



## AUTHORIZATION TO PURCHASE AND TRANSPORT OIL FROM LEASE - FORM 8

INDUSTRIAL COMMISSION OF NORTH DAKOTA  
OIL AND GAS DIVISION  
600 EAST BOULEVARD DEPT 405  
BISMARCK, ND 58505-0840  
SFN 5698 (03-2000)

RECEIVED

JAN 28 2020

Well File No.

23370

PLEASE READ INSTRUCTIONS BEFORE FILLING OUT FORM.

PLEASE SUBMIT THE ORIGINAL.

ND OIL &amp; GAS DIVISION

Well Name and Number <b>Atlanta 3-6H</b>	Qtr-Qtr <b>NWNW</b>	Section <b>6</b>	Township <b>153 N</b>	Range <b>101 W</b>	County <b>Williams</b>
Operator <b>Continental Resources, Inc.</b>			Telephone Number <b>405-234-9000</b>	Field <b>Baker</b>	
Address <b>P.O. Box 268870</b>			City <b>Oklahoma City</b>	State <b>OK</b>	Zip Code <b>73126</b>

Name of First Purchaser <b>Continental Resources, Inc.</b>	Telephone Number <b>405-234-9000</b>	% Purchased <b>100</b>	Date Effective <b>April 9, 2013</b>
Principal Place of Business <b>20 N. Broadway</b>	City <b>Oklahoma City</b>	State <b>OK</b>	Zip Code <b>73102</b>
Field Address	City	State	Zip Code
Name of Transporter <b>Hiland Crude</b>	Telephone Number <b>580-616-2050</b>	% Transported <b>100</b>	Date Effective <b>April 9, 2013</b>
Address <b>8811 S. Yale, Ste. 200</b>	City <b>Tulsa</b>	State <b>OK</b>	Zip Code <b>74137</b>

The above named producer authorizes the above named purchaser to purchase the percentage of oil stated above which is produced from the lease designated above until further notice. The oil will be transported by the above named transporter.

Other First Purchasers Purchasing From This Lease	% Purchased	Date Effective
Other First Purchasers Purchasing From This Lease	% Purchased	Date Effective
Other Transporters Transporting From This Lease	% Transported	Date Effective
Other Transporters Transporting From This Lease	% Transported	Date Effective
Comments		

I hereby swear or affirm that all transporters of Bakken Petroleum System oil listed above implement or adhere to a tariff specification as stringent as the Commissions VPCR<sub>4</sub> requirement  13.7 psi VPCR<sub>4</sub> Tariff Specification Hiland Crude Tariff Authority

I hereby swear or affirm that the information provided is true, complete and correct as determined from all available records.		Date <b>January 20, 2020</b>
Signature 	Printed Name <b>Terry L. Olson</b>	Title <b>Regulatory Compliance Specialist</b>

Above Signature Witnessed By

Witness Signature 	Witness Printed Name <b>Christi Scritchfield</b>	Witness Title <b>Regulatory Compliance Specialist</b>
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FOR STATE USE ONLY

Date Approved <b>JAN 29 2020</b>	NDIC CTB NO <b>23372</b>
By 	Title <b>DG &amp; Gas Production Analyst</b>



# SUNDRY NOTICES AND REPORTS ON WELLS - FORM

INDUSTRIAL COMMISSION OF NORTH DAKOTA  
OIL AND GAS DIVISION  
600 EAST BOULEVARD DEPT 405  
BISMARCK, ND 58505-0840  
SFN 5749 (09-2006)

Well File No.  
**23370**



PLEASE READ INSTRUCTIONS BEFORE FILLING OUT FORM.  
PLEASE SUBMIT THE ORIGINAL AND ONE COPY.

<input type="checkbox"/> Notice of Intent	Approximate Start Date	<input type="checkbox"/> Drilling Prognosis	<input type="checkbox"/> Spill Report
<input checked="" type="checkbox"/> Report of Work Done	Date Work Completed <b>June 4, 2014</b>	<input type="checkbox"/> Redrilling or Repair	<input type="checkbox"/> Shooting
<input type="checkbox"/> Notice of Intent to Begin a Workover Project that may Qualify for a Tax Exemption Pursuant to NDCC Section 57-51.1-03.	Approximate Start Date	<input type="checkbox"/> Casing or Liner	<input type="checkbox"/> Acidizing
		<input type="checkbox"/> Plug Well	<input type="checkbox"/> Fracture Treatment
		<input type="checkbox"/> Supplemental History	<input checked="" type="checkbox"/> Change Production Method
		<input type="checkbox"/> Temporarily Abandon	<input type="checkbox"/> Reclamation
		<input type="checkbox"/> Other	

Well Name and Number  
**Atlanta 3-6H**

Footages <b>495 F N L</b>	Qtr-Qtr <b>590 F W L</b>	Section <b>NWNW</b>	Township <b>6</b>	Range <b>153 N 101 W</b>
Field <b>Baker</b>	Pool <b>Bakken</b>	County <b>Williams</b>		

## 24-HOUR PRODUCTION RATE

	Before		After
Oil	<b>234</b> Bbls	Oil	<b>179</b> Bbls
Water	<b>248</b> Bbls	Water	<b>171</b> Bbls
Gas	<b>162</b> MCF	Gas	<b>186</b> MCF

Name of Contractor(s)

Address

City

State

Zip Code

## DETAILS OF WORK

Continental Resources would like to request a change in production method on the Atlanta 3-6H. The well went from flowing to pumping on 6/4/2014.

Company <b>Continental Resources</b>	Telephone Number <b>(405) 234-9000</b>	
Address <b>P.O. Box 268870</b>		
City <b>Oklahoma City</b>	State <b>OK</b>	Zip Code <b>73126</b>
Signature 	Printed Name <b>Zach Green</b>	
Title <b>Regulatory Compliance Specialist</b>	Date <b>July 18, 2014</b>	
Email Address <b>Zach.Green@clr.com</b>		

## FOR STATE USE ONLY

<input checked="" type="checkbox"/> Received	<input type="checkbox"/> Approved
Date <i>7/18/14</i>	
By 	
Title <i>Regulatory Compliance Specialist</i>	



WELL COMPLETION OR RECOMPLETION REPORT - FORM 6

INDUSTRIAL COMMISSION OF NORTH DAKOTA  
OIL AND GAS DIVISION  
600 EAST BOULEVARD DEPT 405  
BISMARCK, ND 58505-0840  
SFR 2468 (04-2010)

Well File No.  
**23370**

PLEASE READ INSTRUCTIONS BEFORE FILLING OUT FORM.

PLEASE SUBMIT THE ORIGINAL AND ONE COPY.

Designate Type of Completion							
<input checked="" type="checkbox"/> Oil Well	<input type="checkbox"/> EOR Well	<input type="checkbox"/> Recompletion	<input type="checkbox"/> Deepened Well	<input type="checkbox"/> Added Horizontal Leg	<input type="checkbox"/> Extended Horizontal Leg		
<input type="checkbox"/> Gas Well	<input type="checkbox"/> SWD Well	<input type="checkbox"/> Water Supply Well	<input type="checkbox"/> Other:				
Well Name and Number <b>Atlanta 3-6H</b>				Spacing Unit Description <b>Sec 5, 6, 7, &amp; 8 T153N R101W</b>			
Operator <b>Continental Resources, Inc.</b>		Telephone Number <b>405-234-9000</b>		Field <b>Baker</b>			
Address <b>P.O. Box 268870</b>				Pool <b>Bakken</b>			
City <b>Oklahoma City</b>		State <b>OK</b>	Zip Code <b>73126</b>	Permit Type <input type="checkbox"/> Wildcat <input checked="" type="checkbox"/> Development <input type="checkbox"/> Extension			

**LOCATION OF WELL**

At Surface		Qtr-Qtr	Section	Township	Range	County
		NWNW	6	153 N	101 W	Williams
495 F N L	590 F W L					
Spud Date	Date TD Reached	Drilling Contractor and Rig Number	KB Elevation (Ft)	Graded Elevation (Ft)		
11/16/2013	2/8/2013	Cyclone 2	1967	1945		

Type of Electric and Other Logs Run (See Instructions)

**CBI /GR/MAC/mud**

**CASING & TUBING RECORD (Report all strings set in well)**

Casing & Tubulars Record										
Well Bore	String		Top Set (MD Ft)	Depth Set (MD Ft)	Hole Size (Inch)	Weight (Lbs/Ft)	Anchor Set (MD Ft)	Packer Set (MD Ft)	Sacks Cement	Top of Cement
	Type	Size (Inch)								
Lateral1	Conductor	16		102	20	94			400	0
	Surface	13 3/8		522	17 1/4	48			415	0
	Surface	9 5/8		1992	13 1/2	36			896	70
	Intermediate	7		10857	8 3/4	26-32				
	Liner	2 7/8		20068		11.6				

#### **PERFORATION & OPEN HOLE INTERVALS**

## **PRODUCTION**

Current Producing Open Hole or Perforated Interval(s), This Completion, Top and Bottom, (MD Ft) <b>Bakken 10,857' - 20,225'</b>					Name of Zone (If Different from Pool Name)			
Date Well Completed (SEE INSTRUCTIONS) 4/7/2013		Producing Method <b>Flowing</b>	Pumping-Size & Type of Pump			Well Status (Producing or Shut-In) <b>Producing</b>		
Date of Test <b>4/8/2013</b>	Hours Tested <b>24</b>	Choke Size <b>/64</b>	Production for Test	Oil (Bbls) <b>597</b>	Gas (MCF) <b>929</b>	Water (Bbls) <b>1079</b>	Oil Gravity-API (Corr.) °	Disposition of Gas <b>Flared</b>
Flowing Tubing Pressure (PSI) <b>0</b>		Flowing Casing Pressure (PSI) <b>0</b>		Calculated 24-Hour Rate	Oil (Bbls) <b>597</b>	Gas (MCF) <b>929</b>	Water (Bbls) <b>1079</b>	Gas-Oil Ratio <b>1556</b>

## GEOLOGICAL MARKERS

## **PLUG BACK INFORMATION**

CORES CUT

Top (Ft)	Bottom (Ft)	Formation	Top (Ft)	Bottom (Ft)	Formation

## Drill Stem Test

**Well Specific Stimulation**

Date Stimulated	Stimulated Formation	Top (Ft)	Bottom (Ft)	Stimulation Stages	Volume	Volume Units
3/20/2013	MB	11156	20225	27	44335	Barrels
Type Treatment	Acid %	Lbs Proppant	Maximum Treatment Pressure (PSI)			Maximum Treatment Rate (BBLS/Min)
Sand Frac		3227114	8059			31.0

Details

Pumped 2251322# 20/40 sand and 975822# 20/40 ceramic.

Date Stimulated	Stimulated Formation	Top (Ft)	Bottom (Ft)	Stimulation Stages	Volume	Volume Units
Type Treatment	Acid %	Lbs Proppant	Maximum Treatment Pressure (PSI)			Maximum Treatment Rate (BBLS/Min)

Details

Date Stimulated	Stimulated Formation	Top (Ft)	Bottom (Ft)	Stimulation Stages	Volume	Volume Units
Type Treatment	Acid %	Lbs Proppant	Maximum Treatment Pressure (PSI)			Maximum Treatment Rate (BBLS/Min)

Details

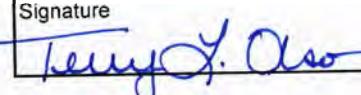
Date Stimulated	Stimulated Formation	Top (Ft)	Bottom (Ft)	Stimulation Stages	Volume	Volume Units
Type Treatment	Acid %	Lbs Proppant	Maximum Treatment Pressure (PSI)			Maximum Treatment Rate (BBLS/Min)

Details

Date Stimulated	Stimulated Formation	Top (Ft)	Bottom (Ft)	Stimulation Stages	Volume	Volume Units
Type Treatment	Acid %	Lbs Proppant	Maximum Treatment Pressure (PSI)			Maximum Treatment Rate (BBLS/Min)

Details

**ADDITIONAL INFORMATION AND/OR LIST OF ATTACHMENTS**

I hereby swear or affirm that the information provided is true, complete and correct as determined from all available records.	Email Address Terry.Olson@clr.com	Date 5/15/2013
Signature 	Printed Name Terry L. Olson	Title Regulatory Compliance Specialist



# AUTHORIZATION TO PURCHASE AND TRANSPORT OIL FROM LEASE - FORM 8

INDUSTRIAL COMMISSION OF NORTH DAKOTA  
OIL AND GAS DIVISION  
600 EAST BOULEVARD DEPT 405  
BISMARCK, ND 58505-0840  
SFN 5698 (03-2000)



Well File No.	23370
NDIC CTB No.	223372

PLEASE READ INSTRUCTIONS BEFORE FILLING OUT FORM.

PLEASE SUBMIT THE ORIGINAL AND FOUR COPIES.

Well Name and Number <b>Atlanta 3-6H</b>	Qtr-Qtr <b>NWNW</b>	Section <b>6</b>	Township <b>153 N</b>	Range <b>101 W</b>	County <b>Williams</b>
Operator <b>Continental Resources, Inc.</b>	Telephone Number <b>405-234-9000</b>		Field <b>Baker</b>		
Address <b>P.O. Box 268870</b>	City <b>Oklahoma City</b>		State <b>OK</b>	Zip Code <b>73126</b>	

Name of First Purchaser <b>Continental Resources, Inc.</b>	Telephone Number <b>405-234-9000</b>	% Purchased <b>100</b>	Date Effective <b>April 9, 2013</b>
Principal Place of Business <b>P.O. Box 268870</b>	City <b>Oklahoma City</b>	State <b>OK</b>	Zip Code <b>73126</b>
Field Address	City	State	Zip Code
Name of Transporter <b>Hiland Crude</b>	Telephone Number	% Transported	Date Effective <b>April 9, 2013</b>
Address	City	State	Zip Code
The above named producer authorizes the above named purchaser to purchase the percentage of oil stated above which is produced from the lease designated above until further notice. The oil will be transported by the above named transporter.			

Other First Purchasers Purchasing From This Lease	% Purchased	Date Effective
Other First Purchasers Purchasing From This Lease	% Purchased	Date Effective
Other Transporters Transporting From This Lease <b>Hofmann Trucking, LLC</b>	% Transported	Date Effective <b>April 9, 2013</b>
Other Transporters Transporting From This Lease <b>RD Midwest, LLC</b>	% Transported	Date Effective <b>April 9, 2013</b>
Comments		

I hereby swear or affirm that the information provided is true, complete and correct as determined from all available records.	Date <b>May 2, 2013</b>
Signature <u>Terry L. Olson</u>	Printed Name <b>Terry L. Olson</b>
	Title <b>Regulatory Compliance Specialist</b>

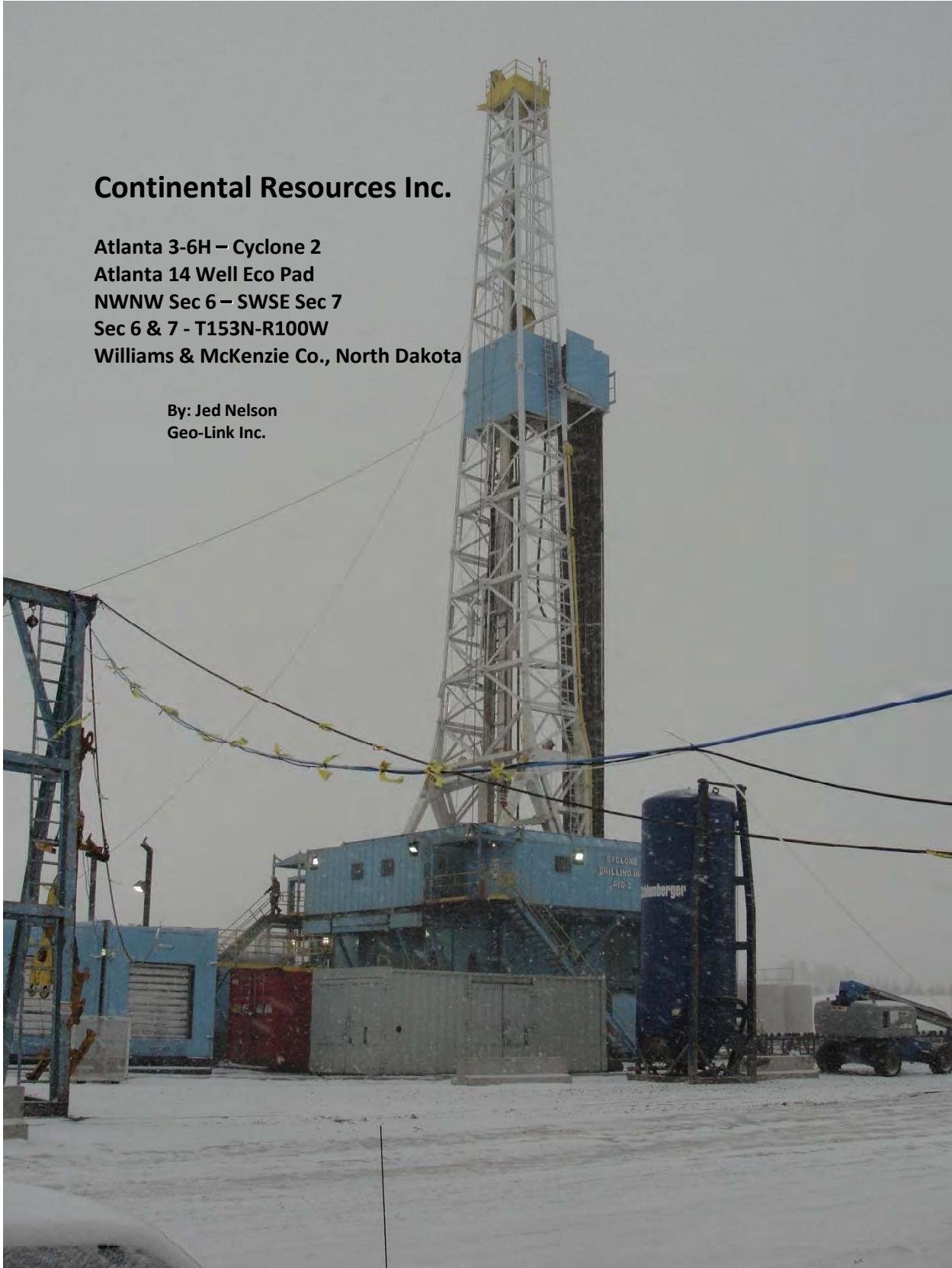
Above Signature Witnessed By	
Witness Signature <u>Christi Scritchfield</u>	Witness Printed Name <b>Christi Scritchfield</b>
	Witness Title <b>Regulatory Compliance Specialist</b>

FOR STATE USE ONLY	
Date Approved <b>MAY 07 2013</b>	
By <u>Annette M. Johnson</u>	
Title <b>Oil &amp; Gas Production Analyst</b>	

## **Continental Resources Inc.**

**Atlanta 3-6H – Cyclone 2  
Atlanta 14 Well Eco Pad  
NWNW Sec 6 – SWSE Sec 7  
Sec 6 & 7 - T153N-R100W  
Williams & McKenzie Co., North Dakota**

**By: Jed Nelson  
Geo-Link Inc.**





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## Well Information

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WELL NAME: Atlanta 3-6H

OPERATOR: Continental Resources, Inc.  
P.O. Box 269000  
Oklahoma City, Ok 73126

SURFACE LOCATION: 495' FNL & 590' FWL  
NWNW Section 6, T153N, R101W

CASING: 7" intermediate casing set at 10875'MD, 10527'TVD  
1067' FNL & 722' FWL

BOTTOM HOLE LOCATION: Projection to Bit: 20225' MD, 10521' TVD  
243' FSL & 2222' FEL  
SWSE Section 7, T153N, R101W

FIELD/AREA: Williston

COUNTY: Williams & McKenzie

STATE: North Dakota

API#: 33-105-02730

ELEVATION: GL: 1945' KB: 1967'

SPUD: January 27<sup>th</sup>, 2013

TOTAL DEPTH/DATE:  
Total Days: 20225' MD on February 8, 2013  
15

BOTTOM HOLE DATA:  
Kick-off Point: MD=9930' TVD=9929'  
Vertical Section: -15.39  
Drift of Azimuth: 165.89°  
Average Inclination (lateral): 90.16°  
Lateral footage: 9350'

WELL STATUS: To be completed as a Middle Bakken oil well

MWD REP: Baker Hughes

DIRECTIONAL REP: Baker Hughes

MUD LOGGING SERVICE: Geo-Link Inc.



## Well Information

GEOLOGICAL CONSULTANT: Jed D Nelson  
MUD LOGGER: R.C. Whitmore

GAS EQUIPMENT: M-Logger / M-Control – SN ML-197  
Spare SN ML-145

SAMPLE PROGRAM:  
30' Samples lagged and caught by mud loggers 8500'-10870'  
Logging: Top Charles, BLS, Mission Canyon, Lodgepole, Upper Bakken Shale, Middle Bakken Member  
  
100' Samples lagged and caught by mud loggers 10900'-20225'  
Logging: Middle Bakken Member  
One set sent to NDGS Core Library (Grand Forks)

### DISTRIBUTION LIST:

Owner	Information	Casing Point Election	Dry Hole Takeover Election
NDIC Oil and Gas Division Attn: Open Hole Logs 1016 East Calgary Ave. Bismarck, ND 58503-5512 Email: <a href="mailto:digitallogs@nd.gov">digitallogs@nd.gov</a>	<b>Open Hole Logs (1 paper copy) – (email TIFF/ LAS)</b>	No	No
Continental Resources, Inc. Attn: Robert Sandbo P.O. Box 269000 OKC, OK 73126 Email: <a href="mailto:GeoOps@clr.com">GeoOps@clr.com</a>	Standard Information <b>(2 copies of Final Geological Reports/Mud Logs) – (email PDF)</b>	No	No
Continental Resources, Inc. Attn: Robert Sandbo P.O. Box 269000 OKC, OK 73126 Email: <a href="mailto:GeoOps@clr.com">GeoOps@clr.com</a>	<b>Cased and Open Hole Logs (2 hard-copies) – (email TIFF/LAS)</b>	No	No



## Well Information

Black Stone Energy Company, LLC c/o Mark Connally 1001 Fannin, Suite 2020 Houston, TX 77002 Phone: 713.658.0647 Fax: 713.658.0943 Email: <a href="mailto:kdolfi@blackstoneminerals.com">kdolfi@blackstoneminerals.com</a> , <a href="mailto:mconnally@blackstoneminerals.com">mconnally@blackstoneminerals.com</a> (Send Well Information daily, via email)	See Attached Well Requirements	No	Yes
Boedecker Resources 151 O'Brien Ln. Moore, MT 59464 Phone: 406.374.2270 (Send Well Info weekly, via US Mail)	Standard Well Information	No	Yes
Brigham Oil & Gas, L.P. 6300 Bridge Point Parkway Building 2, Suite 500 Austin, TX 78730 Phone: 512.427.3300 Fax: 512.427.3388 Email: <a href="mailto:reports@bexp3d.com">reports@bexp3d.com</a> (Send Well Information daily, via email)	See Attached Well Requirements	No	Yes
Dale Lease Acquisitions 2011-B, L.P. Attn: John D. Crocker, Jr. 2100 Ross Avenue, Suite 1870 Dallas, TX 75201 Phone: 214.979.9010, Ext. 16 Fax: 214.969.9394 Email: <a href="mailto:reports@dale-energy.com">reports@dale-energy.com</a> , <a href="mailto:johnc@dale-energy.com">johnc@dale-energy.com</a> (Send Well Information daily, via email)	See Attached Well Requirements	No	Yes
Golden Eye Resources, LLC 5460 South Quebec Street, Suite 335 Greenwood Village, CO 80111 Phone: 303.832.1994 Fax: 303.832.5118 Email: <a href="mailto:reports@goldeneyerесources.com">reports@goldeneyerесources.com</a> (Send Well Information daily, via email)	See Attached Well Requirements	No	Yes



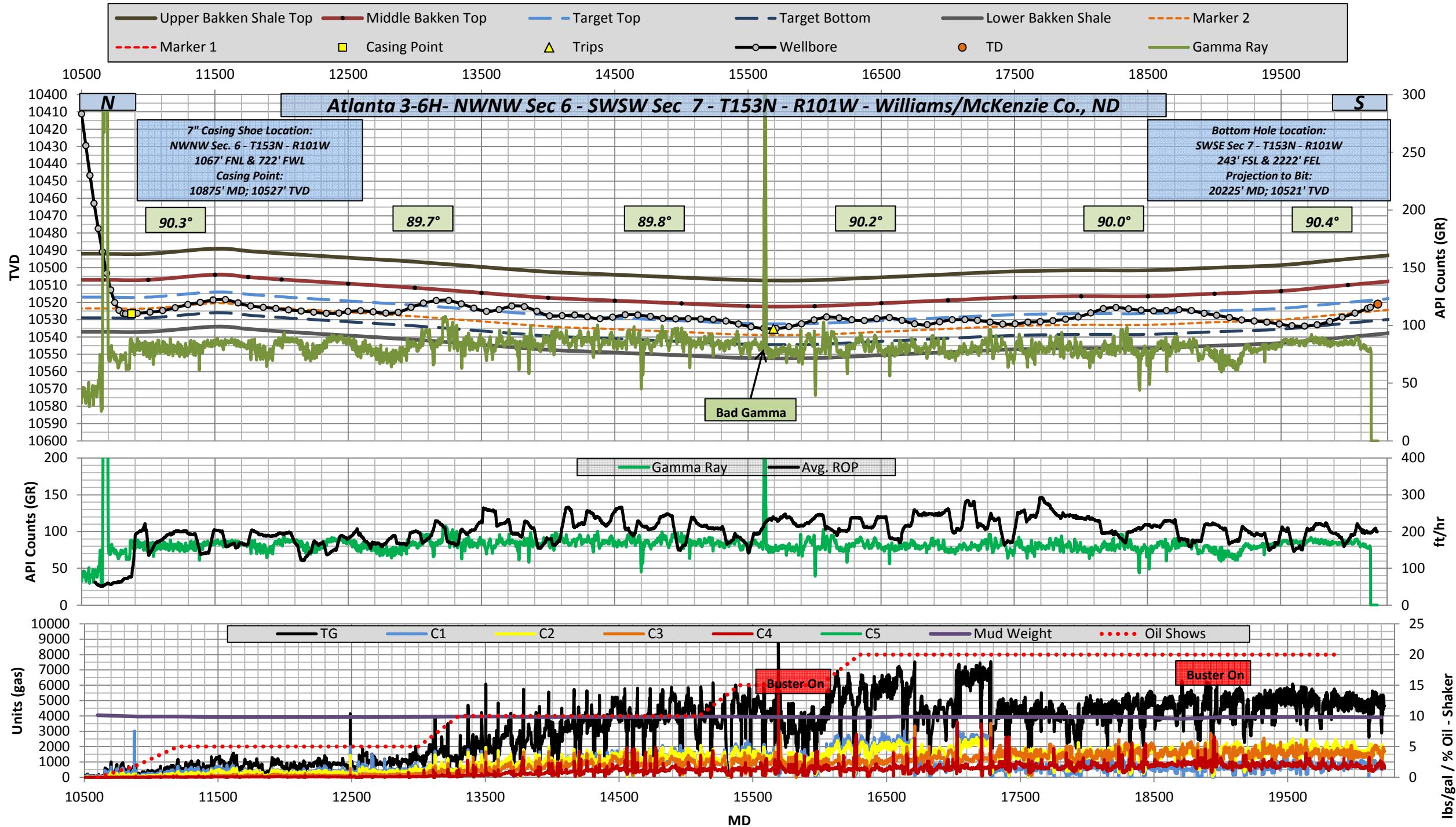
## Well Information

Helm Energy, LLC c/o Joe Brinkman 5251 DTC Parkway Suite 425 Greenwood Village, CO 80111 Email: <a href="mailto:jbrinkman@helmenergy.com">jbrinkman@helmenergy.com</a> (Send Well Information daily, via email)	See Attached Well Requirements	No	Yes
Intervention Energy, LLC Attn: John Zimmerman P.O. Box 1028 Minot, ND 58702-1028 Email: <a href="mailto:john@interventionenergy.com">john@interventionenergy.com</a> (Send Well Information daily, via email)	Standard Well Information	No	Yes
John H. Holt Oil Properties, Inc. Attn: John H. Holt P.O. Box 24 Williston, ND 58802 Phone: 701.774.1200 Fax: 701.572.8499 Email: <a href="mailto:john@jhhop.com">john@jhhop.com</a> (Send Well Information daily, via email)	Standard Well Information	No	Yes
Lario Oil & Gas Company P.O. Box 29 Denver, CO 80201-0029 Fax: 303.595.4849 Email: <a href="mailto:reportsdenver@lario.net">reportsdenver@lario.net</a> (Send Well Information daily, via email)	See Attached Well Requirements	No	Yes
Liberty Resources, LLC Attn: Reports 1200 17 <sup>th</sup> Street, Suite 2050 Denver, CO 80202 Email: <a href="mailto:reports@libertyresourcesllc.com">reports@libertyresourcesllc.com</a> (Send Well Information daily, via email)	See Attached Well Requirements	No	Yes
MHM Resources, LP Attn: Julie Larson P.O. Box 51570 Midland, TX 79710 Phone: 432.685.6045 Fax: 432.685.9081 Email: <a href="mailto:drlgreports@mhmresourceslp.com">drlgreports@mhmresourceslp.com</a> , <a href="mailto:jlarson@mhmresourceslp.com">jlarson@mhmresourceslp.com</a> (Send Well Information daily, via email)	See Attached Well Requirements	No	Yes



## Well Information

Michael Harrison Moore 2006 Trust Attn: Julie Larson P.O. Box 51570 Midland, TX 79710 Phone: 432.685.6045 Fax: 432.685.9081 Email: <a href="mailto:drlreports@mhmresourceslp.com">drlreports@mhmresourceslp.com</a> , <a href="mailto:jlarson@mhmresourceslp.com">jlarson@mhmresourceslp.com</a> (Send Well Information daily, via email)	See Attached Well Requirements	No	Yes
Steven H. Harris Family L.P. P.O. Box 2323 Bismarck, ND 58502 Phone: 701.223.4866 Fax: 701.223.2556 Email: <a href="mailto:w2harris@aol.com">w2harris@aol.com</a> (Send Well Information daily, via email)	Standard Well Information	No	Yes
XTO Energy, Inc. Attn: Randy Hosey 810 Houston Street Fort Worth, TX 76102 Phone: 817.885.2398 Fax: 817.885.2698 Email: <a href="mailto:randy_hosey@xtoenergy.com">randy_hosey@xtoenergy.com</a> , <a href="mailto:non-op_reports@xtoenergy.com">non-op_reports@xtoenergy.com</a> , <a href="mailto:rose_holman@xtoenergy.com">rose_holman@xtoenergy.com</a> (Send Well Information daily, via email)	See Attached Well Requirements	No	Yes





## WELL SYNOPSIS

**Well Plan:** The Atlanta 3-6H was spud on January 27<sup>th</sup>, 2013 with a surface location of 495' FNL and 590' FWL, NWNW Section 6 - Township 153 North and Range 101 West in Williams Co., North Dakota. This well was operated by Continental Resources Incorporated with the objective target of the late Devonian to early Mississippian Middle Bakken Dolomite. The plan showed a build section with a kickoff point of 9957' MD in the Mississippian Lodgepole with a 10'/100' build rate to the landing point of 10858' MD; 10530' TVD, 20' into the Middle Bakken Dolomite. The actual KOP was 9930' MD and actual casing point is 10875' MD; 10527' TVD. The target zone for this Middle Bakken Dolomite well started approximately 10' below the Upper Bakken Shale and ended 6' above the Lower Bakken Shale. The plan was to drill lateral for an estimated 9099' to the hardline in the SWSE of section 7 - Township 153 North and Range 101 West following the estimated up dip of 90.12° and following an azimuth of 165.89°.

The offsets provided were the Hansen 11-2 (tops picked from) and Hansen 1-3 (Sec 3-T153N-R102W) both operated by Citation Oil and Gas Corporation and the Lippert 1-12H (Sec 1-T153N – R102W) operated by Brigham Oil and Gas LP. The two previous Atlanta wells (Atlanta 1-6H & Atlanta 2-6H) were also used for reference.

Gas logged in the vertical and lateral sections were monitored using Mud Logging Systems – Logger & Control. (Primary Logger: ML-197 – Spare Logger ML-145) M-Logger CC & TC filaments calibrated with 1% and 100% test gas – Chromatograph calibrated with 1% test gas (gas-units).

**Build Section:** The build section of the well was kicked off at 9930' MD on January 31<sup>st</sup>, 2013. The up hole markers logged were the Base of the Last Salt 9014' TVD, Mission Canyon 9236' TVD, and the Lodgepole 9783' TVD. The down hole markers below kick off point consisted of the False Bakken 10486' TVD, Upper Bakken Shale 10493' TVD and the Middle Bakken Member 10507' TVD. These markers, along with the up hole markers, all came in three feet high to four feet low from the prognosis. The landing for 7" intermediate casing was completed February 1<sup>st</sup>, 2013 at 11:55 hours, 20' TVD into the Middle Bakken Dolomite with the landing at 10875' MD and 10527' TVD, with a location of; NWNW Sec 6 – T153N – R101W -- 1067' FNL & 722' FWL. (See Atlanta 3-6H Build and TVD logs for any additional information)

Gas observed in the build section, which showed gas averaging 85-390 units through the Lodgepole formation, with a max trip gas of 78u and with no background sample shows and oil shows. There was an increase in the gas going through the Upper Bakken Shale, up to approximately 1000u, and landing in the Middle Bakken Dolomite gas was averaging 340-740u of background, (average) gas.

**Lateral Leg:** Casing operations were completed and penetration of the lateral section started, on February 3<sup>rd</sup>, 2013 at 04:55 hours with a depth of 10875' MD and 10527' TVD. The plan was to drill in the target zone and follow the approximate 12' TVD zone of interest. The lateral section was drilled from 10875' MD to 20225' MD for a lateral length of about 9350' MD. The section was drilled entirely in the Middle Bakken Dolomite. There was one complete trip in the lateral section, for an MWD tool failure at 15690' MD, on February 5th. The lateral section was completed on February 8<sup>th</sup>, 2013 – 20225' MD and 10521' TVD.



## WELL SYNOPSIS

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Oil observed in the possum during the lateral section, ranged from 2-20% oil with a presence of light brown to green brown oil accumulating in the corners of the possum belly. Staining and fluorescence increased with oil shows, with a light blue to bright yellow - green cut were observed in the cuttings throughout the lateral section. There was an increase in the staining and fluorescence from about 13100' to 15300' MD, and stayed very bright and even fluorescence throughout the lateral. While in the upper and middle target zone, the inter-crystalline porosity considered was fair to good. Samples collected were primarily light-medium tan/brown, light-dark gray, microcrystalline-cryptocrystalline, slight-moderately firm, moderately to very calcareous and displayed moderately bright to very bright yellow-green fluorescence with immediate streaming cloudy blue/white cut. Samples appeared to be more medium-dark gray when drilling lower target zone and light to medium-dark tan/brown when drilling the upper zone (For more detailed sample descriptions see Atlanta 3-6H horizontal mud log)

Using the cooler and more consistent gamma counts in the lower section of the target zone and the hotter gamma found in the upper 10' of the zone, it was possible to identify formation dip changes during the lateral section. The marker 1 line illustrates warmer rattier gamma that is consistent with the middle of the target zone. Gamma counts in the middle of the target zone and corresponded with the tan/brown dolomite we were seeing near our upper hard streak. The hotter gamma counts were present in the upper section of the target zone, with the hottest gamma (104-108) came in about 6' below Upper Bakken Shale. Drilling the lower target zone displayed consistent gamma readings giving us good indicators we were in the bottom of the target zone. The lateral section was projected to come up 15', an average dip of 90.1°, the formation did up dip slightly more, at the end of the lateral, 90.4°.

Drilling Activity													
ATLANTA 3-6H													
<u>Day</u>	<u>Date</u>	<u>Depth</u>	<u>Footage</u>	<u>WOB</u>	<u>RPM</u>	<u>Diff P</u>	<u>ROP</u>	<u>PP</u>	<u>SPM</u>	<u>WT</u>	<u>VIS</u>	<u>ACTIVITY</u>	
3	1/30/2013	8993	946	20.7	75	451.3	228.3	3005	98	10	43	Drilling Vertical Section: Drill, Survey, Slide, Rig Service	
4	1/31/2013	9930	937	32.2	68	671.9	88	3265	97	10.1	49	TIH, TOOH for build assembly, Reached KOP @ 9930, Drill, Slide, Survey, Rig Service	
5	2/1/2013	10607	677	40.2	0	282.4	62.0	2970	102	10.1	49	Drilling Build Section: Slide, Survey, Drill, Rig Service	
6	2/2/2013	10875	268	NA	NA	NA	NA	NA	NA	NA	NA	TD'D Build Section: Casing Operations	
7	2/3/2013	10880	5	20.6	63	610.6	125.8	2441	98	9.9	29	Drilling Lateral Section: Drill, Survey, Slide, Rig Service	
8	2/4/2013	12839	1959	20	66	948.5	205.3	3544	96	9.85	28	Drilling Lateral Section: Drill, Survey, Slide, Rig Service, Pick up collars	
9	2/5/2013	15149	2310	17.4	65	923.6	179.3	3692	96	9.8	28	Drilling Lateral Section: Drill, Survey, Slide, Rig Service	
10	2/6/2013	15690	541	8.5	67	401.2	101	3046	95	9.9	28	Drilling Lateral : Drill, Survey, Slide, Rig Service, TOOH, TIH, Slip and Cut	
11	2/7/2013	17937	2247	15.7	67	643.3	154.1	3563	96	9.8	28	Drilling Lateral Section: Drill, Survey, Slide, Rig Service	
12	2/8/2013	19963	2026	61.7	23	90.6	18.9	3276	96	9.8	28	Drilling Lateral Section: Drill, Survey, Slide, Rig Service	
13	2/9/2013	20225	262	NA	NA	NA	NA	NA	NA	NA	NA	TD'D Lateral Section	

Chronological Gas/Sample/Oil							
Atlanta 3-6H							
<u>Date</u>	<u>Depth 0500hrs</u>	<u>Max Gas(u)</u>	<u>Avg Gas(u)</u>	<u>Conn Gas(u)</u>	<u>Trip Gas(u)</u>	<u>Oil Show</u>	<u>Sample Show</u>
1/30/2013	8993	61	21	NA	NA	NA	No Shows
1/31/2013	9930	162	63	NA	NA	NA	No Shows
2/1/2013	10607	398	85	NA	72	NA	No Shows
2/2/2013	10875	995	390	NA	NA	NA	No Shows
2/3/2013	10880	NA	NA	NA	NA	NA	Trace
2/4/2013	12839	4139	714	151-821	4139	5%	MOD BRI YEL-GRN FLOR, G LT BLU/WHT FLASH/DIFF C
2/5/2013	15149	6075	2615	554-3778	NA	10%	MOD BRI YEL-GRN FLOR, G LT BLU/WHT FLASH/DIFF C
2/6/2013	15690	6158	3807	340-3593	NA	15%	V BRI YEL-GRN FLOR, G IMMD LT BLU/WHT FLASH/DIFF C
2/7/2013	17937	8777	4603	2960-5099	8777	20%	MOD BRI YEL-GRN FLOR, G LT BLU/WHT FLASH/DIFF C
2/8/2013	19963	6238	4561	1000-4650	NA	20%	MOD BRI YEL-GRN FLOR, G LT BLU/WHT FLASH/DIFF C
2/9/2013	20225	5624	4778	900-4500	NA	20%	MOD BRI YEL-GRN FLOR, G LT BLU/WHT FLASH/DIFF C

## **Formation Tops**

Atlanta 3-6H

## **VERTICAL & BUILD SECTIONS**

FORMATION TOPS		Ground Elevation:		1945	Kelly Bushing:		1967
Formation	MD (ft)	TVD (ft)	VS (ft)	SS (ft)	Prognosed SS (ft)	Difference	
Pierre Shale		1867			100		
Greenhorn		4549			-2582		
Dakota Grp. (fka Mowry)		4925			-2958		
Base of Dakota Sand		5624			-3657		
Dunham Salt Top							
Dunham Salt Base							
Pine Salt Top		7156			-5189		
Pine Salt Base		7183			-5216		
Minnekahta		7202			-5235		
Opeche Salt Top							
Opeche Salt Base							
Minnelusa Grp.		7431			-5464		
Tyler		7617			-5650		
Kibbey		8153			-6186		
Charles		8300			-6333		
BLS	9015	9014	-7047	-7047	-7044	3	
Mission Canyon	9237	9236	-7269	-7269	-7267	2	
Lodgepole	9784	9783	-7816	-7816	-7820	-4	
False Bakken	10642	10485	-8518		NP	NA	
Upper Bakken Shale	10659	10493	-8526		-8529		
Middle Bakken	10700	10507	-8540		-8543		
Middle Bakken Target	10735	10517	-8550		NP		

## Projected Tops

## Not Projected

**Sub Sea (ft)**

## Actual Tops Picked

## *Tops picked by Drilling breaks (Rop & Differential), Samples, and Gamma*

## Atlanta 3-6H

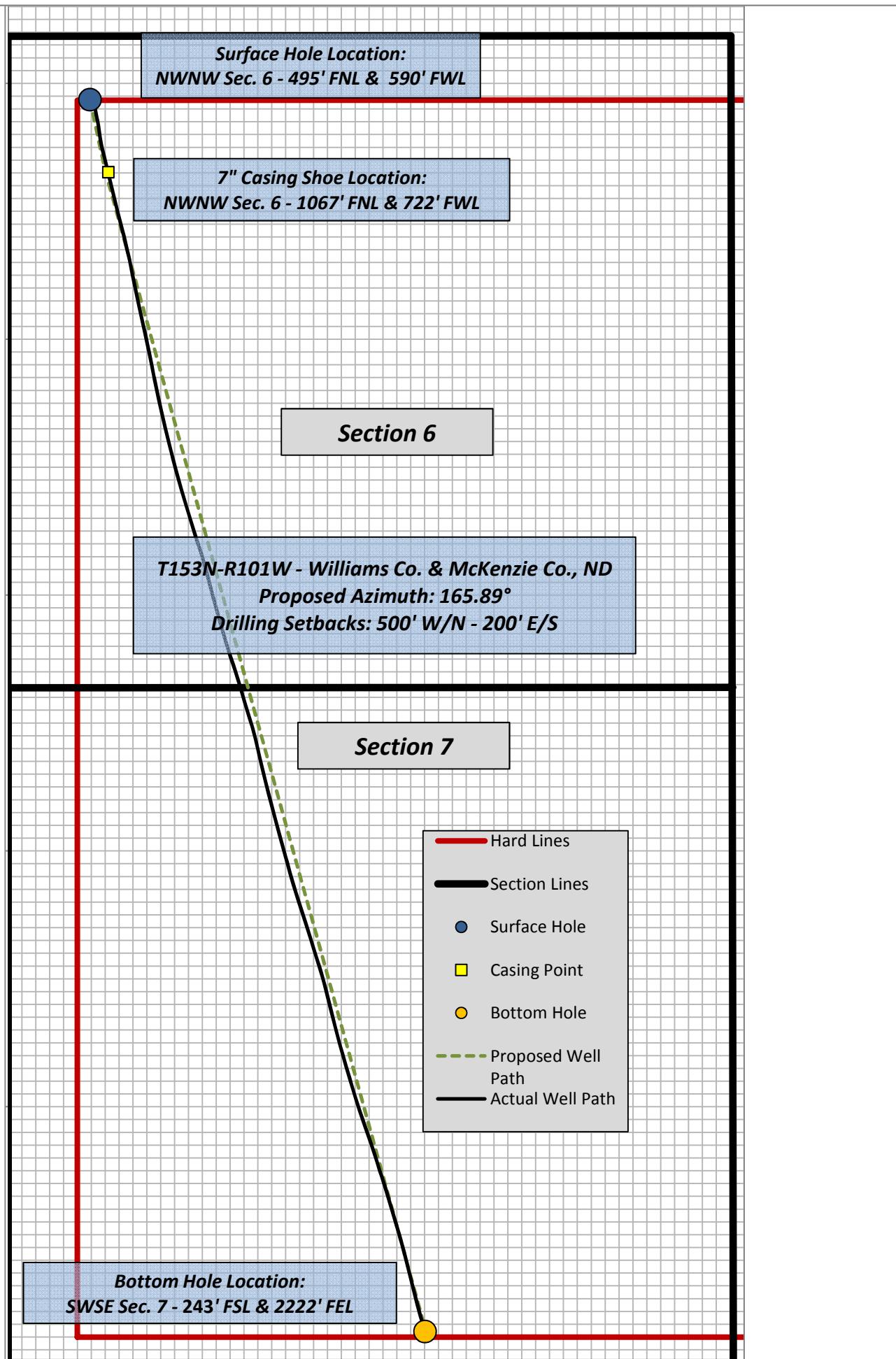
<u>Critical Points</u>	<u>MD</u>	<u>TVD</u>	<u>SUBSEA</u>	<u>V/S</u>
Middle Bakken Member	10700	10507	-8540	414.34
Surface Hole location	<b>NWNW Section 6: 495' FNL &amp; 590' FWL</b>			
Casing Point	10875	10527	-8560	587.05
Casing Location	<b>NWNW Section 6: 1067' FNL &amp; 722' FWL</b>			
Total Depth (projection to Bit)	20225	10521	-8554	9030.78
Bottom Hole Location	<b>SWSE Section 7: 243' FSL &amp; 3002' FEL</b>			

<u>Lateral Trips</u>	<u>MD</u>	<u>TVD</u>	<u>Vertical &amp; Build Trips</u>	<u>MD</u>	<u>TVD</u>
MWD	15690	10535	Build Assembly	9930	9929

### LATERAL SUMMARY

Total Lateral Footage	<b>9350</b>	%	
Middle Bakken	9350	100.0%	<i>Target Zone</i>
		0.0%	<i>Out of Target Zone</i>
		100.0%	

Atlanta 3-6H: STRUCTURE (MD - TVD)									
MD (ft)	Upper Bakken Shale Top	Middle Bakken Top	Target Zone Top	Target Zone Bottom	Lower Bakken Shale	Marker 2	Marker 1	Dip (angle)	Dip Rate (ft/100)
10000.0	10492.0	10507.0	10517.0	10529.0	10537.0	10523.5			
10660.0	10492.0	10507.0	10517.0	10529.0	10537.0	10523.5		#DIV/0!	0.00
11000.0	10492.0	10507.0	10517.0	10529.0	10537.0	10523.5		#DIV/0!	0.00
11500.0	10489.0	10504.0	10514.0	10526.0	10534.0	10520.5		90.34	-0.60
11750.0	10490.4	10505.4	10515.4	10527.4	10535.4	10521.9		89.68	0.56
12000.0	10491.8	10506.8	10516.8	10528.8	10536.8	10523.3		89.68	0.56
12500.0	10494.2	10509.2	10519.2	10531.2	10539.2	10525.7		89.72	0.48
13000.0	10496.6	10511.6	10521.6	10533.6	10541.6	10528.1		89.72	0.48
13500.0	10499.5	10514.5	10524.5	10536.5	10544.5	10531.0		89.67	0.58
14000.0	10502.4	10517.4	10527.4	10539.4	10547.4	10533.9		89.67	0.58
14500.0	10504.0	10519.0	10529.0	10541.0	10549.0	10535.5		89.82	0.32
15000.0	10505.6	10520.6	10530.6	10542.6	10550.6	10537.1		89.82	0.32
15500.0	10507.2	10522.2	10532.2	10544.2	10552.2	10538.7		89.82	0.32
16000.0	10507.2	10522.2	10532.2	10544.2	10552.2	10538.7		#DIV/0!	0.00
16500.0	10505.5	10520.5	10530.5	10542.5	10550.5	10537.0		90.19	-0.34
17000.0	10503.8	10518.8	10528.8	10540.8	10548.8	10535.3		90.19	-0.34
17500.0	10502.1	10517.1	10527.1	10539.1	10547.1	10533.6		90.19	-0.34
18000.0	10501.5	10516.5	10526.5	10538.5	10546.5	10533.0		90.07	-0.12
18500.0	10501.5	10516.5	10526.5	10538.5	10546.5	10533.0		#DIV/0!	0.00
19000.0	10500.0	10515.0	10525.0	10537.0	10545.0	10531.5		90.17	-0.30
19500.0	10498.5	10513.5	10523.5	10535.5	10543.5	10530.0		90.17	-0.30
20000.0	10495.0	10510.0	10520.0	10532.0	10540.0	10526.5		90.40	-0.70
20500.0	10491.5	10506.5	10516.5	10528.5	10536.5	10523.0		90.40	-0.70



# ADVANTAGE Final Survey Listing



INTEQ

Operator	Continental Resources	Fields	Williams County	API No	S6 T153N R101E							
Well	Atlanta 3-6H	Wellbore	Atlanta 3-6H Orig Hole	Rig	Cyclone 2							
Well Origin												
<b>Latitude</b>	48.1094 deg	<b>Longitude</b>	-103.7312 deg									
<b>North Reference</b>	True	<b>Drill Depth Zero</b>	Kelly Bushing									
<b>Vertical Datum is</b>	Ground Level	<b>Vertical Datum to DDZ</b>	22.00 ft									
<b>Vertical Section North</b>	0.00 ft	<b>Vertical Section East</b>	0.00 ft									
<b>Vertical Section Azimuth</b>	165.8900 deg	<b>Vertical Section Depth</b>	0.00 ft									
<b>Grid Convergence</b>	0.0000 deg	<b>Magnetic Declination</b>	8.5613 deg									
<b>Total Correction</b>	8.5613 deg	<b>TVD Calculation Method</b>	Minimum Curvature									
<b>D-Raw Calculation</b>	Magcorr1	<b>Local Magnetic Field</b>	56552 nT									
<b>Local Magnetic Dip Angle</b>	73.0271 deg	<b>Local Gravity Field</b>	9.808 m/s^2									
Tie In	MD ft	Incl deg	Azim deg	North ft	East ft	TVD ft	VS ft	Temperature degF	CRS LEN ft	DLS deg/100ft	Build deg/100ft	Turn deg/100ft
T	0.00	0.00	0.00	0.00	0.00	0.00	0.00					
U	22.00	0.00	150.60	0.00	0.00	22.00	0.00		22.00			
	164.00	0.20	150.60	-0.22	0.12	164.00	0.24		142.00	0.14	0.14	0.00
	243.00	0.10	98.30	-0.35	0.26	243.00	0.40		79.00	0.20	-0.13	-66.20
	323.00	0.10	217.40	-0.41	0.28	323.00	0.47		80.00	0.22	0.00	148.87
	403.00	0.30	242.00	-0.57	0.06	403.00	0.56		80.00	0.27	0.25	30.75
	495.00	0.50	149.20	-1.02	0.05	495.00	1.00		92.00	0.65	0.22	-100.87
	588.00	0.20	150.30	-1.51	0.34	588.00	1.55		93.00	0.32	-0.32	1.18
	679.00	0.10	149.20	-1.72	0.46	679.00	1.78		91.00	0.11	-0.11	-1.21
	774.00	0.10	118.00	-1.83	0.57	774.00	1.91		95.00	0.06	0.00	-32.84
	869.00	0.20	39.60	-1.74	0.75	868.99	1.87		95.00	0.22	0.11	-82.53
	961.00	0.40	60.60	-1.46	1.13	960.99	1.69		92.00	0.24	0.22	22.83
	1054.00	0.20	49.40	-1.19	1.54	1053.99	1.53		93.00	0.22	-0.22	-12.04
	1147.00	0.10	108.10	-1.11	1.74	1146.99	1.50		93.00	0.18	-0.11	63.12
	1239.00	0.20	138.00	-1.26	1.92	1238.99	1.69		92.00	0.13	0.11	32.50
	1332.00	0.10	221.00	-1.44	1.98	1331.99	1.88		93.00	0.23	-0.11	89.25
	1424.00	0.20	45.20	-1.39	2.04	1423.99	1.84		92.00	0.33	0.11	-191.09
	1515.00	0.10	213.60	-1.34	2.11	1514.99	1.82		91.00	0.33	-0.11	185.05
	1608.00	0.40	242.80	-1.56	1.78	1607.99	1.94		93.00	0.34	0.32	31.40
	1701.00	0.60	246.60	-1.90	1.04	1700.99	2.10		93.00	0.22	0.22	4.09
	1792.00	0.50	234.00	-2.32	0.28	1791.98	2.32		91.00	0.17	-0.11	-13.85
	1887.00	0.60	238.20	-2.83	-0.48	1886.98	2.63		95.00	0.11	0.11	4.42
	1992.00	0.90	219.20	-3.76	-1.46	1991.97	3.29		105.00	0.37	0.29	-18.10
	2065.00	1.25	219.88	-4.81	-2.34	2064.96	4.10	68.9	73.00	0.48	0.48	0.93
	2158.00	1.50	226.15	-6.43	-3.87	2157.93	5.30	71.6	93.00	0.31	0.27	6.74
	2246.00	1.71	224.09	-8.17	-5.61	2245.89	6.56	74.3	88.00	0.24	0.24	-2.34
	2345.00	0.69	265.17	-9.28	-7.23	2344.87	7.24	77.0	99.00	1.29	-1.03	41.50
	2439.00	0.93	228.56	-9.84	-8.36	2438.86	7.50	77.0	94.00	0.59	0.26	-38.95
	2531.00	1.29	211.36	-11.21	-9.46	2530.85	8.57	82.4	92.00	0.53	0.39	-18.69
	2623.00	1.94	218.06	-13.32	-10.96	2622.81	10.25	85.1	92.00	0.74	0.71	7.28
	2716.00	1.20	134.70	-15.24	-11.24	2715.78	12.04	85.1	93.00	2.32	-0.80	-89.63
	2809.00	1.21	128.64	-16.54	-9.78	2808.76	13.66	87.8	93.00	0.14	0.02	-6.52
	2903.00	1.35	136.84	-17.97	-8.24	2902.74	15.42	93.2	94.00	0.24	0.15	8.73
	2996.00	2.15	18.62	-17.12	-6.94	2995.72	14.91	93.2	93.00	3.26	0.85	-127.12
	3090.00	1.94	16.16	-13.92	-5.93	3089.66	12.06	96.0	94.00	0.24	-0.22	-2.62
	3184.00	1.79	19.68	-11.02	-5.00	3183.61	9.46	98.7	94.00	0.21	-0.17	3.75
	3277.00	1.55	17.77	-8.45	-4.12	3276.57	7.19	98.7	93.00	0.26	-0.25	-2.05
	3370.00	1.68	21.54	-5.98	-3.24	3369.53	5.01	104.1	93.00	0.17	0.13	4.06
	3464.00	1.27	23.92	-3.75	-2.31	3463.50	3.07	106.8	94.00	0.44	-0.43	2.53
	3557.00	1.29	28.24	-1.89	-1.40	3556.48	1.49	106.8	93.00	0.11	0.02	4.65
	3651.00	0.94	39.09	-0.35	-0.41	3650.46	0.24	109.5	94.00	0.43	-0.37	11.54
	3744.00	0.89	47.57	0.73	0.61	3743.45	-0.56	109.5	93.00	0.16	-0.05	9.11
	3837.00	0.50	39.43	1.53	1.40	3836.44	-1.14	112.2	93.00	0.44	-0.42	-8.75
	3929.00	0.56	45.66	2.15	1.97	3928.44	-1.60	112.2	92.00	0.09	0.07	6.77
	4023.00	0.62	56.21	2.75	2.72	4022.43	-2.00	117.6	94.00	0.14	0.07	11.22
	4117.00	0.19	50.35	3.13	3.27	4116.43	-2.24	117.6	94.00	0.47	-0.46	-6.23
	4210.00	0.52	40.78	3.55	3.66	4209.43	-2.55	117.6	93.00	0.36	0.35	-10.29
	4304.00	0.35	58.28	4.02	4.18	4303.42	-2.88	120.3	94.00	0.22	-0.18	18.61
	4397.00	0.45	36.00	4.46	4.63	4396.42	-3.20	120.3	93.00	0.20	0.11	-23.95
	4491.00	0.35	60.05	4.90	5.09	4490.42	-3.51	177.0	94.00	0.21	-0.11	25.59

# ADVANTAGE Final Survey Listing

INTEQ

Operator	Continental Resources			Fields				Williams County		API No		Location		
	Well	Atlanta 3-6H		Wellbore	Atlanta 3-6H Orig Hole		Rig	Cyclone 2		Job	S6 T153N R101E			
Tie In	MD ft	Incl deg	Azim deg	North ft	East ft	TVD ft	VS ft	Temperature degF	CRS LEN ft	DLS deg/100ft	Build deg/100ft	Turn deg/100ft		
	4584.00	0.34	81.87	5.08	5.62	4583.42	-3.56	123.0	93.00	0.14	-0.00	23.47		
	4678.00	0.22	30.21	5.28	5.99	4677.42	-3.66	85.1	94.00	0.29	-0.13	-54.96		
	4772.00	0.74	96.95	5.36	6.68	4771.41	-3.57	123.0	94.00	0.73	0.56	70.99		
	4865.00	0.86	92.26	5.26	7.98	4864.40	-3.15	128.4	93.00	0.15	0.13	-5.04		
	4959.00	1.23	95.28	5.14	9.69	4958.39	-2.62	128.4	94.00	0.39	0.39	3.21		
	5053.00	0.95	113.40	4.73	11.41	5052.37	-1.81	128.4	94.00	0.47	-0.29	19.28		
	5146.00	2.01	225.37	3.28	10.95	5145.35	-0.51	128.4	93.00	2.72	1.14	120.39		
	5240.00	1.06	317.74	2.76	9.20	5239.33	-0.44	131.1	94.00	2.46	-1.01	98.27		
	5332.00	0.46	102.96	3.31	8.99	5331.32	-1.02	133.8	92.00	1.59	-0.65	157.85		
	5426.00	0.59	172.62	2.74	9.42	5425.32	-0.36	136.5	94.00	0.65	0.14	74.10		
	5520.00	0.88	201.96	1.59	9.21	5519.31	0.71	139.2	94.00	0.50	0.31	31.22		
	5613.00	0.69	198.12	0.39	8.77	5612.30	1.76	139.2	93.00	0.21	-0.20	-4.12		
	5705.00	0.90	196.49	-0.83	8.39	5704.29	2.85	141.9	92.00	0.23	0.22	-1.78		
	5799.00	1.06	204.06	-2.33	7.83	5798.28	4.17	141.9	94.00	0.22	0.17	8.06		
	5891.00	1.41	197.52	-4.19	7.14	5890.26	5.80	141.9	92.00	0.41	0.38	-7.11		
	5985.00	1.41	178.36	-6.45	6.82	5984.23	7.92	141.9	94.00	0.50	-0.00	-20.38		
	6079.00	0.17	201.44	-7.73	6.81	6078.22	9.16	141.9	94.00	1.34	-1.32	24.56		
	6173.00	0.25	183.96	-8.06	6.74	6172.22	9.46	144.6	94.00	0.11	0.09	-18.60		
	6266.00	0.61	115.66	-8.47	7.17	6265.22	9.97	155.4	93.00	0.61	0.39	-73.44		
	6360.00	2.13	84.18	-8.51	9.36	6359.19	10.54	147.3	94.00	1.75	1.62	-33.49		
	6453.00	2.83	89.35	-8.31	13.38	6452.10	11.32	152.7	93.00	0.79	0.75	5.55		
	6547.00	0.85	99.62	-8.40	16.39	6546.05	12.14	147.3	94.00	2.13	-2.11	10.93		
	6641.00	0.61	151.82	-8.96	17.32	6640.04	12.91	260.8	94.00	0.72	-0.26	55.53		
	6734.00	0.93	121.04	-9.78	18.20	6733.03	13.92	155.4	93.00	0.56	0.35	-33.09		
	6827.00	0.82	206.23	-10.77	18.55	6826.03	14.97	158.1	93.00	1.28	-0.12	91.60		
	6921.00	1.94	344.87	-9.84	17.84	6920.01	13.89	163.5	94.00	2.78	1.19	147.48		
	7015.00	2.04	346.22	-6.67	17.02	7013.95	10.62	166.2	94.00	0.12	0.11	1.44		
	7108.00	1.92	336.71	-3.63	16.01	7106.90	7.42	166.2	93.00	0.38	-0.13	-10.23		
	7202.00	1.74	353.77	-0.76	15.23	7200.85	4.45	166.2	94.00	0.61	-0.20	18.15		
	7296.00	0.81	324.85	1.20	14.69	7294.83	2.42	166.2	94.00	1.17	-0.99	-30.77		
	7389.00	0.75	286.70	1.92	13.73	7387.82	1.49	166.2	93.00	0.55	-0.07	-41.02		
	7483.00	0.87	296.45	2.41	12.50	7481.81	0.71	166.2	94.00	0.20	0.13	10.38		
	7576.00	0.75	288.69	2.93	11.29	7574.80	-0.09	168.9	93.00	0.17	-0.13	-8.34		
	7669.00	0.54	288.97	3.26	10.29	7667.79	-0.66	171.6	93.00	0.23	-0.23	0.30		
	7763.00	0.60	276.62	3.46	9.39	7761.79	-1.07	168.9	94.00	0.14	0.06	-13.15		
	7856.00	0.50	246.06	3.35	8.53	7854.79	-1.17	174.3	93.00	0.33	-0.10	-32.86		
	7949.00	0.37	309.97	3.38	7.93	7947.78	-1.35	177.0	93.00	0.51	-0.14	68.72		
	8043.00	0.31	337.78	3.81	7.60	8041.78	-1.85	177.0	94.00	0.19	-0.07	29.58		
	8137.00	0.52	340.32	4.44	7.36	8135.78	-2.52	179.7	94.00	0.22	0.22	2.70		
	8230.00	0.84	343.51	5.49	7.02	8228.77	-3.61	179.7	93.00	0.35	0.35	3.43		
	8324.00	0.89	51.73	6.60	7.40	8322.76	-4.60	179.7	94.00	1.03	0.06	72.57		
	8417.00	0.64	30.27	7.50	8.23	8415.76	-5.27	166.2	93.00	0.41	-0.27	-23.07		
	8510.00	0.54	32.30	8.32	8.73	8508.75	-5.94	166.2	93.00	0.11	-0.11	2.18		
	8604.00	0.74	47.70	9.10	9.42	8602.74	-6.53	168.9	94.00	0.28	0.22	16.38		
	8697.00	0.78	53.56	9.89	10.37	8695.74	-7.06	168.9	93.00	0.09	0.04	6.31		
	8790.00	0.89	38.78	10.83	11.33	8788.73	-7.74	174.3	93.00	0.26	0.12	-15.90		
	8884.00	0.65	38.95	11.81	12.13	8882.72	-8.50	177.0	94.00	0.26	-0.26	0.18		
	8977.00	0.69	57.09	12.53	12.93	8975.71	-9.00	323.0	93.00	0.23	0.05	19.51		
	9070.00	0.66	46.64	13.21	13.80	9068.71	-9.44	179.7	93.00	0.14	-0.03	-11.24		
	9162.00	0.55	42.33	13.90	14.48	9160.70	-9.95	182.5	92.00	0.14	-0.13	-4.68		
	9256.00	0.58	22.54	14.67	14.97	9254.70	-10.58	182.5	94.00	0.21	0.04	-21.06		
	9349.00	0.64	36.73	15.53	15.46	9347.69	-11.29	187.9	93.00	0.17	0.06	15.26		
	9443.00	0.58	22.94	16.39	15.96	9441.69	-12.00	190.6	94.00	0.17	-0.07	-14.67		
	9536.00	0.50	35.00	17.15	16.37	9534.68	-12.64	193.3	93.00	0.15	-0.09	12.97		
	9630.00	0.58	7.96	17.96	16.67	9628.68	-13.35	190.6	94.00	0.28	0.09	-28.77		
	9723.00	0.40	14.87	18.74	16.82	9721.67	-14.07	193.3	93.00	0.21	-0.20	7.43		
	9817.00	0.45	7.91	19.42	16.96	9815.67	-14.70	193.3	94.00	0.07	0.05	-7.41		
	9879.00	0.44	12.10	19.89	17.04	9877.67	-15.14	198.7	62.00	0.05	-0.01	6.77		
	9910.00	0.43	14.16	20.12	17.10	9908.67	-15.35	174.3	31.00	0.06	-0.03	6.64		
	9941.00	0.21	106.78	20.22	17.18	9939.67	-15.42	168.9	31.00	1.57	-0.73	298.75		

# ADVANTAGE Final Survey Listing

INTEQ

Operator	Continental Resources			Fields				Williams County		API No		Location		
	Well	Atlanta 3-6H		Wellbore	Atlanta	3-6H	Orig Hole	Rig	Cyclone 2	Job	5245611	S6 T153N R101E		
Tie In	MD ft	Incl deg	Azim deg	North ft	East ft	TVD ft	VS ft	Temperature degF	CRS LEN ft	DLS deg/100ft	Build deg/100ft	Turn deg/100ft		
	9972.00	3.07	156.33	19.44	17.56	9970.65	-14.58	174.3	31.00	9.48	9.23	159.87		
	10003.00	6.70	162.73	16.96	18.43	10001.53	-11.95	171.6	31.00	11.84	11.73	20.65		
	10034.00	10.18	156.93	12.71	20.05	10032.19	-7.44	168.9	31.00	11.54	11.23	-18.74		
	10065.00	13.27	152.79	7.02	22.75	10062.54	-1.26	177.0	31.00	10.31	9.96	-13.35		
	10097.00	16.39	156.21	-0.38	26.25	10093.48	6.77	179.7	32.00	10.14	9.77	10.68		
	10128.00	18.59	164.90	-9.16	29.30	10123.05	16.02	179.7	31.00	10.99	7.08	28.03		
	10159.00	21.46	169.69	-19.51	31.61	10152.17	26.62	182.5	31.00	10.66	9.26	15.47		
	10190.00	25.12	171.40	-31.60	33.60	10180.64	38.84	179.7	31.00	12.02	11.83	5.53		
	10221.00	29.13	172.52	-45.59	35.57	10208.22	52.89	179.7	31.00	13.02	12.91	3.58		
	10252.00	32.83	172.21	-61.40	37.69	10234.80	68.74	182.5	31.00	11.95	11.94	-0.99		
	10284.00	36.48	172.34	-79.43	40.14	10261.12	86.82	182.5	32.00	11.42	11.42	0.41		
	10315.00	39.70	171.81	-98.37	42.78	10285.51	105.83	182.5	31.00	10.44	10.38	-1.72		
	10346.00	41.95	170.49	-118.39	45.90	10308.97	126.01	187.9	31.00	7.77	7.26	-4.25		
	10376.00	44.17	168.84	-138.54	49.58	10330.88	146.45	187.9	30.00	8.30	7.41	-5.48		
	10407.00	46.85	168.53	-160.22	53.92	10352.61	168.54	187.9	31.00	8.66	8.63	-1.01		
	10438.00	49.75	170.93	-183.00	58.04	10373.23	191.62	190.6	31.00	11.01	9.37	7.75		
	10470.00	52.56	171.89	-207.64	61.75	10393.29	216.43	187.9	32.00	9.08	8.78	3.00		
	10500.00	54.29	171.50	-231.48	65.23	10411.17	240.40	187.9	30.00	5.84	5.74	-1.31		
	10532.00	55.63	172.94	-257.43	68.78	10429.54	266.43	187.9	32.00	5.59	4.20	4.50		
	10563.00	56.91	173.49	-283.04	71.82	10446.76	292.01	187.9	31.00	4.38	4.13	1.75		
	10594.00	60.46	171.79	-309.29	75.22	10462.87	318.30	187.9	31.00	12.38	11.46	-5.48		
	10625.00	63.47	169.87	-336.30	79.59	10477.44	345.56	190.6	31.00	11.12	9.70	-6.17		
	10656.00	65.13	168.44	-363.73	84.85	10490.88	373.44	187.9	31.00	6.79	5.36	-4.63		
	10688.00	69.55	167.34	-392.60	91.05	10503.20	402.95	187.9	32.00	14.18	13.82	-3.44		
	10719.00	74.19	167.02	-421.32	97.58	10512.85	432.40	190.6	31.00	15.00	14.96	-1.02		
	10750.00	78.73	166.72	-450.66	104.43	10520.10	462.52	190.6	31.00	14.66	14.63	-0.96		
	10781.00	84.30	167.11	-480.51	111.37	10524.67	493.16	190.6	31.00	18.03	17.98	1.24		
	10812.00	88.99	167.49	-510.69	118.17	10526.49	524.09	198.7	31.00	15.16	15.11	1.23		
	10830.00	89.88	167.39	-528.26	122.08	10526.67	542.09	193.3	18.00	4.97	4.94	-0.53		
	10919.00	90.55	168.25	-615.26	140.85	10526.33	631.03	223.0	89.00	1.23	0.76	0.97		
	11013.00	90.22	167.09	-707.09	160.92	10525.70	724.98	225.7	94.00	1.29	-0.36	-1.24		
	11108.00	90.90	166.83	-799.63	182.36	10524.78	819.96	225.7	95.00	0.77	0.72	-0.27		
	11203.00	91.09	167.06	-892.16	203.82	10523.13	914.93	225.7	95.00	0.31	0.20	0.24		
	11297.00	91.14	165.81	-983.52	225.86	10521.30	1008.91	228.4	94.00	1.33	0.06	-1.32		
	11391.00	90.40	168.36	-1075.13	246.87	10520.03	1102.87	225.7	94.00	2.83	-0.79	2.71		
	11486.00	91.26	167.19	-1167.96	266.98	10518.65	1197.81	228.4	95.00	1.53	0.91	-1.23		
	11580.00	89.01	168.66	-1259.87	286.64	10518.42	1291.74	225.7	94.00	2.86	-2.39	1.57		
	11675.00	88.61	169.42	-1353.12	304.69	10520.39	1386.57	225.7	95.00	0.90	-0.42	0.80		
	11769.00	89.23	169.67	-1445.54	321.74	10522.16	1480.36	228.4	94.00	0.71	0.66	0.27		
	11864.00	89.88	169.33	-1538.95	339.05	10522.90	1575.17	231.1	95.00	0.77	0.68	-0.36		
	11958.00	89.35	168.75	-1631.23	356.92	10523.54	1669.03	233.8	94.00	0.83	-0.56	-0.61		
	12053.00	89.57	167.36	-1724.17	376.58	10524.43	1763.95	236.5	95.00	1.49	0.23	-1.47		
	12148.00	89.72	169.33	-1817.20	395.78	10525.02	1858.86	233.8	95.00	2.09	0.16	2.08		
	12242.00	89.45	168.07	-1909.38	414.19	10525.70	1952.74	233.8	94.00	1.38	-0.30	-1.35		
	12337.00	89.72	170.12	-2002.65	432.16	10526.39	2047.59	233.8	95.00	2.18	0.29	2.16		
	12431.00	90.52	169.88	-2095.22	448.49	10526.19	2141.34	236.5	94.00	0.89	0.85	-0.25		
	12500.00	90.93	169.23	-2163.07	461.00	10525.32	2210.20	239.2	69.00	1.11	0.58	-0.95		
	12594.00	89.60	169.13	-2255.40	478.64	10524.88	2304.04	239.2	94.00	1.42	-1.41	-0.10		
	12689.00	89.69	169.15	-2348.70	496.53	10525.47	2398.88	239.2	95.00	0.10	0.10	0.02		
	12783.00	89.32	167.83	-2440.80	515.29	10526.28	2492.78	239.2	94.00	1.46	-0.39	-1.41		
	12877.00	91.30	167.61	-2532.64	535.28	10525.77	2586.73	239.2	94.00	2.12	2.11	-0.24		
	12972.00	92.17	167.23	-2625.32	555.97	10522.89	2681.65	241.9	95.00	1.00	0.92	-0.40		
	13066.00	90.77	166.86	-2716.89	577.04	10520.47	2775.60	239.2	94.00	1.54	-1.49	-0.39		
	13161.00	91.05	167.03	-2809.43	598.50	10518.96	2870.57	244.6	95.00	0.34	0.29	0.18		
	13255.00	89.04	166.06	-2900.84	620.37	10518.89	2964.55	244.6	94.00	2.37	-2.13	-1.03		
	13350.00	88.55	165.18	-2992.84	643.96	10520.88	3059.53	244.6	95.00	1.06	-0.51	-0.93		
	13444.00	88.52	164.16	-3083.47	668.80	10523.28	3153.48	244.6	94.00	1.08	-0.04	-1.08		
	13539.00	89.14	164.41	-3174.90	694.52	10525.22	3248.42	247.3	95.00	0.70	0.65	0.26		
	13633.00	92.18	165.30	-3265.61	719.07	10524.14	3342.39	247.3	94.00	3.38	3.24	0.95		
	13728.00	90.25	164.38	-3357.28	743.91	10522.12	3437.34	247.3	95.00	2.26	-2.04	-0.98		

# ADVANTAGE Final Survey Listing

INTEQ

Operator Continental Resources				Fields Williams County				API No		Location S6 T153N R101E			
Well	Atlanta 3-6H			Wellbore	Atlanta 3-6H Orig Hole			Rig	Cyclone 2	Job	5245611		
Tie In	MD ft	Incl deg	Azim deg	North ft	East ft	TVD ft	VS ft	Temperature degF	CRS LEN ft	DLS deg/100ft	Build deg/100ft	Turn deg/100ft	
	13822.00	89.35	162.34	-3447.34	770.83	10522.45	3531.25	247.3	94.00	2.37	-0.95	-2.17	
	13917.00	87.43	163.28	-3538.05	798.90	10525.12	3626.07	247.3	95.00	2.25	-2.02	0.99	
	14012.00	89.26	165.78	-3629.56	824.22	10527.86	3720.99	244.6	95.00	3.27	1.92	2.64	
	14106.00	90.99	166.37	-3720.80	846.84	10527.65	3814.98	247.3	94.00	1.94	1.84	0.63	
	14201.00	89.45	166.69	-3813.18	868.96	10527.30	3909.97	247.3	95.00	1.66	-1.62	0.33	
	14295.00	89.26	166.11	-3904.54	891.06	10528.36	4003.96	250.0	94.00	0.64	-0.20	-0.61	
	14390.00	89.44	164.78	-3996.48	914.93	10529.43	4098.95	250.0	95.00	1.41	0.19	-1.40	
	14484.00	91.63	165.82	-4087.40	938.78	10528.55	4192.94	252.7	94.00	2.58	2.33	1.10	
	14579.00	90.09	164.87	-4179.29	962.81	10527.12	4287.92	250.0	95.00	1.91	-1.62	-1.00	
	14673.00	89.72	164.62	-4269.98	987.55	10527.27	4381.90	252.7	94.00	0.47	-0.39	-0.26	
	14768.00	89.23	162.76	-4361.15	1014.23	10528.14	4476.82	252.7	95.00	2.02	-0.52	-1.96	
	14862.00	89.42	161.85	-4450.69	1042.79	10529.25	4570.63	252.7	94.00	0.98	0.20	-0.96	
	14957.00	90.28	165.63	-4541.87	1069.38	10529.51	4665.54	250.0	95.00	4.08	0.91	3.97	
	15052.00	89.81	165.01	-4633.77	1093.46	10529.43	4760.54	252.7	95.00	0.81	-0.49	-0.65	
	15146.00	90.00	164.42	-4724.45	1118.23	10529.58	4854.52	252.7	94.00	0.66	0.20	-0.63	
	15240.00	89.63	163.44	-4814.78	1144.25	10529.89	4948.46	252.7	94.00	1.12	-0.39	-1.04	
	15334.00	89.29	165.07	-4905.24	1169.75	10530.77	5042.42	252.7	94.00	1.77	-0.36	1.73	
	15429.00	88.63	167.52	-4997.51	1192.25	10532.49	5137.39	252.7	95.00	2.67	-0.69	2.58	
	15523.00	89.41	168.85	-5089.51	1211.49	10534.09	5231.30	255.4	94.00	1.64	0.83	1.42	
	15618.00	89.48	167.45	-5182.48	1231.00	10535.01	5326.22	258.1	95.00	1.47	0.07	-1.47	
	15712.00	90.40	167.46	-5274.23	1251.42	10535.11	5420.18	252.7	94.00	0.98	0.98	0.00	
	15807.00	90.90	166.65	-5366.81	1272.70	10534.03	5515.15	252.7	95.00	1.00	0.52	-0.85	
	15902.00	91.02	166.30	-5459.16	1294.92	10532.44	5610.14	258.1	95.00	0.39	0.13	-0.37	
	15996.00	91.81	166.36	-5550.47	1317.13	10530.13	5704.10	252.7	94.00	0.85	0.85	0.07	
	16090.00	90.28	166.30	-5641.79	1339.34	10528.41	5798.08	252.7	94.00	1.63	-1.63	-0.07	
	16185.00	89.07	166.14	-5734.05	1361.97	10528.96	5893.08	252.7	95.00	1.28	-1.27	-0.17	
	16279.00	89.54	165.11	-5825.10	1385.30	10530.10	5987.07	255.4	94.00	1.20	0.50	-1.09	
	16373.00	90.00	165.92	-5916.11	1408.81	10530.48	6081.06	258.1	94.00	0.99	0.49	0.86	
	16467.00	91.29	166.20	-6007.34	1431.45	10529.42	6175.06	255.4	94.00	1.41	1.38	0.29	
	16561.00	89.51	165.04	-6098.38	1454.80	10528.76	6269.05	252.7	94.00	2.27	-1.90	-1.24	
	16656.00	88.55	164.01	-6189.92	1480.14	10530.37	6364.00	252.7	95.00	1.48	-1.01	-1.08	
	16750.00	88.95	162.99	-6280.03	1506.83	10532.43	6457.90	258.1	94.00	1.17	0.43	-1.09	
	16845.00	90.49	163.65	-6371.03	1534.10	10532.89	6552.80	258.1	95.00	1.76	1.62	0.69	
	16939.00	91.50	163.29	-6461.13	1560.84	10531.26	6646.70	258.1	94.00	1.14	1.07	-0.38	
	17033.00	89.96	164.59	-6551.45	1586.84	10530.06	6740.63	258.1	94.00	2.14	-1.64	1.38	
	17128.00	90.15	163.26	-6642.73	1613.14	10529.97	6835.57	258.1	95.00	1.41	0.20	-1.40	
	17222.00	89.35	164.24	-6732.97	1639.45	10530.38	6929.51	252.7	94.00	1.35	-0.85	1.04	
	17317.00	89.38	163.87	-6824.31	1665.54	10531.43	7024.45	255.4	95.00	0.39	0.03	-0.39	
	17411.00	89.23	166.36	-6915.14	1689.69	10532.57	7118.43	258.1	94.00	2.65	-0.16	2.65	
	17505.00	90.95	167.49	-7006.70	1710.95	10532.42	7212.41	258.1	94.00	2.19	1.83	1.20	
	17600.00	90.21	167.28	-7099.40	1731.70	10531.46	7307.37	258.1	95.00	0.81	-0.78	-0.22	
	17694.00	90.18	166.77	-7191.00	1752.80	10531.14	7401.35	260.8	94.00	0.54	-0.03	-0.54	
	17788.00	90.49	166.61	-7282.47	1774.44	10530.59	7495.34	260.8	94.00	0.37	0.33	-0.17	
	17883.00	90.55	165.70	-7374.71	1797.18	10529.73	7590.33	260.8	95.00	0.96	0.06	-0.96	
	17977.00	91.04	165.31	-7465.71	1820.70	10528.43	7684.32	260.8	94.00	0.67	0.52	-0.41	
	18072.00	91.76	164.69	-7557.44	1845.28	10526.11	7779.28	260.8	95.00	1.00	0.76	-0.65	
	18166.00	91.19	164.81	-7648.10	1870.00	10523.69	7873.23	260.8	94.00	0.62	-0.61	0.13	
	18261.00	89.66	164.44	-7739.70	1895.18	10522.98	7968.20	260.8	95.00	1.66	-1.61	-0.39	
	18356.00	89.41	163.41	-7830.98	1921.49	10523.75	8063.14	260.8	95.00	1.12	-0.26	-1.08	
	18450.00	89.63	163.16	-7921.00	1948.52	10524.54	8157.04	260.8	94.00	0.35	0.23	-0.27	
	18544.00	89.96	162.55	-8010.82	1976.23	10524.88	8250.91	260.8	94.00	0.74	0.35	-0.65	
	18639.00	90.21	161.50	-8101.19	2005.55	10524.74	8345.69	260.8	95.00	1.14	0.26	-1.11	
	18734.00	90.46	162.91	-8191.64	2034.58	10524.18	8440.49	260.8	95.00	1.51	0.26	1.48	
	18828.00	88.89	163.93	-8281.72	2061.40	10524.71	8534.40	260.8	94.00	1.99	-1.67	1.09	
	18923.00	89.16	164.21	-8373.06	2087.47	10526.33	8629.33	260.8	95.00	0.41	0.28	0.29	
	19017.00	89.44	162.45	-8463.10	2114.43	10527.48	8723.23	260.8	94.00	1.90	0.30	-1.87	
	19112.00	88.98	165.07	-8554.29	2141.00	10528.79	8818.15	260.8	95.00	2.80	-0.48	2.76	
	19205.00	89.32	164.95	-8644.12	2165.05	10530.17	8911.13	263.5	93.00	0.39	0.37	-0.13	
	19299.00	89.90	164.31	-8734.75	2189.96	10530.81	9005.10	263.5	94.00	0.92	0.62	-0.68	
	19394.00	89.34	165.15	-8826.40	2214.98	10531.44	9100.08	263.5	95.00	1.06	-0.59	0.88	

