Design #1

Local Co-ordinate Reference: Well 515H
TVD Reference: Well @ 3566.10usft (Cactus 126)
MD Reference: Well @ 3566.10usft (Cactus 126)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at: 2.00 sigma
Database: 5000.1 Conroe DB
Offset TVD Reference: Offset Datum

Offset Design Cotton Draw Unit - 516H - Wellbore #1 - Design #1													Offset Site Error: 0.00 usft
Survey Program: 0-MWD													Offset Well Error: 0.00 usft
Reference		Offset		Semi Major Axis		Azimuth from North (°)	Offset Wellbore Centre		Distance		Minimum Separation (usft)	Separation Factor	Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)			
9,400.00	9,242.36	9,271.22	9,242.76	32.92	33.56	-24.05	434.26	-122.70	356.67	291.17	65.51	5.445	
9,450.00	9,261.61	9,309.53	9,262.01	32.99	33.69	-22.22	434.26	-122.70	401.19	335.53	65.66	6.111	
9,500.00	9,276.77	9,305.63	9,277.17	33.08	33.68	-20.71	434.26	-122.70	447.49	381.84	65.65	6.816	
9,550.00	9,287.73	9,316.59	9,288.13	33.17	33.71	-19.46	434.26	-122.70	495.17	429.48	65.69	7.538	
9,600.00	9,294.39	9,323.25	9,294.79	33.27	33.74	-18.42	434.26	-122.70	543.80	478.08	65.72	8.275	
9,649.26	9,296.70	9,325.56	9,297.10	33.37	33.75	-17.55	434.26	-122.70	592.23	526.51	65.73	9.011	
9,700.00	9,296.91	9,325.77	9,297.31	33.49	33.75	-16.75	434.26	-122.70	642.24	576.51	65.73	9.771	
9,800.00	9,297.31	9,326.18	9,297.71	33.80	33.75	-15.29	434.26	-122.70	740.68	674.95	65.73	11.269	
9,900.00	9,297.72	9,326.58	9,298.12	34.17	33.75	-13.94	434.26	-122.70	838.94	773.20	65.73	12.763	
10,000.00	9,298.12	9,326.99	9,298.52	34.62	33.75	-12.67	434.26	-122.70	936.96	871.22	65.74	14.252	
10,027.33	9,298.24	9,327.10	9,298.64	34.75	33.75	-12.33	434.26	-122.70	963.71	897.96	65.74	14.658	
10,100.00	9,298.53	9,327.39	9,298.93	35.13	33.75	-11.49	434.26	-122.70	1,034.91	969.15	65.75	15.739	
10,200.00	9,298.93	9,327.79	9,299.33	35.71	33.75	-10.52	434.26	-122.70	1,133.18	1,067.42	65.77	17.231	
10,300.00	9,299.34	9,328.20	9,299.74	36.35	33.76	-9.70	434.26	-122.70	1,231.74	1,165.96	65.78	18.725	
10,400.00	9,299.74	9,328.60	9,300.14	37.06	33.76	-9.00	434.26	-122.70	1,330.51	1,264.72	65.80	20.222	
10,500.00	9,300.15	9,329.01	9,300.55	37.83	33.76	-8.39	434.26	-122.70	1,429.45	1,363.64	65.81	21.721	
10,600.00	9,300.55	9,329.41	9,300.95	38.65	33.76	-7.87	434.26	-122.70	1,528.53	1,462.71	65.83	23.220	
10,700.00	9,300.96	9,329.82	9,301.36	39.53	33.76	-7.41	434.26	-122.70	1,627.73	1,561.88	65.85	24.720	
10,800.00	9,301.36	9,330.22	9,301.76	40.45	33.76	-7.00	434.26	-122.70	1,727.01	1,661.15	65.86	26.221	
10,900.00	9,301.76	9,330.63	9,302.16	41.42	33.76	-6.64	434.26	-122.70	1,826.37	1,760.49	65.88	27.721	
11,000.00	9,302.17	9,331.03	9,302.57	42.44	33.77	-6.31	434.26	-122.70	1,925.80	1,859.90	65.90	29.222	
11,100.00	9,302.57	9,331.43	9,302.97	43.49	33.77	-6.02	434.26	-122.70	2,025.29	1,959.36	65.92	30.721	
11,200.00	9,302.98	9,331.84	9,303.38	44.58	33.77	-5.75	434.26	-122.70	2,124.82	2,058.87	65.95	32.220	
11,300.00	9,303.38	9,332.24	9,303.78	45.71	33.77	-5.51	434.26	-122.70	2,224.40	2,158.43	65.97	33.719	
11,400.00	9,303.79	9,332.65	9,304.19	46.86	33.77	-5.29	434.26	-122.70	2,324.01	2,258.02	65.99	35.216	
11,500.00	9,304.19	9,333.05	9,304.59	48.05	33.77	-5.08	434.26	-122.70	2,423.65	2,357.63	66.02	36.713	
11,600.00	9,304.60	9,333.46	9,305.00	49.26	33.77	-4.90	434.26	-122.70	2,523.32	2,457.28	66.04	38.208	
11,700.00	9,305.00	9,333.86	9,305.40	50.50	33.78	-4.72	434.26	-122.70	2,623.02	2,556.95	66.07	39.702	
11,800.00	9,305.40	9,334.27	9,305.80	51.76	33.78	-4.56	434.26	-122.70	2,722.74	2,656.64	66.10	41.194	
11,900.00	9,305.81	14,676.93	12,076.18	53.05	59.75	-0.35	-2,371.96	94.52	2,769.98	2,708.98	61.00	45.407	
12,000.00	9,306.21	14,776.93	12,076.46	54.35	60.91	-0.35	-2,471.96	95.13	2,769.86	2,707.72	62.14	44.576	
12,100.00	9,306.62	14,876.93	12,076.75	55.67	62.09	-0.35	-2,571.96	95.74	2,769.74	2,706.45	63.29	43.763	
12,200.00	9,307.02	14,976.93	12,077.03	57.01	63.29	-0.35	-2,671.95	96.36	2,769.62	2,705.16	64.46	42.966	
12,300.00	9,307.43	15,076.93	12,077.32	58.37	64.51	-0.35	-2,771.95	96.97	2,769.50	2,703.85	65.65	42.188	
12,400.00	9,307.83	15,176.93	12,077.60	59.74	65.75	-0.35	-2,871.95	97.58	2,769.38	2,702.53	66.85	41.428	
12,500.00	9,308.23	15,276.93	12,077.88	61.13	67.01	-0.35	-2,971.95	98.20	2,769.26	2,701.20	68.06	40.686	
12,600.00	9,308.64	15,376.93	12,078.17	62.53	68.29	-0.35	-3,071.94	98.81	2,769.14	2,699.85	69.29	39.962	
12,700.00	9,309.04	15,476.93	12,078.45	63.94	69.58	-0.35	-3,171.94	99.42	2,769.02	2,698.48	70.54	39.256	
12,800.00	9,309.45	15,576.93	12,078.74	65.36	70.89	-0.35	-3,271.94	100.04	2,768.90	2,697.11	71.79	38.568	
12,900.00	9,309.85	15,676.93	12,079.02	66.80	72.21	-0.35	-3,371.94	100.65	2,768.78	2,695.72	73.06	37.897	
13,000.00	9,310.26	15,776.93	12,079.31	68.24	73.54	-0.35	-3,471.93	101.26	2,768.66	2,694.32	74.34	37.243	
13,100.00	9,310.66	15,876.93	12,079.59	69.69	74.89	-0.35	-3,571.93	101.88	2,768.54	2,692.91	75.63	36.607	
13,200.00	9,311.07	15,976.93	12,079.87	71.16	76.25	-0.35	-3,671.93	102.49	2,768.42	2,691.49	76.93	35.987	
13,300.00	9,311.47	16,076.93	12,080.16	72.63	77.63	-0.35	-3,771.93	103.10	2,768.30	2,690.06	78.24	35.383	
13,400.00	9,311.87	16,176.93	12,080.44	74.11	79.01	-0.35	-3,871.93	103.72	2,768.18	2,688.62	79.56	34.795	
13,500.00	9,312.28	16,276.93	12,080.73	75.59	80.40	-0.35	-3,971.92	104.33	2,768.06	2,687.18	80.88	34.223	
13,600.00	9,312.68	16,376.93	12,081.01	77.09	81.81	-0.35	-4,071.92	104.94	2,767.94	2,685.72	82.22	33.665	
13,700.00	9,313.09	16,476.93	12,081.30	78.59	83.22	-0.35	-4,171.92	105.56	2,767.82	2,684.26	83.56	33.123	
13,800.00	9,313.49	16,576.93	12,081.58	80.09	84.64	-0.35	-4,271.92	106.17	2,767.70	2,682.79	84.91	32.594	
13,900.00	9,313.90	16,676.93	12,081.87	81.60	86.07	-0.35	-4,371.91	106.79	2,767.58	2,681.31	86.27	32.080	
14,000.00	9,314.30	16,776.93	12,082.15	83.12	87.51	-0.35	-4,471.91	107.40	2,767.46	2,679.82	87.64	31.579	
14,100.00	9,314.71	16,876.93	12,082.43	84.64	88.96	-0.35	-4,571.91	108.01	2,767.34	2,678.33	89.01	31.091	

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



MS Energy Services
Anticollision Report



Company: Devon Energy
Project: Eddy County, New Mexico (NAD 83)
Reference Site: Cotton Draw Unit
Site Error: 0.00 usft
Reference Well: 515H
Well Error: 0.00 usft
Reference Wellbore: Wellbore #1
Reference Design: Design #1

Local Co-ordinate Reference: Well 515H
TVD Reference: Well @ 3566.10usft (Cactus 126)
MD Reference: Well @ 3566.10usft (Cactus 126)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at: 2.00 sigma
Database: 5000.1 Conroe DB
Offset TVD Reference: Offset Datum

Offset Design Cotton Draw Unit - 516H - Wellbore #1 - Design #1											Offset Site Error: 0.00 usft	
Survey Program: 0-MWD											Offset Well Error: 0.00 usft	
Reference		Offset		Semi Major Axis		Azimuth from North (°)	Distance		Minimum Separation (usft)	Separation Factor	Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		Offset Wellbore Centre +N-S (usft)	+E/W (usft)				Between Centras (usft)
14,200.00	9,315.11	16,976.93	12,082.72	86.17	90.41	-0.35	-4,671.91	108.63	2,767.22	2,676.83	90.39	30.615
14,300.00	9,315.51	17,076.93	12,083.00	87.70	91.87	-0.35	-4,771.90	109.24	2,767.10	2,675.33	91.77	30.152
14,400.00	9,315.92	17,176.93	12,083.29	89.24	93.34	-0.35	-4,871.90	109.85	2,766.98	2,673.82	93.16	29.701
14,500.00	9,316.32	17,276.93	12,083.57	90.78	94.81	-0.35	-4,971.90	110.47	2,766.86	2,672.30	94.56	29.261
14,600.00	9,316.73	17,376.93	12,083.86	92.33	96.29	-0.35	-5,071.90	111.08	2,766.74	2,670.78	95.96	28.833
14,700.00	9,317.13	17,476.93	12,084.14	93.88	97.78	-0.35	-5,171.89	111.69	2,766.62	2,669.26	97.36	28.416
14,800.00	9,317.54	17,576.93	12,084.42	95.43	99.27	-0.35	-5,271.89	112.31	2,766.50	2,667.73	98.77	28.009
14,900.00	9,317.94	17,676.93	12,084.71	96.99	100.76	-0.35	-5,371.89	112.92	2,766.38	2,666.19	100.19	27.612
15,000.00	9,318.34	17,776.93	12,084.99	98.55	102.26	-0.35	-5,471.89	113.53	2,766.26	2,664.65	101.61	27.225
15,100.00	9,318.75	17,876.93	12,085.28	100.11	103.77	-0.35	-5,571.89	114.15	2,766.14	2,663.11	103.03	26.847
15,200.00	9,319.15	17,976.93	12,085.56	101.68	105.28	-0.35	-5,671.88	114.76	2,766.02	2,661.56	104.46	26.479
15,300.00	9,319.56	18,076.93	12,085.85	103.24	106.79	-0.35	-5,771.88	115.37	2,765.90	2,660.01	105.89	26.120
15,400.00	9,319.96	18,176.93	12,086.13	104.82	108.31	-0.35	-5,871.88	115.99	2,765.78	2,658.45	107.33	25.769
15,500.00	9,320.37	18,276.93	12,086.41	106.39	109.83	-0.35	-5,971.88	116.60	2,765.66	2,656.89	108.77	25.427
15,600.00	9,320.77	18,376.93	12,086.70	107.97	111.36	-0.35	-6,071.87	117.21	2,765.54	2,655.33	110.21	25.093
15,700.00	9,321.18	18,476.93	12,086.98	109.55	112.89	-0.35	-6,171.87	117.83	2,765.42	2,653.76	111.66	24.767
15,800.00	9,321.58	18,576.93	12,087.27	111.13	114.42	-0.35	-6,271.87	118.44	2,765.30	2,652.19	113.11	24.449
15,900.00	9,321.98	18,676.93	12,087.55	112.71	115.96	-0.35	-6,371.87	119.05	2,765.18	2,650.62	114.56	24.138
16,000.00	9,322.39	18,776.93	12,087.84	114.30	117.50	-0.35	-6,471.86	119.67	2,765.06	2,649.04	116.01	23.834
16,100.00	9,322.79	18,876.93	12,088.12	115.88	119.05	-0.35	-6,571.86	120.28	2,764.94	2,647.47	117.47	23.537
16,200.00	9,323.20	18,976.93	12,088.41	117.47	120.59	-0.35	-6,671.86	120.89	2,764.82	2,645.88	118.93	23.247
16,300.00	9,323.60	19,076.93	12,088.69	119.07	122.14	-0.35	-6,771.86	121.51	2,764.70	2,644.30	120.40	22.963
16,400.00	9,324.01	19,176.93	12,088.97	120.66	123.69	-0.35	-6,871.85	122.12	2,764.58	2,642.71	121.86	22.686
16,500.00	9,324.41	19,276.93	12,089.26	122.25	125.25	-0.35	-6,971.85	122.74	2,764.46	2,641.13	123.33	22.414
16,600.00	9,324.82	19,376.93	12,089.54	123.85	126.81	-0.35	-7,071.85	123.35	2,764.34	2,639.53	124.81	22.149
16,700.00	9,325.22	19,476.93	12,089.83	125.45	128.37	-0.35	-7,171.85	123.96	2,764.22	2,637.94	126.28	21.890
16,800.00	9,325.62	19,576.93	12,090.11	127.05	129.93	-0.35	-7,271.85	124.58	2,764.10	2,636.34	127.76	21.636
16,900.00	9,326.03	19,676.93	12,090.40	128.65	131.49	-0.35	-7,371.84	125.19	2,763.98	2,634.75	129.23	21.388
17,000.00	9,326.43	19,776.93	12,090.68	130.25	133.06	-0.35	-7,471.84	125.80	2,763.86	2,633.15	130.71	21.144
17,100.00	9,326.84	19,876.93	12,090.96	131.86	134.63	-0.35	-7,571.84	126.42	2,763.74	2,631.54	132.20	20.906
17,200.00	9,327.24	19,976.93	12,091.25	133.46	136.20	-0.35	-7,671.84	127.03	2,763.62	2,629.94	133.68	20.673
17,300.00	9,327.65	20,076.92	12,091.53	135.07	137.78	-0.35	-7,771.83	127.64	2,763.50	2,628.33	135.17	20.445
17,400.00	9,328.05	20,176.92	12,091.82	136.68	139.35	-0.35	-7,871.83	128.26	2,763.38	2,626.72	136.65	20.222
17,500.00	9,328.45	20,276.92	12,092.10	138.29	140.93	-0.35	-7,971.83	128.87	2,763.26	2,625.11	138.14	20.003
17,600.00	9,328.86	20,376.92	12,092.39	139.90	142.51	-0.35	-8,071.83	129.48	2,763.14	2,623.50	139.64	19.788
17,700.00	9,329.26	20,476.92	12,092.67	141.51	144.09	-0.35	-8,171.82	130.10	2,763.02	2,621.89	141.13	19.578
17,800.00	9,329.67	20,576.92	12,092.96	143.12	145.67	-0.35	-8,271.82	130.71	2,762.90	2,620.27	142.62	19.372
17,900.00	9,330.07	20,676.92	12,093.24	144.73	147.26	-0.35	-8,371.82	131.32	2,762.78	2,618.66	144.12	19.170
18,000.00	9,330.48	20,776.92	12,093.52	146.35	148.84	-0.35	-8,471.82	131.94	2,762.66	2,617.04	145.62	18.972
18,100.00	9,330.88	20,876.92	12,093.81	147.96	150.43	-0.35	-8,571.81	132.55	2,762.54	2,615.42	147.12	18.778
18,200.00	9,331.29	20,976.92	12,094.09	149.58	152.02	-0.35	-8,671.81	133.16	2,762.42	2,613.80	148.62	18.587
18,300.00	9,331.69	21,076.92	12,094.38	151.20	153.61	-0.35	-8,771.81	133.78	2,762.30	2,612.18	150.12	18.400
18,400.00	9,332.09	21,176.92	12,094.66	152.81	155.20	-0.35	-8,871.81	134.39	2,762.18	2,610.55	151.63	18.217
18,500.00	9,332.50	21,276.92	12,094.95	154.43	156.80	-0.35	-8,971.81	135.00	2,762.06	2,608.93	153.13	18.037
18,600.00	9,332.90	21,376.92	12,095.23	156.05	158.39	-0.35	-9,071.80	135.62	2,761.94	2,607.30	154.64	17.861
18,700.00	9,333.31	21,476.92	12,095.51	157.67	159.99	-0.35	-9,171.80	136.23	2,761.82	2,605.67	156.14	17.688
18,800.00	9,333.71	21,576.92	12,095.80	159.30	161.58	-0.35	-9,271.80	136.84	2,761.70	2,604.05	157.65	17.518
18,900.00	9,334.12	21,676.92	12,096.08	160.92	163.18	-0.35	-9,371.80	137.46	2,761.58	2,602.42	159.16	17.351
19,000.00	9,334.52	21,776.92	12,096.37	162.54	164.78	-0.35	-9,471.79	138.07	2,761.46	2,600.78	160.67	17.187
19,100.00	9,334.93	21,876.92	12,096.65	164.16	166.38	-0.35	-9,571.79	138.69	2,761.34	2,599.15	162.19	17.026
19,200.00	9,335.33	21,976.92	12,096.94	165.79	167.98	-0.35	-9,671.79	139.30	2,761.22	2,597.52	163.70	16.868
9,300.00	9,335.73	22,076.92	12,097.22	167.41	169.59	-0.35	-9,771.79	139.91	2,761.10	2,595.89	165.21	16.712

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

devon

MS Energy Services
Anticollision Report

MS Energy Services.
WWW.MSENERGYSERVICES.COM

Company: Devon Energy
Project: Eddy County, New Mexico (NAD 83)
Reference Site: Cotton Draw Unit
Site Error: 0.00 usft
Reference Well: 515H
Well Error: 0.00 usft
Reference Wellbore: Wellbore #1
Reference Design: Design #1

Local Co-ordinate Reference: Well 515H
TVD Reference: Well @ 3566.10usft (Cactus 126)
MD Reference: Well @ 3566.10usft (Cactus 126)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: 5000.1 Conroe DB
Offset TVD Reference: Offset Datum

Offset Design												Offset Site Error:	0.00 usft
Survey Program: 0-MWD												Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Distance							
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Azimuth from North (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
19,390.56	9,336.10	22,167.48	12,097.48	168.88	171.04	-0.35	-9,862.34	140.47	2,760.99	2,594.40	166.58	16.574	



MS Energy Services Anticollision Report



Company: Devon Energy
Project: Eddy County, New Mexico (NAD 83)
Reference Site: Cotton Draw Unit
Site Error: 0.00 usft
Reference Well: 515H
Well Error: 0.00 usft
Reference Wellbore: Wellbore #1
Reference Design: Design #1

Local Co-ordinate Reference: Well 515H
TVD Reference: Well @ 3566.10usft (Cactus 126)
MD Reference: Well @ 3566.10usft (Cactus 126)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: 5000.1 Conroe DB
Offset TVD Reference: Offset Datum

Offset Design Cotton Draw Unit - 517H - Wellbore #1 - Design #1														Offset Site Error:	0.00 usft
Survey Program: 0-MWD														Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Azimuth from North (°)	Offset Wellbore Centre		Distance				Warning		
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N-S (usft)	+E-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor			
0.00	0.00	0.30	0.30	0.00	0.00	-90.32	-0.34	-59.96	59.97						
100.00	100.00	100.30	100.30	0.13	0.14	-90.32	-0.34	-59.96	59.97	59.70	0.27	222.152			
200.00	200.00	200.30	200.30	0.49	0.49	-90.32	-0.34	-59.96	59.97	58.98	0.99	60.763			
300.00	300.00	300.30	300.30	0.85	0.85	-90.32	-0.34	-59.96	59.97	58.26	1.70	35.195			
400.00	400.00	400.30	400.30	1.21	1.21	-90.32	-0.34	-59.96	59.97	57.54	2.42	24.771			
500.00	500.00	500.30	500.30	1.57	1.57	-90.32	-0.34	-59.96	59.97	56.83	3.14	19.111			
600.00	600.00	600.30	600.30	1.93	1.93	-90.32	-0.34	-59.96	59.97	56.11	3.85	15.557			
700.00	700.00	700.30	700.30	2.29	2.29	-90.32	-0.34	-59.96	59.97	55.39	4.57	13.117			
800.00	800.00	800.30	800.30	2.64	2.64	-90.32	-0.34	-59.96	59.97	54.68	5.29	11.339			
900.00	900.00	900.30	900.30	3.00	3.00	-90.32	-0.34	-59.96	59.97	53.96	6.01	9.985			
1,000.00	1,000.00	1,000.30	1,000.30	3.36	3.36	-90.32	-0.34	-59.96	59.97	53.24	6.72	8.920			
1,100.00	1,100.00	1,100.30	1,100.30	3.72	3.72	-90.32	-0.34	-59.96	59.97	52.53	7.44	8.061			
1,200.00	1,200.00	1,200.30	1,200.30	4.08	4.08	-90.32	-0.34	-59.96	59.97	51.81	8.16	7.352			
1,300.00	1,300.00	1,300.30	1,300.30	4.44	4.44	-90.32	-0.34	-59.96	59.97	51.09	8.87	6.758			
1,400.00	1,400.00	1,400.30	1,400.30	4.79	4.80	-90.32	-0.34	-59.96	59.97	50.38	9.59	6.253			
1,500.00	1,500.00	1,500.30	1,500.30	5.15	5.15	-90.32	-0.34	-59.96	59.97	49.66	10.31	5.818			
1,600.00	1,600.00	1,600.30	1,600.30	5.51	5.51	-90.32	-0.34	-59.96	59.97	48.94	11.02	5.439			
1,700.00	1,700.00	1,700.30	1,700.30	5.87	5.87	-90.32	-0.34	-59.96	59.97	48.22	11.74	5.107			
1,800.00	1,800.00	1,800.30	1,800.30	6.23	6.23	-90.32	-0.34	-59.96	59.97	47.51	12.46	4.813			
1,900.00	1,900.00	1,900.30	1,900.30	6.59	6.59	-90.32	-0.34	-59.96	59.97	46.79	13.17	4.551			
2,000.00	2,000.00	2,000.30	2,000.30	6.95	6.95	-90.32	-0.34	-59.96	59.97	46.07	13.89	4.317			
2,100.00	2,100.00	2,100.30	2,100.30	7.30	7.30	-90.32	-0.34	-59.96	59.97	45.36	14.61	4.105			
2,200.00	2,200.00	2,200.30	2,200.30	7.66	7.66	-90.32	-0.34	-59.96	59.97	44.64	15.33	3.913			
2,300.00	2,300.00	2,300.30	2,300.30	8.02	8.02	-90.32	-0.34	-59.96	59.97	43.92	16.04	3.738			
2,400.00	2,400.00	2,400.30	2,400.30	8.38	8.38	-90.32	-0.34	-59.96	59.97	43.21	16.76	3.578			
2,500.00	2,500.00	2,500.30	2,500.30	8.74	8.74	-90.32	-0.34	-59.96	59.97	42.49	17.48	3.431 CC			
2,600.00	2,599.99	2,599.89	2,599.88	9.10	9.10	-90.39	0.46	-60.31	60.27	42.08	18.19	3.313 ES			
2,700.00	2,699.96	2,699.47	2,699.43	9.45	9.45	-90.60	2.84	-61.35	61.18	42.27	18.90	3.237			
2,800.00	2,799.86	2,799.04	2,798.91	9.81	9.81	-90.94	6.81	-63.08	62.69	43.08	19.61	3.196			
2,900.00	2,899.68	2,898.60	2,898.28	10.17	10.16	-91.39	12.37	-65.49	64.81	44.48	20.32	3.189 SF			
3,000.00	2,999.37	2,998.13	2,997.50	10.53	10.52	-91.93	19.50	-68.60	67.53	46.50	21.03	3.211			
3,100.00	3,098.90	3,097.63	3,096.55	10.89	10.88	-92.53	28.22	-72.38	70.87	49.12	21.75	3.259			
3,200.00	3,198.26	3,197.10	3,195.39	11.25	11.24	-93.18	38.50	-76.86	74.81	52.35	22.46	3.330			
3,299.74	3,297.14	3,303.95	3,293.70	11.61	11.63	-93.86	50.32	-82.00	79.36	56.15	23.21	3.419			
3,300.00	3,297.40	3,303.68	3,293.96	11.61	11.63	-93.86	50.35	-82.01	79.37	56.16	23.21	3.419			
3,400.00	3,396.43	3,403.60	3,392.86	11.98	12.00	-94.42	63.10	-87.56	84.26	60.31	23.95	3.518			
3,500.00	3,495.46	3,496.27	3,491.77	12.36	12.34	-94.91	75.85	-93.10	89.16	64.49	24.67	3.615			
3,600.00	3,594.49	3,603.85	3,590.67	12.73	12.75	-95.36	88.59	-98.65	94.06	68.62	25.44	3.697			
3,700.00	3,693.51	3,703.97	3,689.58	13.11	13.12	-95.76	101.34	-104.19	98.97	72.77	26.20	3.778			
3,800.00	3,792.54	3,804.10	3,788.48	13.49	13.50	-96.12	114.09	-109.73	103.88	76.93	26.95	3.854			
3,900.00	3,891.57	3,904.22	3,887.39	13.87	13.89	-96.45	126.84	-115.28	108.80	81.08	27.72	3.925			
4,000.00	3,990.60	4,004.34	3,986.29	14.25	14.27	-96.75	139.59	-120.82	113.72	85.24	28.48	3.993			
4,100.00	4,089.62	4,104.46	4,085.20	14.64	14.66	-97.03	152.34	-126.37	118.64	89.39	29.25	4.056			
4,200.00	4,188.65	4,204.59	4,184.10	15.02	15.05	-97.28	165.08	-131.91	123.57	93.54	30.03	4.115			
4,300.00	4,287.68	4,295.29	4,283.01	15.41	15.40	-97.51	177.83	-137.46	128.49	97.73	30.77	4.177			
4,400.00	4,386.71	4,404.83	4,381.91	15.80	15.83	-97.73	190.58	-143.00	133.42	101.84	31.58	4.225			
4,500.00	4,485.73	4,504.95	4,480.82	16.19	16.22	-97.93	203.33	-148.55	138.36	105.99	32.36	4.275			
4,600.00	4,584.76	4,605.08	4,579.72	16.59	16.62	-98.12	216.08	-154.09	143.29	110.14	33.15	4.323			
4,700.00	4,683.79	4,705.20	4,678.63	16.98	17.01	-98.30	228.83	-159.64	148.22	114.29	33.93	4.368			
4,800.00	4,782.81	4,805.32	4,777.53	17.37	17.41	-98.46	241.57	-165.18	153.16	118.44	34.72	4.411			
4,900.00	4,881.84	4,905.45	4,876.43	17.77	17.80	-98.61	254.32	-170.73	158.10	122.59	35.51	4.452			
5,000.00	4,980.87	5,005.57	4,975.34	18.17	18.20	-98.76	267.07	-176.27	163.03	126.73	36.30	4.491			

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



MS Energy Services
Anticollision Report



Company: Devon Energy
Project: Eddy County, New Mexico (NAD 83)
Reference Site: Cotton Draw Unit
Site Error: 0.00 usft
Reference Well: 515H
Well Error: 0.00 usft
Reference Wellbore: Wellbore #1
Reference Design: Design #1

Local Co-ordinate Reference: Well 515H
TVD Reference: Well @ 3566.10usft (Cactus 126)
MD Reference: Well @ 3566.10usft (Cactus 126)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: 5000.1 Conroe DB
Offset TVD Reference: Offset Datum

Offset Design Cotton Draw Unit - 517H - Wellbore #1 - Design #1													Offset Site Error: 0.00 usft
Survey Program: 0-MWD													Offset Well Error: 0.00 usft
Reference		Offset		Semi Major Axis		Azimuth from North (°)	Distance		Minimum Separation (usft)	Separation Factor	Warning		
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		Between Centres (usft)	Between Ellipses (usft)					
5,100.00	5,079.90	5,105.69	5,074.24	18.56	18.60	-98.89	279.82	-181.82	167.97	130.88	37.10	4.528	
5,200.00	5,178.92	5,205.81	5,173.15	18.96	19.00	-99.02	292.57	-187.36	172.91	135.02	37.89	4.563	
5,300.00	5,277.95	5,305.94	5,272.05	19.36	19.40	-99.14	305.32	-192.91	177.85	139.17	38.69	4.597	
5,400.00	5,376.98	5,406.06	5,370.96	19.76	19.80	-99.26	318.06	-198.45	182.80	143.31	39.49	4.629	
5,500.00	5,476.01	5,493.82	5,469.86	20.16	20.15	-99.37	330.81	-204.00	187.74	147.50	40.24	4.666	
5,600.00	5,575.03	5,606.31	5,568.77	20.56	20.61	-99.47	343.56	-209.54	192.68	151.59	41.09	4.689	
5,628.09	5,602.86	5,621.75	5,596.56	20.68	20.67	-99.50	347.14	-211.10	194.07	152.81	41.26	4.703	
5,700.00	5,674.12	5,706.43	5,667.68	20.96	21.01	-99.44	356.31	-215.09	197.58	155.69	41.89	4.717	
5,800.00	5,773.42	5,806.56	5,766.58	21.36	21.41	-98.94	369.06	-220.63	202.30	159.62	42.68	4.740	
5,900.00	5,872.91	5,893.28	5,865.44	21.74	21.76	-97.99	381.80	-226.17	206.89	163.48	43.40	4.767	
6,000.00	5,972.56	5,994.07	5,965.36	22.12	22.17	-96.78	393.94	-231.45	211.19	167.01	44.18	4.780	
6,100.00	6,072.35	6,095.03	6,065.66	22.49	22.56	-95.60	404.48	-236.04	214.96	170.02	44.94	4.784	
6,200.00	6,172.23	6,196.11	6,166.26	22.86	22.95	-94.43	413.41	-239.92	218.20	172.52	45.68	4.777	
6,300.00	6,272.18	6,297.28	6,267.12	23.21	23.34	-93.28	420.72	-243.10	220.90	174.49	46.41	4.760	
6,400.00	6,372.17	6,398.56	6,368.21	23.56	23.71	-92.14	426.40	-245.57	223.07	175.95	47.12	4.734	
6,427.83	6,400.00	6,426.77	6,396.38	23.66	23.81	-91.82	427.69	-246.13	223.57	176.27	47.31	4.726	
6,500.00	6,472.17	6,499.95	6,469.50	23.90	24.07	-91.11	430.44	-247.33	224.69	176.88	47.81	4.699	
6,600.00	6,572.17	6,601.46	6,570.97	24.25	24.43	-90.50	432.84	-248.37	225.68	177.18	48.50	4.653	
6,700.00	6,672.17	6,702.96	6,672.47	24.59	24.78	-90.30	433.60	-248.70	226.00	176.81	49.19	4.594	
6,800.00	6,772.17	6,802.96	6,772.47	24.93	25.12	-90.30	433.60	-248.70	226.00	176.12	49.88	4.531	
6,900.00	6,872.17	6,902.96	6,872.47	25.28	25.46	-90.30	433.60	-248.70	226.00	175.44	50.56	4.470	
7,000.00	6,972.17	7,002.96	6,972.47	25.62	25.81	-90.30	433.60	-248.70	226.00	174.75	51.25	4.410	
7,100.00	7,072.17	7,102.96	7,072.47	25.97	26.15	-90.30	433.60	-248.70	226.00	174.06	51.94	4.351	
7,200.00	7,172.17	7,202.96	7,172.47	26.31	26.49	-90.30	433.60	-248.70	226.00	173.37	52.63	4.294	
7,300.00	7,272.17	7,302.96	7,272.47	26.66	26.83	-90.30	433.60	-248.70	226.00	172.68	53.32	4.239	
7,400.00	7,372.17	7,402.96	7,372.47	27.00	27.18	-90.30	433.60	-248.70	226.00	171.99	54.01	4.184	
7,500.00	7,472.17	7,502.96	7,472.47	27.35	27.52	-90.30	433.60	-248.70	226.00	171.30	54.70	4.131	
7,600.00	7,572.17	7,602.96	7,572.47	27.69	27.87	-90.30	433.60	-248.70	226.00	170.60	55.40	4.080	
7,700.00	7,672.17	7,702.96	7,672.47	28.04	28.21	-90.30	433.60	-248.70	226.00	169.91	56.09	4.029	
7,800.00	7,772.17	7,802.96	7,772.47	28.39	28.55	-90.30	433.60	-248.70	226.00	169.22	56.78	3.980	
7,900.00	7,872.17	7,902.96	7,872.47	28.74	28.90	-90.30	433.60	-248.70	226.00	168.52	57.48	3.932	
8,000.00	7,972.17	8,002.96	7,972.47	29.08	29.25	-90.30	433.60	-248.70	226.00	167.83	58.17	3.885	
8,100.00	8,072.17	8,102.96	8,072.47	29.43	29.59	-90.30	433.60	-248.70	226.00	167.14	58.86	3.839	
8,200.00	8,172.17	8,202.96	8,172.47	29.78	29.94	-90.30	433.60	-248.70	226.00	166.44	59.56	3.794	
8,300.00	8,272.17	8,302.96	8,272.47	30.13	30.28	-90.30	433.60	-248.70	226.00	165.74	60.26	3.751	
8,400.00	8,372.17	8,402.96	8,372.47	30.48	30.63	-90.30	433.60	-248.70	226.00	165.05	60.95	3.708	
8,500.00	8,472.17	8,502.96	8,472.47	30.83	30.98	-90.30	433.60	-248.70	226.00	164.35	61.65	3.666	
8,600.00	8,572.17	8,602.96	8,572.47	31.18	31.33	-90.30	433.60	-248.70	226.00	163.65	62.35	3.625	
8,700.00	8,672.17	8,702.96	8,672.47	31.52	31.67	-90.30	433.60	-248.70	226.00	162.95	63.05	3.585	
8,751.58	8,723.75	8,754.54	8,724.05	31.70	31.85	-90.30	433.60	-248.70	226.00	162.59	63.41	3.564	
8,800.00	8,772.11	8,802.90	8,772.41	31.86	32.02	-89.79	433.60	-248.70	226.28	162.56	63.72	3.551	
8,850.00	8,821.68	8,852.47	8,821.98	32.00	32.19	-88.20	433.60	-248.70	227.27	163.25	64.02	3.550	
8,900.00	8,870.51	8,901.30	8,870.81	32.12	32.36	-85.56	433.60	-248.70	229.32	165.04	64.28	3.568	
8,950.00	8,918.22	8,949.01	8,918.52	32.24	32.53	-81.98	433.60	-248.70	232.96	168.45	64.51	3.611	
9,000.00	8,964.46	9,004.76	8,964.76	32.34	32.72	-77.60	433.60	-248.70	238.87	174.14	64.74	3.690	
9,050.00	9,008.86	9,039.65	9,009.16	32.43	32.85	-72.61	433.60	-248.70	247.78	182.92	64.86	3.820	
9,100.00	9,051.09	9,081.88	9,051.39	32.51	32.99	-67.28	433.60	-248.70	260.33	195.33	65.00	4.005	
9,150.00	9,090.83	9,121.61	9,091.13	32.58	33.13	-61.88	433.60	-248.70	277.01	211.89	65.12	4.254	
9,200.00	9,127.77	9,158.56	9,128.07	32.65	33.26	-56.64	433.60	-248.70	298.06	232.83	65.23	4.569	
9,250.00	9,161.64	9,207.57	9,161.94	32.71	33.43	-51.74	433.60	-248.70	323.49	258.11	65.39	4.947	
9,300.00	9,192.18	9,222.97	9,192.48	32.78	33.48	-47.29	433.60	-248.70	353.11	287.67	65.43	5.397	
9,350.00	9,219.15	9,249.94	9,219.45	32.85	33.58	-43.33	433.60	-248.70	386.56	321.04	65.52	5.900	

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



MS Energy Services Anticollision Report



Company: Devon Energy
Project: Eddy County, New Mexico (NAD 83)
Reference Site: Cotton Draw Unit
Site Error: 0.00 usft
Reference Well: 515H
Well Error: 0.00 usft
Reference Wellbore: Wellbore #1
Reference Design: Design #1

Local Co-ordinate Reference: Well 515H
TVD Reference: Well @ 3566.10usft (Cactus 126)
MD Reference: Well @ 3566.10usft (Cactus 126)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: 5000.1 Conroe DB
Offset TVD Reference: Offset Datum

Offset Design Cotton Draw Unit - 517H - Wellbore #1 - Design #1													Offset Site Error: 0.00 usft
Survey Program: 0-MWD													Offset Well Error: 0.00 usft
Reference		Offset		Semi Major Axis		Azimuth from North (°)	Offset Wellbore Centre		Distance		Minimum Separation (usft)	Separation Factor	Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)			
9,400.00	9,242.36	9,273.14	9,242.66	32.92	33.66	-39.85	433.60	-248.70	423.42	357.82	65.60	6.454	
9,450.00	9,261.61	9,307.60	9,261.91	32.99	33.78	-36.83	433.60	-248.70	463.20	397.48	65.72	7.048	
9,500.00	9,276.77	9,307.56	9,277.07	33.08	33.78	-34.22	433.60	-248.70	505.42	439.70	65.72	7.691	
9,550.00	9,287.73	9,318.51	9,288.03	33.17	33.82	-31.97	433.60	-248.70	549.56	483.80	65.76	8.358	
9,600.00	9,294.39	9,325.18	9,294.69	33.27	33.84	-30.02	433.60	-248.70	595.14	529.36	65.78	9.048	
9,649.26	9,296.70	9,327.49	9,297.00	33.37	33.85	-28.37	433.60	-248.70	640.98	575.20	65.78	9.744	
9,700.00	9,296.91	9,327.70	9,297.21	33.49	33.85	-26.86	433.60	-248.70	688.60	622.82	65.78	10.468	
9,800.00	9,297.31	9,328.10	9,297.61	33.80	33.85	-24.24	433.60	-248.70	782.79	717.01	65.79	11.899	
9,900.00	9,297.72	9,328.51	9,298.02	34.17	33.85	-21.97	433.60	-248.70	877.24	811.44	65.80	13.332	
10,000.00	9,298.12	9,328.91	9,298.42	34.62	33.85	-19.94	433.60	-248.70	971.77	905.96	65.81	14.765	
10,027.33	9,298.24	9,329.02	9,298.54	34.75	33.85	-19.43	433.60	-248.70	997.60	931.78	65.82	15.157	
10,100.00	9,298.53	9,329.32	9,298.83	35.13	33.86	-18.15	433.60	-248.70	1,066.55	1,000.71	65.83	16.201	
10,200.00	9,298.93	9,329.72	9,299.23	35.71	33.86	-16.64	433.60	-248.70	1,162.16	1,096.30	65.86	17.647	
10,300.00	9,299.34	9,330.13	9,299.64	36.35	33.86	-15.37	433.60	-248.70	1,258.46	1,192.58	65.88	19.102	
10,400.00	9,299.74	9,330.53	9,300.04	37.06	33.86	-14.27	433.60	-248.70	1,355.29	1,289.39	65.90	20.565	
10,500.00	9,300.15	9,330.94	9,300.45	37.83	33.86	-13.32	433.60	-248.70	1,452.55	1,386.63	65.93	22.032	
10,600.00	9,300.55	9,331.34	9,300.85	38.65	33.86	-12.49	433.60	-248.70	1,550.16	1,484.21	65.95	23.504	
10,700.00	9,300.96	9,331.74	9,301.26	39.53	33.86	-11.76	433.60	-248.70	1,648.06	1,582.08	65.98	24.979	
10,800.00	9,301.36	9,332.15	9,301.66	40.45	33.87	-11.11	433.60	-248.70	1,746.20	1,680.19	66.00	26.456	
10,900.00	9,301.76	9,332.55	9,302.06	41.42	33.87	-10.53	433.60	-248.70	1,844.53	1,778.50	66.03	27.935	
11,000.00	9,302.17	9,332.96	9,302.47	42.44	33.87	-10.01	433.60	-248.70	1,943.04	1,876.98	66.05	29.416	
11,100.00	9,302.57	9,333.36	9,302.87	43.49	33.87	-9.54	433.60	-248.70	2,041.69	1,975.61	66.08	30.897	
11,200.00	9,302.98	9,333.77	9,303.28	44.58	33.87	-9.11	433.60	-248.70	2,140.46	2,074.36	66.11	32.379	
11,300.00	9,303.38	9,334.17	9,303.68	45.71	33.87	-8.72	433.60	-248.70	2,239.35	2,173.21	66.13	33.861	
11,400.00	9,303.79	9,334.57	9,304.09	46.86	33.87	-8.37	433.60	-248.70	2,338.33	2,272.17	66.16	35.343	
11,500.00	9,304.19	9,334.98	9,304.49	48.05	33.88	-8.04	433.60	-248.70	2,437.39	2,371.20	66.19	36.824	
11,600.00	9,304.60	9,335.38	9,304.90	49.26	33.88	-7.74	433.60	-248.70	2,536.53	2,470.31	66.22	38.305	
11,700.00	9,305.00	9,335.79	9,305.30	50.50	33.88	-7.46	433.60	-248.70	2,635.73	2,569.48	66.25	39.786	
11,800.00	9,305.40	9,336.19	9,305.70	51.76	33.88	-7.20	433.60	-248.70	2,734.99	2,668.71	66.28	41.265	
11,900.00	9,305.81	9,336.60	9,306.11	53.05	33.88	-6.96	433.60	-248.70	2,834.30	2,767.99	66.31	42.744	
12,000.00	9,306.21	9,337.00	9,306.51	54.35	33.88	-6.73	433.60	-248.70	2,933.66	2,867.32	66.34	44.221	
12,100.00	9,306.62	9,337.41	9,306.92	55.67	33.88	-6.52	433.60	-248.70	3,033.06	2,966.68	66.37	45.697	
12,200.00	9,307.02	15,401.21	12,423.05	57.01	65.12	179.65	-2,706.64	96.57	3,115.84	3,049.99	65.85	47.318	
12,300.00	9,307.43	15,501.20	12,422.19	58.37	66.33	179.65	-2,806.63	97.18	3,114.58	3,047.55	67.03	46.469	
12,400.00	9,307.83	15,601.19	12,421.33	59.74	67.56	179.65	-2,906.61	97.80	3,113.31	3,045.10	68.22	45.639	
12,500.00	9,308.23	15,701.18	12,420.47	61.13	68.81	179.65	-3,006.60	98.41	3,112.05	3,042.63	69.42	44.828	
12,600.00	9,308.64	15,801.18	12,419.61	62.53	70.07	179.65	-3,106.59	99.02	3,110.78	3,040.14	70.64	44.036	
12,700.00	9,309.04	15,901.17	12,418.75	63.94	71.35	179.65	-3,206.57	99.64	3,109.52	3,037.64	71.87	43.264	
12,800.00	9,309.45	16,001.16	12,417.89	65.36	72.65	179.65	-3,306.56	100.25	3,108.25	3,035.13	73.12	42.510	
12,900.00	9,309.85	16,101.15	12,417.02	66.80	73.96	179.65	-3,406.55	100.86	3,106.99	3,032.61	74.38	41.774	
13,000.00	9,310.26	16,201.14	12,416.16	68.24	75.28	179.65	-3,506.53	101.48	3,105.72	3,030.08	75.64	41.057	
13,100.00	9,310.66	16,301.14	12,415.30	69.69	76.62	179.65	-3,606.52	102.09	3,104.46	3,027.53	76.92	40.358	
13,200.00	9,311.07	16,401.13	12,414.44	71.16	77.97	179.65	-3,706.51	102.70	3,103.19	3,024.98	78.21	39.676	
13,300.00	9,311.47	16,501.12	12,413.58	72.63	79.33	179.65	-3,806.49	103.32	3,101.93	3,022.42	79.51	39.012	
13,400.00	9,311.87	16,601.11	12,412.72	74.11	80.70	179.65	-3,906.48	103.93	3,100.66	3,019.84	80.82	38.365	
13,500.00	9,312.28	16,701.10	12,411.86	75.59	82.09	179.65	-4,006.46	104.54	3,099.40	3,017.26	82.14	37.734	
13,600.00	9,312.68	16,801.10	12,411.00	77.09	83.48	179.65	-4,106.45	105.16	3,098.13	3,014.67	83.46	37.120	
13,700.00	9,313.09	16,901.09	12,410.14	78.59	84.88	179.65	-4,206.44	105.77	3,096.87	3,012.07	84.80	36.521	
13,800.00	9,313.49	17,001.08	12,409.28	80.09	86.29	179.65	-4,306.42	106.38	3,095.60	3,009.46	86.14	35.937	
13,900.00	9,313.90	17,101.07	12,408.42	81.60	87.71	179.65	-4,406.41	107.00	3,094.34	3,006.85	87.49	35.369	
14,000.00	9,314.30	17,201.06	12,407.56	83.12	89.14	179.65	-4,506.40	107.61	3,093.07	3,004.23	88.84	34.815	
4,100.00	9,314.71	17,301.06	12,406.70	84.64	90.58	179.65	-4,606.38	108.22	3,091.81	3,001.60	90.21	34.275	

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MS Energy Services
Anticollision Report



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Local Co-ordinate Reference: Well 515H
TVD Reference: Well @ 3566.10usft (Cactus 126)
MD Reference: Well @ 3566.10usft (Cactus 126)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: 5000.1 Conroe DB
Offset TVD Reference: Offset Datum

