

District I
1625 N. French Dr., Hobbs, NM 88240
District II
1301 W. Grand Avenue, Artesia, NM 88210
District III
1000 Rio Brazos Road, Aztec, NM 87410
District IV
1220 S. St. Francis Dr., Santa Fe, NM 87505

State of New Mexico
Energy Minerals and Natural Resources
Department
Oil Conservation Division
1220 South St. Francis Dr.
Santa Fe, NM 87505

Form C-144 CLEZ
July 21, 2008

For closed-loop systems that only use above ground steel tanks or haul-off bins and propose to implement waste removal for closure, submit to the appropriate NMOCD District Office.

Closed-Loop System Permit or Closure Plan Application

(that only use above ground steel tanks or haul-off bins and propose to implement waste removal for closure)

Type of action: ☒ Permit ☐ Closure

Instructions: Please submit one application (Form C-144 CLEZ) per individual closed-loop system request. For any application request other than for a closed-loop system that only use above ground steel tanks or haul-off bins and propose to implement waste removal for closure, please submit a Form C-144.

Please be advised that approval of this request does not relieve the operator of liability should operations result in pollution of surface water, ground water or the environment. Nor does approval relieve the operator of its responsibility to comply with any other applicable governmental authority's rules, regulations or ordinances.

1. Operator: **COG OPERATING LLC** OGRID #: **229137**
Address: **550 WEST TEXAS, SUITE 100 MIDLAND, TX 79701**
Facility or well name: **HATFIELD STATE #6H**
API Number: **30-015- 40430** OCD Permit Number: **213138**
U/L or Qtr/Qtr **UL J** Section **8** Township **17S** Range **29E** County: **EDDY**
Center of Proposed Design: Latitude **N/A** Longitude **N/A** NAD: ☐ 1927 ☐ 1983
Surface Owner: ☐ Federal ☒ State ☐ Private ☐ Tribal Trust or Indian Allotment

2. ☒ **Closed-loop System:** Subsection H of 19.15.17.11 NMAC
Operation: ☒ Drilling a new well ☐ Workover or Drilling (Applies to activities which require prior approval of a permit or notice of intent) ☐ P&A
☐ Above Ground Steel Tanks or ☒ Haul-off Bins

3. **Signs:** Subsection C of 19.15.17.11 NMAC
☐ 12"x 24", 2" lettering, providing Operator's name, site location, and emergency telephone numbers
☒ Signed in compliance with 19.15.3.103 NMAC

RECEIVED

JUN 29 2012

NMOCD ARTESIA

4. **Closed-loop Systems Permit Application Attachment Checklist:** Subsection B of 19.15.17.9 NMAC
Instructions: Each of the following items must be attached to the application. Please indicate, by a check mark in the box, that the documents are attached.
☒ Design Plan - based upon the appropriate requirements of 19.15.17.11 NMAC
☒ Operating and Maintenance Plan - based upon the appropriate requirements of 19.15.17.12 NMAC
☒ Closure Plan (Please complete Box 5) - based upon the appropriate requirements of Subsection C of 19.15.17.9 NMAC and 19.15.17.13 NMAC
☐ Previously Approved Design (attach copy of design) API Number: _____
☐ Previously Approved Operating and Maintenance Plan API Number: _____

5. **Waste Removal Closure For Closed-loop Systems That Utilize Above Ground Steel Tanks or Haul-off Bins Only:** (19.15.17.13.D NMAC)
Instructions: Please identify the facility or facilities for the disposal of liquids, drilling fluids and drill cuttings. Use attachment if more than two facilities are required.
Disposal Facility Name: **CRI** Disposal Facility Permit Number: **R1966**
Disposal Facility Name: **GM INC** Disposal Facility Permit Number: **711-019-001**
Will any of the proposed closed-loop system operations and associated activities occur on or in areas that will not be used for future service and operations?
☐ Yes (If yes, please provide the information below) ☒ No
Required for impacted areas which will not be used for future service and operations:
☐ Soil Backfill and Cover Design Specifications - based upon the appropriate requirements of Subsection H of 19.15.17.13 NMAC
☐ Re-vegetation Plan - based upon the appropriate requirements of Subsection I of 19.15.17.13 NMAC
☐ Site Reclamation Plan - based upon the appropriate requirements of Subsection G of 19.15.17.13 NMAC

6. **Operator Application Certification:**
I hereby certify that the information submitted with this application is true, accurate and complete to the best of my knowledge and belief.
Name (Print): **Kacie Connally** Title: **Permitting Tech**
Signature: *Kacie Connally* Date: **3-21-2012**
e-mail address: **kconnally@concho.com** Telephone: **432-221-0336**

7. **OCD Approval:** ☒ Permit Application (including closure plan) ☐ Closure Plan (only)

OCD Representative Signature: _____

Approval Date: 2/3/12

Title: _____

OCD Permit Number: 213138

8. **Closure Report (required within 60 days of closure completion):** Subsection K of 19.15.17.13 NMAC

Instructions: Operators are required to obtain an approved closure plan prior to implementing any closure activities and submitting the closure report. The closure report is required to be submitted to the division within 60 days of the completion of the closure activities. Please do not complete this section of the form until an approved closure plan has been obtained and the closure activities have been completed.

☐ Closure Completion Date: _____

9. **Closure Report Regarding Waste Removal Closure For Closed-loop Systems That Utilize Above Ground Steel Tanks or Haul-off Bins Only:**

Instructions: Please indentify the facility or facilities for where the liquids, drilling fluids and drill cuttings were disposed. Use attachment if more than two facilities were utilized.

Disposal Facility Name: _____ Disposal Facility Permit Number: _____

Disposal Facility Name: _____ Disposal Facility Permit Number: _____

Were the closed-loop system operations and associated activities performed on or in areas that *will not* be used for future service and operations?

☐ Yes (If yes, please demonstrate compliance to the items below) ☐ No

Required for impacted areas which will not be used for future service and operations.

☐ Site Reclamation (Photo Documentation)

☐ Soil Backfilling and Cover Installation

☐ Re-vegetation Application Rates and Seeding Technique

10. **Operator Closure Certification:**

I hereby certify that the information and attachments submitted with this closure report is true, accurate and complete to the best of my knowledge and belief. I also certify that the closure complies with all applicable closure requirements and conditions specified in the approved closure plan.

Name (Print): _____ Title: _____

Signature: _____ Date: _____

e-mail address: _____ Telephone: _____

Closed Loop Operation & Maintenance Procedure

All drilling fluid circulated over shaker(s) with cuttings discharged into roll off container.

Fluid and fines below shaker(s) are circulated with transfer pump through centrifuge(s) or solids separator with cuttings and fines discharged into roll off container.

Fluid is continuously re-circulated through equipment with polymer added to aid separation of cutting fines.

Roll off containers are lined and de-watered with fluids re-circulated into system.

Additional tank is used to capture unused drilling fluid or cement returns from casing jobs.

This equipment will be maintained 24 hrs./day by solids control personnel and or rig crews that stay on location.

Cuttings will be hauled to either:

CRI (permit number R9166)

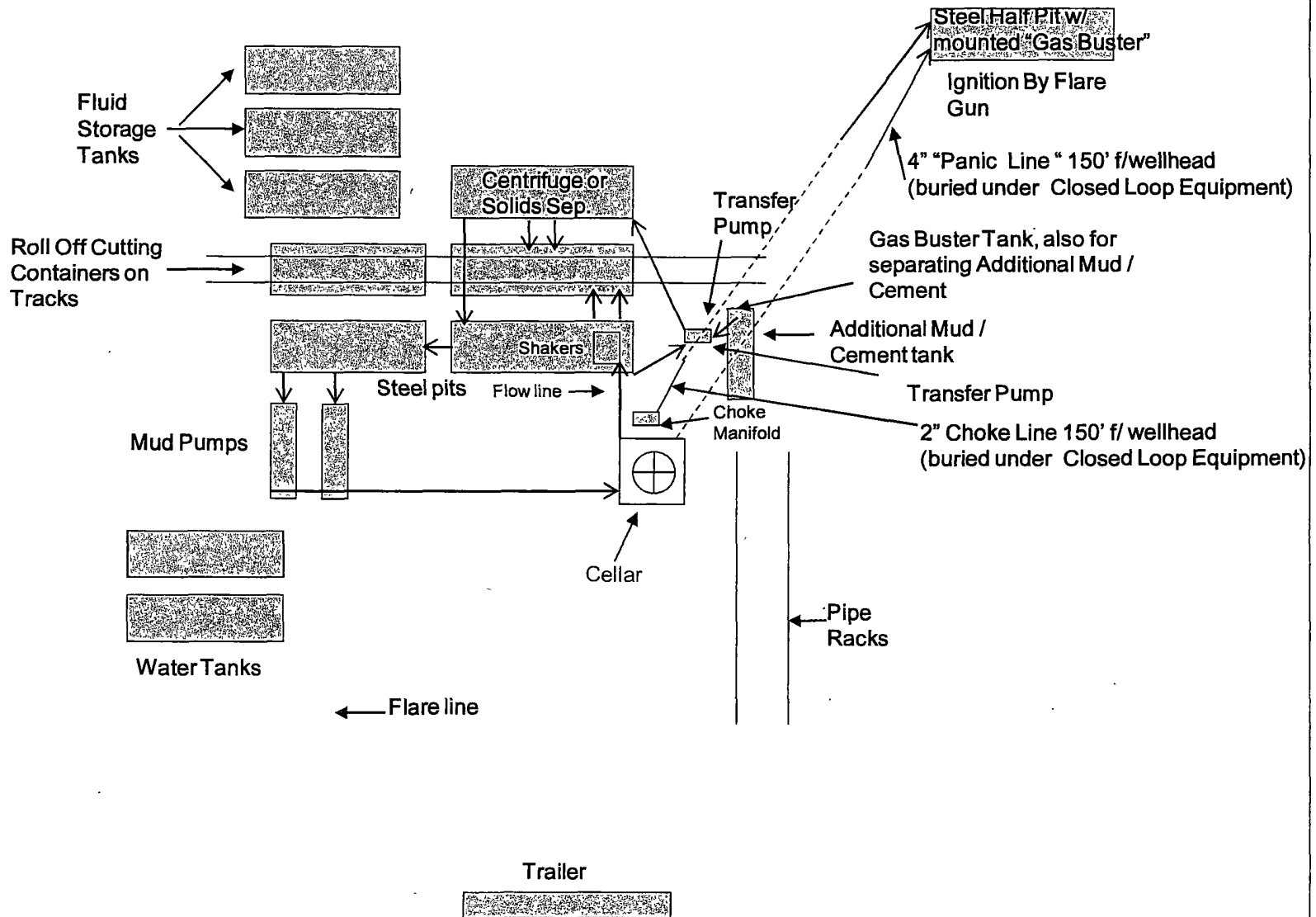
or

GMI (permit number 711-019-001)

dependent upon which rig is available to drill this well.

COG Operating LLC

Closed Loop Equipment Diagram



DISTRICT I
1625 N. French Dr., Hobbs, NM 88240
Phone: (575) 393-6161 Fax: (575) 393-0720

DISTRICT II
811 S. First St., Artesia, NM 88210
Phone (575) 748-1283 Fax: (575) 748-9720

DISTRICT III
1000 Rio Brazos Road, Aztec, NM 87410
Phone (505) 334-6178 Fax (505) 334-6170

DISTRICT IV
1220 S. St. Francis Dr., Santa Fe, NM 87505
Phone: (505) 476-3460 Fax: (505) 476-3462

State of New Mexico
Energy, Minerals & Natural Resources Department
OIL CONSERVATION DIVISION
1220 South St. Francis Dr.
Santa Fe, New Mexico 87505

Form C-102
Revised August 1, 2011
Submit one copy to appropriate
District Office

☐ AMENDED REPORT

WELL LOCATION AND ACREAGE DEDICATION PLAT

| | | |
|-------------------------------|--|--|
| API Number 30-015- | Pool Code 96610 | Pool Name Emoire; Glorieta-Yeso East |
| Property Code 37902 | Property Name HATFIELD STATE | Well Number 6H |
| OGRID No. 229137 | Operator Name COG OPERATING, LLC | Elevation 3618' |

Surface Location

| UL or lot No. | Section | Township | Range | Lot Idn | Feet from the | North/South line | Feet from the | East/West line | County |
|---------------|---------|----------|-------|---------|---------------|------------------|---------------|----------------|--------|
| J | 8 | 17-S | 29-E | | 2310 | SOUTH | 2560 | EAST | EDDY |

Bottom Hole Location If Different From Surface

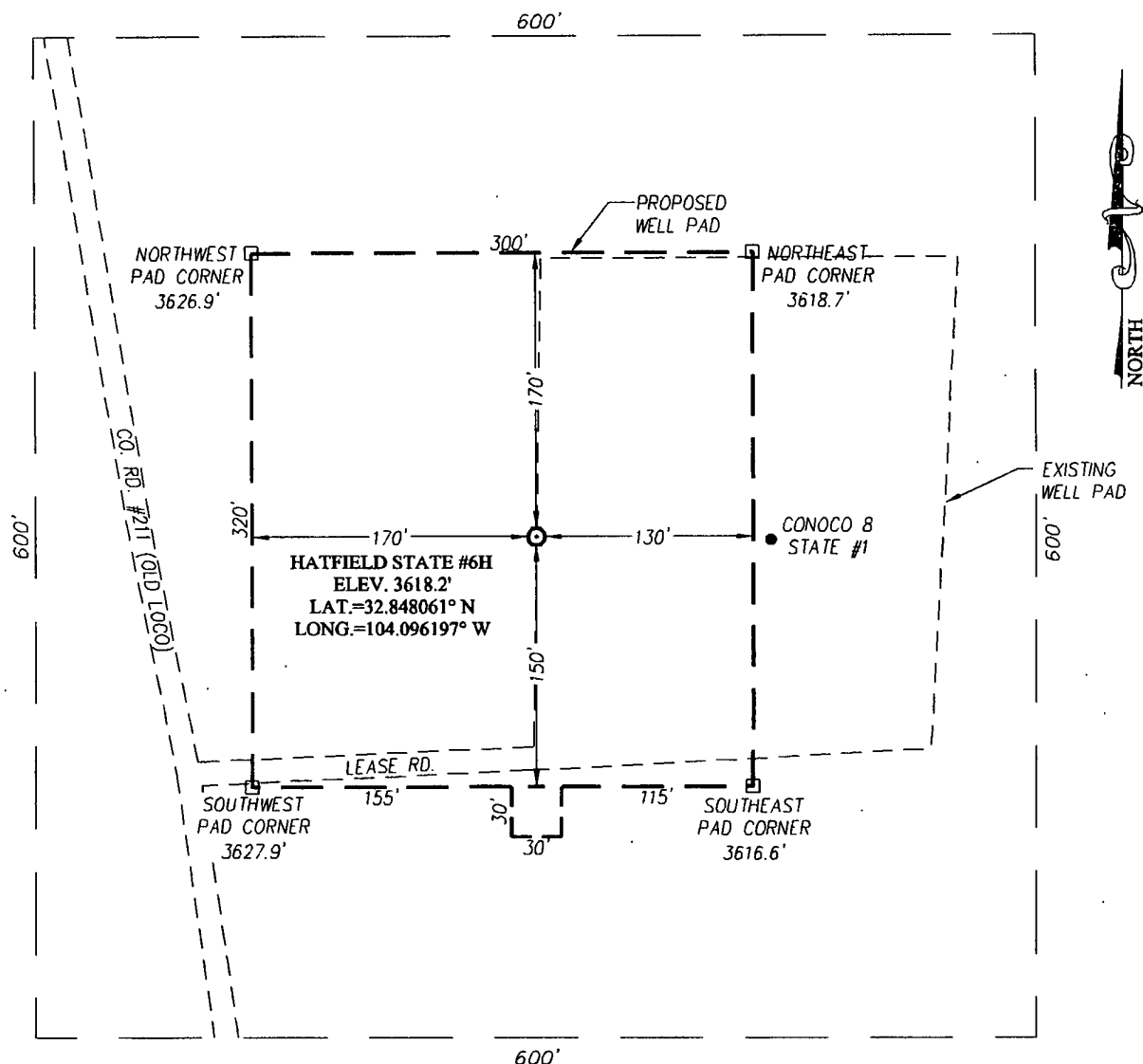
| UL or lot No. | Section | Township | Range | Lot Idn | Feet from the | North/South line | Feet from the | East/West line | County |
|---------------|---------|----------|-------|---------|---------------|------------------|---------------|----------------|--------|
| L | 8 | 17-S | 29-E | | 2310 | SOUTH | 330 | WEST | EDDY |

| Dedicated Acres | Joint or Infill | Consolidation Code | Order No |
|-----------------|-----------------|--------------------|----------|
| 80 | | | |

NO ALLOWABLE WILL BE ASSIGNED TO THIS COMPLETION UNTIL ALL INTERESTS HAVE BEEN CONSOLIDATED OR A NON-STANDARD UNIT HAS BEEN APPROVED BY THE DIVISION

| | |
|--|---|
| <p>CORNER COORDINATES TABLE</p> <p>Ⓐ - Y=672643.0 N, X=570092.3 E</p> <p>Ⓑ - Y=672649.8 N, X=575385.8 E</p> <p>Ⓒ - Y=671323.5 N, X=570096.2 E</p> <p>Ⓓ - Y=671330.0 N, X=575386.2 E</p> <p>Ⓔ - Y=672646.4 N, X=572735.4 E</p> <p>Ⓕ - Y=671326.8 N, X=572738.9 E</p> <p>GEODETIC COORDINATES NAD 27 NME</p> <p>SURFACE LOCATION Y=672317.7 N X=572826.5 E</p> <p>LAT.=32.848061° N LONG.=104.096197° W</p> <p>BOTTOM HOLE LOCATION Y=672313.9 N X=570423.2 E</p> <p>Project Area GRID. AZ.=269°54'26" HORIZ. DIST=2403.9'</p> <p>Producing Area</p> <p>Estimated Completed Interval: 2260 FSL+ 2890 FEL</p> | <p>OPERATOR CERTIFICATION</p> <p>I hereby certify that the information herein is true and complete to the best of my knowledge and belief, and that this organization either owns a working interest or unleased mineral interest in the land including the proposed bottom hole location or has a right to drill this well at this location pursuant to a contract with an owner of such mineral or working interest, or to a voluntary pooling agreement or a compulsory pooling order heretofore entered by the division</p> <p> Signature</p> <p>6-27-12 Date</p> <p><u>Kelly J. Holly</u> Printed Name</p> <p><u>kholly@concho.com</u> E-mail Address</p> <p>SURVEYOR CERTIFICATION</p> <p>I hereby certify that the well location shown on this plat was plotted from field notes of actual surveys made by me or under my supervision, and that the same is true and correct to the best of my belief</p> <p>APRIL 21, 2012</p> <p>Date of Survey</p> <p>Signature & Seal of Professional Surveyor</p> <p></p> <p>Certificate Number Gary Eidson 12641 Ronald J. Eidson 3239</p> <p>AF WSC W.O.. 12.11.0866</p> |
|--|---|

SECTION 8, TOWNSHIP 17 SOUTH, RANGE 29 EAST, N.M.P.M.
EDDY COUNTY **NEW MEXICO**



DIRECTIONS TO LOCATION

FROM THE INTERSECTION OF U.S. HWY. #82 AND CO. RD. #211
(OLD LOCO) GO NORTH ON CO RD #211 APPROX 2.5 MILES.
THE LOCATION STAKE IS 237 FEET EAST OF THE LEASE ROAD.



PROVIDING SURVEYING SERVICES
SINCE 1946

JOHN WEST SURVEYING COMPANY

412 N. DAL PASO
HOBBS, N.M. 88240
(575) 393-3117 www.jwsc.biz

COG OPERATING, LLC

**HATFIELD STATE 6H WELL
LOCATED 2310 FEET FROM THE SOUTH LINE
AND 2560 FEET FROM THE EAST LINE OF SECTION 8,
TOWNSHIP 17 SOUTH, RANGE 29 EAST, N.M.P.M.,
EDDY COUNTY, NEW MEXICO**

Survey Date. 4/21/12

CAD Date: 4/25/12

Drawn By: AF

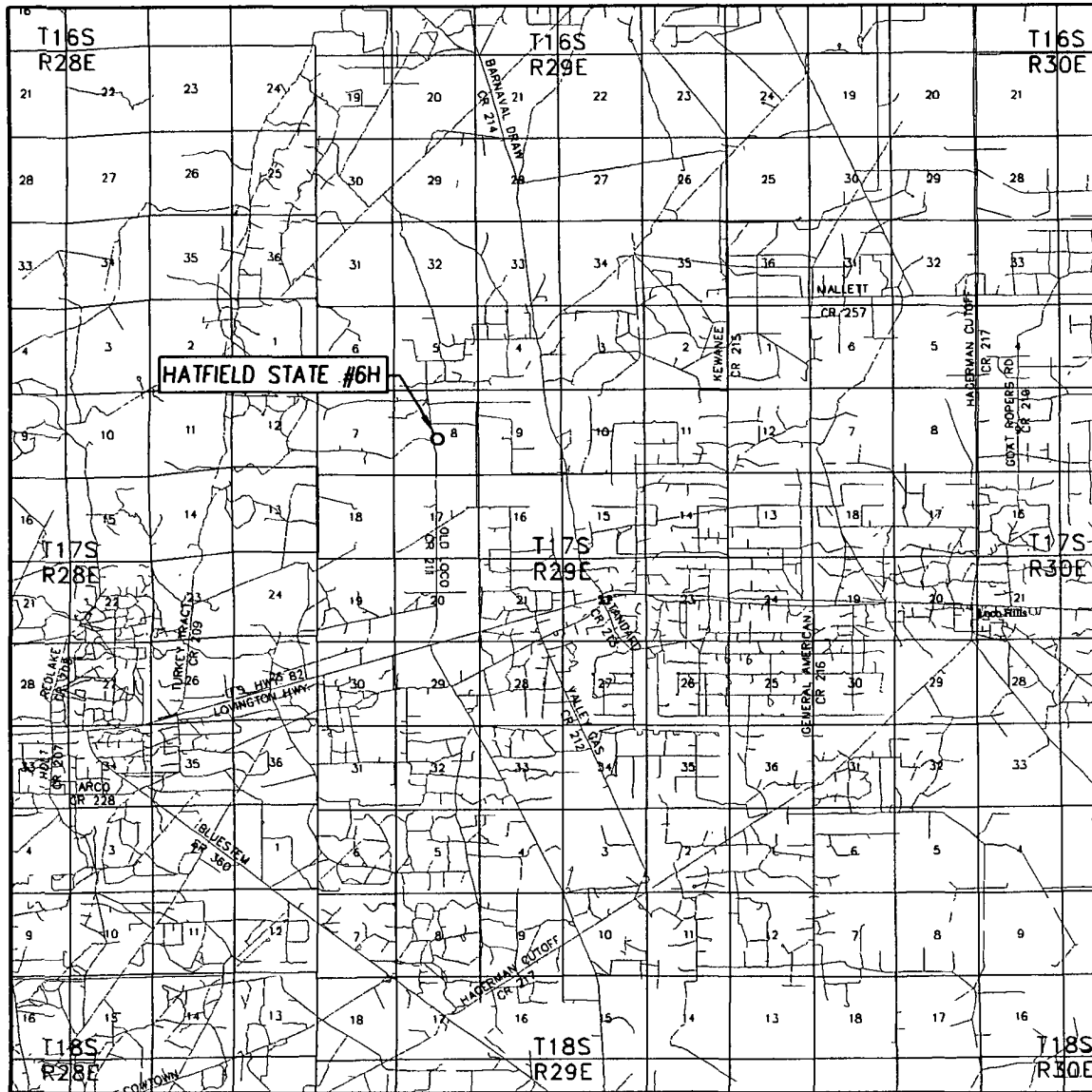
WO No. 12110866

Rev:

Rel W.O.:

Sheet 1 of 1

VICINITY MAP



SCALE: 1" = 2 MILES

SEC. 8 TWP. 17-S RGE. 29-E

SURVEY N.M.P.M.

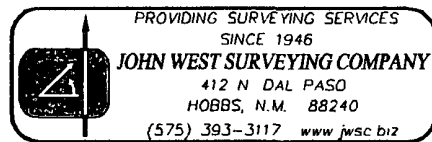
COUNTY EDDY STATE NEW MEXICO

DESCRIPTION 2310' FSL & 2560' FEL

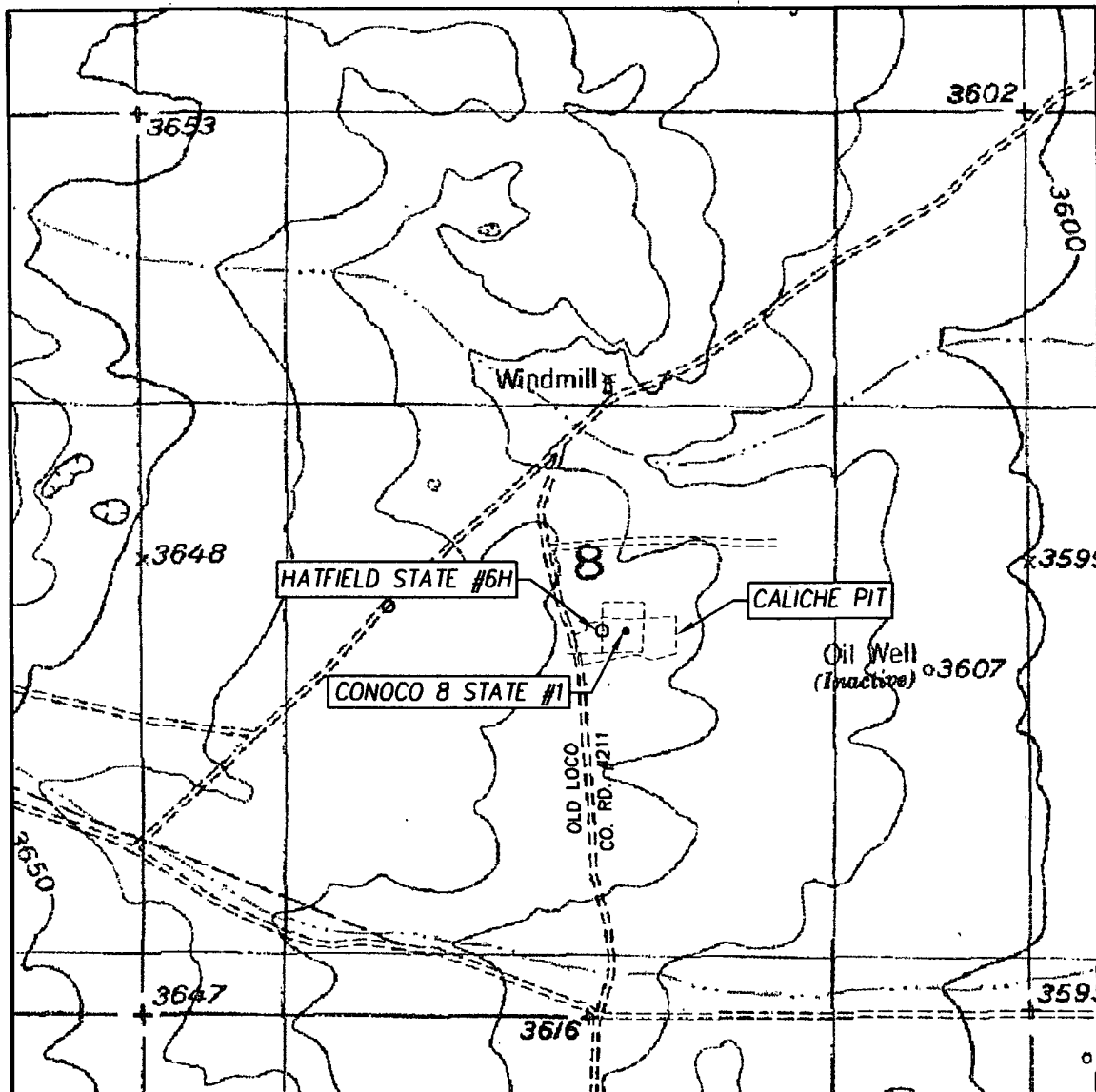
ELEVATION 3618'

OPERATOR COG OPERATING, LLC

LEASE HATFIELD STATE



LOCATION VERIFICATION MAP



SCALE: 1" = 1000'

CONTOUR INTERVAL:
RED LAKE SE, N.M. - 10'

SEC. 8 TWP. 17-S RGE 29-E

SURVEY N.M.P.M.

COUNTY EDDY STATE NEW MEXICO

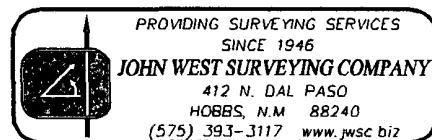
DESCRIPTION 2310' FSL & 2560' FEL

ELEVATION 3618'

OPERATOR COG OPERATING, LLC

LEASE HATFIELD STATE

U.S.G.S. TOPOGRAPHIC MAP
RED LAKE SE, N.M.



COG Operating LLC

Eddy County, NM

Hatfield State 6H

Hatfield State 6H

Lower Lateral

Plan: LL Plan #1

Surface: 2310' FSL, 2560' FEL, Sec 8, T17S, R29E, Unit J

BHL: 2310' FSL, 330' FWL, Sec 8, T17S, R29E, Unit L

PP: 2260' FSL, 2890' FEL, Sec 8, T17S, R29E, Unit J

Standard Planning Report

09 May, 2012

Crescent Directional Drilling

Planning Report

| | | | |
|-----------|-------------------|------------------------------|---------------------------------------|
| Database: | R5000 Houston DB | Local Co-ordinate Reference: | Site Hatfield State 6H. |
| Company: | COG Operating LLC | TVD Reference: | WELL @ 3636 00ft (Original Well Elev) |
| Project: | Eddy County, NM | MD Reference: | WELL @ 3636 00ft (Original Well-Elev) |
| Site: | Hatfield State 6H | North Reference: | Grid |
| Well: | Hatfield State 6H | Survey Calculation Method: | Minimum Curvature |
| Wellbore: | Lower Lateral | | |
| Design: | LL Plan #1 | | |

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

| | | | |
|-----------------------|-------------------|-------------------|---------------|
| Site: | Hatfield State 6H | | |
| Site Position: | | Northing: | 672,317 70 ft |
| From: | Map | Easting: | 572,826 50 ft |
| Position Uncertainty: | 0 00 ft | Slot Radius: | 13 200 in |
| | | Latitude: | 32 848058 |
| | | Longitude: | -104 096201 |
| | | Grid Convergence: | 0 13 ° |

| | | | | | | |
|----------------------|-------------------|---------|---------------------|---------------|---------------|-------------|
| Well: | Hatfield State 6H | | | | | |
| Well Position | +N/-S | 0 00 ft | Northing: | 672,317 70 ft | Latitude: | 32 848058 |
| | +E/-W | 0 00 ft | Easting: | 572,826 50 ft | Longitude: | -104 096201 |
| Position Uncertainty | | 0 00 ft | Wellhead Elevation: | | Ground Level: | 3,618 00 ft |
| | | | | | | |

| | | | | | |
|-----------|------------|---------------|--------------------|------------------|------------------------|
| Wellbore: | | Lower Lateral | | | |
| Magnetics | Model Name | Sample Date | Declination (°) | Dip Angle (°) | Field Strength (nT) |
| | IGRF2010 | 5/8/2012 | 7 77 | 60 65 | 48,842 |

| | | | | |
|-------------------|------------------|-------|---------------|-----------|
| Design: | LL Plan #1 | | | |
| Audit Notes: | | | | |
| Version: | Phase: | PLAN | Tie On Depth: | 0 00 |
| Vertical Section: | Depth From (TVD) | +N/-S | +E/-W | Direction |
| | (ft) | (ft) | (ft) | (°) |
| | 0 00 | 0 00 | 0 00 | 269 91 |

| Measured Depth | Inclination | Azimuth | Vertical Depth | +N/-S | +E/-W | Dogleg Rate | Build Rate | Turn Rate | TFO | Target |
|----------------|-------------|---------|----------------|--------|-----------|-------------|------------|-----------|--------|--------------------------|
| (ft) | (°) | (°) | (ft) | (ft) | (ft) | (°/100ft) | (°/100ft) | (°/100ft) | (°) | |
| 0 00 | 0 00 | 0 00 | 0 00 | 0 00 | 0 00 | 0.00 | 0 00 | 0 00 | 0 00 | |
| 4,470 21 | 0 00 | 0 00 | 4,470 21 | 0 00 | 0 00 | 0 00 | 0 00 | 0 00 | 0 00 | |
| 5,053 54 | 70 00 | 262 56 | 4,918 88 | -40 68 | -311 52 | 12 00 | 12 00 | 0 00 | 262 56 | |
| 5,242 86 | 91 00 | 271 39 | 4,950.00 | -50 03 | -496 77 | 12 00 | 11 10 | 4 66 | 23 41 | |
| 7,150 25 | 91 00 | 271 39 | 4,916 55 | -3 80 | -2,403 30 | 0 00 | 0 00 | 0 00 | 0 00 | PBHL (Hatfield State 6H) |

Crescent Directional Drilling

Planning Report

| | | | |
|-----------|-------------------|------------------------------|---------------------------------------|
| Database: | R5000 Houston DB | Local Co-ordinate Reference: | Site Hatfield State 6H |
| Company: | COG Operating LLC | TVD Reference: | WELL @ 3636.00ft (Original Well Elev) |
| Project: | Eddy County, NM | MD Reference: | WELL @ 3636.00ft (Original Well Elev) |
| Site: | Hatfield State 6H | North Reference: | Grid |
| Well: | Hatfield State 6H | Survey Calculation Method: | Minimum Curvature |
| Wellbore: | Lower Lateral | | |
| Design: | LL Plan #1 | | |

| 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) | |
| 4,470.21 | 0.00 | 0.00 | 4,470.21 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |
| KOP - Start Build @ 12.00°/100' | | | | | | | | | | |
| 4,500.00 | 3.57 | 262.56 | 4,499.98 | -0.12 | -0.92 | 0.92 | 12.00 | 12.00 | 0.00 | |
| 4,600.00 | 15.57 | 262.56 | 4,598.41 | -2.27 | -17.38 | 17.39 | 12.00 | 12.00 | 0.00 | |
| 4,700.00 | 27.57 | 262.56 | 4,691.23 | -7.02 | -53.78 | 53.79 | 12.00 | 12.00 | 0.00 | |
| 4,800.00 | 39.57 | 262.56 | 4,774.40 | -14.17 | -108.52 | 108.54 | 12.00 | 12.00 | 0.00 | |
| 4,900.00 | 51.57 | 262.56 | 4,844.27 | -23.40 | -179.20 | 179.24 | 12.00 | 12.00 | 0.00 | |
| 5,000.00 | 63.57 | 262.56 | 4,897.79 | -34.31 | -262.75 | 262.80 | 12.00 | 12.00 | 0.00 | |
| 5,053.54 | 70.00 | 262.56 | 4,918.88 | -40.68 | -311.52 | 311.58 | 12.00 | 12.00 | 0.00 | |
| Continue Build & Turn @ 12.00°/100' | | | | | | | | | | |
| 5,100.00 | 75.13 | 264.85 | 4,932.80 | -45.53 | -355.56 | 355.63 | 12.00 | 11.04 | 4.93 | |
| 5,166.89 | 82.55 | 267.97 | 4,945.74 | -49.61 | -421.00 | 421.08 | 12.00 | 11.10 | 4.66 | |
| PP @ 5166.89 MD; 4945.74 TVD, 82.55° INC, 267.97° AZ, 421.08° VS | | | | | | | | | | |
| 5,200.00 | 86.23 | 269.47 | 4,948.97 | -50.35 | -453.94 | 454.01 | 12.00 | 11.12 | 4.53 | |
| 5,242.86 | 91.00 | 271.39 | 4,950.00 | -50.03 | -496.77 | 496.85 | 12.00 | 11.13 | 4.49 | |
| Landing Point - Hold @ 91.00° INC, 271.39° AZ | | | | | | | | | | |
| 5,300.00 | 91.00 | 271.39 | 4,949.00 | -48.64 | -553.88 | 553.96 | 0.00 | 0.00 | 0.00 | |
| 5,400.00 | 91.00 | 271.39 | 4,947.25 | -46.22 | -653.84 | 653.91 | 0.00 | 0.00 | 0.00 | |
| 5,500.00 | 91.00 | 271.39 | 4,945.49 | -43.79 | -753.79 | 753.86 | 0.00 | 0.00 | 0.00 | |
| 5,600.00 | 91.00 | 271.39 | 4,943.74 | -41.37 | -853.75 | 853.81 | 0.00 | 0.00 | 0.00 | |
| 5,700.00 | 91.00 | 271.39 | 4,941.99 | -38.95 | -953.70 | 953.76 | 0.00 | 0.00 | 0.00 | |
| 5,800.00 | 91.00 | 271.39 | 4,940.23 | -36.52 | -1,053.66 | 1,053.71 | 0.00 | 0.00 | 0.00 | |
| 5,900.00 | 91.00 | 271.39 | 4,938.48 | -34.10 | -1,153.61 | 1,153.67 | 0.00 | 0.00 | 0.00 | |
| 6,000.00 | 91.00 | 271.39 | 4,936.72 | -31.68 | -1,253.57 | 1,253.62 | 0.00 | 0.00 | 0.00 | |
| 6,100.00 | 91.00 | 271.39 | 4,934.97 | -29.25 | -1,353.52 | 1,353.57 | 0.00 | 0.00 | 0.00 | |
| 6,200.00 | 91.00 | 271.39 | 4,933.22 | -26.83 | -1,453.48 | 1,453.52 | 0.00 | 0.00 | 0.00 | |
| 6,300.00 | 91.00 | 271.39 | 4,931.46 | -24.41 | -1,553.43 | 1,553.47 | 0.00 | 0.00 | 0.00 | |
| 6,400.00 | 91.00 | 271.39 | 4,929.71 | -21.98 | -1,653.39 | 1,653.42 | 0.00 | 0.00 | 0.00 | |
| 6,500.00 | 91.00 | 271.39 | 4,927.95 | -19.56 | -1,753.34 | 1,753.37 | 0.00 | 0.00 | 0.00 | |
| 6,600.00 | 91.00 | 271.39 | 4,926.20 | -17.14 | -1,853.30 | 1,853.32 | 0.00 | 0.00 | 0.00 | |
| 6,700.00 | 91.00 | 271.39 | 4,924.45 | -14.71 | -1,953.26 | 1,953.28 | 0.00 | 0.00 | 0.00 | |
| 6,800.00 | 91.00 | 271.39 | 4,922.69 | -12.29 | -2,053.21 | 2,053.23 | 0.00 | 0.00 | 0.00 | |
| 6,900.00 | 91.00 | 271.39 | 4,920.94 | -9.86 | -2,153.17 | 2,153.18 | 0.00 | 0.00 | 0.00 | |
| 7,000.00 | 91.00 | 271.39 | 4,919.19 | -7.44 | -2,253.12 | 2,253.13 | 0.00 | 0.00 | 0.00 | |
| 7,100.00 | 91.00 | 271.39 | 4,917.43 | -5.02 | -2,353.08 | 2,353.08 | 0.00 | 0.00 | 0.00 | |
| 7,150.25 | 91.00 | 271.39 | 4,916.55 | -3.80 | -2,403.30 | 2,403.30 | 0.00 | 0.00 | 0.00 | |
| TD @ 7150.25' MD, 4916.55' TVD - PBHL (Hatfield State 6H LL Plan 1) | | | | | | | | | | |

| Design Targets | | | | | | | | | | |
|---------------------------|---------------|-------------|----------|------------|------------|---------------|--------------|-----------|-------------|--|
| Target Name | Dip Angle (°) | Dip Dir (°) | TVD (ft) | +N/-S (ft) | +E/-W (ft) | Northing (ft) | Easting (ft) | Latitude | Longitude | |
| -hit/miss target | | | | | | | | | | |
| -Shape | | | | | | | | | | |
| PBHL (Hatfield State 6H | 0.00 | 0.00 | 4,916.55 | -3.80 | -2,403.30 | 672,313.90 | 570,423.20 | 32.848062 | -104.104026 | |
| - plan hits target center | | | | | | | | | | |
| - Point | | | | | | | | | | |

Crescent Directional Drilling

Planning Report

| | | | |
|------------------|-------------------|-------------------------------------|---------------------------------------|
| Database: | R5000-Houston DB | Local Co-ordinate Reference: | Site Hatfield State 6H |
| Company: | COG Operating LLC | TVD Reference: | WELL @ 3636 00ft (Original Well Elev) |
| Project: | Eddy County NM | MD Reference: | WELL @ 3636 00ft (Original Well Elev) |
| Site: | Hatfield State 6H | North Reference: | Grid |
| Well: | Hatfield State 6H | Survey Calculation Method: | Minimum Curvature |
| Wellbore: | Lower Lateral | | |
| Design: | LL Plan #1 | | |

| Plan Annotations | | | | | |
|---------------------|---------------------|-------------------|------------|---|--|
| Measured Depth (ft) | Vertical Depth (ft) | Local Coordinates | | | |
| | | +N/-S (ft) | +E/-W (ft) | Comment | |
| 4,470 21 | 4,470 21 | 0 00 | 0 00 | KOP - Start Build @ 12 00°/100' | |
| 5,053 54 | 4,918 88 | -40 68 | -311 52 | Continue Build & Turn @ 12 00°/100' | |
| 5,166 89 | 4,945 74 | -49 61 | -421 00 | PP @ 5166 89 MD, 4945 74 TVD, 82 55 INC, 267 97 AZ, 421 08 VS | |
| 5,242 86 | 4,950 00 | -50 03 | -496 77 | Landing Point - Hold @ 91 00° INC, 271 39° AZ | |
| 7,150 25 | 4,916 55 | -3 80 | -2,403 30 | TD @ 7150 25' MD, 4916 55' TVD | |



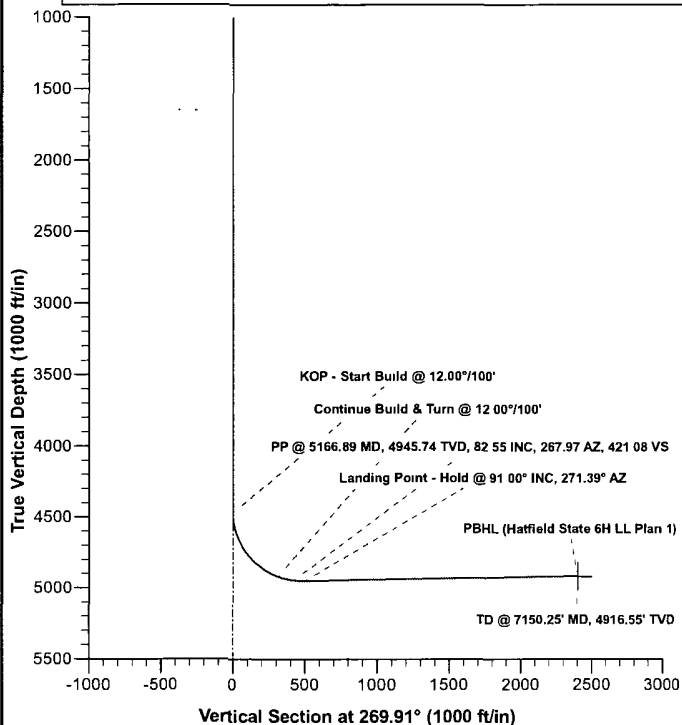
COG Operating LLC
Hatfield State 6H
Eddy County, NM
LL Plan #1



| Surface Location | | Ground Elev: 3618.00 WELL @ 3636.00ft (Original Well Elev) | | | |
|------------------|-------|--|-----------|-----------|-------------|
| +N/-S | +E/-W | Northing | Easting | Latitude | Longitude |
| 0.00 | 0.00 | 672317.70 | 572826.50 | 32.848058 | -104.096201 |

| TARGET DETAILS | | | | | | |
|------------------------------------|---------|-------|----------|-----------|-----------|-----------|
| Name | TVD | +N/-S | +E/-W | Northing | Easting | Latitude |
| PBHL (Hatfield State 6H LL Plan 1) | 4916.55 | -3.80 | -2403.30 | 672313.90 | 570423.20 | 32.848062 |

| SECTION DETAILS | | | | | | | | | | |
|-----------------|---------|-------|--------|---------|--------|----------|-------|--------|---------|---|
| Sec | MD | Inc | Azi | TVD | +N/-S | +E/-W | Dleg | TFace | VSec | Annotation |
| 1 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 2 | 4470.21 | 0.00 | 0.00 | 4470.21 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | KOP - Start Build @ 12.00°/100' |
| 3 | 5053.54 | 70.00 | 262.56 | 4918.88 | -40.68 | -311.52 | 12.00 | 262.56 | 311.58 | Continue Build & Turn @ 12.00°/100' |
| 4 | 5242.86 | 91.00 | 271.39 | 4950.00 | -50.03 | -496.77 | 12.00 | 23.41 | 496.85 | Landing Point - Hold @ 91.00° INC, 271.39° AZ |
| 5 | 7150.25 | 91.00 | 271.39 | 4916.55 | -3.80 | -2403.30 | 0.00 | 0.00 | 2403.30 | TD @ 7150.25' MD, 4916.55' TVD |



Azimuths to Grid North
 True North -0.13°
 Magnetic North 7.64°

Magnetic Field
 Strength: 48842.3snT
 Dip Angle: 60.65°
 Date 5/8/2012
 Model IGRF2010

