

STATE OF UTAH  
DEPARTMENT OF NATURAL RESOURCES  
DIVISION OF OIL, GAS AND MINING

FORM 3

AMENDED REPORT

<b>APPLICATION FOR PERMIT TO DRILL</b>						1. WELL NAME and NUMBER GORDON CREEK STATE NE 31-14-8								
2. TYPE OF WORK DRILL NEW WELL <input checked="" type="checkbox"/> REENTER P&A WELL <input type="checkbox"/> DEEPEN WELL <input type="checkbox"/>						3. FIELD OR WILDCAT UNDESIGNATED								
4. TYPE OF WELL Gas Well Coalbed Methane Well: YES						5. UNIT or COMMUNITIZATION AGREEMENT NAME								
6. NAME OF OPERATOR GORDON CREEK, LLC						7. OPERATOR PHONE 403 453-1608								
8. ADDRESS OF OPERATOR 1179 E Main #345, Price, UT, 84501						9. OPERATOR E-MAIL rironside@thunderbirdenergy.com								
10. MINERAL LEASE NUMBER (FEDERAL, INDIAN, OR STATE) ML-46539			11. MINERAL OWNERSHIP FEDERAL <input type="checkbox"/> INDIAN <input type="checkbox"/> STATE <input checked="" type="checkbox"/> FEE <input type="checkbox"/>			12. SURFACE OWNERSHIP FEDERAL <input type="checkbox"/> INDIAN <input type="checkbox"/> STATE <input checked="" type="checkbox"/> FEE <input type="checkbox"/>								
13. NAME OF SURFACE OWNER (if box 12 = 'fee')						14. SURFACE OWNER PHONE (if box 12 = 'fee')								
15. ADDRESS OF SURFACE OWNER (if box 12 = 'fee')						16. SURFACE OWNER E-MAIL (if box 12 = 'fee')								
17. INDIAN ALLOTTEE OR TRIBE NAME (if box 12 = 'INDIAN')			18. INTEND TO COMMINGLE PRODUCTION FROM MULTIPLE FORMATIONS YES <input type="checkbox"/> (Submit Commingling Application) NO <input checked="" type="checkbox"/>			19. SLANT VERTICAL <input checked="" type="checkbox"/> DIRECTIONAL <input type="checkbox"/> HORIZONTAL <input type="checkbox"/>								
20. LOCATION OF WELL		FOOTAGES		QTR-QTR		SECTION		TOWNSHIP		RANGE		MERIDIAN		
LOCATION AT SURFACE		106 FNL 1308 FEL		NENE		31		14.0 S		8.0 E		S		
Top of Uppermost Producing Zone		106 FNL 1308 FEL		NENE		31		14.0 S		8.0 E		S		
At Total Depth		106 FNL 1308 FEL		NENE		31		14.0 S		8.0 E		S		
21. COUNTY CARBON			22. DISTANCE TO NEAREST LEASE LINE (Feet) 106			23. NUMBER OF ACRES IN DRILLING UNIT 160								
			25. DISTANCE TO NEAREST WELL IN SAME POOL (Applied For Drilling or Completed) 4100			26. PROPOSED DEPTH MD: 4361 TVD: 4361								
27. ELEVATION - GROUND LEVEL 7629			28. BOND NUMBER RLB0010790			29. SOURCE OF DRILLING WATER / WATER RIGHTS APPROVAL NUMBER IF APPLICABLE 91-5205								
<b>Hole, Casing, and Cement Information</b>														
String	Hole Size	Casing Size	Length	Weight	Grade & Thread	Max Mud Wt.	Cement	Sacks	Yield	Weight				
SURF	11	8.625	0 - 1990	24.0	J-55 Casing/Tubing	8.7	Class G	940	1.142	15.84				
PROD	7.875	5.5	0 - 4361	17.0	N-80 LT&C	8.7	Class C	210	4.12	10.5				
							Class C	109	2.39	11.5				
<b>ATTACHMENTS</b>														
VERIFY THE FOLLOWING ARE ATTACHED IN ACCORDANCE WITH THE UTAH OIL AND GAS CONSERVATION GENERAL RULES														
<input checked="" type="checkbox"/> WELL PLAT OR MAP PREPARED BY LICENSED SURVEYOR OR ENGINEER						<input checked="" type="checkbox"/> COMPLETE DRILLING PLAN								
<input type="checkbox"/> AFFIDAVIT OF STATUS OF SURFACE OWNER AGREEMENT (IF FEE SURFACE)						<input type="checkbox"/> FORM 5. IF OPERATOR IS OTHER THAN THE LEASE OWNER								
<input type="checkbox"/> DIRECTIONAL SURVEY PLAN (IF DIRECTIONALLY OR HORIZONTALLY DRILLED)						<input checked="" type="checkbox"/> TOPOGRAPHICAL MAP								
NAME Barry Brumwell				TITLE Vice President-Operations				PHONE 403 453-1608						
SIGNATURE				DATE 12/04/2012				EMAIL bbrumwell@thunderbirdenergy.com						
API NUMBER ASSIGNED 43007503540000				APPROVAL   Permit Manager										

**DRILLING PLAN and PROGRAM**

Attached to UDOGM Form 3

**GORDON CREEK, LLC.****GORDON CREEK ST NE-31-14-8**

SURFACE LOCATION: 105.75' FNL &amp; 1,307.94' FEL

NE/4 of NE/4 of Section 31-14S-8E

Carbon County, Utah

**1. SURFACE GEOLOGIC FORMATION**

Emery Sandstone Member of the Mancos Shale

**2. ESTIMATED TOPS OF IMPORTANT GEOLOGIC MARKERS**

Blue Gate Shale Member top: 1,987' KB

Lower Blue Gate Bentonite Marker: 3,756' KB

Ferron SS: 3,891' KB

Tununk Shale: 4,303' KB

**3. PROJECTED GAS & H<sub>2</sub>O ZONES**

It is anticipated that groundwater may be encountered within the Emery Sandstone Member of the Mancos Shale. Any water encountered will be reported on a Form 7 "Report of Water Encountered During Drilling". All indications of usable water will be reported.

Casing & cementing will be done to protect potentially productive hydrocarbons, lost circulation zones, abnormal pressure zones and prospectively valuable mineral deposits.

Surface casing will be tested to 500 psi and the Production casing will be tested to 1,500 psi, with a minimum of 1 psi/ft of the last casing string setting depth.

**4. PROPOSED CASING AND CEMENTING PROGRAMS**

Refer to EXHIBIT "A" for casing design information

**A. CASING PROGRAM**

<b>HOLE SIZE (in)</b>	<b>CASING SIZE (in)</b>	<b>WEIGHT (#/ft)</b>	<b>GRADE</b>	<b>JOINT</b>	<b>DEPTH SET (ft)</b>
14 <sup>3</sup> / <sub>4</sub>	12 <sup>3</sup> / <sub>4</sub>	40.5	H-40	ST&C	0 - 40
11	8 <sup>5</sup> / <sub>8</sub>	24.00	J-55	ST&C	0 - 1,990
7 <sup>7</sup> / <sub>8</sub>	5 <sup>1</sup> / <sub>2</sub>	17.00	N-80	LT&C	0 - 4,361

**B. CEMENTING PROGRAM**

The 8 <sup>5</sup>/<sub>8</sub>" surface casing will be set and cemented full length with approximately 940 sacks of 0-1-0 Class "G" cement + 2% CaCl<sub>2</sub> + 0.25 #/sk of cellophane flakes mixed at 15.84 ppg (yield = 1.142 ft<sup>3</sup>/sk); volume based on nominal hole size + 100% excess. The cement will be circulated back to surface. In the event that the cement is not circulated back to surface, a 1" top out job will be performed with 0-1-0 Class "G" cement + 2% CaCl<sub>2</sub> + 0.25 #/sk of cellophane flakes mixed at 15.84 ppg (yield = 1.142 ft<sup>3</sup>/sk).

The 5 <sup>1</sup>/<sub>2</sub>" production casing will be set and cemented full length using a MINIMUM of 210 sx of LEAD CEMENT incorporating 2% Gypsum-60 + 0.25 #/sk of Superflake + 2% Super Sil SP mixed at 10.5 ppg (yield = 4.12 ft<sup>3</sup>/sk); cement volume based on nominal hole size + 100% excess, followed by a MINIMUM of 109 sx of HIGH EARLY COMPRESSIVE STRENGTH TAIL CEMENT incorporating 2% Gypsum-60 + 0.25 #/sk of Superflake + 2% Super Sil SP mixed at 11.5 ppg (yield = 2.39 ft<sup>3</sup>/sk); cement volume based on nominal hole size + 50% excess over the bottom 1000' of hole.

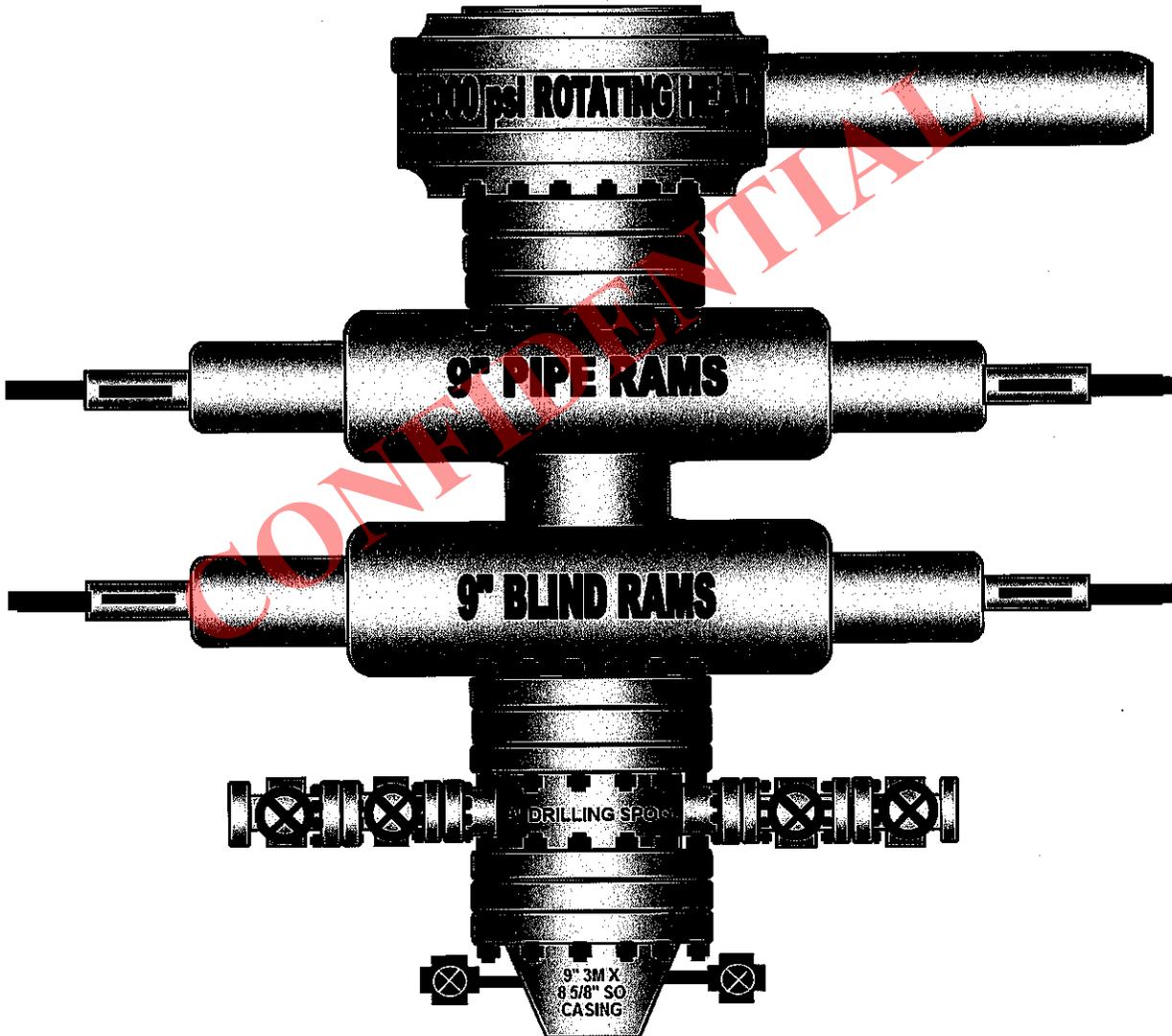
It is our intention for the cement mixture to be circulated back to surface, *IF POSSIBLE*.