Offset Design Cotton Draw Unit - 517H - Wellbore #1 - Design #1													Offset Site Error: 0.00 usft
Survey Program: 0-MWD													Offset Well Error: 0.00 usft
Reference													Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Azimuth from North (°)	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	
14,200.00	9,315.11	17,401.05	12,405.84	86.17	92.02	179.65	-4,706.37	108.84	3,090.54	2,998.97	91.58	33.748	
14,300.00	9,315.51	17,501.04	12,404.98	87.70	93.47	179.65	-4,806.36	109.45	3,089.28	2,996.33	92.95	33.236	
14,400.00	9,315.92	17,601.03	12,404.12	89.24	94.93	179.65	-4,906.34	110.06	3,088.01	2,993.68	94.33	32.735	
14,500.00	9,316.32	17,701.02	12,403.26	90.78	96.39	179.65	-5,006.33	110.68	3,086.75	2,991.03	95.72	32.248	
14,600.00	9,316.73	17,801.02	12,402.40	92.33	97.86	179.65	-5,106.32	111.29	3,085.48	2,988.37	97.11	31.773	
14,700.00	9,317.13	17,901.01	12,401.54	93.88	99.34	179.65	-5,206.30	111.90	3,084.22	2,985.71	98.51	31.309	
14,800.00	9,317.54	18,001.00	12,400.68	95.43	100.82	179.65	-5,306.29	112.52	3,082.95	2,983.04	99.91	30.857	
14,900.00	9,317.94	18,100.99	12,399.82	96.99	102.31	179.65	-5,406.27	113.13	3,081.69	2,980.37	101.32	30.416	
15,000.00	9,318.34	18,200.98	12,398.96	98.55	103.80	179.65	-5,506.26	113.74	3,080.42	2,977.69	102.73	29.985	
15,100.00	9,318.75	18,300.98	12,398.09	100.11	105.30	179.65	-5,606.25	114.36	3,079.16	2,975.01	104.15	29.566	
15,200.00	9,319.15	18,400.97	12,397.23	101.68	106.80	179.65	-5,706.23	114.97	3,077.89	2,972.33	105.57	29.156	
15,300.00	9,319.56	18,500.96	12,396.37	103.24	108.31	179.65	-5,806.22	115.58	3,076.63	2,969.64	106.99	28.756	
15,400.00	9,319.96	18,600.95	12,395.51	104.82	109.82	179.65	-5,906.21	116.20	3,075.36	2,966.94	108.42	28.365	
15,500.00	9,320.37	18,700.94	12,394.65	106.39	111.33	179.65	-6,006.19	116.81	3,074.10	2,964.25	109.85	27.984	
15,600.00	9,320.77	18,800.94	12,393.79	107.97	112.85	179.65	-6,106.18	117.42	3,072.84	2,961.55	111.29	27.611	
15,700.00	9,321.18	18,900.93	12,392.93	109.55	114.37	179.65	-6,206.17	118.04	3,071.57	2,958.84	112.73	27.248	
15,800.00	9,321.58	19,000.92	12,392.07	111.13	115.90	179.65	-6,306.15	118.65	3,070.31	2,956.13	114.17	26.892	
15,900.00	9,321.98	19,100.91	12,391.21	112.71	117.43	179.65	-6,406.14	119.26	3,069.04	2,953.42	115.62	26.545	
16,000.00	9,322.39	19,200.90	12,390.35	114.30	118.96	179.65	-6,506.13	119.88	3,067.78	2,950.71	117.07	26.206	
16,100.00	9,322.79	19,300.90	12,389.49	115.88	120.50	179.65	-6,606.11	120.49	3,066.51	2,947.99	118.52	25.874	
16,200.00	9,323.20	19,400.89	12,388.63	117.47	122.04	179.65	-6,706.10	121.10	3,065.25	2,945.27	119.97	25.550	
16,300.00	9,323.60	19,500.88	12,387.77	119.07	123.58	179.65	-6,806.08	121.72	3,063.98	2,942.55	121.43	25.232	
16,400.00	9,324.01	19,600.87	12,386.91	120.66	125.13	179.65	-6,906.07	122.33	3,062.72	2,939.83	122.89	24.922	
16,500.00	9,324.41	19,700.86	12,386.05	122.25	126.68	179.65	-7,006.06	122.95	3,061.45	2,937.10	124.35	24.619	
16,600.00	9,324.82	19,800.86	12,385.19	123.85	128.23	179.65	-7,106.04	123.56	3,060.19	2,934.37	125.82	24.322	
16,700.00	9,325.22	19,900.85	12,384.33	125.45	129.78	179.65	-7,206.03	124.17	3,058.92	2,931.63	127.29	24.032	
16,800.00	9,325.62	20,000.84	12,383.47	127.05	131.34	179.65	-7,306.02	124.79	3,057.66	2,928.90	128.76	23.747	
16,900.00	9,326.03	20,100.83	12,382.61	128.65	132.90	179.65	-7,406.00	125.40	3,056.39	2,926.16	130.23	23.469	
17,000.00	9,326.43	20,200.82	12,381.75	130.25	134.46	179.65	-7,505.99	126.01	3,055.13	2,923.42	131.70	23.197	
17,100.00	9,326.84	20,300.82	12,380.89	131.86	136.02	179.65	-7,605.98	126.63	3,053.86	2,920.68	133.18	22.930	
17,200.00	9,327.24	20,400.81	12,380.03	133.46	137.59	179.65	-7,705.96	127.24	3,052.60	2,917.94	134.66	22.669	
17,300.00	9,327.65	20,500.80	12,379.16	135.07	139.16	179.65	-7,805.95	127.85	3,051.33	2,915.19	136.14	22.413	
17,400.00	9,328.05	20,600.79	12,378.30	136.68	140.73	179.65	-7,905.94	128.47	3,050.07	2,912.44	137.62	22.162	
17,500.00	9,328.45	20,700.78	12,377.44	138.29	142.30	179.65	-8,005.92	129.08	3,048.80	2,909.69	139.11	21.917	
17,600.00	9,328.86	20,800.78	12,376.58	139.90	143.87	179.65	-8,105.91	129.69	3,047.54	2,906.94	140.60	21.676	
17,700.00	9,329.26	20,900.77	12,375.72	141.51	145.45	179.65	-8,205.89	130.31	3,046.27	2,904.19	142.08	21.440	
17,800.00	9,329.67	21,000.76	12,374.86	143.12	147.03	179.65	-8,305.88	130.92	3,045.01	2,901.43	143.57	21.209	
17,900.00	9,330.07	21,100.75	12,374.00	144.73	148.61	179.65	-8,405.87	131.53	3,043.74	2,898.68	145.07	20.982	
18,000.00	9,330.48	21,200.74	12,373.14	146.35	150.19	179.65	-8,505.85	132.15	3,042.48	2,895.92	146.56	20.759	
18,100.00	9,330.88	21,300.74	12,372.28	147.96	151.77	179.65	-8,605.84	132.76	3,041.21	2,893.16	148.05	20.541	
18,200.00	9,331.29	21,400.73	12,371.42	149.58	153.35	179.65	-8,705.83	133.37	3,039.95	2,890.40	149.55	20.327	
18,300.00	9,331.69	21,500.72	12,370.56	151.20	154.94	179.65	-8,805.81	133.99	3,038.68	2,887.63	151.05	20.117	
18,400.00	9,332.09	21,600.71	12,369.70	152.81	156.53	179.65	-8,905.80	134.60	3,037.42	2,884.87	152.55	19.911	
18,500.00	9,332.50	21,700.70	12,368.84	154.43	158.12	179.65	-9,005.79	135.21	3,036.15	2,882.10	154.05	19.709	
18,600.00	9,332.90	21,800.70	12,367.98	156.05	159.71	179.65	-9,105.77	135.83	3,034.89	2,879.34	155.55	19.511	
18,700.00	9,333.31	21,900.69	12,367.12	157.67	161.30	179.65	-9,205.76	136.44	3,033.62	2,876.57	157.05	19.316	
18,800.00	9,333.71	22,000.68	12,366.26	159.30	162.89	179.65	-9,305.74	137.05	3,032.36	2,873.80	158.56	19.125	
18,900.00	9,334.12	22,100.67	12,365.40	160.92	164.48	179.65	-9,405.73	137.67	3,031.09	2,871.03	160.06	18.937	
19,000.00	9,334.52	22,200.66	12,364.54	162.54	166.08	179.65	-9,505.72	138.28	3,029.83	2,868.26	161.57	18.752	
19,100.00	9,334.93	22,300.66	12,363.68	164.16	167.68	179.65	-9,605.70	138.89	3,028.56	2,865.48	163.08	18.571	
19,200.00	9,335.33	22,400.65	12,362.82	165.79	169.27	179.65	-9,705.69	139.51	3,027.30	2,862.71	164.59	18.393	
19,300.00	9,335.73	22,500.64	12,361.96	167.41	170.87	179.65	-9,805.68	140.12	3,026.03	2,859.93	166.10	18.218	

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



MS Energy Services
Anticollision Report



Company:	Devon Energy	Local Co-ordinate Reference:	Well 515H
Project:	Eddy County, New Mexico (NAD 83)	TVD Reference:	Well @ 3566.10usft (Cactus 126)
Reference Site:	Cotton Draw Unit	MD Reference:	Well @ 3566.10usft (Cactus 126)
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	515H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	5000.1 Conroe DB
Reference Design:	Design #1	Offset TVD Reference:	Offset Datum

Offset Design Cotton Draw Unit - 517H - Wellbore #1 - Design #1													Offset Site Error:	0.00 usft
Survey Program: 0-MWD													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Azimuth from North (°)	Offset Wellbore Centre		Distance		Minimum Separation (usft)	Separation Factor	Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)				
19,390.56	9,336.10	22,565.16	12,361.40	168.88	171.78	0.00	-9,870.19	140.52	3,025.00	2,858.05	166.95	18.119		



MS Energy Services
Anticollision Report



Company: Devon Energy
Project: Eddy County, New Mexico (NAD 83)
Reference Site: Cotton Draw Unit
Site Error: 0.00 usft
Reference Well: 515H
Well Error: 0.00 usft
Reference Wellbore: Wellbore #1
Reference Design: Design #1

Local Co-ordinate Reference: Well 515H
TVD Reference: Well @ 3566.10usft (Cactus 126)
MD Reference: Well @ 3566.10usft (Cactus 126)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: 5000.1 Conroe DB
Offset TVD Reference: Offset Datum

Offset Design King Tut Federal - #1H - Wellbore #1 - Surveys													Offset Site Error: 0.00 usft
Survey Program: 211-Reference													Offset Well Error: 0.00 usft
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Azimuth from North (°)	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
0.00	0.00	0.00	0.00	0.00	0.00	67.91	299.63	738.19	796.68				
100.00	100.00	92.57	92.57	0.13	0.15	67.91	299.72	738.60	797.13	796.85	0.28	2,825.193	
200.00	200.00	185.32	185.31	0.49	0.29	67.93	300.00	739.85	798.49	797.71	0.79	1,015.604	
300.00	300.00	292.41	292.39	0.85	0.63	67.94	300.44	741.53	800.11	798.64	1.48	542.152	
400.00	400.00	394.22	394.19	1.21	0.99	67.94	300.71	742.12	800.75	798.55	2.20	364.299	
500.00	500.00	492.17	492.13	1.57	1.34	67.95	300.86	742.94	801.58	798.67	2.91	275.766	
600.00	600.00	590.11	590.07	1.93	1.69	67.98	300.88	744.07	802.66	799.05	3.62	222.018	
700.00	700.00	688.04	687.99	2.29	2.04	68.03	300.80	745.52	804.00	799.68	4.32	185.950	
800.00	800.00	787.10	787.04	2.64	2.39	68.09	300.59	747.29	805.58	800.55	5.04	159.965	
900.00	900.00	890.90	890.82	3.00	2.77	68.15	300.26	748.93	806.93	801.17	5.76	139.978	
1,000.00	1,000.00	994.71	994.62	3.36	3.14	68.21	299.82	750.09	807.81	801.32	6.49	124.401	
1,100.00	1,100.00	1,092.61	1,092.52	3.72	3.49	68.28	299.23	751.19	808.63	801.43	7.20	112.293	
1,200.00	1,200.00	1,191.20	1,191.09	4.08	3.84	68.37	298.42	752.56	809.62	801.71	7.91	102.341	
1,300.00	1,300.00	1,290.91	1,290.78	4.44	4.19	68.48	297.44	754.15	810.74	802.11	8.63	93.988	
1,400.00	1,400.00	1,391.27	1,391.13	4.79	4.55	68.58	296.49	755.70	811.83	802.48	9.34	86.884	
1,500.00	1,500.00	1,491.63	1,491.48	5.15	4.91	68.67	295.61	757.17	812.87	802.81	10.06	80.789	
1,600.00	1,600.00	1,592.00	1,591.83	5.51	5.27	68.76	294.80	758.57	813.87	803.09	10.78	75.501	
1,700.00	1,700.00	1,692.37	1,692.19	5.87	5.63	68.85	294.05	759.89	814.83	803.33	11.50	70.870	
1,800.00	1,800.00	1,792.74	1,792.55	6.23	5.99	68.92	293.37	761.13	815.74	803.53	12.22	66.779	
1,900.00	1,900.00	1,893.11	1,892.91	6.59	6.35	68.99	292.75	762.30	816.61	803.68	12.93	63.139	
2,000.00	2,000.00	1,993.49	1,993.28	6.95	6.71	69.05	292.20	763.39	817.43	803.78	13.65	59.879	
2,100.00	2,100.00	2,093.87	2,093.66	7.30	7.07	69.11	291.72	764.41	818.20	803.83	14.37	56.941	
2,200.00	2,200.00	2,194.25	2,194.03	7.66	7.43	69.16	291.30	765.35	818.93	803.84	15.09	54.279	
2,300.00	2,300.00	2,293.13	2,292.90	8.02	7.79	69.22	290.88	766.40	819.77	803.97	15.80	51.881	
2,400.00	2,400.00	2,392.64	2,392.41	8.38	8.14	69.27	290.49	767.47	820.64	804.12	16.52	49.687	
2,500.00	2,500.00	2,492.15	2,491.91	8.74	8.50	69.32	290.12	768.60	821.57	804.34	17.23	47.678	
2,600.00	2,599.99	2,599.45	2,599.21	9.10	8.87	69.44	289.55	769.43	821.85	803.88	17.96	45.753	
2,700.00	2,699.96	2,707.09	2,706.85	9.45	9.25	69.67	288.55	769.35	820.66	801.97	18.69	43.904	
2,800.00	2,799.86	2,814.61	2,814.34	9.81	9.62	70.03	287.15	768.34	818.05	798.63	19.42	42.124	
2,900.00	2,899.68	2,900.41	2,900.15	10.17	9.92	70.50	286.22	768.28	815.79	795.71	20.08	40.626	
3,000.00	2,999.37	2,991.50	2,991.22	10.53	10.23	71.10	285.43	768.99	814.05	793.29	20.76	39.220	
3,100.00	3,098.90	3,083.06	3,082.77	10.89	10.55	71.82	284.89	770.62	812.97	791.54	21.43	37.930	
3,200.00	3,198.26	3,182.33	3,182.01	11.25	10.91	72.69	284.23	772.88	812.04	789.89	22.15	36.659	
3,299.74	3,297.14	3,280.61	3,280.27	11.61	11.26	73.68	283.52	775.17	810.93	788.06	22.87	35.461	
3,300.00	3,297.40	3,280.87	3,280.52	11.61	11.26	73.68	283.52	775.17	810.92	788.05	22.87	35.458	
3,400.00	3,396.43	3,379.31	3,378.94	11.98	11.62	74.72	282.91	777.49	809.91	786.32	23.59	34.331	
3,500.00	3,495.46	3,477.79	3,477.39	12.36	11.97	75.77	282.40	779.83	809.23	784.91	24.32	33.280	
3,600.00	3,594.49	3,576.62	3,576.18	12.73	12.33	76.80	281.98	782.21	808.86	783.81	25.04	32.297	
3,700.00	3,693.51	3,676.09	3,675.62	13.11	12.69	77.87	281.18	784.65	808.71	782.93	25.78	31.371	
3,800.00	3,792.54	3,777.73	3,777.22	13.49	13.05	78.97	279.86	787.08	808.70	782.18	26.52	30.490	
3,869.40	3,861.26	3,847.23	3,846.70	13.75	13.30	79.75	278.72	788.54	808.62	781.58	27.04	29.907	
3,900.00	3,891.57	3,876.85	3,876.31	13.87	13.41	80.09	278.20	789.18	808.64	781.38	27.26	29.663	
4,000.00	3,990.60	3,975.61	3,975.03	14.25	13.77	81.22	276.38	791.40	809.00	781.01	28.00	28.895	
4,100.00	4,089.62	4,074.36	4,073.74	14.64	14.12	82.35	274.61	793.55	809.62	780.88	28.74	28.173	
4,200.00	4,188.65	4,172.72	4,172.05	15.02	14.47	83.48	272.77	795.74	810.59	781.11	29.48	27.499	
4,300.00	4,287.68	4,269.45	4,268.74	15.41	14.82	84.62	270.78	798.04	811.99	781.78	30.21	26.877	
4,400.00	4,386.71	4,371.33	4,370.56	15.80	15.19	85.79	268.31	800.47	813.72	782.75	30.97	26.276	
4,500.00	4,485.73	4,465.85	4,465.02	16.19	15.53	86.95	265.82	802.72	815.74	784.05	31.69	25.737	
4,600.00	4,584.76	4,564.72	4,563.83	16.59	15.89	88.11	263.29	805.11	818.16	785.72	32.44	25.220	
4,700.00	4,683.79	4,663.46	4,662.50	16.98	16.24	89.26	260.76	807.90	821.31	788.12	33.19	24.748	
4,800.00	4,782.81	4,763.29	4,762.29	17.37	16.67	90.37	258.72	809.61	823.42	789.41	34.01	24.213	
4,900.00	4,881.84	4,860.24	4,859.23	17.77	17.03	91.39	258.00	808.73	823.52	788.76	34.76	23.692	

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



MS Energy Services Anticollision Report



Company: Devon Energy
Project: Eddy County, New Mexico (NAD 83)
Reference Site: Cotton Draw Unit
Site Error: 0.00 usft
Reference Well: 515H
Well Error: 0.00 usft
Reference Wellbore: Wellbore #1
Reference Design: Design #1

Local Co-ordinate Reference: Well 515H
TVD Reference: Well @ 3566.10usft (Cactus 126)
MD Reference: Well @ 3566.10usft (Cactus 126)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: 5000.1 Conroe DB
Offset TVD Reference: Offset Datum

Offset Design King Tut Federal - #1H - Wellbore #1 - Surveys													Offset Site Error: 0.00 usft
Survey Program: 211-													Offset Well Error: 0.00 usft
Reference		Offset		Semi Major Axis		Azimuth from North (°)	Offset Wellbore Centre		Distance		Minimum Separation (usft)	Separation Factor	Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N-S (usft)	+E-W (usft)	Between Centres (usft)	Between Ellipses (usft)			
5,000.00	4,980.87	4,987.05	4,986.04	18.17	17.35	92.41	257.23	807.94	823.93	788.45	35.48	23.222	
5,100.00	5,079.90	5,084.18	5,083.16	18.56	17.68	93.42	256.57	807.39	824.84	788.63	36.21	22.782	
5,200.00	5,178.92	5,183.68	5,182.66	18.96	18.02	94.43	255.84	806.93	826.10	789.16	36.94	22.363	
5,300.00	5,277.95	5,282.53	5,281.51	19.36	18.36	95.44	255.17	806.39	827.54	789.87	37.67	21.966	
5,400.00	5,376.98	5,385.04	5,384.01	19.76	18.71	96.44	254.44	805.67	829.08	790.67	38.42	21.581	
5,500.00	5,476.01	5,484.93	5,483.89	20.16	19.04	97.44	253.78	804.65	830.56	791.41	39.15	21.215	
5,600.00	5,575.03	5,583.29	5,582.25	20.56	19.38	98.44	253.14	803.64	832.27	792.39	39.88	20.871	
5,628.09	5,602.86	5,611.32	5,610.28	20.68	19.47	98.72	252.95	803.35	832.80	792.72	40.08	20.777	
5,700.00	5,674.12	5,683.22	5,682.17	20.96	19.71	99.40	252.51	802.59	834.12	793.51	40.61	20.540	
5,800.00	5,773.42	5,783.31	5,782.25	21.36	20.05	100.25	251.78	801.37	835.67	794.33	41.34	20.217	
5,900.00	5,872.91	5,879.72	5,878.65	21.74	20.38	100.97	251.25	800.43	837.18	795.14	42.04	19.912	
6,000.00	5,972.56	5,979.87	5,978.79	22.12	20.72	101.58	250.60	799.55	838.50	795.74	42.76	19.609	
6,100.00	6,072.35	6,079.99	6,078.91	22.49	21.06	102.04	250.32	798.67	839.38	795.91	43.47	19.311	
6,200.00	6,172.23	6,181.21	6,180.12	22.86	21.40	102.39	250.06	797.78	839.85	795.68	44.17	19.014	
6,300.00	6,272.18	6,284.21	6,283.12	23.21	21.75	102.65	249.57	796.37	839.45	794.57	44.87	18.706	
6,400.00	6,372.17	6,382.86	6,381.75	23.56	22.09	102.80	248.98	794.95	838.54	792.98	45.56	18.405	
6,427.83	6,400.00	6,410.03	6,408.92	23.66	22.18	102.82	248.76	794.58	838.24	792.49	45.75	18.322	
6,500.00	6,472.17	6,482.48	6,481.37	23.90	22.43	102.87	248.24	793.67	837.47	791.22	46.24	18.109	
6,600.00	6,572.17	6,582.73	6,581.60	24.25	22.77	102.90	248.11	792.44	836.30	789.37	46.93	17.820	
6,700.00	6,672.17	6,686.49	6,685.36	24.59	23.12	102.94	247.88	791.01	835.01	787.38	47.63	17.533	
6,800.00	6,772.17	6,787.46	6,786.31	24.93	23.47	102.99	247.50	789.13	833.28	784.97	48.31	17.247	
6,900.00	6,872.17	6,886.34	6,885.17	25.28	23.80	103.03	247.35	787.41	831.62	782.62	49.00	16.973	
7,000.00	6,972.17	6,988.27	6,987.09	25.62	24.15	103.04	247.51	785.69	829.94	780.25	49.69	16.703	
7,100.00	7,072.17	7,083.12	7,081.93	25.97	24.47	103.07	247.42	784.18	828.41	778.05	50.36	16.449	
7,200.00	7,172.17	7,189.28	7,188.07	26.31	24.84	103.10	247.43	782.48	826.86	775.79	51.07	16.192	
7,300.00	7,272.17	7,285.55	7,284.33	26.66	25.17	103.13	247.31	780.85	825.23	773.49	51.75	15.948	
7,400.00	7,372.17	7,388.25	7,387.01	27.00	25.52	103.18	247.05	779.02	823.55	771.11	52.44	15.703	
7,500.00	7,472.17	7,489.06	7,487.80	27.35	25.87	103.23	246.73	776.98	821.66	768.52	53.14	15.463	
7,600.00	7,572.17	7,588.43	7,587.15	27.69	26.21	103.29	246.33	774.95	819.75	765.92	53.83	15.229	
7,700.00	7,672.17	7,687.54	7,686.24	28.04	26.55	103.37	245.64	772.97	817.97	763.45	54.52	15.003	
7,800.00	7,772.17	7,774.80	7,773.47	28.39	26.86	103.50	244.09	771.35	816.63	761.46	55.18	14.800	
7,806.07	7,778.24	7,779.38	7,778.04	28.41	26.87	103.52	243.91	771.30	816.63	761.41	55.21	14.790 ES	
7,900.00	7,872.17	7,844.64	7,843.05	28.74	27.11	103.89	238.56	771.11	818.22	762.48	55.74	14.680	
8,000.00	7,972.17	7,910.05	7,907.21	29.08	27.34	104.73	225.98	771.55	823.79	767.60	56.20	14.659	
8,100.00	8,072.17	7,984.82	7,978.67	29.43	27.62	106.16	204.20	772.97	833.65	777.00	56.65	14.715	
8,200.00	8,172.17	8,053.00	8,041.33	29.78	27.87	107.92	177.40	773.31	846.73	789.76	56.97	14.863	
8,300.00	8,272.17	8,116.00	8,096.59	30.13	28.11	109.87	147.17	773.29	864.34	807.22	57.12	15.132	
8,400.00	8,372.17	8,164.81	8,137.44	30.48	28.29	111.54	120.48	773.56	887.59	830.64	56.95	15.585	
8,500.00	8,472.17	8,210.00	8,173.51	30.83	28.47	113.19	93.29	774.45	917.14	860.57	56.58	16.210	
8,600.00	8,572.17	8,265.33	8,214.88	31.18	28.70	115.38	56.58	774.57	951.94	895.70	56.25	16.925	
8,700.00	8,672.17	8,304.00	8,241.35	31.52	28.87	117.03	28.42	773.80	992.47	936.95	55.52	17.876	
8,751.58	8,723.75	8,318.33	8,250.62	31.70	28.93	117.66	17.50	773.44	1,015.70	960.69	55.01	18.463	
8,800.00	8,772.11	8,336.00	8,261.76	31.86	29.00	118.34	3.79	773.09	1,037.84	983.26	54.58	19.015	
8,850.00	8,821.68	8,349.53	8,270.06	32.00	29.06	118.61	-6.89	772.88	1,059.69	1,005.69	54.00	19.622	
8,900.00	8,870.51	8,367.00	8,280.46	32.12	29.14	118.85	-20.93	772.68	1,080.36	1,026.88	53.47	20.204	
8,950.00	8,918.22	8,382.60	8,289.45	32.24	29.21	118.81	-33.68	772.60	1,099.65	1,046.76	52.89	20.793	
9,000.00	8,964.46	8,399.00	8,298.61	32.34	29.29	118.60	-47.28	772.64	1,117.42	1,065.12	52.30	21.366	
9,050.00	9,008.86	8,419.26	8,309.53	32.43	29.39	118.37	-64.35	772.83	1,133.49	1,081.71	51.78	21.892	
9,100.00	9,051.09	8,430.00	8,315.15	32.51	29.44	117.48	-73.50	772.98	1,147.79	1,096.71	51.08	22.472	
9,150.00	9,090.83	8,461.00	8,330.39	32.58	29.59	117.41	-100.48	773.67	1,160.24	1,109.48	50.76	22.859	
9,200.00	9,127.77	8,461.00	8,330.39	32.65	29.59	115.58	-100.48	773.67	1,170.77	1,120.89	49.88	23.470	
9,250.00	9,161.64	8,493.00	8,344.34	32.71	29.75	115.23	-129.25	774.68	1,179.41	1,129.81	49.60	23.777	

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



MS Energy Services Anticollision Report



Company: Devon Energy
Project: Eddy County, New Mexico (NAD 83)
Reference Site: Cotton Draw Unit
Site Error: 0.00 usft
Reference Well: 515H
Well Error: 0.00 usft
Reference Wellbore: Wellbore #1
Reference Design: Design #1

Local Co-ordinate Reference: Well 515H
TVD Reference: Well @ 3566.10usft (Cactus 126)
MD Reference: Well @ 3566.10usft (Cactus 126)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: 5000.1 Conroe DB
Offset TVD Reference: Offset Datum

Offset Design King Tut Federal - #1H - Wellbore #1 - Surveys													Offset Site Error:	0.00 usft
Survey Program: 211-													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Azimuth from North (°)	Distance		Minimum Separation (usft)	Separation Factor	Warning			
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)				Between Centres (usft)	Between Ellipses (usft)	
9,300.00	9,192.18	8,493.00	8,344.34	32.78	29.75	112.94	-129.25	774.68	1,186.01	1,137.21	48.80	24.303		
9,350.00	9,219.15	8,524.00	8,356.08	32.85	29.91	112.23	-157.92	775.78	1,190.50	1,141.94	48.55	24.519		
9,400.00	9,242.36	8,535.61	8,360.04	32.92	29.97	110.21	-168.83	776.23	1,192.88	1,144.84	48.04	24.830		
9,450.00	9,261.61	8,556.00	8,366.49	32.99	30.08	108.54	-188.14	777.20	1,193.19	1,145.47	47.72	25.002		
9,500.00	9,276.77	8,569.45	8,370.40	33.08	30.16	106.27	-200.98	777.98	1,191.35	1,143.97	47.38	25.147		
9,550.00	9,287.73	8,596.00	8,377.28	33.17	30.30	104.73	-226.56	779.86	1,187.52	1,140.24	47.28	25.114		
9,600.00	9,294.39	8,604.98	8,379.35	33.27	30.35	101.86	-235.26	780.55	1,181.34	1,134.29	47.05	25.110		
9,649.26	9,296.70	8,628.00	8,384.02	33.37	30.48	99.95	-257.75	782.12	1,173.16	1,126.10	47.07	24.924		
9,700.00	9,296.91	8,649.03	8,387.43	33.49	30.60	97.72	-278.47	783.25	1,164.46	1,117.35	47.12	24.715		
9,800.00	9,297.31	8,690.00	8,391.60	33.80	30.84	93.14	-319.19	784.67	1,152.57	1,105.26	47.32	24.360		
9,900.00	9,297.72	8,745.76	8,393.30	34.17	31.17	89.59	-374.91	785.74	1,147.37	1,099.63	47.74	24.032		
9,959.69	9,297.96	8,793.17	8,392.79	34.44	31.47	88.59	-422.31	785.96	1,146.75	1,098.64	48.10	23.839		
10,000.00	9,298.12	8,832.23	8,392.29	34.62	31.73	88.49	-461.37	786.31	1,146.94	1,098.54	48.40	23.697		
10,027.33	9,298.24	8,858.72	8,392.09	34.75	31.91	88.42	-487.85	786.77	1,147.30	1,098.68	48.62	23.596		
10,100.00	9,298.53	8,935.49	8,392.07	35.13	32.46	88.76	-564.59	788.73	1,148.41	1,099.10	49.32	23.287		
10,200.00	9,298.93	9,020.89	8,392.13	35.71	33.12	87.58	-649.97	790.96	1,149.97	1,099.69	50.27	22.874		
10,300.00	9,299.34	9,101.16	8,390.06	36.35	33.79	85.99	-730.18	793.14	1,153.56	1,102.30	51.26	22.504		
10,400.00	9,299.74	9,214.67	8,386.90	37.06	34.80	87.08	-843.58	796.89	1,157.80	1,105.33	52.47	22.066		
10,500.00	9,300.15	9,379.99	8,386.33	37.83	36.38	92.34	-1,008.87	796.77	1,157.91	1,103.93	53.98	21.451		
10,600.00	9,300.55	9,489.72	8,387.08	38.65	37.50	93.13	-1,118.49	791.83	1,154.52	1,099.31	55.22	20.909		
10,700.00	9,300.86	9,573.99	8,387.63	39.53	38.39	91.86	-1,202.69	788.61	1,151.64	1,095.23	56.41	20.415		
10,800.00	9,301.36	9,654.88	8,386.21	40.45	39.27	90.30	-1,283.50	785.45	1,150.58	1,092.98	57.61	19.973		
10,900.00	9,301.76	9,753.69	8,385.31	41.42	40.39	90.20	-1,382.29	784.11	1,150.44	1,091.42	59.01	19.494		
11,000.00	9,302.17	9,852.01	8,387.49	42.44	41.55	90.06	-1,480.56	786.11	1,149.86	1,089.22	60.64	18.961		
11,005.54	9,302.19	9,856.27	8,387.61	42.50	41.60	89.95	-1,484.82	786.26	1,149.86	1,089.13	60.73	18.934		
11,100.00	9,302.57	9,926.77	8,389.15	43.49	42.45	87.98	-1,555.23	789.43	1,150.77	1,088.56	62.21	18.498		
11,200.00	9,302.98	9,992.07	8,389.58	44.58	43.25	85.17	-1,620.37	793.89	1,154.36	1,090.59	63.77	18.101		
11,300.00	9,303.38	10,120.42	8,390.36	45.71	44.87	87.47	-1,748.30	804.21	1,158.91	1,092.94	65.97	17.568		
11,400.00	9,303.79	10,197.58	8,391.50	46.86	45.86	85.65	-1,825.16	810.94	1,162.97	1,095.18	67.79	17.156		
11,500.00	9,304.19	10,332.56	8,394.28	48.05	47.64	88.42	-1,959.73	820.84	1,165.77	1,095.58	70.19	16.609		
11,600.00	9,304.60	10,436.66	8,397.25	49.26	49.04	88.73	-2,063.61	826.83	1,167.09	1,094.77	72.31	16.139		
11,700.00	9,305.00	10,526.47	8,397.97	50.50	50.25	87.94	-2,153.36	830.13	1,168.72	1,094.49	74.23	15.744		
11,800.00	9,305.40	10,612.43	8,399.35	51.76	51.43	86.86	-2,239.12	835.76	1,171.55	1,095.30	76.25	15.365		
11,900.00	9,305.81	10,699.81	8,398.54	53.05	52.65	85.90	-2,326.38	840.29	1,175.47	1,097.26	78.21	15.030		
12,000.00	9,306.21	10,784.30	8,398.03	54.35	53.83	84.74	-2,410.64	846.48	1,180.54	1,100.30	80.24	14.713		
12,100.00	9,306.62	10,869.91	8,396.96	55.67	55.05	83.68	-2,495.89	854.18	1,187.14	1,104.81	82.33	14.418		
12,200.00	9,307.02	11,004.25	8,394.69	57.01	56.97	86.27	-2,629.88	863.31	1,192.74	1,107.85	84.89	14.050		
12,300.00	9,307.43	11,164.60	8,392.23	58.37	59.27	90.77	-2,790.18	863.69	1,193.77	1,106.49	87.28	13.677		
12,400.00	9,307.83	11,263.53	8,391.92	59.74	60.70	90.70	-2,889.11	862.71	1,193.30	1,104.04	89.26	13.368		
12,500.00	9,308.23	11,393.05	8,392.00	61.13	62.57	92.92	-3,018.55	858.32	1,190.93	1,099.62	91.31	13.043		
12,600.00	9,308.64	11,489.61	8,392.31	62.53	63.97	92.67	-3,115.00	853.67	1,187.55	1,094.38	93.17	12.746		
12,700.00	9,309.04	11,589.02	8,392.45	63.94	65.43	92.63	-3,214.31	849.40	1,184.63	1,089.58	95.05	12.463		
12,800.00	9,309.45	11,702.78	8,392.47	65.36	67.10	93.70	-3,327.90	843.28	1,181.15	1,084.23	96.93	12.186		
12,900.00	9,309.85	11,816.61	8,394.26	66.80	68.77	94.79	-3,441.48	835.92	1,175.71	1,076.91	98.80	11.900		
13,000.00	9,310.26	11,890.00	8,394.84	68.24	69.86	92.74	-3,514.78	832.66	1,172.05	1,071.43	100.63	11.647		
13,100.00	9,310.66	11,978.56	8,394.85	69.69	71.19	91.85	-3,603.31	830.14	1,170.12	1,067.58	102.54	11.411		
13,200.00	9,311.07	12,073.46	8,394.01	71.16	72.61	91.45	-3,698.13	826.30	1,168.25	1,063.86	104.39	11.191		
13,300.00	9,311.47	12,202.26	8,391.50	72.63	74.54	93.75	-3,826.55	816.96	1,165.20	1,059.14	106.06	10.986		
13,400.00	9,311.87	12,322.82	8,391.79	74.11	76.35	95.43	-3,946.78	808.15	1,160.53	1,052.75	107.79	10.767		
13,500.00	9,312.28	12,428.39	8,393.80	75.59	77.94	95.93	-4,051.99	799.75	1,154.12	1,044.59	109.52	10.538		
13,600.00	9,312.68	12,523.09	8,395.80	77.09	79.37	95.53	-4,146.42	792.94	1,148.04	1,036.74	111.30	10.315		
13,700.00	9,313.09	12,601.86	8,396.90	78.59	80.57	93.79	-4,225.01	787.68	1,142.94	1,029.88	113.06	10.109		

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



MS Energy Services Anticollision Report



Company: Devon Energy
Project: Eddy County, New Mexico (NAD 83)
Reference Site: Cotton Draw Unit
Site Error: 0.00 usft
Reference Well: 515H
Well Error: 0.00 usft
Reference Wellbore: Wellbore #1
Reference Design: Design #1

Local Co-ordinate Reference: Well 515H
TVD Reference: Well @ 3566.10usft (Cactus 126)
MD Reference: Well @ 3566.10usft (Cactus 126)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at: 2.00 sigma
Database: 5000.1 Conroe DB
Offset TVD Reference: Offset Datum

Offset Design King Tut Federal - #1H - Wellbore #1 - Surveys													Offset Site Error:	0.00 usft
Survey Program: 211-Reference													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Distance							Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Azimuth from North (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor		
13,800.00	9,313.49	12,673.90	8,396.86	80.09	81.67	91.45	-4,296.97	784.27	1,140.14	1,025.33	114.81	9.931		
13,860.16	9,313.74	12,716.45	8,396.41	81.00	82.33	89.96	-4,339.50	783.14	1,139.67	1,023.80	115.87	9.836		
13,900.00	9,313.90	12,745.00	8,395.94	81.60	82.77	89.01	-4,368.05	782.77	1,139.87	1,023.29	116.58	9.778		
14,000.00	9,314.30	12,819.06	8,394.15	83.12	83.92	86.81	-4,442.08	783.05	1,142.00	1,023.60	118.40	9.646		
14,100.00	9,314.71	12,896.52	8,391.49	84.64	85.13	84.91	-4,519.47	785.07	1,146.27	1,025.99	120.28	9.530		
14,200.00	9,315.11	13,018.93	8,388.62	86.17	87.05	86.80	-4,641.67	791.20	1,151.22	1,028.34	122.88	9.368		
14,300.00	9,315.51	13,102.63	8,388.47	87.70	88.37	85.46	-4,725.20	796.65	1,155.20	1,030.01	125.19	9.228		
14,400.00	9,315.92	13,182.46	8,387.11	89.24	89.63	83.82	-4,804.82	802.25	1,160.73	1,033.34	127.39	9.112		
14,500.00	9,316.32	13,303.56	8,384.06	90.78	91.55	85.57	-4,925.60	810.36	1,166.81	1,036.65	130.16	8.964		
14,600.00	9,316.73	13,439.35	8,385.05	92.33	93.70	88.50	-5,061.23	816.70	1,168.68	1,035.55	133.13	8.778		
14,700.00	9,317.13	13,535.77	8,384.84	93.88	95.23	88.21	-5,157.60	819.75	1,170.71	1,035.25	135.46	8.642		
14,800.00	9,317.54	13,634.04	8,384.37	95.43	96.78	88.07	-5,255.84	821.79	1,172.30	1,034.57	137.73	8.512		
14,900.00	9,317.94	13,753.45	8,383.63	96.99	98.68	89.63	-5,375.22	824.45	1,174.22	1,034.01	140.21	8.375		
15,000.00	9,318.34	13,838.19	8,385.12	98.55	100.03	88.41	-5,459.90	827.25	1,174.85	1,032.30	142.54	8.242		
15,100.00	9,318.75	13,917.84	8,384.92	100.11	101.30	86.78	-5,539.48	830.46	1,177.42	1,032.67	144.75	8.134		
15,200.00	9,319.15	14,015.06	8,383.93	101.68	102.85	86.57	-5,636.58	835.34	1,181.23	1,034.02	147.21	8.024		
15,300.00	9,319.56	14,111.00	8,383.97	103.24	104.39	86.26	-5,732.34	840.99	1,184.75	1,034.97	149.78	7.910		
15,400.00	9,319.96	14,234.56	8,385.16	104.82	106.38	88.11	-5,855.59	849.63	1,188.37	1,035.44	152.93	7.771		
15,500.00	9,320.37	14,317.97	8,386.69	106.39	107.72	86.83	-5,938.81	855.03	1,190.90	1,035.43	155.47	7.660		
15,600.00	9,320.77	14,393.98	8,386.63	107.97	108.95	84.99	-6,014.64	860.31	1,195.24	1,037.43	157.81	7.574		
15,700.00	9,321.18	14,505.38	8,384.66	109.55	110.74	85.88	-6,125.76	867.88	1,200.88	1,040.24	160.64	7.476		
15,800.00	9,321.58	14,616.78	8,384.17	111.13	112.54	86.76	-6,236.98	874.12	1,204.64	1,041.19	163.45	7.370		
15,900.00	9,321.98	14,691.55	8,384.02	112.71	113.75	84.88	-6,311.57	879.35	1,209.14	1,043.35	165.79	7.293		
16,000.00	9,322.39	14,816.94	8,383.69	114.30	115.78	86.79	-6,436.62	888.49	1,213.94	1,044.91	169.03	7.182		
16,100.00	9,322.79	14,885.24	8,383.06	115.88	116.89	84.46	-6,504.76	892.94	1,218.71	1,047.51	171.21	7.118		
16,200.00	9,323.20	15,018.26	8,380.70	117.47	119.04	86.90	-6,637.51	901.05	1,224.04	1,049.67	174.37	7.020		
16,300.00	9,323.60	15,168.40	8,381.78	119.07	121.47	90.57	-6,787.57	905.60	1,225.33	1,047.83	177.50	6.903		
16,392.85	9,323.98	15,252.41	8,383.03	120.55	122.82	89.93	-6,871.56	906.39	1,224.78	1,045.07	179.71	6.815		
16,400.00	9,324.01	15,258.39	8,383.08	120.66	122.92	89.84	-6,877.54	906.46	1,224.78	1,044.91	179.87	6.809		
16,500.00	9,324.41	15,374.15	8,383.71	122.25	124.78	90.99	-6,993.29	906.86	1,224.54	1,042.22	182.32	6.716		
16,555.41	9,324.63	15,414.98	8,383.70	123.14	125.44	89.93	-7,034.12	906.56	1,224.23	1,040.75	183.48	6.672		
16,600.00	9,324.82	15,448.53	8,383.40	123.85	125.98	89.12	-7,067.67	906.46	1,224.43	1,040.05	184.39	6.641		
16,700.00	9,325.22	15,573.39	8,382.01	125.45	127.99	90.94	-7,192.52	905.47	1,224.79	1,038.13	186.66	6.562		
16,730.75	9,325.34	15,590.36	8,381.80	125.94	128.26	89.93	-7,209.48	905.26	1,224.73	1,037.48	187.24	6.541		
16,800.00	9,325.62	15,643.26	8,380.85	127.05	129.11	88.73	-7,262.37	904.73	1,225.19	1,036.60	188.59	6.497		
16,900.00	9,326.03	15,795.70	8,380.14	128.65	131.56	92.58	-7,414.78	902.62	1,224.69	1,033.77	190.93	6.414		
17,000.00	9,326.43	15,900.41	8,382.62	130.25	133.24	92.94	-7,519.42	899.65	1,220.96	1,027.83	193.13	6.322		
17,100.00	9,326.84	15,984.40	8,383.52	131.86	134.59	91.76	-7,603.37	897.31	1,218.29	1,023.08	195.22	6.241		
17,200.00	9,327.24	16,068.43	8,383.74	133.46	135.94	90.57	-7,687.38	895.86	1,216.93	1,019.63	197.30	6.168		
17,253.29	9,327.46	16,113.13	8,383.71	134.32	136.66	89.93	-7,732.08	895.64	1,216.74	1,018.31	198.43	6.132		
17,300.00	9,327.65	16,149.53	8,383.61	135.07	137.25	89.16	-7,768.48	895.77	1,216.92	1,017.50	199.42	6.102		
17,400.00	9,328.05	16,228.78	8,382.81	136.68	138.54	87.62	-7,847.72	897.23	1,218.76	1,017.18	201.58	6.046		
17,500.00	9,328.45	16,353.83	8,381.86	138.29	140.57	89.48	-7,972.74	899.74	1,220.60	1,016.37	204.23	5.976		
17,600.00	9,328.86	16,495.48	8,384.18	139.90	142.87	92.58	-8,114.36	899.74	1,219.20	1,012.32	206.88	5.893		
17,700.00	9,329.26	16,570.46	8,385.69	141.51	144.08	90.72	-8,189.32	899.27	1,217.21	1,008.08	209.13	5.820		
17,739.14	9,329.42	16,599.02	8,385.82	142.14	144.54	89.93	-8,217.88	899.28	1,217.05	1,007.07	209.97	5.796		
17,800.00	9,329.67	16,645.47	8,385.62	143.12	145.30	88.86	-8,264.33	899.53	1,217.41	1,006.15	211.26	5.763		
17,900.00	9,330.07	16,757.76	8,384.12	144.73	147.12	89.77	-8,376.60	900.36	1,218.93	1,005.35	213.59	5.707		
18,000.00	9,330.48	16,860.42	8,383.60	146.35	148.78	89.97	-8,479.26	899.36	1,218.63	1,002.90	215.74	5.649		
18,005.69	9,330.50	16,865.65	8,383.55	146.44	148.87	89.93	-8,484.48	899.31	1,218.63	1,002.78	215.85	5.646		
18,100.00	9,330.88	16,934.84	8,382.28	147.96	149.99	88.06	-8,553.66	898.80	1,219.51	1,001.88	217.63	5.604		
8,200.00	9,331.29	17,038.88	8,378.82	149.58	151.68	88.35	-8,657.65	898.90	1,222.11	1,002.44	219.67	5.563		

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



MS Energy Services
Anticollision Report



Company: Devon Energy
Project: Eddy County, New Mexico (NAD 83)
Reference Site: Cotton Draw Unit
Site Error: 0.00 usft
Reference Well: 515H
Well Error: 0.00 usft
Reference Wellbore: Wellbore #1
Reference Design: Design #1

Local Co-ordinate Reference: Well 515H
TVD Reference: Well @ 3566.10usft (Cactus 126)
MD Reference: Well @ 3566.10usft (Cactus 126)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at: 2.00 sigma
Database: 5000.1 Conroe DB
Offset TVD Reference: Offset Datum

Offset Design King Tut Federal - #1H - Wellbore #1 - Surveys												Offset Site Error:	0.00 usft
Survey Program: 211-												Offset Well Error:	0.00 usft
Reference	Offset	Semi Major Axis		Distance									
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Azimuth from North (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
18,300.00	9,331.69	17,195.78	8,379.06	151.20	154.22	92.62	-8,814.50	896.55	1,220.69	998.66	222.03	5.498	
18,400.00	9,332.09	17,281.59	8,379.65	152.81	155.60	91.55	-8,900.27	894.04	1,218.27	994.23	224.04	5.438	
18,500.00	9,332.50	17,365.31	8,378.95	154.43	156.96	90.33	-8,983.97	891.99	1,217.31	991.36	225.94	5.388	
18,600.00	9,332.90	17,476.93	8,378.58	156.05	158.77	91.21	-9,095.57	890.47	1,216.69	988.63	228.06	5.335	
18,700.00	9,333.31	17,581.54	8,380.93	157.67	160.47	91.56	-9,200.15	889.96	1,214.54	984.07	230.47	5.270	
18,800.00	9,333.71	17,664.15	8,382.22	159.30	161.82	90.24	-9,282.75	890.43	1,213.58	980.78	232.80	5.213	
18,830.71	9,333.84	17,690.99	8,382.48	159.79	162.26	89.94	-9,309.59	890.71	1,213.53	980.01	233.52	5.197	
18,900.00	9,334.12	17,751.84	8,382.84	160.92	163.25	89.30	-9,370.43	891.57	1,213.78	978.63	235.15	5.162	
19,000.00	9,334.52	17,840.53	8,383.06	162.54	164.70	88.44	-9,459.10	893.62	1,214.95	977.40	237.55	5.115	
19,100.00	9,334.93	17,933.11	8,382.78	164.16	166.22	87.88	-9,551.63	896.39	1,216.97	976.96	240.01	5.070	
19,200.00	9,335.33	18,037.07	8,382.89	165.79	167.92	88.18	-9,655.53	900.09	1,219.04	976.31	242.73	5.022	
19,300.00	9,335.73	18,083.00	8,383.13	167.41	168.67	84.14	-9,701.42	901.85	1,222.16	977.70	244.45	5.000 SF	
19,390.56	9,336.10	18,083.00	8,383.13	168.88	168.67	77.50	-9,701.42	901.85	1,231.21	986.96	244.25	5.041	



MS Energy Services Anticollision Report



Company: Devon Energy
Project: Eddy County, New Mexico (NAD 83)
Reference Site: Cotton Draw Unit
Site Error: 0.00 usft
Reference Well: 515H
Well Error: 0.00 usft
Reference Wellbore: Wellbore #1
Reference Design: Design #1

Local Co-ordinate Reference: Well 515H
TVD Reference: Well @ 3566.10usft (Cactus 126)
MD Reference: Well @ 3566.10usft (Cactus 126)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: 5000.1 Conroe DB
Offset TVD Reference: Offset Datum

