



**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.

23362

ND OIL & GAS DIVISION

PLEASE READ INSTRUCTIONS BEFORE FILLING OUT FORM.

PLEASE SUBMIT THE ORIGINAL.

Well Name and Number <b>Atlanta 11-6H</b>	Qtr-Qtr <b>NENW</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>February 27, 2014</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>February 27, 2014</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	<input checked="" type="checkbox"/> 13.7 psi VPCR <sub>4</sub> Tariff Specification Hiland Crude Tariff Authority
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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>23362</b>	
By 	Title <b>Oil &amp; Gas Production Analyst</b>	



## 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.  
**23362**



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

Notice of Intent

Approximate Start Date

Report of Work Done

Date Work Completed  
**June 3, 2014**

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

Drilling Prognosis

Spill Report

Redrilling or Repair

Shooting

Casing or Liner

Acidizing

Plug Well

Fracture Treatment

Supplemental History

Change Production Method

Temporarily Abandon

Reclamation

Other

Well Name and Number  
**Atlanta 11-6H**

Footages	495 F N L	1350 F W L	Qtr-Qtr NENW	Section 6	Township 153 N	Range 101 W
Field	Baker	Pool	Bakken	County	Williams	

### 24-HOUR PRODUCTION RATE

	Before	After	
Oil	135 Bbls	Oil	165 Bbls
Water	256 Bbls	Water	356 Bbls
Gas	160 MCF	Gas	260 MCF

Name of Contractor(s)

Address

City

State

Zip Code

### DETAILS OF WORK

Continental Resources would like to request a change in production on the Atlanta 11-6H. The well went from flowing to pumping on 6/3/2014.

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>
Signature 	Printed Name <b>Zach Green</b>
Title <b>Regulatory Compliance Specialist</b>	Date <b>July 17, 2014</b>
Email Address <b>Zach.Green@clr.com</b>	

### FOR STATE USE ONLY

<input checked="" type="checkbox"/> Received	<input type="checkbox"/> Approved
Date 	
By 	
Title 	



**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.**

**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 11-6H</b>				Spacing Unit Description <b>Sec 5, 6, 7, &amp; 8 T153N R101W</b>			
Operator <b>Ccontinental 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
495 F N L	1350 F W L	NENW	6	153 N	101 W	Williams
Spud Date 3/12/2013	Date TD Reached 5/20/2013	Drilling Contractor and Rig Number <b>Cyclone 2</b>	KB Elevation (Ft) <b>1967</b>	Graded Elevation (Ft) <b>1945</b>		

Type of Electric and Other Logs Run (See Instructions)

CBL/GR/MAC/mud

## CASING & TUBULARS RECORD (Report all strings set in well)

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				0
	Surface	13 1/2		525	13 1/2	48			481	0
	Surface	9 5/8		2024	13 1/2	36			662	0
	Liner	4 1/2		9871	6	11.6				
	Intermediate	7		10896	8 3/4	26-32			990	1830
	Liner	4 1/2	9851	19551	6	11.6		9851		

## **PERFORATION & OPEN HOLE INTERVALS**

## PRODUCTION

Current Producing Open Hole or Perforated Interval(s), This Completion, Top and Bottom, (MD Ft) <b>Bakken 10,896' - 19,697'</b>							Name of Zone (If Different from Pool Name)			
Date Well Completed (SEE INSTRUCTIONS)	Producing Method	Pumping-Size & Type of Pump				Well Status (Producing or Shut-In)				
2/26/2014	<b>Flowing</b>					<b>Producing</b>				
Date of Test	Hours Tested	Choke Size	Production for Test	Oil (Bbls)	Gas (MCF)	Water (Bbls)	Oil Gravity-API (Corr.)	Disposition of Gas		
<b>3/15/2014</b>	<b>24</b>	<b>14 /64</b>		<b>604</b>	<b>249</b>	<b>396</b>	<b>39.6 °</b>	<b>Sold</b>		
Flowing Tubing Pressure (PSI)		Flowing Casing Pressure (PSI)		Calculated	Oil (Bbls)	Gas (MCF)	Water (Bbls)	Gas-Oil Ratio		
				24-Hour Rate	<b>604</b>	<b>249</b>	<b>396</b>	<b>412</b>		

## GEOLOGICAL MARKERS

## **PLUG BACK INFORMATION**

CORES CUT

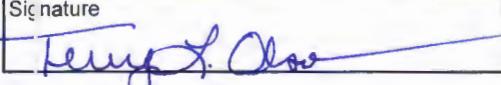
Top (Ft)	Bottom (Ft)	Formation	Top (Ft)	Bottom (Ft)	Formation

Drill Stem Test

**Well Specific Stimulation**

Date Stimulated 1/12/2014	Stimulated Formation Middle Bakken		Top (Ft) 10896	Bottom (Ft) 19697	Stimulation Stages 29	Volume 48847	Volume Units Barrels
Type Treatment Sand Frac	Acid %	Lbs Proppant 3069436	Maximum Treatment Pressure (PSI) 8094			Maximum Treatment Rate (BBLS/Min) 30.0	
Details Pumped 124519# 40/70 mesh, 2121332# 20/40 sand and 948104# 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 3/25/2014
Sig nature 	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.	23362
NDIC CTB No.	223372

PLEASE READ INSTRUCTIONS BEFORE FILLING OUT FORM.

PLEASE SUBMIT THE ORIGINAL AND FOUR COPIES.

Well Name and Number <b>Atlanta 11-6H</b>	Qtr-Qtr <b>NENW</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>February 27, 2014</b>
Principal Place of Business <b>20 N. Broadway</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 (West Camp Creek Pipe)</b>	Telephone Number	% Transported	Date Effective <b>February 27, 2014</b>
Address <b>P.O. Box 3886</b>	City <b>Enid</b>	State <b>OK</b>	Zip Code <b>73702</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 the information provided is true, complete and correct as determined from all available records.	Date <b>March 21, 2014</b>
Signature 	Printed Name <b>Terry L. Olson</b>
	Title <b>Regulatory Compliance Specialist</b>

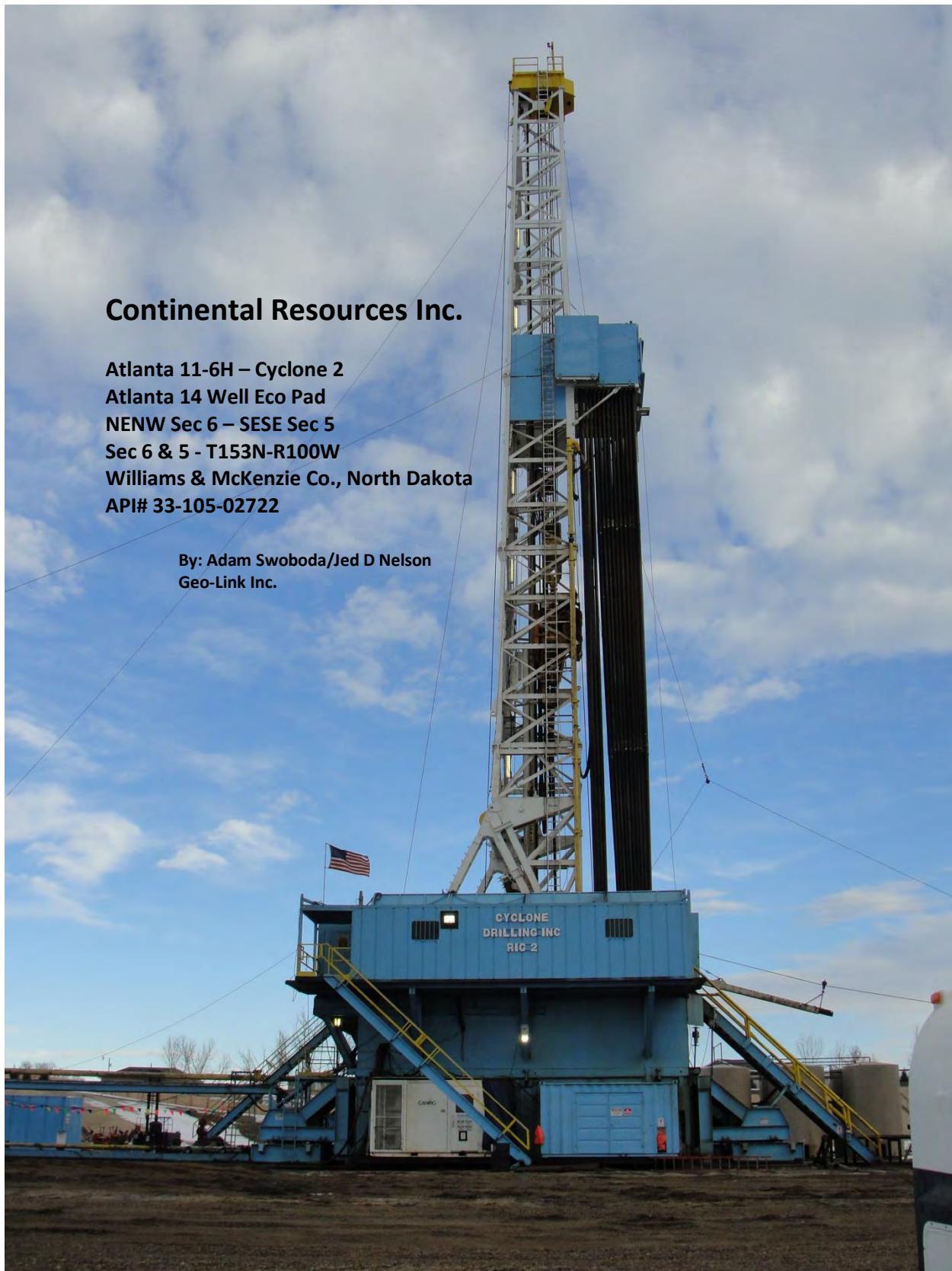
Above Signature Witnessed By	
Witness Signature 	Witness Printed Name <b>Christi Scritchfield</b>
	Witness Title <b>Regulatory Compliance Specialist</b>

FOR STATE USE ONLY	
Date Approved <b>APR 09 2014</b>	
By 	
Title <b>Eric Roberson</b>	
Oil & Gas Production Analyst	

## **Continental Resources Inc.**

**Atlanta 11-6H – Cyclone 2  
Atlanta 14 Well Eco Pad  
NENW Sec 6 – SESE Sec 5  
Sec 6 & 5 - T153N-R100W  
Williams & McKenzie Co., North Dakota  
API# 33-105-02722**

**By: Adam Swoboda/Jed D Nelson  
Geo-Link Inc.**





## Table of Contents

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*Cross Section*

*Well Synopsis*

*Drilling Activity*

*Chronological Gas / Sample Show*

*Gamma Ray, Avg. ROP, 24 Hr Progress, Gas, Mud Weight, Oil Show Plot*

*Formation Tops, Critical Points, Lateral Summary*

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*Atlanta Eco Pad Plat*

*MWD Surveys (Baker Hughes & MS Energy)*

*Drilling / Sliding Report*

*TVD Log*



## Well Information

WELL NAME:	Atlanta 11-6H
OPERATOR:	Continental Resources, Inc. P.O. Box 269000 Oklahoma City, Ok 73126
SURFACE LOCATION:	495 †FNL & 1350 †FWL NENW Section 6: T153N, R101W
CASING:	7 ½" Intermediate casing set at 10896 †MD, 10532 †TVD 708 †FNL & 1967 †FWL NENW Section 6: T153N & R101W
BOTTOM HOLE LOCATION:	Projection to Bit: 19697 †MD, 10509.32 †TVD 1218 †FSL & 323 †FEL SESE Section 5, T153N, R101W
FIELD/AREA:	Williston
COUNTY:	Williams
STATE:	North Dakota
API#:	33-105-02722
ELEVATION:	GL: 1945 † KB: 1967 †
SPUD:	March 12 <sup>th</sup> , 2013
DRILLED OUT/ SURFACE:	March 15 <sup>th</sup> , 2013
DRILLED OUT/ 7 ½" Casing:	May 15 <sup>th</sup> , 2013
TOTAL DEPTH/DATE:	19697 †MD on May 20 <sup>th</sup> , 2013
Total Days:	69
BOTTOM HOLE DATA:	
Kick-off Point:	9900 †MD; 9899 †TVD
Vertical Section:	9448.36
Drift of Azimuth	110.85°
Average Inclination (lateral):	90.06°
Lateral footage:	8801 †
WELL STATUS:	To be completed as a Middle Bakken oil well
MWD REP:	Baker Hughes / MS Energy
DIRECTIONAL REP:	Baker Hughes / MS Energy



## Well Information

MUD LOGGING SERVICE: Geo-Link Inc.

GEOLOGICAL CONSULTANT: Jed D Nelson & Adam Swoboda  
SECOND HAND: R.C. Whitmore & Joe Dunn

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

SAMPLE PROGRAM:  
30 Samples lagged and caught by mud loggers 8650 #10890  
Logging: Top Charles, BLS, Mission Canyon, Lodgepole, Upper Bakken Shale, Middle Bakken Member

100 Samples lagged and caught by mud loggers 10900 #9697  
Logging: Middle Bakken Member  
One set sent to NDGS Core Library (Grand Forks)

DISTRIBUTION LIST:

Continental Resources, Inc.  
Land Department

# Memo

**To:** Archie Taylor, Ben Ainsworth, Brian A. Moss, Cameron Thompson, David McMahan, Doug Pollitt, Gerry Allen, Gil Smith, Gina Callaway, Greg Blocker, Jack Stark, Jaclyn Jantz, Jeanette McDonald, Josh Byler, Marjorie McKenzie, Matt Liter, Neil Olesen, Paula Fast, Renee Sanders, Rob Hersom, Robert Sandbo, Sally Messenger, Shamika Morrison, Shawn Roche, Shelly Ramirez and William Parker

**From:** Nicole Hodges

**CC:** Rick Muncrief and Heath Hibbard

**Date:** January 2, 2013

**RE:** Atlanta 11-6H



## Well Information

Sections 5, 6, 7 & 8-153N-101W  
Williams & McKenzie Counties, North Dakota

Regarding the referenced well, the following parties are entitled to receive the indicated information and be contacted for elections as shown.

**"Standard Information"** means the following:

**DURING DRILLING OPERATIONS:**

E-mail the following  
during drilling and completion operations:

- 1) Daily Drilling Report
- 2) Mud Log
- 3) Lateral Profile
- 4) Gamma Ray, MD & TVD Logs
- 5) Directional Surveys

**POST DRILL:**

Mail the following items after  
drilling is completed:

- 1) Complete Electric Log
- 2) Complete Mud Log
- 3) Complete DST report
- 4) Core Analyses
- 5) Complete Directional Surveys
- 6) Complete Lateral Profile
- 7) Water, Oil & Gas Analysis
- 8) Cement Bond Log
- 9) Final complete drilling report

<b>Owner</b>	<b>Information</b>	<b>Casing Point Election</b>	<b>Dry Hole Takeover Election</b>
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>	<b>Standard Information (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



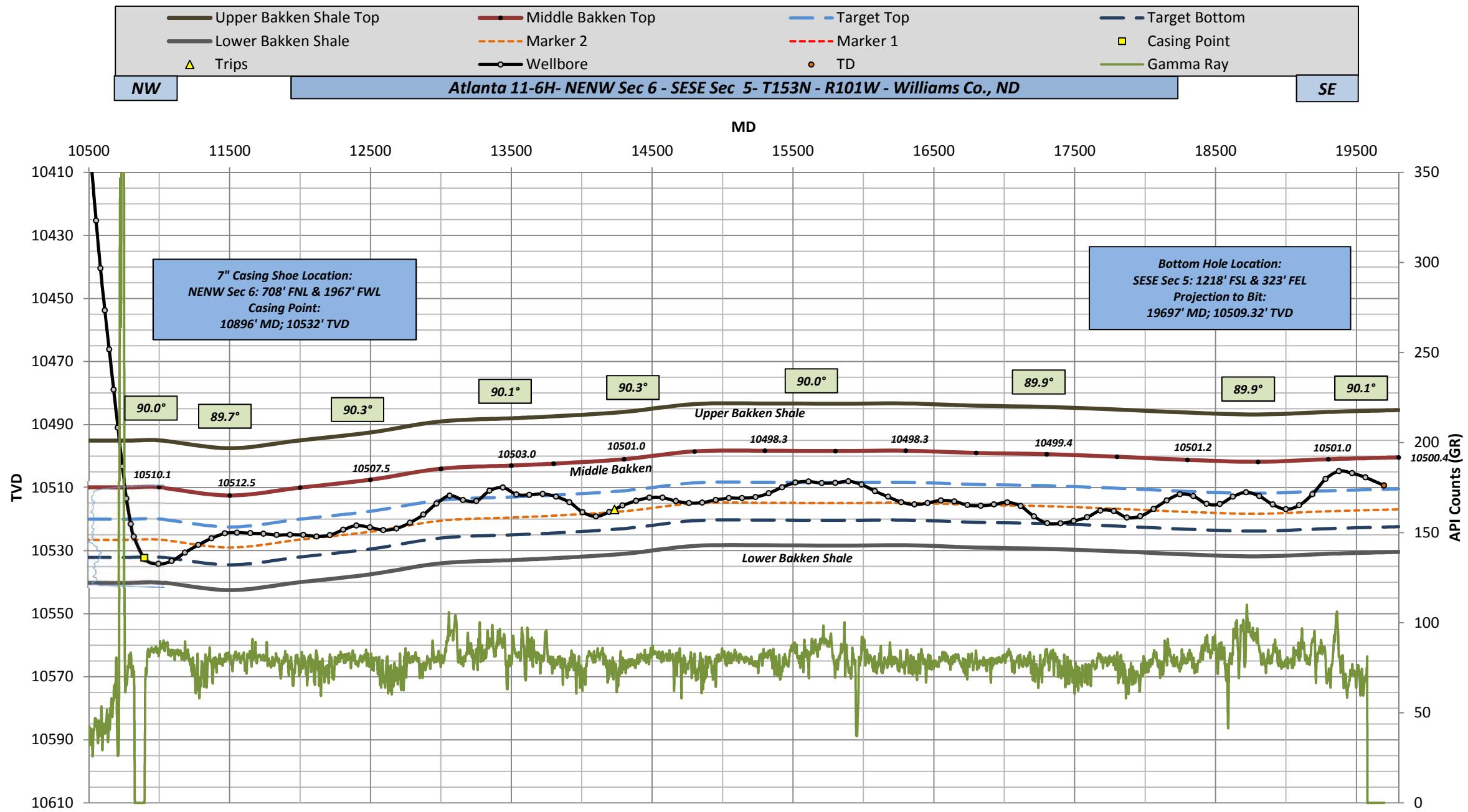
## Well Information

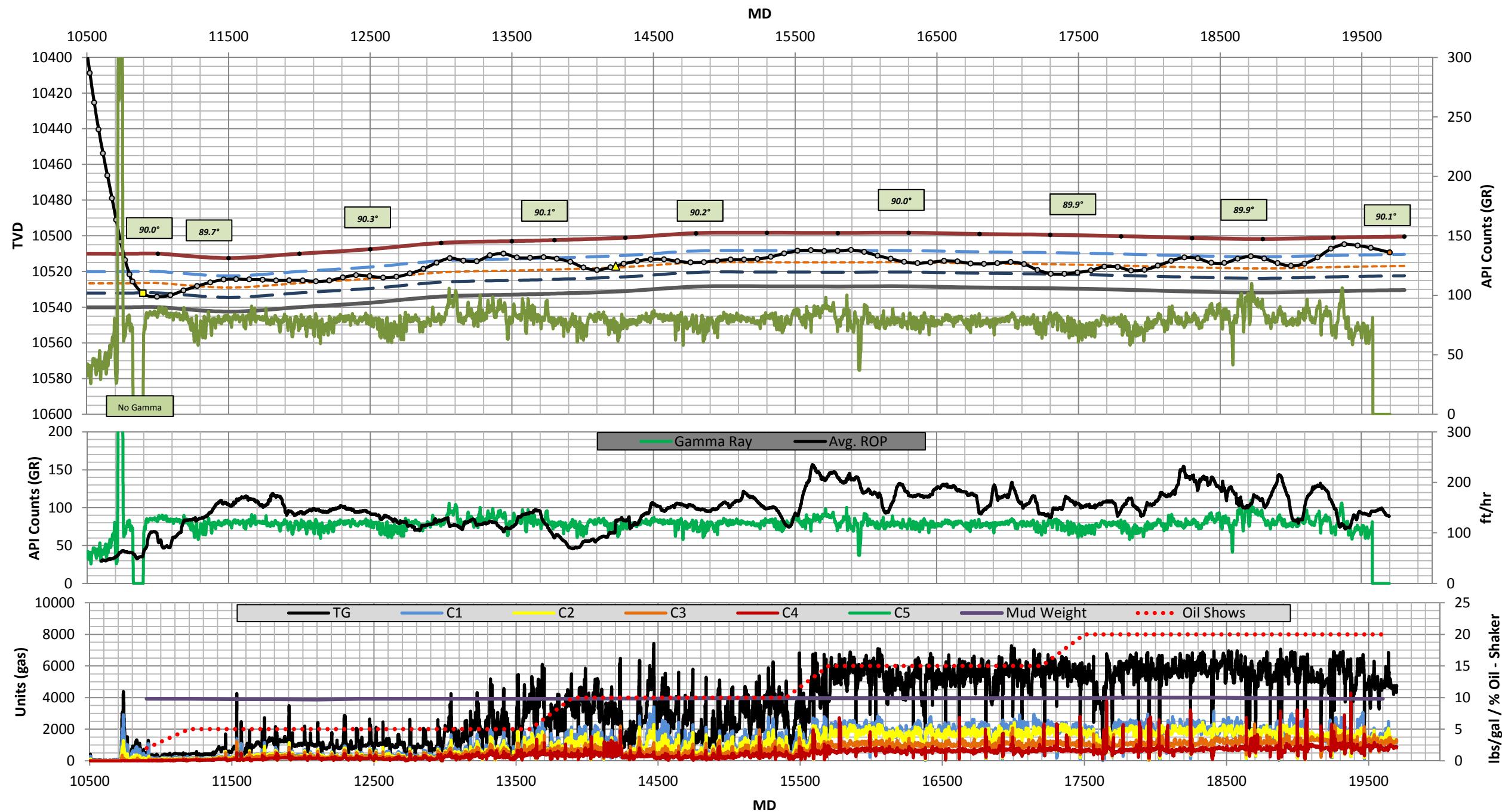
Helm Energy, LLC c/o Joe Brinkman 5251 DTC Parkway Suite 425 Greenwood Village, CO 80111 Email: <a href="mailto:jbrinkman@helmenergy.com">jbrinkman@helmenergy.com</a> (Send Well Information daily, via email)	See Attached Well Requirements	No	Yes
Intervention Energy, LLC Attn: John Zimmerman P.O. Box 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 11-6H was spud on March 12<sup>th</sup>, 2013 with a surface location of 495' FNL and 1350' FWL, NENW 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 10856' MD; 10530' TVD, 20' into the Middle Bakken Dolomite. The actual KOP was 9900' MD and actual casing point is 10896' MD; 10532' 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 9101' to the hardline in the SESE of section 5 - Township 153 North and Range 101 West following the estimated up dip of 89.90° - descending 15' over the length of the lateral and following an azimuth of 110.85°.

The offsets provided were the Hansen 11-2 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 previously drilled Atlanta 1-6H, Atlanta 2-6H, Atlanta 3-6H & the Atlanta 4-6H were 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-077) 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 9900' MD on March 20<sup>th</sup>, 2013. The up hole markers logged were the Base of the Last Salt (BLS) 9017' TVD, Mission Canyon 9244' TVD, and the Lodgepole 9787' TVD. The down hole markers below kick off point consisted of the False Bakken 10487' TVD, Upper Bakken Shale 10496' TVD and the Middle Bakken Member 10510' TVD. The BLS came in 6' low and the Mission Canyon came in 10' low to the prognosis. The rest of the tops came in the same as the prognosis. The landing for 7" intermediate casing was completed March 22<sup>nd</sup>, 2013 at 13:45 hours, 22' TVD into the Middle Bakken Dolomite with a landing at 10896' MD and 10532' TVD, with a location; NENW Sec 6 – T153N – R101W -- 708' FNL & 1967' FWL. (See Atlanta 11-6H Build and TVD logs for any additional information)

Gas observed in the build section, which showed gas averaging 47-151 units through the Lodgepole formation, with a max trip gas of 2954 and with no background sample shows and oil shows. There was an increase in the gas going through the Upper Bakken Shale, max of 4380u, and landing in the Middle Bakken Dolomite gas was averaging 500-725u of background, or average, gas.

**Lateral Leg:** Penetration of the lateral section started, on May 15<sup>th</sup>, 2013 at 16:07 hours with a depth of 10896' MD and 10532' TVD. The plan was to drill in the target zone and follow the 12' zone of interest. The lateral section was drilled from 10896' MD to 19697' MD for a lateral length of about 8801' MD. The section was drilled entirely in the Middle Bakken. There was one complete trip in the lateral section, for BHA performance @ 14233' MD. The lateral section was completed on May 20<sup>th</sup>, 2013 – 19697' MD and 10509.32' TVD, with a



## WELL SYNOPSIS

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*Bottom hole location: SESE Sec 5: 1218' FSL & 323' FEL. The Atlanta 11-6H was called approximately 100' short of actual TD for a motor failure.*

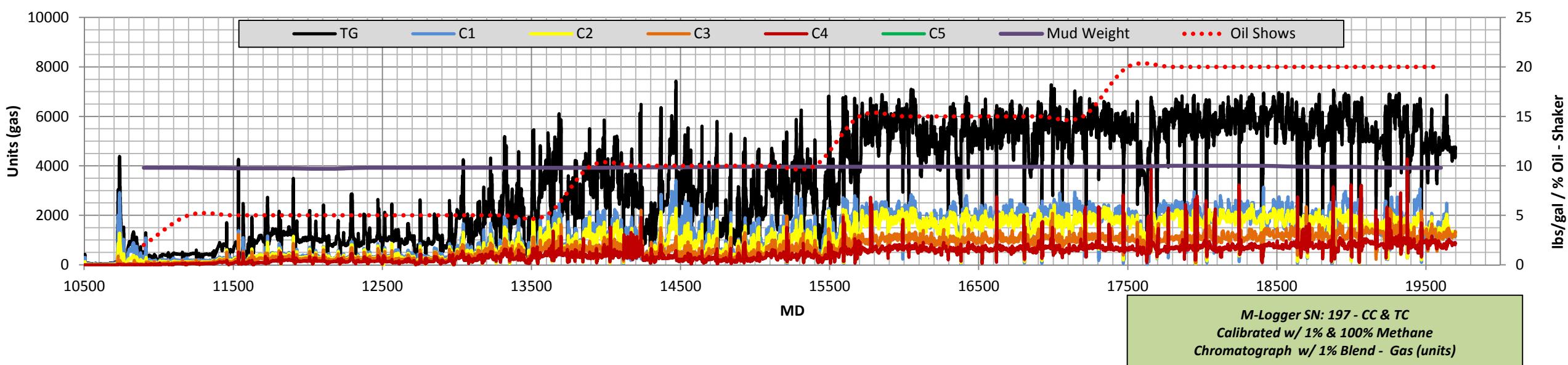
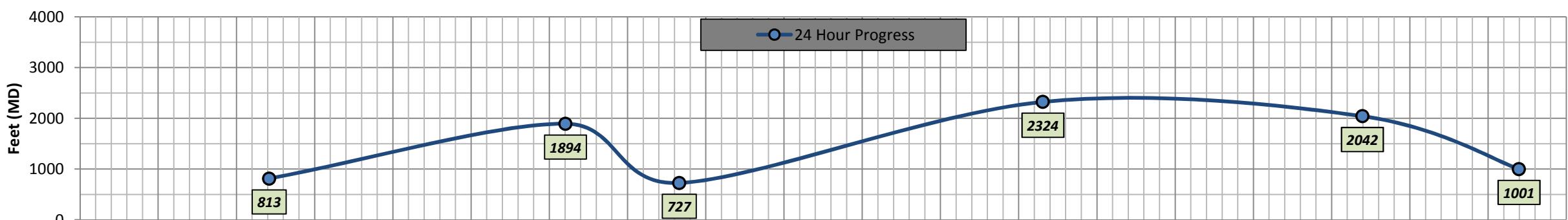
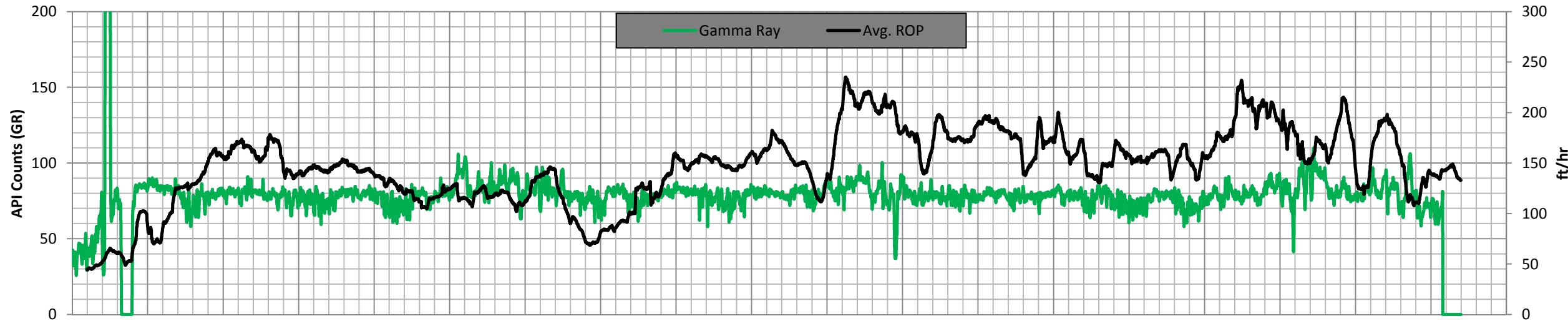
*Oil observed in the possum during the lateral section, ranged from 5-20% oil with a presence of light brown to green brown oil accumulating in the corners of the possum belly. Staining and fluorescence with a light blue to bright yellow - green cut were observed in the cuttings throughout the lateral section. While in the upper and middle target zone, the inter-crystalline porosity considered was fair to good. Samples collected were primarily light-dark gray, some tan-brown, trans tan, off white, 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 11-6H horizontal mud log)*

*Gas observed in the lateral section displayed an average of 3304u, ranging from 260u to 7395u. Connection gasses were ranging from 1431u to 7113u and trip gas maxed out at 7200 units with the gas buster on. Once total depth was reached, a short trip to the shoe and back to bottom resulted in 7800u of gas after circulating.*

*Using the cooler, hotter and consistent gamma counts in the target zone it was possible to identify formation dip changes during the lateral section. The top target line illustrates warmer more sporadic gamma (85-117) that is consistent with the upper 10-12' of the upper target zone which, corresponded with the tan/brown dolomite we were seeing near our upper hard streak. We also had Cooler gamma (62-79) present in the middle target zone (marker 1) which displayed more medium-dark gray properties. The more-tight consistent gamma counts (70-82) were present in the lower target zone 2' above and below the marker 1 line. Utilizing these gamma ranges it was decided to stay around the marker 1 line and drill between the hot and cool zone, giving us sufficient markers to keep track of formation dip changes. The lateral section was projected to come down 15', an average dip of 89.9°, but the formation came up roughly 23', an average dip of 90.06°.*

Drilling Activity													
ATLANTA 11-6H													
<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>SPP</u>	<u>SPM</u>	<u>WT</u>	<u>VIS</u>	<u>ACTIVITY</u>	
7	3/19/2013	9069	NA	27.2	79	402.6	119.1	3338	98	10.15	63	Drilling Vertical Section: Drill, Survey, Slide, Rig Service	
8	3/20/2013	9634	565	15.4	25	248.1	31.9	3365	99	10.2	77	Drilling Build Section: Drill, Survey, Slide, Rig Service	
9	3/21/2013	10364	730	31.8	0	316.7	37.7	3321	97	10.5	67	Drilling Build Section: Drill, Survey, Slide, Rig Service	
10	3/22/2013	10588	224	44.8	0	477.77	54.5	3301	88	10.7	73	Drilling Build Section: Drill, Survey, Slide, Rig Service, TOOH, TIH, Slip & Cut	
11	3/23/2013	10896	308	NA	NA	NA	NA	NA	NA	10.9	100	TD'D Build Section, Casing Operations	
3/23/13 Thru 5/15/13:		Casing Operations & Rig Move: Skid Rig to Drill Build Sections for 12-6H, 13-6H, 14-6H; Drill Lateral Sections: 14-6H, 13-6H, 12-6H											
65	5/16/2013	11709	813	9.8	64	814.2	170.3	3229	100	9.75	26	Drilled out of Casing, Drilling Lateral section: Drill, Survey, Slide, Rig Service	
66	5/17/2013	13603	1894	15.9	61	940.9	192.2	3441	100	9.8	28	Drilling Lateral Section: Drill, Survey, Slide, Rig Service	
67	5/18/2013	14330	727	14.8	61	596.3	111.3	3171	99	9.85	27	Drilling Lateral Section: Drill, Survey, Slide, Rig Service, TOOH, TIH	
68	5/19/2013	16654	2324	19.2	64	928.4	243.3	3631	100	9.9	27	Drilling Lateral Section: Drill, Survey, Slide, Rig Service	
69	5/20/2013	18696	2042	19.4	56	718	167.4	3777	99	10	27	Drilling Lateral Section: Drill, Survey, Slide, Rig Service	
69	5/20/2013	19697	1001	16.2	58	518.2	123.6	3122	99	9.8	26	TD'd Lateral Section - 5/20/13 - 19:38, Wiper Trip, Drill, Slide, Survey, Rig Service	

Chronological Gas/Sample/Oil							
Atlanta 11-6H							
<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>
3/19/2013	9069	61	23	21-33	NA	NA	No Shows
3/20/2013	9634	134	39	23-47	108	NA	No Shows
3/21/2013	10364	871	45	81-73	NA	NA	No Shows
3/22/2013	10588	421	39	NA	421	NA	No Shows
3/23/2013	10896	4379	578	NA	NA	NA	No Shows
<b>3/23/13 Thru 5/15/13</b>	<b>Casing Operations &amp; Rig Move: Skid Rig to Drill Build Sections for 12-6H, 13-6H, 14-6H; Drill Lateral Sections: 14-6H, 13-6H, 12-6H</b>						
5/16/2013	11709	4244	453	NA	4244	5%	G EVN BRI YEL-GRN FLOR, LT BLU/WHT STRMING/DIFF C
5/17/2013	13603	5182	1322	440-1641	NA	5%	G EVN BRI YEL-GRN FLOR, LT BLU/WHT STRMING/DIFF C
5/18/2013	14330	6452	3264	1864-4180	6452	10%	G EVN BRI YEL-GRN FLOR, LT BLU/WHT STRMING/DIFF C
5/19/2013	16654	7396	3827	943-5473	NA	15%	G EVN BRI YEL-GRN FLOR, LT BLU/WHT STRMING/DIFF C
5/20/2013	18696	7278	5480	6941-3464	NA	20%	G-VG DULL/BRI YEL-GRN FLOR, LT IM STM BLU/WHT DIFF C
5/20/2013	19697	7048	5255	5031-7048	NA	20%	G-VG DULL/BRI YEL-GRN FLOR, LT IM STM BLU/WHT DIFF C



Formation Tops							
Atlanta 11-6H							
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	9018	9017	-0.73	-7050	-7044	6	
Mission Canyon	9245	9244	-0.66	-7277	-7267	10	
Lodgepole	9788	9787	-1.36	-7820	-7820	0	
False Bakken	10698	10487	464.23	-8520	NP	--	
Upper Bakken Shale	10719	10496	483.52	-8529	-8529	0	
Middle Bakken	10755	10510	517.04	-8543	-8543	0	
Middle Bakken Target	10794	10520	554.37	-8553	NP	--	
		Projected Tops					
			Not Projected				
			Sub Sea (ft)				
			Actual Tops Picked				
		Tops picked by Drilling breaks (Rop & Differential), Samples, and Gamma					

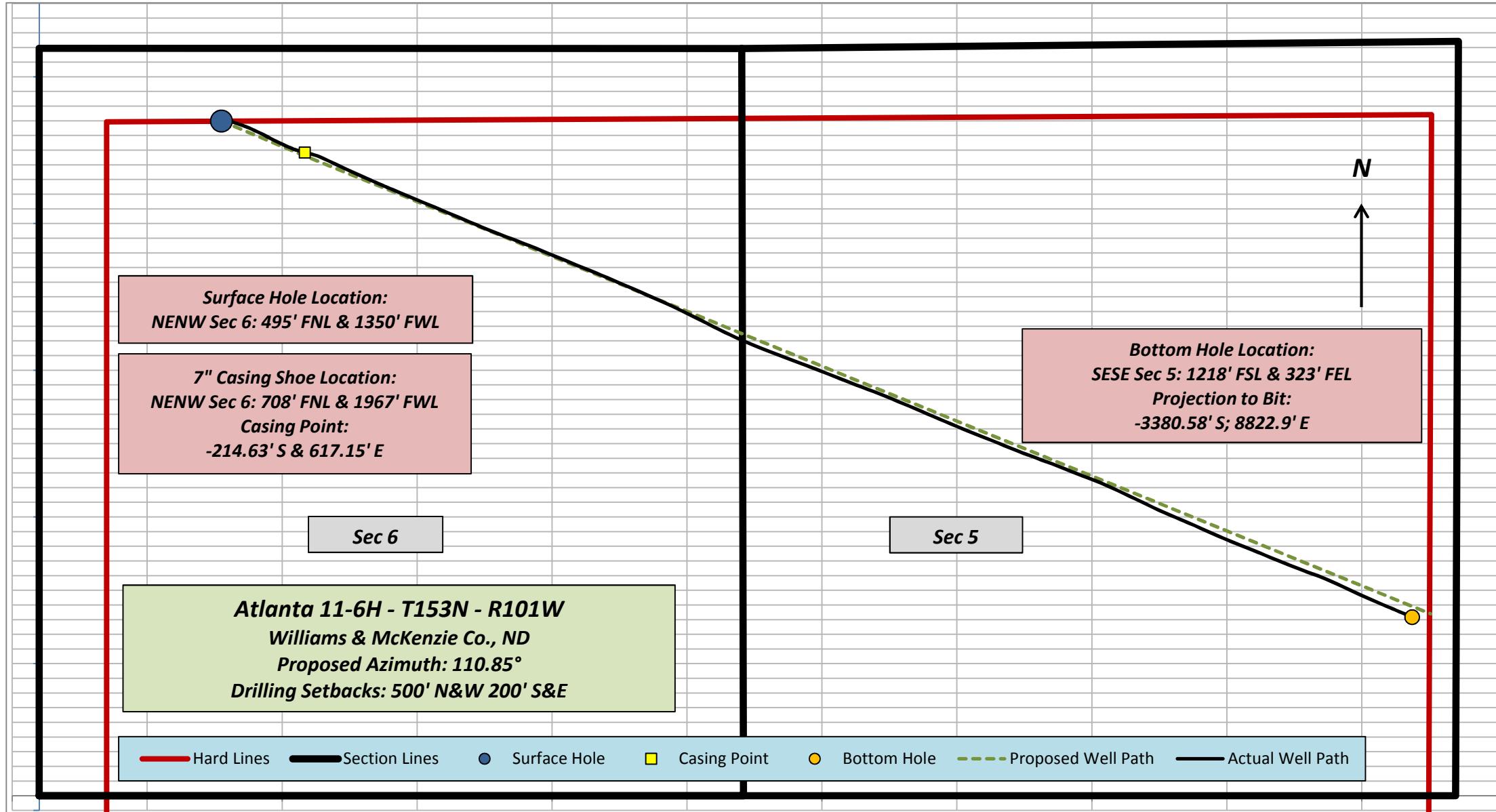
<u>Critical Points</u>	<u>MD</u>	<u>TVD</u>	<u>SUBSEA</u>	<u>V/S</u>
Middle Bakken Member	10755	10510	-8543	517.04
Surface Hole location	<b>NENW Section 6: 495' FNL &amp; 1350' FWL</b>			
Casing Point	10896	10532	-8565	652.7
Casing Location	<b>NENW Section 6: 708' FNL &amp; 1967' FWL</b>			
Total Depth (projection to Bit)	19697	10509	-8542	9448.37
Bottom Hole Location	<b>SESE Section 5: 1218' FSL &amp; 323' FEL</b>			

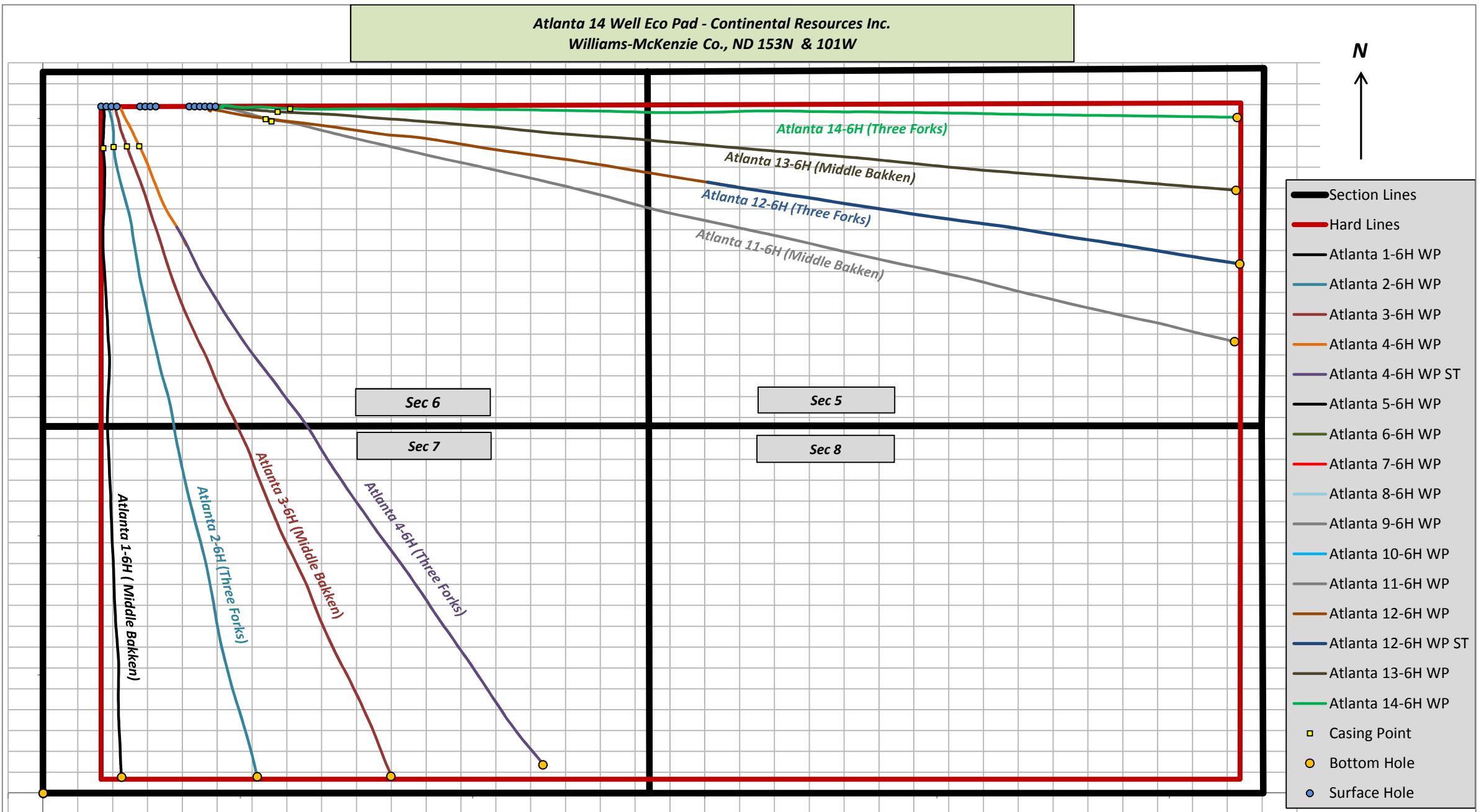
<u>Lateral Trips</u>	<u>MD</u>	<u>TVD</u>	<u>Vertical &amp; Build Trips</u>	<u>MD</u>	<u>TVD</u>
BHA	14233	10517	BHA	9587	9585
			BHA	10503	10399

#### LATERAL SUMMARY

Total Lateral Footage	<b>8801</b>	%	
Middle Bakken	8801	100.0%	<i>Target Zone</i>
		0.0%	<i>Out of Target Zone</i>
		100.0%	

Atlanta 11-6H: STRUCTURE (MD - TVD)									
MD (ft)	Upper Bakken Shale Top	Middle Bakken Top	Target Zone Top	Target Zone Bottom	Lower Bakken Shale	Marker 1	Marker 2	Dip (angle)	Dip Rate (ft/100)
10000.0	10495.0	10510.0	10520.0	10532.0	10540.0	10526.5			
10755.0	10495.1	10510.1	10520.1	10532.1	10540.1	10526.6		89.99	0.01
11000.0	10495.0	10510.0	10520.0	10532.0	10540.0	10526.5		90.02	-0.04
11500.0	10497.5	10512.5	10522.5	10534.5	10542.5	10529.0		89.71	0.50
12000.0	10495.0	10510.0	10520.0	10532.0	10540.0	10526.5		90.29	-0.50
12500.0	10492.5	10507.5	10517.5	10529.5	10537.5	10524.0		90.29	-0.50
13000.0	10489.0	10504.0	10514.0	10526.0	10534.0	10520.5		90.40	-0.70
13500.0	10488.0	10503.0	10513.0	10525.0	10533.0	10519.5		90.11	-0.20
13800.0	10487.4	10502.4	10512.4	10524.4	10532.4	10518.9		90.11	-0.20
14300.0	10486.0	10501.0	10511.0	10523.0	10531.0	10517.5		90.16	-0.28
14800.0	10483.5	10498.5	10508.5	10520.5	10528.5	10515.0		90.29	-0.50
15300.0	10483.3	10498.3	10508.3	10520.3	10528.3	10514.8		90.02	-0.04
15800.0	10483.4	10498.4	10508.4	10520.4	10528.4	10514.9		89.99	0.02
16300.0	10483.3	10498.3	10508.3	10520.3	10528.3	10514.8		90.01	-0.02
16800.0	10484.0	10499.0	10509.0	10521.0	10529.0	10515.5		89.92	0.14
17300.0	10484.4	10499.4	10509.4	10521.4	10529.4	10515.9		89.95	0.08
17800.0	10485.2	10500.2	10510.2	10522.2	10530.2	10516.7		89.91	0.16
18300.0	10486.2	10501.2	10511.2	10523.2	10531.2	10517.7		89.89	0.20
18800.0	10486.8	10501.8	10511.8	10523.8	10531.8	10518.3		89.93	0.12
19300.0	10486.0	10501.0	10511.0	10523.0	10531.0	10517.5		90.09	-0.16
19800.0	10485.4	10500.4	10510.4	10522.4	10530.4	10516.9		90.07	-0.12





# ADVANTAGE Field Survey Listing



INTEQ

<b>Operator</b>	Continental Resources			<b>Fields</b>	Williams County			<b>API No</b>	33-105-02722		<b>Location</b>	S6 T153N R101E	
<b>Well</b>	Atlanta 11-6H			<b>Wellbore</b>	Atlanta 11-6H Orig Hole			<b>Rig</b>	Cyclone 2		<b>Job</b>	5335027	
Well Origin													
<b>Latitude</b>	48.11 deg			<b>Longitude</b>			-103.73 deg						
<b>North Reference</b>	True			<b>Drill Depth Zero</b>			Kelly Bushing						
<b>Vertical Datum is</b>	Mean Sea Level			<b>Vertical Datum to DDZ</b>			1967.00 ft						
<b>Vertical Section North</b>	0.00 ft			<b>Vertical Section East</b>			0.00 ft						
<b>Vertical Section Azimuth</b>	110.85 deg			<b>Vertical Section Depth</b>			0.00 ft						
<b>Grid Convergence</b>	0.00 deg			<b>Magnetic Declination</b>			8.55 deg						
<b>Total Correction</b>	8.55 deg			<b>TVD Calculation Method</b>			Minimum Curvature						
<b>D-Raw Calculation</b>	None			<b>Local Magnetic Field</b>			56610 nT						
<b>Local Magnetic Dip Angle</b>	73.02 deg			<b>Local Gravity Field</b>			9.812 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	0.00					
U	1986.00	1.20	214.90	-3.66	17.97	1985.72	18.09	174.3	1,986.00	0.06	0.06	-7.31	
	2083.00	1.38	242.98	-5.02	16.35	2082.70	17.07	174.3	97.00	0.67	0.18	28.95	
	2177.00	1.23	251.89	-5.85	14.38	2176.67	15.52	174.3	94.00	0.26	-0.15	9.47	
	2270.00	1.65	250.47	-6.61	12.17	2269.64	13.73	174.3	93.00	0.45	0.45	-1.53	
	2364.00	1.77	262.11	-7.26	9.45	2363.60	11.42	174.3	94.00	0.39	0.12	12.39	
	2458.00	0.82	200.64	-8.09	7.78	2457.58	10.15	174.3	94.00	1.65	-1.01	-65.39	
	2551.00	1.01	83.42	-8.62	8.36	2550.57	10.88	174.3	93.00	1.68	0.20	-126.05	
	2643.00	0.80	84.92	-8.47	9.80	2642.56	12.18	174.3	92.00	0.23	-0.22	1.63	
	2737.00	0.84	99.94	-8.53	11.14	2736.55	13.44	174.3	94.00	0.23	0.04	15.98	
	2829.00	1.37	177.72	-9.74	11.85	2828.54	14.54	174.3	92.00	1.57	0.58	84.54	
	2922.00	1.39	174.00	-11.98	12.01	2921.51	15.49	174.3	93.00	0.10	0.02	-4.00	
	3016.00	0.58	258.55	-13.21	11.66	3015.50	15.60	174.3	94.00	1.55	-0.86	89.95	
	3109.00	0.46	298.38	-13.12	10.86	3108.50	14.82	174.3	93.00	0.40	-0.13	42.82	
	3202.00	0.33	328.97	-12.72	10.40	3201.49	14.24	174.3	93.00	0.26	-0.15	32.89	
	3295.00	0.62	330.38	-12.05	10.01	3294.49	13.64	174.3	93.00	0.32	0.32	1.52	
	3387.00	0.52	329.86	-11.25	9.55	3386.49	12.93	174.3	92.00	0.11	-0.11	-0.56	
	3480.00	0.59	5.00	-10.41	9.38	3479.48	12.47	174.3	93.00	0.37	0.08	37.79	
	3573.00	0.50	17.75	-9.54	9.55	3572.48	12.32	174.3	93.00	0.17	-0.10	13.71	
	3667.00	0.48	3.24	-8.76	9.69	3666.48	12.18	174.3	94.00	0.13	-0.02	-15.45	
	3761.00	0.11	316.54	-8.31	9.65	3760.47	11.98	174.3	94.00	0.44	-0.39	-49.68	
	3855.00	0.33	21.22	-7.99	9.69	3854.47	11.90	174.3	94.00	0.32	0.24	68.80	
	3947.00	0.31	31.70	-7.52	9.92	3946.47	11.95	174.3	92.00	0.07	-0.02	11.40	
	4041.00	0.33	83.52	-7.27	10.32	4040.47	12.24	174.3	94.00	0.30	0.02	55.13	
	4134.00	0.15	109.71	-7.29	10.71	4133.47	12.60	174.3	93.00	0.22	-0.19	28.16	
	4227.00	0.35	105.02	-7.40	11.10	4226.47	13.01	174.3	93.00	0.21	0.21	-5.04	
	4321.00	0.47	102.91	-7.56	11.76	4320.47	13.68	174.3	94.00	0.13	0.13	-2.24	
	4414.00	0.25	117.53	-7.74	12.31	4413.46	14.26	174.3	93.00	0.26	-0.24	15.72	
	4508.00	0.49	118.33	-8.03	12.84	4507.46	14.86	174.3	94.00	0.26	0.26	0.85	
	4601.00	0.40	118.19	-8.37	13.48	4600.46	15.58	174.3	93.00	0.10	-0.10	-0.15	
	4695.00	0.58	97.19	-8.59	14.25	4694.46	16.37	174.3	94.00	0.26	0.18	-22.34	
	4789.00	0.90	138.15	-9.20	15.21	4788.45	17.49	174.3	94.00	0.64	0.34	43.58	
	4882.00	0.61	148.17	-10.16	15.96	4881.44	18.53	174.3	93.00	0.34	-0.31	10.77	
	4976.00	0.91	322.50	-9.99	15.76	4975.44	18.29	174.3	94.00	1.62	0.32	185.45	
	5069.00	0.83	344.57	-8.76	15.14	5068.43	17.26	174.3	93.00	0.37	-0.09	23.73	
	5162.00	1.13	43.42	-7.45	15.59	5161.42	17.22	174.3	93.00	1.07	0.32	63.28	
	5255.00	0.94	55.25	-6.34	16.84	5254.40	18.00	174.3	93.00	0.31	-0.20	12.72	
	5348.00	1.11	299.18	-5.47	16.69	5347.39	17.54	174.3	93.00	1.87	0.18	-124.80	
	5442.00	0.80	297.10	-4.73	15.31	5441.38	15.99	174.3	94.00	0.33	-0.33	-2.21	
	5536.00	0.67	312.78	-4.05	14.31	5535.37	14.82	174.3	94.00	0.25	-0.14	16.67	
	5629.00	0.37	318.94	-3.45	13.72	5628.37	14.05	174.3	93.00	0.33	-0.33	6.63	
	5723.00	0.34	0.17	-2.95	13.52	5722.37	13.68	174.3	94.00	0.27	-0.03	43.86	
	5817.00	0.94	110.66	-2.94	14.24	5816.36	14.35	174.3	94.00	1.17	0.64	117.54	
	5910.00	1.00	135.30	-3.79	15.52	5909.35	15.85	174.3	93.00	0.45	0.07	26.50	
	6004.00	1.15	234.02	-4.93	15.33	6003.34	16.08	174.3	94.00	1.74	0.16	105.02	
	6098.00	1.35	215.75	-6.38	13.92	6097.32	15.28	174.3	94.00	0.47	0.21	-19.45	
	6191.00	1.35	196.23	-8.32	12.98	6190.29	15.09	174.3	93.00	0.49	0.00	-20.99	
	6285.00	2.02	173.16	-11.03	12.86	6284.25	15.95	174.3	94.00	1.00	0.71	-24.54	
	6378.00	3.07	168.34	-15.09	13.56	6377.16	18.05	174.3	93.00	1.15	1.13	-5.18	
	6472.00	2.70	168.09	-19.72	14.53	6471.04	20.59	174.3	94.00	0.39	-0.39	-0.26	