**THE FOLLOWING SHALL BE ENTERED INTO THE DRILLER'S LOG:**

- I. Blowout preventer pressure tests, including test pressures and results;
- II. Blowout preventer tests for proper functioning;
- III. Blowout prevention drills conducted;
- IV. Casing run, including size, grade, weight, and depth set;
- V. How the pipe was cemented, including amount of cement, type, whether cement was circulated back to surface, location of the cementing tools, etc.;
- VI. Waiting on cement time for each casing string;
- VII. Casing pressure tests after cementing, including test pressures and results.

**5. THE OPERATOR'S MINIMUM SPECIFICATIONS FOR PRESSURE CONTROL**

Below is a schematic diagram of the blowout preventer equipment requirements for this drilling operation. A 9' X 3,000 psi double gate BOP will be used with a 2,000 psi Rotating Head utilized for air drilling operations. ALL BOPE will be pressure tested to the required operating pressures of each component. All tests will be recorded in the Driller's Report Book. The physical operation of each component of the BOP's will be checked on each trip.



**6. THE TYPE AND CHARACTERISTICS OF THE PROPOSED CIRCULATING FLUIDS / MUDS**

0' – 1,990'	11" Surface Hole	Drill with air, will mud-up if necessary.
1'990' – TMD	7 7/8" Main Hole	Drill with air, 500 psi @ 1500-2300 ft <sup>3</sup> /min

Will "mud up" at Total Depth to run logs and casing. Will mud up sooner if hole conditions dictate. It is anticipated that drilling fluid densities of 8.3 – 8.7 #/gal will be utilized when "mudded up".

**7. THE TESTING, LOGGING AND CORING PROGRAMS**

Open hole logs consisting of a CNL-LDT-GR-CAL will be run from above the Blue Gate Shale to TMD. A DIL-GR-SP log will be run from TMD to surface casing.

**8. ANY ANTICIPATED ABNORMAL PRESSURES or TEMPURATURES**

No abnormal pressures or temperatures have been noted or reported in wells drilled in the area nor at the depths anticipated in this well. Bottom hole pressure expected is approximately 900 psi maximum. No hydrogen sulfide or other hazardous gases or fluids have been found, reported or are known to exist at these depths in the area.

**9. ANTICIPATED STARTING DATE AND DURATION OF THE OPERATIONS**

The well will be drilled as soon as logistically possible after the APD Approval has been issued. Verbal and/or written notifications listed below shall be submitted in accordance with instructions from the Division of Oil, Gas & Mining:

- a) prior to beginning construction;
- b) prior to spudding;
- c) prior to running any casing or BOP tests;
- d) prior to plugging the well, for verbal plugging instructions.

Spills, blowouts, fires, leaks, accidents or other unusual occurrences shall IMMEDIATELY be reported to the Division of Oil, Gas & Mining.

**EXHIBIT "A"****CASING DESIGN  
GORDON CREEK ST NE-31-14-8  
PROJECTED TD: 4,361' KB****SURFACE CASING (0' – 1,590')**

Diameter	8 <sup>5</sup> / <sub>8</sub> "
Interval	1,990' to Surface
Weight	24 #/ft
Grade	J-55
Coupling	ST&C

**Burst Design**

The recommended practice is to base the burst rating of the casing string in psi to be at least numerically equal to 0.225 psi/ft times the setting depth in feet of the next casing string. The rating chosen was also intended to match the BOPE pressure rating and exceed the highest possible surface pressure of approximately 936 psig.

Burst required =	0.225 x 4,361	981 psig
Burst rating of casing string:	2,950 psi	
<b>Safety factor =</b>	<b>2,950 psi / 981 psi =</b>	<b>3.00</b>

**Collapse Design**

Collapse pressure is negligible on this surface string.

**Tension Design**

String weight in air = 24 #/ft X 1,990' =	47,760 #
Tensile strength of joint	244,000 lbf
Safety factor of joint	5.1

**PRODUCTION CASING (0' – 4,361')**

Diameter	5 ½"
Interval	4,361' to surface
Weight	17 #/ft
Grade	N-80
Coupling	LT&C

**Burst Design**

An internal pressure gradient of 0.4863 psi/ft has been used as a basis for these calculations. This gradient is equivalent to the force exerted by 10 ppg drilling fluid, which is a much higher density of fluid than we anticipate being required to drill this well.

Burst rating of casing string:	7,740 psi	
Burst rating required:	4,361' X 0.4863 =	2,121 psig
<b>Safety factor =</b>	<b>7,740 psi / 2,121 psi =</b>	<b><u>3.65</u></b>

**Tension Design**

1.6 Safety factor of top joint, neglecting buoyancy and without over pull.

Tensile rating of casing joint:	348,000 lbf	
String Weight:	4,361' X 17 #/ft =	74,137 lbf
<b>Safety factor =</b>	<b>348,000 lbf / 74,137 lbf =</b>	<b><u>4.69</u></b>

**Collapse Design**

Maximum anticipated mud weight is 10.0 ppg based on a mud gradient of 0.53 psi/ft.

Collapse rating of csg string:	6,280 psi	
Collapse rating required:	4,361' X 0.53 psi/ft =	2,311 psi
<b>Safety factor =</b>	<b>6,280 psi / 2,311 psi =</b>	<b><u>2.72</u></b>

**Production Casing Design**

Interval (ft)	Weight (#/ft)	Grade	S.F. Burst	S.F. Collapse	S.F. Tension
4,361' – 0'	17	N-80	3.65	4.69	2.72

**MULTI-POINT SURFACE USE PLAN**

Attached to UDOGM Form 3

**GORDON CREEK, LLC.**

**GORDON CREEK ST NE-31-14-8**

SURFACE LOCATION: 105.75' FNL & 1,307.94' FEL

NE/4 of NE/4 of Section 31-14S-8E

Carbon County, Utah

**1. EXISTING ROADS**

- a. We do not plan to change, alter or improve upon ANY existing State or County roads.
- b. Existing roads will be maintained in the same or better condition.

**2. PLANNED ACCESS**

- a. Access will be off of Benches Road in Section 28-14S-8E and travel SW through Sections 28, 29 & 32 (SITLA SURFACE) and Section 30 (PRIVATE SURFACE – BURNSIDE) on a newly constructed roadway. ALL Surface Use Agreements in each Section as denoted above are in place and paid up for the planned roadway. The roadway will follow existing 2-track trails wherever possible, and is planned with minimal impact to the terrain.
- b. If the well is productive, the road will be maintained as necessary to prevent soil erosion and maintain year-round traffic. However, we may allow the access road to be gated and closed off during winter production operations and access the site with a snowmobile or other winter ATV.
- c. Maximum Width: 20' travel surface with 27' base.
- d. Maximum grade: 25%
- e. Road culverts may be required. Surface water will be diverted around the well pad as necessary.
- f. Any power lines and / or pipelines to/from the well will follow the proposed access route.

**3. LOCATION OF EXISTING WELLS**

- a. As shown on the Civil Location Survey Plat for the well.

**4. LOCATION OF EXISTING and/or PROPOSED FACILITIES**

- a. If the well is a producer, installation of required production facilities will follow the drilling and completion phase of well operations. Buried flow lines, water lines and electrical cable will follow the proposed access road and other existing access ROWs to the intersection with Thunderbird's main 12' pipeline corridor.
- b. Rehabilitation of all pad areas not used for production facilities will be made in accordance with landowner stipulations.

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

- a. All water to be used for drilling operations will be obtained from area water wells drilled and owned by Gordon Creek, LLC.
- b. Water will be transported to location by truck over approved access roads.

**6. SOURCE OF CONSTRUCTION MATERIALS**

- a. Any necessary construction materials needed will be obtained locally from a private source and hauled to the location on existing roads.
- b. No construction or surfacing materials will be taken from Federal / Indian lands.

**7. METHODS FOR HANDLING WASTE DISPOSAL**

- a. As shown on the Survey Plat, a 100' X 60' X 8' deep "mud pit" with liner will be constructed on the well pad to hold the drilled solids and drilling fluids required during the drilling operations phase of the well. Three sides of the reserve pit will be fenced within 24 hours after completion of construction and the fourth side within 24 hours after drilling operations cease with four strands of barbed wire, or woven wire topped with barbed wire to a height of not less than four feet. The fence will be kept in good repair while the pit is drying.
- b. As the majority of this well is expected to be air drilled, a small reserve "blooie" pit that drains into the main mud pit will be constructed with a minimum of one-half the total depth below the original ground surface on the lowest point within the pit. The pit will not be lined unless conditions encountered during construction warrant it or if deemed necessary by the DOGM Representative during pre-site inspection. Three sides of the reserve pit will be fenced within 24 hours after completion of construction and the fourth side within 24 hours after drilling operations cease with four strands of barbed wire, or woven wire topped with barbed wire to a height of not less than four feet. The fence will be kept in good repair while the pit is drying.
- b. Following drilling, the liquid waste will be evaporated from any pit and the pit backfilled and returned to natural grade. No liquid hydrocarbons will be discharged to the reserve pit or onto or off of the well pad.
- c. In the event that wellbore fluids are produced, any oil will be retained in tanks until sold and any water produced will be retained in the mud pit until its quality can be determined. The quality and quantity of the water will determine the method of disposal.
- d. Trash will be contained in a portable metal container and will be hauled from location periodically and disposed of at an approved disposal site. Chemical toilets will be placed on location and sewage will be disposed of at an appropriate disposal site.

**8. ANCILLARY FACILITIES**

- a. We anticipate no need for ancillary facilities with the exception of a personnel accommodation trailers with closed loop septic systems to be located on the drill site.

## **10. WELLSITE LAYOUT**

- a. Gordon Creek, LLC. has reduced to surface lease size (area stripped and levelled) for this location to the smallest lease size possible to accommodate the required drilling rig and support equipment.
- b. Any available topsoil will be removed from the location and stockpiled. The location of the rig, mud tanks, reserve and berm pits and all other drilling support equipment will be located as per common oilfield rig layouts.
- b. A blooie pit will be located 100' from the drill hole. A line will be placed on the surface from the center hole to the blooie pit. The blooie pit will not be lined, but will be fenced on four sides to protect livestock/wildlife.
- c. Access to the well pad will be as shown on the Civil Location Survey Plat for the well.
- d. Natural runoff will be diverted around the well pad.