# ADVANTAGE Final Survey Listing

INTEQ

Operator Continental Resources				Fields Williams County				API No		Location S6 T153N R101E		
Well	Atlanta 3-6H			Wellbore Atlanta 3-6H Orig Hole				Rig	Cyclone 2	Job	5245611	
Tie In	MD ft	Incl deg	Azim deg	North ft	East ft	TVD ft	VS ft	Temperature degF	CRS LEN ft	DLS deg/100ft	Build deg/100ft	Turn deg/100ft
	19487.00	89.32	164.31	-8916.11	2239.47	10532.52	9193.05	263.5	93.00	0.90	-0.02	-0.90
	19582.00	89.50	168.12	-9008.35	2262.10	10533.50	9288.03	260.8	95.00	4.01	0.19	4.01
	19676.00	90.21	165.95	-9099.95	2283.19	10533.74	9382.00	258.1	94.00	2.43	0.76	-2.31
	19770.00	90.80	167.42	-9191.41	2304.84	10532.91	9475.99	266.2	94.00	1.69	0.63	1.56
	19865.00	91.44	166.91	-9284.02	2325.94	10531.06	9570.94	255.4	95.00	0.86	0.67	-0.54
	19959.00	91.57	166.84	-9375.53	2347.28	10528.59	9664.90	263.5	94.00	0.16	0.14	-0.07
	20054.00	91.29	165.59	-9467.77	2369.91	10526.22	9759.86	269.0	95.00	1.35	-0.29	-1.32
	20149.00	91.90	165.84	-9559.79	2393.34	10523.57	9854.83	269.0	95.00	0.69	0.64	0.26
	20170.00	92.01	165.75	-9580.14	2398.49	10522.86	9875.81	263.5	21.00	0.68	0.52	-0.43
Projection to TD												
	20225.00	92.01	165.75	-9633.41	2412.02	10520.93	9930.78		55.00	0.00	0.00	0.00

Tie Column Legend: I - interpolated tie-point, S - survey station, U - user-defined, T - Surface



Scale 1:240 (5"=100') Imperial  
Measured Depth Log

Well Name: Atlanta 3-6H  
Location: Sections 6 - T153N - R101W  
License Number: 33-105-02730 Region: Williston  
Spud Date: 12/16/12 Drilling Completed: 12/24/12  
Surface Coordinates: NWNW Sec. 6 - 153N - 101W  
495' FNL & 590' FWL  
Bottom Hole Casing Point: 10875' MD; 10527' TVD  
Coordinates: NWNW SEC. 6 - 153N - 101W - 1067' FNL & 722' FWL  
Ground Elevation (ft): 1945' K.B. Elevation (ft): 1967'  
Logged Interval (ft): 9700' To: 10527' Total Depth (ft): 827'  
Formation: Lodgepole, Upper Bakken Shale, Middle Bakken Member  
Type of Drilling Fluid: Invert

Printed by WellSight Log Viewer from WellSight Systems 1-800-447-1534 [www.WellSight.com](http://www.WellSight.com)

**CORE**

Contractor:  
Core #:  
Formation:  
Core Interval: From: Cut:  
To: Recovered:  
Bit type:  
Size:  
Coring Time:

**OPERATOR**

Company: Continental Resources, Inc.  
Address: PO Box 1032  
Enid, OK 73702

**GEOLOGIST**

Name: Jed D Nelson  
Company: Geo-Link  
Address: PO Box 1764  
Red Lodge, MT 59068

**Directional:**

Baker Hughes - Keith

# MWD:

## Scientific Drilling - Josh

### ROCK TYPES

	Anhy		Clyst		Gyp		Mrlst		Shgy
	Bent		Coal		Igne		Salt		Slst
	Brec		Congl		Lmst		Shale		Ss
	Cht		Dol		Meta		Shcol		Till

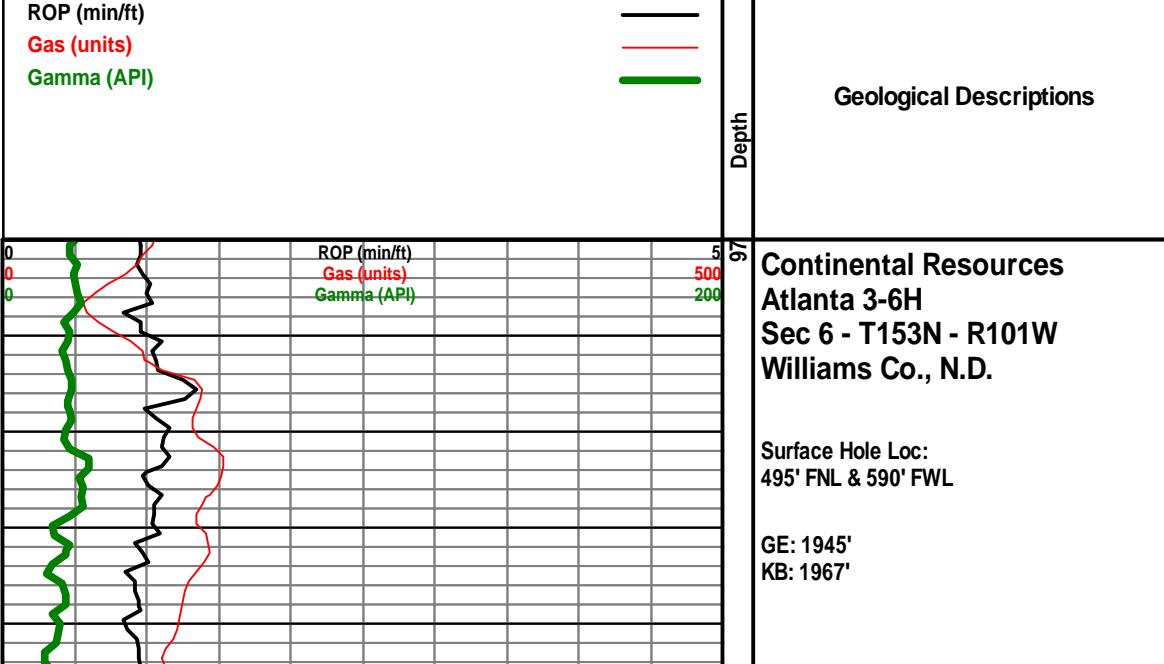
### ACCESSORIES

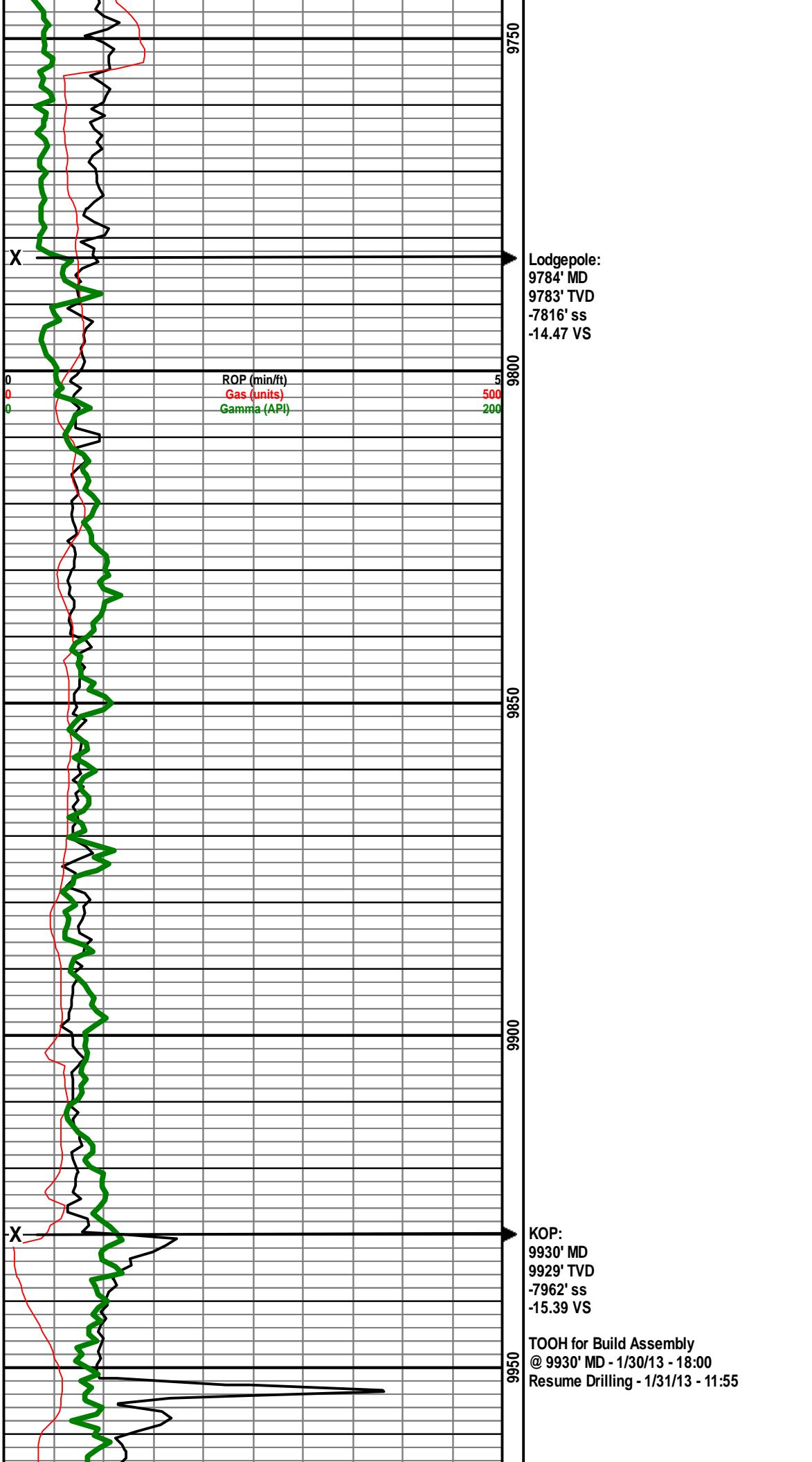
MINERAL	Gyp	FOSSIL	Ostra	TEXTURE	
	Hvymin		Algae		Slitstrg
	Kaol		Amph		Ssstrg
	Marl		Belm		Boundst
	Minxl		Bioclst		Chalky
	Nodule		Brach		Cryxln
	Phos		Bryozoa		Earthy
	Pyr		Cephal		Finexln
	Salt		Coral		Grainst
	Sandy		Crin		Lithogr
	Silt		Echin		Microxln
	Sil		Fish		Mudst
	Sulphur		Foram		Packst
	Tuff		Fossil		Wackest
			Gastro		
			Oolite		

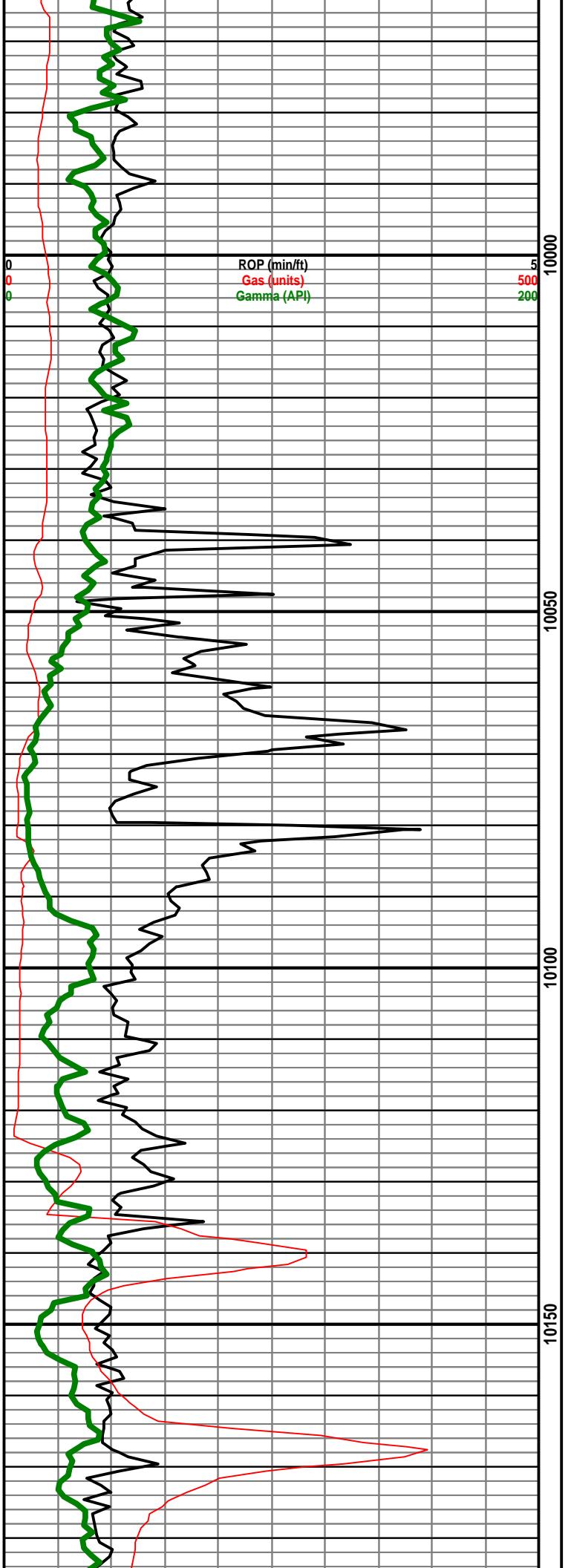
### OTHER SYMBOLS

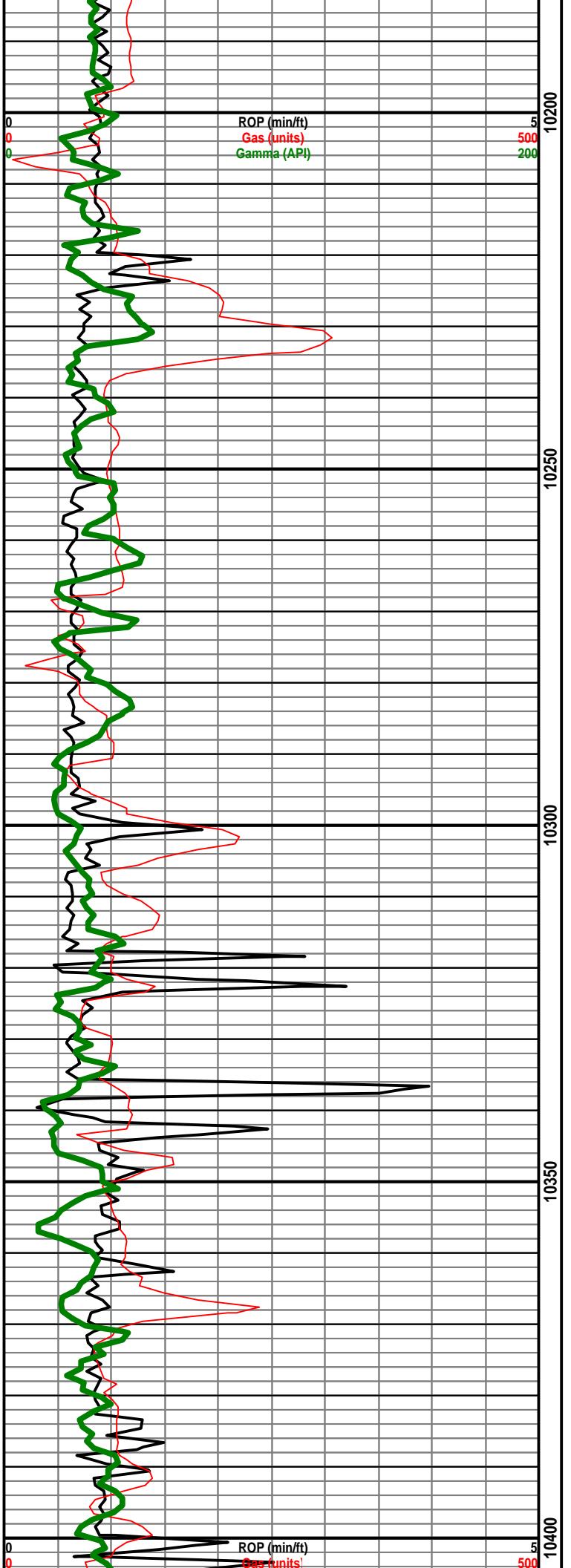
POROSITY TYPE	Vuggy	ROUNDING	Spotted	EVENTS
SORTING				
OIL SHOWS	Even	INTERVALS		

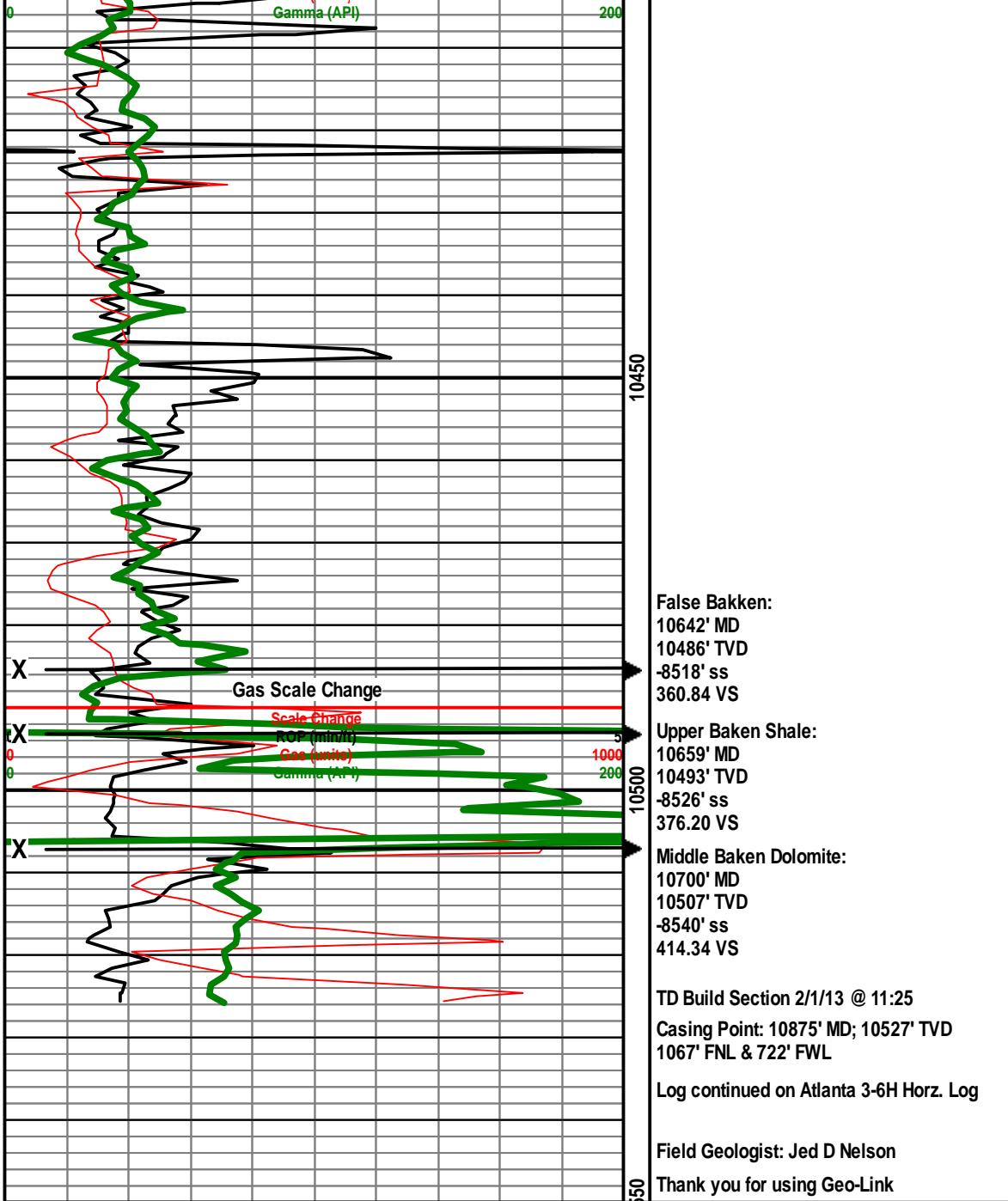
### Curve Track 1











## Industrial Commission of North Dakota

## Oil and Gas Division

## Verbal Approval To Purchase and Transport Oil

Well or Facility No

**23370**

Tight Hole Yes

**OPERATOR**

Operator  
**CONTINENTAL RESOURCES, INC.**

Representative  
**Shannon Sletvold**

Rep Phone  
**(406) 433-3006**

**WELL INFORMATION**

Well Name

**ATLANTA 3-6H**

Inspector

**Jessica Gilkey**

Well Location QQ Sec Twp Rng  
**NWNW 6 153 N 101 W**

County  
**WILLIAMS**

Footages 495 Feet From the N Line  
**590** Feet From the W Line

Field

**BAKER**

Pool  
**BAKKEN**

Date of First Production Through Permanent Wellhead

**This Is The First Sales****PURCHASER / TRANSPORTER**

Purchaser  
**CONTINENTAL RESOURCES, INC.**

Transporter  
**HILAND CRUDE, LLC**

**TANK BATTERY**

Central Tank Battery Number :

**SALES INFORMATION** This Is The First Sales

ESTIMATED BARRELS TO BE SOLD		ACTUAL BARRELS SOLD	DATE
5000	BBLS	BBLS	
	BBLS	BBLS	

**DETAILS**

Start Date **1/31/2013**  
 Date Approved **1/31/2013**  
 Approved By **John Axtman**

# **NEWSCO**

## **International Energy Services Inc.**

Continental Resources  
Company

32284  
Job Number

11/27/2012  
Date

Cyclone 2  
Rig

Atlanta 3-6H  
Well Name

Williams Co., ND  
County & State

Surveyed from depth of: Surface to 1945'

GL to KB: 22'

Type of Survey: Nvader/MWD

**True North**

Directional Supervisor/Surveyor: David Hopper

The data and calculations for this survey have been checked by me and conform to the standards and procedures set forth by Newsco International Energy Services Inc. This report represents a true and correct directional survey of this well based on the original data obtained at the well site. Wellbore coordinates are calculated using minimum curvature .

Certified by:

  
Joshua Mahoney

# **NEWSCO**

Directional Services U.S.A.

<b>CLIENT:</b>	Continental Resources	<b>NEWSCO JOB #</b>	32284
<b>DATE:</b>	11/27/2012	<b>WELL NAME:</b>	Atlanta 3-6H
<b>STATE:</b>	North Dakota	<b>RIG:</b>	AES
<b>FIELD:</b>	Baker	<b>CONTRACTOR:</b>	4.00

TIE-ON DATA		TARGET DATA	
C/L (10,30,100):	100.00 Feet	SENSOR TO BIT:	47.00
MEASURED DEPTH:	0.00 Feet	KB TO GL :	6.00
TVD:	0.00 Feet	Total:	53.00
INCLINATION:	0.00 Deg.	TVD:	0.00
AZIMUTH:	0.00 Deg.	INC:	0.00
N(+) S(-):	0.00 Feet	VS:	0.00
E(+) W(-):	0.00 Feet	Big rig KB to GL	22.00
V/SECTION PLANE:	0.00 Deg.		
V/SECTION :	0.00 Feet		

THESE SURVEYS HAVE BEEN ADJUSTED TO BIG RIG KB



1675 Broadway Suite 1500  
Denver, CO 80202  
303-534-3223 Fax 303-534-1822

**INTEQ**

**Report  
of  
Sub-Surface  
Directional  
Survey**

**CONTINENTAL**  
Company

**ATLANTA 3-6H**  
Well Name

**WILLIAMS/ ND**  
Location

**1/24/2013**  
Date

**5245611**  
Job Number

**Denver**  
Office



1675 Broadway Suite 1500  
Denver, CO 80202  
303-534-3223 Fax 303-534-1822

**INTEQ**

### Survey Certification Sheet

**CONTINENTAL**  
Company

**5245611**  
Job Number

**01/24/13**  
Date

**SEC.06-T153N-R101W**  
Lease

**ATLANTA 3-6H**  
Well Name

**WILLIAMS/ ND**  
County & State

Surveyed from a measured depth of: 2065 feet to 20170 feet

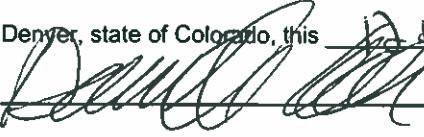
Type of Survey: MWD

Directional Surveyor: ANDY KING

The data and calculations for this survey have been checked by me and conform to the standards and procedures set forth by Baker Hughes INTEQ. This report represents a true and correct Directional Survey of this well based on the original data obtained at the well site. Wellbore Coordinates are calculated using minimum curvature.

  
\_\_\_\_\_  
Seth Painter  
Well Planner

This document has been subscribed and affirmed, or sworn to before me in the county of

Denver, state of Colorado, this 12<sup>th</sup> day of February, 2013  
  
\_\_\_\_\_  
My commission expires 3/14/14

Certification Number: 10879  
Certification Date: 2/12/13

# CONTINENTAL RESOURCES

Location: NORTH DAKOTA  
 Field: WILLIAMS COUNTY  
 Facility: SEC.06-T153N-R101W

Slot: SLOT#03 ATLANTA 3-6H(495'FNL & 590'FWL,SEC.06)  
 Well: ATLANTA 3-6H  
 Wellbore: ATLANTA 3-6H PWB

Plot reference wellpath is ATLANTA 3-6H (REV-F.0) PW

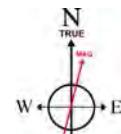
True vertical depths are referenced to CYCLONE 2 (RKB)

Measured depths are referenced to CYCLONE 2 (RKB)

CYCLONE 2 (RKB) to Mean Sea Level: 1967 feet

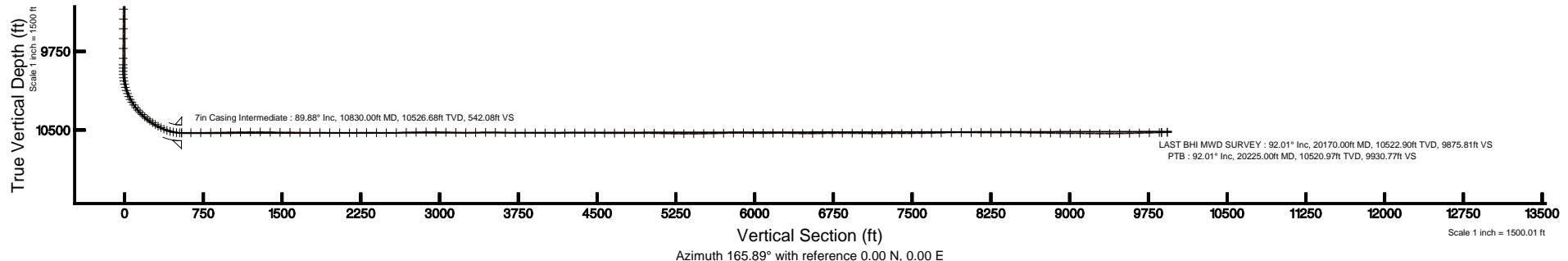
Mean Sea Level to Mud line (At Slot: SLOT#03 ATLANTA 3-6H(495'FNL & 590'FWL,SEC.06)): 0 feet

Coordinates are in feet referenced to Slot



BGGM (1945.0 to 2014.0) Dip: 73.02° Field: 56547.4 nT  
 Magnetic North is 8.56 degrees East of True North (at 2/7/2013)

To correct azimuth from Magnetic to True add 8.56 degrees  
 For example: if the Magnetic North Azimuth = 90 degs, then the True North Azimuth = 90 + 8.56 = 98.56





# Actual Wellpath Report

ATLANTA 3-6H AWP

Page 1 of 12



## REFERENCE WELLPATH IDENTIFICATION

Operator	CONTINENTAL RESOURCES	Slot	SLOT#03 ATLANTA 3-6H(495'FNL & 590'FWL,SEC.06)
Area	NORTH DAKOTA	Well	ATLANTA 3-6H
Field	WILLIAMS COUNTY	Wellbore	ATLANTA 3-6H AWB
Facility	SEC.06-T153N-R101W		

## REPORT SETUP INFORMATION

Projection System	NAD83 / Lambert North Dakota SP, Northern Zone (3301), US feet	Software System	WellArchitect® 4.0.0
North Reference	True	User	Painsetr
Scale	0.999936	Report Generated	6/4/2013 at 3:30:48 PM
Convergence at slot	n/a	Database/Source file	WA_Denver/ATLANTA_3-6H_AWB.xml

## WELLPATH LOCATION

	Local coordinates		Grid coordinates		Geographic coordinates	
	North[ft]	East[ft]	Easting[US ft]	Northing[US ft]	Latitude	Longitude
Slot Location	29.29	320.05	1179355.18	421214.92	48°06'33.668"N	103°43'52.244"W
Facility Reference Pt			1179034.20	421199.10	48°06'33.379"N	103°43'56.960"W
Field Reference Pt			1379474.78	594749.03	48°36'17.680"N	102°56'05.560"W

## WELLPATH DATUM

Calculation method	Minimum curvature	CYCLONE 2 (RKB) to Facility Vertical Datum	1967.00ft
Horizontal Reference Pt	Slot	CYCLONE 2 (RKB) to Mean Sea Level	1967.00ft
Vertical Reference Pt	CYCLONE 2 (RKB)	CYCLONE 2 (RKB) to Mud Line at Slot (SLOT#03 ATLANTA 3-6H(495'FNL & 590'FWL,SEC.06))	1967.00ft
MD Reference Pt	CYCLONE 2 (RKB)	Section Origin	N 0.00, E 0.00 ft
Field Vertical Reference	Mean Sea Level	Section Azimuth	165.89°



# Actual Wellpath Report

ATLANTA 3-6H AWP

Page 2 of 12



## REFERENCE WELLPATH IDENTIFICATION

Operator	CONTINENTAL RESOURCES	Slot	SLOT#03 ATLANTA 3-6H(495'FNL & 590'FWL,SEC.06)
Area	NORTH DAKOTA	Well	ATLANTA 3-6H
Field	WILLIAMS COUNTY	Wellbore	ATLANTA 3-6H AWB
Facility	SEC.06-T153N-R101W		

## WELLPATH DATA (218 stations)

MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Vert Sect [ft]	North [ft]	East [ft]	DLS [°/100ft]	Comments
1945.00	0.900	219.200	1944.97	3.17	-3.65	-1.51	0.37	TIE TO NEWSCO
2065.00	1.250	219.880	2064.95	4.51	-5.39	-2.94	0.29	
2158.00	1.500	226.150	2157.92	5.71	-7.01	-4.47	0.31	
2246.00	1.710	224.090	2245.89	6.97	-8.75	-6.21	0.25	
2345.00	0.690	265.170	2344.86	7.65	-9.86	-7.84	1.29	
2439.00	0.930	228.550	2438.86	7.91	-10.41	-8.97	0.59	
2531.00	1.290	211.360	2530.84	8.98	-11.79	-10.07	0.53	
2623.00	1.940	218.060	2622.80	10.66	-13.90	-11.57	0.73	
2716.00	1.200	134.700	2715.78	12.46	-15.83	-11.85	2.32	
2809.00	1.210	128.640	2808.76	14.07	-17.12	-10.39	0.14	
2903.00	1.350	136.840	2902.73	15.83	-18.55	-8.86	0.24	
2996.00	2.150	18.620	2995.71	15.32	-17.70	-7.55	3.26	
3090.00	1.940	16.160	3089.65	12.47	-14.50	-6.54	0.24	
3184.00	1.790	19.680	3183.60	9.87	-11.59	-5.61	0.20	
3277.00	1.550	17.770	3276.56	7.60	-9.02	-4.73	0.26	
3370.00	1.680	21.540	3369.52	5.42	-6.56	-3.85	0.18	
3464.00	1.270	23.920	3463.49	3.48	-4.32	-2.92	0.44	
3557.00	1.290	28.240	3556.47	1.89	-2.46	-2.01	0.11	
3651.00	0.940	39.090	3650.45	0.65	-0.93	-1.02	0.43	
3744.00	0.890	47.570	3743.44	-0.15	0.15	-0.01	0.16	
3837.00	0.500	39.430	3836.43	-0.73	0.95	0.78	0.43	
3929.00	0.560	45.660	3928.43	-1.20	1.58	1.36	0.09	
4023.00	0.620	56.210	4022.42	-1.60	2.18	2.11	0.13	
4117.00	0.190	50.350	4116.42	-1.84	2.56	2.65	0.46	
4210.00	0.520	40.780	4209.42	-2.15	2.98	3.05	0.36	
4304.00	0.350	58.280	4303.41	-2.48	3.45	3.57	0.23	
4397.00	0.450	36.000	4396.41	-2.80	3.90	4.03	0.20	
4491.00	0.350	60.050	4490.41	-3.11	4.34	4.49	0.21	
4584.00	0.340	81.870	4583.41	-3.16	4.52	5.01	0.14	
4678.00	0.220	30.210	4677.41	-3.26	4.72	5.38	0.28	



# Actual Wellpath Report

ATLANTA 3-6H AWP

Page 3 of 12



## REFERENCE WELLPATH IDENTIFICATION

Operator	CONTINENTAL RESOURCES	Slot	SLOT#03 ATLANTA 3-6H(495'FNL & 590'FWL,SEC.06)
Area	NORTH DAKOTA	Well	ATLANTA 3-6H
Field	WILLIAMS COUNTY	Wellbore	ATLANTA 3-6H AWB
Facility	SEC.06-T153N-R101W		

## WELLPATH DATA (218 stations)

MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Vert Sect [ft]	North [ft]	East [ft]	DLS [°/100ft]	Comments
4772.00	0.740	96.950	4771.40	-3.17	4.80	6.07	0.73	
4865.00	0.860	92.260	4864.40	-2.76	4.70	7.37	0.15	
4959.00	1.230	95.280	4958.38	-2.23	4.58	9.08	0.40	
5053.00	0.950	113.400	5052.36	-1.42	4.18	10.80	0.47	
5146.00	2.010	225.370	5145.34	-0.12	2.73	10.34	2.71	
5240.00	1.060	317.740	5239.32	-0.05	2.21	8.59	2.46	
5332.00	0.460	102.960	5331.31	-0.63	2.76	8.37	1.59	
5426.00	0.590	172.620	5425.31	0.02	2.19	8.80	0.65	
5520.00	0.880	201.960	5519.30	1.08	1.04	8.59	0.50	
5613.00	0.690	198.120	5612.29	2.13	-0.15	8.15	0.21	
5705.00	0.900	196.490	5704.29	3.23	-1.37	7.78	0.23	
5799.00	1.060	204.060	5798.27	4.54	-2.87	7.21	0.22	
5891.00	1.410	197.520	5890.25	6.18	-4.73	6.52	0.41	
5985.00	1.410	178.360	5984.22	8.29	-6.99	6.21	0.50	
6079.00	0.170	201.440	6078.21	9.53	-8.27	6.19	1.34	
6173.00	0.250	183.960	6172.21	9.84	-8.61	6.13	0.11	
6266.00	0.610	115.660	6265.21	10.35	-9.02	6.56	0.61	
6360.00	2.130	84.180	6359.18	10.92	-9.06	8.75	1.75	
6453.00	2.830	89.350	6452.09	11.71	-8.86	12.76	0.79	
6547.00	0.850	99.620	6546.04	12.53	-8.95	15.77	2.13	
6641.00	0.610	151.820	6640.03	13.29	-9.51	16.69	0.72	
6734.00	0.930	121.040	6733.03	14.31	-10.34	17.58	0.55	
6827.00	0.820	206.230	6826.02	15.35	-11.32	17.93	1.28	
6921.00	1.940	344.870	6920.00	14.27	-10.39	17.21	2.78	
7015.00	2.040	346.220	7013.95	11.01	-7.23	16.40	0.12	
7108.00	1.920	336.710	7106.89	7.82	-4.19	15.39	0.38	
7202.00	1.740	353.770	7200.84	4.85	-1.33	14.61	0.61	
7296.00	0.810	324.850	7294.82	2.81	0.64	14.08	1.17	
7389.00	0.750	286.700	7387.81	1.89	1.35	13.11	0.55	
7483.00	0.870	296.450	7481.80	1.11	1.84	11.89	0.19	



# Actual Wellpath Report

ATLANTA 3-6H AWP

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## REFERENCE WELLPATH IDENTIFICATION

Operator	CONTINENTAL RESOURCES	Slot	SLOT#03 ATLANTA 3-6H(495'FNL & 590'FWL,SEC.06)
Area	NORTH DAKOTA	Well	ATLANTA 3-6H
Field	WILLIAMS COUNTY	Wellbore	ATLANTA 3-6H AWB
Facility	SEC.06-T153N-R101W		

## WELLPATH DATA (218 stations)

MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Vert Sect [ft]	North [ft]	East [ft]	DLS [°/100ft]	Comments
7576.00	0.750	288.690	7574.79	0.32	2.35	10.68	0.17	
7669.00	0.540	288.970	7667.79	-0.25	2.69	9.69	0.23	
7763.00	0.600	276.610	7761.78	-0.66	2.89	8.78	0.15	
7856.00	0.500	246.060	7854.78	-0.77	2.78	7.92	0.33	
7949.00	0.370	309.970	7947.78	-0.94	2.81	7.32	0.51	
8043.00	0.310	337.780	8041.77	-1.44	3.24	6.99	0.18	
8137.00	0.520	340.320	8135.77	-2.11	3.88	6.75	0.22	
8230.00	0.840	343.510	8228.76	-3.22	4.93	6.42	0.35	
8324.00	0.890	51.730	8322.76	-4.20	6.04	6.80	1.03	
8417.00	0.640	30.270	8415.75	-4.87	6.94	7.63	0.40	
8510.00	0.540	32.300	8508.74	-5.54	7.76	8.12	0.11	
8604.00	0.740	47.700	8602.74	-6.14	8.54	8.81	0.28	
8697.00	0.780	53.560	8695.73	-6.66	9.32	9.76	0.09	
8790.00	0.890	38.780	8788.72	-7.34	10.26	10.72	0.26	
8884.00	0.650	38.950	8882.71	-8.10	11.24	11.51	0.26	
8977.00	0.690	57.090	8975.70	-8.59	11.96	12.32	0.23	
9070.00	0.660	46.640	9068.70	-9.04	12.63	13.18	0.14	
9162.00	0.550	42.330	9160.69	-9.54	13.32	13.86	0.13	
9256.00	0.580	22.540	9254.69	-10.17	14.09	14.34	0.21	
9349.00	0.640	36.730	9347.68	-10.88	14.94	14.84	0.17	
9443.00	0.580	22.940	9441.68	-11.59	15.80	15.34	0.17	
9536.00	0.500	35.000	9534.67	-12.23	16.57	15.75	0.15	
9630.00	0.580	7.960	9628.67	-12.94	17.38	16.05	0.28	
9723.00	0.400	14.870	9721.67	-13.66	18.16	16.20	0.20	
9817.00	0.450	7.910	9815.66	-14.29	18.84	16.34	0.08	
9879.00	0.440	12.100	9877.66	-14.73	19.31	16.42	0.05	
9910.00	0.430	14.160	9908.66	-14.94	19.54	16.47	0.06	
9941.00	0.210	106.770	9939.66	-15.01	19.64	16.56	1.57	
9972.00	3.070	156.330	9970.65	-14.16	18.86	16.94	9.48	
10003.00	6.700	162.730	10001.53	-11.54	16.37	17.81	11.82	



# Actual Wellpath Report

ATLANTA 3-6H AWP

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## REFERENCE WELLPATH IDENTIFICATION

Operator	CONTINENTAL RESOURCES	Slot	SLOT#03 ATLANTA 3-6H(495'FNL & 590'FWL,SEC.06)
Area	NORTH DAKOTA	Well	ATLANTA 3-6H
Field	WILLIAMS COUNTY	Wellbore	ATLANTA 3-6H AWB
Facility	SEC.06-T153N-R101W		

## WELLPATH DATA (218 stations)

MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Vert Sect [ft]	North [ft]	East [ft]	DLS [°/100ft]	Comments
10034.00	10.180	156.930	10032.19	-7.02	12.12	19.42	11.54	
10065.00	13.270	152.790	10062.54	-0.85	6.44	22.13	10.32	
10097.00	16.390	156.210	10093.47	7.18	-0.96	25.63	10.12	
10128.00	18.590	164.900	10123.04	16.43	-9.74	28.68	11.00	
10159.00	21.460	169.690	10152.16	27.04	-20.09	30.98	10.66	
10190.00	25.120	171.400	10180.63	39.25	-32.18	32.98	12.01	
10221.00	29.130	172.510	10208.22	53.30	-46.17	34.95	13.04	
10252.00	32.830	172.210	10234.79	69.15	-61.98	37.07	11.95	
10284.00	36.480	172.340	10261.11	87.23	-80.01	39.52	11.41	
10315.00	39.700	171.810	10285.50	106.24	-98.95	42.16	10.44	
10346.00	41.950	170.490	10308.96	126.42	-118.97	45.28	7.77	
10376.00	44.170	168.840	10330.88	146.86	-139.12	48.96	8.30	
10407.00	46.850	168.530	10352.60	168.94	-160.80	53.30	8.67	
10438.00	49.750	170.930	10373.22	192.03	-183.57	57.42	11.00	
10470.00	52.560	171.890	10393.29	216.83	-208.21	61.13	9.09	
10500.00	54.290	171.500	10411.17	240.80	-232.05	64.61	5.86	
10532.00	55.630	172.940	10429.54	266.84	-258.01	68.16	5.58	
10563.00	56.910	173.480	10446.76	292.41	-283.61	71.21	4.38	
10594.00	60.460	171.790	10462.87	318.71	-309.87	74.61	12.36	
10625.00	63.470	169.870	10477.44	345.96	-336.87	78.97	11.14	
10656.00	65.130	168.440	10490.88	373.85	-364.31	84.23	6.78	
10688.00	69.550	167.340	10503.20	403.35	-393.17	90.43	14.17	
10719.00	74.190	167.020	10512.85	432.80	-421.89	96.96	15.00	
10750.00	78.730	166.720	10520.10	462.93	-451.23	103.81	14.68	
10781.00	84.300	167.110	10524.68	493.57	-481.08	110.75	18.01	
10812.00	88.990	167.490	10526.49	524.50	-511.27	117.55	15.18	
10830.00	89.880	167.390	10526.67	542.49	-528.83	121.46	4.98	
10919.00	90.550	168.250	10526.33	631.44	-615.83	140.24	1.22	
11013.00	90.220	167.090	10525.70	725.39	-707.66	160.31	1.28	
11108.00	90.900	166.830	10524.77	820.37	-800.20	181.75	0.77	



# Actual Wellpath Report

ATLANTA 3-6H AWP

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## REFERENCE WELLPATH IDENTIFICATION

Operator	CONTINENTAL RESOURCES	Slot	SLOT#03 ATLANTA 3-6H(495'FNL & 590'FWL,SEC.06)
Area	NORTH DAKOTA	Well	ATLANTA 3-6H
Field	WILLIAMS COUNTY	Wellbore	ATLANTA 3-6H AWB
Facility	SEC.06-T153N-R101W		

## WELLPATH DATA (218 stations)

MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Vert Sect [ft]	North [ft]	East [ft]	DLS [°/100ft]	Comments
11203.00	91.090	167.060	10523.12	915.34	-892.73	203.20	0.31	
11297.00	91.140	165.810	10521.29	1009.31	-984.09	225.25	1.33	
11391.00	90.400	168.360	10520.03	1103.27	-1075.70	246.25	2.82	
11486.00	91.260	167.190	10518.66	1198.21	-1168.53	266.36	1.53	
11580.00	89.010	168.660	10518.43	1292.14	-1260.44	286.03	2.86	
11675.00	88.610	169.420	10520.41	1386.98	-1353.69	304.08	0.90	
11769.00	89.230	169.670	10522.18	1480.77	-1446.11	321.14	0.71	
11864.00	89.880	169.330	10522.92	1575.58	-1539.52	338.45	0.77	
11958.00	89.350	168.750	10523.55	1669.43	-1631.80	356.32	0.84	
12053.00	89.570	167.360	10524.44	1764.36	-1724.74	375.98	1.48	
12148.00	89.720	169.330	10525.03	1859.26	-1817.77	395.17	2.08	
12242.00	89.450	168.070	10525.71	1953.15	-1909.94	413.59	1.37	
12337.00	89.720	170.120	10526.40	2047.99	-2003.22	431.56	2.18	
12431.00	90.520	169.880	10526.20	2141.75	-2095.79	447.88	0.89	
12500.00	90.930	169.220	10525.33	2210.60	-2163.64	460.40	1.13	
12594.00	89.600	169.130	10524.90	2304.44	-2255.97	478.05	1.42	
12689.00	89.690	169.150	10525.48	2399.29	-2349.26	495.95	0.10	
12783.00	89.320	167.830	10526.30	2493.18	-2441.37	514.71	1.46	
12877.00	91.300	167.600	10525.79	2587.13	-2533.21	534.71	2.12	
12972.00	92.170	167.230	10522.91	2682.05	-2625.88	555.40	1.00	
13066.00	90.770	166.860	10520.50	2776.00	-2717.46	576.46	1.54	
13161.00	91.050	167.030	10518.99	2870.97	-2809.99	597.92	0.34	
13255.00	89.040	166.060	10518.92	2964.96	-2901.40	619.79	2.37	
13350.00	88.550	165.180	10520.92	3059.94	-2993.41	643.38	1.06	
13444.00	88.520	164.160	10523.32	3153.88	-3084.03	668.22	1.09	
13539.00	89.140	164.410	10525.26	3248.83	-3175.46	693.94	0.70	
13633.00	92.180	165.300	10524.18	3342.79	-3266.18	718.50	3.37	
13728.00	90.250	164.380	10522.16	3437.75	-3357.85	743.34	2.25	
13822.00	89.350	162.340	10522.49	3531.65	-3447.90	770.25	2.37	
13917.00	87.430	163.270	10525.16	3626.47	-3538.62	798.32	2.25	



# Actual Wellpath Report

ATLANTA 3-6H AWP

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## REFERENCE WELLPATH IDENTIFICATION

Operator	CONTINENTAL RESOURCES	Slot	SLOT#03 ATLANTA 3-6H(495'FNL & 590'FWL,SEC.06)
Area	NORTH DAKOTA	Well	ATLANTA 3-6H
Field	WILLIAMS COUNTY	Wellbore	ATLANTA 3-6H AWB
Facility	SEC.06-T153N-R101W		

## WELLPATH DATA (218 stations)

MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Vert Sect [ft]	North [ft]	East [ft]	DLS [°/100ft]	Comments
14012.00	89.260	165.780	10527.90	3721.39	-3630.12	823.66	3.27	
14106.00	90.990	166.370	10527.70	3815.39	-3721.36	846.28	1.94	
14201.00	89.450	166.690	10527.33	3910.38	-3813.74	868.41	1.66	
14295.00	89.260	166.110	10528.39	4004.37	-3905.10	890.51	0.65	
14390.00	89.440	164.780	10529.47	4099.36	-3997.04	914.38	1.41	
14484.00	91.630	165.820	10528.59	4193.34	-4087.95	938.23	2.58	
14579.00	90.090	164.870	10527.17	4288.32	-4179.85	962.26	1.90	
14673.00	89.720	164.620	10527.32	4382.30	-4270.54	986.99	0.48	
14768.00	89.230	162.760	10528.19	4477.22	-4361.70	1013.67	2.02	
14862.00	89.420	161.850	10529.30	4571.03	-4451.25	1042.24	0.99	
14957.00	90.280	165.630	10529.55	4665.95	-4542.43	1068.83	4.08	
15052.00	89.810	165.010	10529.47	4760.94	-4634.33	1092.91	0.82	
15146.00	90.000	164.420	10529.63	4854.92	-4725.00	1117.69	0.66	
15240.00	89.630	163.440	10529.93	4948.87	-4815.33	1143.71	1.11	
15334.00	89.290	165.070	10530.82	5042.82	-4905.80	1169.21	1.77	
15429.00	88.630	167.520	10532.54	5137.79	-4998.07	1191.72	2.67	
15523.00	89.410	168.850	10534.15	5231.70	-5090.06	1210.96	1.64	
15618.00	89.480	167.450	10535.07	5326.62	-5183.03	1230.47	1.48	
15712.00	90.400	167.460	10535.17	5420.58	-5274.78	1250.88	0.98	
15807.00	90.900	166.650	10534.09	5515.56	-5367.36	1272.16	1.00	
15902.00	91.020	166.300	10532.50	5610.54	-5459.71	1294.38	0.39	
15996.00	91.810	166.360	10530.18	5704.51	-5551.02	1316.59	0.84	
16090.00	90.280	166.300	10528.47	5798.49	-5642.34	1338.80	1.63	
16185.00	89.070	166.140	10529.00	5893.48	-5734.60	1361.42	1.28	
16279.00	89.540	165.110	10530.14	5987.47	-5825.65	1384.76	1.20	
16373.00	90.000	165.920	10530.52	6081.47	-5916.66	1408.27	0.99	
16467.00	91.290	166.200	10529.46	6175.46	-6007.89	1430.91	1.40	
16561.00	89.510	165.040	10528.81	6269.45	-6098.94	1454.26	2.26	
16656.00	88.550	164.010	10530.42	6364.41	-6190.48	1479.60	1.48	
16750.00	88.950	162.990	10532.47	6458.30	-6280.58	1506.29	1.17	



# Actual Wellpath Report

ATLANTA 3-6H AWP

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## REFERENCE WELLPATH IDENTIFICATION

Operator	CONTINENTAL RESOURCES	Slot	SLOT#03 ATLANTA 3-6H(495'FNL & 590'FWL,SEC.06)
Area	NORTH DAKOTA	Well	ATLANTA 3-6H
Field	WILLIAMS COUNTY	Wellbore	ATLANTA 3-6H AWB
Facility	SEC.06-T153N-R101W		

## WELLPATH DATA (218 stations)

MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Vert Sect [ft]	North [ft]	East [ft]	DLS [°/100ft]	Comments
16845.00	90.490	163.650	10532.93	6553.20	-6371.58	1533.56	1.76	
16939.00	91.500	163.290	10531.30	6647.10	-6461.68	1560.30	1.14	
17033.00	89.960	164.590	10530.10	6741.04	-6552.00	1586.30	2.14	
17128.00	90.150	163.260	10530.01	6835.98	-6643.28	1612.60	1.41	
17222.00	89.350	164.240	10530.42	6929.91	-6733.53	1638.91	1.35	
17317.00	89.380	163.870	10531.47	7024.86	-6824.86	1665.00	0.39	
17411.00	89.230	166.360	10532.61	7118.83	-6915.70	1689.15	2.65	
17505.00	90.950	167.490	10532.47	7212.81	-7007.25	1710.41	2.19	
17600.00	90.210	167.280	10531.50	7307.77	-7099.96	1731.16	0.81	
17694.00	90.180	166.770	10531.18	7401.75	-7191.55	1752.26	0.54	
17788.00	90.490	166.610	10530.63	7495.74	-7283.03	1773.90	0.37	
17883.00	90.550	165.700	10529.77	7590.74	-7375.26	1796.63	0.96	
17977.00	91.040	165.310	10528.47	7684.73	-7466.26	1820.16	0.67	
18070.00	91.760	164.690	10526.20	7777.69	-7556.07	1844.22	1.02	
18166.00	91.190	164.810	10523.72	7873.63	-7648.65	1869.46	0.61	
18261.00	89.660	164.440	10523.02	7968.61	-7740.25	1894.65	1.66	
18356.00	89.410	163.410	10523.79	8063.55	-7831.53	1920.95	1.12	
18450.00	89.630	163.160	10524.58	8157.45	-7921.55	1947.99	0.35	
18544.00	89.960	162.550	10524.91	8251.31	-8011.38	1975.70	0.74	
18639.00	90.210	161.500	10524.77	8346.09	-8101.74	2005.02	1.14	
18734.00	90.460	162.910	10524.22	8440.89	-8192.19	2034.05	1.51	
18828.00	88.890	163.930	10524.75	8534.80	-8282.27	2060.87	1.99	
18923.00	89.160	164.210	10526.37	8629.74	-8373.61	2086.94	0.41	
19017.00	89.440	162.450	10527.52	8723.64	-8463.65	2113.90	1.90	
19112.00	88.980	165.070	10528.83	8818.55	-8554.84	2140.46	2.80	
19205.00	89.320	164.950	10530.21	8911.53	-8644.67	2164.52	0.39	
19299.00	89.900	164.300	10530.85	9005.50	-8735.30	2189.44	0.93	
19394.00	89.340	165.150	10531.48	9100.48	-8826.94	2214.47	1.07	
19487.00	89.320	164.310	10532.56	9193.46	-8916.65	2238.96	0.90	
19582.00	89.500	168.120	10533.54	9288.43	-9008.90	2261.59	4.01	



# Actual Wellpath Report

ATLANTA 3-6H AWP

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## REFERENCE WELLPATH IDENTIFICATION

Operator	CONTINENTAL RESOURCES	Slot	SLOT#03 ATLANTA 3-6H(495'FNL & 590'FWL,SEC.06)
Area	NORTH DAKOTA	Well	ATLANTA 3-6H
Field	WILLIAMS COUNTY	Wellbore	ATLANTA 3-6H AWB
Facility	SEC.06-T153N-R101W		

## WELLPATH DATA (218 stations)

MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Vert Sect [ft]	North [ft]	East [ft]	DLS [°/100ft]	Comments
19676.00	90.210	165.950	10533.78	9382.41	-9100.49	2282.68	2.43	
19770.00	90.800	167.420	10532.95	9476.39	-9191.96	2304.32	1.69	
19865.00	91.440	166.910	10531.09	9571.35	-9284.57	2325.42	0.86	
19959.00	91.570	166.840	10528.63	9665.30	-9376.08	2346.76	0.16	
20054.00	91.290	165.590	10526.25	9760.27	-9468.31	2369.39	1.35	
20149.00	91.900	165.840	10523.61	9855.23	-9560.34	2392.82	0.69	
20170.00	92.010	165.750	10522.89	9876.22	-9580.69	2397.97	0.68	LAST BHI MWD SURVEY
20225.00	92.010	165.750	10520.97	9931.18	-9633.96	2411.50	0.00	PTB

## HOLE & CASING SECTIONS - Ref Wellbore: ATLANTA 3-6H AWB    Ref Wellpath: ATLANTA 3-6H AWP

String/Diameter	Start MD [ft]	End MD [ft]	Interval [ft]	Start TVD [ft]	End TVD [ft]	Start N/S [ft]	Start E/W [ft]	End N/S [ft]	End E/W [ft]
9.625in Casing Surface	22.00	1992.00	1970.00	22.00	1991.96	0.00	0.00	-4.27	-2.01
8.75in Open Hole	1992.00	10830.00	8838.00	1991.96	10526.67	-4.27	-2.01	-528.83	121.46
7in Casing Intermediate	22.00	10830.00	10808.00	22.00	10526.67	0.00	0.00	-528.83	121.46
6in Open Hole	10830.00	20225.00	9395.00	10526.67	10520.97	-528.83	121.46	-9633.96	2411.50



# Actual Wellpath Report

ATLANTA 3-6H AWP

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## REFERENCE WELLPATH IDENTIFICATION

Operator	CONTINENTAL RESOURCES	Slot	SLOT#03 ATLANTA 3-6H(495'FNL & 590'FWL,SEC.06)
Area	NORTH DAKOTA	Well	ATLANTA 3-6H
Field	WILLIAMS COUNTY	Wellbore	ATLANTA 3-6H AWB
Facility	SEC.06-T153N-R101W		

## TARGETS

Name	MD [ft]	TVD [ft]	North [ft]	East [ft]	Grid East [US ft]	Grid North [US ft]	Latitude	Longitude	Shape
ATLANTA 3-6H SECTION 06		0.00	0.00	0.00	1179355.18	421214.92	48°06'33.668"N	103°43'52.244"W	polygon
ATLANTA 3-6H SECTION 07		0.00	0.00	0.00	1179355.18	421214.92	48°06'33.668"N	103°43'52.244"W	polygon
ATLANTA 3-6H SECTION 08		0.00	0.00	0.00	1179355.18	421214.92	48°06'33.668"N	103°43'52.244"W	polygon
ATLANTA 3-6H SECTION LINES		0.00	0.00	0.00	1179355.18	421214.92	48°06'33.668"N	103°43'52.244"W	polygon
ATLANTA 3-6H BHL ON PLAT REV-1(200'FSL & 2186'FEL,SEC.07)	10513.00	-9865.04	2604.00	1181542.88	411249.99	48°04'56.315"N	103°43'13.894"W	point	
ATLANTA 3-6H BHL ON PLAT REV-2(200'FSL & 2186'FEL,SEC.07)	10515.00	-9671.50	2430.20	1181377.36	411450.63	48°04'58.225"N	103°43'16.453"W	point	
ATLANTA 3-6H BHL ON PLAT REV-3(200'FSL & 2186'FEL,SEC.07)	10515.00	-9667.50	2430.20	1181377.53	411454.63	48°04'58.264"N	103°43'16.453"W	point	
ATLANTA 3-6H BHL ON PLAT REV-4(200'FSL & 2186'FEL,SEC.07)	10515.00	-9667.00	2430.20	1181377.55	411455.13	48°04'58.269"N	103°43'16.453"W	point	
ATLANTA 3-6H HARDLINES (500'N/W & 200'S/E)	10515.00	0.00	0.00	1179355.18	421214.92	48°06'33.668"N	103°43'52.244"W	polygon	
FED MINERLAS NWSE SECTION 6	10584.00	21.22	44.95	1179400.97	421234.24	48°06'33.877"N	103°43'51.582"W	polygon	



# Actual Wellpath Report

ATLANTA 3-6H AWP

Page 11 of 12



## REFERENCE WELLPATH IDENTIFICATION

Operator	CONTINENTAL RESOURCES	Slot	SLOT#03 ATLANTA 3-6H(495'FNL & 590'FWL,SEC.06)
Area	NORTH DAKOTA	Well	ATLANTA 3-6H
Field	WILLIAMS COUNTY	Wellbore	ATLANTA 3-6H AWB
Facility	SEC.06-T153N-R101W		

## WELLPATH COMPOSITION - Ref Wellbore: ATLANTA 3-6H AWB      Ref Wellpath: ATLANTA 3-6H AWP

Start MD [ft]	End MD [ft]	Positional Uncertainty Model	Log Name/Comment	Wellbore
22.00	1945.00	ISCWSA MWD, Rev. 2 (Standard)	NEWSCO SURFACE MWD SURVEYS<117-1945>	ATLANTA 3-6H AWB
1945.00	10830.00	NaviTrak (Standard)	BHI MWD 8.75 HOLE<2065-10830>	ATLANTA 3-6H AWB
10830.00	20170.00	NaviTrak (Standard)	BHI MWD 6 HOLE<10919-20170>	ATLANTA 3-6H AWB
20170.00	20225.00	Blind Drilling (std)	Projection to bit	ATLANTA 3-6H AWB



# Actual Wellpath Report

ATLANTA 3-6H AWP

Page 12 of 12



## REFERENCE WELLPATH IDENTIFICATION

Operator	CONTINENTAL RESOURCES	Slot	SLOT#03 ATLANTA 3-6H(495'FNL & 590'FWL,SEC.06)
Area	NORTH DAKOTA	Well	ATLANTA 3-6H
Field	WILLIAMS COUNTY	Wellbore	ATLANTA 3-6H AWB
Facility	SEC.06-T153N-R101W		

## WELLPATH COMMENTS

MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Comment
1945.00	0.900	219.200	1944.97	TIE TO NEWSCO
20170.00	92.010	165.750	10522.89	LAST BHI MWD SURVEY
20225.00	92.010	165.750	10520.97	PTB

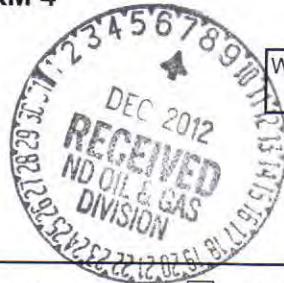


# SUNDRY NOTICES AND REPORTS ON WELLS - FORM 4

INDUSTRIAL COMMISSION OF NORTH DAKOTA  
OIL AND GAS DIVISION  
600 EAST BOULEVARD DEPT 405  
BISMARCK, ND 58505-0840  
SFN 5749 (03-2004)

Well File No.

23370



PLEASE READ INSTRUCTIONS BEFORE FILLING OUT FORM.  
PLEASE SUBMIT THE ORIGINAL AND ONE COPY.

<input checked="" type="checkbox"/> Notice of Intent	Approximate Start Date <b>January 29, 2013</b>	<input type="checkbox"/> Drilling Prognosis	<input type="checkbox"/> Spill Report
<input type="checkbox"/> Report of Work Done	Date Work Completed	<input type="checkbox"/> Redrilling or Repair	<input type="checkbox"/> Shooting
<input type="checkbox"/> Notice of Intent to Begin a Workover Project that may Qualify for a Tax Exemption Pursuant to NDCC Section 57-51.1-03.	Approximate Start Date	<input type="checkbox"/> Casing or Liner	<input type="checkbox"/> Acidizing
		<input type="checkbox"/> Plug Well	<input type="checkbox"/> Fracture Treatment
		<input type="checkbox"/> Supplemental History	<input type="checkbox"/> Change Production Method
		<input type="checkbox"/> Temporarily Abandon	<input type="checkbox"/> Reclamation
		<input checked="" type="checkbox"/> Other	<b>Flow back exemption</b>

Well Name and Number  
**Atlanta 3-6H**

Footages	Qtr-Qtr	Section	Township	Range
495 F N L	590 F W L	NWNW	6	153 N 101 W
Field <b>Baker</b>	Pool <b>Bakken</b>		County <b>Williams</b>	

## 24-HOUR PRODUCTION RATE

Before		After	
Oil	Bbls	Oil	Bbls
Water	Bbls	Water	Bbls
Gas	MCF	Gas	MCF

Name of Contractor(s)

Address	City	State	Zip Code
---------	------	-------	----------

## DETAILS OF WORK

Continental Resources, Inc. requests a waiver from the tubing/pkr requirement included in NDIC 43-02-03-21: Casing, Tubing, and Cementing Requirements during the completion period immediately following the upcoming fracture stimulation. The following assurances apply:

- 1) The well is equipped with 26#/ft P-110 7" casing at surface with an API burst rating of 9960 psig for the 26 #/ft casing.
- 2) The frac design will use a safety factor of 0.85 \* API burst rating to determine the max pressure.
- 3) Damage to the casing during the frac would be detected immediately by monitoring equipment.
- 4) The casing is exposed to significantly lower rates and pressures during flow back than during the frac job.
- 5) The frac fluid and formation fluids have very low corrosion and erosion rates
- 6) Production equipment will be installed as soon as possible after the well ceases flowing.
- 7) A 300# gauge will be installed on surface casing during flowback period.

Company <b>Continental Resources, Inc.</b>	Telephone Number <b>405-234-9000</b>	
Address <b>P.O. Box 269000</b>		
City <b>Oklahoma City</b>	State <b>OK</b>	Zip Code <b>73126</b>
Signature 	Printed Name <b>Jim Landigan</b>	
Title <b>Completion Engineer</b>	Date <b>December 3, 2012</b>	

## FOR STATE USE ONLY

<input type="checkbox"/> Received	<input checked="" type="checkbox"/> Approved
Date <i>December 14, 2012</i>	
By <i>David J. M. Loh</i>	
Title <b>PETROLEUM ENGINEER</b>	

**A  
MERICAN  
TECHNICAL  
SERVICES, INC.**

8105 Black Hawk Rd • PQ Box 658 • Black Hawk, SD 57718-0558 • Phone (605) 787-9303 • FAX (605) 787-9515  
140 Pine Needle Drive • Spearfish, SD 57783 • Phone (605) 642-2742 • Mobile 390-3768

**CONTINENTAL RESOURCES, INC.**

C/O Brosz Engineering  
P.O. Box 357  
Bowman, North Dakota 58623

June 12, 2012

Attn: Jade Hedge

Subj: Report of Geotechnical Engineering Analysis  
Atlanta Drill Pad  
Continental Resources  
Near Williston, North Dakota

ATS No. 12-12165

We have completed the geotechnical engineering analysis of the soils at the proposed Atlanta Drill Pad site located approximately 5 miles southwest of Williston, North Dakota. This analysis was authorized by Jade Hedge of Brosz Engineering on behalf of Continental Resources. Our soil design and construction recommendations are attached.

**Geologic Profile:**

Based on our analysis, we have determined the soil profile at the proposed Atlanta Drill Pad site consists of variable depths of sand and clay glacial deposits overlying fat clay glacial till and Pierre Shale. The sand and clay glacial deposits have variable amounts of clay, sand, gravel and traces of coal. The sands are of low plasticity and the fat clay glacial till is highly plastic and expansive.

**Global Slope Stability:**

The Owner elected not to conduct a slope stability analysis at this site. Thus, our recommendations are given with no acceptance or assumption of the global stability of the slopes at this site. Global stability issues may be present and may create land shifting or sliding in the future.

**Geotechnical Summary:**

The Atlanta Drill Pad will be constructed on a site with ridge and swale topography on the breaks of the Missouri River near Williston. We understand the Atlanta Drill pad will be created with massive cut and fill earthwork techniques. Cut depths on the order of 20 to 25 feet and fill depths up to 50 feet are planned for the construction of the drill pad.

We are providing drill pad construction earthwork recommendations given the soil profile and knowing the earthwork required to create the drill pad. We offer the following:

**Cut Sections:**

We recommend that any structure, drill rig, or other more permanent elements which are intolerant to differential movement be placed on the cut areas of the site.

Based on our drill program, we know that variable depths of sand mixtures overlie fat clay glacial till in the cut areas of the site. We recommend the fill pad finished elevation be established at the fat clay till contact or the sands be totally removed to the glacial till contact and then replaced with compacted clays. It is desired to not have layers of sand over clays as instability can result with moisture accumulation below sands and atop clays.

**Fill Sections:**

We recommend that no structure, drill rig, or other more permanent elements which are intolerant to differential movement be placed over fill areas. If it is desired or necessary to occupy fill areas, we recommend placement of such elements not be conducted until the fill sections have been allowed to consolidate for a minimum of one (1) year. We recommend the fill sections be monitored for vertical and horizontal movement upon completion in order to determine the stability of the sections.

We recommend the swales (valleys) which will be filled have underdrains installed prior to placing fill. We recommend pairs (set of 2 pipes) of 6" flexible PVC drain tile materials be installed along the toes of the existing swales prior to placing fill. The underdrain pipes should be sloped to daylight and must be kept unobstructed.

Fill placed on the existing toes of slopes must be keyed in a minimum depth of five (5) feet prior to placing fill. Fill must also be horizontally benched into existing slopes as fill is placed. We recommend benches be a minimum of 8 feet wide and be installed every two (2) feet vertically.

**Drainage Considerations:**

We recommend an intercepting drainage trench be excavated atop the cut to divert surface runoff away from the site. We also recommend the final drill pad be sloped to drain at a minimum rate of 5%.

We recommend the drill pad finished surface consist of compacted clays (either exposed native soils or placed clay soils) to minimize subsurface infiltration. Service gravel with separation fabric should be used in traffic areas to allow for access over clay surfaces.

**Earthwork Considerations:**

All fill soils must be moisture conditioned to +/-3% of optimum moisture content and be compacted to a minimum of 95% of ASTM D 698 standard proctor value.

Loose lifts of fill must not exceed 8" and may be increased to 12" if proper compaction equipment is used and density is verified. Cut/fill earthwork operations in freezing weather must be monitored for frost intrusion and frost lensing. Cut/fill earthwork in winter months is not recommended for this site due to the depths of fill planned.

**CONTINENTAL RESOURCES, INC.**  
**Report of Geotechnical Engineering Analysis**  
**Atlanta Drill Pad**

**June 12, 2012**  
**ATS No. 12-12165**  
**Near Williston, ND**

**Closure:**

Critical specific recommendations are presented in the report. Reference the site plan in the Appendix for boring locations.

We are available to give further design or consultation if necessary. We should be retained to observe, test, and approve the soils at the time of construction.

We look forward to working with you on future projects.

Sincerely,  
**American Technical Services, Inc.**



Dave G. Bressler, P.E.  
Director of Engineering

Copies to: Addressee (4)

## **INTRODUCTION**

This report presents the results of our geotechnical engineering analysis of the soils at the proposed Atlanta Drill Pad site located approximately 5 miles southwest of Williston, North Dakota. This analysis was authorized by Jade Hedge of Brosz Engineering on behalf of Continental Resources.

Our services included laboratory testing of provided samples, performing engineering analysis, providing recommendations for use in drill pad design and construction. Results of the laboratory tests are presented in the report.

Our professional services were performed using the degree of care and skill ordinarily exercised, under similar circumstances, by geotechnical engineers practicing in this or similar localities. No other warranty, express or implied, is made. This report is not a bidding document. Any contractor reviewing this report must draw his own conclusions regarding site conditions and specific construction techniques to be used on this project.

## **PROJECT INFORMATION**

Project information supplied by Brosz Engineering indicates Continental Resources intends to construct a drill pad near Williston, North Dakota. It is our understanding the site will be leveled by massive cut/fill construction. Based on our review of the provided site plans, some fill sections will be upwards of 50 feet in depth. Based on the request for proposal from Brosz Engineering, we are to provide a geotechnical evaluation of the site, provide recommendations for benching and side slopes, and provide slope construction guidelines.

We previously submitted (March, 2012) a proposal for the work at this site which included a slope stability analysis. We understand the Owner elected not to conduct the slope stability analysis.

## **SUBSURFACE EXPLORATION & TESTING PROGRAMS**

We conducted ten (10) explorations to depths of 21 to 61 feet below existing site grades at the Atlanta Drill pad site. The explorations were at the approximate location shown on the attached site plan.

The Unified Soil Classification System was used to classify the soils encountered. Laboratory analyses were performed on representative soil samples to aid in material classification and to estimate pertinent engineering properties of the on-site soils. Testing was performed in accordance with applicable ASTM specifications.

The scope of our services did not include any environmental assessment or investigation for the presence or absence of hazardous or toxic materials in the soil, surface water, groundwater or air, on or below this site. All conditions noted or observed are strictly for the information of our client. If environmental information is required, we recommend an environmental assessment be conducted which addresses environmental concerns.

## **SITE CONDITIONS**

### **Surface:**

The Atlanta Drill Pad site is located approximately 5 miles southwest of Williston, North Dakota. The site lies on the breaks of the Missouri River. The surface at the pad site consists of ridge and swale topography with well defined drainage swales present. The surface is primarily grass and weed covered with overall drainage trending to the south.

### **Subsurface:**

Detailed soil profiles are presented in the boring logs in the Appendix. Based on our analysis, we have determined the soil profile at the proposed Atlanta Drill Pad site consists of variable depths of sand and clay glacial deposits overlying fat clay glacial till and Pierre Shale. The sand and clay glacial deposits have variable amounts of clay, sand, gravel and traces of coal. The sands are of low plasticity and the fat clay glacial till is highly plastic and expansive.

### **Groundwater Conditions:**

Groundwater was encountered at our Boring 1 (57' below existing site grades) location, and at approximately 15 to 18 feet below existing site grades at our boring 8, 9, and 10 locations (lower area of site). Fluctuations in the groundwater table may occur for various reasons, i.e., variations in precipitation, evaporation, surface runoff, groundwater withdrawal and recharge. A more accurate evaluation of the water table would require installing and monitoring piezometers over an extended time period.

### **Laboratory Analyses:**

In-situ moisture contents and dry densities of representative samples from the borings are presented on the boring logs in the Appendix.

## **CONCLUSIONS AND RECOMMENDATIONS**

### **GENERAL**

Our recommendations are based on the assumption that the soil conditions are similar to those disclosed by the provided samples. If variations are noted during construction or if changes are made in the site plan, structural loading, or foundation type, we should be notified so we can supplement our recommendations, as applicable. This report does not encompass the effects, if any, of underlying geologic hazards or regional groundwater withdrawal and expresses no opinion regarding their effects on surface movement.

### **Global Slope Stability:**

The Owner elected not to conduct a slope stability analysis at this site. Thus, our recommendations are given with no acceptance or assumption of the global stability of the slopes at this site. Global stability issues may be present and may create land shifting or sliding in the future.

**Geotechnical Summary:**

The Atlanta Drill Pad will be constructed on a site with ridge and swale topography on the breaks of the Missouri River near Williston. We understand the Atlanta Drill pad will be created with massive cut and fill earthwork techniques. Cut depths on the order of 20 to 25 feet and fill depths up to 50 feet are planned for the construction of the drill pad.

We recommend an intercepting drainage trench be excavated atop the cut to divert surface runoff away from the site. We also recommend the final drill pad be sloped to drain at a minimum rate of 5%.

We recommend the drill pad finished surface consist of compacted clays (either exposed native soils or placed clay soils) to minimize subsurface infiltration. Service gravel with separation fabric should be used in traffic areas to allow for access over clay surfaces.

We are providing drill pad construction earthwork recommendations given the soil profile and knowing the earthwork required to create the drill pad.

**DRILL PAD CUT SECTIONS:**

We recommend that any structure, drill rig, or other more permanent elements which are intolerant to differential movement be placed on the cut areas of the site.

Based on our drill program, we know that variable depths of sand mixtures overlie fat clay glacial till in the cut areas of the site. We recommend the fill pad finished elevation be established at the fat clay till contact or the sands be totally removed to the glacial till contact and then replaced with compacted clays. It is desired to not have layers of sand over clays as instability can result with moisture accumulation below sands and atop clays.

For grading cut slope design purposes and due to the presence of sandy soils, we recommend cut slopes be designed to slope at a rate of no steeper than 3:1 (horizontal to vertical). Said slopes will allow for maintenance and repair as necessary and will minimize erosion after vegetation is established. We offer the following grading guidelines for construction of surfacing or elements (excluding permanent structures) over cut sections:

- 1) We recommend a minimum of 8 inches of the on-site surficial soils and topsoil be removed, as applicable.
- 2) We recommend the soils exposed in the cut area be scarified a minimum of 8 inches, and be moisture conditioned to +/-3% of optimum moisture content.
- 3) We recommend the soils be compacted to a minimum of 95% of ASTM 698 standard proctor value. Compaction equipment must be sufficient to gain the desired results and will depend on the soils placed. The geotechnical engineer should observe, classify, and test the soils during the fill placement to assure proper techniques are employed.

- 4) After subgrade preparation and compaction, we recommend gravel base course or desired surfacing be placed. We recommend stabilization/separation fabric such as Mirafi HP370 be placed between the soil subgrade and surfacing material. Oversized rock may be required high traffic or soft soil areas.

#### **DRILL PAD FILL SECTIONS:**

We recommend that no structure, drill rig, or other more permanent elements which are intolerant to differential movement be placed over fill areas.

If it is desired or necessary to occupy fill areas, we recommend placement of such elements not be conducted until the fill sections have been allowed to consolidate for a minimum of one (1) year. We recommend the fill sections be monitored for vertical and horizontal movement upon completion in order to determine the stability of the sections.

We recommend the final slopes be no steeper than 3:1 (horizontal to vertical).

#### **Underdrains:**

We recommend the swales (valleys) which will be filled have underdrains installed prior to placing fill. We recommend pairs (set of 2 pipes) be installed along the toes of the existing swales prior to placing fill. We recommend the underdrains consist of 6" diameter fabric wrapped flexible perforated drain pipe. We recommend the drain pipe be bedded with a minimum of 12 inches of 1" clean rock bedding for the entire pipe length at the specified locations. The underdrain pipes should be sloped to daylight and must be kept unobstructed.

#### **Keyways:**

At the toes of the existing slopes, we recommend the native soils have a keyway cut to aid in supporting slope fill retention. We recommend the slope keyway consist of a five (5) foot minimum vertical cut in the native approved soils along the east side toe. Keyway areas over daylight pipe areas may be modified depending on depth. We recommend the keyway be a minimum of 10 feet in width. Additional underdrains may be required for the system if water is encountered within keyways.

#### **Fill Construction:**

We understand the fill for the pad will come from on-site as the grading is conducted. With the aforementioned grading plan in mind and our analysis of the soils present, we offer the following grading recommendations:

- 1) We recommend the fill areas be stripped to receive new fill. Stripping should clear all vegetation, topsoil and debris. The depth of such materials and horizontal extent of the fill/cut slopes will vary along the proposed toe slopes.
- 2) We recommend a minimum of 8 inches of the soils at the base of fill sections be removed (includes topsoil).

- 3) We recommend the soils present at the bottom of the aforementioned stripping depth be proofroiled in the presence of the geotechnical engineer. Soft or debris laden soil areas may require removal or stabilization with oversized rock prior to placing fill.
- 4) It is critical that newly placed embankment fill be benched into the existing side slopes as the fill is raised. We recommend a minimum bench width of eight (8) feet or one (1) scraper width per every two (2) feet of fill placed.
- 5) The soils placed must be placed in an engineered manner. The soils should be moisture conditioned to within 3% of optimum moisture content and be compacted to a minimum of 95% of ASTM D 698 standard proctor value. Compaction equipment must be sufficient to gain the desired results and will depend on the soils placed. The geotechnical engineer should observe, classify, and test the soils during the fill placement to assure proper techniques are employed.
- 6) Loose lifts of fill must not exceed 8" and may be increased to 12" if proper compaction equipment is used and density is verified. Cut/fill earthwork operations in freezing weather must be monitored for frost intrusion and frost lensing. Cut/fill earthwork in winter months is not recommended for this site due to the depths of fill planned.
- 7) We recommend that all finished fill slopes for the roadways be covered with topsoil and/or be hydro-seeded as soon as possible after the slopes have been finished to avoid excessive moisture intrusion and erosion. Seeding and erosion control measures should then follow as dictated by progress.
- 8) Erosion control measures must be implemented during and after construction to avoid loss of soil structure and sedimentation due to surface water infiltration and erosion. Erosion control techniques and materials should be upgraded or repaired as necessary during the course of construction. We recommend final slopes be no steeper than 3:1 (horizontal to vertical) to reduce erosion and facilitate mowing, etc. Steeper slopes can be used, however, maintenance during and after construction must be provided.
- 9) We estimate a shrinkage of soil from cut to fill of 25%.

**Buried Debris, Large Cobbles, Boulders & Lignite Coal Lenses:**

Buried debris may be present at any location at this site. Traces of lignite coal was encountered during our drilling and sampling program at this site. Cobbles were also encountered in the mixed glacial deposit areas.

We recommend buried debris pockets and lignite coal lenses, if exposed, be observed by the geotechnical engineer to determine the affects of the soils with respect to the drill pad. Removal and replacement of said materials may be required.

Large cobbles or boulders encountered may be placed at the bottom of fill areas as long as large particles are not allowed to "nest". Such particles should be isolated and surrounded by compacted fill.

### **Frost Depth Considerations**

A minimum frost depth of 5 feet (60 inches) should be used for pertinent element design.

### **DRAINAGE AND MOISTURE PROTECTION**

It is extremely important that the site soils not be allowed to become saturated during or after construction. Sump pumps should be present during construction to facilitate water removal after inclement weather.

Surface drainage is critical to assure long tank pad life. Grades should be such that drainage is away from all structures. Utility line excavations should be properly backfilled to avoid possible sources for subsurface saturation. The finished exterior grades of the pad must be sloped a minimum of 5% to promote positive drainage. Respective structure or well pads should be elevated relative to the surrounding finished grades to aid in promoting positive drainage.

We recommend the surface across the pad consist of native or placed compacted clay. We recommend any clay cap material be moisture conditioned to +/-3% of optimum moisture content and be compacted to a minimum of 95% of ASTM D 698 standard proctor value.

### **OSHA SLOPE STABILITY**

#### **GENERAL**

The owner and contractor should make themselves aware of and become familiar with applicable local, state, and federal safety regulations, including the current OSHA Excavation and Trench Safety Standards. Construction site safety generally is the sole responsibility of the Contractor, who shall also be solely responsible for the means, methods, and sequencing of construction operations. We are providing this information solely as a service to our client. Under no circumstances should the information provided below be interpreted to mean that American Technical Services, Inc., is assuming responsibility for construction site safety or the Contractor's activities; such responsibility is not being implied and should not be inferred.

#### **EXCAVATIONS AND SLOPES**

The Contractor should be aware that slope height, slope inclination, or excavation depths (including utility trench excavations) should in no case exceed those specified in local, state, or federal safety regulations, e.g., OSHA Health and Safety Standards for Excavations, 29 CFR Part 1926, or successor regulations, such regulations are strictly enforced and, if they are not followed, the Owner, Contractor, and/or earthwork and utility subcontractors could be liable for substantial penalties.