# ADVANTAGE Field Survey Listing

**INTEQ**

Operator Continental Resources				Fields Williams County				API No	33-105-02722		Location S6 T153N R101E		
Well	Atlanta 11-6H			Wellbore	Atlanta 11-6H Orig Hole			Rig	Cyclone 2	Job	5335027		
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	
	6565.00	1.59	188.64	-23.15	14.78	6563.97	22.05	174.3	93.00	1.43	-1.19	22.09	
	6659.00	1.25	246.02	-24.86	13.65	6657.95	21.60	174.3	94.00	1.49	-0.36	61.04	
	6753.00	0.25	185.86	-25.48	12.69	6751.94	20.92	174.3	94.00	1.23	-1.07	-64.01	
	6845.00	1.25	308.65	-25.04	11.88	6843.93	20.02	174.3	92.00	1.52	1.09	133.47	
	6939.00	1.13	313.05	-23.77	10.40	6937.91	18.18	174.3	94.00	0.16	-0.12	4.69	
	7032.00	1.02	314.37	-22.56	9.14	7030.90	16.57	174.3	93.00	0.13	-0.13	1.42	
	7126.00	1.24	326.03	-21.13	7.97	7124.88	14.97	174.3	94.00	0.34	0.24	12.41	
	7219.00	1.27	326.48	-19.44	6.84	7217.86	13.31	174.3	93.00	0.03	0.02	0.48	
	7313.00	1.45	325.98	-17.59	5.60	7311.83	11.49	174.3	94.00	0.19	0.19	-0.53	
	7406.00	1.32	331.39	-15.67	4.43	7404.80	9.72	174.3	93.00	0.20	-0.14	5.82	
	7499.00	1.36	343.68	-13.67	3.61	7497.78	8.24	174.3	93.00	0.31	0.05	13.21	
	7593.00	1.41	345.69	-11.48	3.01	7591.75	6.90	174.3	94.00	0.07	0.05	2.14	
	7687.00	1.37	336.07	-9.33	2.27	7685.72	5.44	174.3	94.00	0.25	-0.04	-10.23	
	7780.00	1.59	341.21	-7.10	1.40	7778.69	3.83	174.3	93.00	0.27	0.23	5.53	
	7873.00	1.66	356.00	-4.53	0.89	7871.65	2.44	174.3	93.00	0.46	0.08	15.90	
	7966.00	1.59	338.09	-1.98	0.31	7964.62	1.00	174.3	93.00	0.55	-0.08	-19.25	
	8060.00	0.77	6.80	-0.14	-0.10	8058.60	-0.04	174.3	94.00	1.05	-0.87	30.54	
	8153.00	0.86	5.13	1.18	0.04	8151.59	-0.38	174.3	93.00	0.09	0.09	-1.79	
	8247.00	1.02	26.83	2.62	0.48	8245.58	-0.49	174.3	94.00	0.41	0.17	23.08	
	8341.00	0.58	21.08	3.81	1.02	8339.57	-0.40	174.3	94.00	0.47	-0.47	-6.11	
	8434.00	0.87	21.00	4.90	1.44	8432.56	-0.40	174.3	93.00	0.31	0.31	-0.09	
	8527.00	0.68	14.42	6.10	1.84	8525.55	-0.46	174.3	93.00	0.22	-0.20	-7.08	
	8621.00	0.64	25.85	7.11	2.20	8619.54	-0.47	166.2	94.00	0.15	-0.04	12.17	
	8713.00	0.76	16.69	8.16	2.60	8711.54	-0.47	266.2	92.00	0.18	0.13	-9.96	
	8806.00	0.46	4.79	9.12	2.81	8804.53	-0.62	168.9	93.00	0.35	-0.33	-12.80	
	8900.00	0.62	14.95	9.98	2.97	8898.53	-0.78	174.3	94.00	0.20	0.17	10.81	
	8994.00	0.50	28.92	10.83	3.30	8992.52	-0.77	177.0	94.00	0.19	-0.13	14.87	
	9087.00	0.34	19.46	11.44	3.59	9085.52	-0.72	179.7	93.00	0.18	-0.17	-10.17	
	9181.00	0.47	32.60	12.02	3.88	9179.52	-0.65	182.5	94.00	0.17	0.14	13.98	
	9274.00	0.56	2.16	12.80	4.10	9272.51	-0.72	179.7	93.00	0.31	0.11	-32.73	
	9368.00	0.33	14.50	13.52	4.19	9366.51	-0.90	182.5	94.00	0.27	-0.25	13.12	
	9461.00	0.53	9.83	14.21	4.33	9459.51	-1.01	187.9	93.00	0.22	0.21	-5.02	
	9555.00	0.35	15.46	14.92	4.48	9553.51	-1.12	166.2	94.00	0.20	-0.19	5.99	
	9647.00	0.44	6.70	15.54	4.60	9645.50	-1.23	174.3	92.00	0.12	0.10	-9.52	
	9741.00	0.49	18.58	16.28	4.77	9739.50	-1.34	179.7	94.00	0.11	0.05	12.64	
	9834.00	0.45	5.81	17.01	4.93	9832.50	-1.45	182.5	93.00	0.12	-0.04	-13.73	
	9928.00	2.65	96.75	17.13	7.12	9926.46	0.56	179.7	94.00	2.86	2.34	96.75	
	9959.00	6.35	100.72	16.72	9.52	9957.36	2.94	182.5	31.00	11.99	11.96	12.81	
	9990.00	9.57	105.19	15.73	13.69	9988.06	7.20	182.5	31.00	10.55	10.37	14.43	
	10021.00	12.53	107.13	14.06	19.39	10018.48	13.12	182.5	31.00	9.62	9.55	6.26	
	10052.00	16.27	107.42	11.77	26.75	10048.50	20.81	182.5	31.00	12.07	12.07	0.92	
	10083.00	19.77	106.14	9.01	35.93	10077.98	30.37	185.2	31.00	11.38	11.31	-4.12	
	10115.00	22.87	108.14	5.57	47.04	10107.79	41.98	182.5	32.00	9.93	9.67	6.24	
	10146.00	26.70	110.04	1.31	59.32	10135.93	54.97	182.5	31.00	12.63	12.37	6.13	
	10177.00	30.49	108.51	-3.58	73.32	10163.14	69.79	187.9	31.00	12.45	12.23	-4.93	
	10208.00	33.84	107.53	-8.68	89.02	10189.38	86.27	187.9	31.00	10.93	10.79	-3.17	
	10239.00	36.46	108.08	-14.14	106.01	10214.72	104.09	187.9	31.00	8.51	8.45	1.79	
	10270.00	37.94	107.72	-19.89	123.84	10239.41	122.81	187.9	31.00	4.85	4.79	-1.18	
	10301.00	39.86	108.58	-25.96	142.34	10263.54	142.26	187.9	31.00	6.43	6.19	2.78	
	10332.00	42.69	108.09	-32.39	161.75	10286.83	162.69	187.9	31.00	9.17	9.11	-1.58	
	10364.00	45.50	108.96	-39.47	182.86	10309.81	184.93	187.9	32.00	8.99	8.79	2.72	
	10395.00	46.92	111.11	-47.14	203.88	10331.27	207.30	185.2	31.00	6.79	4.57	6.95	
	10427.00	49.53	113.56	-56.22	225.94	10352.59	231.15	106.8	32.00	9.97	8.18	7.65	
	10458.00	52.45	112.83	-65.70	248.08	10372.10	255.22	177.0	31.00	9.58	9.40	-2.36	
	10489.00	54.40	113.17	-75.43	270.99	10390.57	280.10	179.7	31.00	6.36	6.30	1.10	
	10521.00	56.32	114.34	-86.04	295.09	10408.76	306.39	174.3	32.00	6.72	6.01	3.64	
	10552.00	58.99	115.47	-97.07	318.84	10425.34	332.51	179.7	31.00	9.15	8.61	3.65	
	10583.00	62.89	116.27	-108.89	343.22	10440.39	359.50	182.5	31.00	12.79	12.58	2.60	
	10614.00	66.10	115.31	-121.06	368.41	10453.74	387.37	190.6	31.00	10.72	10.34	-3.11	
	10645.00	66.66	114.43	-133.01	394.17	10466.16	415.70	190.6	31.00	3.16	1.79	-2.85	

# ADVANTAGE Field Survey Listing

**INTEQ**

<b>Operator</b> Continental Resources				<b>Fields</b> Williams County				<b>API No</b>	33-105-02722			<b>Location</b>	S6 T153N R101E
<b>Well</b>		Atlanta 11-6H		<b>Wellbore</b> Atlanta 11-6H Orig Hole				<b>Rig</b>	Cyclone 2			<b>Job</b>	5335027
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	
	10677.00	66.37	114.12	-145.07	420.93	10478.92	445.00	190.6	32.00	1.26	-0.91	-0.96	
	10707.00	66.16	114.09	-156.29	446.00	10490.99	472.42	187.9	30.00	0.69	-0.69	-0.10	
	10739.00	68.52	112.71	-168.01	473.09	10503.32	501.91	190.6	32.00	8.37	7.36	-4.33	
	10770.00	72.73	111.53	-179.01	500.18	10513.61	531.14	190.6	31.00	14.05	13.58	-3.79	
	10801.00	77.41	110.27	-189.69	528.16	10521.59	561.09	190.6	31.00	15.62	15.12	-4.07	
	10822.00	80.83	109.90	-196.77	547.52	10525.55	581.70	193.3	21.00	16.34	16.24	-1.77	

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

**Notice:** Field Copy Only. Certified results will be provided after submission to the Baker Hughes INTEQ office.



Job Number:   
Company: Continental Resources  
Lease/Well: Atlanta 11-6H  
Location: Williams County  
Rig Name: Cyclone 2  
RKB:   
G.L. or M.S.L.:

State/Country: North Dakota  
Declination:   
Grid:   
File name: C:\DOCUME~1\CAIG\DESKTOP\ATLNT~11.SVY  
Date/Time: 21-May-13 / 00:27  
Curve Name: Atlanta 11-6H

### Atlanta 13-6H

WINSERVE SURVEY CALCULATIONS  
*Minimum Curvature Method*  
Vertical Section Plane 110.85  
Vertical Section Referenced to Wellhead  
Rectangular Coordinates Referenced to Wellhead

Measured Depth FT	Incl Angle Deg	Drift Direction Deg	True Vertical Depth	N-S FT	E-W FT	Vertical Section FT	Distance FT	CLOSURE Direction Deg	Dogleg Severity Deg/100
<b>Tie in</b>									
10822.00	80.83	109.90	10525.57	-195.62	545.83	579.71	579.83	109.72	.00
10901.00	88.90	98.20	10532.66	-214.62	621.97	657.63	657.96	109.04	17.93
10995.00	89.30	111.10	10534.14	-238.34	712.71	750.87	751.51	108.49	13.73
11089.00	91.70	113.40	10533.32	-273.93	799.70	844.83	845.32	108.91	3.54
11183.00	91.60	113.80	10530.62	-311.55	885.80	938.68	938.99	109.38	.44
11278.00	91.30	112.40	10528.21	-348.81	973.15	1033.58	1033.78	109.72	1.51
11371.00	91.30	112.40	10526.10	-384.24	1059.12	1126.52	1126.66	109.94	.00
11466.00	90.60	111.80	10524.53	-419.97	1147.12	1221.48	1221.58	110.11	.97
11553.00	89.70	111.30	10524.30	-451.93	1228.04	1308.47	1308.56	110.20	1.18
11647.00	90.10	111.30	10524.46	-486.07	1315.62	1402.47	1402.54	110.28	.43
11741.00	89.70	110.90	10524.63	-519.91	1403.32	1496.47	1496.53	110.33	.60
11835.00	89.80	110.90	10525.04	-553.45	1491.13	1590.47	1590.53	110.36	.11

Measured Depth FT	Incl Angle Deg	Drift Direction Deg	True Vertical Depth	N-S FT	E-W FT	Vertical Section FT	C L O S U R E Distance FT	Direction Deg	Dogleg Severity Deg/100
11929.00	90.30	111.00	10524.95	-587.06	1578.92	1684.47	1684.52	110.40	.54
12024.00	89.60	111.20	10525.04	-621.26	1667.55	1779.47	1779.51	110.43	.77
12117.00	89.80	111.30	10525.52	-654.96	1754.22	1872.46	1872.50	110.47	.24
12212.00	90.70	111.10	10525.11	-689.32	1842.79	1967.46	1967.49	110.51	.97
12307.00	91.40	111.50	10523.37	-723.82	1931.28	2062.44	2062.47	110.55	.85
12401.00	90.20	109.80	10522.06	-756.96	2019.23	2156.42	2156.45	110.55	2.21
12496.00	89.10	109.10	10522.64	-788.60	2108.81	2251.39	2251.43	110.50	1.37
12592.00	89.90	109.60	10523.47	-820.40	2199.38	2347.35	2347.41	110.46	.98
12685.00	90.70	109.50	10522.99	-851.52	2287.02	2440.33	2440.40	110.42	.87
12781.00	91.50	111.60	10521.14	-885.21	2376.89	2536.30	2536.37	110.43	2.34
12876.00	91.60	110.60	10518.57	-919.40	2465.48	2631.27	2631.33	110.45	1.06
12969.00	92.70	110.90	10515.09	-952.32	2552.39	2724.20	2724.26	110.46	1.23
13063.00	90.40	110.80	10512.54	-985.77	2640.19	2818.16	2818.22	110.47	2.45
13158.00	87.90	109.50	10513.95	-1018.49	2729.36	2913.13	2913.20	110.46	2.97
13252.00	91.70	111.70	10514.28	-1051.55	2817.33	3007.11	3007.17	110.47	4.67
13346.00	92.30	111.70	10511.00	-1086.29	2904.61	3101.04	3101.10	110.51	.64
13441.00	88.90	111.20	10510.01	-1121.02	2993.01	3196.01	3196.06	110.53	3.62
13536.00	88.50	112.10	10512.16	-1156.06	3081.29	3290.98	3291.02	110.57	1.04
13629.00	91.30	112.20	10512.32	-1191.12	3167.42	3383.95	3383.98	110.61	3.01
13724.00	89.10	112.00	10511.99	-1226.86	3255.43	3478.92	3478.94	110.65	2.33
13818.00	89.80	113.40	10512.89	-1263.13	3342.14	3572.86	3572.87	110.70	1.67
13913.00	88.10	114.30	10514.63	-1301.53	3429.01	3667.71	3667.71	110.79	2.02
14007.00	88.00	114.90	10517.83	-1340.64	3514.43	3761.45	3761.45	110.88	.65
14101.00	90.40	115.00	10519.15	-1380.29	3599.64	3855.20	3855.21	110.98	2.56
14196.00	91.30	114.70	10517.74	-1420.20	3685.84	3949.95	3949.98	111.07	1.00
14290.00	91.20	113.40	10515.69	-1458.50	3771.65	4043.78	4043.84	111.14	1.39
14385.00	90.60	112.00	10514.19	-1495.16	3859.28	4138.72	4138.79	111.18	1.60
14480.00	90.60	110.70	10513.20	-1529.74	3947.76	4233.71	4233.78	111.18	1.37
14574.00	89.40	109.20	10513.20	-1561.81	4036.11	4327.69	4327.75	111.15	2.04
14668.00	89.30	109.50	10514.26	-1592.96	4124.80	4421.65	4421.70	111.12	.34
14762.00	89.90	109.10	10514.92	-1624.02	4213.51	4515.62	4515.65	111.08	.77
14856.00	90.30	109.30	10514.76	-1654.94	4302.28	4609.58	4609.60	111.04	.48
14951.00	90.70	109.60	10513.93	-1686.57	4391.86	4704.55	4704.56	111.01	.53
15045.00	90.00	110.10	10513.35	-1718.49	4480.27	4798.53	4798.54	110.99	.92

Measured Depth FT	Incl Angle Deg	Drift Direction Deg	True Vertical Depth	N-S FT	E-W FT	Vertical Section FT	C L O S U R E Distance FT	Direction Deg	Dogleg Severity Deg/100
15139.00	90.00	109.90	10513.35	-1750.64	4568.60	4892.52	4892.53	110.97	.21
15234.00	90.40	109.50	10513.02	-1782.66	4658.04	4987.50	4987.50	110.94	.60
15328.00	91.10	109.30	10511.79	-1813.88	4746.69	5081.46	5081.46	110.91	.77
15423.00	91.20	109.00	10509.89	-1845.04	4836.42	5176.40	5176.40	110.88	.33
15517.00	90.60	111.00	10508.41	-1877.18	4924.73	5270.37	5270.37	110.87	2.22
15611.00	89.80	111.20	10508.08	-1911.02	5012.43	5364.37	5364.37	110.87	.88
15705.00	89.60	110.80	10508.57	-1944.71	5100.18	5458.37	5458.37	110.87	.48
15800.00	90.50	111.90	10508.49	-1979.29	5188.66	5553.36	5553.36	110.88	1.50
15894.00	90.10	111.70	10508.00	-2014.20	5275.94	5647.35	5647.35	110.90	.48
15987.00	88.60	110.90	10509.05	-2047.98	5362.58	5740.33	5740.34	110.90	1.83
16082.00	88.90	111.20	10511.12	-2082.09	5451.22	5835.31	5835.31	110.90	.45
16175.00	88.90	110.30	10512.91	-2115.04	5538.17	5928.29	5928.29	110.90	.97
16269.00	89.00	109.80	10514.63	-2147.26	5626.46	6022.27	6022.27	110.89	.54
16363.00	90.10	110.60	10515.37	-2179.72	5714.67	6116.26	6116.26	110.88	1.45
16456.00	90.50	110.60	10514.88	-2212.44	5801.72	6209.25	6209.25	110.87	.43
16551.00	90.50	110.40	10514.06	-2245.70	5890.70	6304.25	6304.25	110.87	.21
16645.00	89.10	108.50	10514.38	-2277.00	5979.33	6398.21	6398.21	110.85	2.51
16739.00	89.50	108.60	10515.53	-2306.90	6068.44	6492.13	6492.13	110.81	.44
16833.00	90.20	109.00	10515.78	-2337.20	6157.42	6586.07	6586.07	110.79	.86
16927.00	90.30	110.60	10515.37	-2369.04	6245.86	6680.05	6680.06	110.77	1.71
17022.00	90.50	110.20	10514.70	-2402.15	6334.90	6775.04	6775.05	110.77	.47
17116.00	88.10	108.90	10515.85	-2433.60	6423.47	6869.00	6869.01	110.75	2.90
17211.00	87.90	111.30	10519.17	-2466.23	6512.62	6963.93	6963.94	110.74	2.53
17305.00	89.50	112.70	10521.30	-2501.43	6599.75	7057.88	7057.89	110.76	2.26
17400.00	90.40	113.70	10521.38	-2538.85	6687.06	7152.80	7152.80	110.79	1.42
17493.00	90.60	113.70	10520.57	-2576.23	6772.22	7245.68	7245.68	110.83	.22
17588.00	90.80	113.60	10519.41	-2614.34	6859.23	7340.56	7340.56	110.86	.24
17682.00	91.80	113.40	10517.28	-2651.81	6945.41	7434.43	7434.44	110.90	1.08
17777.00	88.00	110.90	10517.45	-2687.62	7033.38	7529.39	7529.39	110.91	4.79
17871.00	89.50	111.10	10519.50	-2721.30	7121.11	7623.36	7623.36	110.91	1.61
17966.00	91.00	112.40	10519.08	-2756.50	7209.34	7718.34	7718.35	110.92	2.09
18060.00	91.80	112.40	10516.78	-2792.31	7296.22	7812.28	7812.29	110.94	.85
18154.00	91.50	111.70	10514.08	-2827.58	7383.31	7906.22	7906.23	110.96	.81
18248.00	90.90	111.30	10512.11	-2862.02	7470.75	8000.19	8000.21	110.96	.77

Measured Depth FT	Incl Angle Deg	Drift Direction Deg	True Vertical Depth	N-S FT	E-W FT	Vertical Section FT	C L O S U R E Distance FT	Direction Deg	Dogleg Severity Deg/100
18342.00	88.40	109.60	10512.68	-2894.86	7558.82	8094.18	8094.19	110.96	3.22
18437.00	88.60	110.20	10515.17	-2927.19	7648.11	8189.13	8189.14	110.94	.67
18530.00	91.30	111.40	10515.25	-2960.21	7735.04	8282.12	8282.13	110.94	3.18
18624.00	91.60	110.60	10512.87	-2993.88	7822.77	8376.09	8376.10	110.94	.91
18717.00	90.10	110.10	10511.49	-3026.22	7909.95	8469.07	8469.08	110.94	1.70
18811.00	88.40	108.80	10512.72	-3057.52	7998.57	8563.03	8563.04	110.92	2.28
18906.00	88.40	108.40	10515.38	-3087.81	8088.58	8657.92	8657.92	110.89	.42
19000.00	89.80	110.80	10516.85	-3119.33	8177.11	8751.88	8751.88	110.88	2.96
19094.00	91.70	113.20	10515.62	-3154.54	8264.25	8845.84	8845.84	110.89	3.26
19188.00	92.60	113.30	10512.10	-3191.62	8350.55	8939.69	8939.70	110.92	.96
19282.00	93.30	112.80	10507.26	-3228.37	8436.93	9033.49	9033.51	110.94	.91
19376.00	89.70	111.80	10504.80	-3264.02	8523.86	9127.42	9127.43	110.95	3.97
19470.00	89.50	111.60	10505.45	-3298.78	8611.19	9221.40	9221.42	110.96	.30
19564.00	88.90	111.00	10506.77	-3332.92	8698.76	9315.39	9315.41	110.96	.90
<b>PTB</b>									
19697.00	88.90	111.00	10509.32	-3380.57	8822.91	9448.37	9448.38	110.96	.00



**JOB NO.:** DDMT-130261  
**Company:** Continental Resources  
**LOCATION:** Atlanta Eco Pad  
**RIG NAME:** Cyclone 2  
**STATE:** North Dakota  
**COUNTY:** Williams Co.  
**WELL NAME:** Atlanta 11-6H  
**Survey File:**

**FIELD:** Williston  
**Township:** 153N  
**Range/Section:** 101W/6

MOTOR INFORMATION		
Desc:	4 3/4 1.5 fxd 5/6, 8.3 @1.04 RPG	
Bent Hsg/Sub:	1.5	1.5
Bit to Bend:	5.26	
Pad OD:	7 1/4	NB Stab: 5 5/8

## Slide Report for all BHA's in Job: DDMT-130261

Note: Sliding and Drilling Surveys are LOGICAL expectations.

#	Date	Hrs	Start MD	End MD	DMD	WOB	ROP	RPM	Surf Torq	Flow Rate	SPP On B	SPP Off B	Delta SPP	TFO cTFO	Survey MD	INC	AZM	Surv DLS	Mot DLS	Rot DLS	Q	Drill Mode	
1	15-May	1.25	10896	10969	73		10	58.4	75	4000	275	2600	2050	550		10969	0.00	0.00	0.00	0.00	0.00	0	Drilling
1	15-May	0.42	10969	10979	10		10	24.0	65	5300	275	2600	2050	550		10979	0.00	0.00	0.00	0.00	0.00	0	Drilling
1	15-May	1.58	10979	11004	25		20	15.8	0	0	290	2400	2200	200	75R	11004	0.00	0.00	0.00	0.00	0.00	0	Sliding
1	15-May	0.67	11004	11063	59		10	88.5	65	5300	290	2950	2200	750		11063	0.00	0.00	0.00	0.00	0.00	0	Drilling
1	15-May	0.67	11063	11083	20		20	30.0	0	0	290	2400	2200	200	60R	11083	0.00	0.00	0.00	0.00	0.00	0	Sliding
1	15-May	0.67	11083	11157	74		10	111.0	65	5300	290	2950	2200	750		11157	0.00	0.00	0.00	0.00	0.00	0	Drilling
1	15-May	1.58	11157	11346	189		10	119.4	65	5300	290	2950	2200	750		11346	0.00	0.00	0.00	0.00	0.00	0	Drilling
1	16-May	0.83	11346	11450	104		10	124.8	65	5300	290	3200	2400	800		11450	0.00	0.00	0.00	0.00	0.00	0	Drilling
1	16-May	0.42	11450	11456	6		22	14.4	0	0	290	2600	2400	200	180	11456	0.00	0.00	0.00	0.00	0.00	0	Sliding
1	16-May	0.58	11456	11534	78		10	133.7	65	5500	290	3200	2400	800		11534	0.00	0.00	0.00	0.00	0.00	0	Drilling
1	16-May	0.58	11534	11620	86		10	147.4	65	5500	290	3200	2400	800		11620	0.00	0.00	0.00	0.00	0.00	0	Drilling
1	16-May	1.67	11620	11809	189		10	113.4	65	5500	290	3200	2400	800		11809	0.00	0.00	0.00	0.00	0.00	0	Drilling
1	16-May	0.83	11809	11903	94		10	112.8	65	5500	290	3200	2400	800		11903	0.00	0.00	0.00	0.00	0.00	0	Drilling
1	16-May	0.75	11903	11997	94		18	125.3	65	5500	290	3200	2400	800		11997	0.00	0.00	0.00	0.00	0.00	0	Drilling
1	16-May	0.75	11997	12092	95		18	126.7	65	5500	290	3200	2400	800		12092	0.00	0.00	0.00	0.00	0.00	0	Drilling
1	16-May	0.75	12092	12185	93		18	124.0	65	5500	290	3200	2400	800		12185	0.00	0.00	0.00	0.00	0.00	0	Drilling
1	16-May	0.67	12185	12280	95		18	142.5	65	5500	290	3200	2400	800		12280	0.00	0.00	0.00	0.00	0.00	0	Drilling
1	16-May	0.67	12280	12375	95		18	142.5	65	5500	290	3200	2400	800		12375	0.00	0.00	0.00	0.00	0.00	0	Drilling
1	16-May	0.75	12375	12469	94		18	125.3	65	6500	290	3200	2400	800		12469	0.00	0.00	0.00	0.00	0.00	0	Drilling
1	16-May	0.75	12469	12564	95		18	126.7	65	6500	290	3200	2400	800		12564	0.00	0.00	0.00	0.00	0.00	0	Drilling
1	16-May	0.42	12564	12569	5		28	12.0	0	0	290	2550	2400	150	90R	12569	0.00	0.00	0.00	0.00	0.00	0	Sliding
1	16-May	0.92	12569	12660	91		18	99.3	65	6500	290	3200	2400	800		12660	0.00	0.00	0.00	0.00	0.00	0	Drilling
1	16-May	0.83	12660	12753	93		18	111.6	65	6500	290	3200	2400	800		12753	0.00	0.00	0.00	0.00	0.00	0	Drilling
1	16-May	0.67	12753	12763	10		28	15.0	65	6500	290	2550	2400	150	90R	12763	0.00	0.00	0.00	0.00	0.00	0	Sliding
1	16-May	0.75	12763	12849	86		18	114.7	65	6500	290	3200	2400	800		12849	0.00	0.00	0.00	0.00	0.00	0	Drilling

Slide Report for all BHA's in Job: DDMT-130261																		Note: Sliding and Drilling Surveys are LOGICAL expectations.					
#	Date	Hrs	Start MD	End MD	DMD	WOB	ROP	RPM	Surf Torq	Flow Rate	SPP On B	SPP Off B	Delta SPP	TFO cTFO	Survey MD	INC	AZM	Surv DLS	Mot DLS	Rot DLS	Q	Drill Mode	
1	16-May	0.92	12849	12960	111	18	121.1	65	6500	290	3200	2400	800		12960	0.00	0.00	0.00	0.00	0.00	0	Drilling	
1	16-May	0.42	12960	12967	7	18	16.8	0	0	290	2550	2400	150	165R	12967	0.00	0.00	0.00	0.00	0.00	0	Sliding	
1	16-May	0.58	12967	13050	83	18	142.3	65	6500	290	3340	2500	840		13050	0.00	0.00	0.00	0.00	0.00	0	Drilling	
1	16-May	0.67	13050	13065	15	40	22.5	0	0	290	2700	2500	200	150R	13065	0.00	0.00	0.00	0.00	0.00	0	Sliding	
1	16-May	1.00	13065	13236	171	18	171.0	65	6500	290	3340	2500	840		13236	0.00	0.00	0.00	0.00	0.00	0	Drilling	
1	16-May	0.92	13236	13260	24	40	26.2	0	0	290	2700	2500	200	50R	13260	0.00	0.00	0.00	0.00	0.00	0	Sliding	
1	16-May	0.25	13260	13287	27	18	108.0	65	6500	290	3340	2500	840		13287	0.00	0.00	0.00	0.00	0.00	0	Drilling	
1	17-May	0.58	13287	13340	53	18	90.9	65	6500	290	3340	2500	840		13340	0.00	0.00	0.00	0.00	0.00	0	Drilling	
1	17-May	0.67	13340	13350	10	40	15.0	0	0	290	2700	2500	200	180	13350	0.00	0.00	0.00	0.00	0.00	0	Sliding	
1	17-May	0.58	13350	13414	64	18	109.7	65	6500	290	3340	2500	840		13414	0.00	0.00	0.00	0.00	0.00	0	Drilling	
1	17-May	0.25	13414	13430	16	18	64.0	65	6500	290	3340	2500	840		13430	0.00	0.00	0.00	0.00	0.00	0	Drilling	
1	17-May	0.75	13430	13445	15	40	20.0	0	0	290	2700	2500	200	155R	13445	0.00	0.00	0.00	0.00	0.00	0	Sliding	
1	17-May	0.58	13445	13503	58	18	99.4	65	7800	290	3340	2500	840		13503	0.00	0.00	0.00	0.00	0.00	0	Drilling	
1	17-May	1.67	13503	13697	194	18	116.4	65	7800	290	3300	2500	800		13697	0.00	0.00	0.00	0.00	0.00	0	Drilling	
1	17-May	0.92	13697	13715	18	40	19.6	65	7800	290	2700	2500	200	155R	13715	0.00	0.00	0.00	0.00	0.00	0	Sliding	
1	17-May	0.83	13715	13792	77	18	92.4	65	7800	290	3300	2500	800		13792	0.00	0.00	0.00	0.00	0.00	0	Drilling	
1	17-May	1.33	13792	13886	94	18	70.5	65	7800	290	3300	2500	800		13886	0.00	0.00	0.00	0.00	0.00	0	Drilling	
1	17-May	0.75	13886	13900	14	40	18.7	65	7800	290	2700	2500	200	180	13900	0.00	0.00	0.00	0.00	0.00	0	Sliding	
1	17-May	1.08	13900	13981	81	18	74.8	65	7800	290	3300	2500	800		13981	0.00	0.00	0.00	0.00	0.00	0	Drilling	
1	17-May	1.08	13981	14075	94	18	86.8	65	7800	290	3300	2500	800		14075	0.00	0.00	0.00	0.00	0.00	0	Drilling	
1	17-May	0.50	14075	14087	12	40	24.0	65	7800	290	2700	2500	200		14087	0.00	0.00	0.00	0.00	0.00	0	Sliding	
1	17-May	0.92	14087	14169	82	18	89.5	65	7800	290	3300	2500	800		14169	0.00	0.00	0.00	0.00	0.00	0	Drilling	
1	17-May	0.75	14169	14233	64	18	85.3	65	7800	290	3300	2500	800		14233	0.00	0.00	0.00	0.00	0.00	0	Drilling	
2	18-May	0.58	14233	14264	31	9	53.1	60	6000	290	3050	2500	550		14264	0.00	0.00	0.00	0.00	0.00	0	Drilling	
2	18-May	0.08	14264	14275	11	9	132.0	60	7000	290	3050	2500	550		14275	0.00	0.00	0.00	0.00	0.00	0	Drilling	
2	18-May	0.50	14275	14285	10	50	20.0	0	0	290	2700	2500	200	145L	14285	0.00	0.00	0.00	0.00	0.00	0	Sliding	
2	18-May	0.67	14285	14358	73	15	109.5	60	7700	290	3170	2500	670		14358	0.00	0.00	0.00	0.00	0.00	0	Drilling	
2	18-May	0.17	14358	14370	12	15	72.0	60	7700	290	3170	2500	670		14370	0.00	0.00	0.00	0.00	0.00	0	Drilling	
2	18-May	0.08	14370	14373	3	50	36.0	0	0	290	2700	2500	200	145L	14373	0.00	0.00	0.00	0.00	0.00	0	Sliding	
2	18-May	0.33	14373	14385	12	50	36.0	0	0	290	2700	2500	200	130L	14385	0.00	0.00	0.00	0.00	0.00	0	Sliding	
2	18-May	0.58	14385	14453	68	15	116.6	60	8000	290	3300	2500	800		14453	0.00	0.00	0.00	0.00	0.00	0	Drilling	
2	18-May	0.67	14453	14548	95	15	142.5	60	8000	290	3300	2500	800		14548	0.00	0.00	0.00	0.00	0.00	0	Drilling	
2	18-May	0.33	14548	14552	4	50	12.0	60	0	290	3300	2500	800	140R	14552	0.00	0.00	0.00	0.00	0.00	0	Sliding	

Slide Report for all BHA's in Job: DDMT-130261																		Note: Sliding and Drilling Surveys are LOGICAL expectations.					
#	Date	Hrs	Start MD	End MD	DMD	WOB	ROP	RPM	Surf Torq	Flow Rate	SPP On B	SPP Off B	Delta SPP	TFO cTFO	Survey MD	INC	AZM	Surv DLS	Mot DLS	Rot DLS	Q	Drill Mode	
2	18-May	0.75	14552	14642	90	20	120.0	60	8000	290	3300	2500	800		14642	0.00	0.00	0.00	0.00	0.00	0	Drilling	
2	18-May	0.83	14642	14736	94	20	112.8	60	8000	290	3300	2500	800		14736	0.00	0.00	0.00	0.00	0.00	0	Drilling	
2	18-May	0.67	14736	14830	94	20	141.0	60	8000	290	3300	2500	800		14830	0.00	0.00	0.00	0.00	0.00	0	Drilling	
2	18-May	0.67	14830	14924	94	20	141.0	60	8000	290	3300	2500	800		14924	0.00	0.00	0.00	0.00	0.00	0	Drilling	
2	18-May	0.58	14924	15019	95	20	162.9	60	8000	290	3300	2500	800		15019	0.00	0.00	0.00	0.00	0.00	0	Drilling	
2	18-May	0.08	15019	15025	6	20	72.0	60	8000	290	3300	2500	800		15025	0.00	0.00	0.00	0.00	0.00	0	Drilling	
2	18-May	0.42	15025	15031	6	35	14.4	0	0	290	3300	2500	800	110R	15031	0.00	0.00	0.00	0.00	0.00	0	Sliding	
2	18-May	0.50	15031	15113	82	20	164.0	60	8000	290	3300	2500	800		15113	0.00	0.00	0.00	0.00	0.00	0	Drilling	
2	18-May	0.58	15113	15207	94	20	161.1	60	8000	290	3300	2500	800		15207	0.00	0.00	0.00	0.00	0.00	0	Drilling	
2	18-May	0.67	15207	15302	95	20	142.5	60	8000	290	3300	2500	800		15302	0.00	0.00	0.00	0.00	0.00	0	Drilling	
2	18-May	0.75	15302	15396	94	20	125.3	60	8000	290	3300	2500	800		15396	0.00	0.00	0.00	0.00	0.00	0	Drilling	
2	18-May	0.83	15396	15491	95	20	114.0	60	8000	290	3300	2500	800		15491	0.00	0.00	0.00	0.00	0.00	0	Drilling	
2	18-May	0.08	15491	15500	9	20	108.0	60	8000	290	3300	2500	800		15500	0.00	0.00	0.00	0.00	0.00	0	Drilling	
2	18-May	0.33	15500	15517	17	40	51.0	0	0	290	3300	2500	800	120R	15517	0.00	0.00	0.00	0.00	0.00	0	Sliding	
2	18-May	0.42	15517	15585	68	20	163.2	60	8000	290	3300	2500	800		15585	0.00	0.00	0.00	0.00	0.00	0	Drilling	
2	18-May	0.67	15585	15679	94	20	141.0	60	8000	290	3300	2500	800		15679	0.00	0.00	0.00	0.00	0.00	0	Drilling	
2	18-May	0.83	15679	15773	94	20	112.8	60	8000	290	3300	2500	800		15773	0.00	0.00	0.00	0.00	0.00	0	Drilling	
2	18-May	0.58	15773	15868	95	20	162.9	60	8000	290	3300	2500	800		15868	0.00	0.00	0.00	0.00	0.00	0	Drilling	
2	18-May	0.08	15868	15885	17	20	204.0	60	8000	290	3300	2500	800		15885	0.00	0.00	0.00	0.00	0.00	0	Drilling	
2	18-May	0.50	15885	15895	10	40	20.0	0	0	290	3110	2810	300	175L	15895	0.00	0.00	0.00	0.00	0.00	0	Sliding	
2	18-May	0.50	15895	15962	67	20	134.0	60	8800	290	3610	2810	800		15962	0.00	0.00	0.00	0.00	0.00	0	Drilling	
2	18-May	0.08	15962	15985	23	20	276.0	60	8800	290	3610	2810	800		15985	0.00	0.00	0.00	0.00	0.00	0	Drilling	
2	18-May	0.42	15985	15995	10	60	24.0	0	0	290	3110	2810	300	160L	15995	0.00	0.00	0.00	0.00	0.00	0	Sliding	
2	18-May	0.33	15995	16055	60	20	180.0	60	8800	290	3610	2810	800		16055	0.00	0.00	0.00	0.00	0.00	0	Drilling	
2	18-May	0.58	16055	16107	52	20	89.1	60	8800	290	3610	2810	800		16107	0.00	0.00	0.00	0.00	0.00	0	Drilling	
2	18-May	0.25	16107	16110	3	70	12.0	0	0	290	3110	2810	300	22L	16110	0.00	0.00	0.00	0.00	0.00	0	Sliding	
2	19-May	0.42	16110	16117	7	70	16.8	0	0	290	3110	2810	300	22L	16117	0.00	0.00	0.00	0.00	0.00	0	Sliding	
2	19-May	0.25	16117	16150	33	20	132.0	60	8800	290	3560	2810	750		16150	0.00	0.00	0.00	0.00	0.00	0	Drilling	
2	19-May	0.50	16150	16243	93	20	186.0	60	8800	290	3560	2810	750		16243	0.00	0.00	0.00	0.00	0.00	0	Drilling	
2	19-May	0.58	16243	16337	94	20	161.1	60	8800	290	3560	2810	750		16337	0.00	0.00	0.00	0.00	0.00	0	Drilling	
2	19-May	0.58	16337	16431	94	20	161.1	60	8800	290	3560	2810	750		16431	0.00	0.00	0.00	0.00	0.00	0	Drilling	
2	19-May	0.42	16431	16524	93	20	223.2	60	8800	290	3560	2810	750		16524	0.00	0.00	0.00	0.00	0.00	0	Drilling	
2	19-May	0.42	16524	16620	96	20	230.4	60	8800	290	3560	2810	750		16620	0.00	0.00	0.00	0.00	0.00	0	Drilling	

Slide Report for all BHA's in Job: DDMT-130261																		Note: Sliding and Drilling Surveys are LOGICAL expectations.					
#	Date	Hrs	Start MD	End MD	DMD	WOB	ROP	RPM	Surf Torq	Flow Rate	SPP On B	SPP Off B	Delta SPP	TFO cTFO	Survey MD	INC	AZM	Surv DLS	Mot DLS	Rot DLS	Q	Drill Mode	
2	19-May	0.58	16620	16713	93	20	159.4	60	8800	290	3560	2810	750		16713	0.00	0.00	0.00	0.00	0.00	0	Drilling	
2	19-May	0.67	16713	16807	94	20	141.0	60	8800	290	3560	2810	750		16807	0.00	0.00	0.00	0.00	0.00	0	Drilling	
2	19-May	0.50	16807	16901	94	20	188.0	60	9800	290	3610	2810	800		16901	0.00	0.00	0.00	0.00	0.00	0	Drilling	
2	19-May	0.08	16901	16910	9	20	108.0	60	9800	290	3510	2810	700		16910	0.00	0.00	0.00	0.00	0.00	0	Drilling	
2	19-May	0.83	16910	16923	13	70	15.6	0	0	290	2900	2810	90	90R	16923	0.00	0.00	0.00	0.00	0.00	0	Sliding	
2	19-May	0.58	16923	16995	72	20	123.4	60	10000	290	3610	2810	800		16995	0.00	0.00	0.00	0.00	0.00	0	Drilling	
2	19-May	0.67	16995	17090	95	20	142.5	60	11000	290	3610	2810	800		17090	0.00	0.00	0.00	0.00	0.00	0	Drilling	
2	19-May	0.08	17090	17100	10	20	120.0	60	11000	290	3560	2810	750		17100	0.00	0.00	0.00	0.00	0.00	0	Drilling	
2	19-May	0.58	17100	17184	84	20	144.0	60	11500	290	3560	2810	750		17184	0.00	0.00	0.00	0.00	0.00	0	Drilling	
2	19-May	0.17	17184	17194	10	20	60.0	60	11500	290	3560	2810	750		17194	0.00	0.00	0.00	0.00	0.00	0	Drilling	
2	19-May	0.83	17194	17218	24	70	28.8	0	0	290	2960	2810	150	90R	17218	0.00	0.00	0.00	0.00	0.00	0	Sliding	
2	19-May	0.50	17218	17279	61	20	122.0	60	10000	290	3610	2810	800		17279	0.00	0.00	0.00	0.00	0.00	0	Drilling	
2	19-May	0.08	17279	17289	10	20	120.0	60	10000	290	3610	2810	800		17289	0.00	0.00	0.00	0.00	0.00	0	Drilling	
2	19-May	0.67	17289	17309	20	50	30.0	0	0	290	3085	2810	275	10R	17309	0.00	0.00	0.00	0.00	0.00	0	Sliding	
2	19-May	0.50	17309	17373	64	20	128.0	60	10000	290	3610	2810	800		17373	0.00	0.00	0.00	0.00	0.00	0	Drilling	
2	19-May	0.67	17373	17468	95	20	142.5	60	10500	290	3610	2810	800		17468	0.00	0.00	0.00	0.00	0.00	0	Drilling	
2	19-May	0.67	17468	17561	93	20	139.5	60	10500	290	3610	2810	800		17561	0.00	0.00	0.00	0.00	0.00	0	Drilling	
2	19-May	0.67	17561	17656	95	20	142.5	60	10500	290	3610	2810	800		17656	0.00	0.00	0.00	0.00	0.00	0	Drilling	
2	19-May	0.75	17656	17750	94	20	125.3	60	10500	290	3610	2810	800		17750	0.00	0.00	0.00	0.00	0.00	0	Drilling	
2	19-May	0.08	17750	17760	10	20	120.0	60	9500	290	3610	2810	800		17760	0.00	0.00	0.00	0.00	0.00	0	Drilling	
2	19-May	0.92	17760	17770	10	70	10.9	0	0	290	3010	2810	200	150L	17770	0.00	0.00	0.00	0.00	0.00	0	Sliding	
2	19-May	0.50	17770	17845	75	20	150.0	60	9500	290	3610	2810	800		17845	0.00	0.00	0.00	0.00	0.00	0	Drilling	
2	19-May	0.17	17845	17860	15	20	90.0	60	9500	290	3610	2810	800		17860	0.00	0.00	0.00	0.00	0.00	0	Drilling	
2	19-May	1.17	17860	17880	20	70	17.1	0	0	290	3010	2810	200	35R	17880	0.00	0.00	0.00	0.00	0.00	0	Sliding	
2	19-May	0.42	17880	17939	59	20	141.6	60	10000	290	3610	2810	800		17939	0.00	0.00	0.00	0.00	0.00	0	Drilling	
2	19-May	0.92	17939	18034	95	20	103.6	60	10000	290	3610	2810	800		18034	0.00	0.00	0.00	0.00	0.00	0	Drilling	
2	19-May	0.58	18034	18128	94	20	161.1	60	10000	290	3610	2810	800		18128	0.00	0.00	0.00	0.00	0.00	0	Drilling	
2	19-May	0.58	18128	18222	94	20	161.1	60	10000	290	3610	2810	800		18222	0.00	0.00	0.00	0.00	0.00	0	Drilling	
2	20-May	0.25	18222	18245	23	18	92.0	60	9000	290	3820	3020	800		18245	0.00	0.00	0.00	0.00	0.00	0	Drilling	
2	20-May	0.33	18245	18252	7	60	21.0	0	0	290	3220	3020	200	180	18252	0.00	0.00	0.00	0.00	0.00	0	Sliding	
2	20-May	0.42	18252	18316	64	18	153.6	60	9000	290	3820	3020	800		18316	0.00	0.00	0.00	0.00	0.00	0	Drilling	
2	20-May	0.08	18316	18331	15	18	180.0	60	9000	290	3820	3020	800		18331	0.00	0.00	0.00	0.00	0.00	0	Drilling	
2	20-May	0.42	18331	18336	5	60	12.0	0	0	290	3220	3020	200	180	18336	0.00	0.00	0.00	0.00	0.00	0	Sliding	

Slide Report for all BHA's in Job: DDMT-130261																		Note: Sliding and Drilling Surveys are LOGICAL expectations.					
#	Date	Hrs	Start MD	End MD	DMD	WOB	ROP	RPM	Surf Torq	Flow Rate	SPP On B	SPP Off B	Delta SPP	TFO cTFO	Survey MD	INC	AZM	Surv DLS	Mot DLS	Rot DLS	Q	Drill Mode	
2	20-May	0.42	18336	18410	74	18	177.6	60	9600	290	3820	3020	800		18410	0.00	0.00	0.00	0.00	0.00	0	Drilling	
2	20-May	0.58	18410	18507	97	18	166.3	60	9600	290	3820	3020	800		18507	0.00	0.00	0.00	0.00	0.00	0	Drilling	
2	20-May	0.50	18507	18598	91	18	182.0	60	9600	290	3820	3020	800		18598	0.00	0.00	0.00	0.00	0.00	0	Drilling	
2	20-May	0.17	18598	18625	27	18	162.0	60	9600	290	3820	3020	800		18625	0.00	0.00	0.00	0.00	0.00	0	Drilling	
2	20-May	0.58	18625	18633	8	65	13.7	0	0	290	3120	3020	100	170R	18633	0.00	0.00	0.00	0.00	0.00	0	Sliding	
2	20-May	0.50	18633	18696	63	18	126.0	60	9800	290	3820	3020	800		18696	0.00	0.00	0.00	0.00	0.00	0	Drilling	
2	20-May	0.67	18696	18785	89	18	133.5	60	9800	290	3820	3020	800		18785	0.00	0.00	0.00	0.00	0.00	0	Drilling	
2	20-May	0.25	18785	18800	15	18	60.0	60	10500	290	3820	3020	800		18800	0.00	0.00	0.00	0.00	0.00	0	Drilling	
2	20-May	0.50	18800	18804	4	65	8.0	0	0	290	3070	3020	50	180	18804	0.00	0.00	0.00	0.00	0.00	0	Sliding	
2	20-May	0.42	18804	18879	75	18	180.0	60	10500	290	3070	3020	50		18879	0.00	0.00	0.00	0.00	0.00	0	Drilling	
2	20-May	0.58	18879	18974	95	18	162.9	60	8000	290	3070	3020	50		18974	0.00	0.00	0.00	0.00	0.00	0	Drilling	
2	20-May	0.17	18974	18985	11	18	66.0	60	8000	290	3070	3020	50		18985	0.00	0.00	0.00	0.00	0.00	0	Drilling	
2	20-May	1.08	18985	19003	18	65	16.6	0	0	290	3070	3020	50	60R	19003	0.00	0.00	0.00	0.00	0.00	0	Sliding	
2	20-May	0.58	19003	19068	65	20	111.4	60	8000	290	3070	3020	50		19068	0.00	0.00	0.00	0.00	0.00	0	Drilling	
2	20-May	0.58	19068	19162	94	20	161.1	60	8000	290	3070	3020	50		19162	0.00	0.00	0.00	0.00	0.00	0	Drilling	
2	20-May	0.67	19162	19256	94	20	141.0	60	8000	290	3070	3020	50		19256	0.00	0.00	0.00	0.00	0.00	0	Drilling	
2	20-May	0.08	19256	19266	10	20	120.0	60	8000	290	3070	3020	50		19266	0.00	0.00	0.00	0.00	0.00	0	Drilling	
2	20-May	0.67	19266	19272	6	40	9.0	60	8000	290	3070	3020	50	180	19272	0.00	0.00	0.00	0.00	0.00	0	Sliding	
2	20-May	0.67	19272	19319	47	20	70.5	60	8000	290	3070	3020	50		19319	0.00	0.00	0.00	0.00	0.00	0	Drilling	
2	20-May	1.08	19319	19341	22	60	20.3	0	0	290	3070	3020	50	180	19341	0.00	0.00	0.00	0.00	0.00	0	Sliding	
2	20-May	0.08	19341	19350	9	20	108.0	60	8000	290	3070	3020	50		19350	0.00	0.00	0.00	0.00	0.00	0	Drilling	
2	20-May	0.17	19350	19363	13	20	78.0	60	8000	290	3070	3020	50		19363	0.00	0.00	0.00	0.00	0.00	0	Drilling	
2	20-May	0.58	19363	19375	12	60	20.6	60	8000	290	3070	3020	50	180	19375	0.00	0.00	0.00	0.00	0.00	0	Sliding	
2	20-May	0.67	19375	19444	69	20	103.5	60	8000	290	3070	3020	50		19444	0.00	0.00	0.00	0.00	0.00	0	Drilling	
2	20-May	0.17	19444	19460	16	20	96.0	60	8000	290	3070	3020	50		19460	0.00	0.00	0.00	0.00	0.00	0	Drilling	
2	20-May	0.42	19460	19466	6	60	14.4	0	0	290	3070	3020	50	180	19466	0.00	0.00	0.00	0.00	0.00	0	Sliding	
2	20-May	0.83	19466	19538	72	20	86.4	60	8000	290	3070	3020	50		19538	0.00	0.00	0.00	0.00	0.00	0	Drilling	
2	20-May	0.67	19538	19632	94	20	141.0	60	8000	290	3070	3020	50		19632	0.00	0.00	0.00	0.00	0.00	0	Drilling	
2	20-May	0.92	19632	19697	65	20	70.9	60	8000	290	3070	3020	50		19697	0.00	0.00	0.00	0.00	0.00	0	Drilling	
<b>Total Drilled:</b>					8801	<b>Avg. Total ROP:</b>			96.98	<b>DEPTH% - TIME %</b>													
<b>Total Rotary Drilled:</b>					8363	<b>Avg. Rotary ROP:</b>			123.44	<b>Percent Rotary:</b> 95.02 - 74.66													
<b>Total Drilled Sliding:</b>					438	<b>Avg. Slide ROP:</b>			19.04	<b>Percent Slide:</b> 4.98 - 25.34													



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

Well Name: Atlanta 11-6H  
Location: Sections 6 - T153N - R101W  
License Number: 33-105-02722 Region: Williston  
Spud Date: 03/12/13 Drilling Completed: 03/22/13  
Surface Coordinates: NENW Sec. 6 - 153N - 101W  
495' FNL & 1350' FWL  
Bottom Hole Casing Point: 10896' MD; 10532' TVD  
Coordinates: NWNW SEC. 6 - 153N - 101W - 708' FNL & 1967' FWL  
Ground Elevation (ft): 1945' K.B. Elevation (ft): 1967'  
Logged Interval (ft): 9700' To: 10532' Total Depth (ft): 832'  
Formation: Lodgepole, Upper Bakken Shale, Middle Bakken Member  
Type of Drilling Fluid: Invert

Printed by MUD.LOG 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  
MS Energy Services - Kurt

# MWD:

Baker Hughes - Phil  
MS Energy Services - Tim

## ROCK TYPES

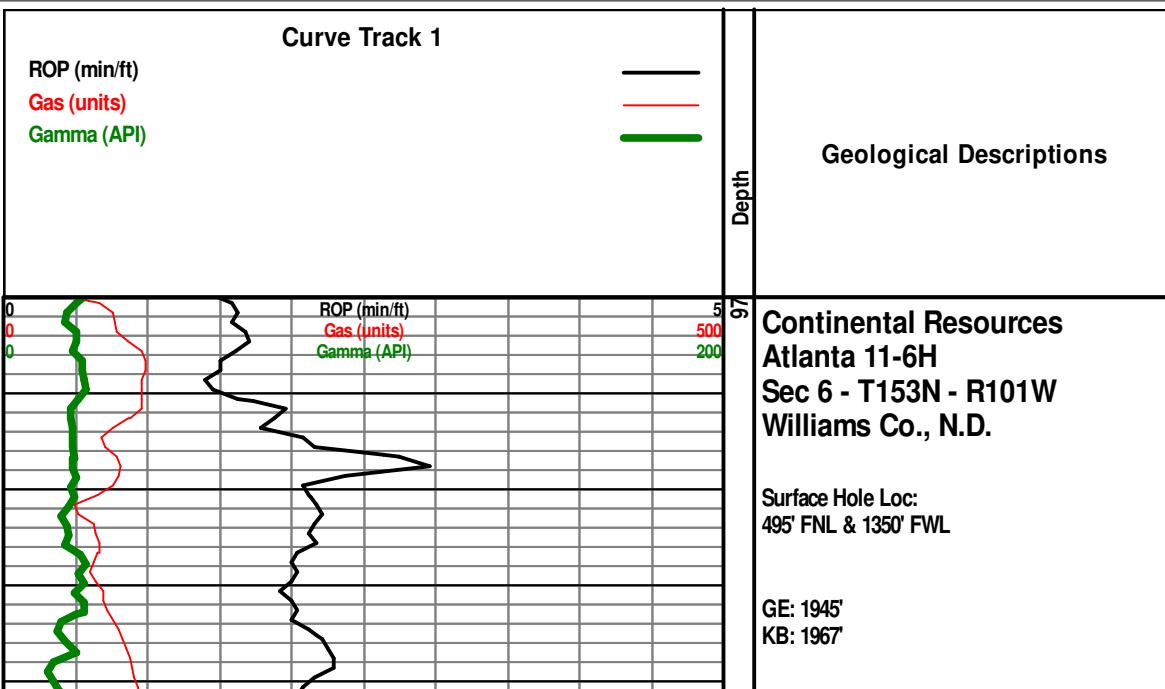
	Anhy		Clyst		Gyp		Mrlst		Shgy
	Bent		Coal		Igne		Salt		Sltst
	Brec		Congl		Lmst		Shale		Ss
	Cht		Dol		Meta		Shcol		Till

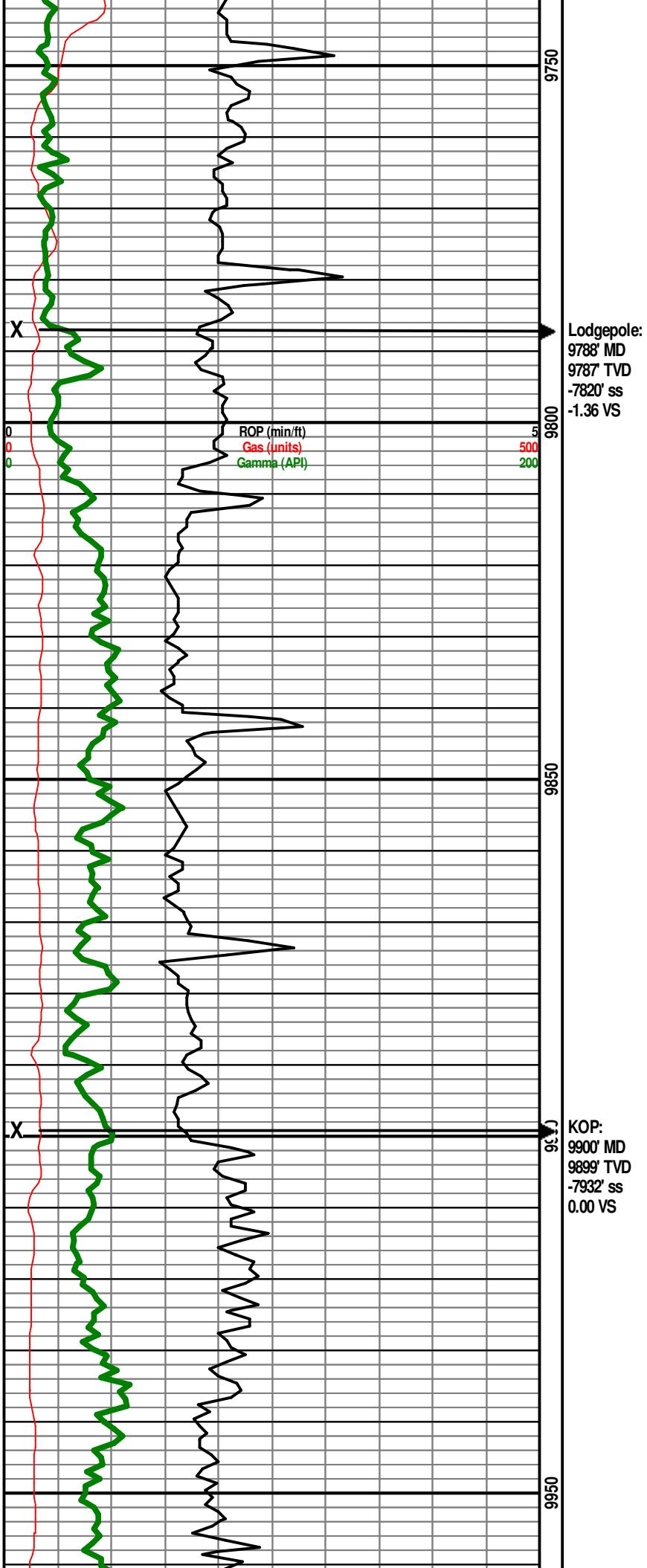
## ACCESSORIES

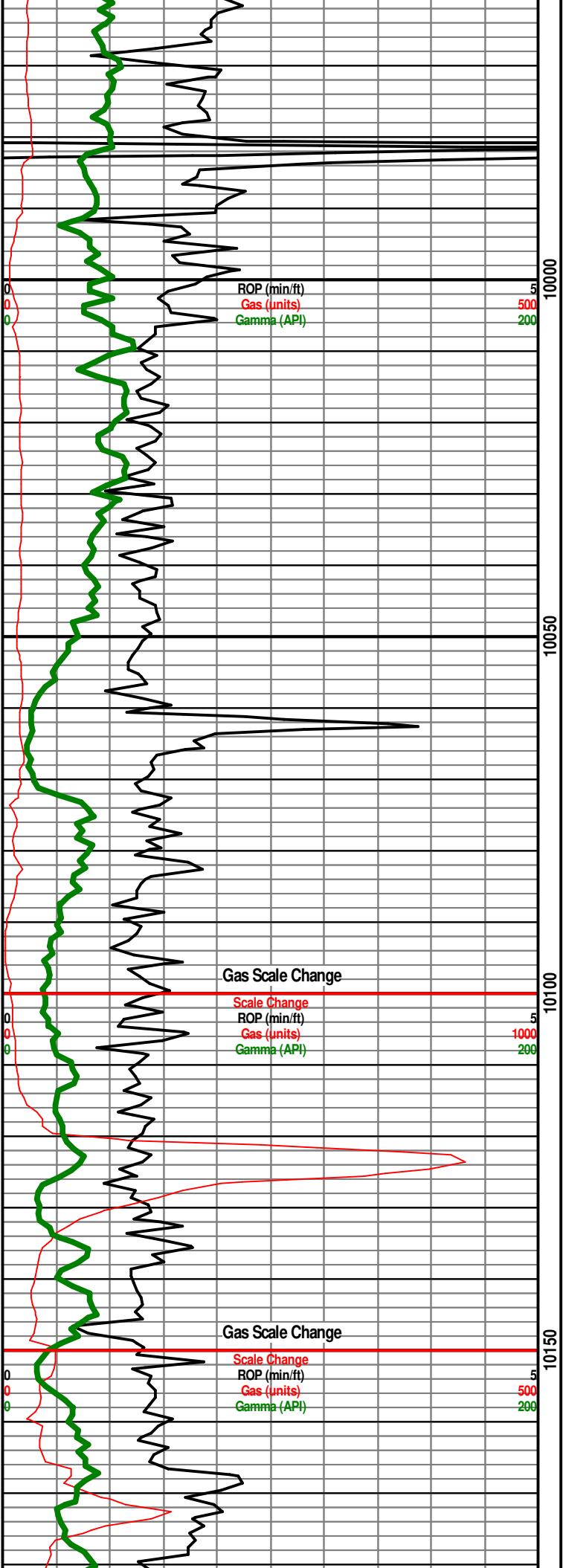
MINERAL	FOSSIL	Ostra	Slitstrg
	Gyp		
	Hvymin		
	Kaol		
	Marl		
	Minxl		
	Nodule		
	Phos		
	Pyr		
	Salt		
	Sandy		
	Silt		
	Sil		
	Sulphur		
	Tuff		

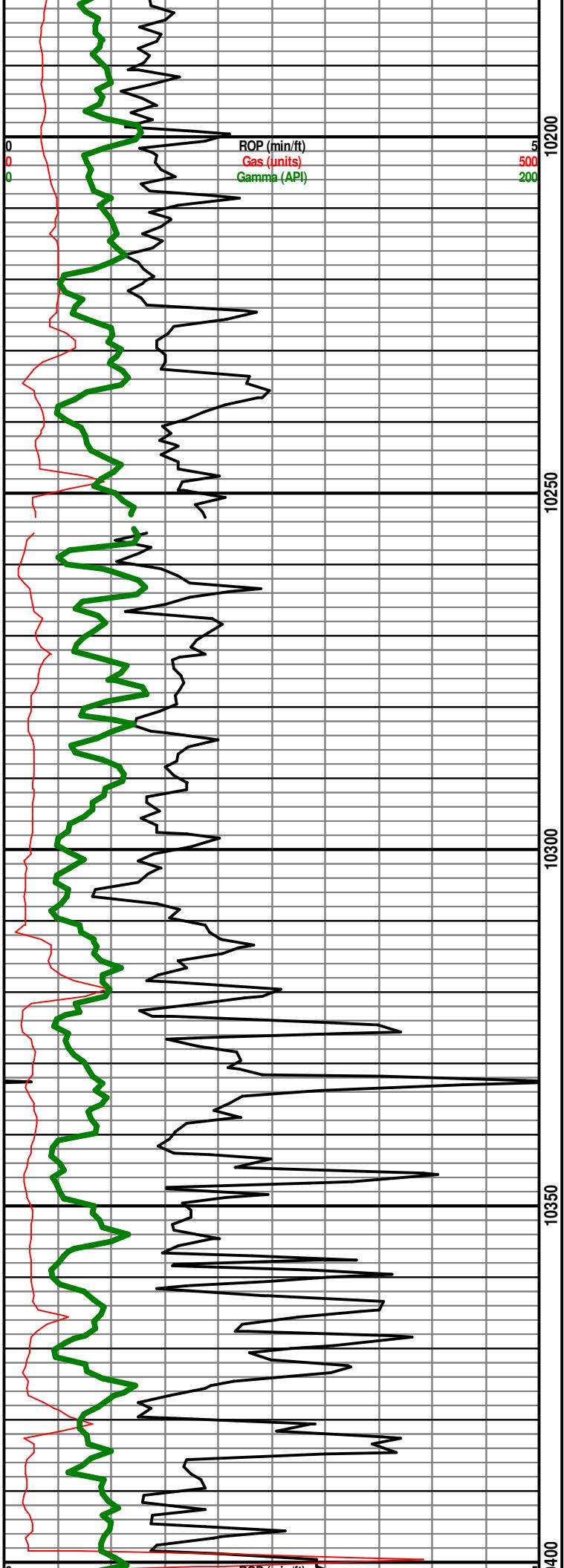
## OTHER SYMBOLS

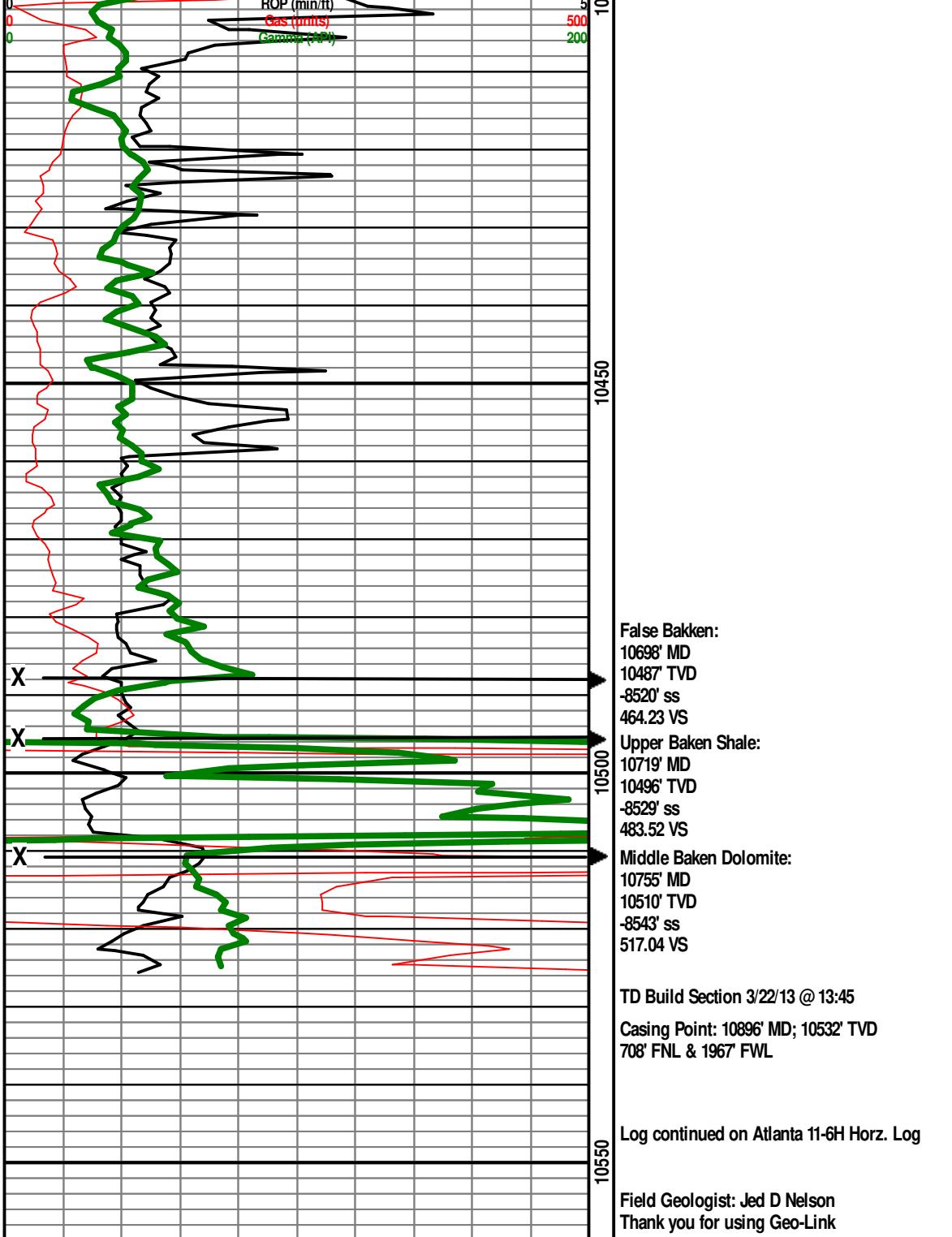
POROSITY TYPE	Vuggy	ROUNDING	Spotted	EVENTS
SORTING	Well	Subang	Core	Sidewall
Moderate	Moderate	Angular	Dst	
Poor	Poor			
OIL SHOWS	Even			











# **NEWSCO**

## **International Energy Services Inc.**

Continental Resources  
Company

33144  
Job Number

3/14/2013  
Date

Cyclone 2  
Rig

Atlanta 11-6H  
Well Name

Williams Co., ND  
County & State

Surveyed from depth of: Surface to 1986'

GL to KB: 22'

Type of Survey: Nvader

**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

Certified by:

  
Joshua Mahoney

# **NEWSCO**

Directional Services U.S.A.

**CLIENT:** Continental Resources  
**DATE:** 3/14/2013  
**STATE:** North Dakota  
**FIELD:**

NEWSCO JOB #33144

**WELL NAME:** Atlanta 11-6H

**RIG:** 2

**CONTRACTOR:** Cyclone

## TIE-ON DATA

C/L (10,30,100):	100.00	Feet
<b>MEASURED DEPTH:</b>	0.00	Feet
TVD:	0.00	Feet
<b>INCLINATION:</b>	0.00	Deg.
AZIMUTH:	0.00	Deg.
N(+) S(-):	0.00	Feet
E(+) W(-):	0.00	Feet
V/SECTION PLANE:	0.00	Deg.
V/SECTION :	0.00	Feet

## TARGET DATA

SENSOR TO BIT:	54.00
KB TO GL :	22.00
Total:	54.00
TVD:	0.00
INC:	0.00
VS:	0.00

0.00



717 17th Street, Suite 2000  
Denver, CO 80202  
303-534-3223 Fax 303-534-1822

**INTEQ**

**Report  
of  
Sub-Surface  
Directional  
Survey**

**CONTINENTAL**  
Company

**ATLANTA 11-6H**  
Well Name

**WILLIAMS/ND**  
Location

**3/12/2013**  
Date

**5335027**  
Job Number

**Denver**  
Office



717 17th Street, Suite 2000  
Denver, CO 80202  
303-534-3223 Fax 303-534-1822

**INTEQ**

### Survey Certification Sheet

CONTINENTAL  
Company

5335027  
Job Number

03/12/13  
Date

SEC.06-T153N-R101W  
Lease

ATLANTA 11-6H  
Well Name

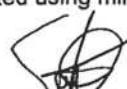
WILLIAMS/ND  
County & State

Surveyed from a measured depth of: 2083 feet to 10822 feet

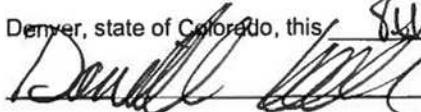
Type of Survey: MWD

Directional Surveyor: PHIL PETTEY

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 8th day of April, 20 13.  
  
My commission expires 7/14/14

Certification Number: 11013  
Certification Date: 4/8/13

# CONTINENTAL RESOURCES

Location: NORTH DAKOTA

Slot: SLOT#11 ATLANTA 11-6H(495'FNL & 1350'FWL,SEC.06)

Field: WILLIAMS COUNTY

Well: ATLANTA 11-6H

Facility: SEC.06-T153N-R101W

Wellbore: ATLANTA 11-6H PWB

Plot reference wellpath is ATLANTA 11-6H (REV-C.0) PWP

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#11 ATLANTA 11-6H(495'FNL & 1350'FWL,SEC.06)): 0 feet

Coordinates are in feet referenced to Slot

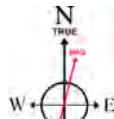
Grid System: NAD83 / Lambert North Dakota SP, Northern Zone (3301), US feet

North Reference: True north

Scale: True distance

Depths are in feet

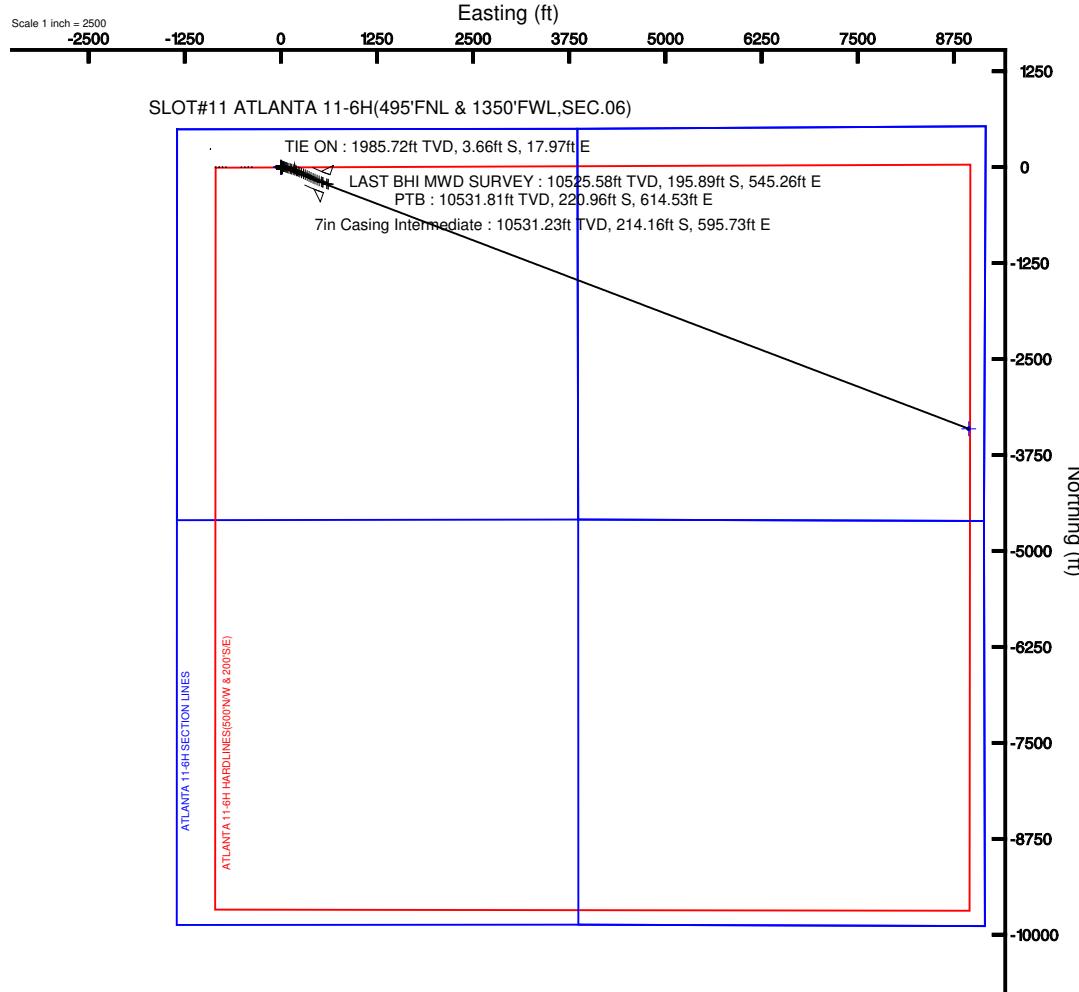
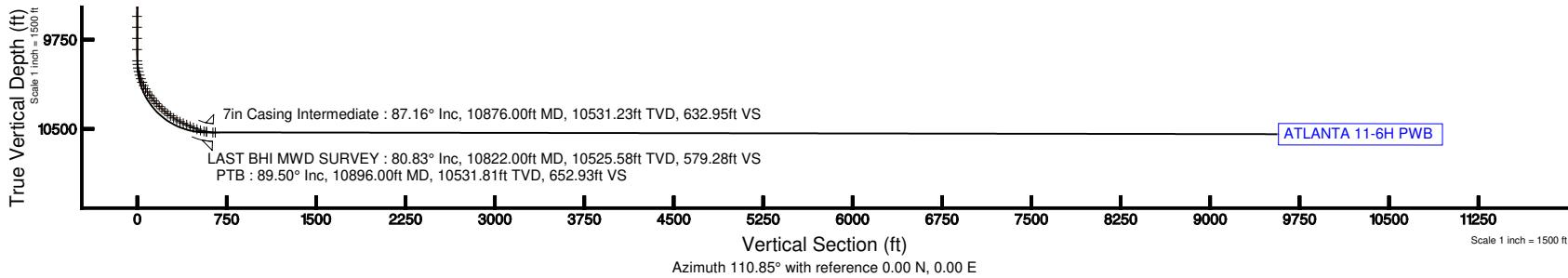
Created by: parssetr on 4/8/2013



BGGM (1945.0 to 2014.0) Dip: 73.02° Field: 56527.2 mT

Magnetic North is 8.54 degrees East of True North (at 4/1/2013)

To correct azimuth from Magnetic to True add 8.54 degrees  
For example: if the Magnetic North Azimuth = 90 degs, then the True North Azimuth = 90 + 8.54 = 98.54





# Actual Wellpath Report

ATLANTA 11-6H AWP

Page 1 of 8



## REFERENCE WELLPATH IDENTIFICATION

Operator	CONTINENTAL RESOURCES	Slot	SLOT#11 ATLANTA 11-6H(495'FNL & 1350'FWL,SEC.06)
Area	NORTH DAKOTA	Well	ATLANTA 11-6H
Field	WILLIAMS COUNTY	Wellbore	ATLANTA 11-6H AWB
Facility	SEC.06-T153N-R101W		

## REPORT SETUP INFORMATION

Projection System	NAD83 / Lambert North Dakota SP, Northern Zone (3301), US feet	Software System	WellArchitect® 3.0.2
North Reference	True	User	Painsetr
Scale	0.999936	Report Generated	5/8/2013 at 10:51:51 AM
Convergence at slot	2.40° West	Database/Source file	WA_Denver/ATLANTA_11-6H_AWB.xml

## WELLPATH LOCATION

	Local coordinates		Grid coordinates		Geographic coordinates	
	North[ft]	East[ft]	East[US ft]	Northing[US ft]	Latitude	Longitude
Slot Location	27.49	1079.94	1180114.28	421181.24	48°06'33.650"N	103°43'41.047"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#11 ATLANTA 11-6H(495'FNL & 1350'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	110.85°



# Actual Wellpath Report

ATLANTA 11-6H AWP

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## REFERENCE WELLPATH IDENTIFICATION

Operator	CONTINENTAL RESOURCES	Slot	SLOT#11 ATLANTA 11-6H(495'FNL & 1350'FWL,SEC.06)
Area	NORTH DAKOTA	Well	ATLANTA 11-6H
Field	WILLIAMS COUNTY	Wellbore	ATLANTA 11-6H AWB
Facility	SEC.06-T153N-R101W		

## WELLPATH DATA (116 stations)

MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Vert Sect [ft]	North [ft]	East [ft]	DLS [°/100ft]	Comments
1986.00	1.200	214.900	1985.71	18.53	-3.40	18.53	2.63	TIE TO NEWSCO MWD
2083.00	1.380	242.910	2082.69	17.50	-4.76	16.91	0.67	
2177.00	1.230	251.800	2176.66	15.96	-5.59	14.95	0.27	
2270.00	1.650	250.380	2269.63	14.17	-6.35	12.74	0.45	
2364.00	1.770	262.010	2363.59	11.86	-7.01	10.03	0.39	
2458.00	0.820	200.630	2457.57	10.60	-7.84	8.35	1.65	
2551.00	1.010	83.470	2550.56	11.33	-8.37	8.93	1.68	
2643.00	0.800	84.970	2642.55	12.62	-8.22	10.38	0.23	
2737.00	0.840	100.050	2736.54	13.89	-8.29	11.71	0.23	
2829.00	1.370	177.730	2828.53	14.99	-9.50	12.42	1.57	
2922.00	1.390	174.010	2921.50	15.93	-11.74	12.58	0.10	
3016.00	0.580	258.520	3015.49	16.04	-12.96	12.23	1.55	
3109.00	0.460	298.350	3108.49	15.28	-12.88	11.44	0.40	
3202.00	0.330	328.960	3201.48	14.70	-12.47	10.97	0.26	
3295.00	0.620	330.310	3294.48	14.10	-11.81	10.59	0.31	
3387.00	0.520	329.840	3386.48	13.39	-11.01	10.13	0.11	
3480.00	0.590	5.000	3479.47	12.93	-10.17	9.96	0.37	
3573.00	0.500	17.760	3572.47	12.78	-9.31	10.13	0.16	
3667.00	0.480	3.230	3666.46	12.63	-8.52	10.27	0.13	
3761.00	0.110	316.540	3760.46	12.43	-8.07	10.23	0.44	
3855.00	0.330	21.220	3854.46	12.35	-7.75	10.27	0.32	
3947.00	0.310	31.710	3946.46	12.40	-7.29	10.50	0.07	
4041.00	0.330	83.540	4040.46	12.69	-7.04	10.90	0.30	
4134.00	0.150	109.720	4133.46	13.05	-7.05	11.28	0.22	
4227.00	0.350	105.040	4226.46	13.46	-7.17	11.67	0.22	
4321.00	0.470	102.940	4320.46	14.12	-7.33	12.32	0.13	
4414.00	0.250	117.540	4413.45	14.70	-7.51	12.87	0.25	
4508.00	0.490	118.350	4507.45	15.30	-7.79	13.41	0.26	
4601.00	0.400	118.210	4600.45	16.02	-8.14	14.04	0.10	
4695.00	0.580	97.220	4694.45	16.81	-8.35	14.81	0.27	



# Actual Wellpath Report

ATLANTA 11-6H AWP

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## REFERENCE WELLPATH IDENTIFICATION

Operator	CONTINENTAL RESOURCES	Slot	SLOT#11 ATLANTA 11-6H(495'FNL & 1350'FWL,SEC.06)
Area	NORTH DAKOTA	Well	ATLANTA 11-6H
Field	WILLIAMS COUNTY	Wellbore	ATLANTA 11-6H AWB
Facility	SEC.06-T153N-R101W		

## WELLPATH DATA (116 stations)

MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Vert Sect [ft]	North [ft]	East [ft]	DLS [°/100ft]	Comments
4789.00	0.900	138.920	4788.44	17.92	-8.97	15.76	0.64	
4882.00	0.610	148.190	4881.43	18.96	-9.94	16.50	0.34	
4976.00	0.910	322.460	4975.43	18.72	-9.77	16.31	1.62	
5069.00	0.830	344.550	5068.42	17.69	-8.54	15.68	0.37	
5162.00	1.130	342.450	5161.40	16.73	-7.01	15.23	0.32	
5255.00	0.940	55.290	5254.39	16.59	-5.70	15.58	1.33	
5348.00	1.110	299.130	5347.38	16.13	-4.83	15.42	1.87	
5442.00	0.800	297.060	5441.37	14.57	-4.09	14.04	0.33	
5536.00	0.670	312.750	5535.36	13.41	-3.42	13.05	0.25	
5629.00	0.370	318.920	5628.36	12.64	-2.82	12.45	0.33	
5723.00	0.340	0.170	5722.36	12.28	-2.32	12.26	0.27	
5817.00	0.940	110.710	5816.35	12.95	-2.31	12.98	1.18	
5910.00	1.000	135.360	5909.34	14.45	-3.16	14.26	0.45	
6004.00	1.150	233.970	6003.33	14.68	-4.30	14.07	1.74	
6098.00	1.350	215.710	6097.31	13.88	-5.75	12.67	0.47	
6191.00	1.350	196.220	6190.28	13.69	-7.69	11.72	0.49	
6285.00	2.020	173.190	6284.24	14.55	-10.40	11.61	1.00	
6373.00	3.070	168.400	6372.15	16.53	-14.25	12.26	1.22	
6472.00	2.700	168.150	6471.03	19.22	-19.13	13.28	0.37	
6565.00	1.590	188.060	6563.96	20.68	-22.55	13.55	1.42	
6659.00	1.250	245.970	6657.94	20.25	-24.26	12.43	1.50	
6753.00	0.250	285.600	6751.93	19.32	-24.62	11.29	1.14	
6845.00	1.250	308.590	6843.92	18.16	-23.94	10.31	1.11	
6939.00	1.130	313.010	6937.90	16.33	-22.67	8.84	0.16	
7032.00	1.020	314.340	7030.88	14.72	-21.46	7.57	0.12	
7126.00	1.240	326.000	7124.87	13.12	-20.04	6.41	0.34	
7219.00	1.270	326.450	7217.84	11.46	-18.34	5.27	0.03	
7313.00	1.450	325.950	7311.82	9.64	-16.49	4.03	0.19	
7406.00	1.320	331.370	7404.79	7.86	-14.57	2.86	0.20	
7499.00	1.360	343.660	7497.76	6.38	-12.57	2.04	0.31	



# Actual Wellpath Report

ATLANTA 11-6H AWP

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## REFERENCE WELLPATH IDENTIFICATION

Operator	CONTINENTAL RESOURCES	Slot	SLOT#11 ATLANTA 11-6H(495'FNL & 1350'FWL,SEC.06)
Area	NORTH DAKOTA	Well	ATLANTA 11-6H
Field	WILLIAMS COUNTY	Wellbore	ATLANTA 11-6H AWB
Facility	SEC.06-T153N-R101W		

## WELLPATH DATA (116 stations)

MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Vert Sect [ft]	North [ft]	East [ft]	DLS [°/100ft]	Comments
7593.00	1.410	345.670	7591.74	5.04	-10.38	1.44	0.07	
7687.00	1.370	336.040	7685.71	3.58	-8.24	0.69	0.25	
7780.00	1.590	341.180	7778.68	1.97	-6.00	-0.17	0.28	
7873.00	1.660	355.980	7871.64	0.58	-3.43	-0.69	0.46	
7966.00	1.590	338.060	7964.60	-0.86	-0.89	-1.26	0.55	
8060.00	0.770	6.800	8058.58	-1.90	0.94	-1.67	1.05	
8153.00	0.860	5.130	8151.58	-2.24	2.26	-1.54	0.10	
8247.00	1.020	26.840	8245.56	-2.35	3.71	-1.10	0.41	
8341.00	0.580	21.090	8339.55	-2.26	4.90	-0.55	0.48	
8434.00	0.870	21.000	8432.55	-2.25	6.00	-0.13	0.31	
8527.00	0.680	14.420	8525.54	-2.31	7.19	0.26	0.23	
8621.00	0.640	25.850	8619.53	-2.33	8.20	0.63	0.15	
8713.00	0.760	16.690	8711.52	-2.33	9.25	1.03	0.18	
8806.00	0.460	4.790	8804.52	-2.48	10.21	1.24	0.35	
8900.00	0.620	14.950	8898.51	-2.63	11.08	1.40	0.20	
8994.00	0.500	28.920	8992.51	-2.63	11.93	1.73	0.19	
9087.00	0.340	19.460	9085.51	-2.58	12.55	2.02	0.19	
9181.00	0.470	32.600	9179.51	-2.51	13.13	2.32	0.17	
9274.00	0.560	2.160	9272.50	-2.57	13.91	2.54	0.31	
9368.00	0.330	14.500	9366.50	-2.75	14.63	2.63	0.26	
9461.00	0.530	9.830	9459.50	-2.86	15.31	2.77	0.22	
9555.00	0.350	15.460	9553.49	-2.97	16.02	2.92	0.20	
9647.00	0.440	6.700	9645.49	-3.09	16.64	3.04	0.12	
9741.00	0.490	18.580	9739.49	-3.19	17.38	3.21	0.12	
9834.00	0.450	5.810	9832.49	-3.30	18.12	3.37	0.12	
9929.00	2.650	96.750	9927.45	-1.27	18.23	5.59	2.84	
9960.00	6.350	100.720	9958.35	1.12	17.83	7.99	11.97	
9990.00	9.570	105.190	9988.06	5.23	16.87	12.02	10.92	
10021.00	12.530	107.130	10018.48	11.15	15.20	17.73	9.62	
10052.00	16.270	107.420	10048.50	18.85	12.91	25.09	12.07	



# Actual Wellpath Report

ATLANTA 11-6H AWP

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## REFERENCE WELLPATH IDENTIFICATION

Operator	CONTINENTAL RESOURCES	Slot	SLOT#11 ATLANTA 11-6H(495'FNL & 1350'FWL,SEC.06)
Area	NORTH DAKOTA	Well	ATLANTA 11-6H
Field	WILLIAMS COUNTY	Wellbore	ATLANTA 11-6H AWB
Facility	SEC.06-T153N-R101W		

## WELLPATH DATA (116 stations)

MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Vert Sect [ft]	North [ft]	East [ft]	DLS [%/100ft]	Comments
10083.00	19.770	106.140	10077.97	28.41	10.15	34.27	11.36	
10115.00	22.870	108.140	10107.78	40.02	6.71	45.38	9.95	
10146.00	26.700	110.040	10135.92	53.00	2.45	57.65	12.62	
10177.00	30.490	108.510	10163.14	67.83	-2.44	71.66	12.45	
10208.00	33.840	107.530	10189.37	84.31	-7.54	87.35	10.94	
10240.00	36.460	108.080	10215.54	102.71	-13.17	104.89	8.25	
10270.00	37.940	107.720	10239.43	120.82	-18.75	122.15	4.99	
10301.00	39.860	108.580	10263.56	140.26	-24.81	140.64	6.43	
10332.00	42.690	108.090	10286.85	160.69	-31.24	160.05	9.19	
10364.00	45.500	108.960	10309.83	182.94	-38.32	181.16	8.98	
10395.00	46.920	111.110	10331.29	205.31	-45.99	202.18	6.79	
10427.00	49.530	113.560	10352.60	229.16	-55.07	224.25	9.96	
10458.00	52.450	112.830	10372.11	253.23	-64.55	246.39	9.60	
10489.00	54.400	113.170	10390.59	278.10	-74.28	269.30	6.35	
10521.00	56.320	114.340	10408.77	304.39	-84.88	293.40	6.71	
10552.00	58.990	115.470	10425.36	330.52	-95.92	317.15	9.15	
10583.00	62.890	116.270	10440.41	357.50	-107.74	341.52	12.78	
10614.00	66.100	115.310	10453.76	385.37	-119.91	366.71	10.73	
10645.00	66.660	114.430	10466.18	413.71	-131.85	392.48	3.17	
10677.00	66.370	114.120	10478.93	443.00	-143.92	419.23	1.27	
10707.00	66.160	114.090	10491.01	470.42	-155.14	444.30	0.71	
10739.00	68.520	112.710	10503.34	499.92	-166.86	471.40	8.38	
10770.00	72.730	111.530	10513.62	529.15	-177.86	498.49	14.05	
10801.00	77.410	110.270	10521.60	559.09	-188.54	526.46	15.60	
10822.00	80.830	109.900	10525.57	579.71	-195.62	545.83	16.38	LAST BHI MWD SURVEY
10896.00	89.500	109.900	10531.80	653.37	-220.70	615.10	11.72	PTB



# Actual Wellpath Report

ATLANTA 11-6H AWP

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## REFERENCE WELLPATH IDENTIFICATION

Operator	CONTINENTAL RESOURCES	Slot	SLOT#11 ATLANTA 11-6H(495'FNL & 1350'FWL,SEC.06)
Area	NORTH DAKOTA	Well	ATLANTA 11-6H
Field	WILLIAMS COUNTY	Wellbore	ATLANTA 11-6H AWB
Facility	SEC.06-T153N-R101W		

## HOLE & CASING SECTIONS - Ref Wellbore: ATLANTA 11-6H AWB Ref Wellpath: ATLANTA 11-6H 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	2040.00	2018.00	22.00	2039.70	0.00	0.00	-4.23	17.75
8.75in Open Hole	2040.00	10896.00	8856.00	2039.70	10531.80	-4.23	17.75	-220.70	615.10
7in Casing Intermediate	22.00	10876.00	10854.00	22.00	10531.22	0.00	0.00	-213.89	596.30

## TARGETS

Name	MD [ft]	TVD [ft]	North [ft]	East [ft]	Grid East [US ft]	Grid North [US ft]	Latitude	Longitude	Shape
ATLANTA 11-6H SECTION 05		0.00	0.00	0.00	1180114.27	421181.24	48°06'33.650"N	103°43'41.047"W	polygon
ATLANTA 11-6H SECTION 06		0.00	0.00	0.00	1180114.27	421181.24	48°06'33.650"N	103°43'41.047"W	polygon
ATLANTA 11-6H SECTION 08		0.00	0.00	0.00	1180114.27	421181.24	48°06'33.650"N	103°43'41.047"W	polygon
ATLANTA 11-6H SECTION LINES		0.00	0.00	0.00	1180114.27	421181.24	48°06'33.650"N	103°43'41.047"W	polygon
ATLANTA 11-6H BHL ON PLAT REV-1(1191'FSL & 500'FEL,SEC.05)	10531.00	-3593.93	8710.04	1188665.47	417225.67	48°05'58.164"N	103°41'32.729"W	point	
ATLANTA 11-6H BHL REV-2 (1191'FSL & 200'FEL,SEC.05)	10531.00	-3594.04	9010.00	1188965.14	417212.99	48°05'58.162"N	103°41'28.310"W	point	
ATLANTA 11-6H BHL REV-3 (1191'FSL & 200'FEL,SEC.05)	10545.00	-3407.70	8945.90	1188908.91	417401.84	48°06'00.001"N	103°41'29.253"W	point	
ATLANTA 11-6H HARDLINES (500'N/W & 200'S/E)	10545.00	0.00	0.00	1180114.27	421181.24	48°06'33.650"N	103°43'41.047"W	polygon	



# Actual Wellpath Report

ATLANTA 11-6H AWP

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## REFERENCE WELLPATH IDENTIFICATION

Operator	CONTINENTAL RESOURCES	Slot	SLOT#11 ATLANTA 11-6H(495'FNL & 1350'FWL,SEC.06)
Area	NORTH DAKOTA	Well	ATLANTA 11-6H
Field	WILLIAMS COUNTY	Wellbore	ATLANTA 11-6H AWB
Facility	SEC.06-T153N-R101W		

## WELLPATH COMPOSITION - Ref Wellbore: ATLANTA 11-6H AWB    Ref Wellpath: ATLANTA 11-6H AWP

Start MD [ft]	End MD [ft]	Positional Uncertainty Model	Log Name/Comment	Wellbore
22.00	1986.00	ISCWSA MWD, Rev. 2 (Standard)	NEWSCO SURFACE MWD<140-1986>	ATLANTA 11-6H AWB
1986.00	10822.00	NaviTrak (Standard)	BHI MWD 8.75 HOLE<2083-10822>	ATLANTA 11-6H AWB
10822.00	10896.00	Blind Drilling (std)	Projection to bit	ATLANTA 11-6H AWB



# Actual Wellpath Report

ATLANTA 11-6H AWP

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## REFERENCE WELLPATH IDENTIFICATION

Operator	CONTINENTAL RESOURCES	Slot	SLOT#11 ATLANTA 11-6H(495'FNL & 1350'FWL,SEC.06)
Area	NORTH DAKOTA	Well	ATLANTA 11-6H
Field	WILLIAMS COUNTY	Wellbore	ATLANTA 11-6H AWB
Facility	SEC.06-T153N-R101W		

## WELLPATH COMMENTS

MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Comment
1986.00	1.200	214.900	1985.71	TIE TO NEWSCO MWD
10822.00	80.830	109.900	10525.57	LAST BHI MWD SURVEY
10896.00	89.500	109.900	10531.80	PTB



7821 Will Rogers Blvd.  
Fort Worth, Texas 76140

817.568.1038 (office)  
817.568.1499 (fax)  
[www.msenergyservices.com](http://www.msenergyservices.com)

June 1, 2013

North Dakota Mineral Resources  
Survey Certification Sheet

**Company:** Continental Resources, Inc.

**Lease:** Atlanta 11

**Well Number:** 6H

**Location:** Williams County, ND

**Job Number:** DDMT-130259

**Well API# 33-105-02722**

Attached please find the original surveys performed on the above referenced well by MS Energy Services. The data is true, correct, complete and within the limitations of the tool as set forth by MS Energy Services. I am authorized and qualified to make this report and it conforms to the principles and procedures as set forth by MS Energy Services. The surveys were performed as listed below.

---

<u>Name of Surveyor</u>	<u>Drain hole No.</u>	<u>Surveyed Depths</u>	<u>Dates Performed</u>	<u>Survey</u>
Tim Coleman	Original Wellbore	10,901' – 19,564' MD	05/13/2013 to 05/21/2013	MWD

If any other information is required, please contact the undersigned at the letterhead address and telephone number.

Sincerely,

A handwritten signature in black ink, appearing to read "Amber Greer".  
Amber Greer  
MWD Operations Office Administrator

Attachments



V09.04.02

## SURVEY CALCULATION PROGRAM

5/31/13 14:39

Company:	Continental Resources, Inc.
Well Name:	Atlanta 11-6H
Location:	Williams County, ND
Rig:	Cyclone #2
Job Number:	DDMT-130261
API #:	33-105-02722

Magnetic Declination: 8.53 REFERENCED TO TRUE NORTH ▼

Vertical Section Azimuth:	110.85	Proposed Direction:	110.85
---------------------------	--------	---------------------	--------

Survey Calculation Method:	Minimum Curvature
----------------------------	-------------------

PTB:	MD	INC	AZM	TVD	N/S	E/W	VS
	19,697	88.9	111	10509.32	-3380.57	8822.91	9448.37

#	Depth Feet	Inc Degrees	Azm Degrees	TVD Feet	N/S Feet	E/W Feet	Surface Vert Sec	Closure Distance	DLS/ 100	BUR/ 100'
TIE IN	10,822	80.83	109.90	10525.57	-195.62	545.83	579.71	579.83	109.72	
1	10,901	88.90	98.20	10532.66	-214.62	621.97	657.63	657.96	109.04	17.93
2	10,995	89.30	111.10	10534.14	-238.34	712.71	750.87	751.51	108.49	13.73
3	11,089	91.70	113.40	10533.32	-273.93	799.70	844.83	845.32	108.91	3.54
4	11,183	91.60	113.80	10530.62	-311.55	885.80	938.68	938.99	109.38	0.44
5	11,278	91.30	112.40	10528.21	-348.81	973.15	1033.58	1033.78	109.72	1.51
6	11,371	91.30	112.40	10526.10	-384.24	1059.12	1126.52	1126.66	109.94	0.00
7	11,466	90.60	111.80	10524.53	-419.97	1147.12	1221.48	1221.58	110.11	0.97
8	11,553	89.70	111.30	10524.30	-451.93	1228.04	1308.47	1308.56	110.20	1.18
9	11,647	90.10	111.30	10524.46	-486.07	1315.62	1402.47	1402.54	110.28	0.43
10	11,741	89.70	110.90	10524.63	-519.91	1403.32	1496.47	1496.53	110.33	0.60
11	11,835	89.80	110.90	10525.04	-553.45	1491.13	1590.47	1590.53	110.36	0.11
12	11,929	90.30	111.00	10524.95	-587.06	1578.92	1684.47	1684.52	110.40	0.54
13	12,024	89.60	111.20	10525.04	-621.26	1667.55	1779.47	1779.51	110.43	0.77
14	12,117	89.80	111.30	10525.52	-654.96	1754.22	1872.46	1872.50	110.47	0.24
15	12,212	90.70	111.10	10525.11	-689.32	1842.79	1967.46	1967.49	110.51	0.97
16	12,307	91.40	111.50	10523.37	-723.82	1931.28	2062.44	2062.47	110.55	0.85
17	12,401	90.20	109.80	10522.06	-756.96	2019.23	2156.42	2156.45	110.55	2.21
18	12,496	89.10	109.10	10522.64	-788.60	2108.81	2251.39	2251.43	110.50	1.37
19	12,592	89.90	109.60	10523.47	-820.40	2199.38	2347.35	2347.41	110.46	0.98
20	12,685	90.70	109.50	10522.99	-851.52	2287.02	2440.33	2440.40	110.42	0.87
21	12,781	91.50	111.60	10521.14	-885.21	2376.89	2536.30	2536.37	110.43	2.34
22	12,876	91.60	110.60	10518.57	-919.40	2465.48	2631.27	2631.33	110.45	1.06
23	12,969	92.70	110.90	10515.09	-952.32	2552.39	2724.20	2724.26	110.46	1.23
24	13,063	90.40	110.80	10512.54	-985.77	2640.19	2818.16	2818.22	110.47	2.45
25	13,158	87.90	109.50	10513.95	-1018.49	2729.36	2913.13	2913.20	110.46	2.97
26	13,252	91.70	111.70	10514.28	-1051.55	2817.33	3007.11	3007.17	110.47	4.67
27	13,346	92.30	111.70	10511.00	-1086.29	2904.61	3101.04	3101.10	110.51	0.64
28	13,441	88.90	111.20	10510.01	-1121.02	2993.01	3196.01	3196.06	110.53	3.62
29	13,536	88.50	112.10	10512.16	-1156.06	3081.29	3290.98	3291.02	110.57	1.04
30	13,629	91.30	112.20	10512.32	-1191.12	3167.42	3383.95	3383.98	110.61	3.01
31	13,724	89.10	112.00	10511.99	-1226.86	3255.43	3478.92	3478.94	110.65	2.33



V09.04.02

## SURVEY CALCULATION PROGRAM

5/31/13 14:39

Company:	Continental Resources, Inc.
Well Name:	Atlanta 11-6H
Location:	Williams County, ND
Rig:	Cyclone #2
Job Number:	DDMT-130261
API #:	33-105-02722

Magnetic Declination: 8.53 REFERENCED TO TRUE NORTH ▼

Vertical Section Azimuth:	110.85	Proposed Direction:	110.85
Survey Calculation Method:	Minimum Curvature		

PTB:	MD	INC	AZM	TVD	N/S	E/W	VS
	19,697	88.9	111	10509.32	-3380.57	8822.91	9448.37

#	Depth Feet	Inc Degrees	Azm Degrees	TVD Feet	N/S Feet	E/W Feet	Surface Vert Sec	Closure Distance	DLS/ 100	BUR/ 100'	
32	13,818	89.80	113.40	10512.89	-1263.13	3342.14	3572.86	3572.87	110.70	1.67	0.74
33	13,913	88.10	114.30	10514.63	-1301.53	3429.01	3667.71	3667.71	110.79	2.02	-1.79
34	14,007	88.00	114.90	10517.83	-1340.64	3514.43	3761.45	3761.45	110.88	0.65	-0.11
35	14,101	90.40	115.00	10519.15	-1380.29	3599.64	3855.20	3855.21	110.98	2.56	2.55
36	14,196	91.30	114.70	10517.74	-1420.20	3685.84	3949.95	3949.98	111.07	1.00	0.95
37	14,290	91.20	113.40	10515.69	-1458.50	3771.65	4043.78	4043.84	111.14	1.39	-0.11
38	14,385	90.60	112.00	10514.19	-1495.16	3859.28	4138.72	4138.79	111.18	1.60	-0.63
39	14,480	90.60	110.70	10513.20	-1529.74	3947.76	4233.71	4233.78	111.18	1.37	0.00
40	14,574	89.40	109.20	10513.20	-1561.81	4036.11	4327.69	4327.75	111.15	2.04	-1.28
41	14,668	89.30	109.50	10514.26	-1592.96	4124.80	4421.65	4421.70	111.12	0.34	-0.11
42	14,762	89.90	109.10	10514.92	-1624.02	4213.51	4515.62	4515.65	111.08	0.77	0.64
43	14,856	90.30	109.30	10514.76	-1654.94	4302.28	4609.58	4609.60	111.04	0.48	0.43
44	14,951	90.70	109.60	10513.93	-1686.57	4391.86	4704.55	4704.56	111.01	0.53	0.42
45	15,045	90.00	110.10	10513.35	-1718.49	4480.27	4798.53	4798.54	110.99	0.92	-0.74
46	15,139	90.00	109.90	10513.35	-1750.64	4568.60	4892.52	4892.53	110.97	0.21	0.00
47	15,234	90.40	109.50	10513.02	-1782.66	4658.04	4987.50	4987.50	110.94	0.60	0.42
48	15,328	91.10	109.30	10511.79	-1813.88	4746.69	5081.46	5081.46	110.91	0.77	0.74
49	15,423	91.20	109.00	10509.89	-1845.04	4836.42	5176.40	5176.40	110.88	0.33	0.11
50	15,517	90.60	111.00	10508.41	-1877.18	4924.73	5270.37	5270.37	110.87	2.22	-0.64
51	15,611	89.80	111.20	10508.08	-1911.02	5012.43	5364.37	5364.37	110.87	0.88	-0.85
52	15,705	89.60	110.80	10508.57	-1944.71	5100.18	5458.37	5458.37	110.87	0.48	-0.21
53	15,800	90.50	111.90	10508.49	-1979.29	5188.66	5553.36	5553.36	110.88	1.50	0.95
54	15,894	90.10	111.70	10508.00	-2014.20	5275.94	5647.35	5647.35	110.90	0.48	-0.43
55	15,987	88.60	110.90	10509.05	-2047.98	5362.58	5740.33	5740.34	110.90	1.83	-1.61
56	16,082	88.90	111.20	10511.12	-2082.09	5451.22	5835.31	5835.31	110.90	0.45	0.32
57	16,175	88.90	110.30	10512.91	-2115.04	5538.17	5928.29	5928.29	110.90	0.97	0.00
58	16,269	89.00	109.80	10514.63	-2147.26	5626.46	6022.27	6022.27	110.89	0.54	0.11
59	16,363	90.10	110.60	10515.37	-2179.72	5714.67	6116.26	6116.26	110.88	1.45	1.17
60	16,456	90.50	110.60	10514.88	-2212.44	5801.72	6209.25	6209.25	110.87	0.43	0.43
61	16,551	90.50	110.40	10514.06	-2245.70	5890.70	6304.25	6304.25	110.87	0.21	0.00
62	16,645	89.10	108.50	10514.38	-2277.00	5979.33	6398.21	6398.21	110.85	2.51	-1.49
63	16,739	89.50	108.60	10515.53	-2306.90	6068.44	6492.13	6492.13	110.81	0.44	0.43
64	16,833	90.20	109.00	10515.78	-2337.20	Page 2 6157.42	6586.07	6586.07	110.79	0.86	0.74



V09.04.02

## SURVEY CALCULATION PROGRAM

5/31/13 14:39

Company:	Continental Resources, Inc.
Well Name:	Atlanta 11-6H
Location:	Williams County, ND
Rig:	Cyclone #2
Job Number:	DDMT-130261
API #:	33-105-02722

Magnetic Declination: 8.53 REFERENCED TO TRUE NORTH ▼

Vertical Section Azimuth:	110.85	Proposed Direction:	110.85
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Survey Calculation Method:	Minimum Curvature
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PTB:	MD	INC	AZM	TVD	N/S	E/W	VS
	19,697	88.9	111	10509.32	-3380.57	8822.91	9448.37

#	Depth Feet	Inc Degrees	Azm Degrees	TVD Feet	N/S Feet	E/W Feet	Surface Vert Sec	Closure Distance	DLS/ 100	BUR/ 100'	
65	16,927	90.30	110.60	10515.37	-2369.04	6245.86	6680.05	6680.06	110.77	1.71	0.11
66	17,022	90.50	110.20	10514.70	-2402.15	6334.90	6775.04	6775.05	110.77	0.47	0.21
67	17,116	88.10	108.90	10515.85	-2433.60	6423.47	6869.00	6869.01	110.75	2.90	-2.55
68	17,211	87.90	111.30	10519.17	-2466.23	6512.62	6963.93	6963.94	110.74	2.53	-0.21
69	17,305	89.50	112.70	10521.30	-2501.43	6599.75	7057.88	7057.89	110.76	2.26	1.70
70	17,400	90.40	113.70	10521.38	-2538.85	6687.06	7152.80	7152.80	110.79	1.42	0.95
71	17,493	90.60	113.70	10520.57	-2576.23	6772.22	7245.68	7245.68	110.83	0.22	0.22
72	17,588	90.80	113.60	10519.41	-2614.34	6859.23	7340.56	7340.56	110.86	0.24	0.21
73	17,682	91.80	113.40	10517.28	-2651.81	6945.41	7434.43	7434.44	110.90	1.08	1.06
74	17,777	88.00	110.90	10517.45	-2687.62	7033.38	7529.39	7529.39	110.91	4.79	-4.00
75	17,871	89.50	111.10	10519.50	-2721.30	7121.11	7623.36	7623.36	110.91	1.61	1.60
76	17,966	91.00	112.40	10519.08	-2756.50	7209.34	7718.34	7718.35	110.92	2.09	1.58
77	18,060	91.80	112.40	10516.78	-2792.31	7296.22	7812.28	7812.29	110.94	0.85	0.85
78	18,154	91.50	111.70	10514.08	-2827.58	7383.31	7906.22	7906.23	110.96	0.81	-0.32
79	18,248	90.90	111.30	10512.11	-2862.02	7470.75	8000.19	8000.21	110.96	0.77	-0.64
80	18,342	88.40	109.60	10512.68	-2894.86	7558.82	8094.18	8094.19	110.96	3.22	-2.66
81	18,437	88.60	110.20	10515.17	-2927.19	7648.11	8189.13	8189.14	110.94	0.67	0.21
82	18,530	91.30	111.40	10515.25	-2960.21	7735.04	8282.12	8282.13	110.94	3.18	2.90
83	18,624	91.60	110.60	10512.87	-2993.88	7822.77	8376.09	8376.10	110.94	0.91	0.32
84	18,717	90.10	110.10	10511.49	-3026.22	7909.95	8469.07	8469.08	110.94	1.70	-1.61
85	18,811	88.40	108.80	10512.72	-3057.52	7998.57	8563.03	8563.04	110.92	2.28	-1.81
86	18,906	88.40	108.40	10515.38	-3087.81	8088.58	8657.92	8657.92	110.89	0.42	0.00
87	19,000	89.80	110.80	10516.85	-3119.33	8177.11	8751.88	8751.88	110.88	2.96	1.49
88	19,094	91.70	113.20	10515.62	-3154.54	8264.25	8845.84	8845.84	110.89	3.26	2.02
89	19,188	92.60	113.30	10512.10	-3191.62	8350.55	8939.69	8939.70	110.92	0.96	0.96
90	19,282	93.30	112.80	10507.26	-3228.37	8436.93	9033.49	9033.51	110.94	0.91	0.74
91	19,376	89.70	111.80	10504.80	-3264.02	8523.86	9127.42	9127.43	110.95	3.97	-3.83
92	19,470	89.50	111.60	10505.45	-3298.78	8611.19	9221.40	9221.42	110.96	0.30	-0.21
93	19,564	88.90	111.00	10506.77	-3332.92	8698.76	9315.39	9315.41	110.96	0.90	-0.64

Industrial Commission of North Dakota  
Oil and Gas Division  
Spill / Incident Report

Date/Time Reported : Mar 17 2013 / 00:01

State Agency person :

Responsible Party : Cyclone Drilling

Well Operator : CONTINENTAL RESOURCES, INC.

Date/Time of Incident : 3/16/2013 12:00:00 AM

NDIC File Number : 23362

Facility Number :

Well or Facility Name : ATLANTA 11-6H

Type of Incident : Valve/Piping Connection Leak

Field Name : BAKER

County : WILLIAMS

Section : 6

Township : 153

Range : 101

Quarter-Quarter :

Quarter :

Distance to nearest residence : 600 Feet

Distance to nearest water well :

Release Oil : 0 barrels

Release Brine : 0 barrels

Release Other : 15 barrels

Recovered Oil : 0 barrels

Recovered Brine : 0 barrels

Recovered Other : 15 barrels

Has/Will the incident be reported to the NRC? : No

Was release contained : Yes - Within Dike

Description of other released substance : diesel

Immediate risk evaluation : none

Followup Report Requested Y/N : N



# 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.

23362

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"/> Report of Work Done	Date Work Completed
<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"/> Drilling Progress    | <input type="checkbox"/> Spill Report             |
| <input type="checkbox"/> Redrilling or Repair | <input type="checkbox"/> Shooting                 |
| <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 11-6H**

Footages	Qtr-Qtr	Section	Township	Range
495 F N L	1350 F W L	NENW	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>
Signature 	Printed Name <b>Jim Landrigan</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 <b>December 14, 2012</b>	
By 	
Title <b>PETROLEUM ENGINEER</b>	

**AMERICAN  
TECHNICAL  
SERVICES, INC.**

8105 Black Hawk Rd • PQ 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

**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 proofrolled 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**

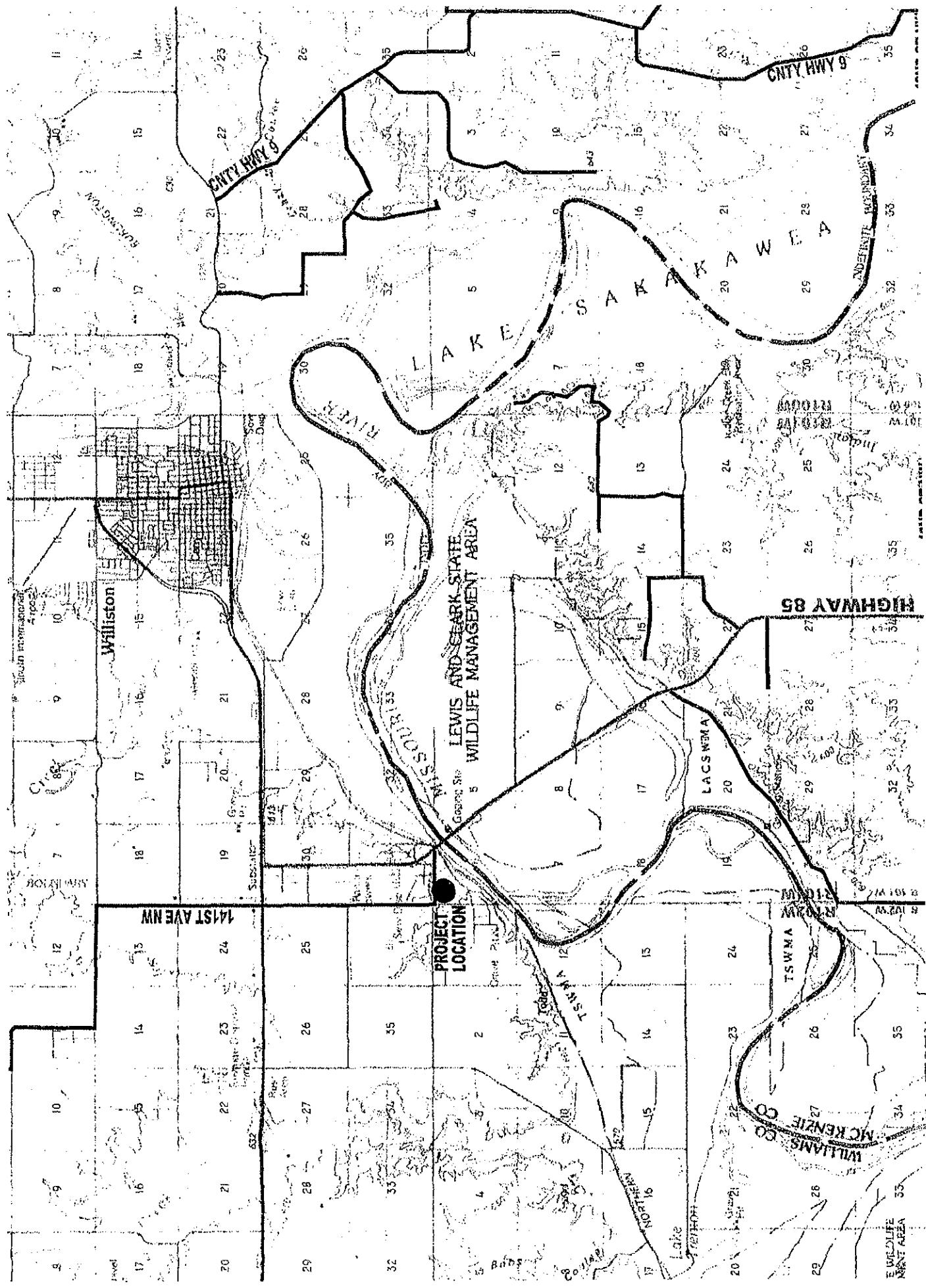
**SITE PLAN WITH BORING LOCATIONS**

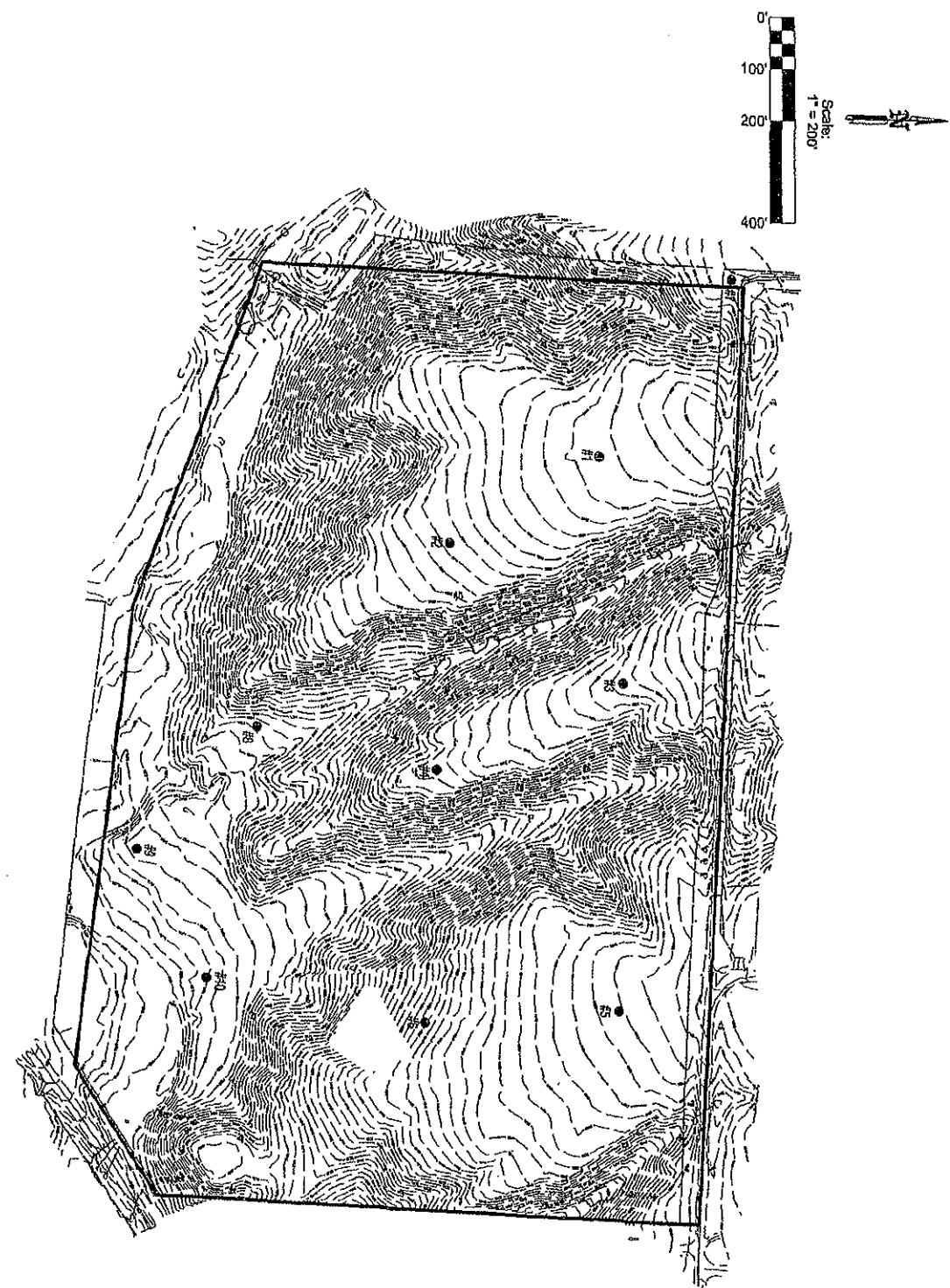
**BORING LOGS**

**BORING LOG GENERAL NOTES**

**CLASSIFICATION OF SOILS FOR ENGINEERING PURPOSES**

**MOISTURE-DENSITY CURVES**





 BROSZ ENGINEERING, INC. ARCHITECTURE • ENGINEERING • SURVEYING	SHEET DESCRIPTION: Site Layout PROJECT NAME: Atlanta Site PROJECT NO.: N12B10	REVISION	DATE	DESIGNED BY: DRAWN BY: JBE DATE PRINTED: 5/8/12	0 OF
		1	xx/xx/xx		
		2			
		3			
		4			

# 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 PL	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'							13	7	SB	111
45.0'							NSR			
48.0'										
50.0'	Dk gray				14	8	SB			
55.0'										
57.0'										
58.0'							V			
60.0'	Shale: Dk. Gray, wet, m. stiff (CH)	Pierre Shale			9	9	SB	30	95	
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							

**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: 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'	less stiff									
41.0'	End of Boring									
DATE: 6/5/12	WATER TABLE MEASUREMENTS Not Encountered Borehole caved to 25'	DATE: 6/5/12	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: 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
							PL			
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	11	FR	36		
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		9	5	SB					
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			

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# 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 PL	QU
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: 6/6/12	WATER TABLE MEASUREMENTS Not Encountered Borehole caved to 32'	DATE: 6/6/12	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: 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'				9	8	SB				
60.0'										
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
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'										
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							

**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: 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'										
10.0'	Gravelly Sand: Brown, moist, dense, variable sand content (SW)									
15.0'	obstructed sampler									
18.0'	less dense, wet, less gravel									
20.0'										
21.0'	End of Boring									
25.0'										
DATE:	WATER TABLE MEASUREMENTS	DATE: 6/7/12								
6/7/12	Encountered at 18'	METHOD OF DRILLING: 2.25" HSA								
	Borehole caved to 13'	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: 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
							PL			
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'							NSR			
26.0'	End of Boring									
DATE:	WATER TABLE MEASUREMENTS		DATE: 6/7/12							
6/7/12	Encountered at 15'		METHOD OF DRILLING: 2.25" HSA							
	Borehole caved to 13'		CREW CHIEF: MS							

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

## 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									
Coarse-grained soils More than 50% retained on No. 200 sieve*	Sands More than 50% of coarse fraction passes No. 4 sieve	GW	Well-graded gravels and gravel-sand mixtures, little or no fines	Gravels 50% or more of coarse fraction retained on No. 4 sieve	$C_u = \frac{D_{50}}{D_{10}}$ greater than 4; $C_z = \frac{(D_{50})^2}{D_{10} \times D_{50}}$ between 1 and 3	Not meeting both criteria for GW								
						Atterberg limits below "A" line or PI. less than 4								
		GP	Poorly graded gravels and gravel-sand mixtures, little or no fines	Clean gravels		Atterberg limits above "A" line with PI. greater than 7								
						$C_u = \frac{D_{50}}{D_{10}}$ greater than 6; $C_z = \frac{(D_{50})^2}{D_{10} \times D_{50}}$ between 1 and 3								
		Sands with fines	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, SM, SC 5 to 12% pass No. 200 sieve ..... Borderline classifications requiring use of dual symbols	Not meeting both criteria for SW								
						Atterberg limits below "A" line or PI. less than 4								
			GC	Clayey gravels, gravel-sand-clay mixtures		Atterberg limits above "A" line with PI. greater than 7								
						$C_u = \frac{D_{50}}{D_{10}}$ greater than 6; $C_z = \frac{(D_{50})^2}{D_{10} \times D_{50}}$ between 1 and 3								
			SW	Well-graded sands and gravelly sands, little or no fines		Not meeting both criteria for SW								
						Atterberg limits below "A" line or PI. less than 4								
Fine-grained soils 50% or more passes No. 200 sieve*	Sils and clays Liquid limit 50% or less	SM	Silty sands, 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, SM, SC 5 to 12% pass No. 200 sieve ..... Borderline classifications requiring use of dual symbols	Atterberg limits above "A" line with PI. greater than 7									
					Atterberg limits plotting in hatched area are borderline classifications requiring use of dual symbols									
		SC	Clayey sands, sand-clay mixtures		Not meeting both criteria for SC									
					Atterberg limits below "A" line or PI. less than 4									
		ML	Inorganic silts, very fine sands, rock flour, silty or clayey fine sands		Atterberg limits above "A" line with PI. greater than 7									
					Atterberg limits plotting in hatched area are borderline classifications requiring use of dual symbols									
Sils and clays Liquid limit greater than 50%	CL	CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays	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: $PI = 0.73(LL - 20)$	CH									
					CH									
		OL	Organic silts and organic silty clays of low plasticity		OH and MH									
					OH and MH									
		MH	Inorganic silts, micaceous or diatomaceous fine sands or silts, elastic silts		CL									
					CL									
Highly organic soils	PI	Peat, muck and other highly organic soils			Liquid Limit									
		Based on the material passing the 3 in. (75 mm) sieve.			Based on the material passing the 3 in. (75 mm) sieve.									



AMERICAN  
TECHNICAL  
SERVICES, INC.

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

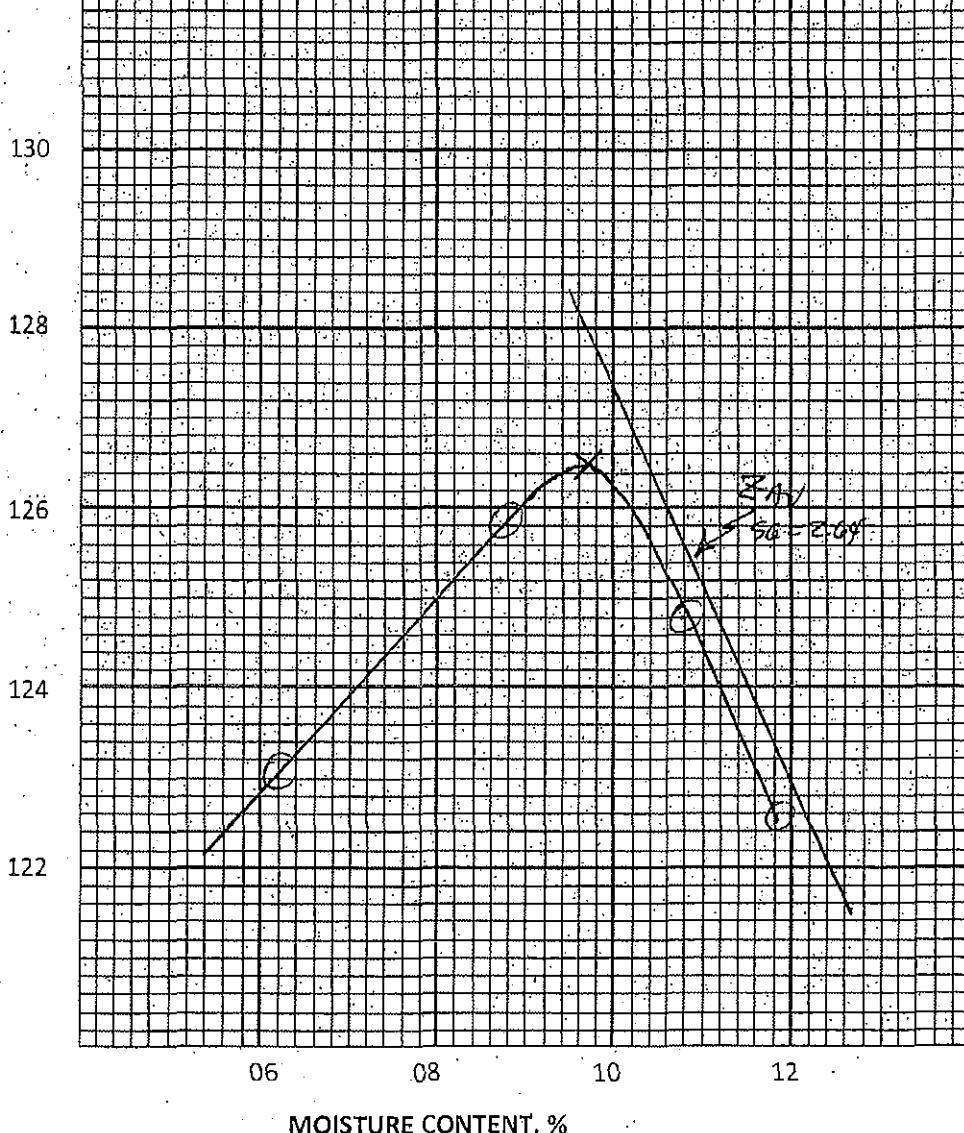
Soil Classification: (SC-CL) Clayey  
Sand/Sandy Clay

Project: Continental Atlanta Pad, Near  
Williston, North Dakota

Project Number: 12-12165

**MAXIMUM DENSITY: 126.5 pdf**

**OPTIMUM MOISTURE CONTENT: 9.7%**



DRY DENSITY. pdf

Cc:

SIOUX FALLS • BLACK HAWK • SPEARFISH

**AMERICAN  
TECHNICAL  
SERVICES, INC.**

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#: 2 Date: 06/11/12

ASTM: 698 Method: A

Attn: Jade

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

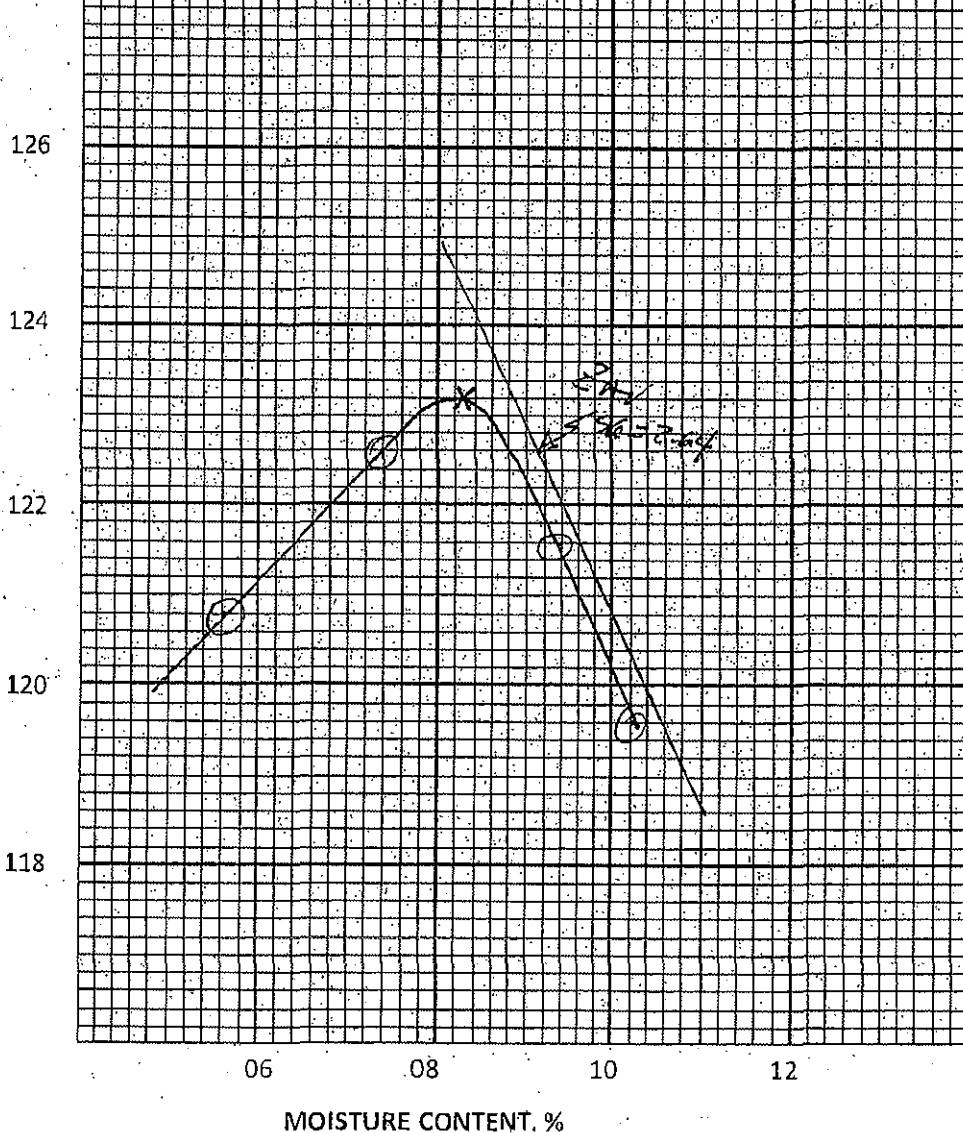
Project: Continental Atlanta Pad, Near  
Williston, North Dakota

Project Number: 12-12165

**MAXIMUM DENSITY: 123.2 pcf**

**OPTIMUM MOISTURE CONTENT: 8.3%**

DRY DENSITY, pcf



Cc:

**SIOUX FALLS • BLACK HAWK • SPEARFISH**

# 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):  $9.08 \times 10^{-6}$

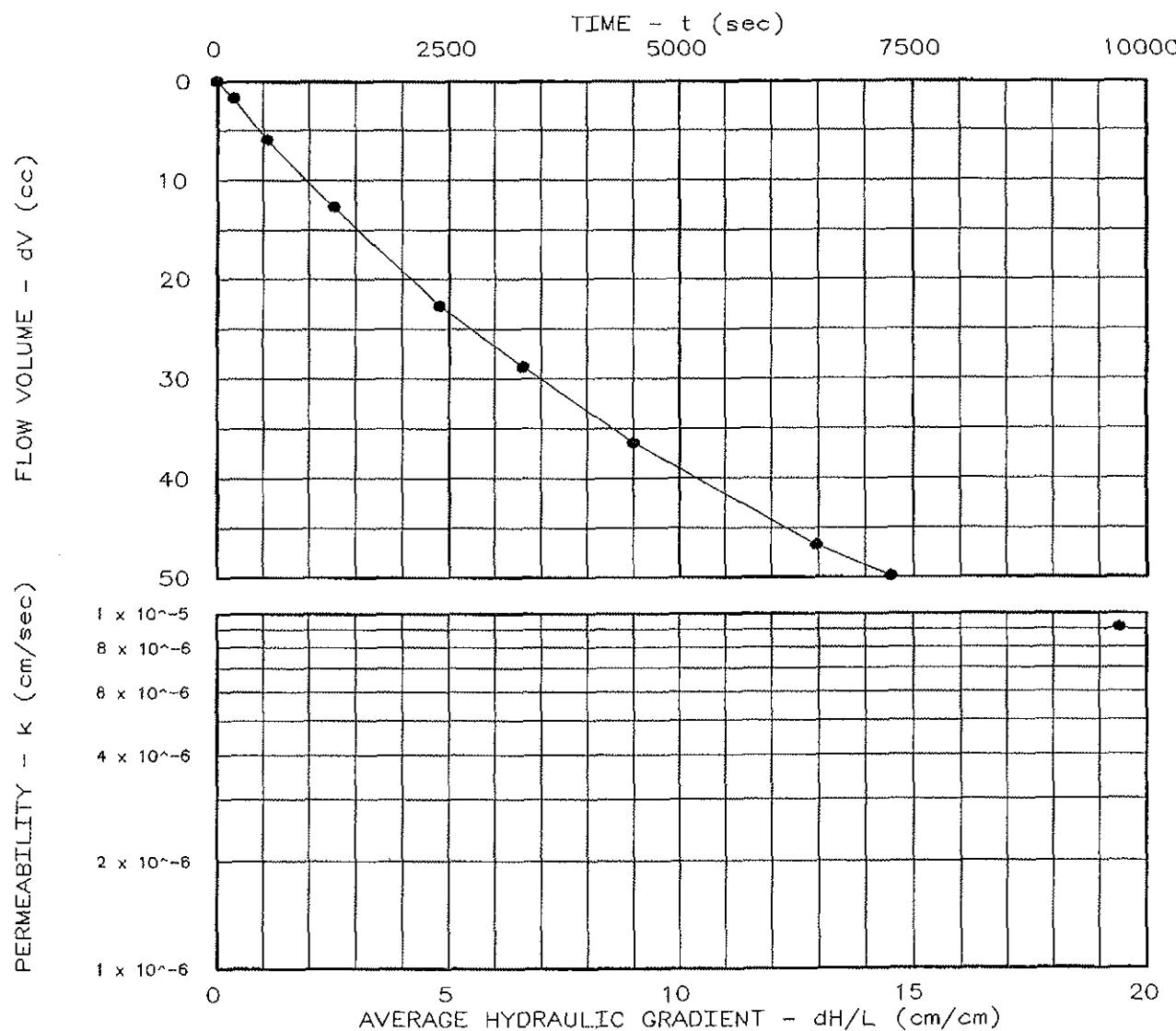
**SAMPLE DATA:**

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: Flexwett  
 Sample type: Remolded



Project: Atlanta Site

Location:

Date: 9/10/2012

Project No.: 114-551057

File No.: 258

Lab No.:

Tested by:

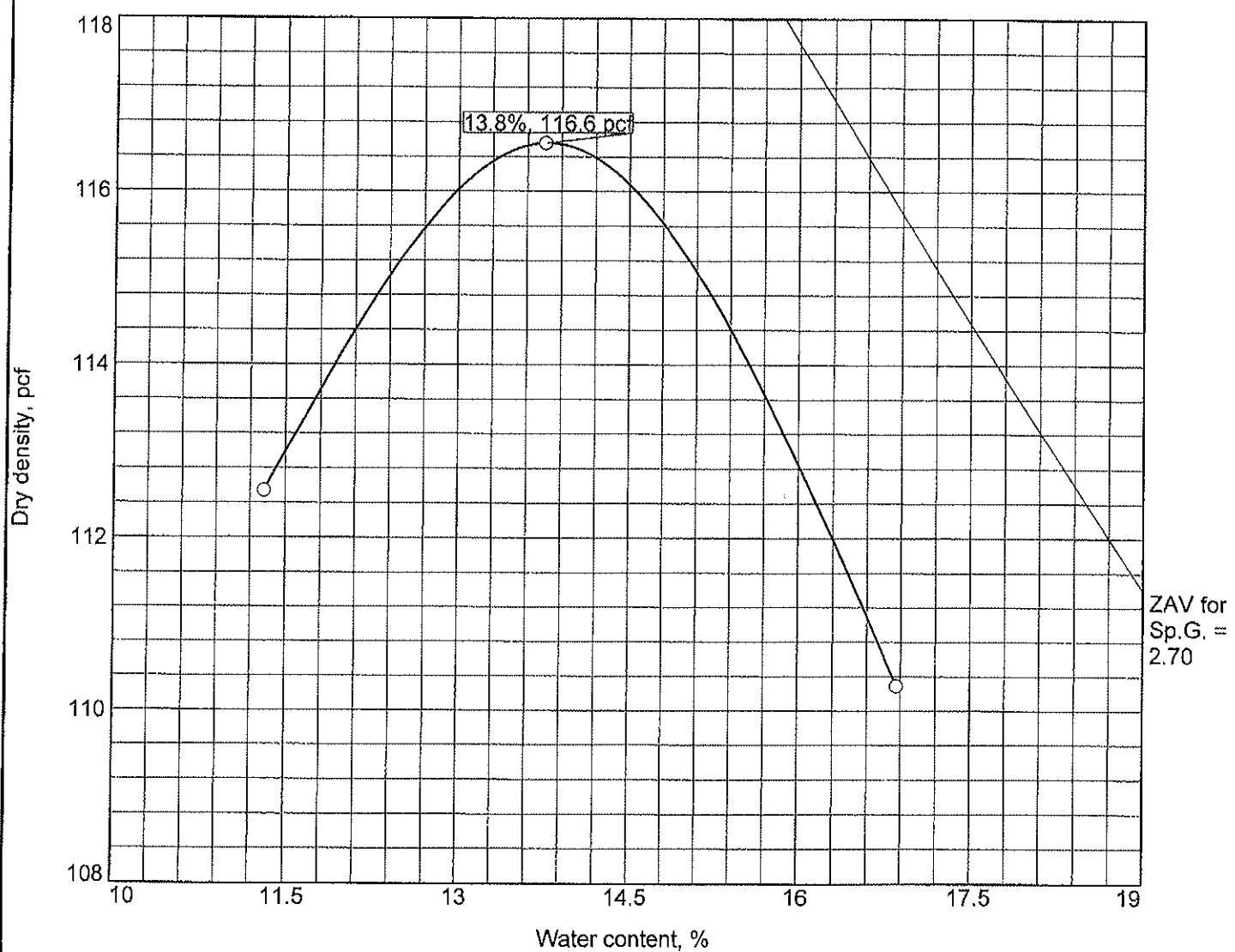
Checked by:

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):  $2.49 \times 10^{-5}$

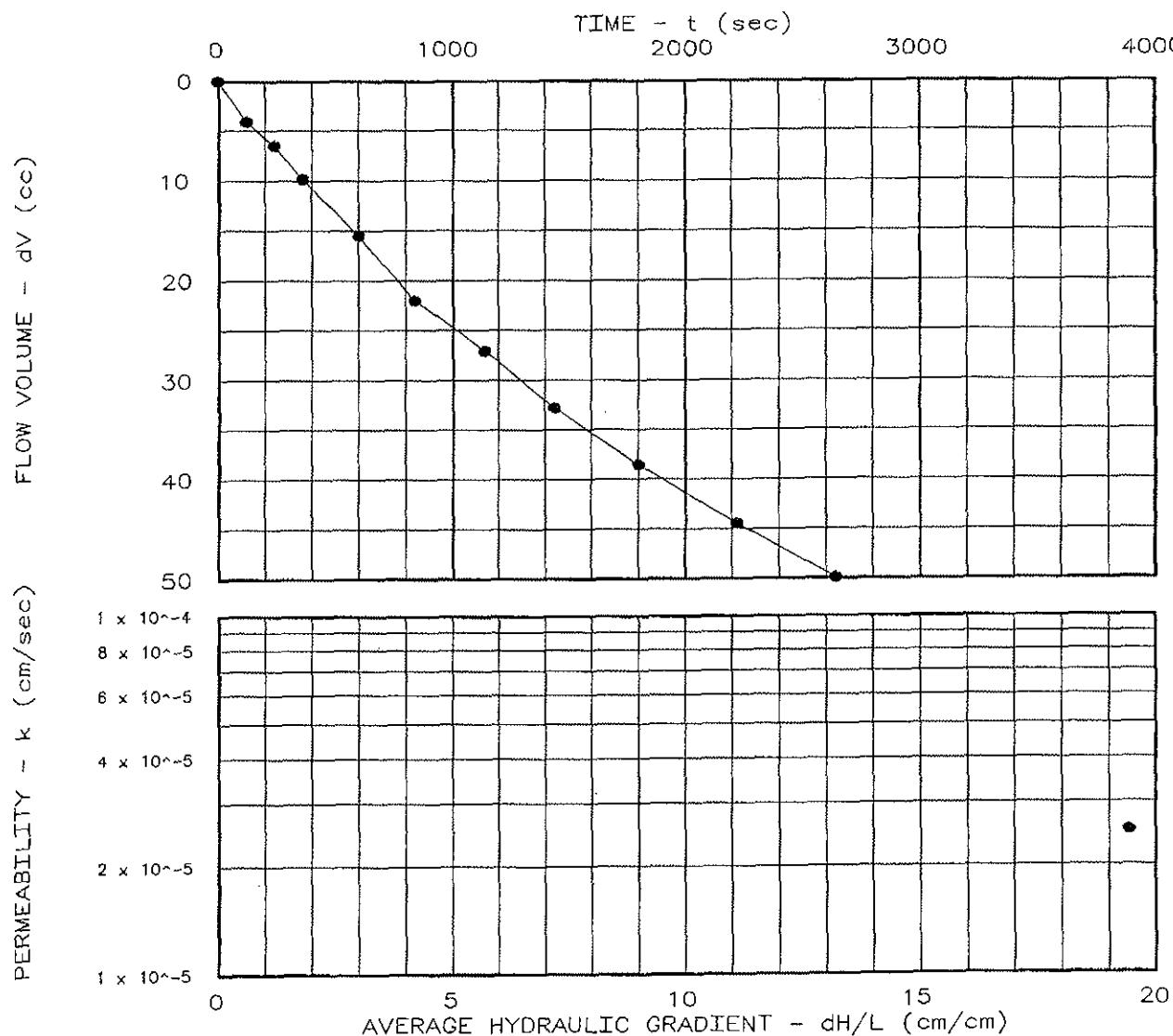
**SAMPLE DATA:**

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				
<b>TEST RESULTS</b>							<b>MATERIAL DESCRIPTION</b>	
Maximum dry density = 118.2 pcf								
Optimum moisture = 12.1 %								
Project No. 114-551057 Client: Continental Resources Project: Atlanta Site							Remarks:	
<input checked="" type="checkbox"/> 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):  $1.97 \times 10^{-5}$

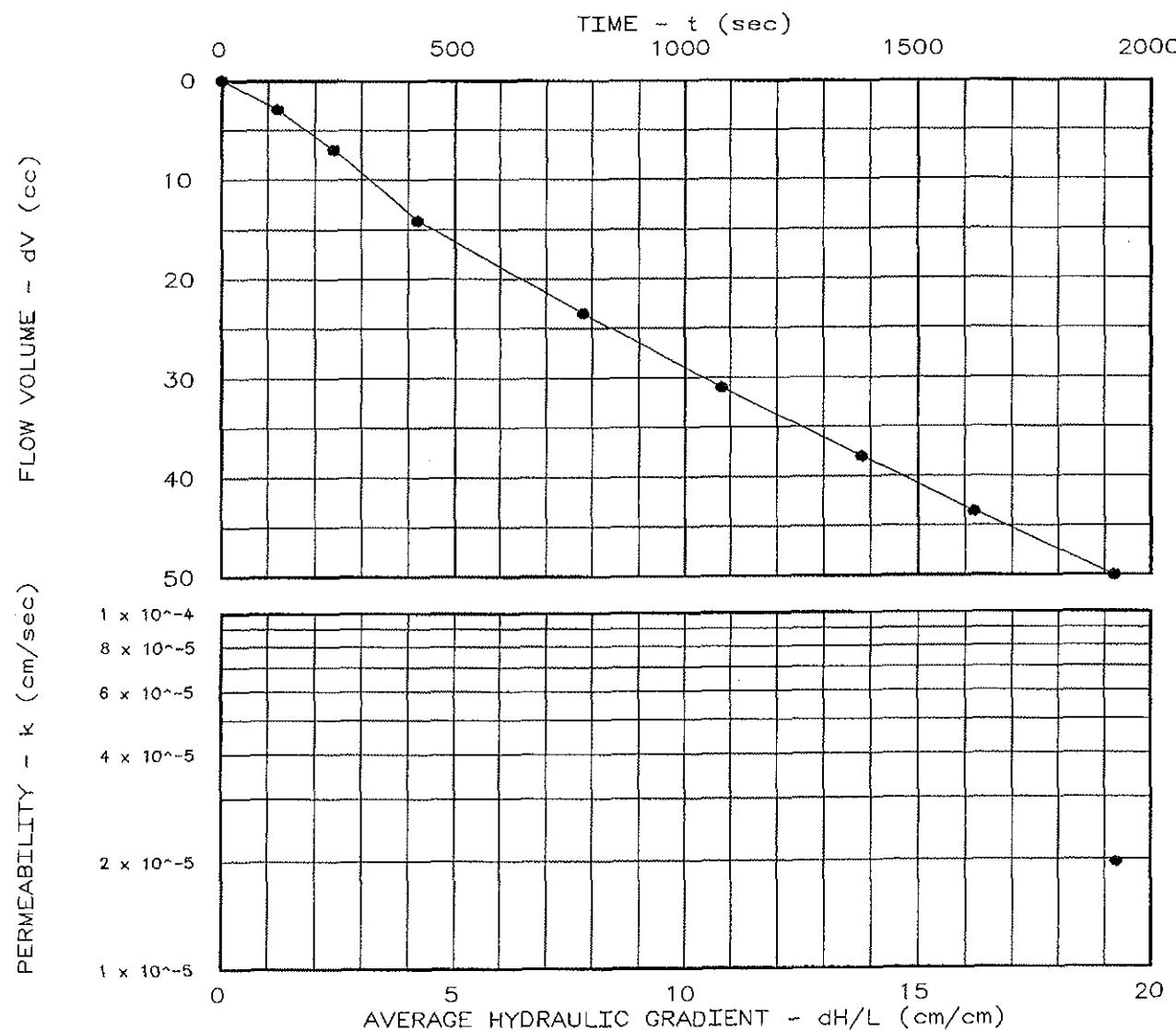
**SAMPLE DATA:**

Sample Identification: Fill No.2

Visual Description:

Remarks:

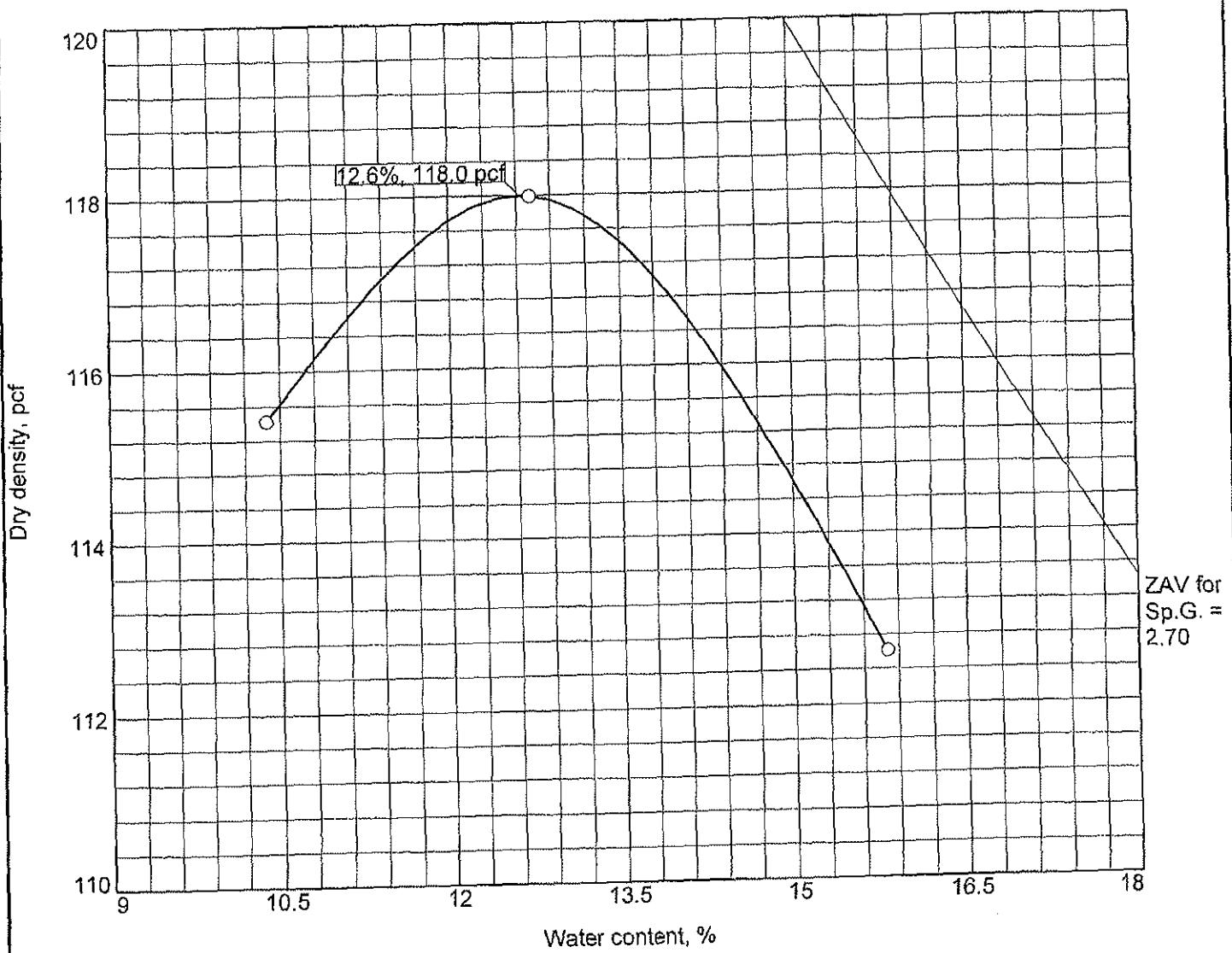
Maximum Dry Density (pcf): 118.0  
 Optimum Moisture Content (%): 12.6  
 ASTM(D698)  
 Percent Compaction: 95.0%  
 Permeameter type: Flexwall  
 Sample type: Remolded



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

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

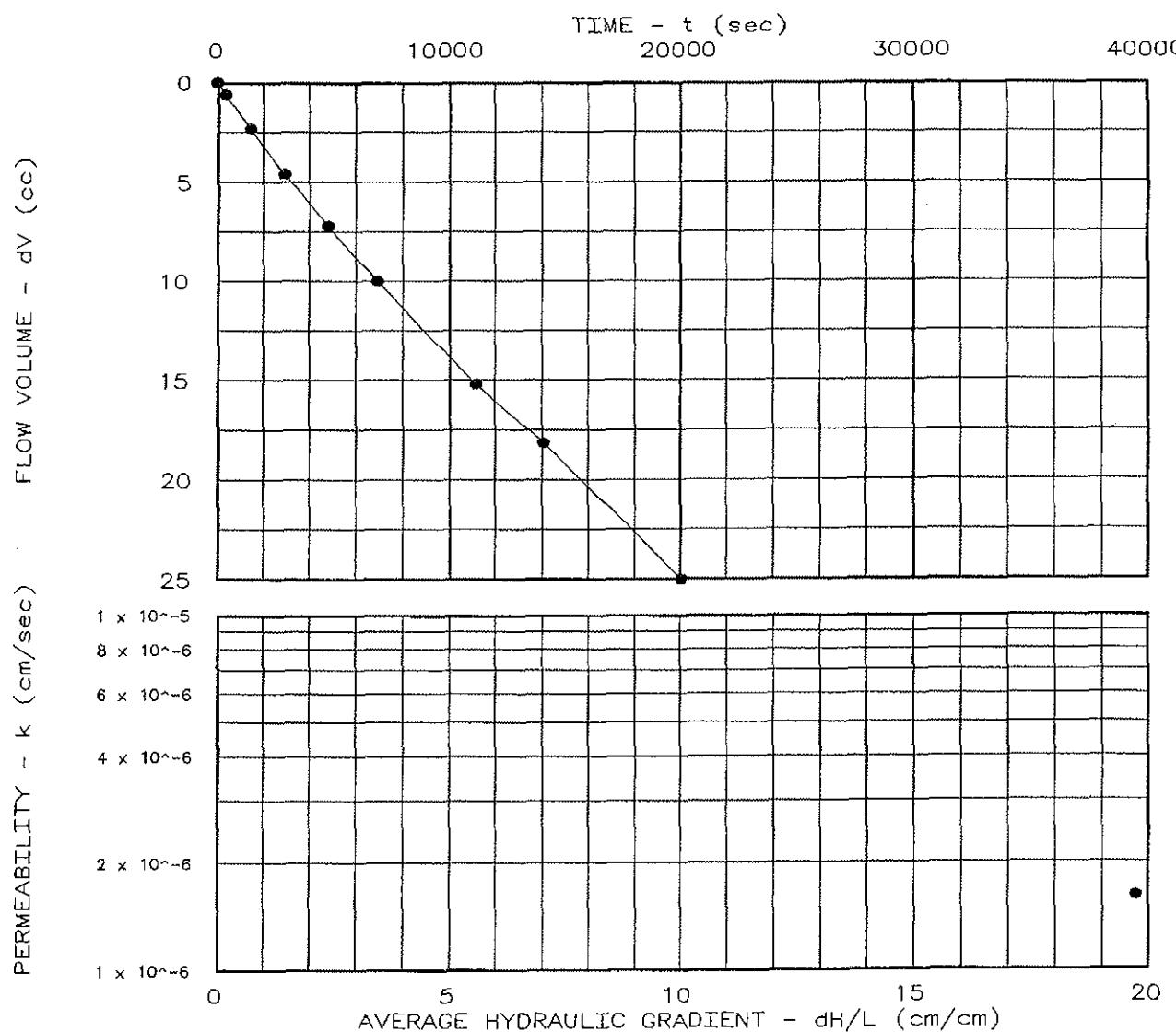
# PERMEABILITY TEST REPORT

**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 A  
 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:

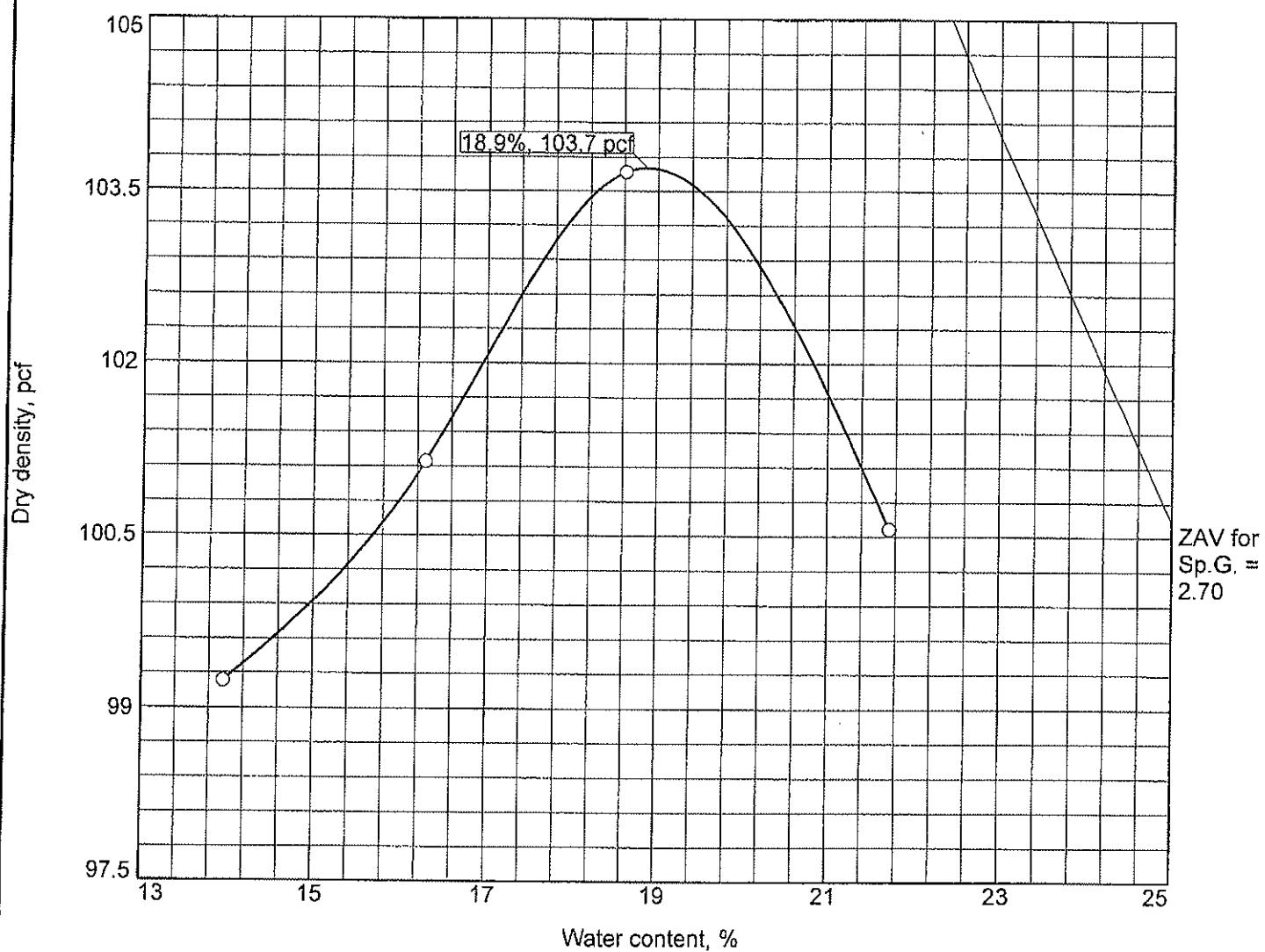
Checked by:

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

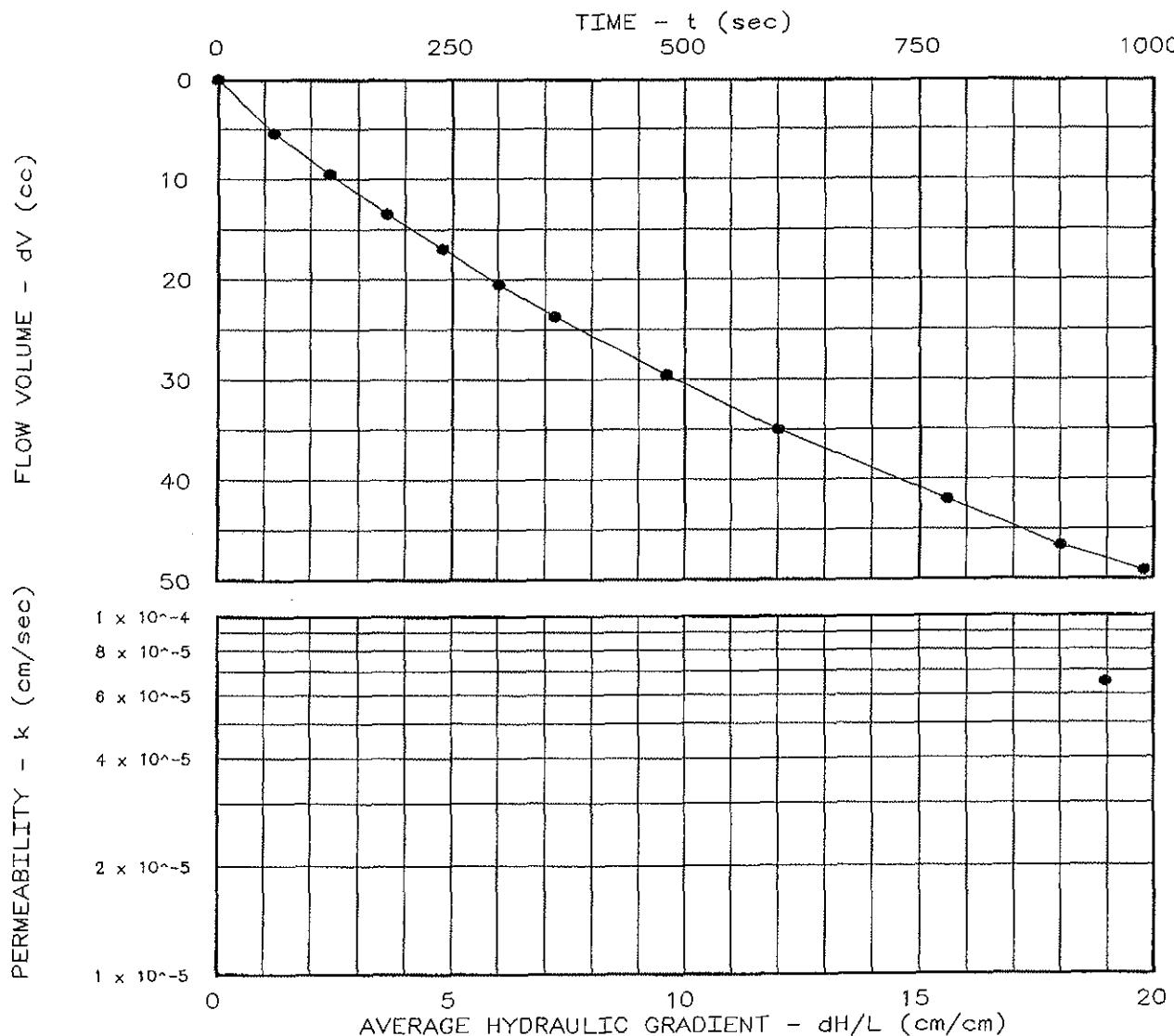
# PERMEABILITY TEST REPORT

**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:

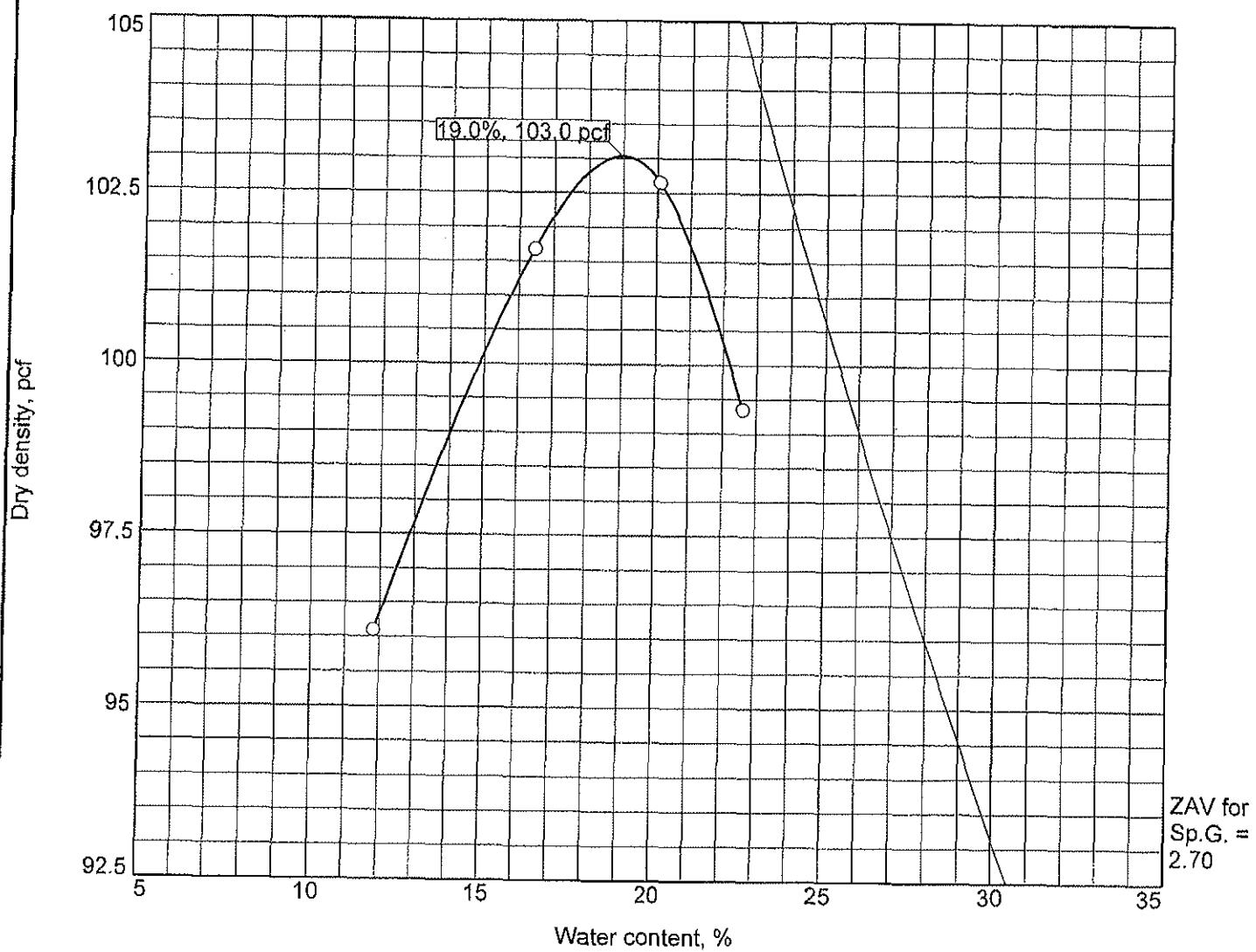
Checked by:

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

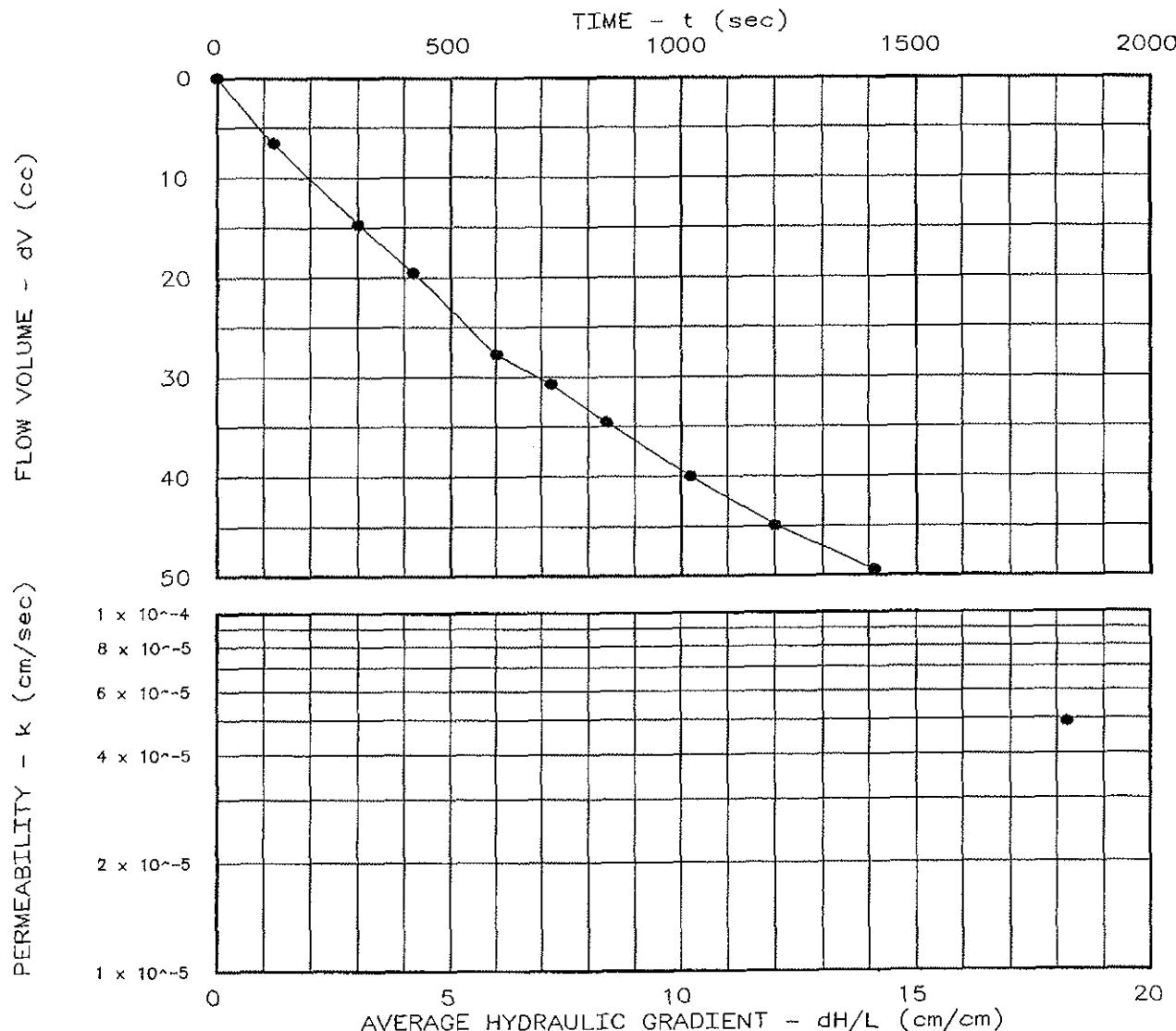
# PERMEABILITY TEST REPORT

**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 A  
 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:

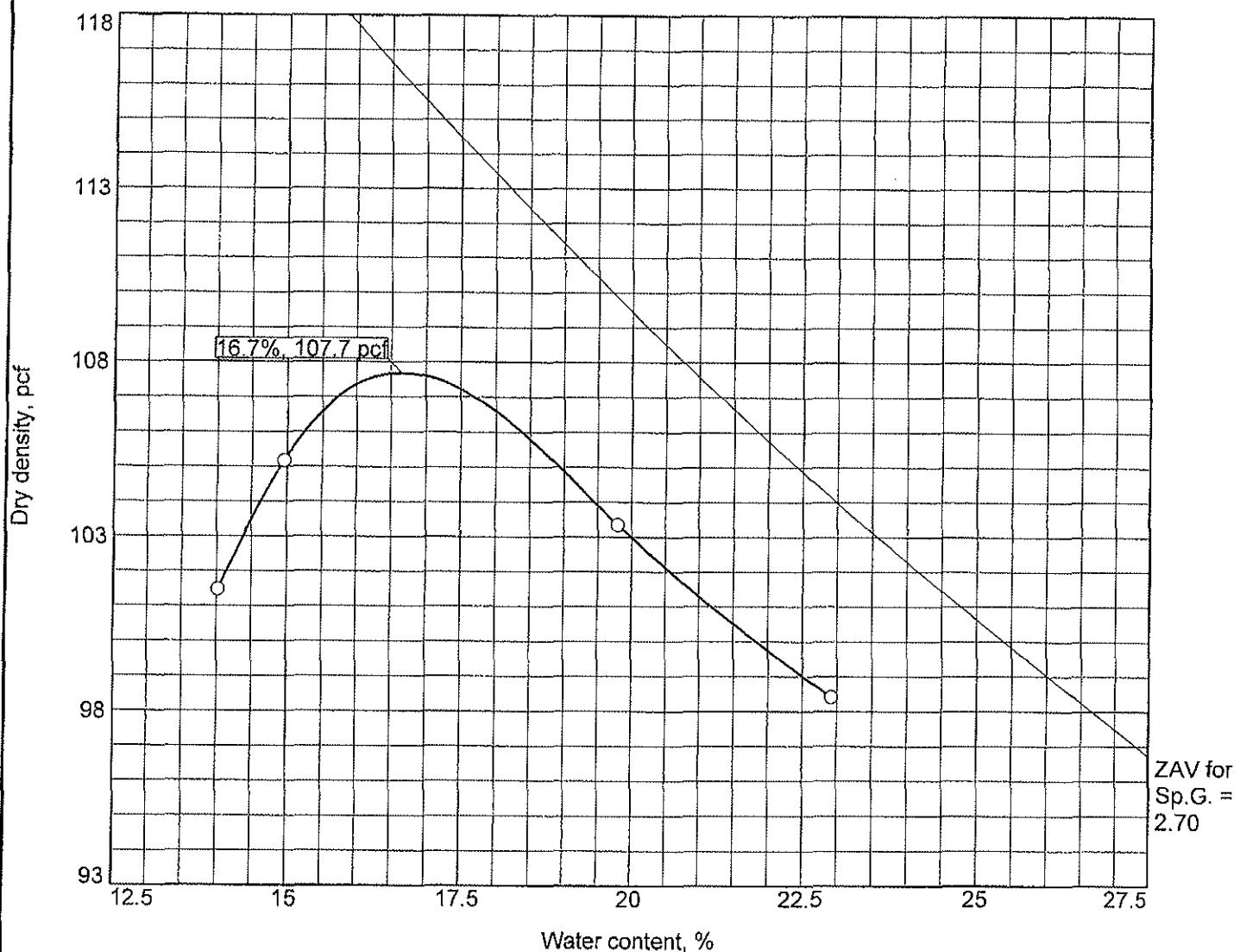
Checked by:

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		MATERIAL DESCRIPTION
Maximum dry density = 107.7 pcf		
Optimum moisture = 16.7 %		
Project No. 114-551057 Client: Continental Resources Project: Atlanta Site		Remarks:
<input type="checkbox"/> Source of Sample: Cement No. 2 Tetra Tech, Inc.		Billings, MT

Figure

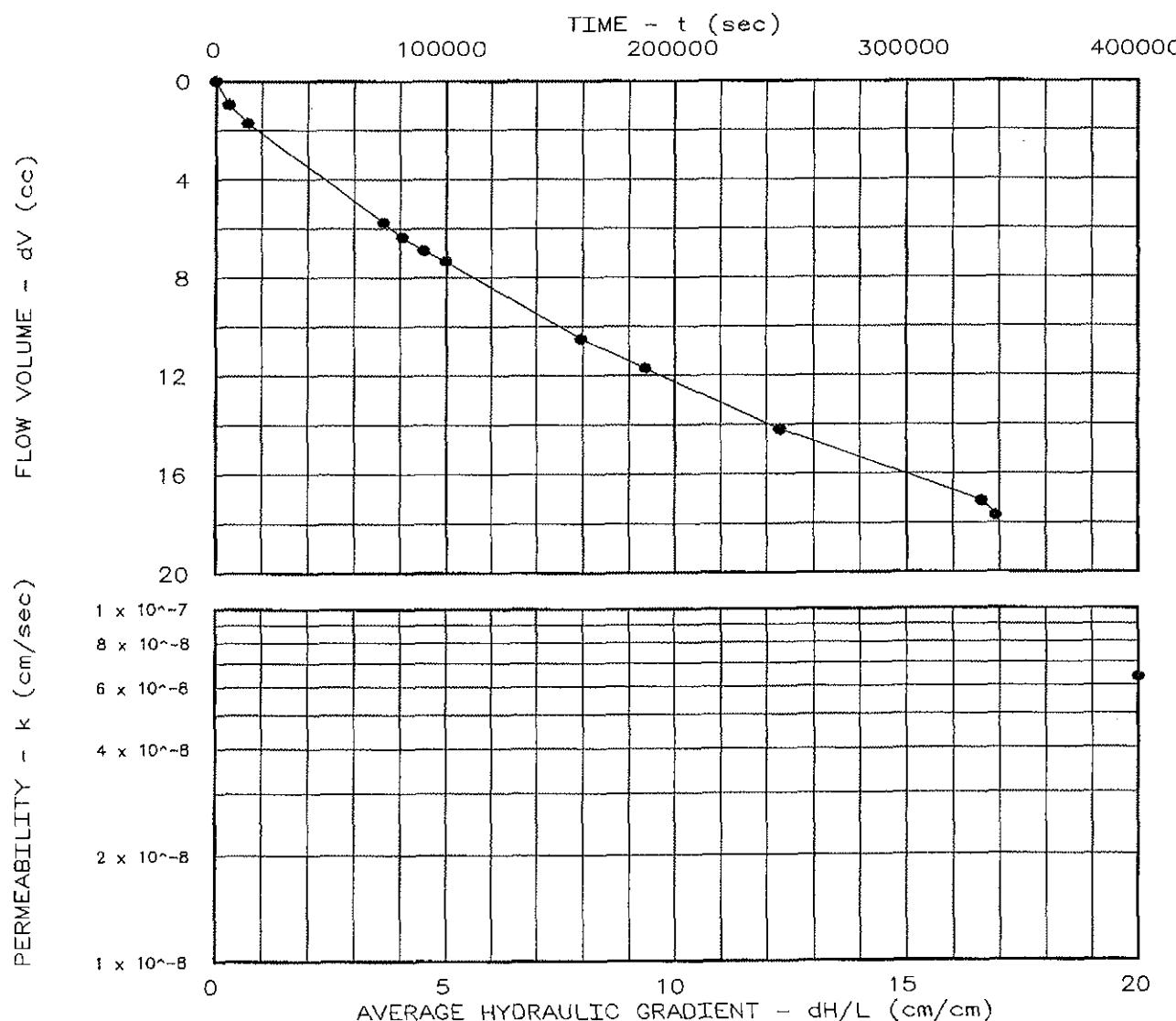
# PERMEABILITY TEST REPORT

**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:**

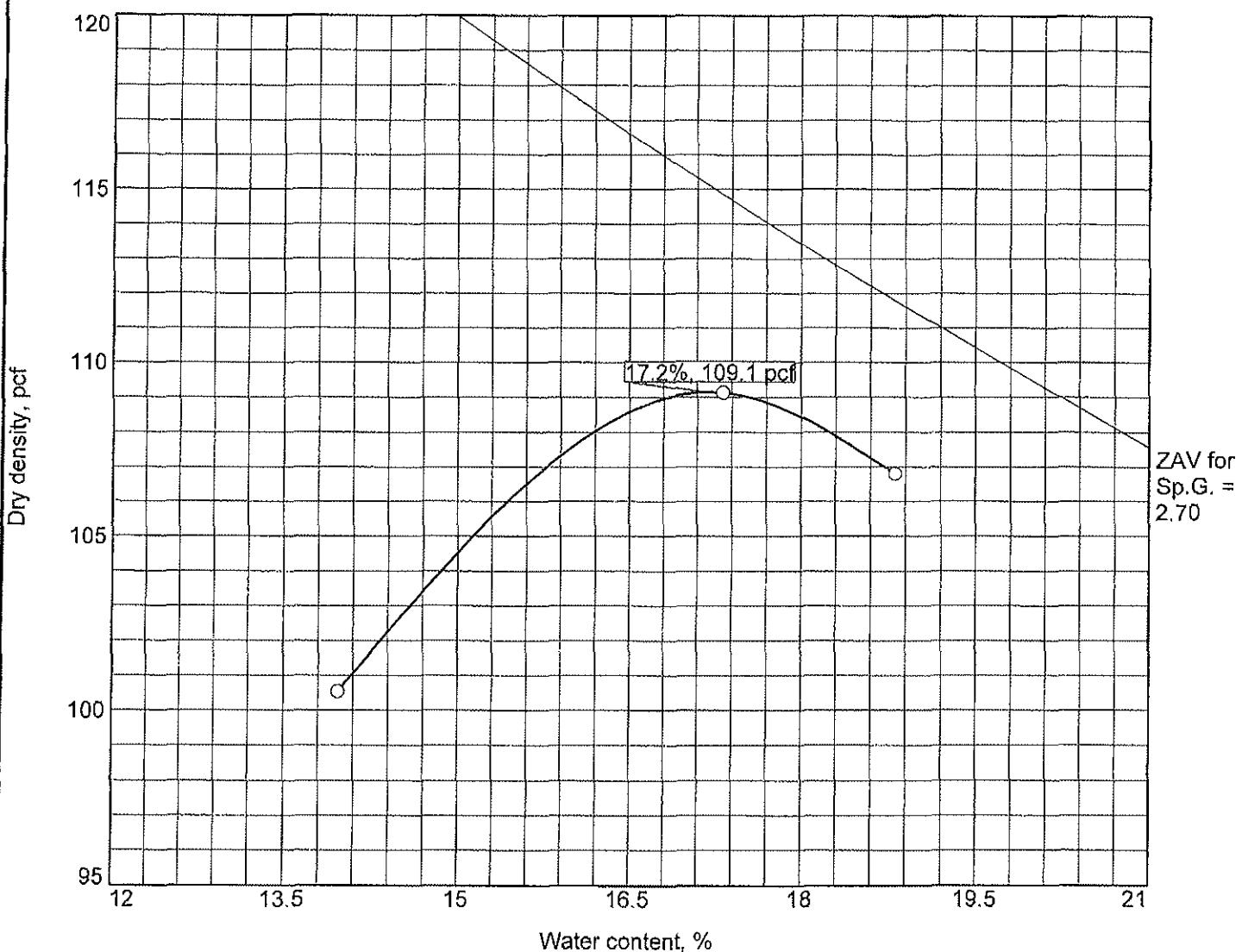
Sample Identification: Fill No. 4  
 Visual Description:  
 Remarks:  
 Maximum Dry Density (pcf): 109.1  
 Optimum Moisture Content (%): 17.2  
 ASTM(D698)  
 Percent Compaction: 95.0%  
 Permeameter type: Flexwall  
 Sample type: Remolded



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

## 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 = 109.1 pcf		
Optimum moisture = 17.2 %		
Project No. 114-551057 Client: Continental Resources Project: Atlanta Site		Remarks:
<input type="checkbox"/> 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:



## LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client: Continental Resources

Project: Atlanta Site

Client Sample ID: Original Material, From Cut

Location: E-1180177.20, 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 / srm
Conductivity, sat. paste	4.8 mmhos/cm	ASA10-3	09/06/12 16:30 / srm
Calcium, sat. paste	24.4 meq/l.	SW6010B	09/05/12 13:07 / rh
Magnesium, sat. paste	29.5 meq/L	SW6010B	09/05/12 13:07 / rh
Sodium, sat. paste	18.7 meq/L	D	SW6010B 09/05/12 13:07 / rh
Sodium Adsorption Ratio (SAR)	3.60 unitless		Calculation 09/06/12 16:30 / srm

### CHEMICAL CHARACTERISTICS

Cation Exchange Capacity	19.8 meq/100g	D	SW6010B	09/06/12 15:11 / rh
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Report Definitions: RL - Analyte reporting limit.  
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. 1937.65  
Lab ID: B12082786-002

Report Date: 09/06/12  
Collection Date: 09/29/12 19:00  
Date Received: 09/30/12  
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 / sm
Conductivity, sat. paste	2.8	mmhos/cm		ASA10-3	09/06/12 16:30 / sm
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 / sm
<b>CHEMICAL CHARACTERISTICS</b>					
Cation Exchange Capacity	15.1	meq/100g	D	SW6010B	09/06/12 15:15 / rh

Report Definitions: RL - Analyte reporting limit.  
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: B12002786-003

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
<b>SATURATED PASTE</b>					
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 / rh
Magnesium, sat. paste	8.07	meq/L		SW6010B	09/05/12 13:28 / rh
Sodium, sat. paste	3.40	meq/L		SW6010B	09/05/12 13:28 / rh
Sodium Adsorption Ratio (SAR)	1.47	unitless		Calculation	09/06/12 16:30 / srm
<b>CHEMICAL CHARACTERISTICS</b>					
Cation Exchange Capacity	12.3	meq/100g	D	SW6010B	09/06/12 15:22 / 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 #3

Location: E-1179963.65, N-421120.95, Elv. 1937.90

Lab ID: B120827B6-004

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

### SATURATED PASTE

pH, sat. paste	7.9 s.u.	ASAM10-3	09/06/12 16:30 / srn
Conductivity, sat. paste	4.5 mmhos/cm	ASA10-3	09/06/12 16:30 / srn
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	11.5 meq/L	D	SW6010B 09/05/12 13:32 / rh
Sodium Adsorption Ratio (SAR)	2.07 unitless		Calculation 09/06/12 16:30 / srn

### CHEMICAL CHARACTERISTICS

Cation Exchange Capacity	16.4 meq/100g	D	SW6010B	09/06/12 15:29 / rh
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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.



## 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								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
<b>Method:</b> ASAM10-9.2									
Sample ID: B12082786-001A DUP pH, sat. paste	Sample Duplicate 7.60	s.u.	0.10		Run: MISC-SOIL_120906B		2.6	10	09/06/12 16:30
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	RPDLimit	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)	3.86	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	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: SW6010B									Batch: 65170
Sample ID: LCS-65170	Laboratory Control Sample				Run: ICP201-B_120905A				09/05/12 13:03
Calcium, sat. paste	46.4	meq/L	0.050	88	50	150			
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	Sample Duplicate				Run: ICP201-B_120905A				09/05/12 13:10
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	Sample Matrix Spike				Run: ICP201-B_120905A				09/05/12 13:25
Calcium, sat. paste	26.8	meq/L	0.050	101	50	150			
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	Laboratory Control Sample				Run: ICP201-B_120905B				09/06/12 15:08
Cation Exchange Capacity	22.4	meq/100g	0.16	90	60	140			
Sample ID: B12082786-002A DUP	Sample Duplicate				Run: ICP201-B_120905B				09/06/12 15:18
Cation Exchange Capacity	13.8	meq/100g	0.16				8.8		50
Sample ID: B12082786-003AMS2	Sample Matrix Spike				Run: ICP201-B_120905B				09/06/12 15:25
Cation Exchange Capacity	33.6	meq/100g	0.17	98	50	150			

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 <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Not Present <input type="checkbox"/>
Custody seals intact on shipping container/cooler?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	Not Present <input checked="" type="checkbox"/>
Custody seals intact on sample bottles?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	Not Present <input checked="" type="checkbox"/>
Chain of custody present?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Chain of custody signed when relinquished and received?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Chain of custody agrees with sample labels?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Samples in proper container/bottle?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Sample containers intact?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Sufficient sample volume for indicated test?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
All samples received within holding time? (Exclude analyses that are considered field parameters such as pH, DO, Res Cl, Sulfite, Ferrous Iron, etc.)	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Temp Blank received?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	Not Applicable <input type="checkbox"/>
Container/Temp Blank temperature:	24.6°C No Ice		
Water + VOA vials have zero headspace?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	No VOA vials submitted <input checked="" type="checkbox"/>
Water + pH acceptable upon receipt?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	Not Applicable <input checked="" type="checkbox"/>

### 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: PO Box 268870      73126 Oklahoma City, OK		Contact Name: <b>Chad Newby</b> Phone/Fax: <b>405-574-2172</b> Email: <b>chad.newby@clr.com</b>		Purchase Order: <b>Spencer Ingalls</b>	Sampler, (Please Print) <b>Chad Newby</b>
Invoice Address: PO Box 268870      73126 Oklahoma City, OK		Invoice Contact & Phone: <b>Chad Newby</b> <b>405-574-2172</b>		Quote/Bottle Order: <b>Unknown</b>	Shipment <b>Hand</b> Cedar (R40):
Special Report/Formats - ELI must be notified prior to sample submittal for the following:		ANALYSIS REQUESTED		Comments: <b>E-1180177.20</b> <b>N-421287.75</b> <b>ELU 1940.40</b>	Receipt Temp <b>24.6 °C</b>
<input type="checkbox"/> DW <input type="checkbox"/> GSA <input type="checkbox"/> POTW/MMWTP <input type="checkbox"/> 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		Number of Containers Sample Type: A/W/S/V/R/D Soil/Solids Air/Water/Bioassay Other	Normal Turnaround (TAT) <b>24 hrs</b>
<b>SAMPLE IDENTIFICATION</b> (Name, Location, Interval, etc.)		Collection Date <b>8-29-12</b>	Collection Time <b>7:00pm</b>	MATRIX <b>I-S</b>	SEE ATTACHED <b>X</b>
Original Material ( <input checked="" type="checkbox"/> ) 2 3 4 5 6 7 8 9 10 11 12					
<b>Custody Record MUST be Signed</b>		Received by (print): <b>Mick Albright</b>	Date/Time: <b>8-30-12 9:00 AM</b>	Received by (print): <b>Mick Albright</b>	Date/Time: <b>8-30-12 9:00 AM</b>
		Received by (print): <b>Mick Albright</b>	Date/Time: <b>8-30-12 3:05 PM</b>	Received by (print): <b>Mick Albright</b>	Date/Time: <b>8-30-12 3:05 PM</b>
Sample Disposal: <b>Return to Client</b>		Lab Disposal: <b>X</b>	<b>LABORATORY USE ONLY</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.enerylab.com](http://www.enerylab.com) for additional information, downloadable fee schedule, forms, and links.



## 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>Oklahoma City, OK PO Box 268870 73126</b>		Contact Name: <b>Chad Newby</b> Phone/Fax: <b>405-574-2172</b> Email: <b>chad.newby@cir.com</b>		Sampler: (Please Print) <b>Spencer Ingalls</b>		
Invoice Address: <b>Oklahoma City, OK PO Box 268870 73126</b>		Invoice Contact & Phone: <b>Chad Newby 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 Sample Type: A/W/S/V/B/C Air/Water/Solids/Solvent Vegetation/Other	ANALYSIS REQUESTED		Shipped by: <b>Chad</b> Carrier ID(s):	
<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	<b>E</b> <b>C</b> <b>S</b> <b>A</b> <b>R</b> <b>C</b> <b>E</b> <b>C</b> <b>P</b> <b>H</b> <b>P</b> <b>e</b> <b>s</b> <b>s</b>	<b>SEE ATTACHED</b> <b>Normal Turnaround (TAT)</b>	<b>R</b> <b>U</b> <b>S</b> <b>H</b> Contact ELI prior to RUSH sample submittal for charges and scheduling - See Instruction Page Comments: <b>E-1179926-05</b> <b>W-421267-60</b> <b>E.U. 1937-65</b> Receipt Temp: <b>24.5°C</b> On Ice: <b>Yes <input checked="" type="checkbox"/> No <input type="checkbox"/></b> Custody Seal: <b>Y <input type="checkbox"/></b> Intact: <b>Y <input type="checkbox"/></b> Signature: <b>Y <input type="checkbox"/></b> Match: <b>Y <input type="checkbox"/></b> <b>8/20/2012-002</b>	
SAMPLE IDENTIFICATION (Name, Location, Interval, etc.)		Collection Date <b>8-29-12</b>	Collection Time <b>7:00PM</b>	MATRIX	<b>LABORATORY USE ONLY</b>	
1 Fill #1					X	
2						
3						
4						
5						
6						
7						
8						
9						
10						
Custody Record <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>	Received by (print):	Date/Time:	Signature:
	Relinquished by (print): <b>Mark Albright</b>	Date/Time: <b>8-30-12 3:05</b>	Signature: <b>Mark Albright</b>	Received by (print):	Date/Time:	Signature:
Sample Deposit:	Return to Client:	Lab Disposal:	Received by Laboratory:	Date/Time:	Signature:	
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.						



# 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>PO Box 268870 73126</b>		Contact Name: <b>Chad Newby</b> Phone/Fax: <b>405-574-2172</b> Email: <b>chad.newby@okc.com</b>			Purchase Order: <b>Spencer Ingalls</b>	Sampler: (Please Print)																												
Invoice Address: <b>PO Box 268870 73126</b>		Invoice Contact & Phone: <b>Chad Newby 405-574-2172</b>			Quote/Bottle Order: <b>Chad Newby Unknown</b>																													
Special Report/Formats – ELI must be notified prior to sample submittal for the following:		<table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th colspan="4">ANALYSIS REQUESTED</th> </tr> <tr> <th>Number of Containers</th> <th>Sample Type: A/W/S/V/B/O</th> <th>Air/Water/Solids/Solids</th> <th>Vegetation/Holassay/Other</th> </tr> </thead> <tbody> <tr> <td><input type="checkbox"/> DW</td> <td><input type="checkbox"/> A2LA</td> <td><input type="checkbox"/> S/A/R</td> <td><input type="checkbox"/> Per.</td> </tr> <tr> <td><input type="checkbox"/> GSA</td> <td><input type="checkbox"/> EDD/EDT (Electronic Data)</td> <td><input type="checkbox"/> C/E/C</td> <td><input type="checkbox"/> H</td> </tr> <tr> <td><input type="checkbox"/> POTWWWWTP</td> <td>Format: <input type="checkbox"/> LEVEL IV</td> <td><input type="checkbox"/> PH</td> <td><input type="checkbox"/> S</td> </tr> <tr> <td><input type="checkbox"/> State: _____</td> <td><input type="checkbox"/> NELAC</td> <td><input type="checkbox"/> E/C</td> <td><input type="checkbox"/> U</td> </tr> <tr> <td><input type="checkbox"/> Other: _____</td> <td></td> <td><input type="checkbox"/> T</td> <td><input type="checkbox"/> R</td> </tr> </tbody> </table>			ANALYSIS REQUESTED				Number of Containers	Sample Type: A/W/S/V/B/O	Air/Water/Solids/Solids	Vegetation/Holassay/Other	<input type="checkbox"/> DW	<input type="checkbox"/> A2LA	<input type="checkbox"/> S/A/R	<input type="checkbox"/> Per.	<input type="checkbox"/> GSA	<input type="checkbox"/> EDD/EDT (Electronic Data)	<input type="checkbox"/> C/E/C	<input type="checkbox"/> H	<input type="checkbox"/> POTWWWWTP	Format: <input type="checkbox"/> LEVEL IV	<input type="checkbox"/> PH	<input type="checkbox"/> S	<input type="checkbox"/> State: _____	<input type="checkbox"/> NELAC	<input type="checkbox"/> E/C	<input type="checkbox"/> U	<input type="checkbox"/> Other: _____		<input type="checkbox"/> T	<input type="checkbox"/> R	Contact ELI prior to RUSH sample submittal for charges and scheduling - See Instruction Page	Shipped by: <b>TNT</b> Carrier Date:
ANALYSIS REQUESTED																																		
Number of Containers	Sample Type: A/W/S/V/B/O	Air/Water/Solids/Solids	Vegetation/Holassay/Other																															
<input type="checkbox"/> DW	<input type="checkbox"/> A2LA	<input type="checkbox"/> S/A/R	<input type="checkbox"/> Per.																															
<input type="checkbox"/> GSA	<input type="checkbox"/> EDD/EDT (Electronic Data)	<input type="checkbox"/> C/E/C	<input type="checkbox"/> H																															
<input type="checkbox"/> POTWWWWTP	Format: <input type="checkbox"/> LEVEL IV	<input type="checkbox"/> PH	<input type="checkbox"/> S																															
<input type="checkbox"/> State: _____	<input type="checkbox"/> NELAC	<input type="checkbox"/> E/C	<input type="checkbox"/> U																															
<input type="checkbox"/> Other: _____		<input type="checkbox"/> T	<input type="checkbox"/> R																															
<input type="checkbox"/> DW <input type="checkbox"/> GSA <input type="checkbox"/> POTWWWWTP <input type="checkbox"/> State: _____ <input type="checkbox"/> Other: _____					Comments: <b>E-1179924-V0</b> <b>N-421196-70</b> <b>Elv. 1937.95</b>	Receipt Temp: <b>24.6°C</b> Color: <b>Yes <input checked="" type="checkbox"/></b>																												
<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>	MATRIX <b>I-S d d a a K</b>	SEE ATTACHED	Custody Seal: <b>Y N</b> Initial: <b>Y N</b> Signature Match: <b>Y N</b>																												
						<b>2009-8-29</b>																												
						<b>LABORATORY USE ONLY</b>																												
<b>Custody Record MUST be Signed</b>	Released by (print): <b>Mark Albright</b>	Date/Time: <b>8-30-12 9:00 AM</b>	Signature: <b>MM</b>	Received by (print):	Date/Time:	Signature:																												
	Released by (print): <b>Mark Albright</b>	Date/Time: <b>8-30-12 3:05 PM</b>	Signature: <b>MM</b>	Received by (print):	Date/Time:	Signature:																												
Sample Disposal: Return to Client:		Lab Disposal: <b>K</b>		Received by Laboratory:	Date/Time:	Signature:																												
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, terms, and links.																																		



## Chain of Custody and Analytical Request Record

Page 1 of 1

PLEASE PRINT - Provide as much information as possible.			
Company Name: <b>Continental Resources</b>		Project Name, PMS, Permit, Etc. <b>Atlanta Site</b>	
Report Mail Address: <b>PO Box 2168870 73126 Oklahoma City, OK</b>		Sample Origin State: <b>ND</b>	
Invoice Address: <b>PO Box 2168870 73126 Oklahoma City, OK</b>		EPA/State Compliance: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	
Special Report/Formats - ELI must be notified prior to sample submittal for the following:		Sampler, (Please Print) <b>Spencer Ingalls</b>	
<input type="checkbox"/> DW <input type="checkbox"/> GSA <input type="checkbox"/> PCTWAWWTP <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
<b>Fill #3</b>		<b>8-29-12</b>	<b>7:00pm</b>
		1-3	d d d d d
		MATRIX	SEE ATTACHED
		CC	Normal Turnaround (TAT)
		SAR	R
		CEC	U
		P/H	G
		Perch	H
		45	Comments: <b>E-1179963.65 N-421120.95 EL-1937.90</b>
		LABORATORY USE ONLY	Received Temp <b>24.5 °C</b>
			On Site: <b>Yes <input checked="" type="checkbox"/> No <input type="checkbox"/></b>
			Custody Seal <b>Y</b>
			In tact <b>Y</b>
			Signature Match <b>Y</b>
Custody Record <b>MUST be Signed</b>		Received by (print): <b>Mick Albright</b>	Date/Time: <b>8-30-12 9:00AM</b>
		Signature: <b>Mick Albright</b>	Received by (print):
		Received by (print): <b>Mick Albright</b>	Date/Time: <b>8-30-12 3:05 PM</b>
		Received by (print): <b>Mick Albright</b>	Signature: <b>Mick Albright</b>
Sample Disposal: Return to Client:		Lab Disposal:	Received by Laboratory: <b>Spencer Ingalls</b>
		Date/Time: <b>8-30-12 3:05 PM</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.

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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**

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

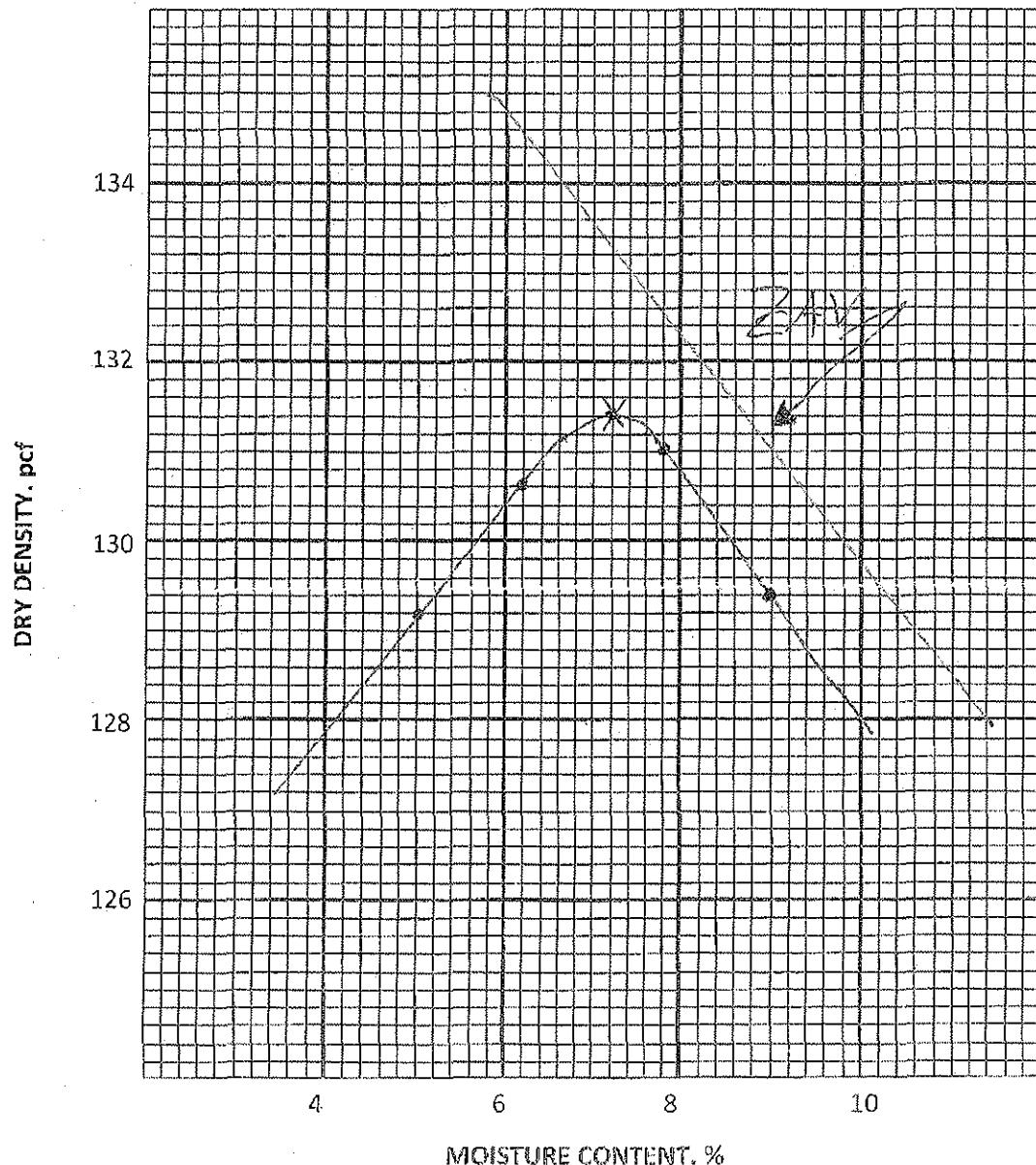
Proctor#: Date: 08/21/12  
ASTM: 698 Method: C  
Soil Classification: Brown Gravelly  
Sand

Project: Atlanta Drill Pad, Williston,  
North Dakota

Project Number: 12-12165

**MAXIMUM DENSITY: 131.4 pcf**

**OPTIMUM MOISTURE CONTENT: 7.2%**



Cc:

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**PROCTOR TEST**

**MOISTURE DENSITY RELATION**

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

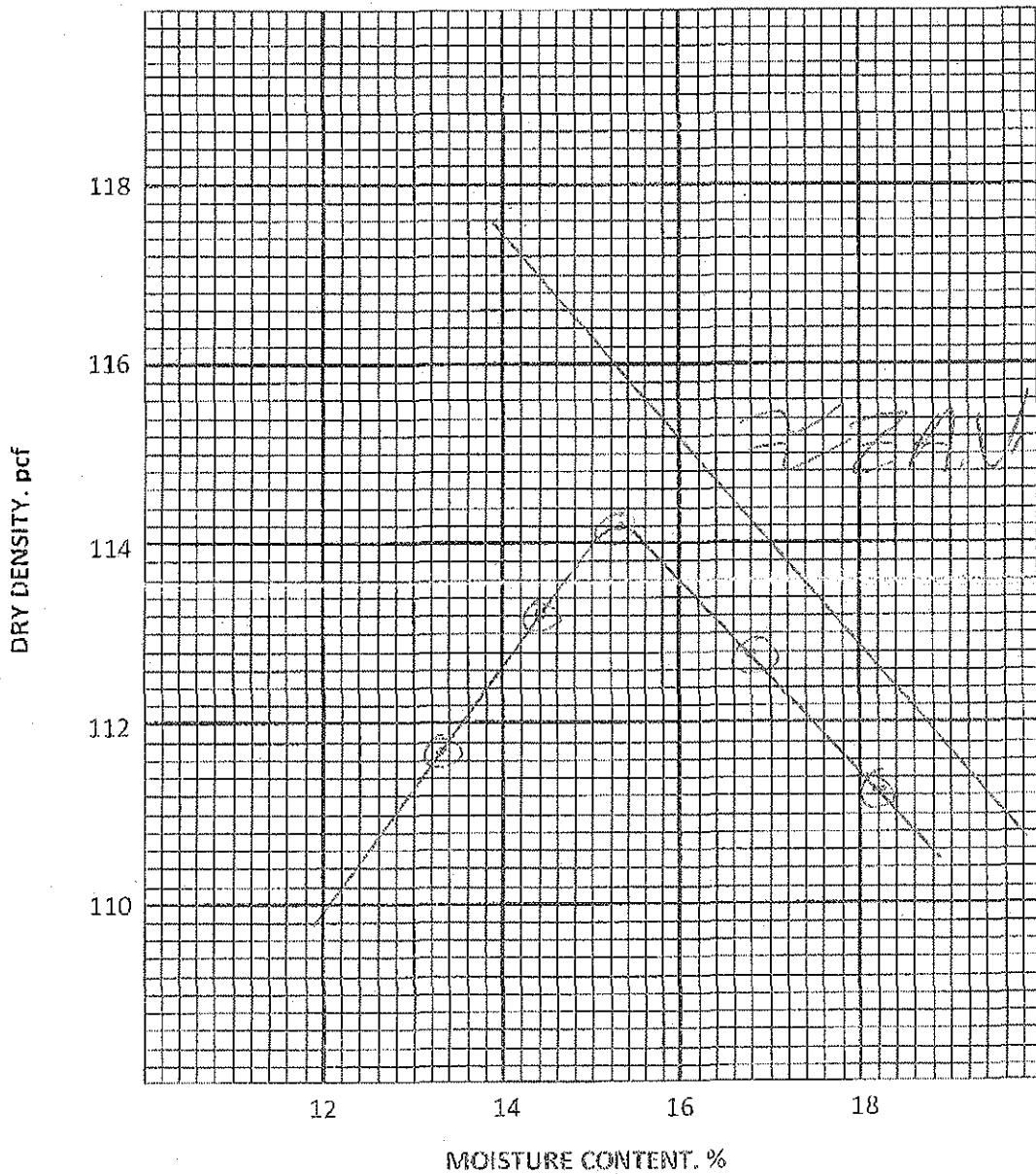
Proctor#: Date: 07/31/12  
ASTM: 698 Method:  
Soil Classification: CL

Project: Atlanta Drill Pad, Williston,  
North Dakota

Project Number: 12-12165

MAXIMUM DENSITY: 114.2pcf

OPTIMUM MOISTURE CONTENT: 15.3%



Cc:

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

## **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.

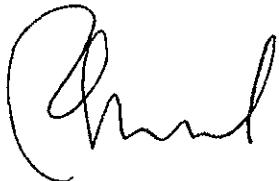
## **CONCLUSIONS AND RECOMMENDATIONS**

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

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SERVICES, INC.**

Engineering • Environmental • Drilling • Materials  
9105 Black Hawk Rd • PO Box 558  
Black Hawk, CO 80718-0558

## 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 COMPACTION	
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

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AMERICAN TECHNICAL SERVICES, INC.

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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 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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**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 COMPACTION	
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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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:

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CC:

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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: 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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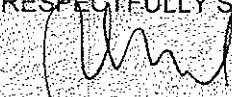


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Black Hawk SD 57718-0558

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

ASTM D6938

CLIENT	CONTINENTAL RESOURCES, INC. PO Box 268836 Oklahoma City, OK 73126	ATS #	12-12165
ATTENTION:	Project Manager	DATE	08/01/12
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	
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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CC:

  
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8105 Black Hawk Rd. • P.O. 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: 08/01/12  
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: \_\_\_\_\_

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

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ASTM D6938

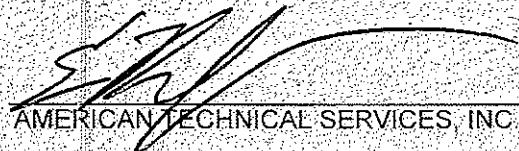
CLIENT	CONTINENTAL RESOURCES, INC. PO Box 268836 Oklahoma City, OK 73126	ATS #	12-12165
ATTENTION:	Project Manager	DATE	08/03/12
PROJECT:	Atlanta Drill Site	ATS TECH	Russell Harwood
		GAGE #	2
		BENCHMARK	

TEST #	DATE	PROCTOR # / CLASSIFICATION	LABORATORY		FIELD		SPECIFICATIONS			PASS
			% MOIST	DRY DENSITY	% MOISTURE	DRY DENSITY	% COMPACTION	SPEC MOISTURE %	SPEC COMPACTION	
48	08/01/12	#3	15.3	114.2	13.7	113.9	100	+/-2%	95	PASS
49	08/01/12	#3	15.3	114.2	13.4	112.6	99	+/-2%	95	PASS
50	08/01/12	#3	15.3	114.2	13.5	108.9	95	+/-2%	95	PASS
51	08/01/12	#3	15.3	114.2	14.2	110.0	96	+/-2%	95	PASS
52	08/01/12	#3	15.3	114.2	13.3	113.5	99	+/-2%	95	PASS
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 42 1100.20 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

RESPECTFULLY SUBMITTED



AMERICAN TECHNICAL SERVICES, INC.

CC:

**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: 08/03/12  
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:

RESPECTFULLY SUBMITTED

CC:

AMERICAN TECHNICAL SERVICES, INC.

**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.  
P.O. 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

RESPECTFULLY SUBMITTED

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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: 08/07/12  
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	
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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AMERICAN TECHNICAL SERVICES, INC.

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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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SERVICES, INC.**

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8105 Black Hawk Rd • PO Box 556  
Black Hawk, SD 57718-0556

**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: \_\_\_\_\_ RESPECTFULLY SUBMITTED

CC:

  
AMERICAN TECHNICAL SERVICES, INC.

**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: 08/15/12  
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 COMPACTATION	
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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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:

TEST #	DATE	PROCTOR # / CLASSIFICATION	LABORATORY		FIELD		SPECIFICATIONS			
			% 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.**

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**S**ERVICES, INC.

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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:

		LABORATORY		FIELD		SPECIFICATIONS				
TEST #	DATE	PROCTOR # / CLASSIFICATION	% MOIST	DRY DENSITY	% MOISTURE	DRY DENSITY	% COMPACTION	SPEC MOISTURE %	SPEC COMPACTION	PASS
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:

TEST #	DATE	PROCTOR # / CLASSIFICATION	LABORATORY		FIELD		SPECIFICATIONS			PASS
			% MOIST	DRY DENSITY	% MOISTURE	DRY DENSITY	% COMPACTION	SPEC MOISTURE %	SPEC COMPACTION	
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:

RESPECTFULLY SUBMITTED

CC:

AMERICAN TECHNICAL SERVICES, INC.

**A  
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ERVICES, INC.**

ENGINEERING • ENVIRONMENTAL • DRILLING • MATERIALS  
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			
			% MOIST	DRY DENSITY	% MOISTURE	DRY DENSITY	% COMPACTION	SPEC MOISTURE %	SPEC COMPACTION	PASS
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

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CC:

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: 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:

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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: 08/17/12  
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.

**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: 08/17/12  
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
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,

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:** 08/17/12  
**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
119	08/16/12	#1	15.3	114.2	13.7	110.0	96	+/-2%	95	PASS
120	08/16/12	#1	15.3	114.2	13.9	112.0	98	+/-2%	95	PASS
121	08/16/12	#1	15.3	114.2	13.6	112.4	98	+/-2%	95	PASS
122	08/16/12	#1	15.3	114.2	13.4	112.6	99	+/-2%	95	PASS
123	08/16/12	#1	15.3	114.2	13.6	114.0	100	+/-2%	95	PASS
124	08/16/12	#1	15.3	114.2	13.9	115.2	101	+/-2%	95	PASS
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

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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: 08/17/12  
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

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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:** 08/17/12  
**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

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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			PASS
			% MOIST	DRY DENSITY	% MOISTURE	DRY DENSITY	% COMPACTION	SPEC MOISTURE	% SPEC COMPACTION	
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

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CC:

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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 117937.90	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

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CC:

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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
131	08/18/12	#2	8.3	123.2	9.0	118.4	96	+/-2%	95	PASS
132	08/18/12	#3	15.3	114.2	13.8	113.9	100	+/-2%	95	PASS
133	08/18/12	#3	15.3	114.2	13.6	113.3	99	+/-2%	95	PASS
134	08/18/12	#3	15.3	114.2	13.4	116.1	102	+/-2%	95	PASS
135	08/18/12	#2	8.3	123.2	9.1	118.5	96	+/-2%	95	PASS
136	08/18/12	#2	8.3	123.2	9.2	117.5	95	+/-2%	95	PASS
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.

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## REPORT OF SOIL DENSITY TESTING - NUCLEAR METHOD

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PO Box 268836  
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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.



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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: 08/20/12  
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

CC:

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AMERICAN TECHNICAL SERVICES, INC.



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ENGINEERING • ENVIRONMENTAL • DRILLING • MATERIALS  
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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	ATS #:	12-12165
ATTENTION:	Project Manager	DATE	08/23/12
PROJECT:	Atlanta Drill Site	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

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ASTM D6938

CLIENT: CONTINENTAL RESOURCES, INC.  
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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			PASS
			% MOIST	DRY DENSITY	% MOISTURE	DRY DENSITY	% COMPACTION	SPEC MOISTURE %	SPEC COMPACTION	
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

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CC:

AMERICAN TECHNICAL SERVICES, INC.



**AMERICAN  
TECHNICAL  
SERVICES, INC.**

Engineering • Environmental • Drilling • Materials  
3105 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: 08/23/12  
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: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
CC: \_\_\_\_\_

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**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	08/28/12
PROJECT:	Atlanta Drill Site	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
160	08/23/12	#3	15.3	114.2	13.3	111.8	98	+/-2%	95	PASS
161	08/23/12	#2	8.3	123.2	9.3	118.7	96	+/-2%	95	PASS
162	08/23/12	#3	15.3	114.2	13.7	115.4	101	+/-2%	95	PASS
163	08/23/12	#3	15.3	114.2	13.4	109.7	96	+/-2%	95	PASS
164	08/23/12	#3	15.3	114.2	13.6	109.3	96	+/-2%	95	PASS
165	08/23/12	#3	15.3	114.2	13.4	115.6	101	+/-2%	95	PASS
166	08/23/12	#3	15.3	114.2	13.5	113.9	100	+/-2%	95	PASS
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

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:	08/28/12
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	
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	96	+/-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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~~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: 08/28/12  
ATS TECH: Evan Schultze  
GAGE #: 2  
BENCHMARK: East Valley Fill

TEST #	DATE	PROCTOR # / CLASSIFICATION	LABORATORY		FIELD		SPECIFICATIONS			PASS
			% MOIST	DRY DENSITY	% MOISTURE	DRY DENSITY	% COMPACTION	SPEC MOISTURE	% SPEC COMPACTION	
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:

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AMERICAN TECHNICAL SERVICES, INC.

CC:

**AMERICAN  
TECHNICAL  
SERVICES, INC.**

ENGINEERING • ENVIRONMENTAL • DRILLING • MATERIALS  
8105 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: 08/28/12  
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: \_\_\_\_\_

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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: 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:

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AMERICAN TECHNICAL SERVICES, INC.

**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: 08/28/12  
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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AMERICAN TECHNICAL SERVICES, INC.

CC:

**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: 08/28/12  
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.

**A**MERICAN  
TECHNICAL  
SERVICES, INC.

Engineering • Environmental • Drilling • Mapping  
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

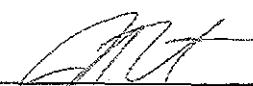
ATS #: 12-12165  
DATE: 08/28/12  
ATS TECH: Evan Schultze  
GAGE #: 2  
BENCHMARK: East Valley Fill

TEST #	DATE	PROCTOR # / CLASSIFICATION	LABORATORY		FIELD			SPECIFICATIONS		PASS
			% MOIST	DRY DENSITY	% MOISTURE	DRY DENSITY	% COMPACTION	SPEC MOISTURE %	SPEC COMPACTION	
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

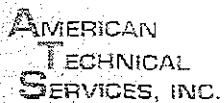
TEST #	LOCATION	ELEVATION
181	N 421380.15 E 1179686.15	1939.3
182	N 421450.10 E 1179722.45	1940.2
183	N 421439.30 E 1179760.00	1941.5
184	N 421399.40 E 1179722.30	1941.95
185	N 421415.95 E 1179832.95	1942.2
186	N 421485.05 E 1179852.75	1942.95
187	N 421491.20 E 1179749.45	1943.1
188	N 421264.40 E 1179734.90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

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

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AMERICAN TECHNICAL SERVICES, INC.



# REPORT OF SOIL DENSITY TESTING - NUCLEAR METHOD

ASTM D6938

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

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 Schutze  
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: \_\_\_\_\_  
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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: \_\_\_\_\_

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

TEST #	DATE	PROCTOR # / CLASSIFICATION	LABORATORY		FIELD		SPECIFICATIONS			
			% MOIST	DRY DENSITY	% MOISTURE	DRY DENSITY	% COMPACTION	SPEC MOISTURE %	SPEC COMPACTION	PASS
201	08/29/12	#3	15.3	114.2	15.0	112.1	98	+/-2%	95	PASS
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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AMERICAN TECHNICAL SERVICES, INC.



CC:

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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: 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
202	08/30/12	#2	8.3	123.2	9.7	122.5	99	+/-2%	95
203	08/30/12	#3	15.3	114.2	13.4	115.7	101	+/-2%	95
204	08/30/12	#3	15.3	114.2	13.6	113.0	99	+/-2%	95
205	08/30/12	#3	15.3	114.2	13.5	113.4	99	+/-2%	95
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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cc:

AMERICAN TECHNICAL SERVICES, INC.



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TECHNICAL  
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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: 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.



**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: 09/04/12  
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

RESPECTFULLY SUBMITTED

CC:

AMERICAN TECHNICAL SERVICES, INC.





Engineering • Environmental • Drilling • Materials  
8105 Black Hawk Rd. • PO Box 556  
Black Hawk, SD 57718-0556

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  
  
  
  
  
CC:

RESPECTFULLY SUBMITTED

AMERICAN TECHNICAL SERVICES, INC.

**AMERICAN  
TECHNICAL  
SERVICES, INC.**

ENGINEERING • ENVIRONMENTAL • DRILLING • MATERIALS  
8105 Black Hawk Rd. • PO Box 658  
Black Hawk, CO 80428-0658

**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
223	09/04/12	#3	15.3	114.2	13.6	110.4	97	+/-2%	95
224	09/04/12	#3	15.3	114.2	13.4	110.8	97	+/-2%	95
225	09/04/12	#3	15.3	114.2	13.7	111.2	97	+/-2%	95
226	09/04/12	#3	15.3	114.2	13.3	115.9	101	+/-2%	95
227	09/04/12	#1	9.7	126.5	10.2	121.0	96	+/-2%	95
228	09/04/12	#1	9.7	126.5	10.1	121.1	96	+/-2%	95
229	09/04/12	#1	9.7	126.5	9.3	120.6	95	+/-2%	95
230	09/04/12	#3	15.3	114.2	13.8	115.6	101	+/-2%	95
231	09/04/12	#3	15.3	114.2	14.4	111.7	98	+/-2%	95
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  
8105 Black Hawk Rd • PO Box 558  
Black 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: 09/07/12

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

RESPECTFULLY SUBMITTED

AMERICAN TECHNICAL SERVICES, INC.

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**AMERICAN  
TECHNICAL  
SERVICES, INC.**

Engineering • Environmental • Drilling • Materials  
510S 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 258836  
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:

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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: 09/18/12  
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	
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

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CC:

AMERICAN TECHNICAL SERVICES, INC.



SHORING • ENVIRONMENTAL • DRILLING • MATERIALS  
9105 Black Hawk Rd • PO Box 568  
Black Hawk, SD 57715-0688

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
252	09/17/12	#3	15.3	114.2	13.3	109.3	96	+/-2%	96	PASS
253	09/17/12	#3	15.3	114.2	13.4	108.9	95	+/-2%	95	PASS
254	09/17/12	#1	9.7	126.5	8.9	122.4	97	+/-2%	95	PASS
255	09/17/12	#3	15.3	114.2	13.8	110.3	97	+/-2%	95	PASS
256	09/17/12	#2	8.3	123.2	8.1	118.4	96	+/-2%	95	PASS
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:

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AMERICAN TECHNICAL SERVICES, INC.

**AMERICAN  
TECHNICAL  
SERVICES, INC.**

Engineering • Environmental • Drilling • Materials  
8105 Bent Hwy Rd • PO Box 558  
Clark Ferry, 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	PASS
257	09/22/12	#3	15.3	114.2	14.1	109.2	96	+/-2%	95	PASS
258	09/22/12	#2	8.3	123.2	7.2	118.5	96	+/-2%	95	PASS
259	09/22/12	#2	8.3	123.2	8.0	118.7	96	+/-2%	95	PASS
260	09/22/12	#2	8.3	123.2	7.1	120.7	98	+/-2%	95	PASS
261	09/22/12	#3	15.3	114.2	13.8	110.0	96	+/-2%	95	PASS
262	09/22/12	#2	8.3	123.2	7.9	119.6	97	+/-2%	95	PASS
263	09/22/12	#3	15.3	114.2	13.4	109.4	96	+/-2%	95	PASS
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:

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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

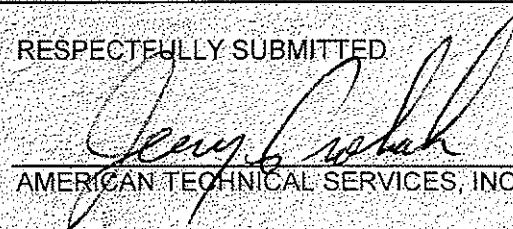
CLIENT	CONTINENTAL RESOURCES, INC. PO Box 268836 Oklahoma City, OK 73126	ATS #	12-12165
ATTENTION:	Project Manager	DATE	10/15/12
PROJECT:	Atlanta Drill Site	ATS TECH	Evan Schultze
		GAGE #	26
		BENCHMARK	Atlanta Pad Road

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: \_\_\_\_\_

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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

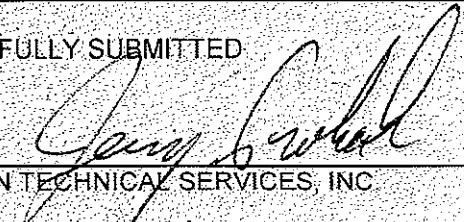
ATS #: 12-12165  
DATE: 10/15/12  
ATS TECH: Evan Schultze  
GAGE #: 26  
BENCHMARK: Atlanta Pad Road

TEST #	DATE	PROCTOR # / CLASSIFICATION	LABORATORY		FIELD			SPECIFICATIONS		
			% MOIST	DRY DENSITY	% MOISTURE	DRY DENSITY	% COMPACTION	SPEC MOISTURE %	SPEC COMPACTION	PASS
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: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

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

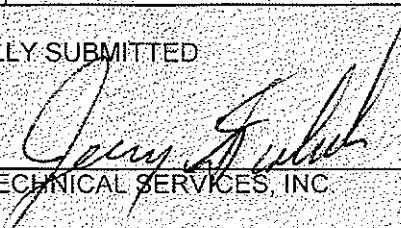
TEST #	DATE	PROCTOR # / CLASSIFICATION	LABORATORY		FIELD		SPECIFICATIONS			
			% MOIST	DRY DENSITY	% MOISTURE	DRY DENSITY	% COMPACTION	SPEC MOISTURE %	SPEC COMPACTION	PASS
271	10/12/12	#1	9.7	126.5	9.4	124.8	99	+/-2%	95	PASS
272							#VALUE!			
273							#VALUE!			
274							#VALUE!			
275							#VALUE!			
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: \_\_\_\_\_

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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			
			% MOIST	DRY DENSITY	% MOISTURE	DRY DENSITY	% COMPACTION	SPEC MOISTURE %	SPEC COMPACTION	PASS
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: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
CC: \_\_\_\_\_

RESPECTFULLY SUBMITTED

  
AMERICAN TECHNICAL SERVICES, INC.



# Oil and Gas Division

23362  
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 11-6H Well File No.: 23362  
Location: NENW 6-153-101 County: WILLIAMS  
Permit Type: Development - HORIZONTAL  
Field: BAKER Target Horizon: MIDDLE 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



## SUNDY 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.

*23362*



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"/> Report of Work Done	Date Work Completed
<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"/> Drilling Prognosis	<input type="checkbox"/> Spill Report
<input type="checkbox"/> Redrilling or Repair	<input type="checkbox"/> Shooting
<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 11-6H**

Footages	Qtr-Qtr	Section	Township	Range
495 F N L	1350 F W L	NENW	6	153 N 101 W
Field	Pool		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 8, 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>7-20-2012</i>	
By <i>Richard A. Suggs</i>	
Title <b>Richard A. Suggs</b> <b>Geologist</b>	



Approved  
David Tabor  
7-20-2012

Engineering Technician

July 20, 2012

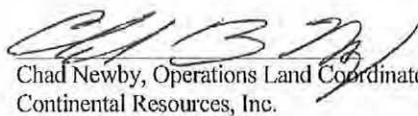
Industrial Commission of North Dakota  
Oil & Gas Division  
600 East Boulevard, Dept 405  
Bismarck, North Dakota 58505

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.

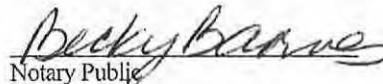
In the event that another owner seeks revocation of the drilling permit, CRI should retain the permit for the following reasons:

- 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                  )  
  )  
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 11-6H  
NENW Section 6-153N-101W  
Williams County  
Well File # 23362**

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: 8951E.

### **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>11-6H</b>				
Surface Footages <b>495 F N L      1350 F W L</b>		Qtr-Qtr <b>NENW</b>	Section <b>6</b>	Township <b>153 N</b>	Range <b>101 W</b>	County <b>Williams</b>	
Longstring Casing Point Footages <b>699 F N L      1885 F W L</b>		Qtr-Qtr <b>NENW</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>204 S From WH      535 E From WH</b>		Azimuth <b>111 °</b>	Longstring Total Depth <b>10856 Feet MD      10530 Feet TVD</b>				
Bottom Hole Footages From Nearest Section Line <b>1239 F S L      205 F E L</b>		Qtr-Qtr <b>SESE</b>	Section <b>5</b>	Township <b>153 N</b>	Range <b>101 W</b>	County <b>McKenzie</b>	
Bottom Hole Coordinates From Well Head <b>3408 S From WH      8946 E From WH</b>		KOP Lateral 1 <b>9957 Feet MD</b>	Azimuth Lateral 1 <b>111 °</b>	Estimated Total Depth Lateral 1 <b>19857 Feet MD      10545 Feet TVD</b>			
Latitude of Well Head <b>48 ° 06 ' 33.65 "</b>	Longitude of Well Head <b>-103 ° 43 ' 41.05 "</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>1945 Feet Above S.L.</b>	Acres in Spacing/Drilling Unit <b>2560</b>	Spacing/Drilling Unit Setback Requirement Feet N/S      Feet E/W			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>Middle 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>10856 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      F      L		Qtr-Qtr	Section	Township <b>N</b>	Range <b>W</b>	County	
Bottom Hole Footages From Nearest Section Line F      L      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      F      L		Qtr-Qtr	Section	Township <b>N</b>	Range <b>W</b>	County	
Bottom Hole Footages From Nearest Section Line F      L      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      F      L		Qtr-Qtr	Section	Township <b>N</b>	Range <b>W</b>	County	
Bottom Hole Footages From Nearest Section Line F      L      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      F      L		Qtr-Qtr	Section	Township <b>N</b>	Range <b>W</b>	County	
Bottom Hole Footages From Nearest Section Line F      L      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 / 9 / 2012

ePermit

Printed Name  
**Terry L. Olson**

Title

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

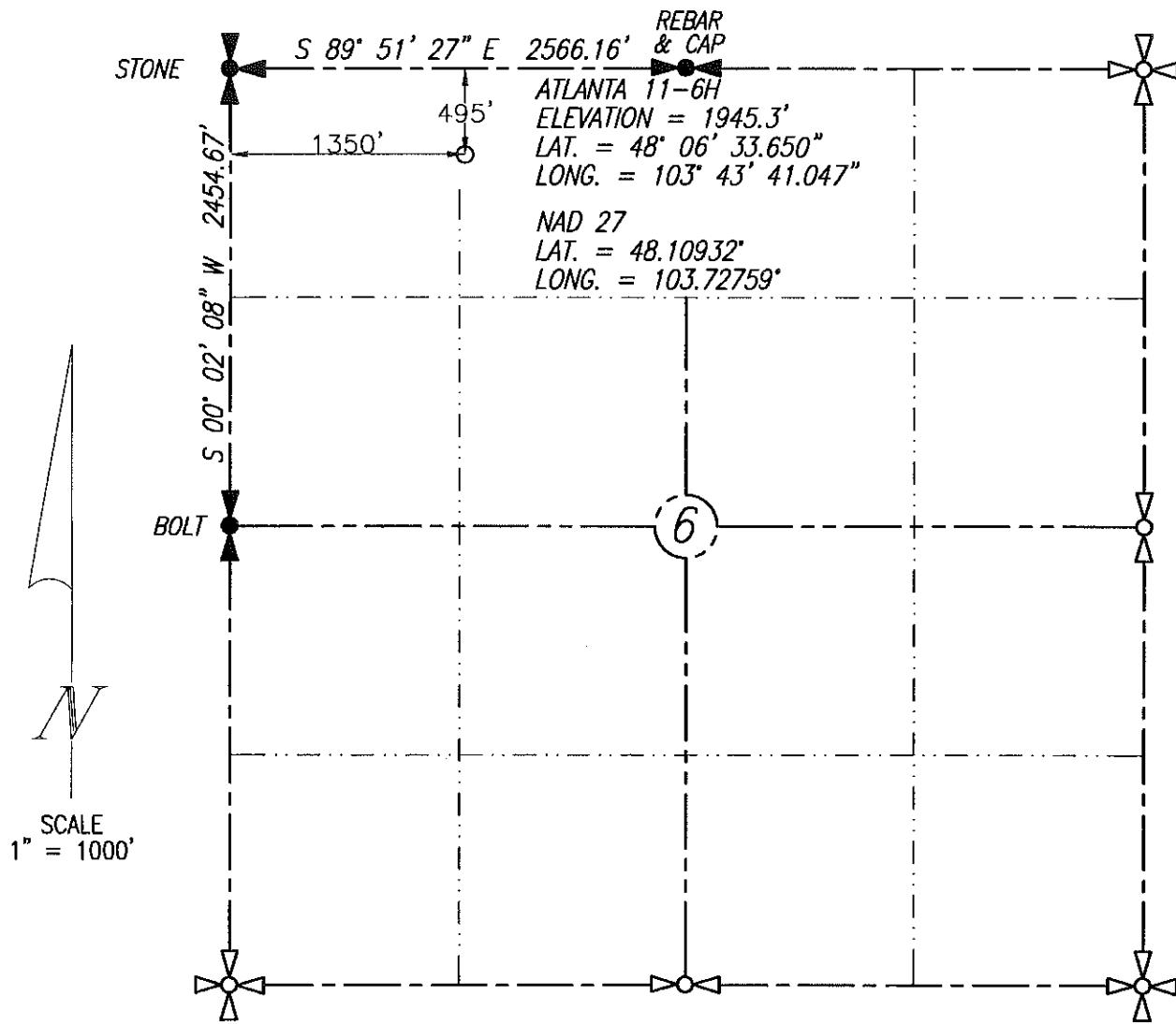
Permit and File Number <b>23362</b>	API Number <b>33 - 105 - 02722</b>
Field <b>BAKER</b>	
Pool <b>BAKKEN</b>	Permit Type <b>DEVELOPMENT</b>

**FOR STATE USE ONLY**

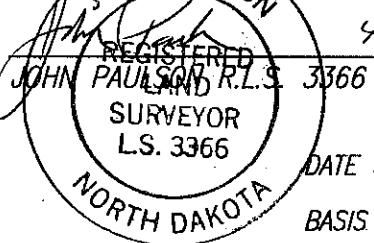
Date Approved <b>7 / 20 / 2012</b>
By <b>Todd L. Holweger</b>
Title <b>Mineral Resources Permit Manager</b>

WELL LOCATION PLAT  
CONTINENTAL RESOURCES INC.  
ATLANTA 11-6H  
SECTION 6, T153N, R101W  
WILLIAMS COUNTY, NORTH DAKOTA  
495' FNL & 1350' 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



4-23-12

DATE STAKED: 2-9-2012  
BASIS OF VERTICAL DATUM:  
NAVD 1988 GEODETIC 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.

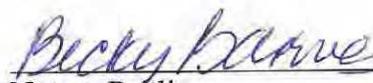
- 1) During construction of the location, the entire location will be constructed per NDIC permit stipulations, and to ensure any spills or runoff which occur on location do not penetrate the fresh ground water and are contained on surface of the location.
- 2) Drainage will be re-routed to avoid the 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**

5/7/2012

Lease and Well No.

Atlanta 11-6H

**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' - 10856'	Invert	9.6-10.0	40-55 sec, 10-15 cc's O/W 70/30 to 80/20
10856' - 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
		10856'	1646'	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 "	19680'	9760'	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	10856	Lead	7800'	0'	457	35/65 Poz/Class "C", 3% KCl, 5#/sk Silica	3.21	11.3
		Tail	10856'	7800'	376	Class "G", 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 11-6H  
**Rig:** Cyclone 02  
**Prospect:** Williston  
**Target:** Middle Bakken  
**Spacing:** 2560

**SHL:** 495' FNL & 1350' FWL  
 Sec. 6 - 153N - 101W  
 Williams , ND

**BHL:** 1191' FSL & 200' FEL  
 Sec. 5 - 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	-8,578	10,545



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

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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



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## Planned Wellpath Report

ATLANTA 11-6H (REV-C.0) PWP

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### REFERENCE WELLPATH IDENTIFICATION

Operator	CONTINENTAL RESOURCES	Slot	SLOT#11 ATLANTA 11-6H(495'FNL & 1350'FWL,SEC.06)
Area	NORTH DAKOTA	Well	ATLANTA 11-6H
Field	WILLIAMS COUNTY	Wellbore	ATLANTA 11-6H 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	5/1/2012 at 8:25:41 AM
Convergence at slot	2.40° West	Database/Source file	WA_Denver/_ATLANTA_11-6H_PWB.xml

### WELLPATH LOCATION

	Local coordinates		Grid coordinates		Geographic coordinates	
	North[ft]	East[ft]	Easting[US ft]	Northing[US ft]	Latitude	Longitude
Slot Location	27.49	1079.94	1180114.28	421181.24	48°06'33.650"N	103°43'41.047"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#11 ATLANTA 11-6H(495'FNL & 1350'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	110.85°

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## Planned Wellpath Report

ATLANTA 11-6H (REV-C.0) PWP

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### REFERENCE WELLPATH IDENTIFICATION

Operator	CONTINENTAL RESOURCES	Slot	SLOT#11 ATLANTA 11-6H(495'FNL & 1350'FWL,SEC.06)
Area	NORTH DAKOTA	Well	ATLANTA 11-6H
Field	WILLIAMS COUNTY	Wellbore	ATLANTA 11-6H PWB
Facility	SEC.06-T153N-R101W		

### WELLPATH DATA (203 stations) † = interpolated/extrapolated station

MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Vert Sect [ft]	North [ft]	East [ft]	DLS [%/100ft]	Comments
0.00†	0.00	110.853	0.00	0.00	0.00	0.00	0.00	
22.00	0.00	110.853	22.00	0.00	0.00	0.00	0.00	
122.00†	0.00	110.853	122.00	0.00	0.00	0.00	0.00	
222.00†	0.00	110.853	222.00	0.00	0.00	0.00	0.00	
322.00†	0.00	110.853	322.00	0.00	0.00	0.00	0.00	
422.00†	0.00	110.853	422.00	0.00	0.00	0.00	0.00	
522.00†	0.00	110.853	522.00	0.00	0.00	0.00	0.00	
622.00†	0.00	110.853	622.00	0.00	0.00	0.00	0.00	
722.00†	0.00	110.853	722.00	0.00	0.00	0.00	0.00	
822.00†	0.00	110.853	822.00	0.00	0.00	0.00	0.00	
922.00†	0.00	110.853	922.00	0.00	0.00	0.00	0.00	
1022.00†	0.00	110.853	1022.00	0.00	0.00	0.00	0.00	
1122.00†	0.00	110.853	1122.00	0.00	0.00	0.00	0.00	
1222.00†	0.00	110.853	1222.00	0.00	0.00	0.00	0.00	
1322.00†	0.00	110.853	1322.00	0.00	0.00	0.00	0.00	
1422.00†	0.00	110.853	1422.00	0.00	0.00	0.00	0.00	
1522.00†	0.00	110.853	1522.00	0.00	0.00	0.00	0.00	
1622.00†	0.00	110.853	1622.00	0.00	0.00	0.00	0.00	
1722.00†	0.00	110.853	1722.00	0.00	0.00	0.00	0.00	
1822.00†	0.00	110.853	1822.00	0.00	0.00	0.00	0.00	
1922.00†	0.00	110.853	1922.00	0.00	0.00	0.00	0.00	
2022.00†	0.00	110.853	2022.00	0.00	0.00	0.00	0.00	
2122.00†	0.00	110.853	2122.00	0.00	0.00	0.00	0.00	
2222.00†	0.00	110.853	2222.00	0.00	0.00	0.00	0.00	
2322.00†	0.00	110.853	2322.00	0.00	0.00	0.00	0.00	
2422.00†	0.00	110.853	2422.00	0.00	0.00	0.00	0.00	
2522.00†	0.00	110.853	2522.00	0.00	0.00	0.00	0.00	
2622.00†	0.00	110.853	2622.00	0.00	0.00	0.00	0.00	
2722.00†	0.00	110.853	2722.00	0.00	0.00	0.00	0.00	
2822.00†	0.00	110.853	2822.00	0.00	0.00	0.00	0.00	

5/1/2012

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## Planned Wellpath Report

ATLANTA 11-6H (REV-C.0) PWP

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### REFERENCE WELLPATH IDENTIFICATION

Operator	CONTINENTAL RESOURCES	Slot	SLOT#11 ATLANTA 11-6H(495'FNL & 1350'FWL,SEC.06)
Area	NORTH DAKOTA	Well	ATLANTA 11-6H
Field	WILLIAMS COUNTY	Wellbore	ATLANTA 11-6H PWB
Facility	SEC.06-T153N-R101W		

### WELLPATH DATA (203 stations) † = interpolated/extrapolated station

MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Vert Sect [ft]	North [ft]	East [ft]	DLS [°/100ft]	Comments
2922.00†	0.000	110.853	2922.00	0.00	0.00	0.00	0.00	
3022.00†	0.000	110.853	3022.00	0.00	0.00	0.00	0.00	
3122.00†	0.000	110.853	3122.00	0.00	0.00	0.00	0.00	
3222.00†	0.000	110.853	3222.00	0.00	0.00	0.00	0.00	
3322.00†	0.000	110.853	3322.00	0.00	0.00	0.00	0.00	
3422.00†	0.000	110.853	3422.00	0.00	0.00	0.00	0.00	
3522.00†	0.000	110.853	3522.00	0.00	0.00	0.00	0.00	
3622.00†	0.000	110.853	3622.00	0.00	0.00	0.00	0.00	
3722.00†	0.000	110.853	3722.00	0.00	0.00	0.00	0.00	
3822.00†	0.000	110.853	3822.00	0.00	0.00	0.00	0.00	
3922.00†	0.000	110.853	3922.00	0.00	0.00	0.00	0.00	
4022.00†	0.000	110.853	4022.00	0.00	0.00	0.00	0.00	
4122.00†	0.000	110.853	4122.00	0.00	0.00	0.00	0.00	
4222.00†	0.000	110.853	4222.00	0.00	0.00	0.00	0.00	
4322.00†	0.000	110.853	4322.00	0.00	0.00	0.00	0.00	
4422.00†	0.000	110.853	4422.00	0.00	0.00	0.00	0.00	
4522.00†	0.000	110.853	4522.00	0.00	0.00	0.00	0.00	
4622.00†	0.000	110.853	4622.00	0.00	0.00	0.00	0.00	
4722.00†	0.000	110.853	4722.00	0.00	0.00	0.00	0.00	
4822.00†	0.000	110.853	4822.00	0.00	0.00	0.00	0.00	
4922.00†	0.000	110.853	4922.00	0.00	0.00	0.00	0.00	
5022.00†	0.000	110.853	5022.00	0.00	0.00	0.00	0.00	
5122.00†	0.000	110.853	5122.00	0.00	0.00	0.00	0.00	
5222.00†	0.000	110.853	5222.00	0.00	0.00	0.00	0.00	
5322.00†	0.000	110.853	5322.00	0.00	0.00	0.00	0.00	
5422.00†	0.000	110.853	5422.00	0.00	0.00	0.00	0.00	
5522.00†	0.000	110.853	5522.00	0.00	0.00	0.00	0.00	
5622.00†	0.000	110.853	5622.00	0.00	0.00	0.00	0.00	
5722.00†	0.000	110.853	5722.00	0.00	0.00	0.00	0.00	
5822.00†	0.000	110.853	5822.00	0.00	0.00	0.00	0.00	

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## Planned Wellpath Report

ATLANTA 11-6H (REV-C.0) PWP

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### REFERENCE WELLPATH IDENTIFICATION

Operator	CONTINENTAL RESOURCES	Slot	SLOT#11 ATLANTA 11-6H(495'FNL & 1350'FWL,SEC.06)
Area	NORTH DAKOTA	Well	ATLANTA 11-6H
Field	WILLIAMS COUNTY	Wellbore	ATLANTA 11-6H PWB
Facility	SEC.06-T153N-R101W		

### WELLPATH DATA (203 stations) † = interpolated/extrapolated station

MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Vert Sect [ft]	North [ft]	East [ft]	DLS [%/100ft]	Comments
5922.00†	0.000	110.853	5922.00	0.00	0.00	0.00	0.00	
6022.00†	0.000	110.853	6022.00	0.00	0.00	0.00	0.00	
6122.00†	0.000	110.853	6122.00	0.00	0.00	0.00	0.00	
6222.00†	0.000	110.853	6222.00	0.00	0.00	0.00	0.00	
6322.00†	0.000	110.853	6322.00	0.00	0.00	0.00	0.00	
6422.00†	0.000	110.853	6422.00	0.00	0.00	0.00	0.00	
6522.00†	0.000	110.853	6522.00	0.00	0.00	0.00	0.00	
6622.00†	0.000	110.853	6622.00	0.00	0.00	0.00	0.00	
6722.00†	0.000	110.853	6722.00	0.00	0.00	0.00	0.00	
6822.00†	0.000	110.853	6822.00	0.00	0.00	0.00	0.00	
6922.00†	0.000	110.853	6922.00	0.00	0.00	0.00	0.00	
7022.00†	0.000	110.853	7022.00	0.00	0.00	0.00	0.00	
7122.00†	0.000	110.853	7122.00	0.00	0.00	0.00	0.00	
7222.00†	0.000	110.853	7222.00	0.00	0.00	0.00	0.00	
7322.00†	0.000	110.853	7322.00	0.00	0.00	0.00	0.00	
7422.00†	0.000	110.853	7422.00	0.00	0.00	0.00	0.00	
7522.00†	0.000	110.853	7522.00	0.00	0.00	0.00	0.00	
7622.00†	0.000	110.853	7622.00	0.00	0.00	0.00	0.00	
7722.00†	0.000	110.853	7722.00	0.00	0.00	0.00	0.00	
7822.00†	0.000	110.853	7822.00	0.00	0.00	0.00	0.00	
7922.00†	0.000	110.853	7922.00	0.00	0.00	0.00	0.00	
8022.00†	0.000	110.853	8022.00	0.00	0.00	0.00	0.00	
8122.00†	0.000	110.853	8122.00	0.00	0.00	0.00	0.00	
8222.00†	0.000	110.853	8222.00	0.00	0.00	0.00	0.00	
8322.00†	0.000	110.853	8322.00	0.00	0.00	0.00	0.00	
8422.00†	0.000	110.853	8422.00	0.00	0.00	0.00	0.00	
8522.00†	0.000	110.853	8522.00	0.00	0.00	0.00	0.00	
8622.00†	0.000	110.853	8622.00	0.00	0.00	0.00	0.00	
8722.00†	0.000	110.853	8722.00	0.00	0.00	0.00	0.00	
8822.00†	0.000	110.853	8822.00	0.00	0.00	0.00	0.00	

5/1/2012

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## Planned Wellpath Report

ATLANTA 11-6H (REV-C.0) PWP

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### REFERENCE WELLPATH IDENTIFICATION

Operator	CONTINENTAL RESOURCES	Slot	SLOT#11 ATLANTA 11-6H(495'FNL & 1350'FWL,SEC.06)
Area	NORTH DAKOTA	Well	ATLANTA 11-6H
Field	WILLIAMS COUNTY	Wellbore	ATLANTA 11-6H PWB
Facility	SEC.06-T153N-R101W		

### WELLPATH DATA (203 stations) † = interpolated/extrapolated station

MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Vert Sect [ft]	North [ft]	East [ft]	DLS [%100ft]	Comments
8922.00†	0.000	110.853	8922.00	0.00	0.00	0.00	0.00	
9022.00†	0.000	110.853	9022.00	0.00	0.00	0.00	0.00	
9122.00†	0.000	110.853	9122.00	0.00	0.00	0.00	0.00	
9222.00†	0.000	110.853	9222.00	0.00	0.00	0.00	0.00	
9322.00†	0.000	110.853	9322.00	0.00	0.00	0.00	0.00	
9422.00†	0.000	110.853	9422.00	0.00	0.00	0.00	0.00	
9522.00†	0.000	110.853	9522.00	0.00	0.00	0.00	0.00	
9622.00†	0.000	110.853	9622.00	0.00	0.00	0.00	0.00	
9722.00†	0.000	110.853	9722.00	0.00	0.00	0.00	0.00	
9822.00†	0.000	110.853	9822.00	0.00	0.00	0.00	0.00	
9922.00†	0.000	110.853	9922.00	0.00	0.00	0.00	0.00	
9957.04	0.000	110.853	9957.04	0.00	0.00	0.00	0.00	
10022.00†	6.496	110.853	10021.86	3.68	-1.31	3.44	10.00	
10122.00†	16.496	110.853	10119.73	23.58	-8.39	22.04	10.00	
10222.00†	26.496	110.853	10212.66	60.18	-21.42	56.24	10.00	
10322.00†	36.496	110.853	10297.82	112.36	-40.00	105.00	10.00	
10422.00†	46.496	110.853	10372.62	178.53	-63.55	166.84	10.00	
10522.00†	56.496	110.853	10434.80	256.69	-91.37	239.87	10.00	
10622.00†	66.496	110.853	10482.46	344.45	-122.62	321.89	10.00	
10722.00†	76.496	110.853	10514.16	439.16	-156.33	410.40	10.00	
10822.00†	86.496	110.853	10528.93	537.94	-191.49	502.70	10.00	
10856.08	89.904	110.853	10530.00	572.00	-203.62	534.53	10.00	End of Build
10922.00†	89.904	110.853	10530.11	637.92	-227.08	596.13	0.00	
11022.00†	89.904	110.853	10530.27	737.92	-262.68	689.58	0.00	
11122.00†	89.904	110.853	10530.44	837.92	-298.27	783.03	0.00	
11222.00†	89.904	110.853	10530.61	937.92	-333.87	876.48	0.00	
11322.00†	89.904	110.853	10530.77	1037.92	-369.47	969.93	0.00	
11422.00†	89.904	110.853	10530.94	1137.92	-405.07	1063.38	0.00	
11522.00†	89.904	110.853	10531.11	1237.92	-440.66	1156.83	0.00	
11622.00†	89.904	110.853	10531.27	1337.92	-476.26	1250.28	0.00	

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## Planned Wellpath Report

ATLANTA 11-6H (REV-C.0) PWP

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### REFERENCE WELLPATH IDENTIFICATION

Operator	CONTINENTAL RESOURCES	Slot	SLOT#11 ATLANTA 11-6H(495'FNL & 1350'FWL,SEC.06)
Area	NORTH DAKOTA	Well	ATLANTA 11-6H
Field	WILLIAMS COUNTY	Wellbore	ATLANTA 11-6H PWB
Facility	SEC.06-T153N-R101W		

### WELLPATH DATA (203 stations) † = interpolated/extrapolated station

MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Vert Sect [ft]	North [ft]	East [ft]	DLS [°/100ft]	Comments
11722.00†	89.904	110.853	10531.44	1437.92	-511.86	1343.73	0.00	
11822.00†	89.904	110.853	10531.61	1537.92	-547.45	1437.18	0.00	
11922.00†	89.904	110.853	10531.77	1637.92	-583.05	1530.63	0.00	
12022.00†	89.904	110.853	10531.94	1737.92	-618.65	1624.08	0.00	
12122.00†	89.904	110.853	10532.11	1837.92	-654.25	1717.53	0.00	
12222.00†	89.904	110.853	10532.27	1937.92	-689.84	1810.98	0.00	
12322.00†	89.904	110.853	10532.44	2037.92	-725.44	1904.43	0.00	
12422.00†	89.904	110.853	10532.61	2137.92	-761.04	1997.88	0.00	
12522.00†	89.904	110.853	10532.77	2237.92	-796.63	2091.32	0.00	
12622.00†	89.904	110.853	10532.94	2337.92	-832.23	2184.77	0.00	
12722.00†	89.904	110.853	10533.11	2437.92	-867.83	2278.22	0.00	
12822.00†	89.904	110.853	10533.27	2537.92	-903.43	2371.67	0.00	
12922.00†	89.904	110.853	10533.44	2637.91	-939.02	2465.12	0.00	
13022.00†	89.904	110.853	10533.61	2737.91	-974.62	2558.57	0.00	
13122.00†	89.904	110.853	10533.77	2837.91	-1010.22	2652.02	0.00	
13222.00†	89.904	110.853	10533.94	2937.91	-1045.81	2745.47	0.00	
13322.00†	89.904	110.853	10534.11	3037.91	-1081.41	2838.92	0.00	
13422.00†	89.904	110.853	10534.27	3137.91	-1117.01	2932.37	0.00	
13522.00†	89.904	110.853	10534.44	3237.91	-1152.60	3025.82	0.00	
13622.00†	89.904	110.853	10534.61	3337.91	-1188.20	3119.27	0.00	
13722.00†	89.904	110.853	10534.77	3437.91	-1223.80	3212.72	0.00	
13822.00†	89.904	110.853	10534.94	3537.91	-1259.40	3306.17	0.00	
13922.00†	89.904	110.853	10535.11	3637.91	-1294.99	3399.62	0.00	
14022.00†	89.904	110.853	10535.27	3737.91	-1330.59	3493.07	0.00	
14122.00†	89.904	110.853	10535.44	3837.91	-1366.19	3586.52	0.00	
14222.00†	89.904	110.853	10535.61	3937.91	-1401.78	3679.97	0.00	
14322.00†	89.904	110.853	10535.77	4037.91	-1437.38	3773.42	0.00	
14422.00†	89.904	110.853	10535.94	4137.91	-1472.98	3866.87	0.00	
14522.00†	89.904	110.853	10536.11	4237.91	-1508.58	3960.32	0.00	
14622.00†	89.904	110.853	10536.27	4337.91	-1544.17	4053.77	0.00	

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## Planned Wellpath Report

ATLANTA 11-6H (REV-C.0) PWP

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### REFERENCE WELLPATH IDENTIFICATION

Operator	CONTINENTAL RESOURCES	Slot	SLOT#11 ATLANTA 11-6H(495'FNL & 1350'FWL,SEC.06)
Area	NORTH DAKOTA	Well	ATLANTA 11-6H
Field	WILLIAMS COUNTY	Wellbore	ATLANTA 11-6H PWB
Facility	SEC.06-T153N-R101W		

### WELLPATH DATA (203 stations) † = interpolated/extrapolated station

MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Vert Sect [ft]	North [ft]	East [ft]	DLS [%/100ft]	Comments
14722.00†	89.904	110.853	10536.44	4437.91	-1579.77	4147.22	0.00	
14822.00†	89.904	110.853	10536.61	4537.91	-1615.37	4240.66	0.00	
14922.00†	89.904	110.853	10536.77	4637.91	-1650.96	4334.11	0.00	
15022.00†	89.904	110.853	10536.94	4737.91	-1686.56	4427.56	0.00	
15122.00†	89.904	110.853	10537.11	4837.91	-1722.16	4521.01	0.00	
15222.00†	89.904	110.853	10537.27	4937.91	-1757.76	4614.46	0.00	
15322.00†	89.904	110.853	10537.44	5037.91	-1793.35	4707.91	0.00	
15422.00†	89.904	110.853	10537.61	5137.91	-1828.95	4801.36	0.00	
15522.00†	89.904	110.853	10537.77	5237.91	-1864.55	4894.81	0.00	
15622.00†	89.904	110.853	10537.94	5337.91	-1900.14	4988.26	0.00	
15722.00†	89.904	110.853	10538.11	5437.91	-1935.74	5081.71	0.00	
15822.00†	89.904	110.853	10538.27	5537.91	-1971.34	5175.16	0.00	
15922.00†	89.904	110.853	10538.44	5637.91	-2006.94	5268.61	0.00	
16022.00†	89.904	110.853	10538.61	5737.91	-2042.53	5362.06	0.00	
16122.00†	89.904	110.853	10538.77	5837.91	-2078.13	5455.51	0.00	
16222.00†	89.904	110.853	10538.94	5937.91	-2113.73	5548.96	0.00	
16322.00†	89.904	110.853	10539.11	6037.91	-2149.32	5642.41	0.00	
16422.00†	89.904	110.853	10539.27	6137.91	-2184.92	5735.86	0.00	
16522.00†	89.904	110.853	10539.44	6237.91	-2220.52	5829.31	0.00	
16622.00†	89.904	110.853	10539.61	6337.91	-2256.11	5922.76	0.00	
16722.00†	89.904	110.853	10539.77	6437.91	-2291.71	6016.21	0.00	
16822.00†	89.904	110.853	10539.94	6537.91	-2327.31	6109.66	0.00	
16922.00†	89.904	110.853	10540.11	6637.91	-2362.91	6203.11	0.00	
17022.00†	89.904	110.853	10540.27	6737.91	-2398.50	6296.55	0.00	
17122.00†	89.904	110.853	10540.44	6837.91	-2434.10	6390.00	0.00	
17222.00†	89.904	110.853	10540.61	6937.91	-2469.70	6483.45	0.00	
17322.00†	89.904	110.853	10540.77	7037.91	-2505.29	6576.90	0.00	
17422.00†	89.904	110.853	10540.94	7137.91	-2540.89	6670.35	0.00	
17522.00†	89.904	110.853	10541.11	7237.91	-2576.49	6763.80	0.00	
17622.00†	89.904	110.853	10541.27	7337.91	-2612.09	6857.25	0.00	

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## Planned Wellpath Report

ATLANTA 11-6H (REV-C.0) PWP

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### REFERENCE WELLPATH IDENTIFICATION

Operator	CONTINENTAL RESOURCES	Slot	SLOT#11 ATLANTA 11-6H(495'FNL & 1350'FWL,SEC.06)
Area	NORTH DAKOTA	Well	ATLANTA 11-6H
Field	WILLIAMS COUNTY	Wellbore	ATLANTA 11-6H PWB
Facility	SEC.06-T153N-R101W		

### WELLPATH DATA (203 stations) † = interpolated/extrapolated station

MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Vert Sect [ft]	North [ft]	East [ft]	DLS [°/100ft]	Comments
17722.00†	89.904	110.853	10541.44	7437.91	-2647.68	6950.70	0.00	
17822.00†	89.904	110.853	10541.61	7537.91	-2683.28	7044.15	0.00	
17922.00†	89.904	110.853	10541.77	7637.91	-2718.88	7137.60	0.00	
18022.00†	89.904	110.853	10541.94	7737.91	-2754.47	7231.05	0.00	
18122.00†	89.904	110.853	10542.11	7837.91	-2790.07	7324.50	0.00	
18222.00†	89.904	110.853	10542.27	7937.91	-2825.67	7417.95	0.00	
18322.00†	89.904	110.853	10542.44	8037.91	-2861.27	7511.40	0.00	
18422.00†	89.904	110.853	10542.61	8137.91	-2896.86	7604.85	0.00	
18522.00†	89.904	110.853	10542.77	8237.91	-2932.46	7698.30	0.00	
18622.00†	89.904	110.853	10542.94	8337.91	-2968.06	7791.75	0.00	
18722.00†	89.904	110.853	10543.11	8437.91	-3003.65	7885.20	0.00	
18822.00†	89.904	110.853	10543.27	8537.91	-3039.25	7978.65	0.00	
18922.00†	89.904	110.853	10543.44	8637.91	-3074.85	8072.10	0.00	
19022.00†	89.904	110.853	10543.61	8737.91	-3110.45	8165.55	0.00	
19122.00†	89.904	110.853	10543.77	8837.91	-3146.04	8259.00	0.00	
19222.00†	89.904	110.853	10543.94	8937.91	-3181.64	8352.45	0.00	
19322.00†	89.904	110.853	10544.11	9037.91	-3217.24	8445.89	0.00	
19422.00†	89.904	110.853	10544.27	9137.91	-3252.83	8539.34	0.00	
19522.00†	89.904	110.853	10544.44	9237.91	-3288.43	8632.79	0.00	
19622.00†	89.904	110.853	10544.61	9337.91	-3324.03	8726.24	0.00	
19722.00†	89.904	110.853	10544.77	9437.91	-3359.62	8819.69	0.00	
19822.00†	89.904	110.853	10544.94	9537.91	-3395.22	8913.14	0.00	
19857.05	89.904	110.853	10545.00†	9572.96	-3407.70	8945.90	0.00	End of Tangent

### HOLE & CASING SECTIONS - Ref Wellbore: ATLANTA 11-6H PWB Ref Wellpath: ATLANTA 11-6H (REV-C.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	10856.08	10834.08	22.00	10530.00	0.00	0.00	-203.61	534.53

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## Planned Wellpath Report

ATLANTA 11-6H (REV-C.0) PWP

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### REFERENCE WELLPATH IDENTIFICATION

Operator	CONTINENTAL RESOURCES	Slot	SLOT#11 ATLANTA 11-6H(495'FNL & 1350'FWL,SEC.06)
Area	NORTH DAKOTA	Well	ATLANTA 11-6H
Field	WILLIAMS COUNTY	Wellbore	ATLANTA 11-6H PWB
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 11-6H SECTION 05		0.00	0.00	0.00	1180114.27	421181.24	48°06'33.650"N	103°43'41.047"W	polygon
ATLANTA 11-6H SECTION 06		0.00	0.00	0.00	1180114.27	421181.24	48°06'33.650"N	103°43'41.047"W	polygon
ATLANTA 11-6H SECTION 08		0.00	0.00	0.00	1180114.27	421181.24	48°06'33.650"N	103°43'41.047"W	polygon
ATLANTA 11-6H SECTION LINES		0.00	0.00	0.00	1180114.27	421181.24	48°06'33.650"N	103°43'41.047"W	polygon
ATLANTA 11-6H BHL ON PLAT REV-1 (1191'FSL & 500'FEL,SEC.05)	10531.00	-3593.93	8710.04	1188665.47	417225.67	48°05'58.164"N	103°41'32.729"W	point	
ATLANTA 11-6H BHL REV-2(1191'FSL & 200'FEL,SEC.05)	10531.00	-3594.04	9010.00	1188965.14	417212.99	48°05'58.162"N	103°41'28.310"W	point	
1) ATLANTA 11-6H BHL REV-3 (1191'FSL & 200'FEL,SEC.05)	19857.05	10545.00	-3407.70	8945.90	1188908.91	417401.84	48°06'00.001"N	103°41'29.253"W	point
ATLANTA 11-6H HARDLINES(500'N/W & 200'S/E)		10545.00	0.00	0.00	1180114.27	421181.24	48°06'33.650"N	103°43'41.047"W	polygon

### SURVEY PROGRAM - Ref Wellbore: ATLANTA 11-6H PWB Ref Wellpath: ATLANTA 11-6H (REV-C.0) PWP

Start MD [ft]	End MD [ft]	Positional Uncertainty Model	Log Name/Comment	Wellbore
22.00	21000.00	NaviTrak (Standard)		ATLANTA 11-6H PWB

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## Planned Wellpath Report

ATLANTA 11-6H (REV-C.0) PWP

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### REFERENCE WELLPATH IDENTIFICATION

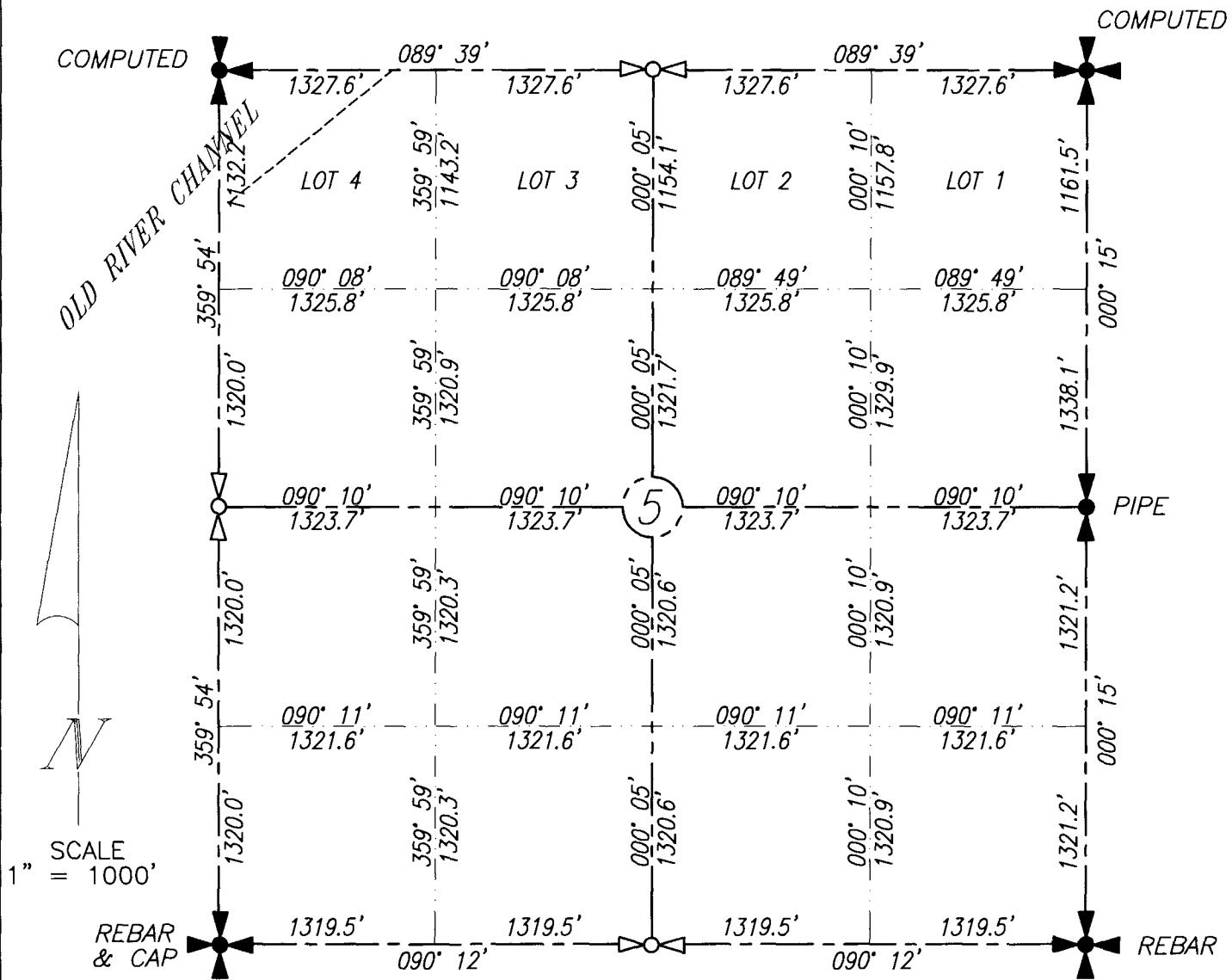
Operator	CONTINENTAL RESOURCES	Slot	SLOT#11 ATLANTA 11-6H(495'FNL & 1350'FWL,SEC.06)
Area	NORTH DAKOTA	Well	ATLANTA 11-6H
Field	WILLIAMS COUNTY	Wellbore	ATLANTA 11-6H PWB
Facility	SEC.06-T153N-R101W		

### DESIGN COMMENTS

MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Comment
22.00	0.000	110.853	22.00	Tie On
9957.04	0.000	110.853	9957.04	End of Tangent
10856.08	89.904	110.853	10530.00	End of Build
19857.05	89.904	110.853	10545.00	End of Tangent

HORIZONTAL SECTION PLAT  
CONTINENTAL RESOURCES INC.

ATLANTA 14-6H  
SECTION 5, T153N, R101W  
WILLIAMS COUNTY, NORTH DAKOTA  
MCKENZIE 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.

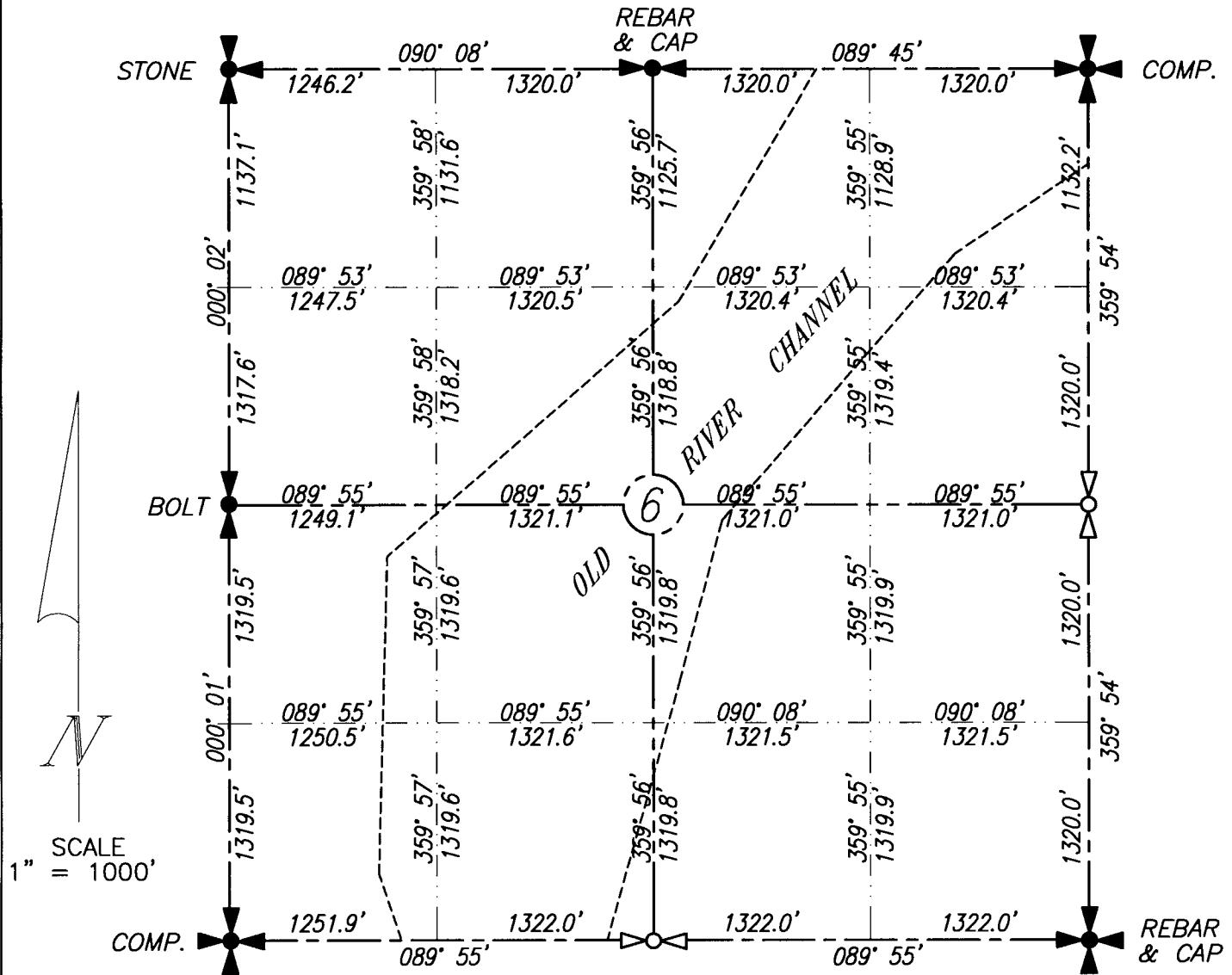
I CERTIFY THAT THIS PLAT CORRECTLY REPRESENTS  
WORK PERFORMED BY ME OR UNDER MY RESPONSIBLE  
CHARGE AND IS TRUE AND CORRECT TO THE BEST OF  
MY KNOWLEDGE AND BELIEF  
L.S. 3366

John Paulson P.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  
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.

I CERTIFY THAT THE REGISTERED 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 REIS 336~~

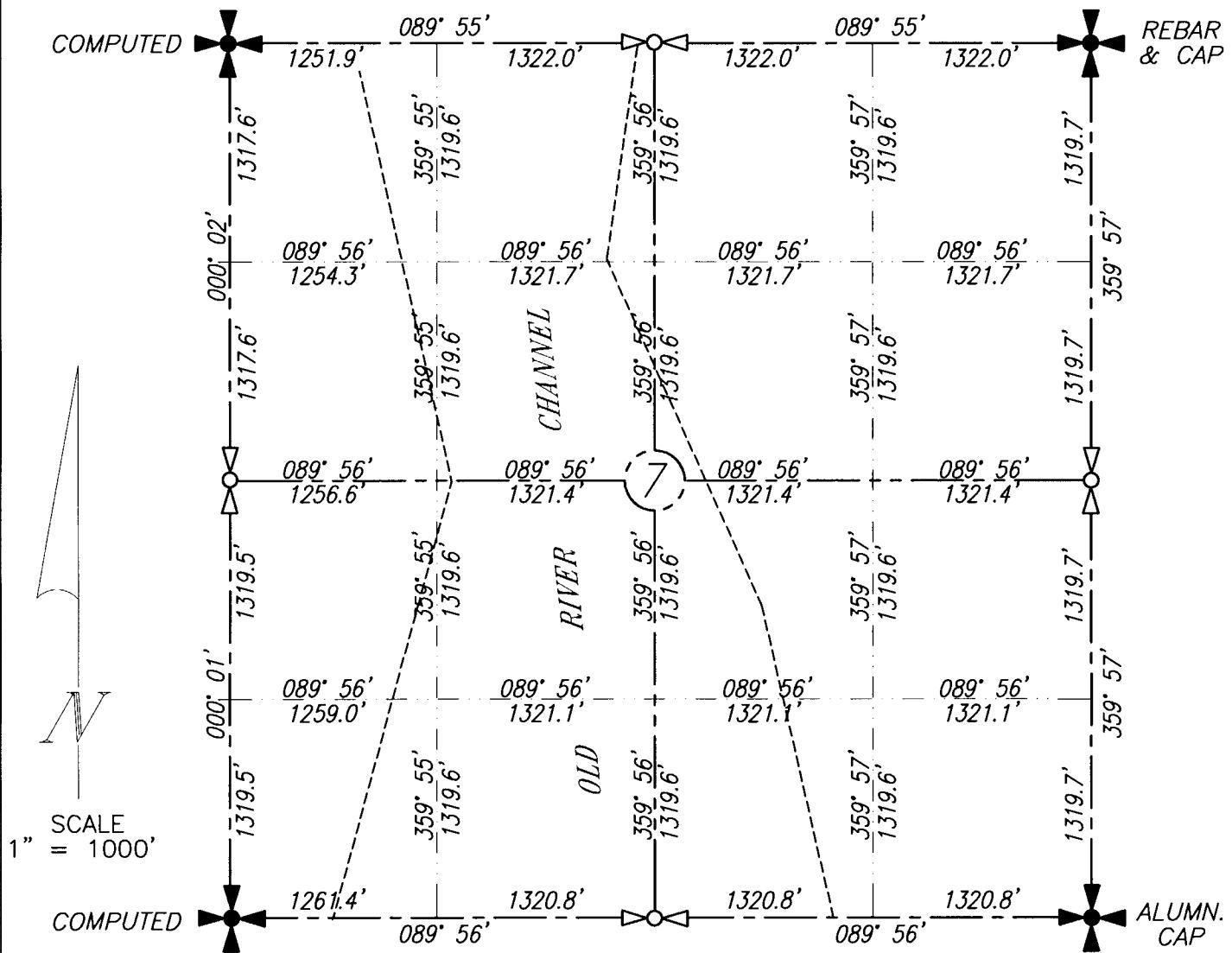
## *BROSZ ENGINEERING INC.*

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 4-6H  
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  
REGISTERED  
125.3366

JOHN PAULSON, P.E., S.R.E. #3366

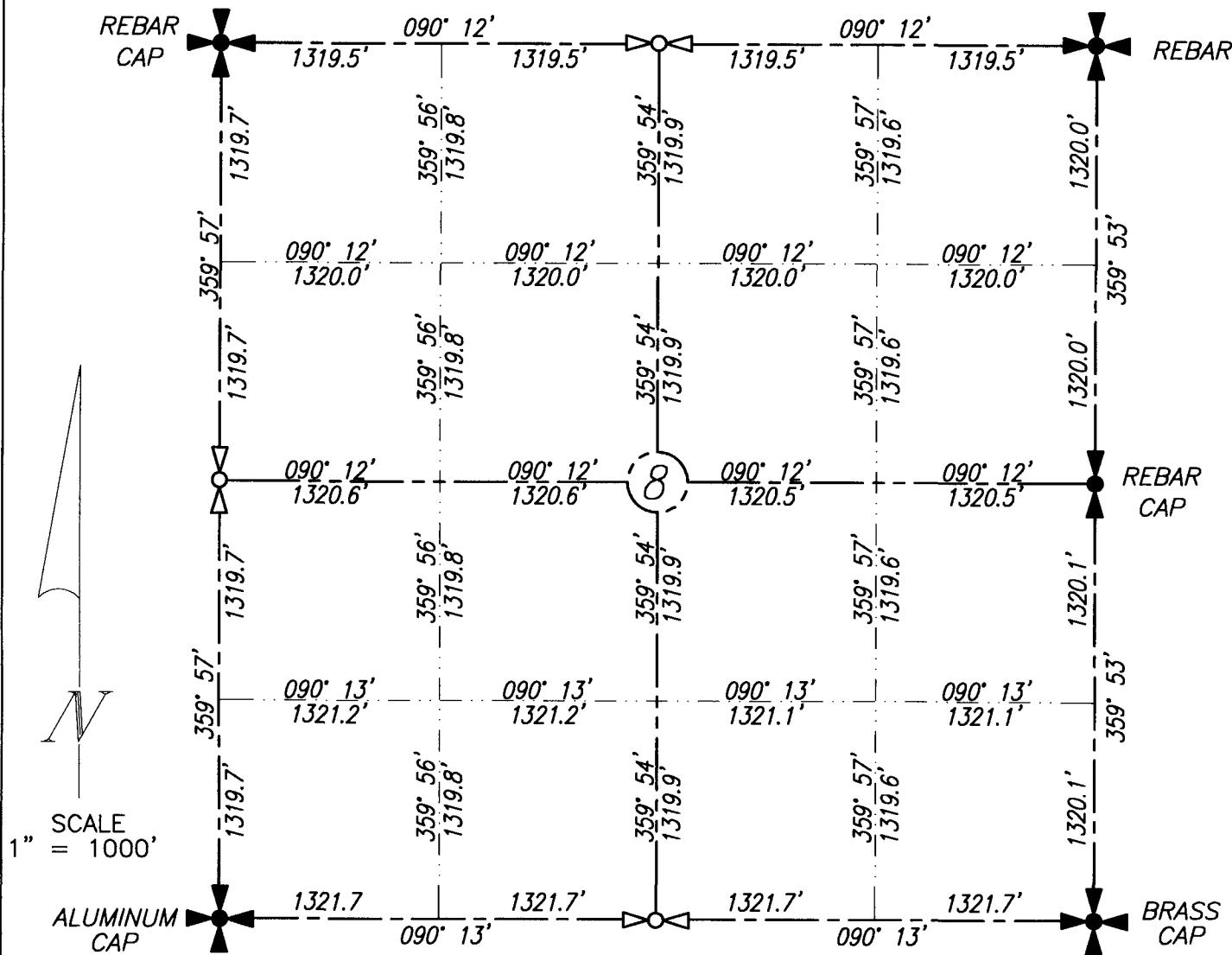
**BROSZ ENGINEERING INC.**

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

REVISED: 5-2-2012



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 SURVEYOR  
S-2262

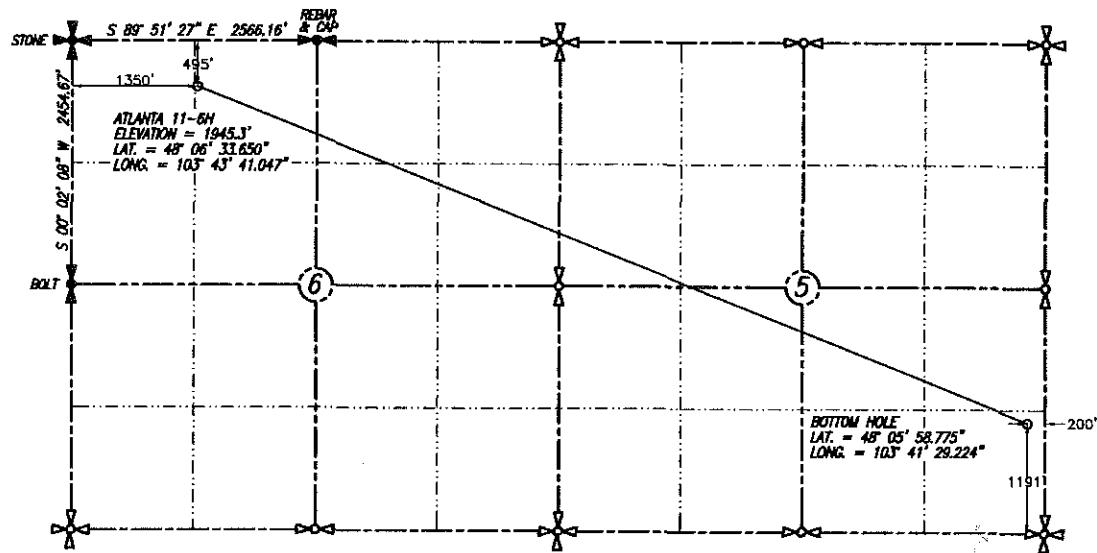
*John Paulson* L.S. 3366  
JOHN PAULSON R.L.S. 3366 H DAKOTA

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

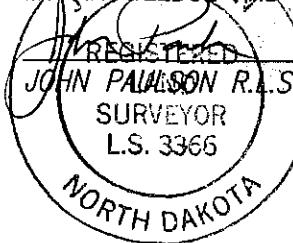
BOTTOM HOLE LOCATION PLAT  
CONTINENTAL RESOURCES INC.

REVISED: 5-4-2012

ATLANTA 11-6H  
SECTION 6, T153N, R101W  
WILLIAMS COUNTY, NORTH DAKOTA  
495' FNL & 1350' 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



5-4-12

DATE STAKED: 2-9-2012

BASIS OF VERTICAL DATUM:  
NAVD 1988 GEOID 09

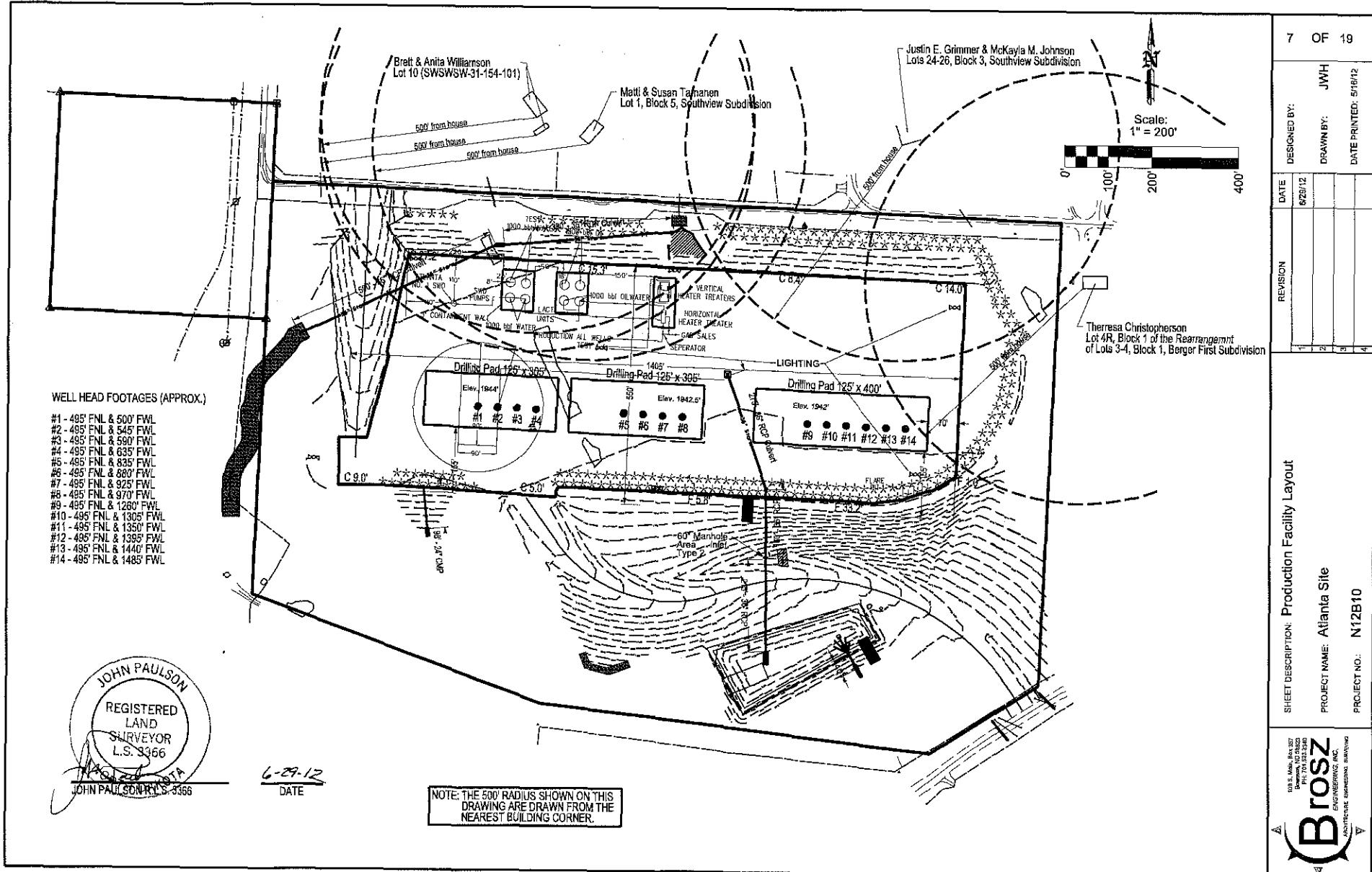
PERSON AUTHORIZING SURVEY;  
CHAD NEWBY

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



## 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.

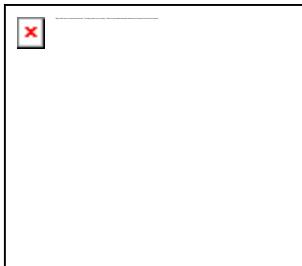
Prairie Disposal for Cuttings  
102C10 52<sup>nd</sup> St NW  
Tioga ND 58852

Let me know if there is anything else that you need.

Thanks.

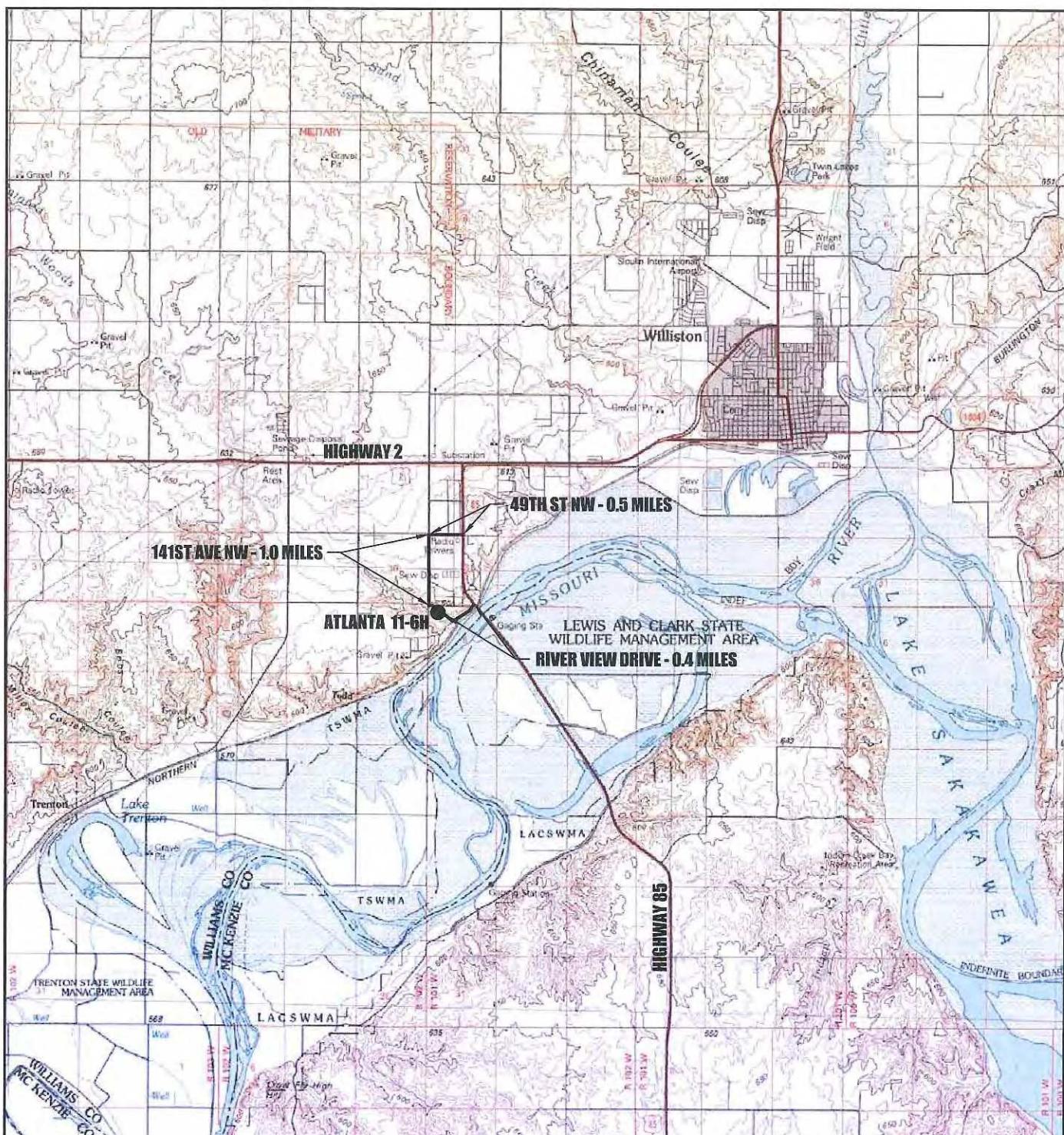
Bb

*Becky Barnes*  
Regulatory Compliance Specialist  
Continental Resources, Inc.  
Office 405-234-9161  
Fax 580-548-5293



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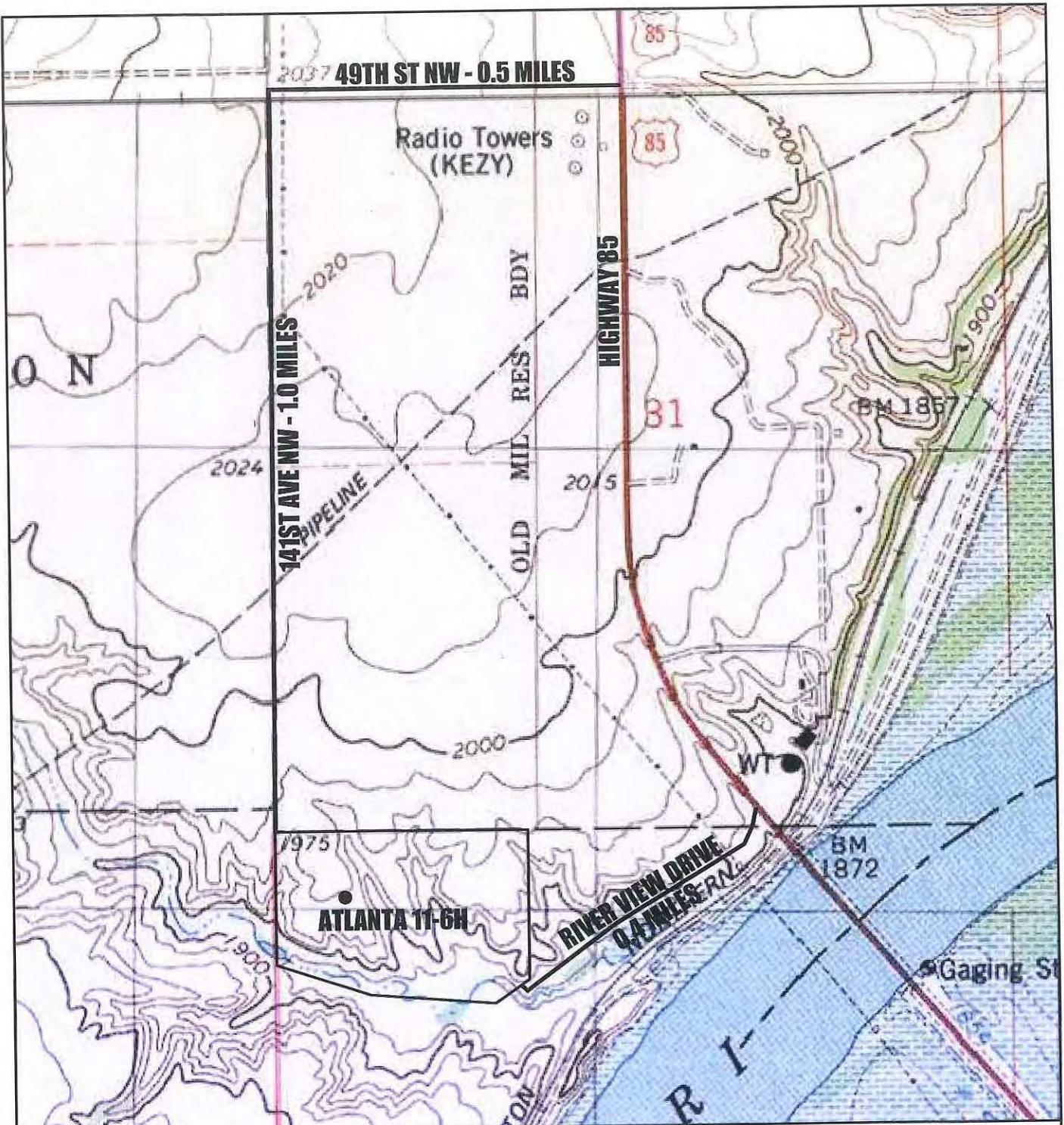
**NOTICE:** This message contains confidential information and is intended for the individual named. If you are not the named addressee, you should not disseminate, distribute or copy this e-mail. Please notify the sender immediately by reply e-mail if you have received this e-mail by mistake and delete 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 11-6H  
SECTION 6, T153N, R101W  
WILLIAMS COUNTY, NORTH DAKOTA



CONTINENTAL RESOURCES INC.

EXHIBIT 2  
QUAD ACCESS

ATLANTA 11-6H  
SECTION 6, T153N, R101W  
WILLIAMS COUNTY, NORTH DAKOTA

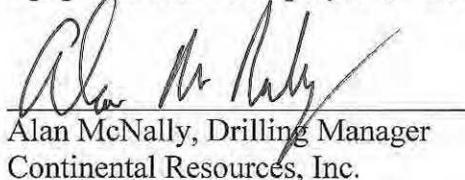
Continental Resources, Inc. (CRI) respectfully submits the following information concerning the drilling of the Atlanta 1 through 14-H, NWNW Sec. 6, T153N, R101W, Williams County, North Dakota.

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 SW¼SW¼SW¼ (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

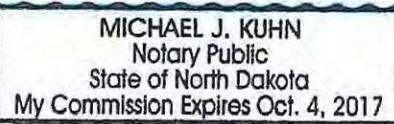
**Affiant:**

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.

  
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

WATFORD CITY, NORTH DAKOTA

McKenzie COUNTY

AMBULANCE .....	911
FIRE .....	911
POLICE .....	911 OR 701-842-2400
McKenzie COUNTY SHERIFF DISPATCH .....	911

BUREAU OF LAND MANAGEMENT

DICKINSON, ND

OFFICE REPRESENTATIVE .....	701-225-9148
-----------------------------	--------------

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 Rockwell C 22 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

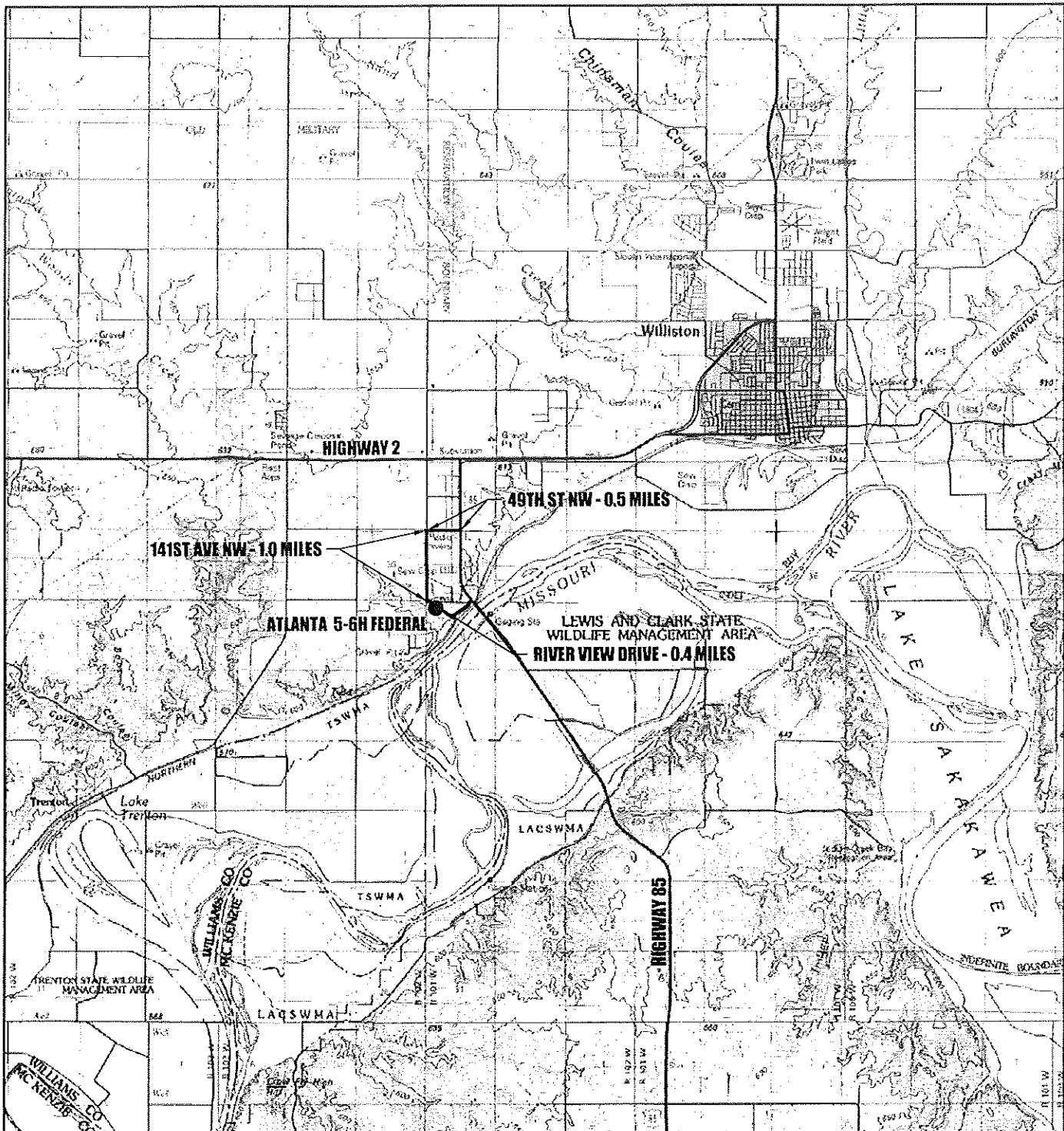
An overbalanced mud should be used to drill potential pay zone with necessary additives for all stabilization.

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

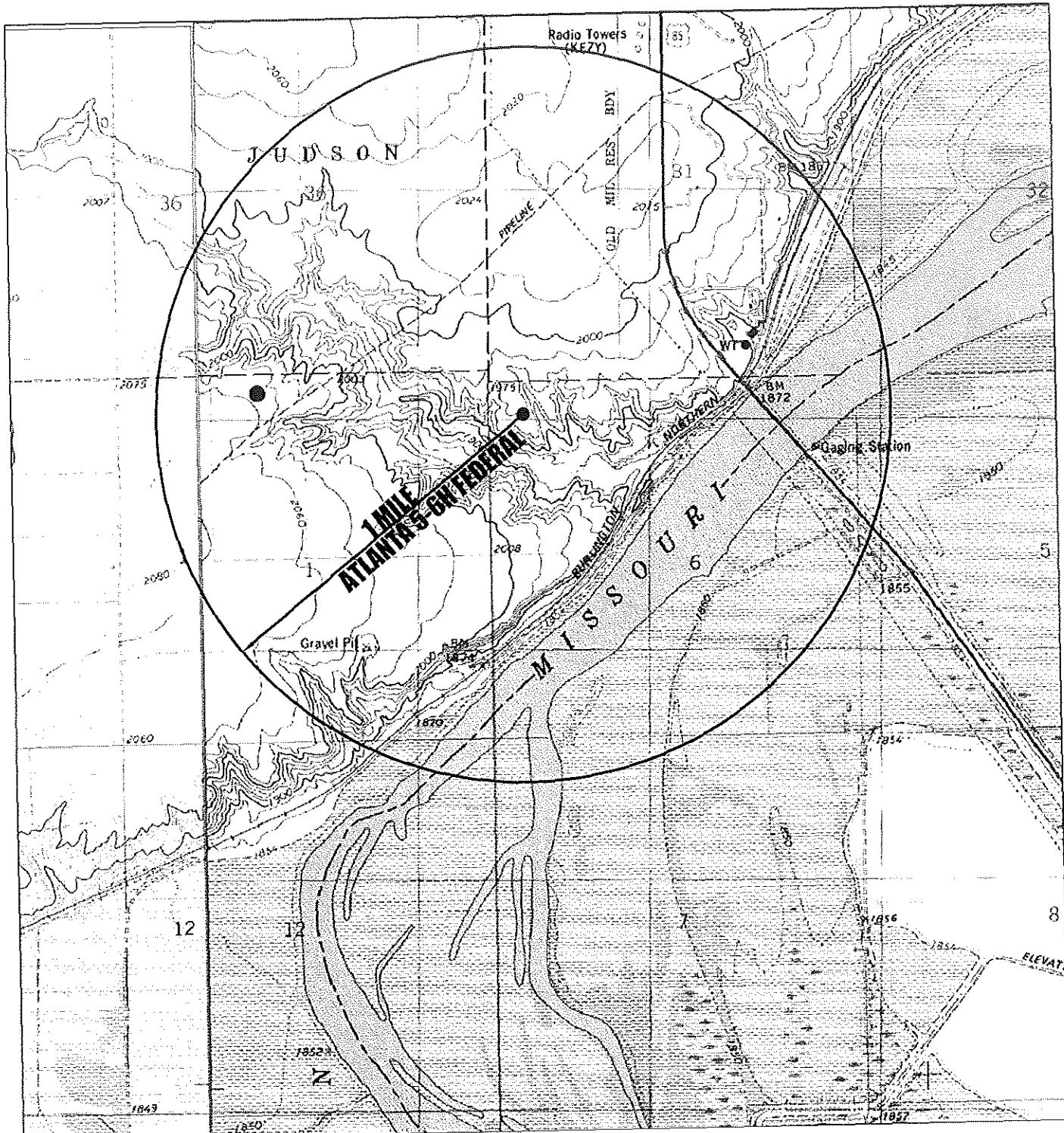
The Safety Advisor will conduct frequent H2S emergency drills for each crew by manually activating the H2S detector. When the lights flash, all personnel on location will assemble at the Upwind Briefing Area. A head count will be taken at this time to determine if rescue operations are indicated. The 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.

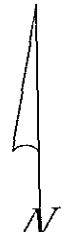
**EXHIBIT 1**  
**VICINITY MAP**  
**PROPOSED ACCESS ROUTE**

ATLANTA 5-6H FEDERAL  
SECTION 6, T153N, R101W  
WILLIAMS COUNTY, NORTH DAKOTA



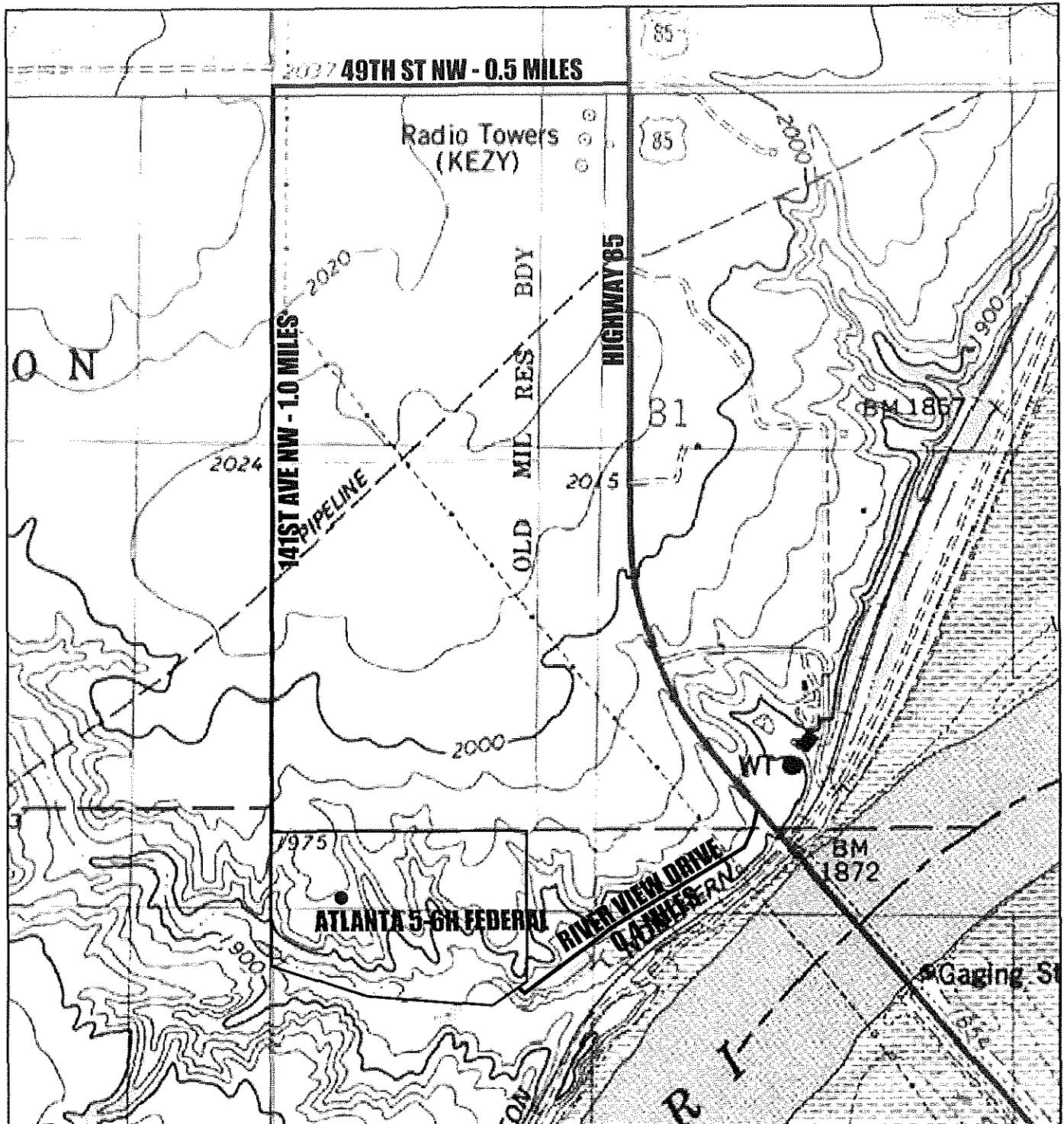
**CONTINENTAL RESOURCES INC.**

● = OIL WELL



**EXHIBIT 3**  
**ONE-MILE RADIUS MAP**

ATLANTA 5-6H FEDERAL  
SECTION 6, T153N, R101W  
WILLIAMS COUNTY, NORTH DAKOTA



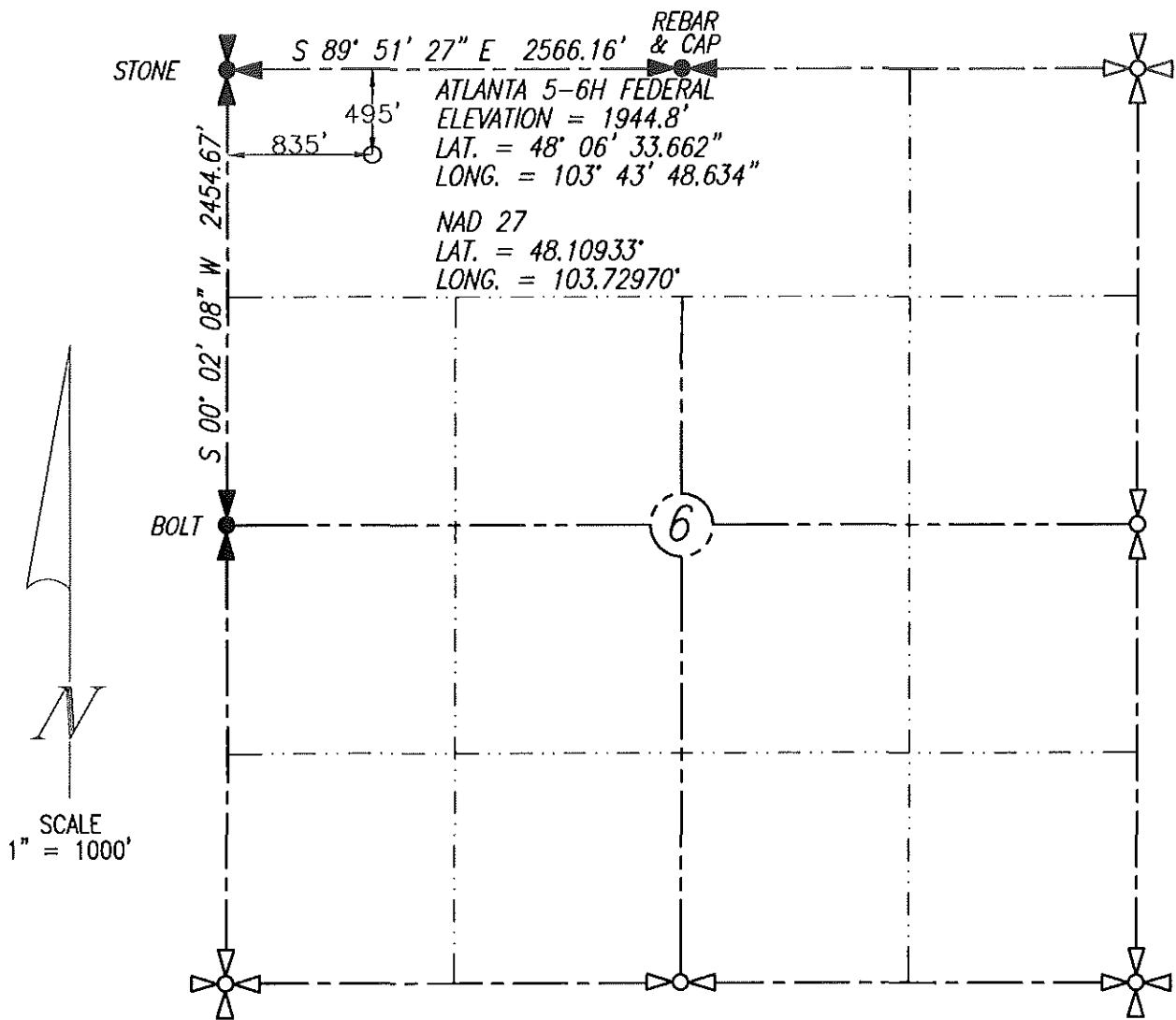
CONTINENTAL RESOURCES INC.

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 Paul

4-23-12



DATE STAKED: 2-9-2012

BASIS OF VERTICAL DATUM:  
NAVD 1988 GEOD 09

PERSON AUTHORIZING SURVEY;  
CHAD NEWBY

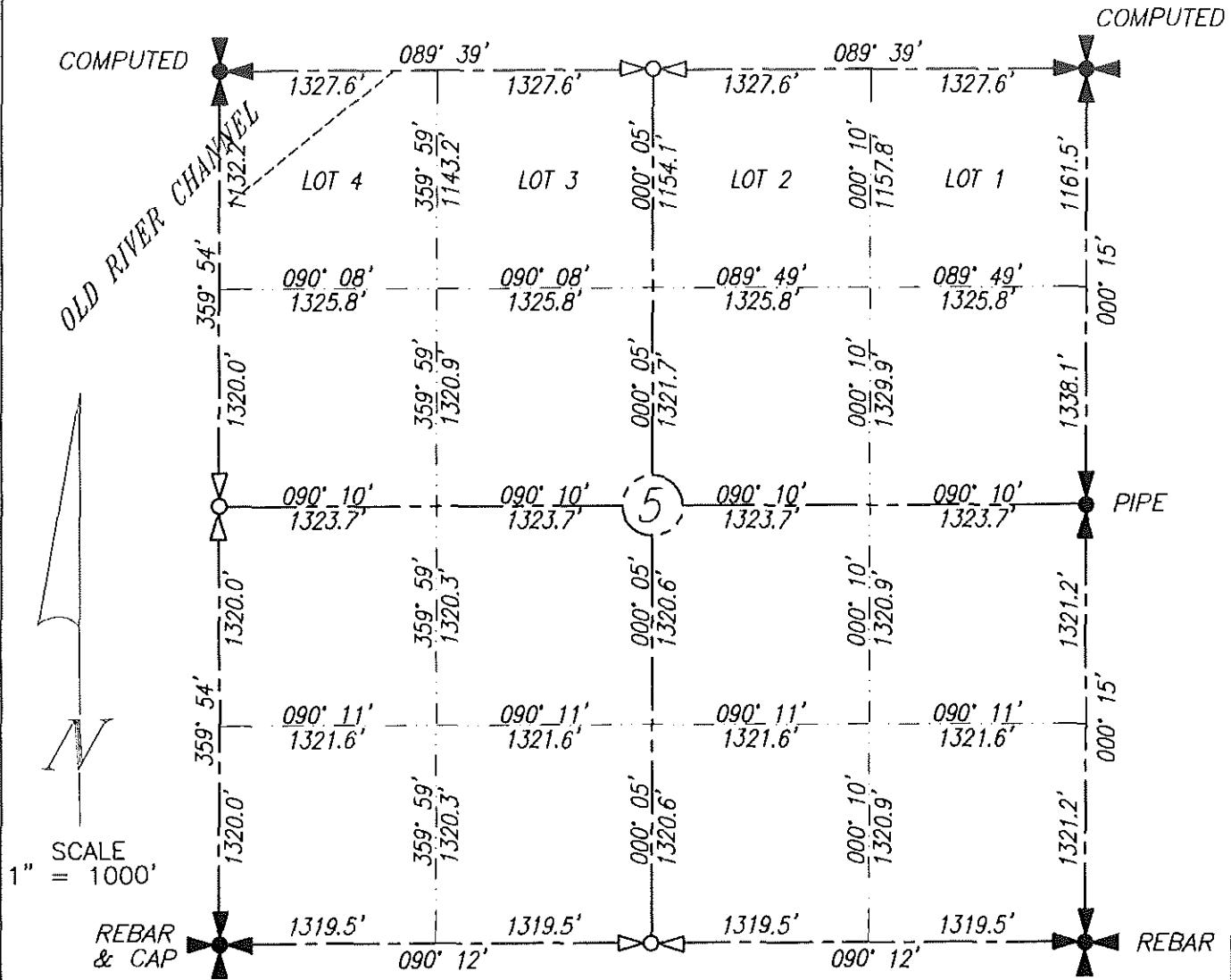
EXPLANATION AREA: NAD83(CORS96)

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  
MCKENZIE 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 PLAT CORRECTLY REPRESENTS  
WORK PERFORMED BY ME OR UNDER MY RESPONSIBLE  
CHARGE, AND IS STATED AND CORRECT TO THE BEST OF  
MY KNOWLEDGE AND BELIEF

JOHN PAULSON  
SURVEYOR  
R.L.S. #3366

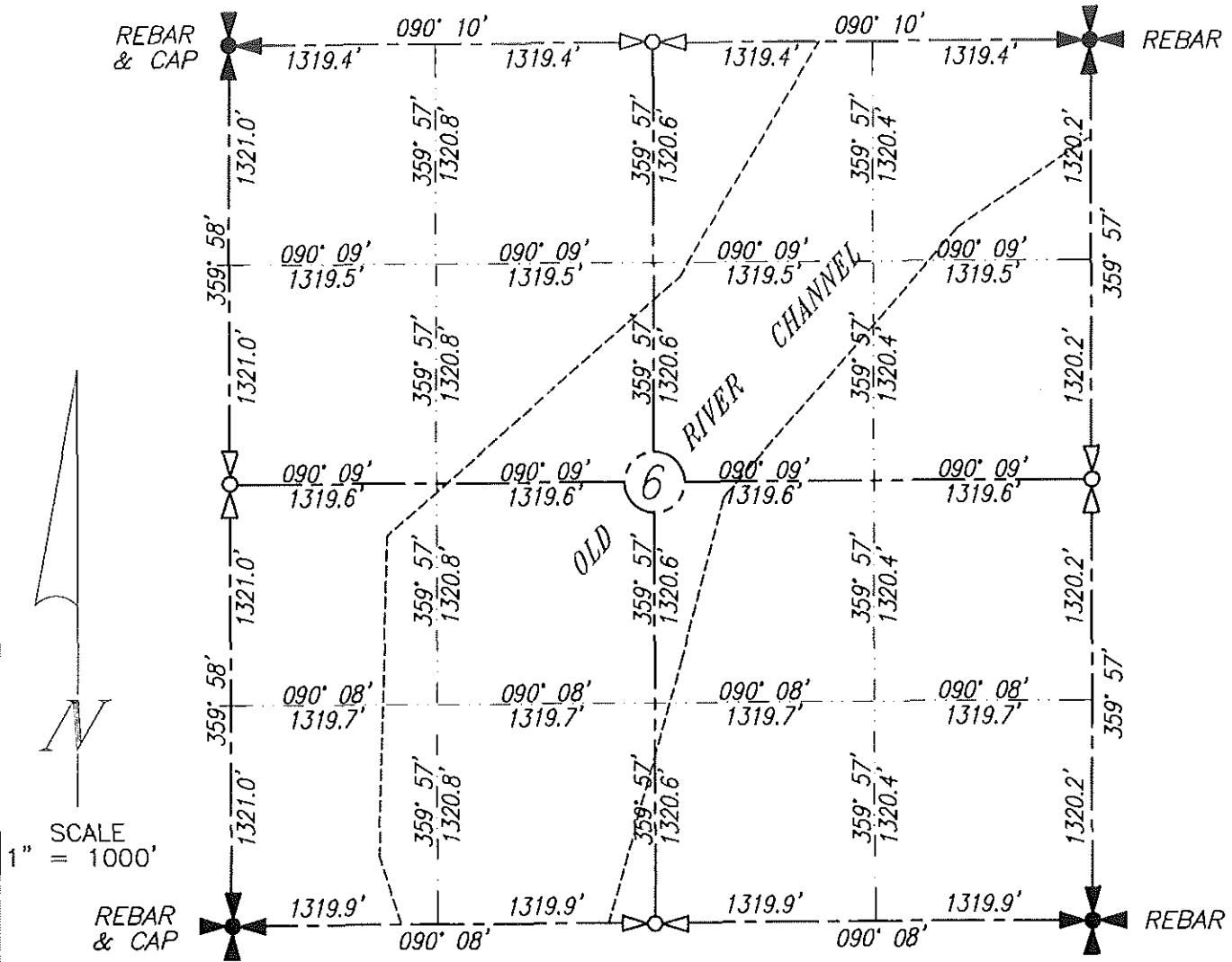
4-9-12

JOHN PAULSON R.L.S. #3366  
NORTH DAKOTA

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.~~

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

~~JOHN PATRICK DALE~~ 49-12  
JOHN PATRICK DALE S. 3366

## *BROSZ ENGINEERING INC.*

BOX 357

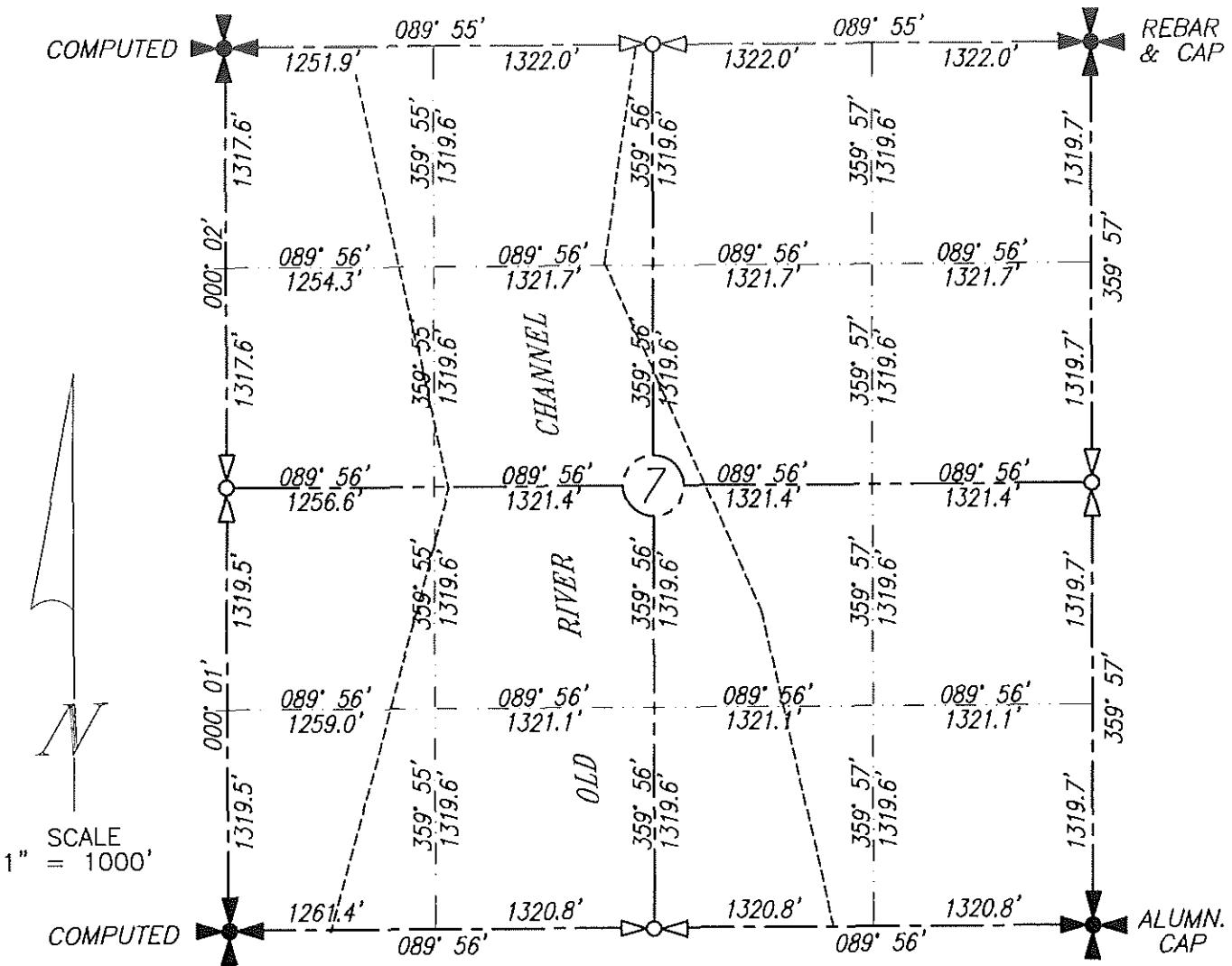
BOWMAN, N.D. 58623

PHONE: 701-523-3340

FAX: 701-523-5243

PROJECT NO. 12-10

HORIZONTAL SECTION PLAT  
CONTINENTAL RESOURCES INC.  
ATLANTA 5-6H FEDERAL  
SECTION 7, T153N, R101W  
CKENZIE COUNTY, NORTH DAKOT



*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.

JOHN PAUPERTANCES TO ALL  
ALL BEARINGS SHOW

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.

MY KNOWLEDGE AND EXPERTISE

4-9-12

JOHN PAULSON R.L.S. 3366

## *BROSZ ENGINEERING INC.*

Box 357

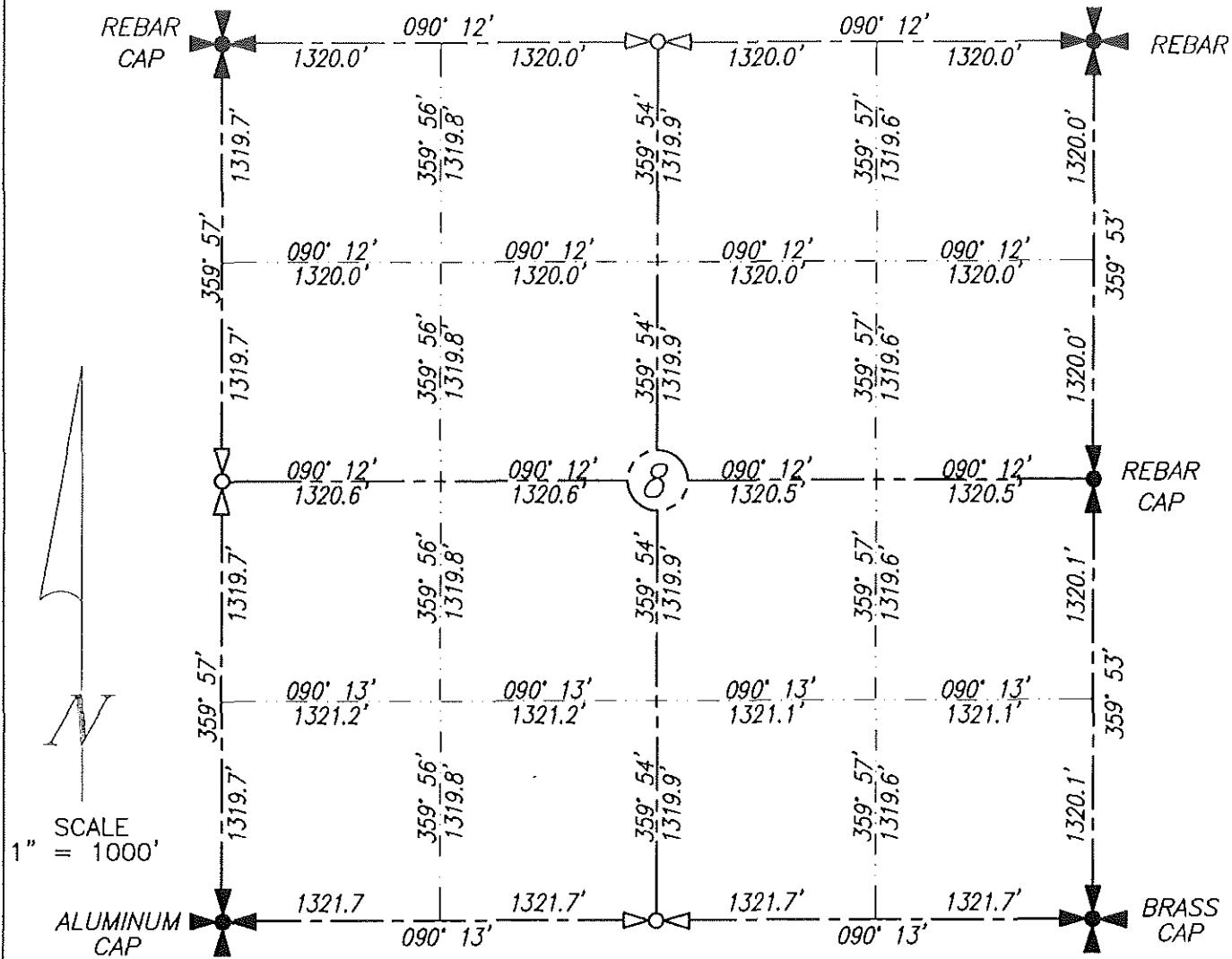
BOWMAN, N.D. 58623

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



ALL CORNERS SHOWN ON THIS PLAT WERE FOUND IN THE FIELD  
DISTANCES TO ALL OTHERS ARE CALCULATED.  
ALL BEARINGS SHOWN ARE ASSUMED.

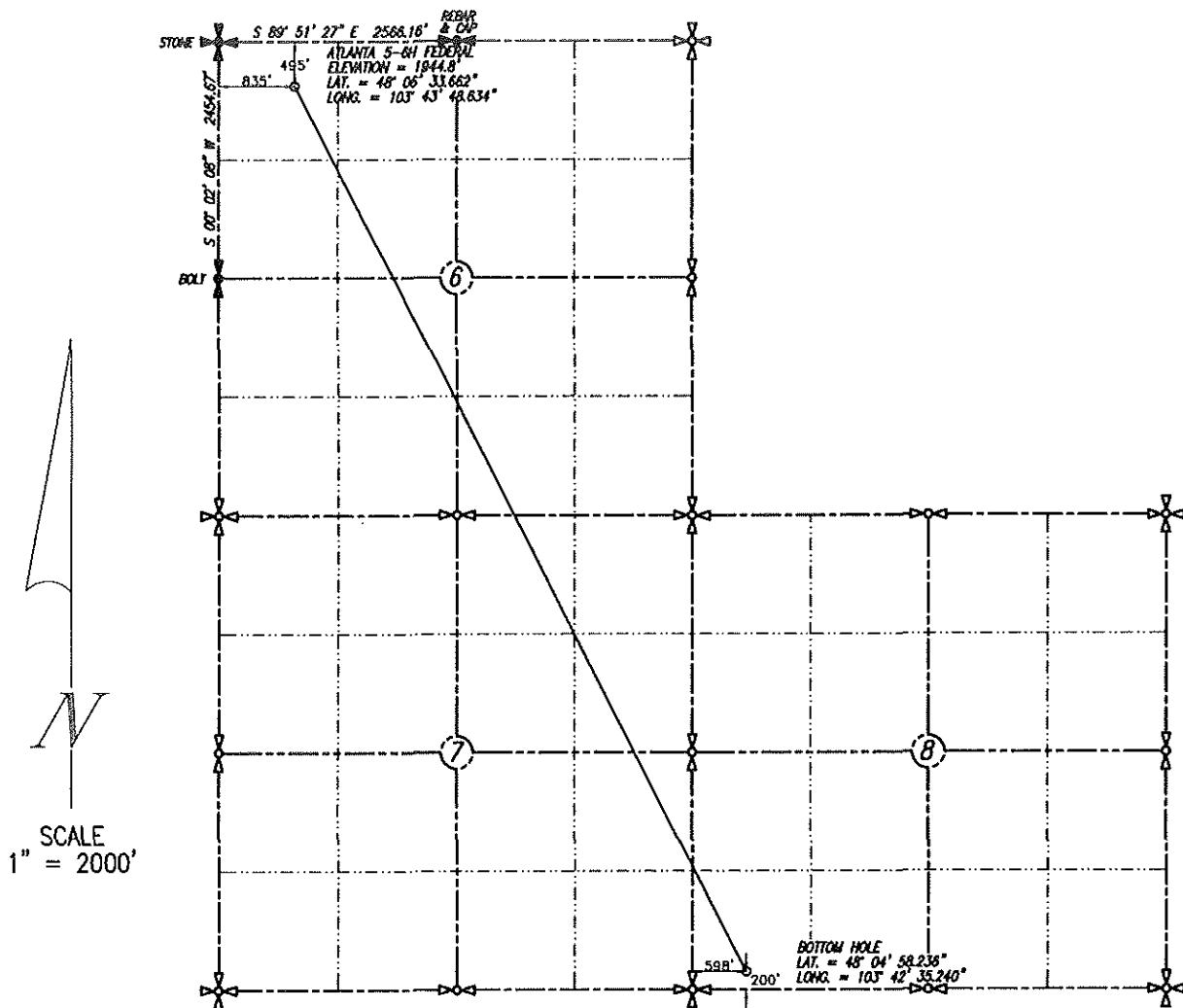
I CERTIFY THAT THIS PLAT CORRECTLY REPRESENTS  
WORK PERFORMED THEREIN OR UNDER MY RESPONSIBLE  
CHARGE, AND IS FAIR AND CORRECT TO THE BEST OF  
MY KNOWLEDGE AND JURISDICTION  
L.S. 3365

L.S. 3366  
JOHN PAULSON R.L.S.  
DAKOTA

14-9-12

**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



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 Pagsund* -23-12  
 JOHN PAGSUND L.S. 3366  
 LAND SURVEYOR  
 L.S. 3366

NORTH DAKOTA

DATE STAKED: 2-9-2012

BASIS OF VERTICAL DATUM:  
 NAVD 1988 GEODETIC

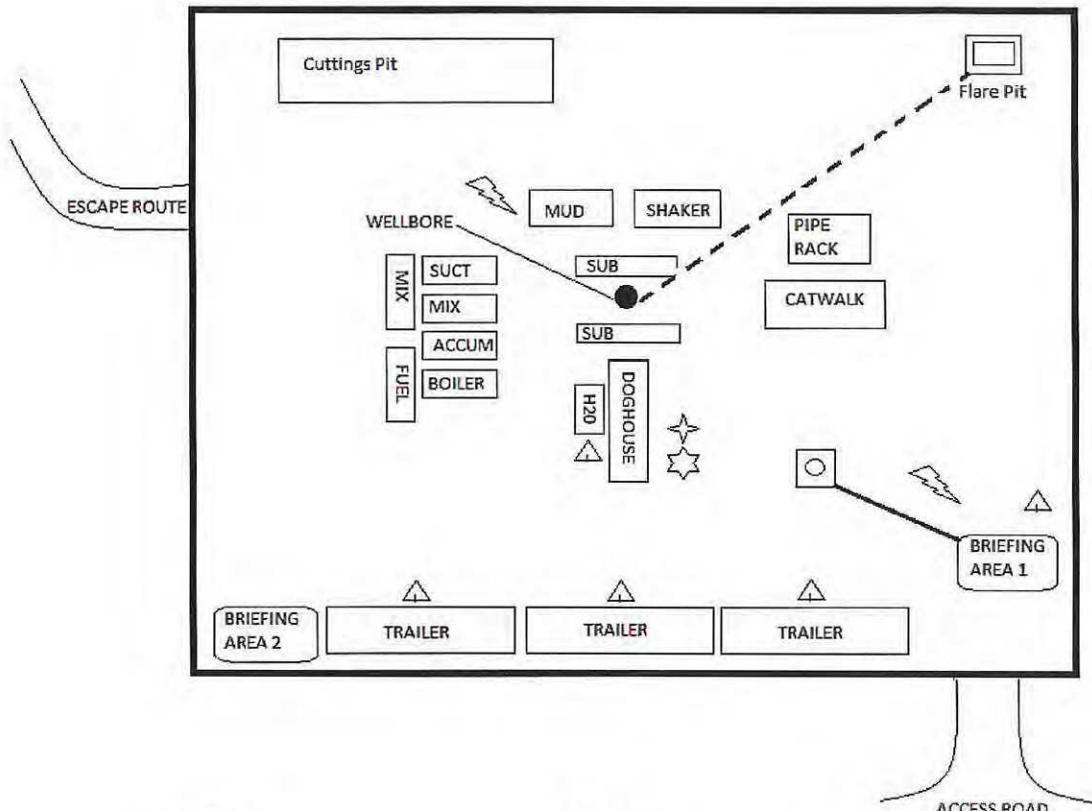
PERSON AUTHORIZING SURVEY;  
CHAD NEWBY

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**)  
**COUNTY OF GARFIELD**)ss:

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.

Betsy Barnes  
Notary Public

## Garfield County, Oklahoma

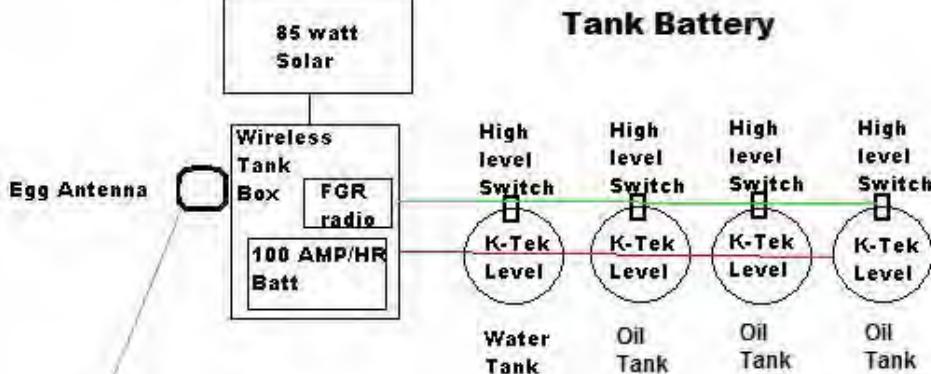
My Commission Expires: 7/5/2015  
Commission No.: 11006023



# Continental Resources Wellhead Automation

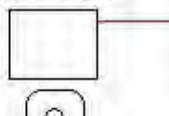


Analog  
Radio  
RS485 Modbus  
Digital I/O



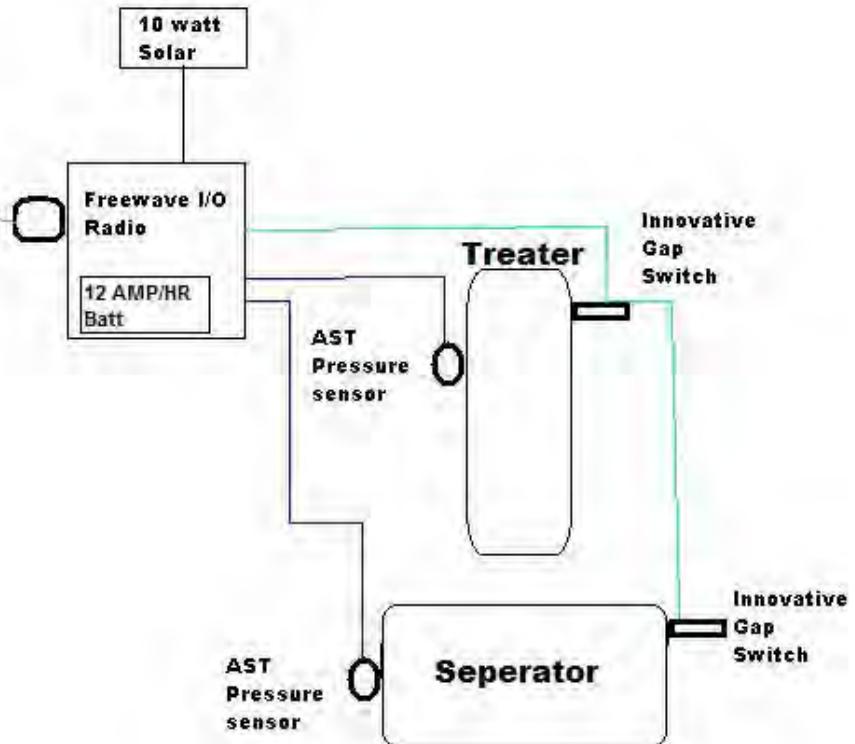
## Wellhead

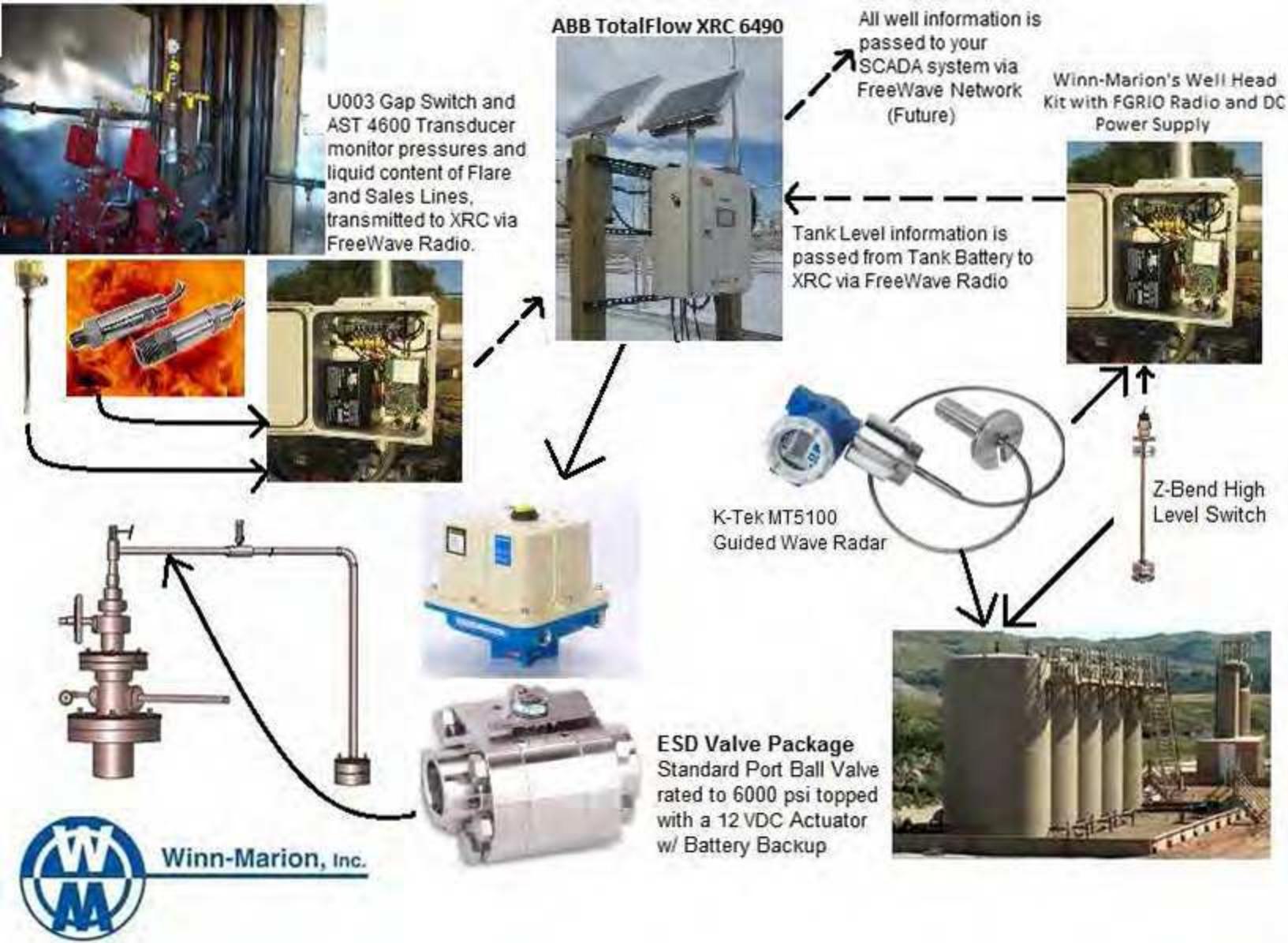
LADC1000  
Actuator



Habonim Valve

Egg Antenna





# Tank Side

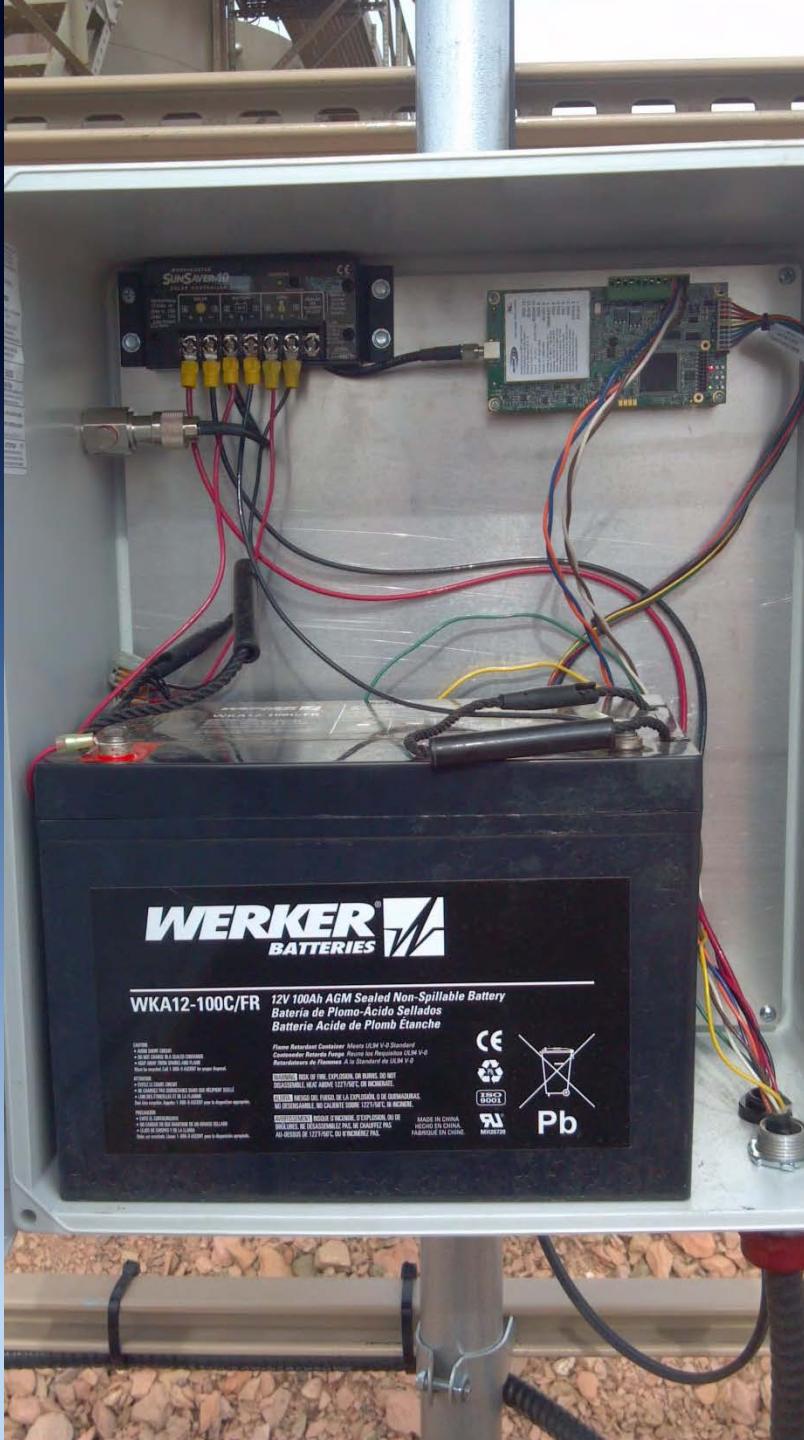
Contains the following Equipment

- 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



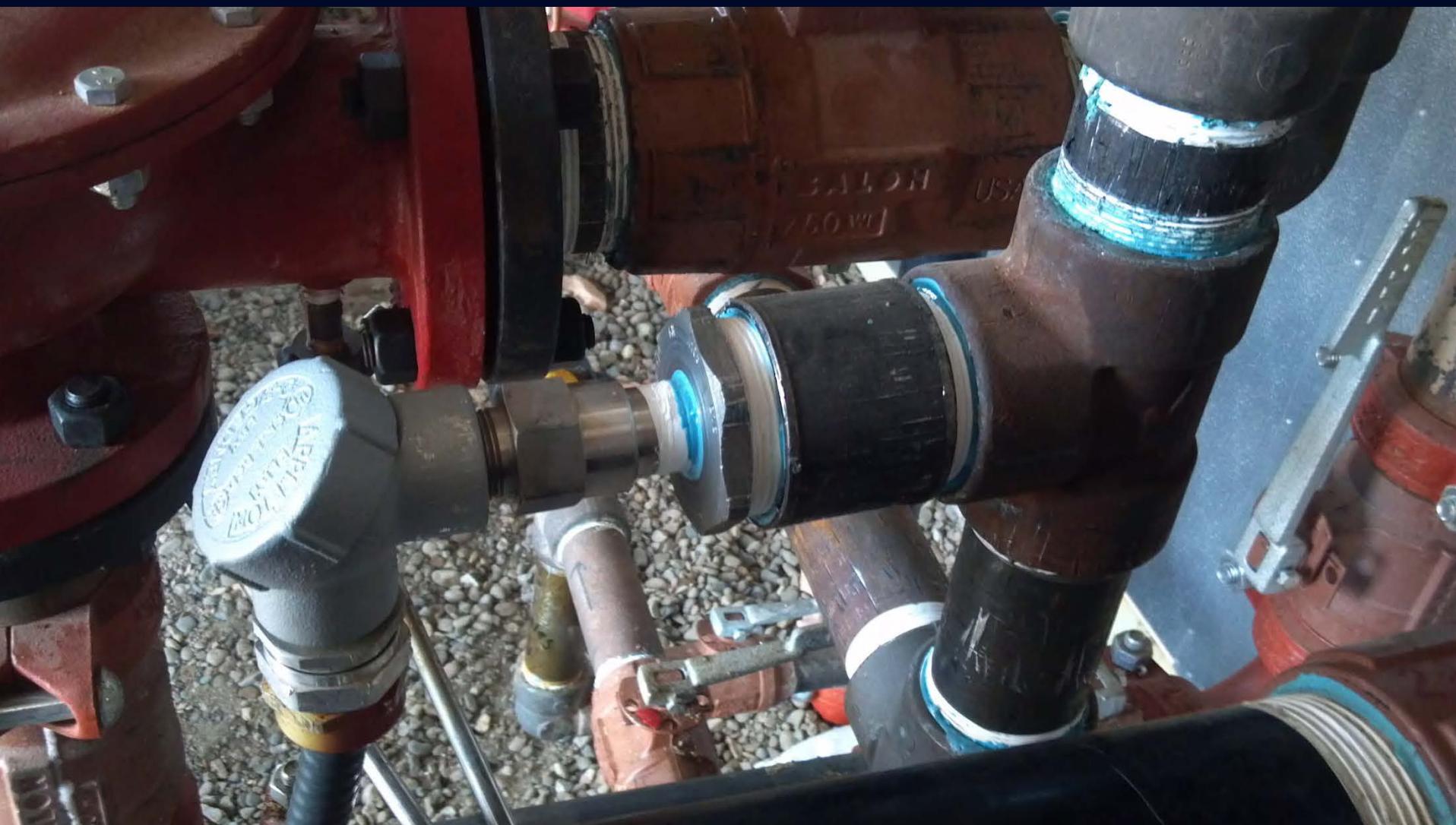
WM Automation  
Service, LLC

# 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

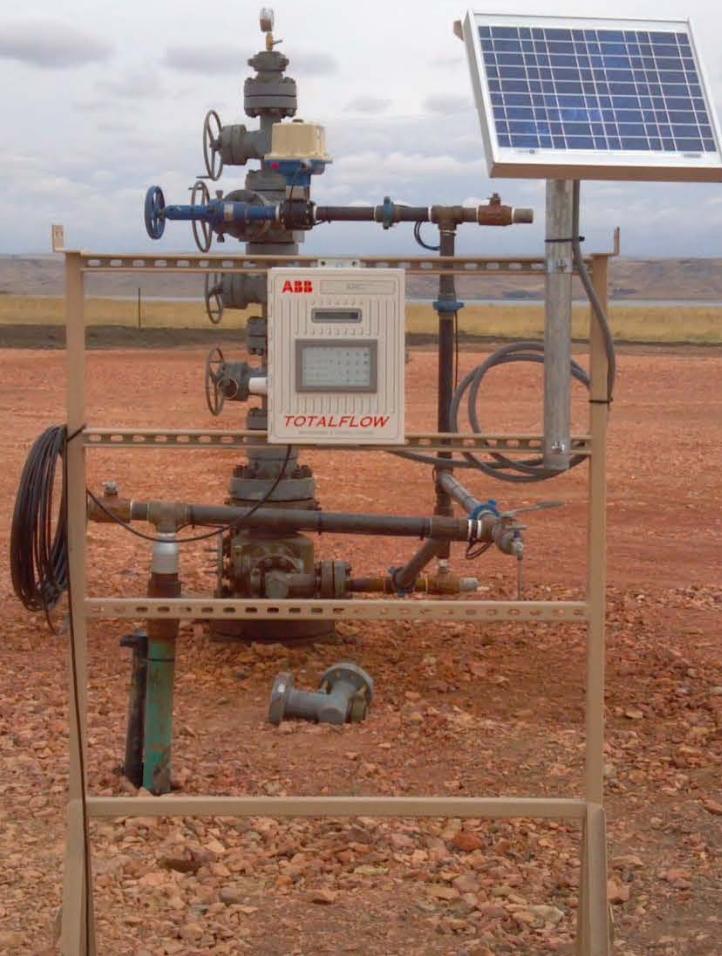




WM Automation  
Service, LLC



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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**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:

- r Mobile Rig (w/integrated fuel/oil storage tanks)
- r Storage Facilities
- r Mud Pumps (diesel-powered pumps w/integrated fuel storage tanks)
- r Generators (w/integrated fuel storage tanks)
- r Water Tanks
- r Pipe Racks

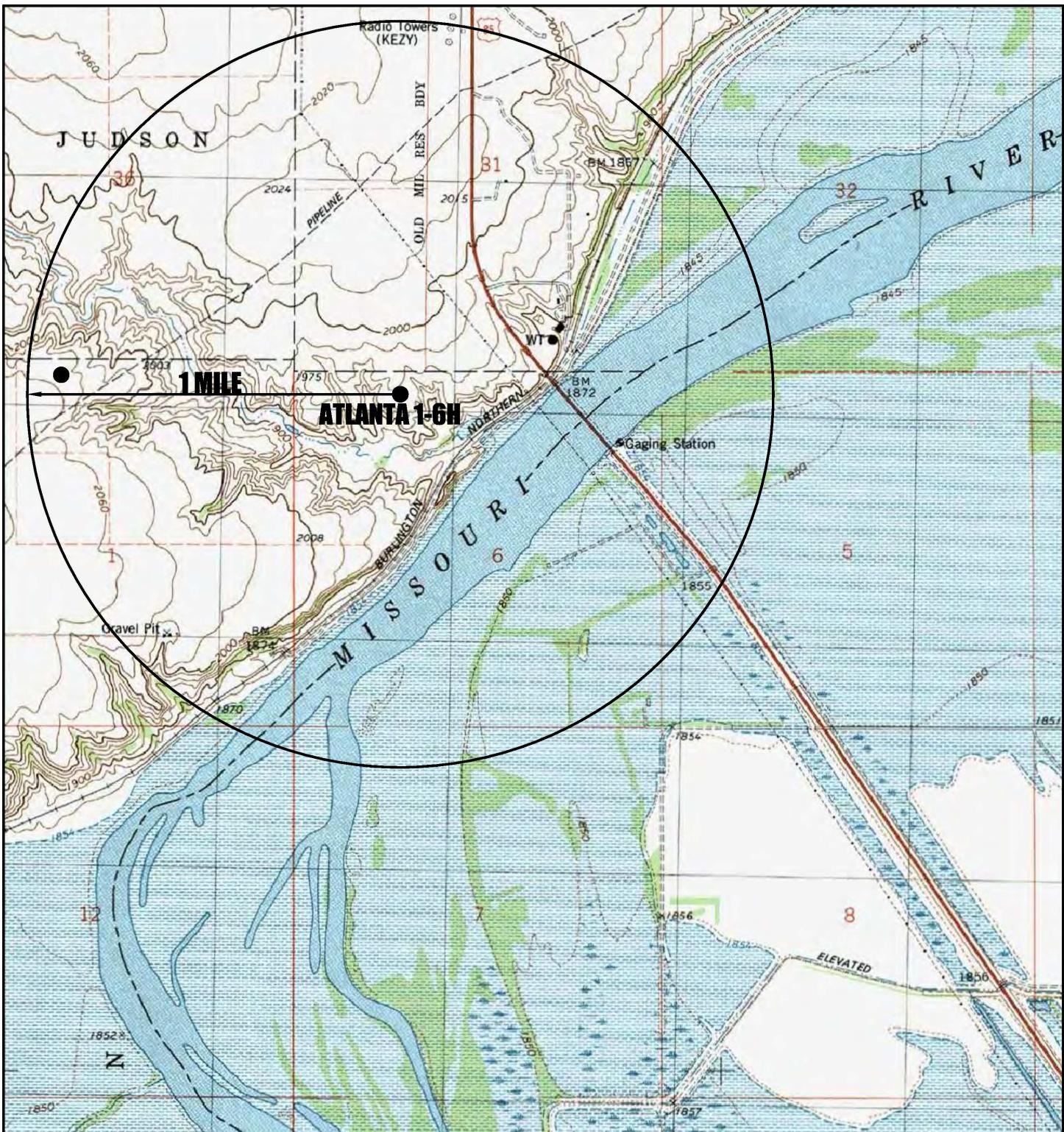
**2.2 Proximity of Rigs to Navigable Waters.** According to 40 CFR 112.7(e)(6)(i), mobile drilling equipment should be positioned or located so as to prevent spilled oil from reaching navigable waters. Depending on the location, catch basins or diversion structures may be necessary to intercept and contain 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:

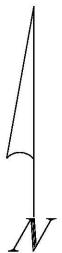
- r Loading/unloading fuel, oil, and used oil to/from storage tanks and containers.
- r Temporary storage of oil containers outside of secondary containment.



**CONTINENTAL RESOURCES INC.**

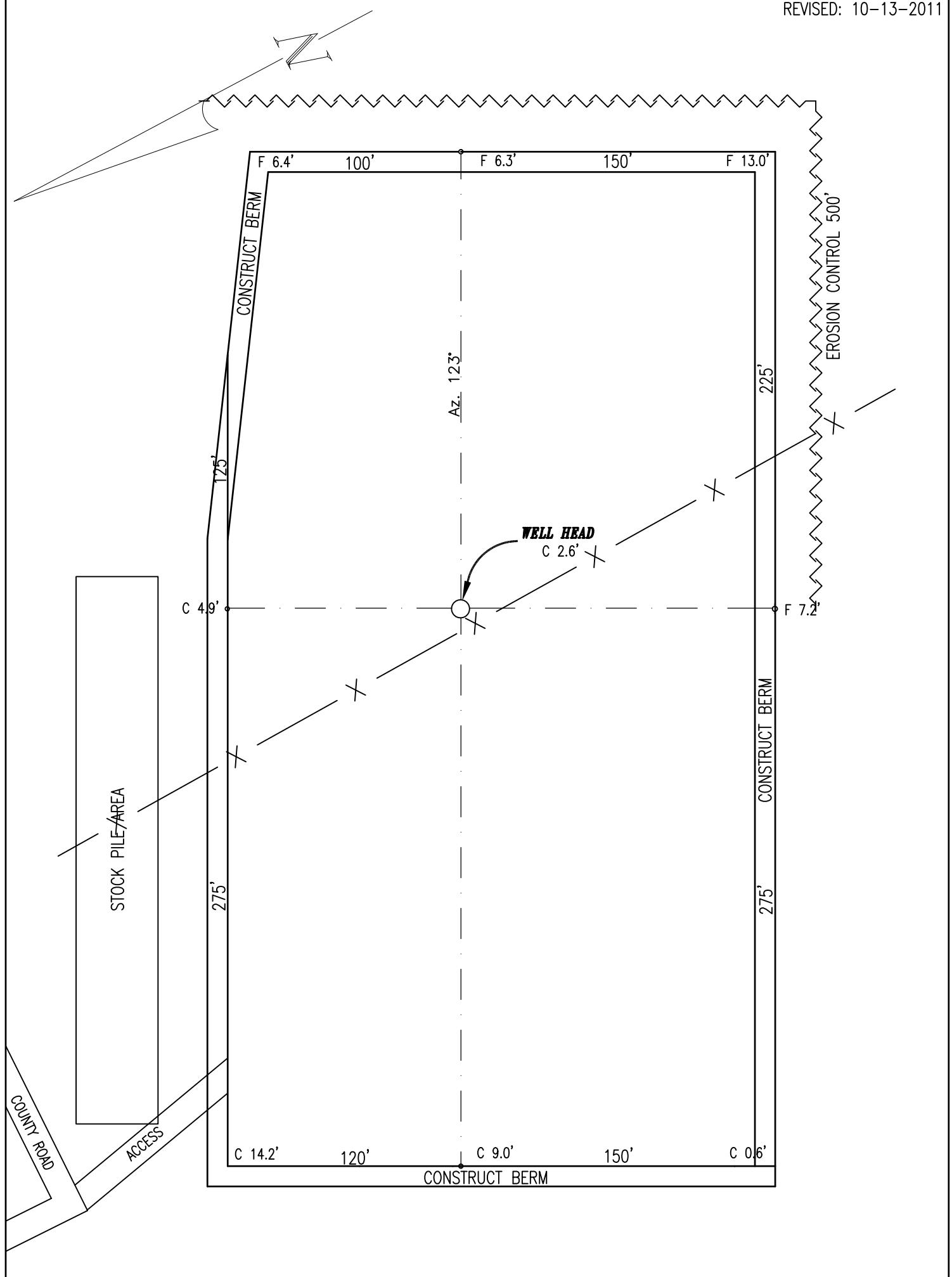
ONE-MILE RADIUS MAP

● = 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
------------	--------	-------------

TOTAL FILL:	12,769	CUBIC YARDS
-------------	--------	-------------

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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- r      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:

- r      Diesel Fuel
- r      Engine Oil
- r      Hydraulic Oil
- r      Gear Oil
- r      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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- r 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.
- r Opening, closing, and locking the bypass valve under responsible supervision following drainage activities.
- r 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 9, 2012

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

Re: Atlanta 11-6H

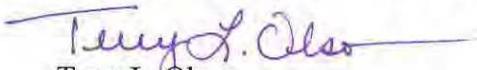
Continental Resources, Inc., would like to request all filings and information regarding the above captioned well be considered "Tight Hole".

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