

**FINNEY LAND CO.**

OIL & GAS CONSULTING  
P.O. BOX 2471  
DURANGO, CO 81302  
PHONE: (970) 259-5691 • FAX (970) 259-4279

April 20, 2015

Bureau of Land Management  
Attn: Barbara Telecky  
San Juan Public Lands Center  
15 Burnett Court  
Durango, CO 81301

RE: Four Star Oil & Gas Company  
Southern Ute #11-D1 and  
Southern Ute #19-D1 Permits

Dear Ms. Telecky:

Attached please find 4 copies of the APD for Four Star Oil & Gas's proposed Southern Ute #11-D1 and Southern Ute #19-D1 Wells. Both of these wells are proposed Fruitland Coal wells to be located in T33N-R9W, Se. 34: SE/4SE/4.

Please charge the application fee to the following Visa Account:  
Anne C. Finney

Please replace the current Visa card that I have on file with the BLM with this new one.

Should you have any questions or need any additional information please don't hesitate to contact me. Thank you for your help on this permit.

Best regards,



Michael J. Finney  
President, Finney Land Co.

xc: John Turner – Four Star Oil & Gas Company

UNITED STATES  
DEPARTMENT OF THE INTERIOR  
BUREAU OF LAND MANAGEMENT

APPLICATION FOR PERMIT TO DRILL OR REENTER

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

1a. Type of work: <input checked="" type="checkbox"/> DRILL <input type="checkbox"/> REENTER		5. Lease Serial No. 14-20-151-32
1b. Type of Well: <input type="checkbox"/> Oil Well <input checked="" type="checkbox"/> Gas Well <input type="checkbox"/> Other <input checked="" type="checkbox"/> Single Zone <input type="checkbox"/> Multiple Zone		6. If Indian, Allottee or Tribe Name Southern Ute Indian Tribe
2. Name of Operator Four Star Oil & Gas Company		7. If Unit or CA Agreement, Name and No. N/A
3a. Address 332 RD. 3100 Aztec, NM 87410		8. Lease Name and Well No. Southern Ute #11-D1
3b. Phone No. (include area code) 505-333-1901		9. API Well No.
4. Location of Well (Report location clearly and in accordance with any State requirements. *) At surface 1049' FSL & 1221' FEL At proposed prod. zone 2102' FSL & 2090' FEL		10. Field and Pool, or Exploratory Ignacio-Blanco
14. Distance in miles and direction from nearest town or post office* 10.25 miles to Ignacio, CO.		11. Sec., T. R. M. or Blk. and Survey or Area Sec. 34, T33N, R9W N.M.P.M.
15. Distance from proposed* 2090' to nearest lease line location to nearest 604.33' from unit line property or lease line, ft. (Also to nearest drig. unit line, if any)	16. No. of acres in lease Total 2560	12. County or Parish La Plata
17. Spacing Unit dedicated to this well E/2	13. State CO	
18. Distance from proposed location* 14' to nearest well, drilling, completed, to proposed SU #19-D1 applied for, on this lease, ft.	19. Proposed Depth 3982'	20. BLM/BIA Bond No. on file BIA-K02907914-F4072 BLM-K0357927A
21. Elevations (Show whether DF, KDB, RT, GL, etc.) GL Elevation 7214'	22. Approximate date work will start* 08/23/2015	23. Estimated duration 16 days

24. Attachments

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

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

25. Signature	Name (Printed/Typed) April E. Pohl	Date 04/20/2015
Title Permitting Specialist		
Approved by (Signature)	Name (Printed/Typed)	Date
Title Office		

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

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

(Continued on page 2)

\*(Instructions on page 2)

# **Surface Use Plan**

Four Star Oil & Gas Company

Southern Ute #11-D1 Well  
**Lease #14-20-151-32**

Twp 33 N, Rge 9 W N.M.P.M.  
Section 34: SE/4SE/4  
1049' FSL x 1221' FEL  
La Plata County, CO

Prepared by: Finney Land Co.  
For: Four Star Oil & Gas Company  
April 15, 2015

## Surface Use Plan, Southern Ute #11-D1 Well

### 1.0 EXISTING ROADS:

See attached plat, Survey Plat A.

The existing "Texaco Hill" road is the main access road for this well. The last approximately 0.1 mile of road turns off of the Texaco Hill road and is the existing Southern Ute #11 Well access road. This road will be used for The Southern Ute #11-D1 Well also.

The "Texaco Hill" road is maintained by oil and gas operators that use it under a "Road Maintenance Agreement" that is overseen by the La Plata County Energy Council. Four Star Oil & Gas Company contributes to this road maintenance.

The existing 0.1 mile of access road described below is approximately 20 feet in width. The road shall be properly maintained in the same or better condition than presently found. The road conditions will be evaluated during the spring of each year. If necessary, additional base material and/or pulling of material from slopes back onto existing running surface to maintain crowning for off road drainage of precipitation run off will be done.

#### Access:

From the junction of State Highway 172 and La Plata County Road 318 in Ignacio, Colorado, travel West on County Road 318 for 12.4 miles;

Go left (South) onto existing "Texaco Hill" road for .3 miles;

Go left (East) on "Texaco Hill" road for 1.6 miles;

Go straight (East) on "Texaco Hill" road for 1.4 miles;

Go right (South) on well access road 0.1 miles to staked location on existing So. Ute #11 well pad.

### 2. NEW ACCESS ROADS: NOT APPLICABLE

No new access roads will need to be constructed. The road is currently in good shape and no additional work is necessary to facilitate the drilling and completion of the proposed well.

### 3. LOCATION OF EXISTING GAS & WATER WELL(S):

See attached plat for details, Plat B, There are no domestic water wells within 1 mile of the proposed well.

### 4. LOCATION OF EXISTING AND PROPOSED FACILITIES:

See attached survey plats, Survey Plat C-1 – Pad Drawing and Survey Plat C-2 Pipeline Survey Plat

**A:** The proposed wells are to be located within the current surface disturbance of the existing Southern Ute #11 wellpad. The new proposed facilities consist of a two (2) wellheads with wellhead piping, two (2) pumping units with electric motors, casing and tubing flowlines from each proposed well to the existing separator already on location, v-cone meters on each casing flowline, water meters on each tubing flowline, one (1) new TotalFlow EFM (including batteries and solar array) to replace the existing

AutoPilot EFM (including batteries and solar array), and an electrical rack with primary disconnect and load center. All permanent equipment will be painted green as required.

## **5. LOCATION AND TYPE OF WATER SUPPLY:**

Water for drilling and completion operations for the proposed wells will be sourced from Basin Disposal, Inc. and from Hydropure Technology, Inc. Water will be trucked to the site using the same roads described above. It is estimated that 1900 barrels of water may be used during the drilling phase of the project and another 3280 barrels of water used during the completion phase. The total anticipated number of truck trips is approximately 50.

Water for drilling and completion operations involves potable water, fresh water, and 2% KCl water.

The potable water will be sourced from Hydropure Technology, Inc. located at 711 North Light Plant Road, Aztec, NM 87410. The potable water will be trucked to the site using the same roads described above. It is estimated that 150 barrels of water may be used during the drilling phase of the project and another 150 barrels of water used during the completion phase. The total anticipated number of truck trips for the potable water is approximately 13. The trucks used to transport the potable water will be 24 bbl capacity, bobtail trucks.

The fresh water will be sourced from Basin Disposal Inc. located at 200 Montana, Bloomfield, NM 87413. Basin Disposal gets their fresh water from the City of Bloomfield, New Mexico. The fresh water will be trucked to the site using the same roads as described above. It is estimated that 1750 barrels of water may be used during the drilling phase of the project and another 3000 barrels of water used during completion. The total anticipated number of truck trips for the fresh water is approximately 35. The trucks used to transport the fresh water will have a capacity of 130 bbl.

The 2% KCl water will be sourced from Basin Disposal Inc. located at 200 Montana, Bloomfield, NM 87413. The 2% KCl water will be trucked to the site using the same roads as described above. No 2% KCl water will be used during the drilling phase of the project and 130 barrels of water used during completion. The total anticipated number of truck trips for the 2% KCl water is approximately 2. The trucks used to transport the KCl water will be 130 bbl capacity.

## **6. CONSTRUCTION MATERIALS:**

Minimal new construction materials will be necessary for this site because it is on an existing wellpad. If necessary, all of the construction materials for the proposed work will be obtained onsite or trucked from a third-party commercial facility. Road Base will be used to build the pad for the pumping unit and to back fill any low spots on the pad. Washed gravel will be spread around the equipment. Fill dirt may also be needed to back fill the on-pad pipeline. The construction materials obtained from an offsite facility will be coming from Durango Gravel's pit located at 995 Highway 3, Durango, CO (Twp 34 N, Rge 9 W NUL, Sec. 2: SE/4)

The earthen berm around the existing water tank may need to be temporarily removed to accommodate drilling equipment. If removed, it will be re-built using the original materials after drilling is completed.

The new on-pad gas piping from each wellhead to the separator is made of 4" x .237" or 6" x .280" pipe (ASTM A106 Grade B, SMLS, FBE – rated to more than 1000psi. Water piping will be made of 2" x .218" pipe (ASTM A106 Grade B, SMLS, FBE – rated to more than 1500psi).

## 7. METHODS FOR HANDLING WASTE:

**A. DRILL CUTTINGS:** The drilling operation will utilize a closed loop mud system with all make-up fluids and mud return cuttings and fluids contained in above ground steel pits. 30 mm reinforced liners will be placed under the tanks and a 6" coil drain pipe will be placed under the liner around the border of the tanks. All drill cuttings and non-recycled drill fluids will be transported off site to approved commercial disposal facilities. Where possible, fluids will be recycled during the drilling operation

### Drill cuttings disposal:

Facility Name: Industrial Ecosystems, Inc.  
Permit #: NM01-0010B  
Address of Facility: 49 County Rd. 215, Aztec, NM 87410

**B. RETURN FLUIDS:** The completion and work-over operation(s) will also utilize steel tanks to capture, contain and control all return fluids until these fluids are transported off site to approved commercial disposal facilities. Where possible, fluids will be recycled during completion or work-over operations. 30 mm reinforced liners will be placed under the tanks and a 6" coil drain pipe will be placed under the liner around the border of the tanks.

### Return Fluids disposal:

Facility name: Sunco  
Permit #: UIC-CL1-005  
Address of Facility: 345 County Rd. 350, Farmington, NM 87401

### Unused Drilling mud left after drilling the well:

Facility Name: Sunco  
Permit #: UIC-CL1-005  
Address of Facility: 345 County Rd. 350, Farmington, NM 87401

**C. GARBAGE AND TRASH:** All garbage and trash will be contained in a cage and hauled away to an approved landfill.

### Garbage and Trash Disposal:

Name of Facility: San Juan County Landfill  
Permit #: 052426  
Address of Facility: 78 County Road 3140, Aztec, NM 87410

**D. CHEMICAL TOILETS:** Chemical toilets will be provided and maintained during construction, drilling and completion operations.

**E. NON-FRESH WATER STORAGE:** Any tanks used to handle or store any material other than fresh water will have 30 mm reinforced liners will be placed under the tanks and a 6" coil drain pipe will be placed under the liner around the border of the tanks.

**F. DRILLING MUD:** Drilling Mud will be mixed on site in the steel mud tank. Fresh water will be mixed with dry additives to make up the drilling mud. The dry additives will be stored in pallets until used. The dry additives will be stored in the shrink wrap plastic until used. A plastic tarp will be placed

over them and be securely fastened. Any drilling mud left after drilling the well will be disposed of at a properly licensed facility.

**G. COMPLETION FLUID:** The completion fluid will utilize fresh water as a base material. The water will be stored in 400 bbl. frac tanks. Any fracturing additives will be pumped “on-the-fly” by the hydraulic fracturing company. The fracturing chemicals will be brought to the location by truck in either drums, “totes”, or in the case of any dry materials in bags stored on pallets. Any fracturing fluid chemical left after the treatment(s) will be removed by the hydraulic fracturing company and returned to their warehouse.

## **8. ANCILLARY FACILITIES**

Camper trailers will be on location for the company man, tool pusher, mud logger and drilling engineers during drilling and completion operations.

## **9. WELLSITE LAYOUT:**

See Drawing D-1 - Drilling Site Layout and Drawing D-2 - Pad Cross Section.

The referenced drawing depicts the layout of the proposed well pad utilizing a closed loop mud/returns system during the drilling and completion operation phases. If the well is completed as a producer, production equipment will be constructed on the location and the equipment will be painted as required.

## **10. SURFACE RESTORATION/RECLAMATION:**

See Drawing E for the proposed interim reclamation area. Interim and final reclamation will be done pursuant to the requirements of the Southern Ute Indian Tribe and the BLM. Interim reclamation will be minimal. It will consist of weed control, erosion control, and re-seeding disturbed areas that are not part of the proposed pad or an existing pad. Final reclamation shall include, but not be limited to: re-contouring the land back to its original condition as much as practical, redistribution of topsoil, reseeding to reestablish vegetation, insuring proper drainage to prevent erosion, and weed control.

No new surface disturbance is anticipated. The well is proposed to be drilled on the existing So. Ute #11 wellpad. Appropriate storm-water measures will be installed as necessary to prevent erosion and runoff.

## **11. SURFACE OWNERSHIP:**

Southern Ute Indian Tribe, P.O. Box 1500, Ignacio, CO 81137

## **12. OTHER INFORMATION:**

Contact the following persons for operations, engineering, and/or regulatory issues:

Permitting Specialist:

April E. Pohl

(505) 333-1941

april.pohl@chevron.com

San Juan Basin Operations Supervisor:  
George Badovinatz (505) 333-1912 [gbado@chevron.com](mailto:gbado@chevron.com)

Lead Facility Engineer:  
Andy Olson (505) 333-1954 [andrewolson@chevron.com](mailto:andrewolson@chevron.com)

HES Specialist:  
Don Lindsey (505) 333-1920 [LLIN@Chevron.com](mailto:LLIN@Chevron.com)

Chevron San Juan Field Management Team Office  
332 Road 3100  
Aztec, New Mexico 87410  
Office: (505) 333-1901

### 13. OPERATOR CERTIFICATION:

I certify that I, or someone under my 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.