Offset Design Redhead 31 Federal - #1H - Wellbore #1 - Surveys														Offset Site Error:	0.00 usft
Survey Program: 100-, 9815-Reference														Offset Well Error:	0.00 usft
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Semi Major Axis (usft)	Azimuth from North (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Distance Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning	
0.00	0.00	0.00	0.00	0.00	0.00	0.00	164.37	-5,113.20	1,430.71	5,309.71					
100.00	100.00	68.05	68.05	0.13	0.05	0.13	164.37	-5,113.20	1,430.65	5,309.57	5,309.39	0.18	N/A		
163.61	163.61	128.51	128.51	0.36	0.12	0.36	164.37	-5,113.20	1,430.51	5,309.53	5,309.05	0.48	N/A		
200.00	200.00	159.82	159.82	0.49	0.18	0.49	164.37	-5,113.24	1,430.43	5,309.55	5,308.88	0.67	7,925.394		
300.00	300.00	265.37	265.37	0.85	0.36	0.85	164.37	-5,113.45	1,430.17	5,309.68	5,308.47	1.21	4,379.136		
400.00	400.00	379.94	379.93	1.21	0.57	1.21	164.38	-5,113.30	1,429.99	5,309.51	5,307.74	1.77	2,996.715		
500.00	500.00	492.78	492.78	1.57	0.77	1.57	164.38	-5,112.89	1,429.78	5,309.11	5,306.78	2.33	2,279.077		
600.00	600.00	617.90	617.90	1.93	0.99	1.93	164.38	-5,112.08	1,429.14	5,308.36	5,305.45	2.91	1,824.571		
700.00	700.00	713.69	713.68	2.29	1.16	2.29	164.38	-5,111.31	1,428.62	5,307.43	5,304.00	3.44	1,544.017		
800.00	800.00	813.86	813.85	2.64	1.34	2.64	164.39	-5,110.55	1,428.02	5,306.54	5,302.57	3.97	1,335.534		
900.00	900.00	927.43	927.40	3.00	1.54	3.00	164.40	-5,109.53	1,426.92	5,305.40	5,300.87	4.53	1,170.461		
1,000.00	1,000.00	1,013.15	1,013.12	3.36	1.69	3.36	164.40	-5,108.84	1,426.11	5,304.37	5,299.33	5.04	1,051.865		
1,100.00	1,100.00	1,107.42	1,107.39	3.72	1.86	3.72	164.41	-5,108.22	1,425.32	5,303.52	5,297.95	5.57	952.519		
1,200.00	1,200.00	1,204.33	1,204.29	4.08	2.03	4.08	164.42	-5,107.72	1,424.36	5,302.75	5,296.65	6.10	869.712		
1,300.00	1,300.00	1,315.60	1,315.55	4.44	2.23	4.44	164.43	-5,107.10	1,423.07	5,301.90	5,295.25	6.65	797.110		
1,400.00	1,400.00	1,409.02	1,408.96	4.79	2.39	4.79	164.44	-5,106.46	1,422.31	5,301.02	5,293.85	7.18	738.802		
1,500.00	1,500.00	1,496.96	1,496.90	5.15	2.55	5.15	164.44	-5,105.93	1,421.85	5,300.31	5,292.62	7.69	689.288		
1,600.00	1,600.00	1,590.74	1,590.68	5.51	2.72	5.51	164.44	-5,105.50	1,421.52	5,299.76	5,291.55	8.21	645.180		
1,700.00	1,700.00	1,700.63	1,700.57	5.87	2.91	5.87	164.44	-5,104.95	1,421.15	5,299.20	5,290.43	8.77	604.389		
1,800.00	1,800.00	1,779.44	1,779.37	6.23	3.05	6.23	164.45	-5,104.64	1,420.90	5,298.73	5,289.46	9.27	571.829		
1,900.00	1,900.00	1,873.08	1,873.02	6.59	3.22	6.59	164.45	-5,104.51	1,420.76	5,298.55	5,288.76	9.79	541.215		
2,000.00	2,000.00	1,986.79	1,986.72	6.95	3.42	6.95	164.45	-5,104.29	1,420.47	5,298.30	5,287.96	10.35	511.959		
2,100.00	2,100.00	2,067.84	2,067.77	7.30	3.56	7.30	164.45	-5,104.06	1,420.44	5,298.03	5,287.18	10.85	488.348		
2,112.10	2,112.10	2,077.07	2,077.00	7.35	3.58	7.35	164.45	-5,104.06	1,420.46	5,298.03	5,287.12	10.91	485.687		
2,200.00	2,200.00	2,174.67	2,174.61	7.66	3.74	7.66	164.45	-5,104.02	1,420.58	5,298.03	5,286.64	11.39	465.020		
2,300.00	2,300.00	2,267.29	2,267.23	8.02	3.91	8.02	164.45	-5,103.89	1,420.41	5,297.85	5,285.94	11.91	444.712		
2,314.28	2,314.28	2,279.25	2,279.19	8.07	3.93	8.07	164.45	-5,103.89	1,420.38	5,297.85	5,285.86	11.99	442.038		
2,400.00	2,400.00	2,358.10	2,358.03	8.38	4.06	8.38	164.45	-5,104.00	1,420.25	5,297.92	5,285.49	12.43	426.311		
2,500.00	2,500.00	2,460.70	2,460.64	8.74	4.24	8.74	164.45	-5,104.12	1,420.33	5,298.06	5,285.10	12.96	408.772		
2,600.00	2,599.99	2,576.28	2,576.21	9.10	4.44	9.10	164.45	-5,104.05	1,420.40	5,298.87	5,285.35	13.52	391.934		
2,700.00	2,699.96	2,662.62	2,662.56	9.45	4.59	9.45	164.46	-5,103.95	1,420.24	5,301.28	5,287.25	14.03	377.908		
2,800.00	2,799.86	2,762.32	2,762.25	9.81	4.76	9.81	164.47	-5,104.09	1,420.29	5,305.68	5,291.12	14.56	364.426		
2,900.00	2,899.68	2,868.20	2,868.13	10.17	4.94	10.17	164.48	-5,104.00	1,420.43	5,311.58	5,296.48	15.10	351.713		
3,000.00	2,999.37	2,959.36	2,959.29	10.53	5.10	10.53	164.49	-5,103.83	1,420.99	5,319.23	5,303.61	15.62	340.578		
3,100.00	3,098.90	3,048.72	3,048.65	10.89	5.25	10.89	164.51	-5,103.81	1,421.71	5,328.79	5,312.66	16.13	330.366		
3,200.00	3,198.26	3,154.75	3,154.67	11.25	5.43	11.25	164.52	-5,103.69	1,423.33	5,340.14	5,323.47	16.67	320.334		
3,299.74	3,297.14	3,262.01	3,261.90	11.61	5.62	11.61	164.52	-5,103.04	1,425.77	5,352.87	5,335.65	17.21	310.981		
3,300.00	3,297.40	3,262.27	3,262.15	11.61	5.62	11.61	164.52	-5,103.04	1,425.77	5,352.90	5,335.69	17.21	310.959		
3,400.00	3,396.43	3,375.55	3,375.41	11.98	5.81	11.98	164.53	-5,102.32	1,428.04	5,366.41	5,348.65	17.77	302.019		
3,500.00	3,495.46	3,478.57	3,478.40	12.36	5.99	12.36	164.54	-5,101.42	1,429.99	5,379.66	5,361.36	18.31	293.885		
3,600.00	3,594.49	3,583.79	3,583.59	12.73	6.18	12.73	164.54	-5,100.38	1,432.28	5,392.88	5,374.03	18.85	286.138		
3,700.00	3,693.51	3,690.88	3,690.67	13.11	6.36	13.11	164.55	-5,099.28	1,434.14	5,405.94	5,386.55	19.39	278.752		
3,800.00	3,792.54	3,799.53	3,799.30	13.49	6.55	13.49	164.57	-5,098.23	1,435.14	5,418.85	5,398.91	19.94	271.703		
3,900.00	3,891.57	3,876.97	3,876.74	13.87	6.69	13.87	164.60	-5,097.67	1,435.51	5,431.87	5,411.43	20.44	265.759		
4,000.00	3,990.60	3,965.24	3,965.01	14.25	6.84	14.25	164.62	-5,097.35	1,435.86	5,445.22	5,424.26	20.95	259.868		
4,100.00	4,089.62	4,044.39	4,044.16	14.64	6.98	14.64	164.65	-5,097.27	1,436.00	5,458.77	5,437.31	21.45	254.475		
4,200.00	4,188.65	4,100.00	4,099.77	15.02	7.08	15.02	164.68	-5,097.49	1,436.03	5,472.83	5,450.93	21.90	249.854		
4,300.00	4,287.68	4,173.42	4,173.18	15.41	7.20	15.41	164.72	-5,098.27	1,436.03	5,487.48	5,465.09	22.39	245.109		
4,400.00	4,386.71	4,246.61	4,246.36	15.80	7.33	15.80	164.75	-5,099.60	1,436.01	5,502.79	5,479.92	22.87	240.600		
4,500.00	4,485.73	4,334.97	4,334.70	16.19	7.48	16.19	164.79	-5,101.46	1,436.04	5,518.40	5,495.02	23.38	236.001		
4,600.00	4,584.76	4,453.07	4,452.77	16.59	7.68	16.59	164.83	-5,104.02	1,435.75	5,534.03	5,510.07	23.95	231.049		
4,700.00	4,683.79	4,580.22	4,579.91	16.98	7.90	16.98	164.87	-5,106.09	1,435.05	5,549.02	5,524.48	24.54	226.133		

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



MS Energy Services Anticollision Report



Company: Devon Energy
Project: Eddy County, New Mexico (NAD 83)
Reference Site: Cotton Draw Unit
Site Error: 0.00 usft
Reference Well: 515H
Well Error: 0.00 usft
Reference Wellbore: Wellbore #1
Reference Design: Design #1

Local Co-ordinate Reference: Well 515H
TVD Reference: Well @ 3566.10usft (Cactus 126)
MD Reference: Well @ 3566.10usft (Cactus 126)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: 5000.1 Conroe DB
Offset TVD Reference: Offset Datum

Offset Design Redhead 31 Federal - #1H - Wellbore #1 - Surveys													Offset Site Error:	0.00 usft
Survey Program: 100-, 9815-													Offset Well Error:	0.00 usft
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Azimuth from North (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning	
4,800.00	4,782.81	4,685.61	4,685.29	17.37	8.09	164.91	-5,107.54	1,434.41	5,563.78	5,538.69	25.09	221.794		
4,900.00	4,881.84	4,801.41	4,801.07	17.77	8.29	164.95	-5,108.94	1,433.57	5,578.36	5,552.71	25.65	217.460		
5,000.00	4,980.87	4,901.51	4,901.16	18.17	8.46	164.99	-5,109.99	1,432.79	5,592.77	5,566.58	26.19	213.545		
5,100.00	5,079.90	4,993.23	4,992.87	18.56	8.62	165.03	-5,111.03	1,432.00	5,607.23	5,580.52	26.71	209.912		
5,200.00	5,178.92	5,108.52	5,108.15	18.96	8.82	165.08	-5,112.25	1,430.97	5,621.63	5,594.35	27.28	206.071		
5,300.00	5,277.95	5,212.76	5,212.39	19.36	9.00	165.12	-5,113.17	1,429.94	5,635.84	5,608.01	27.83	202.530		
5,400.00	5,376.98	5,319.26	5,318.87	19.76	9.19	165.16	-5,113.96	1,428.84	5,649.90	5,621.52	28.38	199.087		
5,500.00	5,476.01	5,412.93	5,412.54	20.16	9.35	165.20	-5,114.65	1,427.92	5,663.97	5,635.07	28.91	195.942		
5,600.00	5,575.03	5,517.50	5,517.10	20.56	9.53	165.24	-5,115.46	1,426.75	5,678.05	5,648.60	29.46	192.769		
5,628.09	5,602.86	5,550.41	5,550.00	20.68	9.59	165.26	-5,115.69	1,426.36	5,681.98	5,652.36	29.62	191.853		
5,700.00	5,674.12	5,623.66	5,623.25	20.96	9.72	165.28	-5,116.10	1,425.49	5,691.51	5,661.50	30.01	189.673		
5,800.00	5,773.42	5,705.30	5,704.88	21.36	9.86	165.32	-5,116.70	1,424.64	5,703.51	5,673.00	30.51	186.940		
5,900.00	5,872.91	5,817.88	5,817.45	21.74	10.06	165.35	-5,117.53	1,423.50	5,713.82	5,682.75	31.07	183.888		
6,000.00	5,972.56	5,925.59	5,925.15	22.12	10.25	165.38	-5,118.23	1,422.18	5,722.30	5,690.67	31.62	180.948		
6,100.00	6,072.35	6,040.45	6,039.99	22.49	10.45	165.41	-5,118.71	1,420.41	5,728.76	5,696.57	32.19	177.975		
6,200.00	6,172.23	6,137.10	6,136.64	22.86	10.62	165.44	-5,119.11	1,418.86	5,733.50	5,700.78	32.72	175.253		
6,300.00	6,272.18	6,231.60	6,231.13	23.21	10.79	165.46	-5,119.42	1,417.77	5,736.57	5,703.33	33.24	172.598		
6,400.00	6,372.17	6,327.55	6,327.07	23.56	10.96	165.47	-5,119.97	1,416.47	5,738.11	5,704.35	33.76	169.976		
6,427.83	6,400.00	6,365.43	6,364.95	23.66	11.02	165.48	-5,120.13	1,415.96	5,738.20	5,704.27	33.93	169.143		
6,500.00	6,472.17	6,440.84	6,440.35	23.90	11.16	165.49	-5,120.28	1,415.09	5,738.13	5,703.82	34.31	167.230		
6,525.84	6,498.00	6,463.40	6,462.90	23.99	11.20	165.49	-5,120.33	1,414.87	5,738.12	5,703.68	34.44	166.599		
6,600.00	6,572.17	6,527.73	6,527.24	24.25	11.31	165.50	-5,120.52	1,414.37	5,738.18	5,703.37	34.82	164.818		
6,700.00	6,672.17	6,617.93	6,617.44	24.59	11.47	165.50	-5,120.88	1,414.03	5,738.47	5,703.15	35.32	162.452		
6,800.00	6,772.17	6,723.10	6,722.60	24.93	11.65	165.50	-5,121.24	1,413.69	5,738.72	5,702.86	35.86	160.019		
6,900.00	6,872.17	6,808.50	6,808.00	25.28	11.80	165.51	-5,121.68	1,413.27	5,739.10	5,702.73	36.36	157.831		
7,000.00	6,972.17	6,888.53	6,888.03	25.62	11.94	165.51	-5,122.32	1,412.94	5,739.78	5,702.93	36.85	155.755		
7,100.00	7,072.17	7,006.65	7,006.14	25.97	12.15	165.52	-5,123.35	1,412.45	5,740.52	5,703.11	37.42	153.424		
7,200.00	7,172.17	7,110.64	7,110.13	26.31	12.33	165.53	-5,124.01	1,412.03	5,741.03	5,703.08	37.95	151.268		
7,300.00	7,272.17	7,196.56	7,196.05	26.66	12.48	165.53	-5,124.61	1,411.81	5,741.64	5,703.19	38.45	149.314		
7,400.00	7,372.17	7,284.21	7,283.69	27.00	12.64	165.54	-5,125.45	1,411.43	5,742.47	5,703.51	38.96	147.399		
7,500.00	7,472.17	7,377.57	7,377.05	27.35	12.80	165.54	-5,126.54	1,410.92	5,743.46	5,703.99	39.47	145.497		
7,600.00	7,572.17	7,471.49	7,470.96	27.69	12.96	165.55	-5,127.69	1,410.59	5,744.56	5,704.57	39.99	143.642		
7,700.00	7,672.17	7,560.65	7,560.11	28.04	13.12	165.56	-5,128.95	1,410.10	5,745.79	5,705.29	40.50	141.871		
7,800.00	7,772.17	7,656.10	7,657.55	28.39	13.29	165.56	-5,130.43	1,409.86	5,747.19	5,706.17	41.02	140.091		
7,900.00	7,872.17	7,765.02	7,764.45	28.74	13.48	165.57	-5,132.00	1,409.42	5,748.52	5,706.95	41.57	138.290		
8,000.00	7,972.17	7,858.83	7,858.25	29.08	13.64	165.58	-5,133.30	1,409.18	5,749.80	5,707.71	42.09	136.619		
8,100.00	8,072.17	7,958.83	7,958.23	29.43	13.82	165.59	-5,134.89	1,408.70	5,751.22	5,708.60	42.62	134.953		
8,200.00	8,172.17	8,067.45	8,066.84	29.78	14.01	165.60	-5,136.55	1,407.87	5,752.51	5,709.34	43.16	133.270		
8,300.00	8,272.17	8,163.47	8,162.85	30.13	14.18	165.61	-5,137.94	1,407.20	5,753.73	5,710.05	43.69	131.704		
8,400.00	8,372.17	8,252.90	8,252.27	30.48	14.34	165.62	-5,139.35	1,406.63	5,755.11	5,710.91	44.20	130.218		
8,500.00	8,472.17	8,346.56	8,345.91	30.83	14.50	165.63	-5,141.08	1,405.76	5,756.66	5,711.95	44.71	128.744		
8,600.00	8,572.17	8,474.49	8,473.80	31.18	14.73	165.65	-5,143.42	1,404.04	5,758.13	5,712.83	45.30	127.109		
8,700.00	8,672.17	8,593.82	8,593.09	31.52	14.94	165.68	-5,145.10	1,401.75	5,759.01	5,713.14	45.87	125.550		
8,751.58	8,723.75	8,716.20	8,715.45	31.70	15.16	165.71	-5,145.96	1,399.23	5,759.12	5,712.84	46.28	124.434		
8,800.00	8,772.11	8,741.04	8,740.28	31.86	15.20	165.71	-5,146.09	1,398.68	5,757.01	5,710.53	46.48	123.854		
8,850.00	8,821.68	8,778.20	8,777.43	32.00	15.26	165.71	-5,146.34	1,397.79	5,750.69	5,703.99	46.70	123.148		
8,900.00	8,870.51	8,800.00	8,799.22	32.12	15.30	165.71	-5,146.53	1,397.22	5,740.23	5,693.35	46.87	122.459		
8,950.00	8,918.22	8,837.51	8,836.72	32.24	15.37	165.70	-5,147.01	1,396.17	5,725.70	5,678.63	47.08	121.629		
9,000.00	8,964.46	8,863.32	8,862.51	32.34	15.41	165.69	-5,147.47	1,395.40	5,707.28	5,660.04	47.24	120.809		
9,050.00	9,008.86	8,900.00	8,899.16	32.43	15.48	165.68	-5,148.31	1,394.24	5,685.09	5,637.67	47.42	119.888		
9,100.00	9,051.09	8,918.59	8,917.74	32.51	15.51	165.65	-5,148.79	1,393.65	5,659.20	5,611.64	47.55	119.015		
9,150.00	9,090.83	8,953.30	8,952.42	32.58	15.57	165.63	-5,149.69	1,392.61	5,629.78	5,582.08	47.70	118.021		

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



MS Energy Services

Anticollision Report



Company: Devon Energy
Project: Eddy County, New Mexico (NAD 83)
Reference Site: Cotton Draw Unit
Site Error: 0.00 usft
Reference Well: 515H
Well Error: 0.00 usft
Reference Wellbore: Wellbore #1
Reference Design: Design #1

Local Co-ordinate Reference: Well 515H
TVD Reference: Well @ 3566.10usft (Cactus 126)
MD Reference: Well @ 3566.10usft (Cactus 126)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: 5000.1 Conroe DB
Offset TVD Reference: Offset Datum

Offset Design Redhead 31 Federal - #1H - Wellbore #1 - Surveys												Offset Site Error:	0.00 usft
Survey Program: 100-, 9815-												Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Distance							
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Azimuth from North (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
9,200.00	9,127.77	8,985.72	8,984.81	32.65	15.63	165.60	-5,150.55	1,391.72	5,597.03	5,549.19	47.84	117.004	
9,250.00	9,181.64	9,040.50	9,039.56	32.71	15.73	165.58	-5,151.93	1,390.35	5,561.14	5,513.14	48.00	115.846	
9,300.00	9,192.18	9,109.91	9,108.94	32.78	15.85	165.55	-5,153.22	1,388.73	5,522.20	5,474.01	48.19	114.592	
9,350.00	9,219.15	9,170.68	9,169.68	32.85	15.96	165.52	-5,153.99	1,387.13	5,480.55	5,432.20	48.35	113.360	
9,400.00	9,242.36	9,400.00	9,181.89	32.92	16.36	165.47	-5,154.05	1,386.69	5,436.56	5,387.79	48.78	111.457	
9,450.00	9,261.61	9,225.20	9,224.18	32.99	16.05	165.43	-5,154.46	1,385.43	5,390.77	5,342.27	48.50	111.151	
9,500.00	9,276.77	9,238.34	9,237.31	33.08	16.08	165.37	-5,154.58	1,385.01	5,343.47	5,294.94	48.54	110.089	
9,550.00	9,287.73	9,247.91	9,246.87	33.17	16.09	165.31	-5,154.67	1,384.71	5,295.05	5,246.49	48.56	109.034	
9,600.00	9,294.39	9,253.83	9,252.79	33.27	16.11	165.25	-5,154.72	1,384.53	5,245.87	5,197.29	48.58	107.987	
9,649.26	9,296.70	9,256.03	9,254.99	33.37	16.11	165.19	-5,154.74	1,384.46	5,197.03	5,148.45	48.59	106.967	
9,700.00	9,296.91	9,256.45	9,255.40	33.49	16.11	165.12	-5,154.75	1,384.44	5,146.72	5,098.14	48.59	105.925	
9,800.00	9,297.31	9,257.34	9,256.30	33.80	16.11	164.94	-5,154.76	1,384.42	5,047.98	4,999.39	48.60	103.876	
9,900.00	9,297.72	9,258.34	9,257.29	34.17	16.11	164.71	-5,154.77	1,384.38	4,949.92	4,901.31	48.61	101.832	
10,000.00	9,298.12	9,259.43	9,258.39	34.62	16.11	164.44	-5,154.78	1,384.35	4,852.70	4,804.07	48.63	99.790	
10,027.33	9,298.24	9,259.75	9,258.71	34.75	16.12	164.36	-5,154.78	1,384.34	4,826.30	4,777.66	48.64	99.233	
10,100.00	9,298.53	9,260.60	9,259.56	35.13	16.12	164.13	-5,154.79	1,384.31	4,756.24	4,707.58	48.66	97.745	
10,200.00	9,298.93	9,261.78	9,260.74	35.71	16.12	163.80	-5,154.80	1,384.28	4,659.96	4,611.26	48.70	95.684	
10,300.00	9,299.34	9,262.97	9,261.92	36.35	16.12	163.46	-5,154.81	1,384.24	4,563.85	4,515.09	48.75	93.609	
10,400.00	9,299.74	9,264.16	9,263.12	37.06	16.12	163.10	-5,154.82	1,384.20	4,467.90	4,419.08	48.82	91.519	
10,500.00	9,300.15	9,265.36	9,264.31	37.83	16.13	162.73	-5,154.83	1,384.17	4,372.14	4,323.24	48.90	89.414	
10,600.00	9,300.55	9,266.57	9,265.52	38.65	16.13	162.34	-5,154.85	1,384.13	4,276.57	4,227.57	48.99	87.293	
10,700.00	9,300.96	9,267.78	9,266.73	39.53	16.13	161.93	-5,154.86	1,384.09	4,181.20	4,132.10	49.10	85.155	
10,800.00	9,301.36	9,268.99	9,267.94	40.45	16.13	161.50	-5,154.87	1,384.05	4,086.06	4,036.83	49.23	83.001	
10,900.00	9,301.76	9,270.22	9,269.17	41.42	16.13	161.06	-5,154.88	1,384.01	3,991.15	3,941.78	49.38	80.830	
11,000.00	9,302.17	9,271.45	9,270.40	42.44	16.14	160.59	-5,154.89	1,383.98	3,896.50	3,846.95	49.55	78.641	
11,100.00	9,302.57	9,272.68	9,271.63	43.49	16.14	160.10	-5,154.91	1,383.94	3,802.12	3,752.38	49.74	76.434	
11,200.00	9,302.98	9,273.92	9,272.87	44.58	16.14	159.58	-5,154.92	1,383.90	3,708.04	3,658.07	49.97	74.210	
11,300.00	9,303.38	9,275.17	9,274.12	45.71	16.14	159.04	-5,154.93	1,383.86	3,614.27	3,564.05	50.22	71.968	
11,400.00	9,303.79	9,276.43	9,275.38	46.86	16.15	158.47	-5,154.94	1,383.82	3,520.85	3,470.34	50.51	69.709	
11,500.00	9,304.19	9,277.69	9,276.64	48.05	16.15	157.86	-5,154.96	1,383.78	3,427.80	3,376.96	50.83	67.432	
11,600.00	9,304.60	9,278.96	9,277.91	49.26	16.15	157.23	-5,154.97	1,383.74	3,335.15	3,283.95	51.20	65.140	
11,700.00	9,305.00	9,280.24	9,279.18	50.50	16.15	156.55	-5,154.98	1,383.70	3,242.93	3,191.32	51.61	62.832	
11,800.00	9,305.40	9,281.52	9,280.46	51.76	16.15	155.84	-5,155.00	1,383.67	3,151.19	3,099.11	52.08	60.511	
11,900.00	9,305.81	9,282.81	9,281.75	53.05	16.16	155.09	-5,155.01	1,383.63	3,059.96	3,007.37	52.60	58.178	
12,000.00	9,306.21	9,284.10	9,283.05	54.35	16.16	154.28	-5,155.02	1,383.59	2,969.30	2,916.13	53.18	55.836	
12,100.00	9,306.62	9,285.40	9,284.35	55.67	16.16	153.43	-5,155.04	1,383.55	2,879.26	2,825.43	53.83	53.468	
12,200.00	9,307.02	9,286.71	9,285.66	57.01	16.16	152.53	-5,155.05	1,383.51	2,789.90	2,735.34	54.56	51.136	
12,300.00	9,307.43	9,288.03	9,286.97	58.37	16.17	151.56	-5,155.06	1,383.46	2,701.28	2,645.91	55.37	48.787	
12,400.00	9,307.83	9,289.35	9,288.29	59.74	16.17	150.53	-5,155.08	1,383.42	2,613.48	2,557.21	56.27	46.443	
12,500.00	9,308.23	9,290.68	9,289.62	61.13	16.17	149.43	-5,155.09	1,383.38	2,526.59	2,469.31	57.28	44.111	
12,600.00	9,308.64	9,292.02	9,290.96	62.53	16.17	148.24	-5,155.11	1,383.34	2,440.70	2,382.31	58.39	41.797	
12,700.00	9,309.04	9,293.37	9,292.31	63.94	16.17	146.98	-5,155.12	1,383.30	2,355.92	2,296.29	59.63	39.509	
12,800.00	9,309.45	9,294.72	9,293.66	65.36	16.18	145.62	-5,155.13	1,383.26	2,272.39	2,211.39	61.00	37.253	
12,900.00	9,309.85	9,296.08	9,295.02	66.80	16.18	144.16	-5,155.15	1,383.22	2,190.23	2,127.72	62.51	35.039	
13,000.00	9,310.26	9,297.45	9,296.38	68.24	16.18	142.58	-5,155.16	1,383.18	2,109.61	2,045.43	64.17	32.874	
13,100.00	9,310.66	9,298.82	9,297.76	69.69	16.18	140.88	-5,155.18	1,383.13	2,030.71	1,964.71	66.00	30.768	
13,200.00	9,311.07	9,300.20	9,299.14	71.16	16.19	139.04	-5,155.19	1,383.09	1,953.75	1,885.74	68.00	28.730	
13,300.00	9,311.47	9,301.59	9,300.53	72.63	16.19	137.06	-5,155.21	1,383.05	1,878.95	1,808.77	70.19	26.770	
3,400.00	9,311.87	9,302.99	9,301.93	74.11	16.19	134.91	-5,155.22	1,383.01	1,806.60	1,734.04	72.56	24.897	
3,500.00	9,312.28	9,304.40	9,303.33	75.59	16.19	132.59	-5,155.24	1,382.96	1,736.99	1,661.86	75.13	23.121	
3,600.00	9,312.68	9,305.81	9,304.74	77.09	16.20	130.08	-5,155.26	1,382.92	1,670.47	1,592.59	77.88	21.449	
3,700.00	9,313.09	9,307.23	9,306.16	78.59	16.20	127.37	-5,155.27	1,382.88	1,607.41	1,526.60	80.81	19.891	

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



MS Energy Services
Anticollision Report



Company: Devon Energy
Project: Eddy County, New Mexico (NAD 83)
Reference Site: Cotton Draw Unit
Site Error: 0.00 usft
Reference Well: 515H
Well Error: 0.00 usft
Reference Wellbore: Wellbore #1
Reference Design: Design #1

Local Co-ordinate Reference: Well 515H
TVD Reference: Well @ 3566.10usft (Cactus 126)
MD Reference: Well @ 3566.10usft (Cactus 126)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at: 2.00 sigma
Database: 5000.1 Conroe DB
Offset TVD Reference: Offset Datum

Offset Design Redhead 31 Federal - #1H - Wellbore #1 - Surveys													Offset Site Error: 0.00 usft
Survey Program: 100- 9815-													Offset Well Error: 0.00 usft
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Azimuth from North (°)	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
13,800.00	9,313.49	9,307.99	9,306.92	80.09	16.20	124.44	-5,155.28	1,382.86	1,548.26	1,464.35	83.91	18.452	
13,900.00	9,313.90	9,309.33	9,308.26	81.60	16.20	121.29	-5,155.30	1,382.81	1,493.46	1,406.33	87.13	17.140	
14,000.00	9,314.30	9,310.68	9,309.61	83.12	16.21	117.91	-5,155.31	1,382.77	1,443.51	1,353.06	90.45	15.960	
14,100.00	9,314.71	9,312.05	9,310.98	84.64	16.21	114.30	-5,155.33	1,382.73	1,398.94	1,305.14	93.80	14.915	
14,200.00	9,315.11	9,313.42	9,312.35	86.17	16.21	110.47	-5,155.34	1,382.69	1,360.27	1,263.16	97.11	14.008	
14,300.00	9,315.51	9,314.81	9,313.74	87.70	16.21	106.43	-5,155.36	1,382.65	1,328.02	1,227.72	100.30	13.241	
14,400.00	9,315.92	9,316.21	9,315.14	89.24	16.22	102.22	-5,155.37	1,382.61	1,302.66	1,199.39	103.28	12.614	
14,500.00	9,316.32	9,317.63	9,316.55	90.78	16.22	97.86	-5,155.39	1,382.57	1,284.61	1,178.66	105.95	12.125	
14,600.00	9,316.73	9,319.05	9,317.98	92.33	16.22	93.40	-5,155.41	1,382.53	1,274.17	1,165.94	108.23	11.773	
14,683.61	9,317.07	9,320.26	9,319.18	93.62	16.22	89.64	-5,155.42	1,382.49	1,271.42	1,161.64	109.79	11.581 CC	
14,700.00	9,317.13	9,320.49	9,319.42	93.88	16.22	88.90	-5,155.42	1,382.48	1,271.53	1,161.48	110.05	11.554 ES	
14,800.00	9,317.54	9,321.95	9,320.87	95.43	16.23	84.41	-5,155.44	1,382.44	1,276.74	1,165.37	111.37	11.464	
14,900.00	9,317.94	9,323.41	9,322.33	96.99	16.23	79.98	-5,155.46	1,382.40	1,289.70	1,177.53	112.18	11.497	
15,000.00	9,318.34	9,324.89	9,323.81	98.55	16.23	75.66	-5,155.48	1,382.36	1,310.19	1,197.71	112.48	11.648	
15,100.00	9,318.75	9,326.38	9,325.31	100.11	16.23	71.50	-5,155.49	1,382.31	1,337.85	1,225.54	112.32	11.911	
15,200.00	9,319.15	9,327.89	9,326.81	101.68	16.24	67.53	-5,155.51	1,382.27	1,372.27	1,260.51	111.75	12.279	
15,300.00	9,319.56	9,329.41	9,328.33	103.24	16.24	63.77	-5,155.53	1,382.23	1,412.93	1,302.08	110.85	12.746	
15,400.00	9,319.96	9,330.95	9,329.87	104.82	16.24	60.23	-5,155.55	1,382.18	1,459.32	1,349.63	109.69	13.305	
15,500.00	9,320.37	9,332.50	9,331.42	106.39	16.24	56.93	-5,155.57	1,382.14	1,510.91	1,402.59	108.32	13.949	
15,600.00	9,320.77	9,334.06	9,332.98	107.97	16.25	53.85	-5,155.59	1,382.10	1,567.19	1,460.37	106.82	14.672	
15,700.00	9,321.18	9,335.64	9,334.56	109.55	16.25	50.99	-5,155.61	1,382.05	1,627.67	1,522.44	105.23	15.468	
15,800.00	9,321.58	9,337.23	9,336.15	111.13	16.25	48.34	-5,155.63	1,382.01	1,691.91	1,588.31	103.60	16.331	
15,900.00	9,321.98	11,328.21	10,489.69	112.71	24.94	84.13	-6,250.52	1,375.29	1,743.97	1,630.96	113.01	15.432	
16,000.00	9,322.39	11,497.46	10,494.20	114.30	27.07	87.27	-6,419.37	1,385.69	1,750.13	1,634.07	116.06	15.079	
16,100.00	9,322.79	11,661.60	10,492.43	115.88	29.24	90.17	-6,583.42	1,390.43	1,750.59	1,631.54	119.05	14.705	
16,200.00	9,323.20	11,768.85	10,488.56	117.47	30.71	90.49	-6,690.56	1,393.21	1,749.25	1,627.74	121.51	14.396	
16,300.00	9,323.60	11,857.23	10,487.01	119.07	31.94	89.96	-6,778.92	1,394.49	1,748.37	1,624.66	123.71	14.133	
16,400.00	9,324.01	11,958.29	10,485.47	120.66	33.37	90.01	-6,879.96	1,395.75	1,747.50	1,621.44	126.07	13.862	
16,486.04	9,324.35	12,031.43	10,485.31	122.03	34.42	89.43	-6,953.10	1,396.24	1,747.17	1,619.25	127.92	13.658	
16,500.00	9,324.41	12,042.42	10,485.38	122.25	34.58	89.30	-6,964.09	1,396.29	1,747.18	1,618.98	128.21	13.628	
16,600.00	9,324.82	12,119.00	10,486.34	123.85	35.68	88.24	-7,040.66	1,396.95	1,747.97	1,617.73	130.24	13.422	
16,700.00	9,325.22	12,189.32	10,487.84	125.45	36.72	86.91	-7,110.94	1,398.44	1,750.27	1,618.09	132.18	13.241	
16,800.00	9,325.62	12,274.99	10,490.20	127.05	37.99	86.27	-7,196.52	1,401.57	1,754.06	1,619.70	134.36	13.055	
16,900.00	9,326.03	12,414.66	10,492.97	128.65	40.08	88.05	-7,336.09	1,406.22	1,757.19	1,619.86	137.33	12.795	
17,000.00	9,326.43	12,501.24	10,493.90	130.25	41.39	87.45	-7,422.63	1,408.77	1,759.34	1,619.75	139.59	12.604	
17,100.00	9,326.84	12,608.48	10,494.33	131.86	43.03	87.78	-7,529.78	1,412.95	1,761.75	1,619.54	142.21	12.388	
17,200.00	9,327.24	12,721.65	10,494.46	133.46	44.76	88.37	-7,642.91	1,416.13	1,763.11	1,618.20	144.91	12.167	
17,300.00	9,327.65	12,806.91	10,495.06	135.07	46.08	87.71	-7,728.13	1,418.60	1,764.98	1,617.77	147.21	11.990	
17,400.00	9,328.05	12,910.42	10,495.94	136.68	47.68	87.87	-7,831.58	1,421.94	1,767.20	1,617.41	149.79	11.799	
17,500.00	9,328.45	13,031.32	10,496.37	138.29	49.57	88.80	-7,952.43	1,425.09	1,768.63	1,616.00	152.63	11.588	
17,600.00	9,328.86	13,150.93	10,495.76	139.90	51.43	89.66	-8,072.03	1,427.23	1,768.86	1,613.42	155.45	11.379	
17,700.00	9,329.26	13,256.92	10,494.13	141.51	53.10	89.93	-8,177.98	1,429.07	1,768.37	1,610.24	158.13	11.183	
17,800.00	9,329.67	13,371.49	10,492.71	143.12	54.90	90.57	-8,292.54	1,429.79	1,767.26	1,606.38	160.87	10.985	
17,900.00	9,330.07	13,472.39	10,492.08	144.73	56.49	90.61	-8,393.44	1,429.35	1,765.79	1,602.40	163.39	10.807	
18,000.00	9,330.48	13,571.11	10,491.72	146.35	58.04	90.55	-8,492.15	1,428.58	1,764.24	1,598.37	165.87	10.636	
18,100.00	9,330.88	13,677.70	10,491.84	147.96	59.73	90.84	-8,598.74	1,427.64	1,762.97	1,594.55	168.42	10.468	
18,200.00	9,331.29	13,797.34	10,489.16	149.58	61.63	91.71	-8,718.34	1,426.97	1,760.26	1,589.02	171.24	10.280	
18,300.00	9,331.69	13,893.14	10,485.87	151.20	63.15	91.52	-8,814.08	1,427.25	1,757.42	1,583.56	173.86	10.108	
18,400.00	9,332.09	13,994.14	10,484.19	152.81	64.76	91.57	-8,915.06	1,426.15	1,754.77	1,578.34	176.43	9.946	
18,500.00	9,332.50	14,084.34	10,482.55	154.43	66.19	91.14	-9,005.25	1,425.40	1,752.21	1,573.31	178.90	9.794	
18,600.00	9,332.90	14,172.41	10,481.09	156.05	67.60	90.61	-9,093.30	1,425.43	1,750.39	1,569.02	181.37	9.651	
18,700.00	9,333.31	14,267.91	10,479.25	157.67	69.14	90.41	-9,188.77	1,426.38	1,749.08	1,565.10	183.98	9.507	

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



MS Energy Services
Anticollision Report



Company: Devon Energy
Project: Eddy County, New Mexico (NAD 83)
Reference Site: Cotton Draw Unit
Site Error: 0.00 usft
Reference Well: 515H
Well Error: 0.00 usft
Reference Wellbore: Wellbore #1
Reference Design: Design #1

Local Co-ordinate Reference: Well 515H
TVD Reference: Well @ 3566.10usft (Cactus 126)
MD Reference: Well @ 3566.10usft (Cactus 126)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: 5000.1 Conroe DB
Offset TVD Reference: Offset Datum

Offset Design Redhead 31 Federal - #1H - Wellbore #1 - Surveys													Offset Site Error: 0.00 usft
Survey Program: 100-, 9815-													Offset Well Error: 0.00 usft
Reference		Offset		Semi Major Axis		Azimuth from North (°)	Distance						Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	
18,800.00	9,333.71	14,377.13	10,476.57	159.30	70.89	90.81	-9,297.96	1,427.80	1,747.67	1,560.84	186.82	9.355	
18,900.00	9,334.12	14,479.68	10,473.02	160.92	72.54	90.92	-9,400.43	1,429.39	1,745.76	1,556.12	189.64	9.206	
19,000.00	9,334.52	14,572.62	10,470.59	162.54	74.04	90.81	-9,493.33	1,430.32	1,744.02	1,551.74	192.28	9.070	
19,100.00	9,334.93	14,683.89	10,468.89	164.16	75.83	91.11	-9,604.58	1,430.34	1,742.29	1,547.23	195.06	8.932	
19,200.00	9,335.33	14,760.00	10,467.06	165.79	77.06	90.05	-9,680.68	1,430.10	1,739.98	1,542.55	197.43	8.813	
19,213.67	9,335.38	14,760.00	10,467.06	166.01	77.06	89.44	-9,680.68	1,430.10	1,739.93	1,542.33	197.60	8.805	
19,300.00	9,335.73	14,760.00	10,467.06	167.41	77.06	85.61	-9,680.68	1,430.10	1,742.07	1,543.63	198.44	8.779 SF	
19,390.56	9,336.10	14,760.00	10,467.06	168.88	77.06	81.64	-9,680.68	1,430.10	1,748.89	1,550.06	198.83	8.796	



MS Energy Services Anticollision Report



Company: Devon Energy
Project: Eddy County, New Mexico (NAD 83)
Reference Site: Cotton Draw Unit
Site Error: 0.00 usft
Reference Well: 515H
Well Error: 0.00 usft
Reference Wellbore: Wellbore #1
Reference Design: Design #1

Local Co-ordinate Reference: Well 515H
TVD Reference: Well @ 3566.10usft (Cactus 126)
MD Reference: Well @ 3566.10usft (Cactus 126)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: 5000.1 Conroe DB
Offset TVD Reference: Offset Datum

Offset Design Windward Federal - #1H - Wellbore #1 - Surveys													Offset Site Error:	0.00 usft
Survey Program: 239-, 9817-													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Azimuth from North (°)	Offset Wellbore Centre		Distance		Minimum Separation (usft)	Separation Factor	Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)				
0.00	0.00	0.00	0.00	0.00	0.00	70.29	300.33	838.19	890.37					
100.00	100.00	95.65	95.65	0.13	0.15	70.27	300.58	838.28	890.55	890.26	0.29	3,095.992		
200.00	200.00	192.36	192.36	0.49	0.31	70.23	301.34	838.58	891.10	890.30	0.80	1,112.985		
300.00	300.00	292.70	292.69	0.85	0.57	70.18	302.40	839.06	891.91	890.49	1.43	625.677		
400.00	400.00	389.34	389.32	1.21	0.92	70.16	303.01	839.70	892.75	890.62	2.13	419.202		
500.00	500.00	491.82	491.80	1.57	1.29	70.13	303.75	840.37	893.61	890.76	2.86	312.983		
600.00	600.00	591.15	591.12	1.93	1.64	70.10	304.43	841.01	894.44	890.88	3.57	250.582		
700.00	700.00	690.47	690.44	2.29	2.00	70.07	305.11	841.72	895.35	891.07	4.28	209.011		
800.00	800.00	791.98	791.94	2.64	2.36	70.06	305.70	842.54	896.31	891.31	5.01	179.075		
900.00	900.00	895.89	895.85	3.00	2.73	70.03	306.29	842.93	896.86	891.12	5.73	156.423		
1,000.00	1,000.00	1,000.65	1,000.60	3.36	3.10	69.98	307.07	842.74	896.94	890.48	6.46	138.881		
1,100.00	1,100.00	1,111.95	1,111.90	3.72	3.47	69.97	306.89	841.77	896.06	888.87	7.19	124.605		
1,200.00	1,200.00	1,206.85	1,206.80	4.08	3.79	70.02	305.77	840.84	894.75	886.88	7.87	113.742		
1,261.92	1,261.92	1,260.89	1,260.82	4.30	3.97	70.06	305.03	840.86	894.48	886.20	8.27	108.139		
1,300.00	1,300.00	1,294.65	1,294.58	4.44	4.09	70.09	304.64	841.10	894.58	886.05	8.52	104.960		
1,400.00	1,400.00	1,387.81	1,387.74	4.79	4.41	70.15	304.07	842.17	895.45	886.24	9.21	97.274		
1,500.00	1,500.00	1,484.30	1,484.21	5.15	4.75	70.12	305.04	843.39	896.98	887.07	9.91	90.558		
1,600.00	1,600.00	1,602.30	1,602.20	5.51	5.17	69.99	307.09	843.40	897.58	886.90	10.68	84.039		
1,700.00	1,700.00	1,714.54	1,714.41	5.87	5.56	69.87	308.46	841.54	896.43	885.00	11.43	78.446		
1,800.00	1,800.00	1,817.60	1,817.44	6.23	5.91	69.82	308.45	839.33	894.41	882.27	12.14	73.683		
1,900.00	1,900.00	1,910.58	1,910.40	6.59	6.23	69.85	307.47	837.89	892.60	879.78	12.82	69.648		
2,000.00	2,000.00	1,999.18	1,999.00	6.95	6.53	69.91	306.33	837.68	891.93	878.45	13.48	66.172		
2,000.83	2,000.83	1,999.91	1,999.73	6.95	6.54	69.91	306.32	837.68	891.93	878.44	13.48	66.146		
2,100.00	2,100.00	2,086.01	2,085.82	7.30	6.84	69.99	305.42	838.65	892.63	878.49	14.14	63.142		
2,200.00	2,200.00	2,178.32	2,178.10	7.66	7.16	70.05	305.18	840.82	894.73	879.91	14.82	60.386		
2,300.00	2,300.00	2,280.14	2,279.89	8.02	7.52	70.05	305.96	842.97	896.97	881.44	15.53	57.739		
2,400.00	2,400.00	2,393.18	2,392.90	8.38	7.92	69.95	308.08	844.10	898.58	882.29	16.30	55.144		
2,500.00	2,500.00	2,500.76	2,500.46	8.74	8.30	69.82	310.04	843.56	898.73	881.70	17.03	52.765		
2,600.00	2,599.99	2,608.44	2,608.13	9.10	8.67	69.77	311.30	842.41	897.87	880.11	17.76	50.543		
2,700.00	2,699.96	2,716.09	2,715.77	9.45	9.05	69.90	311.30	840.73	895.64	877.15	18.49	48.428		
2,800.00	2,799.86	2,812.70	2,812.36	9.81	9.38	70.19	310.30	839.47	892.78	873.60	19.18	46.538		
2,900.00	2,899.68	2,906.94	2,906.58	10.17	9.70	70.67	308.40	838.74	889.65	869.79	19.87	44.781		
3,000.00	2,999.37	2,989.63	2,989.25	10.53	9.99	71.27	306.75	839.42	887.59	867.08	20.51	43.274		
3,100.00	3,098.90	3,083.71	3,083.30	10.89	10.31	72.00	305.23	841.25	886.38	865.19	21.20	41.817		
3,200.00	3,198.26	3,180.43	3,179.99	11.25	10.65	72.80	304.32	843.36	885.31	863.42	21.90	40.432		
3,299.74	3,297.14	3,277.78	3,277.32	11.61	10.99	73.66	304.31	845.43	884.22	861.62	22.60	39.122		
3,300.00	3,297.40	3,278.03	3,277.57	11.61	11.00	73.67	304.31	845.43	884.22	861.62	22.60	39.118		
3,400.00	3,396.43	3,376.24	3,375.76	11.98	11.34	74.53	305.11	847.45	883.29	859.97	23.32	37.880		
3,500.00	3,495.46	3,472.41	3,471.90	12.36	11.68	75.36	306.50	849.24	882.54	858.52	24.03	36.731		
3,515.31	3,510.62	3,485.28	3,484.76	12.41	11.73	75.49	306.63	849.56	882.52	858.39	24.13	36.575		
3,600.00	3,594.49	3,564.33	3,563.77	12.73	12.01	76.28	306.73	852.36	883.13	858.41	24.72	35.724		
3,700.00	3,693.51	3,693.01	3,692.42	13.11	12.46	77.12	307.87	854.32	882.31	856.75	25.56	34.522		
3,800.00	3,792.54	3,807.59	3,806.96	13.49	12.86	77.84	310.22	852.53	878.91	852.58	26.33	33.379		
3,900.00	3,891.57	3,906.25	3,905.58	13.87	13.20	78.64	311.40	850.43	874.97	847.92	27.06	32.340		
4,000.00	3,990.60	4,005.27	4,004.59	14.25	13.54	79.54	311.10	848.75	871.35	843.57	27.78	31.365		
4,100.00	4,089.62	4,095.12	4,094.41	14.64	13.85	80.55	309.43	847.92	868.44	839.96	28.48	30.493		
4,200.00	4,188.65	4,181.88	4,181.15	15.02	14.15	81.61	307.25	848.26	867.00	837.83	29.17	29.724		
4,241.30	4,229.55	4,218.68	4,217.94	15.18	14.28	82.06	306.25	848.78	866.90	837.44	29.46	29.430		
4,300.00	4,287.68	4,273.87	4,273.09	15.41	14.47	82.69	304.93	849.73	867.05	837.17	29.88	29.021		
4,400.00	4,386.71	4,371.93	4,371.12	15.80	14.81	83.74	303.07	851.60	867.77	837.16	30.61	28.351		
4,500.00	4,485.73	4,467.17	4,466.34	16.19	15.15	84.73	302.24	853.45	868.93	837.60	31.33	27.733		
4,600.00	4,584.76	4,568.96	4,568.11	16.59	15.51	85.61	302.96	855.45	870.49	838.40	32.08	27.131		



MS Energy Services Anticollision Report



Company: Devon Energy
Project: Eddy County, New Mexico (NAD 83)
Reference Site: Cotton Draw Unit
Site Error: 0.00 usft
Reference Well: 515H
Well Error: 0.00 usft
Reference Wellbore: Wellbore #1
Reference Design: Design #1

Local Co-ordinate Reference: Well 515H
TVD Reference: Well @ 3566.10usft (Cactus 126)
MD Reference: Well @ 3566.10usft (Cactus 126)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: 5000.1 Conroe DB
Offset TVD Reference: Offset Datum