## **10. PLANS FOR RESTORATION OF SURFACE**

- a. All surface areas not required for producing operations will be graded to as near original condition as possible and contoured to minimize possible erosion.
- b. Available topsoil will be stockpiled and will be evenly distributed over the disturbed areas and the area will be reseeded as prescribed by the landowner.
- c. Pits and any other area that would present a hazard to wildlife or livestock will be fenced off when the rig is released and removed.
- d. Rehabilitation will commence following completion of the well. Rat and mouse holes will be filled in immediately upon release of the drilling rig from the location. If the well site is to be abandoned, all disturbed areas will be re-contoured to the natural terrain found prior to location construction.

## **11. SURFACE OWNERSHIP**

- a. The well site and access road are on and across lands owned through the State of Utah School and Institutional Trust Lands Administration and covered by Surface Use Agreement # ML-46539. The operator shall contact the landowner and the Division of Oil, Gas and Mining 48 hours prior to beginning construction activities.

## **12. OTHER INFORMATION**

- a. The primary surface use is wildlife habitat and/or cattle grazing. The nearest dwelling is approximately 14.1 miles east (Price, Utah).
- b. If there is snow on the ground when construction begins, it will be removed before the soil is disturbed and piled downhill from the topsoil stockpile location.
- c. The back-slope and fore-slope will be constructed no steeper than 4:1.
- d. All equipment and vehicles will be confined to the access road and well pad.

- e. A complete copy of the approved Application for Permit to Drill (APD,) including all conditions and stipulations shall be on the well-site during construction and drilling operations.

There will be no deviation from the proposed drilling and/or workover program without prior approval from the Division of Oil, Gas & Mining.

**13. COMPANY REPRESENTATIVE**

Barry Brumwell, C.E.T.  
Vice President, Operations  
Gordon Creek LLC., a wholly owned subsidiary of  
Thunderbird Energy Corp.  
#800, 555 – 4<sup>th</sup> Avenue S.W.  
Calgary, Alberta, Canada T2P-3E7  
(403) 453-1608 (office)  
(403) 818-0696 (mobile)  
[bbrumwell@thunderbirdenergy.com](mailto:bbrumwell@thunderbirdenergy.com)

**14. CERTIFICATION**

I hereby certify that I, or persons under my direct supervision have inspected the proposed drill site and access route; that I am familiar with the conditions which presently exist; that the statements made in this plan are, to the best of my knowledge, true and correct, and that the work associated with the operations proposed herein will be performed by Gordon Creek, LLC. and its subcontractors in conformity with this plan and the terms and conditions under which it is approved.

11/30/2012  
DATE

  
\_\_\_\_\_  
Barry Brumwell, C.E.T.  
Vice President, Operations  
Gordon Creek LLC. / Thunderbird Energy Inc.



**GORDON CREEK STATE NE-31-14S-8E**  
 NE/4 OF NE/4, 105.75' FNL + 1,307.94' FEL

**SURFACE LEASE #:** ML-46539  
**MINERAL LEASE #:** ML-46539  
**AFE:** 11DRL021  
**WORKING INTEREST:** 100%  
**RIG:**  
**DRILL DAYS BELOW SURFACE CASING SHOE:** 6

**7 7/8" MAIN HOLE TO BE DRILLED WITH AIR**



Survey Grd. Ele: 7,628.6'  
 Est. KB Elev: 7,641'  
 KB - GRD used: 12.4' KB

8.625" Casing Set @ 1,990'

**TOPS** ft TVD

Emerg Fm. @ SFC.

BASE OF GROUNDWATER TBD

Blue Gate Shale Mbr \*\* 1,987'

SURFACE CASING 1,990'

MUD UP WITH 3% KCl POLYMER DRILLING FLUID ONLY IF WATER INFLUX OCCURS OR TIGHT HOLE CONDITIONS OCCUR

Begin taking samples on Geologists orders

\* PRIMARY ZONE OF INT.  
 \*\* SECONDARY ZONE

Lower Bluegate Bentonite Marker 3,765'

FERRON SS \* (800 psi bhp) 3,891'

Ferron Basal Marine SS 4,161'

Tununk Shale 4,303'

TD 4,361'

BOP'S 9" 3000 # CASING BOWL

11" Surface Hole

7.875" Main Hole

5.500" CASING SET AT 4,361'

**SWEET WELL (NO H<sub>2</sub>S)**

**CASING DESIGN**

	Interval (ft)	O.D. (inches)	#/ft	Grade	Thread	Burst/Collapse (psi)	Joint Yield (lbf)	Opt.Torque (ft lbs)
Surface:	0 - 1,590	8 5/8	24	J-55	ST&C	2,950 / 1,370	244,000	2,440
Main:	0 - 4,361	5 1/2	17	N-80	LT&C	7,740 / 6,280	348,000	3,480

ENSURE THAT MARKER JOINTS ARE PLACED IN THE CASING STRING OPPOSITE ANY PAZ ZONE  
 TARGET: FERRON SANDSTONE/COAL; CASING TO BE CUT 16" ABOVE CASING BOWL

**CEMENTING PROGRAM - Primary - Single Stage**

	Bit Size (inches)	Cement	Additives	Yield (ft <sup>3</sup> /sk)	Volume (ex)	% Excess	Cmt Top (ft)	Density (#/gal)
Surface:	11	0-1-0 "G"	2% CaCl <sub>2</sub> + Cellophane flakes	1.142	940.0	100	SFC	15.84
Main:	7 7/8	LEAD	2% Gypsum-80 + 0.25 #/sk SuperFlake + 2% Super SR-SP	4.12	210.0	100	SFC	10.50
		TAIL	High Early Compressive + 2% Gypsum-60 + 0.25 #/sk SuperFlake + 2% Super SR-SP	2.39	109.0	50	2,960'	11.50

**DRILLING FLUIDS** *All water used for Drilling Fluids MUST be 3% KCl - NO FRESH WATER TO BE USED!*

Interval	Type	NOTES
Surface: 0 - 1,990'	AIR	Drill with air, switch over to 3% KCl Polymer water if water influx overcomes air hammer.
	3% KCl Polymer	Run gel sweeps if sloughing occurs; run Cedar Fibre LCM if losses occur. Condition mud thoroughly prior to POOH to run/cement casing
Main: 1,990 - 4,361'	AIR	Drill with air, switch over to 3% KCl Polymer water if water influx overcomes air hammer. Attempt to drill to TD with Air, unless ROP in the Ferron is poor - then POOH and switch to PDC and 3% KCl drilling fluid.
	3% KCl Polymer	MUD UP with 3% KCl polymer drilling fluid ONLY if water influx overcomes air hammer OR if TIGHT HOLE conditions become prevalent.

**11" SURFACE HOLE:**

- Spud with an approved water well/surface casing rig and air drill to surface TD of +/- 1,990'. Set surface casing at least 50' below any water influx zone. Survey every 100'. **Ensure that the surface hole deviation does not exceed 3°.**
- NOTE: If water influx overcomes air hammer or becomes problematic, MUD UP with a 3% KCl Polymer drilling fluid. Refer to the Mud Program and the Cementing Program for further information.
- NOTE: Ensure the well is cemented to surface on both casing strings. Contact the Operations Supervisor if any casing string cement job does not obtain returns to surface.
- Move the Surface Hole drilling rig off of location once surface casing is set and cemented.

**7 7/8" MAIN HOLE:**

- Move on conventional drilling rig and drill out with air hammer assembly and AIR DRILL as far as possible with air. Survey every 300'. Ensure that deviation does not exceed 3°. Notify Calgary operations immediately if a 3° deviation is exceeded.
- TIGHT HOLE is possible on connections. REAM HOLE at first indication of tight hole and attempt to continue to air drill.
- COAL/SHALE SEAMS can occur in the wellbore which may be faulted and unconsolidated resulting in sloughing hole conditions.
- H<sub>2</sub>S WILL NOT be encountered.
- MUD UP with a 3% KCl Polymer drilling fluid ONLY if water influx overrides the air hammer OR if tight hole conditions become prevalent.
- OVER PRESSURE: Generally, all zones in the wellbore should be underpressured (below normal water gradient) or have normal pressure gradients.
- LOST CIRCULATION should only have the potential to occur when drilling with fluids.
- ENSURE AND ADEQUATE AMOUNT OF LCM IS ON LOCATION AT ALL TIMES.
- FERRON SS/COAL PENETRATION - ATTEMPT TO AIR DRILL THROUGH THE FERRON ZONE. WATER may be encountered upon penetration. Ensure good hole conditions are prevalent to penetrating the FERRON.
- MUD UP - switch to a 3% Polymer drilling fluid system at Total Depth OR if water/tight hole problems occur.
- Mud Check - prior to POOH for logging, condition the mud and check mud properties with mudman. DO NOT POOH until the wellbore is circulating free of cuttings and the mud properties are optimal for logging.

**SAMPLE REQUIREMENTS/ EVALUATION**

T-BIRD	Begin taking 2 sets of samples every 10 feet at 3,190' to TD
GOVT:	As per regulations
Detection:	Gas detection/ PASON Mud Log as per Geologists's request.
Cores:	No coring
DST:	No DST's

**LOGGING PROGRAM - DISCUSS SCALES REQUIRED WITH VP OF GEOSCIENCES**

	# of copies
DIL-GR-SP T.D. to surface casing	4
CNL-LDT-GR-CAL T.D. to 3,190'	4

Run a multi-arm calliper log to ensure correct calculation for cement volumes on casing or plugs.