Executed this 20 day of April, 2015

Name: April E. Pohl signature  
April E. Pohl - printed name  
Permitting Specialist  
Four Star Oil & Gas Company  
332 Road 3100  
Aztec, NM 87410

Well Location Survey Plat A

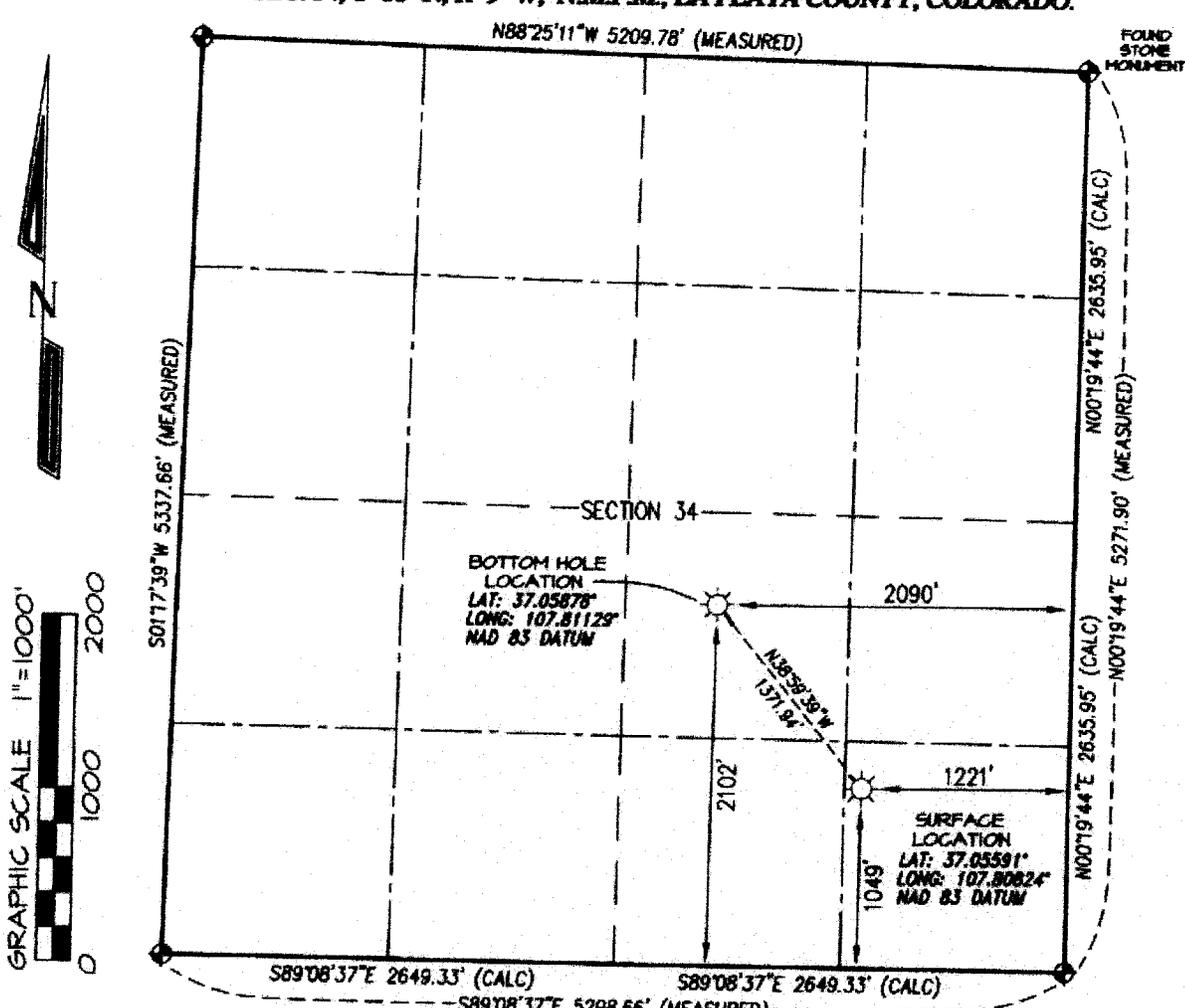
**FOUR STAR OIL & GAS COMPANY  
SOUTHERN UTE 11-D1**

**SURFACE LOCATION: 1049' FSL, 1221' FEL**  
**SEC. 34, T-33-N, R-9-W, N.M.P.M., LA PLATA COUNTY, COLORADO.**  
**GROUND LEVEL ELEVATION: 7214'**

**BOTTOM HOLE LOCATION: 2102' FSL, 2090' FEL**  
**SEC. 34, T-33-N, R-9-W, N.M.P.M., LA PLATA COUNTY, COLORADO.**

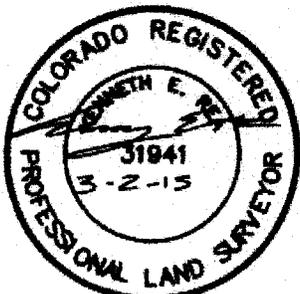
**BASIS OF BEARING:**  
 REAL-TIME KINEMATIC GPS SURVEY  
 SOLUTION OF CO SOUTH STATE  
 PLANE (NAD 83) COORDINATE GRID  
 - NO ROTATION OR SCALE FACTOR APPLIED -

**BASIS OF ELEVATION:**  
 N.G.S. SURVEY MARK "IGNATIO" LOCATED IN THE  
 SE/4 NE/4 OF SECTION 6, T33N, R9W, N1M.P.M., LA PLATA  
 COUNTY COLORADO. REFERENCE ELEVATION = 6590'



- NOTES:
1. WELL LOCATION FOOTAGE CALLS MEASURED PERPENDICULAR TO SECTION LINES.
  2. SURFACE USE FOR THE LAND SURROUNDING THIS LOCATION IS SOUTHERN UTE TRIBAL LAND.
  3. VISIBLE IMPROVEMENTS WITHIN 500' OF WELL BORE LOCATION ARE NOTED ON ATTACHED PHOTO DIAGRAM.
  4. THERE ARE NO BUILDING UNITS, SURFACE WIRES, OR PIPELINE AREAS WITHIN 1000' OF THE WELL BORE LOCATION.
  5. THERE ARE NO PUBLIC ROADS, MAJOR ABOVE GROUND UTILITIES, OR RAILROADS WITHIN 200' OF THE WELL BORE LOCATION.
  6. THERE ARE NO PROPERTY BOUNDARY LINES WITHIN 150' OF THE WELL BORE LOCATION.
  7. WELL GPS OBSERVATION PERFORMED BY NELSON ROSS ON DATE OF SURVEY - PDOP VALUE = 1.92
  8. THIS EXHIBIT IS INTENDED TO DEPICT THE PROPOSED WELL LOCATION AND DOES NOT REPRESENT A MONUMENTED BOUNDARY SURVEY.

and denotes found 3-1/4" B.L.M. aluminum cap unless otherwise noted.



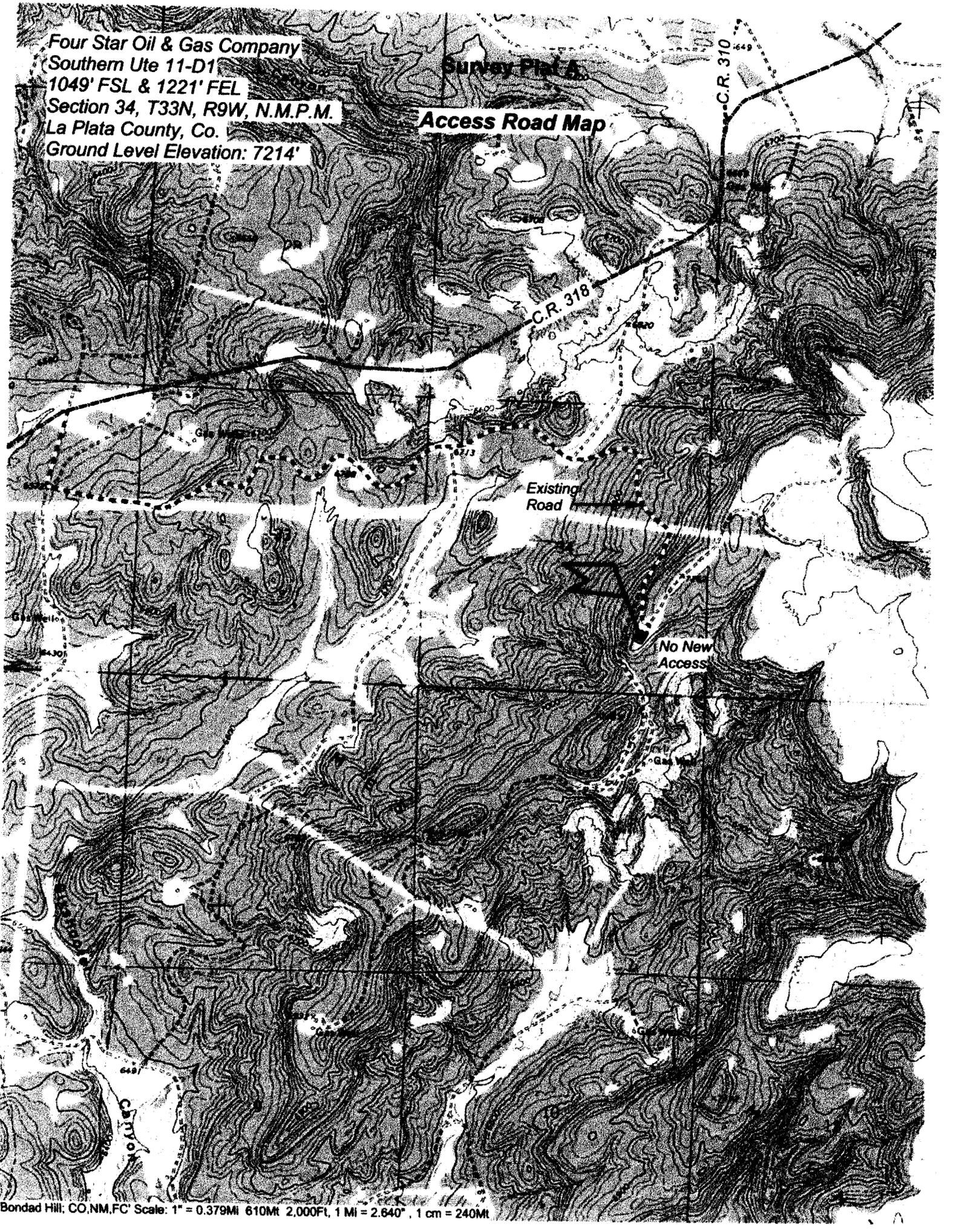
I, KENNETH E. REA, A REGISTERED PROFESSIONAL LAND SURVEYOR IN THE STATE OF COLORADO, DO HEREBY CERTIFY THAT THE WELL LOCATION SHOWN ON THIS PLAT IS ACCURATELY PLOTTED FROM FIELD NOTES OF ACTUAL SURVEYS MADE UNDER MY DIRECT SUPERVISION, AND THAT THIS PLAT IS NOT A LAND SURVEY PLAT OR IMPROVEMENT SURVEY PLAT, AND THAT IS IS NOT TO BE RELIED UPON FOR THE ESTABLISHMENT OF FENCE, BUILDING, OR OTHER FUTURE IMPROVEMENT LINES.

DRAWN BY: K.R. CHECKED BY: K.R. FILE NO.: 01070700	SURVEYED: 1/28/15 DRAWN: 2/11/15 DATE: 01/07/15	PREPARED FOR: <b>FOUR STAR OIL &amp; GAS COMPANY</b>
		<b>NORTHSTAR SURVEYING &amp; MAPPING, INC.</b>
		768 County Rd. 308 DURANGO, CO. 81303 (970) 385-0851

Four Star Oil & Gas Company  
Southern Ute 11-D1  
1049' FSL & 1221' FEL  
Section 34, T33N, R9W, N.M.P.M.  
La Plata County, Co.  
Ground Level Elevation: 7214'

Survey Plat A

**Access Road Map**

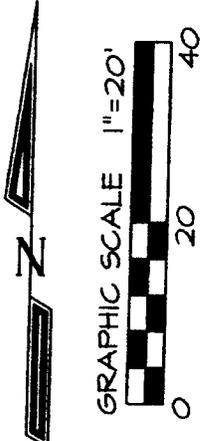
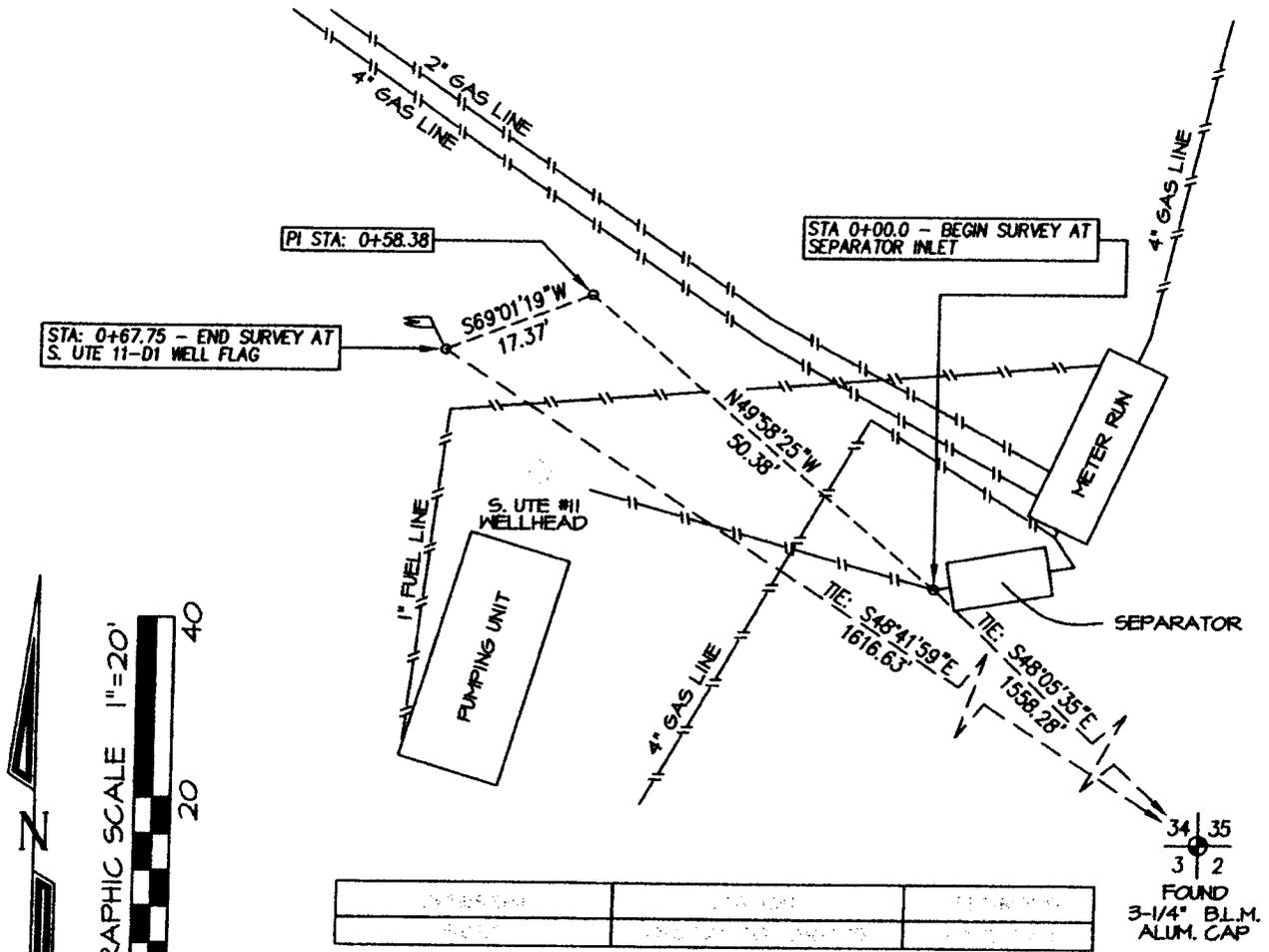






# Survey Plat C-2

## FOUR STAR OIL & GAS COMPANY: SOUTHERN UTE 11-D1 PROPOSED PIPELINE LOCATED IN THE SE/4 SE/4 OF SECTION 34, T33N, R9W, N.M.P.M., LA PLATA COUNTY, COLORADO




34	35
3	2

 FOUND  
 3-1/4" B.L.M.  
 ALUM. CAP

### - LEGAL DESCRIPTION -

A pipeline easement being forty feet (40') wide located in the SE/4 SE/4 of Section 34, Township 33 North, Range 9 West, N.M.P.M., La Plata County, Colorado. Said easement lying twenty feet (20') on each side of the following described centerline:

Beginning at existing S. Ute #11 separator inlet, whence the Southeast corner of said Section 34, being a 3-1/4" B.L.M. Aluminum Cap bears: S48°05'35"E a distance of 1558.28 feet.