Offset Design Windward Federal - #1H - Wellbore #1 - Surveys													Offset Site Error:	0.00 usft
Survey Program: 239-, 9817-													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Azimuth from North (°)	Offset Wellbore Centre		Distance		Minimum Separation (usft)	Separation Factor	Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N-S (usft)	+E-W (usft)	Between Centres (usft)	Between Ellipses (usft)				
4,700.00	4,683.79	4,672.87	4,672.00	16.98	15.87	86.48	303.79	856.98	871.76	838.91	32.85	26.541		
4,800.00	4,782.81	4,776.34	4,775.46	17.37	16.24	87.31	305.10	857.86	872.64	839.03	33.61	25.967		
4,900.00	4,881.84	4,880.34	4,879.44	17.77	16.60	88.11	306.72	858.34	873.33	838.97	34.37	25.412		
5,000.00	4,980.87	4,980.57	4,979.65	18.17	16.96	88.89	308.85	858.19	873.59	838.48	35.11	24.878		
5,100.00	5,079.90	5,076.75	5,075.81	18.56	17.29	89.67	310.87	858.37	874.35	838.51	35.85	24.390		
5,200.00	5,178.92	5,173.42	5,172.46	18.96	17.64	90.45	312.80	858.82	875.55	838.97	36.59	23.931		
5,300.00	5,277.95	5,270.99	5,270.01	19.36	17.98	91.25	314.49	859.55	877.20	839.87	37.33	23.499		
5,400.00	5,376.98	5,370.46	5,369.47	19.76	18.33	92.05	315.94	860.36	879.09	841.01	38.08	23.087		
5,500.00	5,476.01	5,474.57	5,473.57	20.16	18.70	92.86	317.36	860.94	880.91	842.07	38.85	22.678		
5,600.00	5,575.03	5,575.49	5,574.47	20.56	19.06	93.66	318.91	861.04	882.43	842.83	39.60	22.284		
5,628.09	5,602.86	5,602.57	5,601.55	20.68	19.15	93.89	319.25	861.05	882.88	843.07	39.81	22.179		
5,700.00	5,674.12	5,670.81	5,669.79	20.96	19.39	94.43	320.32	861.26	884.21	843.88	40.33	21.923		
5,800.00	5,773.42	5,771.19	5,770.14	21.36	19.75	95.07	322.19	861.74	886.12	845.04	41.08	21.572		
5,900.00	5,872.91	5,870.49	5,869.42	21.74	20.10	95.60	323.95	862.16	887.84	846.02	41.81	21.233		
6,000.00	5,972.56	5,969.48	5,968.41	22.12	20.45	96.03	325.41	862.63	889.43	846.89	42.54	20.908		
6,100.00	6,072.35	6,072.07	6,070.99	22.49	20.81	96.37	326.57	862.93	890.65	847.38	43.27	20.582		
6,200.00	6,172.23	6,173.87	6,172.78	22.86	21.17	96.64	327.25	862.99	891.43	847.44	43.99	20.262		
6,300.00	6,272.18	6,276.51	6,275.43	23.21	21.53	96.82	327.57	862.53	891.47	846.76	44.71	19.940		
6,341.43	6,313.60	6,315.89	6,314.80	23.36	21.67	96.86	327.64	862.39	891.45	846.46	44.99	19.815		
6,400.00	6,372.17	6,372.38	6,371.30	23.56	21.87	96.90	327.68	862.33	891.48	846.09	45.39	19.641		
6,427.83	6,400.00	6,399.50	6,398.41	23.66	21.96	96.90	327.62	862.32	891.49	845.91	45.58	19.560		
6,500.00	6,472.17	6,472.06	6,470.97	23.90	22.21	96.92	327.33	862.35	891.56	845.48	46.08	19.350		
6,600.00	6,572.17	6,575.41	6,574.32	24.25	22.56	96.94	327.10	862.15	891.39	844.61	46.77	19.058		
6,700.00	6,672.17	6,678.95	6,677.86	24.59	22.92	97.00	326.21	861.45	890.82	843.35	47.47	18.766		
6,800.00	6,772.17	6,775.49	6,774.40	24.93	23.25	97.05	325.61	860.69	890.12	841.97	48.15	18.488		
6,900.00	6,872.17	6,877.84	6,876.74	25.28	23.60	97.06	325.45	860.34	889.81	840.97	48.84	18.218		
7,000.00	6,972.17	6,975.50	6,974.40	25.62	23.94	97.08	325.13	859.66	889.16	839.64	49.52	17.954		
7,100.00	7,072.17	7,074.94	7,073.83	25.97	24.28	97.14	324.30	859.29	888.89	838.68	50.21	17.703		
7,200.00	7,172.17	7,174.61	7,173.50	26.31	24.62	97.19	323.65	858.90	888.58	837.69	50.90	17.458		
7,258.45	7,230.62	7,230.63	7,229.52	26.51	24.81	97.22	323.16	858.75	888.49	837.20	51.29	17.322		
7,300.00	7,272.17	7,270.12	7,269.01	26.66	24.95	97.25	322.73	858.74	888.54	836.97	51.57	17.229		
7,400.00	7,372.17	7,378.10	7,376.98	27.00	25.32	97.34	321.27	858.41	888.41	836.12	52.29	16.990		
7,500.00	7,472.17	7,475.97	7,474.82	27.35	25.66	97.48	319.26	857.62	887.88	834.91	52.97	16.761		
7,600.00	7,572.17	7,574.54	7,573.36	27.69	26.00	97.64	316.77	856.96	887.55	833.89	53.66	16.540		
7,700.00	7,672.17	7,674.31	7,673.09	28.04	26.34	97.82	314.10	856.36	887.31	832.96	54.35	16.325		
7,800.00	7,772.17	7,773.90	7,772.64	28.39	26.69	98.01	311.17	855.72	887.08	832.04	55.04	16.116		
7,900.00	7,872.17	7,872.63	7,871.33	28.74	27.03	98.18	308.61	855.30	887.03	831.30	55.73	15.916		
8,000.00	7,972.17	7,974.72	7,973.39	29.08	27.38	98.34	306.16	854.80	886.89	830.46	56.43	15.715		
8,100.00	8,072.17	8,074.73	8,073.36	29.43	27.73	98.50	303.69	854.10	886.56	829.43	57.13	15.518		
8,200.00	8,172.17	8,172.72	8,171.32	29.78	28.07	98.67	301.15	853.60	886.44	828.62	57.82	15.332		
8,225.65	8,197.81	8,198.13	8,196.71	29.87	28.16	98.73	300.29	853.47	886.44	828.44	57.99	15.285		
8,300.00	8,272.17	8,271.88	8,270.41	30.13	28.41	98.92	297.40	853.05	886.47	827.96	58.51	15.151		
8,400.00	8,372.17	8,371.77	8,370.22	30.48	28.76	99.17	293.49	852.53	886.57	827.36	59.21	14.974		
8,500.00	8,472.17	8,469.32	8,467.71	30.83	29.10	99.39	290.16	852.15	886.74	826.85	59.89	14.805		
8,600.00	8,572.17	8,565.99	8,564.35	31.18	29.44	99.54	287.68	852.32	887.33	826.75	60.58	14.648		
8,700.00	8,672.17	8,669.94	8,668.25	31.52	29.80	99.75	284.40	852.46	888.00	826.71	61.29	14.488		
8,751.58	8,723.75	8,719.73	8,718.02	31.70	29.98	99.85	282.89	852.34	888.14	826.50	61.65	14.407		
8,800.00	8,772.11	8,762.33	8,760.59	31.86	30.13	99.82	281.40	852.45	887.93	825.99	61.95	14.334		
8,850.00	8,821.68	8,815.15	8,813.37	32.00	30.31	99.55	279.30	852.78	886.65	824.38	62.27	14.238		
8,900.00	8,870.51	8,862.49	8,860.65	32.12	30.55	99.06	276.70	852.20	883.38	820.74	62.64	14.102		
8,950.00	8,918.22	8,923.88	8,922.01	32.24	30.69	98.24	275.18	851.57	878.68	815.77	62.90	13.968		
9,000.00	8,964.46	8,963.57	8,961.67	32.34	30.83	97.14	273.76	851.31	873.48	810.33	63.15	13.832		

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



MS Energy Services Anticollision Report



Company: Devon Energy
Project: Eddy County, New Mexico (NAD 83)
Reference Site: Cotton Draw Unit
Site Error: 0.00 usft
Reference Well: 515H
Well Error: 0.00 usft
Reference Wellbore: Wellbore #1
Reference Design: Design #1

Local Co-ordinate Reference: Well 515H
TVD Reference: Well @ 3566.10usft (Cactus 126)
MD Reference: Well @ 3566.10usft (Cactus 126)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: 5000.1 Conroe DB
Offset TVD Reference: Offset Datum

Offset Design Windward Federal - #1H - Wellbore #1 - Surveys													Offset Site Error:	0.00 usft
Survey Program: 239-, 9817-													Offset Well Error:	0.00 usft
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Azimuth from North (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning	
9,050.00	9,008.86	9,006.49	9,004.57	32.43	30.98	95.77	272.25	851.30	867.95	804.56	63.39	13.692		
9,100.00	9,051.09	9,049.95	9,047.99	32.51	31.13	94.15	270.65	851.29	862.12	798.49	63.63	13.549		
9,150.00	9,090.83	9,092.61	9,090.63	32.58	31.28	92.28	269.02	851.25	856.32	792.46	63.86	13.410		
9,200.00	9,127.77	9,134.73	9,132.71	32.65	31.43	90.16	267.37	851.04	850.82	786.75	64.08	13.279		
9,250.00	9,161.64	9,173.60	9,171.55	32.71	31.57	87.80	265.81	850.68	846.07	781.80	64.28	13.163		
9,300.00	9,192.18	9,206.16	9,204.09	32.78	31.68	85.18	264.81	850.28	842.60	778.15	64.45	13.073		
9,350.00	9,219.15	9,234.29	9,232.22	32.85	31.78	82.35	264.31	849.87	840.93	776.31	64.62	13.014		
9,363.55	9,225.82	9,241.10	9,239.02	32.87	31.80	81.55	264.24	849.77	840.84	776.18	64.66	13.004 CC, ES		
9,400.00	9,242.36	9,257.66	9,255.58	32.92	31.86	79.34	264.16	849.49	841.49	776.72	64.77	12.992		
9,450.00	9,261.61	9,277.00	9,274.92	32.99	31.93	76.21	264.13	849.16	844.63	779.72	64.91	13.013		
9,500.00	9,276.77	9,292.92	9,290.84	33.08	31.99	73.02	264.01	848.91	850.56	785.52	65.04	13.078		
9,550.00	9,287.73	9,305.03	9,302.95	33.17	32.03	69.82	263.84	848.73	859.39	794.23	65.16	13.189		
9,600.00	9,294.39	9,313.01	9,310.93	33.27	32.06	66.64	263.70	848.62	871.13	805.86	65.26	13.348		
9,649.26	9,296.70	9,316.51	9,314.42	33.37	32.07	63.57	263.63	848.57	885.45	820.10	65.35	13.549		
9,700.00	9,296.91	9,317.81	9,315.73	33.49	32.07	60.53	263.61	848.55	903.26	837.82	65.44	13.803		
9,800.00	9,297.31	9,320.62	9,318.53	33.80	32.08	54.98	263.55	848.52	947.67	882.05	65.63	14.440		
9,900.00	9,297.72	9,323.77	9,321.67	34.17	32.09	50.08	263.48	848.47	1,002.99	937.18	65.82	15.239		
10,000.00	9,298.12	9,327.31	9,325.22	34.62	32.11	45.85	263.39	848.43	1,067.46	1,001.47	65.99	16.175		
10,027.33	9,298.24	9,328.36	9,326.27	34.75	32.11	44.80	263.36	848.42	1,086.46	1,020.42	66.04	16.451		
10,100.00	9,298.53	9,331.31	9,329.21	35.13	32.12	42.21	263.29	848.38	1,138.84	1,072.69	66.15	17.215		
10,200.00	9,298.93	9,335.77	9,333.67	35.71	32.14	39.02	263.17	848.32	1,214.34	1,148.03	66.30	18.316		
10,300.00	9,299.34	9,340.79	9,338.69	36.35	32.15	36.21	263.02	848.26	1,293.15	1,226.71	66.43	19.465		
10,400.00	9,299.74	11,236.64	10,411.84	37.06	38.51	85.17	-816.63	834.22	1,343.13	1,289.20	53.93	24.905		
10,500.00	9,300.15	11,332.36	10,413.81	37.83	39.29	84.87	-912.20	839.30	1,347.13	1,292.10	55.03	24.480		
10,600.00	9,300.55	11,422.38	10,417.04	38.65	40.08	84.13	-1,002.07	843.19	1,351.85	1,295.72	56.12	24.088		
10,700.00	9,300.96	11,531.98	10,421.30	39.53	41.08	84.86	-1,111.50	847.71	1,356.72	1,299.31	57.41	23.634		
10,800.00	9,301.36	11,646.23	10,423.73	40.45	42.19	85.94	-1,225.60	852.88	1,360.31	1,301.47	58.85	23.117		
10,900.00	9,301.76	11,727.78	10,426.08	41.42	43.02	84.58	-1,307.04	856.23	1,364.32	1,304.26	60.06	22.717		
11,000.00	9,302.17	11,826.96	10,429.49	42.44	44.06	84.54	-1,406.07	860.72	1,369.04	1,307.56	61.47	22.271		
11,100.00	9,302.57	11,936.23	10,432.08	43.49	45.25	85.24	-1,515.14	866.68	1,373.40	1,310.32	63.08	21.773		
11,200.00	9,302.98	12,042.34	10,434.63	44.58	46.45	85.70	-1,621.12	871.30	1,377.16	1,312.48	64.68	21.291		
11,300.00	9,303.38	12,147.19	10,436.95	45.71	47.66	86.06	-1,725.86	875.56	1,380.61	1,314.29	66.32	20.817		
11,400.00	9,303.79	12,269.34	10,440.30	46.86	49.11	87.68	-1,847.94	877.78	1,383.27	1,315.17	68.10	20.314		
11,500.00	9,304.19	12,356.92	10,441.87	48.05	50.18	86.77	-1,935.49	879.32	1,385.10	1,315.50	69.60	19.902		
11,600.00	9,304.60	12,451.85	10,444.97	49.26	51.35	86.41	-2,030.36	880.80	1,387.97	1,316.80	71.17	19.503		
11,700.00	9,305.00	12,559.75	10,447.73	50.50	52.72	86.98	-2,138.19	883.11	1,390.62	1,317.69	72.94	19.066		
11,800.00	9,305.40	12,659.96	10,450.08	51.76	54.00	87.00	-2,238.36	884.92	1,392.89	1,318.24	74.65	18.658		
11,900.00	9,305.81	12,738.35	10,453.09	53.05	55.02	85.44	-2,316.68	885.67	1,395.93	1,319.81	76.12	18.339		
12,000.00	9,306.21	12,901.83	10,456.43	54.35	57.18	90.02	-2,480.10	885.35	1,396.39	1,317.92	78.47	17.980		
12,043.50	9,306.39	12,935.59	10,457.12	54.92	57.63	89.31	-2,513.84	884.54	1,396.24	1,317.14	79.10	17.652		
12,100.00	9,306.62	12,993.75	10,458.82	55.67	58.41	89.43	-2,571.95	882.83	1,396.28	1,316.25	80.03	17.447		
12,200.00	9,307.02	13,101.67	10,461.13	57.01	59.86	90.00	-2,679.80	879.87	1,395.82	1,314.06	81.76	17.072		
12,300.00	9,307.43	13,197.51	10,462.53	58.37	61.17	89.69	-2,775.61	877.87	1,395.19	1,311.76	83.43	16.722		
12,400.00	9,307.83	13,304.81	10,464.67	59.74	62.65	90.22	-2,882.85	875.13	1,394.75	1,309.55	85.20	16.370		
12,500.00	9,308.23	13,431.06	10,465.48	61.13	64.41	92.16	-3,009.04	871.40	1,392.98	1,305.80	87.18	15.979		
12,600.00	9,308.64	13,526.98	10,466.88	62.53	65.75	91.86	-3,104.78	865.88	1,390.33	1,301.58	88.75	15.665		
12,700.00	9,309.04	13,607.08	10,469.73	63.94	66.87	90.36	-3,184.62	860.00	1,388.59	1,298.48	90.10	15.411		
12,800.00	9,309.45	13,698.55	10,474.51	65.36	68.16	89.68	-3,275.66	852.60	1,387.89	1,296.43	91.46	15.175		
12,900.00	9,309.85	13,810.68	10,480.17	66.80	69.75	90.58	-3,387.28	843.57	1,387.13	1,294.17	92.96	14.922		
13,000.00	9,310.26	13,930.23	10,483.95	68.24	71.46	92.08	-3,506.46	834.97	1,385.32	1,290.72	94.59	14.645		
13,100.00	9,310.66	14,048.83	10,483.97	69.69	73.18	93.55	-3,624.89	828.89	1,381.94	1,285.52	96.41	14.333		
13,200.00	9,311.07	14,127.82	10,482.70	71.16	74.33	91.90	-3,703.84	826.62	1,378.47	1,280.45	98.02	14.064		

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



MS Energy Services Anticollision Report



Company: Devon Energy
Project: Eddy County, New Mexico (NAD 83)
Reference Site: Cotton Draw Unit
Site Error: 0.00 usft
Reference Well: 515H
Well Error: 0.00 usft
Reference Wellbore: Wellbore #1
Reference Design: Design #1

Local Co-ordinate Reference: Well 515H
TVD Reference: Well @ 3566.10usft (Cactus 126)
MD Reference: Well @ 3566.10usft (Cactus 126)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: 5000.1 Conroe DB
Offset TVD Reference: Offset Datum

Offset Design Windward Federal - #1H - Wellbore #1 - Surveys												Offset Site Error:	0.00 usft
Survey Program: 239-, 9817-												Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Distance							
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Azimuth from North (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
13,300.00	9,311.47	14,201.95	10,483.02	72.63	75.42	89.85	-3,777.96	825.21	1,377.13	1,277.58	99.55	13.833	
13,344.56	9,311.65	14,239.19	10,483.60	73.29	75.97	89.27	-3,815.19	824.56	1,377.01	1,276.74	100.27	13.733	
13,400.00	9,311.87	14,283.31	10,484.59	74.11	76.63	88.37	-3,859.29	823.82	1,377.22	1,276.09	101.13	13.618	
13,500.00	9,312.28	14,358.30	10,487.16	75.59	77.74	86.37	-3,934.23	823.06	1,378.95	1,276.33	102.62	13.438	
13,600.00	9,312.68	14,444.92	10,491.28	77.09	79.03	85.30	-4,020.75	822.61	1,382.07	1,277.85	104.22	13.261	
13,700.00	9,313.09	14,528.36	10,496.05	78.59	80.28	83.97	-4,104.05	822.55	1,386.27	1,280.49	105.78	13.106	
13,800.00	9,313.49	14,670.96	10,502.80	80.09	82.43	87.34	-4,246.48	822.55	1,389.72	1,281.62	108.10	12.856	
13,900.00	9,313.90	14,786.67	10,505.89	81.60	84.18	88.59	-4,362.14	821.45	1,390.85	1,280.76	110.09	12.634	
14,000.00	9,314.30	14,872.00	10,507.44	83.12	85.47	87.40	-4,447.46	820.56	1,391.33	1,279.58	111.75	12.450	
14,100.00	9,314.71	14,872.00	10,507.44	84.64	85.47	79.48	-4,447.46	820.56	1,396.57	1,284.37	112.20	12.447 SF	
14,200.00	9,315.11	14,872.00	10,507.44	86.17	85.47	71.93	-4,447.46	820.56	1,408.91	1,296.62	112.29	12.547	
14,300.00	9,315.51	14,872.00	10,507.44	87.70	85.47	64.96	-4,447.46	820.56	1,428.17	1,316.12	112.05	12.746	
14,400.00	9,315.92	14,872.00	10,507.44	89.24	85.47	58.69	-4,447.46	820.56	1,454.06	1,342.56	111.50	13.040	
14,500.00	9,316.32	14,872.00	10,507.44	90.78	85.47	53.14	-4,447.46	820.56	1,486.24	1,375.55	110.69	13.426	
14,600.00	9,316.73	14,872.00	10,507.44	92.33	85.47	48.29	-4,447.46	820.56	1,524.32	1,414.64	109.67	13.899	
14,700.00	9,317.13	14,872.00	10,507.44	93.88	85.47	44.07	-4,447.46	820.56	1,567.85	1,459.37	108.49	14.452	
14,800.00	9,317.54	14,872.00	10,507.44	95.43	85.47	40.39	-4,447.46	820.56	1,616.41	1,509.22	107.19	15.080	
14,900.00	9,317.94	14,872.00	10,507.44	96.99	85.47	37.20	-4,447.46	820.56	1,669.55	1,563.74	105.81	15.778	
15,000.00	9,318.34	14,872.00	10,507.44	98.55	85.47	34.41	-4,447.46	820.56	1,726.86	1,622.45	104.40	16.540	
15,100.00	9,318.75	14,872.00	10,507.44	100.11	85.47	31.96	-4,447.46	820.56	1,787.92	1,684.93	102.99	17.360	
15,200.00	9,319.15	14,872.00	10,507.44	101.68	85.47	29.80	-4,447.46	820.56	1,852.37	1,750.78	101.59	18.233	
15,300.00	9,319.56	14,872.00	10,507.44	103.24	85.47	27.89	-4,447.46	820.56	1,919.87	1,819.64	100.23	19.154	
15,400.00	9,319.96	14,872.00	10,507.44	104.82	85.47	26.19	-4,447.46	820.56	1,990.11	1,891.19	98.92	20.119	
15,500.00	9,320.37	14,872.00	10,507.44	106.39	85.47	24.67	-4,447.46	820.56	2,062.80	1,965.14	97.66	21.122	
15,600.00	9,320.77	14,872.00	10,507.44	107.97	85.47	23.31	-4,447.46	820.56	2,137.70	2,041.24	96.47	22.160	
15,700.00	9,321.18	14,872.00	10,507.44	109.55	85.47	22.08	-4,447.46	820.56	2,214.59	2,119.25	95.34	23.229	
15,800.00	9,321.58	14,872.00	10,507.44	111.13	85.47	20.97	-4,447.46	820.56	2,293.26	2,198.98	94.27	24.326	
15,900.00	9,321.98	14,872.00	10,507.44	112.71	85.47	19.95	-4,447.46	820.56	2,373.53	2,280.26	93.27	25.447	
16,000.00	9,322.39	14,872.00	10,507.44	114.30	85.47	19.03	-4,447.46	820.56	2,455.25	2,362.92	92.34	26.591	
16,100.00	9,322.79	14,872.00	10,507.44	115.88	85.47	18.18	-4,447.46	820.56	2,538.29	2,446.83	91.46	27.753	
16,200.00	9,323.20	14,872.00	10,507.44	117.47	85.47	17.40	-4,447.46	820.56	2,622.50	2,531.86	90.64	28.933	
16,300.00	9,323.60	14,872.00	10,507.44	119.07	85.47	16.68	-4,447.46	820.56	2,707.79	2,617.92	89.88	30.127	
16,400.00	9,324.01	14,872.00	10,507.44	120.66	85.47	16.02	-4,447.46	820.56	2,794.06	2,704.89	89.17	31.335	
16,500.00	9,324.41	14,872.00	10,507.44	122.25	85.47	15.41	-4,447.46	820.56	2,881.21	2,792.71	88.50	32.555	
16,600.00	9,324.82	14,872.00	10,507.44	123.85	85.47	14.83	-4,447.46	820.56	2,969.18	2,881.29	87.89	33.784	
16,700.00	9,325.22	14,872.00	10,507.44	125.45	85.47	14.30	-4,447.46	820.56	3,057.88	2,970.57	87.31	35.022	
16,800.00	9,325.62	14,872.00	10,507.44	127.05	85.47	13.81	-4,447.46	820.56	3,147.26	3,060.49	86.78	36.268	
16,900.00	9,326.03	14,872.00	10,507.44	128.65	85.47	13.34	-4,447.46	820.56	3,237.27	3,150.99	86.28	37.520	
17,000.00	9,326.43	14,872.00	10,507.44	130.25	85.47	12.90	-4,447.46	820.56	3,327.84	3,242.02	85.82	38.778	
17,100.00	9,326.84	14,872.00	10,507.44	131.86	85.47	12.49	-4,447.46	820.56	3,418.94	3,333.55	85.39	40.041	
17,200.00	9,327.24	14,872.00	10,507.44	133.46	85.47	12.11	-4,447.46	820.56	3,510.52	3,425.54	84.98	41.308	
17,300.00	9,327.65	14,872.00	10,507.44	135.07	85.47	11.75	-4,447.46	820.56	3,602.55	3,517.94	84.61	42.578	
17,400.00	9,328.05	14,872.00	10,507.44	136.68	85.47	11.40	-4,447.46	820.56	3,695.00	3,610.73	84.26	43.850	
17,500.00	9,328.45	14,872.00	10,507.44	138.29	85.47	11.08	-4,447.46	820.56	3,787.83	3,703.89	83.94	45.125	
17,600.00	9,328.86	14,872.00	10,507.44	139.90	85.47	10.77	-4,447.46	820.56	3,881.01	3,797.37	83.64	46.402	
17,700.00	9,329.26	14,872.00	10,507.44	141.51	85.47	10.48	-4,447.46	820.56	3,974.53	3,891.17	83.36	47.679	
17,800.00	9,329.67	14,872.00	10,507.44	143.12	85.47	10.20	-4,447.46	820.56	4,068.35	3,985.26	83.10	48.958	
17,900.00	9,330.07	14,872.00	10,507.44	144.73	85.47	9.94	-4,447.46	820.56	4,162.47	4,079.61	82.86	50.237	
8,000.00	9,330.48	14,872.00	10,507.44	146.35	85.47	9.69	-4,447.46	820.56	4,256.85	4,174.22	82.63	51.516	
8,100.00	9,330.88	14,872.00	10,507.44	147.96	85.47	9.45	-4,447.46	820.56	4,351.48	4,269.06	82.42	52.795	
8,200.00	9,331.29	14,872.00	10,507.44	149.58	85.47	9.22	-4,447.46	820.56	4,446.35	4,364.12	82.23	54.073	
3,300.00	9,331.69	14,872.00	10,507.44	151.20	85.47	9.01	-4,447.46	820.56	4,541.43	4,459.39	82.05	55.351	

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



MS Energy Services Anticollision Report



Company: Devon Energy
Project: Eddy County, New Mexico (NAD 83)
Reference Site: Cotton Draw Unit
Site Error: 0.00 usft
Reference Well: 515H
Well Error: 0.00 usft
Reference Wellbore: Wellbore #1
Reference Design: Design #1

Local Co-ordinate Reference: Well 515H
TVD Reference: Well @ 3566.10usft (Cactus 126)
MD Reference: Well @ 3566.10usft (Cactus 126)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: 5000.1 Conroe DB
Offset TVD Reference: Offset Datum

Offset Design Windward Federal - #1H - Wellbore #1 - Surveys											Offset Site Error: 0.00 usft		
Survey Program: 239-, 9817-											Offset Well Error: 0.00 usft		
Reference		Offset		Semi Major Axis		Azimuth from North (°)	Offset Wellbore Centre		Distance		Minimum Separation (usft)	Separation Factor	Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)			
18,400.00	9,332.09	14,872.00	10,507.44	152.81	85.47	8.80	-4,447.46	820.56	4,636.73	4,554.85	81.88	56.627	
18,500.00	9,332.50	14,872.00	10,507.44	154.43	85.47	8.60	-4,447.46	820.56	4,732.22	4,650.49	81.73	57.903	
18,600.00	9,332.90	14,872.00	10,507.44	156.05	85.47	8.41	-4,447.46	820.56	4,827.89	4,746.30	81.58	59.177	
18,700.00	9,333.31	14,872.00	10,507.44	157.67	85.47	8.23	-4,447.46	820.56	4,923.73	4,842.28	81.45	60.450	
18,800.00	9,333.71	14,872.00	10,507.44	159.30	85.47	8.05	-4,447.46	820.56	5,019.74	4,938.41	81.33	61.720	
18,900.00	9,334.12	14,872.00	10,507.44	160.92	85.47	7.88	-4,447.46	820.56	5,115.89	5,034.68	81.22	62.989	
19,000.00	9,334.52	14,872.00	10,507.44	162.54	85.47	7.72	-4,447.46	820.56	5,212.20	5,131.08	81.12	64.256	
19,100.00	9,334.93	14,872.00	10,507.44	164.16	85.47	7.57	-4,447.46	820.56	5,308.64	5,227.62	81.02	65.521	
19,200.00	9,335.33	14,872.00	10,507.44	165.79	85.47	7.42	-4,447.46	820.56	5,405.21	5,324.27	80.94	66.784	
19,300.00	9,335.73	14,872.00	10,507.44	167.41	85.47	7.27	-4,447.46	820.56	5,501.90	5,421.04	80.86	68.044	
19,390.56	9,336.10	14,872.00	10,507.44	168.88	85.47	7.15	-4,447.46	820.56	5,589.56	5,508.76	80.79	69.183	



MS Energy Services Anticollision Report



Company: Devon Energy
Project: Eddy County, New Mexico (NAD 83)
Reference Site: Cotton Draw Unit
Site Error: 0.00 usft
Reference Well: 515H
Well Error: 0.00 usft
Reference Wellbore: Wellbore #1
Reference Design: Design #1

Local Co-ordinate Reference: Well 515H
TVD Reference: Well @ 3566.10usft (Cactus 126)
MD Reference: Well @ 3566.10usft (Cactus 126)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: 5000.1 Conroe DB
Offset TVD Reference: Offset Datum

Offset Design Windward Federal - #5H - Wellbore #1 - Surveys													Offset Site Error:	0.00 usft
Survey Program: 100-, 8399-													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis			Distance							
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Azimuth from North (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning	
0.00	0.00	0.00	0.00	0.00	0.00	73.33	281.04	938.44	979.62					
100.00	100.00	110.33	110.32	0.13	0.15	73.34	280.66	937.87	979.03	978.75	0.28	3,489.915		
200.00	200.00	209.64	209.63	0.49	0.52	73.36	280.10	936.92	977.96	976.95	1.01	970.079		
300.00	300.00	311.03	311.02	0.85	0.87	73.37	279.54	935.83	976.77	975.04	1.72	567.263		
400.00	400.00	410.89	410.87	1.21	1.22	73.38	278.96	934.73	975.54	973.11	2.43	401.397		
500.00	500.00	514.24	514.20	1.57	1.58	73.41	278.15	933.43	974.11	970.96	3.15	309.106		
600.00	600.00	613.97	613.92	1.93	1.93	73.44	277.21	932.07	972.54	968.68	3.86	251.979		
700.00	700.00	714.29	714.23	2.29	2.29	73.47	276.28	930.72	970.98	966.41	4.57	212.470		
800.00	800.00	815.95	815.87	2.64	2.64	73.48	275.59	929.14	969.30	964.02	5.28	183.414		
900.00	900.00	916.49	916.40	3.00	2.99	73.48	275.00	927.42	967.49	961.50	6.00	161.361		
1,000.00	1,000.00	1,014.87	1,014.76	3.36	3.34	73.49	274.44	925.80	965.76	959.06	6.70	144.157		
1,100.00	1,100.00	1,113.46	1,113.34	3.72	3.68	73.50	273.81	924.37	964.18	956.77	7.40	130.231		
1,200.00	1,200.00	1,212.31	1,212.18	4.08	4.03	73.52	273.13	923.09	962.74	954.63	8.11	118.729		
1,300.00	1,300.00	1,312.66	1,312.52	4.44	4.38	73.54	272.43	921.80	961.32	952.50	8.82	109.004		
1,400.00	1,400.00	1,410.84	1,410.69	4.79	4.73	73.55	271.90	920.60	959.99	950.47	9.52	100.819		
1,500.00	1,500.00	1,509.51	1,509.35	5.15	5.07	73.55	271.56	919.50	958.82	948.59	10.23	93.759		
1,600.00	1,600.00	1,608.00	1,607.84	5.51	5.42	73.54	271.45	918.48	957.79	946.86	10.93	87.628		
1,700.00	1,700.00	1,703.02	1,702.85	5.87	5.75	73.50	271.80	917.72	957.13	945.51	11.62	82.362		
1,800.00	1,800.00	1,799.74	1,799.57	6.23	6.09	73.45	272.50	917.25	956.88	944.56	12.32	77.691		
1,844.74	1,844.74	1,843.71	1,843.54	6.39	6.24	73.43	272.87	917.13	956.86	944.23	12.63	75.763		
1,900.00	1,900.00	1,898.03	1,897.86	6.59	6.43	73.40	273.39	917.00	956.89	943.87	13.02	73.512		
2,000.00	2,000.00	1,998.39	1,998.21	6.95	6.78	73.34	274.40	916.78	956.97	943.24	13.72	69.728		
2,100.00	2,100.00	2,095.14	2,094.95	7.30	7.12	73.28	275.41	916.71	957.20	942.78	14.42	66.386		
2,200.00	2,200.00	2,194.33	2,194.14	7.66	7.46	73.22	276.46	916.86	957.65	942.53	15.12	63.330		
2,300.00	2,300.00	2,298.14	2,297.95	8.02	7.82	73.18	277.21	916.96	957.95	942.11	15.84	60.473		
2,400.00	2,400.00	2,401.50	2,401.30	8.38	8.18	73.17	277.30	916.84	957.86	941.30	16.56	57.841		
2,500.00	2,500.00	2,506.74	2,506.54	8.74	8.55	73.21	276.48	916.50	957.33	940.04	17.29	55.379		
2,600.00	2,599.99	2,608.26	2,608.05	9.10	8.91	73.34	275.08	915.99	956.25	938.25	18.00	53.124		
2,700.00	2,699.96	2,707.32	2,707.09	9.45	9.25	73.58	273.35	915.57	954.72	936.02	18.70	51.041		
2,800.00	2,799.86	2,799.52	2,799.27	9.81	9.57	73.95	271.42	915.71	953.28	933.90	19.38	49.177		
2,900.00	2,899.68	2,888.72	2,888.44	10.17	9.89	74.45	269.32	916.76	952.42	932.37	20.05	47.497		
2,949.99	2,949.53	2,932.71	2,932.41	10.35	10.04	74.74	268.22	917.68	952.30	931.92	20.38	46.720		
3,000.00	2,999.37	2,976.49	2,976.16	10.53	10.19	75.06	267.20	918.86	952.42	931.71	20.71	45.983		
3,100.00	3,098.90	3,064.43	3,064.03	10.89	10.50	75.76	265.75	921.90	953.41	932.04	21.37	44.613		
3,200.00	3,198.26	3,157.12	3,156.65	11.25	10.82	76.48	265.73	925.71	955.23	933.18	22.05	43.324		
3,299.74	3,297.14	3,257.08	3,256.51	11.61	11.17	77.26	266.61	929.90	957.18	934.42	22.76	42.055		
3,300.00	3,297.40	3,257.35	3,256.78	11.61	11.17	77.26	266.61	929.91	957.18	934.42	22.76	42.052		
3,400.00	3,396.43	3,358.62	3,357.97	11.98	11.52	78.04	268.14	933.67	958.83	935.34	23.48	40.830		
3,500.00	3,495.46	3,468.45	3,467.73	12.36	11.90	78.79	270.04	937.23	960.27	936.02	24.24	39.608		
3,600.00	3,594.49	3,576.44	3,575.68	12.73	12.28	79.51	272.19	939.22	960.51	935.51	25.00	38.422		
3,700.00	3,693.51	3,679.31	3,678.53	13.11	12.64	80.27	273.55	940.66	960.38	934.65	25.74	37.318		
3,800.00	3,792.54	3,778.55	3,777.76	13.49	12.99	81.06	274.38	941.92	960.22	933.76	26.46	36.289		
3,816.70	3,809.08	3,795.00	3,794.20	13.55	13.04	81.19	274.52	942.14	960.22	933.64	26.58	36.124		
3,900.00	3,891.57	3,875.96	3,875.15	13.87	13.33	81.85	275.16	943.27	960.35	933.17	27.18	35.332		
4,000.00	3,990.60	3,971.26	3,970.44	14.25	13.66	82.66	275.68	944.89	960.93	933.04	27.89	34.449		
4,100.00	4,089.62	4,067.07	4,066.22	14.64	13.99	83.49	275.83	946.95	962.12	933.50	28.61	33.626		
4,200.00	4,188.65	4,164.52	4,163.64	15.02	14.33	84.34	275.73	949.32	963.75	934.41	29.34	32.850		
4,300.00	4,287.68	4,265.13	4,264.23	15.41	14.69	85.21	275.21	951.83	965.62	935.54	30.08	32.104		
4,400.00	4,386.71	4,364.90	4,363.96	15.80	15.03	86.11	274.17	954.14	967.50	936.68	30.82	31.396		
4,500.00	4,485.73	4,463.64	4,462.67	16.19	15.38	87.00	273.16	956.42	969.61	938.05	31.55	30.731		
4,600.00	4,584.76	4,562.46	4,561.46	16.59	15.72	87.89	272.08	958.70	971.95	939.67	32.29	30.103		
700.00	4,683.79	4,661.33	4,660.29	16.98	16.07	88.77	271.04	960.99	974.53	941.51	33.03	29.508		

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



MS Energy Services

Anticollision Report



Company: Devon Energy
Project: Eddy County, New Mexico (NAD 83)
Reference Site: Cotton Draw Unit
Site Error: 0.00 usft
Reference Well: 515H
Well Error: 0.00 usft
Reference Wellbore: Wellbore #1
Reference Design: Design #1

Local Co-ordinate Reference: Well 515H
TVD Reference: Well @ 3566.10usft (Cactus 126)
MD Reference: Well @ 3566.10usft (Cactus 126)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: 5000.1 Conroe DB
Offset TVD Reference: Offset Datum

Offset Design Windward Federal - #5H - Wellbore #1 - Surveys													Offset Site Error:	0.00 usft
Survey Program: 100-, 8399-													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis			Distance							
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Azimuth from North (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning	
4,800.00	4,782.81	4,760.23	4,759.16	17.37	16.41	89.65	270.03	963.27	977.34	943.57	33.76	28.946		
4,900.00	4,881.84	4,859.46	4,858.36	17.77	16.76	90.53	268.96	965.54	980.36	945.85	34.51	28.412		
5,000.00	4,980.87	4,957.68	4,956.56	18.17	17.10	91.39	267.96	967.77	983.58	948.33	35.24	27.908		
5,100.00	5,079.90	5,077.74	5,076.58	18.56	17.52	92.22	267.56	969.80	986.51	950.44	36.07	27.353		
5,200.00	5,178.92	5,195.06	5,193.88	18.96	17.93	92.89	269.85	968.90	986.98	950.12	36.87	26.771		
5,300.00	5,277.95	5,297.12	5,295.89	19.36	18.29	93.54	272.61	967.20	986.69	949.07	37.62	26.228		
5,400.00	5,376.98	5,395.98	5,394.69	19.76	18.63	94.20	275.30	965.47	986.44	948.08	38.36	25.713		
5,500.00	5,476.01	5,495.59	5,494.26	20.16	18.98	94.85	278.00	963.74	986.33	947.23	39.11	25.220		
5,600.00	5,575.03	5,597.06	5,595.67	20.56	19.33	95.50	280.80	961.87	986.24	946.38	39.86	24.743		
5,628.09	5,602.86	5,624.36	5,622.95	20.68	19.43	95.68	281.55	961.34	986.21	946.15	40.07	24.614		
5,662.11	5,636.55	5,657.25	5,655.83	20.81	19.54	95.90	282.45	960.73	986.21	945.89	40.32	24.461		
5,700.00	5,674.12	5,693.93	5,692.48	20.96	19.67	96.13	283.46	960.09	986.21	945.62	40.60	24.293		
5,800.00	5,773.42	5,792.96	5,791.47	21.36	20.02	96.66	286.16	958.44	986.19	944.86	41.33	23.860		
5,900.00	5,872.91	5,889.82	5,888.28	21.74	20.36	97.09	288.77	956.98	986.10	944.04	42.06	23.447		
6,000.00	5,972.56	5,989.12	5,987.54	22.12	20.70	97.43	291.31	955.65	985.94	943.16	42.78	23.047		
6,054.49	6,026.92	6,039.14	6,037.54	22.32	20.88	97.60	292.35	955.05	985.84	942.68	43.16	22.843		
6,100.00	6,072.35	6,079.99	6,078.39	22.49	21.02	97.73	292.76	954.71	985.91	942.45	43.47	22.681		
6,200.00	6,172.23	6,176.55	6,174.95	22.86	21.36	98.01	292.81	954.24	986.34	942.17	44.17	22.332		
6,300.00	6,272.18	6,276.75	6,275.15	23.21	21.70	98.20	292.72	953.83	986.55	941.67	44.87	21.986		
6,400.00	6,372.17	6,377.41	6,375.81	23.56	22.06	98.28	292.62	953.35	986.35	940.78	45.57	21.645		
6,427.83	6,400.00	6,405.42	6,403.82	23.66	22.15	98.29	292.55	953.20	986.23	940.46	45.76	21.550		
6,500.00	6,472.17	6,477.30	6,475.70	23.90	22.40	98.31	292.35	952.81	985.87	939.61	46.26	21.311		
6,600.00	6,572.17	6,577.10	6,575.49	24.25	22.75	98.33	291.97	952.28	985.40	938.45	46.95	20.987		
6,700.00	6,672.17	6,677.58	6,675.97	24.59	23.10	98.36	291.53	951.74	984.93	937.28	47.65	20.671		
6,800.00	6,772.17	6,776.06	6,774.45	24.93	23.45	98.40	290.96	951.20	984.47	936.14	48.34	20.368		
6,900.00	6,872.17	6,875.84	6,874.22	25.28	23.79	98.47	289.79	950.70	984.15	935.13	49.03	20.073		
7,000.00	6,972.17	6,982.82	6,981.17	25.62	24.17	98.62	287.46	949.69	983.55	933.80	49.75	19.772		
7,100.00	7,072.17	7,086.30	7,084.54	25.97	24.53	98.87	283.32	947.75	982.29	931.84	50.45	19.470		
7,200.00	7,172.17	7,186.02	7,184.17	26.31	24.88	99.12	279.34	945.72	980.91	929.77	51.14	19.179		
7,300.00	7,272.17	7,287.67	7,285.72	26.66	25.23	99.36	275.47	943.64	979.50	927.66	51.84	18.893		
7,400.00	7,372.17	7,387.49	7,385.45	27.00	25.58	99.60	271.66	941.48	978.00	925.46	52.54	18.615		
7,500.00	7,472.17	7,484.13	7,481.99	27.35	25.91	99.85	267.79	939.52	976.67	923.45	53.22	18.350		
7,600.00	7,572.17	7,582.19	7,579.92	27.69	26.26	100.13	263.18	937.71	975.66	921.75	53.91	18.097		
7,700.00	7,672.17	7,682.63	7,680.23	28.04	26.61	100.43	258.38	935.90	974.75	920.14	54.61	17.849		
7,800.00	7,772.17	7,782.22	7,779.70	28.39	26.96	100.71	253.83	934.11	973.81	918.51	55.31	17.608		
7,900.00	7,872.17	7,880.52	7,877.89	28.74	27.30	100.97	249.59	932.48	973.00	917.00	56.00	17.376		
8,000.00	7,972.17	7,980.16	7,977.44	29.08	27.65	101.23	245.47	930.99	972.33	915.64	56.69	17.151		
8,100.00	8,072.17	8,078.44	8,075.62	29.43	28.00	101.48	241.32	929.57	971.74	914.35	57.38	16.934		
8,200.00	8,172.17	8,176.46	8,173.52	29.78	28.34	101.77	236.69	928.25	971.37	913.30	58.07	16.727		
8,300.00	8,272.17	8,276.29	8,273.22	30.13	28.69	102.06	231.81	926.99	971.14	912.37	58.77	16.524		
8,395.34	8,367.51	8,369.50	8,366.31	30.46	28.96	102.35	227.18	925.83	970.99	911.61	59.38	16.353		
8,400.00	8,372.17	8,373.95	8,370.75	30.48	28.97	102.36	226.95	925.78	970.99	911.59	59.40	16.347		
8,500.00	8,472.17	8,471.84	8,468.52	30.83	29.02	102.65	222.05	924.86	971.16	911.36	59.79	16.242		
8,600.00	8,572.17	8,568.26	8,564.85	31.18	29.02	102.90	217.95	924.34	971.57	911.42	60.15	16.154		
8,700.00	8,672.17	8,671.07	8,667.56	31.52	29.04	103.16	213.38	923.92	972.18	911.67	60.51	16.067		
8,751.58	8,723.75	8,726.65	8,723.00	31.70	29.04	103.39	209.71	923.14	972.26	911.56	60.70	16.018		
8,800.00	8,772.11	8,772.51	8,768.55	31.86	29.05	103.59	204.53	921.94	971.55	910.69	60.86	15.964		
8,850.00	8,821.68	8,819.38	8,814.50	32.00	29.06	103.78	195.57	919.96	969.41	908.40	61.01	15.890		
8,900.00	8,870.51	8,865.39	8,877.71	32.12	29.09	104.31	177.25	915.32	965.39	904.23	61.16	15.785		
8,950.00	8,918.22	8,939.35	8,927.71	32.24	29.11	104.69	157.84	909.62	959.07	897.78	61.30	15.646		
9,000.00	8,964.46	8,981.62	8,965.71	32.34	29.14	104.75	140.01	904.67	951.44	890.02	61.42	15.490		
9,050.00	9,008.86	9,026.25	9,004.56	32.43	29.17	104.80	118.75	899.12	942.65	881.10	61.54	15.316		



MS Energy Services Anticollision Report



Company: Devon Energy
Project: Eddy County, New Mexico (NAD 83)
Reference Site: Cotton Draw Unit
Site Error: 0.00 usft
Reference Well: 515H
Well Error: 0.00 usft
Reference Wellbore: Wellbore #1
Reference Design: Design #1

Local Co-ordinate Reference: Well 515H
TVD Reference: Well @ 3566.10usft (Cactus 126)
MD Reference: Well @ 3566.10usft (Cactus 126)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: 5000.1 Conroe DB
Offset TVD Reference: Offset Datum