**T14S, R8E, S.L.B.&M.**

**THUNDERBIRD ENERGY**

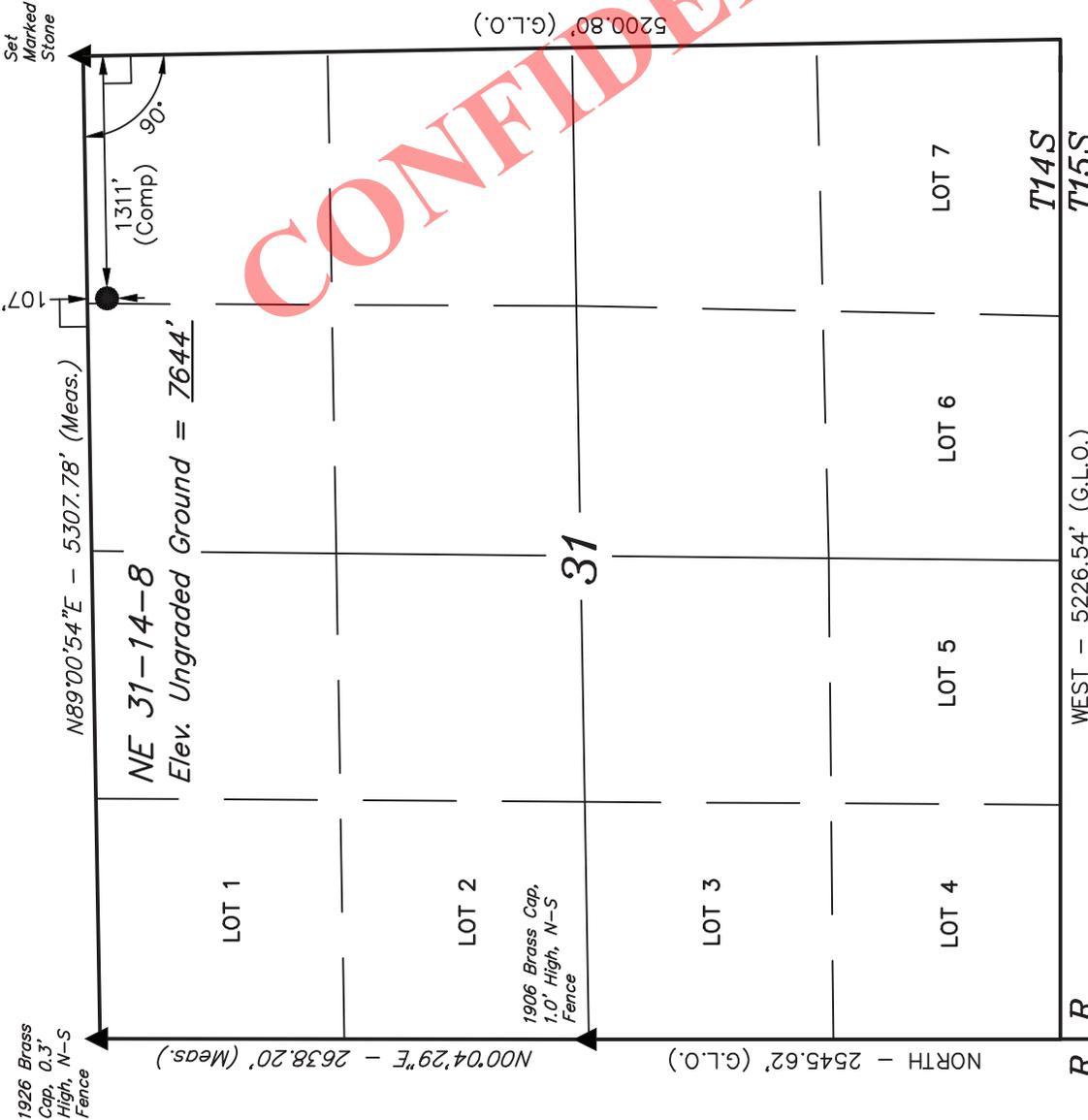
Well location, NE 31-14-8, located as shown in The NE 1/4 NE 1/4 of Section 31, T14S, R8E, S.L.B.&M., Carbon County, Utah.

**BASIS OF ELEVATION**

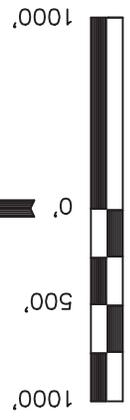
SPOT ELEVATION LOCATED AT THE NORTHWEST CORNER OF SECTION 34, T13S, R8E, S.L.B.&M., TAKEN FROM THE JUMP CREEK, QUADRANGLE, UTAH, CARBON COUNTY, 7.5 MINUTE QUAD. (TOPOGRAPHIC MAP) PUBLISHED BY THE UNITED STATES DEPARTMENT OF THE INTERIOR, GEOLOGICAL SURVEY. SAID ELEVATION IS MARKED AS BEING 7236 FEET.

**BASIS OF BEARINGS**

BASIS OF BEARINGS IS A G.P.S. OBSERVATION.



CONFIDENTIAL



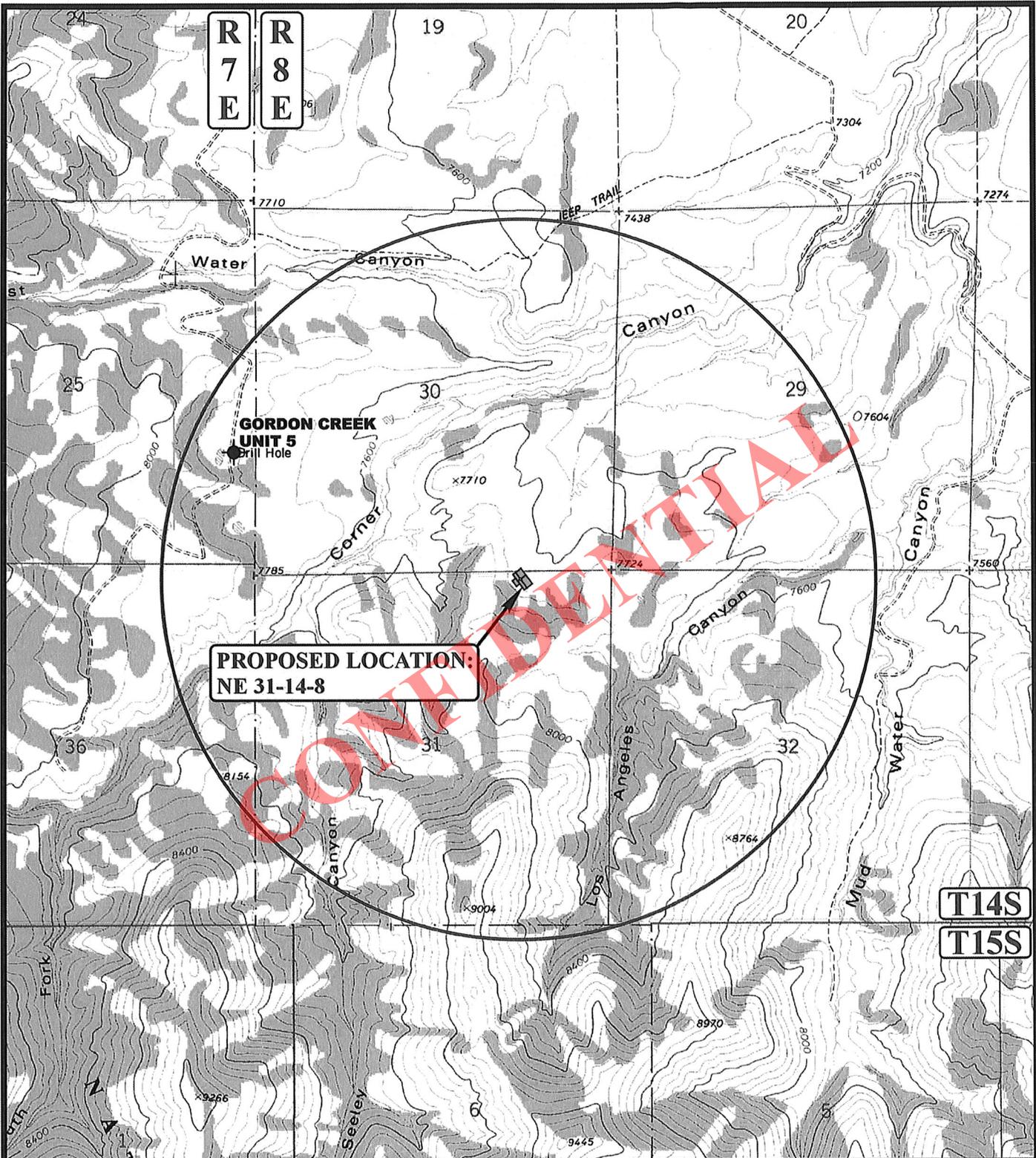
S C A L E  
C E R T I F I C A T E

THIS IS TO CERTIFY THAT THE ABOVE PLAT WAS PREPARED FROM FIELD NOTES OF ACTUAL SURVEYS MADE BY ME OR UNDER MY CLOSE SUPERVISION AND THAT THE SAME ARE TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF.  
 KAY E. FLETCHER  
 REGISTERED LAND SURVEYOR  
 REGISTRATION NO. 161319  
 STATE OF UTAH  
 EXPIRES 01-20-13

<b>UINTAH ENGINEERING &amp; LAND SURVEYING</b>	
85 SOUTH 200 EAST - VERNAL, UTAH 84078 (435) 789-1017	
SCALE 1" = 1000'	DATE SURVEYED: 01-14-13
PARTY B.H. G.O. K.O.	DATE DRAWN: 01-18-13
WEATHER COLD	REFERENCES G.L.O. PLAT
	FILE THUNDERBIRD ENERGY

<b>NAD 83 (SURFACE LOCATION)</b>	
LATITUDE = 39°34'15.74"	(39.571039)
LONGITUDE = 111°03'56.68"	(111.065744)
<b>NAD 27 (SURFACE LOCATION)</b>	
LATITUDE = 39°34'15.87"	(39.571075)
LONGITUDE = 111°03'54.07"	(111.065019)

- LEGEND:**
- = 90° SYMBOL
  - = PROPOSED WELL HEAD.
  - ▲ = SECTION CORNERS LOCATED.



**PROPOSED LOCATION:**  
NE 31-14-8

**LEGEND:**

- ⊗ DISPOSAL WELLS
- PRODUCING WELLS
- SHUT IN WELLS
- ABANDONED WELLS
- TEMPORARILY ABANDONED



**Utah Engineering & Land Surveying**  
85 South 200 East Vernal, Utah 84078  
(435) 789-1017 \* FAX (435) 789-1813



**THUNDERBIRD ENERGY**

**NE 31-14-8**  
**SECTION 31, T14S, R8E, S.L.B.&M.**  
**107' FNL 1311' FEL**

**TOPOGRAPHIC**  
**MAP**

**01** **21** **13**  
MONTH DAY YEAR

SCALE: 1" = 2000' DRAWN BY: C.I. REVISED: 00-00-00





THUNDERBIRD  
ENERGY

November 27<sup>th</sup>, 2012

Utah Division of Oil, Gas and Mining  
1594 West North Temple, Suite 1210  
Box 145801  
Salt Lake City, Utah 84114-5801

To Whom It May Concern;

Re: **LOCATION EXEMPTION LETTER - GORDON CREEK STATE NE-31-14S-8E**

In reference to the State of Utah Oil & Gas Conservation Rule # R649-3-2, the proposed well GORDON CREEK STATE NE-31-14S-8E is an exception to the rule due to the topography of the 160 acre Section that the well is located in.

There are no additional lease owners within 460' of the proposed location.

If you have any further questions regarding this matter, please don't hesitate to contact me by telephone at (403) 453-1608 or via email at [bbrumwell@thunderbirdenergy.com](mailto:bbrumwell@thunderbirdenergy.com).

Respectfully;

Barry Brumwell, C.E.T.

Vice President of Operations

Thunderbird Energy

Gordon Creek, LLC.