For this site, the overburden soil encountered in our exploratory investigation is primarily a sand. This is considered to be a type B soil when applying the OSHA regulations. OSHA recommends a maximum slope inclination of 1:1 - (horizontal/vertical) for type B soils. As a safety measure, it is recommended that all vehicles and soil piles be kept a minimum lateral distance from the crest of the slope equal to no less than the slope height. Also, the exposed slope face should be protected against the elements.

We recommend that you retain us to monitor the soils exposed in all excavations and provide engineering services for such slopes. This will provide an opportunity to monitor the soil types encountered and to modify the excavation slope as necessary. It also offers an opportunity to verify the soil type and bearing capacity of the exposed soils.

## **EARTHWORK**

### **GENERAL**

1. The conclusions in this report are contingent upon compliance with recommendations in this section.
2. Due to the possible presence of buried debris, lignite coal, and groundwater impacted soils, we recommend the geotechnical engineer or his representative observe the soils exposed at bottom of slope keyway elevations and along underdrain areas prior to placing fill. Additional overexcavation and replacement may be required.

### **SITE CLEARING**

Strip and remove existing debris, soft or loose soil and any other deleterious materials from the building and parking areas and at least 5 feet beyond. All exposed surfaces should be free of mounds and depressions which could prevent uniform compaction.

### **EXCAVATION**

1. Standard excavation equipment should be sufficient for excavations at this site. Buried debris or large cobble to boulder sized materials may be encountered which are difficult to handle.
2. On-site soils may pump if allowed to become saturated. Scarification and drying, replacement with granular materials, use of special equipment or stabilization may be required to minimize subgrade pumping.

### **CONSTRUCTION OVER CUT OR FILL AREAS**

1. Drain, prepare and construct cut or fill areas as presented in the respective sections of this report. Fill section consolidation period with monitoring is recommended prior to construction of elements.
2. Drainage of cut and fill slope surfaces is critical to prevent erosion and slope movement. Drill pad surface cross-slopes must be maintained at a minimum of 5% to promote surface drainage.

3. Respective subgrade preparation area to be accomplished in a manner which will result in uniform water contents and densities after compaction.
4. Soft, wet or debris laden soil lenses may require additional removal and replacement with oversized rock to stabilize.

## MATERIALS

1. Granular engineered fill for structures should consist of on-site or imported sand or gravel. Structure placement recommendations is beyond the scope of this report.
2. Frozen soils should not be used as fill or backfill.
3. Gravel surfacing materials should conform to the following:
  - o Gradation (ASTM C136):

Sieve Size	Percent Finer By Weight
3"	100
No. 4 Sieve	40-100
No. 200 Sieve	15 (max)
Liquid Limit	25 (max)
  - o Maximum expansive potential(%) \*0.2

\*Measured on a sample compacted to approximately 95 percent of the ASTM D698 maximum dry density at about 3 percent below optimum water content. The sample is confined under a 100 psf surcharge and submerged.

4. Acceptance of use of on-site materials shall be at the direction of the geotechnical engineer. The on-site soils shall be placed in an engineered manner. Moisture and density conditioning of the soil is critical.

## PLACEMENT AND COMPACTION

1. Place and compact fill in horizontal lifts using equipment and procedures that will produce recommended water contents and densities throughout the lift.
2. No fill should be placed over frozen ground.
3. Materials should be compacted to the following:

Soil Placement	Minimum Percent Compaction (ASTM D698)
----------------	--

Miscellaneous fill ----- 95

4. On -site and imported soils should be compacted at or near optimum moisture conditions.

## **COMPLIANCE**

Structure foundation and slab support is beyond the scope of this report. Structures supported on cut surfaces or compacted fills are dependent upon compliance to respective cut and fill construction recommendations. To assess compliance with these recommendations, observation and testing should be performed under the direction of a geotechnical engineer.

## **CLOSURE**

Our conclusions and recommendations are predicated on observation and testing of the earthwork preparations directed by a geotechnical engineer. Responsibility for any design or construction work or for our conclusions, recommendations, opinions or interpretations, either oral or written, cannot be accepted unless we perform the plan and specification review and construction monitoring to determine whether or not the work performed is in substantial compliance with our conclusions, recommendations, opinions or interpretations, and whether changed soil conditions have occurred.

Deviations from our recommendations by the plans, written specifications, or field applications shall relieve us of responsibility unless our written concurrence with such deviations has been obtained.

## **APPENDIX**

**PROJECT LOCATION MAP**

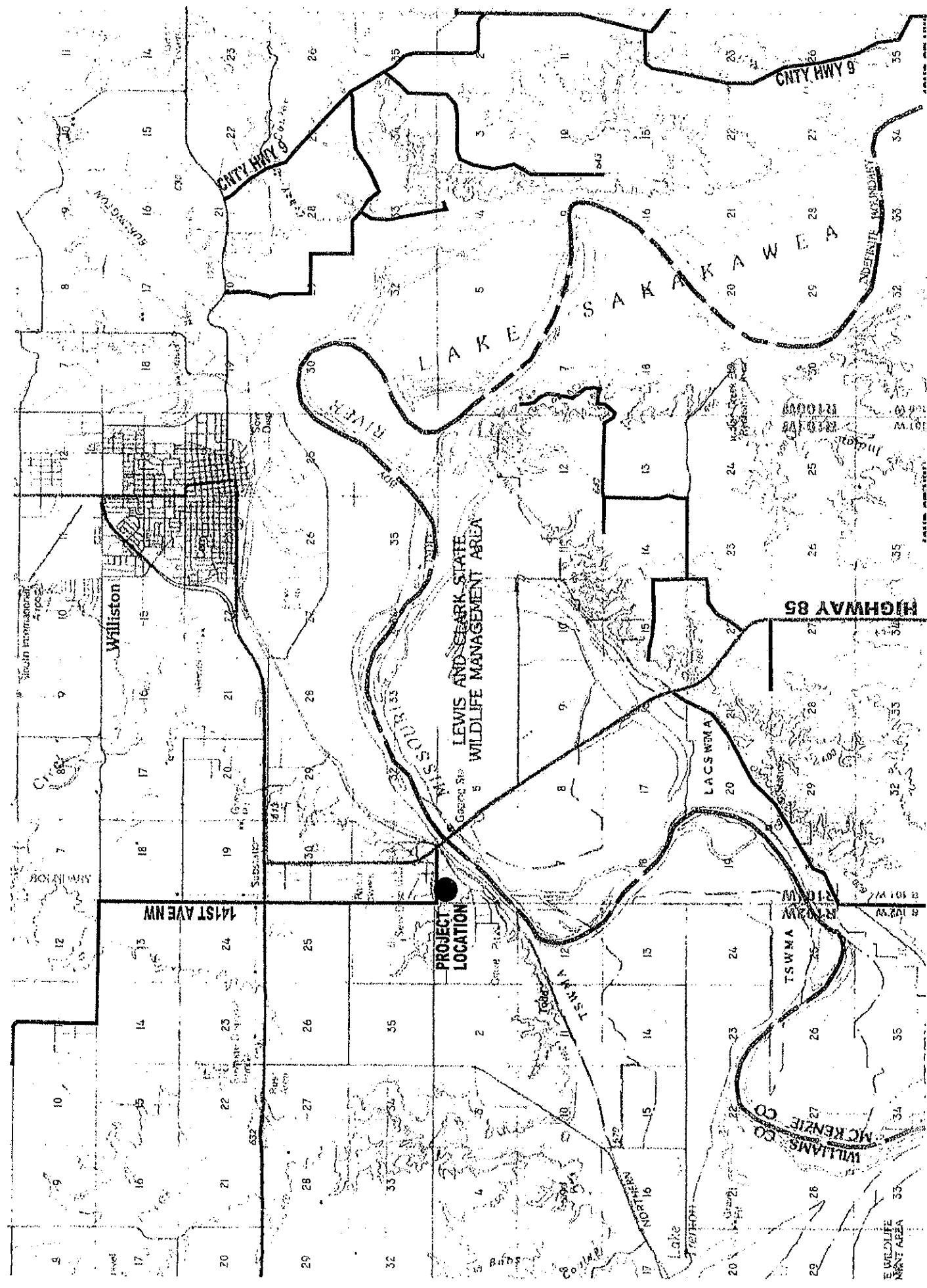
**SITE PLAN WITH BORING LOCATIONS**

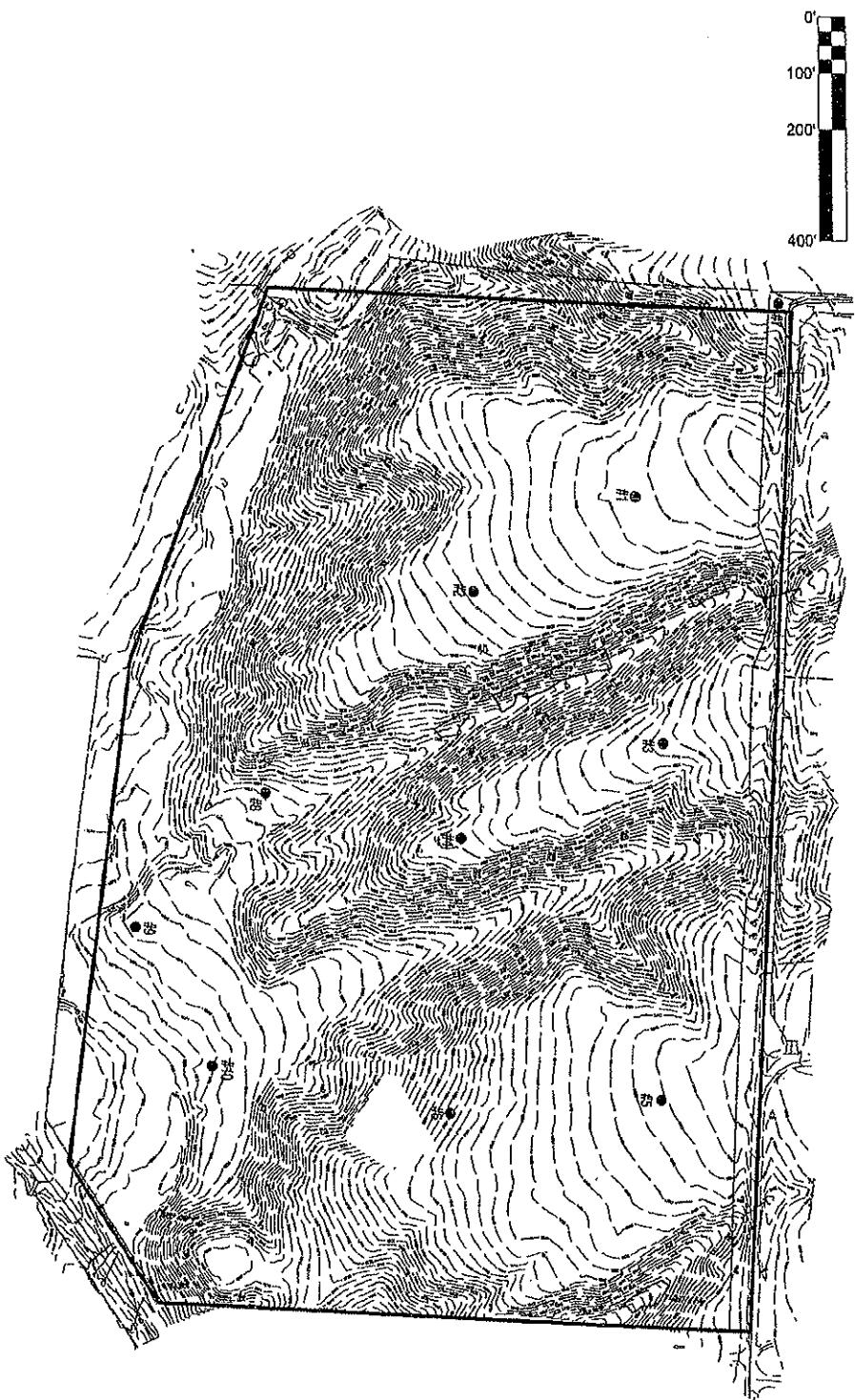
**BORING LOGS**

**BORING LOG GENERAL NOTES**

**CLASSIFICATION OF SOILS FOR ENGINEERING PURPOSES**

**MOISTURE-DENSITY CURVES**





SHEET DESCRIPTION: Site Layout

PROJECT NAME: Atlanta Site

PROJECT NO.: N12B10

REVISION	DATE	DESIGNED BY:	0 OF
1	xx/xx/xx	DRAWN BY: JBE	
2			
3			
4		DATE PRINTED: 3/8/12	

# TEST BORING LOG

PROJECT TITLE: Continental Atlanta Drill Pad, Near Williston, ND

PROJECT NUMBER: 12-12165

BORING NO: 1

DEPTH IN FEET	Approximate Surface Elevation = 1969.2' Description of Materials	GEOLOGIC ORIGIN	SAMPLE DATA				LABORATORY TESTS			
			WL	N	NO	TYPE	W	D	LL	QU
0.0'	Grass/weed cover									
2.5'	Sand w/clay: Brown, dry, loose (SC)	Alluvium								
5.0'	Sand: Brown, sl. moist, loose, m. grained, poorly graded, gravel present (SP)	Glacial Deposit		7	1	SB	4	FR	NP	
9.0'										
10.0'										
12.0'	Sandy Clay w/gravel: Brown, sl. Moist v. stiff, cobble present, variable gravel and sand content (CL w/sand and gravel)			15	2	SB	9	118		
15.0'	cobble absent, less gravel				12	3	SB	17	110	
17.5'										
20.0'	Fat Clay w/sand: Brown, moist, stiff, gravel present (CH w/sand) traces of gravel, variable sand content	Glacial Till		14	4	SB	16	108		
24.0'										
25.0'				14	5	SB				
30.0'					12	6	SB	18	108	
35.0'							NSR			
36.0'										
40.0'										
45.0'							NSR			
48.0'										
50.0'	Dk gray				13	7	SB	18	111	
55.0'										
57.0'										
58.0'										
60.0'	Shale: Dk. Gray, wet, m. stiff (CH)	Pierre Shale			14	8	SB			
61.0'	End of Boring									
DATE:	WATER TABLE MEASUREMENTS		DATE: 6/5/12							
6/5/12	Encountered at 57'		METHOD OF DRILLING: 2.25" HSA							
	Borehole caved to 40'		CREW CHIEF: MS							

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# TEST BORING LOG

PROJECT TITLE: Continental Atlanta Drill Pad, Near Williston, ND

PROJECT NUMBER: 12-12165

BORING NO: 2

DEPTH IN FEET	Approximate Surface Elevation = 1955.0' Description of Materials	GEOLOGIC ORIGIN	SAMPLE DATA				LABORATORY TESTS			
			WL	N	NO	TYPE	W	D	LL	QU
										PL
0.0'	Grass/weed cover	Glacial Deposit								
2.5'	Sand w/clay: Brown, dry, loose variable clay content (SC)									
5.0'	Clayey Sand: Brown, sl. Moist, m. dense, variable sand content, trace of gravel (SC)			16	1	SB	8	117		
8.0'		Glacial Till								
10.0'	Fat Clay w/sand: Brown, moist, v. stiff, traces of gravel, variable sand content (CH)			16	2	SB	16	105	64 28	
15.0'	stiff			13	3	SB	17	111		
16.0'										
20.0'	v. stiff			21	4	SB	18	102		
24.0'										
25.0'				21	5	SB	19	107		
30.0'						NSR				
32.0'										
35.0'					15	6	SB			
40.0'										
41.0'	End of Boring				14	7	SB			
DATE:	WATER TABLE MEASUREMENTS	DATE: 6/5/12								
6/5/12	Not Encountered	METHOD OF DRILLING: 2.25" HSA								
	Borehole caved to 25'	CREW CHIEF: MS								

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# TEST BORING LOG

PROJECT TITLE: Continental Atlanta Drill Pad, Near Williston, ND

PROJECT NUMBER: 12-12165

BORING NO: 3

DEPTH IN FEET	Approximate Surface Elevation = 1958.9' Description of Materials	GEOLOGIC ORIGIN	SAMPLE DATA				LABORATORY TESTS			
			WL	N	NO	TYPE	W	D	LL	QU
							PL			
0.0'	Grass/weed cover									
1.5'	Sand w/clay: Brown, dry, loose (SC)	Glacial Deposit								
	Sand w/clay: Brown, dry, m. dense m. grained, poorly graded (SP) variable clay content									
5.0'					18	1	SB	4	FR	NP
8.0'										
10.0'					11	2	SB			
13.0'	Sandy Clay: Brown, moist, stiff, gravel present, variable sand content (CL)									
15.0'	Fat Clay w/sand: Brown, moist, stiff, traces of gravel variable sand content (CH)	Glacial Till			11	3	SB	17	110	
16.0'										
20.0'					12	4	SB			
24.0'										
25.0'							NSR			
30.0'	dk. Gray				13	5	SB	15	107	
32.0'										
35.0'							NSR			
40.0'										
41.0'	less stiff End of Boring				9	6	SB			
DATE:	WATER TABLE MEASUREMENTS	DATE: 6/5/12								
6/5/12	Not Encountered	METHOD OF DRILLING: 2.25" HSA								
	Borehole caved to 25'	CREW CHIEF: MS								

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# TEST BORING LOG

PROJECT TITLE: Continental Atlanta Drill Pad, Near Williston, ND  
 PROJECT NUMBER: 12-12165

BORING NO: 4

DEPTH IN FEET	Approximate Surface Elevation = 1941.2' Description of Materials	GEOLOGIC ORIGIN	SAMPLE DATA				LABORATORY TESTS			
			WL	N	NO	TYPE	W	D	LL	QU
0.0'	Grass/weed cover									
1.5'	Sand w/clay: Brown, dry, loose, gravel and cobble present (SC)	Glacial Deposit								
3.0'										
4.5'	Sand: Tan, dry, loose (SP)									
5.0'	Sandy Clay: Brown, moist, stiff, trace of gravel, variable sand content (CL)									
8.0'										
9.0'										
10.0'	Fat Clay w/sand: Brown, moist stiff, traces of gravel, variable sand content (CH)	Glacial Till	14	2	SB	16	107			
15.0'			14	3	SB					
16.0'										
20.0'			14	4	SB					
24.0'										
25.0'						NSR				
30.0'										
31.0'										
32.0'	End of Boring									
40.0'										
DATE: 6/6/12	WATER TABLE MEASUREMENTS Not Encountered Borehole caved to 24'	DATE: 6/6/12 METHOD OF DRILLING: 2.25" HSA CREW CHIEF: MS								

**AMERICAN TECHNICAL SERVICES, INC. (605) 787-9303**

# TEST BORING LOG

PROJECT TITLE: Continental Atlanta Drill Pad, Near Williston, ND  
 PROJECT NUMBER: 12-12165

BORING NO: 5

DEPTH IN FEET	Approximate Surface Elevation = 1963.6' Description of Materials	GEOLOGIC ORIGIN	SAMPLE DATA				LABORATORY TESTS			
			WL	N	NO	TYPE	W	D	LL	QU
										PL
0.0'	Grass/weed cover									
1.0'	Sand w/clay: Brown, dry, loose (SC)	Alluvium								
5.0'	Sand w/clay: Brown, sl. moist, m. dense, m. grained, poorly graded, gravel present (SP)	Glacial Deposit		13	1	SB	5	FR		
10.0'				11	2	SB	15	112		
12.0'	Fat Clay w/sand: Brown, moist, stiff, gravel present, (CH w/sand)	Glacial Till		11	3	SB	20	97	62	26
15.0'				10	4	SB	19	107		
20.0'										
24.0'										
25.0'										
30.0'										
35.0'										
36.0'										
40.0'	dk. Gray			12	6	SB	15	115		
45.0'										
48.0'										
50.0'	v. stiff			15	7	SB	15	FR		
51.0'	End of Boring									
60.0'										
DATE:	WATER TABLE MEASUREMENTS	DATE: 6/6/12								
6/6/12	Not Encountered	METHOD OF DRILLING: 2.25" HSA								
	Borehole caved to 32'	CREW CHIEF: MS								

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# TEST BORING LOG

PROJECT TITLE: Continental Atlanta Drill Pad, Near Williston, ND

PROJECT NUMBER: 12-12165

BORING NO: 6

DEPTH IN FEET	Approximate Surface Elevation = 1921.5' Description of Materials	GEOLOGIC ORIGIN	SAMPLE DATA				LABORATORY TESTS			
			WL	N	NO	TYPE	W	D	LL	QU
0.0'	Grass/weed cover									
	Clayey Sand/Sandy Clay: Brown, dry, stiff/m. dense, variable clay & sand content (SC-CL)	Glacial Deposit								
4.5'										
5.0'	Fat Clay w/sand: Brown, moist, v. stiff, traces of gravel, variable sand content (CH)	Glacial Till		19	1	SB	11	114		
10.0'	less stiff			8	2	SB	11	118		
15.0'				11	3	SB	15	116		
17.0'										
	Shale: Gray & brown, moist, stiff, sand present (CH)	Pierre Shale								
20.0'				10	4	SB	34	88		
25.0'										
26.0'	End of Boring			11	5	SB				
DATE:	WATER TABLE MEASUREMENTS	DATE: 6/6/12								
6/6/12	Not Encountered	METHOD OF DRILLING: 2.25" HSA								
	Borehole caved to 24'	CREW CHIEF: MS								

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# TEST BORING LOG

PROJECT TITLE: Continental Atlanta Drill Pad, Near Williston, ND

PROJECT NUMBER: 12-12165

BORING NO: 7

DEPTH IN FEET	Approximate Surface Elevation = 1977.1' Description of Materials	GEOLOGIC ORIGIN	SAMPLE DATA				LABORATORY TESTS			
			WL	N	NO	TYPE	W	O	LL	QU
										PL
0.0'	Grass/weed cover									
2.0'	Sand w/clay: Brown, dry, loose (SC)	Alluvium								
5.0'	Sand: Brown, sl. moist, loose, m. grained, poorly graded, gravel present (SP)	Glacial Deposit		9	1	SB	6	FR		
10.0'	Fat Clay w/sand: Brown, moist, stiff, gravel present, (CH w/sand) variable sand content	Glacial Till		10	2	SB	16	109		
12.0'										
15.0'				8	3	SB				
20.0'				9	4	SB	16	111		
24.0'										
25.0'				10	5	SB				
30.0'						NSR				
35.0'					9	6	SB			
36.0'										
40.0'						NSR				
45.0'	Dk. Gray				10	7	SB			
48.0'										
50.0'						NSR				
55.0'										
60.0'					9	8	SB			
61.0'	End of Boring				8	9	SB			
DATE: 6/6/12	WATER TABLE MEASUREMENTS Not Encountered	DATE: 6/6/12	METHOD OF DRILLING: 2.25" HSA							
	Borehole caved to 43'	CREW CHIEF: MS								

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# TEST BORING LOG

PROJECT TITLE: Continental Atlanta Drill Pad, Near Williston, ND

PROJECT NUMBER: 12-12165

BORING NO: 8

DEPTH IN FEET	Approximate Surface Elevation = 1892.3' Description of Materials	GEOLOGIC ORIGIN	SAMPLE DATA				LABORATORY TESTS			
			WL	N	NO	TYPE	W	D	LL	QU
PL										
0.0'	Grass/weed cover	Alluvium								
	Clay w/sand: Gray, moist, stiff, sand present (CL)									
5.0'				8	1	SB	21	97		
10.0'				10	2	SB	19	107		
15.0'	Fat Clay w/sand: Brown, moist, stiff, variable sand content (CH)	Pierre Shale		9	3	SB	22	97		
18.0'			V							
20.0'				10	4	SB	33	91		
21.0'	Shale: Gray & brown, moist, stiff, sand present (CH)									
25.0'	End of Boring									
DATE: 6/7/12	WATER TABLE MEASUREMENTS Encountered at 18' Borehole caved to 14'	DATE: 6/7/12	METHOD OF DRILLING: 2.25" HSA CREW CHIEF: MS							

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# TEST BORING LOG

PROJECT TITLE: Continental Atlanta Drill Pad, Near Williston, ND  
 PROJECT NUMBER: 12-12165

BORING NO: 9

DEPTH IN FEET	Approximate Surface Elevation = 1878.6' Description of Materials	GEOLOGIC ORIGIN	SAMPLE DATA				LABORATORY TESTS			
			WL	N	NO	TYPE	W	D	LL	QU
										PL
0.0'	Grass/weed cover									
	Sand w/clay: Brown, moist, loose, variable clay content (SC), traces of gravel present	Alluvium								
5.0'					9	1	SB	14	105	
10.0'	Gravelly Sand: Brown, moist, dense, variable sand content (SW)			22	2	SB	4		FR	
15.0'	obstructed sampler				11	NSR	SB	4		FR
18.0'	less dense, wet, less gravel		V							
20.0'				4	4	SB	23	109		
21.0'	End of Boring									
25.0'										
DATE: 6/7/12	WATER TABLE MEASUREMENTS Encountered at 18' Borehole caved to 13'	DATE: 6/7/12	METHOD OF DRILLING: 2.25" HSA				CREW CHIEF: MS			

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# TEST BORING LOG

PROJECT TITLE: Continental Atlanta Drill Pad, Near Williston, ND  
 PROJECT NUMBER: 12-12165

BORING NO: 10

DEPTH IN FEET	Approximate Surface Elevation = 1874.4' Description of Materials	GEOLOGIC ORIGIN	SAMPLE DATA				LABORATORY TESTS			
			WL	N	NO	TYPE	W	D	LL	QU
0.0'	Grass/weed cover									
	Sandy Clay/Clayey Sand: Brown, moist, m. stiff/loose, variable sand & clay content (CL-SC)	Alluvium								
5.0'	traces of gravel present			6	1	SB	11	111		
10.0'	soft/v. loose			4	2	SB	19	105		
15.0'	wet, softer/looser		V	2	3	SB	25	FR		
19.0'										
20.0'	Sand: Brown, poorly graded wet, v. loose (SP)						NSR			
22.0'	Gravel & cobble present									
25.0'										
26.0'	End of Boring						NSR			
DATE: 6/7/12	WATER TABLE MEASUREMENTS Encountered at 15' Borehole caved to 13'	DATE: 6/7/12	METHOD OF DRILLING: 2.25" HSA CREW CHIEF: MS							

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## GENERAL NOTES

DESCRIPTIVE TERMINOLOGY		RELATIVE SIZES	
Density Term	"N" Value	Boulder	> 12"
Very Loose	0 - 4	Cobble	3" - 12"
Loose	4 - 10	Gravel	3/4" - 3"
Medium Dense	10 - 16	Coarse	#4 - 3/4"
Dense	16 - 30	Fine	#4 - #10
Very Dense	> 30	Sand	#10 - #40
		Coarse	#40 - #200
		Medium	#200 (PI)
		Fine	<#200 (PI)
		Silt & Clay	

Consistency Term	"N" Value	Term	Range
Very Soft	0 - 2	Trace	0 - 5%
Soft	2 - 4	A Little	5 - 15%
Medium stiff	4 - 8	Some	15 - 30%
Stiff	8 - 15	With	30 - 50%
Very stiff	15 - 30		
Hard	< 30		

### BORING AND SAMPLING SYMBOLS

SYMBOL	DEFINITION
HSA	Hollow Stem Auger - 3 1/4" ID & 4 1/4" ID
FA	Flight Auger - 4" OD
HA	Hand Auger - 1 1/2" OD
DC	Drive Casing
PD	Pipe Drill or Clean Out Tube
CS	Continuous Split Barrel Sampling
DM	Drilling Mud
JW	Jetting Water
SB	Split Barrel Sampler
TW	Thin Wall Tube Sampler
LS	Split Barrel Liner Sample
W	Wash Sample
B	Bag Sample
NSR	No Sample Retrieved
NMR	No Water Level Measurement Recorded
WL	Water Level
N	Standard Penetration Value
	Water Level Symbol

### LABORATORY TEST SYMBOLS

SYMBOL	DEFINITION
W	Moisture Content-Percent of Dry Weight    ASTM D2216
D	Dry Density-Pound Per Cubic Foot
LL & PL	Liquid Limit and Plastic Limit ASTM D4318
Qu	Unconfined Compressive Strength Pounds Per Square Foot    ASTM D2166

# CLASSIFICATION OF SOILS FOR ENGINEERING PURPOSES

ASTM Designation: D 2487 — 69 AND D 2488 — 69

(Unified Soil Classification System)

Major divisions		Group symbols	Typical Names	Classification Criteria	
Fine-grained soils 50% or more passes No. 200 sieve*	Sands and clays Liquid limit 50% or less	GW	Well-graded gravels and gravel-sand mixtures, little or no fines	$C_u = \frac{D_{50}}{D_{10}}$ greater than 4; $C_z = \frac{(D_{30})^2}{D_{10} \times D_{50}}$ between 1 and 3	
			Clean gravels		
		GP	Poorly graded gravels and gravel-sand mixtures, little or no fines	Not meeting both criteria for GW	
		GM	Silty gravels, gravel-sand-silt mixtures	Classification on basis of percentage of fines Less than 5% pass No. 200 sieve ..... GW, GP, SW, SP More than 12% pass No. 200 sieve ..... GM, GC, SH, SC 5 to 12% pass No. 200 sieve ..... Borderline classifications requiring use of dual symbols	Atterberg limits below "A" line or P.I. less than 4 Atterberg limits above "A" line with P.I. greater than 7
		GC	Clayey gravels, gravel-sand-clay mixtures		
		SW	Well-graded sands and gravelly sands, little or no fines		
		SP	Poorly graded sands and gravelly sands, little or no fines		
		SM	Silty sands, sand-silt mixtures		
		SC	Clayey sands, sand-clay mixtures		
	Highly organic soils	ML	Inorganic silts, very fine sands, rock flour, silty or clayey fine sands	Plasticity Chart For classification of fine-grained soils and fine fraction of coarse-grained soils. Atterberg Limits plotting in hatched area are borderline classifications requiring use of dual symbols. Equation of A-line: $PI = 0.73(LL - 20)$	Atterberg limits plotting in hatched area are borderline classifications requiring use of dual symbols
		CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays		
		OL	Organic silts and organic silty clays of low plasticity		
		MH	Inorganic silts, micaceous or diatomaceous fine sands or silts, elastic silts		
		CH	Inorganic clays of high plasticity, fat clays		
		OH	Organic clays of medium to high plasticity		
		PI	Peat, muck and other highly organic soils	Liquid Limit	

\* Based on the material passing the 3 in. (75 mm) sieve.



8105 Black Hawk Rd • PO Box 558 • Black Hawk, SD 57718-0558 • Phone (605) 787-9303 • FAX (605) 787-9515  
140 Pine Needle Drive • Spearfish, SD 57783 • Phone (605) 642-2742 • Mobile 390-3768

#### PROCTOR TEST

#### MOISTURE DENSITY RELATION

BROSZ ENGINEERING

Proctor#: 1 Date: 06/11/12

ASTM: 698 Method: A

Attn: Jade

Soil Classification: (SC-CL) Clayey  
Sand/Sandy Clay

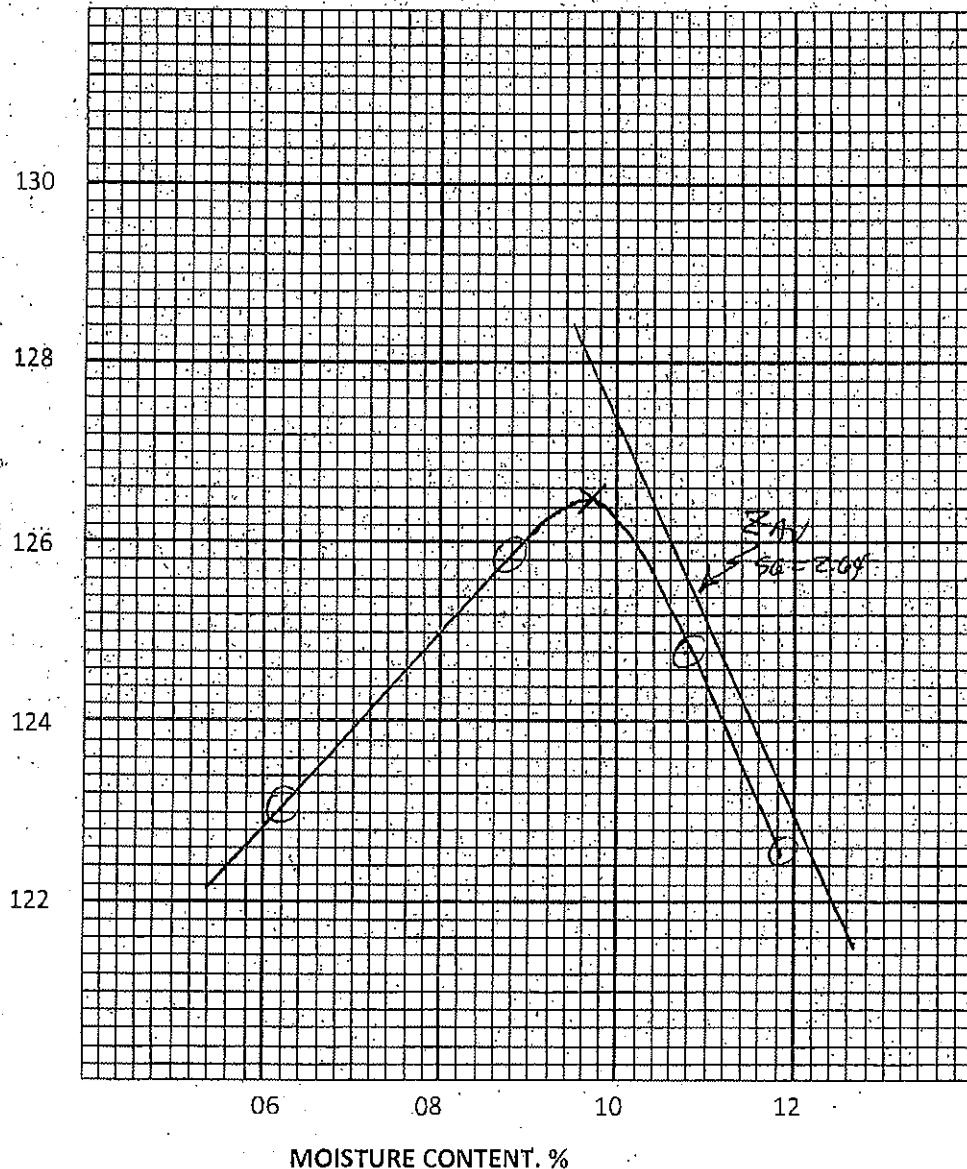
Project: Continental Atlanta Pad, Near  
Williston, North Dakota

Project Number: 12-12165

MAXIMUM DENSITY: 126.5 pcf

OPTIMUM MOISTURE CONTENT: 9.7%

DRY DENSITY, pcf



Cc:

SIOUX FALLS • BLACK HAWK • SPEARFISH

**AMERICAN  
TECHNICAL  
SERVICES, INC.**

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140 Pine Needle Drive • Spearfish, SD 57783 • Phone (605) 642-2742 • Mobile 390-3768

**PROCTOR TEST**

**MOISTURE DENSITY RELATION**

BROSZ ENGINEERING

Proctor#: 2 Date: 06/11/12

ASTM: 698 Method: A

Attn: Jade

Soil Classification: (SP) Sand w/ Gravel,  
B15-0'-10'

Project: Continental Atlanta Pad, Near  
Williston, North Dakota

Project Number: 12-12165

**MAXIMUM DENSITY: 123.2 pcf**

**OPTIMUM MOISTURE CONTENT: 8.3%**

DRY DENSITY, pcf

126

124

122

120

118

06 08 10 12

MOISTURE CONTENT, %

Cc:

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# PERMEABILITY TEST REPORT

**TEST DATA:**

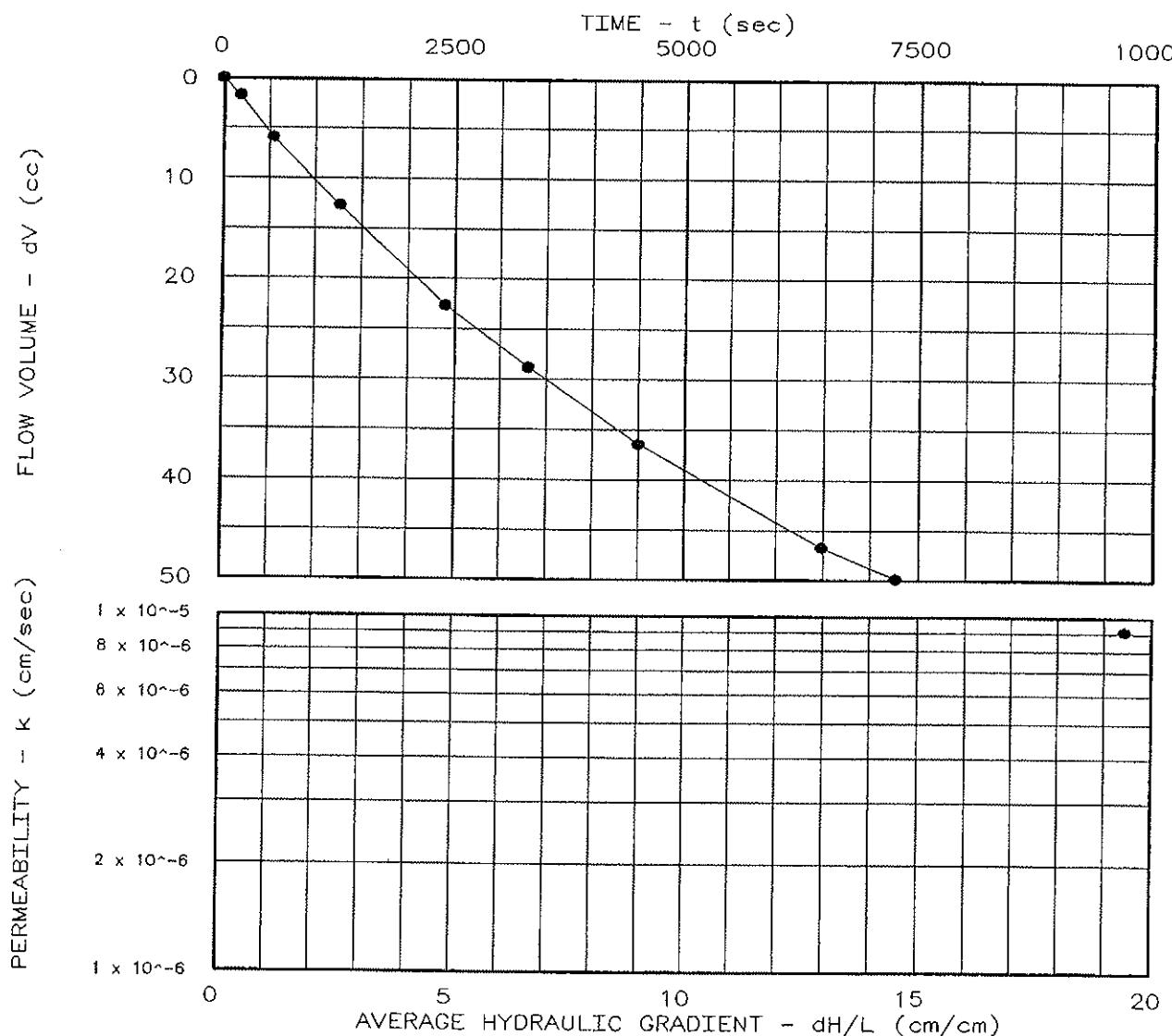
Specimen Height (cm): 7.50  
 Specimen Diameter (cm): 7.07  
 Dry Unit Weight (pcf): 110.8  
 Moisture Before Test (%): 13.8  
 Moisture After Test (%): 0.0  
 Run Number: 1 ● 2 ▲  
 Cell Pressure (psi): 65.0  
 Test Pressure(psi): 60.0  
 Back Pressure(psi): 57.9  
 Diff. Head (psi): 2.1  
 Flow Rate (cc/sec):  $6.93 \times 10^{-3}$   
 Perm. (cm/sec):  $9.08 \times 10^{-6}$

**SAMPLE DATA:**

Sample Identification: Fill No.3

**Visual Description:**
**Remarks:**

Maximum Dry Density (pcf): 116.6  
 Optimum Moisture Content (%): 13.8  
 ASTM(D698)  
 Percent Compaction: 95.0%  
 Permeameter type: Flexwall  
 Sample type: Remolded



Project: Atlanta Site

Location:

Date: 9/10/2012

Project No.: 114-551057

File No.: 258

Lab No.:

Tested by:

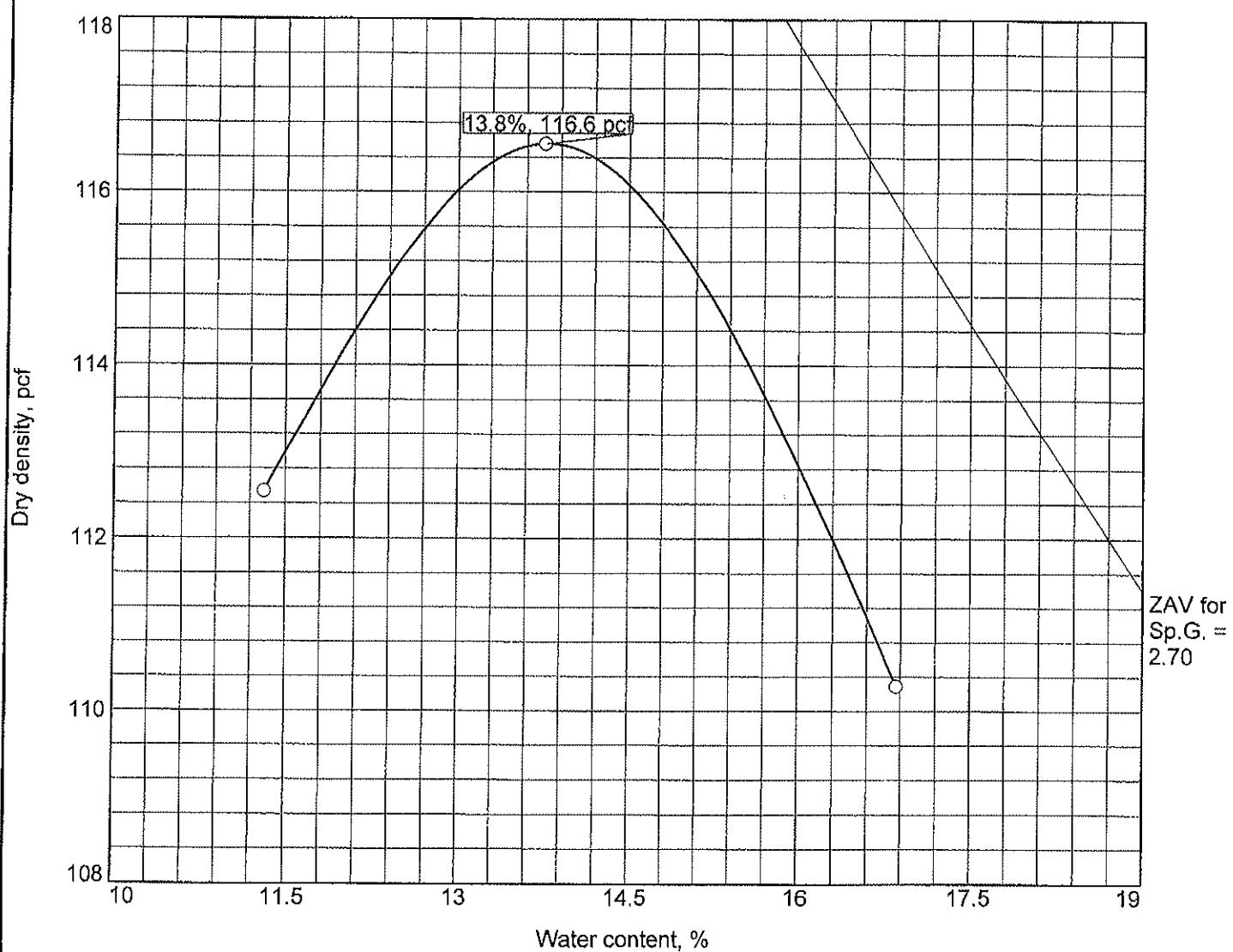
Checked by:

Test: CH - Constant head

PERMEABILITY TEST REPORT

**TETRA TECH**

## Moisture Density Relationship



Test specification: ASTM D 698-00a Method A Standard

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > #4	% < No.200
	USCS	AASHTO						
				2.70				

TEST RESULTS		MATERIAL DESCRIPTION
Maximum dry density = 116.6 pcf		
Optimum moisture = 13.8 %		

Project No. 114-551057 Client: Continental Resources Project: Atlanta Site	Remarks:
○ Source of Sample: Fill No. 3	
Tetra Tech, Inc. Billings, MT	Figure

# PERMEABILITY TEST REPORT

**TEST DATA:**

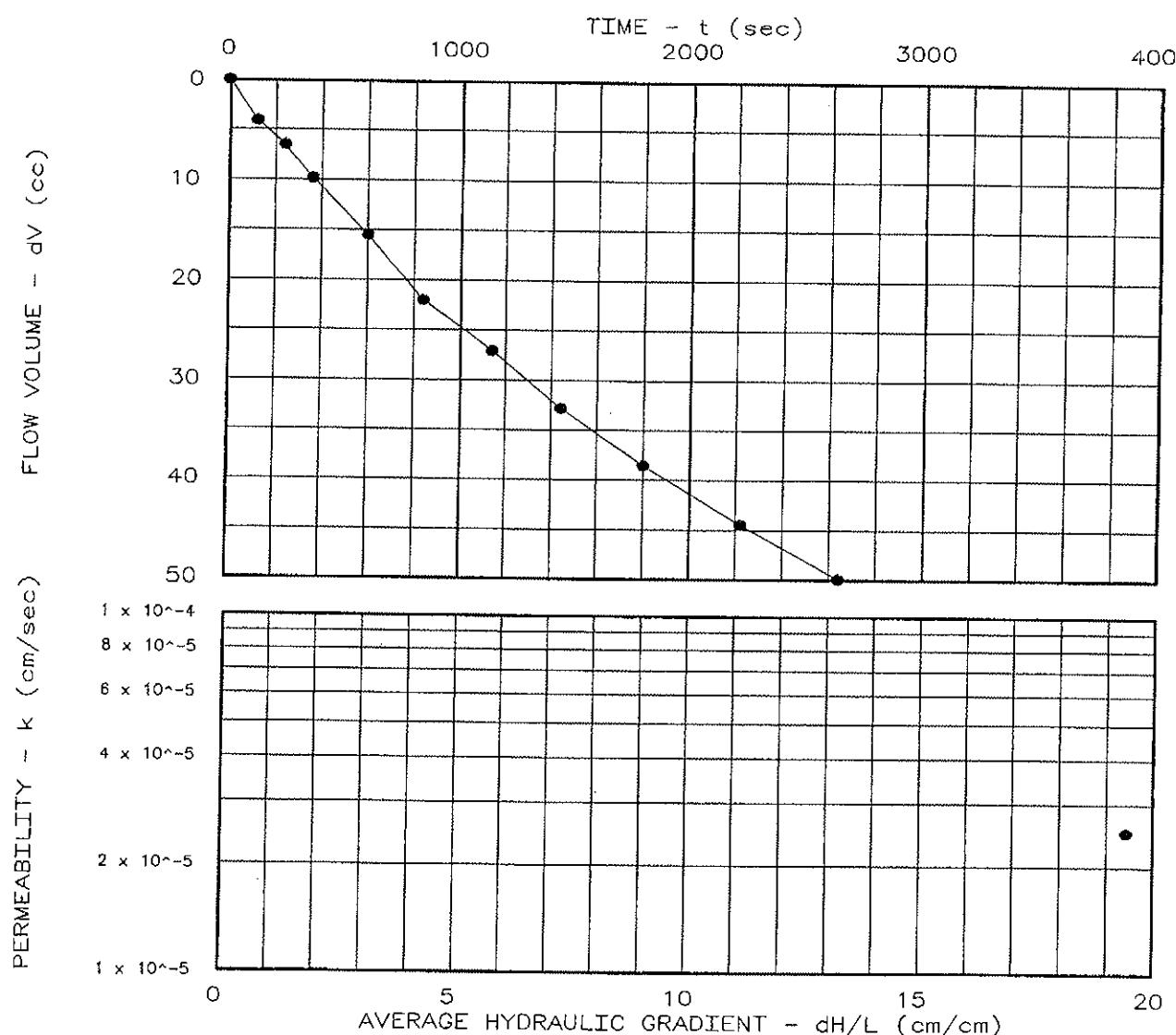
Specimen Height (cm): 7.50  
 Specimen Diameter (cm): 7.07  
 Dry Unit Weight (pcf): 112.3  
 Moisture Before Test (%): 13.1  
 Moisture After Test (%): 0.0  
 Run Number: 1 • 2 ▲  
 Cell Pressure (psi): 65.0  
 Test Pressure(psi): 60.0  
 Back Pressure(psi): 57.9  
 Diff. Head (psi): 2.1  
 Flow Rate (cc/sec):  $1.90 \times 10^{-2}$   
 Perm. (cm/sec):  $2.49 \times 10^{-5}$

**SAMPLE DATA:**

Sample Identification: Fill No.1

**Visual Description:**
**Remarks:**

Maximum Dry Density (pcf): 118.2  
 Optimum Moisture Content (%): 12.1  
 ASTM(D698)  
 Percent Compaction: 95.0%  
 Permeameter type: Flexwall  
 Sample type: Remolded



Project: Atlanta Site

Location:

Date: 9/10/2012

Project No.: 114-551057

File No.: 259

Lab No.:

Tested by:

Checked by:

Test: CH - Constant head

PERMEABILITY TEST REPORT

TETRA TECH

## Moisture Density Relationship



Test specification: ASTM D 698-00a Method A Standard

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > #4	% < No.200
	USCS	AASHTO						
				2.70				

### TEST RESULTS

Maximum dry density = 118.2 pcf

Optimum moisture = 12.1 %

### MATERIAL DESCRIPTION

Project No. 114-551057 Client: Continental Resources  
Project: Atlanta Site

Remarks:

Source of Sample: Fill No.1

Tetra Tech, Inc.

Billings, MT

Figure

# PERMEABILITY TEST REPORT

**TEST DATA:**

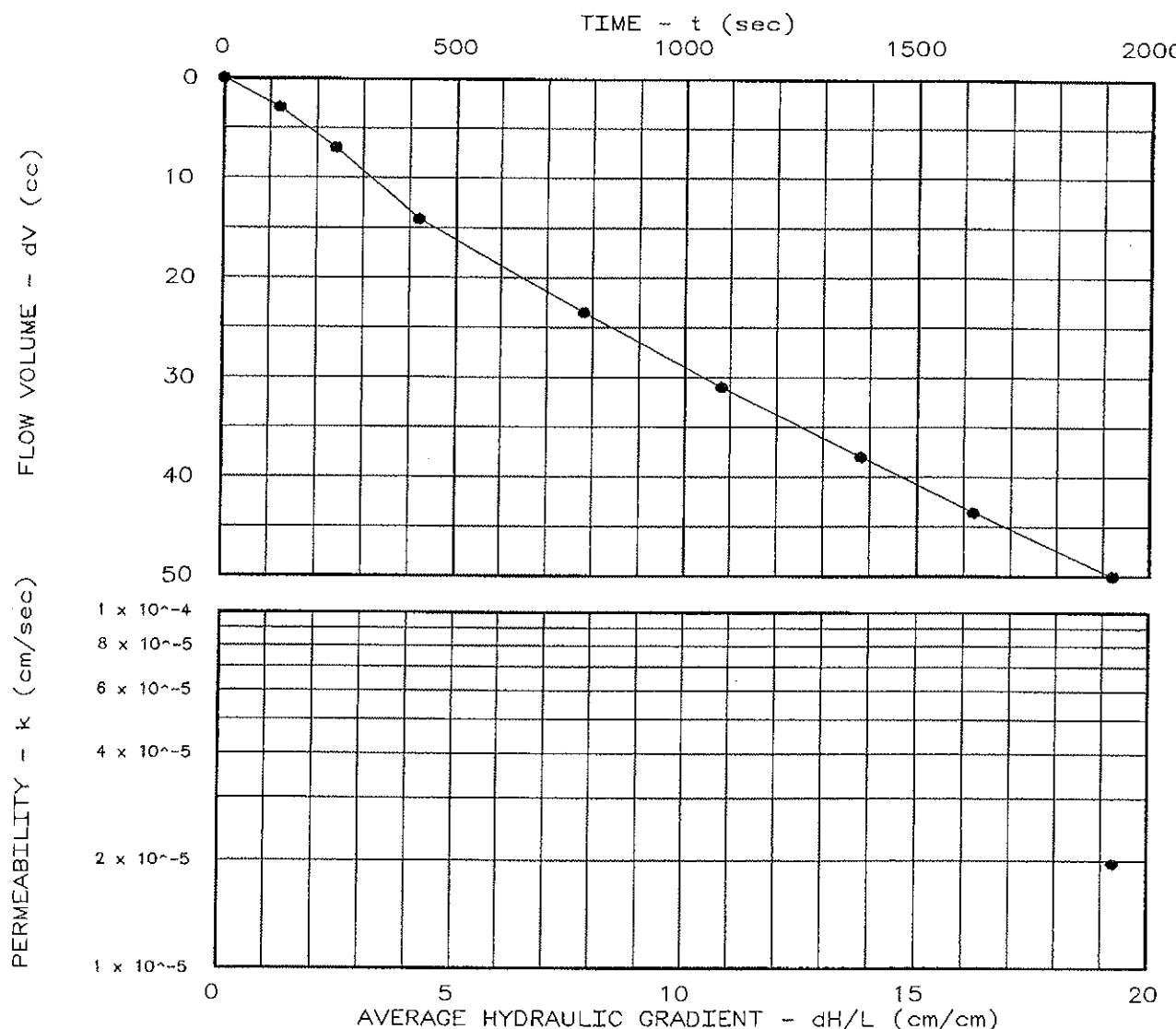
Specimen Height (cm): 7.50  
 Specimen Diameter (cm): 7.07  
 Dry Unit Weight (pcf): 112.1  
 Moisture Before Test (%): 12.6  
 Moisture After Test (%): 0.0  
 Run Number: 1 • 2 ▲  
 Cell Pressure (psi): 65.0  
 Test Pressure(psi): 60.0  
 Back Pressure(psi): 57.9  
 Diff. Head (psi): 2.1  
 Flow Rate (cc/sec):  $2.63 \times 10^{-2}$   
 Perm. (cm/sec):  $1.97 \times 10^{-5}$

**SAMPLE DATA:**

Sample Identification: Fill No.2

**Visual Description:**
**Remarks:**

Maximum Dry Density (pcf): 118.0  
 Optimum Moisture Content (%): 12.6  
 ASTM(D698)  
 Percent Compaction: 95.0%  
 Permeameter type: Flexwall  
 Sample type: Remolded



Project: Atlanta Site

Location:

Date: 9/10/2012

Project No.: 114-551057

File No.: 260

Lab No.:

Tested by:

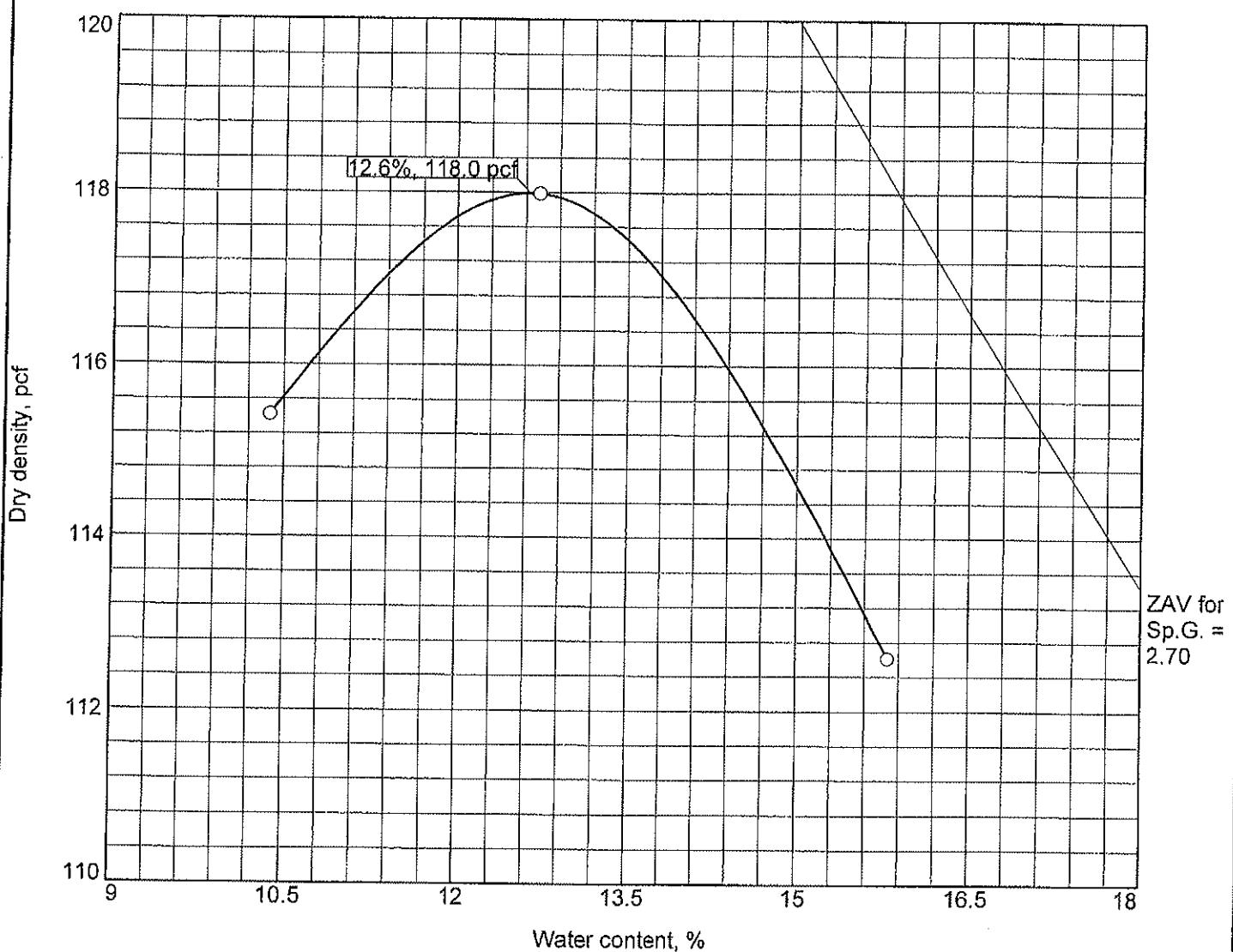
Checked by:

Test: CH - Constant head

PERMEABILITY TEST REPORT

TETRA TECH

## Moisture Density Relationship



Test specification: ASTM D 698-00a Method A Standard

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > #4	% < No.200
	USCS	AASHTO						
				2.70				

TEST RESULTS		MATERIAL DESCRIPTION
Maximum dry density = 118.0 pcf		
Optimum moisture = 12.6 %		
Project No. 114-551057 Client: Continental Resources Project: Atlanta Site		Remarks:
<input type="checkbox"/> Source of Sample: Fill No. 2		
Tetra Tech, Inc.		
Billings, MT		Figure

# PERMEABILITY TEST REPORT

**TEST DATA:**

Specimen Height (cm): 7.50  
 Specimen Diameter (cm): 7.07  
 Dry Unit Weight (pcf): 98.6  
 Moisture Before Test (%): 19.0  
 Moisture After Test (%): 0.0  
 Run Number: 1 • 2 ▲  
 Cell Pressure (psi): 65.0  
 Test Pressure(psi): 60.0  
 Back Pressure(psi): 57.9  
 Diff. Head (psi): 2.1  
 Flow Rate (cc/sec):  $1.25 \times 10^{-3}$   
 Perm. (cm/sec):  $1.61 \times 10^{-6}$

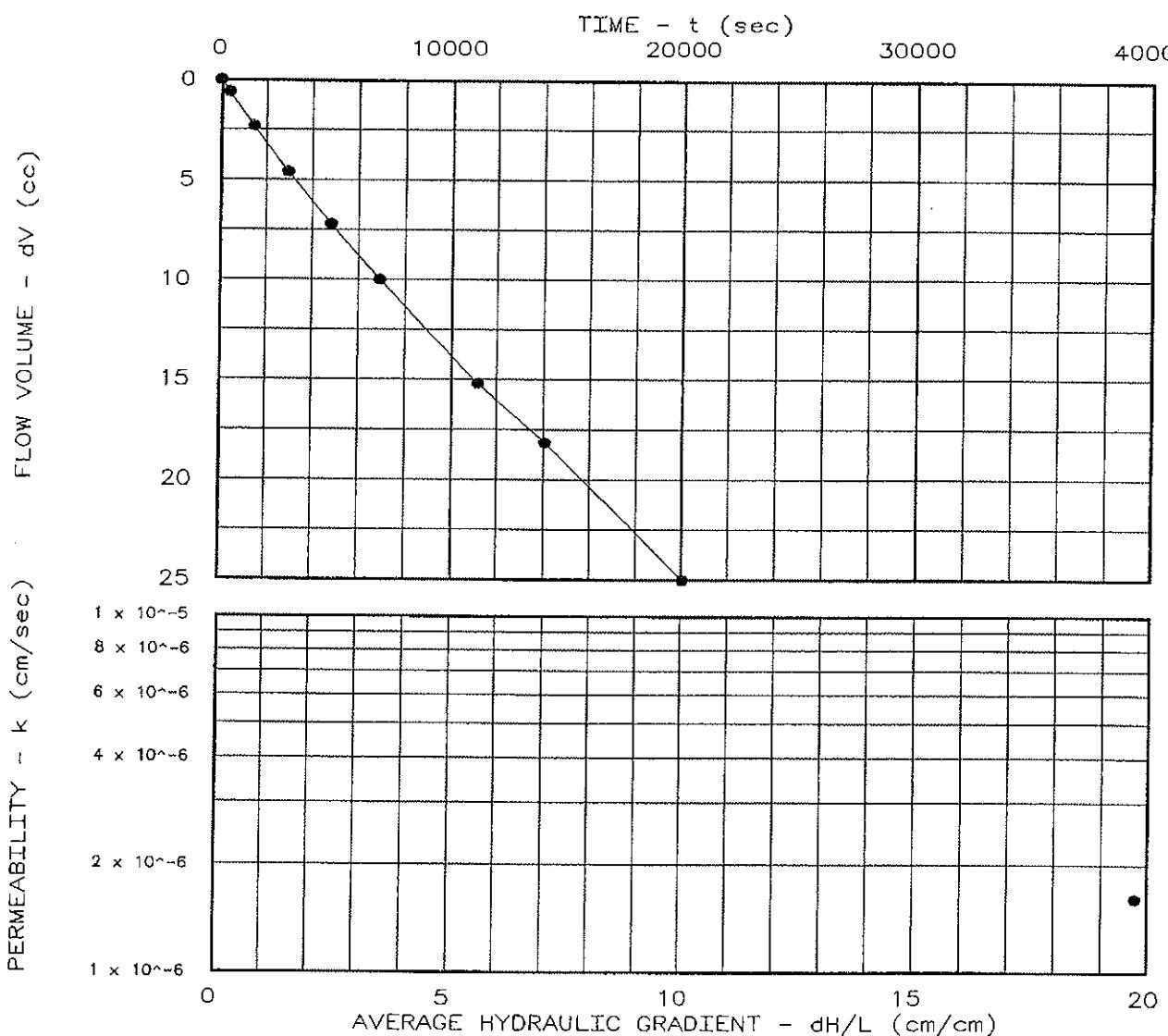
**SAMPLE DATA:**

Sample Identification: Cement No.1

Visual Description:

Remarks:

Maximum Dry Density (pcf): 103.7  
 Optimum Moisture Content (%): 18.9  
 ASTM(D698)  
 Percent Compaction: 95.0%  
 Permeameter type: Flexwall  
 Sample type: Remolded



Project: Atlanta Site

Location:

Date: 9/12/2012

Project No.: 114-551057

File No.: 261

Lab No.:

Tested by:

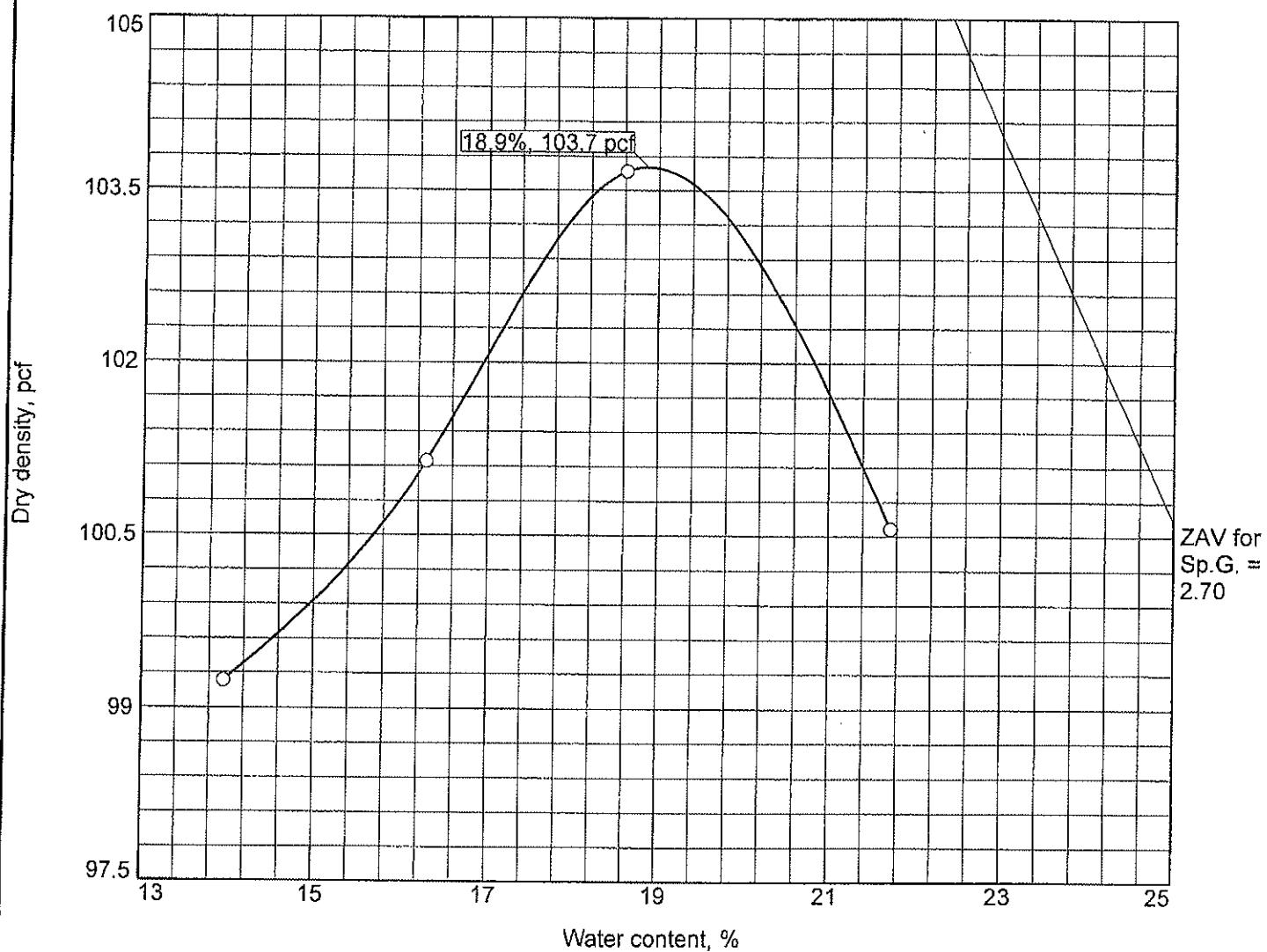
Checked by:

Test: CH - Constant head

PERMEABILITY TEST REPORT

TETRA TECH

## Moisture Density Relationship



Test specification: ASTM D 698-00a Method A Standard

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > #4	% < No.200
	USCS	AASHTO						
				2.70				

### TEST RESULTS

### MATERIAL DESCRIPTION

Maximum dry density = 103.7 pcf

Optimum moisture = 18.9 %

Project No. 114-551057 Client: Continental Resources  
Project: Atlanta Site

Remarks:

○ Source of Sample: Cement No.1

Tetra Tech, Inc.

Billings, MT

Figure

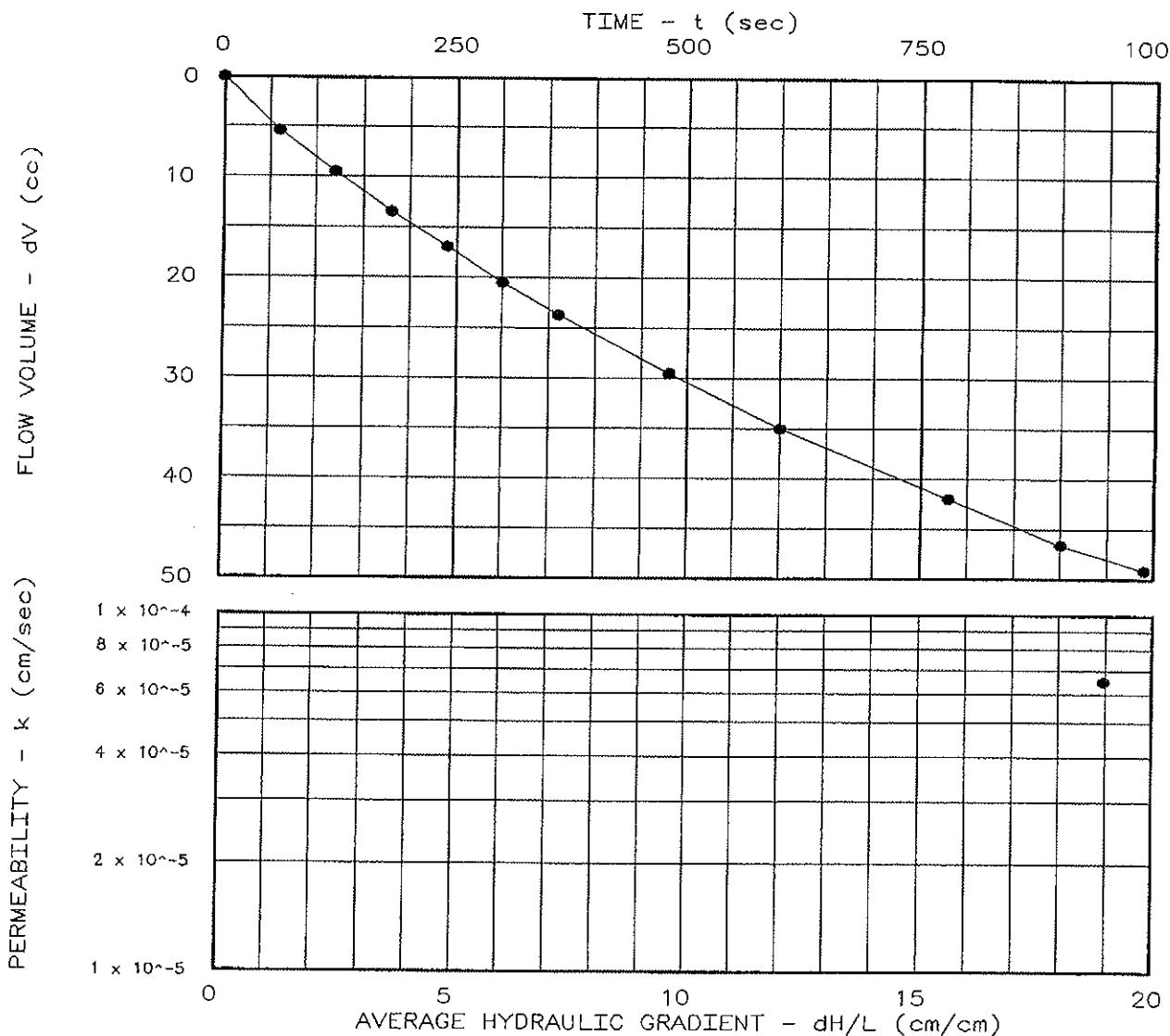
# PERMEABILITY TEST REPORT

**TEST DATA:**

Specimen Height (cm): 7.50  
 Specimen Diameter (cm): 7.07  
 Dry Unit Weight (pcf): 97.9  
 Moisture Before Test (%): 19.0  
 Moisture After Test (%): 0.0  
 Run Number: 1 ● 2 ▲  
 Cell Pressure (psi): 65.0  
 Test Pressure(psi): 60.0  
 Back Pressure(psi): 58.0  
 Diff. Head (psi): 2.0  
 Flow Rate (cc/sec):  $4.84 \times 10^{-2}$   
 Perm. (cm/sec):  $6.51 \times 10^{-5}$

**SAMPLE DATA:**

Sample Identification: Cement No.3  
 Visual Description:  
 Remarks:  
 Maximum Dry Density (pcf): 103.0  
 Optimum Moisture Content (%): 19.0  
 ASTM(D698)  
 Percent Compaction: 95.0%  
 Permeameter type: Flexwall  
 Sample type: Remolded



Project: Atlanta Site

Location:

Date: 9/12/12

Project No.: 114-551057

File No.: 262

Lab No.:

Tested by:

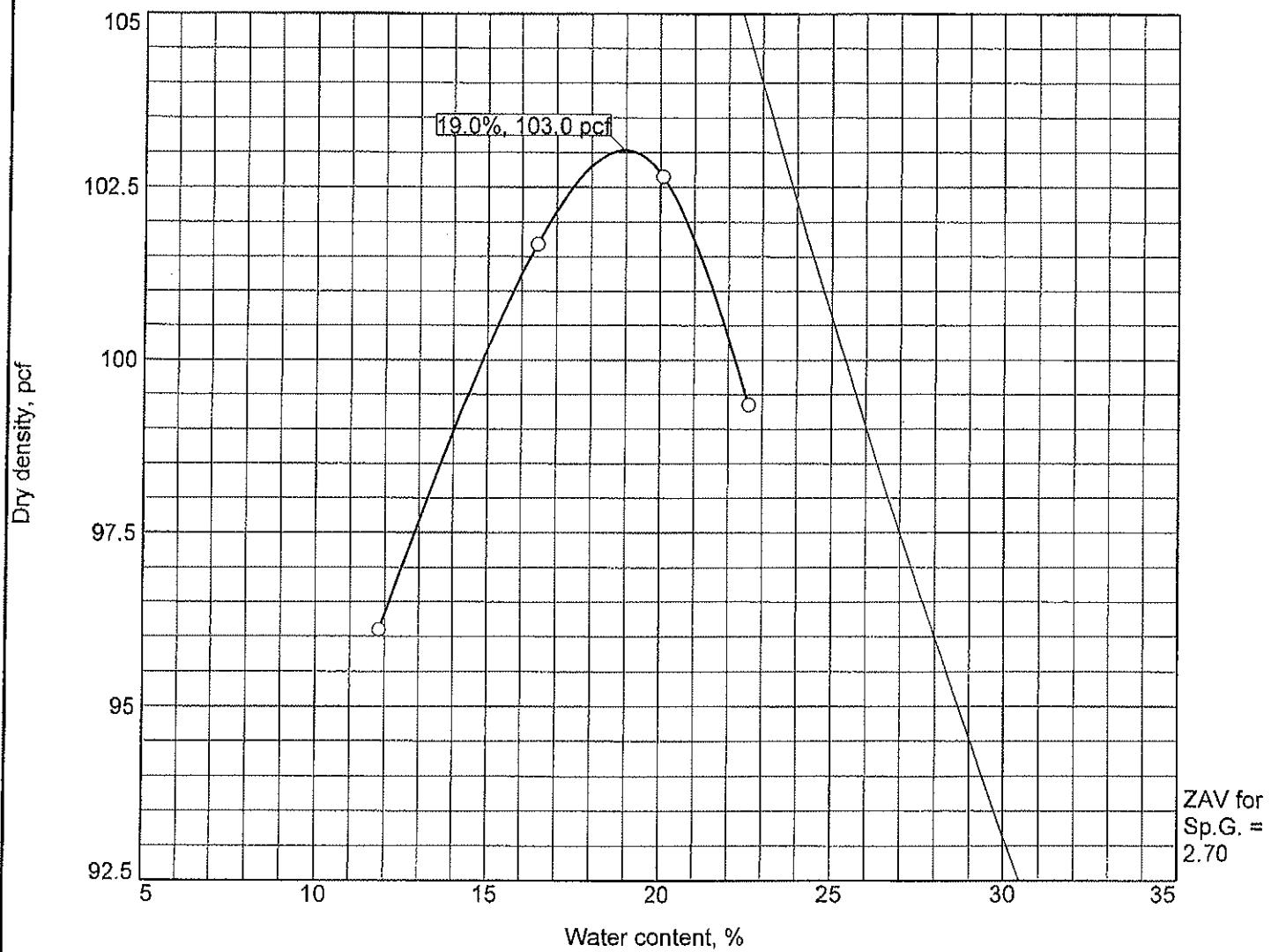
Checked by:

Test: CH - Constant head

PERMEABILITY TEST REPORT

TETRA TECH

# Moisture Density Relationship



Test specification: ASTM D 698-00a Method A Standard

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > #4	% < No.200
	USCS	AASHTO						
				2.70				

TEST RESULTS		MATERIAL DESCRIPTION
Maximum dry density = 103.0 pcf		
Optimum moisture = 19.0 %		
Project No. 114-551057 Client: Continental Resources Project: Atlanta Site		Remarks:
<input checked="" type="checkbox"/> Source of Sample: Cement No. 3		
Tetra Tech, Inc.		
Billings, MT		Figure

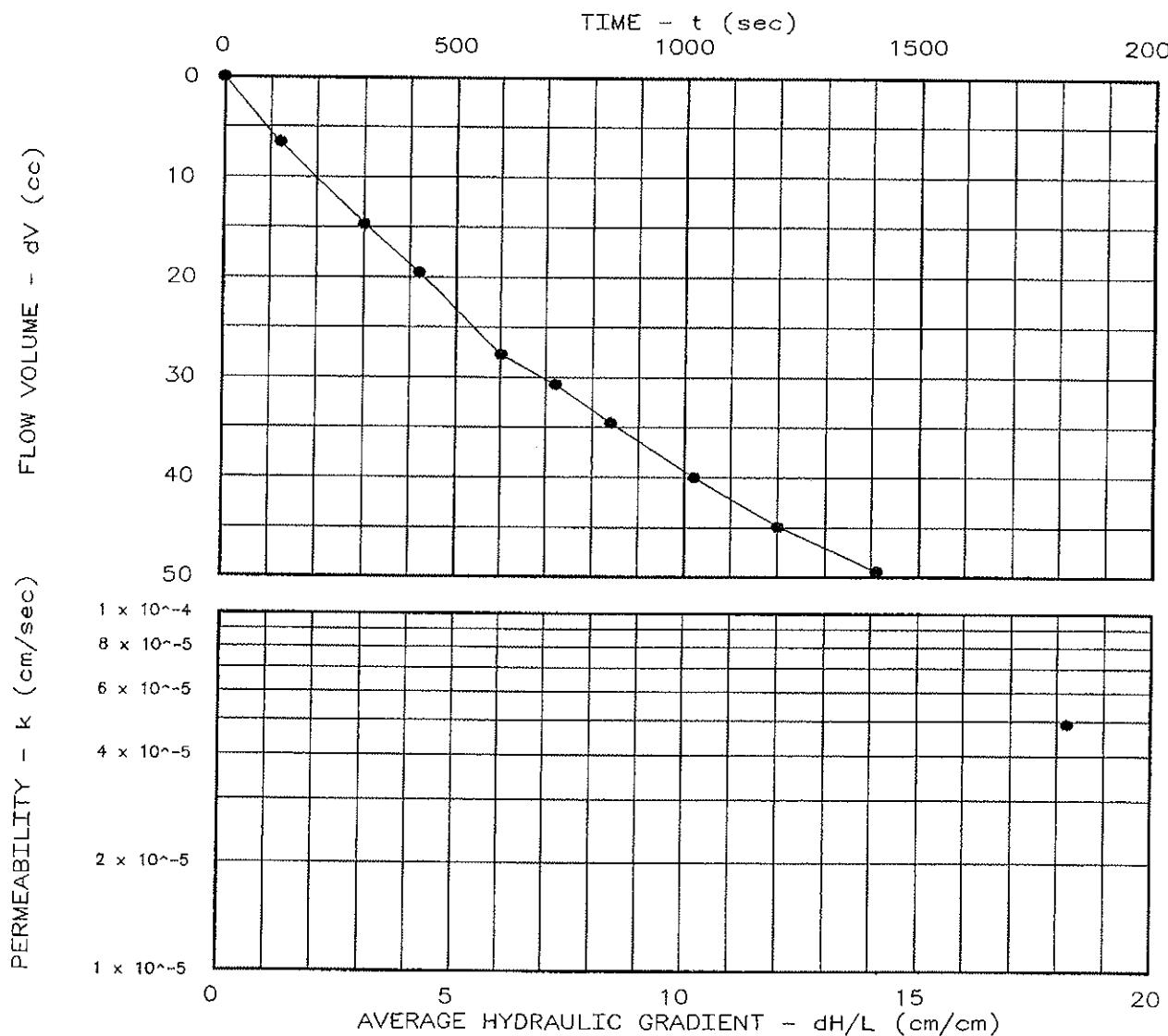
# PERMEABILITY TEST REPORT

**TEST DATA:**

Specimen Height (cm): 7.50  
 Specimen Diameter (cm): 7.07  
 Dry Unit Weight (pcf): 102.4  
 Moisture Before Test (%): 16.7  
 Moisture After Test (%): 0.0  
 Run Number: 1 • 2 ▲  
 Cell Pressure (psi): 65.0  
 Test Pressure(psi): 60.0  
 Back Pressure(psi): 58.1  
 Diff. Head (psi): 1.9  
 Flow Rate (cc/sec):  $3.50 \times 10^{-2}$   
 Perm. (cm/sec):  $4.90 \times 10^{-5}$

**SAMPLE DATA:**

Sample Identification: Cement No.2  
 Visual Description:  
 Remarks:  
 Maximum Dry Density (pcf): 107.7  
 Optimum Moisture Content (%): 16.7  
 ASTM(D698)  
 Percent Compaction: 95.0%  
 Permeometer type: Flexwall  
 Sample type: Remolded



Project: Atlanta Site

Location:

Date: 9/12/12

Project No.: 114-551057

File No.: 263

Lab No.:

Tested by:

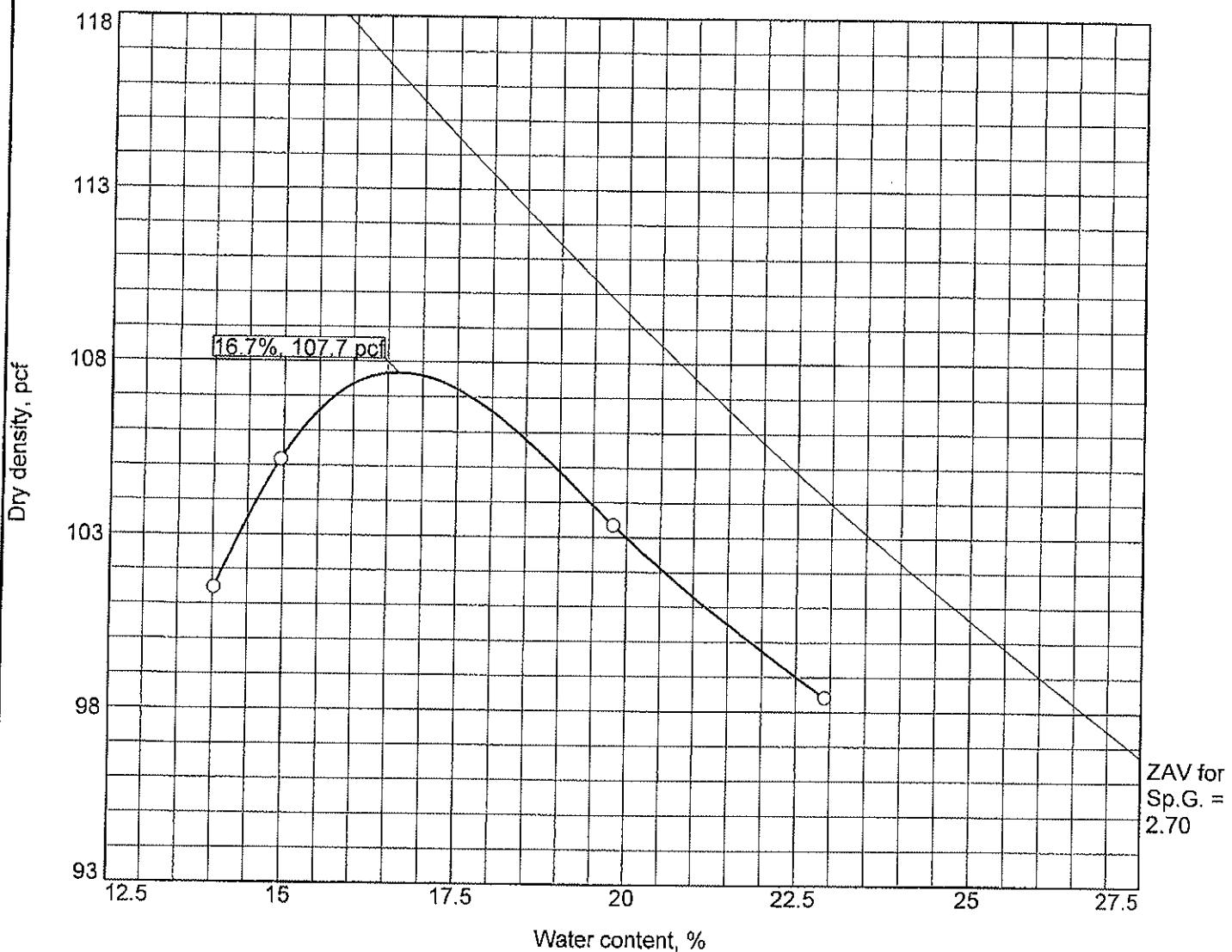
Checked by:

Test: CH - Constant head

PERMEABILITY TEST REPORT

TETRA TECH

## Moisture Density Relationship



Test specification: ASTM D 698-00a Method A Standard

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > #4	% < No.200
	USCS	AASHTO						
				2.70				

### TEST RESULTS

Maximum dry density = 107.7 pcf

Optimum moisture = 16.7 %

### MATERIAL DESCRIPTION

Project No. 114-551057 Client: Continental Resources  
Project: Atlanta Site

Remarks:

Source of Sample: Cement No. 2

Tetra Tech, Inc.