Offset Design Windward Federal - #5H - Wellbore #1 - Surveys													Offset Site Error:	0.00 usft
Survey Program: 100-, 8399-													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Distance								Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Azimuth from North (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor		
9,100.00	9,051.09	9,077.16	9,046.82	32.51	29.22	105.03	91.32	891.96	932.41	870.73	61.67	15.118		
9,150.00	9,090.83	9,149.45	9,102.07	32.58	29.30	106.18	46.52	879.43	920.37	858.54	61.83	14.886		
9,200.00	9,127.77	9,212.03	9,144.03	32.65	29.41	107.17	2.35	865.26	905.55	843.56	62.00	14.607		
9,250.00	9,161.64	9,234.00	9,157.50	32.71	29.45	106.15	-14.20	860.02	889.83	827.72	62.11	14.327		
9,300.00	9,192.18	9,265.00	9,175.35	32.78	29.52	105.44	-38.62	853.28	874.21	811.99	62.23	14.049		
9,350.00	9,219.15	9,280.15	9,183.63	32.85	29.56	103.71	-50.99	850.42	859.01	796.71	62.30	13.788		
9,400.00	9,242.36	9,304.40	9,196.15	32.92	29.62	102.32	-71.36	846.40	844.38	781.98	62.40	13.532		
9,450.00	9,261.61	9,344.38	9,214.38	32.99	29.73	101.78	-106.32	839.93	829.68	767.10	62.58	13.258		
9,500.00	9,276.77	9,390.71	9,230.84	33.08	29.88	101.67	-148.90	832.12	814.63	751.82	62.80	12.971		
9,550.00	9,287.73	9,444.05	9,242.83	33.17	30.08	102.10	-199.80	821.87	798.53	735.45	63.08	12.659		
9,600.00	9,294.39	9,485.00	9,246.62	33.27	30.25	101.68	-239.69	813.57	782.03	718.71	63.32	12.350		
9,649.26	9,296.70	9,520.23	9,247.72	33.37	30.42	100.84	-274.21	806.62	765.90	702.33	63.58	12.047		
9,700.00	9,296.91	9,552.75	9,248.18	33.49	30.57	99.64	-306.21	800.87	750.56	686.72	63.85	11.756		
9,800.00	9,297.31	9,616.19	9,247.97	33.80	30.90	97.04	-368.97	791.59	725.98	661.52	64.46	11.263		
9,900.00	9,297.72	9,674.00	9,247.84	34.17	31.21	93.77	-426.48	785.77	709.50	644.36	65.15	10.891		
10,000.00	9,298.12	9,742.72	9,248.15	34.62	31.63	91.25	-495.11	782.35	701.43	635.43	66.00	10.627		
10,027.33	9,298.24	9,768.00	9,248.42	34.75	31.78	91.08	-520.38	782.08	700.81	634.53	66.29	10.573		
10,074.58	9,298.43	9,798.04	9,248.68	34.99	31.98	89.67	-550.42	782.17	700.50	633.77	66.73	10.498		
10,100.00	9,298.53	9,820.06	9,248.73	35.13	32.13	89.39	-572.44	782.35	700.56	633.55	67.01	10.455		
10,200.00	9,298.93	9,909.03	9,247.60	35.71	32.75	88.49	-661.38	784.01	701.91	633.71	68.20	10.292		
10,300.00	9,299.34	10,036.88	9,242.38	36.35	33.73	90.75	-789.09	785.81	703.34	633.53	69.80	10.076		
10,400.00	9,299.74	10,148.91	9,236.02	37.06	34.67	91.73	-900.89	782.51	700.26	628.86	71.41	9.807		
10,500.00	9,300.15	10,244.38	9,230.80	37.83	35.54	91.35	-996.16	779.57	697.12	624.13	73.00	9.550		
10,600.00	9,300.55	10,356.90	9,229.24	38.65	36.63	92.39	-1,108.60	775.73	693.29	618.42	74.87	9.260		
10,700.00	9,300.96	10,462.98	9,231.46	39.53	37.70	92.90	-1,214.54	770.84	687.91	611.10	76.81	8.956		
10,800.00	9,301.36	10,557.78	9,233.18	40.45	38.71	92.48	-1,309.22	766.43	682.54	603.80	78.74	8.668		
10,900.00	9,301.76	10,643.82	9,234.31	41.42	39.65	91.30	-1,395.20	763.49	678.48	597.81	80.66	8.411		
10,991.12	9,302.13	10,715.74	9,235.36	42.35	40.45	89.67	-1,467.11	763.04	677.24	594.85	82.39	8.220		
11,000.00	9,302.17	10,724.25	9,235.47	42.44	40.55	89.64	-1,475.61	763.10	677.25	594.67	82.58	8.201		
11,100.00	9,302.57	10,820.54	9,235.34	43.49	41.66	89.32	-1,571.90	763.99	677.60	592.87	84.73	7.997		
11,200.00	9,302.98	10,919.69	9,233.11	44.58	42.84	89.25	-1,671.02	765.03	678.30	591.34	86.97	7.799		
11,300.00	9,303.38	11,020.35	9,232.56	45.71	44.06	89.31	-1,771.66	766.21	678.95	589.65	89.30	7.603		
11,400.00	9,303.79	11,116.66	9,231.86	46.86	45.26	88.99	-1,867.96	767.44	679.74	588.10	91.64	7.418		
11,500.00	9,304.19	11,211.80	9,229.67	48.05	46.47	88.58	-1,963.05	769.45	681.51	587.52	93.99	7.251		
11,600.00	9,304.60	11,325.00	9,228.03	49.26	47.93	89.69	-2,076.23	771.28	682.74	586.09	96.65	7.064		
11,700.00	9,305.00	11,441.12	9,228.29	50.50	49.46	91.06	-2,192.35	770.34	681.31	581.91	99.40	6.854		
11,800.00	9,305.40	11,541.93	9,227.46	51.76	50.81	91.13	-2,293.12	768.15	678.68	576.70	101.98	6.655		
11,900.00	9,305.81	11,648.38	9,227.86	53.05	52.26	91.68	-2,399.53	765.70	675.80	571.12	104.68	6.456		
12,000.00	9,306.21	11,752.37	9,230.50	54.35	53.69	92.03	-2,503.44	762.62	672.00	564.59	107.41	6.256		
12,100.00	9,306.62	11,845.47	9,231.50	55.67	54.98	91.44	-2,596.50	759.97	668.49	558.46	110.03	6.075		
12,200.00	9,307.02	11,946.63	9,231.13	57.01	56.40	91.54	-2,697.63	757.30	665.34	552.58	112.76	5.900		
12,300.00	9,307.43	12,034.22	9,228.73	58.37	57.64	90.46	-2,785.16	755.64	663.19	547.88	115.32	5.751		
12,400.00	9,307.83	12,145.06	9,227.18	59.74	59.22	91.41	-2,895.95	753.47	660.83	542.63	118.20	5.591		
12,500.00	9,308.23	12,243.37	9,226.74	61.13	60.64	91.27	-2,994.24	751.08	657.91	536.94	120.97	5.439		
12,600.00	9,308.64	12,335.28	9,224.87	62.53	61.97	90.55	-3,086.11	749.15	655.54	531.89	123.65	5.302		
12,650.79	9,308.84	12,376.14	9,224.02	63.24	62.56	89.68	-3,126.96	748.96	655.16	530.23	124.93	5.244		
12,700.00	9,309.04	12,415.81	9,223.40	63.94	63.14	88.84	-3,166.62	749.40	655.52	529.36	126.16	5.196		
2,800.00	9,309.45	12,496.93	9,222.05	65.36	64.33	87.18	-3,247.69	752.04	658.41	529.79	128.62	5.119		
2,900.00	9,309.85	12,584.99	9,220.17	66.80	65.63	86.14	-3,335.59	756.96	663.67	532.47	131.20	5.058		
3,000.00	9,310.26	12,682.55	9,216.98	68.24	67.08	85.95	-3,432.88	763.34	670.04	536.05	134.00	5.000		
3,100.00	9,310.66	12,776.72	9,211.71	69.69	68.49	85.45	-3,526.69	769.61	676.89	540.22	136.66	4.953		
3,200.00	9,311.07	12,896.83	9,206.10	71.16	70.29	87.17	-3,646.45	776.41	682.63	542.63	140.00	4.876		

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



MS Energy Services
Anticollision Report



Company: Devon Energy
Project: Eddy County, New Mexico (NAD 83)
Reference Site: Cotton Draw Unit
Site Error: 0.00 usft
Reference Well: 515H
Well Error: 0.00 usft
Reference Wellbore: Wellbore #1
Reference Design: Design #1

Local Co-ordinate Reference: Well 515H
TVD Reference: Well @ 3566.10usft (Cactus 126)
MD Reference: Well @ 3566.10usft (Cactus 126)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at: 2.00 sigma
Database: 5000.1 Conroe DB
Offset TVD Reference: Offset Datum

Offset Design Windward Federal - #5H - Wellbore #1 - Surveys												Offset Site Error:	0.00 usft
Survey Program: 100-, 8389-												Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Distance		Minimum Separation		Separation Factor		Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Azimuth from North (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)		
13,300.00	9,311.47	12,994.33	9,202.19	72.63	71.76	86.96	-3,743.78	780.73	687.09	544.28	142.80	4.811	
13,400.00	9,311.87	13,092.09	9,196.64	74.11	73.24	86.76	-3,841.26	785.41	692.19	546.61	145.58	4.755	
13,500.00	9,312.28	13,207.02	9,189.67	75.59	74.99	88.00	-3,955.92	789.47	696.18	547.47	148.71	4.682	
13,600.00	9,312.68	13,331.17	9,182.39	77.09	76.88	90.00	-4,079.83	790.57	697.63	545.74	151.89	4.593	
13,700.00	9,313.09	13,431.17	9,180.60	78.59	78.41	90.00	-4,179.81	789.87	696.74	541.94	154.80	4.501	
13,800.00	9,313.49	13,528.36	9,180.48	80.09	79.91	89.77	-4,277.00	790.08	696.45	538.71	157.74	4.415	
13,900.00	9,313.90	13,629.24	9,179.24	81.60	81.46	89.84	-4,377.87	790.21	696.29	535.59	160.71	4.333	
13,941.61	9,314.06	13,669.13	9,178.22	82.24	82.08	89.69	-4,417.75	790.17	696.23	534.34	161.89	4.301	
14,000.00	9,314.30	13,724.56	9,176.27	83.12	82.93	89.44	-4,473.14	790.20	696.36	532.83	163.53	4.258	
14,100.00	9,314.71	13,820.37	9,173.24	84.64	84.42	89.09	-4,568.90	790.82	697.10	530.74	166.36	4.190	
14,200.00	9,315.11	13,936.38	9,174.06	86.17	86.22	90.43	-4,684.89	791.53	697.05	527.39	169.66	4.108	
14,300.00	9,315.51	14,031.81	9,176.69	87.70	87.71	90.04	-4,780.28	791.84	696.29	523.57	172.72	4.031	
14,368.99	9,315.79	14,096.67	9,178.31	88.77	88.72	89.69	-4,845.12	792.32	696.09	521.27	174.82	3.982	
14,400.00	9,315.92	14,125.66	9,178.89	89.24	89.18	89.52	-4,874.10	792.63	696.13	520.38	175.75	3.961	
14,500.00	9,316.32	14,218.46	9,179.83	90.78	90.63	88.92	-4,966.88	794.05	696.92	518.20	178.71	3.900	
14,600.00	9,316.73	14,310.93	9,179.44	92.33	92.08	88.29	-5,059.33	796.30	698.86	517.24	181.62	3.848	
14,700.00	9,317.13	14,413.56	9,177.10	93.88	93.70	88.51	-5,161.90	798.89	701.26	516.60	184.66	3.798	
14,800.00	9,317.54	14,520.12	9,177.19	95.43	95.38	89.06	-5,268.43	800.74	702.40	514.53	187.87	3.739	
14,900.00	9,317.94	14,611.93	9,177.94	96.99	96.83	88.38	-5,360.21	802.98	704.10	513.28	190.82	3.690	
15,000.00	9,318.34	14,728.68	9,179.18	98.55	98.68	89.76	-5,476.91	806.24	706.27	511.99	194.28	3.635	
15,100.00	9,318.75	14,841.28	9,181.25	100.11	100.46	90.81	-5,589.48	805.25	704.43	506.83	197.60	3.565	
15,200.00	9,319.15	14,934.40	9,181.59	101.68	101.93	90.24	-5,682.59	804.40	702.95	502.35	200.60	3.504	
15,277.22	9,319.47	15,005.10	9,181.22	102.89	103.05	89.69	-5,753.29	804.36	702.59	499.71	202.88	3.463	
15,300.00	9,319.56	15,025.91	9,180.90	103.24	103.38	89.53	-5,774.10	804.44	702.62	499.09	203.53	3.452	
15,400.00	9,319.96	15,145.05	9,179.84	104.82	105.28	91.12	-5,893.22	804.09	702.06	495.24	206.82	3.395	
15,500.00	9,320.37	15,243.72	9,179.97	106.39	106.84	91.01	-5,991.87	802.27	699.72	489.83	209.89	3.334	
15,600.00	9,320.77	15,336.74	9,178.61	107.97	108.32	90.43	-6,084.87	800.84	697.98	485.16	212.82	3.280	
15,700.00	9,321.18	15,430.02	9,175.80	109.55	109.80	89.86	-6,178.10	800.05	697.24	481.56	215.68	3.233	
15,800.00	9,321.58	15,543.27	9,173.65	111.13	111.61	90.98	-6,291.32	798.40	695.66	476.84	218.82	3.179	
15,900.00	9,321.98	15,635.86	9,171.55	112.71	113.08	90.35	-6,383.87	796.91	694.06	472.36	221.70	3.131	
16,000.00	9,322.39	15,735.75	9,167.27	114.30	114.67	90.33	-6,483.66	795.61	693.21	468.66	224.55	3.087	
16,100.00	9,322.79	15,843.26	9,165.55	115.88	116.39	90.97	-6,591.13	793.61	691.22	463.62	227.60	3.037	
16,200.00	9,323.20	15,940.45	9,164.05	117.47	117.94	90.73	-6,688.30	791.93	689.38	458.83	230.56	2.990	
16,300.00	9,323.60	16,041.10	9,165.33	119.07	119.55	90.79	-6,788.92	790.88	687.57	453.85	233.72	2.942	
16,400.00	9,324.01	16,137.17	9,165.82	120.66	121.09	90.45	-6,884.99	789.81	685.87	449.08	236.79	2.897	
16,500.00	9,324.41	16,229.52	9,164.08	122.25	122.58	89.79	-6,977.32	789.19	685.15	445.48	239.67	2.859	
16,600.00	9,324.82	16,334.20	9,160.67	123.85	124.26	90.19	-7,081.94	788.87	685.13	442.52	242.61	2.824	
16,700.00	9,325.22	16,437.97	9,159.17	125.45	125.92	90.52	-7,185.69	787.52	683.71	438.07	245.64	2.783	
16,800.00	9,325.62	16,572.37	9,159.40	127.05	128.08	93.50	-7,319.99	783.65	680.57	431.79	248.78	2.736	
16,900.00	9,326.03	16,666.79	9,162.59	128.65	129.59	93.02	-7,414.26	779.33	674.80	422.77	252.03	2.677	
17,000.00	9,326.43	16,760.25	9,164.96	130.25	131.09	92.46	-7,507.62	775.49	669.70	414.47	255.23	2.624	
17,100.00	9,326.84	16,858.39	9,166.40	131.86	132.66	92.31	-7,605.67	771.73	665.13	406.76	258.37	2.574	
17,200.00	9,327.24	16,953.81	9,166.91	133.46	134.19	91.91	-7,701.03	768.38	661.10	399.67	261.43	2.529	
17,300.00	9,327.65	17,050.71	9,166.05	135.07	135.75	91.63	-7,797.87	765.08	657.51	393.12	264.39	2.487	
17,400.00	9,328.05	17,143.14	9,163.63	136.68	137.24	90.95	-7,890.23	762.50	654.95	387.74	267.21	2.451	
17,500.00	9,328.45	17,244.03	9,162.76	138.29	138.86	91.03	-7,991.09	760.41	652.67	382.46	270.20	2.415	
17,600.00	9,328.86	17,339.12	9,162.58	139.90	140.40	90.59	-8,086.16	759.06	650.84	377.63	273.21	2.382	
17,700.00	9,329.26	17,435.36	9,161.17	141.51	141.95	90.25	-8,182.39	757.92	649.59	373.46	276.13	2.353	
17,800.00	9,329.67	17,532.08	9,159.94	143.12	143.52	89.95	-8,279.10	757.62	649.12	370.05	279.07	2.326	
17,900.00	9,330.07	17,634.41	9,160.95	144.73	145.18	90.16	-8,381.42	757.63	648.38	366.09	282.29	2.297	
17,993.55	9,330.45	17,723.05	9,161.62	146.24	146.62	89.71	-8,470.07	757.82	647.94	362.76	285.18	2.272 CC	
18,000.00	9,330.48	17,728.92	9,161.64	146.35	146.71	89.66	-8,475.94	757.86	647.94	362.57	285.37	2.271	



MS Energy Services
Anticollision Report



Company: Devon Energy
Project: Eddy County, New Mexico (NAD 83)
Reference Site: Cotton Draw Unit
Site Error: 0.00 usft
Reference Well: 515H
Well Error: 0.00 usft
Reference Wellbore: Wellbore #1
Reference Design: Design #1

Local Co-ordinate Reference: Well 515H
TVD Reference: Well @ 3566.10usft (Cactus 126)
MD Reference: Well @ 3566.10usft (Cactus 126)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: 5000.1 Conroe DB
Offset TVD Reference: Offset Datum

Offset Design Windward Federal - #5H - Wellbore #1 - Surveys													Offset Site Error:	0.00 usft
Survey Program: 100-, 8399-													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis			Distance						Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Azimuth from North (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centras (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor		
18,100.00	9,330.88	17,820.92	9,161.72	147.96	148.21	88.93	-8,567.92	759.06	648.70	360.34	288.35	2.250		
18,200.00	9,331.29	17,919.85	9,160.40	149.58	149.81	88.83	-8,666.82	760.92	650.36	359.00	291.36	2.232		
18,300.00	9,331.69	18,023.36	9,163.07	151.20	151.50	89.15	-8,770.27	763.25	651.38	356.54	294.84	2.209		
18,400.00	9,332.09	18,125.87	9,166.64	152.81	153.17	89.37	-8,872.68	765.69	652.31	353.93	298.38	2.186		
18,500.00	9,332.50	18,225.24	9,168.88	154.43	154.79	89.31	-8,972.02	767.21	652.73	351.02	301.71	2.163		
18,600.00	9,332.90	18,321.24	9,168.78	156.05	156.35	88.95	-9,068.00	768.67	653.74	348.86	304.77	2.145		
18,700.00	9,333.31	18,423.90	9,167.25	157.67	158.02	89.19	-9,170.64	770.11	654.98	347.13	307.85	2.128		
18,800.00	9,333.71	18,519.30	9,167.63	159.30	159.58	88.77	-9,266.02	771.73	656.04	345.10	310.94	2.110		
18,900.00	9,334.12	18,609.15	9,167.11	160.92	161.04	87.86	-9,355.84	774.19	658.35	344.55	313.79	2.098 ES		
19,000.00	9,334.52	18,704.20	9,164.40	162.54	162.60	87.42	-9,450.79	777.53	661.98	345.39	316.59	2.091		
19,100.00	9,334.93	18,804.95	9,160.84	164.16	164.24	87.48	-9,551.40	781.14	665.86	346.37	319.49	2.084		
19,200.00	9,335.33	18,902.60	9,159.85	165.79	165.84	87.28	-9,648.97	785.27	669.72	347.18	322.54	2.076		
19,300.00	9,335.73	18,990.29	9,157.72	167.41	167.28	86.20	-9,736.52	789.56	674.61	349.52	325.09	2.075 SF		
19,390.56	9,336.10	19,073.75	9,154.03	168.88	168.64	85.59	-9,819.74	794.63	680.54	353.16	327.37	2.079		



MS Energy Services Anticollision Report



Company: Devon Energy
Project: Eddy County, New Mexico (NAD 83)
Reference Site: Cotton Draw Unit
Site Error: 0.00 usft
Reference Well: 515H
Well Error: 0.00 usft
Reference Wellbore: Wellbore #1
Reference Design: Design #1

Local Co-ordinate Reference: Well 515H
TVD Reference: Well @ 3566.10usft (Cactus 126)
MD Reference: Well @ 3566.10usft (Cactus 126)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at
Database: 5000.1 Conroe DB
Offset TVD Reference: Offset Datum

Offset Design Windward Federal - #6H - Wellbore #1 - Design #1													Offset Site Error:	0.00 usft
Survey Program: 0-, 8720-													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Azimuth from North (°)	Offset Wellbore Centre		Distance		Minimum Separation (usft)	Separation Factor	Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N/-S (usft)	+E/-W (usft)	Between Centras (usft)	Between Ellipses (usft)				
0.00	0.00	1.80	-1.80	0.00	0.00	73.81	281.23	968.39	1,008.40					
100.00	100.00	101.80	98.20	0.13	0.05	73.81	281.23	968.39	1,008.40	1,008.23	0.16	6,145.210		
200.00	200.00	201.80	198.20	0.49	0.18	73.81	281.23	968.39	1,008.40	1,007.80	0.60	1,683.384		
300.00	300.00	301.80	298.20	0.85	0.31	73.81	281.23	968.39	1,008.40	1,007.36	1.03	975.272		
400.00	400.00	401.80	398.20	1.21	0.45	73.81	281.23	968.39	1,008.40	1,006.93	1.47	686.498		
500.00	500.00	501.80	498.20	1.57	0.58	73.81	281.23	968.39	1,008.40	1,006.49	1.90	529.666		
600.00	600.00	601.80	598.20	1.93	0.71	73.81	281.23	968.39	1,008.40	1,006.06	2.34	431.166		
700.00	700.00	701.80	698.20	2.29	0.84	73.81	281.23	968.39	1,008.40	1,005.62	2.77	363.556		
800.00	800.00	801.80	798.20	2.64	0.97	73.81	281.23	968.39	1,008.40	1,005.19	3.21	314.276		
900.00	900.00	901.80	898.20	3.00	1.11	73.81	281.23	968.39	1,008.40	1,004.75	3.64	276.760		
1,000.00	1,000.00	1,001.80	998.20	3.36	1.24	73.81	281.23	968.39	1,008.40	1,004.32	4.08	247.247		
1,100.00	1,100.00	1,101.80	1,098.20	3.72	1.37	73.81	281.23	968.39	1,008.40	1,003.88	4.51	223.421		
1,200.00	1,200.00	1,201.80	1,198.20	4.08	1.50	73.81	281.23	968.39	1,008.40	1,003.45	4.95	203.783		
1,300.00	1,300.00	1,301.80	1,298.20	4.44	1.63	73.81	281.23	968.39	1,008.40	1,003.01	5.38	187.319		
1,400.00	1,400.00	1,401.80	1,398.20	4.79	1.77	73.81	281.23	968.39	1,008.40	1,002.58	5.82	173.316		
1,500.00	1,500.00	1,501.80	1,498.20	5.15	1.90	73.81	281.23	968.39	1,008.40	1,002.15	6.25	161.261		
1,600.00	1,600.00	1,601.80	1,598.20	5.51	2.03	73.81	281.23	968.39	1,008.40	1,001.71	6.69	150.774		
1,700.00	1,700.00	1,701.80	1,698.20	5.87	2.16	73.81	281.23	968.39	1,008.40	1,001.28	7.12	141.568		
1,800.00	1,800.00	1,801.80	1,798.20	6.23	2.29	73.81	281.23	968.39	1,008.40	1,000.84	7.56	133.421		
1,900.00	1,900.00	1,901.80	1,898.20	6.59	2.42	73.81	281.23	968.39	1,008.40	1,000.41	7.99	126.161		
2,000.00	2,000.00	2,001.80	1,998.20	6.95	2.56	73.81	281.23	968.39	1,008.40	999.97	8.43	119.650		
2,100.00	2,100.00	2,101.80	2,098.20	7.30	2.69	73.81	281.23	968.39	1,008.40	999.54	8.86	113.779		
2,200.00	2,200.00	2,201.80	2,198.20	7.66	2.82	73.81	281.23	968.39	1,008.40	999.10	9.30	108.456		
2,300.00	2,300.00	2,301.80	2,298.20	8.02	2.95	73.81	281.23	968.39	1,008.40	998.67	9.73	103.610		
2,400.00	2,400.00	2,401.80	2,398.20	8.38	3.08	73.81	281.23	968.39	1,008.40	998.23	10.17	99.178		
2,500.00	2,500.00	2,501.80	2,498.20	8.74	3.22	73.81	281.23	968.39	1,008.40	997.80	10.60	95.109		
2,600.00	2,599.99	2,601.81	2,598.19	9.10	3.35	73.85	281.23	968.39	1,008.20	997.16	11.04	91.353		
2,700.00	2,699.96	2,701.84	2,698.16	9.45	3.48	74.00	281.23	968.39	1,007.61	996.14	11.47	87.866		
2,800.00	2,799.86	2,801.94	2,798.06	9.81	3.61	74.24	281.23	968.39	1,006.63	994.74	11.90	84.616		
2,900.00	2,899.68	2,902.12	2,897.88	10.17	3.74	74.58	281.23	968.39	1,005.30	992.98	12.32	81.577		
3,000.00	2,999.37	3,002.43	2,997.57	10.53	3.88	75.02	281.23	968.39	1,003.64	990.89	12.75	78.726		
3,100.00	3,098.90	3,102.90	3,097.10	10.89	4.01	75.55	281.23	968.39	1,001.69	988.52	13.17	76.043		
3,200.00	3,198.26	3,203.54	3,196.46	11.25	4.14	76.19	281.23	968.39	999.51	985.91	13.60	73.511		
3,299.74	3,297.14	3,304.66	3,295.34	11.61	4.27	76.93	281.23	968.39	997.15	983.13	14.02	71.120		
3,300.00	3,297.40	3,304.40	3,295.60	11.61	4.27	76.93	281.23	968.39	997.14	983.12	14.02	71.115		
3,400.00	3,396.43	3,405.37	3,394.63	11.98	4.41	77.72	281.23	968.39	994.80	980.35	14.45	68.852		
3,500.00	3,495.46	3,506.34	3,493.66	12.36	4.54	78.51	281.23	968.39	992.65	977.77	14.88	66.718		
3,600.00	3,594.49	3,607.31	3,592.69	12.73	4.67	79.30	281.23	968.39	990.68	975.37	15.31	64.704		
3,700.00	3,693.51	3,708.29	3,691.71	13.11	4.81	80.10	281.23	968.39	988.92	973.17	15.75	62.803		
3,800.00	3,792.54	3,809.26	3,790.74	13.49	4.94	80.90	281.23	968.39	987.34	971.15	16.18	61.007		
3,900.00	3,891.57	3,889.77	3,889.77	13.87	5.05	81.71	281.23	968.39	985.96	969.35	16.61	59.360		
4,000.00	3,990.60	3,988.80	3,988.80	14.25	5.18	82.51	281.23	968.39	984.77	967.72	17.05	57.754		
4,100.00	4,089.62	4,087.82	4,087.82	14.64	5.31	83.32	281.23	968.39	983.77	966.28	17.50	56.232		
4,200.00	4,188.65	4,186.85	4,186.85	15.02	5.44	84.13	281.23	968.39	982.98	965.04	17.94	54.788		
4,300.00	4,287.68	4,285.88	4,285.88	15.41	5.57	84.94	281.23	968.39	982.38	963.99	18.39	53.419		
4,400.00	4,386.71	4,384.91	4,384.91	15.80	5.70	85.75	281.23	968.39	981.97	963.13	18.84	52.119		
4,500.00	4,485.73	4,483.93	4,483.93	16.19	5.83	86.57	281.23	968.39	981.77	962.47	19.29	50.884		
4,554.86	4,540.06	4,538.26	4,538.26	16.41	5.90	87.01	281.23	968.39	981.74	962.19	19.54	50.232 CC		
4,600.00	4,584.76	4,582.96	4,582.96	16.59	5.96	87.38	281.23	968.39	981.76	962.01	19.75	49.709		
4,700.00	4,683.79	4,681.99	4,681.99	16.98	6.09	88.19	281.23	968.39	981.94	961.74	20.21	48.592		
4,800.00	4,782.81	4,781.01	4,781.01	17.37	6.22	89.00	281.23	968.39	982.33	961.66	20.67	47.528 ES		
4,900.00	4,881.84	4,880.04	4,880.04	17.77	6.35	89.81	281.23	968.39	982.91	961.78	21.13	46.514		



MS Energy Services

Anticollision Report



Company: Devon Energy
Project: Eddy County, New Mexico (NAD 83)
Reference Site: Cotton Draw Unit
Site Error: 0.00 usft
Reference Well: 515H
Well Error: 0.00 usft
Reference Wellbore: Wellbore #1
Reference Design: Design #1

Local Co-ordinate Reference: Well 515H
TVD Reference: Well @ 3566.10usft (Cactus 126)
MD Reference: Well @ 3566.10usft (Cactus 126)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: 5000.1 Conroe DB
Offset TVD Reference: Offset Datum

Offset Design Windward Federal - #6H - Wellbore #1 - Design #1														Offset Site Error:	0.00 usft
Survey Program: 0-, 8720-														Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Azimuth from North (°)	Offset Wellbore Centre		Distance				Warning		
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N-S (usft)	+E-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor			
5,000.00	4,980.87	4,979.07	4,979.07	18.17	6.48	90.62	281.23	968.39	983.69	962.09	21.60	45.548			
5,100.00	5,079.90	5,078.10	5,078.10	18.56	6.61	91.43	281.23	968.39	984.66	962.60	22.06	44.627			
5,200.00	5,178.92	5,177.12	5,177.12	18.96	6.74	92.23	281.23	968.39	985.83	963.30	22.53	43.749			
5,300.00	5,277.95	5,276.15	5,276.15	19.36	6.87	93.04	281.23	968.39	987.20	964.19	23.01	42.910			
5,400.00	5,376.98	5,375.18	5,375.18	19.76	7.00	93.84	281.23	968.39	988.75	965.27	23.48	42.109			
5,500.00	5,476.01	5,474.21	5,474.21	20.16	7.13	94.64	281.23	968.39	990.50	966.55	23.96	41.344			
5,600.00	5,575.03	5,573.23	5,573.23	20.56	7.26	95.44	281.23	968.39	992.45	968.01	24.44	40.613			
5,628.09	5,602.86	5,601.06	5,601.06	20.68	7.30	95.66	281.23	968.39	993.03	968.46	24.57	40.413			
5,700.00	5,674.12	5,672.32	5,672.32	20.96	7.40	96.20	281.23	968.39	994.51	969.59	24.92	39.915			
5,800.00	5,773.42	5,771.62	5,771.62	21.36	7.53	96.87	281.23	968.39	996.46	971.07	25.39	39.248			
5,900.00	5,872.91	5,871.11	5,871.11	21.74	7.66	97.44	281.23	968.39	998.24	972.38	25.86	38.609			
6,000.00	5,972.56	5,970.76	5,970.76	22.12	7.79	97.91	281.23	968.39	999.78	973.47	26.31	37.996			
6,100.00	6,072.35	6,070.55	6,070.55	22.49	7.92	98.28	281.23	968.39	1,001.05	974.28	26.76	37.405			
6,200.00	6,172.23	6,170.43	6,170.43	22.86	8.05	98.55	281.23	968.39	1,002.00	974.80	27.20	36.834			
6,300.00	6,272.18	6,270.38	6,270.38	23.21	8.18	98.73	281.23	968.39	1,002.63	975.00	27.63	36.282			
6,400.00	6,372.17	6,370.37	6,370.37	23.66	8.32	98.80	281.23	968.39	1,002.91	974.85	28.06	35.746			
6,427.83	6,400.00	6,401.80	6,398.20	23.66	8.36	98.81	281.23	968.39	1,002.92	974.75	28.17	35.597			
6,500.00	6,472.17	6,470.37	6,470.37	23.90	8.45	98.81	281.23	968.39	1,002.92	974.45	28.47	35.226			
6,600.00	6,572.17	6,570.37	6,570.37	24.25	8.58	98.81	281.23	968.39	1,002.92	974.03	28.89	34.720			
6,700.00	6,672.17	6,670.37	6,670.37	24.59	8.71	98.81	281.23	968.39	1,002.92	973.62	29.30	34.227			
6,800.00	6,772.17	6,770.37	6,770.37	24.93	8.84	98.81	281.23	968.39	1,002.92	973.20	29.72	33.748			
6,900.00	6,872.17	6,870.37	6,870.37	25.28	8.97	98.81	281.23	968.39	1,002.92	972.79	30.13	33.282			
7,000.00	6,972.17	6,970.37	6,970.37	25.62	9.11	98.81	281.23	968.39	1,002.92	972.37	30.55	32.828			
7,100.00	7,072.17	7,070.37	7,070.37	25.97	9.24	98.81	281.23	968.39	1,002.92	971.95	30.97	32.386			
7,200.00	7,172.17	7,170.37	7,170.37	26.31	9.37	98.81	281.23	968.39	1,002.92	971.54	31.39	31.955			
7,300.00	7,272.17	7,270.37	7,270.37	26.66	9.50	98.81	281.23	968.39	1,002.92	971.12	31.80	31.535			
7,400.00	7,372.17	7,370.37	7,370.37	27.00	9.63	98.81	281.23	968.39	1,002.92	970.70	32.22	31.126			
7,500.00	7,472.17	7,470.37	7,470.37	27.35	9.77	98.81	281.23	968.39	1,002.92	970.28	32.64	30.727			
7,600.00	7,572.17	7,570.37	7,570.37	27.69	9.90	98.81	281.23	968.39	1,002.92	969.86	33.06	30.338			
7,700.00	7,672.17	7,670.37	7,670.37	28.04	10.03	98.81	281.23	968.39	1,002.92	969.44	33.48	29.958			
7,800.00	7,772.17	7,770.37	7,770.37	28.39	10.16	98.81	281.23	968.39	1,002.92	969.02	33.90	29.587			
7,900.00	7,872.17	7,870.37	7,870.37	28.74	10.29	98.81	281.23	968.39	1,002.92	968.60	34.32	29.226			
8,000.00	7,972.17	7,970.37	7,970.37	29.08	10.43	98.81	281.23	968.39	1,002.92	968.18	34.74	28.872			
8,100.00	8,072.17	8,070.37	8,070.37	29.43	10.56	98.81	281.23	968.39	1,002.92	967.76	35.16	28.527			
8,200.00	8,172.17	8,170.37	8,170.37	29.78	10.69	98.81	281.23	968.39	1,002.92	967.34	35.58	28.190			
8,300.00	8,272.17	8,270.37	8,270.37	30.13	10.82	98.81	281.23	968.39	1,002.92	966.92	36.00	27.861			
8,400.00	8,372.17	8,370.37	8,370.37	30.48	10.95	98.81	281.23	968.39	1,002.92	966.50	36.42	27.539			
8,500.00	8,472.17	8,470.37	8,470.37	30.83	11.08	98.81	281.23	968.39	1,002.92	966.08	36.84	27.224			
8,600.00	8,572.17	8,570.37	8,570.37	31.18	11.22	98.81	281.23	968.39	1,002.92	965.66	37.26	26.916			
8,700.00	8,672.17	8,670.37	8,670.37	31.52	11.35	98.81	281.23	968.39	1,002.92	965.24	37.68	26.615			
8,707.75	8,679.92	8,678.12	8,678.12	31.55	11.36	98.81	281.23	968.39	1,002.92	965.21	37.71	26.592			
8,751.58	8,723.75	8,719.54	8,719.54	31.70	11.41	98.81	281.23	968.39	1,002.92	965.03	37.90	26.464			
8,800.00	8,772.11	8,741.00	8,740.99	31.86	11.42	98.72	280.82	968.64	1,003.08	965.03	38.04	26.366			
8,850.00	8,821.68	8,762.08	8,762.03	32.00	11.42	98.43	279.62	969.39	1,003.42	965.25	38.17	26.285			
8,900.00	8,870.51	8,783.13	8,782.94	32.12	11.42	97.94	277.64	970.62	1,003.96	965.67	38.29	26.219			
8,950.00	8,918.22	8,800.00	8,799.62	32.24	11.42	97.23	275.48	971.96	1,004.73	966.33	38.40	26.166			
9,000.00	8,964.46	8,825.00	8,824.14	32.34	11.43	96.39	271.37	974.51	1,005.69	967.20	38.50	26.124			
9,050.00	9,008.86	8,850.00	8,848.38	32.43	11.44	95.39	266.18	977.74	1,006.95	968.37	38.59	26.095			
9,100.00	9,051.09	8,866.53	8,864.22	32.51	11.45	94.10	262.16	980.24	1,008.46	969.79	38.68	26.073			
9,150.00	9,090.83	8,887.09	8,883.68	32.58	11.45	92.70	256.51	983.74	1,010.32	971.55	38.77	26.061			
9,200.00	9,127.77	8,907.50	8,902.68	32.65	11.46	91.13	250.21	987.66	1,012.54	973.68	38.86	26.056			
250.00	9,161.64	8,925.00	8,918.72	32.71	11.47	89.36	244.25	991.36	1,015.17	976.21	38.96	26.055			

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



MS Energy Services

Anticollision Report



Company: Devon Energy
Project: Eddy County, New Mexico (NAD 83)
Reference Site: Cotton Draw Unit
Site Error: 0.00 usft
Reference Well: 515H
Well Error: 0.00 usft
Reference Wellbore: Wellbore #1
Reference Design: Design #1

Local Co-ordinate Reference: Well 515H
TVD Reference: Well @ 3566.10usft (Cactus 126)
MD Reference: Well @ 3566.10usft (Cactus 126)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at
Database: 5000.1 Conroe DB
Offset TVD Reference: Offset Datum

Offset Design Windward Federal - #6H - Wellbore #1 - Design #1													Offset Site Error:	0.00 usft
Survey Program: 0-, 8720-													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Azimuth from North (°)	Distance		Minimum Separation (usft)	Separation Factor	Warning			
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)						
9,300.00	9,192.18	8,950.00	8,941.16	32.78	11.49	87.63	234.89	997.17	1,018.24	979.17	39.07	26.061		
9,350.00	9,219.15	8,967.62	8,956.60	32.85	11.50	85.63	227.70	1,001.64	1,021.80	982.60	39.20	26.066		
9,400.00	9,242.36	8,987.23	8,973.42	32.92	11.51	83.69	219.14	1,006.96	1,025.90	986.56	39.35	26.074		
9,450.00	9,261.61	9,006.59	8,989.61	32.99	11.53	81.49	210.11	1,012.57	1,030.59	991.08	39.51	26.084		
9,500.00	9,276.77	9,025.00	9,004.59	33.08	11.54	79.32	201.02	1,018.22	1,035.90	996.20	39.70	26.095		
9,550.00	9,287.73	9,044.49	9,019.98	33.17	11.56	77.18	190.87	1,024.52	1,041.88	1,001.97	39.90	26.109		
9,600.00	9,294.39	9,062.97	9,034.12	33.27	11.58	75.03	180.76	1,030.81	1,048.55	1,008.42	40.13	26.128		
9,649.26	9,296.70	9,080.85	9,047.34	33.37	11.59	72.95	170.54	1,037.15	1,055.84	1,015.47	40.37	26.154		
9,700.00	9,296.91	9,100.00	9,061.00	33.49	11.61	70.91	159.14	1,044.23	1,065.05	1,024.41	40.64	26.210		
9,800.00	9,297.31	9,141.14	9,088.45	33.80	11.65	67.29	133.13	1,060.39	1,090.55	1,049.33	41.22	26.458		
9,900.00	9,297.72	9,188.41	9,116.60	34.17	11.71	64.34	100.89	1,080.42	1,124.84	1,083.00	41.85	26.881		
10,000.00	9,298.12	9,241.66	9,143.65	34.62	11.77	62.06	61.95	1,104.61	1,166.64	1,124.14	42.50	27.452		
10,027.33	9,298.24	9,257.21	9,150.57	34.75	11.79	61.56	50.12	1,111.96	1,179.20	1,136.52	42.68	27.629		
10,100.00	9,298.53	9,300.00	9,167.22	35.13	11.84	60.38	16.66	1,132.75	1,213.88	1,170.71	43.18	28.114		
10,200.00	9,298.93	9,365.67	9,185.75	35.71	11.92	59.27	-36.81	1,165.96	1,263.45	1,219.54	43.91	28.774		
10,300.00	9,299.34	9,434.57	9,195.72	36.35	12.00	58.48	-94.67	1,201.91	1,314.50	1,269.79	44.71	29.400		
10,400.00	9,299.74	10,259.90	9,197.01	37.06	13.71	89.76	-874.33	1,436.00	1,354.42	1,305.72	48.70	27.812		
10,400.45	9,299.74	10,400.45	9,197.01	37.06	14.22	88.44	-843.67	1,435.30	1,354.20	1,304.53	49.66	27.269		
10,500.00	9,300.15	10,354.14	9,197.01	37.83	14.01	89.52	-968.56	1,436.80	1,354.67	1,304.59	50.08	27.052		
10,600.00	9,300.55	10,454.14	9,197.01	38.65	14.40	89.52	-1,068.56	1,437.64	1,354.92	1,303.38	51.54	26.287		
10,700.00	9,300.96	10,554.14	9,197.01	39.53	14.84	89.52	-1,168.55	1,438.48	1,355.18	1,302.10	53.08	25.533		
10,800.00	9,301.36	10,654.13	9,197.01	40.45	15.34	89.52	-1,268.55	1,439.32	1,355.43	1,300.76	54.67	24.794		
10,900.00	9,301.76	10,754.13	9,197.01	41.42	15.89	89.52	-1,368.55	1,440.15	1,355.69	1,299.37	56.32	24.073		
11,000.00	9,302.17	10,854.13	9,197.01	42.44	16.46	89.52	-1,468.54	1,440.99	1,355.94	1,297.92	58.01	23.372		
11,100.00	9,302.57	10,954.13	9,197.01	43.49	17.07	89.52	-1,568.54	1,441.83	1,356.19	1,296.43	59.76	22.694		
11,200.00	9,302.98	11,054.13	9,197.01	44.58	17.70	89.52	-1,668.53	1,442.66	1,356.45	1,294.90	61.55	22.039		
11,300.00	9,303.38	11,154.13	9,197.01	45.71	18.34	89.52	-1,768.53	1,443.50	1,356.70	1,293.33	63.38	21.407		
11,400.00	9,303.79	11,254.13	9,197.01	46.86	19.01	89.52	-1,868.52	1,444.34	1,356.96	1,291.72	65.24	20.799		
11,500.00	9,304.19	11,354.13	9,197.01	48.05	19.68	89.52	-1,968.52	1,445.18	1,357.21	1,290.07	67.14	20.215		
11,600.00	9,304.60	11,454.13	9,197.01	49.26	20.36	89.52	-2,068.51	1,446.01	1,357.47	1,288.40	69.07	19.654		
11,700.00	9,305.00	11,554.13	9,197.01	50.50	21.05	89.52	-2,168.51	1,446.85	1,357.72	1,286.69	71.03	19.115		
11,800.00	9,305.40	11,654.12	9,197.01	51.76	21.75	89.52	-2,268.50	1,447.69	1,357.97	1,284.96	73.01	18.599		
11,900.00	9,305.81	11,754.12	9,197.01	53.05	22.45	89.52	-2,368.50	1,448.53	1,358.23	1,283.21	75.02	18.104		
12,000.00	9,306.21	11,854.12	9,197.01	54.35	23.16	89.52	-2,468.50	1,449.36	1,358.48	1,281.43	77.05	17.630		
12,100.00	9,306.62	11,954.12	9,197.01	55.67	23.88	89.52	-2,568.49	1,450.20	1,358.74	1,279.63	79.11	17.176		
12,200.00	9,307.02	12,054.12	9,197.01	57.01	24.59	89.52	-2,668.49	1,451.04	1,359.00	1,277.81	81.18	16.740		
12,300.00	9,307.43	12,154.12	9,197.01	58.37	25.32	89.52	-2,768.48	1,451.87	1,359.25	1,275.98	83.27	16.323		
12,400.00	9,307.83	12,254.12	9,197.01	59.74	26.04	89.52	-2,868.48	1,452.71	1,359.51	1,274.13	85.38	15.923		
12,500.00	9,308.23	12,354.12	9,197.01	61.13	26.77	89.52	-2,968.47	1,453.55	1,359.76	1,272.26	87.50	15.539		
12,600.00	9,308.64	12,454.12	9,197.01	62.53	27.50	89.52	-3,068.47	1,454.39	1,360.02	1,270.37	89.64	15.172		
12,700.00	9,309.04	12,554.11	9,197.01	63.94	28.23	89.52	-3,168.46	1,455.22	1,360.27	1,268.48	91.80	14.819		
12,800.00	9,309.45	12,654.11	9,197.01	65.36	28.97	89.52	-3,268.46	1,456.06	1,360.53	1,266.57	93.96	14.480		
12,900.00	9,309.85	12,754.11	9,197.01	66.80	29.70	89.52	-3,368.45	1,456.90	1,360.79	1,264.65	96.14	14.155		
13,000.00	9,310.26	12,854.11	9,197.01	68.24	30.44	89.52	-3,468.45	1,457.74	1,361.04	1,262.72	98.33	13.842		
13,100.00	9,310.66	12,954.11	9,197.01	69.69	31.18	89.52	-3,568.45	1,458.57	1,361.30	1,260.77	100.52	13.542		
13,200.00	9,311.07	13,054.11	9,197.01	71.16	31.92	89.52	-3,668.44	1,459.41	1,361.55	1,258.82	102.73	13.253		
13,300.00	9,311.47	13,154.11	9,197.01	72.63	32.67	89.52	-3,768.44	1,460.25	1,361.81	1,256.86	104.95	12.976		
13,400.00	9,311.87	13,254.11	9,197.01	74.11	33.41	89.52	-3,868.43	1,461.08	1,362.07	1,254.89	107.18	12.709		
13,500.00	9,312.28	13,354.11	9,197.01	75.59	34.15	89.52	-3,968.43	1,461.92	1,362.32	1,252.91	109.41	12.452		
13,600.00	9,312.68	13,454.11	9,197.01	77.09	34.90	89.52	-4,068.42	1,462.76	1,362.58	1,250.93	111.65	12.204		
13,700.00	9,313.09	13,554.10	9,197.01	78.59	35.65	89.52	-4,168.42	1,463.60	1,362.84	1,248.94	113.90	11.965		
13,800.00	9,313.49	13,654.10	9,197.01	80.09	36.40	89.52	-4,268.41	1,464.43	1,363.09	1,246.94	116.16	11.735		



MS Energy Services Anticollision Report



Company: Devon Energy
Project: Eddy County, New Mexico (NAD 83)
Reference Site: Cotton Draw Unit
Site Error: 0.00 usft
Reference Well: 515H
Well Error: 0.00 usft
Reference Wellbore: Wellbore #1
Reference Design: Design #1

Local Co-ordinate Reference: Well 515H
TVD Reference: Well @ 3566.10usft (Cactus 126)
MD Reference: Well @ 3566.10usft (Cactus 126)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: 5000.1 Conroe DB
Offset TVD Reference: Offset Datum

Offset Design Windward Federal - #6H - Wellbore #1 - Design #1													Offset Site Error:	0.00 usft
Survey Program: 0-, 8720-													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Azimuth from North (°)	Offset Wellbore Centre		Distance		Minimum Separation (usft)	Separation Factor	Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)				
13,900.00	9,313.90	13,754.10	9,197.01	81.60	37.15	89.52	-4,368.41	1,465.27	1,363.35	1,244.93	118.42	11.513		
14,000.00	9,314.30	13,854.10	9,197.01	83.12	37.90	89.52	-4,468.40	1,466.11	1,363.61	1,242.92	120.69	11.299		
14,100.00	9,314.71	13,954.10	9,197.01	84.64	38.65	89.52	-4,568.40	1,466.95	1,363.87	1,240.91	122.96	11.092		
14,200.00	9,315.11	14,054.10	9,197.01	86.17	39.40	89.52	-4,668.39	1,467.78	1,364.12	1,238.88	125.24	10.892		
14,300.00	9,315.51	14,154.10	9,197.01	87.70	40.15	89.52	-4,768.39	1,468.62	1,364.38	1,236.86	127.53	10.699		
14,400.00	9,315.92	14,254.10	9,197.01	89.24	40.90	89.52	-4,868.39	1,469.46	1,364.64	1,234.82	129.81	10.512		
14,500.00	9,316.32	14,354.10	9,197.01	90.78	41.66	89.52	-4,968.38	1,470.30	1,364.90	1,232.79	132.11	10.332		
14,600.00	9,316.73	14,454.09	9,197.01	92.33	42.41	89.52	-5,068.38	1,471.13	1,365.15	1,230.75	134.41	10.157		
14,700.00	9,317.13	14,570.03	9,197.01	93.88	43.29	90.19	-5,184.31	1,471.91	1,365.31	1,228.55	136.76	9.983		
14,800.00	9,317.54	14,668.95	9,197.00	95.43	44.03	90.15	-5,283.23	1,471.65	1,364.48	1,225.42	139.06	9.812		
14,900.00	9,317.94	14,768.95	9,197.00	96.99	44.78	90.15	-5,383.22	1,471.40	1,363.65	1,222.28	141.37	9.646		
15,000.00	9,318.34	14,868.94	9,197.00	98.55	45.54	90.15	-5,483.22	1,471.14	1,362.82	1,219.14	143.68	9.485		
15,100.00	9,318.75	14,968.94	9,197.00	100.11	46.29	90.15	-5,583.21	1,470.89	1,361.99	1,216.00	145.99	9.329		
15,200.00	9,319.15	15,068.93	9,197.00	101.68	47.04	90.15	-5,683.21	1,470.63	1,361.16	1,212.85	148.31	9.178		
15,300.00	9,319.56	15,168.93	9,197.00	103.24	47.80	90.15	-5,783.20	1,470.38	1,360.33	1,209.70	150.63	9.031		
15,400.00	9,319.96	15,268.92	9,197.00	104.82	48.55	90.15	-5,883.20	1,470.12	1,359.50	1,206.54	152.96	8.888		
15,500.00	9,320.37	15,368.92	9,197.00	106.39	49.31	90.15	-5,983.19	1,469.87	1,358.67	1,203.39	155.28	8.750		
15,600.00	9,320.77	15,468.91	9,197.00	107.97	50.06	90.15	-6,083.19	1,469.61	1,357.84	1,200.23	157.61	8.615		
15,700.00	9,321.18	15,568.91	9,197.00	109.55	50.82	90.15	-6,183.18	1,469.36	1,357.01	1,197.07	159.94	8.484		
15,800.00	9,321.58	15,668.90	9,197.00	111.13	51.58	90.15	-6,283.18	1,469.10	1,356.19	1,193.91	162.28	8.357		
15,900.00	9,321.98	15,768.90	9,197.00	112.71	52.33	90.15	-6,383.17	1,468.85	1,355.36	1,190.74	164.62	8.233		
16,000.00	9,322.39	15,868.90	9,197.00	114.30	53.09	90.15	-6,483.17	1,468.59	1,354.53	1,187.57	166.95	8.113		
16,100.00	9,322.79	15,968.89	9,197.00	115.88	53.85	90.15	-6,583.17	1,468.34	1,353.70	1,184.41	169.30	7.996		
16,200.00	9,323.20	16,068.89	9,197.00	117.47	54.61	90.15	-6,683.16	1,468.08	1,352.87	1,181.23	171.64	7.882		
16,300.00	9,323.60	16,168.88	9,197.00	119.07	55.36	90.15	-6,783.16	1,467.83	1,352.05	1,178.06	173.98	7.771		
16,400.00	9,324.01	16,268.88	9,197.00	120.66	56.12	90.15	-6,883.15	1,467.57	1,351.22	1,174.89	176.33	7.663		
16,500.00	9,324.41	16,368.87	9,197.00	122.25	56.88	90.15	-6,983.15	1,467.32	1,350.39	1,171.71	178.68	7.558		
16,600.00	9,324.82	16,468.87	9,197.00	123.85	57.64	90.15	-7,083.14	1,467.06	1,349.56	1,168.53	181.03	7.455		
16,700.00	9,325.22	16,568.86	9,197.00	125.45	58.40	90.15	-7,183.14	1,466.80	1,348.74	1,165.36	183.38	7.355		
16,800.00	9,325.62	16,668.86	9,197.00	127.05	59.16	90.15	-7,283.13	1,466.55	1,347.91	1,162.17	185.73	7.257		
16,900.00	9,326.03	16,768.85	9,197.00	128.65	59.92	90.15	-7,383.13	1,466.29	1,347.08	1,158.99	188.09	7.162		
17,000.00	9,326.43	16,868.85	9,197.00	130.25	60.68	90.15	-7,483.12	1,466.04	1,346.26	1,155.81	190.45	7.069		
17,100.00	9,326.84	16,968.84	9,197.00	131.86	61.44	90.15	-7,583.12	1,465.78	1,345.43	1,152.63	192.80	6.978		
17,200.00	9,327.24	17,068.84	9,197.00	133.46	62.20	90.15	-7,683.11	1,465.53	1,344.60	1,149.44	195.16	6.890		
17,300.00	9,327.65	17,168.84	9,197.00	135.07	62.96	90.15	-7,783.11	1,465.27	1,343.78	1,146.25	197.52	6.803		
17,400.00	9,328.05	17,268.83	9,197.00	136.68	63.72	90.15	-7,883.10	1,465.02	1,342.95	1,143.07	199.89	6.719		
17,500.00	9,328.45	17,368.83	9,197.00	138.29	64.48	90.15	-7,983.10	1,464.76	1,342.13	1,139.88	202.25	6.636		
17,600.00	9,328.86	17,468.82	9,197.00	139.90	65.24	90.15	-8,083.09	1,464.51	1,341.30	1,136.69	204.61	6.555		
17,700.00	9,329.26	17,568.82	9,197.00	141.51	66.00	90.15	-8,183.09	1,464.25	1,340.48	1,133.50	206.98	6.476		
17,800.00	9,329.67	17,668.81	9,197.00	143.12	66.76	90.15	-8,283.08	1,464.00	1,339.65	1,130.31	209.34	6.399		
17,900.00	9,330.07	17,768.81	9,197.00	144.73	67.52	90.15	-8,383.08	1,463.74	1,338.82	1,127.11	211.71	6.324		
18,000.00	9,330.48	17,868.80	9,197.00	146.35	68.28	90.15	-8,483.07	1,463.49	1,338.00	1,123.92	214.08	6.250		
18,100.00	9,330.88	17,968.80	9,197.00	147.96	69.04	90.15	-8,583.07	1,463.23	1,337.18	1,120.73	216.45	6.178		
18,200.00	9,331.29	18,068.79	9,197.00	149.58	69.81	90.15	-8,683.06	1,462.98	1,336.35	1,117.53	218.82	6.107		
8,300.00	9,331.69	18,168.79	9,197.00	151.20	70.57	90.15	-8,783.06	1,462.72	1,335.53	1,114.34	221.19	6.038		
8,400.00	9,332.09	18,268.79	9,197.00	152.81	71.33	90.15	-8,883.05	1,462.47	1,334.70	1,111.14	223.56	5.970		
3,500.00	9,332.50	18,368.78	9,197.00	154.43	72.09	90.15	-8,983.05	1,462.21	1,333.88	1,107.94	225.94	5.904		
3,600.00	9,332.90	18,468.78	9,197.00	156.05	72.85	90.15	-9,083.04	1,461.95	1,333.06	1,104.75	228.31	5.839		
1,700.00	9,333.31	18,568.77	9,197.00	157.67	73.62	90.15	-9,183.04	1,461.70	1,332.23	1,101.55	230.68	5.775		
1,800.00	9,333.71	18,668.77	9,197.00	159.30	74.38	90.15	-9,283.03	1,461.44	1,331.41	1,098.35	233.06	5.713		
1,900.00	9,334.12	18,768.76	9,197.00	160.92	75.14	90.15	-9,383.03	1,461.19	1,330.59	1,095.15	235.43	5.652		
000.00	9,334.52	18,868.76	9,197.00	162.54	75.90	90.15	-9,483.02	1,460.93	1,329.76	1,091.95	237.81	5.592		