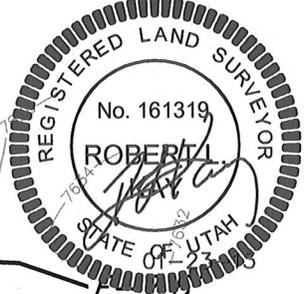
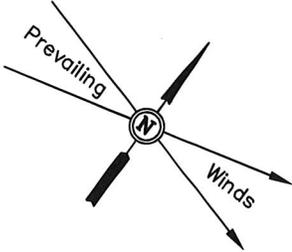
**THUNDERBIRD ENERGY**

LOCATION LAYOUT FOR

NE 31-14-8  
SECTION 31, T14S, R8E, S.L.B.&M.  
107' FNL 1311' FEL

**FIGURE #1**

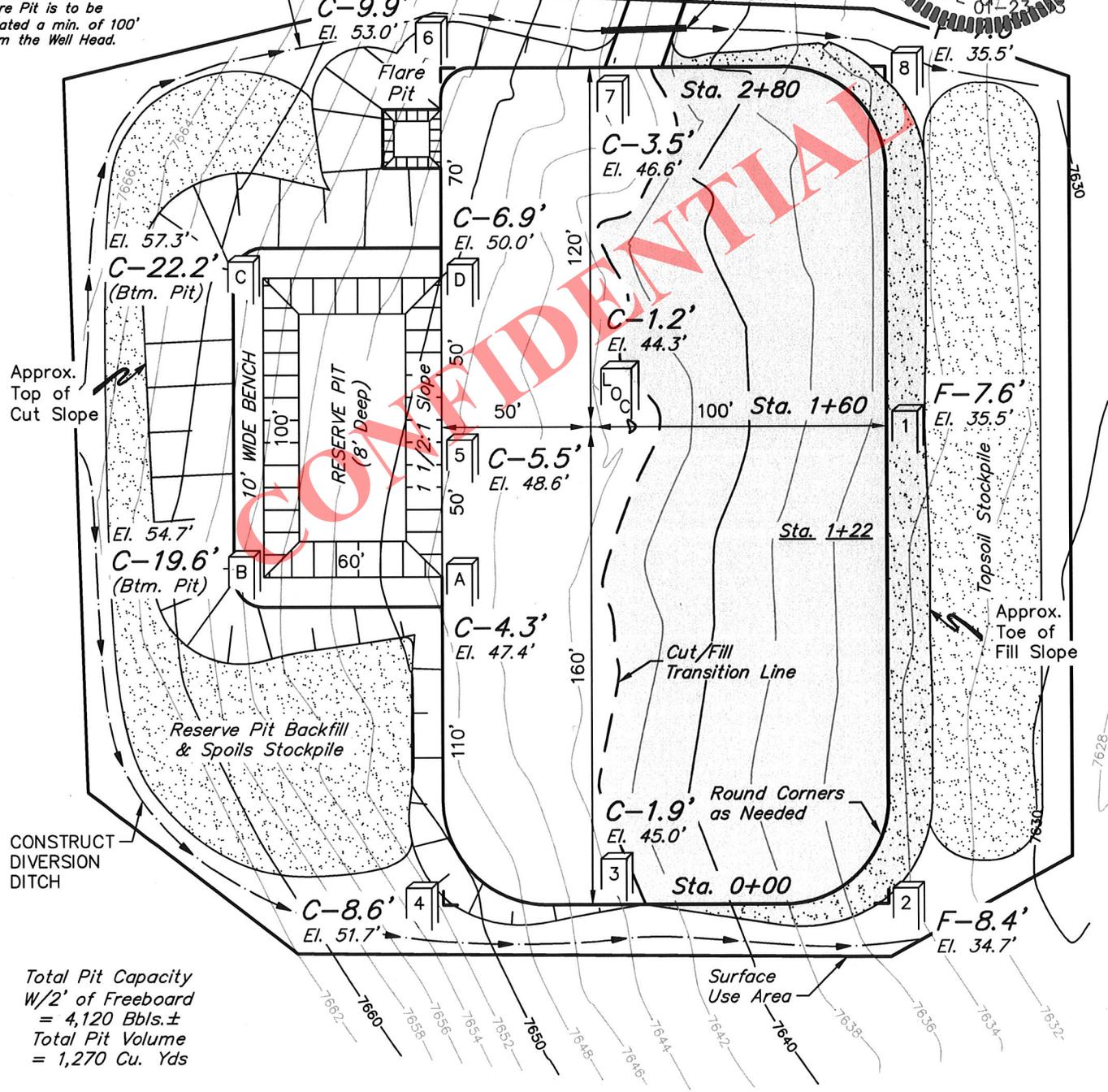
SCALE: 1" = 50'  
DATE: 01-18-13  
DRAWN BY: K.O.



**NOTE:**  
Flare Pit is to be located a min. of 100' from the Well Head.

CONSTRUCT DIVERSION DITCH

Proposed Access Road  
Install 18" Culvert



Approx. Top of Cut Slope

Approx. Toe of Fill Slope

CONSTRUCT DIVERSION DITCH

Total Pit Capacity  
W/2' of Freeboard  
= 4,120 Bbls.±  
Total Pit Volume  
= 1,270 Cu. Yds

Elev. Ungraded Ground At Loc. Stake = 7644.3'  
FINISHED GRADE ELEV. AT LOC. STAKE = 7643.1'

**UINTAH ENGINEERING & LAND SURVEYING**  
85 So. 200 East \* Vernal, Utah 84078 \* (435) 789-1017

**THUNDERBIRD ENERGY**

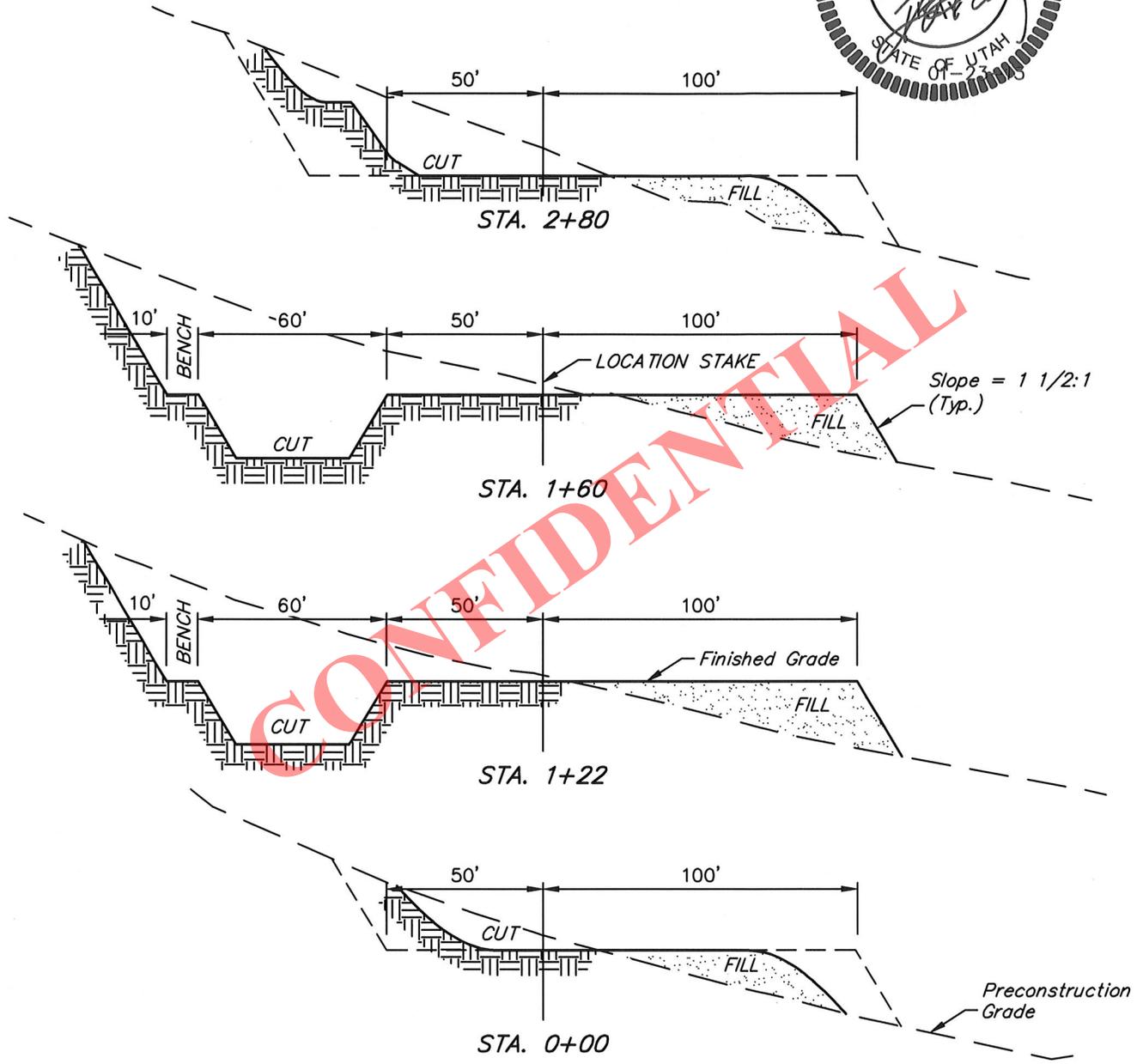
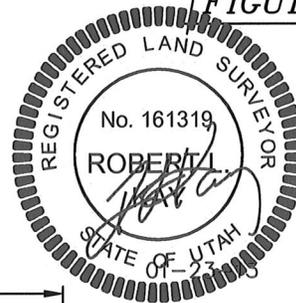
**TYPICAL CROSS SECTIONS FOR**

NE 31-14-8  
SECTION 31, T14S, R8E, S.L.B.&M.  
107' FNL 1311' FEL

**FIGURE #2**

1" = 20'  
X-Section Scale  
1" = 50'

DATE: 01-18-13  
DRAWN BY: K.O.



CONFIDENTIAL

**NOTE:**

Topsoil should not be Stripped Below Finished Grade on Substructure Area.

**APPROXIMATE ACREAGES**  
WELL SITE DISTURBANCE = ± 2.330 ACRES  
ACCESS ROAD & PIPELINE DISTURBANCE = ± 2.331 ACRES  
TOTAL = ± 4.661 ACRES

\* NOTE: FILL QUANTITY INCLUDES 5% FOR COMPACTION

**APPROXIMATE YARDAGES**

(6") Topsoil Stripping	=	2,340 Cu. Yds.
Remaining Location	=	7,810 Cu. Yds.
<b>TOTAL CUT</b>	=	<b>10,150 CU. YDS.</b>
<b>FILL</b>	=	<b>5,120 CU. YDS.</b>

EXCESS MATERIAL	=	5,030 Cu. Yds.
Topsoil & Pit Backfill (1/2 Pit Vol.)	=	2,980 Cu. Yds.
EXCESS UNBALANCE (After Interim Rehabilitation)	=	2,050 Cu. Yds.