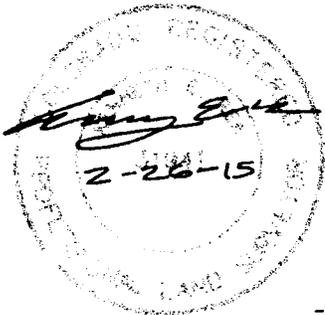
Thence N49°58'25"W a distance of 50.38 feet,

Thence S69°01'19"W a distance of 17.37 feet, ending at Four Star Oil & Gas Company: Southern Ute 11-D1 wellflag, whence said Southeast corner of Section 34 bears: S48°41'59"E a distance of 1616.63 feet.

Described easement being 67.75 feet in length & containing 0.062 acres, more or less.

### BASIS OF BEARING:

REAL-TIME KINEMATIC GPS SURVEY  
 SOLUTION OF CO SOUTH STATE  
 PLANE (NAD 83) COORDINATE GRID  
 -NO ROTATION OR SCALE FACTOR APPLIED-

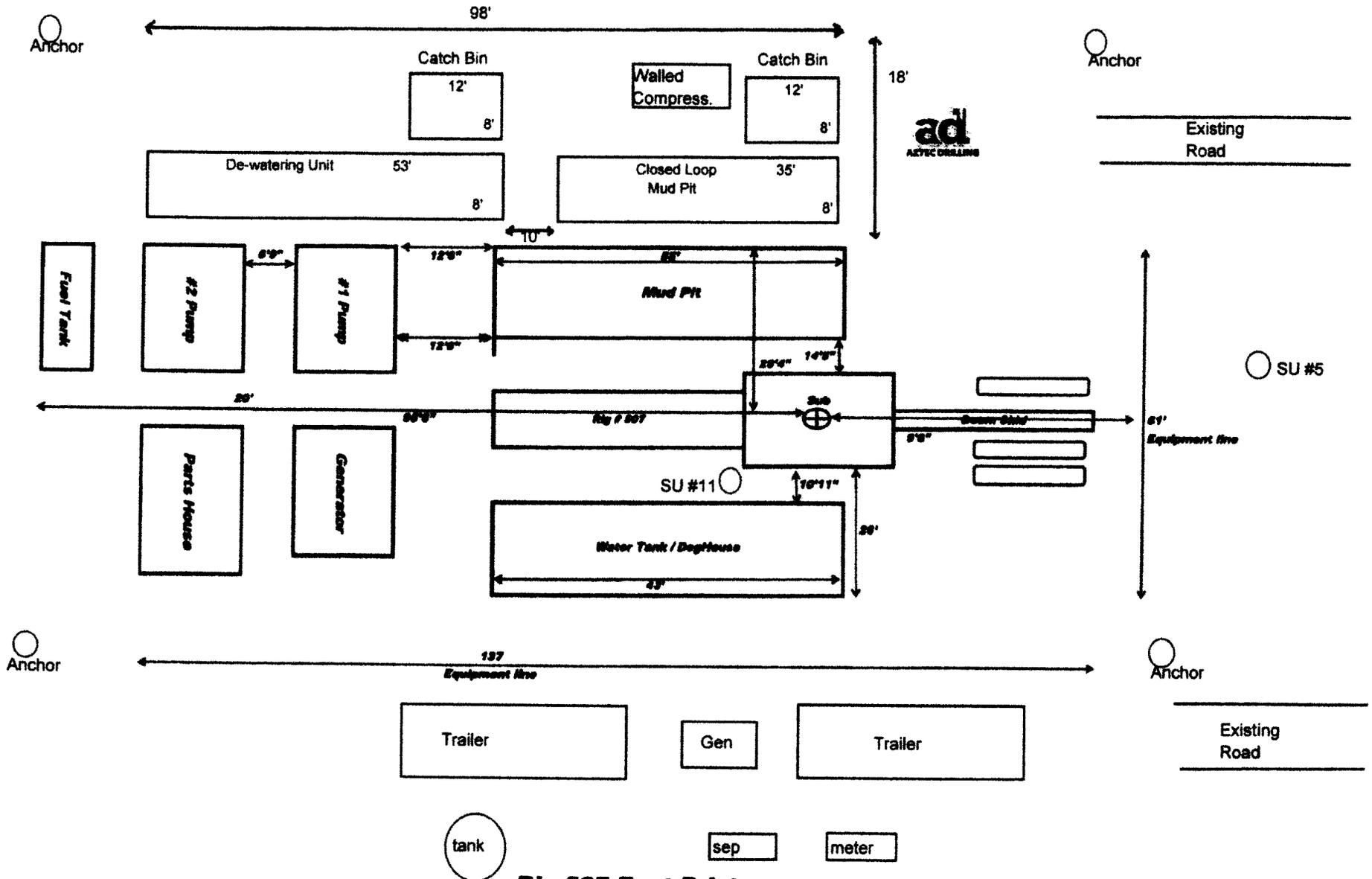


I, KENNETH E. REA, A REGISTERED PROFESSIONAL LAND SURVEYOR IN THE STATE OF COLORADO, DO HEREBY CERTIFY THAT THE SURVEY REPRESENTED BY THIS PLAT WAS MADE UNDER MY DIRECT SUPERVISION AND THAT THIS PLAT ACCURATELY REPRESENTS THIS SURVEY TO THE BEST OF MY KNOWLEDGE AND BELIEF.

REVISED: 2/26/15 DRAWN BY: K.R. CHECKED BY: K.R. FILE NO.: C11077PL	SURVEYED: 2/5/15 DRAWN: 2/10/15 JOB NO.: CH107	PREPARED FOR: <h3 style="text-align: center;">FOUR STAR OIL &amp; GAS CO.</h3> <h2 style="text-align: center;">NORTHSTAR SURVEYING &amp; MAPPING, INC.</h2> <p style="text-align: center;">                     768 County Road 308                      DURANGO, CO. 81303                      (970) 385-0851                 </p>
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# DRILLING SITE LAYOUT

Drawing D-1



**Rig 507 Foot Print**

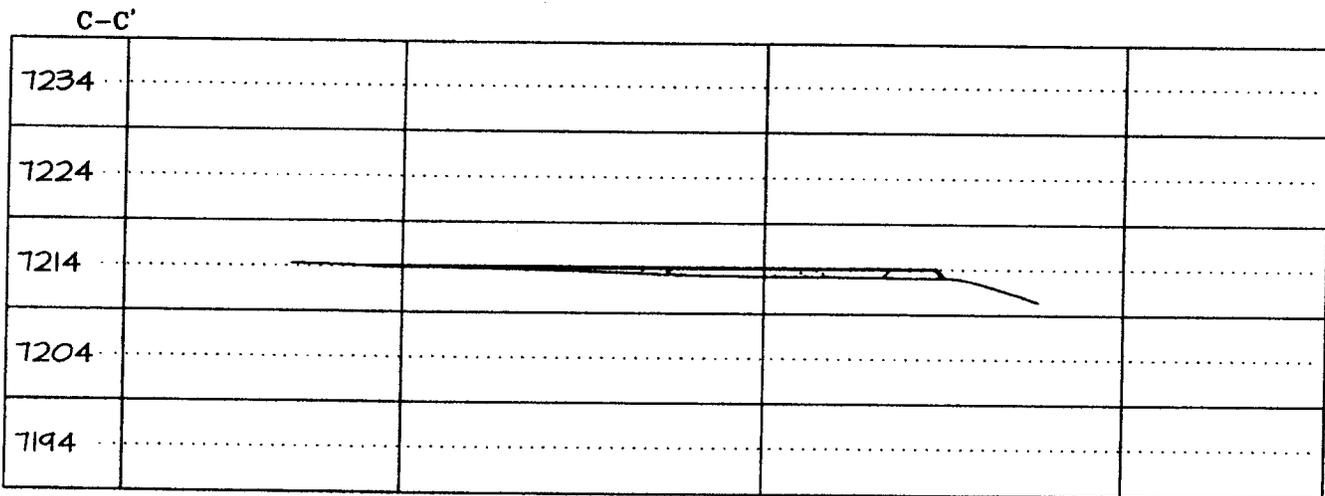
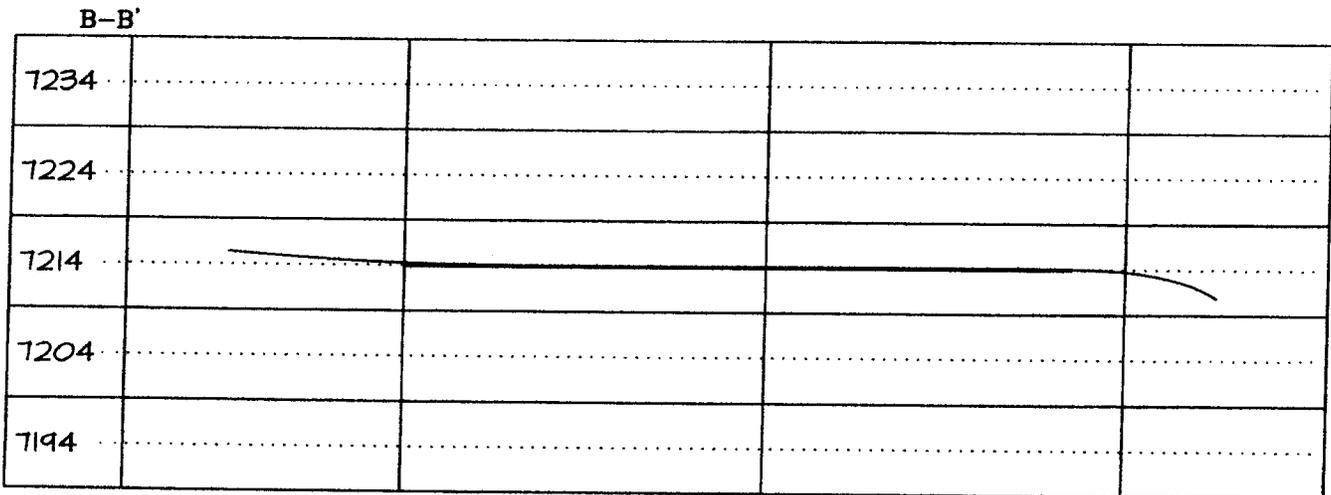
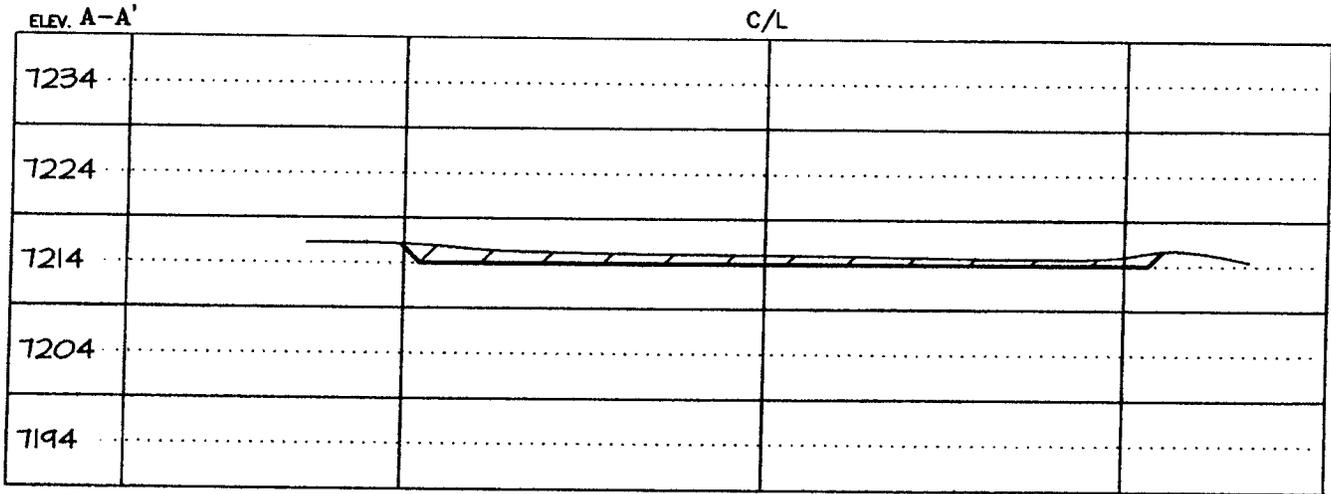
Well SU #11-D1

Updated March, 2012

# Plat D-2

**FOUR STAR OIL & GAS CO. SOUTHERN UTE 11-D1  
1049' FSL, 1221' FEL, SECTION 34, T-33-N, R-9-W, N.M.P.M.,  
LA PLATA COUNTY, CO. GROUND LEVEL ELEVATION: 7214'**

## PAD CROSS SECTION DETAIL



VERTICAL SCALE: 1" = 20' / HORIZONTAL SCALE: 1" = 50'

DATE DRAWN: 1/07/15

NORTHSTAR SURVEYING & MAPPING, INC.

FILE NO: CHV07CFB

DRAWN BY: K.R.