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



MS Energy Services
Anticollision Report



Company: Devon Energy
Project: Eddy County, New Mexico (NAD 83)
Reference Site: Cotton Draw Unit
Site Error: 0.00 usft
Reference Well: 515H
Well Error: 0.00 usft
Reference Wellbore: Wellbore #1
Reference Design: Design #1

Local Co-ordinate Reference: Well 515H
TVD Reference: Well @ 3566.10usft (Cactus 126)
MD Reference: Well @ 3566.10usft (Cactus 126)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at: 2.00 sigma
Database: 5000.1 Conroe DB
Offset TVD Reference: Offset Datum

Offset Design Windward Federal - #6H - Wellbore #1 - Design #1													Offset Site Error:	0.00 usft
Survey Program: 0-, 8720-Reference													Offset Well Error:	0.00 usft
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Semi Major Axis		Azimuth from North (°)	Offset Wellbore Centre		Distance		Minimum Separation (usft)	Separation Factor	Warning	
				Reference (usft)	Offset (usft)		+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)				
19,100.00	9,334.93	18,968.75	9,197.00	164.16	76.66	90.15	-9,583.02	1,460.68	1,328.94	1,088.75	240.19	5.533		
19,200.00	9,335.33	19,068.75	9,197.00	165.79	77.43	90.15	-9,683.01	1,460.42	1,328.12	1,085.55	242.56	5.475		
19,300.00	9,335.73	19,168.74	9,197.00	167.41	78.19	90.15	-9,783.01	1,460.17	1,327.29	1,082.35	244.94	5.419		
19,363.04	9,335.99	19,220.87	9,197.00	168.44	78.59	89.67	-9,835.14	1,460.03	1,326.82	1,080.41	246.41	5.385		
19,390.56	9,336.10	19,220.87	9,197.00	168.88	78.59	88.48	-9,835.14	1,460.03	1,327.11	1,080.19	246.91	5.375 SF		



MS Energy Services

Anticollision Report



Company: Devon Energy
Project: Eddy County, New Mexico (NAD 83)
Reference Site: Cotton Draw Unit
Site Error: 0.00 usft
Reference Well: 515H
Well Error: 0.00 usft
Reference Wellbore: Wellbore #1
Reference Design: Design #1

Local Co-ordinate Reference: Well 515H
TVD Reference: Well @ 3566.10usft (Cactus 126)
MD Reference: Well @ 3566.10usft (Cactus 126)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: 5000.1 Conroe DB
Offset TVD Reference: Offset Datum

Reference Depths are relative to Well @ 3566.10usft (Cactus 126)

Offset Depths are relative to Offset Datum

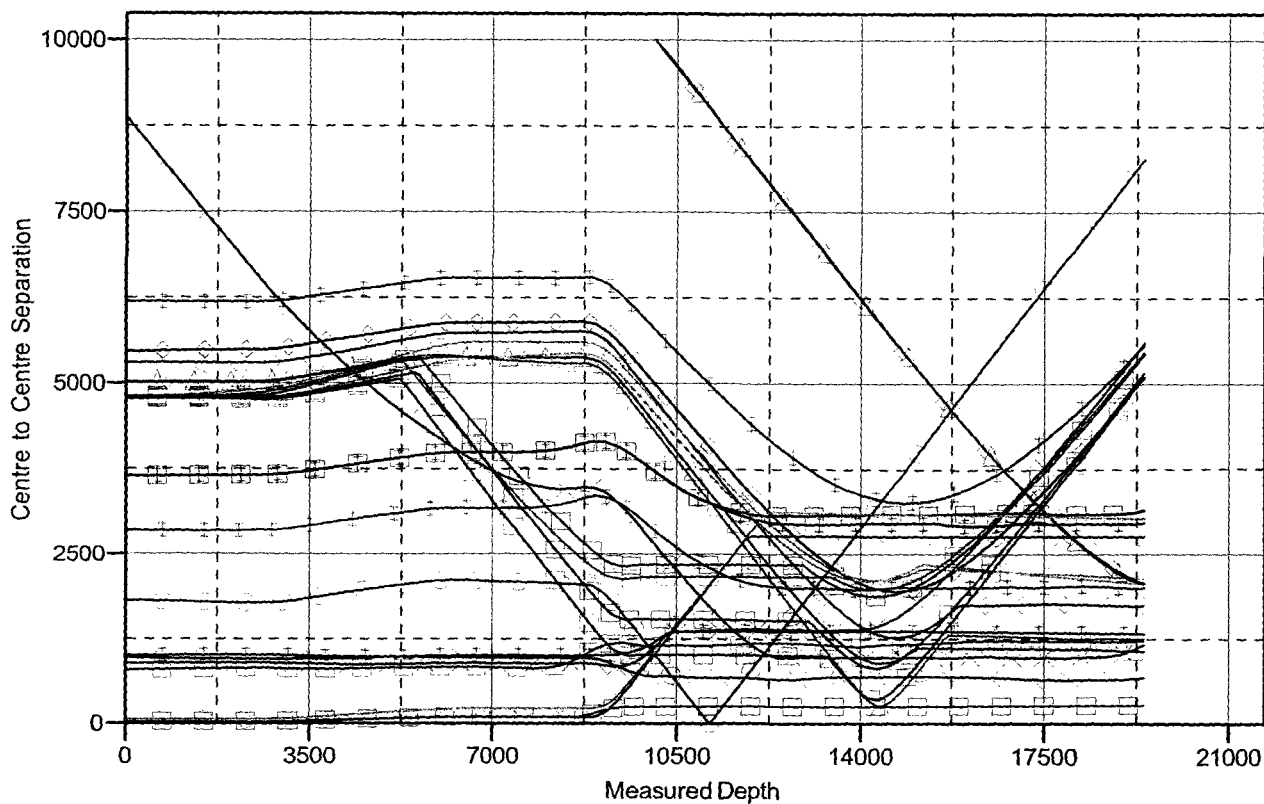
Central Meridian is 104° 20' 0.000 W

Coordinates are relative to: 515H

Coordinate System is US State Plane 1983, New Mexico Eastern Zone

Grid Convergence at Surface is: 0.32°

Ladder Plot



LEGEND

#99, Wellbore #1, Surveys V0	511H, Wellbore #1, Surveys V0	230H, Wellbore #1, Surveys V0
#1H, Wellbore #1, Surveys V0	167H, Wellbore #1, Surveys V0	231H, Wellbore #1, Design #2 V0
#5H, Wellbore #1, Surveys V0	167H, Wellbore #2, Surveys V0	242H, Wellbore #1, Surveys V0
#1H, Wellbore #1, Surveys V0	294H, Wellbore #1, Design #2 V0	517H, Wellbore #1, Design #1 V0
#6H, Wellbore #1, Design #1 V0	172H, Wellbore #1, Surveys V0	111H, Wellbore #1, Surveys V0
#1H, Wellbore #1, Surveys V0	292H, Wellbore #1, Surveys V0	516H, Wellbore #1, Design #1 V0
#2, Wellbore #1, Surveys V0	162H, Wellbore #1, Surveys V0	513H, Wellbore #1, Design #2 V0
116H, Wellbore #1, Surveys V0	514H, Wellbore #1, Design #1 V0	
512H, Wellbore #1, Design #2 V0	293H, Wellbore #1, Design #2 V0	

devon

MS Energy Services Anticollision Report

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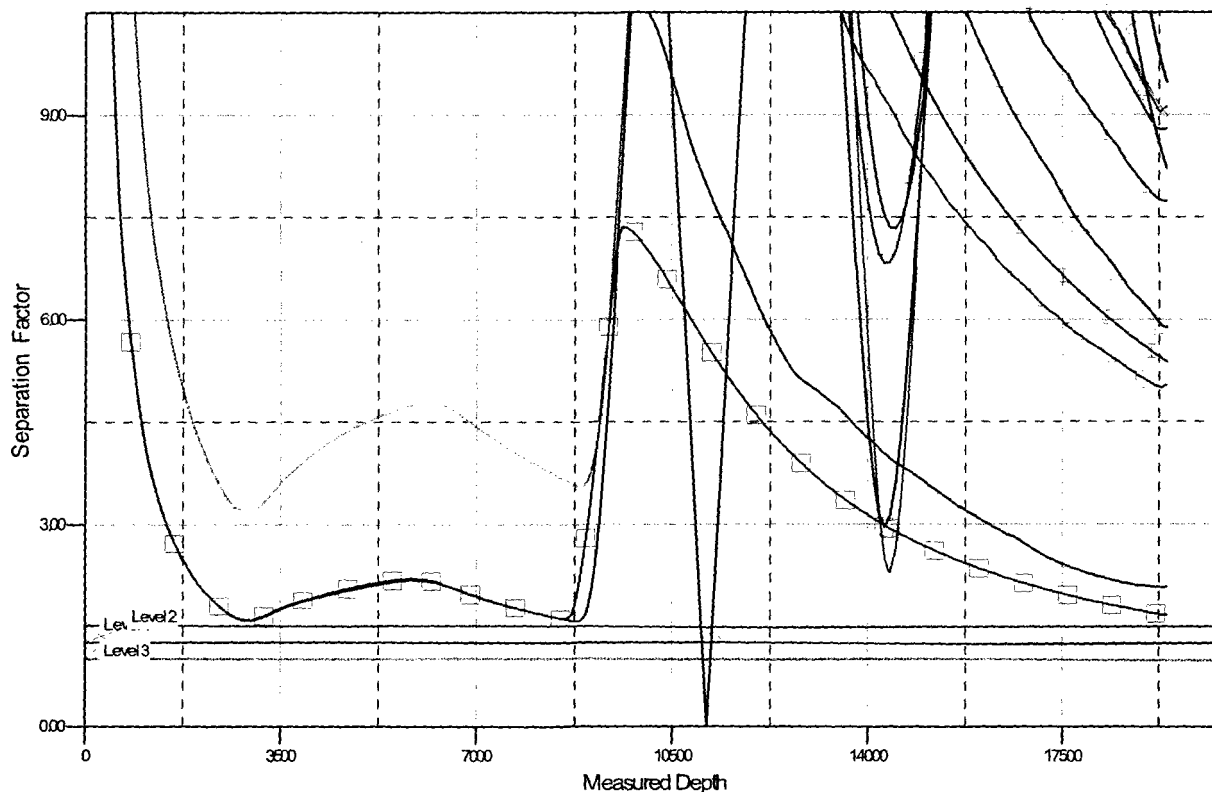
Company: Devon Energy
Project: Eddy County, New Mexico (NAD 83)
Reference Site: Cotton Draw Unit
Site Error: 0.00 usft
Reference Well: 515H
Well Error: 0.00 usft
Reference Wellbore: Wellbore #1
Reference Design: Design #1

Local Co-ordinate Reference: Well 515H
TVD Reference: Well @ 3566.10usft (Cactus 126)
MD Reference: Well @ 3566.10usft (Cactus 126)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: 5000.1 Conroe DB
Offset TVD Reference: Offset Datum

Reference Depths are relative to Well @ 3566.10usft (Cactus 126)
Offset Depths are relative to Offset Datum
Central Meridian is 104° 20' 0.000 W

Coordinates are relative to: 515H
Coordinate System is US State Plane 1983, New Mexico Eastern Zone
Grid Convergence at Surface is: 0.32°

Separation Factor Plot



LEGEND

- | | | |
|---------------------------------|---------------------------------|---------------------------------|
| #99, Wellbore #1, Surveys V0 | 511H, Wellbore #1, Surveys V0 | 290H, Wellbore #1, Surveys V0 |
| #11H, Wellbore #1, Surveys V0 | 167H, Wellbore #1, Surveys V0 | 291H, Wellbore #1, Design #2 V0 |
| #5H, Wellbore #1, Surveys V0 | 167H, Wellbore #2, Surveys V0 | 242H, Wellbore #1, Surveys V0 |
| #11H, Wellbore #1, Surveys V0 | 294H, Wellbore #1, Design #2 V0 | 517H, Wellbore #1, Design #1 V0 |
| #6H, Wellbore #1, Design #1 V0 | 172H, Wellbore #1, Surveys V0 | 111H, Wellbore #1, Surveys V0 |
| #1H, Wellbore #1, Surveys V0 | 292H, Wellbore #1, Surveys V0 | 518H, Wellbore #1, Design #1 V0 |
| #2, Wellbore #1, Surveys V0 | 182H, Wellbore #1, Surveys V0 | 513H, Wellbore #1, Design #2 V0 |
| 516H, Wellbore #1, Surveys V0 | 514H, Wellbore #1, Design #1 V0 | |
| 512H, Wellbore #1, Design #2 V0 | 293H, Wellbore #1, Design #2 V0 | |

Devon Energy Prod. Co., L.P./Cotton Draw Unit 515H

1. Geologic Formations

TVD of target	9,336	Pilot hole depth	
MD at TD:	19,390	Deepest expected fresh water:	400

Basin

[illegible]

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

2. Casing Program

Hole Size	Casing Interval		Csg. Size	Weight (lbs)	Grade	Conn.	SF Collapse	SF Burst	SF Tension
	From	To							
17.5"	0	725'	13.375"	48	H-40	STC	1.74	2.45	4.13
12.25"	0	4,350'	9.625"	40	J-55	LTC	1.19	1.42	3.98
8.75"	0	19,390'	5.5"	17	P110	BTC	2.18	2.7	3.21
				BLM Minimum Safety Factor			1.125	1	1.6 Dry 1.8 Wet

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

Must have table for contingency casing

	Y or N
Is casing new? If used, attach certification as required in Onshore Order #1	Y

Devon Energy Prod. Co., L.P./Cotton Draw Unit 515H

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?	
Is well located within Capitan Reef?	
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?	
If yes, are the first 2 strings cemented to surface and 3 rd string cement tied back 500' into previous casing?	
Is well located in R-111-P and SOPA?	
If yes, are the first three strings cemented to surface?	
Is 2 nd string set 100' to 600' below the base of salt?	
Is well located in high Cave/Karst?	
If yes, are there two strings cemented to surface?	
(For 2 string wells) If yes, is there a contingency casing if lost circulation occurs?	
Is well located in critical Cave/Karst?	
If yes, are there three strings cemented to surface?	

Devon Energy Prod. Co., L.P./Cotton Draw Unit 515H

3. Cementing Program

Casing	# Sk	Wt. lb/ gal	H ₂ O gal/sk	Yld ft ³ / sack	500# Comp. Strength (hours)	Slurry Description
13-3/8" Surface	755	14.8	6.34	1.34	6	Tail: Class C Cement + 1% Calcium Chloride
9-5/8" Inter.	737	12.9	9.81	1.85	14	Lead: (65:35) Class C Cement: Poz (Fly Ash): 6% BWOC Bentonite + 5% BWOW Sodium Chloride + 0.125 lbs/sack Poly-E-Flake
	306	14.8	6.32	1.33	6	Tail: Class C Cement + 0.125 lbs/sack Poly-E-Flake
5-1/2" Prod	487	9	13.5	3.27	21	Lead: Tuned Light® Cement
	2680	14.5	5.31	1.2	25	Tail: (50:50) Class H Cement: Poz (Fly Ash) + 0.5% bwoc HALAD-344 + 0.4% bwoc CFR-3 + 0.2% BWOC HR-601 + 2% bwoc Bentonite

Casing String	TOC	% Excess
13-3/8" Surface	0'	50%
9-5/8" Intermediate	0'	30%
5-1/2" Production Casing	4150'	25%

Devon Energy Prod. Co., L.P./Cotton Draw Unit 515H

4. Pressure Control Equipment

	A variance is requested for the use of a diverter on the surface casing. See attached for schematic.
--	--

BOP installed and tested before drilling which hole?	Size?	Min. Required WP	Type	✓	Tested to:
12-1/4"	13-5/8"	3M	Annular	x	50% of working pressure
			Blind Ram		3M
			Pipe Ram		
			Double Ram		
			Other*		
8-3/4"	13-5/8"	3M	Annular	x	50% testing pressure
			Blind Ram	x	3M
			Pipe Ram	x	
			Double Ram		
			Other*		
			Annular		
			Blind Ram		
			Pipe Ram		
			Double Ram		
			Other*		

*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.

X	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.
---	---

Devon Energy Prod. Co., L.P./Cotton Draw Unit 515H

A variance is requested for the use of a flexible choke line from the BOP to Choke Manifold. See attached for specs and hydrostatic test chart.	
Y /N	Are anchors required by manufacturer?
A multibowl wellhead is being used. The BOP will be tested per Onshore Order #2 after installation on the surface casing which will cover testing requirements for a maximum of 30 days. If any seal subject to test pressure is broken the system must be tested. • Provide description here See attached schematic.	

5. Mud Program

Depth		Type	Weight (ppg)	Viscosity	Water Loss
From	To				
0	725	FW Gel	8.6-8.8	28-34	N/C
725	4350	Saturated Brine	10.0-10.2	28-34	N/C
4350	19390	Cut Brine	8.5-9.3	28-34	N/C

Sufficient mud materials to maintain mud properties and meet minimum lost circulation and weight increase requirements will be kept on location at all times.

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

6. Logging and Testing Procedures

Logging, Coring and Testing	
x	Will run GR/CNL 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.
	Drill stem test? If yes, explain
	Coring? If yes, explain

Additional logs planned		Interval
	Resistivity	Int. shoe to KOP
	Density	Int. shoe to KOP
x	CBL	Production casing
X	Mud log	Intermediate shoe to TD
	PEX	

Devon Energy Prod. Co., L.P./Cotton Draw Unit 515H

7. Drilling Conditions

Condition	Specify what type and where?
BH Pressure at deepest TVD	4514 psi
Abnormal Temperature	Yes/No

Mitigation measure for abnormal conditions. Describe. Lost circulation material/sweeps/mud scavengers.

Hydrogen Sulfide (H ₂ S) monitors will be installed prior to drilling out the surface shoe. If H ₂ S 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.	
	H ₂ S is present
	H ₂ S Plan attached

8. Other facets of operation

Is this a walking operation? If yes, describe.
Will be pre-setting casing? If yes, describe.

Attachments

___ Directional Plan
___ Other, describe

A multibowl wellhead may be used. The BOP will be tested per Onshore Order #2 after installation on the surface casing which will cover testing requirements for a maximum of 30 days. If any seal subject to test pressure is broken the system must be tested.

Devon proposes using a multi-bowl wellhead assembly. This assembly will only be tested when installed on the surface casing. Minimum working pressure of the blowout preventer (BOP) and related equipment (BOPE) required for drilling below the surface casing shoe shall be 3000 (3M) psi.

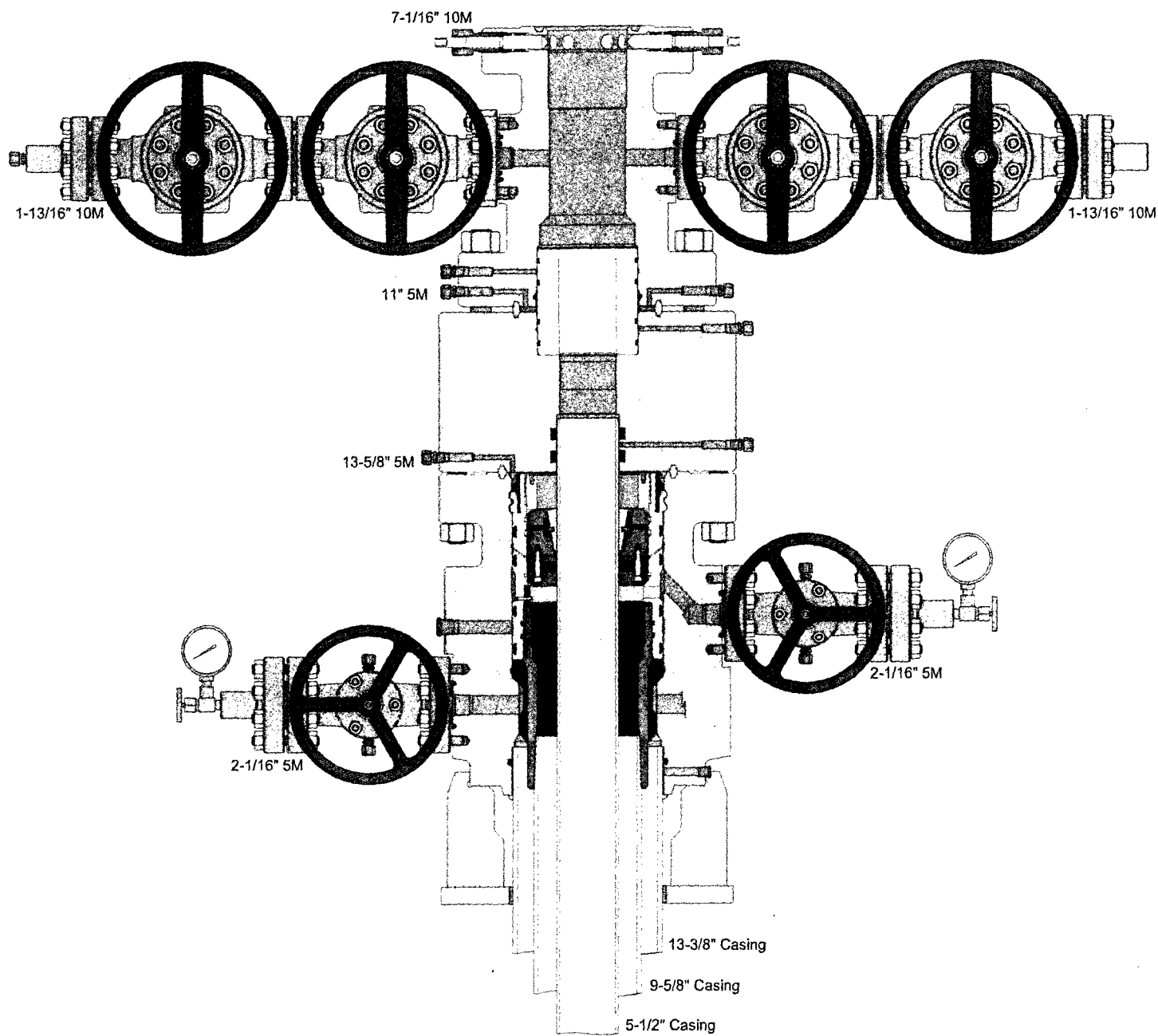
- Wellhead will be installed by wellhead representatives.
- If the welding is performed by a third party, the wellhead representative will monitor the temperature to verify that it does not exceed the maximum temperature of the seal.
- Wellhead representative will install the test plug for the initial BOP test.
- Wellhead company will install a solid steel body pack-off to completely isolate the lower head after cementing intermediate casing. After installation of the pack-off, the pack-off and the lower flange will be tested to 3M, as shown on the attached schematic. Everything above the pack-off will not have been altered whatsoever from the initial nipple up. Therefore the BOP components will not be retested at that time.
- If the cement does not circulate and one inch operations would have been possible with a standard wellhead, the well head will be cut and top out operations will be conducted.
- Devon will pressure test all seals above and below the mandrel (but still above the casing) to full working pressure rating.
- Devon will test the casing to 0.22 psi/ft or 1500 psi, whichever is greater, as per Onshore Order #2.

After running the 13-3/8" surface casing, a 13-5/8" BOP/BOPE system with a minimum rating of 3M will be installed on the wellhead system and will undergo a 250 psi low pressure test followed by a 3,000 psi high pressure test. The 3,000 psi high and 250 psi low test will cover testing requirements a maximum of 30 days, as per Onshore Order #2. If the well is not complete within 30 days of this BOP test, another full BOP test will be conducted, as per Onshore Order #2.

After running the 9-5/8" intermediate casing with a mandrel hanger, the 13-5/8" BOP/BOPE system with a minimum rating of 3M will already be installed on the wellhead.

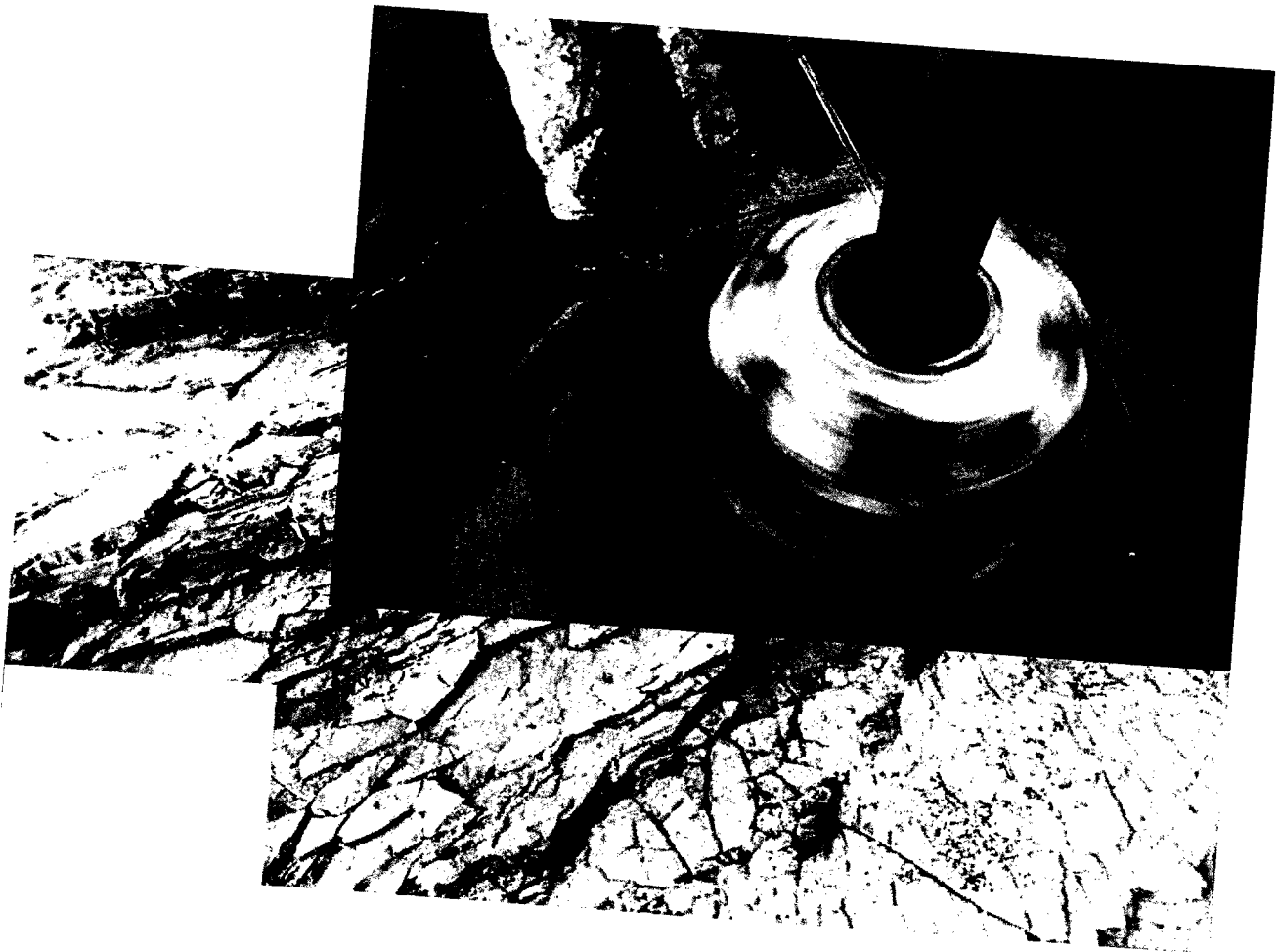
The pipe rams will be operated and checked each 24 hour period and each time the drill pipe is out of the hole. These tests will be logged in the daily driller's log. A 2" kill line and 3" choke line will be incorporated into the drilling spool below the ram BOP. In addition to the rams and annular preventer, additional BOP accessories include a kelly cock, floor safety valve, choke lines, and choke manifold rated at 3,000 psi WP.

Devon's proposed wellhead manufactures will be FMC Technologies, Cactus Wellhead, or Cameron.





Commitment Runs Deep



Design Plan
Operation and Maintenance Plan
Closure Plan

SENM - Closed Loop Systems
June 2010

I. Design Plan

Devon uses MI SWACO closed loop system (CLS). The MI SWACO CLS is designed to maintain drill solids at or below 5%. The equipment is arranged to progressively remove solids from the largest to the smallest size. Drilling fluids can thus be reused and savings is realized on mud and disposal costs. Dewatering may be required with the centrifuges to insure removal of ultra fine solids.

The drilling location is constructed to allow storm water to flow to a central sump normally the cellar. This insures no contamination leaves the drilling pad in the event of a spill. Storm water is reused in the mud system or stored in a reserve fluid tank farm until it can be reused. All lubricants, oils, or chemicals are removed immediately from the ground to prevent the contamination of storm water. An oil trap is normally installed on the sump if an oil spill occurs during a storm.

A tank farm is utilized to store drilling fluids including fresh water and brine fluids. The tank farm is constructed on a 20 ml plastic lined, bermed pad to prevent the contamination of the drilling site during a spill. Fluids from other sites may be stored in these tanks for processing by the solids control equipment and reused in the mud system. At the end of the well the fluids are transported from the tank farm to an adjoining well or to the next well for the rig.

Prior to installing a closed-loop system on site, the topsoil, if present, will be stripped and stockpiled for use as the final cover or fill at the time of closure.

Signs will be posted on the fence surrounding the closed-loop system unless the closed-loop system is located on a site where there is an existing well, that is operated by Devon.

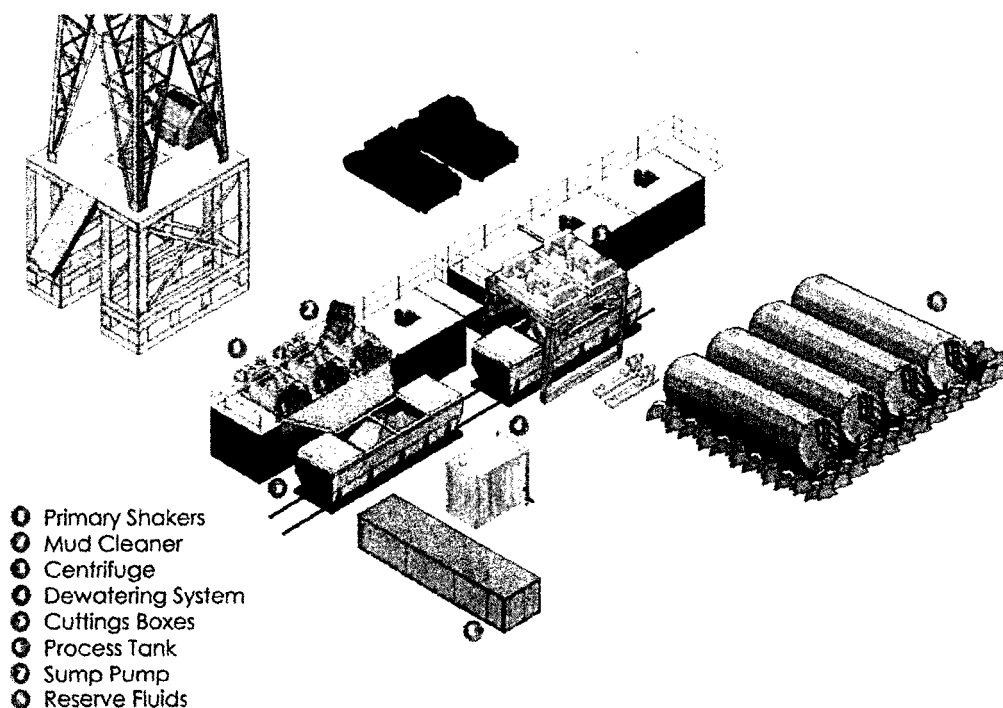
II. Operations and Maintenance Plan

Primary Shakers: The primary shakers make the first removal of drill solids from the drilling mud as it leaves the well bore. The shakers are sized to handle maximum drilling rate at optimal screen size. The shakers normally remove solids down to 74 microns.

Mud Cleaner: The Mud Cleaner cleans the fluid after it leaves the shakers. A set of hydrocyclones are sized to handle 1.25 to 1.5 times the maximum circulating rate. This ensures all the fluid is being processed to an average cut point of 25 microns. The wet discharged is dewatered on a shaker equipped with ultra fine mesh screens and generally cut at 40 microns.

devon

Closed Loop Schematic



Mi SWACO

Centrifuges: The centrifuges can be one or two in number depending on the well geometry or depth of well. The centrifuges are sized to maintain low gravity solids at 5% or below. They may or may not need a dewatering system to enhance the removal rates. The centrifuges can make a cut point of 8-10 microns depending on bowl speed, feed rate, solids loading and other factors.

The centrifuge system is designed to work on the active system and be flexible to process incoming fluids from other locations. This set-up is also dependant on well factors.

Dewatering System: The dewatering system is a chemical mixing and dosing system designed to enhance the solids removal of the centrifuge. Not commonly used in shallow wells. It may contain pH adjustment, coagulant mixing and dosing, and polymer mixing and dosing. Chemical flocculation binds ultra fine solids into a mass that is within the centrifuge operating design. The

dewatering system improves the centrifuge cut point to infinity or allows for the return of clear water or brine fluid. This ability allows for the ultimate control of low gravity solids.

Cuttings Boxes: Cuttings boxes are utilized to capture drill solids that are discarded from the solids control equipment. These boxes are set upon a rail system that allows for the removal and replacement of a full box of cuttings with an empty one. They are equipped with a cover that insures no product is spilled into the environment during the transportation phase.

Process Tank: (Optional) The process tank allows for the holding and process of fluids that are being transferred into the mud system. Additionally, during times of lost circulation the process tank may hold active fluids that are removed for additional treatment. It can further be used as a mixing tank during well control conditions.

Sump and Sump Pump: The sump is used to collect storm water and the pump is used to transfer this fluid to the active system or to the tank for to hold in reserve. It can also be used to collect fluids that may escape during spills. The location contains drainage ditches that allow the location fluids to drain to the sump.

Reserve Fluids (Tank Farm): A series of frac tanks are used to replace the reserve pit. These are steel tanks that are equipped with a manifold system and a transfer pump. These tanks can contain any number of fluids used during the drilling process. These can include fresh water, cut brine, and saturated salt fluid. The fluid can be from the active well or reclaimed fluid from other locations. A 20 ml liner and berm system is employed to ensure the fluids do not migrate to the environment during a spill.

If a leak develops, the appropriate division district office will be notified within 48 hours of the discovery and the leak will be addressed. Spill prevention is accomplished by maintaining pump packing, hoses, and pipe fittings to insure no leaks are occurring. During an upset condition the source of the spill is isolated and repaired as soon as it is discovered. Free liquid is removed by a diaphragm pump and returned to the mud system. Loose topsoil may be used to stabilize the spill and the contaminated soil is excavated and placed in the cuttings boxes. After the well is finished and the rig has moved, the entire location is scrapped and testing will be performed to determine if a release has occurred.

All trash is kept in a wire mesh enclosure and removed to an approved landfill when full. All spent motor oils are kept in separate containers and they are removed and sent to an approved recycling center. Any spilled lubricants, pipe

dope, or regulated chemicals are removed from soil and sent to landfills approved for these products.

These operations are monitored by Mi Swaco service technicians. Daily logs are maintained to ensure optimal equipment operation and maintenance. Screen and chemical use is logged to maintain inventory control. Fluid properties are monitored and recorded and drilling mud volumes are accounted for in the mud storage farm. This data is kept for end of well review to insure performance goals are met. Lessons learned are logged and used to help with continuous improvement.

A MI SWACO field supervisor manages from 3-5 wells. They are responsible for training personnel, supervising installations, and inspecting sites for compliance of MI SWACO safety and operational policy.

III. Closure Plan

A maximum 340' X 340' caliche pad is built per well. All of the trucks and steel tanks fit on this pad. All fluid cuttings go to the steel tanks to be hauled by various trucking companies to an agency approved disposal.



Fluid Technology

ContiTech Beattie Corp.
Website: www.contitechbeattie.com

Monday, June 14, 2010

RE: Drilling & Production Hoses
Lifting & Safety Equipment

To Helmerich & Payne,

A Continental Contitech hose assembly can perform as intended and suitable for the application regardless of whether the hose is secured or unsecured in its configuration. As a manufacturer of High Pressure Hose Assemblies for use in Drilling & Production, we do offer the corresponding lifting and safety equipment, this has the added benefit of easing the lifting and handling of each hose assembly whilst affording hose longevity by ensuring correct handling methods and procedures as well as securing the hose in the unlikely event of a failure; but in no way does the lifting and safety equipment affect the performance of the hoses providing the hoses have been handled and installed correctly. It is good practice to use lifting & safety equipment but not mandatory.

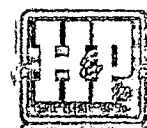
Should you have any questions or require any additional information/clarifications then please do not hesitate to contact us.

ContiTech Beattie is part of the Continental AG Corporation and can offer the full support resources associated with a global organization.

Best regards,

Robin Hodgson
Sales Manager
ContiTech Beattie Corp

ContiTech Beattie Corp,
11535 Brittmoore Park Drive,
Houston, TX 77041
Phone: +1 (832) 327-0141
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RIG 212



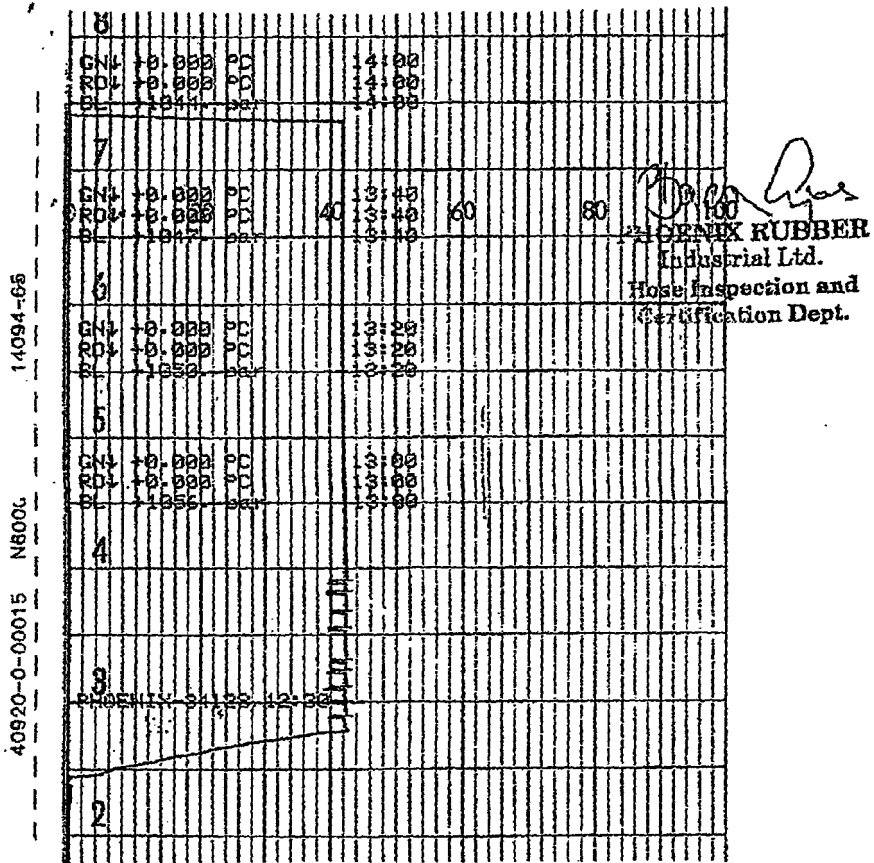
QUALITY DOCUMENT

**PHOENIX RUBBER
INDUSTRIAL LTD.**

 6728 Szeged, Budapest út 10. Hungary • H-6701 Szeged, P. O. Box 152
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 Phone: (361) 456-4200 • Fax: (361) 217-2972, 456-4273 • www.taurusemerge.hu

QUALITY CONTROL INSPECTION AND TEST CERTIFICATE				CERT. N°: 552	
PURCHASER: Phoenix Beattie Co.				P.O. N°: 1519FA-871	
PHOENIX RUBBER order N°: 170466		HOSE TYPE: 3" ID Choke and Kill Hose			
HOSE SERIAL N°: 34128		NOMINAL / ACTUAL LENGTH: 11,43 m			
W.P. 68,96 MPa 10000 psi		T.P. 103,4 MPa 15000 psi		Duration: 60 min.	
Pressure test with water at ambient temperature See attachment. (1 page)					
↑ 10 mm = 10 Min. → 10 mm = 25 MPa					
COUPLINGS					
Type	Serial N°	Quality	Heat N°		
3" coupling with 4 1/16" Flange end	720 719	AISI 4130	C7626		
		AISI 4130	47357		
API Spec 16 C Temperature rate: "B"					
All metal parts are flawless					
WE CERTIFY THAT THE ABOVE HOSE HAS BEEN MANUFACTURED IN ACCORDANCE WITH THE TERMS OF THE ORDER AND PRESSURE TESTED AS ABOVE WITH SATISFACTORY RESULT.					
Date:	Inspector	Quality Control			
29. April. 2002.		PHOENIX RUBBER Industrial Ltd. Hose Inspection and VERIFIED TRUE COPY PHOENIX RUBBER Q.C.			



VERIFIED TRUE CO.
 PHOENIX RUBBER CO.



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

SUPO Data Report

02/08/2018

APD ID: 10400017569

Submission Date: 08/28/2017

Highlighted data
reflects the most
recent changes

Operator Name: DEVON ENERGY PRODUCTION COMPANY LP

Well Name: COTTON DRAW UNIT

Well Number: 515H

[Show Final Text](#)

Well Type: OIL WELL

Well Work Type: Drill

Section 1 - Existing Roads

Will existing roads be used? YES

Existing Road Map:

CDU_515H_Ex_Access_Rd_08-25-2017.pdf

Existing Road Purpose: ACCESS,FLUID TRANSPORT

Row(s) Exist? NO

ROW ID(s)

ID:

Do the existing roads need to be improved? YES

Existing Road Improvement Description: Improve road to accommodate Drilling and Completion operations.

Existing Road Improvement Attachment:

Section 2 - New or Reconstructed Access Roads

Will new roads be needed? YES

New Road Map:

CDU_515H_Access_Rd_08-25-2017.pdf

New road type: COLLECTOR,RESOURCE

Length: 2618

Feet

Width (ft.): 30

Max slope (%): 6

Max grade (%): 4

Army Corp of Engineers (ACOE) permit required? NO

ACOE Permit Number(s):

New road travel width: 30

New road access erosion control: WATER DRAINAGE DITCH

New road access plan or profile prepared? NO

New road access plan attachment:

Access road engineering design? NO

Access road engineering design attachment:

Operator Name: DEVON ENERGY PRODUCTION COMPANY LP

Well Name: COTTON DRAW UNIT

Well Number: 515H

Access surfacing type: GRAVEL

Access topsoil source: ONSITE

Access surfacing type description:

Access onsite topsoil source depth: 6

Offsite topsoil source description:

Onsite topsoil removal process: See attached Interim reclamation diagram.

Access other construction information:

Access miscellaneous information:

Number of access turnouts:

Access turnout map:

Drainage Control

New road drainage crossing: OTHER

Drainage Control comments: N/A

Road Drainage Control Structures (DCS) description: N/A

Road Drainage Control Structures (DCS) attachment:

Access Additional Attachments

Additional Attachment(s):

Section 3 - Location of Existing Wells

Existing Wells Map? YES

Attach Well map:

CDU_515H_1_Mile_Map_07-28-2017.pdf

Existing Wells description:

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

Submit or defer a Proposed Production Facilities plan? DEFER

Estimated Production Facilities description: All Flow lines will be buried going to the Cotton Draw Unit 25 BS CTB 1, located in Sec 25-T24S-R31E.

Section 5 - Location and Types of Water Supply

Water Source Table

Operator Name: DEVON ENERGY PRODUCTION COMPANY LP

Well Name: COTTON DRAW UNIT

Well Number: 515H

Water source use type: STIMULATION

Water source type: RECYCLED

Describe type:

Source latitude:

Source longitude:

Source datum:

Water source permit type: OTHER

Source land ownership: FEDERAL

Water source transport method: PIPELINE,TRUCKING

Source transportation land ownership: FEDERAL

Water source volume (barrels): 170000

Source volume (acre-feet): 21.911827

Source volume (gal): 7140000

Water source and transportation map:

CDU_515H_Wtr_Xfr_Map_08-03-2017.pdf

Water source comments: The attached Water Transfer Map is a proposal only and the final route and documentation will be provided by a Devon contractor prior to installation. When available Devon will always follow existing disturbance.