**UINTAH ENGINEERING & LAND SURVEYING**  
85 So. 200 East \* Vernal, Utah 84078 \* (435) 789-1017

**THUNDERBIRD ENERGY**

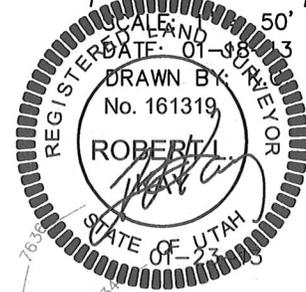
TYPICAL RIG LAYOUT FOR

NE 31-14-8

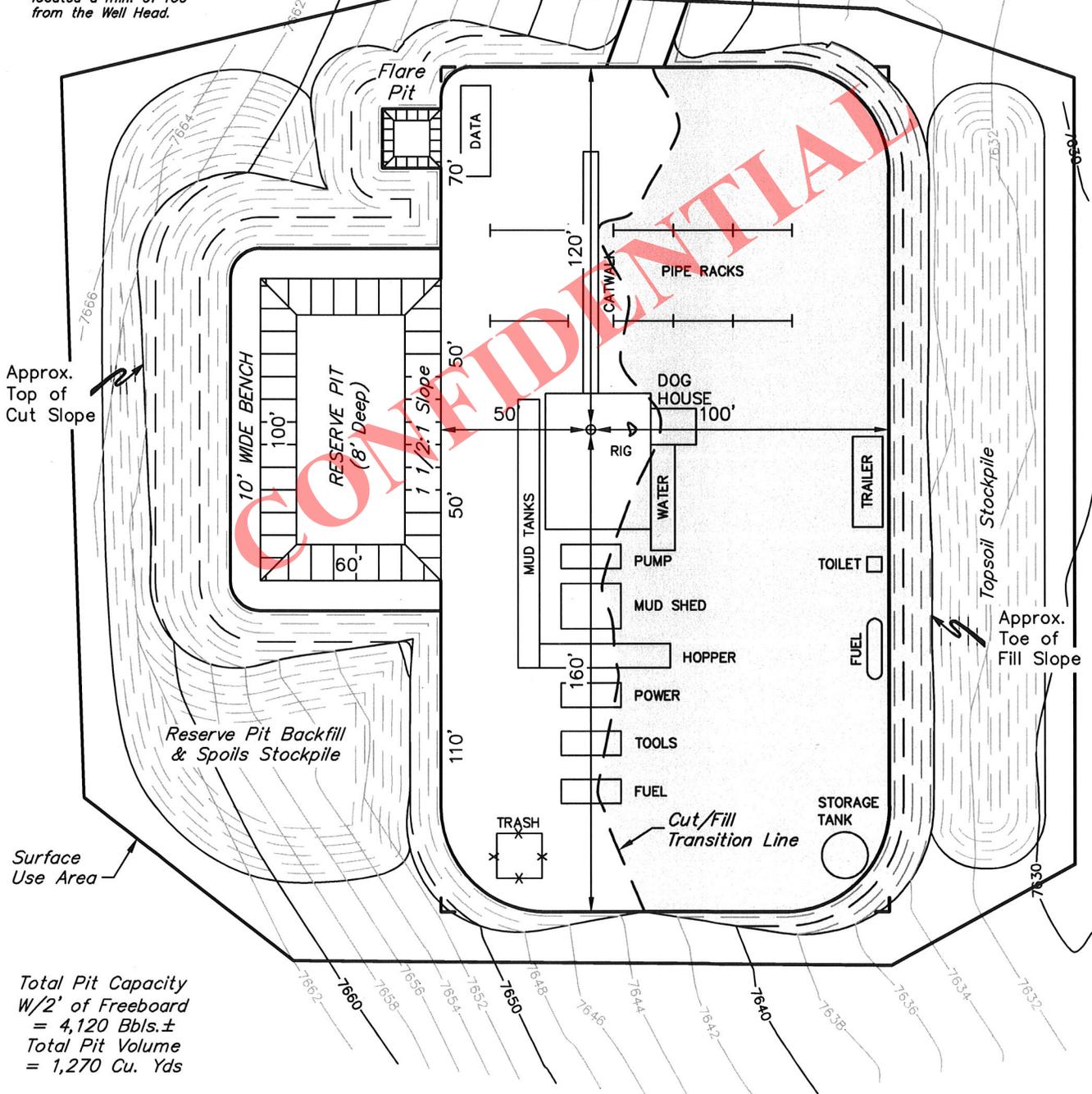
SECTION 31, T14S, R8E, S.L.B.&M.

107' FNL 1311' FEL

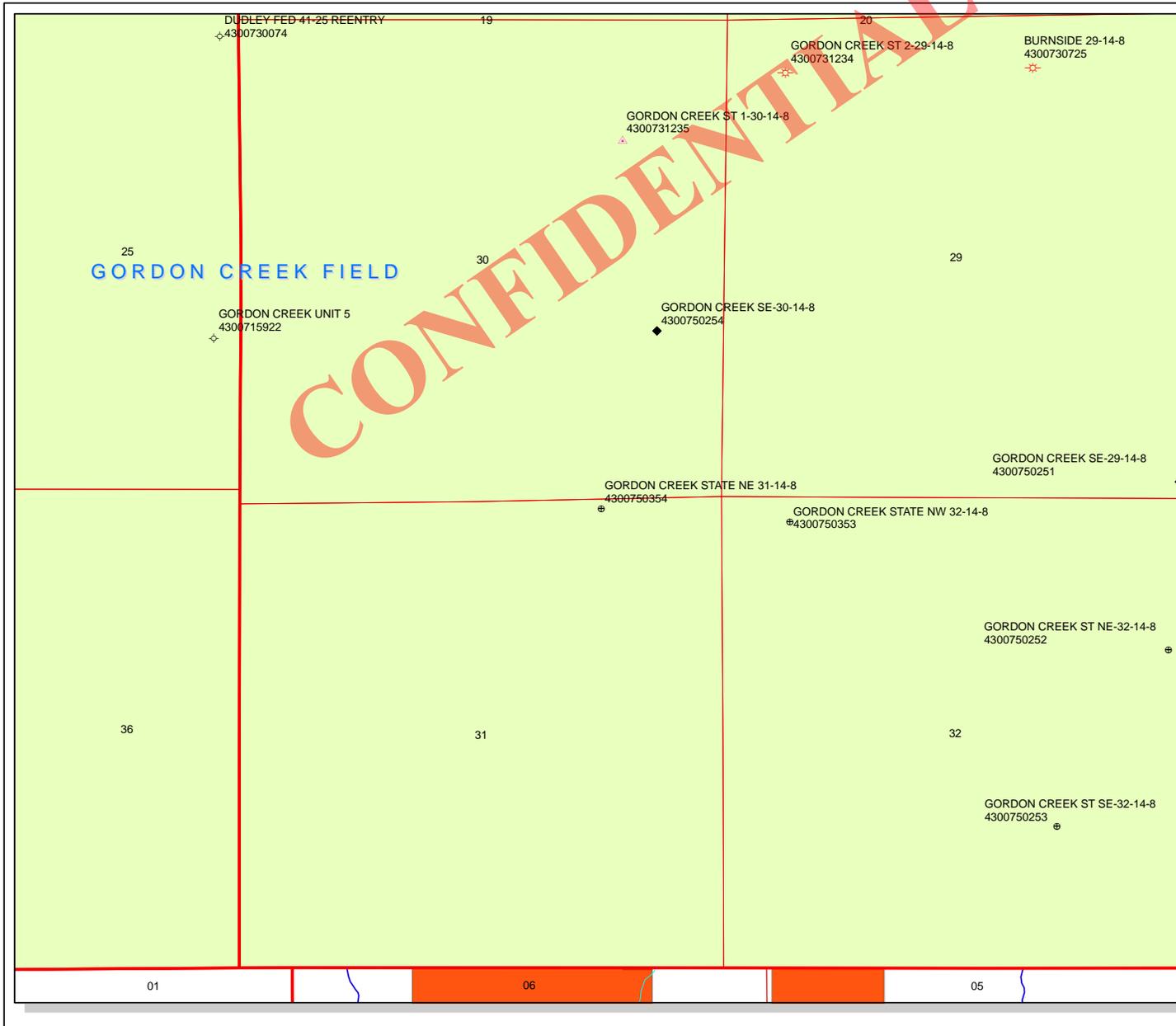
**FIGURE #3**



**NOTE:**  
Flare Pit is to be located a min. of 100' from the Well Head.



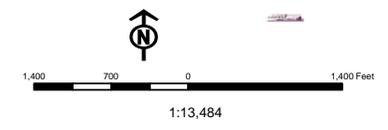
Total Pit Capacity  
W/2' of Freeboard  
= 4,120 Bbls.±  
Total Pit Volume  
= 1,270 Cu. Yds



**API Number: 4300750354**  
**Well Name: GORDON CREEK STATE NE 31-14-8**  
**Township T14.0S Range R08.0E Section 31**  
**Meridian: SLBM**  
**Operator: GORDON CREEK, LLC**

Map Prepared:  
 Map Produced by Diana Mason

- | Units Status | Wells Query Status                 |
|--------------|------------------------------------|
| ACTIVE       | APD - Approved Permit              |
| EXPLORATORY  | DRL - Spudded (Drilling Commenced) |
| GAS STORAGE  | GIW - Gas Injection                |
| NF PP OIL    | GS - Gas Storage                   |
| NF SECONDARY | LOC - New Location                 |
| P1 OIL       | OPS - Operation Suspended          |
| PP GAS       | PA - Plugged Abandoned             |
| PP GEOTHERML | PGW - Producing Gas Well           |
| PP OIL       | POW - Producing Oil Well           |
| SECONDARY    | SGW - Shut-in Gas Well             |
| TERMINATED   | SOW - Shut-in Oil Well             |
| Unknown      | TA - Temp. Abandoned               |
| ABANDONED    | TW - Test Well                     |
| ACTIVE       | WDW - Water Disposal               |
| COMBINED     | WW - Water Injection Well          |
| INACTIVE     | WSW - Water Supply Well            |
| STORAGE      | Bottom Hole Location - Oil/Gas/Dib |
| TERMINATED   |                                    |





Well Number: 4300750354000

dianawhitney@utah.gov

- Mail
- COMPOSE**
- Inbox (8)
- Starred
- Important
- Sent Mail
- Drafts
- BLM
- Cabinet
- Electronic Sign
- Eng. Tech (1)
- New Parents
- Equal
- Follow up
- Misc
- Priority
- Tariq
- More

Gordon Creek 31-14-8 Inbox x

**Jeff Conley** 10:06 AM (3 minutes ago) ★

to Jim, me, Brad, bbrumwell, REvans

Hello,

The following well has been cleared by SITLA for both arch and paleo:

(4300750354) Gordon Creek State NE 31-14-8

Regards,



[Click here to Reply](#), [Reply to all](#), or [Forward](#)

**0% full**  
Using 0.1 GB of your 25 GB

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Last account activity: 32 minutes ago [Details](#)

Powered by

People (5)

**Jeff Conley**

Trust Lands Resource Specialist

[Show details](#)

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Well Name	GORDON CREEK, LLC GORDON CREEK STATE NE 31-14-8 43007503			
String	SURF	PROD		
Casing Size(")	8.625	5.500		
Setting Depth (TVD)	1990	4361		
Previous Shoe Setting Depth (TVD)	0	1990		
Max Mud Weight (ppg)	8.7	8.7		
BOPE Proposed (psi)	2000	3000		
Casing Internal Yield (psi)	2950	7740		
Operators Max Anticipated Pressure (psi)	900	4.0		

Calculations	SURF String	8.625	"	
Max BHP (psi)	.052*Setting Depth*MW=	900		
			BOPE Adequate For Drilling And Setting Casing at Depth?	
MASP (Gas) (psi)	Max BHP-(0.12*Setting Depth)=	661	YES	2M Rotating Head for air drill
MASP (Gas/Mud) (psi)	Max BHP-(0.22*Setting Depth)=	462	YES	OK
			*Can Full Expected Pressure Be Held At Previous Shoe?	
Pressure At Previous Shoe	Max BHP-.22*(Setting Depth - Previous Shoe Depth)=	462	NO	OK
Required Casing/BOPE Test Pressure=		1990	psi	
*Max Pressure Allowed @ Previous Casing Shoe=		0	psi *Assumes 1psi/ft frac gradient	