Billings, MT

Figure

# PERMEABILITY TEST REPORT

**TEST DATA:**

Specimen Height (cm): 7.50  
 Specimen Diameter (cm): 7.07  
 Dry Unit Weight (pcf): 103.7  
 Moisture Before Test (%): 17.2  
 Moisture After Test (%): 0.0  
 Run Number: 1 • 2 ▲  
 Cell Pressure (psi): 65.0  
 Test Pressure(psi): 60.0  
 Back Pressure(psi): 57.9  
 Diff. Head (psi): 2.1  
 Flow Rate (cc/sec):  $4.99 \times 10^{-5}$   
 Perm. (cm/sec):  $6.35 \times 10^{-8}$

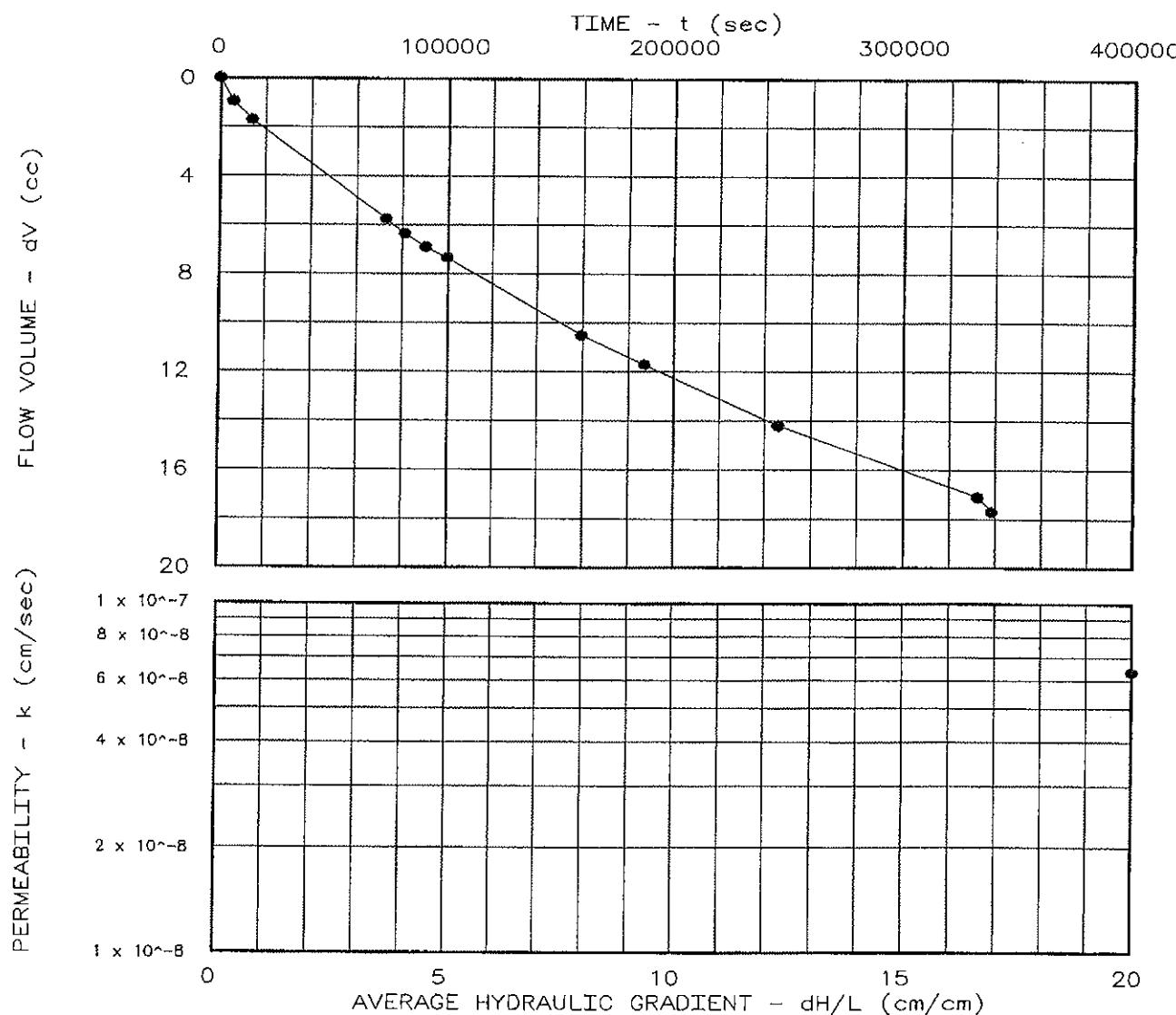
**SAMPLE DATA:**

Sample Identification: Fill No.4

Visual Description:

Remarks:

Maximum Dry Density (pcf): 109.1  
 Optimum Moisture Content (%): 17.2  
 ASTM(D698)  
 Percent Compaction: 95.0%  
 Permeameter type: Flexwall  
 Sample type: Remolded



Project: Atlanta Site

Location:

Date: 9/14/2012

Project No.: 114-551057

File No.: 264

Lab No.:

Tested by:

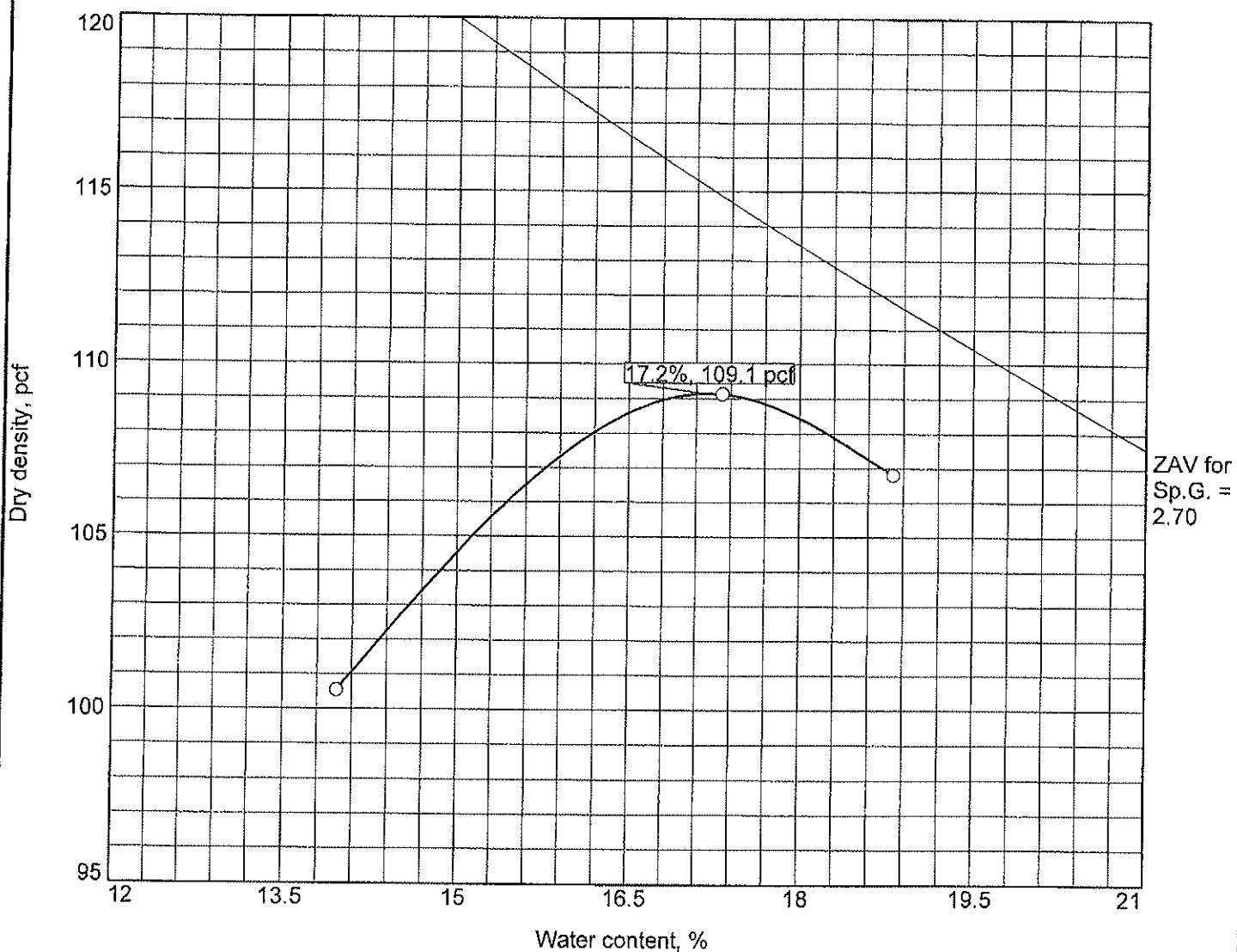
Checked by:

Test: CH - Constant head

PERMEABILITY TEST REPORT

TETRA TECH

## Moisture Density Relationship



Test specification: ASTM D 698-00a Method A Standard

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > #4	% < No.200
	USCS	AASHTO						
				2.70				

### TEST RESULTS

Maximum dry density = 109.1 pcf

Optimum moisture = 17.2 %

### MATERIAL DESCRIPTION

Project No. 114-551057 Client: Continental Resources

Project: Atlanta Site

Remarks:

○ Source of Sample: Fill No. 4

Tetra Tech, Inc.

Billings, MT

Figure



## ANALYTICAL SUMMARY REPORT

September 06, 2012

Continental Resources  
PO Box 268870  
Oklahoma City, OK 73126-8870

Workorder No.: B12082786

Project Name: Atlanta Site

Energy Laboratories Inc Billings MT received the following 4 samples for Continental Resources on 8/30/2012 for analysis.

Sample ID	Client Sample ID	Collect Date	Receive Date	Matrix	Test
B12082786-001	Original Material, From Cut	08/29/12 19:00	08/30/12	Soil	Cation Exchange Capacity Cations, Saturated Paste Conductivity pH, Saturated Paste NH4AC Soil Extraction for CEC Saturated Paste Extraction Sodium Adsorption Ratio
B12082786-002	Fill #1	08/29/12 19:00	08/30/12	Soil	Same As Above
B12082786-003	Fill #2	08/29/12 19:00	08/30/12	Soil	Same As Above
B12082786-004	Fill #3	08/29/12 19:00	08/30/12	Soil	Same As Above

The analyses presented in this report were performed by Energy Laboratories, Inc., 1120 S 27th St., Billings, MT 59101, unless otherwise noted. Any exceptions or problems with the analyses are noted in the Laboratory Analytical Report, the QA/QC Summary Report, or the Case Narrative.

The results as reported relate only to the item(s) submitted for testing.

If you have any questions regarding these test results, please call.

Report Approved By:

*Sonya Mallett*



## LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client: Continental Resources

Project: Atlanta Site

Client Sample ID: Original Material, From Cut

Location: E-1160177.20, N-421287.75, Elv. 1940.40

Lab ID: B12082786-001

Report Date: 09/06/12

Collection Date: 08/29/12 19:00

Date Received: 08/30/12

Sampled By: Spencer Ingalls

### Analyses

Result Units Qualifier Method Analysis Date / By

#### SATURATED PASTE

pH, sat. paste	7.8 s.u.		ASAM10-3.	09/06/12 16:30 / sm
Conductivity, sat. paste	4.8 mmhos/cm		ASA10-3	09/06/12 16:30 / sm
Calcium, sat. paste	24.4 meq/L		SW6010B	09/05/12 13:07 / rlh
Magnesium, sat. paste	29.5 meq/L		SW6010B	09/05/12 13:07 / rlh
Sodium, sat. paste	10.7 meq/L	D	SW6010B	09/05/12 13:07 / rlh
Sodium Adsorption Ratio (SAR)	3.60 unitless		Calculation	09/06/12 16:30 / sm

#### CHEMICAL CHARACTERISTICS

Cation Exchange Capacity	19.8 meq/100g	D	SW6010B	09/06/12 15:11 / rlh
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Report: RL - Analyte reporting limit.  
Definitions: QCL - Quality control limit.  
D - RL increased due to sample matrix.

MCL - Maximum contaminant level.  
ND - Not detected at the reporting limit.



## LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client: Continental Resources  
Project: Atlanta Site  
Client Sample ID: Fill #1  
Location: E-1179926.05, N-421267.60, Elv. 1997.65  
Lab ID: B12082706-002

Report Date: 09/06/12  
Collection Date: 08/29/12 19:00  
Date Received: 08/30/12  
Sampled By: Spencer Ingalls

Analytes	Result	Units	Qualifier	Method	Analysis Date / By
<b>SATURATED PASTE</b>					
pH, sat. paste	7.7	s.u.		ASAM10-3	09/06/12 16:30 / srm
Conductivity, sat. paste	2.8	mmhos/cm		ASA10-3	09/06/12 16:30 / srm
Calcium, sat. paste	14.2	meq/L		SW6010B	09/05/12 13:14 / rh
Magnesium, sat. paste	20.1	meq/L		SW6010B	09/05/12 13:14 / rh
Sodium, sat. paste	5.61	meq/L	D	SW6010B	09/05/12 13:14 / rh
Sodium Adsorption Ratio (SAR)	1.35	unitless		Calculation	09/06/12 16:30 / srm
<b>CHEMICAL CHARACTERISTICS</b>					
Cation Exchange Capacity	15.1	meq/100g	D	SW6010B	09/06/12 15:15 / rh

Report: RL - Analyte reporting limit.  
Definitions: QCL - Quality control limit.  
D - RL increased due to sample matrix.

MCL - Maximum contaminant level.  
ND - Not detected at the reporting limit.



## LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client: Continental Resources  
Project: Atlanta Site  
Client Sample ID: Fill #2  
Location: E-1179924.40, N-421196.70, Elv. 1937.95  
Lab ID: B12082786-003  
Report Date: 09/06/12  
Collection Date: 08/29/12 19:00  
Date Received: 08/30/12  
Sampled By: Spencer Ingalls

Analyses	Result	Units	Qualifier	Method	Analysis Date / By
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### SATURATED PASTE

pH, sat. paste	8.1	s.u.	ASAM10-3,	09/06/12 16:30 / srm
Conductivity, sat. paste	1.2	mmhos/cm	ASA10-3	09/06/12 16:30 / srm
Calcium, sat. paste	2.59	meq/L	SW6010B	09/05/12 13:28 / rlh
Magnesium, sat. paste	8.07	meq/L	SW6010B	09/05/12 13:28 / rlh
Sodium, sat. paste	3.40	meq/L	SW6010B	09/05/12 13:28 / rlh
Sodium Adsorption Ratio (SAR)	1.47	unitless	Calculation	09/06/12 16:30 / srm

### CHEMICAL CHARACTERISTICS

Cation Exchange Capacity	12.3	meq/100g	D	SW6010B	09/06/12 15:22 / rlh
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Report RL - Analyte reporting limit.  
Definitions: QCL - Quality control limit.  
D - RL increased due to sample matrix.

MCL - Maximum contaminant level.  
ND - Not detected at the reporting limit.



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Gillette, WY 800-686-7176 • Rapid City, SD 800-872-1226 • College Station, TX 800-686-2218

## LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client: Continental Resources  
Project: Atlanta Site  
Client Sample ID: Fill #3  
Location: E-1179963.65, N-421120.95, Elv. 1937.90  
Lab ID: B12082786-004

Report Date: 09/06/12

Collection Date: 08/29/12 19:00

Date Received: 08/30/12

Sampled By: Spencer Ingalls

Analyses	Result	Units	Qualifier	Method	Analysis Date / By
<b>SATURATED PASTE</b>					
pH, sat. paste	7.9	s.u.		ASAM10-3,	09/06/12 16:30 / srm
Conductivity, sat. paste	4.5	mmhos/cm		ASA10-3	09/06/12 16:30 / srm
Calcium, sat. paste	25.1	meq/L		SW6010B	09/05/12 13:32 / rh
Magnesium, sat. paste	36.7	meq/L		SW6010B	09/05/12 13:32 / rh
Sodium, sat. paste	11.6	meq/L	D	SW6010B	09/05/12 13:32 / rh
Sodium Adsorption Ratio (SAR)	2.07	unitless		Calculation	09/06/12 16:30 / srm
<b>CHEMICAL CHARACTERISTICS</b>					
Cation Exchange Capacity	16.4	meq/100g	D	SW6010B	09/06/12 16:29 / rh

Report RL - Analyte reporting limit.  
Definitions: QCL - Quality control limit.  
D - RL increased due to sample matrix.

MCL - Maximum contaminant level.  
ND - Not detected at the reporting limit.



## QA/QC Summary Report

Prepared by Billings, MT Branch

Client: Continental Resources

Report Date: 09/06/12

Project: Atlanta Site

Work Order: B12082786

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: ASA10-3									Batch: R191314
Sample ID: B12082786-001A DUP	Sample Duplicate								09/06/12 16:30
Conductivity, sat. paste	4.86	mmhos/cm	0.10				1.2		30
Sample ID: LCS-1209061630	Laboratory Control Sample						Run: MISC-SOIL_120906B		09/06/12 16:30
Conductivity, sat. paste	7.54	mmhos/cm	0.10	97	50	150			

**Qualifiers:**

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.



## QA/QC Summary Report

Prepared by Billings, MT Branch

Client: Continental Resources

Report Date: 09/06/12

Project: Atlanta Site

Work Order: B12082786

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: ASAM10-3.2	Batch: R191314								
Sample ID: B12082706-001A DUP pH, sat. paste	Sample Duplicate 7.60	s.u.	0.10		Run: MISC-SOIL_120906B		2.6	10	
Sample ID: LCS-1209061630 pH, sat. paste	Laboratory Control Sample 7.00	s.u.	0.10	99	90	110			09/06/12 16:30

### Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.



## QA/QC Summary Report

Prepared by Billings, MT Branch

Client: Continental Resources

Report Date: 09/06/12

Project: Atlanta Site

Work Order: B12082786

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPD Limit	Qual
Method: Calculation	Batch: R191314								
Sample ID: B12082786-001A DUP	Sample Duplicate				Run: MISC-SOIL_120906B				09/06/12 16:30
Sodium Adsorption Ratio (SAR)	3.85	unitless	0.010				6.7		30
Sample ID: LCS-1209061630	Laboratory Control Sample				Run: MISC-SOIL_120906B				09/06/12 16:30
Sodium Adsorption Ratio (SAR)	5.11	unitless	0.010	83	60	150			

### Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.



## QA/QC Summary Report

Prepared by Billings, MT Branch

Client: Continental Resources

Report Date: 09/06/12

Project: Atlanta Site

Work Order: B12082786

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: SW6010B	Batch: 66170								
Sample ID: LCS-65170	Run: ICP201-B_120905A								
Calcium, sat. paste	46.4	meq/L	0.050	88	50	150			09/05/12 13:03
Magnesium, sat. paste	29.0	meq/L	0.082	86	50	150			
Sodium, sat. paste	32.0	meq/L	0.16	77	50	150			
Sample ID: B12082786-001A DUP	Run: ICP201-B_120905A								
Calcium, sat. paste	25.2	meq/L	0.050				3.1		30
Magnesium, sat. paste	31.0	meq/L	0.082				4.8		30
Sodium, sat. paste	20.4	meq/L	0.081				8.7		30
Sample ID: B12082786-002AMS2	Run: ICP201-B_120905A								
Calcium, sat. paste	26.8	meq/L	0.050	101	50	150			09/05/12 13:25
Magnesium, sat. paste	39.5	meq/L	0.082	94	50	150			
Sodium, sat. paste	16.1	meq/L	0.084	96	50	150			
Method: SW6010B	Batch: 65201								
Sample ID: LCS-65201	Run: ICP201-B_120905B								
Cation Exchange Capacity	Laboratory Control Sample	22.4 meq/100g	0.16	90	60	140			09/06/12 15:08
Sample ID: B12082786-002A DUP	Run: ICP201-B_120905B								
Cation Exchange Capacity	Sample Duplicate	13.8 meq/100g	0.16				8.8		50
Sample ID: B12082786-003AMS2	Run: ICP201-B_120905B								
Cation Exchange Capacity	Sample Matrix Spike	33.6 meq/100g	0.17	98	50	150			09/06/12 15:25

**Qualifiers:**

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.



## Standard Reporting Procedures

Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH, Dissolved Oxygen and Residual Chlorine, are qualified as being analyzed outside of recommended holding time.

Solid/soil samples are reported on a wet weight basis (as received) unless specifically indicated. If moisture corrected, data units are typically noted as -dry. For agricultural and mining soil parameters/characteristics, all samples are dried and ground prior to sample analysis.

### Workorder Receipt Checklist

Continental Resources

B12082786

Login completed by: Randa Nees

Date Received: 8/30/2012

Reviewed by: BL2000\kmcdonald

Received by: jrz

Reviewed Date: 8/30/2012

Carrier Hand Del  
name:

Shipping container/cooler in good condition? Yes  No  Not Present

Custody seals intact on shipping container/cooler? Yes  No  Not Present

Custody seals intact on sample bottles? Yes  No  Not Present

Chain of custody present? Yes  No

Chain of custody signed when relinquished and received? Yes  No

Chain of custody agrees with sample labels? Yes  No

Samples in proper container/bottle? Yes  No

Sample containers intact? Yes  No

Sufficient sample volume for indicated test? Yes  No

All samples received within holding time?  
(Exclude analyses that are considered field parameters such as pH, DO, Res Cl, Sulfite, Ferrous Iron, etc.) Yes  No

Temp Blank received? Yes  No  Not Applicable

Container/Temp Blank temperature: 24.6°C No Ice

Water - VOA vials have zero headspace? Yes  No  No VOA vials submitted

Water - pH acceptable upon receipt? Yes  No  Not Applicable

---

#### Contact and Corrective Action Comments:

Perc analysis not done at Energy Laboratories. These samples were taken to another laboratory by Mick Albright of Continental Resources.



## Chain of Custody and Analytical Request Record

PLEASE PRINT- Provide as much information as possible.

Page 1 of 1

Company Name: <b>Continental Resources</b>		Project Name, PWS, Permit, Etc. <b>Atlanta Site</b>		Sample Origin State: <b>ND</b>	EPA/State Compliance: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>		
Report Mail Address: <b>P.O. Box 268870</b> <b>73126</b> <b>Oklahoma City, OK</b>		Contact Name: <b>Chad Newby</b> Phone/Fax: <b>405-574-2172</b> Email: <b>chad.newby@cr.com</b>		Sampler. (Please Print) <b>Spencer Ingalls</b>			
Invoice Address: <b>P.O. Box 268870</b> <b>73126</b> <b>Oklahoma City, OK</b>		Invoice Contact & Phone: <b>Chad Newby</b> <b>405-574-2172</b>		Purchase Order: <b>Chad Newby</b>	Quote/Bottle Order: <b>Unknown</b>		
Special Report/Formats - ELI must be notified prior to sample submittal for the following:		Number of Containers Samples Type: A W S V B O Air Water Soils Solids Vegetation Bioassay Other	ANALYSIS REQUESTED		Contact ELI prior to RUSH sample submittal for charges and scheduling - See Instruction Page		
<input type="checkbox"/> DW <input type="checkbox"/> GSA <input type="checkbox"/> POTW/WWTP Format _____ <input type="checkbox"/> State: _____ <input type="checkbox"/> Other: _____			<input type="checkbox"/> A2LA	<input type="checkbox"/> EDD/EDT (Electronic Data)		<input type="checkbox"/> LEVEL IV	<input type="checkbox"/> NELAC
SAMPLE IDENTIFICATION (Name, Location, Interval, etc.)		Collection Date <b>8-29-12</b>	Collection Time <b>7:00pm</b>	MATRIX <b>I-S</b>	U S H	Shipped by <b>Hand</b> Carrier/Mode: <b>Cedar River</b>	
1. Original Material ( <i>From</i> <i>To</i> )				SEE ATTACHED <b>W/S U/A</b>	X	Comments: <b>E-1180177.30</b> <b>N-421287.75</b> <b>ELU 1940.40</b>	
2.						Receipt Temp <b>24.6 °C</b>	
3.						On Ice: <b>Yes</b> <input checked="" type="checkbox"/>	
4.						Surfacy Seal <b>Y</b> <input checked="" type="checkbox"/> Intact <b>Y</b> <input checked="" type="checkbox"/>	
5.						<b>8/29/12</b>	
6.							
7.							
8.							
9.							
10.							
11.							
12.							
Custody Record <b>MUST be Signed</b>		Released by (print): <b>Mick Albright</b>	Date/Time: <b>8-30-12 9:00 AM</b>	Signature: <b>MLA</b>	Received by (print):	Date/Time:	Signature:
		Released by (print): <b>Mick Albright</b>	Date/Time: <b>8-30-12 3:05 PM</b>	Signature: <b>MLA</b>	Received by (print):	Date/Time:	Signature:
Sample Disposal: Return to Client		Lab Disposal: <b>K</b>		Received by Laboratory:	Date/Time:	Signature:	

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Visit our web site at [www.enerylab.com](http://www.enerylab.com) for additional information, downloadable fee schedule, forms, and links.



# Chain of Custody and Analytical Request Record

Page 1 of 1

Company Name: <b>Continental Resources</b>		PLEASE PRINT - Provide as much information as possible. Project Name, PWS, Permit, Etc. <b>Atlanta Site</b>		Sample Origin State: <b>ND</b>	EPA/State Compliance: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>		
Report Mail Address: <b>PO Box 268870</b> Oklahoma City, OK 73126		Contact Name: <b>Chad Newby</b> Phone/Fax: <b>405-574-2172</b> Email: <b>chad.newby@clr.com</b>		Email: <b>Spencer Ingalls</b>	Sampler: (Please Print)		
Invoice Address: <b>PO Box 268870</b> Oklahoma City, OK 73126		Invoice Contact & Phone: <b>Chad Newby</b> <b>405-574-2172</b>		Purchase Order: <b>Chad Newby</b>	Quote/Bottle Order: <b>Unknown</b>		
Special Report/Formats - ELU must be notified prior to sample submittal for the following:		Number of Containers Sample Type: A W S V B O Air/Water/Solids Vegetation/Biosolids Other		Contact ELU prior to RUSH sample submittal for charges and scheduling - See Instruction Page			
<input type="checkbox"/> DW <input type="checkbox"/> GSA <input type="checkbox"/> POTW/WWTP <input type="checkbox"/> State: _____ <input type="checkbox"/> Other: _____		<input type="checkbox"/> A2LA <input type="checkbox"/> EDD/EDT (Electronic Data) Format: _____		<input type="checkbox"/> LEVEL IV <input type="checkbox"/> NELAC			
SAMPLE IDENTIFICATION (Name, Location, Interval, etc.)		Collection Date	Collection Time	ANALYSIS REQUESTED			
<b>Fill #1</b>		<b>8-29-12</b>	<b>7:00pm</b>	<b>MATRIX</b> EC SAR CEC PH <i>Pearl</i> <i>X</i> <i>X</i> <i>X</i> <i>X</i> <i>X</i>			
				SEE ATTACHED	Normal Turnaround (TAT)		
				<b>R</b>	Comments: <b>E-1179926-05</b>		
				<b>U</b>	Receipt Temp: <b>24.6°C</b>		
				<b>S</b>	On loc: <b>Yes</b> <input checked="" type="checkbox"/>		
				<b>H</b>	Comments: <b>N-421267-60</b>		
					Comments: <b>E14.1937.65</b>		
					Comments: <b>8/2085782-002</b>		
					Custody Seal: <b>Y</b> <input checked="" type="checkbox"/>		
					Intact: <b>Y</b> <input checked="" type="checkbox"/>		
					Signature Match: <b>Y</b> <input checked="" type="checkbox"/>		
LABORATORY USE ONLY							
<b>Custody Record MUST be Signed</b>	Requester (print): <b>Mark Albright</b> Date/Time: <b>8-30-12 9:00AM</b>		Signature: <b>Mark Albright</b>		Received by (print): _____ Date/Time: _____ Signature: _____		
	Requester (print): <b>Mark Albright</b> Date/Time: <b>8-30-12 305</b>		Signature: <b>Mark Albright</b>		Received by (print): _____ Date/Time: _____ Signature: _____		
Sample Disposal: Return to Client:		Lab Disposal: <b>X</b>		Received by Laboratory: <b>Spencer Ingalls</b> Date/Time: <b>8/2085782-305</b>		Signature: <b>Spencer Ingalls</b>	

In certain circumstances, samples submitted to Energy Laboratories, Inc. may be subcontracted to other certified laboratories in order to complete the analysis requested. This serves as notice of this possibility. All sub-contract data will be clearly noted on your analytical report. Visit our web site at [www.energylab.com](http://www.energylab.com) for additional information, downloadable fee schedule, forms, and links.



# Chain of Custody and Analytical Request Record

Page 1 of 1

Company Name: <b>Continental Resources</b>		PLEASE PRINT. Provide as much information as possible. Project Name, PWS, Permit, Etc.			
Report Mail Address: <b>PO Box 268870 Oklahoma City, OK 73126</b>		Contact Name: <b>Atlanta Site</b> Phone/Fax:		Sample Origin State: <b>ND</b>	
Invoice Address: <b>PO Box 268870 Oklahoma City, OK 73126</b>		Invoice Contact & Phone <b>Chad Newby 405-574-2172 chad.newby@okc.com</b>		EPA/State Compliance: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Sampler: (Please Print) <b>Spencer Ingalls</b>	
Special Report/Formats – ELI must be notified prior to sample submittal for the following:		Purchase Order: <b>Chad Newby</b> Quote/Bottle Order: <b>Unknown</b>		Shipped by: <b>Hand</b> Carrier ID#: <b>1</b>	
<input type="checkbox"/> DW <input type="checkbox"/> GSA <input type="checkbox"/> POTW/MMTWP <input type="checkbox"/> State: _____ <input type="checkbox"/> Other: _____		<input type="checkbox"/> A2LA <input type="checkbox"/> EDD/EDT (Electronic Data) Format: <input type="checkbox"/> LEVEL IV <input type="checkbox"/> NELAC		Number of Containers: <b>0</b> Sample Type: <b>A/W S/V B/O</b> Air Water Spots/Solids Vegetation Necessary Other	
<b>SAMPLE IDENTIFICATION</b> (Name, Location, Interval, etc.) <b>Fill #2</b>		Collection Date <b>8-29-12</b>	Collection Time <b>7:00pm</b>	<b>MATRIX</b> <b>P-S &amp; a a a K</b>	
<b>ANALYSIS REQUESTED</b>		<b>R</b> <b>U</b> <b>G</b> <b>H</b>		SEE ATTACHED Normal Turnaround (TAT)	
<b>Comments:</b> <b>E-1179924-40</b> <b>N. 421196.70</b> <b>Ele. 1937.95</b>		<b>Receipt Temp:</b> <b>24.6°C</b>		<b>Date:</b> <b>Yes <input checked="" type="checkbox"/></b>	
<b>Custody Seal</b> <b>Intact</b> <b>Signature Match</b> <b>Y N</b>		<b>20082782-003</b>		<b>LABORATORY USE ONLY</b>	
<b>Custody Record</b> <b>MUST be Signed</b>		Relinquished by (print): <b>Mark Albright</b> Date/Time: <b>8-30-12 9:00AM</b> Signature: <b>Mark Albright</b> Relinquished by (print): <b>Mark Albright</b> Date/Time: <b>8-30-12 3:05 PM</b> Signature: <b>Mark Albright</b>		Received by (print): <b>Mark Albright</b> Date/Time: <b>8-30-12 3:05 PM</b> Signature: <b>Mark Albright</b> Received by (print): <b>Mark Albright</b> Date/Time: <b>8-30-12 3:05 PM</b> Signature: <b>Mark Albright</b>	
Sample Disposal: <b>Return to Client</b>		Lab Dispos: <b>X</b>		Received by Laboratory: <b>Mark Albright</b> Date/Time: <b>8-30-12 3:05 PM</b> Signature: <b>Mark Albright</b>	

In certain circumstances, samples submitted to Energy Laboratories, Inc. may be subcontracted to other certified laboratories in order to complete the analysis requested. This serves as notice of this possibility. All sub-contract data will be clearly noted on your analytical report. Visit our web site at [www.energylab.com](http://www.energylab.com) for additional information, downloadable fee schedule, forms, and links.



## Chain of Custody and Analytical Request Record

Page 1 of 1

Company Name: <b>Continental Resources</b>		PLEASE PRINT - Provide as much information as possible. Project Name, PWS, Permit, Etc. <b>Atlanta Site</b>		Sample Origin State: <b>ND</b> Email:	EPA/State Compliance: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Sampler: (Please Print) <b>Spencer Ingalls</b>		
Report Mail Address: <b>P.O. Box 268870</b> <b>Oklahoma City, OK</b> <b>73126</b>		Contact Name: <b>Chad Newby</b> Phone/Fax: <b>405-574-2172</b> chad.newby@cr.com		Purchase Order: <b>Chad Newby</b> <b>Unknown</b>		Quote/Contract Order: <b>Chad Newby</b> <b>Unknown</b>	
Invoice Address: <b>P.O. Box 268870</b> <b>Oklahoma City, OK</b> <b>73126</b>		Invoice Contact & Phone: <b>Chad Newby</b> <b>405-574-2172</b>		Comments: <b>E: 1178963.65</b> <b>N: 421120.95</b> <b>Elv. 1937.90</b>		Received Temp: <b>74.1 °C</b>	
Special Report/Formats - ELI must be notified prior to sample submittal for the following:		Number of Containers Sample Type: A/W/S/V/B/O Air/Water/Solids/Soils/Other Biosassay/Other		ANALYSIS REQUESTED		Contact ELI prior to RUSAT sample submittal for charges and scheduling - See Instruction Page	
<input type="checkbox"/> DW <input type="checkbox"/> GSA <input type="checkbox"/> POTWWWWTP <input type="checkbox"/> State: _____ <input type="checkbox"/> Other: _____		<input type="checkbox"/> A2LA <input type="checkbox"/> EDD/EDT (Electronic Data) Format <input type="checkbox"/> LEVEL IV <input type="checkbox"/> NELAC		<b>E/C</b> <b>SAR</b> <b>CSC</b> <b>PP</b> <b>Perk</b>	<b>SEE ATTACHED</b>	<b>R</b> <b>U</b> <b>G</b> <b>H</b>	Normal Turnaround (TAT)
SAMPLE IDENTIFICATION (Name, Location, Interval, etc.)		Collection Date	Collection Time	MATRIX		Comments: <b>E: 1178963.65</b> <b>N: 421120.95</b> <b>Elv. 1937.90</b>	
<b>Fill #3</b>		<b>8-29-12</b>	<b>7:00pm</b>	<b>1-3</b> <b>d/d/d/d/d</b>		Received by (print): <b>Mark Albright</b> Date/Time: <b>8-30-12 9:00AM</b> Signature: <b>Mark Albright</b>	
						Received by (print): <b>Mark Albright</b> Date/Time: <b>8-30-12 3:05 PM</b> Signature: <b>Mark Albright</b>	
						Received by Laboratory: <b>OEZoener</b> Date/Time: <b>8/30/12 3:05 PM</b> Signature: <b>OEZoener</b>	
Custody Record <b>MUST be Signed</b>		Received by (print): <b>Mark Albright</b> Date/Time: <b>8-30-12 9:00AM</b> Signature: <b>Mark Albright</b>		Received by (print): <b>Mark Albright</b> Date/Time: <b>8-30-12 3:05 PM</b> Signature: <b>Mark Albright</b>		Received by Laboratory: <b>OEZoener</b> Date/Time: <b>8/30/12 3:05 PM</b> Signature: <b>OEZoener</b>	
In certain circumstances, samples submitted to Energy Laboratories, Inc. may be subcontracted to other certified laboratories in order to complete the analysis requested. This serves as notice of this possibility. All sub-contract data will be clearly noted on your analytical report. Visit our web site at <a href="http://www.energylab.com">www.energylab.com</a> for additional information, downloadable fee schedule, forms, and links.							

**A  
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8105 Black Hawk Rd • PO Box 559 • Black Hawk, SD 57718-0559 • Phone (605) 787-9303 • FAX (605) 787-9515  
140 Pine Needle Drive • Spearfish, SD 57783 • Phone (605) 642-2742 • Mobile 390-3768

**PROCTOR TEST**

**MOISTURE DENSITY RELATION**

CONTINENTAL RESOURCES, INC.  
PO Box 268836  
Oklahoma City, OK 73126  
Attn: Project Manager

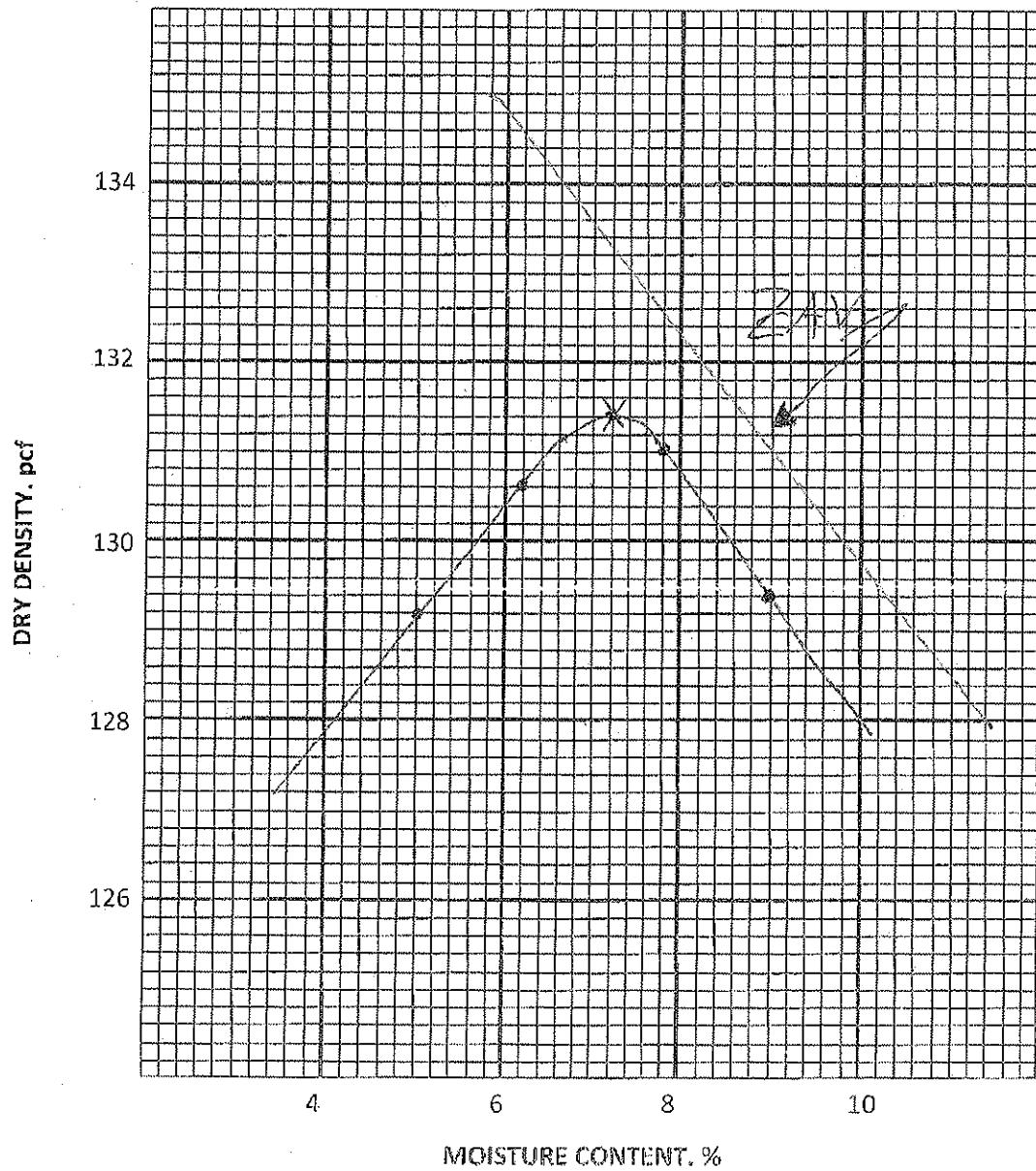
Proctor#: Date: 08/21/12  
ASTM: 698 Method: C  
Soil Classification: Brown Gravelly  
Sand

Project: Atlanta Drill Pad, Williston,  
North Dakota

Project Number: 12-12165

**MAXIMUM DENSITY: 131.4pcf**

**OPTIMUM MOISTURE CONTENT: 7.2%**



Cc:

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SERVICES, INC.**

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**PROCTOR TEST**

**MOISTURE DENSITY RELATION**

CONTINENTAL RESOURCES, INC.  
PO Box 268836  
Oklahoma City, OK 73126  
Attn: Project Manager

Proctor#: Date: 07/31/12

ASTM: 698 Method:

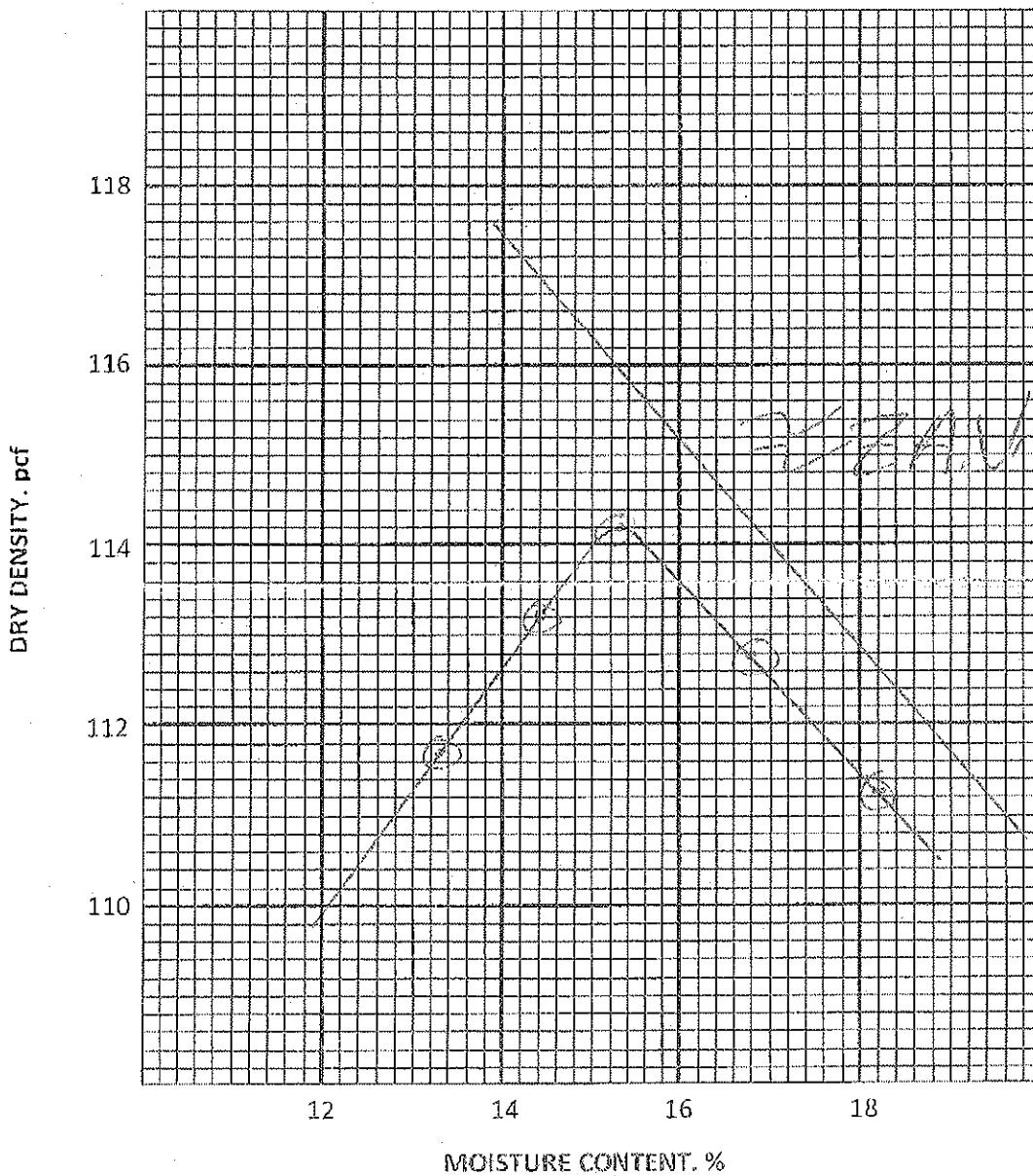
Soil Classification: CL

Project: Atlanta Drill Pad, Williston,  
North Dakota

Project Number: 12-12165

**MAXIMUM DENSITY: 114.2 pcf**

**OPTIMUM MOISTURE CONTENT: 15.3%**



Cc:

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## **REPORT OF EXCAVATION OBSERVATIONS**

**CONTINENTAL RESOURCES**  
P.O. Box 268836  
Oklahoma City, OK 73126

**September 7, 2012**

**Attn: Project Manager**

**Subj: Report of Excavation Observations**  
Drill Pad Spillage Line Construction  
Atlanta Drill Pad  
Williston, North Dakota

**ATS No. 12-12165**

## **INTRODUCTION**

Our presence on the above referenced project was requested by Continental Resources of Oklahoma City, Oklahoma.

We were to observe and test the overexcavation and fill placement over the spillage liner placed below the Atlanta Drill Pad being constructed in Williston, North Dakota.

## **EXCAVATION OBSERVATIONS**

### **Pad Spillage Liner Excavation & Subgrade Preparation:**

We observed the overexcavation of the spillage liner on August 12, 2012. We observed that the bottom of the overexcavation was taken to 5 feet below finished grades in the spillage liner site. The bottom of the overexcavation was recompacted and smoothed prior to synthetic liner installation.

The synthetic liner material was delivered in rolls and placed over the prepared subgrade soils. We observed that the liner laps were welded as the liner materials were pulled into place.

### **Liner Area Backfill:**

On August 14, 2012, we observed on-site soil placement over the synthetic liner. A cushion layer was compacted in place then material was placed via scrapers. Water was added and dozers mixed the soils prior to compaction in lifts. All compaction tests taken indicate the backfill material was placed in an engineered manner.

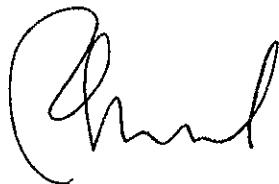
## **CONCLUSIONS AND RECOMMENDATIONS**

Based on our observations and tests, it is our opinion that the liner subgrade was prepared and the backfill placed in an engineered manner.

## **CLOSURE**

If you have questions or comments about this report, please contact us and we will be glad to respond.

Sincerely,  
**AMERICAN TECHNICAL SERVICES, INC.**



Dave G. Bressler, P.E.  
Geotechnical Consultant

cc: File

**AMERICAN  
TECHNICAL  
SERVICES, INC.**

Engineering • Environmental • Drilling • Research &  
9105 Black Hawk Rd • PO Box 558  
Black Hawk, CO 80101-0558

**REPORT OF SOIL DENSITY TESTING - NUCLEAR METHOD**  
ASTM D6938

CLIENT: **CONTINENTAL RESOURCES, INC.**  
PO Box 268836  
Oklahoma City, OK 73126

ATTENTION: Project Manager  
PROJECT: Atlanta Drill Site

ATS #: 12-12165  
DATE: 07/30/12  
ATS TECH: Russell Harwood  
GAGE #: 2  
BENCHMARK:

TEST #	DATE	PROCTOR # / CLASSIFICATION	LABORATORY		FIELD		SPECIFICATIONS			
			% MOIST	DRY DENSITY	% MOISTURE	DRY DENSITY	% COMPACTION	SPEC MOISTURE %	SPEC COMPACTION	PASS
1	07/25/12	#1	9.7	126.5	7.7	128.2	101	+/-2%	95	PASS
2	07/25/12	#1	9.7	126.5	8.7	120.2	95	+/-2%	95	PASS
3	07/25/12	#1	9.7	126.5	8.8	125.8	99	+/-2%	95	PASS
4	07/25/12	#1	9.7	126.5	9.9	126.8	100	+/-2%	95	PASS
5	07/25/12	#1	9.7	126.5	9.1	120.4	95	+/-2%	95	PASS
6	07/25/12	#1	9.7	126.5	7.8	121.0	96	+/-2%	95	PASS
7							#DIV/0!			
8							#DIV/0!			
9							#DIV/0!			
10							#DIV/0!			

TEST #	LOCATION	ELEVATION
1	North 421071.00, East 117953.00	1913.95
2	North 421274.95, East 1179466.60	1924.65
3	North 421032.65, East 1179535.15	1911.2
4	North 421208.75, East 1179464.72	1922.6
5	North 421225.55, East 1179501.00	1923.1
6	North 420954.70, East 1179641.10	1905.35
7		
8		
9		
10		

NOTES: All Test in West Valley Fill

RESPECTFULLY SUBMITTED

AMERICAN TECHNICAL SERVICES, INC.

cc:

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**T**ECHNICAL  
**S**ERVICES, INC.

ENGINEERING • ENVIRONMENTAL • DRILLING • MATERIALS  
8105 Black Hawk Rd. • PO Box 558  
Black Hawk, SD 57718-0558

**REPORT OF SOIL DENSITY TESTING - NUCLEAR METHOD**

ASTM D6938

**CLIENT** CONTINENTAL RESOURCES, INC.  
PO Box 268836  
Oklahoma City, OK 73126  
**ATTENTION:** Project Manager  
**PROJECT:** Atlanta Drill Site

ATS # 12-12165  
DATE 07/30/12  
ATS TECH Russell Harwood  
GAGE # 2  
BENCHMARK:

TEST #	DATE	PROCTOR # / CLASSIFICATION	LABORATORY		FIELD		SPECIFICATIONS			
			% MOIST	DRY DENSITY	% MOISTURE	DRY DENSITY	% COMPACTION	SPEC MOISTURE	% SPEC COMPACTION	PASS
7	07/26/12	#1	9.7	126.5	8.1	126.2	100	+/-2%	95	PASS
8	07/26/12	#1	9.7	126.5	7.8	128.4	102	+/-2%	95	PASS
9	07/26/12	#1	9.7	126.5	7.9	126.1	100	+/-2%	95	PASS
10	07/26/12	#1	9.7	126.5	7.7	120.2	95	+/-2%	95	PASS
11	07/26/12	#1	9.7	126.5	8.0	124.7	99	+/-2%	95	PASS
12	07/26/12	#1	9.7	126.5	8.1	123.7	98	+/-2%	95	PASS
13							#DIV/0!			
14							#DIV/0!			
15							#DIV/0!			
16							#DIV/0!			

TEST #	LOCATION	ELEVATION
7	North 420733.85, East 1179715.80	1889.35
8	North 421024.65, East 1179590.75	1911.8
9	North 4211162.20, East 1179535.00	1920.75
10	North 420989.90, East 1179617.40	1910.3
11	North 421163.80, East 1179533.60	1921.65
12	North 420730.65, East 1179774.25	1887.9
13		
14		
15		
16		

NOTES:

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RESPECTFULLY SUBMITTED

AMERICAN TECHNICAL SERVICES, INC.

CC:

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**S**ERVICES, INC.

ENGINEERING • ENVIRONMENTAL • DRILLING • MATERIALS  
8105 Black Hawk Rd • PO Box 558  
Black Hawk, CO 80428-0558

**REPORT OF SOIL DENSITY TESTING - NUCLEAR METHOD**

ASTM D6938

CLIENT: CONTINENTAL RESOURCES, INC.  
PO Box 268836  
Oklahoma City, OK 73126

ATTENTION: Project Manager  
PROJECT: Atlanta Drill Site

ATS #: 12-12165  
DATE: 07/30/12  
ATS TECH: Russell Harwood  
GAGE #: 2  
BENCHMARK:

TEST #	DATE	PROCTOR # / CLASSIFICATION	LABORATORY		FIELD		SPECIFICATIONS			PASS
			% MOIST	DRY DENSITY	% MOISTURE	DRY DENSITY	% COMPACTION	SPEC MOISTURE	% SPEC COMPACTA	
13	07/27/12	#1	9.7	126.5	8.2	128.8	102	+/-2%	95	PASS
14	07/27/12	#1	9.7	126.5	7.8	125.7	99	+/-2%	95	PASS
15	07/27/12	#1	9.7	126.5	8.0	126.2	100	+/-2%	95	PASS
16	07/27/12	#1	9.7	126.5	7.9	126.7	100	+/-2%	95	PASS
17	07/27/12	#1	9.7	126.5	8.3	121.5	96	+/-2%	95	PASS
18	07/27/12	#1	9.7	126.5	8.0	120.7	95	+/-2%	95	PASS
19	07/27/12	#1	9.7	126.5	10.4	124.3	98	+/-2%	95	PASS
20	07/27/12	#1	9.7	126.5	8.3	121.5	96	+/-2%	95	PASS
21	07/27/12	#1	9.7	126.5	8.7	123.2	97	+/-2%	95	PASS
22	07/27/12	#1	9.7	126.5	10.1	121.2	96	+/-2%	95	PASS

TEST #	LOCATION	ELEVATION
13	North 420922.45, East 1179615.55	1907.5
14	North 421133.55, East 1179531.25	1920.75
15	North 421328.60, East 1179449.60	1930
16	North 420734.90, East 1179720.10	1891.95
17	North 421331.0, East 1179468.55	1930.25
18	North 421115.0, East 1179565.80	1920.35
19	North 421129.55, East 1179544.70	1921.55
20	North 420997.45, East 1179569.10	1913.85
21	North 421218.20, East 1179468.55	1927.65
22	North 421036.70, East 1179556.20	1916.5

NOTES:

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CC:

AMERICAN TECHNICAL SERVICES, INC.

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ENGINEERING • ENVIRONMENTAL • DRILLING • MATERIALS  
8105 Black Hawk Rd. • PO Box 558  
Black Hawk, SD 57718-0558

**REPORT OF SOIL DENSITY TESTING - NUCLEAR METHOD**

ASTM D6938

CLIENT: **CONTINENTAL RESOURCES, INC.**  
PO Box 268836  
Oklahoma City, OK 73126

ATTENTION: Project Manager  
PROJECT: Atlanta Drill Site

ATS #: 12-12165  
DATE: 07/30/12  
ATS TECH: Russell Harwood  
GAGE #: 2  
BENCHMARK:

TEST #	DATE	PROCTOR # / CLASSIFICATION	LABORATORY		FIELD		SPECIFICATIONS			
			% MOIST	DRY DENSITY	% MOISTURE	DRY DENSITY	% COMPACTION	SPEC MOISTURE %	SPEC COMPACTION	PASS
23	07/28/12	#1	9.7	126.5	7.7	121.3	96	+/-2%	95	PASS
24	07/28/12	#1	9.7	126.5	8.6	122.3	97	+/-2%	95	PASS
25	07/28/12	#1	9.7	126.5	9.8	121.4	96	+/-2%	95	PASS
26	07/28/12	#1	9.7	126.5	10.3	120.4	95	+/-2%	95	PASS
27	07/28/12	#1	9.7	126.5	8.8	123.1	97	+/-2%	95	PASS
28	07/28/12	#1	9.7	126.5	10.2	121.1	96	+/-2%	95	PASS
29	07/28/12	#1	9.7	126.5	9.5	121.7	96	+/-2%	95	PASS
30	07/28/12	#1	9.7	126.5	8.9	121.6	96	+/-2%	95	PASS
31							#DIV/0!			
32							#DIV/0!			

TEST #	LOCATION	ELEVATION
23	North 421030.00, East 1179567.90	1917.25
24	North 421168.40, East 1179502.30	1925.8
25	North 420941.60, East 1179621.90	1910.9
26	North 420775.75, East 1179540.35	1915
27	North 420747.80, East 1179641.35	1901.75
28	North 421160.85, East 1179530.85	1925
29	North 421021.90, East 117618.15	1915.65
30	North 420886.85, East 1179717.40	1904.9
31		
32		

NOTES:

RESPECTFULLY SUBMITTED



CC:

AMERICAN TECHNICAL SERVICES, INC.

**AMERICAN  
TECHNICAL  
SERVICES, INC.**

ENGINEERING • ENVIRONMENTAL • DRILLING • MATERIALS  
8105 Black Hawk Rd • PO Box 558  
Black Hawk, SD 57718-0558

**REPORT OF SOIL DENSITY TESTING - NUCLEAR METHOD**

ASTM D6938

CLIENT: **CONTINENTAL RESOURCES, INC.**  
PO Box 268836  
Oklahoma City, OK 73126

ATTENTION: Project Manager  
PROJECT: Atlanta Drill Site

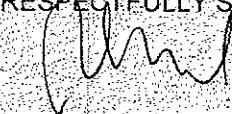
ATS #: 12-12165  
DATE: 07/30/12  
ATS TECH: Russell Harwood  
GAGE #: 2  
BENCHMARK:

TEST #	DATE	PROCTOR # / CLASSIFICATION	LABORATORY		FIELD		SPECIFICATIONS			
			% MOIST	DRY DENSITY	% MOISTURE	DRY DENSITY	% COMPACTION	SPEC MOISTURE %	SPEC COMPACTION	PASS
31	07/29/12	#1	9.7	126.5	10.2	120.4	95	+/-2%	95	PASS
32	07/29/12	#1	9.7	126.5	10.1	121.2	96	+/-2%	95	PASS
33	07/29/12	#1	9.7	126.5	8.2	121.7	96	+/-2%	95	PASS
34	07/29/12	#1	9.7	126.5	9.2	121.7	96	+/-2%	95	PASS
35	07/29/12	#1	9.7	126.5	9.9	120.4	95	+/-2%	95	PASS
36	07/29/12	#1	9.7	126.5	9.4	120.8	95	+/-2%	95	PASS
37							#DIV/0!			
38							#DIV/0!			
39							#DIV/0!			
40							#DIV/0!			

TEST #	LOCATION	ELEVATION
31	North 421067.10, East 1179554.40	1920.8
32	North 420928.65, East 1179636.40	1911.25
33	North 420835.80, East 1179608.55	1912.35
34	North 421077.20, East 1179797.50	1922.35
35	North 420932.15, East 1179576.05	1914.35
36	North 420901.40, East 1179652.05	1909.95
37		
38		
39		
40		

NOTES: \_\_\_\_\_  
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**REPORT OF SOIL DENSITY TESTING - NUCLEAR METHOD**

ASTM D6938

CLIENT: **CONTINENTAL RESOURCES, INC.**  
PO Box 268836  
Oklahoma City, OK 73126

ATTENTION: Project Manager  
PROJECT: Atlanta Drill Site

ATS #: 12-12165  
DATE: 08/01/12  
ATS TECH: Russell Harwood  
GAGE #: 2  
BENCHMARK:

TEST #	DATE	PROCTOR # / CLASSIFICATION	LABORATORY		FIELD		SPECIFICATIONS			
			% MOIST	DRY DENSITY	% MOISTURE	DRY DENSITY	% COMPACTION	SPEC MOISTURE	% SPEC COMPACTION	PASS
37	07/30/12	#3	15.3	114.2	14.2	108.7	95	+/-2%	95	PASS
38	07/30/12	#3	15.3	114.2	13.7	109.1	96	+/-2%	95	PASS
39	07/30/12	#3	15.3	114.2	13.6	110.4	97	+/-2%	95	PASS
40	07/30/12	#3	15.3	114.2	14.1	109.2	96	+/-2%	95	PASS
41	07/30/12	#3	15.3	114.2	13.8	110.0	96	+/-2%	95	PASS
42	07/30/12	#3	15.3	114.2	14.0	112.6	99	+/-2%	95	PASS
43							#DIV/0!			
44							#DIV/0!			
45							#DIV/0!			
46							#DIV/0!			

TEST #	LOCATION	ELEVATION
37	North 420807.75, East 1179702.80	1909.05
38	North 420783.10, East 1179629.25	1916.6
39	North 421008.30, East 1179597.45	1916.65
40	North 420912.45, East 1179672.00	1910.05
41	North 420800.0, East 1179606.85	1922.55
42	North 420784.65, East 1179714.00	1911.75
43		
44		
45		
46		

NOTES:

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Black Hawk, SD 57718-0558

**REPORT OF SOIL DENSITY TESTING - NUCLEAR METHOD**

ASTM D6938

CLIENT: **CONTINENTAL RESOURCES, INC.**  
PO Box 268836  
Oklahoma City, OK 73126

ATTENTION: Project Manager  
PROJECT: Atlanta Drill Site

ATS #: 12-12165  
DATE: 08/01/12  
ATS TECH: Russell Harwood  
GAGE #: 2  
BENCHMARK:

TEST #	DATE	PROCTOR # / CLASSIFICATION	LABORATORY		FIELD		SPECIFICATIONS			
			% MOIST	DRY DENSITY	% MOISTURE	DRY DENSITY	% COMPACTION	SPEC MOISTURE %	SPEC COMPACTION	PASS
43	07/31/12	#3	15.3	114.2	13.4	108.9	95	+/-2%	95	PASS
44	07/31/12	#3	15.3	114.2	14.1	113.3	99	+/-2%	95	PASS
45	07/31/12	#3	15.3	114.2	13.3	109.5	96	+/-2%	95	PASS
46	07/31/12	#3	15.3	114.2	13.5	115.0	101	+/-2%	95	PASS
47	07/31/12	#1	9.7	126.5	8.9	124.7	99	+/-2%	95	PASS
48							#DIV/0!			
49							#DIV/0!			
50							#DIV/0!			
51							#DIV/0!			
52							#DIV/0!			

TEST #	LOCATION	ELEVATION
43	North 421075.80, East 1179492.75	1925.45
44	North 420939.60, East 1179667.90	1915.7
45	North 421024.15, East 1179494.95	1926.15
46	North 420978.15, East 1179573.50	1923.35
47	North 420958.05, East 1179629.60	1919.6
48		
49		
50		
51		
52		

NOTES: \_\_\_\_\_

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Black Hawk, SD 57718-0558

REPORT OF SOIL DENSITY TESTING - NUCLEAR METHOD

ASTM D6938

CLIENT: CONTINENTAL RESOURCES, INC.  
PO Box 268836  
Oklahoma City, OK 73126  
ATTENTION: Project Manager  
PROJECT: Atlanta Drill Site

ATS #: 12-12165  
DATE: 08/03/12  
ATS TECH: Russell Harwood  
GAGE #: 2  
BENCHMARK:

TEST #	DATE	PROCTOR # / CLASSIFICATION	LABORATORY		FIELD		SPECIFICATIONS		PASS
			% MOIST	DRY DENSITY	% MOISTURE	DRY DENSITY	% COMPACTION	SPEC MOISTURE %	
48	08/01/12	#3	15.3	114.2	13.7	113.9	100	+/-2%	95
49	08/01/12	#3	15.3	114.2	13.4	112.6	99	+/-2%	95
50	08/01/12	#3	15.3	114.2	13.5	108.9	95	+/-2%	95
51	08/01/12	#3	15.3	114.2	14.2	110.0	96	+/-2%	95
52	08/01/12	#3	15.3	114.2	13.3	113.5	99	+/-2%	95
53							#DIV/0!		
54							#DIV/0!		
55							#DIV/0!		
56							#DIV/0!		
57							#DIV/0!		

TEST #	LOCATION	ELEVATION
48	78' North of South End of West Valley- Middle	
49	25' North of South End of West Valley-Middle	
50	225' North of South End of West Valley-Middle	
51	North 421100.20 East 1179617.10	1924.9
52	North 420962.20 East 1179574.20	1928.75
53		
54		
55		
56		
57		

NOTES: Not Able to Get GPS Readings System Down

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Black Hawk, SD 57718-0558

**REPORT OF SOIL DENSITY TESTING - NUCLEAR METHOD**

ASTM D6938

CLIENT: **CONTINENTAL RESOURCES, INC.**  
PO Box 268836  
Oklahoma City, OK 73126  
ATTENTION: Project Manager  
PROJECT: Atlanta Drill Site

ATS #: 12-12165  
DATE: 08/03/12  
ATS TECH: Russell Harwood  
GAGE #: 2  
BENCHMARK:

TEST #	DATE	PROCTOR # / CLASSIFICATION	LABORATORY		FIELD		SPECIFICATIONS			
			% MOIST	DRY DENSITY	% MOISTURE	DRY DENSITY	% COMPACTION	SPEC MOISTURE %	SPEC COMPACTION	PASS
53	08/02/12	#3	15.3	114.2	13.5	114.9	101	+/-2%	95	PASS
54	08/02/12	#3	15.3	114.2	13.7	112.9	99	+/-2%	95	PASS
55	08/02/12	#3	15.3	114.2	13.5	110.2	96	+/-2%	95	PASS
56	08/02/12	#3	15.3	114.2	13.6	114.0	100	+/-2%	95	PASS
57	08/02/12	#3	15.3	114.2	13.6	113.9	100	+/-2%	95	PASS
58	08/02/12	#3	15.3	114.2	13.8	115.5	101	+/-2%	95	PASS
59	08/02/12	#3	15.3	114.2	13.4	109.7	96	+/-2%	95	PASS
60							#DIV/0!			
61							#DIV/0!			
62							#DIV/0!			

TEST #	LOCATION	ELEVATION
53	North 420981.65, East 1179560.25	1930.75
54	North 420989.70, East 1179597.65	1928.25
55	North 420091.15, East 1179511.90	1933.95
56	North 421074.40, East 1179515.05	1933.45
57	North 421145.45, East 1179458.95	1932.75
58	North 421084.85, East 1179531.55	1934.45
59	North 421196.80, East 1179508.90	1934.35
60		
61		
62		

NOTES: \_\_\_\_\_

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8105 Black Hawk Rd. • PO Box 558  
Black Hawk, SD 57718-0558

**REPORT OF SOIL DENSITY TESTING - NUCLEAR METHOD**

ASTM D6938

CLIENT: CONTINENTAL RESOURCES, INC.  
PO Box 268836  
Oklahoma City, OK 73126

ATTENTION: Project Manager

PROJECT: Atlanta Drill Site

ATS #: 12-12165  
DATE: 08/07/12  
ATS TECH: Russell Harwood  
GAGE #: 2  
BENCHMARK:

TEST #	DATE	PROCTOR # / CLASSIFICATION	LABORATORY		FIELD		SPECIFICATIONS			
			% MOIST	DRY DENSITY	% MOISTURE	DRY DENSITY	% COMPACTION	SPEC MOISTURE %	SPEC COMPACTION	PASS
60	08/04/12	#3	15.3	114.2	13.9	112.2	98	+/-2%	95	PASS
61	08/04/12	#1	9.7	126.5	8.9	120.6	95	+/-2%	95	PASS
62	08/04/12	#3	15.3	114.2	14.1	113.9	100	+/-2%	95	PASS
63	08/04/12	#3	15.3	114.2	13.4	113.3	99	+/-2%	95	PASS
64							#DIV/0!			
65							#DIV/0!			
66							#DIV/0!			
67							#DIV/0!			
68							#DIV/0!			
69							#DIV/0!			

TEST #	LOCATION	ELEVATION
60	300' North of South Slope, East 1/3 of West Valley	4 to 5' Below
61	100' North of South Slope, East 1/3 of West Valley	4 to 5' Below
62	North 421154.15, East 1179488.85	1930.7
63	North 421086.15, East 1179544.25	1937.05
64		
65		
66		
67		
68		
69		

NOTES: No GPS for Location

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9105 Black Hawk Rd. • PO Box 558  
Black Hawk, CO 80428-0558

**REPORT OF SOIL DENSITY TESTING - NUCLEAR METHOD**

ASTM D6938

CLIENT: CONTINENTAL RESOURCES, INC.  
PO Box 268836  
Oklahoma City, OK 73126

ATTENTION: Project Manager

PROJECT: Atlanta Drill Site

ATS #: 12-12165  
DATE: 08/07/12  
ATS TECH: Russell Harwood  
GAGE #: 2  
BENCHMARK: \_\_\_\_\_

TEST #	DATE	PROCTOR # / CLASSIFICATION	LABORATORY		FIELD			SPECIFICATIONS		
			% MOIST	DRY DENSITY	% MOISTURE	DRY DENSITY	% COMPACTION	SPEC MOISTURE %	SPEC COMPACTION	PASS
64	08/05/12	#1	9.7	126.5	10.1	124.9	99	+/-2%	95	PASS
65	08/05/12	#3	15.3	114.2	13.4	112.2	98	+/-2%	95	PASS
66	08/05/12	#1	9.7	126.5	8.3	128.5	102	+/-2%	95	PASS
67	08/05/12	#1	9.7	126.5	9.1	121.8	96	+/-2%	95	PASS
68							#DIV/0!			
69							#DIV/0!			
70							#DIV/0!			
71							#DIV/0!			
72							#DIV/0!			
73							#DIV/0!			

TEST #	LOCATION	ELEVATION
64	North 421047.10 East 1179483.90	1939
65	North 421236.15 East 1179463.75	1938.55
66	North 421344.40 East 1179447.75	1940.25
67	North 421219.15 East 1179501.00	1940.4
68		
69		
70		
71		
72		
73		

NOTES: \_\_\_\_\_

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9105 Black Hawk Rd • PO Box 558  
Black Hawk, SD 57718-0558

**REPORT OF SOIL DENSITY TESTING - NUCLEAR METHOD**

ASTM D6938

CLIENT: CONTINENTAL RESOURCES, INC.  
PO Box 268836  
Oklahoma City, OK 73126

ATTENTION: Project Manager  
PROJECT: Atlanta Drill Site

ATS #: 12-12165  
DATE: 08/09/12  
ATS TECH: Russell Harwood  
GAGE #: 2  
BENCHMARK: \_\_\_\_\_

TEST #	DATE	PROCTOR # / CLASSIFICATION	LABORATORY		FIELD		SPECIFICATIONS			
			% MOIST	DRY DENSITY	% MOISTURE	DRY DENSITY	% COMPACTION	SPEC MOISTURE %	SPEC COMPACTION	PASS
68	08/07/12	#1	9.7	126.5	7.8	122.6	97	+/-2%	95	PASS
69	08/07/12	#2	8.3	123.2	7.5	118.7	96	+/-2%	95	PASS
70	08/07/12	#1	9.7	126.5	8.7	126.3	100	+/-2%	95	PASS
71	08/07/12	#1	9.7	126.5	7.8	123.8	98	+/-2%	95	PASS
72							#DIV/0!			
73							#DIV/0!			
74							#DIV/0!			
75							#DIV/0!			
76							#DIV/0!			
77							#DIV/0!			

TEST #	LOCATION	ELEVATION
68	North 420982.95 East 1179952.45	1895.45
69	North 421008.10 East 1179936.05	1896.5
70	North 421099.00 East 1179911.80	1898.75
71	North 421191.80 East 1179859.30	1904.05
72		
73		
74		
75		
76		
77		

NOTES

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8105 Black Hawk Rd • PO Box 558  
Black Hawk, SD 57718-0558

**REPORT OF SOIL DENSITY TESTING - NUCLEAR METHOD**

ASTM D6938

CLIENT: **CONTINENTAL RESOURCES, INC.**  
PO Box 268836  
Oklahoma City, OK 73126

ATTENTION: Project Manager  
PROJECT: Atlanta Drill Site

ATS.# 12-12165  
DATE 08/09/12  
ATS TECH: Russell Harwood  
GAGE # 2  
BENCHMARK

TEST #	DATE	PROCTOR # / CLASSIFICATION	LABORATORY		FIELD		SPECIFICATIONS			
			% MOIST	DRY DENSITY	% MOISTURE	DRY DENSITY	% COMPACTION	SPEC MOISTURE	% SPEC COMPACTION	PASS
72	08/08/12	#1	9.7	126.5	8.6	124.9	99	+/-2%	95	PASS
73	08/08/12	#1	9.7	123.2	7.7	128.6	104	+/-2%	95	PASS
74	08/08/12	#2	8.3	123.2	8.4	117.5	95	+/-2%	95	PASS
75	08/08/12	#1	9.7	126.5	7.9	128.5	102	+/-2%	95	PASS
76							#DIV/0!			
77							#DIV/0!			
78							#DIV/0!			
79							#DIV/0!			
80							#DIV/0!			
81							#DIV/0!			

TEST #	LOCATION	ELEVATION
72	North 421032.80 East 1179904.95	1907.4
73	North 421121.00 East 1179879.00	1909.35
74	North 421046.25 East 1179873.80	1911.65
75	North 421154.10 East 1179910.70	1913.7
76		
77		
78		
79		
80		
81		

NOTES:

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AMERICAN TECHNICAL SERVICES, INC.

CC:

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TECHNICAL  
SERVICES, INC.**

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8105 Black Hawk Rd. • PO Box 558  
Black Hawk, SD 57718-0558

**REPORT OF SOIL DENSITY TESTING - NUCLEAR METHOD**

ASTM D6938

CLIENT           **CONTINENTAL RESOURCES, INC.**  
 PO Box 268836  
 Oklahoma City, OK 73126

ATTENTION:      Project Manager  
 PROJECT:        Atlanta Drill Site

ATS #            12-12165  
 DATE            08/15/12  
 ATS TECH:      Russell Harwood  
 GAGE #          2  
 BENCHMARK:

TEST #	DATE	PROCTOR # / CLASSIFICATION	LABORATORY		FIELD		SPECIFICATIONS			PASS
			% MOIST	DRY DENSITY	% MOISTURE	DRY DENSITY	% COMPACTION	SPEC. MOISTURE %	SPEC. COMPACTION	
76	08/09/12	#1	9.7	126.5	8.0	120.4	95	+/-2%	95	PASS
77	08/09/12	#2	8.3	123.2	8.1	120.3	98	+/-2%	95	PASS
78							#DIV/0!			
79							#DIV/0!			
80							#DIV/0!			
81							#DIV/0!			
82							#DIV/0!			
83							#DIV/0!			
84							#DIV/0!			
85							#DIV/0!			

TEST #	LOCATION	ELEVATION
76	North 421078.95 East 1179862.60	1914.45
77	North 421199.70 East 1179870.90	1915.05
78		
79		
80		
81		
82		
83		
84		
85		

NOTES: \_\_\_\_\_

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CC:

AMERICAN TECHNICAL SERVICES, INC.



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MERICAN  
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S  
ERVICES, INC.**

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5105 Black Hawk Rd • PO Box 558  
Black Hawk, SD 57718-0558

**REPORT OF SOIL DENSITY TESTING - NUCLEAR METHOD**

ASTM D6938

CLIENT: **CONTINENTAL RESOURCES, INC.**  
 PO Box 268836  
 Oklahoma City, OK 73126

ATTENTION: Project Manager  
 PROJECT: Atlanta Drill Site

ATS #: 12-12165  
 DATE: 08/15/12  
 ATS TECH: Russell Harwood  
 GAGE #: 2  
 BENCHMARK:

		LABORATORY		FIELD		SPECIFICATIONS				
TEST #	DATE	PROCTOR # / CLASSIFICATION	% MOIST	DRY DENSITY	% MOISTURE	DRY DENSITY	% COMPACTION	SPEC MOISTURE %	SPEC COMPACTION	PASS
82	08/12/12	#1	9.7	126.5	10.0	124.2	98	+/-2%	95	PASS
83	08/12/12	#1	9.7	126.5	10.3	120.7	95	+/-2%	95	PASS
84	08/12/12	#1	9.7	126.5	10.1	122.8	97	+/-2%	95	PASS
85	08/12/12	#3	15.3	114.2	13.4	115.5	101	+/-2%	95	PASS
86	08/12/12	#3	15.3	114.2	14.0	116.6	102	+/-2%	95	PASS
87	08/12/12	#3	15.3	114.2	13.9	114.9	101	+/-2%	95	PASS
88							#DIV/0!			
89							#DIV/0!			
90							#DIV/0!			
91							#DIV/0!			

TEST #	LOCATION	ELEVATION
82	North 421169.15 East 1179661.00	1934.25
83	North 421281.75 East 1179530.30	1935.9
84	North 421187.85 East 1179466.20	1935.2
85	North 421265.35 East 1179372.75	1936.3
86	North 421179.15 East 1179257.80	1935.9
87	North 421253.65 East 1179177.25	1937.1
88		
89		
90		
91		

NOTES: All Test in Overex on West 1/2 Subgrade Before Liner Installation

RESPECTFULLY SUBMITTED

CC:

AMERICAN TECHNICAL SERVICES, INC.

**A**MERICAN  
**T**ECHNICAL  
**S**ERVICES, INC.

ENGINEERING • ENVIRONMENTAL • DRILLING • MATERIALS  
6105 Black Hawk Rd. • PO Box 558  
Black Hawk, SD 57718-0558

**REPORT OF SOIL DENSITY TESTING - NUCLEAR METHOD**

ASTM D6938

CLIENT: **CONTINENTAL RESOURCES, INC.**  
PO Box 268836  
Oklahoma City, OK 73126

ATTENTION: Project Manager  
PROJECT: Atlanta Drill Site

ATS #: 12-12165  
DATE: 08/15/12  
ATS TECH: Russell Harwood  
GAGE #: 2  
BENCHMARK:

TEST #	DATE	PROCTOR # / CLASSIFICATION	LABORATORY		FIELD		SPECIFICATIONS			PASS
			% MOIST	DRY DENSITY	% MOISTURE	DRY DENSITY	% COMPACTION	SPEC MOISTURE %	SPEC COMPACTION	
78	08/12/12	#3	15.3	114.2	13.5	113.9	100	+/-2%	95	PASS
79	08/12/12	#3	15.3	114.2	13.7	115.1	101	+/-2%	95	PASS
80	08/12/12	#3	15.3	114.2	13.4	114.9	101	+/-2%	95	PASS
81	08/12/12	#3	15.3	114.2	13.3	113.3	99	+/-2%	95	PASS
82							#DIV/0!			
83							#DIV/0!			
84							#DIV/0!			
85							#DIV/0!			
86							#DIV/0!			
87							#DIV/0!			

TEST #	LOCATION	ELEVATION
78	North 421150.90 East 1179896.40	1917
79	North 421240.60 East 1179845.60	1917.8
80	North 421006.70 East 1179882.55	1922.3
81	North 420992.55 East 1179992.15	1919.75
82		
83		
84		
85		
86		
87		

NOTES:

RESPECTFULLY SUBMITTED

CC:

  
AMERICAN TECHNICAL SERVICES, INC.

AMERICAN  
TECHNICAL  
SERVICES, INC.

ENGINEERING • ENVIRONMENTAL • DRILLING • MATERIALS  
8105 Back Hawk Rd. • PO Box 558  
Black Hawk, SD 57718-0558

REPORT OF SOIL DENSITY TESTING - NUCLEAR METHOD  
ASTM D6938

CLIENT: CONTINENTAL RESOURCES INC  
PO Box 268836  
Oklahoma City, OK 73126

ATTENTION: Project Manager  
PROJECT: Atlanta Drill Site

ATS #: 12-12165  
DATE: 08/15/12  
ATS TECH: Russell Harwood  
GAGE #: 2  
BENCHMARK:

			LABORATORY		FIELD		SPECIFICATIONS			
TEST #	DATE	PROCTOR # / CLASSIFICATION	% MOIST	DRY DENSITY	% MOISTURE	DRY DENSITY	% COMPACTION	SPEC MOISTURE %	SPEC COMPACTION	PASS
88	08/13/12	#3	15.3	114.2	13.6	113.7	100	+/-2%	95	PASS
89	08/13/12	#3	15.3	114.2	13.8	113.3	99	+/-2%	95	PASS
90	08/13/12	#3	15.3	114.2	13.4	115.5	101	+/-2%	95	PASS
91	08/13/12	#2	8.3	123.2	8.8	118.9	97	+/-2%	95	PASS
92	08/13/12	#1	9.7	126.5	8.9	126.1	100	+/-2%	95	PASS
93							#DIV/0!			
94							#DIV/0!			
95							#DIV/0!			
96							#DIV/0!			
97							#DIV/0!			

TEST #	LOCATION	ELEVATION
88	North 421063.70 East 1179944.20	1918.35
89	North 421008.35 East 1179861.05	1927.7
90	North 421038.50 East 1179985.85	1920.7
91	North 421044.50 East 1179840.40	1927.5
92	North 421017.25 East 1179950.30	1925.65
93		
94		
95		
96		
97		

NOTES:

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AMERICAN TECHNICAL SERVICES, INC.

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8105 Black Hawk Rd. • PO Box 558  
Black Hawk, SD 57713-0558

**REPORT OF SOIL DENSITY TESTING - NUCLEAR METHOD**

ASTM D6938

CLIENT: **CONTINENTAL RESOURCES, INC.**  
 PO Box 268836  
 Oklahoma City, OK 73126  
 ATTENTION: Project Manager  
 PROJECT: Atlanta Drill Site

ATS #: 12-12165  
 DATE: 08/15/12  
 ATS TECH: Russell Harwood  
 GAGE #: 2  
 BENCHMARK:

TEST #	DATE	PROCTOR # / CLASSIFICATION	LABORATORY		FIELD		SPECIFICATIONS			PASS
			% MOIST	DRY DENSITY	% MOISTURE	DRY DENSITY	% COMPACTION	SPEC MOISTURE %	SPEC COMPACTION	
98	08/14/12	#1	9.7	126.5	10.2	120.9	96	+/-2%	95	PASS
99	08/14/12	#1	9.7	126.5	10.3	121.3	96	+/-2%	95	PASS
100	08/14/12	#1	9.7	126.5	10.1	121.9	96	+/-2%	95	PASS
101	08/14/12	#3	15.3	114.2	13.3	114.5	100	+/-2%	95	PASS
102	08/14/12	#1	9.7	126.5	10.1	123.5	98	+/-2%	95	PASS
103	08/14/12	#1	9.7	126.5	10.2	121.2	96	+/-2%	95	PASS
104	08/14/12	#3	15.3	114.2	13.4	115.6	101	+/-2%	95	PASS
105							#DIV/0!			
106							#DIV/0!			
107							#DIV/0!			

TEST #	LOCATION	ELEVATION
98	North 421249.95 East 1179384.30	1937.55
99	North 421288.40 East 1179300.25	1938.65
100	North 421171.30 East 1179237.30	1937.9
101	North 421272.15 East 1179362.50	1938.75
102	North 421267.10 East 1179238.35	1939.7
103	North 421229.90 East 1179254.90	1939.2
104	North 421203.80 East 1179320.25	1938.65
105		
106		
107		

NOTES: Drill Pad Area on Liner Fill

RESPECTFULLY SUBMITTED

CC:

  
**AMERICAN TECHNICAL SERVICES, INC.**

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SERVICES, INC.**

ENGINEERING • ENVIRONMENTAL • DRILLING • MATERIALS  
3105 Black Hawk Rd. • PO Box 558  
Black Hawk, SD 57718-0558

**REPORT OF SOIL DENSITY TESTING - NUCLEAR METHOD**  
ASTM D6938

CLIENT: CONTINENTAL RESOURCES, INC.  
PO Box 268836  
Oklahoma City, OK 73126  
ATTENTION: Project Manager  
PROJECT: Atlanta Drill Site

ATS #: 12-12165  
DATE: 08/15/12  
ATS TECH: Russell Harwood  
GAGE #: 2  
BENCHMARK: \_\_\_\_\_

TEST #	DATE	PROCTOR # / CLASSIFICATION	LABORATORY		FIELD		SPECIFICATIONS			
			% MOIST	DRY DENSITY	% MOISTURE	DRY DENSITY	% COMPACTION	SPEC MOISTURE %	SPEC COMPACTION	PASS
93	08/14/12	#3	15.3	114.2	13.6	114.5	100	+/-2%	95	PASS
94	08/14/12	#3	15.3	114.2	13.7	114.7	100	+/-2%	95	PASS
95	08/14/12	#1	9.7	126.5	10.4	122.5	97	+/-2%	95	PASS
96	08/14/12	#1	9.7	126.5	8.7	124.0	98	+/-2%	95	PASS
97	08/14/12	#1	9.7	126.5	9.3	121.3	96	+/-2%	95	PASS
98							#DIV/0!			
99							#DIV/0!			
100							#DIV/0!			
101							#DIV/0!			
102							#DIV/0!			

TEST #	LOCATION	ELEVATION
93	North 421035.45 East 1179873.40	1927.55
94	North 421012.25 East 1179971.80	1925.7
95	North 421091.95 East 1179838.70	1927.15
96	North 421038.25 East 1179899.75	1928.35
97	North 420986.05 East 1170007.50	1925.5
98		
99		
100		
101		
102		

NOTES:

RESPECTFULLY SUBMITTED

CC:

AMERICAN TECHNICAL SERVICES, INC.

**AMERICAN  
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SERVICES, INC.**

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8105 Black Hawk Rd. • PO Box 558  
Black Hawk, SD 57718-0558

**REPORT OF SOIL DENSITY TESTING - NUCLEAR METHOD**

ASTM D6938

CLIENT: CONTINENTAL RESOURCES, INC.  
PO Box 268836  
Oklahoma City, OK 73126

ATTENTION: Project Manager  
PROJECT: Atlanta Drill Site

ATS #: 12-12165  
DATE: 08/17/12  
ATS TECH: Russell Harwood  
GAGE #: 2  
BENCHMARK: \_\_\_\_\_

TEST #	DATE	PROCTOR # / CLASSIFICATION	LABORATORY		FIELD		SPECIFICATIONS			
			% MOIST	DRY DENSITY	% MOISTURE	DRY DENSITY	% COMPACTION	SPEC MOISTURE %	SPEC COMPACTION	PASS
111	08/15/12	#1	9.7	126.5	10.4	120.1	95	+/-2%	95	PASS
112	08/15/12	#3	15.3	114.2	13.7	113.9	100	+/-2%	95	PASS
113							#DIV/0!			
114							#DIV/0!			
115							#DIV/0!			
116							#DIV/0!			
117							#DIV/0!			
118							#DIV/0!			
119							#DIV/0!			
120							#DIV/0!			

TEST #	LOCATION	ELEVATION
111	North 421056.40 East 1179836.10	1931.4
112	North 421052.05 East 1179918.50	1927.8
113		
114		
115		
116		
117		
118		
119		
120		

NOTES: \_\_\_\_\_

RESPECTFULLY SUBMITTED

CC:

AMERICAN TECHNICAL SERVICES, INC.

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8105 Black Hawk Rd. • PO Box 558  
Black Hawk, SD 57718-0558

**REPORT OF SOIL DENSITY TESTING - NUCLEAR METHOD**

ASTM D6938

CLIENT	CONTINENTAL RESOURCES, INC. PO Box 268836 Oklahoma City, OK 73126	ATS #	12-12165
ATTENTION:	Project Manager	DATE	08/17/12
PROJECT	Atlanta Drill Site	ATS TECH	Russell Harwood
		GAGE #	2
		BENCHMARK	

TEST #	DATE	PROCTOR # / CLASSIFICATION	LABORATORY		FIELD		SPECIFICATIONS			PASS
			% MOIST	DRY DENSITY	% MOISTURE	DRY DENSITY	% COMPACTION	SPEC MOISTURE	% SPEC COMPACTION	
105	08/15/12	#3	15.3	114.2	13.6	118.0	103	+/-2%	95	PASS
106	08/15/12	#2	8.3	123.2	8.9	119.5	97	+/-2%	95	PASS
107	08/15/12	#3	15.3	114.2	13.7	115.6	101	+/-2%	95	PASS
108	08/15/12	#1	9.7	126.5	10.6	123.6	98	+/-2%	95	PASS
109	08/15/12	#3	15.3	114.2	13.4	116.1	102	+/-2%	95	PASS
110	08/15/12	#3	15.3	114.2	13.7	114.7	100	+/-2%	95	PASS
111							#DIV/0!			
112							#DIV/0!			
113							#DIV/0!			
114							#DIV/0!			

TEST #	LOCATION	ELEVATION
105	North 421228.10 East 1179216.50	1941.2
106	North 421250.80 East 1179341.55	1940.4
107	North 421159.45 East 1179335.60	1939.75
108	North 421292.70 East 1179491.85	1939.45
109	North 421261.20 East 1179545.20	1938.45
110	North 421175.25 East 1179545.40	1937.05
111		
112		
113		
114		

NOTES: Drill Pad Back Fill

RESPECTFULLY SUBMITTED

cc:

  
AMERICAN TECHNICAL SERVICES, INC.

**AMERICAN  
TECHNICAL  
SERVICES, INC.**

ENGINEERING • ENVIRONMENTAL • DRILLING • MATERIALS  
8105 Black Hawk Rd. • PO Box 558  
Black Hawk, CO 80428-0558

**REPORT OF SOIL DENSITY TESTING - NUCLEAR METHOD**  
ASTM D6938

CLIENT	CONTINENTAL RESOURCES, INC. PO Box 268836 Oklahoma City, OK 73126	ATS #	12-12165
ATTENTION:	Project Manager	DATE	08/17/12
PROJECT	Atlanta Drill Site	ATS TECH	Russell Harwood
		GAGE #	2
		BENCHMARK	

TEST #	DATE	PROCTOR # / CLASSIFICATION	LABORATORY		FIELD		SPECIFICATIONS		PASS
			% MOIST	DRY DENSITY	% MOISTURE	DRY DENSITY	% COMPACTION	SPEC MOISTURE %	
119	08/16/12	#1	15.3	114.2	13.7	110.0	96	+/-2%	95
120	08/16/12	#1	15.3	114.2	13.9	112.0	98	+/-2%	95
121	08/16/12	#1	15.3	114.2	13.6	112.4	98	+/-2%	95
122	08/16/12	#1	15.3	114.2	13.4	112.6	99	+/-2%	95
123	08/16/12	#1	15.3	114.2	13.6	114.0	100	+/-2%	95
124	08/16/12	#1	15.3	114.2	13.9	115.2	101	+/-2%	95
125							#DIV/0!		
126							#DIV/0!		
127							#DIV/0!		
128							#DIV/0!		

TEST #	LOCATION	ELEVATION
119	120' East of West Outlet	6' Above Top of Pipe
120	110' East of West Outlet	8' Above Top of Pipe
121	100' East of West Outlet	10' Above Top of Pipe
122	STA 2 + 80	6' Above Top of Pipe
123	STA 2 + 70	8' Above Top of Pipe
124	STA 2 + 60	10' Above Top of Pipe
125		
126		
127		
128		

NOTES: Northwest Storm Sewer Trench Back Fill

RESPECTFULLY SUBMITTED

CC:

  
AMERICAN TECHNICAL SERVICES, INC.

AMERICAN  
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SERVICES, INC.

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8105 Black Hawk Rd • PO Box 558  
Black Hawk, SD 57718-0558

## REPORT OF SOIL DENSITY TESTING - NUCLEAR METHOD

ASTM D6938

CLIENT: CONTINENTAL RESOURCES, INC.  
PO Box 268836  
Oklahoma City, OK 73126

ATTENTION: Project Manager  
PROJECT: Atlanta Drill Site

ATS #: 12-12165  
DATE: 08/17/12  
ATS TECH: Russell Harwood  
GAGE #: 2  
BENCHMARK:

TEST #	DATE	PROCTOR # / CLASSIFICATION	LABORATORY		FIELD		SPECIFICATIONS			PASS
			% MOIST	DRY DENSITY	% MOISTURE	DRY DENSITY	% COMPACTION	SPEC MOISTURE %	SPEC COMPACTION	
116	08/16/12	#3	15.3	114.2	13.6	115.5	101	+/-2%	95	PASS
117	08/16/12	#3	15.3	114.2	13.3	111.5	98	+/-2%	95	PASS
118	08/16/12	#3	15.3	114.2	13.8	111.3	97	+/-2%	95	PASS
119							#DIV/0!			
120							#DIV/0!			
121							#DIV/0!			
122							#DIV/0!			
123							#DIV/0!			
124							#DIV/0!			
125							#DIV/0!			

TEST #	LOCATION	ELEVATION
116	North 421295.55 East 1179462.65	1941.3
117	North 421250.20 East 1179528.35	1939.95
118	North 421191.60 East 1179541.70	1939.5
119		
120		
121		
122		
123		
124		
125		

NOTES: Drill Pad Area

RESPECTFULLY SUBMITTED



AMERICAN TECHNICAL SERVICES, INC.

CC:

**AMERICAN  
TECHNICAL  
SERVICES, INC.**

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8105 Black Hawk Rd • PO Box 558  
Black Hawk, SD 57718-0558

**REPORT OF SOIL DENSITY TESTING - NUCLEAR METHOD**  
ASTM D6938

**CLIENT** CONTINENTAL RESOURCES, INC.  
PO Box 268836  
Oklahoma City, OK 73126  
**ATTENTION:** Project Manager  
**PROJECT** Atlanta Drill Site

ATS #: 12-12165  
DATE: 08/17/12  
ATS TECH: Russell Harwood  
GAGE #: 2  
BENCHMARK:

TEST #	DATE	PROCTOR #/CLASSIFICATION	LABORATORY		FIELD		SPECIFICATIONS			
			% MOIST	DRY DENSITY	% MOISTURE	DRY DENSITY	% COMPACTION	SPEC MOISTURE %	SPEC COMPACTION	PASS
113	08/16/12	#3	15.3	114.2	14.5	116.3	102	+/-2%	95	PASS
114	08/16/12	#2	8.3	123.2	9.4	119.5	97	+/-2%	95	PASS
115	08/16/12	#3	15.3	114.2	13.4	114.0	100	+/-2%	95	PASS
116							#DIV/0!			
117							#DIV/0!			
118							#DIV/0!			
119							#DIV/0!			
120							#DIV/0!			
121							#DIV/0!			
122							#DIV/0!			

TEST #	LOCATION	ELEVATION
113	North 421004.30 East 1180053.35	1925.95
114	North 421047.15 East 1179917.95	1929.8
115	North 421131.15 East 1179860.70	1923.2
116		
117		
118		
119		
120		
121		
122		

NOTES: East Valley Fill

RESPECTFULLY SUBMITTED

CC:

  
AMERICAN TECHNICAL SERVICES, INC.

AMERICAN  
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SERVICES, INC.

ENGINEERING • ENVIRONMENTAL • DRILLING • MATERIALS  
8105 Black Hawk Rd. • PO Box 558  
Black Hawk, SD 57718-0558

## REPORT OF SOIL DENSITY TESTING - NUCLEAR METHOD

ASTM D6938

CLIENT: CONTINENTAL RESOURCES, INC.  
PO Box 268836  
Oklahoma City, OK 73126  
ATTENTION: Project Manager  
PROJECT: Atlanta Drill Site

ATS #: 12-12165  
DATE: 08/20/12  
ATS TECH: Russell Harwood  
GAGE #: 2  
BENCHMARK:

TEST #	DATE	PROCTOR # / CLASSIFICATION	LABORATORY		FIELD		SPECIFICATIONS			
			% MOIST	DRY DENSITY	% MOISTURE	DRY DENSITY	% COMPACTION	SPEC MOISTURE	% SPEC COMPACTION	PASS
125	08/17/12	#3	15.3	114.2	13.3	110.1	96	+/-2%	95	PASS
126	08/17/12	#1	9.7	126.5	10.4	122.2	97	+/-2%	95	PASS
127	08/17/12	#3	15.3	114.2	13.4	116.7	102	+/-2%	95	PASS
128							#DIV/0!			
129							#DIV/0!			
130							#DIV/0!			
131							#DIV/0!			
132							#DIV/0!			
133							#DIV/0!			
134							#DIV/0!			

TEST #	LOCATION		ELEVATION
125	421406.45	1178944.55	1951.4
126	421405.80	1179870.85	1952.55
127	421474.75	1179005.90	1952.45
128			
129			
130			
131			
132			
133			
134			

NOTES: Road Rebuild Going North & South Along West Side

RESPECTFULLY SUBMITTED

CC:

AMERICAN TECHNICAL SERVICES, INC.

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ERVICES, INC.**

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8105 Black Hawk Rd • PO Box 558  
Black Hawk, SD 57718-0558

**REPORT OF SOIL DENSITY TESTING - NUCLEAR METHOD**

ASTM D6938

CLIENT: CONTINENTAL RESOURCES, INC.  
PO Box 268836  
Oklahoma City, OK 73126  
ATTENTION: Project Manager  
PROJECT: Atlanta Drill Site

ATS #: 12-12165  
DATE: 08/20/12  
ATS TECH: Russell Harwood  
GAGE #: 2  
BENCHMARK:

TEST #	DATE	PROCTOR # / CLASSIFICATION	LABORATORY		FIELD		SPECIFICATIONS			
			% MOIST	DRY DENSITY	% MOISTURE	DRY DENSITY	% COMPACTION	SPEC MOISTURE	% SPEC COMPACTION	PASS
128	08/17/12	#1	9.7	126.5	10.3	126.5	100	+/-2%	95	PASS
129	08/17/12	#1	9.7	126.5	9.3	124.1	98	+/-2%	95	PASS
130	08/17/12	#1	9.7	126.5	10.2	124.2	98	+/-2%	95	PASS
131							#DIV/0!			
132							#DIV/0!			
133							#DIV/0!			
134							#DIV/0!			
135							#DIV/0!			
136							#DIV/0!			
137							#DIV/0!			

TEST #	LOCATION	ELEVATION
128	N 421184.10 E 1179371.90	1943.55
129	N 421234.95 E 1179377.35	1943.6
130	N 421205.50 E 1179455.95	1943.55
131		
132		
133		
134		
135		
136		
137		

NOTES: Drill Pad Area

RESPECTFULLY SUBMITTED

CC:

AMERICAN TECHNICAL SERVICES, INC.

**AMERICAN  
TECHNICAL  
SERVICES, INC.**

ENGINEERING • ENVIRONMENTAL • DRILLING • MATERIALS  
8105 Black Hawk Rd • PO Box 558  
Black Hawk, SD 57718-0558

**REPORT OF SOIL DENSITY TESTING - NUCLEAR METHOD**

ASTM D6938

CLIENT: **CONTINENTAL RESOURCES, INC.**  
PO Box 268836  
Oklahoma City, OK 73126

ATTENTION: Project Manager  
PROJECT: Atlanta Drill Site

ATS #: 12-12165  
DATE: 08/20/12  
ATS TECH: Russell Harwood  
GAGE #: 2  
BENCHMARK:

TEST #	DATE	PROCTOR # / CLASSIFICATION	LABORATORY		FIELD			SPECIFICATIONS	
			% MOIST	DRY DENSITY	% MOISTURE	DRY DENSITY	% COMPACTION	SPEC MOISTURE	% SPEC COMPACTION
131	08/18/12	#2	8.3	123.2	9.0	118.4	96	+/-2%	95
132	08/18/12	#3	15.3	114.2	13.8	113.9	100	+/-2%	95
133	08/18/12	#3	15.3	114.2	13.6	113.3	99	+/-2%	95
134	08/18/12	#3	15.3	114.2	13.4	116.1	102	+/-2%	95
135	08/18/12	#2	8.3	123.2	9.1	118.5	96	+/-2%	95
136	08/18/12	#2	8.3	123.2	9.2	117.5	95	+/-2%	95
137						#DIV/0!			
138						#DIV/0!			
139						#DIV/0!			
140						#DIV/0!			

TEST #	LOCATION	ELEVATION
131	N 421121.60 E 1179889.35	1925.65
132	N 421052.95 E 1179930.80	1929.35
133	N 421037.40 E 1179997.15	1929.1
134	N 421186.90 E 1179885.25	1919.9
135	N 421258.50 E 1179843.35	1920
136	N 421339.55 E 1179823.35	1921.65
137		
138		
139		
140		

NOTES: All Test in East Valley.

RESPECTFULLY SUBMITTED

CC:

AMERICAN TECHNICAL SERVICES, INC.

**A**MERICAN  
TECHNICAL  
SERVICES, INC.

ENGINEERING • ENVIRONMENTAL • DRILLING • MATERIALS  
8105 Black Hawk Rd. • PO Box 558  
Black Hawk, SD 57718-0558

**REPORT OF SOIL DENSITY TESTING - NUCLEAR METHOD**

ASTM D6938

CLIENT: CONTINENTAL RESOURCES, INC.  
PO Box 268836  
Oklahoma City, OK 73126  
ATTENTION: Project Manager  
PROJECT: Atlanta Drill Site

ATS #: 12-12165  
DATE: 08/20/12  
ATS TECH: Russell Harwood  
GAGE #: 2  
BENCHMARK:

TEST #	DATE	PROCTOR # / CLASSIFICATION	LABORATORY		FIELD		SPECIFICATIONS			
			% MOIST	DRY DENSITY	% MOISTURE	DRY DENSITY	% COMPACTION	SPEC MOISTURE %	SPEC COMPACTION	PASS
137	08/19/12	#3	15.3	114.2	13.3	114.1	100	+/-2%	95	PASS
138	08/19/12	#3	15.3	114.2	14.2	113.5	99	+/-2%	95	PASS
139	08/19/12	#3	15.3	114.2	13.7	110.3	97	+/-2%	95	PASS
140	08/19/12	#3	15.3	114.2	13.5	115.5	101	+/-2%	95	PASS
141							#DIV/0!			
142							#DIV/0!			
143							#DIV/0!			
144							#DIV/0!			
145							#DIV/0!			
146							#DIV/0!			

TEST #	LOCATION	ELEVATION
137	N 421079.05 E 1180014.40	1927.3
138	N 421111.75 E 1179924.40	1928.6
139	N 421192.30 E 1179886.40	1920.7
140	N 421263.65 E 1179839.65	1922.1
141		
142		
143		
144		
145		
146		

NOTES: East Valley

RESPECTFULLY SUBMITTED

CC:

AMERICAN TECHNICAL SERVICES, INC.

**AMERICAN  
TECHNICAL  
SERVICES, INC.**

ENGINEERING • ENVIRONMENTAL • DRILLING • MATERIALS  
8105 Black Hawk Rd. • PO Box 558  
Black Hawk, SD 57718-0558

**REPORT OF SOIL DENSITY TESTING - NUCLEAR METHOD**  
ASTM D6938

CLIENT: **CONTINENTAL RESOURCES, INC.**  
PO Box 268836  
Oklahoma City, OK 73126

ATTENTION:  
PROJECT: **Project Manager**  
**Atlanta Drill Site**

ATS #: **12-12165**  
DATE: **08/20/12**  
ATS TECH: **Russell Harwood**  
GAGE #: **2**  
BENCHMARK:

TEST #	DATE	PROCTOR # / CLASSIFICATION	LABORATORY		FIELD		SPECIFICATIONS			
			% MOIST	DRY DENSITY	% MOISTURE	DRY DENSITY	% COMPACTION	SPEC MOISTURE	% SPEC COMPACTION	PASS
141	08/19/12	#2	8.3	123.2	8.8	121.8	99	+/-2%	95	PASS
142	08/19/12	#2	8.3	123.2	7.2	122.1	99	+/-2%	95	PASS
143	08/19/12	#2	8.3	123.2	7.1	120.4	98	+/-2%	95	PASS
144	08/19/12	#1	9.7	126.5	9.6	123.8	98	+/-2%	95	PASS
145							#DIV/0!			
146							#DIV/0!			
147							#DIV/0!			
148							#DIV/0!			
149							#DIV/0!			
150							#DIV/0!			

TEST #	LOCATION	ELEVATION
141	N 421638.85 E 1178871.85	1963.85
142	N 421644.55 E 1178852.40	1964
143	N 421637.05 E 1178851.85	1967.65
144	N 421669.20 E 1178823.50	1969.9
145		
146		
147		
148		
149		
150		

NOTES: Over Culvert North Road

RESPECTFULLY SUBMITTED

CC:

AMERICAN TECHNICAL SERVICES, INC.



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SERVICES, INC.**

ENGINEERING • ENVIRONMENTAL • DRILLING • MATERIALS  
8105 Black Hawk Rd • PO Box 558  
Black Hawk, SD 57718-0558

**REPORT OF SOIL DENSITY TESTING - NUCLEAR METHOD**

ASTM D6938

CLIENT: CONTINENTAL RESOURCES, INC  
PO Box 268836  
Oklahoma City, OK 73126

ATTENTION: Project Manager  
PROJECT: Atlanta Drill Site

ATS #: 12-12165  
DATE: 08/23/12  
ATS TECH: Russell Harwood  
GAGE #: 2  
BENCHMARK:

TEST #	DATE	PROCTOR # / CLASSIFICATION	LABORATORY		FIELD		SPECIFICATIONS			
			% MOIST	DRY DENSITY	% MOISTURE	DRY DENSITY	% COMPACTION	SPEC MOISTURE	% SPEC COMPACTION	PASS
145	08/20/12	#3	15.3	114.2	13.4	115.6	101	+/-2%	95	PASS
146	08/20/12	#2	8.3	123.2	7.2	121.5	99	+/-2%	95	PASS
147	08/20/12	#3	15.3	114.2	13.8	115.9	101	+/-2%	95	PASS
148	08/20/12	#3	15.3	114.2	14.2	111.6	98	+/-2%	95	PASS
149							#DIV/0!			
150							#DIV/0!			
151							#DIV/0!			
152							#DIV/0!			
153							#DIV/0!			
154							#DIV/0!			

TEST #	LOCATION	ELEVATION
145	N 421166.85 E 1179865.40	1922.8
146	N 421256.90 E 1179836.55	1923.95
147	N 420996.10 E 1180218.95	1928.9
148	N 421096.00 E 1180016.65	1927.85
149		
150		
151		
152		
153		
154		

NOTES: East Valley Fill

RESPECTFULLY SUBMITTED

CC:

  
AMERICAN TECHNICAL SERVICES, INC.

**AMERICAN  
TECHNICAL  
SERVICES, INC.**

ENGINEERING • ENVIRONMENTAL • DRILLING • MATERIALS  
8105 Black Hawk Rd. • PO Box 558  
Black Hawk, SD 57716-0558

**REPORT OF SOIL DENSITY TESTING - NUCLEAR METHOD**

ASTM C6938

CLIENT: CONTINENTAL RESOURCES, INC.  
PO Box 268836  
Oklahoma City, OK 73126

ATTENTION: Project Manager  
PROJECT: Atlanta Drill Site

ATS #: 12-12165  
DATE: 08/23/12  
ATS TECH: Russell Harwood  
GAGE #: 2  
BENCHMARK:

TEST #	DATE	PROCTOR#/ CLASSIFICATION	LABORATORY		FIELD		SPECIFICATIONS			
			% MOIST	DRY DENSITY	% MOISTURE	DRY DENSITY	% COMPACTION	SPEC MOISTURE %	SPEC COMPACTION	PASS
149	08/21/12	#3	15.3	114.2	15.2	111.7	98	+/-2%	95	PASS
150	08/21/12	#3	15.3	114.2	15.1	113.9	100	+/-2%	95	PASS
151	08/21/12	#3	15.3	114.2	15.8	109.2	96	+/-2%	95	PASS
152	08/21/12	#3	15.3	114.2	13.4	112.2	98	+/-2%	95	PASS
153	08/21/12	#1	9.7	126.5	9.8	122.0	96	+/-2%	95	PASS
154							#DIV/0!			
155							#DIV/0!			
156							#DIV/0!			
157							#DIV/0!			
158							#DIV/0!			

TEST #	LOCATION	ELEVATION
149	N 421037.20 E 1180130.55	1932.6
150	N 421061.85 E 1179979.85	1933.1
151	N 421067.40 E 1180184.00	1936.15
152	N 421064.45 E 1180152.60	1937.45
153	N 421025.40 E 1180078.60	1935.85
154		
155		
156		
157		
158		

NOTES: East Valley Fill

RESPECTFULLY SUBMITTED

CC:

AMERICAN TECHNICAL SERVICES, INC.



**AMERICAN  
TECHNICAL  
SERVICES, INC.**

ENGINEERING • ENVIRONMENTAL • DRILLING • MATERIALS  
3105 Black Hawk Rd. • PO Box 558  
Black Hawk, SD 57719-0558

**REPORT OF SOIL DENSITY TESTING - NUCLEAR METHOD**  
ASTM D6938

CLIENT: CONTINENTAL RESOURCES, INC.  
PO Box 268836  
Oklahoma City, OK 73126

ATTENTION: Project Manager  
PROJECT: Atlanta Drill Site

ATS #: 12-12165  
DATE: 08/23/12  
ATS TECH: Russell Harwood  
GAGE #: 2  
BENCHMARK:

TEST #	DATE	PROCTOR # / CLASSIFICATION	LABORATORY		FIELD		SPECIFICATIONS			
			% MOIST	DRY DENSITY	% MOISTURE	DRY DENSITY	% COMPACTION	SPEC MOISTURE %	SPEC COMPACTION	PASS
154	08/22/12	#3	15.3	114.2	14.7	108.8	95	+/-2%	95	PASS
155	08/22/12	#3	15.3	114.2	14.3	110.2	96	+/-2%	95	PASS
156	08/22/12	#3	15.3	114.2	14.4	109.7	96	+/-2%	95	PASS
157	08/22/12	#3	15.3	114.2	13.8	110.5	97	+/-2%	95	PASS
158	08/22/12	#3	15.3	114.2	13.5	113.9	100	+/-2%	95	PASS
159	08/22/12	#3	15.3	114.2	13.3	110.0	96	+/-2%	95	PASS
160							#DIV/0!			
161							#DIV/0!			
162							#DIV/0!			
163							#DIV/0!			

TEST #	LOCATION	ELEVATION
154	N 421280.95 E 1178919.20	1926.3
155	N 421212.65 E 1179814.85	1925.7
156	N 421284.60 E 1179834.35	1926.75
157	N 421178.25 E 1179842.25	1929.45
158	N 421253.35 E 1179825.80	1928.9
159	N 421234.00 E 1179906.10	1928.15
160		
161		
162		
163		

NOTES: \_\_\_\_\_  
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CC: \_\_\_\_\_

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AMERICAN TECHNICAL SERVICES, INC.

**AMERICAN  
TECHNICAL  
SERVICES, INC.**

ENGINEERING • ENVIRONMENTAL • DRILLING • MATERIALS  
8105 Black Hawk Rd • PO Box 558  
Black Hawk, SD 57718-0558

**REPORT OF SOIL DENSITY TESTING - NUCLEAR METHOD**

ASTM D6938

CLIENT: **CONTINENTAL RESOURCES, INC.**  
PO Box 268836  
Oklahoma City, OK 73126  
ATTENTION: Project Manager  
PROJECT: Atlanta Drill Site

ATS #: 12-12165

DATE: 08/28/12

ATS.TECH: Russell Harwood

GAGE #: 2

BENCHMARK:

TEST #	DATE	PROCTOR #/ CLASSIFICATION	LABORATORY		FIELD		SPECIFICATIONS		
			% MOIST	DRY DENSITY	% MOISTURE	DRY DENSITY	% COMPACTION	SPEC MOISTURE %	SPEC COMPACTION
160	08/23/12	#3	15.3	114.2	13.3	111.8	98	+/-2%	95
161	08/23/12	#2	8.3	123.2	9.3	118.7	96	+/-2%	95
162	08/23/12	#3	15.3	114.2	13.7	115.4	101	+/-2%	95
163	08/23/12	#3	15.3	114.2	13.4	109.7	96	+/-2%	95
164	08/23/12	#3	15.3	114.2	13.6	109.3	96	+/-2%	95
165	08/23/12	#3	15.3	114.2	13.4	115.6	101	+/-2%	95
166	08/23/12	#3	15.3	114.2	13.5	113.9	100	+/-2%	95
167							#DIV/0!		
168							#DIV/0!		
169							#DIV/0!		

TEST #	LOCATION	ELEVATION
160	N 421096.35 E 1179858.25	1934.6
161	N 421213.05 E 1179810.50	1932.55
162	N 421263.40 E 1179882.15	1930.9
163	N 421144.40 E 1179949.80	1931.65
164	N 421153.10 E 1179905.35	1933.6
165	N 421225.20 E 1179886.80	1933.15
166	N 421206.55 E 1179945.15	1932.5
167		
168		
169		

NOTES: \_\_\_\_\_

RESPECTFULLY SUBMITTED

CC:

  
**AMERICAN TECHNICAL SERVICES, INC.**

**AMERICAN  
TECHNICAL  
SERVICES, INC.**

ENGINEERING • ENVIRONMENTAL • DRILLING • MATERIALS  
8105 Black Hawk Rd • PO Box 558  
Black Hawk, SD 57718-0558

**REPORT OF SOIL DENSITY TESTING - NUCLEAR METHOD**

ASTM D6938

CLIENT: **CONTINENTAL RESOURCES, INC.**  
PO Box 268836  
Oklahoma City, OK 73126  
ATTENTION:  
PROJECT: Project Manager  
Atlanta Drill Site

ATS #: 12-12165  
DATE: 08/28/12  
ATS TECH: Russell Harwood  
GAGE #: 2  
BENCHMARK:

TEST #	DATE	PROCTOR # / CLASSIFICATION	LABORATORY		FIELD		SPECIFICATIONS			
			% MOIST	DRY DENSITY	% MOISTURE	DRY DENSITY	% COMPACTION	SPEC MOISTURE %	SPEC COMPACTION	PASS
167	08/24/12	#3	15.3	114.2	14.3	112.8	99	+/-2%	95	PASS
168	08/24/12	#2	8.3	123.2	9.2	119.9	97	+/-2%	95	PASS
169	08/24/12	#2	8.3	123.2	9.4	118.5	98	+/-2%	95	PASS
170							#DIV/0!			
171							#DIV/0!			
172							#DIV/0!			
173							#DIV/0!			
174							#DIV/0!			
175							#DIV/0!			
176							#DIV/0!			

TEST #	LOCATION	ELEVATION
167	N 421222.70 E 1179902.60	1934.85
168	N 421303.55 E 1179866.40	1934.45
169	N 421401.35 E 1179821.85	1933.25
170		
171		
172		
173		
174		
175		
176		

NOTES: \_\_\_\_\_  
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\_\_\_\_\_  
CC: \_\_\_\_\_

RESPECTFULLY SUBMITTED

AMERICAN TECHNICAL SERVICES, INC.

**AMERICAN  
TECHNICAL  
SERVICES, INC.**

ENGINEERING • ENVIRONMENTAL • DRILLING • MATERIALS  
8105 Black Hawk Rd • PO Box 558  
Black Hawk, SD 57718-0558

**REPORT OF SOIL DENSITY TESTING - NUCLEAR METHOD**

ASTM D6938

CLIENT: **CONTINENTAL RESOURCES, INC.**  
PO Box 268836  
Oklahoma City, OK 73126

ATTENTION: Project Manager  
PROJECT: Atlanta Drill Site

ATS #: 12-12165  
DATE: 08/28/12  
ATS TECH: Evan Schultze  
GAGE #: 2  
BENCHMARK: East Valley Fill

TEST #	DATE	PROCTOR # / CLASSIFICATION	LABORATORY		FIELD		SPECIFICATIONS			
			% MOIST	DRY DENSITY	% MOISTURE	DRY DENSITY	% COMPACTION	SPEC MOISTURE	% SPEC COMPACTION	PASS
170	08/24/12	#3	15.3	114.2	14.6	113.5	99	+/-2%	95	PASS
171	08/24/12	#3	15.3	114.2	14.4	111.8	98	+/-2%	95	PASS
172	08/24/12	#3	15.3	114.2	14.9	112.3	98	+/-2%	95	PASS
173							#DIV/0!			
174							#DIV/0!			
175							#DIV/0!			
176							#DIV/0!			
177							#DIV/0!			
178							#DIV/0!			
179							#DIV/0!			

TEST #	LOCATION	ELEVATION
170	N 421153.30 E 1179861.65	1936.7
171	N 421252.75 E 1179826.85	1936.5
172	N 421346.00 E 1179790.95	1936.6
173		
174		
175		
176		
177		
178		
179		

NOTES: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
CC: \_\_\_\_\_

RESPECTFULLY SUBMITTED



AMERICAN TECHNICAL SERVICES, INC.

**AMERICAN  
TECHNICAL  
SERVICES, INC.**

ENGINEERING • ENVIRONMENTAL • DRILLING • MATERIALS  
6105 Black Hawk Rd. • PO Box 558  
Black Hawk, SD 57718-0558

**REPORT OF SOIL DENSITY TESTING - NUCLEAR METHOD**

ASTM D6938

CLIENT: CONTINENTAL RESOURCES, INC.  
PO Box 268836  
Oklahoma City, OK 73126

ATTENTION: Project Manager

PROJECT: Atlanta Drill Site

ATS #: 12-12165  
DATE: 08/28/12  
ATS TECH: Evan Schultze  
GAGE #: 2  
BENCHMARK: South Road Culvert Back Fill

TEST #	DATE	PROCTOR # / CLASSIFICATION	LABORATORY		FIELD		SPECIFICATIONS			
			% MOIST	DRY DENSITY	% MOISTURE	DRY DENSITY	% COMPACTION	SPEC MOISTURE %	SPEC COMPACTION	PASS
191	08/25/12	#3	15.3	114.2	14.0	110.5	97	+/-2%	95	PASS
192							#DIV/0!			
193							#DIV/0!			
194							#DIV/0!			
195							#DIV/0!			
196							#DIV/0!			
197							#DIV/0!			
198							#DIV/0!			
199							#DIV/0!			
200							#DIV/0!			

TEST #	LOCATION	ELEVATION
191	3' East of Center of Pipe-77' South of Type 2 Inlet at STA 545 + 70	5' Above Pipe
192		
193		
194		
195		
196		
197		
198		
199		
200		

NOTES: \_\_\_\_\_

RESPECTFULLY SUBMITTED

AMERICAN TECHNICAL SERVICES, INC.

CC:

**AMERICAN  
TECHNICAL  
SERVICES, INC.**

Engineering • Environmental • Drilling • Materials  
8105 Black Hawk Rd • PO Box 558  
Black Hawk, CO 80428-0558

**REPORT OF SOIL DENSITY TESTING - NUCLEAR METHOD**

ASTM D6938

CLIENT: CONTINENTAL RESOURCES, INC.  
PO Box 268836  
Oklahoma City, OK 73126

ATTENTION: Project Manager  
PROJECT: Atlanta Drill Site

ATS #: 12-12165  
DATE: 08/28/12  
ATS TECH: Evan Schultze  
GAGE #: 2  
BENCHMARK: East Valley Fill

TEST #	DATE	PROCTOR # / CLASSIFICATION	LABORATORY		FIELD			SPECIFICATIONS		
			% MOIST	DRY DENSITY	% MOISTURE	DRY DENSITY	% COMPACTION	SPEC MOISTURE %	SPEC COMPACTION	PASS
173	08/25/12	#1	9.7	126.5	10.1	121.4	96	+/-2%	95	PASS
174	08/25/12	#1	9.7	126.5	9.4	121.7	96	+/-2%	95	PASS
175	08/25/12	#2	8.3	123.2	7.8	119.7	97	+/-2%	95	PASS
176							#DIV/0!			
177							#DIV/0!			
178							#DIV/0!			
179							#DIV/0!			
180							#DIV/0!			
181							#DIV/0!			
182							#DIV/0!			

TEST #	LOCATION	ELEVATION
173	N 421098.70 E 1179890.60	1936.15
174	N 421274.30 E 1179841.15	1936.7
175	N 421152.42 E 1179836.80	1937.7
176		
177		
178		
179		
180		
181		
182		

NOTES: \_\_\_\_\_

RESPECTFULLY SUBMITTED

CC:

  
AMERICAN TECHNICAL SERVICES, INC.

**AMERICAN  
TECHNICAL  
SERVICES, INC.**

ENGINEERING • ENVIRONMENTAL • DRILLING • MATERIALS  
8105 Black Hawk Rd • PO Box 558  
Black Hawk, SD 57718-0558

**REPORT OF SOIL DENSITY TESTING - NUCLEAR METHOD**

ASTM D6938

CLIENT: CONTINENTAL RESOURCES, INC.  
PO Box 268836  
Oklahoma City, OK 73126

ATTENTION: Project Manager

PROJECT: Atlanta Drill Site

ATS #: 12-12165  
DATE: 08/28/12  
ATS TECH: Evan Schultze  
GAGE #: 2  
BENCHMARK: East Valley Fill

TEST #	DATE	PROCTOR # / CLASSIFICATION	LABORATORY		FIELD		SPECIFICATIONS			
			% MOIST	DRY DENSITY	% MOISTURE	DRY DENSITY	% COMPACTION	SPEC MOISTURE %	SPEC COMPACTION	PASS
176	08/26/12	#1	9.7	126.5	9.5	123.2	97	+/-2%	95	PASS
177	08/26/12	#3	15.3	114.2	14.8	114.0	100	+/-2%	95	PASS
178	08/26/12	#2	8.3	123.2	8.6	121.6	99	+/-2%	95	PASS
179	08/26/12	#2	8.3	123.2	8.4	119.5	97	+/-2%	95	PASS
180	08/26/12	#1	9.7	126.5	8.9	126.3	100	+/-2%	95	PASS
181							#DIV/0!			
182							#DIV/0!			
183							#DIV/0!			
184							#DIV/0!			
185							#DIV/0!			

TEST #	LOCATION	ELEVATION
176	N 421289.45 E 1179811.95	1937.6
177	N 421261.50 E 1179823.70	1936.9
178	N 421129.50 E 1179936.90	1938.3
179	N 421407.25 E 1179820.20	1937.4
180	N 421405.25 E 1179828.90	1937.25
181		
182		
183		
184		
185		

NOTES:

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CC:

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AMERICAN TECHNICAL SERVICES, INC.

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SERVICES, INC.**

Engineering • Environmental • Drilling • Materials  
6105 Black Hawk Rd • PO Box 558  
Black Hawk, SD 57718-0558

**REPORT OF SOIL DENSITY TESTING - NUCLEAR METHOD**

ASTM D6938

CLIENT: CONTINENTAL RESOURCES, INC.  
PO Box 268836  
Oklahoma City, OK 73126  
ATTENTION: Project Manager  
PROJECT: Atlanta Drill Site

ATS #: 12-12165  
DATE: 08/28/12  
ATS TECH: Evan Schultze  
GAGE #: 2  
BENCHMARK: South Road Culvert Back Fill

TEST #	DATE	PROCTOR # / CLASSIFICATION	LABORATORY		FIELD			SPECIFICATIONS		
			% MOIST	DRY DENSITY	% MOISTURE	DRY DENSITY	% COMPACTION	SPEC MOISTURE %	SPEC COMPACTION	PASS
192	08/26/12	#3	15.3	114.2	15.7	112.8	99	+/-2%	95	PASS
193	08/26/12	#3	15.3	114.2	14.2	114.1	100	+/-2%	95	PASS
194	08/26/12	#3	15.3	114.2	13.9	113.7	100	+/-2%	95	PASS
195	08/26/12	#3	15.3	114.2	15.1	113.9	100	+/-2%	95	PASS
196							#DIV/0!			
197							#DIV/0!			
198							#DIV/0!			
199							#DIV/0!			
200							#DIV/0!			
201							#DIV/0!			

TEST #	LOCATION	ELEVATION
192	3' West of Center Pipe-60' South of Type 2 Inlet at STA 545 + 71	4' Above Pipe
193	Center of Pipe-65' South of Type 2 Inlet at STA 545 + 72	7' Above Pipe
194	2' East of Center of Pipe-55' South of Type 2 Inlet at STA 545 + 73	10' Above Pipe
195	2' West of Center of Pipe-50' South of type 2 Inlet at STA 545 + 74	12' Above Pipe
196		
197		
198		
199		
200		
201		

NOTES:  


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CC:  


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AMERICAN TECHNICAL SERVICES, INC.

**AMERICAN  
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SERVICES, INC.**

ENGINEERING • ENVIRONMENTAL • DRILLING • MATERIALS  
8105 Black Hawk Rd • PO Box 558  
Black Hawk, CO 80426-0558

**REPORT OF SOIL DENSITY TESTING - NUCLEAR METHOD**  
ASTM D6938

CLIENT: CONTINENTAL RESOURCES, INC.  
PO Box 268836  
Oklahoma City, OK 73126  
ATTENTION: Project Manager  
PROJECT: Atlanta Drill Site

ATS #: 12-12165  
DATE: 08/28/12  
ATS TECH: Evan Schultze  
GAGE #: 2  
BENCHMARK: East Valley Fill

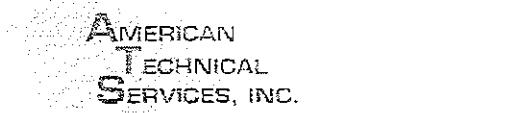
TEST #	DATE	PROCTOR # / CLASSIFICATION	LABORATORY		FIELD			SPECIFICATIONS		
			% MOIST	DRY DENSITY	% MOISTURE	DRY DENSITY	% COMPACTION	SPEC MOISTURE %	SPEC COMPACTION	PASS
181	08/27/12	#1	9.7	126.5	9.9	120.5	95	+/-2%	95	PASS
182	08/27/12	#3	15.3	114.2	13.9	111.8	98	+/-2%	95	PASS
183	08/27/12	#2	8.3	123.2	8.1	120.1	97	+/-2%	95	PASS
184	08/27/12	#3	15.3	114.2	15.0	113.8	100	+/-2%	95	PASS
185	08/27/12	#3	15.3	114.2	14.8	111.3	97	+/-2%	95	PASS
186	08/27/12	#3	15.3	114.2	14.2	112.7	99	+/-2%	95	PASS
187	08/27/12	#3	15.3	114.2	14.9	112.7	99	+/-2%	95	PASS
188	08/27/12	#3	15.3	114.2	13.9	112.8	99	+/-2%	95	PASS
189	08/27/12	#1	9.7	126.5	10.1	122.0	96	+/-2%	95	PASS
190	08/27/12	#3	15.3	114.2	14.0	111.8	98	+/-2%	95	PASS

TEST #	LOCATION	ELEVATION
181	N 421380.15 E 1179686.15	1939.3
182	N 421450.10 E 1179722.45	1940.2
183	N 421439.30 E 1179760.00	1941.5
184	N 421399.40 E 1179722.30	1941.95
185	N 421415.95 E 1179832.95	1942.2
186	N 421485.05 E 1179852.75	1942.95
187	N 421491.20 E 1179749.45	1943.1
188	N 421264.40 E 1179734.90	1938.2
189	N 421224.35 E 1179924.85	1937.5
190	N 421295.60 E 1180039.95	1937.35

NOTES: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
CC: \_\_\_\_\_

RESPECTFULLY SUBMITTED

  
AMERICAN TECHNICAL SERVICES, INC.



## REPORT OF SOIL DENSITY TESTING - NUCLEAR METHOD

ASTM D6938

**EXCELSIOR • ENTHALOGEL • DBLINE • MAYERS**

8105 Black Hawk Rd. • PO Box 558  
Black Hawk, CO 80219-0558

**CLIENT:** CONTINENTAL RESOURCES, INC.  
PO Box 268836  
Oklahoma City, OK 73126

**ATTENTION:** Project Manager

**PROJECT:** Atlanta Drill Site

ATS #: 12-12165  
DATE: 08/28/12  
ATS TECH: Evan Schultze  
GAGE #: 2  
BENCHMARK: South Road Culvert Back Fill

TEST #	DATE	PROCTOR # / CLASSIFICATION	LABORATORY		FIELD			SPECIFICATIONS		
			% MOIST	DRY DENSITY	% MOISTURE	DRY DENSITY	% COMPACTION	SPEC MOISTURE %	SPEC COMPACTION	PASS
196	08/27/12	#3	15.3	114.2	14.8	112.8	99	+/-2%	95	PASS
197							#DIV/0!			
198							#DIV/0!			
199							#DIV/0!			
200							#DIV/0!			
201							#DIV/0!			
202							#DIV/0!			
203							#DIV/0!			
204							#DIV/0!			
205							#DIV/0!			

TEST #	LOCATION	ELEVATION
196	1' East of Center of Pipe-12' South of type 2 Inlet at STA 545 + 75	5' Above Pipe
197		
198		
199		
200		
201		
202		
203		
204		
205		

NOTES: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

RESPECTFULLY SUBMITTED

---

AMERICAN TECHNICAL SERVICES, INC.

**REPORT OF SOIL DENSITY TESTING - NUCLEAR METHOD**  
ASTM D6938

CLIENT: **CONTINENTAL RESOURCES, INC.**  
PO Box 268836  
Oklahoma City, OK 73126

ATTENTION: Project Manager  
PROJECT: Atlanta Drill Site

ATS #: 12-12165  
DATE: 08/31/12  
ATS TECH: Evan Schultze  
GAGE #: 2  
BENCHMARK: East Valley Fill

TEST #	DATE	PROCTOR # / CLASSIFICATION	LABORATORY		FIELD			SPECIFICATIONS		
			% MOIST	DRY DENSITY	% MOISTURE	DRY DENSITY	% COMPACTION	SPEC MOISTURE	% SPEC COMPACT	PASS
197	08/28/12	#1	9.7	126.5	8.2	121.3	96	+/-2%	95	PASS
198	08/28/12	#1	9.7	126.5	9.6	123.2	97	+/-2%	95	PASS
199	08/28/12	#1	9.7	126.5	9.8	124.5	98	+/-2%	95	PASS
200	08/28/12	#1	9.7	126.5	9.3	123.6	98	+/-2%	95	PASS
201							#DIV/0!			
202							#DIV/0!			
203							#DIV/0!			
204							#DIV/0!			
205							#DIV/0!			
206							#DIV/0!			

TEST #	LOCATION	ELEVATION
197	421186.95 1180094.55	1939.05
198	421133.25 1179974.25	1938.15
199	421273.45 1179880.10	1937.65
200	421117.15 1179767.85	1938.8
201		
202		
203		
204		
205		
206		

NOTES:

RESPECTFULLY SUBMITTED

CC:

AMERICAN TECHNICAL SERVICES, INC.



**AMERICAN  
TECHNICAL  
SERVICES, INC.**

ENGINEERING • ENVIRONMENTAL • DRILLING • MATERIALS  
8105 Black Hawk Rd • PO Box 558  
Black Hawk, SD 57718-0558

**REPORT OF SOIL DENSITY TESTING - NUCLEAR METHOD**

ASTM D6938

CLIENT: **CONTINENTAL RESOURCES, INC.**  
PO Box 268836  
Oklahoma City, OK 73126

ATTENTION: Project Manager  
PROJECT: Atlanta Drill Site

ATS #: 12-12165  
DATE: 08/31/12  
ATS TECH: Evan Schultze  
GAGE #: 2  
BENCHMARK:

TEST #	DATE	PROCTOR # / CLASSIFICATION	LABORATORY		FIELD		SPECIFICATIONS		PASS
			% MOIST	DRY DENSITY	% MOISTURE	DRY DENSITY	% COMPACTION	SPEC MOISTURE %	
201	08/29/12	#3	15.3	114.2	15.0	112.1	98	+/-2%	95
202							#DIV/0!		
203							#DIV/0!		
204							#DIV/0!		
205							#DIV/0!		
206							#DIV/0!		
207							#DIV/0!		
208							#DIV/0!		
209							#DIV/0!		
210							#DIV/0!		

TEST #	LOCATION	ELEVATION
201	60' North of Type 2 Inlet at STA 545 + 70	4' Above Pipe
202		
203		
204		
205		
206		
207		
208		
209		
210		

NOTES:

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CC:

**A**MERICAN  
**T**ECHNICAL  
**S**ERVICES, INC.

Engineering • Environmental • Drilling • Materials  
8105 Black Hawk Rd. • PO Box 558  
Black Hawk, CO 80426-0558

**REPORT OF SOIL DENSITY TESTING - NUCLEAR METHOD**

ASTM D6938

CLIENT: **CONTINENTAL RESOURCES, INC.**  
PO Box 268836  
Oklahoma City, OK 73126  
ATTENTION: Project Manager  
PROJECT: Atlanta Drill Site

ATS #: 12-12165  
DATE: 09/04/12  
ATS TECH: Russell Harwood  
GAGE #: 2  
BENCHMARK:

TEST #	DATE	PROCTOR # / CLASSIFICATION	LABORATORY		FIELD			SPECIFICATIONS		
			% MOIST	DRY DENSITY	% MOISTURE	DRY DENSITY	% COMPACTION	SPEC MOISTURE %	SPEC COMPACTION	PASS
202	08/30/12	#2	8.3	123.2	9.7	122.5	99	+/-2%	95	PASS
203	08/30/12	#3	15.3	114.2	13.4	115.7	101	+/-2%	95	PASS
204	08/30/12	#3	15.3	114.2	13.6	113.0	99	+/-2%	95	PASS
205	08/30/12	#3	15.3	114.2	13.5	113.4	99	+/-2%	95	PASS
206							#DIV/0!			
207							#DIV/0!			
208							#DIV/0!			
209							#DIV/0!			
210							#DIV/0!			
211							#DIV/0!			

TEST #	LOCATION	ELEVATION
202	200' North of South Manhole	3' Below Grade
203	120' North of South Manhole	2' Below Grade
204	250' North of South Manhole	1' Below Grade
205	80' North of South Manhole	1' Below Grade
206		
207		
208		
209		
210		
211		

NOTES: Storm Sewer in Drill Pad Area

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AMERICAN TECHNICAL SERVICES, INC.

CC:

**REPORT OF SOIL DENSITY TESTING - NUCLEAR METHOD**

ASTM D6938

CLIENT: **CONTINENTAL RESOURCES, INC.**  
 PO Box 268836  
 Oklahoma City, OK 73126

ATTENTION: Project Manager  
 PROJECT: Atlanta Drill Site

ATS #: 12-12165  
 DATE: 09/04/12  
 ATS TECH: Russell Harwood  
 GAGE #: 2  
 BENCHMARK:

TEST #	DATE	PROCTOR # / CLASSIFICATION	LABORATORY		FIELD		SPECIFICATIONS			
			% MOIST	DRY DENSITY	% MOISTURE	DRY DENSITY	% COMPACTION	SPEC MOISTURE %	SPEC COMPACTION	PASS
206	09/01/12	#1	9.7	126.5	9.2	123.4	98	+/-2%	95	PASS
207	09/01/12	#2	8.3	123.2	8.7	121.5	99	+/-2%	95	PASS
208	09/01/12	#2	8.3	123.2	9.3	117.5	95	+/-2%	95	PASS
209	09/01/12	#1	9.7	126.5	10.5	120.4	95	+/-2%	95	PASS
210	09/01/12	#1	9.7	126.5	8.9	122.6	97	+/-2%	95	PASS
211	09/01/12	#1	9.7	126.5	9.0	120.5	95	+/-2%	95	PASS
212	09/01/12	#3	15.3	114.2	13.3	114.1	100	+/-2%	95	PASS
213							#DIV/0!			
214							#DIV/0!			
215							#DIV/0!			

TEST #	LOCATION	ELEVATION
206	N 421148.50 E 1179772.65	1939
207	N 421278.05 E 1179873.65	1936.95
208	N 421243.90 E 1179995.40	1937
209	N 421256.85 E 1180111.45	1937
210	N 421246.20 E 1180276.70	1936.7
211	N 421165.45 E 1180219.90	1937
212	N 421131.65 E 1180128.40	1937
213		
214		
215		

NOTES: Drill Pad Subgrade Pre-Liner

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CC:

AMERICAN TECHNICAL SERVICES, INC.



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TECHNICAL  
SERVICES, INC.**

ENGINEERING • ENVIRONMENTAL • DRILLING • MATERIALS  
8105 Black Hawk Rd • PO Box 558  
Black Hawk, SD 57718-0558

**REPORT OF SOIL DENSITY TESTING - NUCLEAR METHOD**

ASTM D6938

CLIENT: CONTINENTAL RESOURCES, INC.  
PO Box 268836  
Oklahoma City, OK 73126  
ATTENTION: Project Manager  
PROJECT: Atlanta Drill Site

ATS #: 12-12165  
DATE: 09/04/12  
ATS TECH: Russell Harwood  
GAGE #: 2  
BENCHMARK:

TEST #	DATE	PROCTOR # / CLASSIFICATION	LABORATORY		FIELD		SPECIFICATIONS			
			% MOIST	DRY DENSITY	% MOISTURE	DRY DENSITY	% COMPACTION	SPEC MOISTURE %	SPEC COMPACTION	PASS
213	09/02/12	#3	15.3	114.2	13.4	112.5	99	+/-2%	95	PASS
214	09/02/12	#2	8.3	123.2	8.5	119.2	97	+/-2%	95	PASS
215	09/02/12	#2	8.3	123.2	7.6	119.4	97	+/-2%	95	PASS
216	09/02/12	#3	15.3	114.2	13.6	114.1	100	+/-2%	95	PASS
217	09/02/12	#3	15.3	114.2	13.5	114.1	100	+/-2%	95	PASS
218	09/02/12	#1	9.7	126.5	9.2	121.9	96	+/-2%	95	PASS
219	09/02/12	#1	9.7	126.5	8.5	121.7	96	+/-2%	95	PASS
220							#DIV/0!			
221							#DIV/0!			
222							#DIV/0!			

TEST #	LOCATION	ELEVATION
213	N 421177.85 E 1179944.00	1939.2
214	N 421197.20 E 1179980.55	1938.5
215	N 421155.10 E 1180018.00	1938.65
216	N 421161.40 E 1179809.10	1940.8
217	N 421166.65 E 1179943.15	1940.55
218	N 421198.80 E 1179984.45	1939.55
219	N 421207.30 E 1179940.30	1939.9
220		
221		
222		

NOTES: Drill Pad Area Over Liner Fill  
  
  
  
CC: \_\_\_\_\_

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AMERICAN TECHNICAL SERVICES, INC.

**AMERICAN  
TECHNICAL  
SERVICES, INC.**

Engineering • Environmental • Drilling • Materials  
8105 Black Hawk Rd. • PO Box 556  
Black Hawk, SD 57718-0566

**REPORT OF SOIL DENSITY TESTING - NUCLEAR METHOD**

ASTM D6938

CLIENT: **CONTINENTAL RESOURCES, INC.**  
PO Box 268836  
Oklahoma City, OK 73126

ATTENTION: Project Manager

PROJECT: Atlanta Drill Site

ATS #: 12-12165  
DATE: 09/04/12  
ATS TECH: Russell Harwood  
GAGE #: 2  
BENCHMARK:

TEST #	DATE	PROCTOR # / CLASSIFICATION	LABORATORY		FIELD		SPECIFICATIONS			
			% MOIST	DRY DENSITY	% MOISTURE	DRY DENSITY	% COMPACTION	SPEC MOISTURE %	SPEC COMPACTION	PASS
220	09/03/12	#3	15.3	114.2	13.7	114.9	101	+/-2%	95	PASS
221	09/03/12	#3	15.3	114.2	13.4	114.1	100	+/-2%	95	PASS
222	09/03/12	#3	15.3	114.2	13.8	114.8	101	+/-2%	95	PASS
223							#DIV/0!			
224							#DIV/0!			
225							#DIV/0!			
226							#DIV/0!			
227							#DIV/0!			
228							#DIV/0!			
229							#DIV/0!			

TEST #	LOCATION	ELEVATION
220	N 421261.45 E 1179919.60	1940.9
221	N 421234.80 E 1179980.75	1940.75
222	N 421166.65 E 1179999.30	1940.65
223		
224		
225		
226		
227		
228		
229		

NOTES: Drill Pad Area Over Liner Fill

RESPECTFULLY SUBMITTED

AMERICAN TECHNICAL SERVICES, INC.

cc:

**AMERICAN  
TECHNICAL  
SERVICES, INC.**

ENGINEERING • ENVIRONMENTAL • DRILLING • MATERIALS  
8105 Black Hawk Rd. • PO Box 558  
Black Hawk, SD 57718-0558

**REPORT OF SOIL DENSITY TESTING - NUCLEAR METHOD**  
ASTM D6938

CLIENT: CONTINENTAL RESOURCES, INC.  
PO Box 268836  
Oklahoma City, OK 73126  
ATTENTION: Project Manager  
PROJECT: Atlanta Drill Site

ATS #: 12-12165  
DATE: 09/07/12  
ATS TECH: Russell Harwood  
GAGE #: 2  
BENCHMARK:

TEST #	DATE	PROCTOR # / CLASSIFICATION	LABORATORY		FIELD			SPECIFICATIONS		
			% MOIST	DRY DENSITY	% MOISTURE	DRY DENSITY	% COMPACTION	SPEC MOISTURE %	SPEC COMPACTION	PASS
223	09/04/12	#3	15.3	114.2	13.6	110.4	97	+/-2%	95	PASS
224	09/04/12	#3	15.3	114.2	13.4	110.8	97	+/-2%	95	PASS
225	09/04/12	#3	15.3	114.2	13.7	111.2	97	+/-2%	95	PASS
226	09/04/12	#3	15.3	114.2	13.3	115.9	101	+/-2%	95	PASS
227	09/04/12	#1	9.7	126.5	10.2	121.0	96	+/-2%	95	PASS
228	09/04/12	#1	9.7	126.5	10.1	121.1	96	+/-2%	95	PASS
229	09/04/12	#1	9.7	126.5	9.3	120.6	95	+/-2%	95	PASS
230	09/04/12	#3	15.3	114.2	13.8	115.6	101	+/-2%	95	PASS
231	09/04/12	#3	15.3	114.2	14.4	111.7	98	+/-2%	95	PASS
232							#DIV/0!			

TEST #	LOCATION	ELEVATION
223	N 421253.00 E 1180307.60	1938
224	N 421215.25 E 1180269.15	1938.7
225	N 421166.55 E 1180234.35	1938.1
226	N 421208.40 E 1180056.70	1941.35
227	N 421254.80 E 1179946.55	1941.45
228	N 421191.80 E 1179850.65	1941.75
229	N 421178.45 E 1179723.60	1943.35
230	N 421233.40 E 1180248.00	1939.75
231	N 421180.50 E 1180248.70	1940.4
232		

NOTES: Drill Pad Area  
  
  
  
CC:

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AMERICAN TECHNICAL SERVICES, INC.

**AMERICAN  
TECHNICAL  
SERVICES, INC.**

ENGINEERING • ENVIRONMENTAL • DRILLING • MATERIALS  
3105 Black Hawk Rd • PO Box 558  
Black Hawk, SD 57718-0558

**REPORT OF SOIL DENSITY TESTING - NUCLEAR METHOD**  
ASTM D6938

CLIENT: CONTINENTAL RESOURCES, INC.  
PO Box 268836  
Oklahoma City, OK 73126

ATTENTION: Project Manager  
PROJECT: Atlanta Drill Site

ATS #: 12-12165  
DATE: 09/07/12  
ATS TECH: Russell Harwood  
GAGE #: 2  
BENCHMARK:

TEST #	DATE	PROCTOR # / CLASSIFICATION	LABORATORY		FIELD			SPECIFICATIONS		
			% MOIST	DRY DENSITY	% MOISTURE	DRY DENSITY	% COMPACTION	SPEC MOISTURE %	SPEC COMPACTION	PASS
232	09/05/12	#3	15.3	114.2	13.3	114.1	100	+/-2%	95	PASS
233	09/05/12	#3	15.3	114.2	13.6	114.0	100	+/-2%	95	PASS
234	09/05/12	#2	8.3	123.2	9.5	120.3	98	+/-2%	95	PASS
235	09/05/12	#3	15.3	114.2	13.4	114.2	100	+/-2%	95	PASS
236	09/05/12	#3	15.3	114.2	13.7	114.4	100	+/-2%	95	PASS
237							#DIV/0!			
238							#DIV/0!			
239							#DIV/0!			
240							#DIV/0!			
241							#DIV/0!			

TEST #	LOCATION	ELEVATION
232	N 421154.40 E 1180235.30	1941.3
233	N 421194.20 E 1180115.05	1941.25
234	N 421154.70 E 1179961.25	1941.2
235	N 421215.40 E 1179812.25	1943.3
236	N 421164.80 E 1179750.50	1943.2
237		
238		
239		
240		
241		

NOTES: Drill Pad Final Subgrade

CC:

RESPECTFULLY SUBMITTED

AMERICAN TECHNICAL SERVICES, INC.

**AMERICAN  
TECHNICAL  
SERVICES, INC.**

Engineering • Environmental • Drilling • Materials  
5105 Black Hawk Rd • PO Box 558  
Black Hawk, SD 57718-0558

**REPORT OF SOIL DENSITY TESTING - NUCLEAR METHOD**

ASTM D6938

CLIENT: CONTINENTAL RESOURCES, INC.  
PO Box 268836  
Oklahoma City, OK 73126

ATTENTION: Project Manager  
PROJECT: Atlanta Drill Site

ATS #: 12-12165  
DATE: 09/11/12  
ATS TECH: Russell Harwood  
GAGE #: 2  
BENCHMARK:

TEST #	DATE	PROCTOR # / CLASSIFICATION	LABORATORY		FIELD			SPECIFICATIONS		
			% MOIST	DRY DENSITY	% MOISTURE	DRY DENSITY	% COMPACTION	SPEC MOISTURE %	SPEC COMPACTION	PASS
237	09/07/12	#2	8.3	123.2	7.9	122.1	99	+/-2%	95	PASS
238	09/07/12	#3	15.3	114.2	14.5	108.7	95	+/-2%	95	PASS
239	09/07/12	#2	8.3	123.2	8.1	118.5	96	+/-2%	95	PASS
240	09/07/12	#3	15.3	114.2	14.0	110.0	96	+/-2%	95	PASS
241	09/07/12	#3	15.3	114.2	13.4	114.1	100	+/-2%	95	PASS
242	09/07/12	#3	15.3	114.2	13.7	111.0	97	+/-2%	95	PASS
243	09/07/12	#2	8.3	123.2	8.1	117.4	95	+/-2%	95	PASS
244	09/07/12	#3	15.3	114.2	14.1	109.9	96	+/-2%	95	PASS
245							#DIV/0!			
246							#DIV/0!			

TEST #	LOCATION	ELEVATION
237	N 421519.00 E 1180368.00	1963.9
238	N 421460.00 E 1180390.40	1956.8
239	N 421424.20 E 1180438.15	1961.7
240	N 421414.40 E 1180424.20	1954.1
241	N 421365.45 E 1180416.00	1960.75
242	N 421362.70 E 1180451.00	1954.5
243	N 421279.10 E 1180484.90	1961.7
244	N 421283.65 E 1180471.85	1952.45
245		
246		

NOTES: East Berm  
  
  
  
  
CC:

RESPECTFULLY SUBMITTED

AMERICAN TECHNICAL SERVICES, INC.

**A**MERICAN  
TECHNICAL  
SERVICES, INC.

ENGINEERING • ENVIRONMENTAL • DRILLING • MATERIALS  
8105 Black Hawk Rd. • PO Box 558  
Black Hawk, SD 57718-0558

**REPORT OF SOIL DENSITY TESTING - NUCLEAR METHOD**  
ASTM D6938

CLIENT: CONTINENTAL RESOURCES, INC.  
PO Box 268836  
Oklahoma City, OK 73126  
ATTENTION: Project Manager  
PROJECT: Atlanta Drill Site

ATS #: 12-12165  
DATE: 09/18/12  
ATS TECH: Russell Harwood  
GAGE #: 2  
BENCHMARK:

TEST #	DATE	PROCTOR # / CLASSIFICATION	LABORATORY		FIELD			SPECIFICATIONS		
			% MOIST	DRY DENSITY	% MOISTURE	DRY DENSITY	% COMPACTION	SPEC MOISTURE %	SPEC COMPACTION	PASS
245	09/14/12	#4	7.2	131.4	5.3	127.4	97	+/-2%	95	PASS
246	09/14/12	#4	7.2	131.4	5.7	131.0	100	+/-2%	95	PASS
247	09/14/12	#4	7.2	131.4	5.4	131.1	100	+/-2%	95	PASS
248	09/14/12	#4	7.2	131.4	5.6	127.9	97	+/-2%	95	PASS
249	09/14/12	#4	7.2	131.4	5.5	131.5	100	+/-2%	95	PASS
250	09/14/12	#4	7.2	131.4	5.3	130.5	99	+/-2%	95	PASS
251	09/14/12	#4	7.2	131.4	5.4	131.3	100	+/-2%	95	PASS
252							#DIV/0!			
253							#DIV/0!			
254							#DIV/0!			

TEST #	LOCATION	ELEVATION
245	N 421250.10 E 1180221.35	1941.9
246	N 421172.20 E 1180121.95	1941.9
247	N 421231.95 E 1180017.80	1941.95
248	N 421271.80 E 1179924.75	1941.9
249	N 421228.85 E 1179835.15	1943.9
250	N 421180.60 E 1179720.90	1943.9
251	N 421236.80 E 1179604.75	1943.9
252		
253		
254		

NOTES: Drill Pad Gravel

RESPECTFULLY SUBMITTED

AMERICAN TECHNICAL SERVICES, INC.

CC:

**AMERICAN  
TECHNICAL  
SERVICES, INC.**

Engineering • Environmental • Drilling • Materials  
9105 Black Hawk Rd. • PO Box 558  
Black Hawk, CO 80426-0558

**REPORT OF SOIL DENSITY TESTING - NUCLEAR METHOD**  
**ASTM D6938**

CLIENT: CONTINENTAL RESOURCES, INC.  
PO Box 268836  
Oklahoma City, OK 73126

ATTENTION: Project Manager  
PROJECT: Atlanta Drill Site

ATS #: 12-12165  
DATE: 09/18/12  
ATS TECH: Russell Harwood  
GAGE #: 2  
BENCHMARK:

TEST #	DATE	PROCTOR # / CLASSIFICATION	LABORATORY		FIELD			SPECIFICATIONS	
			% MOIST	DRY DENSITY	% MOISTURE	DRY DENSITY	% COMPACTION	SPEC MOISTURE %	SPEC COMPACTION
252	09/17/12	#3	15.3	114.2	13.3	109.3	96	+/-2%	95
253	09/17/12	#3	15.3	114.2	13.4	108.9	95	+/-2%	95
254	09/17/12	#1	9.7	126.5	8.9	122.4	97	+/-2%	95
255	09/17/12	#3	15.3	114.2	13.8	110.3	97	+/-2%	95
256	09/17/12	#2	8.3	123.2	8.1	118.4	96	+/-2%	95
257							#DIV/0!		
258							#DIV/0!		
259							#DIV/0!		
260							#DIV/0!		
261							#DIV/0!		

TEST #	LOCATION	ELEVATION
252	N 420632.90 E 1180063.05	1880.8
253	N 420613.15 E 1179979.55	1870.1
254	N 420646.00 E 1179961.30	1864.95
255	N 420670.10 E 1179894.80	1872.05
256	N 420613.40 E 1179840.10	1873.45
257		
258		
259		
260		
261		

NOTES: South Pond Pre-Liner (Finish Subgrade)

CC:

RESPECTFULLY SUBMITTED

  
AMERICAN TECHNICAL SERVICES, INC.

**A**MERICAN  
**T**ECHNICAL  
**S**ERVICES, INC.

Engineering • Environmental • Drilling • Materials  
8105 Bent Head Rd • PO Box 558  
Clark Hawk, SD 57712-0558

**REPORT OF SOIL DENSITY TESTING - NUCLEAR METHOD**  
ASTM D6938

CLIENT: CONTINENTAL RESOURCES, INC.  
PO Box 268836  
Oklahoma City, OK 73126

ATTENTION: Project Manager

PROJECT: Atlanta Drill Site

ATS #: 12-12165  
DATE: 09/25/12  
ATS TECH: Russell Harwood  
GAGE #: 2  
BENCHMARK:

TEST #	DATE	PROCTOR # / CLASSIFICATION	LABORATORY		FIELD			SPECIFICATIONS	
			% MOIST	DRY DENSITY	% MOISTURE	DRY DENSITY	% COMPACTION	SPEC MOISTURE %	SPEC COMPACTION
257	09/22/12	#3	15.3	114.2	14.1	109.2	96	+/-2%	95
258	09/22/12	#2	8.3	123.2	7.2	118.5	96	+/-2%	95
259	09/22/12	#2	8.3	123.2	8.0	118.7	96	+/-2%	95
260	09/22/12	#2	8.3	123.2	7.1	120.7	98	+/-2%	95
261	09/22/12	#3	15.3	114.2	13.8	110.0	96	+/-2%	95
262	09/22/12	#2	8.3	123.2	7.9	119.6	97	+/-2%	95
263	09/22/12	#3	15.3	114.2	13.4	109.4	96	+/-2%	95
264							#DIV/0!		
265							#DIV/0!		
266							#DIV/0!		

TEST #	LOCATION	ELEVATION
257	N 420679.75 E 1180078.75	1870.1
258	N 420720.90 E 1180029.20	1878.2
259	N 420680.85 E 1179984.50	1870.7
260	N 420614.75 E 1179949.80	1869.95
261	N 420614.40 E 1179901.55	1868.85
262	N 420594.10 E 1179848.15	1877.55
263	N 420592.00 E 1179984.65	1884.6
264		
265		
266		

NOTES: Pond Subgrade After Liner & Finish Grade

CC:

RESPECTFULLY SUBMITTED

  
AMERICAN TECHNICAL SERVICES, INC.

**AMERICAN  
TECHNICAL  
SERVICES, INC.**

ENGINEERING • ENVIRONMENTAL • DRILLING • MATERIALS  
8105 Black Hawk Rd. • PO Box 558  
Black Hawk, SD 57718-0558

**REPORT OF SOIL DENSITY TESTING - NUCLEAR METHOD**  
ASTM D6938

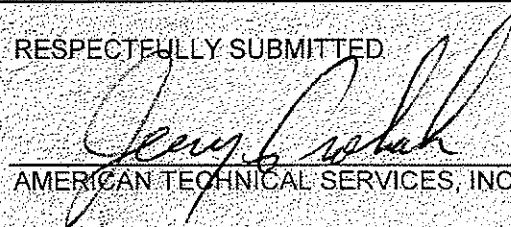
CLIENT:	CONTINENTAL RESOURCES, INC. PO Box 268836 Oklahoma City, OK 73126	ATS #:	12-12165
ATTENTION:	Project Manager	DATE:	10/15/12
PROJECT:	Atlanta Drill Site	ATS TECH:	Evan Schultze
		GAGE #:	26
		BENCHMARK:	Atlanta Pad Road

TEST #	DATE	PROCTOR # / CLASSIFICATION	LABORATORY		FIELD		SPECIFICATIONS			
			% MOIST	DRY DENSITY	% MOISTURE	DRY DENSITY	% COMPACTION	SPEC MOISTURE %	SPEC COMPACTION	PASS
264	10/10/12	#1	9.7	126.5	9.3	120.3	95	+/-2%	95	PASS
265	10/10/12	#1	9.7	126.5	9.5	120.9	96	+/-2%	95	PASS
266	10/10/12	#1	9.7	126.5	9.8	122.1	97	+/-2%	95	PASS
267							#VALUE!			
268							#VALUE!			
269							#VALUE!			
270							#VALUE!			
271							#DIV/0!			
272							#DIV/0!			
273							#DIV/0!			

TEST #	LOCATION	ELEVATION
264	N 48D07.125' W 103D44.108'	1.5' Below Top of Subgrade
265	N 48D07.071' W 103D44.106'	1' Below Top of Subgrade
266	N 48D07.053' W 103D44.018'	5' Below Top of Subgrade
267		
268		
269		
270		
271		
272		
273		

NOTES: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 CC: \_\_\_\_\_

RESPECTFULLY SUBMITTED



AMERICAN TECHNICAL SERVICES, INC.

**AMERICAN  
TECHNICAL  
SERVICES, INC.**

ENGINEERING • ENVIRONMENTAL • DRILLING • MATERIALS  
8105 Black Hawk Rd • PO Box 558  
Black Hawk, SD 57718-0558

## REPORT OF SOIL DENSITY TESTING - NUCLEAR METHOD

ASTM D6938

CLIENT	CONTINENTAL RESOURCES, INC. PO Box 268836 Oklahoma City, OK 73126	ATS #	12-12165
ATTENTION:	Project Manager	DATE	10/15/12
PROJECT:	Atlanta Drill Site	ATS TECH	Evan Schultze
		GAGE #	26
		BENCHMARK	Atlanta Pad Road

TEST #	DATE	PROCTOR # / CLASSIFICATION	LABORATORY		FIELD		SPECIFICATIONS			PASS
			% MOIST	DRY DENSITY	% MOISTURE	DRY DENSITY	% COMPACTION	SPEC MOISTURE %	SPEC COMPACTION	
267	10/11/12	#1	9.7	126.5	8.9	123.4	98	+/-2%	95	PASS
268	10/11/12	#1	9.7	126.5	9.2	122.8	97	+/-2%	95	PASS
269	10/11/12	#1	9.7	126.5	8.8	124.3	98	+/-2%	95	PASS
270	10/11/12	#1	9.7	126.5	9.1	123.7	98	+/-2%	95	PASS
271							#VALUE!			
272							#VALUE!			
273							#VALUE!			
274							#DIV/0!			
275							#DIV/0!			
276							#DIV/0!			

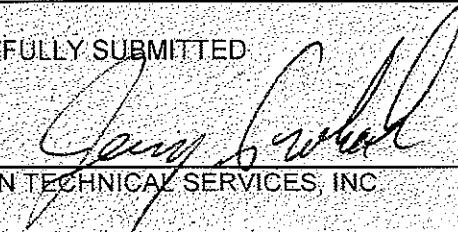
TEST #	LOCATION		ELEVATION
267	N 48D06.762'	W 103D44.019'	5' Below Top of Subgrade
268	N 48D07.078'	W 103D44.106'	5' Below Top of Subgrade
269	N 48D07.101'	W 103D44.020'	1' Below Top of Subgrade
270	N 48D07.164'	W 103D44.019'	2' Below Top of Subgrade
271			
272			
273			
274			
275			
276			

NOTES: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

RESPECTFULLY SUBMITTED

AMERICAN TECHNICAL SERVICES, INC.

CC:



**AMERICAN  
TECHNICAL  
SERVICES, INC.**

ENGINEERING • ENVIRONMENTAL • DRILLING • MATERIALS  
6105 Black Hawk Rd. • PO Box 558  
Black Hawk, SD 57718-0558

**REPORT OF SOIL DENSITY TESTING - NUCLEAR METHOD**  
ASTM D6938

CLIENT: CONTINENTAL RESOURCES, INC.  
PO Box 268836  
Oklahoma City, OK 73126  
ATTENTION: Project Manager  
PROJECT: Atlanta Drill Site

ATS #: 12-12165  
DATE: 10/15/12  
ATS TECH: Evan Schultze  
GAGE #: 26  
BENCHMARK: Atlanta Pad Road

TEST #	DATE	PROCTOR # / CLASSIFICATION	LABORATORY		FIELD		SPECIFICATIONS			
			% MOIST	DRY DENSITY	% MOISTURE	DRY DENSITY	% COMPACTION	SPEC MOISTURE %	SPEC COMPACTION	PASS
271	10/12/12	#1	9.7	126.5	9.4	124.8	99	+/-2%	95	PASS
272							#VALUE!			
273							#VALUE!			
274							#VALUE!			
275							#VALUE!			
276							#VALUE!			
277							#VALUE!			
278							#DIV/0!			
279							#DIV/0!			
280							#DIV/0!			

TEST #	LOCATION		ELEVATION
271	N 48D06.807'	W 103D44.019'	1' Below Top of Subgrade
272			
273			
274			
275			
276			
277			
278			
279			
280			

NOTES:  
  
  
  
  
CC:

RESPECTFULLY SUBMITTED

AMERICAN TECHNICAL SERVICES, INC.

**A**MERICAN  
TECHNICAL  
SERVICES, INC.

ENGINEERING • ENVIRONMENTAL • DRILLING • MATERIALS  
8105 Black Hawk Rd. • PO Box 558  
Black Hawk, SD 57718-0558

## REPORT OF SOIL DENSITY TESTING - NUCLEAR METHOD

ASTM D6938

**CLIENT** CONTINENTAL RESOURCES, INC.  
PO Box 268836  
Oklahoma City, OK 73126

**ATTENTION:** Project Manager  
**PROJECT:** Atlanta Drill Site

**ATS #** 12-12165  
**DATE** 10/17/12  
**ATS TECH** Evan Schultze  
**GAGE #** 26  
**BENCHMARK** Atlanta Pad Road- Cement Stabilized Soil

TEST #	DATE	PROCTOR # / CLASSIFICATION	LABORATORY		FIELD		SPECIFICATIONS		PASS	
			% MOIST	DRY DENSITY	% MOISTURE	DRY DENSITY	% COMPACTION	SPEC MOISTURE %		
283	10/16/12	#1	9.7	126.5	9.7	123.0	97	+/-2%	95	PASS
284	10/16/12	#1	9.7	126.5	9.5	124.2	98	+/-2%	95	PASS
285	10/16/12	#1	9.7	126.5	9.9	122.3	97	+/-2%	95	PASS
286	10/16/12	#1	9.7	126.5	9.8	123.4	98	+/-2%	95	PASS
287	10/16/12	#1	9.7	126.5	10.3	124.1	98	+/-2%	95	PASS
288	10/16/12	#1	9.7	126.5	10.5	121.9	96	+/-2%	95	PASS
289							#VALUE!			
290							#DIV/0!			
291							#DIV/0!			
292							#DIV/0!			

TEST #	LOCATION			ELEVATION
283	North 48d07 167'	West 103d44.014'		1.5' Below Top of Subgrade
284	North 48d07 187'	West 103d44.021'		2' Below Top of Subgrade
285	North 48d07 175'	West 103d44.017'		1' Below Top of Subgrade
286	North 48d06 217'	West 103d44.015'		1' Below Top of Subgrade
287	North 48d07 235'	West 103d44.013'		.5' Below Top of Subgrade
288	North 48d07 197'	West 103d44.014'		5' Below Top of Subgrade
289				
290				
291				
292				

NOTES  


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CC

RESPECTFULLY SUBMITTED

  
AMERICAN TECHNICAL SERVICES, INC.



SUNDRY NOTICES AND REPORTS ON WELLS FORM 4  
 INDUSTRIAL COMMISSION OF NORTH DAKOTA  
 OIL AND GAS DIVISION  
 600 EAST BOULEVARD DEPT 405  
 BISMARCK, ND 58505-0840  
 SFN 5749 (09-2006)



Well File No. 23370  
 23370

PLEASE READ INSTRUCTIONS BEFORE FILLING OUT FORM.  
 PLEASE SUBMIT THE ORIGINAL AND ONE COPY.

<input checked="" type="checkbox"/> Notice of Intent	Approximate Start Date September 7, 2012	<input type="checkbox"/> Drilling Prognosis	<input type="checkbox"/> Spill Report
<input type="checkbox"/> Report of Work Done	Date Work Completed	<input type="checkbox"/> Redrilling or Repair	<input type="checkbox"/> Shooting
<input type="checkbox"/> Notice of Intent to Begin a Workover Project that may Qualify for a Tax Exemption Pursuant to NDCC Section 57-51.1-03.		<input type="checkbox"/> Casing or Liner	<input type="checkbox"/> Acidizing
Approximate Start Date		<input type="checkbox"/> Plug Well	<input type="checkbox"/> Fracture Treatment
		<input type="checkbox"/> Supplemental History	<input type="checkbox"/> Change Production Method
		<input type="checkbox"/> Temporarily Abandon	<input type="checkbox"/> Reclamation
		<input checked="" type="checkbox"/> Other	Spud with Small Rig

Well Name and Number  
**Atlanta 3-6H**

Footages	495 F N	L	590 F	WL	Qlr-Qlr NWNW	Section 6	Township 153 N	Range 101 W
Field	Baker		Pool	Bakken		County	Williams	

24-HOUR PRODUCTION RATE

Before		After	
Oil	Bbls	Oil	Bbls
Water	Bbls	Water	Bbls
Gas	MCF	Gas	MCF

Name of Contractor(s)  
**Advanced Energy Services, LLC Rig #4**

Address	City	State	Zip Code
---------	------	-------	----------

DETAILS OF WORK

Continental Resources, Inc. (CRI) requests permission for suspension of drilling for up to 90 days for the referenced well under NDAC 43-02-03-55. CRI intends to drill the surface hole with freshwater based drilling mud and set surface casing with a small drilling rig and move off within 3 to 5 days. The casing will be set at a depth pre-approved by the NDIC per the Application for Permit to Drill NDAC 43-02-03-21. No saltwater will be used in the drilling and cementing operations of the surface casing. Once the surface casing is cemented, a plug or mechanical seal will be placed at the top of the casing to prevent any foreign matter from getting into the well. A rig capable of drilling to TD will move onto the location within the 90 days previously outlined to complete the drilling and casing plan as per the APD. The undersigned states that this request for suspension of drilling operations in accordance with the Subsection 4 of Section 43-02-03-55 of the NDAC, is being requested to take advantage of the cost savings and time savings of using an initial rig that is smaller than the rig necessary to drill a well to total depth but is not intended to alter or extend the terms and conditions of, or suspend any obligation under, any oil and gas lease with acreage in or under the spacing or drilling unit for the above-referenced well. CRI understands NDAC 43-02-03-31 requirements regarding confidentiality pertaining to this permit. The drilling pit will be fenced immediately after construction if the well pad is located in a pasture (NDAC 43-02-03-19 & 19.1). CRI will plug and abandon the well and reclaim the well site if the well is not drilled by the larger rotary rig within 90 days after spudding the well with the smaller drilling rig.

Company <b>Continental Resources, Inc.</b>	Telephone Number <b>(405) 234-9000</b>	
Address <b>P.O. Box 268870</b>		
City <b>Oklahoma City</b>	State <b>OK</b>	Zip Code <b>73126</b>
Signature <i>Terry L. Olson</i>	Printed Name <b>Terry L. Olson</b>	
Title <b>Regulatory Compliance Specialist</b>	Date <b>August 15, 2012</b>	
Email Address <b>Terry.Olson@clr.com</b>		

FOR STATE USE ONLY

<input type="checkbox"/> Received	<input checked="" type="checkbox"/> Approved
Date <i>8-20-2012</i>	
By <i>Dawn Tabay</i>	
Title <b>Engineering Technician</b>	



# Oil and Gas Division

23370  
Lynn D. Helms - Director      Bruce E. Hicks - Assistant Director  
**Department of Mineral Resources**  
Lynn D. Helms - Director  
**North Dakota Industrial Commission**  
[www.dmr.nd.gov/oilgas](http://www.dmr.nd.gov/oilgas)

BECKY BARNES  
CONTINENTAL RESOURCES, INC.  
PO BOX 1032  
ENID, OK 73702-1032 USA

Date: 7/23/2012

**RE: CORES AND SAMPLES**

Well Name: **ATLANTA 3-6H** Well File No.: **23370**  
Location: **NWNW 6-153-101** County: **WILLIAMS**  
Permit Type: **Development - HORIZONTAL**  
Field: **BAKER** Target Horizon: **BAKKEN**

Dear BECKY BARNES:

North Dakota Century Code (NDCC) Section 38-08-04 provides for the preservation of cores and samples and their shipment to the State Geologist when requested. The following is required on the above referenced well:

- 1) All cores, core chips and samples must be submitted to the State Geologist as provided for the NDCC Section 38-08-04 and North Dakota Administrative Code 43-02-03-38.1.
- 2) Samples shall include all cuttings from:

**Base of the Last Charles Salt**

Samples of cuttings shall be taken at 30' maximum intervals through all vertical, build and horizontal sections. Samples must be washed, dried, packed in sample envelopes in correct order with labels showing operator, well name, location and depth, and forwarded in standard boxes to the State Geologist within 30 days of the completion of drilling operations.

- 3) Cores: ALL CORES cut shall be preserved in correct order, properly boxed, and forwarded to the State Geologist within 90 days of completion of drilling operations. Any extension of time must have written approval from the State Geologist.
- 4) All cores, core chips, and samples must be shipped, prepaid, to the State Geologist at the following address:

**ND Geological Survey Core Library  
Campus Road and Cornell  
Grand Forks, ND 58202**

- 5) NDCC Section 38-08-16 allows for a civil penalty for any violation of Chapter 38 08 not to exceed \$12,500 for each offense, and each day's violation is a separate offense.

Sincerely

**Richard A. Suggs**  
Geologist



## SUNDRY NOTICES AND REPORTS ON WELLS - FORM 4

INDUSTRIAL COMMISSION OF NORTH DAKOTA  
OIL AND GAS DIVISION  
600 EAST BOULEVARD DEPT 405  
BISMARCK, ND 58505-0840  
SFN 5749 (09-2006)

Well File No. **23370**



PLEASE READ INSTRUCTIONS BEFORE FILLING OUT FORM.

PLEASE SUBMIT THE ORIGINAL AND ONE COPY.

<input type="checkbox"/> Notice of Intent	Approximate Start Date	<input type="checkbox"/> Drilling Prognosis	<input type="checkbox"/> Spill Report
<input type="checkbox"/> Report of Work Done	Date Work Completed	<input type="checkbox"/> Redrilling or Repair	<input type="checkbox"/> Shooting
<input type="checkbox"/> Notice of Intent to Begin a Workover Project that may Qualify for a Tax Exemption Pursuant to NDCC Section 57-51.1-03. Approximate Start Date		<input type="checkbox"/> Casing or Liner	<input type="checkbox"/> Acidizing
		<input type="checkbox"/> Plug Well	<input type="checkbox"/> Fracture Treatment
		<input type="checkbox"/> Supplemental History	<input type="checkbox"/> Change Production Method
		<input type="checkbox"/> Temporarily Abandon	<input type="checkbox"/> Reclamation
		<input checked="" type="checkbox"/> Other	<input type="checkbox"/> Open Hole Log Waiver

Well Name and Number

**Atlanta 3-6H**

Footages	Qtr-Qtr	Section	Township	Range
495 F N L	590 F W L	NWNW	6	153 N 101 W
Field	Pool Bakken		County	Williams

### 24-HOUR PRODUCTION RATE

	Before		After
Oil	Bbls	Oil	Bbls
Water	Bbls	Water	Bbls
Gas	MCF	Gas	MCF

Name of Contractor(s)

Address City State Zip Code

### DETAILS OF WORK

Requested variance to not run openhole logs. GR/CBL/CCL will be run from deepest point obtainable to base of surface casing.

Offset logs used will be the Brigham Oil and Gas, LP, Lippert 1-12, Sec 1-153N-102W, Williams County, ND.

The Gamma Ray Log will be run all the way to surface and all mud logs will be submitted as one digital tiff formatted file and one digital LAS formatted file.

Company <b>Continental Resources, Inc.</b>	Telephone Number <b>580-233-8955</b>	
Address <b>P.O. Box 1032</b>		
City <b>Enid</b>	State <b>OK</b>	Zip Code <b>73702</b>
Signature <i>Terry L. Olson</i>	Printed Name <b>Terry L. Olson</b>	
Title <b>Regulatory Compliance Specialist</b>	Date <b>May 4, 2012</b>	
Email Address <b>Terry.Olson@cir.com</b>		

### FOR STATE USE ONLY

<input type="checkbox"/> Received	<input checked="" type="checkbox"/> Approved
Date <b>7-20-2012</b>	
By <i>RCOB</i>	
Title <b>Richard A. Suggs Geologist</b>	



Approved  
David Tabor  
7-20-2012

Engineering Technician

July 20, 2012

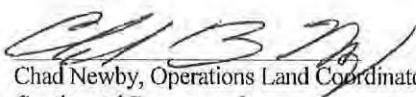
Industrial Commission of North Dakota  
Oil & Gas Division  
600 East Boulevard, Dept 405  
Bismarck, North Dakota 58505

Continental Resources, Inc. (CRI) respectfully requests a waiver to the requirement to delay commencement of operations until three business days following approval of the drilling permit for the Atlanta 1-14-6H.

Township 153N, Range 101W of the 5<sup>th</sup> P.M.  
Section 6, N/2 NW/4 Williams County, North Dakota.

In the event that another owner seeks revocation of the drilling permit, CRI should retain the permit for the following reasons:

- 1) CRI has the necessary technical ability to drill and complete the well(s).
- 2) CRI has drilled and completed more than 130 horizontal Bakken wells in North Dakota.
- 3) CRI operates more than 500 wells in North Dakota and more than 100 in McKenzie County.
- 4) CRI has a contract with Cyclone Drilling that may require standby payments in the event a location is not ready to move onto. There are no near term lease expirations associated with the subject well.
- 5) CRI controls a working interest of 55.54% and is the majority working interest owner within the subject spacing unit consisting of 2560 acres of sections 5, 6, 7, 8, 153N – 101W of the 5<sup>th</sup> P.M.

  
Chad Newby, Operations Land Coordinator  
Continental Resources, Inc.

STATE OF OKLAHOMA )  
                          )  
                          )ss:  
COUNTY OF GARFIELD )

On the 20<sup>th</sup> day of July 2012, before me, a Notary Public in and for said County and State, personally appeared Chad Newby, known to me to be the Operations Land Coordinator of Continental Resources, Inc., the Corporation that executed the within instrument, and acknowledged to me that such Corporation executed the same.

  
Notary Public

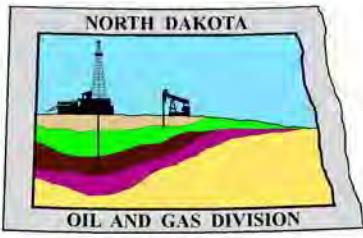
Garfield County, Oklahoma

My Commission Expires: 7/5/2015

Commission No.: 11006023

P.O. Box 1032 • 302 N. Independence • Enid, OK 73702  
Voice (580) 233-8955 • Fax (580) 242-4703





# Oil and Gas Division

Lynn D. Helms - Director

Bruce E. Hicks - Assistant Director

## Department of Mineral Resources

Lynn D. Helms - Director

## North Dakota Industrial Commission

[www.oilgas.nd.gov](http://www.oilgas.nd.gov)

July 20, 2012

Terry L. Olson  
Regulatory Compliance Specialist  
CONTINENTAL RESOURCES, INC.  
P.O. Box 1032  
Enid, OK 73702

**RE: HORIZONTAL WELL  
ATLANTA 3-6H  
NW NW Section 6-153N-101W  
Williams County  
Well File # 23370**

Dear Terry :

Pursuant to Commission Order No. 19840, approval to drill the above captioned well is hereby given. The approval is granted on the condition that all portions of the well bore not isolated by cement, be no closer than the **500' setback** from the north or west boundaries and **200' setback** from the east or south boundaries within the 2560 acre spacing unit consisting of Sections 5, 6, 7, & 8 T153N R101W.

**PERMIT STIPULATIONS:** A sufficient number of horizontal wells shall be drilled and completed in the 2560-acre spacing unit described as Sections 5, 6, 7, and 8, Township 153 North, Range 101 West, McKenzie and Williams Counties, North Dakota, which reasonably develop all portions of the 2560-acre spacing unit within two years after the first horizontal well is completed. If this condition is not met, the Commission shall schedule the matter for a consideration to reduce the size of the spacing unit **THIS WELL IS LOCATED IN A SURFACE WATER PROTECTION AREA: ONSITE INSPECTION REQUIRED (CONTACT NDIC FIELD INSPECTOR FOR SITE SPECIFIC STIPULATIONS).** TO INCLUDE BUT NOT LIMITED TO: CLOSED MUD SYSTEM, NO DRILLING PIT, AND IMPERMEABLE LINER IS REQUIRED ON THE ENTIRE LOCATION AND A STRING OF CASING MUST BE PLACED IN THE RAT AND MOUSE HOLE AND CEMENTED TO GROUND LEVEL. FURTHERMORE CONTINENTAL MUST COMPLY WITH ALL AFFIDAVIT'S. LASTLY, AN IMPERMEABLE PERIMETER DIKE MUST BE PLACED AROUND THE ENTIRE LOCATION. CONTINENTAL RESOURCES must contact NDIC Field Inspector John Axtman at 701-770-2564 prior to location construction.

### Drilling pit

NDAC 43-02-03-19.4 states that "a pit may be utilized to bury drill cuttings and solids generated during well drilling and completion operations, providing the pit can be constructed, used and reclaimed in a manner that will prevent pollution of the land surface and freshwaters. Reserve and circulation of mud system through earthen pits are prohibited. All pits shall be inspected by an authorized representative of the director prior to lining and use. Drill cuttings and solids must be stabilized in a manner approved by the director prior to placement in a cuttings pit."

### Form 1 Changes & Hard Lines

Any changes, shortening of casing point or lengthening at Total Depth must have prior approval by the NDIC. The proposed directional plan is at a legal location. The minimum legal coordinate from the well head at casing point is: 5S. Also, based on the azimuth of the proposed lateral the maximum legal coordinate from the well head is: 9667S.

### **Location Construction Commencement (Three Day Waiting Period)**

Operators shall not commence operations on a drill site until the 3rd business day following publication of the approved drilling permit on the NDIC - OGD Daily Activity Report. If circumstances require operations to commence before the 3rd business day following publication on the Daily Activity Report, the waiting period may be waived by the Director. Application for a waiver must be by sworn affidavit providing the information necessary to evaluate the extenuating circumstances, the factors of NDAC 43-02-03-16.2 (1), (a)-(f), and any other information that would allow the Director to conclude that in the event another owner seeks revocation of the drilling permit, the applicant should retain the permit.

### **Permit Fee & Notification**

Payment was received in the amount of \$100 via credit card. It is requested that notification be given immediately upon the spudding of the well. This information should be relayed to the Oil & Gas Division, Bismarck, via telephone. The following information must be included: Well name, legal location, permit number, drilling contractor, company representative, date and time of spudding. Office hours are 8:00 a.m. to 12:00 p.m. and 1:00 p.m. to 5:00 p.m. Central Time. Our telephone number is (701) 328-8020, leave a message if after hours or on the weekend.

### **Survey Requirements for Horizontal, Horizontal Re-entry, and Directional Wells**

NDAC Section 43-02-03-25 (Deviation Tests and Directional Surveys) states in part (that) the survey contractor shall file a certified copy of all surveys with the director free of charge within thirty days of completion. Surveys must be submitted as one electronic copy, or in a form approved by the director. However, the director may require the directional survey to be filed immediately after completion if the survey is needed to conduct the operation of the director's office in a timely manner. Certified surveys must be submitted via email in one adobe document, with a certification cover page to [certsurvey@nd.gov](mailto:certsurvey@nd.gov).

Survey points shall be of such frequency to accurately determine the entire location of the well bore.

Specifically, the Horizontal and Directional well survey frequency is 100 feet in the vertical, 30 feet in the curve (or when sliding) and 90 feet in the lateral.

### **Confidential status**

Your request for confidential status of all information furnished to the Director, or his representatives, is hereby granted. Such information, except production runs, shall remain confidential for six months commencing on the date the well is spud.

Confidential status notwithstanding, the Director and his representatives shall have access to all well records wherever located. Your company personnel, or any person performing work for your company shall permit the Director and his representatives to come upon any lease, property, well, or drilling rig operated or controlled by them, complying with all safety rules, and to inspect the records and operation of such wells and to have access at all times to any and all records of wells. The Commission's field personnel periodically inspect producing and drilling wells. Any information regarding such wells shall be made available to them at any time upon request. The information so obtained by the field personnel shall be maintained in strict confidence and shall be available only to the Commission and its staff.

### **Surface casing cement**

Tail cement utilized on surface casing must have a minimum compressive strength of 500 psi within 12 hours, and tail cement utilized on production casing must have a minimum compressive strength of 500 psi before drilling the plug or initiating tests.

### **Logs**

NDAC Section 43-02-03-31 requires the running of (1) a suite of open hole logs from which formation tops and porosity zones can be determined, (2) a Gamma Ray Log run from total depth to ground level elevation of the well bore, and (3) a log from which the presence and quality of cement can be determined (Standard CBL or Ultrasonic cement evaluation log) in every well in which production or intermediate casing has been set, this log must be run prior to completing the well. All logs run must be submitted free of charge, as one digital TIFF (tagged image file format) copy and one digital LAS (log ASCII) formatted copy. Digital logs may be submitted on a standard CD, DVD, or attached to an email sent to [digitallogs@nd.gov](mailto:digitallogs@nd.gov). Thank you for your cooperation.

Sincerely,

Todd L. Holweger  
Mineral Resources Permit Manager



# APPLICATION FOR PERMIT TO DRILL HORIZONTAL WELL - FORM 1H

INDUSTRIAL COMMISSION OF NORTH DAKOTA  
OIL AND GAS DIVISION  
600 EAST BOULEVARD DEPT 405  
BISMARCK, ND 58505-0840  
SFN 54269 (08-2005)

PLEASE READ INSTRUCTIONS BEFORE FILLING OUT FORM.

PLEASE SUBMIT THE ORIGINAL AND ONE COPY.

Type of Work <b>New Location</b>	Type of Well <b>Oil &amp; Gas</b>	Approximate Date Work Will Start <b>6 / 1 / 2012</b>	Confidential Status <b>Yes</b>
Operator <b>CONTINENTAL RESOURCES, INC.</b>		Telephone Number <b>580-233-8955</b>	
Address <b>P.O. Box 1032</b>		City <b>Enid</b>	State <b>OK</b> Zip Code <b>73702</b>

Notice has been provided to the owner of any permanently occupied dwelling within 1,320 feet.

This well is not located within five hundred feet of an occupied dwelling.

## WELL INFORMATION (If more than one lateral proposed, enter data for additional laterals on page 2)

Well Name <b>ATLANTA</b>			Well Number <b>3-6H</b>				
Surface Footages <b>495 F N L      590 F W L</b>		Qtr-Qtr <b>NWNW</b>	Section <b>6</b>	Township <b>153 N</b>	Range <b>101 W</b>	County <b>Williams</b>	
Longstring Casing Point Footages <b>1058 F N L      702 F W L</b>		Qtr-Qtr <b>NWNW</b>	Section <b>6</b>	Township <b>153 N</b>	Range <b>101 W</b>	County <b>Williams</b>	
Longstring Casing Point Coordinates From Well Head <b>563 S From WH      112 E From WH</b>		Azimuth <b>169 °</b>	Longstring Total Depth <b>10858 Feet MD      10530 Feet TVD</b>				
Bottom Hole Footages From Nearest Section Line <b>200 F S L      2203 F E L</b>		Qtr-Qtr <b>SWSE</b>	Section <b>7</b>	Township <b>153 N</b>	Range <b>101 W</b>	County <b>McKenzie</b>	
Bottom Hole Coordinates From Well Head <b>9667 S From WH      2430 E From WH</b>		KOP Lateral 1 <b>9957 Feet MD</b>	Azimuth Lateral 1 <b>165 °</b>	Estimated Total Depth Lateral 1 <b>20256 Feet MD      10515 Feet TVD</b>			
Latitude of Well Head <b>48 ° 06 ' 33.67 "</b>		Longitude of Well Head <b>-103 ° 43 ' 52.24 "</b>	NAD Reference <b>NAD83</b>	Description of Spacing Unit: <b>Sec 5, 6, 7, &amp; 8 T153N R101W</b> (Subject to NDIC Approval)			
Ground Elevation <b>1955 Feet Above S.L.</b>	Acres in Spacing/Drilling Unit <b>2560</b>		Spacing/Drilling Unit Setback Requirement Feet N/S		Industrial Commission Order <b>19840</b>		
North Line of Spacing/Drilling Unit <b>10516 Feet</b>		South Line of Spacing/Drilling Unit <b>10510 Feet</b>		East Line of Spacing/Drilling Unit <b>10422 Feet</b>		West Line of Spacing/Drilling Unit <b>10367 Feet</b>	
Objective Horizons <b>Bakken</b>						Pierre Shale Top <b>1867</b>	
Proposed Surface Casing	Size <b>9 - 5/8 "</b>	Weight <b>36 Lb./Ft.</b>	Depth <b>1970 Feet</b>	Cement Volume <b>743 Sacks</b>	NOTE: Surface hole must be drilled with fresh water and surface casing must be cemented back to surface.		
Proposed Longstring Casing	Size <b>7 - "</b>	Weight(s) <b>26-32 Lb./Ft.</b>	Longstring Total Depth <b>10858 Feet MD      10530 Feet TVD</b>		Cement Volume <b>833 Sacks</b>	Cement Top <b>0 Feet</b>	Top Dakota Sand <b>4925 Feet</b>
Base Last Charles Salt (If Applicable) <b>9011 Feet</b>		NOTE: Intermediate or longstring casing string must be cemented above the top Dakota Group Sand.					
Proposed Logs <b>CBL/GR from deepest depth obtainable to ground surface/mud</b>							
Drilling Mud Type (Vertical Hole - Below Surface Casing) <b>Invert</b>				Drilling Mud Type (Lateral) <b>Brine</b>			
Survey Type in Vertical Portion of Well <b>MWD Every 100 Feet</b>		Survey Frequency: Build Section <b>30 Feet</b>		Survey Frequency: Lateral <b>90 Feet</b>		Survey Contractor <b>Baker Hughes</b>	

NOTE: A Gamma Ray log must be run to ground surface and a CBL must be run on intermediate or longstring casing string if set.

Surveys are required at least every 30 feet in the build section and every 90 feet in the lateral section of a horizontal well. Measurement inaccuracies are not considered when determining compliance with the spacing/drilling unit boundary setback requirement except in the following scenarios: 1) When the angle between the well bore and the respective boundary is 10 degrees or less; or 2) If Industry standard methods and equipment are not utilized. Consult the applicable field order for exceptions.

If measurement inaccuracies are required to be considered, a 2° MWD measurement inaccuracy will be applied to the horizontal portion of the well bore. This measurement inaccuracy is applied to the well bore from KOP to TD.

**REQUIRED ATTACHMENTS:** Certified surveyor's plat, horizontal section plat, estimated geological tops, proposed mud/cementing plan, directional plot/plan, \$100 fee.

See Page 2 for Comments section and signature block.

**COMMENTS, ADDITIONAL INFORMATION, AND/OR LIST OF ATTACHMENTS****Proposed FW casing: 13 3/8, 48#, 0-500', 189 sks cmt. Setbacks 500' N&W 200' E&S**

Lateral 2

KOP Lateral 2 Feet MD	Azimuth Lateral 2 °	Estimated Total Depth Lateral 2 Feet MD      Feet TVD			KOP Coordinates From Well Head From WH      From WH		
Formation Entry Point Coordinates From Well Head From WH      From WH		Bottom Hole Coordinates From Well Head From WH      From WH					
KOP Footages From Nearest Section Line F      L		Qtr-Qtr	Section	Township <b>N</b>	Range <b>W</b>	County	
Bottom Hole Footages From Nearest Section Line F      L		Qtr-Qtr	Section	Township <b>N</b>	Range <b>W</b>	County	

Lateral 3

KOP Lateral 3 Feet MD	Azimuth Lateral 3 °	Estimated Total Depth Lateral 3 Feet MD      Feet TVD			KOP Coordinates From Well Head From WH      From WH		
Formation Entry Point Coordinates From Well Head From WH      From WH		Bottom Hole Coordinates From Well Head From WH      From WH					
KOP Footages From Nearest Section Line F      L		Qtr-Qtr	Section	Township <b>N</b>	Range <b>W</b>	County	
Bottom Hole Footages From Nearest Section Line F      L		Qtr-Qtr	Section	Township <b>N</b>	Range <b>W</b>	County	

Lateral 4

KOP Lateral 4 Feet MD	Azimuth Lateral 4 °	Estimated Total Depth Lateral 4 Feet MD      Feet TVD			KOP Coordinates From Well Head From WH      From WH		
Formation Entry Point Coordinates From Well Head From WH      From WH		Bottom Hole Coordinates From Well Head From WH      From WH					
KOP Footages From Nearest Section Line F      L		Qtr-Qtr	Section	Township <b>N</b>	Range <b>W</b>	County	
Bottom Hole Footages From Nearest Section Line F      L		Qtr-Qtr	Section	Township <b>N</b>	Range <b>W</b>	County	

Lateral 5

KOP Lateral 5 Feet MD	Azimuth Lateral 5 °	Estimated Total Depth Lateral 5 Feet MD      Feet TVD			KOP Coordinates From Well Head From WH      From WH		
Formation Entry Point Coordinates From Well Head From WH      From WH		Bottom Hole Coordinates From Well Head From WH      From WH					
KOP Footages From Nearest Section Line F      L		Qtr-Qtr	Section	Township <b>N</b>	Range <b>W</b>	County	
Bottom Hole Footages From Nearest Section Line F      L		Qtr-Qtr	Section	Township <b>N</b>	Range <b>W</b>	County	

I hereby swear or affirm the information provided is true, complete and correct as determined from all available records.

Date

5 / 7 / 2012

ePermit

Printed Name  
**Terry L. Olson**

Title

**Regulatory Compliance Specialist****FOR STATE USE ONLY**

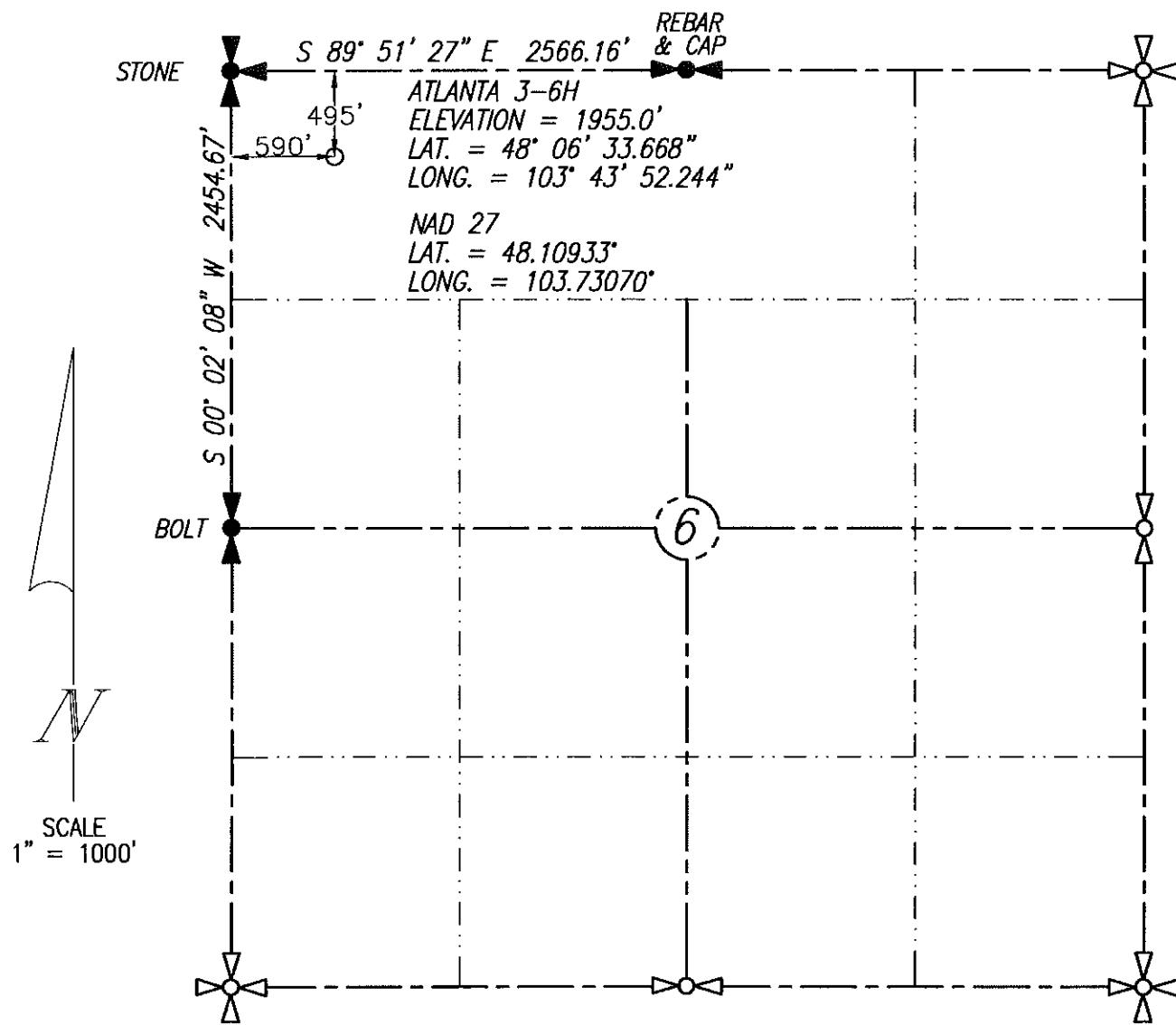
Permit and File Number <b>23370</b>	API Number <b>33 - 105 - 02730</b>
Field <b>BAKER</b>	
Pool <b>BAKKEN</b>	Permit Type <b>DEVELOPMENT</b>

**FOR STATE USE ONLY**

Date Approved <b>7 / 20 / 2012</b>
By <b>Todd L. Holweger</b>
Title <b>Mineral Resources Permit Manager</b>

WELL LOCATION PLAT  
CONTINENTAL RESOURCES INC.  
ATLANTA 3-6H  
SECTION 6, T153N, R101W  
WILLIAMS COUNTY, NORTH DAKOTA  
495' FNL & 590' FWL

REVISED: 4-23-2012



I CERTIFY THAT THIS PLAT CORRECTLY REPRESENTS  
WORK PERFORMED BY ME OR UNDER MY RESPONSIBLE  
CHARGE, AND IS TRUE AND CORRECT TO THE BEST OF  
MY KNOWLEDGE AND BELIEF

JOHN PAULSON  
REGISTERED LAND SURVEYOR  
L.S. 3366

4-23-12

DATE STAKED: 2-9-2012

NORTH DAKOTA

BASIS OF VERTICAL DATUM:  
NAVD 1988 GEOD 09

PERSON AUTHORIZING SURVEY;  
CHAD NEWBY

EXPLANATION AREA: NAD83(CORS96)

BASIS OF BEARING: TRUE NORTH

**BROSZ ENGINEERING INC.**

BOX 357  
BOWMAN, N.D. 58623  
PHONE: 701-523-3340  
FAX: 701-523-5243  
PROJECT NO. 12-10

Continental Resources, Inc. (CRI) respectfully submits the following information concerning the drilling of the Atlanta 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14 -- 6H, N/2 NW/4 Sec. 6, T153N, R101W, Williams County, North Dakota.

The Atlanta well(s) are located in a Well Head Protection Area. CRI would like to propose the following safeguards and precautions to be taken to prevent any contamination to freshwater sources during the drilling and completion of the well.

- 1) During construction of the location, the entire location will be constructed per NDIC permit stipulations, and to ensure any spills or runoff which occur on location do not penetrate the fresh ground water and are contained on surface of the location.
- 2) Drainage will be re-routed to avoid the location and fiber rolls will be employed around the site to reduce sediment contamination to freshwater runoff due to weather events.
- 3) The earthen berm constructed to keep any freshwater runoff off the location will also eliminate any spills from leaving the location
- 4) No reserve pit or dry cuttings pit will be utilized on location.
- 5) The conductor will be drilled to a depth of 80' and 20" pipe will be run to depth and cemented to surface.
- 6) During drilling operations, a freshwater protection string of 13-3/8" 48# H40 casing will be set to a depth of 500' and cemented to surface to protect the shallow freshwater zones. Standard 9-5/8" 36# J-55 surface casing will be set 100' into the Pierre Shale to a depth of 1970' and cemented to surface.
- 7) A frac string will be used to protect the intermediate casing during hydraulic fracturing of the well.
- 8) CRI is submitting a comprehensive; site specific Spill Contingency Plan to prepare for any event which may occur during drilling and completion operations.
- 9) CRI believes a Flood Prevention plan is not necessary for this site due to the Army Corps of Engineers documentation that the high water level for Lake Sakakawea will not affect any elevation 1855' above sea level or higher. The finished rig grade elevation for Atlanta location is 1959.6' above sea level.
- 10) The Atlanta wells will be drilled continuously. They will be batch drilled. The order of drilling for all wells on the pad will be:
  - a. 1, 2, 3, 4,
  - b. 11, 12, 13, 14,
  - c. 9, 10,
  - d. 5, 6, 7, 8.

CRI believes adequate planning and precautions are being taken to prevent any contamination to ground water, shallow aquifers, and fresh water reservoirs.

  
Chad Newby, Operations Land Coordinator  
Continental Resources, Inc.

STATE OF OKLAHOMA )  
                         )ss:  
COUNTY OF GARFIELD )

On the 8<sup>th</sup> day of June 2012, before me, a Notary Public in and for said County and State, personally appeared Chad Newby, known to me to be the Operations Land Coordinator of Continental Resources, Inc., the Corporation that executed the within instrument, and acknowledged to me that such Corporation executed the same.

  
Notary Public  
Garfield County, Oklahoma  
My Commission Expires: 7/5/2015  
Commission No.: 11006023



## Continental Resources Atlanta Site Contact List

### Drilling & Completions / Production

		phone	mobile
<b>Construction / Reclaim &amp; ROW</b>	Title		
Terry Chapman	Construction foreman		970.673.2411
Chad Newby	Operations Land Coordinator - Office		405.574.2172
<b>Drilling</b>			
Company man Cyclone 2 Rig Phone		701.570.8834	
Jared Miller	Lead Company Man Cyclone 2		701.290.0443
Brandon Simkins	Relief Company Man Cyclone 2		307.231.6420
Don Radke	Drilling Superintendent - Field		701.570.6326
Kyle Davis	Drilling Engineer - Office	580.249.4750	
Bryan George	Drilling Superintendent - Office	580.249.4757	
Alan McNally	Drilling Manager - Office	580.249.4792	
<b>Completions</b>			
Jason Walters	Production Superintendent		406.489.1456
Gene Dowhaniuk	Production Superintendent		701.770.8358
Chris Nichols	Area Completions Manager - Office	580.249.4711	580.278.9003
<b>Production</b>			
Howard Hill	Operator		406.489.2832
Brent Bowlds	Production Foreman	406.433.3006	406.489.3029
Donald Kennedy	Senior Production Engineer - Office	580.249.4788	
Russ Atkins	Area Production Manager		406.433.3006
Brad Aman	VP Production Northern Region	580.548.5283	

### **Health Safety Environmental**

Dusty Grosulak	Safety Supervisor		701.260.1138
Zach Laird	Safety Manager		405.742.2696
Mike White	Northern Region Senior Environment Specialist		406.941.2521
Stacy Aguirre	Northern Region Environmental Supervisor		406.478.4450
Andy Truhan	Director of Environmental Compliance		405.535.8967

### **Public Relations & Media Contact Information**

Kristin Miskovsky	VP Public Relations	405.234.9480	
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**Burns, David J.**

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**From:** Shawn Svob <ShawnSvob@contres.com>  
**Sent:** Tuesday, March 13, 2012 3:23 PM  
**To:** Burns, David J.  
**Cc:** Holweger, Todd L.; Becky Barnes; Nicole Caddell; Terry Olson  
**Subject:** Clarification of Drilling and Mud program

Continental Resources respectfully submits this memo as clarification on previously submitted permits.

In the Drilling Program, sub-section Mud Program, Surface Holes will be drilled with Fresh Water. Current Drilling Programs state "Native" as the current mud system. Future permits will reflect Fresh Water as the mud system.

Please contact me if you have further questions or require more clarification.

Respectfully,

Shawn Svob  
580-747-6678

Shawn

NOTICE: This message contains confidential information and is intended for the individual named. If you are not the named addressee, you should not disseminate, distribute or copy this e-mail. Please notify the sender immediately by reply e-mail if you have received this e-mail by mistake and delete this e-mail from your system. E-mail transmission cannot be guaranteed to be secure or error-free as information could be intercepted, corrupted, lost, destroyed, arrive late or incomplete, or contain viruses. The sender therefore does not accept liability for any errors or omissions in the contents of this message which arise as a result of e-mail transmission.

**PRELIMINARY DRILLING PROGRAM**

5/1/2012

Lease and Well No.

Atlanta 3-6H

**MUD PROGRAM**

Depth	Type	Weight	Remarks
0' - 1970'	Native Freshwater	8.4-8.8	Add Soap Sticks for Mud Rings
1970' - 6500'	Invert	9.3-9.5	35-50 sec, 10-30 cc's
6500' - 10858'	Invert	9.6-10.0	40-55 sec, 10-15 cc's O/W 70/30 to 80/20
10858' - TD	Brine	8.7-10.0	Cuttings Pit

**TUBULAR PROGRAM**

String Type	Hole Size	Depth	Feet	Casing Diameter	Weight, Grade, Connection	ERW/Seamless	Critical Inspection
FW	17 1/2 "	500 '	500 '	13-3/8 "	13-3/8", 48 #, H-40, STC	ERW	BCI & Drift
					Float shoe, shoe joint & float collar. Centralize bottom 3 jts and every 4th jt to surface.		
Surf	12 1/4 "	1970 '	1970 '	9 5/8 "	9-5/8", 36 #, J-55, STC	ERW	BCI & Drift
					Float shoe, shoe joint & float collar. Centralize bottom joint then 5 more every other, 1 at conductor		
Int	8 3/4 "	80 '	80 '	7 "	7", 32#, P-110 IC, LTC	ERW	BCI & Drift
		4000 '	3920 '	7 "	7", 26#, P-110 IC, LTC	ERW	BCI & Drift
		8100 '	4100 '	7 "	7", 29#, P-110 IC, LTC	ERW	BCI & Drift
		9210 '	1110 '	7 "	7", 32#, P-110 IC, LTC	Seamless	BCI & Drift
		10858 '	1648 '	7 "	7", 29#, P-110 IC, LTC	ERW	BCI & Drift
					Float shoe, shoe joint & float collar. Centralize bottom 3 joints. Centralize thru curve and across all salts.		
Liner	6 "	20080 '	10160 '	4 1/2 "	4-1/2", 11.6 #, P-110, BTC		
Tubing		9960 '	9960 '	2 7/8 "	2-7/8", 6.5 #, L-80, EUE		

Notes: Pipe to end up in hole from top to bottom as shown.

**CEMENT PROGRAM**

String Type	SHOE/DV Depth	Stage Lead/Tail	Cement Bottom	Cement Top	No Sacks	Cement System	Cement Yield	Cement Weight
		Lead	350 '	0 '	111	35/65 Poz/Class "C", 3% CaCl, 12% gel	2.39	12
FW	500	Tail	500 '	350 '	77.8	Class "C", 2% CaCl	1.46	14.3
(Basis: Gauge hole + 55% excess, tail 30% of length, lead to surface.)								
		Lead	1380 '	0 '	437	35/65 Poz/Class "C", 3% CaCl, 12% gel	2.39	12
Surf	1970	Tail	1970 '	1380 '	306	Class "C", 2% CaCl	1.46	14.3
(Basis: Gauge hole + 55% excess, tail 30% of length, lead to surface.)								
Int	10858	Lead	7800 '	0 '	457	35/65 Poz/Class "C", 3% KCl, 5 #/sk Silica	3.21	11.3
		Tail	10858 '	7800 '	376	Class "C", 3% KCl, 35% Silica	1.59	15.6
(Basis: Gauge hole + 30% excess, Tail to 500 ft above top of Charles Salt, Lead to Surface)								

GEOLOGIC PROGNOSIS

**Well Name:** Atlanta 3-6H  
**Rig:** Cyclone 02  
**Prospect:** Williston  
**Target:** Middle Bakken  
**Spacing:** 1280

**SHL:** 495' FNL & 590' FWL  
 Sec. 6 - 153N - 101W  
 Williams, ND  
**BHL:** 200' FSL & 2186' FEL  
 Sec. 7 - 153N - 101W  
 Williams, ND

- Pre-Staked  
 Staked

Rig Grade Elevation: 1945'  
 KB: 22'  
 RKB: 1967'

FORMATION	SUBSEA	TVD
Pierre Shale	100	1,867
Greenhorn	-2,582	4,549
Dakota Group (fka Mowry)	-2,958	4,925
Basal Dakota Sand	-3,657	5,624
Dunham Salt Top	NA	
Dunham Salt Base	NA	
Pine Salt Top	-5,189	7,156
Pine Salt Base	-5,216	7,183
Minnekahta	-5,235	7,202
Opeche Salt Top	NA	
Opeche Salt Base	NA	
Minnelusa Group	-5,464	7,431
Tyler	-5,650	7,617
Kibby	-6,186	8,153
Top Charles	-6,333	8,300
Base Last Charles Salt	-7,044	9,011
Mission Canyon	-7,267	9,234
Lodgepole	-7,820	9,787
Upper Bakken Shale	-8,529	10,496
Middle Bakken Member	-8,543	10,510
Middle Bakken Target	-8,563	10,530
End of Lateral	-8,548	10,515



To: Todd Holweger, NDIC  
From: Shawn Svob  
Date: 4/5/2012  
Re: Continental Resources standard CCL, CBL, 4-1/2" liner running and testing procedures

---

Continental Resources' standard practice for running the cement bond log and casing caliper log is to run both logs immediately after coming out of the hole after TD, prior to running the 4-1/2" liner, to the deepest depth obtainable; however, if there are well control concerns that require us to run the liner sooner, only the CBL will be run and the CCL will be run after setting the liner.

Based on the CCL results, we determine the actual API minimum burst allowance for the 7" casing. If the downgraded API burst pressure is below our minimum required frac pressures, we will run a 4-1/2" frac string; if severe wear or holes are found in the casing, we will run a 5" cemented, to surface, tie back string.

The CBL log is run in order to determine the top of cement, as required by the NDIC. Our current 4-1/2" liner program for a 1280 unit is 30, evenly spaced, stages with 29 swellable packers. The liner shoe is set approximately 180 feet off bottom. The shoe stage below the last packer has 2 joints, a double valved float, one joint, and a ported guide shoe – appx 130 ft. The liner is run using a running tool on the end of 4" DP. The 7" packer/hanger is set about 40 ft above KOP between two casing collars but conditions occasionally occur that require setting higher, either through unexpected failure or in order to isolate casing wear close to KOP. Recently we have tried 40 stage liners and the trend to explore the optimum stage count will continue.. Once the liner is at depth, a ball is dropped through the DP, the ball is pressured up against the setting tool to approximately 2500 psi, and the 7" packer/hanger is set.

A push pull test is done to confirm the hanger has set. Then, a 4500 psi pressure test is completed on the back side of the 4" DP to confirm the packer has set. The setting tool is then backed off and the 4" DP/running tool is laid down.

Immediately after the rotary rig has been moved off the well location, the 7" csg and liner packer/ hanger are tested to the frac pressure. The testers will rig up and test the tubing head to 5000 psi. Next a test plug will be run and set, using wire line, in the top of the 7" packer/hanger. Testers will pressure up to our frac pressure, typically 8500 psi, to confirm the 7" is ready for completion.

Shawn Svob  
Drilling Operations Coordinator

# CONTINENTAL RESOURCES

Location: NORTH DAKOTA Slot: SLOT#03 ATLANTA 3-6H(495'FNL & 590'FWL,SEC.06)

Field: WILLIAMS COUNTY Well: ATLANTA 3-6H  
Facility: SEC.06-T153N-R101W Wellbore: ATLANTA 3-6H PWB

Plot reference wellpath is ATLANTA 3-6H (REV-F.0) PWP

True vertical depths are referenced to CYCLONE 2 (RKB)

Grid System: NAD83 / Lambert North Dakota SP, Northern Zone (3301), US feet

Measured depths are referenced to CYCLONE 2 (RKB)

North Reference: True north

CYCLONE 2 (RKB) to Mean Sea Level: 1967 feet

Scale: True distance

Mean Sea Level to Mud line (At Slot: SLOT#03 ATLANTA 3-6H(495'FNL & 590'FWL,SEC.06)): 0 feet

Depths are in feet

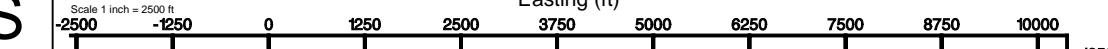
Coordinates are in feet referenced to Slot

Created by: painsetr on 8/4/2012

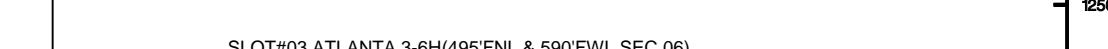
## Location Information

Facility Name	Grid East (US ft)	Grid North (US ft)	Latitude	Longitude		
SEC.06-T153N-R101W	1179034.199	421199.095	48°06'33.379"N	103°43'56.960"W		
Slot	Local N (ft)	Local E (ft)	Grid East (US ft)	Grid North (US ft)	Latitude	Longitude
SLOT#03 ATLANTA 3-6H(495'FNL & 590'FWL,SEC.06)	29.29	320.05	1179355.179	421214.924	48°06'33.668"N	103°43'52.244"W

CYCLONE 2 (RKB) to Mud line (At Slot: SLOT#03 ATLANTA 3-6H(495'FNL & 590'FWL,SEC.06))



Mean Sea Level to Mud line (At Slot: SLOT#03 ATLANTA 3-6H(495'FNL & 590'FWL,SEC.06))



CYCLONE 2 (RKB) to Mean Sea Level

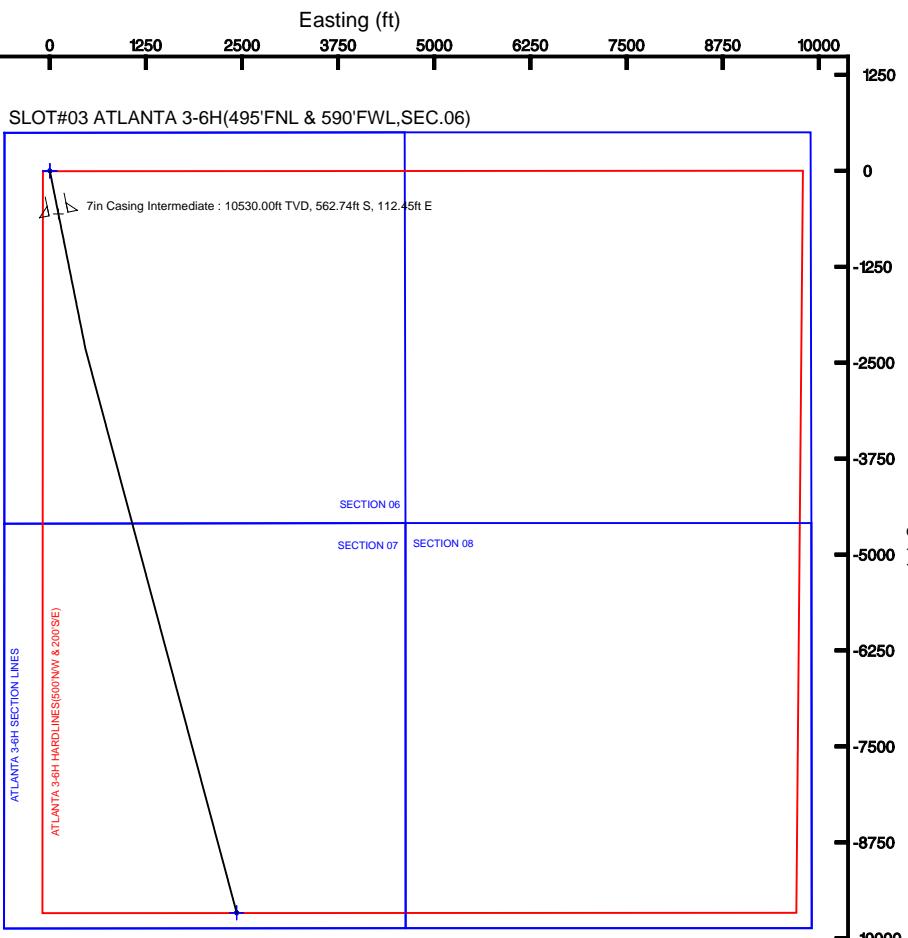


## Targets

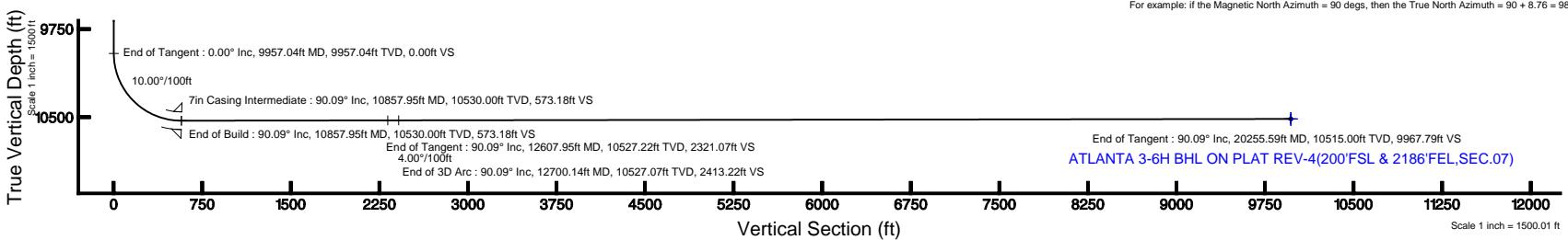
Name	MD (ft)	TVD (ft)	Local N (ft)	Local E (ft)	Grid East (US ft)	Grid North (US ft)	Latitude	Longitude
ATLANTA 3-6H SECTION 06		0.00	0.00	0.00	1179355.18	421214.92	48°06'33.668"N	103°43'52.244"W
ATLANTA 3-6H SECTION 07		0.00	0.00	0.00	1179355.18	421214.92	48°06'33.668"N	103°43'52.244"W
ATLANTA 3-6H SECTION 08		0.00	0.00	0.00	1179355.18	421214.92	48°06'33.668"N	103°43'52.244"W
ATLANTA 3-6H SECTION LINES		0.00	0.00	0.00	1179355.18	421214.92	48°06'33.668"N	103°43'52.244"W
ATLANTA 3-6H BHL ON PLAT REV-1200'FSL & 2186'FEL,SEC.07	10515.00	-9865.04	2604.00	1181542.88	411249.99	48°06'56.151"N	103°43'13.894"W	
ATLANTA 3-6H BHL ON PLAT REV-2200'FSL & 2186'FEL,SEC.07	10515.00	-9671.50	2430.20	1181377.36	411450.63	48°04'58.225"N	103°43'16.453"W	
ATLANTA 3-6H BHL ON PLAT REV-3200'FSL & 2186'FEL,SEC.07	10515.00	-9667.50	2430.20	1181377.53	411454.63	48°04'58.264"N	103°43'16.453"W	
ATLANTA 3-6H BHL ON PLAT REV-4(200'FSL & 2186'FEL,SEC.07)	20255.59	10515.00	-9667.00	2430.20	1181377.55	411455.13	48°04'58.269"N	103°43'16.453"W
ATLANTA 3-6H HARDLINES(500'NW & 200'SE)		10515.00	0.00	0.00	1179355.18	421214.92	48°06'33.668"N	103°43'52.244"W

## Well Profile Data

Design Comment	MD (ft)	Inc (°)	Az (°)	TVD (ft)	Local N (ft)	Local E (ft)	DLS (°/100ft)	VS (ft)
Tie On	22.00	0.000	168.700	22.00	0.00	0.00	0.00	0.00
End of Tangent	9957.04	0.000	168.700	9957.04	0.00	0.00	0.00	0.00
End of Build	10857.95	90.091	168.700	10530.00	-562.74	112.45	10.00	573.18
End of Tangent	12607.95	90.091	168.700	10527.22	-2278.82	455.35	0.00	2321.07
End of 3D Arc	12700.14	90.092	165.013	10527.07	-2368.57	476.31	4.00	2413.22
End of Tangent	20255.59	90.092	165.013	10515.00	-9667.00	2430.20	0.00	9967.79



ATLANTA 3-6H BHL ON PLAT REV-4(200'FSL & 2186'FEL,SEC.07)



BGGM (1945.0 to 2013.0 Dip: 73.08° Field: 56635.5 nT  
Magnetic North is 8.76 degrees East of True North (at 2/10/2012)

To correct azimuth from Magnetic to True add 8.76 degrees  
For example: if the Magnetic North Azimuth = 90 degs, then the True North Azimuth = 90 + 8.76 = 98.76





# Planned Wellpath Report

ATLANTA 3-6H (REV-F.0) PWP

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## REFERENCE WELLPATH IDENTIFICATION

Operator	CONTINENTAL RESOURCES	Slot	SLOT#03 ATLANTA 3-6H(495'FNL & 590'FWL,SEC.06)
Area	NORTH DAKOTA	Well	ATLANTA 3-6H
Field	WILLIAMS COUNTY	Wellbore	ATLANTA 3-6H PWB
Facility	SEC.06-T153N-R101W		

## REPORT SETUP INFORMATION

Projection System	NAD83 / Lambert North Dakota SP, Northern Zone (3301), US feet	Software System	WellArchitect® 3.0.2
North Reference	True	User	Painsetr
Scale	0.999936	Report Generated	6/4/2012 at 8:22:57 AM
Convergence at slot	2.40° West	Database/Source file	WA_Denver/ATLANTA_3-6H_PWB.xml

## WELLPATH LOCATION

	Local coordinates		Grid coordinates		Geographic coordinates	
	North[ft]	East[ft]	Easting[US ft]	Northing[US ft]	Latitude	Longitude
Slot Location	29.29	320.05	1179355.18	421214.92	48°06'33.668"N	103°43'52.244"W
Facility Reference Pt			1179034.20	421199.10	48°06'33.379"N	103°43'56.960"W
Field Reference Pt			1379474.78	594749.03	48°36'17.680"N	102°56'05.560"W

## WELLPATH DATUM

Calculation method	Minimum curvature	CYCLONE 2 (RKB) to Facility Vertical Datum
Horizontal Reference Pt	Slot	CYCLONE 2 (RKB) to Mean Sea Level
Vertical Reference Pt	CYCLONE 2 (RKB)	CYCLONE 2 (RKB) to Mud Line at Slot (SLOT#03 ATLANTA 3-6H(495'FNL & 590'FWL,SEC.06))
MD Reference Pt	CYCLONE 2 (RKB)	Section Origin
Field Vertical Reference	Mean Sea Level	Section Azimuth



# Planned Wellpath Report

ATLANTA 3-6H (REV-F.0) PWP

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## REFERENCE WELLPATH IDENTIFICATION

Operator	CONTINENTAL RESOURCES	Slot	SLOT#03 ATLANTA 3-6H(495'FNL & 590'FWL,SEC.06)
Area	NORTH DAKOTA	Well	ATLANTA 3-6H
Field	WILLIAMS COUNTY	Wellbore	ATLANTA 3-6H PWB
Facility	SEC.06-T153N-R101W		

## WELLPATH DATA (209 stations) † = interpolated/extrapolated station

MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Vert Sect [ft]	North [ft]	East [ft]	DLS [°/100ft]	Comments
0.00†	0.000	168.700	0.00	0.00	0.00	0.00	0.00	
22.00	0.000	168.700	22.00	0.00	0.00	0.00	0.00	Tie On
122.00†	0.000	168.700	122.00	0.00	0.00	0.00	0.00	
222.00†	0.000	168.700	222.00	0.00	0.00	0.00	0.00	
322.00†	0.000	168.700	322.00	0.00	0.00	0.00	0.00	
422.00†	0.000	168.700	422.00	0.00	0.00	0.00	0.00	
522.00†	0.000	168.700	522.00	0.00	0.00	0.00	0.00	
622.00†	0.000	168.700	622.00	0.00	0.00	0.00	0.00	
722.00†	0.000	168.700	722.00	0.00	0.00	0.00	0.00	
822.00†	0.000	168.700	822.00	0.00	0.00	0.00	0.00	
922.00†	0.000	168.700	922.00	0.00	0.00	0.00	0.00	
1022.00†	0.000	168.700	1022.00	0.00	0.00	0.00	0.00	
1122.00†	0.000	168.700	1122.00	0.00	0.00	0.00	0.00	
1222.00†	0.000	168.700	1222.00	0.00	0.00	0.00	0.00	
1322.00†	0.000	168.700	1322.00	0.00	0.00	0.00	0.00	
1422.00†	0.000	168.700	1422.00	0.00	0.00	0.00	0.00	
1522.00†	0.000	168.700	1522.00	0.00	0.00	0.00	0.00	
1622.00†	0.000	168.700	1622.00	0.00	0.00	0.00	0.00	
1722.00†	0.000	168.700	1722.00	0.00	0.00	0.00	0.00	
1822.00†	0.000	168.700	1822.00	0.00	0.00	0.00	0.00	
1922.00†	0.000	168.700	1922.00	0.00	0.00	0.00	0.00	
2022.00†	0.000	168.700	2022.00	0.00	0.00	0.00	0.00	
2122.00†	0.000	168.700	2122.00	0.00	0.00	0.00	0.00	
2222.00†	0.000	168.700	2222.00	0.00	0.00	0.00	0.00	
2322.00†	0.000	168.700	2322.00	0.00	0.00	0.00	0.00	
2422.00†	0.000	168.700	2422.00	0.00	0.00	0.00	0.00	
2522.00†	0.000	168.700	2522.00	0.00	0.00	0.00	0.00	
2622.00†	0.000	168.700	2622.00	0.00	0.00	0.00	0.00	
2722.00†	0.000	168.700	2722.00	0.00	0.00	0.00	0.00	
2822.00†	0.000	168.700	2822.00	0.00	0.00	0.00	0.00	



# Planned Wellpath Report

ATLANTA 3-6H (REV-F.0) PWP

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## REFERENCE WELLPATH IDENTIFICATION

Operator	CONTINENTAL RESOURCES	Slot	SLOT#03 ATLANTA 3-6H(495'FNL & 590'FWL,SEC.06)
Area	NORTH DAKOTA	Well	ATLANTA 3-6H
Field	WILLIAMS COUNTY	Wellbore	ATLANTA 3-6H PWB
Facility	SEC.06-T153N-R101W		

## WELLPATH DATA (209 stations) † = interpolated/extrapolated station

MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Vert Sect [ft]	North [ft]	East [ft]	DLS [°/100ft]	Comments
2922.00†	0.000	168.700	2922.00	0.00	0.00	0.00	0.00	
3022.00†	0.000	168.700	3022.00	0.00	0.00	0.00	0.00	
3122.00†	0.000	168.700	3122.00	0.00	0.00	0.00	0.00	
3222.00†	0.000	168.700	3222.00	0.00	0.00	0.00	0.00	
3322.00†	0.000	168.700	3322.00	0.00	0.00	0.00	0.00	
3422.00†	0.000	168.700	3422.00	0.00	0.00	0.00	0.00	
3522.00†	0.000	168.700	3522.00	0.00	0.00	0.00	0.00	
3622.00†	0.000	168.700	3622.00	0.00	0.00	0.00	0.00	
3722.00†	0.000	168.700	3722.00	0.00	0.00	0.00	0.00	
3822.00†	0.000	168.700	3822.00	0.00	0.00	0.00	0.00	
3922.00†	0.000	168.700	3922.00	0.00	0.00	0.00	0.00	
4022.00†	0.000	168.700	4022.00	0.00	0.00	0.00	0.00	
4122.00†	0.000	168.700	4122.00	0.00	0.00	0.00	0.00	
4222.00†	0.000	168.700	4222.00	0.00	0.00	0.00	0.00	
4322.00†	0.000	168.700	4322.00	0.00	0.00	0.00	0.00	
4422.00†	0.000	168.700	4422.00	0.00	0.00	0.00	0.00	
4522.00†	0.000	168.700	4522.00	0.00	0.00	0.00	0.00	
4622.00†	0.000	168.700	4622.00	0.00	0.00	0.00	0.00	
4722.00†	0.000	168.700	4722.00	0.00	0.00	0.00	0.00	
4822.00†	0.000	168.700	4822.00	0.00	0.00	0.00	0.00	
4922.00†	0.000	168.700	4922.00	0.00	0.00	0.00	0.00	
5022.00†	0.000	168.700	5022.00	0.00	0.00	0.00	0.00	
5122.00†	0.000	168.700	5122.00	0.00	0.00	0.00	0.00	
5222.00†	0.000	168.700	5222.00	0.00	0.00	0.00	0.00	
5322.00†	0.000	168.700	5322.00	0.00	0.00	0.00	0.00	
5422.00†	0.000	168.700	5422.00	0.00	0.00	0.00	0.00	
5522.00†	0.000	168.700	5522.00	0.00	0.00	0.00	0.00	
5622.00†	0.000	168.700	5622.00	0.00	0.00	0.00	0.00	
5722.00†	0.000	168.700	5722.00	0.00	0.00	0.00	0.00	
5822.00†	0.000	168.700	5822.00	0.00	0.00	0.00	0.00	



# Planned Wellpath Report

ATLANTA 3-6H (REV-F.0) PWP

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## REFERENCE WELLPATH IDENTIFICATION

Operator	CONTINENTAL RESOURCES	Slot	SLOT#03 ATLANTA 3-6H(495'FNL & 590'FWL,SEC.06)
Area	NORTH DAKOTA	Well	ATLANTA 3-6H
Field	WILLIAMS COUNTY	Wellbore	ATLANTA 3-6H PWB
Facility	SEC.06-T153N-R101W		

## WELLPATH DATA (209 stations) † = interpolated/extrapolated station

MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Vert Sect [ft]	North [ft]	East [ft]	DLS [°/100ft]	Comments
5922.00†	0.000	168.700	5922.00	0.00	0.00	0.00	0.00	
6022.00†	0.000	168.700	6022.00	0.00	0.00	0.00	0.00	
6122.00†	0.000	168.700	6122.00	0.00	0.00	0.00	0.00	
6222.00†	0.000	168.700	6222.00	0.00	0.00	0.00	0.00	
6322.00†	0.000	168.700	6322.00	0.00	0.00	0.00	0.00	
6422.00†	0.000	168.700	6422.00	0.00	0.00	0.00	0.00	
6522.00†	0.000	168.700	6522.00	0.00	0.00	0.00	0.00	
6622.00†	0.000	168.700	6622.00	0.00	0.00	0.00	0.00	
6722.00†	0.000	168.700	6722.00	0.00	0.00	0.00	0.00	
6822.00†	0.000	168.700	6822.00	0.00	0.00	0.00	0.00	
6922.00†	0.000	168.700	6922.00	0.00	0.00	0.00	0.00	
7022.00†	0.000	168.700	7022.00	0.00	0.00	0.00	0.00	
7122.00†	0.000	168.700	7122.00	0.00	0.00	0.00	0.00	
7222.00†	0.000	168.700	7222.00	0.00	0.00	0.00	0.00	
7322.00†	0.000	168.700	7322.00	0.00	0.00	0.00	0.00	
7422.00†	0.000	168.700	7422.00	0.00	0.00	0.00	0.00	
7522.00†	0.000	168.700	7522.00	0.00	0.00	0.00	0.00	
7622.00†	0.000	168.700	7622.00	0.00	0.00	0.00	0.00	
7722.00†	0.000	168.700	7722.00	0.00	0.00	0.00	0.00	
7822.00†	0.000	168.700	7822.00	0.00	0.00	0.00	0.00	
7922.00†	0.000	168.700	7922.00	0.00	0.00	0.00	0.00	
8022.00†	0.000	168.700	8022.00	0.00	0.00	0.00	0.00	
8122.00†	0.000	168.700	8122.00	0.00	0.00	0.00	0.00	
8222.00†	0.000	168.700	8222.00	0.00	0.00	0.00	0.00	
8322.00†	0.000	168.700	8322.00	0.00	0.00	0.00	0.00	
8422.00†	0.000	168.700	8422.00	0.00	0.00	0.00	0.00	
8522.00†	0.000	168.700	8522.00	0.00	0.00	0.00	0.00	
8622.00†	0.000	168.700	8622.00	0.00	0.00	0.00	0.00	
8722.00†	0.000	168.700	8722.00	0.00	0.00	0.00	0.00	
8822.00†	0.000	168.700	8822.00	0.00	0.00	0.00	0.00	



# Planned Wellpath Report

ATLANTA 3-6H (REV-F.0) PWP

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## REFERENCE WELLPATH IDENTIFICATION

Operator	CONTINENTAL RESOURCES	Slot	SLOT#03 ATLANTA 3-6H(495'FNL & 590'FWL,SEC.06)
Area	NORTH DAKOTA	Well	ATLANTA 3-6H
Field	WILLIAMS COUNTY	Wellbore	ATLANTA 3-6H PWB
Facility	SEC.06-T153N-R101W		

## WELLPATH DATA (209 stations) † = interpolated/extrapolated station

MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Vert Sect [ft]	North [ft]	East [ft]	DLS [°/100ft]	Comments
8922.00†	0.000	168.700	8922.00	0.00	0.00	0.00	0.00	
9022.00†	0.000	168.700	9022.00	0.00	0.00	0.00	0.00	
9122.00†	0.000	168.700	9122.00	0.00	0.00	0.00	0.00	
9222.00†	0.000	168.700	9222.00	0.00	0.00	0.00	0.00	
9322.00†	0.000	168.700	9322.00	0.00	0.00	0.00	0.00	
9422.00†	0.000	168.700	9422.00	0.00	0.00	0.00	0.00	
9522.00†	0.000	168.700	9522.00	0.00	0.00	0.00	0.00	
9622.00†	0.000	168.700	9622.00	0.00	0.00	0.00	0.00	
9722.00†	0.000	168.700	9722.00	0.00	0.00	0.00	0.00	
9822.00†	0.000	168.700	9822.00	0.00	0.00	0.00	0.00	
9922.00†	0.000	168.700	9922.00	0.00	0.00	0.00	0.00	
9957.04	0.000	168.700	9957.04	0.00	0.00	0.00	0.00	End of Tangent
10022.00†	6.496	168.700	10021.86	3.67	-3.61	0.72	10.00	
10122.00†	16.496	168.700	10119.73	23.55	-23.13	4.62	10.00	
10222.00†	26.496	168.700	10212.66	60.11	-59.01	11.79	10.00	
10322.00†	36.496	168.700	10297.82	112.22	-110.18	22.02	10.00	
10422.00†	46.496	168.700	10372.62	178.32	-175.07	34.98	10.00	
10522.00†	56.496	168.700	10434.80	256.38	-251.71	50.30	10.00	
10622.00†	66.496	168.700	10482.46	344.04	-337.78	67.49	10.00	
10722.00†	76.496	168.700	10514.16	438.64	-430.65	86.05	10.00	
10822.00†	86.496	168.700	10528.93	537.29	-527.51	105.41	10.00	
10857.95	90.091	168.700	10530.00	573.18	-562.74	112.45	10.00	End of Build
10922.00†	90.091	168.700	10529.90	637.15	-625.55	125.00	0.00	
11022.00†	90.091	168.700	10529.74	737.03	-723.61	144.59	0.00	
11122.00†	90.091	168.700	10529.58	836.91	-821.67	164.19	0.00	
11222.00†	90.091	168.700	10529.42	936.79	-919.74	183.78	0.00	
11322.00†	90.091	168.700	10529.26	1036.67	-1017.80	203.38	0.00	
11422.00†	90.091	168.700	10529.10	1136.55	-1115.86	222.97	0.00	
11522.00†	90.091	168.700	10528.94	1236.43	-1213.92	242.57	0.00	
11622.00†	90.091	168.700	10528.78	1336.31	-1311.98	262.16	0.00	



# Planned Wellpath Report

ATLANTA 3-6H (REV-F.0) PWP

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## REFERENCE WELLPATH IDENTIFICATION

Operator	CONTINENTAL RESOURCES	Slot	SLOT#03 ATLANTA 3-6H(495'FNL & 590'FWL,SEC.06)
Area	NORTH DAKOTA	Well	ATLANTA 3-6H
Field	WILLIAMS COUNTY	Wellbore	ATLANTA 3-6H PWB
Facility	SEC.06-T153N-R101W		

## WELLPATH DATA (209 stations) † = interpolated/extrapolated station

MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Vert Sect [ft]	North [ft]	East [ft]	DLS [°/100ft]	Comments
11722.00†	90.091	168.700	10528.62	1436.19	-1410.04	281.75	0.00	
11822.00†	90.091	168.700	10528.47	1536.07	-1508.10	301.35	0.00	
11922.00†	90.091	168.700	10528.31	1635.95	-1606.16	320.94	0.00	
12022.00†	90.091	168.700	10528.15	1735.82	-1704.23	340.54	0.00	
12122.00†	90.091	168.700	10527.99	1835.70	-1802.29	360.13	0.00	
12222.00†	90.091	168.700	10527.83	1935.58	-1900.35	379.73	0.00	
12322.00†	90.091	168.700	10527.67	2035.46	-1998.41	399.32	0.00	
12422.00†	90.091	168.700	10527.51	2135.34	-2096.47	418.92	0.00	
12522.00†	90.091	168.700	10527.35	2235.22	-2194.53	438.51	0.00	
12607.95	90.091	168.700	10527.22	2321.07	-2278.82	455.35	0.00	End of Tangent
12622.00†	90.091	168.138	10527.20	2335.11	-2292.58	458.17	4.00	
12700.14	90.092	165.013	10527.07	2413.22	-2368.57	476.31	4.00	End of 3D Arc
12722.00†	90.092	165.013	10527.04	2435.09	-2389.69	481.97	0.00	
12822.00†	90.092	165.013	10526.88	2535.08	-2486.29	507.83	0.00	
12922.00†	90.092	165.013	10526.72	2635.06	-2582.89	533.69	0.00	
13022.00†	90.092	165.013	10526.56	2735.05	-2679.49	559.55	0.00	
13122.00†	90.092	165.013	10526.40	2835.04	-2776.08	585.41	0.00	
13222.00†	90.092	165.013	10526.24	2935.03	-2872.68	611.27	0.00	
13322.00†	90.092	165.013	10526.08	3035.02	-2969.28	637.13	0.00	
13422.00†	90.092	165.013	10525.92	3135.00	-3065.88	662.99	0.00	
13522.00†	90.092	165.013	10525.76	3234.99	-3162.48	688.85	0.00	
13622.00†	90.092	165.013	10525.60	3334.98	-3259.08	714.71	0.00	
13722.00†	90.092	165.013	10525.44	3434.97	-3355.67	740.57	0.00	
13822.00†	90.092	165.013	10525.28	3534.96	-3452.27	766.43	0.00	
13922.00†	90.092	165.013	10525.12	3634.95	-3548.87	792.29	0.00	
14022.00†	90.092	165.013	10524.96	3734.93	-3645.47	818.15	0.00	
14122.00†	90.092	165.013	10524.80	3834.92	-3742.07	844.01	0.00	
14222.00†	90.092	165.013	10524.64	3934.91	-3838.66	869.88	0.00	
14322.00†	90.092	165.013	10524.48	4034.90	-3935.26	895.74	0.00	
14422.00†	90.092	165.013	10524.32	4134.89	-4031.86	921.60	0.00	



# Planned Wellpath Report

ATLANTA 3-6H (REV-F.0) PWP

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## REFERENCE WELLPATH IDENTIFICATION

Operator	CONTINENTAL RESOURCES	Slot	SLOT#03 ATLANTA 3-6H(495'FNL & 590'FWL,SEC.06)
Area	NORTH DAKOTA	Well	ATLANTA 3-6H
Field	WILLIAMS COUNTY	Wellbore	ATLANTA 3-6H PWB
Facility	SEC.06-T153N-R101W		

## WELLPATH DATA (209 stations) † = interpolated/extrapolated station

MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Vert Sect [ft]	North [ft]	East [ft]	DLS [°/100ft]	Comments
14522.00†	90.092	165.013	10524.16	4234.87	-4128.46	947.46	0.00	
14622.00†	90.092	165.013	10524.00	4334.86	-4225.06	973.32	0.00	
14722.00†	90.092	165.013	10523.84	4434.85	-4321.66	999.18	0.00	
14822.00†	90.092	165.013	10523.68	4534.84	-4418.25	1025.04	0.00	
14922.00†	90.092	165.013	10523.52	4634.83	-4514.85	1050.90	0.00	
15022.00†	90.092	165.013	10523.36	4734.82	-4611.45	1076.76	0.00	
15122.00†	90.092	165.013	10523.20	4834.80	-4708.05	1102.62	0.00	
15222.00†	90.092	165.013	10523.04	4934.79	-4804.65	1128.48	0.00	
15322.00†	90.092	165.013	10522.88	5034.78	-4901.24	1154.34	0.00	
15422.00†	90.092	165.013	10522.72	5134.77	-4997.84	1180.20	0.00	
15522.00†	90.092	165.013	10522.56	5234.76	-5094.44	1206.06	0.00	
15622.00†	90.092	165.013	10522.40	5334.74	-5191.04	1231.92	0.00	
15722.00†	90.092	165.013	10522.24	5434.73	-5287.64	1257.78	0.00	
15822.00†	90.092	165.013	10522.08	5534.72	-5384.23	1283.65	0.00	
15922.00†	90.092	165.013	10521.92	5634.71	-5480.83	1309.51	0.00	
16022.00†	90.092	165.013	10521.76	5734.70	-5577.43	1335.37	0.00	
16122.00†	90.092	165.013	10521.60	5834.69	-5674.03	1361.23	0.00	
16222.00†	90.092	165.013	10521.44	5934.67	-5770.63	1387.09	0.00	
16322.00†	90.092	165.013	10521.28	6034.66	-5867.23	1412.95	0.00	
16422.00†	90.092	165.013	10521.12	6134.65	-5963.82	1438.81	0.00	
16522.00†	90.092	165.013	10520.96	6234.64	-6060.42	1464.67	0.00	
16622.00†	90.092	165.013	10520.81	6334.63	-6157.02	1490.53	0.00	
16722.00†	90.092	165.013	10520.65	6434.61	-6253.62	1516.39	0.00	
16822.00†	90.092	165.013	10520.49	6534.60	-6350.22	1542.25	0.00	
16922.00†	90.092	165.013	10520.33	6634.59	-6446.81	1568.11	0.00	
17022.00†	90.092	165.013	10520.17	6734.58	-6543.41	1593.97	0.00	
17122.00†	90.092	165.013	10520.01	6834.57	-6640.01	1619.83	0.00	
17222.00†	90.092	165.013	10519.85	6934.56	-6736.61	1645.69	0.00	
17322.00†	90.092	165.013	10519.69	7034.54	-6833.21	1671.56	0.00	
17422.00†	90.092	165.013	10519.53	7134.53	-6929.81	1697.42	0.00	



# Planned Wellpath Report

ATLANTA 3-6H (REV-F.0) PWP

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## REFERENCE WELLPATH IDENTIFICATION

Operator	CONTINENTAL RESOURCES	Slot	SLOT#03 ATLANTA 3-6H(495'FNL & 590'FWL,SEC.06)
Area	NORTH DAKOTA	Well	ATLANTA 3-6H
Field	WILLIAMS COUNTY	Wellbore	ATLANTA 3-6H PWB
Facility	SEC.06-T153N-R101W		

## WELLPATH DATA (209 stations) † = interpolated/extrapolated station

MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Vert Sect [ft]	North [ft]	East [ft]	DLS [°/100ft]	Comments
17522.00†	90.092	165.013	10519.37	7234.52	-7026.40	1723.28	0.00	
17622.00†	90.092	165.013	10519.21	7334.51	-7123.00	1749.14	0.00	
17722.00†	90.092	165.013	10519.05	7434.50	-7219.60	1775.00	0.00	
17822.00†	90.092	165.013	10518.89	7534.48	-7316.20	1800.86	0.00	
17922.00†	90.092	165.013	10518.73	7634.47	-7412.80	1826.72	0.00	
18022.00†	90.092	165.013	10518.57	7734.46	-7509.39	1852.58	0.00	
18122.00†	90.092	165.013	10518.41	7834.45	-7605.99	1878.44	0.00	
18222.00†	90.092	165.013	10518.25	7934.44	-7702.59	1904.30	0.00	
18322.00†	90.092	165.013	10518.09	8034.43	-7799.19	1930.16	0.00	
18422.00†	90.092	165.013	10517.93	8134.41	-7895.79	1956.02	0.00	
18522.00†	90.092	165.013	10517.77	8234.40	-7992.38	1981.88	0.00	
18622.00†	90.092	165.013	10517.61	8334.39	-8088.98	2007.74	0.00	
18722.00†	90.092	165.013	10517.45	8434.38	-8185.58	2033.60	0.00	
18822.00†	90.092	165.013	10517.29	8534.37	-8282.18	2059.46	0.00	
18922.00†	90.092	165.013	10517.13	8634.35	-8378.78	2085.33	0.00	
19022.00†	90.092	165.013	10516.97	8734.34	-8475.38	2111.19	0.00	
19122.00†	90.092	165.013	10516.81	8834.33	-8571.97	2137.05	0.00	
19222.00†	90.092	165.013	10516.65	8934.32	-8668.57	2162.91	0.00	
19322.00†	90.092	165.013	10516.49	9034.31	-8765.17	2188.77	0.00	
19422.00†	90.092	165.013	10516.33	9134.30	-8861.77	2214.63	0.00	
19522.00†	90.092	165.013	10516.17	9234.28	-8958.37	2240.49	0.00	
19622.00†	90.092	165.013	10516.01	9334.27	-9054.96	2266.35	0.00	
19722.00†	90.092	165.013	10515.85	9434.26	-9151.56	2292.21	0.00	
19822.00†	90.092	165.013	10515.69	9534.25	-9248.16	2318.07	0.00	
19922.00†	90.092	165.013	10515.53	9634.24	-9344.76	2343.93	0.00	
20022.00†	90.092	165.013	10515.37	9734.22	-9441.36	2369.79	0.00	
20122.00†	90.092	165.013	10515.21	9834.21	-9537.96	2395.65	0.00	
20222.00†	90.092	165.013	10515.05	9934.20	-9634.55	2421.51	0.00	
20255.59	90.092	165.013	10515.00 <sup>1</sup>	9967.79	-9667.00	2430.20	0.00	End of Tangent



# Planned Wellpath Report

ATLANTA 3-6H (REV-F.0) PWP

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## REFERENCE WELLPATH IDENTIFICATION

Operator	CONTINENTAL RESOURCES	Slot	SLOT#03 ATLANTA 3-6H(495'FNL & 590'FWL,SEC.06)
Area	NORTH DAKOTA	Well	ATLANTA 3-6H
Field	WILLIAMS COUNTY	Wellbore	ATLANTA 3-6H PWB
Facility	SEC.06-T153N-R101W		

## HOLE & CASING SECTIONS - Ref Wellbore: ATLANTA 3-6H PWB      Ref Wellpath: ATLANTA 3-6H (REV-F.0) PWP

String/Diameter	Start MD [ft]	End MD [ft]	Interval [ft]	Start TVD [ft]	End TVD [ft]	Start N/S [ft]	Start E/W [ft]	End N/S [ft]	End E/W [ft]
7in Casing Intermediate	22.00	10857.95	10835.95	22.00	10530.00	0.00	0.00	-562.74	112.45

## TARGETS

Name	MD [ft]	TVD [ft]	North [ft]	East [ft]	Grid East [US ft]	Grid North [US ft]	Latitude	Longitude	Shape
ATLANTA 3-6H SECTION 06		0.00	0.00	0.00	1179355.18	421214.92	48°06'33.668"N	103°43'52.244"W	polygon
ATLANTA 3-6H SECTION 07		0.00	0.00	0.00	1179355.18	421214.92	48°06'33.668"N	103°43'52.244"W	polygon
ATLANTA 3-6H SECTION 08		0.00	0.00	0.00	1179355.18	421214.92	48°06'33.668"N	103°43'52.244"W	polygon
ATLANTA 3-6H SECTION LINES		0.00	0.00	0.00	1179355.18	421214.92	48°06'33.668"N	103°43'52.244"W	polygon
ATLANTA 3-6H BHL ON PLAT REV-1(200'FSL & 2186'FEL,SEC.07)	10513.00	-9865.04	2604.00	1181542.88	411249.99	48°04'56.315"N	103°43'13.894"W	point	
ATLANTA 3-6H BHL ON PLAT REV-2(200'FSL & 2186'FEL,SEC.07)	10515.00	-9671.50	2430.20	1181377.36	411450.63	48°04'58.225"N	103°43'16.453"W	point	
ATLANTA 3-6H BHL ON PLAT REV-3(200'FSL & 2186'FEL,SEC.07)	10515.00	-9667.50	2430.20	1181377.53	411454.63	48°04'58.264"N	103°43'16.453"W	point	
1) ATLANTA 3-6H BHL ON PLAT REV-4(200'FSL & 2186'FEL,SEC.07)	20255.59	10515.00	-9667.00	2430.20	1181377.55	411455.13	48°04'58.269"N	103°43'16.453"W	point
ATLANTA 3-6H HARDLINES (500'N/W & 200'S/E)	10515.00	0.00	0.00	1179355.18	421214.92	48°06'33.668"N	103°43'52.244"W	polygon	



# Planned Wellpath Report

ATLANTA 3-6H (REV-F.0) PWP

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## REFERENCE WELLPATH IDENTIFICATION

Operator	CONTINENTAL RESOURCES	Slot	SLOT#03 ATLANTA 3-6H(495'FNL & 590'FWL,SEC.06)
Area	NORTH DAKOTA	Well	ATLANTA 3-6H
Field	WILLIAMS COUNTY	Wellbore	ATLANTA 3-6H PWB
Facility	SEC.06-T153N-R101W		

## SURVEY PROGRAM - Ref Wellbore: ATLANTA 3-6H PWB      Ref Wellpath: ATLANTA 3-6H (REV-F.0) PWP

Start MD [ft]	End MD [ft]	Positional Uncertainty Model	Log Name/Comment	Wellbore
22.00	22000.00	NaviTrak (Standard)		ATLANTA 3-6H PWB



# Planned Wellpath Report

ATLANTA 3-6H (REV-F.0) PWP

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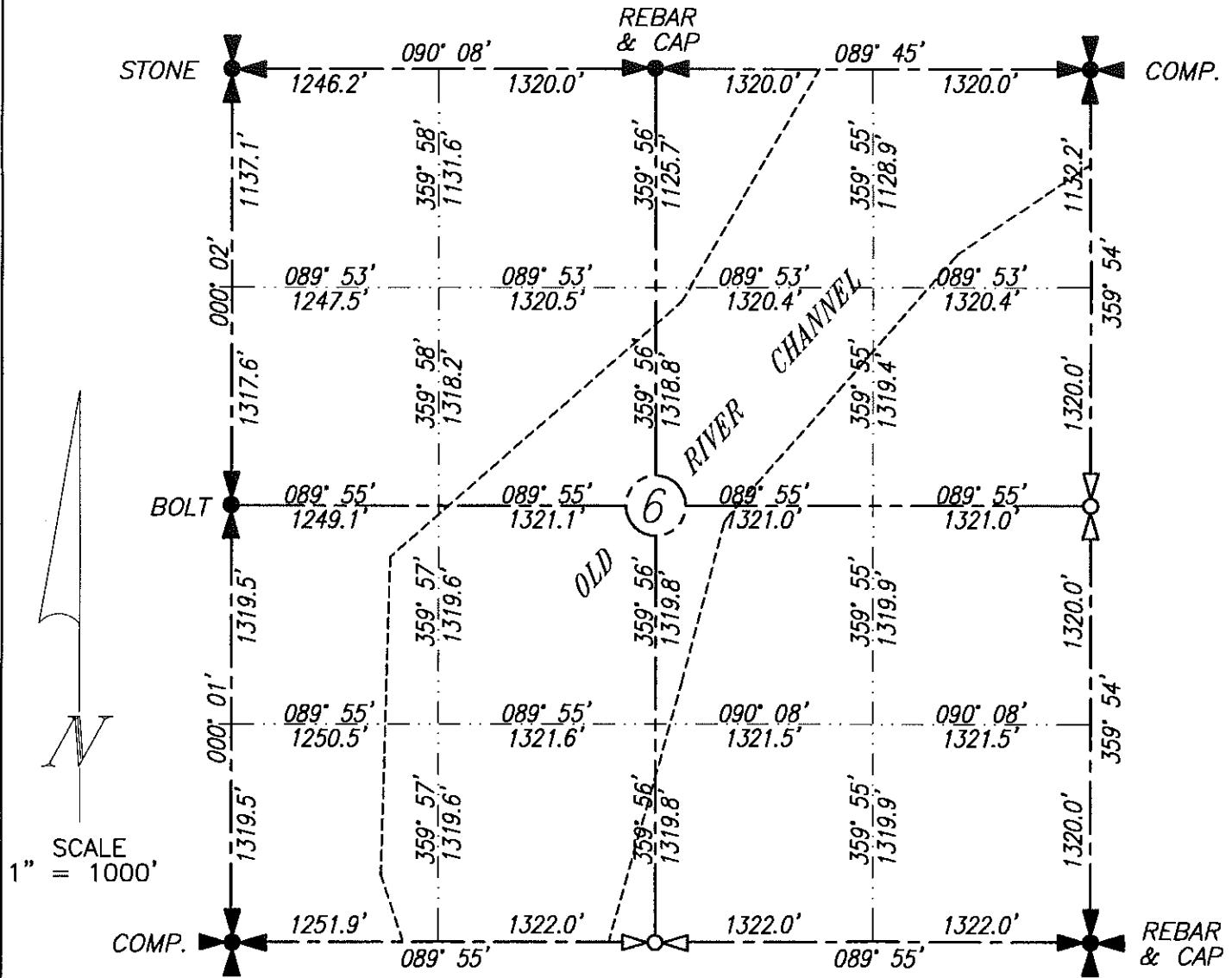
## REFERENCE WELLPATH IDENTIFICATION

Operator	CONTINENTAL RESOURCES	Slot	SLOT#03 ATLANTA 3-6H(495'FNL & 590'FWL,SEC.06)
Area	NORTH DAKOTA	Well	ATLANTA 3-6H
Field	WILLIAMS COUNTY	Wellbore	ATLANTA 3-6H PWB
Facility	SEC.06-T153N-R101W		

## DESIGN COMMENTS

MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Comment
22.00	0.000	168.700	22.00	Tie On
9957.04	0.000	168.700	9957.04	End of Tangent
10857.95	90.091	168.700	10530.00	End of Build
12607.95	90.091	168.700	10527.22	End of Tangent
12700.14	90.092	165.013	10527.07	End of 3D Arc
20255.59	90.092	165.013	10515.00	End of Tangent

HORIZONTAL SECTION PLAT  
CONTINENTAL RESOURCES INC.  
ATLANTA 3-6H  
SECTION 6, T153N, R101W  
WILLIAMS COUNTY, NORTH DAKOTA  
CKENZIE COUNTY, NORTH DAKOTA



*MOST OF THE SECTION IS LOTTED DUE TO THE MISSOURI RIVER.*

ALL CORNERS SHOWN ON THIS PLAT WERE FOUND IN THE FIELD  
DISTANCES TO ALL OTHERS ARE CALCULATED.  
ALL BEARINGS SHOWN ARE ASSUMED.

I CERTIFY THAT THIS (REGISTRATION NUMBER) REPRESENTS  
WORK PERFORMED BY ME OR UNDER MY RESPONSIBLE  
CHARGE, AND IS TRUE AND CORRECT TO THE BEST OF  
MY KNOWLEDGE AND BELIEF.

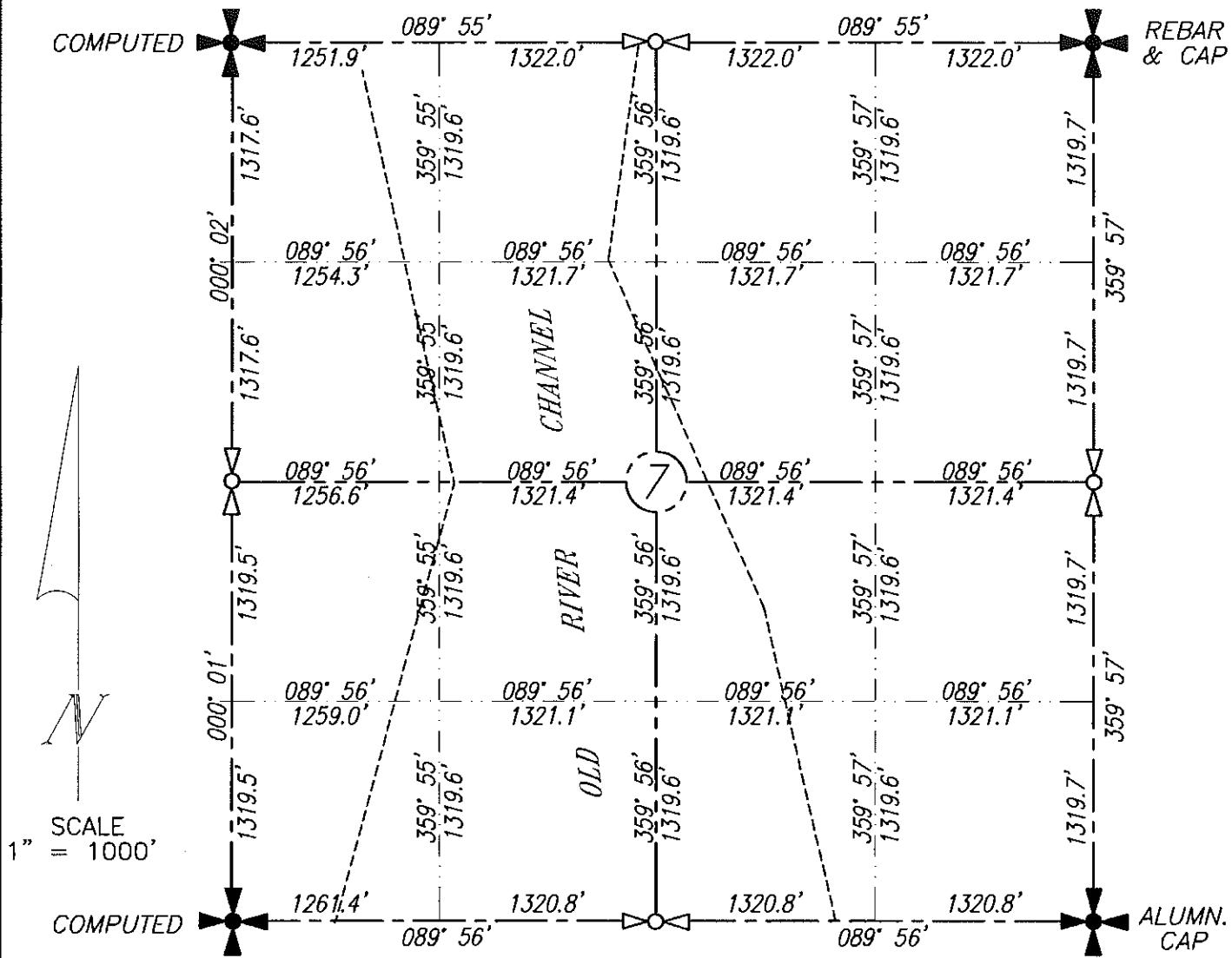
*John Paulson* JOHN PAULSON R.L.S. 3366 NORTH DAKOTA

~~JOHN PAULSON R.L.S. 336~~

**BROSZ ENGINEERING INC.**  
BOX 357  
BOWMAN, N.D. 58623  
PHONE: 701-523-3340  
FAX: 701-523-5243  
PROJECT NO. 12-10

HORIZONTAL SECTION PLAT  
CONTINENTAL RESOURCES INC.

ATLANTA 3-6H  
SECTION 7, T153N, R101W  
MCKENZIE COUNTY, NORTH DAKOTA



**MOST OF THE SECTION IS LOTTED DUE TO THE MISSOURI RIVER.**

ALL CORNERS SHOWN ON THIS PLAT WERE FOUND IN THE FIELD  
DISTANCES TO ALL OTHERS ARE CALCULATED.  
ALL BEARINGS SHOWN ARE ASSUMED.

I CERTIFY THAT THIS PLAT CORRECTLY REPRESENTS  
WORK PERFORMED BY ME OR UNDER MY RESPONSIBLE  
CHARGE AND IS TRUE AND CORRECT TO THE BEST OF  
MY KNOWLEDGE AND BELIEF  
LS 3366

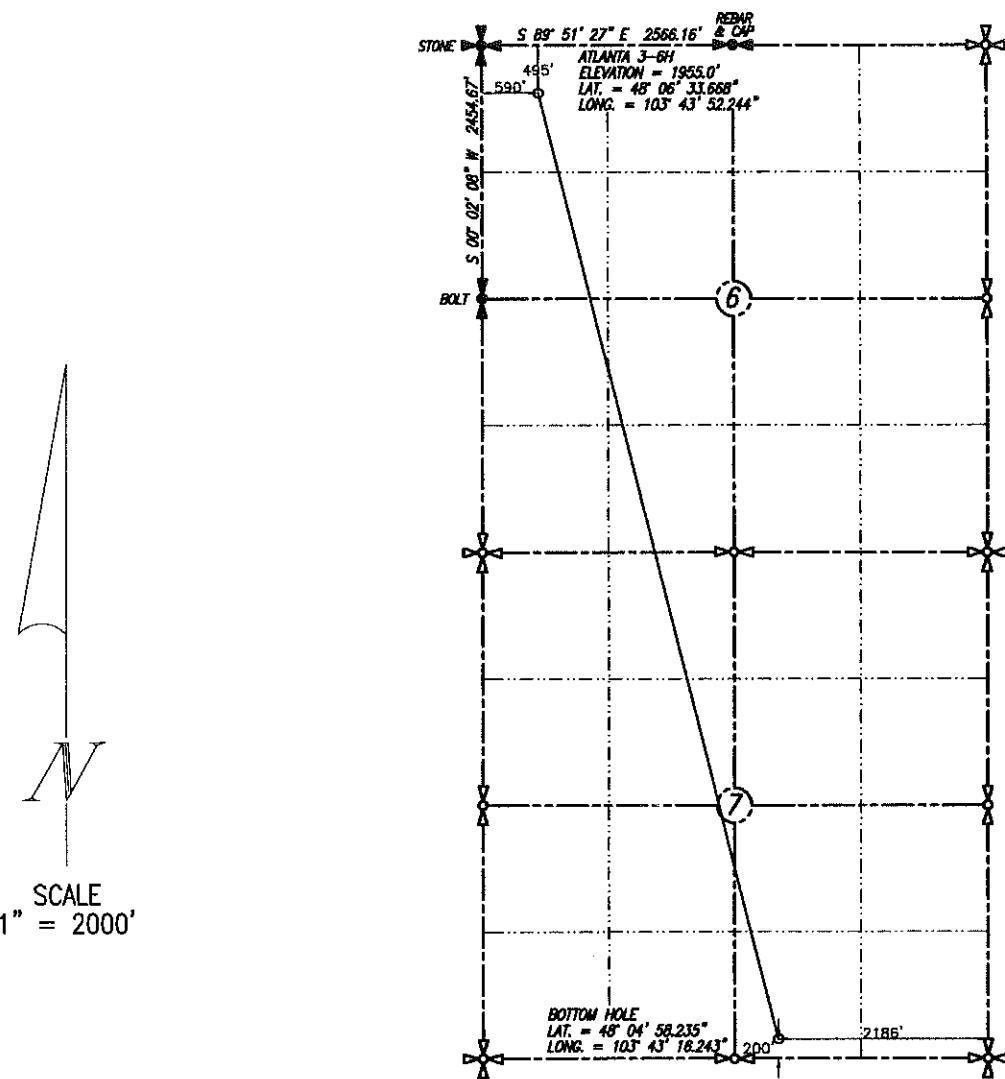
JOHN PAULSON DRA. #3366

**BROSZ ENGINEERING INC.**

BOX 357  
BOWMAN, N.D. 58623  
PHONE: 701-523-3340  
FAX: 701-523-5243

PROJECT NO. 12-10

BOTTOM HOLE LOCATION PLAT  
 CONTINENTAL RESOURCES INC.  
 ATLANTA 3-6H  
 SECTION 6, T153N, R101W  
 WILLIAMS COUNTY, NORTH DAKOTA  
 495' FNL & 590' FWL



I CERTIFY THAT THIS PLAT CORRECTLY REPRESENTS  
 WORK PERFORMED BY ME OR UNDER MY RESPONSIBLE  
 CHARGE, AND IS TRUE AND CORRECT TO THE BEST OF  
 MY KNOWLEDGE AND BELIEF

*John Brosz*  
 JOHN BROSZ, P.E. #3366

LAND  
 SURVEYOR  
 L.S. 3366

4-23-12

DATE STAKED: 2-9-2012

NORTH DAKOTA

BASIS OF VERTICAL DATUM:  
 NAVD 1988 GEOD 09

PERSON AUTHORIZING SURVEY:  
CHAD NEWBY

EXPLANATION AREA: NAD83(CORS96)

BASIS OF BEARING: TRUE NORTH

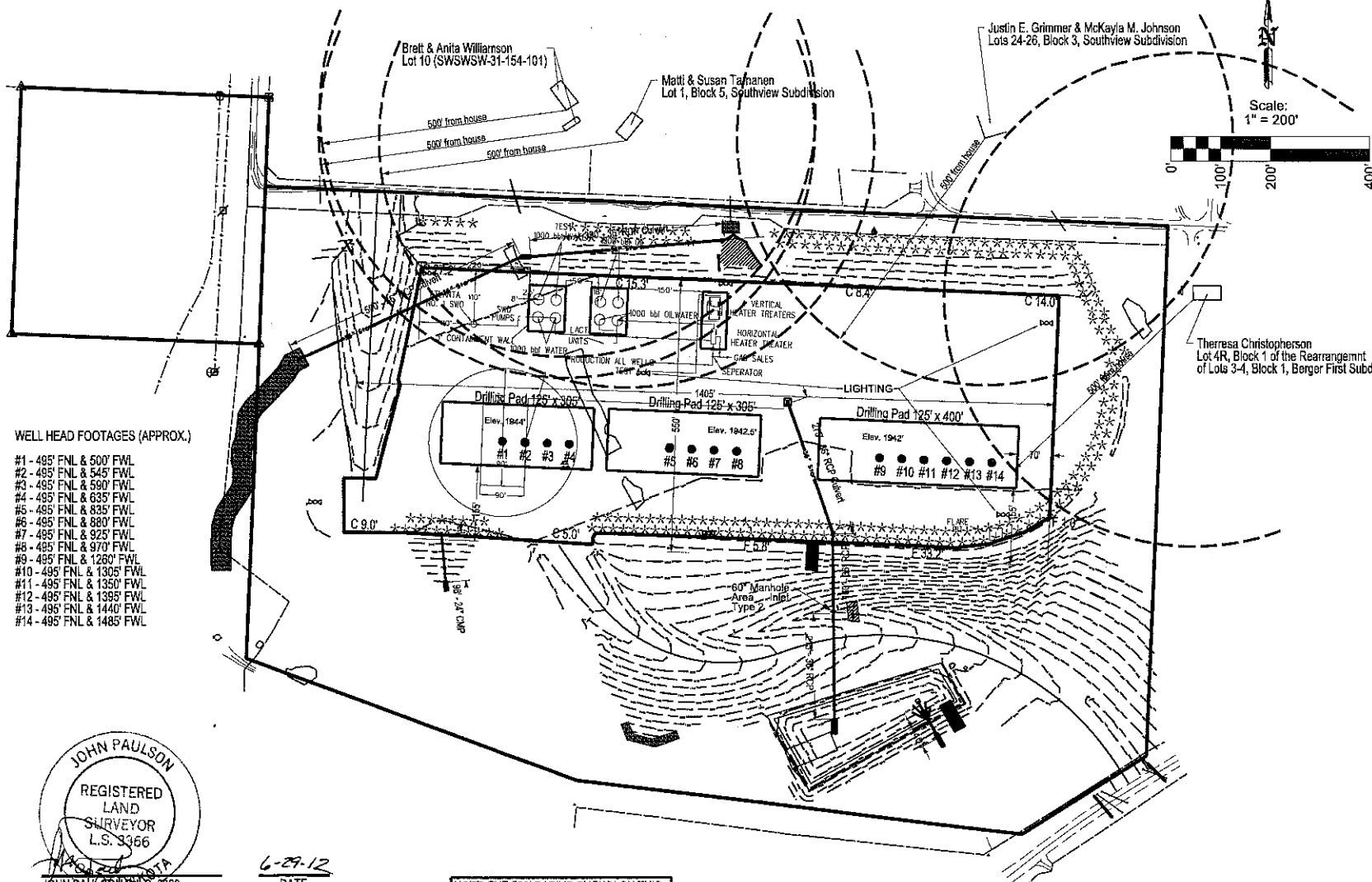
**BROSZ ENGINEERING INC.**

BOX 357  
 BOWMAN, N.D. 58623  
 PHONE: 701-523-3340  
 FAX: 701-523-5243  
 PROJECT NO. 12-10

DESIGNED BY:	JWH
DRAWN BY:	
DATE PRINTED:	5/16/12

REVISION	DATE
1	6/25/12
2	
3	
4	

SHEET DESCRIPTION: Production Facility Layout  
 PROJECT NAME: Atlanta Site  
 PROJECT NO.: N12B10



## Spill Toolkit Inventory

(To be Checked After Each Use)

Supplies	Quantity	Actual	Supplies	Quantity	Actual
<b>Personal Protection</b>			<b>Miscellaneous</b>		
Trauma/1st Aid Kit	1		EnviroClean (5-gal units of concentrate)	2	
Eye Wash	1		Duct Tape (Case)	3	
Hand Cleaner	2		Flashlights	6	
Nitrile Gloves (L & XL Case)	2		Flood Lights	2	
FRC Rain Coat - Extra Large	3		Extension Cord 50' 12-gauge	5	
FRC Rain Coat - Large	3		55-gal. Drums w/lids	2	
Rubber Safety Toed Boots - Size 10	2		Large Trash Cans	2	
Rubber Safety Toed Boots - Size 11	2		HD Drum Liners - boxes	2	
Rubber Safety Toed Boots - Size 12	2		Hoses - Kit (Blue & Green)	5	
FRC Tyvex Suits - Case XL	1		Plastic Buckets	5	
Neoprene Chest Waders - L	1		Propane Cylinders - 20-lb.	2	
Neoprene Chest Waders - L	1		Propane Weed Burner W/Hose	1	
<b>Containment</b>			Pump - Trash	2	
Absorbent (sphag)	10		Pump - 115V Water Transfer	2	
Absorbent Boom 3" x 10'	2		Gas Powered Generator (3-5K Watt)	1	
Absorbent Boom 5" x 10'	10		Misc. Ratchet Straps	6	
Absorbent Boom 8" x 10'	8		Rope 1/2" x 100'	2	
Containment Boom - Fast Water	3		Rope 1/4" x 50'	4	
Absorbent Pads (Hydrocarbon)	10		Rope 3/8" x 100'	2	
Absorbent Pads (Universal)	5		Shop Towels - box	2	
Absorbent Pillows 18" x 18" box	3		Caulking Gun	2	
Absorbent Pom Pom Cube	7		Silicon Tubes	10	
Absorbent Sweep - 16" x 100' - Bag	5		Metal Stakes/Spikes	8	
<b>Miscellaneous</b>			Metal T-Posts	6	
Antifreeze	2		Bungee Cords	3	
Push Broom	2		Wire - 25' roll - smooth	1	
Shovels	2		Fire Extinguisher	1	
Rake	5		Equipment Hooks	6	
Squeegees	2		Shelving	4	
Scoop	2		Drawers	1	
Spark Resistant Scoop	1		Misc. Building Supplies	1	

## **Tabor, David**

---

**From:** Becky Barnes <Becky.Barnes@clr.com>  
**Sent:** Wednesday, June 06, 2012 1:46 PM  
**To:** Tabor, David  
**Subject:** Atlanta Pad Wells

All cuttings for the Atlanta Pad wells will be hauled to the Tioga Prairie disposal.

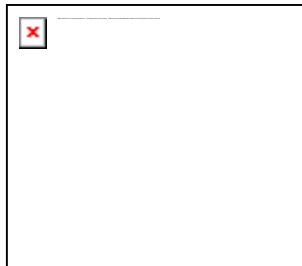
Prairie Disposal for Cuttings  
102C10 52<sup>nd</sup> St NW  
Tioga ND 58852

Let me know if there is anything else that you need.

Thanks.

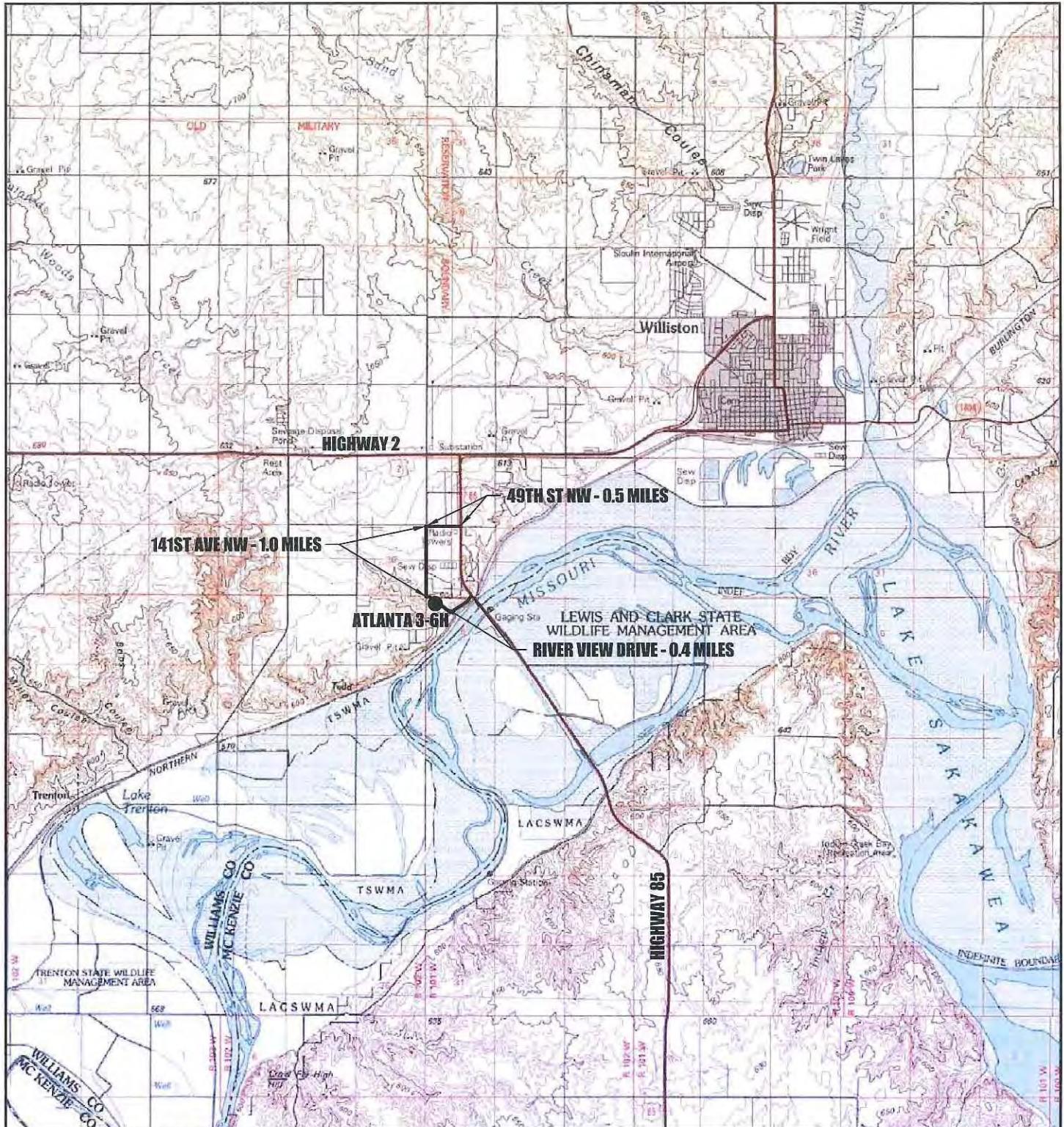
Bb

*Becky Barnes*  
Regulatory Compliance Specialist  
Continental Resources, Inc.  
Office 405-234-9161  
Fax 580-548-5293



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**NOTICE:** This message contains confidential information and is intended for the individual named. If you are not the named addressee, you should not disseminate, distribute or copy this e-mail. Please notify the sender immediately by reply e-mail if you have received this e-mail by mistake and delete this e-mail from your system. E-mail transmission cannot be guaranteed to be secure or error-free as information could be intercepted, corrupted, lost, destroyed, arrive late or incomplete, or contain viruses. The sender therefore does not accept liability for any errors or omissions in the contents of this message which arise as a result of e-mail transmission.



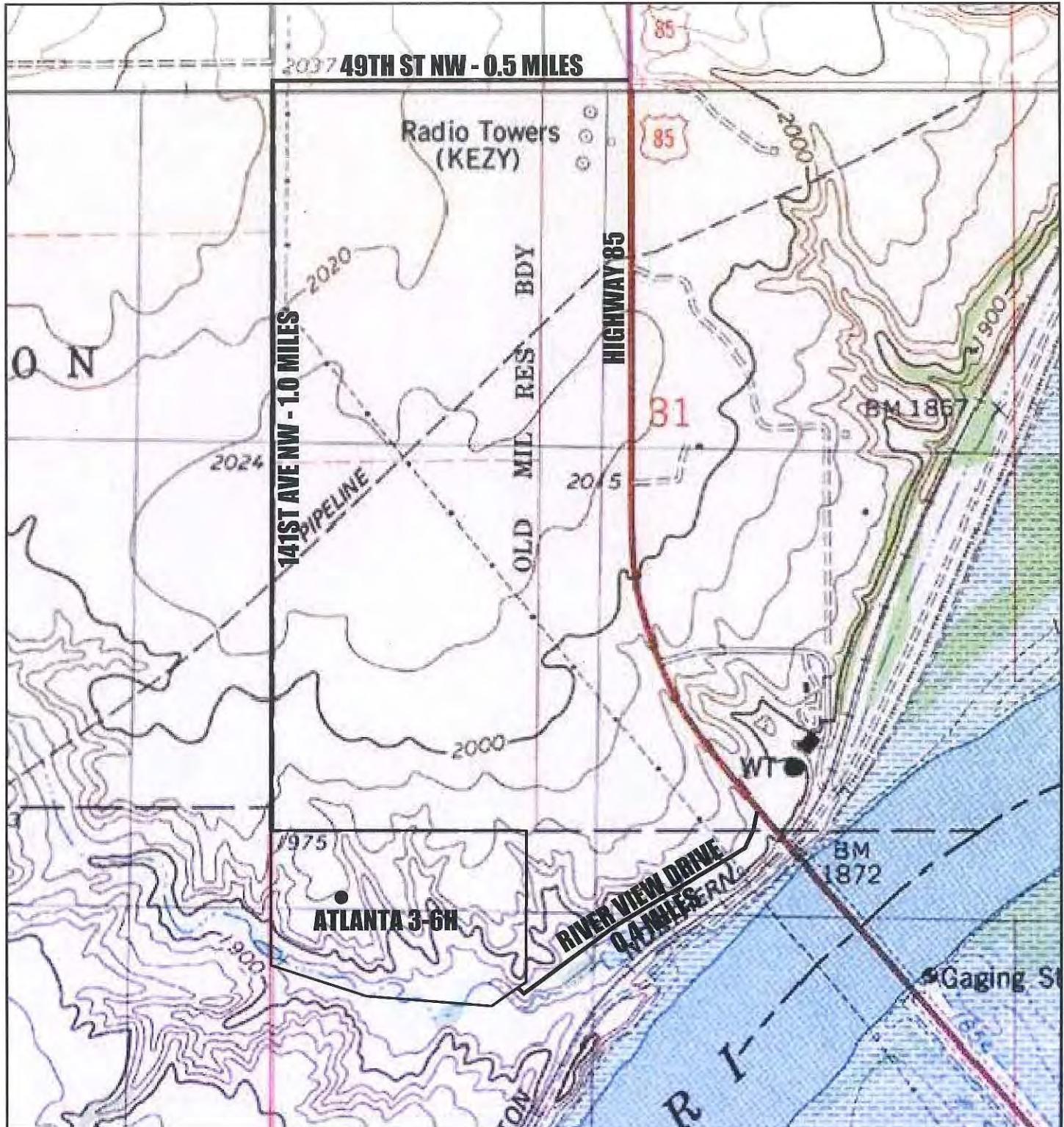
**CONTINENTAL RESOURCES INC.**

---

**EXHIBIT 1**  
**VICINITY MAP**  
**PROPOSED ACCESS ROUTE**

**ATLANTA 3-6H**  
**SECTION 6, T153N, R101W**  
**WILLIAMS COUNTY, NORTH DAKOTA**





CONTINENTAL RESOURCES INC.

EXHIBIT 2  
QUAD ACCESS

ATLANTA 3-6H  
SECTION 6, T153N, R101W  
WILLIAMS COUNTY, NORTH DAKOTA

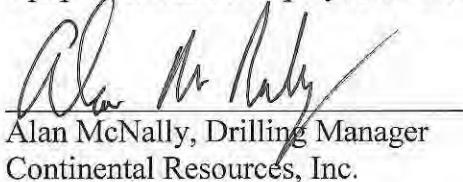
Continental Resources, Inc. (CRI) respectfully submits the following information concerning the drilling of the Atlanta 1 through 14-H, NWNW Sec. 6, T153N, R101W, Williams County, North Dakota.

The Atlanta site is located in an area with neighboring occupied dwellings located within 500 feet of the production equipment and is therefore subject to the provisions of:

NORTH DAKOTA ADMINISTRATIVE CODE § 43-02-03-28.

1. To illustrate more clearly the proximity of the occupied dwellings, the Atlanta Site Production Facility Layout, page 7 of 19 revised 6/29/12 of the plan set has been attached with this affidavit.
2. To comply with the provisions of NORTH DAKOTA ADMINISTRATIVE CODE § 43-02-03-28, waivers from the affected homeowners have been executed and are attached with this affidavit and illustrated on the attached .
  - a. Homeowners affected: Brett and Anita Williamson in Lot 10(SWSWSW-31-154-101).
  - b. Homeowners affected: Matti & Susan Tarnanen in Lot 1, Block 5, Southview Subdivision.
3. Shown on the Atlanta Site Production Facility Layout, page 7 of 19 revised 6/29/12, but not subject to the provisions of NORTH DAKOTA ADMINISTRATIVE CODE § 43-02-03-28 are the homes of:
  - a. Justin E. Grimmer & McKayla M. Johnson in Lots 24-26, Block 3, Southview Subdivision.
  - b. Therresa Christopherson in Lot 4R, Block 1 of the Rearrangement of Lots 3-4, Block 1, Berger First Subdivision.
    - i. Waivers from these homeowners have not been executed.

CRI believes adequate planning and precautions are being taken to limit the impact to the affected homeowners through enhanced drilling and completion techniques such as electric line fed drilling and supplying water pipelined to the site instead of trucking along with visual mitigation via landscaping and privacy fencing to be installed as part of the construction of the site. Fire suppression and other safety equipment will be employed on the site to ensure the safety of these homeowners and their property.



\_\_\_\_\_  
Alan McNally, Drilling Manager  
Continental Resources, Inc.

STATE OF OKLAHOMA )  
                          )ss:  
COUNTY OF GARFIELD )

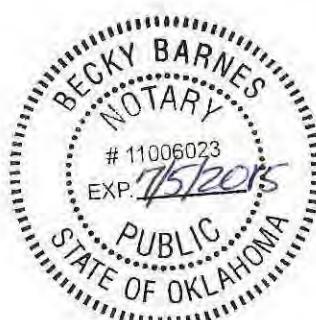
On the 29th day of June 2012, before me, a Notary Public in and for said County and State, personally appeared Alan McNally, known to me to be the Drilling Manager of Continental Resources, Inc., the Corporation that executed the within instrument, and acknowledged to me that such Corporation executed the same.

Becky Barnes  
Notary Public

Garfield County, Oklahoma

My Commission Expires: 7/5/2015

Commission No.: 11006023



**AFFIDAVIT WAIVING PROVISIONS OF  
NORTH DAKOTA ADMINISTRATIVE CODE § 43-02-03-28**

STATE OF NORTH DAKOTA                      )  
  )ss:  
COUNTY OF WILLIAMS                         )

Brett M. Williamson and Anita J. Williamson, being duly sworn deposes and states as follows:

1. That we are the owners of two houses located on a parcel of land in SW $\frac{1}{4}$ SW $\frac{1}{4}$ SW $\frac{1}{4}$  (Lot 10) MFD in Document #720523 containing 5.0 acres more or less in TWN 154 RNG 101 SEC 31 of the Williston Township.
2. That we are aware of the proposed location for Continental Resources, Inc.'s Atlanta multi well pad, which is less than 500 feet from the location of our houses which are located on the above parcel of land.
3. That Section 43-02-03-28 of the North Dakota Administrative Code provided in pertinent part "no well shall be drilled nor production equipment installed less than five hundred feet [152.40 meters] from an occupied dwelling unless agreed to in writing by the surface owner or authorized by order of the commission."
4. I hereby agree to the location of the Continental Resources, Inc.'s Atlanta multi well pad which is less than 500 feet from our houses. Further, I waive any rights that I might otherwise have to protest or contest such location.

Dated this 22<sup>nd</sup> day of June, 2012.

**Affiant:**

x Brett Williamson  
Brett M. Williamson

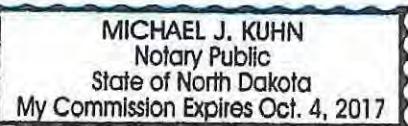
**Affiant:**

x Anita Williamson  
Anita J. Williamson

STATE OF NORTH DAKOTA                      )  
  )ss:  
COUNTY OF WILLIAMS                         )

The foregoing instrument was acknowledged before me this 22<sup>nd</sup> day of June, 2012, by  
Brett M. Williamson and Anita J. Williamson.

Michael J. Kuhn  
Notary Public  
My Commission Expires: OCT 4<sup>th</sup> - 2017



**AFFIDAVIT WAIVING PROVISIONS OF  
NORTH DAKOTA ADMINISTRATIVE CODE § 43-02-03-28**

STATE OF NORTH DAKOTA        )  
    )ss:  
COUNTY OF WILLIAMS        )

Matti K. Tarnanen and Susan V. Tarnanen, being duly sworn deposes and states as follows:

1. That we are the owners of the house located on a parcel of land in Lot 1 Block 5 of Southview Subdivision in TWN 154 RNG 101 SEC 31 of the Williston Township.
2. That we are aware of the proposed location for Continental Resources, Inc.'s Atlanta multi well pad, which is less than 500 feet from the location of our house which is located on the above parcel of land.
3. That Section 43-02-03-28 of the North Dakota Administrative Code provided in pertinent part "no well shall be drilled nor production equipment installed less than five hundred feet [152.40 meters] from an occupied dwelling unless agreed to in writing by the surface owner or authorized by order of the commission."
4. I hereby agree to the location of the Continental Resources, Inc.'s Atlanta multi well pad which is less than 500 feet from our house. Further, I waive any rights that I might otherwise have to protest or contest such location.

Dated this 20<sup>th</sup> day of June, 2012.

Affiant:

x Matti K. Tarnanen  
Matti K. Tarnanen

Affiant:

x Susan V. Tarnanen  
Susan V. Tarnanen

STATE OF NORTH DAKOTA        )  
    )ss:  
COUNTY OF WILLIAMS        )

The foregoing instrument was acknowledged before me this 20<sup>th</sup> day of June, 2012, by  
Matti K. Tarnanen and Susan V. Tarnanen.

  
Notary Public  
My Commission Expires: Jan 31, 2016



July 19, 2012

Industrial Commission of North Dakota  
Oil & Gas Division  
600 East Boulevard, Dept 405  
Bismarck, North Dakota 58505

Continental Resources, Inc. (CRI) respectfully submits the following information concerning the drilling of the Atlanta 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14 -- 6H,

Township 153N, Range 101W of the 5<sup>th</sup> P.M.  
Section 6, N/2 NW/4 Williams County, North Dakota.

Continental Resources Inc. is currently conducting or planning to conduct the following work in the following manner in accordance with NDIC requirements:

- 1) Testing of water well(s)
  - a. The water well on the Atlanta property will be kept operable and has had baseline testing conducted including, hydrocarbon, salinity etc. These results will be kept on record and the well tested from time to time or as requested.
  - b. Currently, the environmental and operations teams are researching other wells in the area to sample.
- 2) CEMENT STABILIZATION:
  - a. Per NDIC requirement, samples will be taken for stabilized areas at pad grade and will be tested for current levels of: pH / EC / CEC / SAR / Soil Permeability.
  - b. These test results will be submitted before cement stabilization work begins and submitted via the appropriate NDIC Form 4 sundry
- 3) The contractor on the project is OE Construction - 16702 West 56<sup>th</sup> Drive Golden, CO 80403
  - a. Cement soil stabilization will be conducted in accordance NDIC requirements and project specifications stated on:  
Plan Page 3, of the construction plan set, section 4. B. Cement Application and Blending:  
Portland cement shall be added to the top 8 inches of the final subgrade at a rate of 5 percent by weight of material or as otherwise indicated in the basis of estimate. The specified manner that allows for uniform distribution of cement over the entire area. The contractor shall supply and use a computer controlled vane feeder to place the cement on the sub-grade prior to mixing. The vane feeder will spread the cement uniformly in the quantity specified. Dumping or blowing cement directly on the ground will not be accepted. The contractor shall apply the cement in a way that minimizes dust and is satisfactory to the Owner.
- 4) RECLAMATION PLAN for the stabilized portion of the drilling pad will be to rip and till the soil adding soil amendments as applicable to reach the original pH, permeability, and other test levels identified above.
- 5) REASON FOR CEMENT STABILIZATION: Cement stabilization will be conducted on this drilling pad to produce the most serviceable and least permeable surface possible so that water that falls on site will sheet directly to the planned site drainage system where it can be disposed of in a controlled fashion.

July 19, 2012

- 6) LINING OF THE SITE: Soil stabilization will be conducted in conjunction with permanently lining with a poly liner, the area around the wellheads, the trenches containing the flow lines from the well heads to the production equipment and the area under the production equipment itself inside the steel containment berms along with the detention pond. Under these systems, a minimum of 1ft. compacted clay liner of native and / or engineered fill material will be placed in 6" lifts maximum and density tested to 95% proctor per specifications provided in the Geotechnical Engineering Analysis for the project dated June 12, 2012 from American Technical Services.
- 7) As the land owner of the property in question, CRI is fully aware and approves of this system. This will also be identified on the sundry form 4 to be provided with the testing data listed above prior to beginning stabilization work.



Chad Newby, Operations Land Coordinator  
Continental Resources, Inc.

STATE OF OKLAHOMA )  
                        )ss:  
COUNTY OF GARFIELD )

On the 19<sup>th</sup> day of July 2012, before me, a Notary Public in and for said County and State, personally appeared Chad Newby, known to me to be the Operations Land Coordinator of Continental Resources, Inc., the Corporation that executed the within instrument, and acknowledged to me that such Corporation executed the same.



Becky Barnes  
Notary Public

Garfield County, Oklahoma

My Commission Expires: 7/5/2015

Commission No.: 11006023



Sincerely,

**CONTINENTAL RESOURCES, INC.**

Becky Barnes  
Regulatory Compliance Specialist

**OILFIELD SAFETY INC  
A Total Safety Company**

**CONTINGENCY PLAN**

This Contingency Plan was written  
Specifically for:

**Continental Resources Inc.  
P.O. Box 1032  
Enid, Oklahoma 73702**

**SAFETY PROGRAM & EMERGENCY EVACUATION PLAN**

**Continental Resources Inc.  
Williams County, North Dakota**

**Oilfield Safety Inc.  
A Total Safety Company  
2523 2<sup>nd</sup> Street West  
Williston, ND 58801**

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THIS PLAN IS SUBJECT TO UPDATING

## **PURPOSE OF PROGRAM**

It is Continental Resources Inc. practice, to provide for the safety of its employees and contractor's employees at the job site, and to provide for the protection of the environment in accordance with applicable laws and regulations.

The primary purpose of this contingency plan is to guide location personnel in the responses expected of them in the event that hydrogen sulfide (H<sub>2</sub>S) is liberated during the drilling program.

Hydrogen Sulfide is extremely hazardous to normal oil field operations due to its capability (1) of destroying life at very low concentrations and (2) of causing instantaneous failure of high strength metals. Drilling and producing operations of hydrocarbons containing toxic gases can, however, be performed safely and without incident when the necessary precautions are taken and the outlined safety procedures are followed. It is imperative that sulfide resistant materials be used, that the proper safety equipment be used, that this equipment be properly maintained, and that all safety regulations be complied with.

The procedures outlined are for your safety and the safety of all others: therefore, it is mandatory that each individual give his one hundred percent cooperation.

## RESPONSIBILITIES AND DUTIES

### ALL PERSONNEL

1. It is the responsibility of all personnel on location to familiarize themselves with the safety procedures.
2. All personnel will attend to their personal safety first.
3. Help anyone who may be injured or overcome by toxic gases. The Drilling Foreman will assign someone to administer first aid to unconscious person (s).
4. Report to the designated "SAFE BRIEFING AREA" and follow the instructions of the Drilling Foreman.

### DRILLING FOREMAN

1. It is the responsibility of the Drilling Foreman to see that these safety and emergency procedures are observed by all personnel on location.
2. The Drilling Foreman will advise Oilfield Safety Inc. whenever the procedures as specified herein are complied with or cannot be followed.
3. The Drilling Foreman will notify the Safety Advisor at least two weeks before the safety equipment specified herein is needed.
4. The Drilling Foreman will keep the number of personnel on location to a minimum during hazardous operations.
5. The Drilling Foreman is responsible for designating the "SAFE BRIEFING AREA". This "SAFE BRIEFING AREA" will change depending upon wind direction and must be redesignated as soon as a wind change occurs.
6. If an unexpected emergency occurs or the H2S alarm sounds, the Drilling Foreman will assess the situation and will advise all personnel what condition exists.
7. When it is necessary to secure the location, the access road to location will be blocked; personnel from the rig crew will be used to guard same.

### **TEMPORARY SERVICE PERSONNEL**

All service personnel such as cementing crews, logging crews, specialists, mechanics, and welders will furnish their own safety equipment as required, to comply with OSHA and the DRILLING FOREMAN for CONTINENTAL RESOURCES INC.

### **VISITORS**

1. VISITORS will be restricted when Hydrogen Sulfide might be unless accompanied by the DRILLING FOREMAN for CONTINENTAL RESOURCES INC.
2. VISITORS and non-essential personnel will be prohibited from remaining in or entering contaminated areas where Hydrogen Sulfide concentration in the atmosphere exceeds 10 ppm.

**NOTE: WHEN HYDROGEN SULFIDE MIGHT BE ENCOUNTERED NO PERSONNEL ON LOCATION WILL BE PERMITTED TO SLEEP IN VEHICLES.**

DIRECTIONS TO: Atlanta 5-6H Federal

From Williston, ND head West on E Broadway toward 2<sup>nd</sup> Ave E; turn left onto Main St; Take the first right onto N Dakota 1804 W/2<sup>nd</sup> St W; continue to follow N Dakota 1804 W for 4.8 miles; Turn left onto US-85 S for 2 miles; Turn right onto 47<sup>th</sup> Ln NW; Turn right onto 48<sup>th</sup> St NW ; Continue onto 141<sup>st</sup> Ave NW and your destination will be ahead.

## THE DRILL SITE

The location as shown in Figure 2 is planned in order to obtain the maximum safety benefits consistent with the rig configuration, well depth, and prevailing winds.

1. Through the use of several maps, the area within a One mile radius of the location has been surveyed and contacts with all permanent residents have been made. Except in a dead calm and a tremendous release of high concentration gases, the probability of lethal dosages beyond one mile is extremely unlikely. Note on the rig layout plat, Figure 2, the direction of prevailing winds.
2. The location of houses, schools, roads, and anything where people may be present and who might need to be warned or evacuated in a crisis have been surveyed. This information with names and telephone numbers are keyed and listed on page 11 and Figure 3 for use if evacuation might be necessary should an emergency develop.
3. The drilling rig, see Figure 2, should be situated at such a location that prevailing winds blow across the rig toward the flare pit.
4. Two (2) SAFETY BRIEFING AREAS will be established not less than 200 feet from the wellhead and in locations so that at least one SAFE BRIEFING AREA will be up-wind of the well at all times.
5. Protective equipment will be stored in strategic locations around the wellsite and each of the SAFE BRIEFING AREAS. Such equipment will include Self Contained Breathing Apparatus (SCBA), First Aid Kits, Stretchers, and Hydrogen Sulfide Hand Operated Detectors. In the event of an emergency, personnel should assemble at the up-wind SAFE BRIEFING AREA for instructions from their supervisor.
6. Windsocks or streamers will be utilized to give wind directions at several elevations; i.e., tree top, derrick floor level, and 6 to 8 feet above ground level. PERSONNEL SHOULD DEVELOP THE PRACTICE OF ROUTINE OBSERVATION OF WIND DIRECTION.
7. Windbreakers and rig curtains can be removed from around the derrick floor and monkey board, if hazardous amounts of H<sub>2</sub>S encountered.
8. Explosion proof ventilating fans if required will be positioned to ensure adequate circulation at the derrick floor, cellar area and any other location where hydrogen sulfide is accumulating in excess of 10 PPM.
9. A kill line of ample strength and securely staked should be laid to the well head from a safe location to permit pumping into the well in an emergency.
10. When approaching a depth where Hydrogen Sulfide may be encountered, the MUD SHOULD BE MAINTAINED IN AN OVER BALANCED CONDITION TO restrict the Hydrogen Sulfide to be treated to that contained in the formation drilled.
11. When approaching a depth where Hydrogen Sulfide may be encountered, appropriate operational danger or caution sign(s) shall be displayed along all controlled accesses to the site.

12. When available 24-hour radio or telephone communication will be provided at the rig. Emergency telephone numbers will be prominently posted: SHERIFF'S DEPARTMENT, AMBULANCE, HOSPITALS, DOCTORS, AND OPERATORS' SUPERVISORY PERSONNEL.

13. Filter-type gas masks are not suitable for protection from Hydrogen Sulfide on drilling rigs. Pressure demand, SCBA'S will be provided for use in any Hydrogen Sulfide concentration. They are not physically exhausting to use, are rugged and dependable, and require little maintenance.

14. SCBA'S will be stored on racks and protected from the weather. Rig crew equipment will be located at readily accessible location on the rig floor. For hygienic reasons, SCBA'S are to be cleaned and sterilized at regular intervals. A six outlet air supply manifold will be installed on the rig floor for continuous use by crews and supervisory personnel working in a "Mask On" situation. The multi-bottle supply cylinders are to be located approximately 200 feet from the well. A minimum of 3,600 cu. ft. compressed breathing air will be on location at all times.

15. An alarm system which can be heard during operations and which can be activated from several points if gas is detected will be installed. When the alarm is sounded, personnel must assemble at the BRIEFING AREA designated SAFE. However, your company may have steps different from these, so pay heed to the requirements on your rig.

16. There will be No Smoking on rig floor or near wellhead. Designated Smoking Areas will be provided by your Supervisor.

17. Safety meetings and training sessions will be held at frequent intervals by the Safety Advisor, the Drilling Supervisor, or the Rig Supervisor. All persons required to work on location will be thoroughly familiar with the use, care and servicing of the following: Personal protective equipment such as respirators, and gas detection equipment.

18. All electric lighting, wiring and electrical devices within 100 feet of the well will be put in vapor-proof condition to minimize the possibility of explosion.

19. Blowout preventers should meet or exceed the recommendations for hydrogen sulfide service (API RP 53). Choke manifolds will be of similar materials.

20. Inspection of installation, operation, and testing of blowout preventers, choke manifolds, etc., dressed for Hydrogen Sulfide services, will be conducted regularly.

21. Every person involved in the operation will be informed of the characteristics of Hydrogen Sulfide and its dangers, safe procedures to use when it is encountered, and recommended first aid procedures. This will be done through frequent safety talks and training sessions.

NAMES AND DUTIES OF PERSONS WITH PRIME RESPONSIBILITIES

A. Continental Resources Inc.  
P.O. Box 1032  
Enid, Oklahoma 73702

B. OILFIELD SAFETY INC.  
2523 2nd Street West  
Williston, ND 58802

Terrie Turbiville  
District Manager  
Office: 701-774-3014  
Cell: 701-580-2912

EMERGENCY NOTIFICATION

LOCAL OFFICIALS AND MEDICAL

WILLISTON, NORTH DAKOTA

AMBULANCE .....	911
FIRE .....	911
NON-EMERGENCY .....	701-627-3903
POLICE .....	911
THREE AFFILIATED TRIBES .....	701-627-3244
MOUNTRAIL COUNTY SHERIF.....	701-628-2975
MOUNTRAIL COUNTY SHERIFF DISPATCH .....	911

WILLIAMS COUNTY

WATFORD CITY, NORTH DAKOTA

AMBULANCE .....	911
FIRE .....	911
POLICE .....	911 OR 701-842-2400
McKenzie COUNTY SHERIFF DISPATCH .....	911

McKenzie COUNTY

BUREAU OF LAND MANAGEMENT

OFFICE REPRESENTATIVE .....	701-225-9148
-----------------------------	--------------

DICKINSON, ND

NORTH DAKOTA HIGHWAY EMERGENCY ASSISTANCE 1-800-472-2121

#### PHYSICAL AND CHEMICAL PROPERTIES

1. Extremely toxic (almost as toxic as Hydrogen Cyanide and 5 to 6 times toxic as Carbon Monoxide).
2. Colorless.
3. Offensive odor, often described as that of rotten eggs.
4. Heavier than air - specific gravity 1.189 (Air = 1.000 @ 60° F.). Vapors may travel considerable distance to a source of ignition and flash back.
5. Forms an explosive mixture with a concentration between 4.3 and 46 percent by volume with auto-ignition occurring at 500° F.
6. Burns with a blue flame and produces Sulfur Dioxide (SO<sub>2</sub>), which is less toxic than Hydrogen Sulfide but very irritating to eyes and lungs and causes serious injury.
7. Soluble in both water and liquid hydrocarbons.
8. Produces irritation to eyes, throat and respiratory system.
9. Threshold Limit Valve (TLV) - Maximum of eight hours exposure.
10. Corrosive to all electrochemical series metals.
11. Boiling Point (-79° F).
12. Melting Point (-177° F).

### PHYSICAL EFFECTS OF HYDROGEN SULFIDE POISONING

THE PRINCIPAL HAZARD IS DEATH BY INHALATION. When the amount of gas absorbed into the blood stream exceeds that which is readily oxidized, systemic poisoning results, with a general action on the nervous system. Labored respiration occurs shortly, and respiratory paralysis may follow immediately at concentrations of 700 ppm and above. This condition may be reached almost without warning as the originally detected odor of Hydrogen Sulfide may have disappeared due to olfactory paralysis. Death then occurs from asphyxiation unless the exposed person is removed immediately to fresh air and breathing stimulated by artificial respiration. Other levels of exposure may cause the following symptoms individually or in combinations:

- a. Headache
- b. Dizziness
- c. Excitement
- d. Nausea or gastro-intestinal disturbances
- e. Dryness and sensation of pain in nose, throat and chest
- f. Coughing
- g. Drowsiness

All personnel should be alerted to the fact that detection of Hydrogen Sulfide solely by smell is highly dangerous as the sense of smell is rapidly paralyzed by the gas.

### H2S TOXICITY TABLE

1 ppm	=	.0001% (1/10,000 of 1%)	Can smell
10 ppm	=	.001% (1/1000 of 1%)	Allowable for 8 hours' exposure. OVER THE ALLOWABLE CONCENTRATION, PROTECTIVE EQUIPMENT WILL BE NECESSARY.
100 ppm	=	.01% (1/100 of 1%)	Kills smell in 3 to 15 minutes. May burn eyes and throat.
200 ppm	=	.02% (2/100 of 1%)	Kills smell rapidly. Burns eyes and throat.
500 ppm	=	.05% (5/100 of 1%)	Loses sense of reasoning and balance. Respiratory disturbances in 2 to 15 minutes. Needs prompt artificial resuscitation.
700 ppm	=	.07% (7/100 of 1%)	Will become unconscious quickly. Breathing will stop and death result if not rescued promptly. Immediate artificial resuscitation.
1,000 ppm	=	.10% (1/10 of 1%)	Unconscious at once. PERMANENT BRAIN DAMAGE MAY RESULT UNLESS RESCUED PROMPTLY.

Ppm= Parts of gas per million parts of air by volume.

1%= 10,000 ppm

## RESUSCITATION CHART

### DID YOU KNOW?

THERE IS NO TIME TO WASTE  
WHEN BREATHING STOPS!

ARTIFICIAL RESUSCITATION MUST BE STARTED IMMEDIATELY!!!

After Breathing is stopped for:

1 Minute  
2 Minutes  
3 Minutes  
4 Minutes  
5 Minutes  
6 Minutes  
7 Minutes  
8 Minutes  
9 Minutes  
10 Minutes  
11 Minutes  
12 Minutes

The Chances for Life are:

98 out of 100  
92 out of 100  
72 out of 100  
50 out of 100  
25 out of 100 \*  
11 out of 100 \*  
8 out of 100 \*  
5 out of 100 \*  
2 out of 100 \*  
1 out of 100 \*  
1 out of 1,000 \*  
1 out of 10,000 \*

\* Irreparable brain damage starts at about the fifth minute.

**COOL-HEADED ACTION IN RESCUE IS CRITICAL.**

## TREATMENT FOR HYDROGEN SULFIDE POISONING

### INHALATION

As Hydrogen Sulfide in the blood oxidizes rapidly, symptoms of acute poisoning pass off when inhalation of the gas ceases. It is important, therefore, to get the victim of poisoning to fresh air as quickly as possible. He should be kept at rest and chilling should be prevented. If respiration is slow, labored, or impaired, artificial respiration may be necessary. Most persons overcome by Hydrogen Sulfide may be revived if artificial respiration is applied before the heart action ceases. Victims of poisoning should be under the care of a physician as soon as possible. Irritation due to sub-acute poisoning may lead to serious complications such as pneumonia. Under those conditions, treatment by the physician necessarily would be symptomatic. The patient should be kept in fresh air, and hygienic conditions should be watched carefully.

### CONTACT WITH EYES

Eye contact with liquid and/or gas containing Hydrogen Sulfide will cause painful irritation (conjunctivitis). Keep patient in a darkened room, apply ice compresses to eyes, put ice on forehead, and send for a physician. Eye irritation caused by exposure to Hydrogen Sulfide requires treatment by a physician, preferably an eye specialist. The progress to recovery in these cases is usually good.

### CONTACT WITH SKIN

Skin absorption is very low. Skin discoloration is possible after contact with liquids containing Hydrogen Sulfide. If such skin contact is suspected, the area should be thoroughly washed.

## EFFECTS OF HYDROGEN SULFIDE ON METAL

Hydrogen Sulfide dissolves in water to form a weak acid that can cause some pitting, particularly in the presence of oxygen and/or carbon dioxide. However, the most significant action of H<sub>2</sub>S is its contribution to a form of hydrogen embrittlement known as sulfide stress cracking. Sulfide stress cracking is a result of metals being subjected to high stress levels in a corrosive environment where H<sub>2</sub>S is present. The metal will often fail catastrophically in a brittle manner. Sulfide stress cracking of steel is dependent upon and determined by:

- a. Strength (hardness) of the steel - the higher the strength, the greater the susceptibility to sulfide stress cracking. Steels having yield strengths up to 95,000 psi and hardness up to Rc22 are generally resistant to sulfide stress cracking. These limitations can be extended slightly higher for properly quenched and tempered materials.
- b. Total member stress (load) - the higher the stress level (load) the greater the susceptibility to sulfide stress cracking.
- c. Corrosive environment - corrosive reactions, acids, bacterial action, thermal degradation, or low PH fluid environment.

Use as protection against sulfide stresses cracking, all casing, BOP and safety equipment should be of H<sub>2</sub>S resistant material.

### CASING GRADES ACCEPTABLE FOR H2S SERVICE

CASING GRADE	H2S SERVICE	COMMENTS **	
H-40	YES		
K-55	YES		
C-75	YES		
N-80	CONDITIONAL	ABOVE	200° F
L-80	YES		
MN-80	YES		
C-90	YES		
C-95	YES		
S-95	NO	ABOVE	200° F
SOO-95	NO	ABOVE	200° F
S-105	NO	ABOVE	200° F
SOO-90	YES	ABOVE	200° F
P-110	NO	ABOVE	200° F
S-135	NO	ABOVE	200° F
V-150	NO	ABOVE	200° F

\* Service conditions for any H2S environment.

\*\* Denotes usable grades above 200° F.

### DRILL PIPE GRADES FOR H2S SERVICE

<u>GRADE</u>	<u>H2S SERVICE</u>
D	YES
E	YES
X-95	YES
G-105	NO
S-135	YES
ALUMINUM	YES

### DRILL STEM TEST

1. Drill Stem testing shall be done during daylight hours whenever practical. If it is necessary to work under artificial light, levels shall be sufficient to allow employees to conduct the test safely.
2. Ammine Corrosion Inhibitor should be used to coat inside of drill pipe prior to conducting Drill Stem Test in order to prevent Sulfide Stress Cracking.
3. If warranted, the use of Ammonia Hydroxide (26 Degree B'eaume Aqua Ammonia) for neutralizing Hydrogen Sulfide from tubing or drill pipe can be used.

## H2S SAFETY EQUIPMENT ON LOCATION

(PROVIDED BY SAFETY CONTRACTOR)

1. One safety trailer with a cascade system of cylinders of compressed GRADE D breathing air, complete with high pressure regulator.
2. Low pressure breathing air line (approximately 1,000 feet depending on the location). Equipped with quick connects.
3. Two low pressure manifold systems.
4. Eight pressure-demand type breathing apparatus (SCBA) 30 minute duration, NIOSH, and MSHA approved.
5. Eight airline breathing apparatus c/w 7 cu. ft. egress cylinders.
6. One four (4) channel fixed electronic monitoring system with sensors and alarms (explosion proof light and siren).
7. One hand operated portable pump type (with low and high range H2S detector tubes).
8. One first aid kit.
9. One stretcher (Ferro folding).
10. Three luminous wind socks with frames and extension poles. Windsocks must be placed so that they are visible by day and by night from all points on location.
11. One Flare Piston with 12 gauge meteor flares for igniting well.
12. One operating condition sign with flags at well entrance.  
Condition I - Normal Operating Conditions (green flag);  
Condition II - Potential to Moderate Danger to Life (yellow flag);  
Condition III - Moderate to Extreme Danger to Life (red flag).
13. One fire blanket.
14. One warning light.
15. One warning siren.

**H2S SAFETY EQUIPMENT ON LOCATION**

(PROVIDED BY THE SAFETY CONTRACTOR)

16. Two traffic cones.
17. Two compressed breathing air cylinders for briefing area number 2.
18. Briefing area stand
19. Briefing area number 2 sign.

NOTE: ADDITIONAL EQUIPMENT WILL BE ADDED IF WELL CONDITIONS REQUIRE OR UPON REQUEST

NOTE: Equipment for a maximum of sixteen (16) people on location.

Equipment will be rigged up and operational when drilling reaches a depth of 500 ft. above, or three days, whichever is sooner, prior to penetrating the first zone containing or reasonably expected to contain H2S.

## IGNITING THE WELL

### RESPONSIBILITY

THE DECISION TO IGNITE THE WELL IS THE RESPONSIBILITY OF THE DRILLING FOREMAN. In the event he is incapacitated, it becomes the responsibility of the Rig Tool Pusher. This decision should be made only as a last resort and in a situation where it is clear that:

1. Human life and property are endangered.
2. No hope exists for controlling the blowout under prevailing conditions at the well.

Notify the Oilfield Safety Inc. office, if time permits, but do not delay if human life is in danger. Initiate first phase of evacuation plan.

### INSTRUCTIONS FOR IGNITING THE WELL

1. Two people are required for the actual igniting operation. They must wear self-contained breathing units and have a safety rope attached. One man will check the atmosphere for explosive gases with the Explosimeter. The other man is responsible for igniting the well.
2. Primary method to ignite: Meteor-type Flare Gun.
3. Ignite upwind and do not approach any closer than is warranted.
4. Select the ignition site which is best for protection.
5. Select area for hasty retreat.
6. BEFORE FIRING, check regarding combustible gases.
7. Since Hydrogen Sulfide converts to Sulfur Dioxide, the area is not safe after igniting the well.
8. After igniting, continue emergency action and procedure as before.
9. All unassigned personnel will limit their actions to only those directed by the Drilling Foreman.

REMEMBER: AFTER WELL IS IGNITED, BURNING HYDROGEN SULFIDE WILL CONVERT TO SULFUR DIOXIDE, WHICH IS ALSO HIGHLY TOXIC. DO NOT ASSUME THE AREA IS SAFE AFTER THE WELL IS IGNITED.

### **BLOWOUT PREVENTION EQUIPMENT**

1. A kill line of ample strength and length should be laid to a safe point to allow pumping into the well in an emergency situation.
2. The closing unit should be located a safe distance from the wellbore and positioned for maximum utilization based on the prevailing wind direction.
3. BOP equipment will be tested in accordance with standard company practice.
4. All equipment should be H2S trimmed for service in sour gas environments.
5. All drill pipe and casing will be of a grade acceptable for H2S service.

#### SPECIAL EQUIPMENT

1. If a MUD-GAS SEPARATOR is installed, it will be installed with one or more flare lines.
2. Flare lines should be as long as practical and securely staked.
3. Flare Systems must be equipped with a safe and suitable means of ignition. The ignition system must either be electrically or gas operated. Buckets of diesel fuel and torches are no longer acceptable.
4. An automatic Hydrogen Sulfide monitor will be installed with a combination visual and audible alarm system located where it can be seen and/or heard throughout the drilling location. This system will have the capabilities of being activated from several points, which are the rig floor, cellar, and shale shaker.
5. The automatic monitor should be set to trigger the drilling location visual/audible alarms when the Hydrogen Sulfide concentration in the atmosphere reaches 10 ppm. Explosion proof lights and sirens will be provided at or near the rig floor and such that all personnel will be subject to visual and audible warnings.

## MUD ADDITIVES

### DRILLING FLUID RECOMMENDATION

#### MUD TYPE

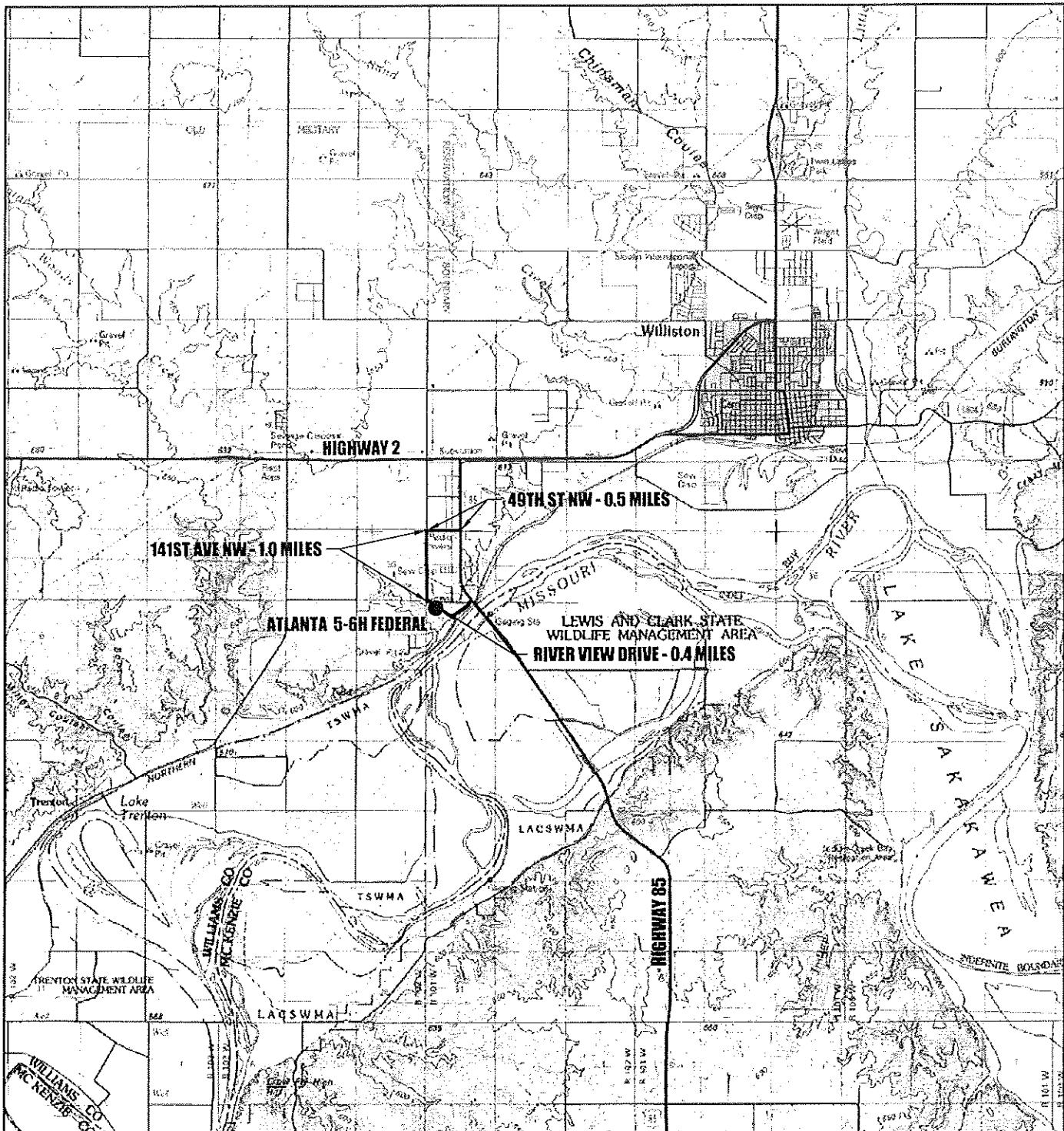
An overbalanced mud should be used to drill potential pay zone with necessary additives for all stabilization.

In the event of H<sub>2</sub>S contamination of the mud system, Hydrogen Sulfide scavengers should be added to the mud.

## **EMERGENCY DRILLS**

### **Hydrogen Sulfide Alarm Drills**

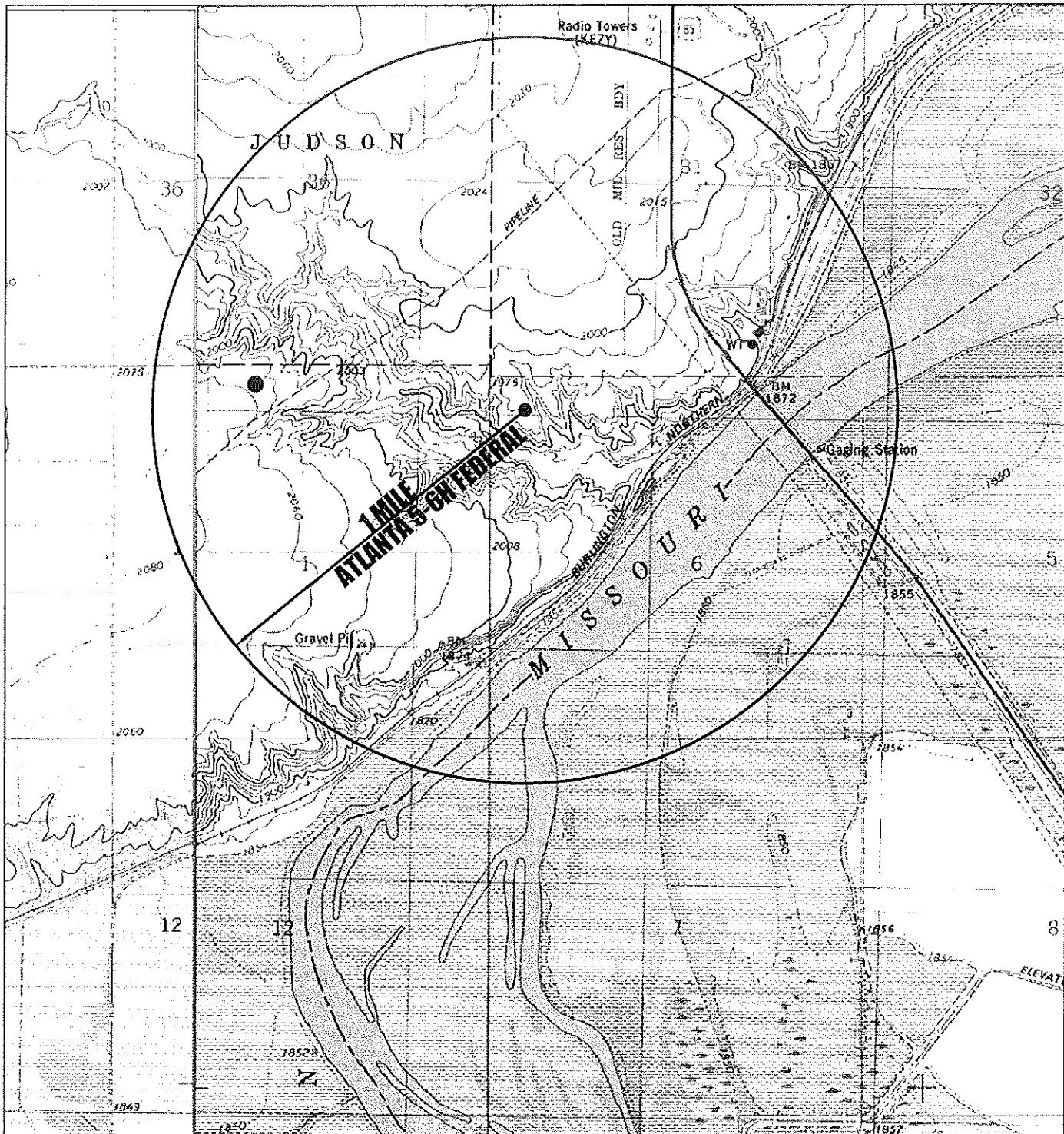
The Safety Advisor will conduct frequent H2S emergency drills for each crew by manually activating the H2S detector. When the lights flash, all personnel on location will assemble at the Upwind Briefing Area. A head count will be taken at this time to determine if rescue operations are indicated. The Safety Advisor must be notified if more personnel are on location than during normal operations. A "Masks On" policy will prevail until the all clear is sounded. These drills will be implemented as frequently as required to familiarize all personnel with the procedures to be followed in the event an actual emergency occurs.



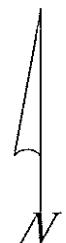
CONTINENTAL RESOURCES INC.

**EXHIBIT 1**  
**VICINITY MAP**  
**PROPOSED ACCESS ROUTE**

ATLANTA 5-6H FEDERAL  
SECTION 6, T153N, R101W  
WILLIAMS COUNTY, NORTH DAKOTA



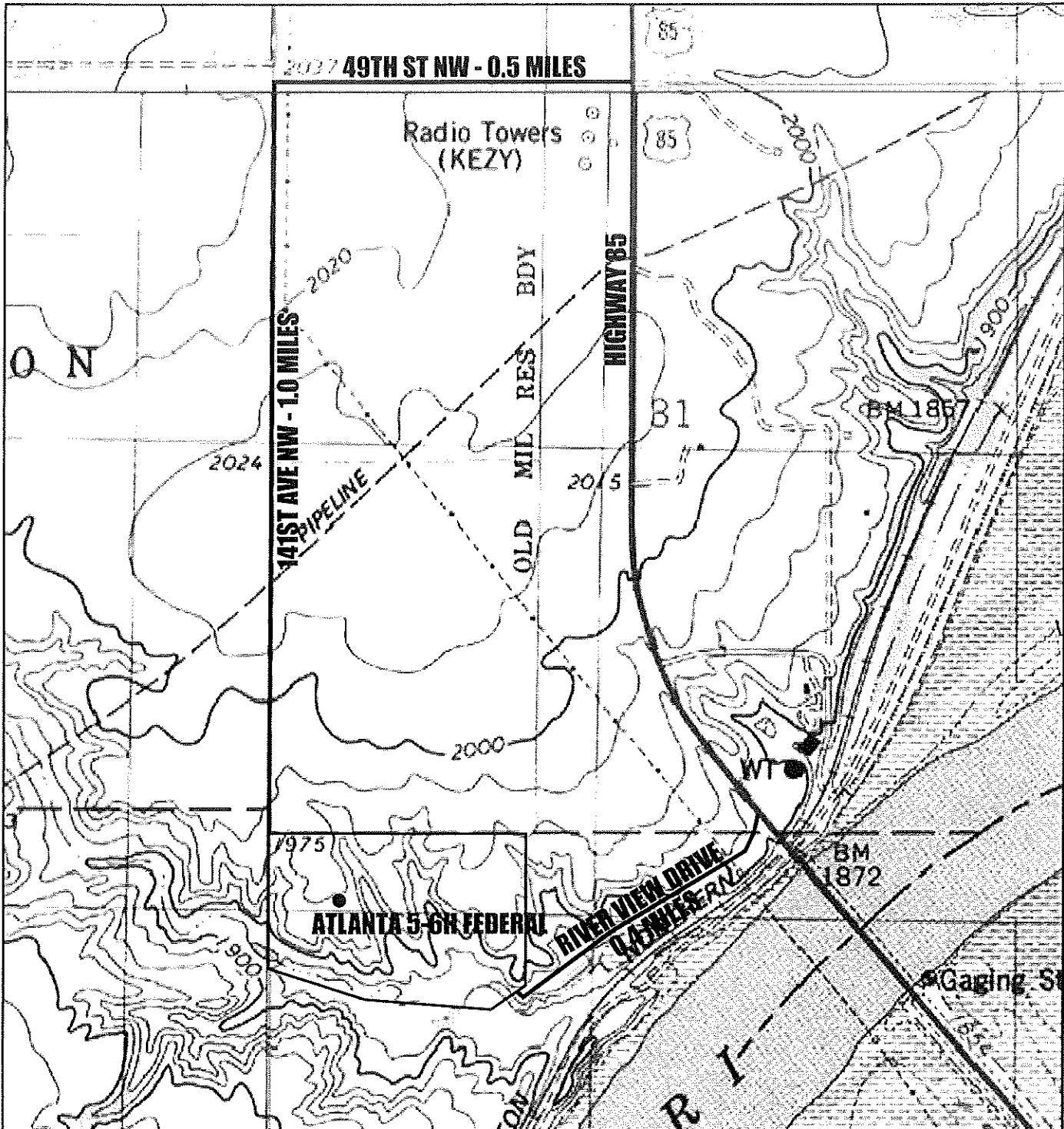
● = OIL WELL



**CONTINENTAL RESOURCES INC.**

**EXHIBIT 3  
ONE-MILE RADIUS MAP**

ATLANTA 5-6H FEDERAL  
SECTION 6, T153N, R101W  
WILLIAMS COUNTY, NORTH DAKOTA



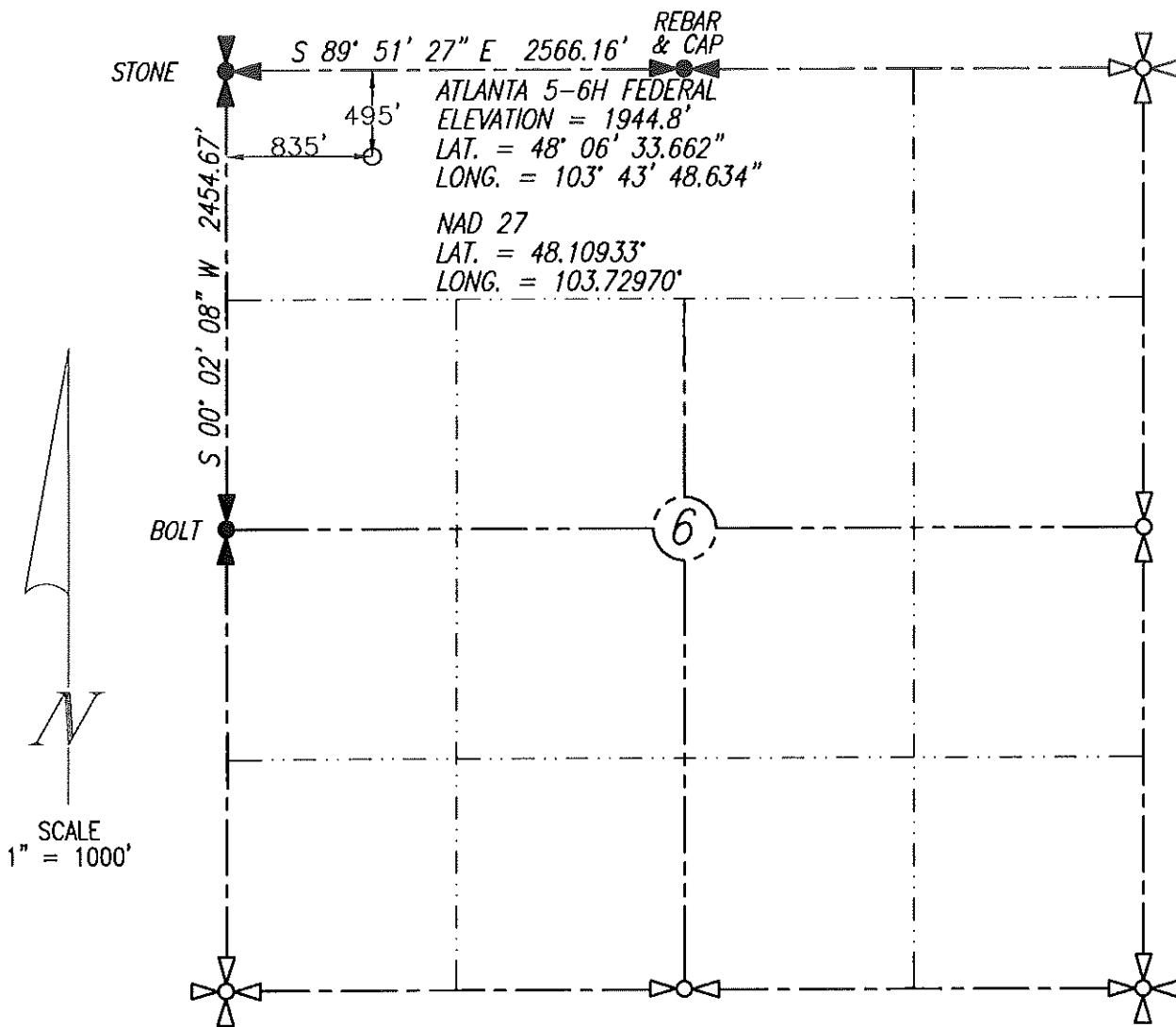
CONTINENTAL RESOURCES INC.

EXHIBIT 2  
QUAD ACCESS

ATLANTA 5-6H FEDERAL  
SECTION 6, T153N, R101W  
WILLIAMS COUNTY, NORTH DAKOTA

REVISED: 4-23-2012

WELL LOCATION PLAT  
CONTINENTAL RESOURCES INC.  
ATLANTA 5-6H FEDERAL  
SECTION 6, T153N, R101W  
WILLIAMS COUNTY, NORTH DAKOTA  
495' FNL & 835' FWL



I CERTIFY THAT THIS PLAT CORRECTLY REPRESENTS  
WORK PERFORMED BY ME OR UNDER MY RESPONSIBLE  
CHARGE, AND IS TRUE AND CORRECT TO THE BEST OF  
MY KNOWLEDGE AND BELIEF

John J. Newby  
4-23-12



DATE STAKED: 2-9-2012

BASIS OF VERTICAL DATUM:  
NAVD 1988 GEOD 09

PERSON AUTHORIZING SURVEY;  
CHAD NEWBY

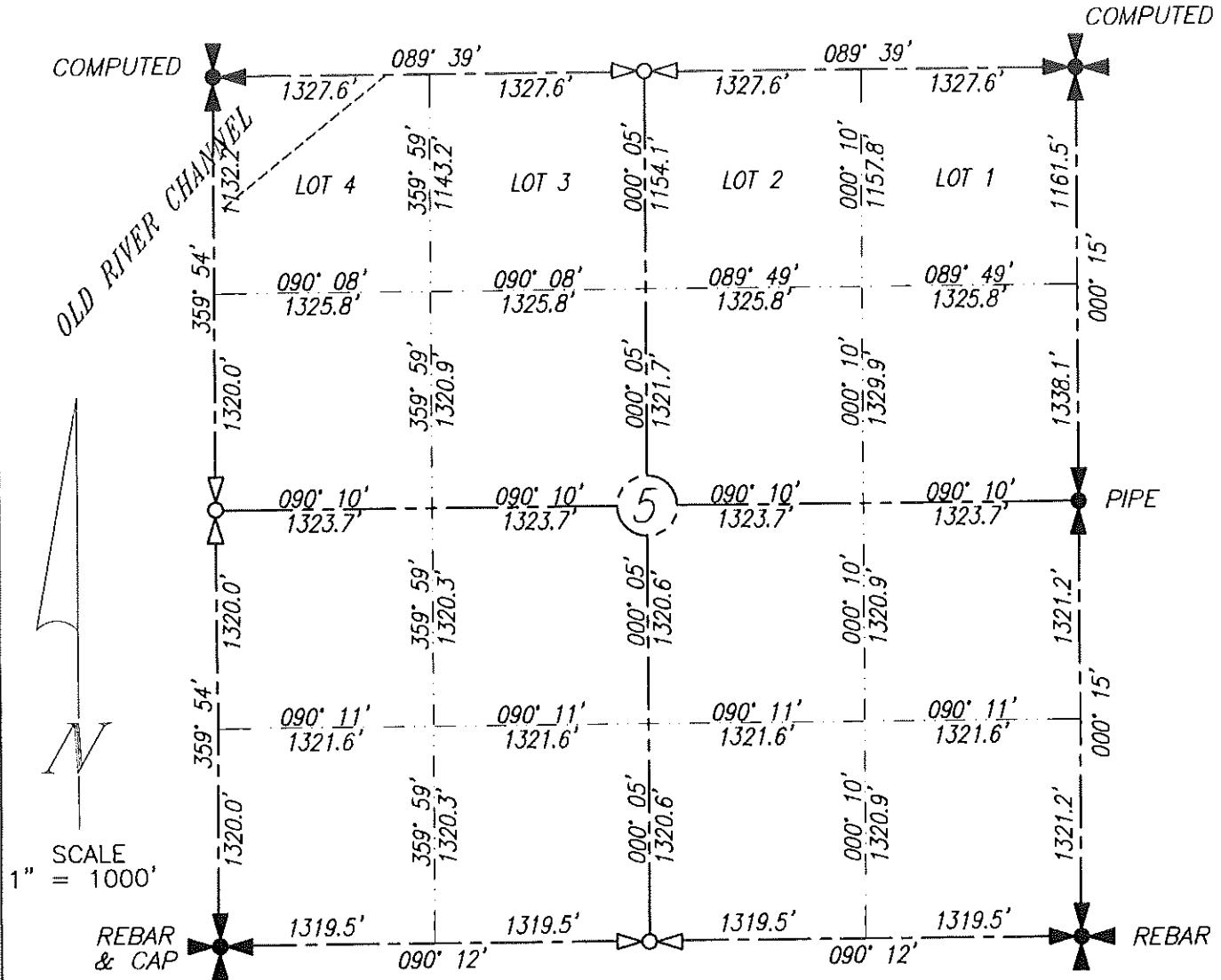
EXPLANATION AREA: NAD83(CORS96)

BASIS OF BEARING: TRUE NORTH

**BROSZ ENGINEERING INC.**

BOX 357  
BOWMAN, N.D. 58623  
PHONE: 701-523-3340  
FAX: 701-523-5243  
PROJECT NO. 12-10

HORIZONTAL SECTION PLAT  
CONTINENTAL RESOURCES INC.  
ATLANTA 5-6H FEDERAL  
SECTION 5, T153N, R101W  
WILLIAMS COUNTY, NORTH DAKOTA  
CKENZIE COUNTY, NORTH DAKOTA



ALL CORNERS SHOWN ON THIS PLAT WERE FOUND IN THE FIELD  
DISTANCES TO ALL OTHERS ARE CALCULATED.  
ALL BEARINGS SHOWN ARE ASSUMED.

I CERTIFY THAT THIS PLAN CORRECTLY REPRESENTS  
WORK PERFORMED BY ME OR UNDER MY RESPONSIBLE  
CHARGE, AND IS STATED AND CORRECT TO THE BEST OF  
MY KNOWLEDGE AND BELIEF  
A. SURVEYOR

*Ruths* SURVEYOR  
R.S. 3366

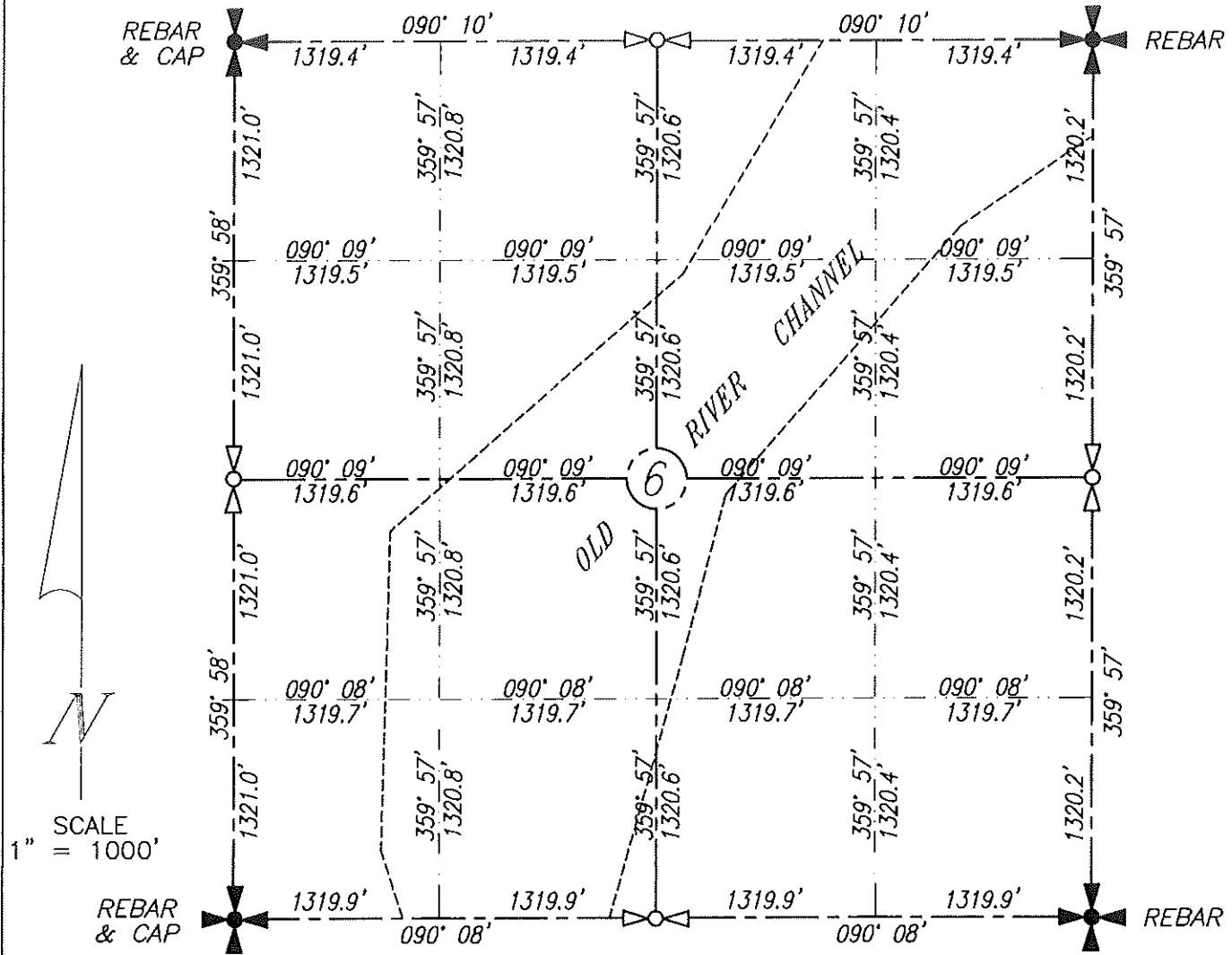
4-9-12

BROSZ ENGINEERING INC.

BOX 357  
BOWMAN, N.D. 58623  
PHONE: 701-523-3340  
FAX: 701-523-5243

PROJECT NO. 12-10

HORIZONTAL SECTION PLAT  
CONTINENTAL RESOURCES INC.  
ATLANTA 5-6H FEDERAL  
SECTION 6, T153N, R101W  
WILLIAMS COUNTY, NORTH DAKOTA  
MCKENZIE COUNTY, NORTH DAKOTA



*MOST OF THE SECTION IS LOTTED DUE TO THE MISSOURI RIVER.*

ALL CORNERS SHOWN ON THIS PLAT WERE FOUND IN THE FIELD  
DISTANCES TO ALL OTHERS ARE CALCULATED.

ALL BEARINGS SHOWN ARE ASSUMED.

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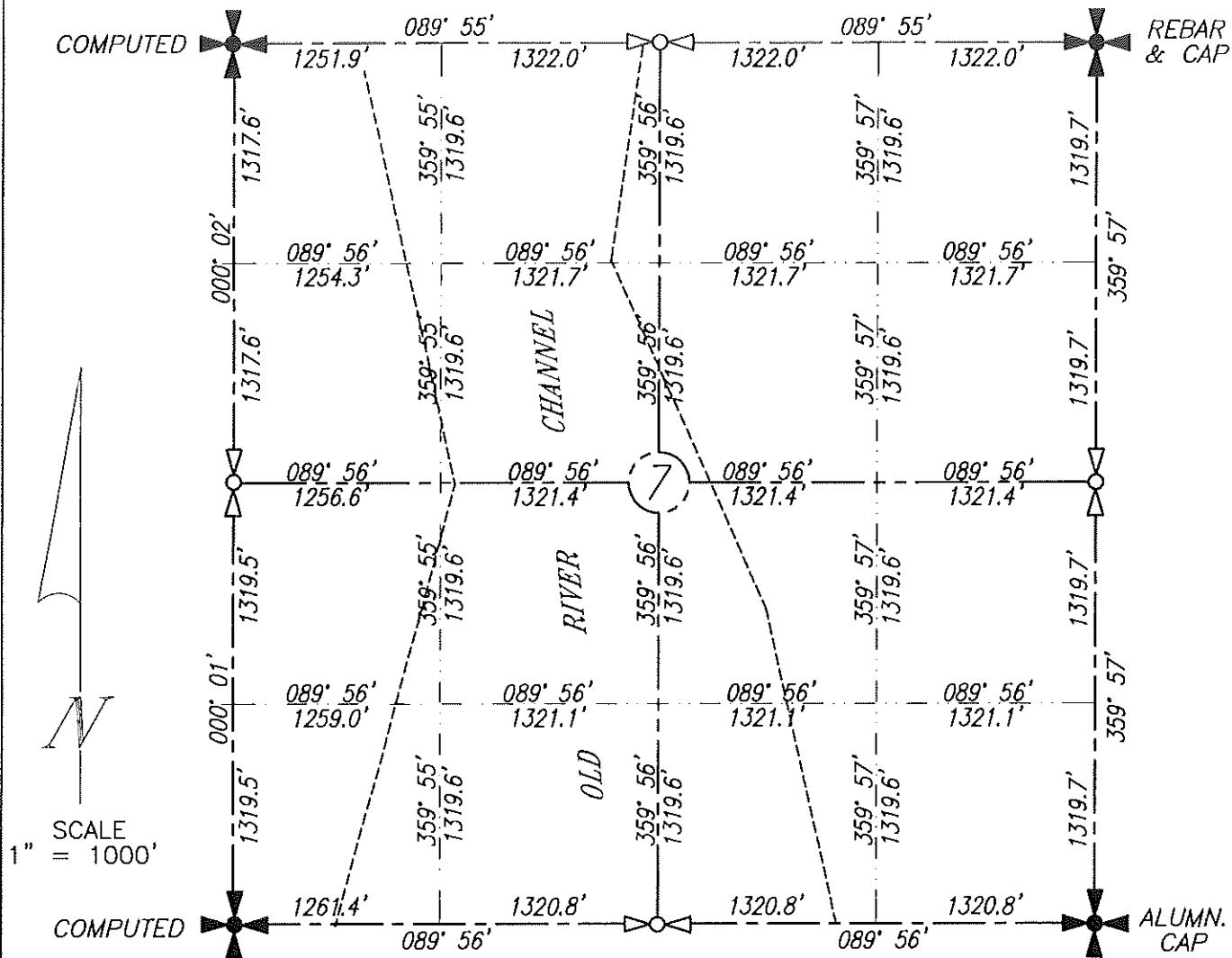
JOHN PAULSON R.L.S. 3366

4-9-12

BROSZ ENGINEERING INC.

BOX 357  
BOWMAN, N.D. 58623  
PHONE: 701-523-3340  
FAX: 701-523-5243  
PROJECT NO. 12-10

HORIZONTAL SECTION PLAT  
CONTINENTAL RESOURCES INC.  
ATLANTA 5-6H FEDERAL  
SECTION 7, T153N, R101W  
MCKENZIE COUNTY, NORTH DAKOTA



MOST OF THE SECTION IS LOTTED DUE TO THE MISSOURI RIVER.

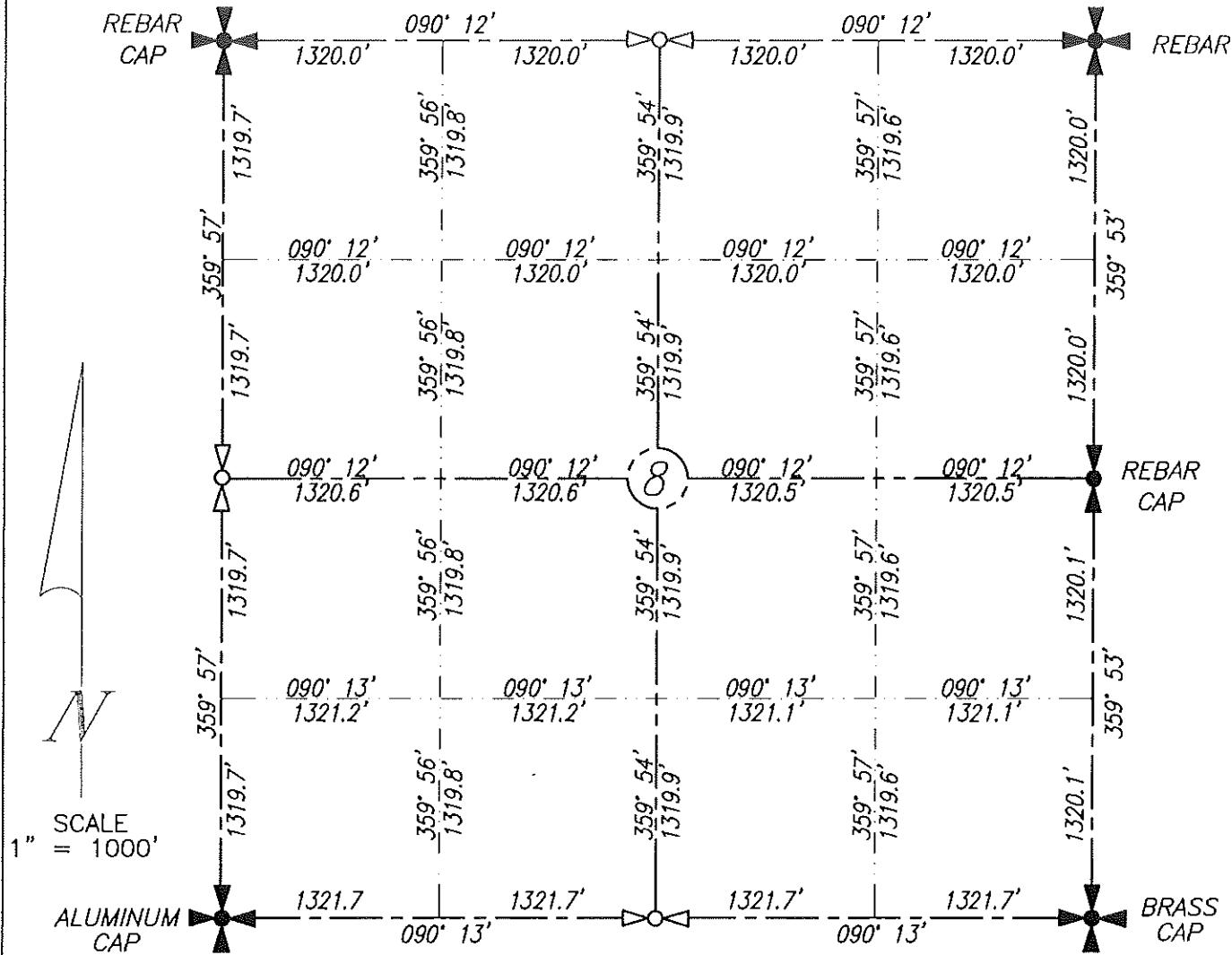
JOHN PAULSON R.L.S. 3366  
REGISTERED  
I CERTIFY THAT THIS PLAT CORRECTLY REPRESENTS  
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AND DISTANCES TO ALL OTHERS ARE CALCULATED.  
BEARINGS SHOWN ARE ASSUMED.

4-9-12

JOHN PAULSON R.L.S. 3366

BROSZ ENGINEERING INC.  
BOX 357  
BOWMAN, N.D. 58623  
PHONE: 701-523-3340  
FAX: 701-523-5243  
PROJECT NO. 12-10

HORIZONTAL SECTION PLAT  
CONTINENTAL RESOURCES INC.  
ATLANTA 5-6H FEDERAL  
SECTION 8, T153N, R101W  
MCKENZIE COUNTY, NORTH DAKOTA



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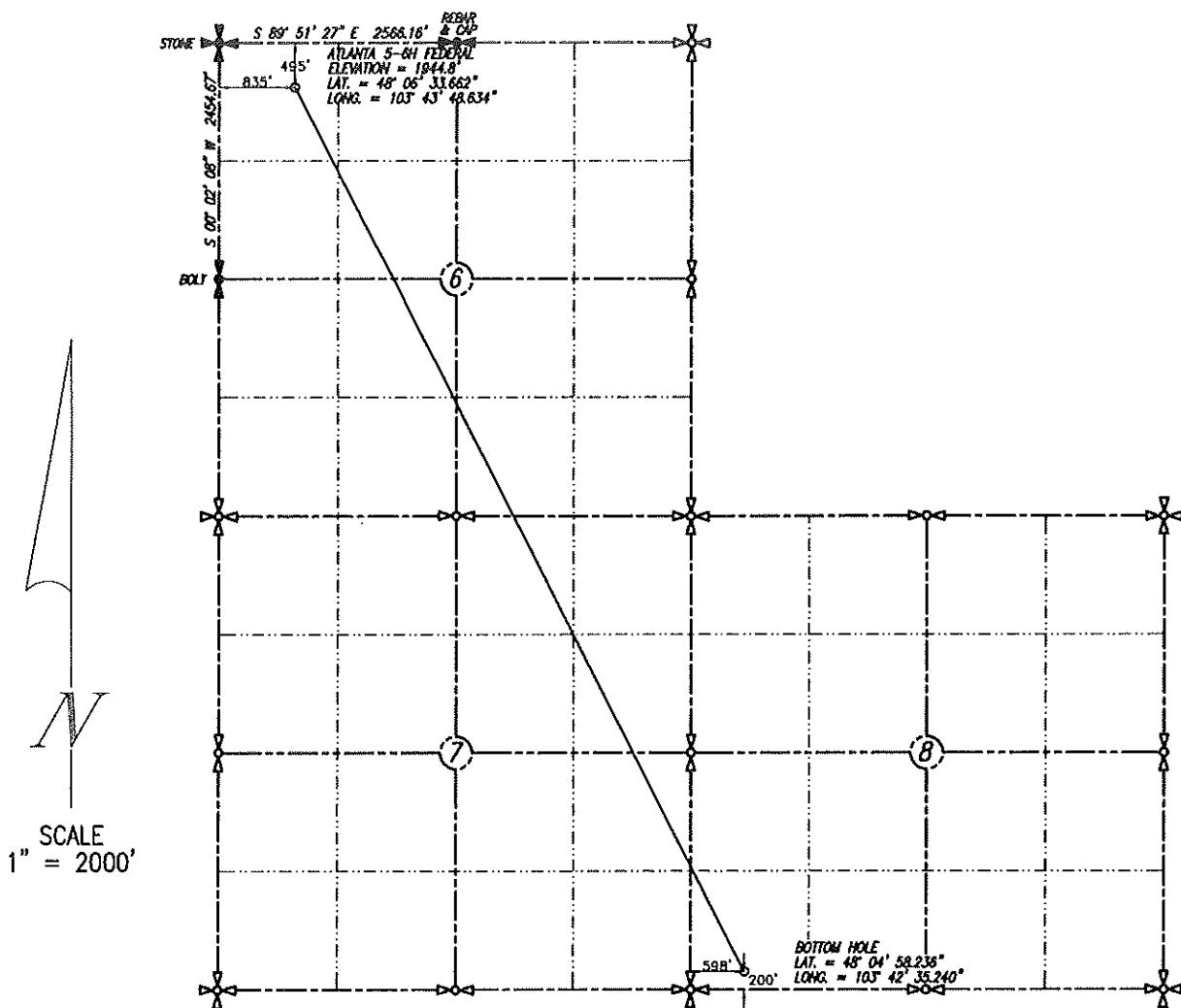
I CERTIFY THAT THIS PLAT CORRECTLY REPRESENTS  
WORK PERFORMED HEREIN OR UNDER MY RESPONSIBLE  
CHARGE, AND IS FAIR AND CORRECT TO THE BEST OF  
MY KNOWLEDGE SURVEYOR'S  
L.S. 3366

*John Paulson*  
JOHN PAULSON TRUST AKO 36

*BROSZ ENGINEERING INC.*  
BOX 357  
BOWMAN, N.D. 58623  
PHONE: 701-523-3340  
FAX: 701-523-5243  
PROJECT NO. 12-10

BOTTOM HOLE LOCATION PLAT  
 CONTINENTAL RESOURCES INC.  
 ATLANTA 5-6H FEDERAL  
 SECTION 6, T153N, R101W  
 WILLIAMS COUNTY, NORTH DAKOTA  
 495' FNL & 835' FWL

REVISED: 4-23-2012



I CERTIFY THAT THIS PLAT CORRECTLY REPRESENTS  
 WORK PERFORMED BY ME OR UNDER MY RESPONSIBLE  
 CHARGE, AND IS TRUE AND CORRECT TO THE BEST OF  
 MY KNOWLEDGE AND BELIEF

*John Newby* -23-12

JOHN NEWBY, L.S. 3366  
 LAND SURVEYOR  
 L.S. 3366

NORTH DAKOTA

DATE STAKED: 2-9-2012

BASIS OF VERTICAL DATUM:  
 NAVD 1988 GEOD 09

PERSON AUTHORIZING SURVEY;  
CHAD NEWBY

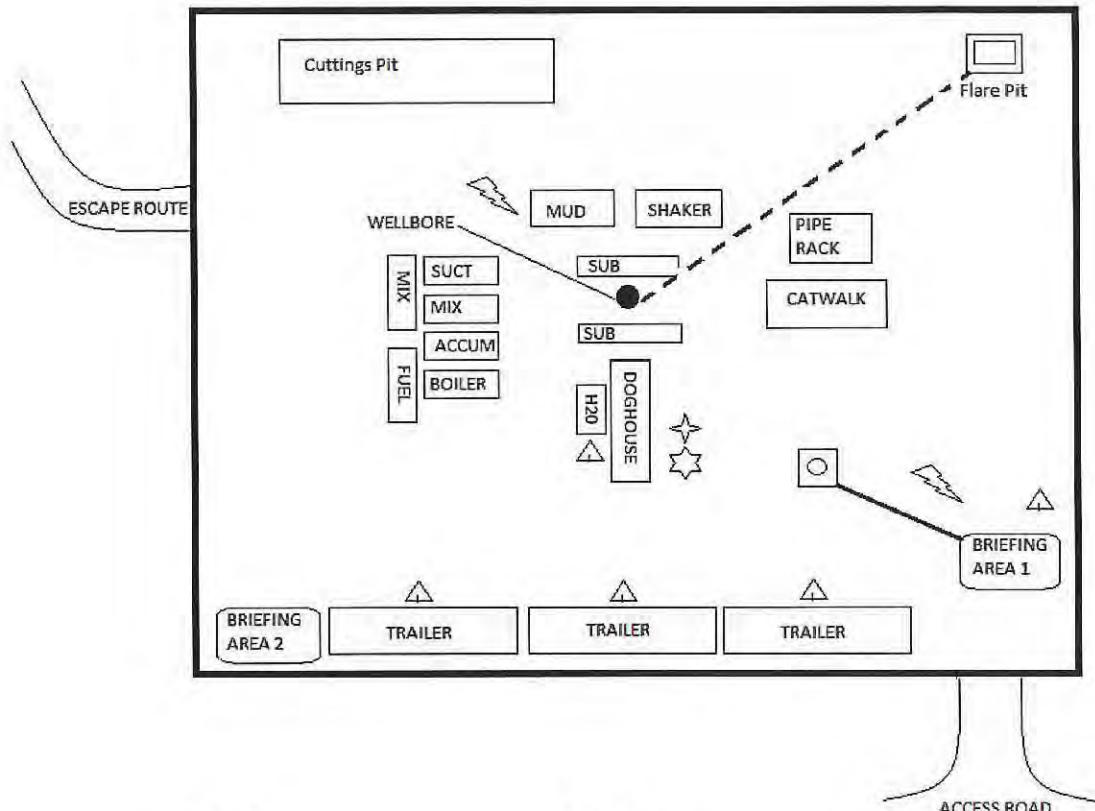
EXPLANATION AREA: NAD83(CORS96)

BASIS OF BEARING: TRUE NORTH

**BROSZ ENGINEERING INC.**

BOX 357  
 BOWMAN, N.D. 58623  
 PHONE: 701-523-3340  
 FAX: 701-523-5243

PROJECT NO. 12-10



### LEGEND

- ⚡ WINDSOCK
- ★ ALARM FLASHING LIGHT
- ☆ ALARM SIREN
- ▲ 30 MIN AIRPACK
- AIRLINE BREATHING APPARATUS W/ MANIFOLD
- WELLBORE
- ↙ 1/2" LOW PRESSURE HOSE CONNECTED TO BREATHING AIR TRAILER
- SAFETY TRAILER W/ CASCADE AIRSYSTEM

**NOTE:** Continuous H<sub>2</sub>S monitoring heads located:

- A. Return airline while air drilling
- B. Shaker while mud drilling
- C. Floor
- D. Substructure, Bell Nipple

### READOUT INSTRUMENT IN DOGHOUSE

Continental Resources, Inc	
Name: Atlanta Federal 5-6H	Site Plan of Safety Equipment
Location: Sec 6-T153N-R101W	
State: ND County: Williams	



July 20, 2012

Industrial Commission of North Dakota  
Oil & Gas Division  
600 East Boulevard, Dept 405  
Bismarck, North Dakota 58505

Continental Resources, Inc. (CRI) respectfully submits the following information concerning the drilling of the Atlanta 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14 -- 6H,  
Township 153N, Range 101W of the 5<sup>th</sup> P.M.  
Section 6, N/2 NW/4 Williams County, North Dakota.

Continental Resources Inc. would like to propose the following automatic shut down equipment and level sensing monitoring equipment be installed on the site to aid in the prevention of any accidental release or safety issue. One-line schematic diagrams, flowchart model, and general product information are attached for your review and approval with this affidavit.

- 1) Tank Side – i) K-Tek Guided Wave Radar and Z-Bend High Level Switch Level Detectors ii) High level switches for oil and water tanks ii) Battery box with solar backup
- 2) Treater / Separator – i) Buffer Switch ii) U003 Gap Switch iii) 2 - AST 4600 pressure transducers – monitor pressure & liquid content of flare / gas sales lines iv) Battery box with solar backup
- 3) Wellhead – i) TotalFlow Controller ii) Emergency ShutDown Valve package iii) Battery box with solar backup
- 4) System Automation through the proposed equipment will provide an independent control system on all equipment on site which will be able to shut the well(s) in should any of the other equipment be incapacitated or functioning improperly.
- 5) Once the system is operational and linked to the CRI Williston Basin SCADA system, a notification will be sent directly to the (Sidney, MT) field office, and field personnel in charge of the site's operation. This system will also provide the capability for remote shutdown from a computer terminal on the system at another location. In the event that an alert was sent from the site, or a call received, CRI estimates that personnel would be able to respond to an incident through the remote system within minutes and be present at the site within 15 to 30 minutes.

  
Chad Newby, Operations Land Coordinator  
Continental Resources, Inc.

STATE OF OKLAHOMA                )  
    )ss:  
COUNTY OF GARFIELD              )

On the 20<sup>th</sup> day of July 2012, before me, a Notary Public in and for said County and State, personally appeared Chad Newby, known to me to be the Operations Land Coordinator of Continental Resources, Inc., the Corporation that executed the within instrument, and acknowledged to me that such Corporation executed the same.

  
Notary Public

Garfield County, Oklahoma

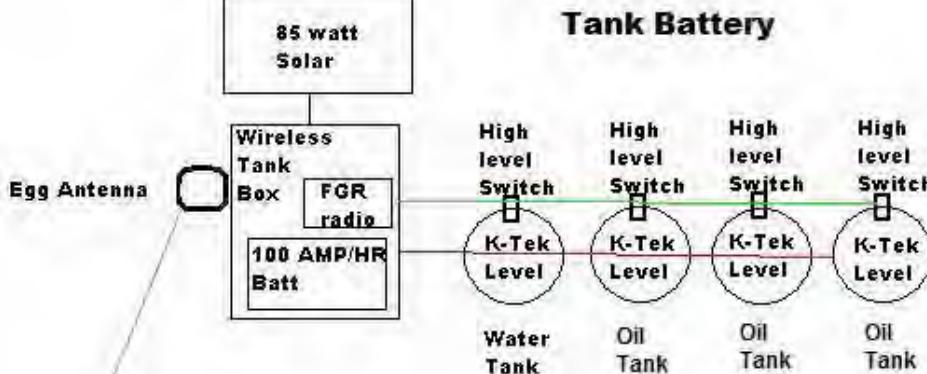
My Commission Expires: 7/5/2015  
Commission No.: 11006023



# Continental Resources Wellhead Automation

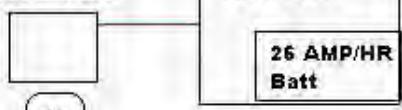


Analog  
Radio  
RS485 Modbus  
Digital I/O

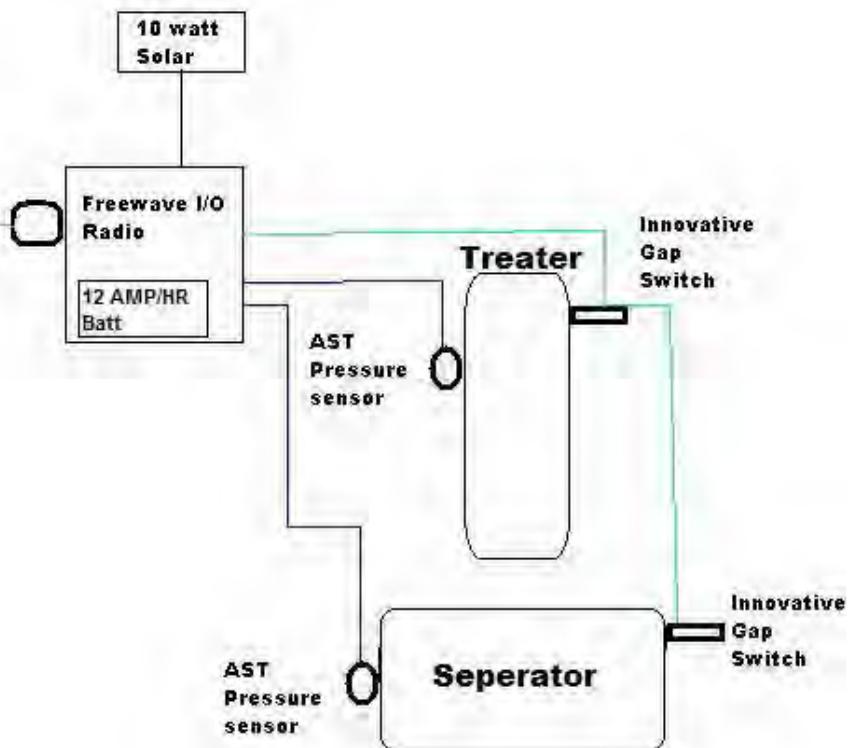


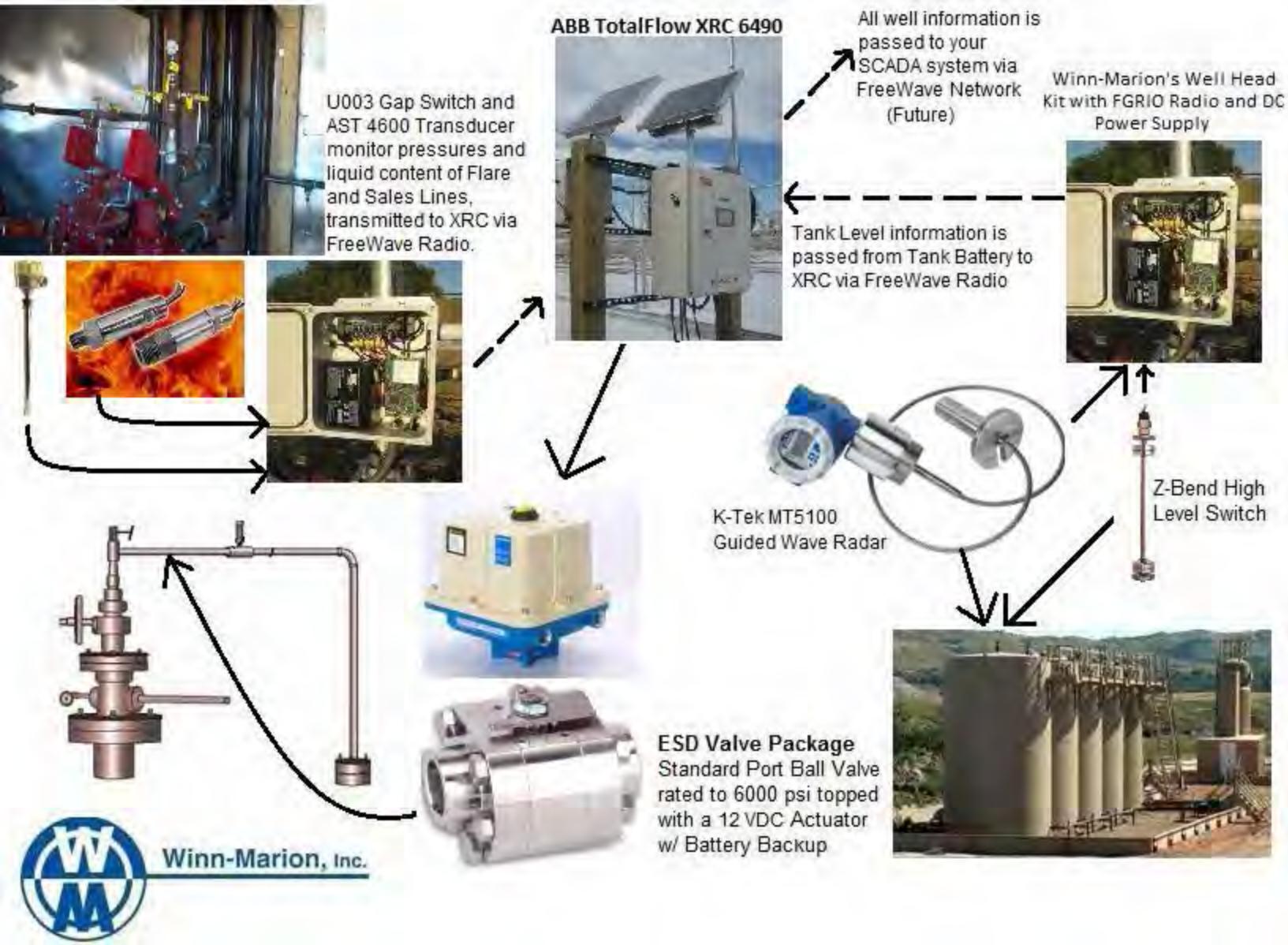
## Wellhead

LADC1000  
Actuator



Habonim Valve





# Tank Side

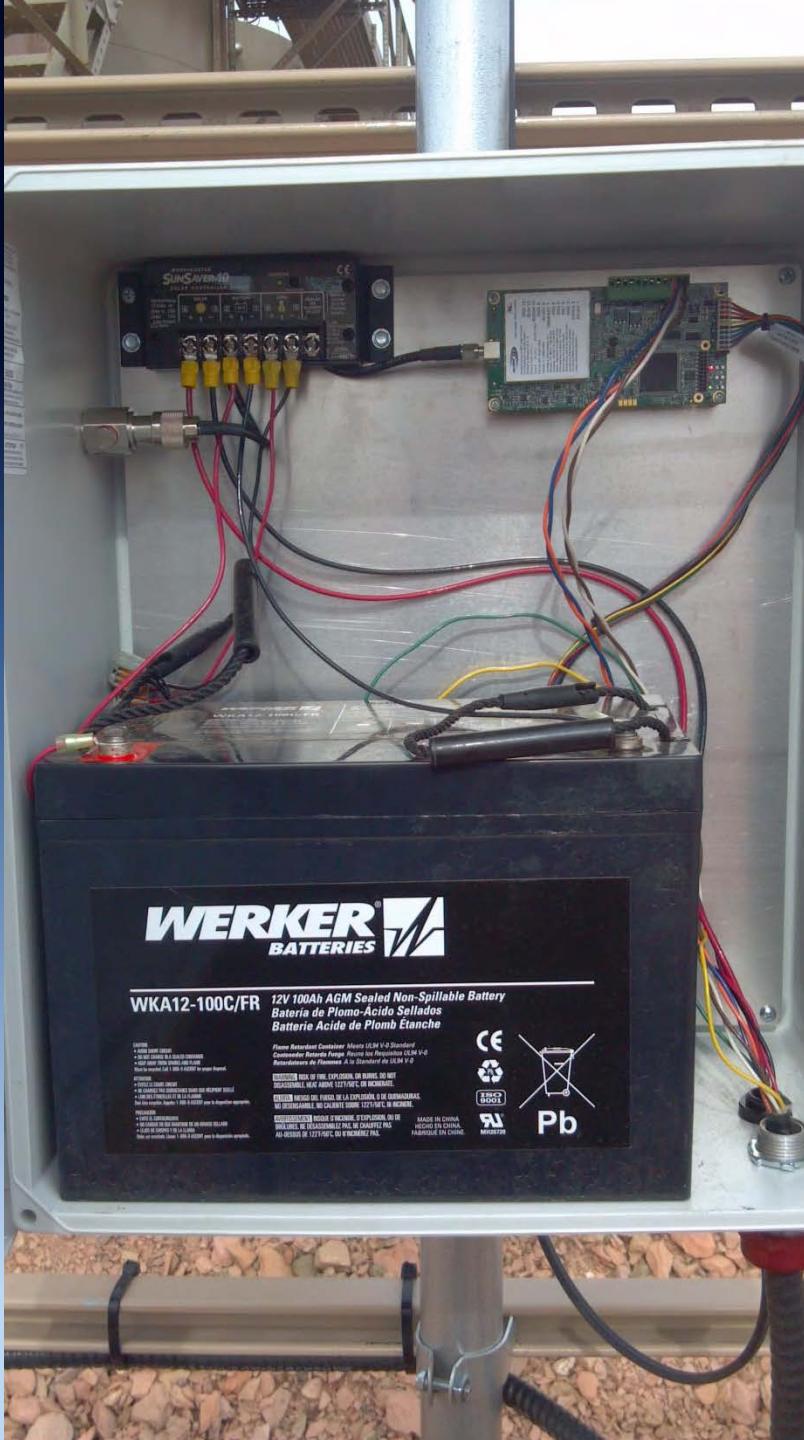
Contains the following Equipment

- 4 K-Tek Guided Wave Radar Level Detectors
- 3 High Level Switches (Oil Tanks)
- 1 Side Level Switch (Water Tank)
- Battery box with 100 AH Battery and 90 W Solar





WM Automation  
Service, LLC



WM Automation  
Service, LLC



WM Automation  
Service, LLC



WM Automation  
Service, LLC



WM Automation  
Service, LLC

# Treater Shack

Contains the following Equipment

- 1 Buffer Switch (Short Gap Switch)
- 1 Gap Switch
- 2 Pressure Transducers
- Battery box with 35 AH Battery and 10 W Solar





WM Automation  
Service, LLC



WM Automation  
Service, LLC



WM Automation  
Service, LLC





WM Automation  
Service, LLC



WM Automation  
Service, LLC

# Wellhead

Contains the following Equipment

- TotalFlow
- ESD Valve
- Battery box with 100 AH Battery and 50 W Solar

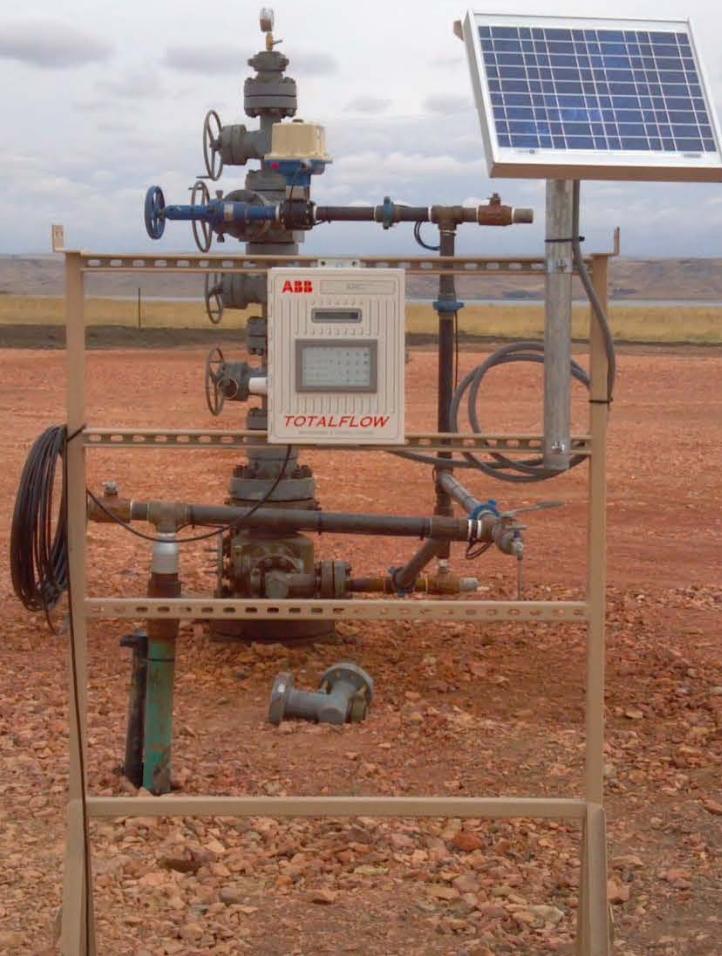




WM Automation  
Service, LLC



WM Automation  
Service, LLC



WM Automation  
Service, LLC

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**Cyclone Drilling Rig No. 20  
Contingency Plan  
For Drilling Activities Conducted at  
Continental Resources, Inc.'s  
Atlanta 1-6H  
Located in Williams County, ND**



November 2011

**CYCLONE DRILLING, INC. RIG NO. 20  
CONTINGENCY PLAN  
FOR DRILLING ACTIVITIES CONDUCTED AT THE  
CONTINENTAL RESOURCES, INC. ATLANTA 1-6H  
6-153N-101W, WILLIAMS COUNTY, NORTH DAKOTA**

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**CYCLONE DRILLING, INC. RIG NO. 20**  
**CONTINGENCY PLAN**  
**FOR DRILLING ACTIVITIES CONDUCTED AT THE**  
**CONTINENTAL RESOURCES, INC. ATLANTA 1-6H**  
**6-153N-101W, WILLIAMS COUNTY, NORTH DAKOTA**

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## 1. INTRODUCTION

The purpose of this Contingency Plan is to outline the procedures that will be implemented by Cyclone Drilling, Inc.'s Rig No. 20 personnel should a spill or flood occur during drilling activities conducted at the Continental Resources, Inc. Atlanta 1-6H lease located in Section 6, 153N, 101W in Williams County, North Dakota. Such procedures are designed to minimize the effects of spills and potential flooding on Cyclone field personnel, Continental facilities, the surrounding community, and the environment in general.

## 2. GENERAL INFORMATION

**2.1 Equipment Description.** Cyclone Drilling, Inc. operates drilling rigs that are moved from site to site therefore, the exact equipment layout will vary slightly. The Atlanta 1-6H location encompasses 3.1-acres and the standard equipment for most drilling jobs is as follows:

- ❑ Mobile Rig (w/integrated fuel/oil storage tanks)
- ❑ Storage Facilities
- ❑ Mud Pumps (diesel-powered pumps w/integrated fuel storage tanks)
- ❑ Generators (w/integrated fuel storage tanks)
- ❑ Water Tanks
- ❑ Pipe Racks

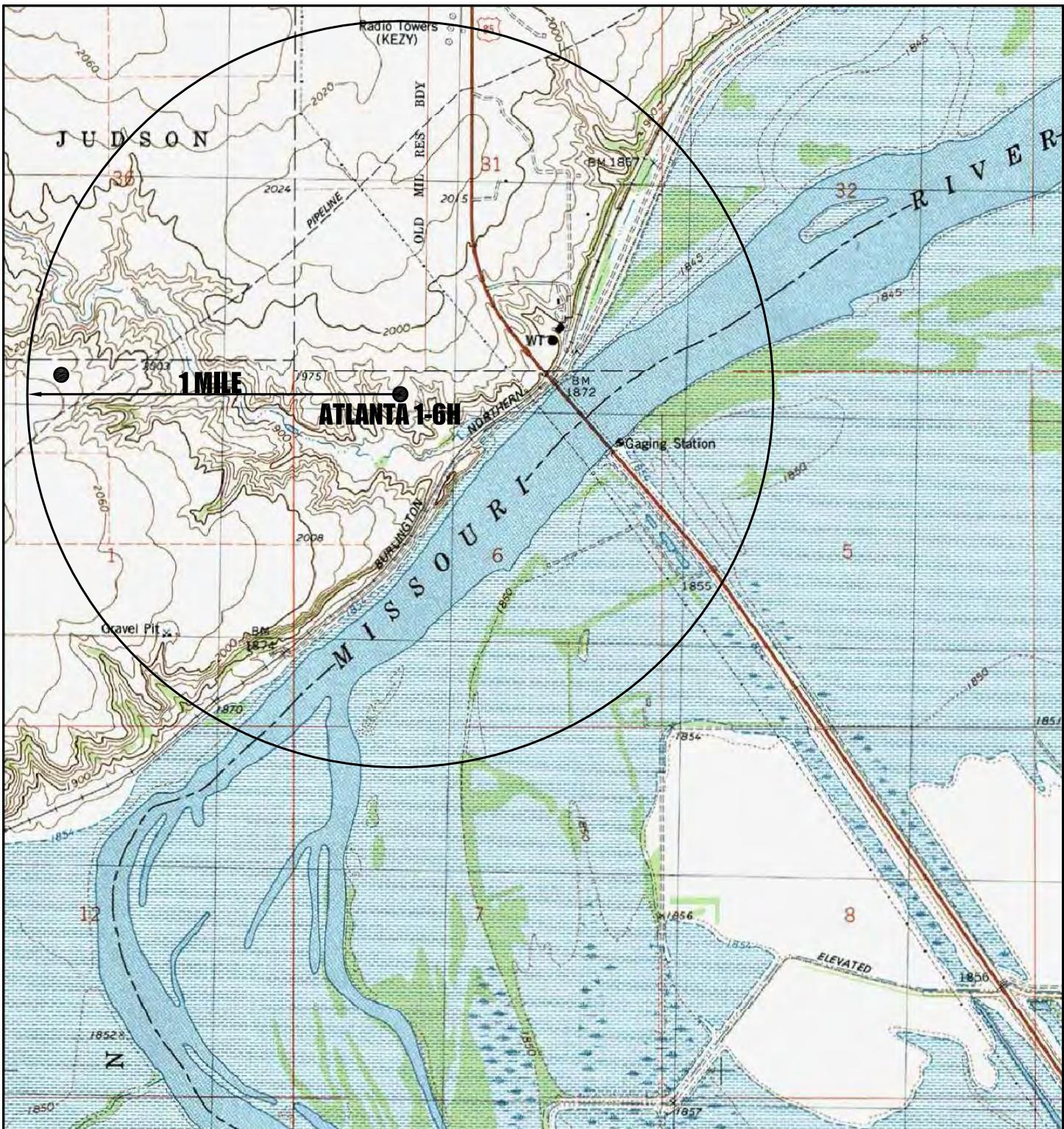
**2.2 Proximity of Rigs to Navigable Waters.** According to 40 CFR 112.7(e)(6)(i), mobile drilling equipment should be positioned or located so as to prevent spilled oil from reaching navigable waters. Depending on the location, catch basins or diversion structures may be necessary to intercept and contain fuel, crude oil, or oily drilling fluid spills.

The nearest potential receiving water for an oil spill is unnamed intermittent tributary of the Missouri River located approximately 500-ft. south of the Atlanta 1-6 lease. A One-Mile Radius Map indicating the location of Continental's Atlanta 1-6H lease is included herein as *Figure 1*.

Cyclone personnel will locate Rig No. 20 and its associated equipment to best prevent a potential release to waterways and provide drainage and containment, as discussed in *Section 3.4* of this Plan. A Drilling Rig Layout Map is included herein as *Figure 2*.

**2.3 Potential Spills and Releases.** The spill prevention system includes visual inspections and containment structures to help reduce the potential for releases to the off-site soil or surface waters. Generally, minor spills or leaks within the work site will be contained by drip pans located on skid-mounted equipment and cleaned-up using an absorbent (i.e., granular or pads). A list of activities that represent the greatest potential for a release of oil to the environment is as follows:

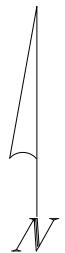
- ❑ Loading/unloading fuel, oil, and used oil to/from storage tanks and containers.
- ❑ Temporary storage of oil containers outside of secondary containment.



**CONTINENTAL RESOURCES INC.**

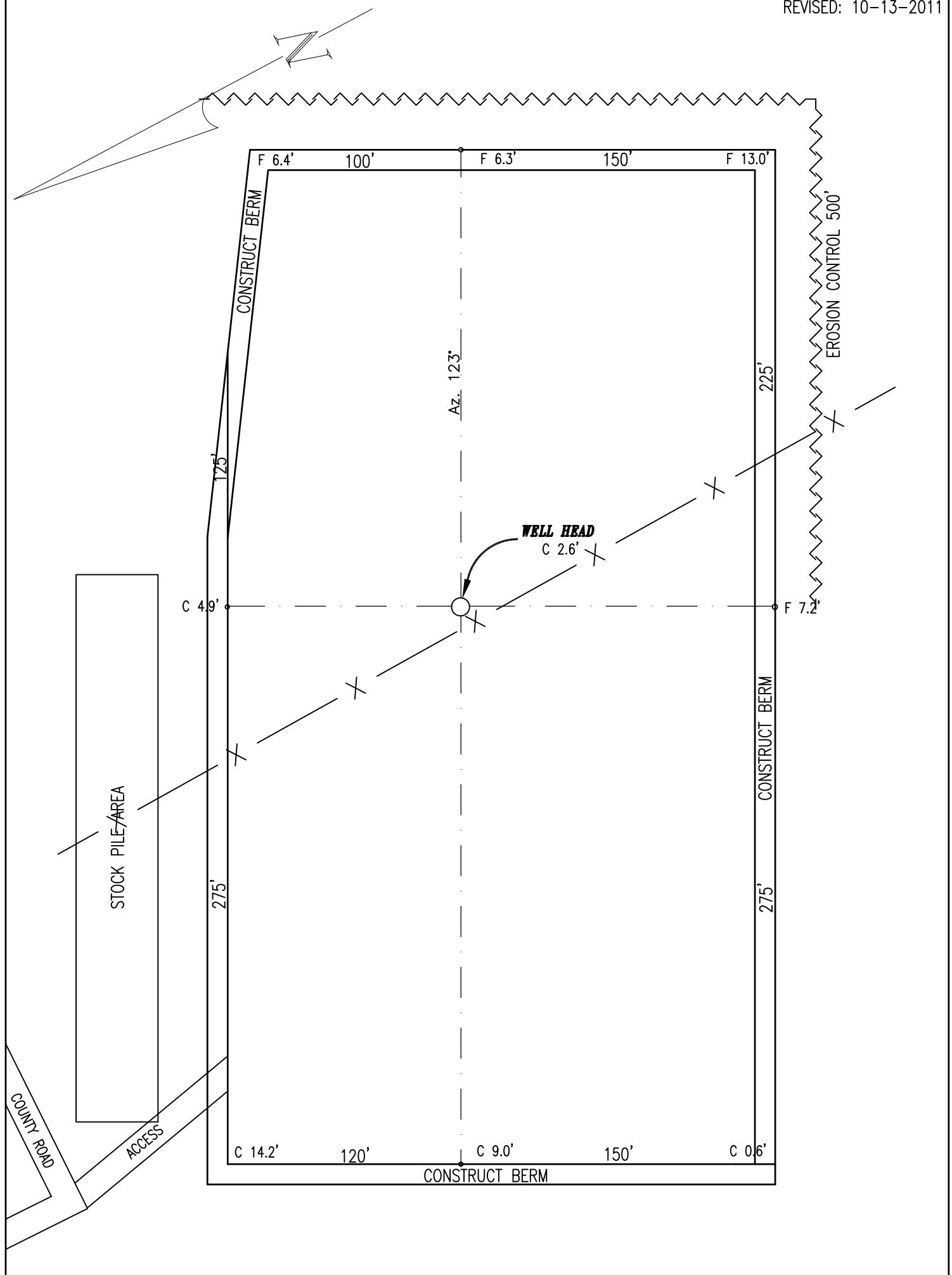
**ONE-MILE RADIUS MAP**

**● = OIL WELL**



**SCALE 1" = 2000'**

**ATLANTA 1-6H**  
**SECTION 6, T153N, R101W**  
**WILLIAMS COUNTY, NORTH DAKOTA**



CONTINENTAL RESOURCES INC.  
PO BOX 1032  
ENID, OKLAHOMA 73702

DRILLING RIG LAYOUT  
ATLANTA 1-6H  
SECTION 6, T153N, R101W  
WILLIAMS COUNTY, NORTH DAKOTA

#### ESTIMATED EARTH QUANTITIES

TOP-SOIL:	2,500	CUBIC YARDS
SUB-SOIL:	14,531	CUBIC YARDS

TOTAL CUT:	17,031	CUBIC YARDS
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TOTAL FILL:	12,769	CUBIC YARDS
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Use excess materials in access road fill

ALL INDICATED  
CUTS & FILLS  
ARE STAKED  
GRADE ELEVA-  
TIONS.

BACKSLOPES  
ASSUMED  
AT 1 1/2 : 1 %

Ground Elevation at Well Head: 1955.6 ft. ASL  
Finished Rig Grade Elevation: 1953.0 ft. ASL

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- ❑ Rigs that are operated without a fresh water or well fluids pit.

### **3. OIL/FUEL STORAGE**

**3.1 Oil, Fuel, and Used Oil Storage Tanks.** The materials stored on-site are mainly used to operate the drilling rig's generators and pumps and generally included the following:

- ❑ Diesel Fuel
- ❑ Engine Oil
- ❑ Hydraulic Oil
- ❑ Gear Oil
- ❑ Used Oil

**3.2 Container Storage.** Multi-compartment storage containers are used to store hydraulic, motor and gear oil in approximate 100- to 150-gal. capacities. These container is generally located within the operating area near the accumulator valve skid. In lieu of such a multi-compartment storage container, fresh oil may be stored in 55-gal. drums.

Used oil is stored in 55-gal. drums prior to contractor removal. Because of limited available space within the rig's operating area, these drums are usually stored outside the operating area. In this event, these drums will be placed in a spill containment pan or within an earthen berm.

Containers stored within the trenched operating area would be contained by drainage to the well fluids pit. Containers used at sites that do not use pits are provided with earthen dike containment or other containment (i.e., metal containment pan.) The containment volume for containers located outside of the trenched operating area will be approximately 10% of the total volume of all containers within the containment area.

**3.3 Transfer Facilities.** Fuel is transferred from bulk tanks into smaller day tanks located on the drilling rig, pump skids, and generator skids. Most bulk fuel tanks are equipped with a fuel pump attached to the skid. The fuel level in the day tanks is usually monitored until the tank is full.

Personnel transfer fresh oil from bulk storage tanks or drums into smaller tanks located on the drilling rig by filling 5-gal. buckets and manually filling the smaller tanks. Personnel transfer used equipment oil into 55-gal. drums using 5-gal. buckets.

Cyclone personnel are present at all times during oil and diesel transfer operations to ensure quick response in the event of a release. In addition, all pumps are securely grounded for static electricity for safety and personnel protection purposes.

**3.4 Drainage and Containment Facilities.** The drains on containment systems will be closed and sealed except during water drainage. Prior to draining water the following steps will be taken:

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- ❑ Visually inspect the diked areas around tanks to ensure that the water does not exhibit an oily sheen and will not result in a harmful discharge.
- ❑ Opening, closing, and locking the bypass valve under responsible supervision following drainage activities.
- ❑ Maintain adequate drainage operation records.

**3.5 Bulk Storage Tanks.** The bulk storage tanks are located within a trenched area where releases drain into the well fluids pit. The well fluids pit will be sized to provide containment volume to accommodate the largest tank within the containment area as well as sufficient volume for stormwater accumulation and the volume required for well fluid storage. Bulk storage tanks at sites that do not use pits are contained by an earthen containment dike constructed around the tank.

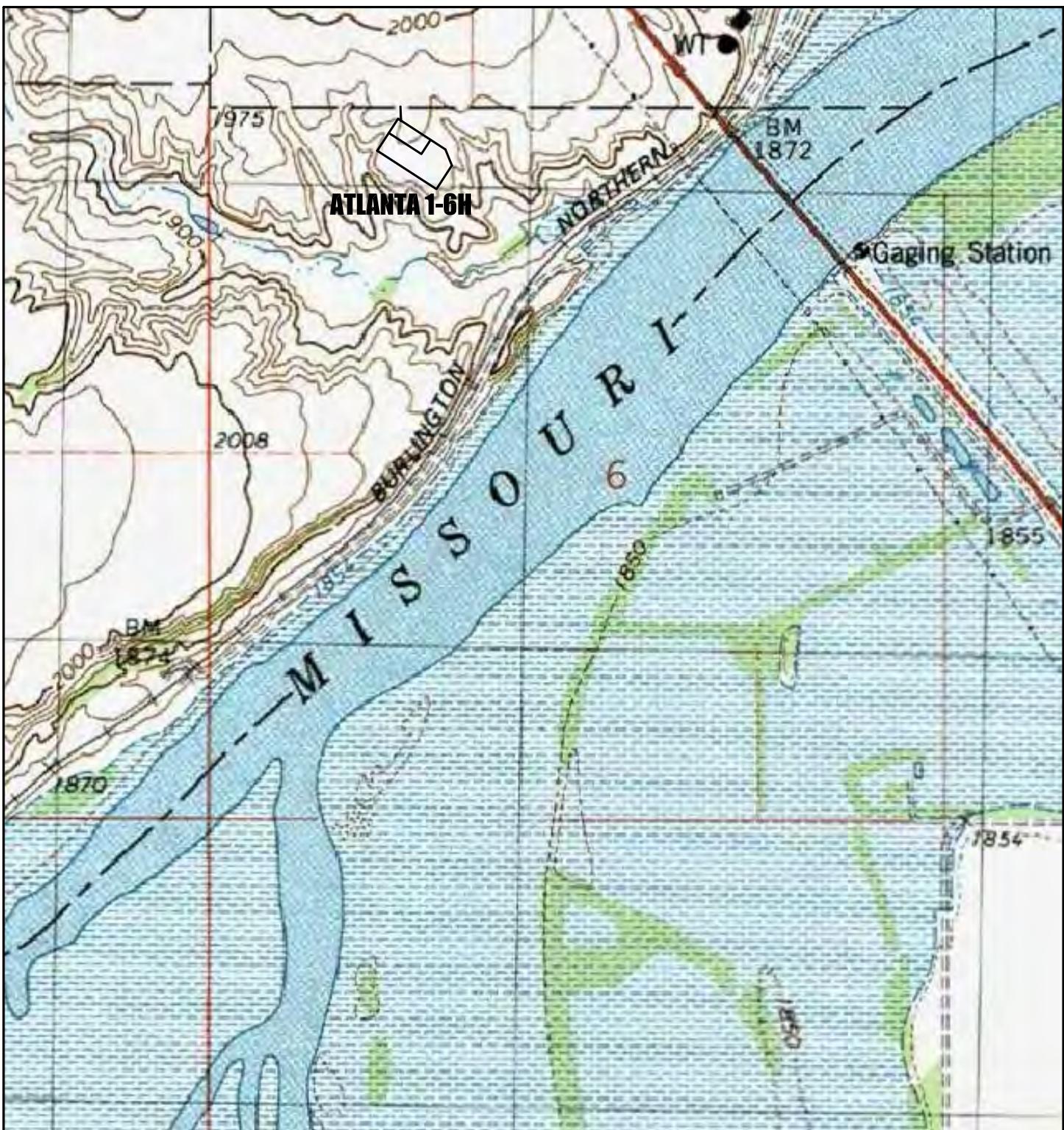
Stormwater that collects within the trenched area flows into the well fluids pit. Stormwater that collects within the earthen dike containment structures is inspected and if no free oil or oil sheen is observed, Continental field personnel or their on-site representatives may pump the water outside of the containment structure. In the event oil is observed in the stormwater within the earthen dike containment structures, it is pumped into a temporary container or storage tank for off-site disposal.

**3.6 Truck Loading/Unloading Areas.** Cyclone personnel will use spill containment booms to contain a release from a truck during loading/unloading operations or hand shovels and containment booms to direct the release to a containment trench or pit. Collected oil from such a release will be pumped into a temporary container or storage tank for off-site disposal.

#### **4. FLOOD CONTINGENCY**

Floods can develop slowly during an extended period of rain, or in a warming trend following a heavy snow. Others, such as flash floods, can occur quickly, even without any visible signs of rain. It's important to be prepared for flooding when working in a low-lying area, near water or downstream from a dam. The Atlanta 1-6H lease is located approximately 500-ft. north of an unnamed intermittent tributary of the Missouri River at an approximate elevation of 1,953-ft. above Mean Sea Level (MSL). A Well Location Map reflecting the topography of the subject site is presented herein as *Figure 3*.

- 4.1 Flood Watch.** A Flood Watch indicates flooding is possible. Tune in to NOAA Weather Radio, commercial radio, or television for information regarding potential timing of flooding. Begin preparing to move portable equipment and storage tanks to higher ground. Anchor equipment and storage tanks that cannot be readily moved.
- 4.2 Flash Flood Watch.** A Flash Flood Watch indicates flooding may occur without warning. Be prepared to move personnel, equipment, and portable storage tanks to higher ground; listen to NOAA Weather Radio, commercial radio, or television for information.



**CONTINENTAL RESOURCES**  
WELL LOCATION

ATLANTA 1-6H  
SECTION 6, T153N, R101W  
WILLIAMS CO., NORTH DAKOTA

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- 4.3 Flood Warning.** A Flood Warning indicates flooding is occurring or will occur soon; if advised to evacuate, do so immediately, if safe to do so move equipment and portable storage tanks to higher ground.
- 4.4 Flash Flood Warning.** A Flash Flood Warning indicates flash flood is occurring; personnel should seek higher ground on foot immediately.
- 4.5 Flood Evacuation Plan.** In the event the Cyclone Drilling Foreman determines that the facility must be evacuated due to flooding, they will notify the personnel concerned by verbally announcing an evacuation or using internal two-way radios. All personnel will be required to meet at the designated evacuation assembly area.

The Cyclone Drilling Foreman will account for all employees at the work site. In the event any employees are missing, an immediate report will be made to the Safety Department. Good judgment must be used in evacuation procedures to avoid placing people in greater danger.

## **5. PREPAREDNESS AND PREVENTION REQUIREMENTS**

Preparedness and prevention is required for all spills and potential flooding. The Cyclone Drilling Foreman will function as Emergency Coordinator and be responsible for establishing and implementing the preparedness and prevention measures discussed in the following sections of this Plan.

- 5.1 Emergency Equipment.** Cyclone Rig No. 20 located at the Atlanta 1-6H will be properly equipped so that Cyclone personnel can immediately respond to an emergency during working hours utilizing emergency equipment. Typical emergency equipment includes but is not limited to fire extinguishers, eyewash stations, first-aid stations, and spill response equipment. Employees will be trained and familiarized with the use and location of all emergency equipment prior to beginning operations at a work site
- 5.2 Internal Communication.** For larger jobs, Cyclone personnel use two-way radios to communicate between the rig personnel and supervisor. For smaller jobs, verbal communication is sufficient. During emergency situations, verbal communication and two-way radios (if available) will be used to provide immediate instructions to emergency response personnel. These systems are maintained, as necessary, to ensure proper operation during an emergency.
- 5.3 External Communication.** Telephones (available on some larger jobs) and cell phones are used to notify Continental's office in the event of an emergency. The office would telephone for assistance from local emergency response personnel, if necessary. The phones are routinely used to ensure proper operation.
- 5.4 Inspections.** Inspections of oil storage units, containment, and emergency equipment are conducted routinely to detect malfunctions and deterioration, operator errors, and/or

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discharges that may lead to, or cause a release of, oil from containment units or from the work site.

- 5.5 Training.** Cyclone personnel that are likely to respond to an incident are trained at least annually in solid waste management, spill response procedures, and stormwater management according to the procedures contained in this Plan. These employees are trained to perform in a manner that emphasizes accident and pollution prevention in an effort to safeguard human health and the environment.

The Cyclone Drilling Foreman is responsible for instructing appropriate personnel in the operation and maintenance of spill response equipment as well as all applicable spill control procedures. When employees are assigned to areas where oil spills may occur, it is required that a review of this Contingency Plan be conducted during on-the-job training sessions.

- 5.6 Emergency Evacuation Plan.** In the event the Cyclone Drilling Foreman determines that the facility has experienced a release, fire, or explosion that could threaten human health, they will notify the personnel concerned by verbally announcing an evacuation or using internal two-way radios. All personnel in the immediate vicinity of the emergency will be required to leave the area and report to his/her immediate supervisor at the designated evacuation assembly area. The assembly area will be determined prior to beginning operations at a work site, but may change based on wind direction during an actual emergency. The assembly area should be upwind of the work site.

The Cyclone Drilling Foreman will account for all employees at the work site. In the event any employees are missing, an immediate report will be made to the Safety Department. Good judgment must be used in evacuation procedures to avoid placing people in greater danger.

## **6. EMERGENCY RESPONSE PROCEDURES**

Emergency Response Procedures have been established for Cyclone's work sites in the event of a spill. All spills, major and minor, will be reported to the Cyclone Drilling Foreman and Continental's Environmental Specialist. The emergency response procedures are included in *Appendix A*. The responsibilities of the First Responder, Cyclone Drilling Foreman, and Continental's Environmental Specialist are addressed in the following sections of this Plan.

- 6.1 First Responder.** When a spill occurs, the employee observing the incident will immediately notify the Cyclone Drilling Foreman and proceed to eliminate the spill source, if possible.
- 6.2 Emergency Coordinator Responsibilities.** The Cyclone Drilling Foreman will **(a)** be responsible for determining whether the release could reach navigable waters or threaten human health and/or the environment; **(b)** assess the hazard, make immediate notifications, and implement spill response procedures; **(c)** collect the necessary information for regulatory notifications and reports; and **(d)** provide the reporting information to Continental's Environmental Specialist.

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Continental's Environmental Specialist will make immediate verbal notifications and prepare and submit all required written spill reports.

Material Safety Data Sheets (MSDS) for the hazardous materials used at the work site are maintained on-site in the "doghouse" and provide information on the chemical hazards at the work site. Most releases will be minor and require only clean-up and disposal of small quantities of material. However, in the event the assessment indicates that evacuation of local areas may be advisable, they will immediately notify appropriate local authorities, as necessary. Appropriate authorities may include local police and fire departments, hospitals, and state and local emergency response teams, as identified in *Table 1*.

The Cyclone Drilling Foreman will immediately notify Continental's Environmental Specialist who will make initial verbal notifications to regulatory agencies and prepare written follow-up reports, as required. In the event the release has impacted the environment, the Cyclone Drilling Foreman and Continental's Environmental Specialist will determine clean-up requirements. In addition, the Cyclone Drilling Foreman and Environmental Specialist will coordinate the appropriate disposal of waste material generated during the response activities.

## **7. SPILL NOTIFICATION REPORTING**

**7.1 Spill Notification and Reporting.** Upon receiving spill information, the Emergency Coordinator will notify Continental's Environmental Specialist who will determine if the spill requires notification and/or reporting to regulatory agencies, as outlined below:

**7.1.1 North Dakota Industrial Commission (NDIC).** According to the North Dakota Industrial Commission's (NDIC) General Rules and Regulations North Dakota Administrative Code (NAC) Chapter 43-02-03 Section C. Drilling:

*All persons controlling or operating any well, pipeline, receiving tank, storage tank, or production facility into which oil, gas, or water is produced, received, stored, processed, or through which oil, gas, or water is injected, piped, or transported, shall verbally notify the director within 24-hrs. after discovery of any fire, leak, spill, blowout, or release of fluid. If any such incident occurs or travels offsite of a facility, the persons, as named above, responsible for proper notification shall within a reasonable time also notify the surface owners upon whose land the incident occurred or traveled. Notification requirements prescribed by this section do not apply to any leak, spill or release of fluid that is less than 1-bbl total volume and remains onsite of a facility. The verbal notification must be followed by a written report within 10-days after cleanup of the incident, unless deemed unnecessary by the director.*

**7.1.2 National Response Center (NRC).** Any discharge to water must be reported immediately to the National Response Center. Therefore, the Cyclone Drilling Foreman must immediately inform Continental's Environmental Specialist with details regarding the spill so that official notifications can be made to the National Response Center.

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#### 8. PLAN AMENDMENT

In the event that a reportable spill or flooding occurs, Cyclone personnel will review the event to determine if an amendment to this Plan is necessary. In addition, Cyclone personnel will amend the Plan whenever there is a modification in the facility design, construction, storage capacity, operation, or maintenance that renders the existing Plan inadequate.

#### 9. MANAGEMENT APPROVAL

This Contingency Plan has been prepared for operation of Cyclone Drilling, Inc.'s Rig No. 20 to be reviewed prior to beginning operations at the Continental Resources, Inc. Atlanta 1-6 lease. The Plan will be implemented as herein described.

*Ryan M*  

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(Signature)

*Ryan Nelson*      *Drilling Engineer*  

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(Name and Title - Please Print)



May 4, 2012

Industrial Commission of North Dakota  
Oil & Gas Division  
600 East Boulevard, Dept 405  
Bismarck, North Dakota 58505

Re: Atlanta 3-6H

Continental Resources, Inc., would like to request all filings and information regarding the above captioned well be considered "Tight Hole".

Please charge the Continental Resources, Inc., credit card that is on file with your agency for the application fee of this well.

Thank you for your prompt attention to this matter. If you have any questions, you may contact me at 580-548-5139 or email the following [Terry.Olson@clr.com](mailto:Terry.Olson@clr.com).

Sincerely,

**CONTINENTAL RESOURCES, INC.**

  
\_\_\_\_\_  
Terry L. Olson  
Regulatory Compliance Specialist