New water well? NO

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:

Operator Name: DEVON ENERGY PRODUCTION COMPANY LP

Well Name: COTTON DRAW UNIT

Well Number: 515H

Section 6 - Construction Materials

Construction Materials description: Dirt fill and caliche will be used to construct well pad.

Construction Materials source location attachment:

CDU_515H_Caliche_Pit_08-25-2017.pdf

Section 7 - Methods for Handling Waste

Waste type: PRODUCED WATER

Waste content description: Produced water during production operations. This amount is a daily average during the first year of production (BWPD).

Amount of waste: 1000 barrels

Waste disposal frequency : Daily

Safe containment description: N/A

Safe containmant attachment:

Waste disposal type: ON-LEASE INJECTION **Disposal location ownership:** PRIVATE

Disposal type description:

Disposal location description: One of three company owned SWD facilities in the area: CDU 181, CDU 89, CDU 84.

Waste type: FLOWBACK

Waste content description: Produced water during flowback operations. This amount is a daily average during flowback (BWPD).

Amount of waste: 1500 barrels

Waste disposal frequency : Daily

Safe containment description: N/A

Safe containmant attachment:

Waste disposal type: ON-LEASE INJECTION **Disposal location ownership:** PRIVATE

Disposal type description:

Disposal location description: One of three company owned SWD facilities in the area: CDU 181, CDU 89, CDU 84.

Waste type: DRILLING

Waste content description: WATER BASED CUTTINGS

Amount of waste: 1810 barrels

Waste disposal frequency : Daily

Safe containment description: N/A

Safe containmant attachment:

Waste disposal type: HAUL TO COMMERCIAL FACILITY **Disposal location ownership:** COMMERCIAL

Operator Name: DEVON ENERGY PRODUCTION COMPANY LP

Well Name: COTTON DRAW UNIT

Well Number: 515H

Disposal type description:

Disposal location description: All cuttings will disposed of at R360, Sundance, or equivalent.

Waste type: COMPLETIONS/STIMULATION

Waste content description: FLOW BACK WATER DURING COMPLETION OPERATIONS

Amount of waste: 3000 barrels

Waste disposal frequency : One Time Only

Safe containment description: N/A

Safe containmant attachment:

Waste disposal type: HAUL TO COMMERCIAL FACILITY **Disposal location ownership:** COMMERCIAL

Disposal type description:

Disposal location description: VARIOUS DISPOSAL LOCATIONS IN LEA AND EDDY COUNTIES.

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? NO

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?

WCuttings area liner

Cuttings area liner specifications and installation description

Operator Name: DEVON ENERGY PRODUCTION COMPANY LP

Well Name: COTTON DRAW UNIT

Well Number: 515H

Section 8 - Ancillary Facilities

Are you requesting any Ancillary Facilities?: NO

Ancillary Facilities attachment:

Comments:

Section 9 - Well Site Layout

Well Site Layout Diagram:

CDU_515H_Rig_Layout_08-03-2017.pdf

Comments:

Section 10 - Plans for Surface Reclamation

Type of disturbance: New Surface Disturbance

Multiple Well Pad Name: COTTON DRAW UNIT

Multiple Well Pad Number: 514H/515H/516H/517H

Recontouring attachment:

CDU_515H_Reclamation_08-03-2017.pdf

Drainage/Erosion control construction: All areas disturbed shall be reclaimed as early and as nearly as practicable to their original condition or their final land use and shall be maintained to control dust and minimize erosion to the extent practicable.

Drainage/Erosion control reclamation: Topsoils and subsoils shall be replaced to their original relative positions and contoured so as to achieve erosion control, long-term stability and preservation of surface water flow patterns. The disturbed area then shall be reseeded in the first favorable growing season.

Wellpad long term disturbance (acres): 2.667

Wellpad short term disturbance (acres): 4.099

Access road long term disturbance (acres): 1.802

Access road short term disturbance (acres): 1.802

Pipeline long term disturbance (acres): 3.6253443

Pipeline short term disturbance (acres): 3.6253443

Other long term disturbance (acres): 5.741

Other short term disturbance (acres): 5.741

Total long term disturbance: 13.835344

Total short term disturbance: 15.267344

Reconstruction method: Operator will use Best Management Practices "BMP" to mechanically recontour to obtain the desired outcome.

Topsoil redistribution: Topsoils shall be replaced to their original relative positions and contoured so as to achieve erosion control, long-term stability and preservation of surface water flow patterns.

Soil treatment: Topsoils shall be replaced to their original relative positions and contoured so as to achieve erosion control, long-term stability and preservation of surface water flow patterns.

Existing Vegetation at the well pad:

Existing Vegetation at the well pad attachment:

Operator Name: DEVON ENERGY PRODUCTION COMPANY LP

Well Name: COTTON DRAW UNIT

Well Number: 515H

Existing Vegetation Community at the road:

Existing Vegetation Community at the road attachment:

Existing Vegetation Community at the pipeline:

Existing Vegetation Community at the pipeline attachment:

Existing Vegetation Community at other disturbances:

Existing Vegetation Community at other disturbances attachment:

Non native seed used? NO

Non native seed description:

Seedling transplant description:

Will seedlings be transplanted for this project? NO

Seedling transplant description attachment:

Will seed be harvested for use in site reclamation? NO

Seed harvest description:

Seed harvest description attachment:

Seed Management

Seed Table

Seed type:

Seed source:

Seed name:

Source name:

Source address:

Source phone:

Seed cultivar:

Seed use location:

PLS pounds per acre:

Proposed seeding season:

Seed Summary

Total pounds/Acre:

Seed Type

Pounds/Acre

Seed reclamation attachment:

Operator Contact/Responsible Official Contact Info

Operator Name: DEVON ENERGY PRODUCTION COMPANY LP

Well Name: COTTON DRAW UNIT

Well Number: 515H

First Name: Jacob

Last Name: Ochoa

Phone: (575)748-9934

Email: jacob.ochoa@dvn.com

Seedbed prep:

Seed BMP:

Seed method:

Existing invasive species? NO

Existing invasive species treatment description:

Existing invasive species treatment attachment:

Weed treatment plan description: Maintain weeds on an as need basis.

Weed treatment plan attachment:

Monitoring plan description: Monitor as needed.

Monitoring plan attachment:

Success standards: N/A

Pit closure description: N/A

Pit closure attachment:

Section 11 - Surface Ownership

Disturbance type: WELL PAD

Describe:

Surface Owner: BUREAU OF LAND MANAGEMENT

Other surface owner description:

BIA Local Office:

BOR Local Office:

COE Local Office:

DOD Local Office:

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: DEVON ENERGY PRODUCTION COMPANY LP

Well Name: COTTON DRAW UNIT

Well Number: 515H

Disturbance type: EXISTING ACCESS ROAD

Describe:

Surface Owner: BUREAU OF LAND MANAGEMENT

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:

Disturbance type: NEW ACCESS ROAD

Describe:

Surface Owner: BUREAU OF LAND MANAGEMENT

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: DEVON ENERGY PRODUCTION COMPANY LP

Well Name: COTTON DRAW UNIT

Well Number: 515H

Disturbance type: PIPELINE

Describe:

Surface Owner: BUREAU OF LAND MANAGEMENT

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:

Section 12 - Other Information

Right of Way needed? NO

Use APD as ROW?

ROW Type(s):

ROW Applications

SUPO Additional Information: Gas Capture Plan Flowline Plat Grading & Cross Section Misc Plats Electric Plat

Use a previously conducted onsite? NO

Previous Onsite information:

Other SUPO Attachment

CDU_515H_GasCapturePlan_08-25-2017.pdf

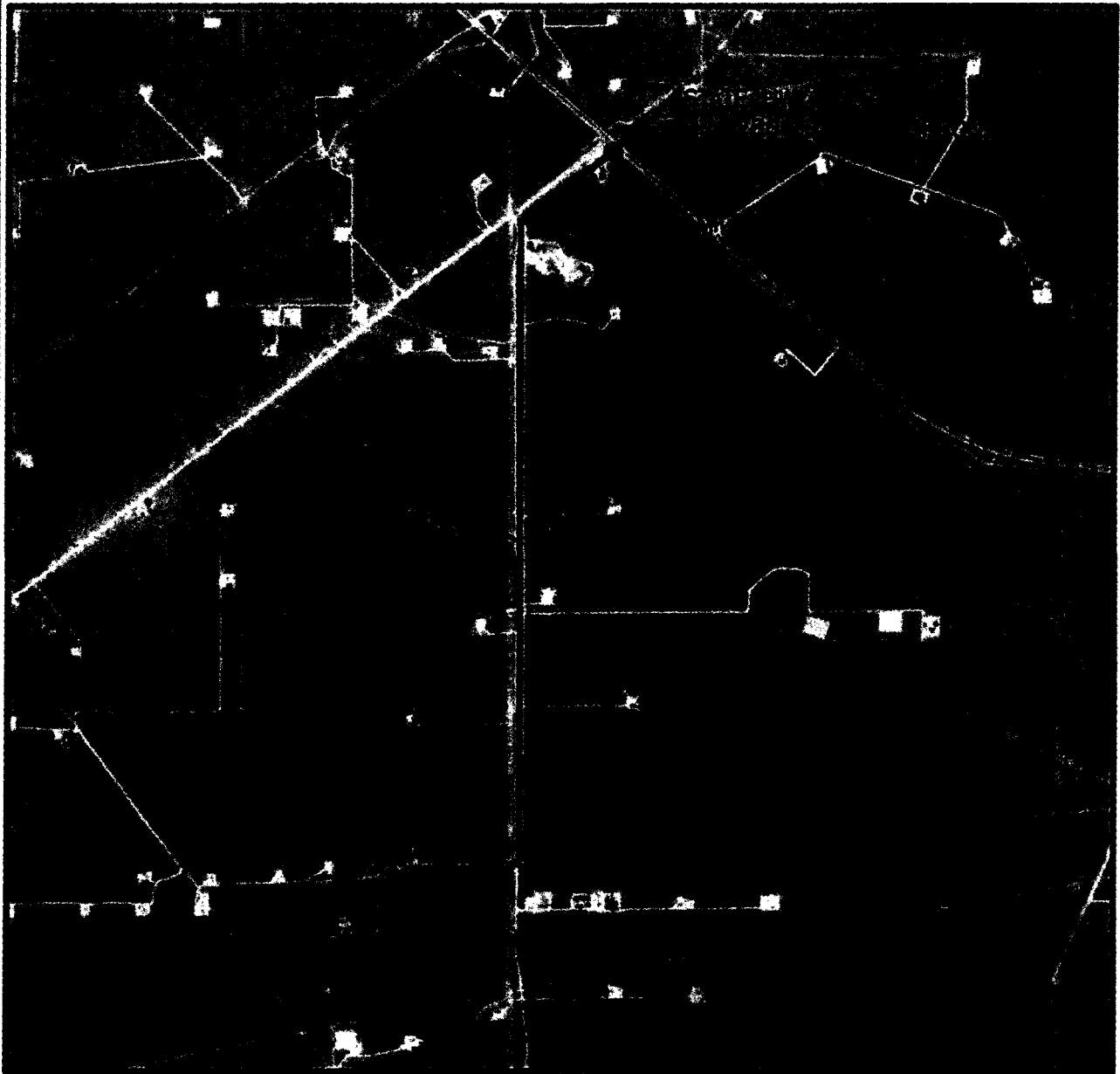
CDU_515H_Flowline_08-25-2017.pdf

CDU_515H_Grading___X_Sec_08-25-2017.pdf

CDU_515H_Misc_Plats_08-25-2017.pdf

20170828092644.pdf

SECTION 25, TOWNSHIP 24 SOUTH, RANGE 31 EAST, N.M.P.M.
EDDY COUNTY, STATE OF NEW MEXICO
AERIAL ACCESS ROUTE MAP



NOT TO SCALE
AERIAL PHOTO:
GOOGLE EARTH
FEB. 2017

DEVON ENERGY PRODUCTION COMPANY, L.P.
COTTON DRAW UNIT 515H

LOCATED 485 FT. FROM THE NORTH LINE
AND 410 FT. FROM THE EAST LINE OF
SECTION 25, TOWNSHIP 24 SOUTH,
RANGE 31 EAST, N.M.P.M.
EDDY COUNTY, STATE OF NEW MEXICO

JULY 13, 2017

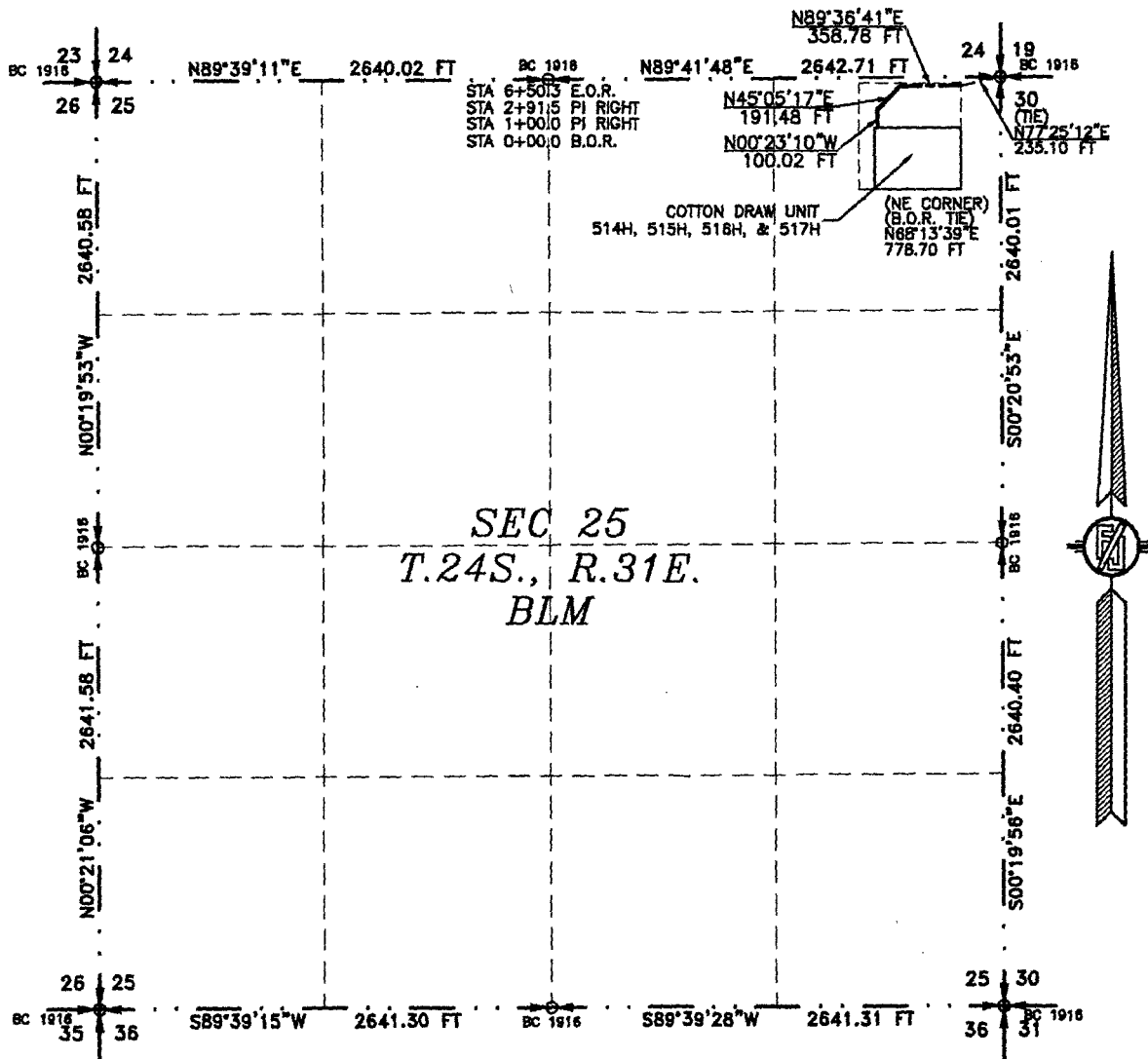
SURVEY NO. 5333

MADRON SURVEYING, INC. 301 SOUTH CANAL (575) 234-3341 CARLSBAD, NEW MEXICO

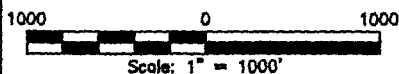
ACCESS ROAD PLAT

ACCESS ROAD FOR COTTON DRAW UNIT 514H, 515H, 516H, & 517H

DEVON ENERGY PRODUCTION COMPANY, L.P.
CENTERLINE SURVEY OF AN ACCESS ROAD CROSSING
SECTION 25, TOWNSHIP 24 SOUTH, RANGE 31 EAST, N.M.P.M.
EDDY COUNTY, STATE OF NEW MEXICO
JULY 17, 2017



SEE NEXT SHEET (2-2) FOR DESCRIPTION



GENERAL NOTES

- 1.) THE INTENT OF THIS ROUTE SURVEY IS TO ACQUIRE AN EASEMENT.
- 2.) BASIS OF BEARING AND DISTANCE IS NMSP EAST (NAD83) MODIFIED TO SURFACE COORDINATES. NAD 83 (FEET) AND NAVD 88 (FEET) COORDINATE SYSTEMS USED IN THE SURVEY.

SURVEYOR CERTIFICATE

I, FILMON F. CARABALLO, A NEW MEXICO PROFESSIONAL SURVEYOR NO. 12797, HEREBY CERTIFY THAT I HAVE CONDUCTED AND AM RESPONSIBLE FOR THIS SURVEY, THAT THIS SURVEY IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF, AND THAT THIS SURVEY AND PLAT MEET THE MINIMUM STANDARDS FOR LAND SURVEYING IN THE STATE OF NEW MEXICO.

IN WITNESS WHEREOF, THIS CERTIFICATE IS EXECUTED AT CARLSBAD, NEW MEXICO, THIS 17 DAY OF JULY 2017.

[Signature]
FILMON F. CARABALLO PLS. 12797

MADRON SURVEYING, INC.
301 SOUTH CANAL
CARLSBAD, NEW MEXICO 88220
Phone (575) 234-3341

SURVEY NO. 5333

SHEET: 1-2

MADRON SURVEYING, INC. CARLSBAD NEW MEXICO

ACCESS ROAD PLAT

ACCESS ROAD FOR COTTON DRAW UNIT 514H, 515H, 516H, & 517H

DEVON ENERGY PRODUCTION COMPANY, L.P.
CENTERLINE SURVEY OF AN ACCESS ROAD CROSSING
SECTION 25, TOWNSHIP 24 SOUTH, RANGE 31 EAST, N.M.P.M.
EDDY COUNTY, STATE OF NEW MEXICO
JULY 17, 2017

DESCRIPTION

A STRIP OF LAND 30 FEET WIDE CROSSING BUREAU OF LAND MANAGEMENT LAND IN SECTION 25, TOWNSHIP 24 SOUTH, RANGE 31 EAST, N.M.P.M., WHENCE THE NORTHEAST CORNER OF SAID SECTION 25, TOWNSHIP 24 SOUTH, RANGE 31 EAST, N.M.P.M. BEARS N68°13'39"E, A DISTANCE OF 778.70 FEET;

BEGINNING AT A POINT WITHIN THE NE/4 NE/4 OF SAID SECTION 25, TOWNSHIP 24 SOUTH, RANGE 31 EAST, N.M.P.M., WHENCE THE NORTHEAST CORNER OF SAID SECTION 25, TOWNSHIP 24 SOUTH, RANGE 31 EAST, N.M.P.M. BEARS N68°13'39"E, A DISTANCE OF 778.70 FEET;
THENCE N00°23'10"W A DISTANCE OF 100.02 FEET TO AN ANGLE POINT OF THE LINE HEREIN DESCRIBED;
THENCE N45°05'17"E A DISTANCE OF 191.48 FEET TO AN ANGLE POINT OF THE LINE HEREIN DESCRIBED;
THENCE N89°36'41"E A DISTANCE OF 358.78 FEET THE TERMINUS OF THIS CENTERLINE SURVEY, WHENCE THE NORTHEAST CORNER OF SAID SECTION 25, TOWNSHIP 24 SOUTH, RANGE 31 EAST, N.M.P.M. BEARS N77°25'12"E, A DISTANCE OF 235.10 FEET;

SAID STRIP OF LAND BEING 650.28 FEET OR 39.41 RODS IN LENGTH, CONTAINING 0.448 ACRES MORE OR LESS AND BEING ALLOCATED BY FORTIES AS FOLLOWS:

NE/4 NE/4 650.28 L.F. 39.41 RODS 0.448 ACRES

GENERAL NOTES

1.) THE INTENT OF THIS ROUTE SURVEY IS TO ACQUIRE AN EASEMENT.

2.) BASIS OF BEARING AND DISTANCE IS NMSP EAST (NAD83) MODIFIED TO SURFACE COORDINATES. NAD 83 (FEET) AND NAVD 88 (FEET) COORDINATE SYSTEMS USED IN THE SURVEY.

SHEET: 2-2

MADRON SURVEYING, INC. CARLSBAD, NEW MEXICO

SURVEYOR CERTIFICATE

I, FILMON F. JARAMILLO, A NEW MEXICO PROFESSIONAL SURVEYOR NO. 12797, HEREBY CERTIFY THAT I HAVE CONDUCTED AND AM RESPONSIBLE FOR THIS SURVEY, THAT THIS SURVEY IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF, AND THAT THIS SURVEY AND PLAT MEET THE MINIMUM STANDARDS FOR LAND SURVEYING IN THE STATE OF NEW MEXICO.

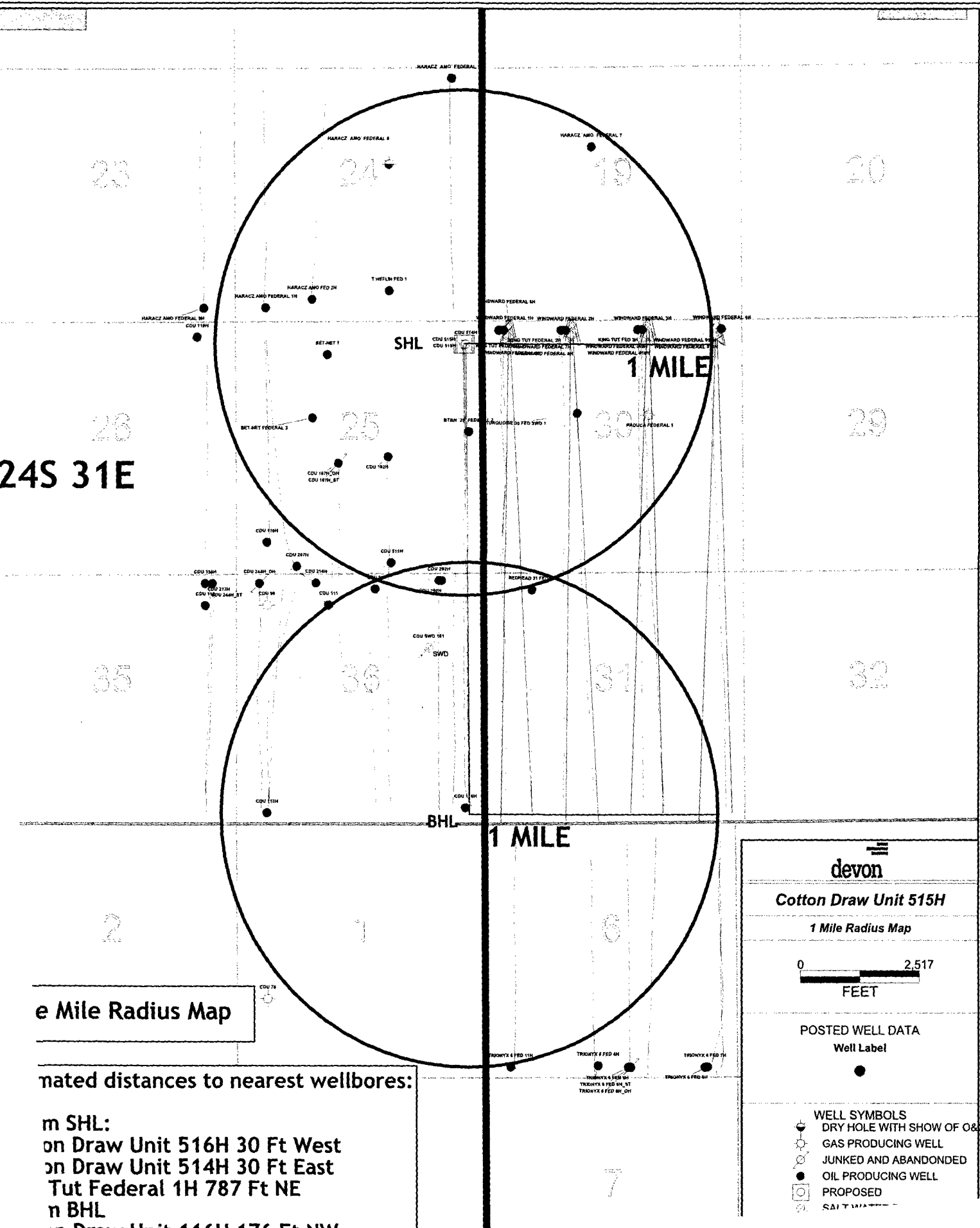
IN WITNESS WHEREOF, THIS CERTIFICATE IS EXECUTED AT CARLSBAD, NEW MEXICO, THIS 17 DAY OF JULY 2017

12797

MADRON SURVEYING, INC.
301 SOUTH CANAL
CARLSBAD, NEW MEXICO 88220
Phone (575) 234-3341

SURVEY NO. 5333

301 SOUTH CANAL
(575) 234-3341



CDU 515 H

Water delivery routes

This map is for illustrative purposes only and is not intended to be used as one. Derron makes no warranty, representation, or guarantee of any kind regarding this map.

4. Web Mercator, Auxiliary Sphere
 Prepared by: Stephen Richards
 is current as of: 01-Aug-2017

Miles 0.14 0.28 0.56 1.12 4.57

Pond

Point (DWN)

Pond (DWN)

AS BUILT/AFTER

BUILT

CONSTRUCTION

PROPOSED

Perbody

Lake/Pond

Playa

Reservoir

Swamp/Marsh

Ream Area

Canal/Ditch

Inundation Area

Water Areas

Other Features

1 Other Features

Streams

Artificial Path

Canal/Ditch

Coastline

Connector

Pipeline

Stream/River

Underground

Conduit

Classification

A, 1%

AE, 1%

AE, Floodway

AE, Floodway

AE, Floodway

AE, Floodway

AE, Floodway

AE, Floodway

AE, Floodway

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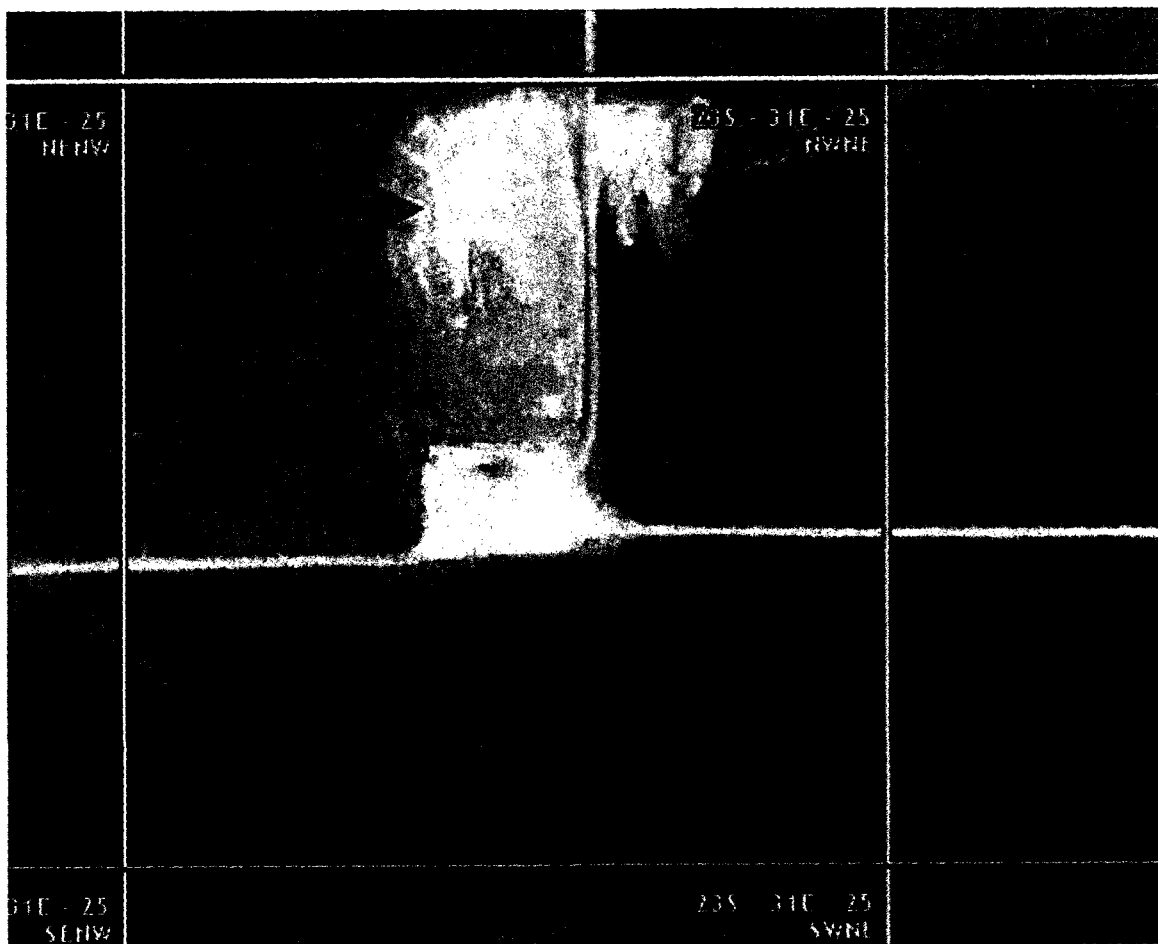
AE, Floodway

AE, Floodway

- State pit 616 and 617 32- 23S- 32E



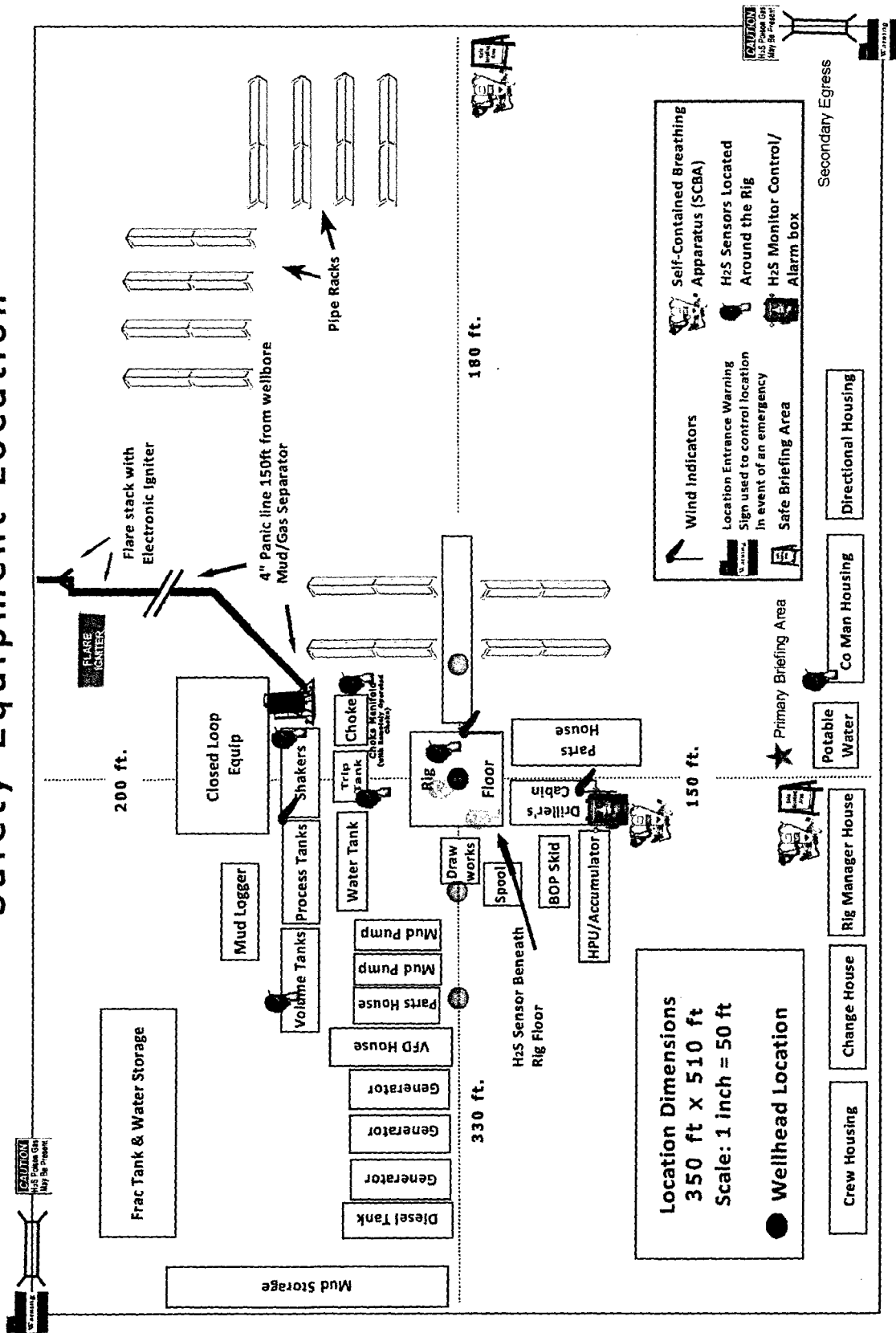
- Fed pit 25- 23S- 31E



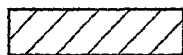
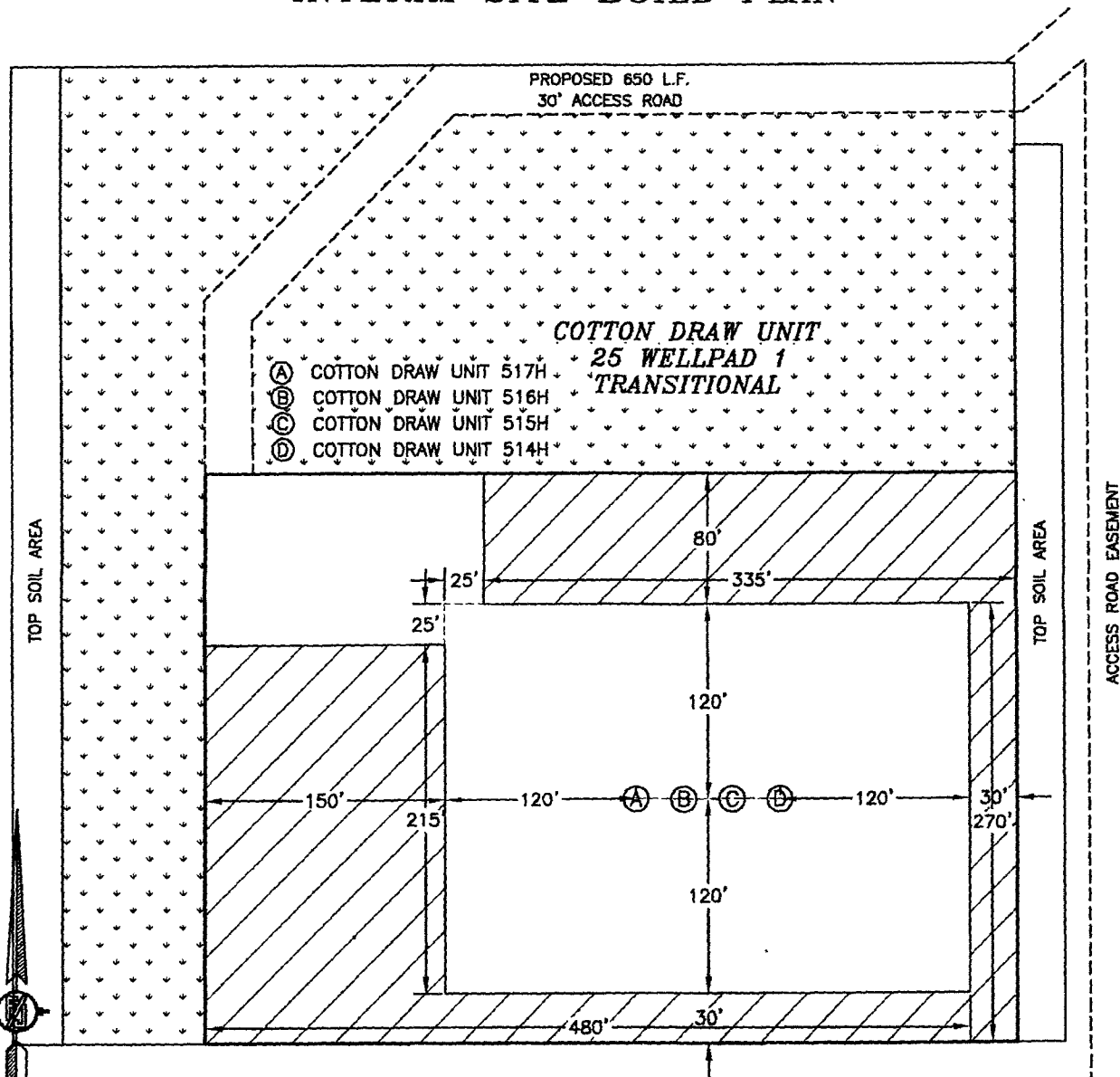
- Private pit 26- 23S- 31E



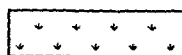
Devon Energy - Well Pad Rig Location Layout Safety Equipment Location



SECTION 25, TOWNSHIP 24 SOUTH, RANGE 31 EAST, N.M.P.M.
EDDY COUNTY, STATE OF NEW MEXICO
INTERIM SITE BUILD PLAN



DENOTES INTERIM PAD
RECLAMATION AREA



DENOTES GRADING SITE
RECLAMATION AREA

0 10 50 100 200
SCALE 1" = 100'

1.872± ACRES INTERIM PAD RECLAMATION AREA
3.718± ACRES GRADING SITE RECLAMATION AREA
2.677± ACRES NON-RECLAIMED AREA
8.267± ACRES COTTON DRAW UNIT 25
WELLPAD 1 TRANSITIONAL

DEVON ENERGY PRODUCTION COMPANY, L.P.
COTTON DRAW UNIT 515H
LOCATED 485 FT. FROM THE NORTH LINE
AND 410 FT. FROM THE EAST LINE OF
SECTION 25, TOWNSHIP 24 SOUTH,
RANGE 31 EAST, N.M.P.M.
EDDY COUNTY, STATE OF NEW MEXICO

JULY 13, 2017

SURVEY NO. 5393

MADRON SURVEYING, INC. 301 SOUTH CANAL
(575) 234-3341

CARLSBAD, NEW MEXICO

FLOWLINE PLAT

TWO-4" POLY FLOWLINES AND ONE-6" GAS LIFT LINE BURIED IN THE SAME DITCH
FROM COTTON DRAW UNIT 514H & 515H TO COTTON DRAW UNIT 25 BS CTB 1

DEVON ENERGY PRODUCTION COMPANY, L.P.
CENTERLINE SURVEY OF A PIPELINE CROSSING
SECTION 25, TOWNSHIP 24 SOUTH, RANGE 31 EAST, N.M.P.M.
EDDY COUNTY, STATE OF NEW MEXICO
JULY 21, 2017

DESCRIPTION

A STRIP OF LAND 30 FEET WIDE CROSSING BUREAU OF LAND MANAGEMENT LAND IN SECTION 25, TOWNSHIP 24 SOUTH, RANGE 31 EAST, N.M.P.M., EDDY COUNTY, STATE OF NEW MEXICO AND BEING 15 FEET EACH SIDE OF THE FOLLOWING DESCRIBED CENTERLINE SURVEY:

BEGINNING AT A POINT WITHIN THE NE/4 NE/4 OF SAID SECTION 25, TOWNSHIP 24 SOUTH, RANGE 31 EAST, N.M.P.M., WHENCE THE NORTHEAST CORNER OF SAID SECTION 25, TOWNSHIP 24 SOUTH, RANGE 31 EAST, N.M.P.M. BEARS N32°31'05"E, A DISTANCE OF 755.71 FEET;
THENCE S00°19'58"E A DISTANCE OF 29.95 FEET TO AN ANGLE POINT OF THE LINE HEREIN DESCRIBED;
THENCE S89°40'28"W A DISTANCE OF 369.66 FEET TO AN ANGLE POINT OF THE LINE HEREIN DESCRIBED;
THENCE S00°17'48"E A DISTANCE OF 619.92 FEET TO AN ANGLE POINT OF THE LINE HEREIN DESCRIBED;
THENCE N89°41'57"E A DISTANCE OF 612.74 FEET TO AN ANGLE POINT OF THE LINE HEREIN DESCRIBED;
THENCE S00°02'37"E A DISTANCE OF 609.72 FEET TO AN ANGLE POINT OF THE LINE HEREIN DESCRIBED;
THENCE S79°01'39"W A DISTANCE OF 2673.17 FEET TO AN ANGLE POINT OF THE LINE HEREIN DESCRIBED;
THENCE S00°00'13"E A DISTANCE OF 348.89 FEET THE TERMINUS OF THIS CENTERLINE SURVEY, WHENCE THE EAST QUARTER CORNER OF SAID SECTION 25, TOWNSHIP 24 SOUTH, RANGE 31 EAST, N.M.P.M. BEARS N87°40'47"E, A DISTANCE OF 2801.94 FEET;

SAID STRIP OF LAND BEING 5264.05 FEET OR 319.03 RODS IN LENGTH, CONTAINING 3.625 ACRES MORE OR LESS AND BEING ALLOCATED BY FORTIES AS FOLLOWS:

NE/4 NE/4	1667.24 L.F.	101.04 RODS	1.148 ACRES
SE/4 NW/4	1745.35 L.F.	105.78 RODS	1.202 ACRES
SW/4 NE/4	1344.09 L.F.	81.46 RODS	0.926 ACRES
SE/4 NW/4	410.13 L.F.	24.86 RODS	0.282 ACRES
NE/4 SW/4	97.24 L.F.	5.89 RODS	0.067 ACRES

GENERAL NOTES

1.) THE INTENT OF THIS ROUTE SURVEY IS TO ACQUIRE AN EASEMENT.

2.) BASIS OF BEARING AND DISTANCE IS NMSP EAST, (NAD83) MODIFIED TO SURFACE COORDINATES, NAD 83 (FEET) AND NAVD 88 (FEET) COORDINATE SYSTEMS USED IN THE SURVEY.

SURVEYOR CERTIFICATE

I, FILIMON F. JARAMILLO, A NEW MEXICO PROFESSIONAL SURVEYOR NO. 12797, HEREBY CERTIFY THAT I HAVE CONDUCTED AND AM RESPONSIBLE FOR THIS SURVEY, THAT THIS SURVEY IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF, AND THAT THIS SURVEY AND PLAT MEET THE MINIMUM STANDARDS FOR LAND SURVEYING IN THE STATE OF NEW MEXICO.

IN WITNESS WHEREOF, THIS CERTIFICATE IS EXECUTED AT CARLSBAD, NEW MEXICO, THIS 21 DAY OF JULY 2017

[Signature]
12797
REGISTERED PROFESSIONAL SURVEYOR
FILIMON F. JARAMILLO, P.L.S. 12797

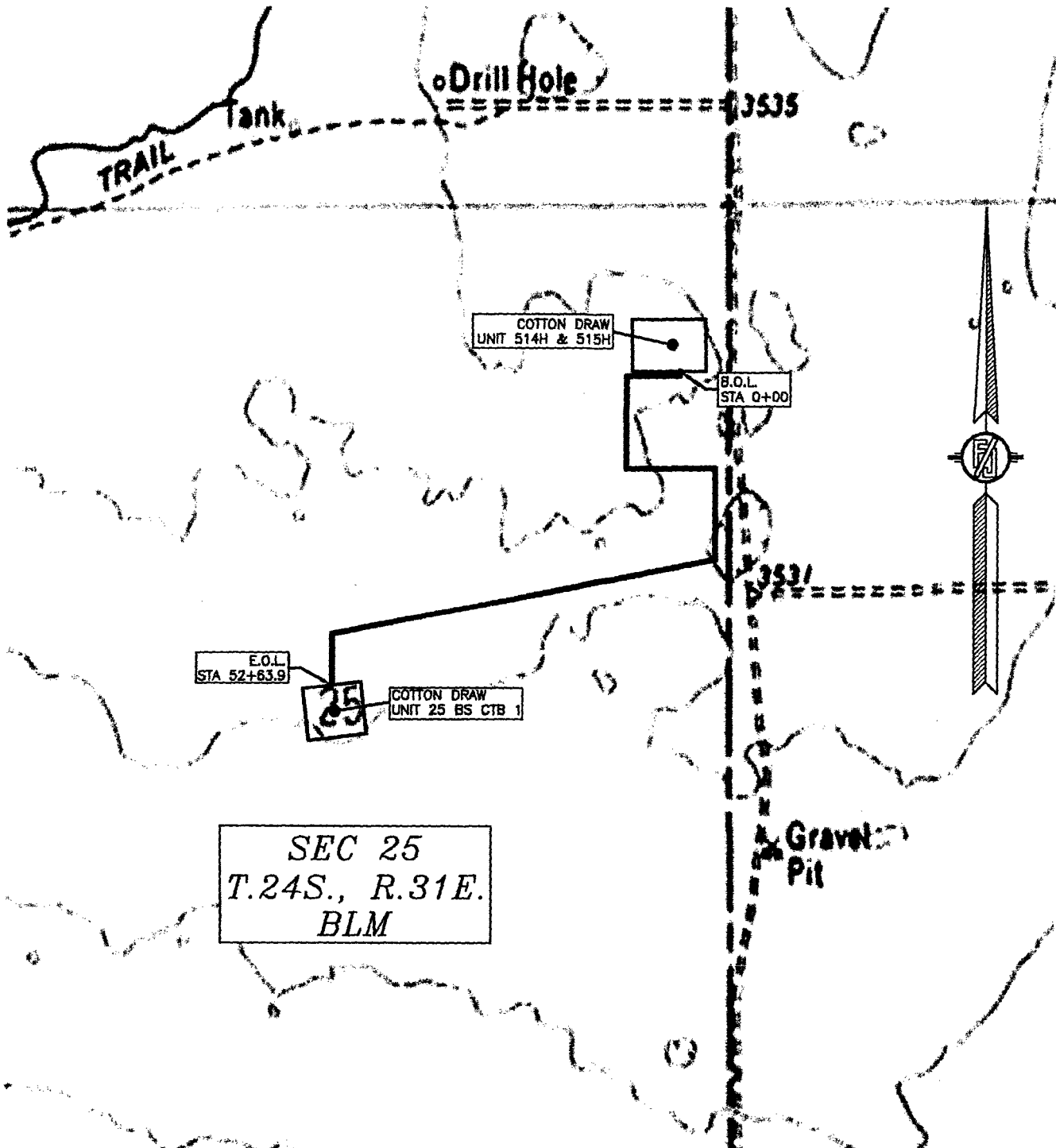
MADRON SURVEYING, INC.
301 SOUTH CANAL
CARLSBAD, NEW MEXICO 88220
Phone (575) 234-3341

SURVEY NO. 5365

FLOWLINE PLAT

**TWO-4" POLY FLOWLINES AND ONE-6" GAS LIFT LINE BURIED IN THE SAME DITCH
FROM COTTON DRAW UNIT 514H & 515H TO COTTON DRAW UNIT 25 BS CTB 1**

**DEVON ENERGY PRODUCTION COMPANY, L.P.
CENTERLINE SURVEY OF A PIPELINE CROSSING
SECTION 25, TOWNSHIP 24 SOUTH, RANGE 31 EAST, N.M.P.M.
EDDY COUNTY, STATE OF NEW MEXICO
JULY 21, 2017**



FLOWLINE PLAT

**TWO-4" POLY FLOWLINES AND ONE-6" GAS LIFT LINE BURIED IN THE SAME DITCH
FROM COTTON DRAW UNIT 514H & 515H TO COTTON DRAW UNIT 25 BS CTB 1**

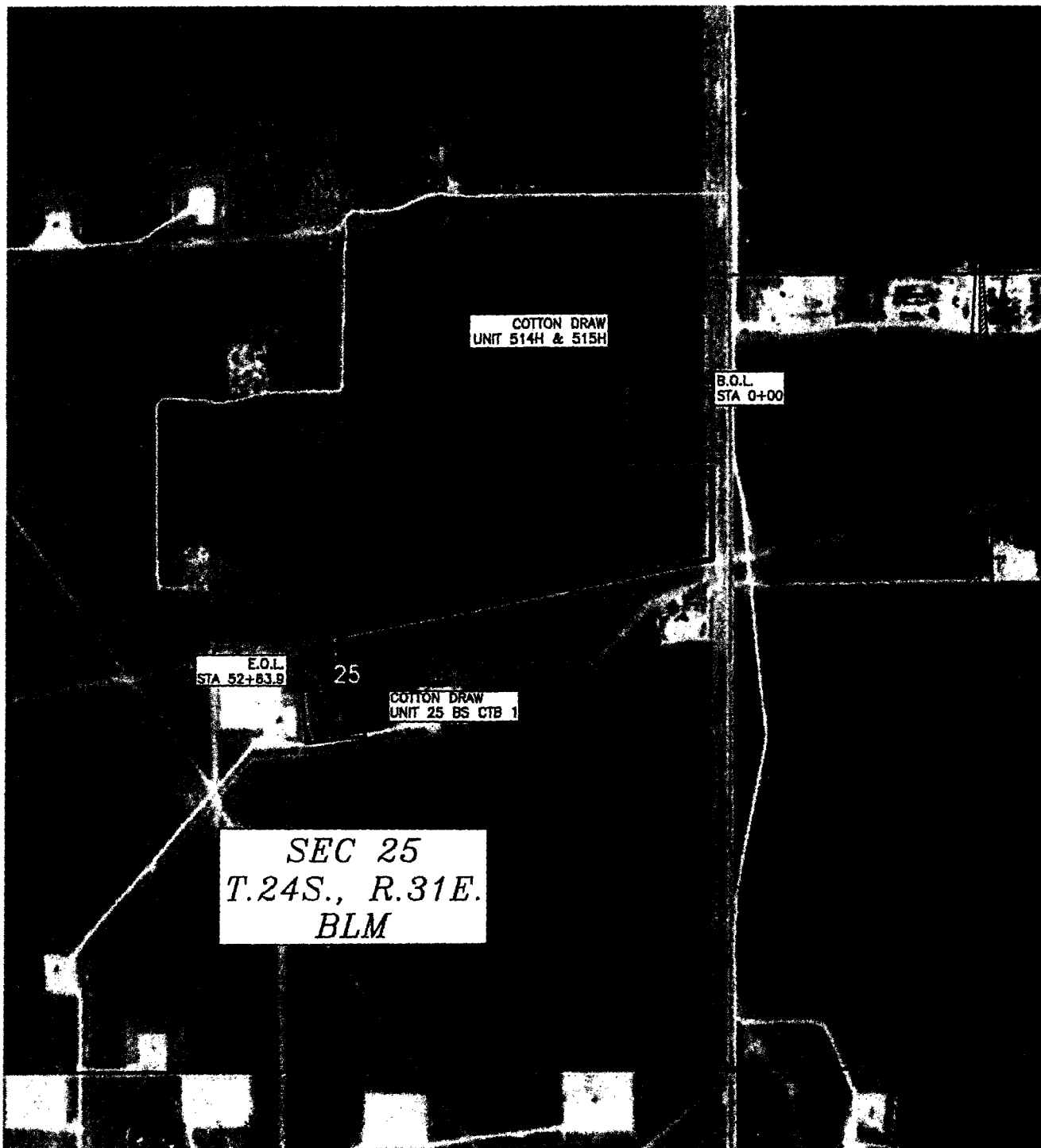
DEVON ENERGY PRODUCTION COMPANY, L.P.