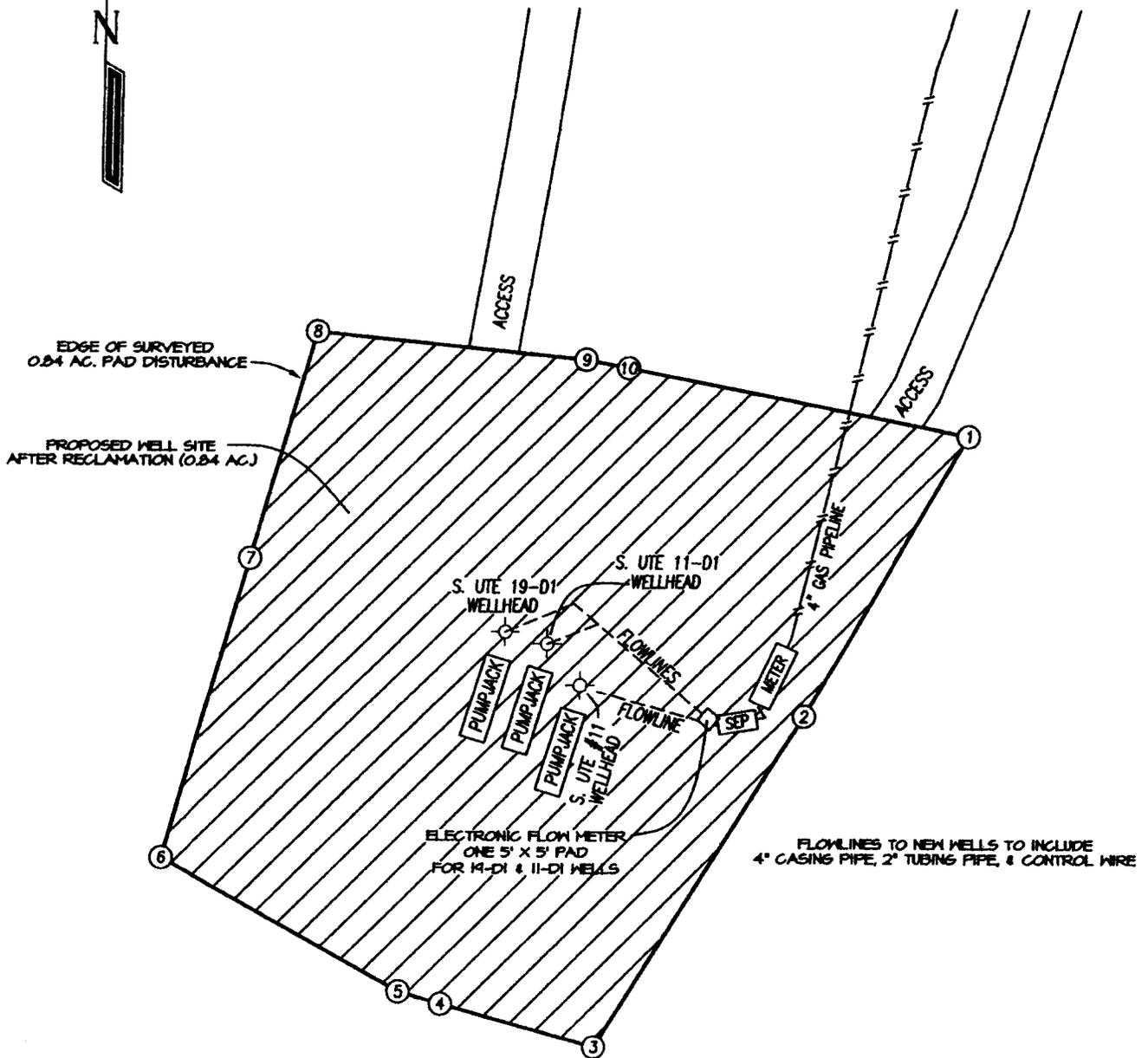
CHECKED BY: K.R.

# Drawing E

**FOUR STAR OIL & GAS CO. SOUTHERN UTE 11-D1  
 1049' FSL, 1221' FEL, SECTION 34, T-33-N, R-9-W, N.M.P.M.,  
 LA PLATA COUNTY, CO. GROUND LEVEL ELEVATION: 7214'**

## PROPOSED RECLAMATION DRAWING

NOTE:  
 THIS PROPOSED RECLAMATION DRAWING  
 DEPICTS THE OPERATORS INTENDED  
 WELL PAD RECLAMATION AND DOES  
 NOT REPRESENT A SURVEY OF  
 THE ACTUAL RECLAIMED WELL PAD.



# Four Star Oil & Gas Company

## Southern Ute #11-D1

SHL: 1049' FSL & 1221' FEL of Section 34, T33N, R9W

BHL: 2102' FSL & 2090' FEL of Section 34, T33N, R9W

La Plata County, Colorado

GL Elevation: 7214'

### Drilling Plan

All Lease and/or unit operations will be conducted in such a manner that full compliance is made with: 43 CFR part 3160, applicable BLM On-Shore Orders, COGCC rules and regulations, as well as the Southern Ute Tribal Conditions of Approval. The operator is fully responsible for the actions of its subcontractors. A copy of the APD and Conditions of Approval will be available to the field representatives to ensure compliance.

### ESTIMATED FORMATION TOPS (KB) and NOTABLE ZONES:

Formation Name	Depth (TVD)	Rock Type	Comments
San Jose	0'	Sandstone / Siltstone	Brackish / Fresh Water
Naicomento	1418'	Shale / Minor Sandstone	
Ojo Alamo	2218'	Sandstone / Siltstone	Brackish / Brine Water
Kirtland	2518'	Shale / Minor Sandstone	
Fruitland	3268'	Coal, Shale, Sandstone	Nat Gas, Brine water
Pictured Cliffs	3832'	Sandstone	Possible Lost Circ, Gas, Water
Proposed Total Depth	3982'		

**Possible Aquifers:** Surface to +/- 500'. Fresh water zones will be adequately protected by setting and cementing the surface casing.

**Oil Shale:** None expected.

**Oil:** None expected.

**Gas:** Gas is expected in the Fruitland Coal. All zones containing commercial quantities of oil or gas will be cased and cemented.

### PRESSURE CONTROL

Maximum expected pressure is 2000 (0.433 pressure gradient) psi. The drilling contract has not yet been awarded, thus the exact BOP and Choke Manifold model to be used is not yet known. A typical 11" 3000 psi model is pictured in Exhibits A & B.

# Four Star Oil & Gas Company

Southern Ute #11-D1

SHL: 1049' FSL & 1221' FEL of Section 34, T33N, R9W

BHL: 2102' FSL & 2090' FEL of Section 34, T33N, R9W

La Plata County, Colorado

GL Elevation: 7214'

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A remote accumulator will be used, and the pressures, the capacities, and the remote & manual controls will be identified at the time of the BLM supervised BOP test.

BOP equipment, accumulator, choke manifold, and all accessories will meet or exceed BLM requirements as listed in Onshore Order #2 for the 3M systems. The pressure control equipment considerations include but will not be limited to:

1. Annular preventer.
2. Double ram with blind rams and pipe rams.
3. Drilling spool, or blowout prevent with 2 side outlets. The choke side shall be a 3" minimum diameter and the kill side shall be at least 2" diameter.
4. 2" minimum kill line.
5. 3" diameter choke line.
6. 2 kill line valves, one of which shall be a 2" minimum check valve.
7. 2 chokes.
8. Pressure gauge on choke manifold.
9. Upper Kelly cock valve with handle available.
10. Safety valve and subs to fit all drill string connections in use.
11. All BOPE connections subjected to well pressure shall be flanged, welded, or clamped.
12. Fill-up line above uppermost preventer.
13. Accumulator will have sufficient capacity to open the hydraulically-controlled choke line valve, close all rams plus the annular preventer, and retain a minimum of 200 psi above per charge on the closing manifold without the use of the closing pumps.
14. Accumulator fluid volume is to be maintained at manufacturer's recommendations and shall be double the usable fluid volume of the accumulator system capacity.
15. Accumulator system shall have 2 independent power sources to close the preventers. Nitrogen bottles (3 minimum) may be 1 of the independent power sources and, if so, shall maintain a charge equal to the manufacturer's specifications.

BOPs will be pressed tested after initial installation, any time a seal is broken, and following any related repairs. Additionally, the BOPs will be operationally checked every 24 hours and a BOPE pit level drill shall be conducted weekly for each drilling crew. All tests and pressure tests will be recorded on an IADC log.

Ram type preventers, annular preventer, choke manifold, and related pressure control equipment will be pressure tested to 2000 psi high and 250 psi low.

The casing strings will be pressure tested per BLM Onshore Order #2 for 30 minutes as follows:

- a. Surface casing tested to 1000 psi prior to drilling out the shoe.
- b. Production casing tested to 3850 psi (80% of the internal yield) prior to commencement of completion operations.

# Four Star Oil & Gas Company

## Southern Ute #11-D1

SHL: 1049' FSL & 1221' FEL of Section 34, T33N, R9W

BHL: 2102' FSL & 2090' FEL of Section 34, T33N, R9W

La Plata County, Colorado

GL Elevation: 7214'

Casing Description	Hole Size	Casing OD	Weight lb/ft	Grade	Age	Connection	Top MD	Bottom MD
Surface	12 1/4"	9 5/8"	36	J-55	New	ST&C	0	500'
Production	8 3/4"	5 1/2"	15.5	J-55	New	LT&C	0	4275'

Casing Description	Casing OD	Footage	Collapse psi	Collapse Safety Factor	Burst psi	Burst Safety Factor	Tensile 1000 lb	Tensile Safety Factor
Surface	9 5/8"	500'	2020	8.2	3520	14.3	394	21.9
Production	5 1/2"	4275'	4040	2.1	4810	2.4	217	3.3

### PROPOSED CASING PROGRAM

See attached Drilling Plan Exhibit C for the Wellbore Schematic.

Collapse Safety Factor: Based on evacuated casing and 9.5 ppg annular hydrostatic at TVD.

Burst Safety Factor: Based on evacuated annulus and 9.5 ppg internal hydrostatic at TVD.

Tensile Safety Factor: Based on hanging air weight of casing in vertical hole at measured depth.

**Surface and production casings are to be cemented to surface.**

### CASING CEMENT

The cement programs are designed to meet the BLM Onshore Order #2 and COGCC requirements. The WOC periods will be sufficient to allow the cement compressive strength at the casing show to have reached 500 psi prior to drill out of the shoe.

**Surface Casing:** will be cemented to surface.

**Cement and properties:** Mix and pump 237 sacks (326 cu ft) Type III cement with CaCl<sub>2</sub>, cellophane, and a fluid loss additive. Slurry density is to be 14.6 ppg, 1.38 cu ft/sk yield. Volume will include 100% excess. Cement is to be displaced using a top plug.

Two centralizers will be run on the shoe joint, one centralizer each on the next two joints, and then one centralizer on every third joint thereafter.

# Four Star Oil & Gas Company

## Southern Ute #11-D1

SHL: 1049' FSL & 1221' FEL of Section 34, T33N, R9W

BHL: 2102' FSL & 2090' FEL of Section 34, T33N, R9W

La Plata County, Colorado

GL Elevation: 7214'

If cement is not circulated to surface, a CBL or temperature survey will be run to determine the TOC and remedial cementing will be conducted to circulate cement to surface.

The surface casing will be pressure tested to 1000 psi prior to drilling out of the shoe.

**Production Casing:** will be cemented to surface.

**Lead cement and properties:** Mix and pump 580 sacks (1175 cu ft) Premium Lite FM cement with CaCl<sub>2</sub>, cellophane, asphaltite, gel, and sodium metasilicate. Slurry density is to be 12.3 ppg, 2.03 cu ft/sk yield. Volume will include 65% excess.

**Tail cement and properties:** Mix and pump 322 sacks (443 cu ft) Type III cement with CaCl<sub>2</sub>, cellophane, and a fluid loss additive. Slurry density is to be 14.6 ppg, 1.38 cu ft/sk yield. Volume will include 35% excess. TOC calculated to be at 3000'.

Two centralizers will be run on the shoe joint, one centralizer each on the next three joints, and then one centralizer on every third joint into the surface casing.

A CBL log will be run in the production casing prior to commencement of completion operations to determine TOC.

Cement specifications may vary slightly due to cement and cement contractor availability.

### MUD PROGRAM

Depth	Type	Mud Weight (ppg)	Funnel Viscosity (sec/q)	API Filtrate (cc/30 min)	pH
0' - 500'	Water/Spud Mud	8.4 - 9.0	27 - 35	NC	8.0 - 9.0
500' - 4275'	MILGEL/LSND	8.5 - 9.5	50 - 65	4.0 - 6.0	8.0 - 9.0

The viscosity, mud weight, and other physical and chemical characteristics of the drilling mud will be varied as required to keep the hole clean, circulate drill cuttings, prevent caving, prevent lost circulation, and maximize penetration rate.

Sufficient mud and materials will be kept on site to maintain mud properties and meet loss circulation or mud weight requirements at all times.

Mud design may change depending on well conditions, and mud properties will be determined by the Chevron representative and the mud engineer.

## Four Star Oil & Gas Company

### Southern Ute #11-D1

SHL: 1049' FSL & 1221' FEL of Section 34, T33N, R9W

BHL: 2102' FSL & 2090' FEL of Section 34, T33N, R9W

La Plata County, Colorado

GL Elevation: 7214'

---

### CORING, TESTING, & LOGGING

No cores, drill stem tests, or open hole logs will be run. If cement is not circulated to surface, a CBL or temperature survey will be run to determine the TOC.

No mud logging will be conducted.

Inclination surveys will be run in 250' intervals and at the base of the surface hole prior to setting surface casing. A Gyro Multishot will be run at KOP below the surface casing and directional surveys will be taken every 100' to surface. Directional MWD surveys will be taken every 200' from the KOP to TD.

### ANTICIPATED PRESSURES AND TEMPERATURES

Expected bottom hole pressure:	1725 psi
Anticipated abnormal pressure:	None
Anticipated abnormal temperatures:	None
Anticipated hazardous gas (H2S):	None

If any foregoing conditions are unexpectedly encountered, suitable steps will be taken to mitigate according to accepted industry best practices.

### OTHER INFORMATION

The anticipated spud date is August 23, 2015, pending permit approval. The spud date will be dependent on the weather conditions, road conditions, and the regulatory agency-supplied Conditions of Approval.

No new dirt work is anticipated for the access road. Minimal dirt work is anticipated for the well pad. The dirt work for the well pad construction will commence upon approval of the APD and will be dependent on weather conditions. This well is to be drilled on an existing pad used by Four Star Oil & Gas Company's Southern Ute #11 well head and surface equipment. Four Star Oil & Gas Company will shut-in the producing well while drilling operations are conducted. Temporary barriers will be placed around the wellheads and equipment to protect them from contact or damage.

The drilling operation is expected to take 7 days. The drilling rig and associated equipment will be removed and preparations will be made for the completion of the well.

The well will be drilled utilizing closed loop and solids control handling equipment. The closed loop and solids control equipment will be set and utilized as per BLM and Southern Ute specifications and Conditions of Approval. The closed loop and solids control equipment set-up and operation are outlined in the 13 point surface use plan.

## **Four Star Oil & Gas Company**

### **Southern Ute #11-D1**

SHL: 1049' FSL & 1221' FEL of Section 34, T33N, R9W

BHL: 2102' FSL & 2090' FEL of Section 34, T33N, R9W

La Plata County, Colorado

GL Elevation: 7214'

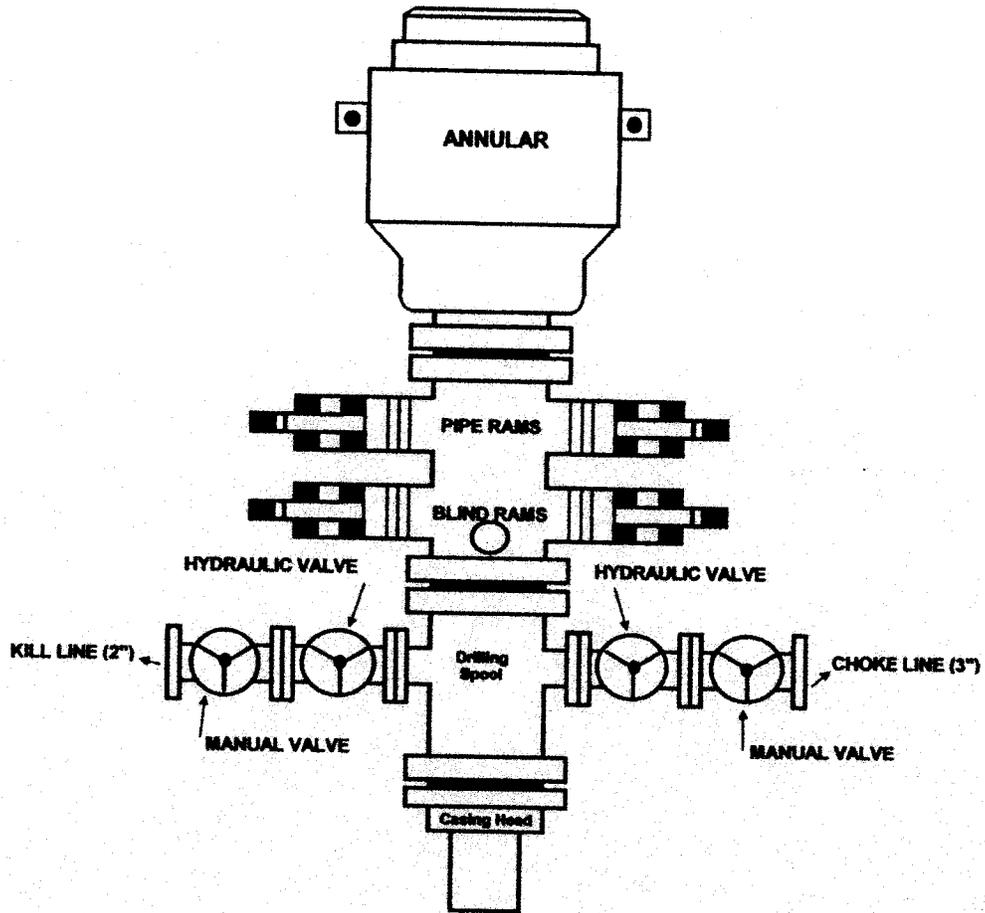
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Completion operations will start about two weeks after the finish of drilling operations. A completion rig will be moved in for the completion phase. The completion phase is expected to take approximately 9 days. The completion phase will include perforating, fracture stimulation, and well testing.

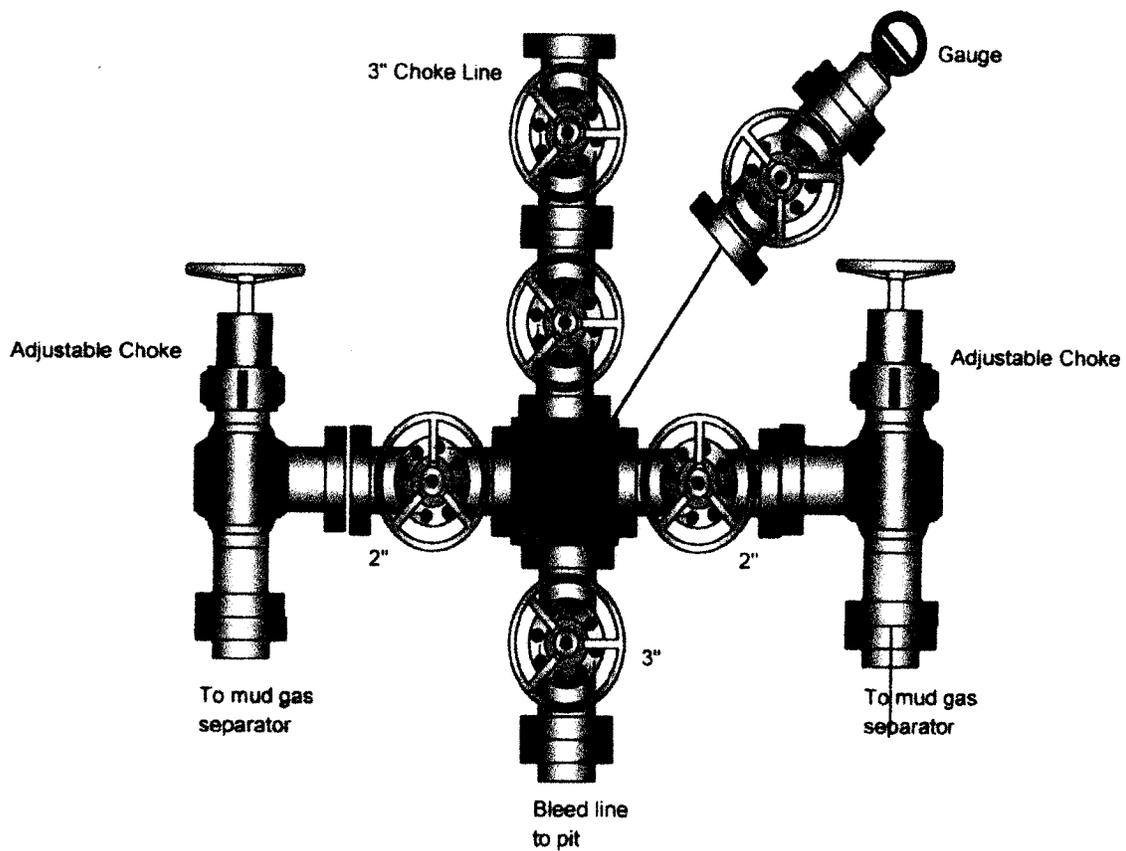
Some event/situations may arise that could potentially change the starting date or project duration that are out of Four Star Oil & Gas Company's control. If such events/situations arise, the proper officials will be promptly notified.

# Drilling Plan Exhibit A

## Blowout Preventer Diagram - 3M System



# Ad 507 Choke



# WELLBORE SCHEMATIC

## Drilling Plan Exhibit C

**SU #11-D1**  
La Plata County, Colorado  
Chevron USA Inc.

Date: 13-Mar-15

By: GT

Survey: Section 34, T33N, R9W

Elev: 7214'

Surf: Surface Location:

1049' FSL & 1221' FEL of Section 34

BHL: 2102' FSL & 2090' FEL of Section 34

API No.:

Well Type: Development

AFE No.:

AFE DHC / Total:

AFE Spud to RR:

Depth MD/TVD	Directional Program	Hole Size	Casing Program	NEB Elev: Big Flats:	PP	APW	PE	Mud & Cost Program	Directional	Logging Program
50'			16" Conductor					Water/Spud Mud		
500'		12-1/4"	9 5/8" 36 ppf, J-55, ST&C			8.4		14.6 ppg LEAD: to Surface 100% XS	Vertical Inclination Surveys	
4275' MD / 3982' TVD		8-3/4"	5-1/2" 15.50 ppf, J-55, LT&C			9.0		MILGEL/LSND to TD	GYRO Multishot at KOP at 500 to Surface	
						8.5		12.3 ppg LEAD: to Surface 65% XS 14.8 ppg TAIL: to 3000' 35% XS	Directional MWD Surveys as per Directional Plan	No OH Logs
						9.5				

Note: Schematic is NOT to scale.

# **Brammer Engineering**

La Plata County, Colorado NAD27

SU 11 Pad

SU 11D1

OH

Plan: Plan #3

## **Standard Planning Report**

08 April, 2015



**Scientific Drilling**

[www.scientificdrilling.com](http://www.scientificdrilling.com)



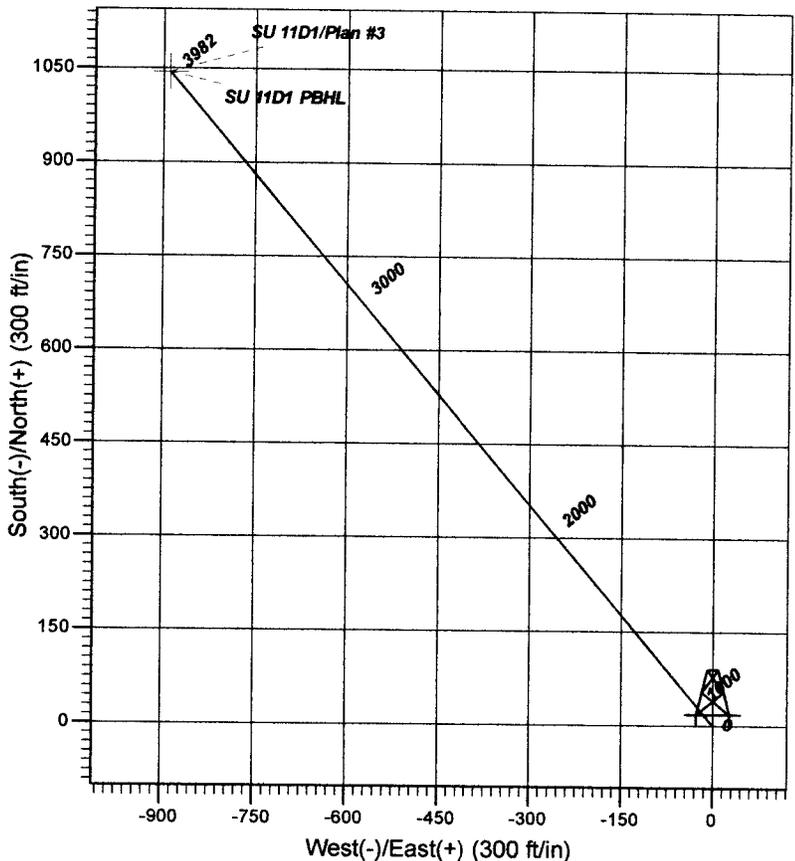
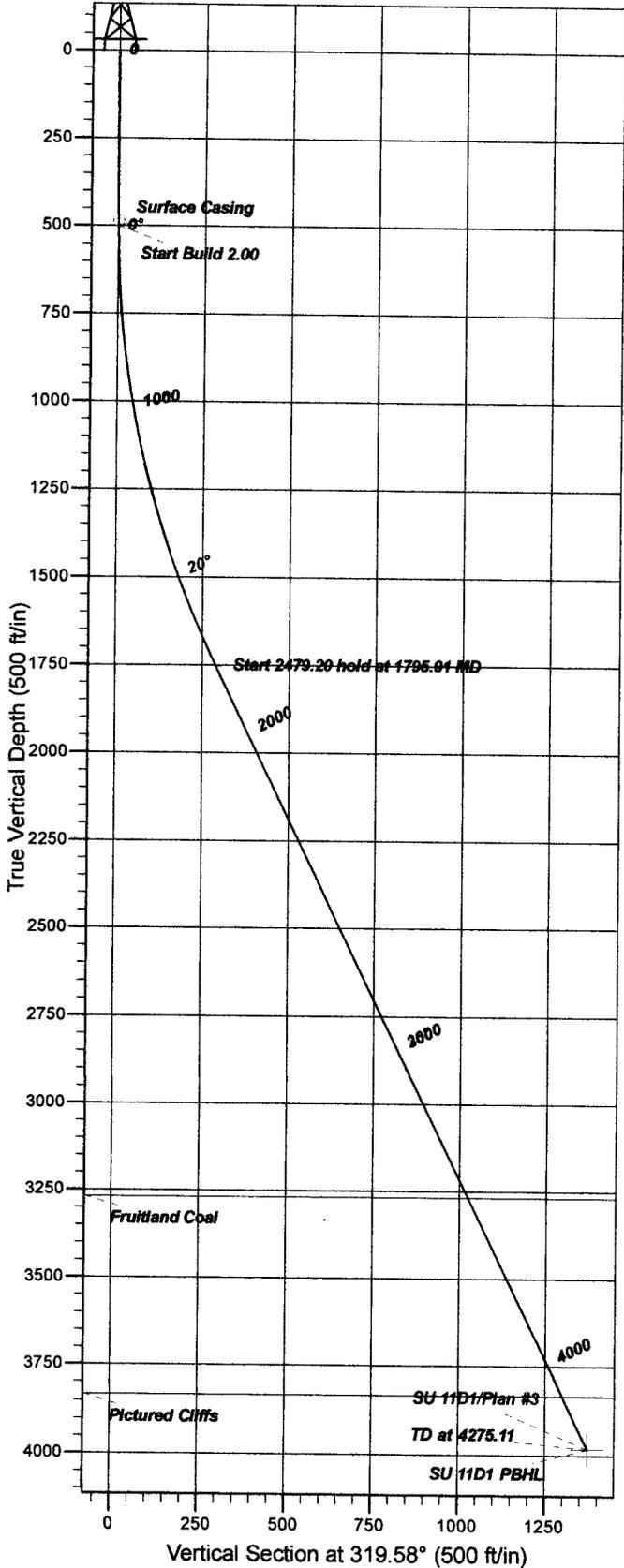
Company: Brammer Engineering  
 Project: La Plata County, Colorado NAD27  
 Site: SU 11 Pad  
 Well: SU 11D1

Well Details: SU 11D1

GL 7214' @ 7214.00ft						
+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Slot
0.00	0.00	1150055.68	2326455.97	37.0559119	-107.8082420	

**T M** Azimuths to True North  
 Magnetic North: 9.56°

Magnetic Field  
 Strength: 50454.9snT  
 Dip Angle: 63.63°  
 Date: 2/5/2015  
 Model: IGRF2015



FORMATION TOP DETAILS			Plan: Plan #3	
TVDPPath	MDPath	Formation	11:52, April 08 2015	
3268.00	3481.26	Fruitland Coal	Created By: Janie Collins	
3832.00	4108.33	Pictured Cliffs	PROJECT DETAILS: La Plata County, Colorado NAD27	
			Geodetic System: US State Plane 1983	
			Datum: North American Datum 1983	
			Ellipsoid: GRS 1980	
			Zone: Colorado Southern Zone	
			System Datum: Mean Sea Level	
CASING DETAILS				
TVDD	MD	Name	Size	
500.00	500.00	Surface Casing	9.625	

SECTION DETAILS										
Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	V Sect	Target
1	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	500.00	0.00	0.00	0.00	0.00	0.00	
3	1795.91	25.92	319.58	1752.16	219.36	-186.83	2.00	319.58	288.14	
4	4275.11	25.92	319.58	3982.00	1044.32	-889.46	0.00	0.001371.77		SU 11D1 PBHL

DESIGN TARGET DETAILS										
Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Shape		
SU 11D1 PBHL	3982.00	1044.32	-889.46	1151121.65	2325592.59	37.0587800	-107.8112900	Point	- plan hits target center	



**Database:** Grand Junction District  
**Company:** Brammer Engineering  
**Project:** La Plata County, Colorado NAD27  
**Site:** SU 11 Pad  
**Well:** SU 11D1  
**Wellbore:** OH  
**Design:** Plan #3

**Local Co-ordinate Reference:** Well SU 11D1  
**TVD Reference:** GL 7214' @ 7214.00ft  
**MD Reference:** GL 7214' @ 7214.00ft  
**North Reference:** True  
**Survey Calculation Method:** Minimum Curvature

<b>Project</b>	La Plata County, Colorado NAD27		
<b>Map System:</b>	US State Plane 1983	<b>System Datum:</b>	Mean Sea Level
<b>Geo Datum:</b>	North American Datum 1983		
<b>Map Zone:</b>	Colorado Southern Zone		

<b>Site</b>	SU 11 Pad				
<b>Site Position:</b>		<b>Northing:</b>	1,150,090.59 usft	<b>Latitude:</b>	37.0560200
<b>From:</b>	Lat/Long	<b>Easting:</b>	2,326,635.49 usft	<b>Longitude:</b>	-107.8076300
<b>Position Uncertainty:</b>	0.00 ft	<b>Slot Radius:</b>	13.200 in	<b>Grid Convergence:</b>	-1.42 °

<b>Well</b>	SU 11D1					
<b>Well Position</b>	<b>+N/-S</b>	-39.34 ft	<b>Northing:</b>	1,150,055.68 usft	<b>Latitude:</b>	37.0559119
	<b>+E/-W</b>	-178.60 ft	<b>Easting:</b>	2,326,455.97 usft	<b>Longitude:</b>	-107.8082420
<b>Position Uncertainty</b>		0.00 ft	<b>Wellhead Elevation:</b>	0.00 ft	<b>Ground Level:</b>	7,214.00 ft

<b>Wellbore</b>	OH				
<b>Magnetics</b>	<b>Model Name</b>	<b>Sample Date</b>	<b>Declination</b>	<b>Dip Angle</b>	<b>Field Strength</b>
	IGRF2015	2/5/2015	(°)	(°)	(nT)
			9.56	63.63	50,455

<b>Design</b>	Plan #3			
<b>Audit Notes:</b>				
<b>Version:</b>	<b>Phase:</b>	PLAN	<b>Tie On Depth:</b>	0.00
<b>Vertical Section:</b>	<b>Depth From (TVD)</b>	<b>+N/-S</b>	<b>+E/-W</b>	<b>Direction</b>
	(ft)	(ft)	(ft)	(°)
	0.00	0.00	0.00	319.58

Plan Sections										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	TFO (°)	Target
0.00	0.00	0.00	0.00	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	
1,795.91	25.92	319.58	1,752.16	219.36	-186.83	2.00	2.00	0.00	319.58	
4,275.11	25.92	319.58	3,982.00	1,044.32	-889.46	0.00	0.00	0.00	0.00	SU 11D1 PBHL



**Database:** Grand Junction District  
**Company:** Brammer Engineering  
**Project:** La Plata County, Colorado NAD27  
**Site:** SU 11 Pad  
**Well:** SU 11D1  
**Wellbore:** OH  
**Design:** Plan #3

**Local Co-ordinate Reference:** Well SU 11D1  
**TVD Reference:** GL 7214' @ 7214.00ft  
**MD Reference:** GL 7214' @ 7214.00ft  
**North Reference:** True  
**Survey Calculation Method:** Minimum Curvature

**Planned Survey**

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
100.00	0.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00
200.00	0.00	0.00	200.00	0.00	0.00	0.00	0.00	0.00	0.00
300.00	0.00	0.00	300.00	0.00	0.00	0.00	0.00	0.00	0.00
400.00	0.00	0.00	400.00	0.00	0.00	0.00	0.00	0.00	0.00
500.00	0.00	0.00	500.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>Surface Casing</b>									
600.00	2.00	319.58	599.98	1.33	-1.13	1.75	2.00	2.00	0.00
700.00	4.00	319.58	699.84	5.31	-4.52	6.98	2.00	2.00	0.00
800.00	6.00	319.58	799.45	11.95	-10.18	15.69	2.00	2.00	0.00
900.00	8.00	319.58	898.70	21.22	-18.08	27.88	2.00	2.00	0.00
1,000.00	10.00	319.58	997.47	33.13	-28.22	43.52	2.00	2.00	0.00
1,100.00	12.00	319.58	1,095.62	47.66	-40.59	62.60	2.00	2.00	0.00
1,200.00	14.00	319.58	1,193.06	64.78	-55.18	85.10	2.00	2.00	0.00
1,300.00	16.00	319.58	1,289.64	84.49	-71.96	110.98	2.00	2.00	0.00
1,400.00	18.00	319.58	1,385.27	106.74	-90.91	140.21	2.00	2.00	0.00
1,500.00	20.00	319.58	1,479.82	131.53	-112.02	172.77	2.00	2.00	0.00
1,600.00	22.00	319.58	1,573.17	158.81	-135.26	208.60	2.00	2.00	0.00
1,700.00	24.00	319.58	1,665.21	188.55	-160.59	247.67	2.00	2.00	0.00
1,795.91	25.92	319.58	1,752.16	219.36	-186.83	288.14	2.00	2.00	0.00
1,800.00	25.92	319.58	1,755.84	220.72	-187.99	289.93	0.00	0.00	0.00
1,900.00	25.92	319.58	1,845.78	254.00	-216.33	333.64	0.00	0.00	0.00
2,000.00	25.92	319.58	1,935.73	287.27	-244.68	377.35	0.00	0.00	0.00
2,100.00	25.92	319.58	2,025.67	320.55	-273.02	421.06	0.00	0.00	0.00
2,200.00	25.92	319.58	2,115.61	353.82	-301.36	464.77	0.00	0.00	0.00
2,300.00	25.92	319.58	2,205.55	387.10	-329.70	508.47	0.00	0.00	0.00
2,400.00	25.92	319.58	2,295.49	420.37	-358.04	552.18	0.00	0.00	0.00
2,500.00	25.92	319.58	2,385.44	453.65	-386.38	595.89	0.00	0.00	0.00
2,600.00	25.92	319.58	2,475.38	486.92	-414.72	639.60	0.00	0.00	0.00
2,700.00	25.92	319.58	2,565.32	520.20	-443.06	683.31	0.00	0.00	0.00
2,800.00	25.92	319.58	2,655.26	553.47	-471.40	727.02	0.00	0.00	0.00
2,900.00	25.92	319.58	2,745.20	586.75	-499.74	770.73	0.00	0.00	0.00
3,000.00	25.92	319.58	2,835.15	620.02	-528.09	814.43	0.00	0.00	0.00
3,100.00	25.92	319.58	2,925.09	653.30	-556.43	858.14	0.00	0.00	0.00
3,200.00	25.92	319.58	3,015.03	686.57	-584.77	901.85	0.00	0.00	0.00
3,300.00	25.92	319.58	3,104.97	719.85	-613.11	945.56	0.00	0.00	0.00
3,400.00	25.92	319.58	3,194.91	753.12	-641.45	989.27	0.00	0.00	0.00
3,481.26	25.92	319.58	3,284.86	786.40	-669.79	1,032.98	0.00	0.00	0.00
3,500.00	25.92	319.58	3,284.86	786.40	-669.79	1,032.98	0.00	0.00	0.00
3,600.00	25.92	319.58	3,374.80	819.67	-698.13	1,076.69	0.00	0.00	0.00
3,700.00	25.92	319.58	3,464.74	852.95	-726.47	1,120.40	0.00	0.00	0.00
3,800.00	25.92	319.58	3,554.68	886.23	-754.81	1,164.10	0.00	0.00	0.00
3,900.00	25.92	319.58	3,644.62	919.50	-783.15	1,207.81	0.00	0.00	0.00
4,000.00	25.92	319.58	3,734.56	952.78	-811.50	1,251.52	0.00	0.00	0.00
4,100.00	25.92	319.58	3,824.51	986.05	-839.84	1,295.23	0.00	0.00	0.00
4,108.33	25.92	319.58	3,832.00	988.82	-842.20	1,298.87	0.00	0.00	0.00
4,200.00	25.92	319.58	3,914.45	1,019.33	-868.18	1,338.94	0.00	0.00	0.00
4,275.11	25.92	319.58	3,982.00	1,044.32	-889.46	1,371.77	0.00	0.00	0.00
<b>SU 11D1 PBHL</b>									



**Database:** Grand Junction District  
**Company:** Brammer Engineering  
**Project:** La Plata County, Colorado NAD27  
**Site:** SU 11 Pad  
**Well:** SU 11D1  
**Wellbore:** OH  
**Design:** Plan #3

**Local Co-ordinate Reference:** Well SU 11D1  
**TVD Reference:** GL 7214' @ 7214.00ft  
**MD Reference:** GL 7214' @ 7214.00ft  
**North Reference:** True  
**Survey Calculation Method:** Minimum Curvature

Design Targets									
Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N-S (ft)	+E-W (ft)	Northing (usft)	Easting (usft)	Latitude	Longitude
SU 11D1 PBHL - plan hits target center - Point	0.00	0.00	3,982.00	1,044.32	-889.46	1,151,121.65	2,325,592.59	37.0587800	-107.8112900

Casing Points					
Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (in)	Hole Diameter (in)	
500.00	500.00	Surface Casing	9.625	12.250	

Formations						
Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)	
3,481.26	3,268.00	Fruitland Coal		0.00		
4,108.33	3,832.00	Pictured Cliffs		0.00		

# **Brammer Engineering**

La Plata County, Colorado NAD27

SU 11 Pad

SU 11D1

OH

Plan #3

## **Anticollision Report**

08 April, 2015



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Anticollision Report



Company: Brammer Engineering  
 Project: La Plata County, Colorado NAD27  
 Reference Site: SU 11 Pad  
 Site Error: 0.00 ft  
 Reference Well: SU 11D1  
 Well Error: 0.00 ft  
 Reference Wellbore: OH  
 Reference Design: Plan #3

Local Co-ordinate Reference: Well SU 11D1  
 TVD Reference: GL 7214' @ 7214.00ft  
 MD Reference: GL 7214' @ 7214.00ft  
 North Reference: True  
 Survey Calculation Method: Minimum Curvature  
 Output errors are at: 2.00 sigma  
 Database: Grand Junction District  
 Offset TVD Reference: Reference Datum

Reference	Plan #3		
Filter type:	NO GLOBAL FILTER: Using user defined selection & filtering criteria		
Interpolation Method:	MD Interval 100.00ft	Error Model:	ISCWSA
Depth Range:	0.00 to 300,000.00ft	Scan Method:	Closest Approach 3D
Results Limited by:	Maximum center-center distance of 10,000.00 ft	Error Surface:	Elliptical Conic
Warning Levels Evaluated at:	2.00 Sigma	Casing Method:	Not applied

Survey Tool Program	Date	4/8/2015
From (ft)	To (ft)	Survey (Wellbore)
0.00	4,275.11	Plan #3 (OH)
		Tool Name
		SDI MWD
		Description
		SDI MWD - Standard ver 1.0.1

Site Name	Reference Measured Depth (ft)	Offset Measured Depth (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Separation Factor	Warning
<b>Summary</b>						
<b>Offset Well - Wellbore - Design</b>						
SU 11 Pad						
SU #5 - OH - OH	1,062.30	1,051.20	306.35	302.64	82.600	CC
SU #5 - OH - OH	1,100.00	1,087.70	306.47	302.59	78.948	ES
SU #5 - OH - OH	1,800.00	1,748.44	388.17	380.33	49.508	SF
SU 11 - OH - OH	500.00	491.00	182.88	168.40	12.630	CC
SU 11 - OH - OH	700.00	690.85	186.26	165.27	8.875	ES
SU 11 - OH - OH	1,200.00	1,184.08	235.16	198.32	6.384	SF
SU 19D1 - OH - Plan #2	500.00	500.00	14.19	12.17	7.015	CC, ES
SU 19D1 - OH - Plan #2	600.00	599.43	14.72	12.27	5.996	SF

Offset Design SU 11 Pad - SU #5 - OH - OH													Offset Site Error:	0.00 R
Survey Program: 101-SDI Standard Keeper 103													Offset Well Error:	0.00 R
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre		Distance		Minimum Separation (ft)	Separation Factor	Warning	
							+N-S (ft)	+E-W (ft)	Between Centres (ft)	Between Ellipses (ft)				
0.00	0.00	0.00	9.00	0.00	0.00	40.87	238.14	206.03	315.02					
100.00	100.00	91.60	100.60	0.11	0.07	40.85	238.14	205.89	314.81	314.61	0.19	1,623.745		
200.00	200.00	192.02	201.02	0.34	0.19	40.83	238.02	205.64	314.55	314.02	0.53	598.209		
300.00	300.00	292.67	301.66	0.56	0.31	40.85	237.62	205.44	314.12	313.28	0.85	370.801		
400.00	400.00	392.66	401.66	0.79	0.43	40.87	237.13	205.19	313.59	312.42	1.16	269.204		
500.00	500.00	492.60	501.60	1.01	0.56	40.90	236.63	204.98	313.07	311.58	1.48	211.165		
600.00	599.98	593.18	602.18	1.23	0.68	81.66	236.15	204.61	312.21	310.29	1.92	162.802		
700.00	699.84	692.76	701.75	1.46	0.81	82.61	235.75	204.06	310.82	308.55	2.27	136.899		
800.00	799.45	792.04	801.03	1.70	0.94	84.23	235.35	203.66	309.25	306.62	2.64	117.327		
900.00	898.70	891.11	900.10	1.98	1.05	86.48	235.08	203.26	307.78	304.77	3.01	102.147		
1,000.00	997.47	990.50	999.48	2.26	1.17	89.34	234.94	202.66	306.65	303.22	3.42	89.532		
1,062.30	1,058.70	1,051.20	1,060.18	2.47	1.24	91.42	234.78	202.32	306.35	302.64	3.71	82.600	CC	
1,100.00	1,095.62	1,087.70	1,096.68	2.60	1.29	92.78	234.73	202.16	306.47	302.59	3.88	78.948	ES	
1,200.00	1,193.06	1,185.25	1,194.24	2.99	1.41	96.83	234.56	201.88	308.06	303.68	4.38	70.255		
1,300.00	1,289.64	1,282.48	1,291.46	3.44	1.53	101.37	234.21	201.55	311.81	306.88	4.93	63.221		
1,400.00	1,385.27	1,377.69	1,386.67	3.95	1.66	106.19	233.86	201.14	318.52	313.01	5.51	57.805		
1,500.00	1,479.82	1,472.03	1,481.01	4.53	1.77	111.22	233.45	200.91	329.11	323.02	6.10	53.971		
1,600.00	1,573.17	1,565.64	1,574.61	5.17	1.89	116.30	232.94	200.68	344.03	337.34	6.69	51.442		
1,700.00	1,665.21	1,657.85	1,666.82	5.88	2.01	121.25	232.40	200.35	363.60	356.33	7.27	49.995		
1,800.00	1,755.84	1,748.44	1,757.42	6.65	2.10	125.93	231.88	200.02	388.17	380.33	7.84	49.508	SF	

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

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Company: Brammer Engineering  
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 Reference Site: SU 11 Pad  
 Site Error: 0.00 ft  
 Reference Well: SU 11D1  
 Well Error: 0.00 ft  
 Reference Wellbore: OH  
 Reference Design: Plan #3

Local Co-ordinate Reference: Well SU 11D1  
 TVD Reference: GL 7214' @ 7214.00ft  
 MD Reference: GL 7214' @ 7214.00ft  
 North Reference: True  
 Survey Calculation Method: Minimum Curvature  
 Output errors are at: 2.00 sigma  
 Database: Grand Junction District  
 Offset TVD Reference: Reference Datum

Offset Design SU 11 Pad - SU #5 - OH - OH													Offset Site Error:	0.00 ft
Survey Program: 101-SDI Standard Keeper 103													Offset Well Error:	0.00 ft
Reference		Offset		Semi Major Axis			Distance						Warning	
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N-S (ft)	+E-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor		
1,900.00	1,845.78	1,838.63	1,847.60	7.47	2.16	130.49	232.22	199.63	418.53	408.19	8.35	49.903		
2,000.00	1,935.73	1,927.97	1,936.94	8.30	2.24	134.57	231.74	199.26	447.40	438.59	8.81	50.791		
2,100.00	2,025.67	2,017.63	2,026.60	9.14	2.36	138.19	231.11	198.96	480.38	471.15	9.23	52.042		
2,200.00	2,115.61	2,107.46	2,116.42	9.98	2.47	141.39	230.44	198.65	515.01	505.39	9.62	53.517		
2,300.00	2,205.55	2,197.99	2,206.96	10.83	2.58	144.23	229.74	198.27	550.92	540.92	10.00	55.092		
2,400.00	2,295.49	2,288.67	2,297.62	11.69	2.70	146.74	229.14	197.78	587.80	577.44	10.36	56.723		
2,500.00	2,385.44	2,379.80	2,388.76	12.54	2.82	148.97	228.63	197.17	625.44	614.71	10.73	58.307		
2,600.00	2,475.38	2,472.23	2,481.17	13.40	2.93	150.97	228.23	196.32	663.57	652.48	11.09	59.831		
2,700.00	2,565.32	2,561.93	2,570.87	14.26	3.04	152.71	227.96	195.32	702.11	690.66	11.46	61.270		
2,800.00	2,655.26	2,650.94	2,659.88	15.12	3.15	154.27	227.62	194.49	741.36	729.53	11.83	62.687		
2,900.00	2,745.20	2,741.42	2,750.36	15.99	3.26	155.69	227.32	193.72	781.09	768.90	12.19	64.071		
3,000.00	2,835.15	2,832.58	2,841.51	16.85	3.38	157.00	226.98	192.78	821.08	808.52	12.56	65.393		
3,100.00	2,925.09	2,922.74	2,931.67	17.72	3.48	158.15	226.86	191.90	861.33	848.40	12.93	66.621		
3,200.00	3,015.03	3,012.11	3,021.03	18.59	3.59	159.21	226.63	191.05	901.93	888.63	13.30	67.801		
3,300.00	3,104.97	3,104.39	3,113.30	19.46	3.70	160.21	226.34	190.05	942.70	929.03	13.67	68.945		
3,400.00	3,194.91	3,200.82	3,209.73	20.32	3.81	161.16	226.44	188.75	983.28	969.23	14.05	69.971		
3,500.00	3,284.86	3,292.42	3,301.31	21.19	3.89	161.98	226.81	187.29	1,023.72	1,009.28	14.44	70.874		
3,600.00	3,374.80	3,385.78	3,394.66	22.06	3.99	162.75	227.26	185.65	1,064.15	1,049.32	14.84	71.717		
3,700.00	3,464.74	3,478.91	3,487.77	22.93	4.07	163.46	227.98	183.91	1,104.50	1,089.26	15.24	72.481		
3,800.00	3,554.68	3,568.27	3,577.11	23.80	4.15	164.07	228.86	182.28	1,144.89	1,129.25	15.65	73.179		
3,900.00	3,644.62	3,658.94	3,667.76	24.67	4.22	164.66	229.72	180.77	1,185.53	1,169.47	16.06	73.841		
4,000.00	3,734.56	3,749.27	3,758.07	25.55	4.30	165.20	230.58	179.19	1,226.21	1,209.74	16.47	74.462		
4,100.00	3,824.51	3,838.91	3,847.70	26.42	4.38	165.71	231.48	177.79	1,267.08	1,250.19	16.88	75.045		
4,200.00	3,914.45	3,930.52	3,939.29	27.29	4.46	166.18	232.42	176.39	1,308.03	1,290.73	17.30	75.592		

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

Anticollision Report



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 Well Error: 0.00 ft  
 Reference Wellbore: OH  
 Reference Design: Plan #3

Local Co-ordinates Reference: Well SU 11D1  
 TVD Reference: GL 7214' @ 7214.00ft  
 MD Reference: GL 7214' @ 7214.00ft  
 North Reference: True  
 Survey Calculation Method: Minimum Curvature  
 Output errors are at: 2.00 sigma  
 Database: Grand Junction District  
 Offset TVD Reference: Reference Datum

Offset Design SU 11 Pad - SU 11 - OH - OH													Offset Site Error:	0.00 ft
Survey Program: 95-INCLINOMETER													Offset Well Error:	0.00 ft
Reference				Offset			Semi Major Axis			Distance			Warning	
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N-S (ft)	+E-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor		
0.00	0.00	0.00	9.00	0.00	0.00	77.58	39.34	178.60	183.10					
100.00	100.00	91.00	100.00	0.11	1.38	77.58	39.34	178.60	182.88	181.39	1.49	122.388		
200.00	200.00	191.00	200.00	0.34	4.36	77.58	39.34	178.60	182.88	178.18	4.70	38.951		
300.00	300.00	291.00	300.00	0.56	7.39	77.58	39.34	178.60	182.88	174.92	7.96	22.984		
400.00	400.00	391.00	400.00	0.79	10.43	77.58	39.34	178.60	182.88	171.66	11.22	16.302		
500.00	500.00	491.00	500.00	1.01	13.47	77.58	39.34	178.60	182.88	168.40	14.48	12.630 CC		
600.00	599.98	590.98	599.98	1.23	16.50	118.47	39.34	178.60	183.71	165.97	17.74	10.357		
700.00	699.84	690.85	699.84	1.46	19.54	119.84	39.34	178.60	186.26	165.27	20.99	8.875 ES		
800.00	799.45	790.46	799.45	1.70	22.56	122.02	39.34	178.60	190.75	166.53	24.23	7.874		
900.00	898.70	889.72	898.70	1.96	25.58	124.90	39.34	178.60	197.51	170.06	27.45	7.195		
1,000.00	997.47	988.49	997.47	2.26	28.58	128.28	39.34	178.60	206.91	178.27	30.84	6.753		
1,100.00	1,095.62	1,086.65	1,095.62	2.60	31.56	131.97	39.34	178.60	219.35	185.57	33.78	6.494		
1,200.00	1,193.06	1,184.08	1,193.06	2.99	34.52	135.77	39.34	178.60	235.16	198.32	36.84	6.384 SF		
1,300.00	1,289.64	1,280.67	1,289.64	3.44	37.45	139.52	39.34	178.60	254.59	214.80	39.79	6.399		
1,400.00	1,385.27	1,376.30	1,385.27	3.95	40.35	143.09	39.34	178.60	277.82	235.20	42.61	6.519		
1,500.00	1,479.82	1,470.85	1,479.82	4.53	43.22	146.40	39.34	178.60	304.90	259.61	45.29	6.732		
1,600.00	1,573.17	1,564.20	1,573.17	5.17	46.06	149.40	39.34	178.60	335.83	288.02	47.81	7.025		
1,700.00	1,665.21	1,656.25	1,665.21	5.88	48.86	152.08	39.34	178.60	370.56	320.41	50.15	7.389		
1,800.00	1,755.84	1,746.88	1,755.84	6.65	51.61	154.46	39.34	178.60	409.01	356.67	52.35	7.814		
1,900.00	1,845.78	1,836.86	1,845.78	7.47	54.34	156.83	39.34	178.60	449.50	394.48	55.02	8.169		
2,000.00	1,935.73	1,926.80	1,935.73	8.30	57.07	158.81	39.34	178.60	490.55	432.82	57.72	8.499		
2,100.00	2,025.67	2,016.74	2,025.67	9.14	59.80	160.50	39.34	178.60	532.01	471.58	60.43	8.803		
2,200.00	2,115.61	2,106.68	2,115.61	9.98	62.53	161.94	39.34	178.60	573.81	510.65	63.16	9.085		
2,300.00	2,205.55	2,196.63	2,205.55	10.83	65.27	163.19	39.34	178.60	615.88	549.98	65.90	9.345		
2,400.00	2,295.49	2,286.58	2,295.49	11.69	68.00	164.28	39.34	178.60	658.16	589.51	68.65	9.587		
2,500.00	2,385.44	2,376.52	2,385.44	12.54	70.73	165.25	39.34	178.60	700.61	629.20	71.41	9.811		
2,600.00	2,475.38	2,466.46	2,475.38	13.40	73.46	166.10	39.34	178.60	743.21	669.04	74.18	10.020		
2,700.00	2,565.32	2,556.41	2,565.32	14.28	76.19	166.86	39.34	178.60	785.93	708.99	76.95	10.214		
2,800.00	2,655.26	2,646.35	2,655.26	15.12	78.92	167.55	39.34	178.60	828.76	749.03	79.73	10.385		
2,900.00	2,745.20	2,736.29	2,745.20	15.99	81.65	168.16	39.34	178.60	871.67	789.16	82.51	10.584		
3,000.00	2,835.15	2,826.26	2,835.15	16.85	84.39	168.72	39.34	178.60	914.66	829.36	85.30	10.723		
3,100.00	2,925.09	2,916.20	2,925.09	17.72	87.12	169.23	39.34	178.60	957.71	869.62	88.09	10.872		
3,200.00	3,015.03	3,006.14	3,015.03	18.59	89.85	169.70	39.34	178.60	1,000.82	909.94	90.89	11.012		
3,300.00	3,104.97	3,096.08	3,104.97	19.46	92.58	170.13	39.34	178.60	1,043.98	950.30	93.69	11.143		
3,400.00	3,194.91	3,186.03	3,194.91	20.32	95.31	170.52	39.34	178.60	1,087.19	990.70	96.49	11.268		
3,500.00	3,284.86	3,275.97	3,284.86	21.19	98.04	170.88	39.34	178.60	1,130.43	1,031.14	99.29	11.385		
3,600.00	3,374.80	3,365.92	3,374.80	22.06	100.78	171.22	39.34	178.60	1,173.71	1,071.61	102.10	11.496		
3,700.00	3,464.74	3,455.86	3,464.74	22.93	103.51	171.53	39.34	178.60	1,217.01	1,112.11	104.91	11.601		
3,800.00	3,554.68	3,521.00	3,529.88	23.80	105.48	171.75	39.34	178.60	1,260.59	1,153.54	107.05	11.776		
3,900.00	3,644.62	3,521.00	3,529.88	24.67	105.48	171.75	39.34	178.60	1,308.75	1,201.31	107.44	12.181		
4,000.00	3,734.56	3,521.00	3,529.88	25.55	105.48	171.75	39.34	178.60	1,362.56	1,254.73	107.83	12.636		
4,100.00	3,824.51	3,521.00	3,529.88	26.42	105.48	171.75	39.34	178.60	1,421.37	1,313.15	108.22	13.134		
4,200.00	3,914.45	3,521.00	3,529.88	27.29	105.48	171.75	39.34	178.60	1,484.59	1,375.99	108.61	13.669		

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 Well Error: 0.00 ft  
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Local Co-ordinate Reference: Well SU 11D1  
 TVD Reference: GL 7214' @ 7214.00ft  
 GL 7214' @ 7214.00ft  
 North Reference: True  
 Survey Calculation Method: Minimum Curvature  
 Output errors are at 2.00 sigma  
 Database: Grand Junction District  
 Offset TVD Reference: Reference Datum

Offset Design SU 11 Pad - SU 19D1 - OH - Plan #2													Offset Site Error:	0.00 ft
Survey Program: 0-SDI MWD													Offset Well Error:	0.00 ft
Reference		Offset		Semi Major Axis			Distance						Warning	
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N-S (ft)	+E-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor		
0.00	0.00	0.00	0.00	0.00	0.00	-75.13	3.64	-13.72	14.19	14.19	0.00	N/A		
100.00	100.00	100.00	100.00	0.11	0.11	-75.13	3.64	-13.72	14.19	13.97	0.22	63.137		
200.00	200.00	200.00	200.00	0.34	0.34	-75.13	3.64	-13.72	14.19	13.52	0.67	21.046		
300.00	300.00	300.00	300.00	0.56	0.56	-75.13	3.64	-13.72	14.19	13.07	1.12	12.627		
400.00	400.00	400.00	400.00	0.79	0.79	-75.13	3.64	-13.72	14.19	12.62	1.57	9.020		
500.00	500.00	500.00	500.00	1.01	1.01	-75.13	3.64	-13.72	14.19	12.17	2.02	7.015 CC, ES		
600.00	599.98	599.43	599.40	1.23	1.22	-43.28	2.93	-15.75	14.72	12.27	2.46	5.996 SF		
700.00	699.84	698.54	698.29	1.46	1.42	-63.89	0.82	-21.83	17.95	15.07	2.88	6.239		
800.00	799.45	796.99	796.16	1.70	1.66	-82.86	-2.68	-31.88	26.36	23.04	3.32	7.937		
900.00	898.70	894.47	892.53	1.96	1.93	-94.41	-7.49	-45.70	40.32	36.50	3.82	10.567		
1,000.00	997.47	990.70	986.96	2.26	2.26	-100.84	-13.56	-63.14	59.25	54.88	4.37	13.552		
1,100.00	1,095.62	1,085.40	1,079.05	2.60	2.64	-104.52	-20.81	-83.94	82.71	77.71	5.00	16.546		
1,200.00	1,193.06	1,178.34	1,168.48	2.99	3.09	-106.70	-29.12	-107.83	110.43	104.73	5.71	19.356		
1,300.00	1,289.64	1,269.30	1,254.94	3.44	3.59	-108.01	-38.41	-134.51	142.20	135.71	6.49	21.900		
1,400.00	1,385.27	1,358.11	1,338.20	3.95	4.16	-108.77	-48.56	-163.67	177.84	170.48	7.36	24.150		
1,500.00	1,479.82	1,444.63	1,418.11	4.53	4.77	-109.16	-59.46	-194.98	217.18	208.86	8.32	26.116		
1,600.00	1,573.17	1,528.73	1,494.53	5.17	5.43	-109.30	-71.00	-228.13	260.04	250.68	9.35	27.803		
1,700.00	1,665.21	1,610.34	1,567.41	5.88	6.13	-109.23	-83.07	-262.80	306.25	295.78	10.47	29.248		
1,800.00	1,755.84	1,689.40	1,636.72	6.65	6.86	-109.05	-95.57	-298.71	355.65	343.98	11.67	30.469		
1,900.00	1,845.78	1,766.23	1,702.78	7.47	7.64	-109.80	-108.46	-335.75	407.54	394.58	12.96	31.444		
2,000.00	1,935.73	1,841.06	1,765.83	8.30	8.44	-109.74	-121.71	-373.81	461.31	447.05	14.27	32.334		
2,100.00	2,025.67	1,913.83	1,825.85	9.14	9.26	-109.63	-135.24	-412.67	516.89	501.31	15.59	33.165		
2,200.00	2,115.61	1,984.47	1,882.83	9.98	10.11	-109.33	-148.97	-452.10	574.20	557.29	16.92	33.945		
2,300.00	2,205.55	2,052.95	1,936.81	10.83	10.98	-108.91	-162.82	-491.89	633.19	614.94	18.25	34.688		
2,400.00	2,295.49	2,119.25	1,987.85	11.69	11.85	-108.42	-176.73	-531.84	693.81	674.23	19.59	35.421		
2,500.00	2,385.44	2,188.37	2,039.85	12.54	12.80	-107.85	-191.70	-574.85	755.92	734.97	20.95	36.074		
2,600.00	2,475.38	2,266.19	2,098.11	13.40	13.88	-107.26	-208.66	-623.58	818.41	796.02	22.39	36.554		
2,700.00	2,565.32	2,344.01	2,156.36	14.26	14.97	-106.76	-225.63	-672.31	880.94	857.11	23.83	36.972		
2,800.00	2,655.26	2,421.84	2,214.62	15.12	16.06	-106.33	-242.59	-721.04	943.51	918.24	25.27	37.339		
2,900.00	2,745.20	2,499.66	2,272.87	15.99	17.16	-105.95	-259.55	-769.78	1,006.10	979.39	26.71	37.663		
3,000.00	2,835.15	2,577.48	2,331.13	16.85	18.26	-105.61	-276.52	-818.51	1,068.72	1,040.56	28.16	37.949		
3,100.00	2,925.09	2,655.30	2,389.38	17.72	19.37	-105.31	-293.48	-867.24	1,131.36	1,101.75	29.61	38.205		
3,200.00	3,015.03	2,733.12	2,447.64	18.59	20.47	-105.04	-310.45	-915.97	1,194.02	1,162.95	31.07	38.435		
3,300.00	3,104.97	2,810.94	2,505.89	19.46	21.58	-104.80	-327.41	-964.70	1,256.69	1,224.17	32.52	38.643		
3,400.00	3,194.91	2,888.77	2,564.15	20.32	22.68	-104.58	-344.38	-1,013.43	1,319.37	1,285.39	33.98	38.832		
3,500.00	3,284.86	2,966.59	2,622.40	21.19	23.79	-104.39	-361.34	-1,062.16	1,382.06	1,346.63	35.43	39.003		
3,600.00	3,374.80	3,044.41	2,680.66	22.06	24.90	-104.20	-378.30	-1,110.89	1,444.77	1,407.87	36.89	39.161		
3,700.00	3,464.74	3,122.23	2,738.91	22.93	26.02	-104.04	-395.27	-1,159.63	1,507.48	1,469.12	38.35	39.305		
3,800.00	3,554.68	3,200.05	2,797.17	23.80	27.13	-103.89	-412.23	-1,208.36	1,570.20	1,530.38	39.82	39.436		
3,900.00	3,644.62	3,277.87	2,855.43	24.67	28.24	-103.74	-429.20	-1,257.09	1,632.92	1,591.64	41.28	39.553		
4,000.00	3,734.56	3,355.70	2,913.68	25.55	29.36	-103.61	-446.16	-1,305.82	1,695.65	1,652.90	42.75	39.662		
4,100.00	3,824.51	3,433.52	2,971.94	26.42	30.47	-103.49	-463.12	-1,354.55	1,758.38	1,714.16	44.22	39.764		
4,200.00	3,914.45	3,511.34	3,030.19	27.29	31.58	-103.38	-480.09	-1,403.28	1,821.12	1,775.43	45.69	39.858		

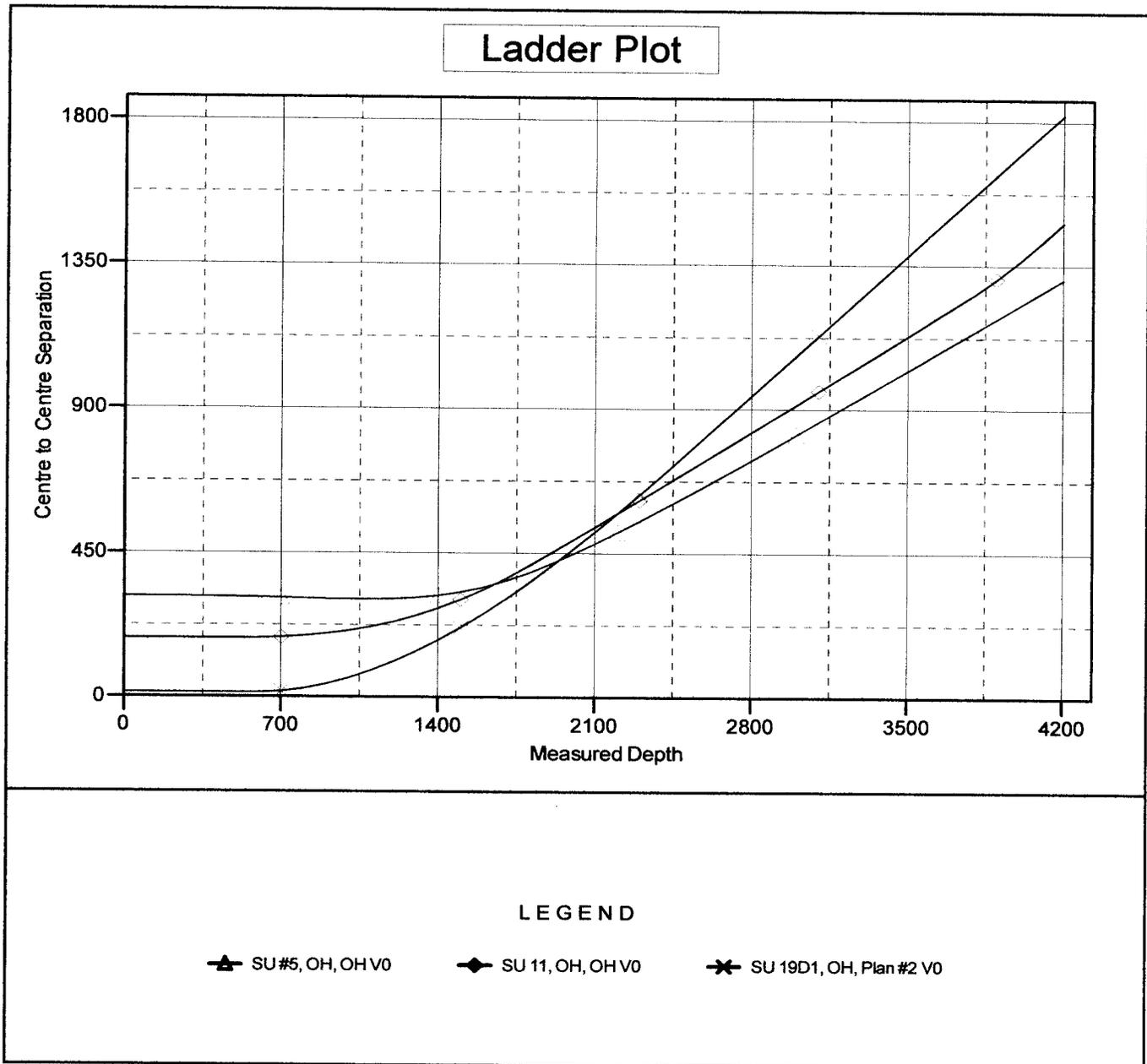
CC - Min centre to center distance or covergent point, SF - min separation factor, ES - min ellipse separation

**Company:** Brammer Engineering  
**Project:** La Plata County, Colorado NAD27  
**Reference Site:** SU 11 Pad  
**Site Error:** 0.00 ft  
**Reference Well:** SU 11D1  
**Well Error:** 0.00 ft  
**Reference Wellbore:** OH  
**Reference Design:** Plan #3

**Local Co-ordinate Reference:** Well SU 11D1  
**TVD Reference:** GL 7214' @ 7214.00ft  
**MD Reference:** GL 7214' @ 7214.00ft  
**North Reference:** True  
**Survey Calculation Method:** Minimum Curvature  
**Output errors are at:** 2.00 sigma  
**Database:** Grand Junction District  
**Offset TVD Reference:** Reference Datum

Reference Depths are relative to GL 7214' @ 7214.00ft  
 Offset Depths are relative to Offset Datum  
 Central Meridian is -105.5000000

Coordinates are relative to: SU 11D1  
 Coordinate System is US State Plane 1983, Colorado Southern Zone  
 Grid Convergence at Surface is: -1.42°

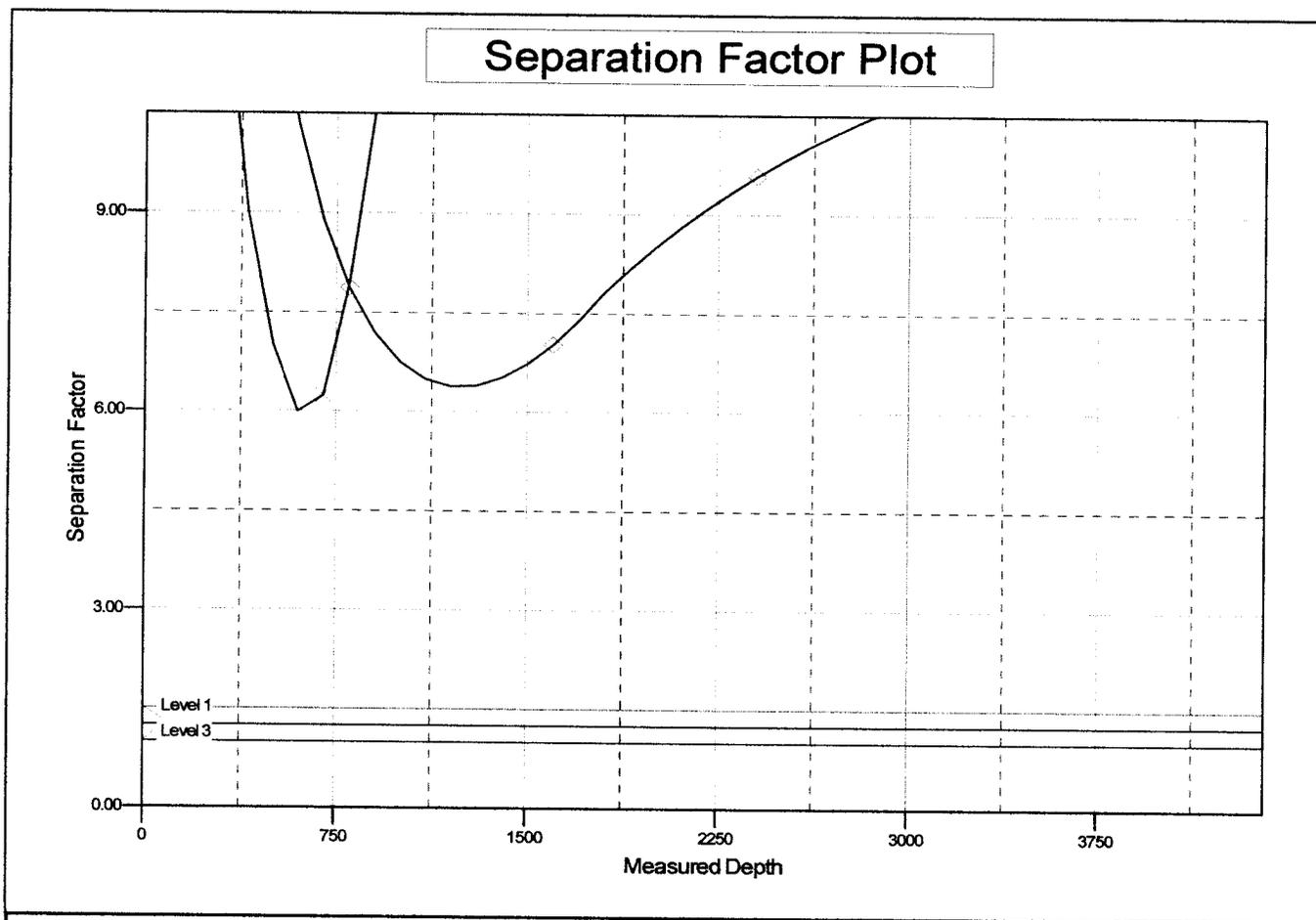


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 Coordinate System is US State Plane 1983, Colorado Southern Zone  
 Grid Convergence at Surface is: -1.42°



#### LEGEND

- ▲ SU #5, OH, OH V0
- ◆ SU 11, OH, OH V0
- ✕ SU 19D1, OH, Plan #2 V0