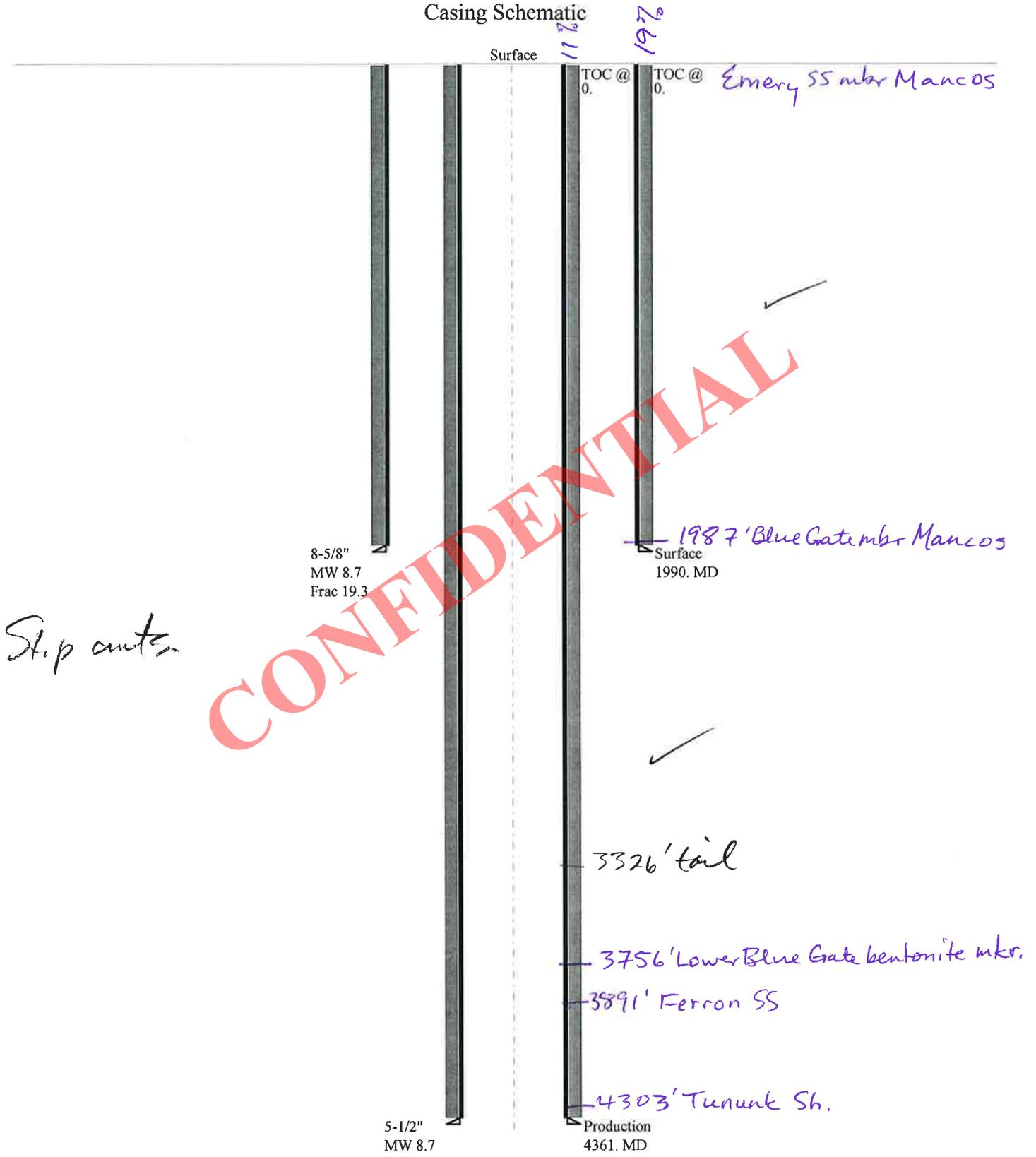
Calculations	PROD String	5.500	"	
Max BHP (psi)	.052*Setting Depth*MW=	1973		
			BOPE Adequate For Drilling And Setting Casing at Depth?	
MASP (Gas) (psi)	Max BHP-(0.12*Setting Depth)=	1450	YES	3M BOPE double gate
MASP (Gas/Mud) (psi)	Max BHP-(0.22*Setting Depth)=	1014	YES	OK
			*Can Full Expected Pressure Be Held At Previous Shoe?	
Pressure At Previous Shoe	Max BHP-.22*(Setting Depth - Previous Shoe Depth)=	1451	YES	OK
Required Casing/BOPE Test Pressure=		3000	psi	
*Max Pressure Allowed @ Previous Casing Shoe=		1990	psi *Assumes 1psi/ft frac gradient	

Calculations	String		"	
Max BHP (psi)	.052*Setting Depth*MW=			
			BOPE Adequate For Drilling And Setting Casing at Depth?	
MASP (Gas) (psi)	Max BHP-(0.12*Setting Depth)=		NO	
MASP (Gas/Mud) (psi)	Max BHP-(0.22*Setting Depth)=		NO	
			*Can Full Expected Pressure Be Held At Previous Shoe?	
Pressure At Previous Shoe	Max BHP-.22*(Setting Depth - Previous Shoe Depth)=		NO	
Required Casing/BOPE Test Pressure=			psi	
*Max Pressure Allowed @ Previous Casing Shoe=			psi *Assumes 1psi/ft frac gradient	

Calculations	String		"	
Max BHP (psi)	.052*Setting Depth*MW=			
			BOPE Adequate For Drilling And Setting Casing at Depth?	
MASP (Gas) (psi)	Max BHP-(0.12*Setting Depth)=		NO	
MASP (Gas/Mud) (psi)	Max BHP-(0.22*Setting Depth)=		NO	
			*Can Full Expected Pressure Be Held At Previous Shoe?	
Pressure At Previous Shoe	Max BHP-.22*(Setting Depth - Previous Shoe Depth)=		NO	
Required Casing/BOPE Test Pressure=			psi	
*Max Pressure Allowed @ Previous Casing Shoe=			psi *Assumes 1psi/ft frac gradient	

# 43007503540000 Gordon Creek State NE 31-14-8

## Casing Schematic



Well name:	<b>43007503540000 Gordon Creek State NE 31-14-8</b>	
Operator:	<b>CORDON CREEK, LLC</b>	Project ID:
String type:	Surface	43-007-50354
Location:	CARBON COUNTY	

**Design parameters:**

**Collapse**

Mud weight: 8.700 ppg  
 Design is based on evacuated pipe.

**Minimum design factors:**

**Collapse:**

Design factor 1.125

**Burst:**

Design factor 1.00

**Environment:**

H2S considered? No  
 Surface temperature: 74 °F  
 Bottom hole temperature: 102 °F  
 Temperature gradient: 1.40 °F/100ft  
 Minimum section length: 100 ft

Cement top: Surface

**Burst**

Max anticipated surface pressure: 1,448 psi  
 Internal gradient: 0.120 psi/ft  
 Calculated BHP 1,686 psi

No backup mud specified.

**Tension:**

8 Round STC: 1.80 (J)  
 8 Round LTC: 1.70 (J)  
 Buttress: 1.60 (J)  
 Premium: 1.50 (J)  
 Body yield: 1.50 (B)

Tension is based on air weight.  
 Neutral point: 1,730 ft

**Non-directional string.**

**Re subsequent strings:**

Next setting depth: 4,361 ft  
 Next mud weight: 8.700 ppg  
 Next setting BHP: 1,971 psi  
 Fracture mud wt: 19.250 ppg  
 Fracture depth: 1,990 ft  
 Injection pressure: 1,990 psi

Run Seq	Segment Length (ft)	Size (in)	Nominal Weight (lbs/ft)	Grade	End Finish	True Vert Depth (ft)	Measured Depth (ft)	Drift Diameter (in)	Est. Cost (\$)
1	1990	8.625	24.00	J-55	ST&C	1990	1990	7.972	10245
Run Seq	Collapse Load (psi)	Collapse Strength (psi)	Collapse Design Factor	Burst Load (psi)	Burst Strength (psi)	Burst Design Factor	Tension Load (kips)	Tension Strength (kips)	Tension Design Factor
1	899	1370	1.523	1686	2950	1.75	47.8	244	5.11 J

Prepared by: Helen Sadik-Macdonald  
 Div of Oil, Gas & Mining

Phone: 801 538-5357  
 FAX: 801-359-3940

Date: May 30, 2013  
 Salt Lake City, Utah

**Remarks:**

Collapse is based on a vertical depth of 1990 ft, a mud weight of 8.7 ppg. The casing is considered to be evacuated for collapse purposes. Collapse strength is based on the Westcott, Dunlop & Kemler method of biaxial correction for tension.

Burst strength is not adjusted for tension.

Well name:	<b>43007503540000 Gordon Creek State NE 31-14-8</b>	
Operator:	<b>CORDON CREEK, LLC</b>	Project ID:
String type:	Production	43-007-50354
Location:	CARBON COUNTY	

**Design parameters:**

**Collapse**

Mud weight: 8.700 ppg  
 Design is based on evacuated pipe.

**Minimum design factors:**

**Collapse:**

Design factor 1.125

**Burst:**

Design factor 1.00

**Environment:**

H2S considered? No  
 Surface temperature: 74 °F  
 Bottom hole temperature: 135 °F  
 Temperature gradient: 1.40 °F/100ft  
 Minimum section length: 100 ft

Cement top: Surface

**Burst**

Max anticipated surface pressure: 1,012 psi  
 Internal gradient: 0.220 psi/ft  
 Calculated BHP 1,971 psi

No backup mud specified.

**Tension:**

8 Round STC: 1.80 (J)  
 8 Round LTC: 1.80 (J)  
 Buttress: 1.60 (J)  
 Premium: 1.50 (J)  
 Body yield: 1.60 (B)

Tension is based on air weight.  
 Neutral point: 3,786 ft

**Non-directional string.**

Run Seq	Segment Length (ft)	Size (in)	Nominal Weight (lbs/ft)	Grade	End Finish	True Vert Depth (ft)	Measured Depth (ft)	Drift Diameter (in)	Est. Cost (\$)
1	4361	5.5	17.00	N-80	LT&C	4361	4361	4.767	24580
Run Seq	Collapse Load (psi)	Collapse Strength (psi)	Collapse Design Factor	Burst Load (psi)	Burst Strength (psi)	Burst Design Factor	Tension Load (kips)	Tension Strength (kips)	Tension Design Factor
1	1971	6290	3.191	1971	7740	3.93	74.1	348	4.69 J

Prepared by: Helen Sadik-Macdonald  
 Div of Oil, Gas & Mining

Phone: 801 538-5357  
 FAX: 801-359-3940

Date: May 30, 2013  
 Salt Lake City, Utah

**Remarks:**

Collapse is based on a vertical depth of 4361 ft, a mud weight of 8.7 ppg. The casing is considered to be evacuated for collapse purposes. Collapse strength is based on the Westcott, Dunlop & Kemler method of biaxial correction for tension.

Burst strength is not adjusted for tension.



**Drainage Diversion Required? Y**

Divert all drainages around and away from the location and access road utilizing such methods as ditches, culverts, turn-outs, rip rap, etc.

**Berm Required? Y**

berm the location to prevent storm runoff waters from entering the location and to contain spills, leaks, and drips on the location at all times.

**Erosion Sedimentation Control Required? Y**

erosion/ sedimentation control methods should be used to slow down and control the onset of erosion associated with the construction and throughout the life of this well pad.

**Paleo Survey Run? Y    Paleo Potential Observed? N    Cultural Survey Run? Y    Cultural Resources? N**

**Reserve Pit****Site-Specific Factors****Site Ranking**

<b>Distance to Groundwater (feet)</b>	100 to 200	5	
<b>Distance to Surface Water (feet)</b>	300 to 1000	2	
<b>Dist. Nearest Municipal Well (ft)</b>	>5280	0	
<b>Distance to Other Wells (feet)</b>	>1320	0	
<b>Native Soil Type</b>	High permeability	20	
<b>Fluid Type</b>	Air/mist	0	
<b>Drill Cuttings</b>	Normal Rock	0	
<b>Annual Precipitation (inches)</b>	>20	10	
<b>Affected Populations</b>			
<b>Presence Nearby Utility Conduits</b>	Not Present	0	
	<b>Final Score</b>	37	1 Sensitivity Level

**Characteristics / Requirements**

Dugout earthen pit (100 x 60 x 8) with a 10' bench exterior to the well pad dimensions is planned. A 16 mil minimum synthetic liner will be utilized in the reserve pit.

**Closed Loop Mud Required? N    Liner Required? Y    Liner Thickness 16    Pit Underlayment Required? N**

**Other Observations / Comments**

Mark Jones  
Evaluator

4/4/2013  
Date / Time

**Application for Permit to Drill  
Statement of Basis  
Utah Division of Oil, Gas and Mining**

APD No	API WellNo	Status	Well Type	Surf Owner	CBM
7236	43007503540000	LOCKED	GW	S	Yes
<b>Operator</b>	GORDON CREEK, LLC		<b>Surface Owner-APD</b>		
<b>Well Name</b>	GORDON CREEK STATE NE 31-14-8		<b>Unit</b>		
<b>Field</b>	UNDESIGNATED		<b>Type of Work</b>	DRILL	
<b>Location</b>	NENE 31 14S 8E S 106 FNL (UTM) 494351E 4380150N		1308 FEL GPS Coord		

**Geologic Statement of Basis**

Gordon Creek, LLC proposes to drill the well to a total depth of 4,361' and plans to set surface casing from 0'-1,990'. The surface string will be drilled using air unless hole conditions require the need to "mud-up" with water and gel chem. Within a one-mile radius there are 25 filed water rights; however, none of these involve underground water resources. This location is within a small north-south trending graben valley. The poorly permeable silty soil has been formed from the erosion of the Upper Blue Gate Member of the Mancos Shale. Several units of the Emery Sandstone Member of the Mancos Shale are present at the near surface or within the subsurface; these strata should be included within the interval to be protected by the surface casing string. The operator should be aware of the likelihood of these units being water saturated and to respond to protecting these zones by extending the surface casing as necessary. The surface casing string shall be extended to a sufficient depth in order to contain water flows as seen in the Gordon Creek ST SE 7-14-8 well. Proposed surface casing and cement should adequately isolate any shallow zones containing water.

Ammon McDonald  
**APD Evaluator**

5/7/2013  
**Date / Time**

**Surface Statement of Basis**

This proposed well is staked in the upper Gordon Creek area situated in a small relatively flat cove between Los Angeles Canyon and Corner Canyon. The site is suitable for a well pad, however, drainage must be addressed in the area in relation to diversion around the pad and around and away from the access road in an efficient and erosion controlled manor. The soils in this area are highly subject to the effects of erosion, as is seen in the field during the pre-site inspection for this well. Soils in the area of the well pad and access road are prone to erosion and should be considered at all times. Erosion/ sedimentation control methods should be used to slow down and control the onset of erosion associated with the construction and throughout the life of this well pad. Divert all drainages around and away from the location and access road utilizing such methods as ditches, culverts, turn-outs, rip rap, etc. berm the location to prevent storm runoff waters from entering the location and to contain spills, leaks, and drips on the location at all times. Dugout earthen pit (100 x 60 x 8) with a 10' bench exterior to the well pad dimensions is planned. A 16 mil minimum synthetic liner will be utilized in the reserve pit.

Mark Jones  
**Onsite Evaluator**

4/4/2013  
**Date / Time**

**Conditions of Approval / Application for Permit to Drill**

<b>Category</b>	<b>Condition</b>
Pits	A synthetic liner with a minimum thickness of 16 mils shall be properly installed and maintained in the reserve pit.
Surface	The well site shall be bermed to prevent fluids from leaving the pad.
Surface	Drainages adjacent to the proposed pad shall be diverted around the location.
Surface	The reserve pit shall be fenced upon completion of drilling operations.
Surface	Erosion/ sedimentation control methods should be used to slow down and control the onset of erosion associated with the construction and throughout the life of this well pad.

**CONFIDENTIAL**

## WORKSHEET APPLICATION FOR PERMIT TO DRILL

APD RECEIVED: 12/4/2012

API NO. ASSIGNED: 43007503540000

WELL NAME: GORDON CREEK STATE NE 31-14-8

OPERATOR: GORDON CREEK, LLC (N3245)

PHONE NUMBER: 403 453-1608

CONTACT: Barry Brumwell

PROPOSED LOCATION: NENE 31 140S 080E

Permit Tech Review: 

SURFACE: 0106 FNL 1308 FEL

Engineering Review: 

BOTTOM: 0106 FNL 1308 FEL

Geology Review: 

COUNTY: CARBON

LATITUDE: 39.57103

LONGITUDE: -111.06577

UTM SURF EASTINGS: 494351.00

NORTHINGS: 4380150.00

FIELD NAME: UNDESIGNATED

LEASE TYPE: 3 - State

LEASE NUMBER: ML-46539

PROPOSED PRODUCING FORMATION(S): FERRON COAL

SURFACE OWNER: 3 - State

COALBED METHANE: YES

## RECEIVED AND/OR REVIEWED:

- PLAT
- Bond: STATE - RLB0010790
- Potash
- Oil Shale 190-5
- Oil Shale 190-3
- Oil Shale 190-13
- Water Permit: 91-5205
- RDCC Review:
- Fee Surface Agreement
- Intent to Commingle

Commingling Approved

## LOCATION AND SITING:

- R649-2-3.
- Unit:
- R649-3-2. General
- R649-3-3. Exception
- Drilling Unit
- Board Cause No: R649-3-3
- Effective Date:
- Siting:
- R649-3-11. Directional Drill

Comments: Presite Completed

Stipulations: 1 - Exception Location - dmason  
5 - Statement of Basis - bhll  
23 - Spacing - dmason  
25 - Surface Casing - hmacdonald



GARY R. HERBERT  
Governor

GREGORY S. BELL  
Lieutenant Governor

# State of Utah

DEPARTMENT OF NATURAL RESOURCES

MICHAEL R. STYLER  
Executive Director

Division of Oil, Gas and Mining

JOHN R. BAZA  
Division Director

## Permit To Drill

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**Well Name:** GORDON CREEK STATE NE 31-14-8  
**API Well Number:** 43007503540000  
**Lease Number:** ML-46539  
**Surface Owner:** STATE  
**Approval Date:** 6/10/2013

### Issued to:

GORDON CREEK, LLC, 1179 E Main #345, Price, UT 84501

### Authority:

Pursuant to Utah Code Ann. 40-6-1 et seq., and Utah Administrative Code R649-3-1 et seq., the Utah Division of Oil, Gas and Mining issues conditions of approval, and permit to drill the listed well. This permit is issued in accordance with the requirements of R649-3-3. The expected producing formation or pool is the FERRON COAL Formation(s), completion into any other zones will require filing a Sundry Notice (Form 9). Completion and commingling of more than one pool will require approval in accordance with R649-3-22.

### Duration:

This approval shall expire one year from the above date unless substantial and continuous operation is underway, or a request for extension is made prior to the expiration date

### Exception Location:

Appropriate information has been submitted to DOGM and administrative approval of the requested exception location is hereby granted.

### General:

Compliance with the requirements of Utah Admin. R. 649-1 et seq., the Oil and Gas Conservation General Rules, and the applicable terms and provisions of the approved Application for permit to drill.

### Conditions of Approval:

This proposed well is located in an area for which drilling units (well spacing patterns) have not been established through an order of the Board of Oil, Gas and Mining (the "Board"). In order to avoid the possibility of waste or injury to correlative rights, the operator is requested, once the well has been drilled, completed, and has produced, to analyze geological and engineering data generated therefrom, as well as any similar data from surrounding areas if available. As soon as is practicable after completion of its analysis, and if the analysis suggests an area larger than the quarter-quarter section upon which the well is located is being drained, the operator is requested to seek an appropriate order from the Board establishing drilling and spacing units in conformance with such analysis by filing a Request for Agency Action with the Board.

Compliance with the Conditions of Approval/Application for Permit to Drill outlined in the Statement of Basis (copy attached).

Surface casing shall be cemented to the surface.

**Additional Approvals:**

The operator is required to obtain approval from the Division of Oil, Gas and mining before performing any of the following actions during the drilling of this well:

- Any changes to the approved drilling plan - contact Dustin Doucet
- Significant plug back of the well - contact Dustin Doucet
- Plug and abandonment of the well - contact Dustin Doucet

**Notification Requirements:**

The operator is required to notify the Division of Oil, Gas and Mining of the following actions during drilling of this well:

- Within 24 hours following the spudding of the well - contact Carol Daniels  
OR  
submit an electronic sundry notice (pre-registration required) via the Utah Oil & Gas website  
at <http://oilgas.ogm.utah.gov>
- 24 hours prior to testing blowout prevention equipment - contact Dan Jarvis
- 24 hours prior to cementing or testing casing - contact Dan Jarvis
- Within 24 hours of making any emergency changes to the approved drilling program  
- contact Dustin Doucet
- 24 hours prior to commencing operations to plug and abandon the well - contact Dan Jarvis

**Contact Information:**

The following are Division of Oil, Gas and Mining contacts and their telephone numbers (please leave a voicemail message if the person is not available to take the call):

- Carol Daniels 801-538-5284 - office
- Dustin Doucet 801-538-5281 - office  
801-733-0983 - after office hours
- Dan Jarvis 801-538-5338 - office  
801-231-8956 - after office hours

**Reporting Requirements:**

All reports, forms and submittals as required by the Utah Oil and Gas Conservation General Rules will be promptly filed with the Division of Oil, Gas and Mining, including but not limited to:

- Entity Action Form (Form 6) - due within 5 days of spudding the well
- Monthly Status Report (Form 9) - due by 5th day of the following calendar month
- Requests to Change Plans (Form 9) - due prior to implementation
- Written Notice of Emergency Changes (Form 9) - due within 5 days
- Notice of Operations Suspension or Resumption (Form 9) - due prior to implementation
- Report of Water Encountered (Form 7) - due within 30 days after completion

- Well Completion Report (Form 8) - due within 30 days after completion or plugging

**Approved By:**

A handwritten signature in black ink, appearing to read "J. Rogers", written in a cursive style.

For John Rogers  
Associate Director, Oil & Gas