CENTERLINE SURVEY OF A PIPELINE CROSSING

SECTION 25, TOWNSHIP 24 SOUTH, RANGE 31 EAST, N.M.P.M.

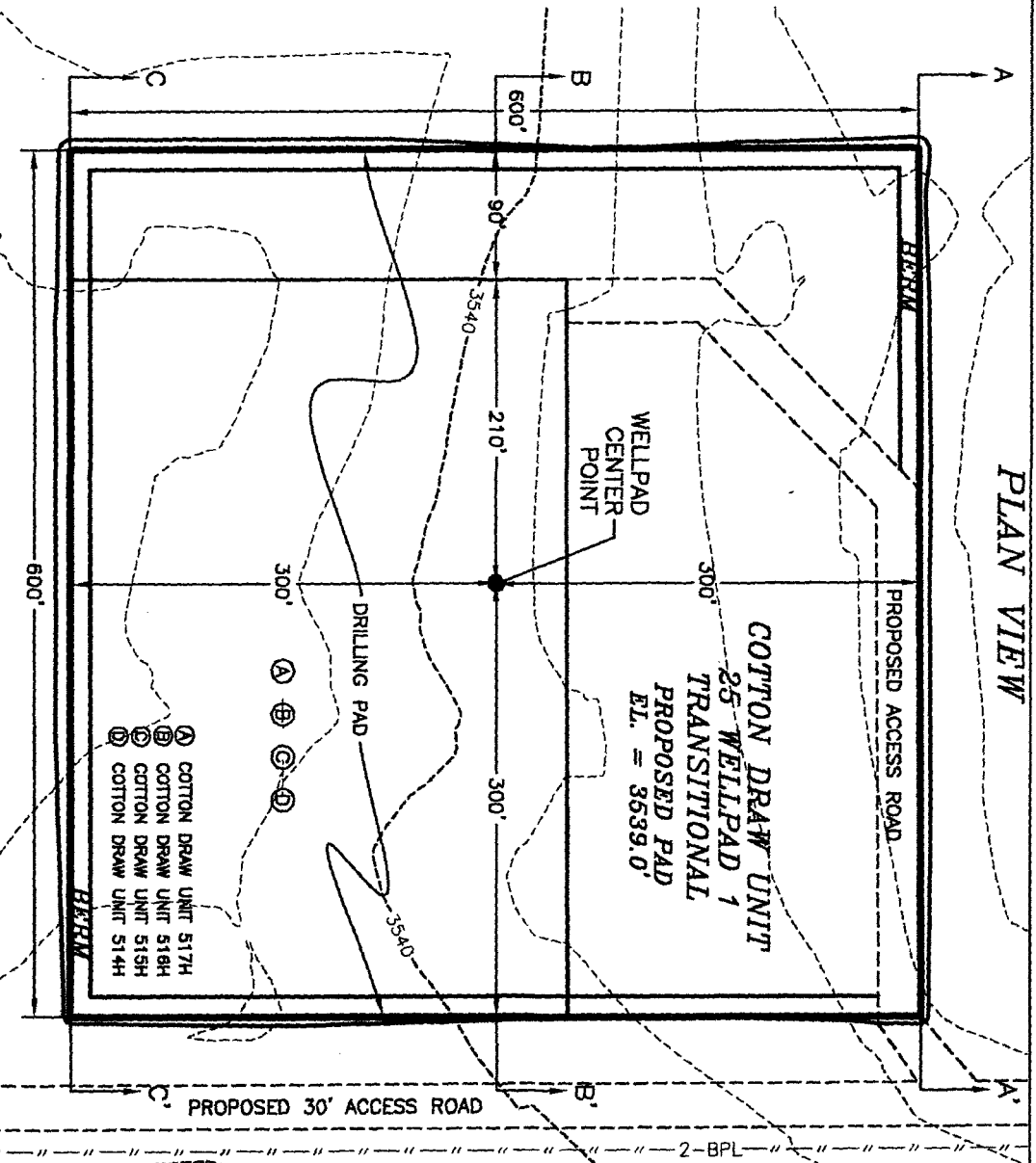
EDDY COUNTY, STATE OF NEW MEXICO

JULY 21, 2017



PLAN VIEW

012 60 120 240
SCALE 1" = 120'



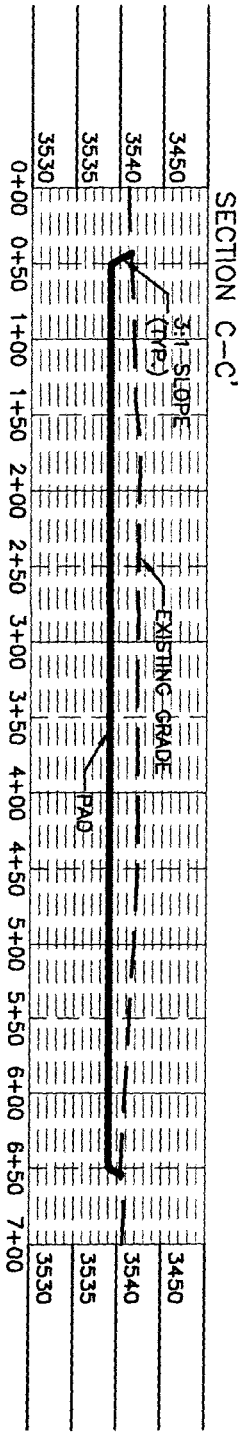
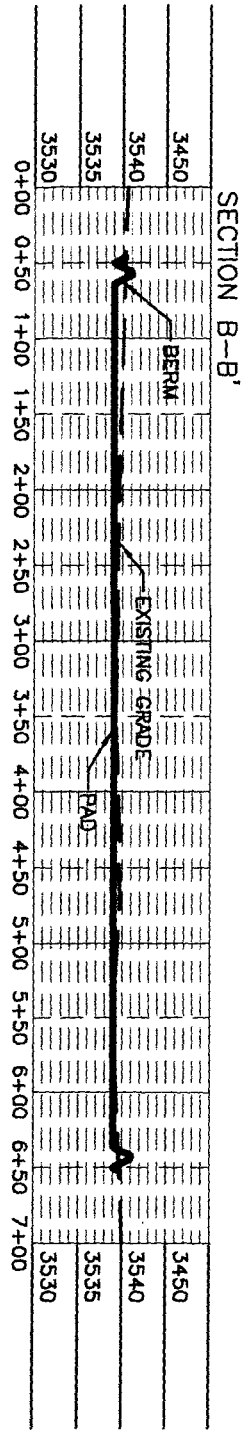
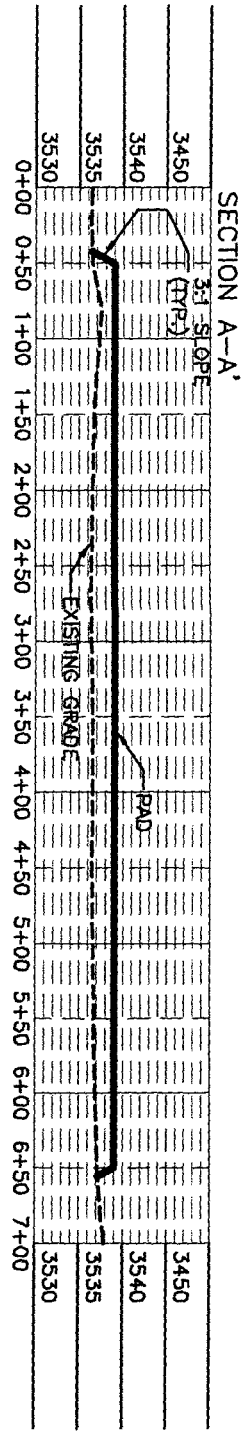
DEVON ENERGY PRODUCTION COMPANY, L.P.
GRADING PLAN AND CROSS SECTIONS
FOR COTTON DRAW UNIT 515H
SECTION 26, TOWNSHIP 24 SOUTH,
RANGE 31 EAST, N.M.P.M.
EDDY COUNTY, STATE OF NEW MEXICO

EARTHWORK QUANTITIES FOR
COTTON DRAW UNIT 25 WELLPAD 1 TRANSITIONAL
CUT FILL NET
13827 CU. YD. 8937 CU. YD. 6890 CU. YD. (CUT)
EARTHWORK QUANTITIES ARE ESTIMATED

MADRON SURVEYING, INC. (575) 234-3341 CARLSBAD, NEW MEXICO

JULY 13, 2017
SHEET 1-2
SURVEY NO. 6333

CROSS-SECTIONS



0+2 60 120 240
SCALE 1" = 120' - 1" = 20' VER

DEVON ENERGY PRODUCTION COMPANY, L.P.
GRADING PLAN AND CROSS SECTIONS
FOR COTTON DRAW UNIT 616H
SECTION 25, TOWNSHIP 24 SOUTH,
RANGE 31 EAST, N.M.P.M.
EDDY COUNTY, STATE OF NEW MEXICO

JULY 13, 2017
301 SOUTH CANAL (S/S) 234-5341
MADRON SURVEYING, INC. CARLSBAD, NEW MEXICO

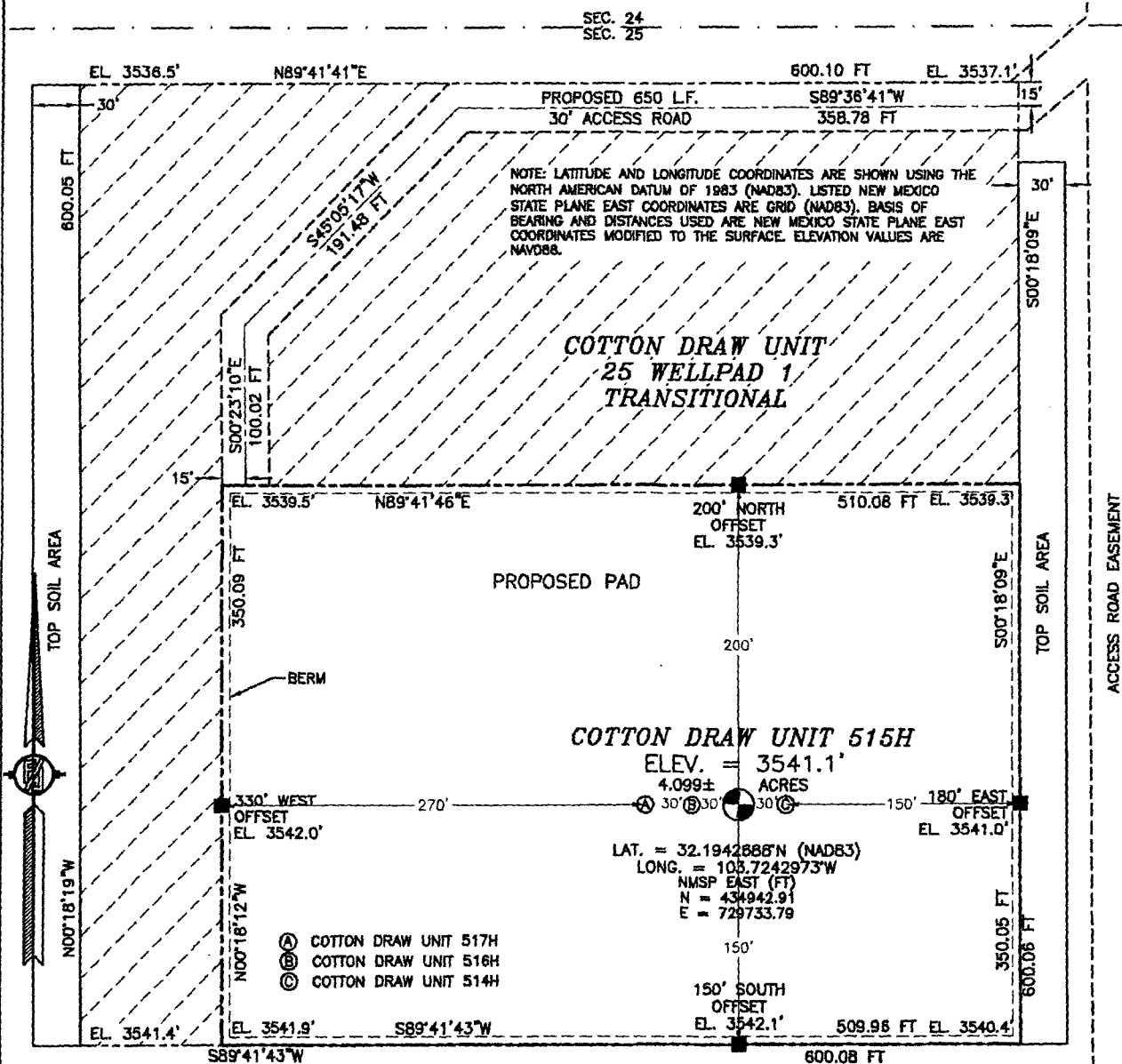
EARTHWORK QUANTITIES FOR
COTTON DRAW UNIT 25 WELLPAD 1 TRANSITIONAL

CUT	FILL	NET
13927 CU. YD	6937 CU. YD	6990 CU. YD (CUT)

EARTHWORK QUANTITIES ARE ESTIMATED

**SECTION 25, TOWNSHIP 24 SOUTH, RANGE 31 EAST, N.M.P.M.
EDDY COUNTY, STATE OF NEW MEXICO
SITE MAP**

SEC. 24
SEC. 25



0 10 50 100 200

SCALE 1" = 100'

DIRECTIONS TO LOCATION

FROM THE INTERSECTION OF STATE HWY. 128 & CR. 786 (BUCK JACKSON ROAD), GO WEST ON BUCK JACKSON RD. APPROX. 0.4 MILE TO A LEASE ROAD ON LEFT (SOUTH), TURN SOUTH GO APPROX. 2.4 MILES TO A GATE ON RIGHT WEST AND ROAD LATHS WITH RED & YELLOW FLAGGING, FOLLOW ROAD LATHS WEST AND SOUTH APPROX. 0.1 MILE TO THE NORTHEAST CORNER OF THE COTTON DRAW UNIT 25 WELLPAD 1 TRANSITIONAL, THEN FOLLOW ROAD SURVEY WEST AND SOUTH 650 FEET TO THE NORTHWEST PAD CORNER FOR THIS LOCATION.

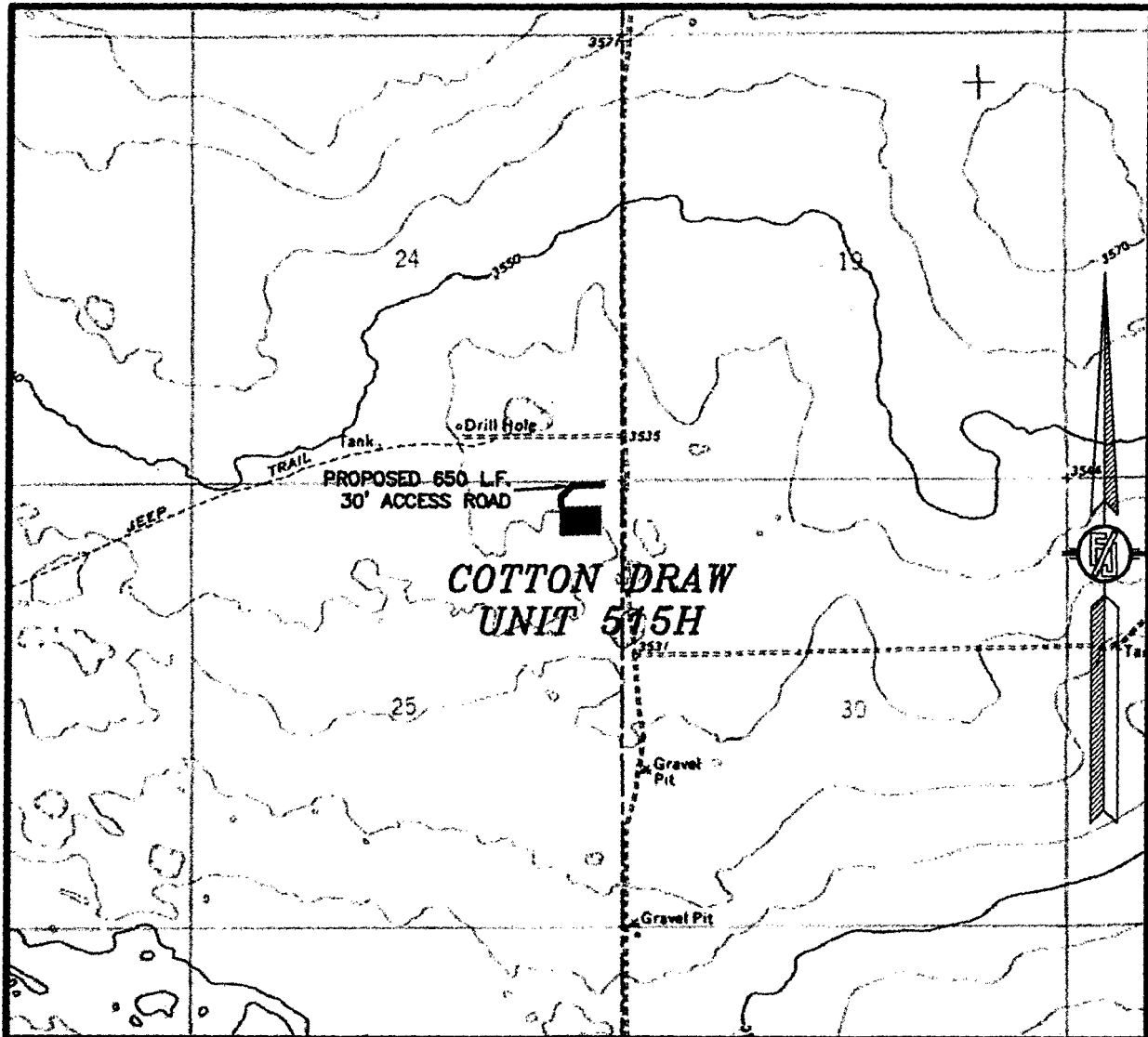
**DEVON ENERGY PRODUCTION COMPANY, L.P.
COTTON DRAW UNIT 515H
LOCATED 485 FT. FROM THE NORTH LINE
AND 410 FT. FROM THE EAST LINE OF
SECTION 25, TOWNSHIP 24 SOUTH,
RANGE 31 EAST, N.M.P.M.
EDDY COUNTY, STATE OF NEW MEXICO**

JULY 13, 2017

SURVEY NO. 5333

MADRON SURVEYING, INC. 301 SOUTH CANAL (575) 234-3341 **CARLSBAD, NEW MEXICO**

SECTION 25, TOWNSHIP 24 SOUTH, RANGE 31 EAST, N.M.P.M.
EDDY COUNTY, STATE OF NEW MEXICO
LOCATION VERIFICATION MAP



USGS QUAD MAP:
PADUCA BREAKS NW

NOT TO SCALE

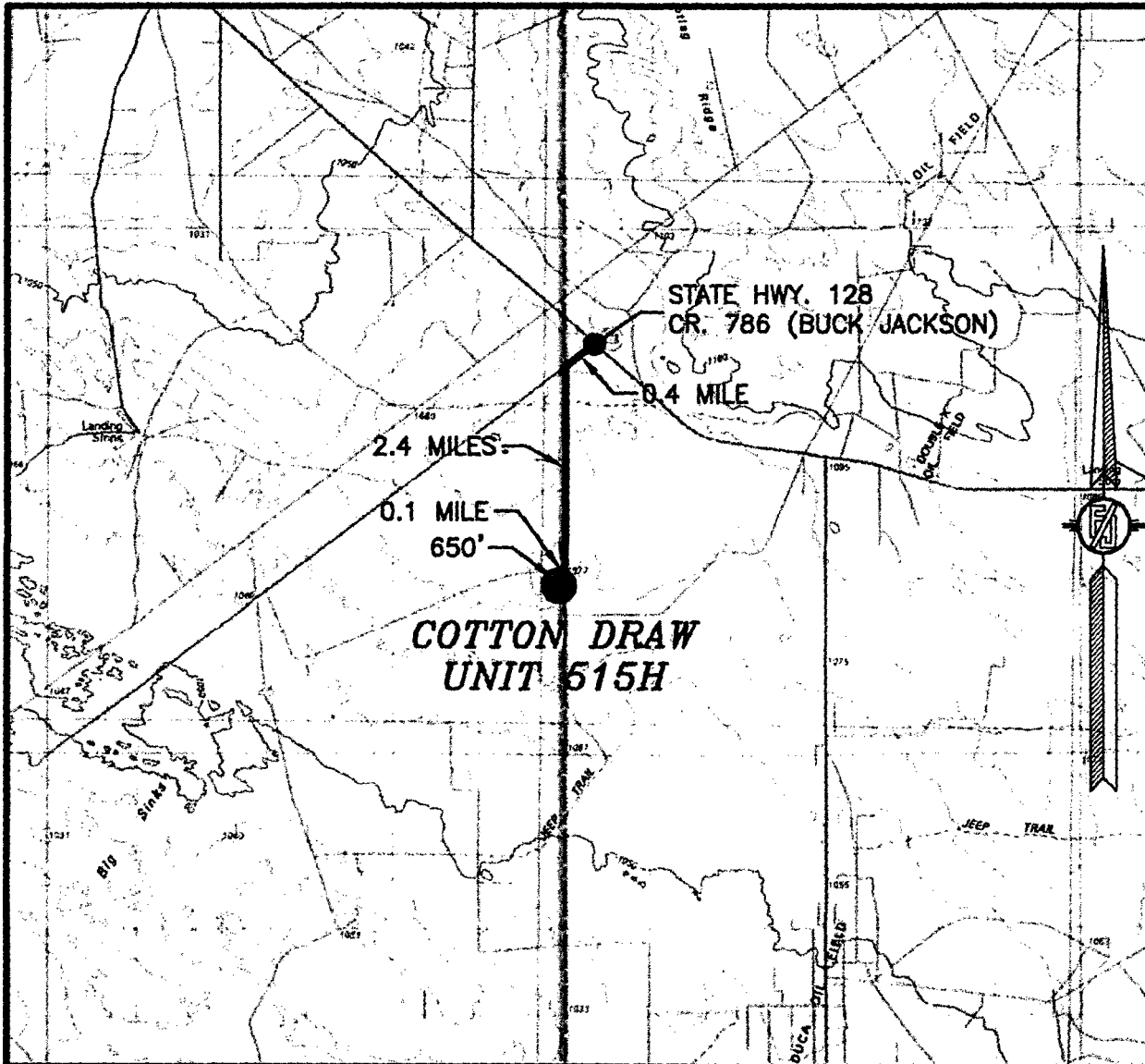
DEVON ENERGY PRODUCTION COMPANY, L.P.
COTTON DRAW UNIT 515H
LOCATED 485 FT. FROM THE NORTH LINE
AND 410 FT. FROM THE EAST LINE OF
SECTION 25, TOWNSHIP 24 SOUTH,
RANGE 31 EAST, N.M.P.M.
EDDY COUNTY, STATE OF NEW MEXICO

JULY 13, 2017

SURVEY NO. 5333

MADRON SURVEYING, INC. 301 SOUTH CANAL (575) 234-3341 CARLSBAD, NEW MEXICO

SECTION 25, TOWNSHIP 24 SOUTH, RANGE 31 EAST, N.M.P.M.
EDDY COUNTY, STATE OF NEW MEXICO
VICINITY MAP



DISTANCES IN MILES

NOT TO SCALE

DIRECTIONS TO LOCATION

FROM THE INTERSECTION OF STATE HWY. 128 & CR. 786 (BUCK JACKSON ROAD), GO WEST ON BUCK JACKSON RD. APPROX. 0.4 MILE TO A LEASE ROAD ON LEFT (SOUTH), TURN SOUTH GO APPROX 2.4 MILES TO A GATE ON RIGHT WEST AND ROAD LATHS WITH RED & YELLOW FLAGGING, FOLLOW ROAD LATHS WEST AND SOUTH APPROX. 0.1 MILE TO THE NORTHEAST CORNER OF THE COTTON DRAW UNIT 25 WELLPAD 1 TRANSITIONAL, THEN FOLLOW ROAD SURVEY WEST AND SOUTH 650 FEET TO THE NORTHWEST PAD CORNER FOR THIS LOCATION.

DEVON ENERGY PRODUCTION COMPANY, L.P.
COTTON DRAW UNIT 515H

LOCATED 485 FT. FROM THE NORTH LINE
AND 410 FT. FROM THE EAST LINE OF
SECTION 25, TOWNSHIP 24 SOUTH,
RANGE 31 EAST, N.M.P.M.
EDDY COUNTY, STATE OF NEW MEXICO

JULY 13, 2017

SURVEY NO. 5333

MADRON SURVEYING, INC. 301 SOUTH CANAL (575) 234-3341 CARLSBAD, NEW MEXICO

SECTION 25, TOWNSHIP 24 SOUTH, RANGE 31 EAST, N.M.P.M.
EDDY COUNTY, STATE OF NEW MEXICO
AERIAL PHOTO



NOT TO SCALE
AERIAL PHOTO:
GOOGLE EARTH
FEB. 2017

DEVON ENERGY PRODUCTION COMPANY, L.P.
COTTON DRAW UNIT 515H

LOCATED 485 FT. FROM THE NORTH LINE
AND 410 FT. FROM THE EAST LINE OF
SECTION 25, TOWNSHIP 24 SOUTH,
RANGE 31 EAST, N.M.P.M.
EDDY COUNTY, STATE OF NEW MEXICO

JULY 13, 2017

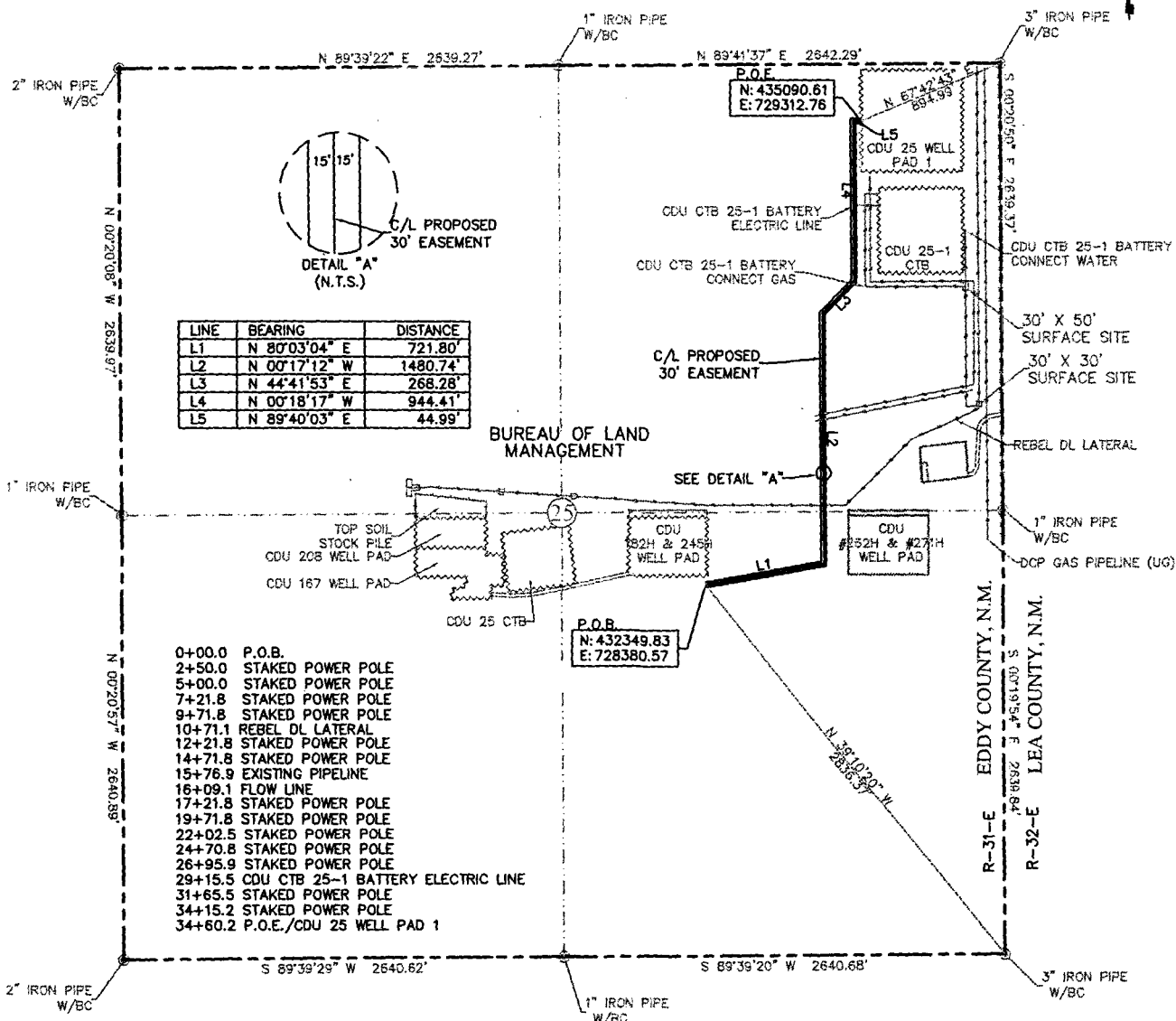
SURVEY NO. 5333

MADRON SURVEYING, INC.

301 SOUTH CANAL
(575) 234-3341

CARLSBAD, NEW MEXICO

EXHIBIT "A"
PAGE 1 of 4
ELECTRIC LINE PLAT
SECTION 25, T24S-R31E, N.M.P.M.
EDDY COUNTY, NEW MEXICO



30' EASEMENT AREA = 2.383 ACRE(S)
3460.22' FEET OR 209.71 RODS

SEE THE ATTACHED LEGAL DESCRIPTION

Note: All bearings recited herein are based on the New Mexico State Plane Coordinate System, NAD 83, New Mexico East Zone 3001, US Survey Feet, all distances are grid.

I, B.L. Laman, New Mexico PLS No. 22404, hereby certify this survey to reflect an actual survey made on the ground under my supervision. This survey meets the minimum standards for surveying in New Mexico.

L. Laman PLS #22404
 gned: 08-23-2017
 24 Richardson Dr., Jasper, TX.
 (03) 388-3045 75951
 nployee of Horizonrow, LLC

HORIZON ROW LLC

Drawn for:

devon

Drawn by:
CHRIS MAAS

Date: 8/19/2017

DEVON ENERGY PRODUCTION COMPANY, L.P.

CDU 25-1 WELL PAD
ELECTRIC LINE

PROPOSED 30' EASEMENT
ON THE PROPERTY OF
BUREAU OF LAND MANAGEMENT
SECTION 25, T10N, R10E

LINE NUMBER:
EL8039

WBS NUMBER:
XX-124092.01

SCALE:
1" = 1000'

REVISIONS:

**SECTION 25, T24S-R31E, N.M.P.M.,
EDDY COUNTY, NEW MEXICO**

ELECTRIC LINE PLAT

LEGAL DESCRIPTION

FOR

DEVON ENERGY PRODUCTION COMPANY, L.P.

BUREAU OF LAND MANAGEMENT

30' EASEMENT DESCRIPTION:

BEING an easement thirty (30) feet in width lying fifteen (15) feet on the right side and fifteen (15) feet on the left side of the survey centerline described below, being out of the southeast quarter (SE ¼) and the northeast quarter (NE ¼) of Section 25, Township 24 South, Range 31 East, N.M.P.M., Eddy County, New Mexico, and being out of a parcel of land owned by the Bureau of Land Management. Said centerline of easement being more particularly described as follows:

Commencing from a 3" iron pipe w/BC for the southeast corner of Section 25, T24S-R31E, N.M.P.M., Eddy County, New Mexico;

Thence N 39°10'20" W a distance of 2836.37' to the **Point of Beginning** of this easement having coordinates of Northing=432349.83, Easting=728380.57 feet and continuing the following courses;

Thence N 80°03'04" E a distance of 721.80' to an angle point;

Thence N 00°17'12" W a distance of 1480.74' to an angle point;

Thence N 44°41'53" E a distance of 268.28' to an angle point;

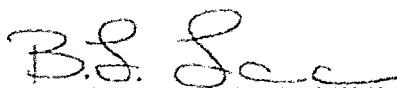
Thence N 00°18'17" W a distance of 944.41' to an angle point;

Thence N 89°40'03" E, a distance of 44.99' to the **Point of Ending** having coordinates of Northing=435090.61, Easting=729312.76 feet, from said point a 3" iron pipe w/BC for the northeast corner of Section 25, T24S-R31E bears N 67°42'43" E a distance of 894.99', covering **3460.22' or 209.71 rods** and having an area of **2.383 acres**.

NOTES:

Bearings, distances and coordinates shown herein are based on New Mexico State Plane Coordinate System, NAD 83, East Zone 3001, US Survey Feet, all distances are grid.

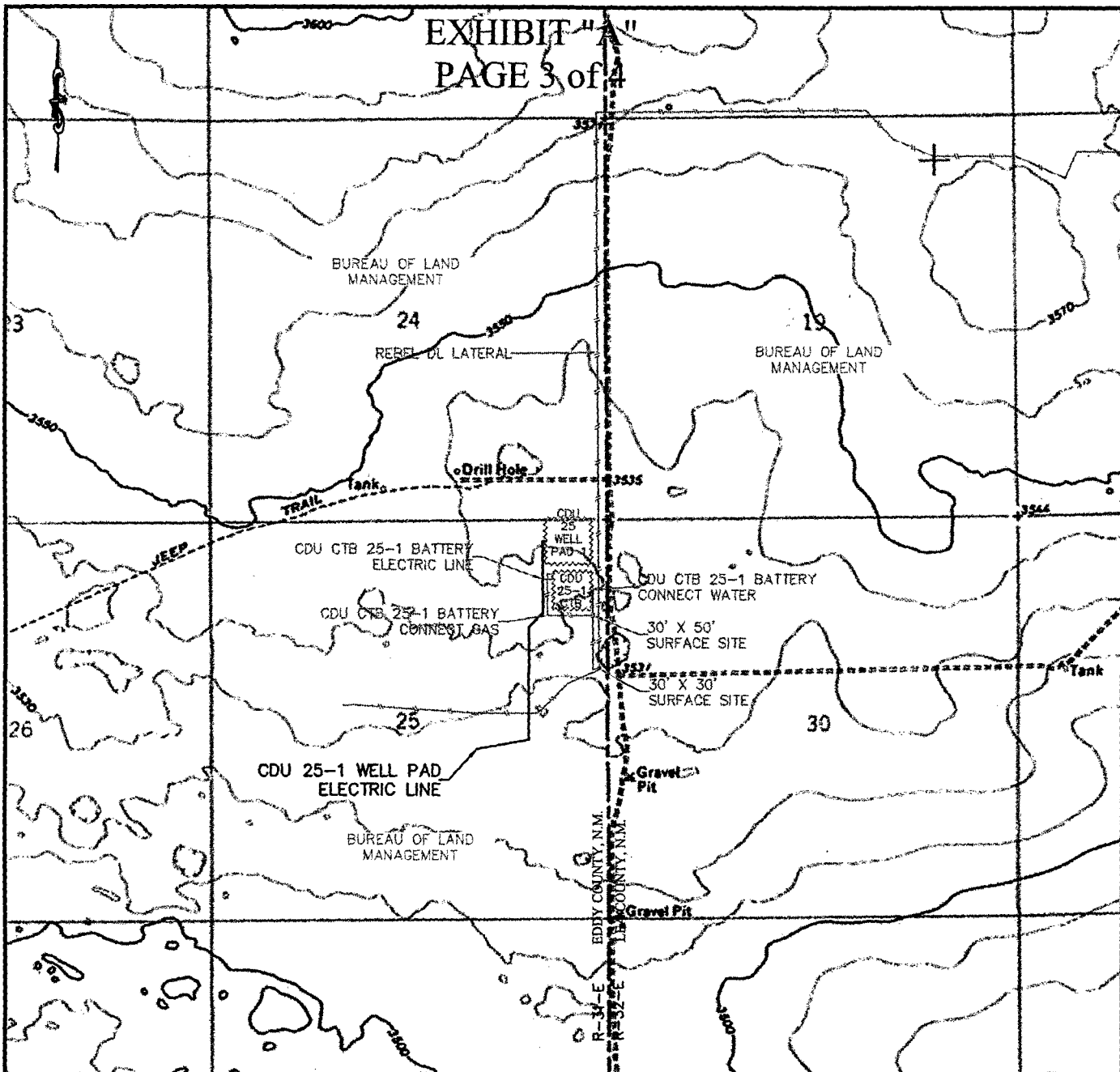
I, B.L. Laman, New Mexico PLS No. 22404, hereby certify this survey to reflect an actual survey made on the ground under my supervision. This survey meets the minimum standards for surveying in New Mexico.



B.L. Laman PLS 22404
Date Signed: 08/23/2017
Horizon Row, LLC
924 Richardson Dr., Jasper, TX
(903) 388-3045 75951
Employee of Horizon Row, LLC



EXHIBIT "A"
PAGE 3 of 4



QUAD MAP

SECTION 25, T24S-R31E, N.M.P.M.
EDDY COUNTY, NEW MEXICO

HORIZON ROW LLC

DEVON ENERGY PRODUCTION CO., L.P.

PROPOSED 30' EASEMENT

Drawn by:
CHRIS MAAS

Date: 08/19/2017

Drawn for:



LINE NUMBER:
EL8039

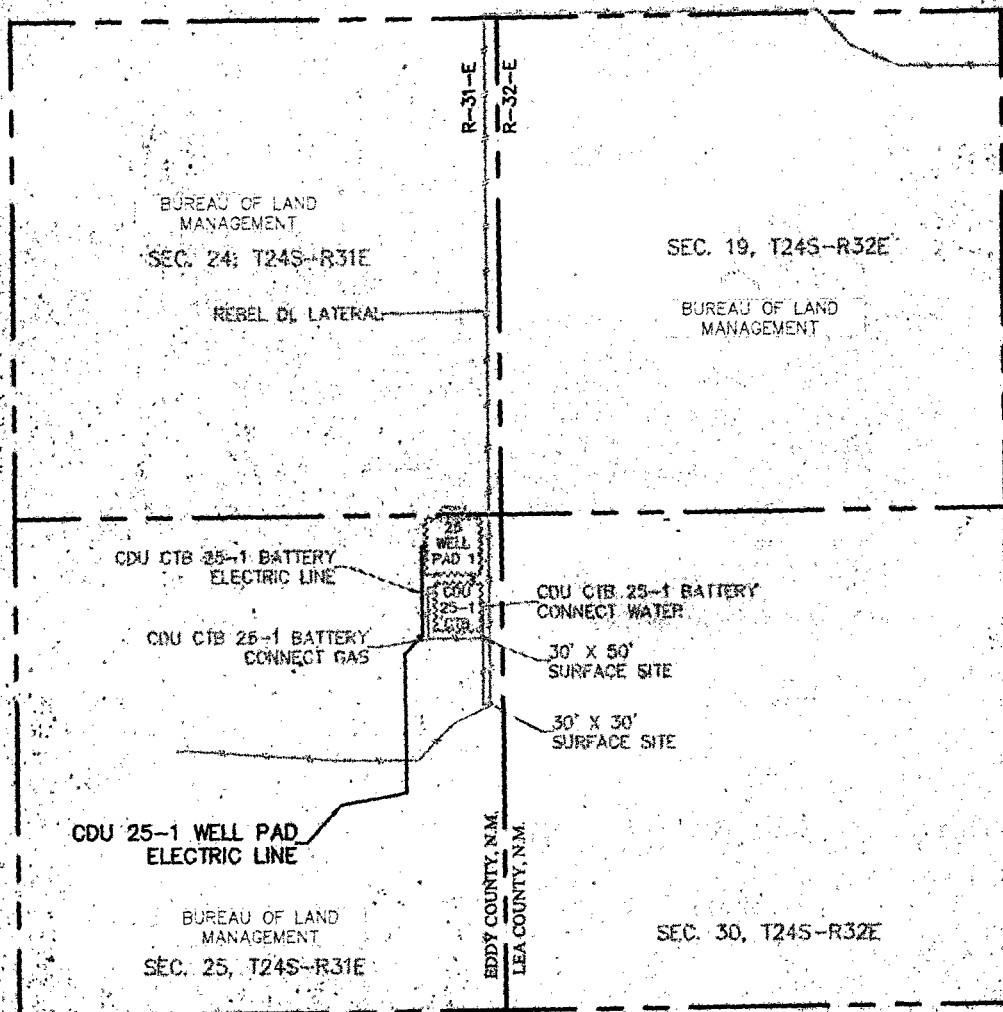
WBS NUMBER:
XX-124092.01

SCALE:
1" = 2000'

REVISIONS:

EXHIBIT "A"

PAGE 4 of 4



AERIAL MAP

SECTION 25, T24S-R31E, N.M.P.M.
EDDY COUNTY, NEW MEXICO

HORIZON ROW LLC

DEVON ENERGY PRODUCTION CO., L.P.

PROPOSED 30' EASEMENT

Drawn by:
CHRIS MAAS

Date: 05/19/2017

Drawn for:



LINE NUMBER:
EL8039

WBS NUMBER:
XX-124092.01

SCALE:
1" = 2000'

REVISIONS:

SHEET:
4 OF 4



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

PWD Data Report

02/08/2018

Section 1 - General

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

Section 2 - Lined Pits

Would you like to utilize Lined Pit PWD options? NO

Produced Water Disposal (PWD) Location:

PWD surface owner:

PWD disturbance (acres):

Lined pit PWD on or off channel:

Lined pit PWD discharge volume (bbl/day):

Lined pit specifications:

Pit liner description:

Pit liner manufacturers information:

Precipitated solids disposal:

Describe precipitated solids disposal:

Precipitated solids disposal permit:

Lined pit precipitated solids disposal schedule:

Lined pit precipitated solids disposal schedule attachment:

Lined pit reclamation description:

Lined pit reclamation attachment:

Leak detection system description:

Leak detection system attachment:

Lined pit Monitor description:

Lined pit Monitor attachment:

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

Is the reclamation bond a rider under the BLM bond?

Lined pit bond number:

Lined pit bond amount:

Section 3 - Unlined Pits

Would you like to utilize Unlined Pit PWD options? NO

Produced Water Disposal (PWD) Location:

PWD surface owner:

PWD disturbance (acres):

Unlined pit PWD on or off channel:

Unlined pit PWD discharge volume (bbl/day):

Unlined pit specifications:

Precipitated solids disposal:

Describe precipitated solids disposal:

Precipitated solids disposal permit:

Unlined pit precipitated solids disposal schedule:

Unlined pit precipitated solids disposal schedule attachment:

Unlined pit reclamation description:

Unlined pit reclamation attachment:

Unlined pit Monitor description:

Unlined pit Monitor attachment:

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

Beneficial use user confirmation:

Estimated depth of the shallowest aquifer (feet):

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

TDS lab results:

Geologic and hydrologic evidence:

State authorization:

Unlined Produced Water Pit Estimated percolation:

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

Is the reclamation bond a rider under the BLM bond?

Unlined pit bond number:

Unlined pit bond amount:

Additional bond information attachment:

Section 4 - Injection

Would you like to utilize Injection PWD options? NO

Produced Water Disposal (PWD) Location:

PWD surface owner:

PWD disturbance (acres):

Injection PWD discharge volume (bbl/day):

Injection well type:

Injection well number:

Injection well name:

Assigned injection well API number?

Injection well API number:

Injection well new surface disturbance (acres):

Minerals protection information:

Mineral protection attachment:

Underground Injection Control (UIC) Permit?

UIC Permit attachment:

Section 5 - Surface Discharge

Would you like to utilize Surface Discharge PWD options? NO

Produced Water Disposal (PWD) Location:

PWD surface owner:

PWD disturbance (acres):

Surface discharge PWD discharge volume (bbl/day):

Surface Discharge NPDES Permit?

Surface Discharge NPDES Permit attachment:

Surface Discharge site facilities information:

Surface discharge site facilities map:

Section 6 - Other

Would you like to utilize Other PWD options? NO

Produced Water Disposal (PWD) Location:

PWD surface owner:

PWD disturbance (acres):

Other PWD discharge volume (bbl/day):

Other PWD type description:

Other PWD type attachment:

Have other regulatory requirements been met?

Other regulatory requirements attachment:



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

Bond Info Data Report

02/08/2018

Bond Information

Federal/Indian APD: FED

BLM Bond number: CO1104

BIA Bond number:

Do you have a reclamation bond? NO

Is the reclamation bond a rider under the BLM bond?

Is the reclamation bond BLM or Forest Service?

BLM reclamation bond number:

Forest Service reclamation bond number:

Forest Service reclamation bond attachment:

Reclamation bond number:

Reclamation bond amount:

Reclamation bond rider amount:

Additional reclamation bond information attachment: