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 (03-2018)

RECEIVED
APR 17 2019
ND OIL & GAS DIVISION

Well File No.
25156

PLEASE READ INSTRUCTIONS BEFORE FILLING OUT FORM.
PLEASE SUBMIT THE ORIGINAL.

☐ Notice of Intent	Approximate Start Date	☐ Drilling Prognosis	☐ Spill Report
		☐ Redrilling or Repair	☐ Shooting
		☐ Casing or Liner	☐ Acidizing
		☐ Plug Well	☐ Fracture Treatment
☑ Report of Work Done	Date Work Completed 4/8/19	☐ Supplemental History	☐ Change Production Method
		☐ Temporarily Abandon	☐ Reclamation
		☑ Other **Workover**	

Well Name and Number					
Columbus Federal 1-16H					
Footages	Qtr-Qtr	Section	Township	Range	
2593 F **S** L **318** F **E** L	**SENE**	**16**	**153 N**	**101 W**	
Field	Pool	County			
Indian Hill	**Bakken**	**McKenzie**			

24-HOUR PRODUCTION RATE

Before			After		
Oil	**0**	Bbls	Oil	**291**	Bbls
Water	**0**	Bbls	Water	**243**	Bbls
Gas	**0**	MCF	Gas	**181**	MCF

Name of Contractor(s)			
Address	City	State	Zip Code

DETAILS OF WORK

Removed ESP from well and installed jet pump valve and packer on 2-7/8" tubing set at 10,398'. Installed surface equipment for jet pump and started producing on 4/8/19.

Company **Continental Resources, Inc.**		Telephone Number **405-234-9000**
Address **P.O. Box 268870**		
City **Oklahoma City**	State **OK**	Zip Code **73126**
Signature Becky Barnes	Printed Name **Becky Barnes**	
Title **Regulatory Compliance Specialist**	Date **April 9, 2019**	
Email Address **becky.barnes@clr.com**		

FOR STATE USE ONLY

☒ Received	☐ Approved
Date 4-19-19	
By DAVE TABOR	
Title Field Supervisor	

Tabor, David

From: Bob Sandbo <Bob.Sandbo@clr.com>
Sent: Thursday, February 07, 2019 11:10 AM
To: Tabor, David
Subject: FW: Continental info needed

CAUTION: This email originated from an outside source. Do not click links or open attachments unless you know they are safe.

David,

Please see the email below on the status of the Columbus Federal 1-16H. Please let me know if you need anything else. It looks like we should have this one back on production around mid-March.

Thank you,

Bob Sandbo
Regulatory Compliance Supervisor

Continental Resources, Inc.
20 N. Broadway
OKC, OK 73102
P: 405-234-9020
F: 405-774-5297
C: 405-708-0691
robert.sandbo@clr.com
www.**clr**.com

Mailing
P.O. Box 268870
OKC, OK 73126

From: Matt Lavoie
Sent: Thursday, February 07, 2019 10:33 AM
To: Bob Sandbo <Bob.Sandbo@clr.com>
Subject: RE: Continental info needed

When we told Weatherford that we were proceeding with the plan to install their jet pump in the Columbus Federal 1-16H they looked at the particular well location again and this time told us that in order to safely operate a jet pump on this well we will need an additional vessel placed near the wellhead. This vessel is being refurbished and will not be ready until the first or second week of March. At that time, we will be ready to turn on the jet pump. This vessel is needed because the facility is on a different pad from the well. In the mean time we will be building containment for this vessel.

Thank you,

Matt LaVoie
Production Engineer

Continental Resources, Inc.
20 N. Broadway
OKC, OK 73102
P/F: 405.234.9692
C: 405.403.1950
Matt.Lavoie@clr.com
www.clr.com

From: Bob Sandbo
Sent: Thursday, February 07, 2019 9:14 AM
To: Matt Lavoie <Matt.Lavoie@clr.com>
Subject: FW: Continental info needed

Matt,

Are you done with the Columbus Federal 1-16H? NDIC is wanting to know when we will get this one back on production.

Thank you,

Bob Sandbo
Regulatory Compliance Supervisor

Continental Resources, Inc.
20 N. Broadway
OKC, OK 73102
P: 405-234-9020
F: 405-774-5297
C: 405-708-0691
robert.sandbo@clr.com
www.**clr**.com

Mailing
P.O. Box 268870
OKC, OK 73126

From: Tabor, David [mailto:adtabor@nd.gov]
Sent: Thursday, February 07, 2019 8:32 AM
To: Bob Sandbo <Bob.Sandbo@clr.com>
Subject: {EXTERNAL}- FW: Continental info needed

External email – beware of links and attachments

Hello Bob,
Hope all is well.

I need the below updates/items.

#27453 Hartman 5-28H3. Plugged on 1/4/19. Need to submit Form 7 plugging report.
#25156 Columbus Federal 1-16H SI for 22.6 months. Was noted to have a workover on Jan 2019.

David Tabor
Field Supervisor
Oil and Gas
701-328-8020

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)

DEC 2018
RECEIVED
ND OIL & GAS DIVISION

Well File No. 25156 ~~25165~~

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

☑ Notice of Intent	Approximate Start Date: January 1, 2019
☐ Report of Work Done	Date Work Completed:
☐ 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 Progress	☐ Spill Report
☐ Redrilling or Repair	☐ Shooting
☐ Casing or Liner	☐ Acidizing
☐ Plug Well	☐ Fracture Treatment
☐ Supplemental History	☐ Change Production Method
☐ Temporarily Abandon	☐ Reclamation
☑ Other: Proposed Workover	

Well Name and Number					
Columbus Federal 1-16H					
Footages		Qtr-Qtr	Section	Township	Range
2593 F N L	318 F E L	~~SENE~~ NESE	16	153 N	101 W
Field		Pool		County	
~~Indian Hill~~ Baker		Bakken		McKenzie	

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. proposes to install a jet pump and bring this well back to production. The tubing and ESP will be pulled from the well and the jet pump BHA will be installed. Installation should be complete by the end of the year. Once the jet pump is installed, we will notify NDIC of the final work done and the date the well is brought back on production.

Company: Continental Resources, Inc.		Telephone Number: (405) 234-9020
Address: PO Box 268870		
City: Oklahoma City	State: OK	Zip Code: 73126
Signature: Robert Sandbo	Printed Name: Robert Sandbo	
Title: Regulatory Compliance Supervisor	Date: December 10, 2018	
Email Address: robert.sandbo@clr.com		

FOR STATE USE ONLY

☒ Received	☐ Approved
Date: 12-18-18	
By: DAVE TABOR	
Title: Field Supervisor	

NORTH DAKOTA
OIL AND GAS DIVISION

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.dmr.nd.gov/oilgas/

December 12, 2018

CONTINENTAL RESOURCES
PO BOX 268870
OKLAHOMA CITY, OK 73126

RE: COLUMBUS FEDERAL 1-16H
NESE 16-153N-101W
MCKENZIE COUNTY
WELL FILE NO.: 25156
Report Date of Last Production: 3/1/2017

Dear Bob Sandbo:

Our records indicate that the above captioned well has not produced or injected **in over a year,** and is in violation of Section 43-02-03-55 of the North Dakota Administrative Code (Abandonment of Wells). This rule states in part that the failure to produce a well for a period of one year constitutes abandonment of the well. Any such well must be plugged and the site reclaimed.

Please place this well back into production or submit for approval plug and abandonment procedures. If the well is to be utilized in the future, a temporarily abandoned status may be granted, provided it can be demonstrated that the well is to be used for purposes related to the production of oil and gas. The temporarily abandoned status is for one year, with extensions upon application. Before a well is granted a temporarily abandoned status, the perforations must be isolated, the integrity of the casing proven, and its casing sealed at the surface, all in a manner approved by the director. A state field inspector must witness the mechanical integrity test. If you have any questions, feel free to contact our office.

Sincerely,

Richard Dunn/CAD

Richard Dunn
Petroleum Engineer - Field Inspector

RSD/CAD

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. 25156

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: December 29, 2017

☐ 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
☐ Redrilling or Repair
☐ Casing or Liner
☐ Plug Well
☐ Supplemental History
☐ Temporarily Abandon
☐ Spill Report
☐ Shooting
☐ Acidizing
☐ Fracture Treatment
☐ Change Production Method
☐ Reclamation
☑ Other: NDAC 43-02-03-49 Compliance

Well Name and Number				
See Attached				
Footages: F L F L	Qtr-Qtr	Section	Township: N	Range: W
Field	Pool	County		

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. has inspected all the sites listed on the attached list and all are in compliance with NDAC 43-02-03-49. All sites are in compliance based on the fact that our oil storage tanks, flow-through process vessels, recycle pumps, and load lines are all located within secondary containment.

confirmed per RSD

Company	Telephone Number
Continental Resources, Inc.	(405) 234-9020
Address: PO Box 268870	
City: Oklahoma City	State: OK / Zip Code: 73126
Signature: Robert Sandbo	Printed Name: Robert Sandbo
Title: Regulatory Compliance Supervisor	Date: February 8, 2018
Email Address: robert.sandbo@clr.com	

FOR STATE USE ONLY

☐ Received ☑ Approved

Date: 3/22/18

By: [signature]

Title: Field Inspector

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)

NOV 2017 RECEIVED ND OIL & GAS DIVISION

Well File No. ~~25165~~ 25156

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

☐ Notice of Intent	Approximate Start Date	☐ Drilling Prognosis	☐ Spill Report
☑ Report of Work Done	Date Work Completed: July 18, 2016	☐ Redrilling or Repair	☐ Shooting
☐ 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	☐ Casing or Liner	☐ Acidizing
		☐ Plug Well	☐ Fracture Treatment
		☐ Supplemental History	☑ Change Production Method
		☐ Temporarily Abandon	☐ Reclamation
		☐ Other	

Well Name and Number					
Columbus Federal 1-16H					
Footages	Qtr-Qtr	Section	Township	Range	
2593 F N L 318 F E L	SENE	16	153 N	101 W	
Field	Pool	County			
Indian Hill	Bakken	McKenzie			

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 changing the Columbus Federal 1-16H from a gas lift to a submersible pump. The date of the change was July 18, 2016. Tubing is set at 10,363'.

Company: Continental Resources, Inc.		Telephone Number: 405-234-9000
Address: P.O. Box 268870		
City: Oklahoma City	State: OK	Zip Code: 73126
Signature: Terry L. Olson	Printed Name: Terry L. Olson	
Title: Regulatory Compliance Specialist	Date: November 10, 2017	
Email Address: Terry.Olson@clr.com		

FOR STATE USE ONLY

☑ Received	☐ Approved
Date: 11-17-2017	
By:	
Title: JARED THUNE Engineering Technician	

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)

NOV 2017 RECEIVED ND OIL & GAS DIVISION

Well File No. 25156

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

☐ Notice of Intent	Approximate Start Date	☐ Drilling Prognosis	☐ Spill Report
☑ Report of Work Done	Date Work Completed: August 12, 2014	☐ Redrilling or Repair	☐ Shooting
☐ 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	☐ Casing or Liner	☐ Acidizing
		☐ Plug Well	☐ Fracture Treatment
		☐ Supplemental History	☑ Change Production Method
		☐ Temporarily Abandon	☐ Reclamation
		☐ Other	

Well Name and Number					
Columbus Federal 1-16H					
Footages	Qtr-Qtr	Section	Township	Range	
2593 F N L 318 F E L	SENE	16	153 N	101 W	
Field	Pool	County			
Indian Hill	Bakken	McKenzie			

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 changing the Columbus Federal 1-16H from flowing to a gas lift. The date of the change was August 12, 2014. Tubing is set at 10,363'.

Company: Continental Resources, Inc.		Telephone Number: 405-234-9000
Address: P.O. Box 268870		
City: Oklahoma City	State: OK	Zip Code: 73126
Signature: Terry L. Olson	Printed Name: Terry L. Olson	
Title: Regulatory Compliance Specialist	Date: November 9, 2017	
Email Address: Terry.Olson@clr.com		

FOR STATE USE ONLY

☑ Received	☐ Approved
Date: 11-17-2017	
By:	
Title: JARED THUNE Engineering Technician	

NORTH DAKOTA
OIL AND GAS DIVISION

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.dmr.nd.gov/oilgas

August 29, 2017

CONTINENTAL RESOURCES
ATTENTION: BOB SANDBO
P.O. BOX 268870
OKLAHOMA CITY, OK 73126

RE: North Dakota Administrative Code (NDAC) Section 43-02-03-49
Perimeter Berm Requirement

NDIC # Please see attached list of 103 Facilities

Dear Bob Sandbo:

Please be advised that the attached list of facilities require a perimeter berm to be constructed within 180 days of this notice because they have:

1. Storage tanks;
2. Daily throughput of more than one hundred barrels of fluid per day; and
3. Includes production equipment or load lines that are not contained within secondary containment dikes

The berm must be at least six inches in height, constructed of sufficiently impermeable material to provide emergency containment, and must be maintained until the facility is either granted a waiver or the site is reclaimed.

Pursuant to NDAC Section 43-02-03-49 - Within one hundred eighty days from the date the operator is notified by the Commission, a perimeter berm, at least six inches in height, must be constructed of sufficiently impermeable material to provide emergency containment and to divert surface drainage away from the site around all storage facilities and production sites that include storage tanks, have a daily throughput of more than one hundred barrels of fluid per day, and include production equipment or load lines that are not contained within secondary containment dikes. The Director may consider an extension of time to implement these requirements if conditions prevent timely construction, or modification of these requirements if other factors are present that provide sufficient protection from environmental impacts.

This perimeter berm requirement may be modified or waived if the operator can demonstrate that other factors are present that provide sufficient protection from environmental impacts. A Sundry Notice (Form 4) outlining any engineering controls or other factors must be submitted to the Commission for approval of this modification or waiver. Should you have any questions regarding this matter, feel free to contact me at 701-770-3554.

Sincerely,

Richard Dunn /BEH

Richard Dunn
Field Inspector

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.dmr.nd.gov/oilgas

NDIC #		Facility Name	TB/CTB #
19126		LANSING 1-25H	
19578		MISSOULA 1-21H	
19740		SYRACUSE 1-23H	
19858		JAMESTOWN 1-17H	
19915		STEELE 1-24H	
19918		CHARLOTTE 1-22H	
20566		MONTPELIER 1-14H	
20629		PATTERSON 1-13H	
20638		KUHN 1-12H	
20676		NORFOLK 1-1H	
21128		CHARLOTTE 2-22H	
21511		BOULDER 1-4H	
21600		ROCHESTER 1-24H	
22155		LANSING 2-25H	
22158		KUHN 2-12H	
22273		STEELE 2-24H	
22375		CHICAGO 2-26H	
22891		MONROE 1-2H	
23048		CHICAGO 3-26H	
23049		CHICAGO 4-26H	
23050		SYRACUSE 3-23H	
23051		SYRACUSE 4-23H	
23086		NORFOLK 2-1H	
23087		NORFOLK 3-1H	
23351		MISSOULA 2-21H	
23352		MISSOULA 3-21H	
23427		MISSOULA 7-21H	
23428		MISSOULA 6-21H	
23429		MISSOULA 5-21H	
23430		MISSOULA 4-21H	
23477		DURHAM 2-2H	
23608		CHARLOTTE 5-22H	
23609		AKRON 3-27AH	
23610		AKRON 2-27AH	
23611		AKRON 4-34H	
23612		CHARLOTTE 4-22H	
23664		CHARLOTTE 3-22H	
23747		ROCHESTER 3-24H	
23748		ROCHESTER 2-24H	
23749		ROCHESTER 5-24H1	
23750		ROCHESTER 4-24H	
24490		DURHAM 4-2H	
24491		DURHAM 5-2H	
24507		NORFOLK 5-1H	
24508		NORFOLK 4-1H	
24804		WAHPETON 14-16H2	224837-01
24805		WAHPETON 13-16H	
24806		WAHPETON 12-16H3	
24807		WAHPETON 11-16H1	
24808		WAHPETON 10-16H2	
24809		WAHPETON 9-16H	
24810		WAHPETON 8-16H1	

NDIC #		Facility Name	TB/CTB #
24834		DURHAM 3X-2H	
24837		WAHPETON 2-16H2	
24840		WAHPETON 4-16H1	
24842		WAHPETON 5-16H2	
24843		WAHPETON 6-16H	
24844		WAHPETON 7-16H3	
24908		CHARLOTTE 6-22H2	
25116		BJARNE 2-29H	
25117		BJARNE 3-29H	
25156		COLUMBUS FEDERAL 1-16H	
25157		TALLAHASSEE 3-16H	
25158		TALLAHASSEE 2-16H	
25159		COLUMBUS FEDERAL 2-16H	
25160		COLUMBUS FEDERAL 3-16H	
25189		PATTERSON FEDERAL 2-13H	
25190		PATTERSON FEDERAL 3-13H	
25826		AKRON 6-34H1	
25827		AKRON 5-34H1	
26190		MONTPELIER 4-14H	
26191		MONTPELIER 3-14H1	
26420		MONTPELIER 2-14H	
26476		ROCHESTER FEDERAL 6-24H	
26477		ROCHESTER FEDERAL 7-24H1	
26525		JERRY 2-8H	
26526		JERRY 3-8H	
26530		JERRY 5-8H	
26531		JERRY 4-8H	
26535		JERRY 7-8H	
26536		JERRY 6-8H	
27418		GARFIELD FEDERAL 7-5H1	
27419		GARFIELD FEDERAL 6-5H	
27420		GARFIELD FEDERAL 5-5H1	
27421		GARFIELD 4-5H	
27694		BERLAIN 3-30H	
27695		BERLAIN 2-30H	
28202		JAMESTOWN FEDERAL 2-17H	
28203		JAMESTOWN FEDERAL 3-17H1	
28405		HARRISBURG 1-34H	
28604		JAMESTOWN FEDERAL 6-17H	
28605		JAMESTOWN FEDERAL 7-17H	
28735		DURHAM 7-2H	
28736		DURHAM 6-2H1	
28737		UHLMAN 1-7H	
28999		NORFOLK 6-1H1	
29000		NORFOLK 7-1H	
31508		AKRON FEDERAL 7-27H	
31838		CHARLOTTE 7X-22H	
32033		NORFOLK 11-1H	
32034		NORFOLK 10-1H1	
32035		NORFOLK 9-1H	
32036		NORFOLK 8-1H1	

TH

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)

JUL 2013 RECEIVED ND OIL & GAS DIVISION

Well File No.	25156
NDIC CTB No.	125156

PLEASE READ INSTRUCTIONS BEFORE FILLING OUT FORM.
PLEASE SUBMIT THE ORIGINAL AND FOUR COPIES.

Well Name and Number	Qtr-Qtr	Section	Township	Range	County
Columbus Federal 1-16H	NESE	16	153 N	101 W	McKenzie

Operator	Telephone Number	Field
Continental Resources, Inc	405-234-9000	Baker

Address	City	State	Zip Code
P.O. Box 268870	Oklahoma City	OK	73126

Name of First Purchaser	Telephone Number	% Purchased	Date Effective
Continental Resources, Inc.	405-234-9000	100	July 19, 2013

Principal Place of Business	City	State	Zip Code
P.O. Box 268870	Oklahoma City	OK	73126
Field Address	City	State	Zip Code

Name of Transporter	Telephone Number	% Transported	Date Effective
Wind River Trucking, LLC			July 19, 2013

Address	City	State	Zip Code
P.O. Box 1166	Pleasant Grove	UT	84062

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
MBI Energy Logistics, LLC		July 19, 2013
Other Transporters Transporting From This Lease	% Transported	Date Effective
~~Powerline Transport, LLC~~		July 19, 2013

Comments
Badlands Power Fuels, LLC 7/19/2013
RD Midwest, LLC 7/19/2013
LT Enterprises 7/19/2013
Hofmann Trucking, LLC 7/19/2013

I hereby swear or affirm that the information provided is true, complete and correct as determined from all available records. Date: July 22, 2013

Signature	Printed Name	Title
Terry L. Olson	Terry L. Olson	Reglulatory Compliance Specialist

Above Signature Witnessed By

Witness Signature	Witness Printed Name	Witness Title
Christi Scritchfield	Christi Scritchfield	Regulatory Compliance Specialist

FOR STATE USE ONLY

Date Approved	AUG 29 2013
By	Annette Gatzke
Title	Oil & Gas Production Analyst

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
SFN 2468 (04-2010)

AUG 2013 RECEIVED ND OIL & GAS DIVISION

TH

Well File No. **25156**

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

Designate Type of Completion
☑ Oil Well ☐ EOR Well ☐ Recompletion ☐ Deepened Well ☐ Added Horizontal Leg ☐ Extended Horizontal Leg
☐ Gas Well ☐ SWD Well ☐ Water Supply Well ☐ Other:

Well Name and Number **Columbus Federal 1-16H**			Spacing Unit Description **Sec 4 & 9 T153N R101W**
Operator **Continental Resources, Inc.**		Telephone Number **405-234-9000**	Field **Baker**
Address **P.O. Box 268870**			Pool **Bakken**
City **Oklahoma City**	State **OK**	Zip Code **73126**	Permit Type ☐ Wildcat ☑ Development ☐ Extension

LOCATION OF WELL

At Surface		Qtr-Qtr	Section	Township	Range	County
2593 F **S** L	**318** F **E** L	**NESE**	**16**	**153 N**	**101 W**	**McKenzie**

Spud Date	Date TD Reached	Drilling Contractor and Rig Number	KB Elevation (Ft)	Graded Elevation (Ft)
4/22/2013	**5/20/2013**	**Patterson 490**	**1942**	**1920**

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 Type	String Size (Inch)	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
Lateral1	Conductor	20		102	20	133				0
	Conductor	13 3/8		578	20	48				0
	Surface	9 5/8		1947	13 1/2	36			421	0
	Liner	4 1/2		10503	8 3/4	11.6				
	Intermediate	7		11371	8 3/4	26-32			1036	1270
	Liner	4 1/2	10498	21140				10498		

PERFORATION & OPEN HOLE INTERVALS

Well Bore	Well Bore TD Drillers Depth (MD Ft)	Completion Type	Open Hole/Perforated Interval (MD,Ft) Top	Bottom	Kick-off Point (MD Ft)	Top of Casing Window (MD Ft)	Date Perf'd or Drilled	Date Isolated	Isolation Method	Sacks Cement
Lateral1	21276	Perforations	11371	21276	10562					

PRODUCTION

Current Producing Open Hole or Perforated Interval(s), This Completion, Top and Bottom, (MD Ft) **Bakken 11,371' - 21,276**							Name of Zone (If Different from Pool Name)	
Date Well Completed (SEE INSTRUCTIONS) 7/17/2013		Producing Method **Flowing**		Pumping-Size & Type of Pump			Well Status (Producing or Shut-In) **Producing**	
Date of Test **7/19/2013**	Hours Tested **24**	Choke Size **16 /64**	Production for Test	Oil (Bbls) **673**	Gas (MCF) **644**	Water (Bbls) **1338**	Oil Gravity-API (Corr.) **40.5 °**	Disposition of Gas **Sold**
Flowing Tubing Pressure (PSI) **2100**		Flowing Casing Pressure (PSI) **0**		Calculated 24-Hour Rate	Oil (Bbls) **673**	Gas (MCF) **644**	Water (Bbls) **1338**	Gas-Oil Ratio **957**

GEOLOGICAL MARKERS

Formation	MD (Ft)	TVD (Ft)
Greenhorn		4568
Dakota Group		4954
Pine Salt		7364
Minnekahta		7463
Base of Last Salt		9040
Mission Canyon		9246
Lodgepole		9793
Upper Bakken Shale		10510
Middle Bakken		10525

PLUG BACK INFORMATION

Well Bore	Type of Plug	Top (Ft)	Bottom (Ft)	Sacks Cement

CORES CUT

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

Drill Stem Test

Test Date	Formation	Top (Ft)	Bottom (Ft)	BH Temp (°F)	CL ppm	H2S ppm	Shut-in 1 (PSIG)	Shut-in 2 (PSIG)
Drill Pipe Recovery								
Sample Chamber Recovery								
Test Date	Formation	Top (Ft)	Bottom (Ft)	BH Temp (°F)	CL ppm	H2S ppm	Shut-in 1 (PSIG)	Shut-in 2 (PSIG)
Drill Pipe Recovery								
Sample Chamber Recovery								
Test Date	Formation	Top (Ft)	Bottom (Ft)	BH Temp (°F)	CL ppm	H2S ppm	Shut-in 1 (PSIG)	Shut-in 2 (PSIG)
Drill Pipe Recovery								
Sample Chamber Recovery								
Test Date	Formation	Top (Ft)	Bottom (Ft)	BH Temp (°F)	CL ppm	H2S ppm	Shut-in 1 (PSIG)	Shut-in 2 (PSIG)
Drill Pipe Recovery								
Sample Chamber Recovery								
Test Date	Formation	Top (Ft)	Bottom (Ft)	BH Temp (°F)	CL ppm	H2S ppm	Shut-in 1 (PSIG)	Shut-in 2 (PSIG)
Drill Pipe Recovery								
Sample Chamber Recovery								

Well Specific Stimulations

Date Stimulated	Stimulated Formation	Top (Ft)	Bottom (Ft)	Stimulation Stages	Volume	Volume Units
7/7/2013	Bakken	11386	21276	30	48693	Barrels

Type Treatment	Acid %	Lbs Proppant	Maximum Treatment Pressure (PSI)	Maximum Treatment Rate (BBLS/Min)
Sand Frac		2686987	7682	30.0

Details
Pumped 156552# 40/70 mesh, 1742173# 20/40 sand and 788262# 20/40 Resin.

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 8/21/2013
Signature Terry L. Olson	Printed Name Terry L. Olson	Title Regulatory Compliance Specialist

END OF WELL REPORT

Prepared For:

Continental Resources Inc.
Columbus Federal 1-16H
Patterson 490
McKenzie County, ND

Prepared By:

Seth Burstad
Scientific Drilling
Rocky Mountain Region

Scientific Drilling International
7237 W. Barton Rd., Casper, WY 82604
P.O. Box 1600, Mills, WY 82644
(307) 472-6621
seth.burstad@scientificdrilling.com

Scientific Drilling
Rocky Mountain Operations

TABLE OF CONTENTS

1. **Directional Plot and Surveys**
2. **Daily Drilling Reports**
3. **BHA Summary Reports and Slide Sheets**
4. **Graphical Job History**
5. **Support Staff**

Project: McKenzie County, ND NAD83
Site: Columbus Federal
Well: Columbus Federal 1-16H
Wellbore: OH
Design: OH

Scientific Drilling

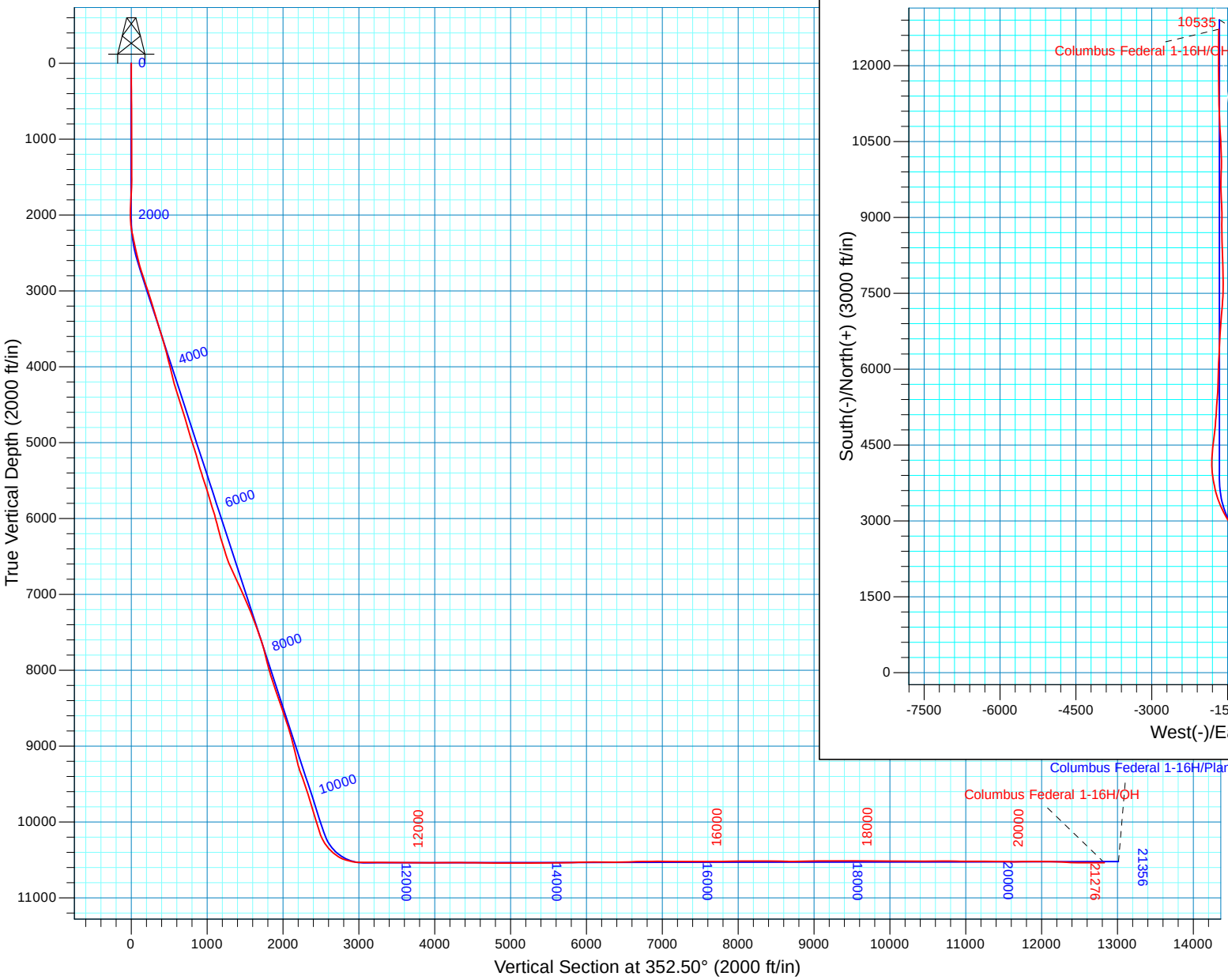
T M Azimuths to True North
Magnetic North: 8.49°

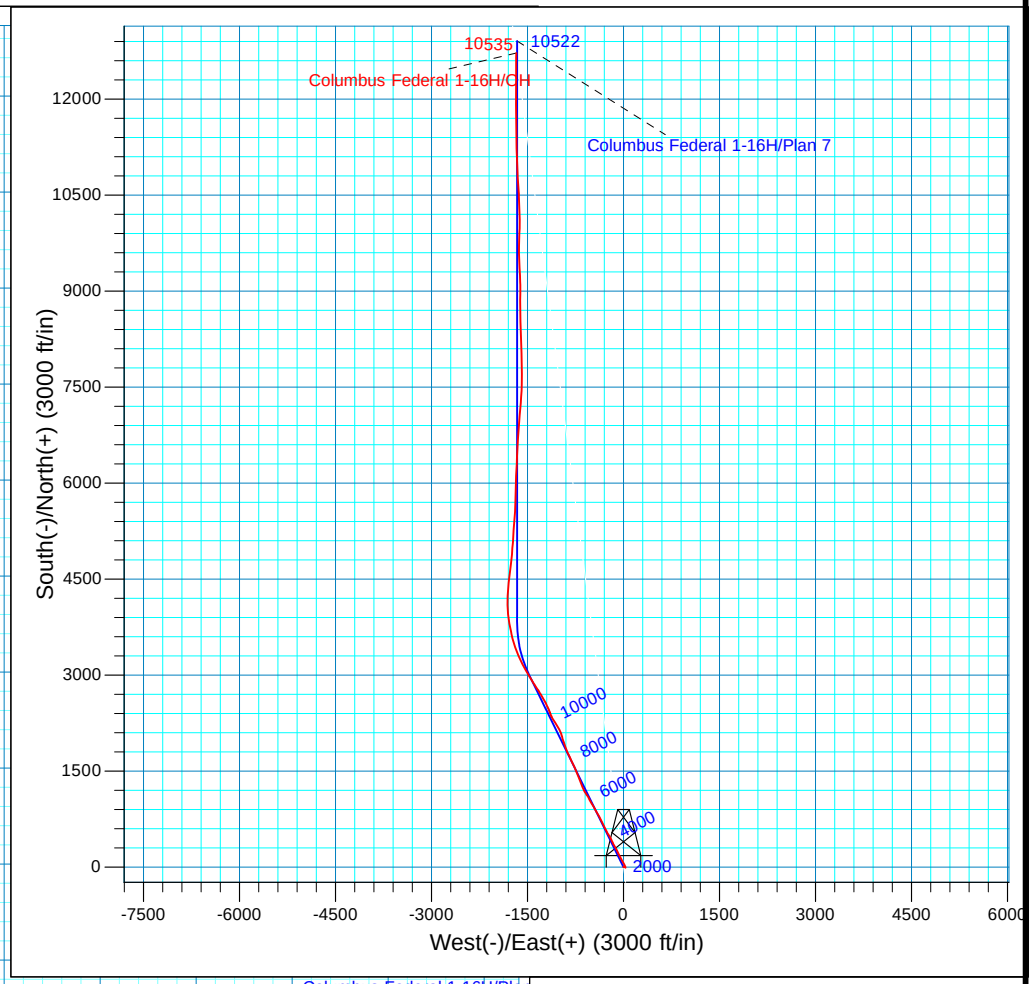
Magnetic Field
Strength: 56550.7snT
Dip Angle: 73.04°
Date: 4/24/2013
Model: IGRF2010

WELL DETAILS: Columbus Federal 1-16H

GL1920' & KB 22' @ 1942.00ft (Patterson 490) 1920.00

Northing	Easting	Latitude	Longitude
408041.65	1193719.94	48° 4' 29.665 N	103° 40' 12.754 W





PROJECT DETAILS: McKenzie County, ND NAD83

Geodetic System: US State Plane 1983
Datum: North American Datum 1983
Ellipsoid: GRS 1980
Zone: North Dakota Northern Zone

System Datum: Mean Sea Level
Local North: True

Design: OH (Columbus Federal 1-16H/OH)

Created By: Seth Burstad Date: 23 May 2013

Continental Resources Inc.

McKenzie County, ND NAD83
Columbus Federal
Columbus Federal 1-16H

OH

Design: OH

Standard Survey Report

23 May, 2013

Scientific Drilling International

Survey Report

Company:	Continental Resources Inc.	**Local Co-ordinate Reference:**	Well Columbus Federal 1-16H
Project:	McKenzie County, ND NAD83	**TVD Reference:**	GL1920' & KB 22' @ 1942.00ft (Patterson 490)
Site:	Columbus Federal	**MD Reference:**	GL1920' & KB 22' @ 1942.00ft (Patterson 490)
Well:	Columbus Federal 1-16H	**North Reference:**	True
Wellbore:	OH	**Survey Calculation Method:**	Minimum Curvature
Design:	OH	**Database:**	Casper District

Project McKenzie County, ND NAD83

Map System:	US State Plane 1983	**System Datum:**	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	North Dakota Northern Zone		

Site Columbus Federal

Site Position:		**Northing:**	408,041.66 usft	**Latitude:**	48° 4' 29.665 N
From:	Lat/Long	**Easting:**	1,193,719.94 usft	**Longitude:**	103° 40' 12.754 W
Position Uncertainty:	0.00 ft	**Slot Radius:**	13.200 in	**Grid Convergence:**	-2.36 °

Well Columbus Federal 1-16H, 2669' FNL 318' FEL Sec 16 T153N R101W

Well Position	**+N/-S**	0.00 ft	**Northing:**	408,041.65 usft	**Latitude:**	48° 4' 29.665 N
	+E/-W	0.00 ft	**Easting:**	1,193,719.94 usft	**Longitude:**	103° 40' 12.754 W
Position Uncertainty		0.00 ft	**Wellhead Elevation:**	ft	**Ground Level:**	1,920.00 ft

Wellbore OH

Magnetics	**Model Name**	**Sample Date**	**Declination (°)**	**Dip Angle (°)**	**Field Strength (nT)**
	IGRF2010	3/28/2013	8.50	73.04	56,559
	IGRF2010	4/24/2013	8.49	73.04	56,551

Design OH

Audit Notes:

Version:	1.0	**Phase:**	ACTUAL	**Tie On Depth:**	0.00

Vertical Section:	**Depth From (TVD) (ft)**	**+N/-S (ft)**	**+E/-W (ft)**	**Direction (°)**
	0.00	0.00	0.00	352.50

Survey Program **Date** 5/23/2013

From (ft)	**To (ft)**	**Survey (Wellbore)**	**Tool Name**	**Description**
88.00	10,562.00	Survey #1 - Vertical (OH)	MWD SDI	MWD - Standard ver 1.0.1
10,594.00	11,343.00	Survey #2 - Curve (OH)	MWD SDI	MWD - Standard ver 1.0.1
11,403.00	21,276.00	Survey #3 - Lateral (OH)	MWD SDI	MWD - Standard ver 1.0.1

Survey

Measured Depth (ft)	**Inclination (°)**	**Azimuth (°)**	**Vertical Depth (ft)**	**+N/-S (ft)**	**+E/-W (ft)**	**Vertical Section (ft)**	**Dogleg Rate (°/100ft)**	**Build Rate (°/100ft)**	**Turn Rate (°/100ft)**
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
88.00	0.36	28.26	88.00	0.24	0.13	0.22	0.41	0.41	0.00
First SDI MWD Survey									
181.00	0.59	20.13	181.00	0.95	0.43	0.89	0.26	0.25	-8.74
274.00	0.68	24.60	273.99	1.90	0.83	1.78	0.11	0.10	4.81
367.00	0.78	27.41	366.98	2.97	1.35	2.76	0.11	0.11	3.02
460.00	0.71	34.82	459.98	4.00	1.97	3.71	0.13	-0.08	7.97

Scientific Drilling International

Survey Report

Company:	Continental Resources Inc.	**Local Co-ordinate Reference:**	Well Columbus Federal 1-16H
Project:	McKenzie County, ND NAD83	**TVD Reference:**	GL1920' & KB 22' @ 1942.00ft (Patterson 490)
Site:	Columbus Federal	**MD Reference:**	GL1920' & KB 22' @ 1942.00ft (Patterson 490)
Well:	Columbus Federal 1-16H	**North Reference:**	True
Wellbore:	OH	**Survey Calculation Method:**	Minimum Curvature
Design:	OH	**Database:**	Casper District

Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
553.00	0.53	41.50	552.97	4.80	2.58	4.42	0.21	-0.19	7.18
646.00	0.43	44.86	645.97	5.37	3.12	4.91	0.11	-0.11	3.61
739.00	0.45	34.93	738.96	5.91	3.57	5.40	0.08	0.02	-10.68
832.00	0.45	47.03	831.96	6.46	4.05	5.88	0.10	0.00	13.01
925.00	0.42	51.24	924.96	6.92	4.58	6.27	0.05	-0.03	4.53
1,018.00	0.41	64.65	1,017.96	7.28	5.15	6.54	0.10	-0.01	14.42
1,111.00	0.64	73.00	1,110.95	7.57	5.94	6.73	0.26	0.25	8.98
1,204.00	0.78	66.41	1,203.94	7.98	7.02	6.99	0.17	0.15	-7.09
1,297.00	1.01	78.49	1,296.93	8.39	8.40	7.23	0.32	0.25	12.99
1,390.00	1.30	99.37	1,389.91	8.39	10.25	6.98	0.54	0.31	22.45
1,483.00	1.49	108.13	1,482.89	7.84	12.44	6.15	0.31	0.20	9.42
1,576.00	1.82	119.24	1,575.85	6.74	14.88	4.74	0.49	0.35	11.95
1,669.00	2.20	123.20	1,668.79	5.04	17.66	2.69	0.43	0.41	4.26
1,762.00	2.76	131.39	1,761.70	2.58	20.83	-0.16	0.71	0.60	8.81
1,855.00	3.35	137.40	1,854.57	-0.90	24.35	-4.07	0.72	0.63	6.46
1,902.00	3.55	142.55	1,901.49	-3.06	26.16	-6.45	0.78	0.43	10.96
2,000.00	3.25	136.99	1,999.31	-7.50	29.90	-11.34	0.45	-0.31	-5.67
2,095.00	5.54	346.19	2,094.19	-5.01	30.65	-8.97	8.97	2.41	-158.74
2,189.00	11.17	340.63	2,187.16	7.99	26.54	4.46	6.04	5.99	-5.91
2,284.00	11.08	340.10	2,280.37	25.26	20.38	22.38	0.14	-0.09	-0.56
2,378.00	13.37	332.81	2,372.24	43.42	12.34	41.44	2.93	2.44	-7.76
2,472.00	13.45	332.02	2,463.68	62.74	2.25	61.91	0.21	0.09	-0.84
2,567.00	15.84	326.49	2,555.59	83.31	-10.10	83.92	2.91	2.52	-5.82
2,662.00	15.90	326.92	2,646.97	105.03	-24.36	107.31	0.14	0.06	0.45
2,757.00	18.99	333.16	2,737.60	129.73	-38.44	133.64	3.80	3.25	6.57
2,851.00	18.83	333.15	2,826.52	156.91	-52.20	162.38	0.17	-0.17	-0.01
2,946.00	19.61	334.30	2,916.23	184.96	-66.04	191.99	0.91	0.82	1.21
3,040.00	19.52	335.71	3,004.80	213.48	-79.34	222.02	0.51	-0.10	1.50
3,136.00	18.31	333.07	3,095.62	241.55	-92.77	251.59	1.54	-1.26	-2.75
3,230.00	17.90	332.25	3,184.96	267.50	-106.18	279.07	0.51	-0.44	-0.87
3,326.00	18.00	331.04	3,276.29	293.53	-120.23	306.72	0.40	0.10	-1.26
3,420.00	17.83	330.16	3,365.73	318.72	-134.43	333.55	0.34	-0.18	-0.94
3,515.00	17.87	329.45	3,456.16	343.89	-149.07	360.41	0.23	0.04	-0.75
3,610.00	18.15	335.05	3,546.51	369.86	-162.72	387.94	1.85	0.29	5.89
3,704.00	17.15	336.28	3,636.08	395.82	-174.47	415.22	1.14	-1.06	1.31
3,799.00	16.09	336.88	3,727.11	420.76	-185.28	441.35	1.13	-1.12	0.63
3,894.00	16.02	329.40	3,818.42	444.15	-197.12	466.08	2.18	-0.07	-7.87
3,989.00	15.33	329.03	3,909.89	466.20	-210.26	489.66	0.73	-0.73	-0.39
4,084.00	16.14	329.09	4,001.32	488.30	-223.50	513.30	0.85	0.85	0.06
4,178.00	14.16	325.49	4,092.06	508.98	-236.73	535.54	2.33	-2.11	-3.83
4,272.00	15.43	331.69	4,182.94	529.47	-249.17	557.47	2.16	1.35	6.60
4,367.00	18.78	335.51	4,273.73	554.52	-261.51	583.92	3.72	3.53	4.02
4,462.00	18.25	333.82	4,363.81	581.78	-274.41	612.63	0.79	-0.56	-1.78
4,555.00	18.09	330.90	4,452.18	607.47	-287.86	639.86	0.99	-0.17	-3.14

Company:	Continental Resources Inc.	**Local Co-ordinate Reference:**	Well Columbus Federal 1-16H
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Well:	Columbus Federal 1-16H	**North Reference:**	True
Wellbore:	OH	**Survey Calculation Method:**	Minimum Curvature
Design:	OH	**Database:**	Casper District

Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
4,649.00	18.00	331.93	4,541.56	633.04	-301.79	667.02	0.35	-0.10	1.10
4,744.00	18.90	335.24	4,631.67	659.96	-315.14	695.46	1.45	0.95	3.48
4,838.00	16.50	334.25	4,721.22	685.81	-327.32	722.68	2.57	-2.55	-1.05
4,932.00	17.67	334.31	4,811.07	710.69	-339.30	748.91	1.24	1.24	0.06
5,027.00	17.02	333.54	4,901.75	736.13	-351.75	775.76	0.73	-0.68	-0.81
5,122.00	18.70	332.34	4,992.17	762.07	-365.02	803.21	1.81	1.77	-1.26
5,218.00	19.59	331.10	5,082.86	789.79	-379.94	832.64	1.02	0.93	-1.29
5,313.00	16.96	330.16	5,173.06	815.76	-394.53	860.29	2.79	-2.77	-0.99
5,407.00	17.32	329.20	5,262.88	839.67	-408.52	885.82	0.49	0.38	-1.02
5,501.00	17.06	329.99	5,352.68	863.63	-422.58	911.41	0.37	-0.28	0.84
5,596.00	20.40	330.52	5,442.64	890.12	-437.70	939.65	3.52	3.52	0.56
5,690.00	20.10	328.80	5,530.83	918.19	-454.13	969.63	0.71	-0.32	-1.83
5,782.00	18.79	329.78	5,617.58	944.52	-469.78	997.77	1.47	-1.42	1.07
5,878.00	17.41	330.13	5,708.83	970.34	-484.71	1,025.32	1.44	-1.44	0.36
5,972.00	18.41	329.26	5,798.27	995.29	-499.31	1,051.96	1.10	1.06	-0.93
6,066.00	18.85	328.90	5,887.35	1,021.05	-514.74	1,079.52	0.48	0.47	-0.38
6,162.00	16.00	336.50	5,978.94	1,046.47	-528.03	1,106.46	3.79	-2.97	7.92
6,256.00	14.56	338.06	6,069.62	1,069.31	-537.61	1,130.35	1.59	-1.53	1.66
6,351.00	16.27	328.76	6,161.21	1,091.77	-548.97	1,154.11	3.16	1.80	-9.79
6,446.00	18.09	325.43	6,251.97	1,115.30	-564.25	1,179.42	2.18	1.92	-3.51
6,542.00	20.22	327.97	6,342.65	1,141.64	-581.50	1,207.79	2.38	2.22	2.65
6,636.00	17.83	327.97	6,431.51	1,167.61	-597.75	1,235.67	2.54	-2.54	0.00
6,731.00	19.53	330.17	6,521.51	1,193.72	-613.37	1,263.59	1.94	1.79	2.32
6,825.00	24.58	336.68	6,608.61	1,225.33	-628.94	1,296.96	5.96	5.37	6.93
6,919.00	25.74	338.56	6,693.69	1,262.28	-644.14	1,335.58	1.50	1.23	2.00
7,014.00	25.34	337.82	6,779.41	1,300.31	-659.35	1,375.27	0.54	-0.42	-0.78
7,109.00	25.23	338.70	6,865.31	1,338.00	-674.38	1,414.60	0.41	-0.12	0.93
7,203.00	24.47	337.82	6,950.61	1,374.69	-689.01	1,452.89	0.90	-0.81	-0.94
7,297.00	24.35	337.26	7,036.20	1,410.59	-703.85	1,490.42	0.28	-0.13	-0.60
7,392.00	24.61	338.11	7,122.66	1,447.01	-718.79	1,528.48	0.46	0.27	0.89
7,485.00	24.06	337.87	7,207.40	1,482.54	-733.16	1,565.58	0.60	-0.59	-0.26
7,578.00	21.99	336.66	7,292.99	1,516.09	-747.20	1,600.68	2.28	-2.23	-1.30
7,673.00	20.71	336.48	7,381.47	1,547.83	-760.95	1,633.93	1.35	-1.35	-0.19
7,767.00	20.55	337.09	7,469.44	1,578.26	-774.00	1,665.82	0.29	-0.17	0.65
7,863.00	20.23	335.72	7,559.42	1,608.91	-787.39	1,697.95	0.60	-0.33	-1.43
7,958.00	17.78	334.15	7,649.24	1,636.94	-800.47	1,727.45	2.63	-2.58	-1.65
8,029.00	15.83	332.19	7,717.20	1,655.27	-809.71	1,746.82	2.86	-2.75	-2.76
8,124.00	14.61	333.31	7,808.87	1,677.43	-821.14	1,770.29	1.32	-1.28	1.18
8,219.00	15.61	337.25	7,900.59	1,699.93	-831.46	1,793.94	1.51	1.05	4.15
8,315.00	15.14	336.41	7,993.15	1,723.33	-841.48	1,818.45	0.54	-0.49	-0.88
8,409.00	19.07	334.04	8,082.98	1,748.39	-853.12	1,844.82	4.25	4.18	-2.52
8,504.00	18.66	335.98	8,172.87	1,776.23	-866.10	1,874.11	0.79	-0.43	2.04
8,598.00	18.91	337.29	8,261.87	1,804.02	-878.10	1,903.23	0.52	0.27	1.39

Scientific Drilling International

Survey Report

Company:	Continental Resources Inc.	**Local Co-ordinate Reference:**	Well Columbus Federal 1-16H
Project:	McKenzie County, ND NAD83	**TVD Reference:**	GL1920' & KB 22' @ 1942.00ft (Patterson 490)
Site:	Columbus Federal	**MD Reference:**	GL1920' & KB 22' @ 1942.00ft (Patterson 490)
Well:	Columbus Federal 1-16H	**North Reference:**	True
Wellbore:	OH	**Survey Calculation Method:**	Minimum Curvature
Design:	OH	**Database:**	Casper District

Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
8,692.00	20.10	338.04	8,350.47	1,833.05	-890.02	1,933.57	1.29	1.27	0.80
8,786.00	20.18	338.12	8,438.72	1,863.07	-902.10	1,964.91	0.09	0.09	0.09
8,882.00	19.71	339.51	8,528.97	1,893.60	-913.94	1,996.73	0.70	-0.49	1.45
8,976.00	18.64	341.05	8,617.75	1,922.66	-924.37	2,026.90	1.26	-1.14	1.64
9,071.00	18.41	341.62	8,707.83	1,951.26	-934.03	2,056.51	0.31	-0.24	0.60
9,165.00	17.11	342.15	8,797.35	1,978.51	-942.95	2,084.69	1.39	-1.38	0.56
9,259.00	16.14	343.45	8,887.42	2,004.19	-950.91	2,111.20	1.11	-1.03	1.38
9,352.00	14.60	343.91	8,977.09	2,027.85	-957.84	2,135.55	1.66	-1.66	0.49
9,446.00	12.67	345.08	9,068.43	2,049.19	-963.78	2,157.49	2.07	-2.05	1.24
9,522.00	12.78	344.29	9,142.57	2,065.34	-968.20	2,174.08	0.27	0.14	-1.04
9,554.00	13.31	343.16	9,173.74	2,072.27	-970.22	2,181.21	1.84	1.66	-3.53
9,649.00	16.87	339.67	9,265.45	2,095.67	-978.18	2,205.45	3.87	3.75	-3.67
9,745.00	20.08	335.60	9,356.50	2,123.75	-989.83	2,234.81	3.60	3.34	-4.24
9,837.00	20.80	332.04	9,442.71	2,152.56	-1,004.02	2,265.23	1.56	0.78	-3.87
9,932.00	20.90	328.48	9,531.49	2,181.91	-1,020.79	2,296.51	1.34	0.11	-3.75
10,026.00	20.06	329.42	9,619.55	2,210.08	-1,037.75	2,326.66	0.96	-0.89	1.00
10,121.00	19.48	327.46	9,708.95	2,237.46	-1,054.56	2,356.00	0.93	-0.61	-2.06
10,215.00	18.45	326.26	9,797.85	2,263.04	-1,071.26	2,383.55	1.17	-1.10	-1.28
10,311.00	16.98	326.92	9,889.29	2,287.42	-1,087.34	2,409.82	1.55	-1.53	0.69
10,406.00	17.69	331.28	9,979.98	2,311.71	-1,101.85	2,435.79	1.56	0.75	4.59
10,500.00	18.42	331.41	10,069.35	2,337.27	-1,115.82	2,462.96	0.78	0.78	0.14
10,530.00	17.92	331.94	10,097.85	2,345.51	-1,120.26	2,471.70	1.76	-1.67	1.77
10,562.00	19.05	331.83	10,128.20	2,354.45	-1,125.04	2,481.20	3.53	3.53	-0.34
10,594.00	22.17	333.17	10,158.15	2,364.45	-1,130.23	2,491.78	9.86	9.75	4.19
10,625.00	23.46	338.26	10,186.73	2,375.40	-1,135.16	2,503.29	7.60	4.16	16.42
10,657.00	26.81	340.08	10,215.69	2,388.11	-1,139.98	2,516.51	10.74	10.47	5.69
10,689.00	28.04	341.38	10,244.10	2,402.02	-1,144.84	2,530.94	4.27	3.84	4.06
10,720.00	31.57	340.33	10,270.99	2,416.57	-1,149.90	2,546.03	11.51	11.39	-3.39
10,752.00	35.96	339.55	10,297.59	2,433.27	-1,156.01	2,563.38	13.79	13.72	-2.44
10,783.00	39.93	336.61	10,322.03	2,450.94	-1,163.14	2,581.83	14.07	12.81	-9.48
10,815.00	42.13	335.46	10,346.17	2,470.13	-1,171.67	2,601.97	7.27	6.88	-3.59
10,846.00	45.09	336.59	10,368.61	2,489.67	-1,180.36	2,622.47	9.87	9.55	3.65
10,878.00	49.05	334.49	10,390.41	2,510.98	-1,190.07	2,644.87	13.27	12.38	-6.56
10,910.00	51.77	334.93	10,410.80	2,533.28	-1,200.60	2,668.35	8.57	8.50	1.38
10,942.00	54.04	333.97	10,430.10	2,556.30	-1,211.61	2,692.62	7.49	7.09	-3.00
10,974.00	57.84	330.75	10,448.02	2,579.77	-1,223.92	2,717.49	14.51	11.88	-10.06
11,006.00	61.64	330.77	10,464.14	2,603.88	-1,237.42	2,743.16	11.88	11.88	0.06
11,038.00	66.36	330.32	10,478.17	2,628.92	-1,251.56	2,769.83	14.80	14.75	-1.41
11,070.00	70.61	330.21	10,489.90	2,654.76	-1,266.32	2,797.38	13.29	13.28	-0.34
11,102.00	74.61	329.84	10,499.46	2,681.21	-1,281.58	2,825.59	12.55	12.50	-1.16
11,133.00	76.95	328.80	10,507.08	2,707.05	-1,296.91	2,853.22	8.22	7.55	-3.35
11,165.00	77.08	328.58	10,514.27	2,733.69	-1,313.11	2,881.74	0.78	0.41	-0.69
11,196.00	78.10	326.89	10,520.93	2,759.29	-1,329.27	2,909.23	6.26	3.29	-5.45

Scientific Drilling International

Survey Report

Company:	Continental Resources Inc.	**Local Co-ordinate Reference:**	Well Columbus Federal 1-16H
Project:	McKenzie County, ND NAD83	**TVD Reference:**	GL1920' & KB 22' @ 1942.00ft (Patterson 490)
Site:	Columbus Federal	**MD Reference:**	GL1920' & KB 22' @ 1942.00ft (Patterson 490)
Well:	Columbus Federal 1-16H	**North Reference:**	True
Wellbore:	OH	**Survey Calculation Method:**	Minimum Curvature
Design:	OH	**Database:**	Casper District

Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
11,228.00	81.32	325.37	10,526.64	2,785.43	-1,346.82	2,937.44	11.09	10.06	-4.75
11,259.00	85.07	325.44	10,530.32	2,810.76	-1,364.29	2,964.84	12.10	12.10	0.23
11,291.00	88.02	327.44	10,532.25	2,837.38	-1,381.95	2,993.53	11.13	9.22	6.25
11,322.00	90.10	328.80	10,532.75	2,863.69	-1,398.32	3,021.76	8.02	6.71	4.39
11,343.00	90.27	328.09	10,532.69	2,881.59	-1,409.31	3,040.94	3.48	0.81	-3.38
Last Survey in 8 3/4" Hole									
11,403.00	90.92	327.18	10,532.06	2,932.26	-1,441.42	3,095.37	1.86	1.08	-1.52
First Survey in 6" Hole									
11,494.00	90.48	329.38	10,530.95	3,009.66	-1,489.26	3,178.35	2.47	-0.48	2.42
11,585.00	89.52	330.35	10,530.95	3,088.36	-1,534.95	3,262.34	1.50	-1.05	1.07
11,677.00	89.25	332.89	10,531.94	3,169.29	-1,578.67	3,348.29	2.78	-0.29	2.76
11,768.00	88.72	335.97	10,533.55	3,251.36	-1,617.94	3,434.78	3.43	-0.58	3.38
11,860.00	88.99	337.29	10,535.39	3,335.79	-1,654.42	3,523.25	1.46	0.29	1.43
11,951.00	89.60	341.16	10,536.51	3,420.85	-1,686.69	3,611.80	4.30	0.67	4.25
12,043.00	88.99	342.39	10,537.64	3,508.23	-1,715.46	3,702.18	1.49	-0.66	1.34
12,133.00	90.92	346.61	10,537.71	3,594.93	-1,739.50	3,791.28	5.16	2.14	4.69
12,224.00	91.19	348.19	10,536.04	3,683.72	-1,759.35	3,881.91	1.76	0.30	1.74
12,316.00	91.01	349.86	10,534.27	3,774.02	-1,776.86	3,973.72	1.83	-0.20	1.82
12,407.00	90.57	351.35	10,533.02	3,863.78	-1,791.72	4,064.65	1.71	-0.48	1.64
12,499.00	89.25	354.87	10,533.16	3,955.10	-1,802.75	4,156.63	4.09	-1.43	3.83
12,591.00	89.52	356.10	10,534.15	4,046.81	-1,809.99	4,248.50	1.37	0.29	1.34
12,683.00	89.69	359.44	10,534.78	4,138.73	-1,813.57	4,340.10	3.64	0.18	3.63
12,774.00	89.60	2.51	10,535.35	4,229.70	-1,812.02	4,430.09	3.38	-0.10	3.37
12,869.00	88.90	4.97	10,536.59	4,324.48	-1,805.83	4,523.25	2.69	-0.74	2.59
12,963.00	88.99	7.08	10,538.32	4,417.94	-1,795.96	4,614.62	2.25	0.10	2.24
13,057.00	88.90	6.56	10,540.05	4,511.26	-1,784.80	4,705.68	0.56	-0.10	-0.55
13,152.00	89.43	6.12	10,541.44	4,605.67	-1,774.31	4,797.92	0.73	0.56	-0.46
13,248.00	90.57	6.91	10,541.44	4,701.05	-1,763.42	4,891.05	1.44	1.19	0.82
13,342.00	89.96	5.41	10,541.00	4,794.50	-1,753.33	4,982.39	1.72	-0.65	-1.60
13,436.00	89.52	5.24	10,541.43	4,888.09	-1,744.61	5,074.04	0.50	-0.47	-0.18
13,531.00	90.22	4.89	10,541.64	4,982.72	-1,736.22	5,166.77	0.82	0.74	-0.37
13,625.00	90.40	4.18	10,541.14	5,076.42	-1,728.79	5,258.70	0.78	0.19	-0.76
13,720.00	90.31	3.66	10,540.55	5,171.20	-1,722.30	5,351.81	0.56	-0.09	-0.55
13,816.00	90.57	3.92	10,539.81	5,266.99	-1,715.95	5,445.95	0.38	0.27	0.27
13,910.00	91.01	4.53	10,538.51	5,360.72	-1,709.03	5,537.98	0.80	0.47	0.65
14,006.00	90.92	4.36	10,536.90	5,456.42	-1,701.59	5,631.89	0.20	-0.09	-0.18
14,101.00	90.57	3.57	10,535.66	5,551.18	-1,695.02	5,724.98	0.91	-0.37	-0.83
14,195.00	91.10	1.63	10,534.29	5,645.07	-1,690.76	5,817.51	2.14	0.56	-2.06
14,290.00	91.01	1.20	10,532.54	5,740.03	-1,688.41	5,911.35	0.46	-0.09	-0.45
14,384.00	92.33	1.46	10,529.80	5,833.96	-1,686.23	6,004.19	1.43	1.40	0.28
14,480.00	91.45	2.25	10,526.64	5,929.85	-1,683.12	6,098.86	1.23	-0.92	0.82
14,575.00	88.90	1.81	10,526.35	6,024.79	-1,679.76	6,192.54	2.72	-2.68	-0.46
14,669.00	88.46	2.07	10,528.51	6,118.71	-1,676.58	6,285.24	0.54	-0.47	0.28
14,764.00	89.52	2.25	10,530.19	6,213.62	-1,673.00	6,378.88	1.13	1.12	0.19

Scientific Drilling International

Survey Report

Company:	Continental Resources Inc.	**Local Co-ordinate Reference:**	Well Columbus Federal 1-16H
Project:	McKenzie County, ND NAD83	**TVD Reference:**	GL1920' & KB 22' @ 1942.00ft (Patterson 490)
Site:	Columbus Federal	**MD Reference:**	GL1920' & KB 22' @ 1942.00ft (Patterson 490)
Well:	Columbus Federal 1-16H	**North Reference:**	True
Wellbore:	OH	**Survey Calculation Method:**	Minimum Curvature
Design:	OH	**Database:**	Casper District

Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
14,858.00	92.07	2.69	10,528.88	6,307.52	-1,668.95	6,471.44	2.75	2.71	0.47
14,954.00	92.42	2.78	10,525.12	6,403.34	-1,664.37	6,565.84	0.38	0.36	0.09
15,048.00	91.80	3.04	10,521.66	6,497.15	-1,659.60	6,658.23	0.72	-0.66	0.28
15,143.00	90.31	2.95	10,519.91	6,592.00	-1,654.64	6,751.62	1.57	-1.57	-0.09
15,238.00	90.31	3.39	10,519.40	6,686.86	-1,649.39	6,844.97	0.46	0.00	0.46
15,333.00	90.40	3.66	10,518.81	6,781.67	-1,643.54	6,938.22	0.30	0.09	0.28
15,427.00	89.78	3.92	10,518.66	6,875.47	-1,637.33	7,030.40	0.72	-0.66	0.28
15,522.00	89.25	4.89	10,519.47	6,970.18	-1,630.04	7,123.35	1.16	-0.56	1.02
15,617.00	88.90	5.15	10,521.00	7,064.81	-1,621.72	7,216.07	0.46	-0.37	0.27
15,711.00	89.78	4.71	10,522.08	7,158.45	-1,613.65	7,307.86	1.05	0.94	-0.47
15,806.00	91.45	4.53	10,521.06	7,253.13	-1,605.99	7,400.74	1.77	1.76	-0.19
15,901.00	90.92	4.01	10,519.10	7,347.85	-1,598.92	7,493.72	0.78	-0.56	-0.55
15,996.00	88.81	2.34	10,519.32	7,442.69	-1,593.66	7,587.06	2.83	-2.22	-1.76
16,090.00	89.52	0.40	10,520.69	7,536.65	-1,591.41	7,679.92	2.20	0.76	-2.06
16,185.00	90.92	0.23	10,520.33	7,631.65	-1,590.89	7,774.04	1.48	1.47	-0.18
16,280.00	91.98	359.35	10,517.92	7,726.61	-1,591.24	7,868.24	1.45	1.12	-0.93
16,374.00	91.36	359.79	10,515.18	7,820.57	-1,591.95	7,961.48	0.81	-0.66	0.47
16,470.00	90.57	0.23	10,513.57	7,916.56	-1,591.93	8,056.64	0.94	-0.82	0.46
16,564.00	89.69	358.73	10,513.35	8,010.55	-1,592.78	8,149.94	1.85	-0.94	-1.60
16,659.00	88.99	357.68	10,514.45	8,105.49	-1,595.76	8,244.46	1.33	-0.74	-1.11
16,754.00	90.57	357.86	10,514.81	8,200.42	-1,599.45	8,339.06	1.67	1.66	0.19
16,849.00	90.04	358.82	10,514.31	8,295.37	-1,602.21	8,433.56	1.15	-0.56	1.01
16,944.00	88.99	358.73	10,515.11	8,390.35	-1,604.24	8,527.99	1.11	-1.11	-0.09
17,039.00	87.67	357.68	10,517.88	8,485.26	-1,607.21	8,622.47	1.78	-1.39	-1.11
17,134.00	90.75	357.68	10,519.19	8,580.16	-1,611.06	8,717.06	3.24	3.24	0.00
17,229.00	91.54	359.53	10,517.29	8,675.11	-1,613.37	8,811.50	2.12	0.83	1.95
17,324.00	90.66	359.61	10,515.47	8,770.09	-1,614.08	8,905.76	0.93	-0.93	0.08
17,417.00	90.48	1.55	10,514.54	8,863.07	-1,613.14	8,997.83	2.09	-0.19	2.09
17,512.00	91.45	0.93	10,512.94	8,958.04	-1,611.08	9,091.71	1.21	1.02	-0.65
17,607.00	89.69	358.82	10,512.00	9,053.02	-1,611.29	9,185.91	2.89	-1.85	-2.22
17,702.00	90.04	357.33	10,512.22	9,147.96	-1,614.48	9,280.45	1.61	0.37	-1.57
17,797.00	90.31	357.42	10,511.93	9,242.86	-1,618.83	9,375.11	0.30	0.28	0.09
17,891.00	89.96	357.86	10,511.71	9,336.78	-1,622.70	9,468.73	0.60	-0.37	0.47
17,986.00	88.99	356.98	10,512.58	9,431.68	-1,626.98	9,563.37	1.38	-1.02	-0.93
18,082.00	89.25	358.12	10,514.05	9,527.58	-1,631.08	9,658.99	1.22	0.27	1.19
18,177.00	90.48	359.96	10,514.28	9,622.56	-1,632.67	9,753.36	2.33	1.29	1.94
18,271.00	90.22	1.20	10,513.70	9,716.55	-1,631.72	9,846.43	1.35	-0.28	1.32
18,367.00	89.52	1.72	10,513.92	9,812.52	-1,629.28	9,941.25	0.91	-0.73	0.54
18,462.00	89.56	1.71	10,514.68	9,907.47	-1,626.43	10,035.02	0.04	0.04	-0.01
18,558.00	88.99	1.55	10,515.90	10,003.43	-1,623.70	10,129.80	0.62	-0.59	-0.17
18,653.00	90.48	0.05	10,516.34	10,098.41	-1,622.38	10,223.80	2.23	1.57	-1.58
18,747.00	90.66	357.94	10,515.40	10,192.39	-1,624.03	10,317.18	2.25	0.19	-2.24
18,842.00	90.31	357.77	10,514.60	10,287.32	-1,627.58	10,411.76	0.41	-0.37	-0.18

Scientific Drilling International

Survey Report

Company:	Continental Resources Inc.	**Local Co-ordinate Reference:**	Well Columbus Federal 1-16H
Project:	McKenzie County, ND NAD83	**TVD Reference:**	GL1920' & KB 22' @ 1942.00ft (Patterson 490)
Site:	Columbus Federal	**MD Reference:**	GL1920' & KB 22' @ 1942.00ft (Patterson 490)
Well:	Columbus Federal 1-16H	**North Reference:**	True
Wellbore:	OH	**Survey Calculation Method:**	Minimum Curvature
Design:	OH	**Database:**	Casper District

Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
18,937.00	89.87	357.94	10,514.45	10,382.25	-1,631.14	10,506.35	0.50	-0.46	0.18
19,031.00	89.34	358.38	10,515.10	10,476.20	-1,634.16	10,599.89	0.73	-0.56	0.47
19,126.00	91.10	355.39	10,514.73	10,571.04	-1,639.32	10,694.59	3.65	1.85	-3.15
19,221.00	89.25	356.19	10,514.44	10,665.78	-1,646.29	10,789.43	2.12	-1.95	0.84
19,316.00	88.72	356.45	10,516.13	10,760.57	-1,652.39	10,884.20	0.62	-0.56	0.27
19,410.00	90.40	356.89	10,516.85	10,854.41	-1,657.85	10,977.95	1.85	1.79	0.47
19,505.00	89.78	357.24	10,516.70	10,949.28	-1,662.71	11,072.65	0.75	-0.65	0.37
19,600.00	89.16	358.03	10,517.58	11,044.19	-1,666.63	11,167.26	1.06	-0.65	0.83
19,695.00	89.16	358.91	10,518.97	11,139.15	-1,669.17	11,261.73	0.93	0.00	0.93
19,790.00	90.75	359.44	10,519.04	11,234.14	-1,670.53	11,356.08	1.76	1.67	0.56
19,885.00	89.08	359.26	10,519.18	11,329.13	-1,671.61	11,450.40	1.77	-1.76	-0.19
19,979.00	87.76	359.35	10,521.78	11,423.08	-1,672.75	11,543.70	1.41	-1.40	0.10
20,074.00	90.84	358.82	10,522.94	11,518.05	-1,674.27	11,638.06	3.29	3.24	-0.56
20,169.00	89.69	359.52	10,522.50	11,613.04	-1,675.65	11,732.41	1.42	-1.21	0.74
20,263.00	90.22	359.53	10,522.57	11,707.03	-1,676.42	11,825.70	0.56	0.56	0.01
20,358.00	91.10	359.17	10,521.48	11,802.02	-1,677.50	11,920.02	1.00	0.93	-0.38
20,452.00	89.78	359.00	10,520.76	11,896.00	-1,679.00	12,013.39	1.42	-1.40	-0.18
20,547.00	89.25	0.05	10,521.56	11,991.00	-1,679.79	12,107.67	1.24	-0.56	1.11
20,642.00	87.58	0.14	10,524.19	12,085.96	-1,679.63	12,201.80	1.76	-1.76	0.09
20,737.00	86.53	0.14	10,529.07	12,180.83	-1,679.40	12,295.83	1.11	-1.11	0.00
20,832.00	88.37	0.40	10,533.29	12,275.73	-1,678.95	12,389.86	1.96	1.94	0.27
20,927.00	88.46	0.76	10,535.92	12,370.69	-1,677.99	12,483.88	0.39	0.09	0.38
21,021.00	91.45	0.49	10,536.00	12,464.67	-1,676.97	12,576.92	3.19	3.18	-0.29
21,117.00	89.60	359.52	10,535.12	12,560.66	-1,676.96	12,672.09	2.18	-1.93	-1.01
21,211.00	90.22	1.11	10,535.26	12,654.66	-1,676.44	12,765.21	1.82	0.66	1.69
Last SDI MWD Survey									
21,276.00	90.22	1.11	10,535.01	12,719.64	-1,675.18	12,829.48	0.00	0.00	0.00
Projection to TD									

Design Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates +N/-S (ft)	Local Coordinates +E/-W (ft)	Comment
88.00	88.00	0.24	0.13	First SDI MWD Survey
11,343.00	10,532.69	2,881.59	-1,409.31	Last Survey in 8 3/4" Hole
11,403.00	10,532.06	2,932.26	-1,441.42	First Survey in 6" Hole
21,211.00	10,535.26	12,654.66	-1,676.44	Last SDI MWD Survey
21,276.00	10,535.01	12,719.64	-1,675.18	Projection to TD

Checked By: _____ Approved By: _____ Date: _____

JOB NO.:	410413HEFMP6213	Report Time:	2400	3 of 28
COMPANY:	Continental Resources Inc.	API JOB #	33-053-04852	
LOCATION:		WORK ORDER#	166165	
RIG NAME:	Patterson 490	FIELD:	Baker	
STATE:	North Dakota	Township:	153N	
COUNTY:	McKenzie	Range/Section	101W	16
WELL NAME:	Columbus Federal 1-16H	Company Man	Chris	
Lead Directional :	Kaleb Smith	2nd Dir Hand :	Hilton Maldonado	

Scientific Drilling

From Saturday, April 27, 2013 at 0000 to Saturday, April 27, 2013 at 2400

DAILY TOTALS

Start Depth	1947.00
End Depth	4471.00
Below Rot Hrs.	20.50
Total Drilled:	2524.00
Avg. Total ROP:	305.94
Slide Footage:	321.00
Slide Hours	2.25
Avg. Slide ROP:	142.67
Rotate Footage:	2203.00
Rotary Hours	6.00
Avg. Rot ROP:	367.17
Circ Hours	0.42
Ream Hours	0.00
Rotary Hrs%:	72.73
Slide Hrs%:	27.27
Rotary Ftg%:	87.28
Slide Ftg%:	12.72

cASING

Size	Lb/Ft	MD

ASSEMBLY TOTALS

BHA #	Motor SN / R.S SN	Slide Ftg	Slide Hrs	Rotate Ftg	Rotate Hrs	Circ Hrs	D & C Hrs	BHA Ftg	Avg ROP
1	2812	1,039.00	16.58	5,068.00	18.75	2.08	37.42	6,107.00	165.43

Drilling Parameters

WOB:	29
Rot Wt:	0
Pick UP:	0
Slack Off:	0
SPP:	2600
Flow:	0 - 500
SPM:	170
Rot. RPM	60 - 65
Mot RPM:	0 - 0
Incl. In:	0
Azm. In:	0
Incl. Out:	0
Azm. Out:	0

Mud Record

Weight:	0
Visc:	0
Chlorides:	0
YP:	0
PV:	0
PH:	0
GAS:	0
SAND:	0
WL:	0
SOLID:	0
BHT°:	0
Flow T°:	0
Oil %:	0

COST BREAKDOWN

Bit Record

Bit No:	2
Model	Security FX65D
SN.:	12158419
MFG.	OTHER
Type	PDC
IADC	
JETS	6-18
TFA:	1.49
Hole ID:	8.75
Bit Hrs:	35.33
Bit Ftg:	6107.00

PUMPS

Liner	0	0
Stroke	0	0
Effic.	95.00%	95.00%
Gal/Stk	0.00	0.00
BBL/Stk	0.000	0.000

Current BHA # 1

Security FX65D
Hunting - 7/8lobe 5.7stage
NM Stab 8 5/8
NMDC
Support Sub
Gap Sub
NM Stab 8 5/8
NMDC
Stab 8 5/8
9 Jts 6.5" DC
X/O
39 Jts 5" HWDP

GENERAL COMMENT

Start Time	End Time	Hours	Start Depth	End Depth	Delta Depth	ROP	Activity Code	COMMENT
00:00	03:30	3.50	1947	1947	0	.00	Standby	Standby
03:30	05:30	2.00	1947	1947	0	.00	Change BHA	P/U BHA 1
05:30	08:00	2.50	1947	1947	0	.00	TIH	TIH
08:00	10:15	2.25	1947	1947	0	.00	Other	Fix pump
10:15	10:30	0.25	1947	1947	0	.00	Drilling Cement	Drill cement
10:30	11:40	1.17	1947	1947	0	.00	Other	FIT and fix pump
11:40	11:55	0.25	1947	2022	75	300.00	Drilling	Drilling - (5kWOB, 65RPM, 500gpm)
11:55	12:10	0.25	2022	2022	0	.00	MWD Survey	MWD Survey@2000' Inc 3.25° Azm 136.99°
12:10	12:25	0.25	2022	2052	30	120.00	Sliding	Slide - (8kWOB, 500GPM, 333MTF)
12:25	12:30	0.08	2052	2052	0	.00	Survey & Conn.	Survey & Conn.@2000' Inc 3.25° Azm 136.99°
12:30	12:45	0.25	2052	2115	63	252.00	Sliding	Sliding - (WOB:8;GPM :500;TFO:333)
12:45	12:55	0.17	2115	2147	32	192.00	Drilling	Drilling - (WOB:5;GPM :500;RPM:65)
12:55	13:00	0.08	2147	2147	0	.00	MWD Survey	MWD Survey@2095' Inc 5.54° Azm 346.19°
13:00	13:10	0.17	2147	2172	25	150.00	Sliding	Sliding - (WOB:8;GPM :500;TFO:360)

Start Time	End Time	Hours	Start Depth	End Depth	Delta Depth	ROP	Activity Code	COMMENT
13:10	13:25	0.25	2172	2241	69	276.00	Drilling	Drilling - (WOB:10;GPM :500;RPM:65)
13:25	13:30	0.08	2241	2241	0	.00	Survey & Conn.	Survey & Conn.@2189' Inc 11.17° Azm 340.63°
13:30	13:45	0.25	2241	2336	95	380.00	Drilling	Drilling - (WOB:10;GPM :500;RPM:65)
13:45	13:55	0.17	2336	2336	0	.00	Survey & Conn.	Survey & Conn.@2284' Inc 11.08° Azm 340.1°
13:55	14:00	0.08	2336	2356	20	240.00	Sliding	Sliding - (WOB:8;GPM :500;TFO:330)
14:00	14:10	0.17	2356	2430	74	444.00	Drilling	Drilling - (WOB:12;GPM :500;RPM:65)
14:10	14:20	0.17	2430	2430	0	.00	Survey & Conn.	Survey & Conn.@2378' Inc 13.37° Azm 332.81°
14:20	14:35	0.25	2430	2524	94	376.00	Drilling	Drilling - (WOB:12;GPM :500;RPM:65)
14:35	14:40	0.08	2524	2524	0	.00	Survey & Conn.	Survey & Conn.@2472' Inc 13.45° Azm 332.02°
14:40	14:50	0.17	2524	2549	25	150.00	Sliding	Sliding - (WOB:10;GPM :500;TFO:360)
14:50	15:00	0.17	2549	2619	70	420.00	Drilling	Drilling - (WOB:12;GPM :500;RPM:65)
15:00	15:15	0.25	2619	2619	0	.00	Survey & Conn.	Survey & Conn.@2567' Inc 15.84° Azm 326.49°
15:15	15:30	0.25	2619	2714	95	380.00	Drilling	Drilling - (WOB:12;GPM :500;RPM:65)
15:30	15:50	0.33	2714	2714	0	.00	Survey & Conn.	Survey & Conn.@2662' Inc 15.9° Azm 326.92°
15:50	16:00	0.17	2714	2744	30	180.00	Sliding	Sliding - (WOB:10;GPM :500;TFO:20)
16:00	16:10	0.17	2744	2809	65	390.00	Drilling	Drilling - (WOB:12;GPM :500;RPM:65)
16:10	16:20	0.17	2809	2809	0	.00	Survey & Conn.	Survey & Conn.@2757' Inc 18.99° Azm 333.16°
16:20	16:30	0.17	2809	2903	94	564.00	Drilling	Drilling - (WOB:12;GPM :500;RPM:65)
16:30	16:40	0.17	2903	2903	0	.00	Survey & Conn.	Survey & Conn.@2851' Inc 18.83° Azm 333.15°
16:40	16:55	0.25	2903	2998	95	380.00	Drilling	Drilling - (WOB:12;GPM :500;RPM:65)
16:55	17:05	0.17	2998	2998	0	.00	Survey & Conn.	Survey & Conn.@2946' Inc 19.61° Azm 334.3°
17:05	17:15	0.17	2998	3092	94	564.00	Drilling	Drilling - (WOB:12;GPM :500;RPM:65)
17:15	17:25	0.17	3092	3092	0	.00	Survey & Conn.	Survey & Conn.@3040' Inc 19.52° Azm 335.71°
17:25	17:35	0.17	3092	3188	96	576.00	Drilling	Drilling - (WOB:16;GPM :500;RPM:60)
17:35	17:45	0.17	3188	3188	0	.00	Survey & Conn.	Survey & Conn.@3136' Inc 18.31° Azm 333.07°
17:45	17:55	0.17	3188	3282	94	564.00	Drilling	Drilling - (WOB:13;GPM :500;RPM:60)
17:55	18:05	0.17	3282	3282	0	.00	Survey & Conn.	Survey & Conn.@3230' Inc 17.9° Azm 332.25°
18:05	18:20	0.25	3282	3378	96	384.00	Drilling	Drilling - (WOB:16;GPM :500;RPM:60)
18:20	18:30	0.17	3378	3378	0	.00	Survey & Conn.	Survey & Conn.@3326' Inc 18° Azm 331.04°
18:30	18:45	0.25	3378	3472	94	376.00	Drilling	Drilling - (WOB:16;GPM :500;RPM:65)
18:45	18:50	0.08	3472	3472	0	.00	Survey & Conn.	Survey & Conn.@3420' Inc 17.83° Azm 330.16°
18:50	19:10	0.33	3472	3567	95	285.00	Drilling	Drilling - (WOB:16;GPM :500;RPM:65)
19:10	19:20	0.17	3567	3567	0	.00	Survey & Conn.	Survey & Conn.@3515' Inc 17.87° Azm 329.45°
19:20	19:25	0.08	3567	3585	18	216.00	Sliding	Sliding - (WOB:10;GPM :500;TFO:75)
19:25	19:40	0.25	3585	3662	77	308.00	Drilling	Drilling - (WOB:16;GPM :500;RPM:65)
19:40	19:45	0.08	3662	3662	0	.00	Survey & Conn.	Survey & Conn.@3610' Inc 18.15° Azm 335.05°
19:45	20:00	0.25	3662	3756	94	376.00	Drilling	Drilling - (WOB:16;GPM :500;RPM:65)
20:00	20:05	0.08	3756	3756	0	.00	Survey & Conn.	Survey & Conn.@3704' Inc 17.15° Azm 336.28°
20:05	20:20	0.25	3756	3851	95	380.00	Drilling	Drilling - (WOB:16;GPM :500;RPM:65)
20:20	20:30	0.17	3851	3851	0	.00	Survey & Conn.	Survey & Conn.@3799' Inc 16.09° Azm 336.88°
20:30	20:40	0.17	3851	3869	18	108.00	Sliding	Sliding - (WOB:12;GPM :500;TFO:-50)
20:40	20:55	0.25	3869	3946	77	308.00	Drilling	Drilling - (WOB:16;GPM :500;RPM:65)
20:55	21:05	0.17	3946	3946	0	.00	Survey & Conn.	Survey & Conn.@3894' Inc 16.02° Azm 329.4°
21:05	21:15	0.17	3946	4041	95	570.00	Drilling	Drilling - (WOB:16;GPM :500;RPM:65)
21:15	21:25	0.17	4041	4041	0	.00	Survey & Conn.	Survey & Conn.@3989' Inc 15.33° Azm 329.03°
21:25	21:40	0.25	4041	4059	18	72.00	Sliding	Sliding - (WOB:12;GPM :500;TFO:20)
21:40	21:50	0.17	4059	4135	76	456.00	Drilling	Drilling - (WOB:29;GPM :500;RPM:60)
21:50	22:00	0.17	4135	4135	0	.00	Survey & Conn.	Survey & Conn.@4084' Inc 16.14° Azm 329.09°

Start Time	End Time	Hours	Start Depth	End Depth	Delta Depth	ROP	Activity Code	COMMENT
22:00	22:20	0.33	4135	4230	95	285.00	Drilling	Drilling - (WOB:29;GPM :500;RPM:60)
22:20	22:30	0.17	4230	4230	0	.00	Survey & Conn.	Survey & Conn.@4178' Inc 14.16° Azm 325.49°
22:30	22:45	0.25	4230	4262	32	128.00	Sliding	Sliding - (WOB:12;GPM :500;TFO:30)
22:45	22:50	0.08	4262	4293	31	372.00	Drilling	Drilling - (WOB:29;GPM :500;RPM:60)
22:50	23:05	0.25	4293	4313	20	80.00	Sliding	Sliding - (WOB:12;GPM :500;TFO:360)
23:05	23:10	0.08	4313	4324	11	132.00	Drilling	Drilling - (WOB:29;GPM :500;RPM:60)
23:10	23:20	0.17	4324	4324	0	.00	Survey & Conn.	Survey & Conn.@4272' Inc 15.43° Azm 331.69°
23:20	23:25	0.08	4324	4356	32	384.00	Drilling	Drilling - (WOB:29;GPM :500;RPM:60)
23:25	23:30	0.08	4356	4356	0	.00	MWD Survey	MWD Survey@4272' Inc 15.43° Azm 331.69°
23:30	23:40	0.17	4356	4378	22	132.00	Sliding	Sliding - (WOB:12;GPM :500;TFO:360)
23:40	23:45	0.08	4378	4419	41	492.00	Drilling	Drilling - (WOB:29;GPM :500;RPM:60)
23:45	23:55	0.17	4419	4419	0	.00	Survey & Conn.	Survey & Conn.@4367' Inc 18.78° Azm 335.51°
23:55	24:00	0.08	4419	4471	52	624.00	Drilling	Drilling - (WOB:29;GPM :500;RPM:60)

JOB NO.:	410413HEFMP6213	Report Time:	2400	4 of 28
COMPANY:	Continental Resources Inc.	API JOB #	33-053-04852	
LOCATION:		WORK ORDER#	166165	
RIG NAME:	Patterson 490	FIELD:	Baker	
STATE:	North Dakota	Township:	153N	
COUNTY:	McKenzie	Range/Section	101W	16
WELL NAME:	Columbus Federal 1-16H	Company Man	Chris	
Lead Directional :	Kaleb Smith	2nd Dir Hand :	Hilton Maldonado	

Scientific Drilling

From Sunday, April 28, 2013 at 0000 to Sunday, April 28, 2013 at 2400

DAILY TOTALS

Start Depth	4471.00
End Depth	6877.00
Below Rot Hrs.	24.00
Total Drilled:	2406.00
Avg. Total ROP:	131.84
Slide Footage:	696.00
Slide Hours	12.17
Avg. Slide ROP:	57.21
Rotate Footage:	1710.00
Rotary Hours	6.08
Avg. Rot ROP:	281.10
Circ Hours	0.50
Ream Hours	0.00
Rotary Hrs%:	33.33
Slide Hrs%:	66.67
Rotary Ftg%:	71.07
Slide Ftg%:	28.93

cASING

Size	Lb/Ft	MD

ASSEMBLY TOTALS

BHA #	Motor SN / R.S SN	Slide Ftg	Slide Hrs	Rotate Ftg	Rotate Hrs	Circ Hrs	D & C Hrs	BHA Ftg	Avg ROP
1	2812	1,039.00	16.58	5,068.00	18.75	2.08	37.42	6,107.00	165.43

Drilling Parameters

WOB:	0
Rot Wt:	0
Pick UP:	0
Slack Off:	0
SPP:	0
Flow:	0 - 500
SPM:	0
Rot. RPM	60 - 60
Mot RPM:	0 - 0
Incl. In:	0
Azm. In:	0
Incl. Out:	0
Azm. Out:	0

Mud Record

Weight:	0
Visc:	0
Chlorides:	0
YP:	0
PV:	0
PH:	0
GAS:	0
SAND:	0
WL:	0
SOLID:	0
BHT°:	0
Flow T°:	0
Oil %:	0

Bit Record

Bit No:	2
Model	Security FX65D
SN.:	12158419
MFG.	OTHER
Type	PDC
IADC	
JETS	6-18
TFA:	1.49
Hole ID:	8.75
Bit Hrs:	35.33
Bit Ftg:	6107.00

PUMPS

Liner	0	0
Stroke	0	0
Effic.	95.00%	95.00%
Gal/Stk	0.00	0.00
BBL/Stk	0.000	0.000

Current BHA # 1

Security FX65D
Hunting - 7/8lobe 5.7stage
NM Stab 8 5/8
NMDC
Support Sub
Gap Sub
NM Stab 8 5/8
NMDC
Stab 8 5/8
9 Jts 6.5" DC
X/O
39 Jts 5" HWDP

COST BREAKDOWN

GENERAL COMMENT

Start Time	End Time	Hours	Start Depth	End Depth	Delta Depth	ROP	Activity Code	COMMENT
00:00	00:05	0.08	4471	4514	43	516.00	Drilling	Drilling - (WOB:29;GPM :500;RPM:60)
00:05	00:15	0.17	4514	4514	0	.00	Survey & Conn.	Survey & Conn.@4462' Inc 18.25° Azm 333.82°
00:15	00:35	0.33	4514	4539	25	75.00	Sliding	Sliding - (WOB:12;GPM :500;TFO:360)
00:35	00:50	0.25	4539	4607	68	272.00	Drilling	Drilling - (WOB:29;GPM :500;RPM:60)
00:50	01:00	0.17	4607	4607	0	.00	Survey & Conn.	Survey & Conn.@4555' Inc 18.09° Azm 330.9°
01:00	01:20	0.33	4607	4638	31	93.00	Sliding	Sliding - (WOB:15;GPM :500;TFO:360)
01:20	01:30	0.17	4638	4701	63	378.00	Drilling	Drilling - (WOB:29;GPM :500;RPM:60)
01:30	01:40	0.17	4701	4701	0	.00	Survey & Conn.	Survey & Conn.@4649' Inc 18° Azm 331.93°
01:40	02:00	0.33	4701	4732	31	93.00	Sliding	Sliding - (WOB:15;GPM :500;TFO:15)
02:00	02:10	0.17	4732	4796	64	384.00	Drilling	Drilling - (WOB:20;GPM :500;RPM:60)
02:10	02:15	0.08	4796	4796	0	.00	Survey & Conn.	Survey & Conn.@4744' Inc 18.9° Azm 335.24°
02:15	02:30	0.25	4796	4890	94	376.00	Drilling	Drilling - (WOB:20;GPM :500;RPM:60)
02:30	02:40	0.17	4890	4890	0	.00	Survey & Conn.	Survey & Conn.@4838' Inc 16.5° Azm 334.25°
02:40	02:50	0.17	4890	4922	32	192.00	Sliding	Sliding - (WOB:15;GPM :500;TFO:15)

Start Time	End Time	Hours	Start Depth	End Depth	Delta Depth	ROP	Activity Code	COMMENT
02:50	03:00	0.17	4922	4953	31	186.00	Drilling	Drilling - (WOB:20;GPM :500;RPM:60)
03:00	03:15	0.25	4953	4975	22	88.00	Sliding	Sliding - (WOB:11;GPM :500;TFO:15)
03:15	03:20	0.08	4975	4984	9	108.00	Drilling	Drilling - (WOB:29;GPM :500;RPM:60)
03:20	03:25	0.08	4984	4984	0	.00	Survey & Conn.	Survey & Conn.@4932' Inc 17.67° Azm 334.31°
03:25	03:35	0.17	4984	5079	95	570.00	Drilling	Drilling - (WOB:29;GPM :500;RPM:60)
03:35	03:45	0.17	5079	5079	0	.00	Survey & Conn.	Survey & Conn.@5027' Inc 17.02° Azm 333.54°
03:45	04:05	0.33	5079	5115	36	108.00	Sliding	Sliding - (WOB:11;GPM :500;TFO:15)
04:05	04:15	0.17	5115	5152	37	222.00	Drilling	Drilling - (WOB:29;GPM :500;RPM:60)
04:15	04:35	0.33	5152	5174	22	66.00	Sliding	Sliding - (WOB:11;GPM :500;TFO:360)
04:35	04:50	0.25	5174	5174	0	.00	Survey & Conn.	Survey & Conn.@5122' Inc 18.7° Azm 332.34°
04:50	05:00	0.17	5174	5194	20	120.00	Sliding	Sliding - (WOB:11;GPM :500;TFO:360)
05:00	05:15	0.25	5194	5270	76	304.00	Drilling	Drilling - (WOB:29;GPM :500;RPM:60)
05:15	05:30	0.25	5270	5270	0	.00	Survey & Conn.	Survey & Conn.@5218' Inc 19.59° Azm 331.1°
05:30	05:45	0.25	5270	5365	95	380.00	Drilling	Drilling - (WOB:29;GPM :500;RPM:60)
05:45	06:00	0.25	5365	5365	0	.00	Survey & Conn.	Survey & Conn.@5313' Inc 16.96° Azm 330.16°
06:00	06:20	0.33	5365	5396	31	93.00	Sliding	Sliding - (WOB:11;GPM :500;TFO:15)
06:20	06:30	0.17	5396	5427	31	186.00	Drilling	Drilling - (WOB:29;GPM :500;RPM:60)
06:30	06:55	0.42	5427	5443	16	38.40	Sliding	Sliding - (WOB:18;GPM :500;TFO:25)
06:55	07:00	0.08	5443	5459	16	192.00	Drilling	Drilling - (WOB:29;GPM :500;RPM:60)
07:00	07:15	0.25	5459	5459	0	.00	Survey & Conn.	Survey & Conn.@5407' Inc 17.32° Azm 329.2°
07:15	07:30	0.25	5459	5559	100	400.00	Drilling	Drilling - (WOB:29;GPM :500;RPM:60)
07:30	07:50	0.33	5559	5559	0	.00	Survey & Conn.	Survey & Conn.@5501' Inc 17.06° Azm 329.99°
07:50	08:20	0.50	5559	5609	50	100.00	Sliding	Sliding - (WOB:18;GPM :500;TFO:10)
08:20	08:25	0.08	5609	5648	39	468.00	Drilling	Drilling - (WOB:28;GPM :500;RPM:60)
08:25	08:40	0.25	5648	5648	0	.00	Survey & Conn.	Survey & Conn.@5596' Inc 20.4° Azm 330.52°
08:40	09:00	0.33	5648	5742	94	282.00	Drilling	Drilling - (WOB:28;GPM :500;RPM:60)
09:00	09:15	0.25	5742	5742	0	.00	Survey & Conn.	Survey & Conn.@5690' Inc 20.1° Azm 328.8°
09:15	09:30	0.25	5742	5834	92	368.00	Drilling	Drilling - (WOB:28;GPM :500;RPM:60)
09:30	09:40	0.17	5834	5834	0	.00	Survey & Conn.	Survey & Conn.@5782' Inc 18.79° Azm 329.78°
09:40	10:00	0.33	5834	5930	96	288.00	Drilling	Drilling - (WOB:28;GPM :500;RPM:60)
10:00	10:10	0.17	5930	5930	0	.00	Survey & Conn.	Survey & Conn.@5878' Inc 17.41° Azm 330.13°
10:10	10:40	0.50	5930	5980	50	100.00	Sliding	Sliding - (WOB:18;GPM :500;TFO:20)
10:40	10:50	0.17	5980	6024	44	264.00	Drilling	Drilling - (WOB:28;GPM :500;RPM:60)
10:50	11:00	0.17	6024	6024	0	.00	Survey & Conn.	Survey & Conn.@5972' Inc 18.41° Azm 329.26°
11:00	11:15	0.25	6024	6118	94	376.00	Drilling	Drilling - (WOB:28;GPM :500;RPM:60)
11:15	11:25	0.17	6118	6118	0	.00	Survey & Conn.	Survey & Conn.@6066' Inc 18.85° Azm 328.9°
11:25	12:25	1.00	6118	6158	40	40.00	Sliding	Sliding - (WOB:20;GPM :500;TFO:360)
12:25	12:35	0.17	6158	6214	56	336.00	Drilling	Drilling - (WOB:28;GPM :500;RPM:60)
12:35	12:45	0.17	6214	6214	0	.00	Survey & Conn.	Survey & Conn.@6162' Inc 16° Azm 336.5°
12:45	13:15	0.50	6214	6308	94	188.00	Drilling	Drilling - (WOB:28;GPM :500;RPM:60)
13:15	13:45	0.50	6308	6308	0	.00	Survey & Conn.	Survey & Conn.@6256' Inc 14.56° Azm 338.06°
13:45	14:20	0.58	6308	6368	60	102.86	Sliding	Sliding - (WOB:20;GPM :500;TFO:330)
14:20	14:30	0.17	6368	6403	35	210.00	Drilling	Drilling - (WOB:28;GPM :500;RPM:60)
14:30	14:40	0.17	6403	6403	0	.00	Survey & Conn.	Survey & Conn.@6351' Inc 16.27° Azm 328.76°
14:40	16:00	1.33	6403	6448	45	33.75	Sliding	Sliding - (WOB:20;GPM :500;TFO:15)
16:00	16:10	0.17	6448	6498	50	300.00	Drilling	Drilling - (WOB:28;GPM :500;RPM:60)
16:10	16:25	0.25	6498	6498	0	.00	Survey & Conn.	Survey & Conn.@6446' Inc 18.09° Azm 325.43°
16:25	17:20	0.92	6498	6558	60	65.45	Sliding	Sliding - (WOB:20;GPM :500;TFO:20)

Start Time	End Time	Hours	Start Depth	End Depth	Delta Depth	ROP	Activity Code	COMMENT
17:20	17:30	0.17	6558	6594	36	216.00	Drilling	Drilling - (WOB:28;GPM :500;RPM:60)
17:30	17:45	0.25	6594	6594	0	.00	Survey & Conn.	Survey & Conn.@6542' Inc 20.22° Azm 327.97°
17:45	18:15	0.50	6594	6688	94	188.00	Drilling	Drilling - (WOB:28;GPM :500;RPM:60)
18:15	18:30	0.25	6688	6688	0	.00	Survey & Conn.	Survey & Conn.@6636' Inc 17.83° Azm 327.97°
18:30	20:35	2.08	6688	6751	63	30.24	Sliding	Sliding - (WOB:18;GPM :500;TFO:30)
20:35	20:50	0.25	6751	6783	32	128.00	Drilling	Drilling - (WOB:28;GPM :500;RPM:60)
20:50	21:00	0.17	6783	6783	0	.00	Survey & Conn.	Survey & Conn.@6731' Inc 19.53° Azm 330.17°
21:00	23:15	2.25	6783	6845	62	27.56	Sliding	Sliding - (WOB:16;GPM :500;TFO:30)
23:15	23:30	0.25	6845	6877	32	128.00	Drilling	Drilling - (WOB:22;GPM :500;RPM:60)
23:30	24:00	0.50	6877	6877	0	.00	Rig Service-Inhol	Rig Service-Inhole

JOB NO.:	410413HEFMP6213	Report Time:	2400 — 5 of 28
COMPANY:	Continental Resources Inc.	API JOB #	33-053-04852
LOCATION:		WORK ORDER#	166165
RIG NAME:	Patterson 490	FIELD:	Baker
STATE:	North Dakota	Township:	153N
COUNTY:	McKenzie	Range/Section	101W — 16
WELL NAME:	Columbus Federal 1-16H	Company Man	Chris
Lead Directional :	Kaleb Smith	2nd Dir Hand :	Hilton Maldonado

Scientific Drilling

From Monday, April 29, 2013 at 0000 to Monday, April 29, 2013 at 2400

DAILY TOTALS

Start Depth	6877.00
End Depth	8054.00
Below Rot Hrs.	24.00
Total Drilled:	1177.00
Avg. Total ROP:	129.58
Slide Footage:	22.00
Slide Hours	2.17
Avg. Slide ROP:	10.15
Rotate Footage:	1155.00
Rotary Hours	6.92
Avg. Rot ROP:	166.99
Circ Hours	1.42
Ream Hours	0.00
Rotary Hrs%:	76.15
Slide Hrs%:	23.85
Rotary Ftg%:	98.13
Slide Ftg%:	1.87

cASING

Size	Lb/Ft	MD

ASSEMBLY TOTALS

BHA #	Motor SN / R.S SN	Slide Ftg	Slide Hrs	Rotate Ftg	Rotate Hrs	Circ Hrs	D & C Hrs	BHA Ftg	Avg ROP
1	2812	1,039.00	16.58	5,068.00	18.75	2.08	37.42	6,107.00	165.43
2	2023	0.00	0.00	0.00	0.00	.00	0.00	0.00	0.00

Drilling Parameters

WOB:	0
Rot Wt:	0
Pick UP:	0
Slack Off:	0
SPP:	0
Flow:	0 - 500
SPM:	0
Rot. RPM	60 - 60
Mot RPM:	0 - 0
Incl. In:	0
Azm. In:	0
Incl. Out:	0
Azm. Out:	0

Mud Record

Weight:	0
Visc:	0
Chlorides:	0
YP:	0
PV:	0
PH:	0
GAS:	0
SAND:	0
WL:	0
SOLID:	0
BHT°:	0
Flow T°:	0
Oil %:	0

Bit Record

Bit No:	3
Model	Security FX65D
SN.:	11951008
MFG.	OTHER
Type	PDC
IADC	
JETS	6-18
TFA:	1.49
Hole ID:	8.75
Bit Hrs:	38.75
Bit Ftg:	1501.00

PUMPS

Liner	0	0
Stroke	0	0
Effic.	95.00%	95.00%
Gal/Stk	0.00	0.00
BBL/Stk	0.000	0.000

Current BHA # 2

Security FX65D
Hunting - 7/8lobe 5.7stage
6.5" NM Pony
NMDC
Support Sub
Gap Sub
NMDC
9 Jts 6.5" DC
X/O
45 Jts 5" HWDP

COST BREAKDOWN

GENERAL COMMENT

Start Time	End Time	Hours	Start Depth	End Depth	Delta Depth	ROP	Activity Code	COMMENT
00:00	00:05	0.08	6877	6877	0	.00	Survey & Conn.	Survey & Conn.@6825' Inc 24.58° Azm 336.68°
00:05	00:35	0.50	6877	6971	94	188.00	Drilling	Drilling - (WOB:22;GPM :500;RPM:60)
00:35	00:45	0.17	6971	6971	0	.00	Survey & Conn.	Survey & Conn.@6919' Inc 25.74° Azm 338.56°
00:45	00:55	0.17	6971	6971	0	.00	Other	Troubleshoot MWD Tool
00:55	01:00	0.08	6971	7003	32	384.00	Drilling	Drilling - (WOB:18;GPM :500;RPM:60)
01:00	01:30	0.50	7003	7003	0	.00	Other	Troubleshoot MWD Tool
01:30	01:35	0.08	7003	7003	0	.00	MWD Survey	MWD Survey@6919' Inc 25.74° Azm 338.56°
01:35	02:00	0.42	7003	7066	63	151.20	Drilling	Drilling - (WOB:18;GPM :500;RPM:60)
02:00	02:20	0.33	7066	7066	0	.00	Survey & Conn.	Survey & Conn.@7014' Inc 25.34° Azm 337.82°
02:20	02:55	0.58	7066	7161	95	162.86	Drilling	Drilling - (WOB:18;GPM :500;RPM:60)
02:55	03:05	0.17	7161	7161	0	.00	Survey & Conn.	Survey & Conn.@7109' Inc 25.23° Azm 338.7°
03:05	03:40	0.58	7161	7255	94	161.14	Drilling	Drilling - (WOB:18;GPM :500;RPM:60)
03:40	03:50	0.17	7255	7255	0	.00	Survey & Conn.	Survey & Conn.@7203' Inc 24.47° Azm 337.82°
03:50	04:30	0.67	7255	7349	94	141.00	Drilling	Drilling - (WOB:18;GPM :500;RPM:60)

Start Time	End Time	Hours	Start Depth	End Depth	Delta Depth	ROP	Activity Code	COMMENT
04:30	04:40	0.17	7349	7349	0	.00	Survey & Conn.	Survey & Conn.@7297' Inc 24.35° Azm 337.26°
04:40	05:05	0.42	7349	7444	95	228.00	Drilling	Drilling - (WOB:18;GPM :500;RPM:60)
05:05	05:25	0.33	7444	7444	0	.00	Survey & Conn.	Survey & Conn.@7392' Inc 24.61° Azm 338.11°
05:25	06:00	0.58	7444	7537	93	159.43	Drilling	Drilling - (WOB:22;GPM :500;RPM:60)
06:00	06:15	0.25	7537	7537	0	.00	Survey & Conn.	Survey & Conn.@7485' Inc 24.06° Azm 337.87°
06:15	06:45	0.50	7537	7630	93	186.00	Drilling	Drilling - (WOB:22;GPM :500;RPM:60)
06:45	07:00	0.25	7630	7630	0	.00	Survey & Conn.	Survey & Conn.@7578' Inc 21.99° Azm 336.66°
07:00	07:40	0.67	7630	7725	95	142.50	Drilling	Drilling - (WOB:22;GPM :500;RPM:60)
07:40	07:50	0.17	7725	7725	0	.00	Survey & Conn.	Survey & Conn.@7673' Inc 20.71° Azm 336.48°
07:50	08:30	0.67	7725	7819	94	141.00	Drilling	Drilling - (WOB:22;GPM :500;RPM:60)
08:30	08:40	0.17	7819	7819	0	.00	Survey & Conn.	Survey & Conn.@7767' Inc 20.55° Azm 337.09°
08:40	09:15	0.58	7819	7915	96	164.57	Drilling	Drilling - (WOB:22;GPM :500;RPM:60)
09:15	09:25	0.17	7915	7915	0	.00	Survey & Conn.	Survey & Conn.@7863' Inc 20.23° Azm 335.72°
09:25	10:00	0.58	7915	8010	95	162.86	Drilling	Drilling - (WOB:22;GPM :500;RPM:60)
10:00	10:10	0.17	8010	8010	0	.00	Survey & Conn.	Survey & Conn.@7958' Inc 17.78° Azm 334.15°
10:10	11:05	0.92	8010	8020	10	10.91	Sliding	Sliding - (WOB:18;GPM :500;TFO:360)
11:05	11:10	0.08	8020	8042	22	264.00	Drilling	Drilling - (WOB:22;GPM :500;RPM:60)
11:10	12:25	1.25	8042	8054	12	9.60	Sliding	Sliding - (WOB:18;GPM :500;TFO:360)
12:25	13:45	1.33	8054	8054	0	.00	Circulating	Circulating
13:45	19:35	5.83	8054	8054	0	.00	POOH	POOH
19:35	22:35	3.00	8054	8054	0	.00	Change BHA	Change BHA
22:35	24:00	1.42	8054	8054	0	.00	TIH	TIH

JOB NO.:	410413HEFMP6213	Report Time:	2400 — 6 of 28
COMPANY:	Continental Resources Inc.	API JOB #	33-053-04852
LOCATION:		WORK ORDER#	166165
RIG NAME:	Patterson 490	FIELD:	Baker
STATE:	North Dakota	Township:	153N
COUNTY:	McKenzie	Range/Section	101W — 16
WELL NAME:	Columbus Federal 1-16H	Company Man	Chris
Lead Directional :	Kaleb Smith	2nd Dir Hand :	Hilton Maldonado

Scientific Drilling

From Tuesday, April 30, 2013 at 0000 to Tuesday, April 30, 2013 at 2400

DAILY TOTALS

Start Depth	8054.00
End Depth	8352.00
Below Rot Hrs.	24.00
Total Drilled:	298.00
Avg. Total ROP:	21.04
Slide Footage:	196.00
Slide Hours	12.92
Avg. Slide ROP:	15.17
Rotate Footage:	102.00
Rotary Hours	1.25
Avg. Rot ROP:	81.60
Circ Hours	2.92
Ream Hours	0.00
Rotary Hrs%:	8.82
Slide Hrs%:	91.18
Rotary Ftg%:	34.23
Slide Ftg%:	65.77

cASING

Size	Lb/Ft	MD

ASSEMBLY TOTALS

BHA #	Motor SN / R.S SN	Slide Ftg	Slide Hrs	Rotate Ftg	Rotate Hrs	Circ Hrs	D & C Hrs	BHA Ftg	Avg ROP
2	2023	422.00	28.50	1,079.00	10.25	7.92	46.67	1,501.00	35.32

Drilling Parameters

WOB:	0
Rot Wt:	157
Pick UP:	170
Slack Off:	140
SPP:	0
Flow:	0 - 598
SPM:	0
Rot. RPM	45 - 60
Mot RPM:	0 - 0
Incl. In:	0
Azm. In:	0
Incl. Out:	0
Azm. Out:	0

Mud Record

Oil Base

Weight:	9.4
Visc:	49
Chlorides:	50200
YP:	11
PV:	12
PH:	0
GAS:	0
SAND:	0
WL:	0
SOLID:	6.08
BHT°:	170
Flow T°:	0
Oil %:	72

Bit Record

Bit No:	3
Model	Security FX65D
SN.:	11951008
MFG.	OTHER
Type	PDC
IADC	
JETS	6-18
TFA:	1.49
Hole ID:	8.75
Bit Hrs:	38.75
Bit Ftg:	1501.00

PUMPS

Liner	0	0
Stroke	0	0
Effic.	95.00%	95.00%
Gal/Stk	0.00	0.00
BBL/Stk	0.000	0.000

Current BHA # 2

Security FX65D
Hunting - 7/8lobe 5.7stage
6.5" NM Pony
NMDC
Support Sub
Gap Sub
NMDC
9 Jts 6.5" DC
X/O
45 Jts 5" HWDP

COST BREAKDOWN

GENERAL COMMENT

Start Time	End Time	Hours	Start Depth	End Depth	Delta Depth	ROP	Activity Code	COMMENT
00:00	05:00	5.00	8054	8054	0	.00	TIH	TIH
05:00	05:40	0.67	8054	8060	6	9.00	Drilling	Drilling - (WOB:18;GPM :500;RPM:60)
05:40	07:45	2.08	8060	8098	38	18.24	Sliding	Sliding - (WOB:18;GPM :500;TFO:360)
07:45	07:55	0.17	8098	8098	0	.00	Survey & Conn.	Survey & Conn.@8029' Inc 15.83° Azm 332.19°
07:55	08:00	0.08	8098	8123	25	300.00	Drilling	Drilling - (WOB:18;GPM :500;RPM:60)
08:00	09:15	1.25	8123	8144	21	16.80	Sliding	Not effective because it would stall and spike every foot of the slide. Sliding - (WOB:22;GPM :596;TFO:360)
09:15	10:05	0.83	8144	8144	0	.00	Circulating	Circulating
10:05	11:30	1.42	8144	8186	42	29.65	Sliding	Not effective because it would stall and spike every foot of the slide. Sliding - (WOB:22;GPM :596;TFO:360)
11:30	11:40	0.17	8186	8186	0	.00	Survey & Conn.	Survey & Conn.@8124' Inc 14.61° Azm 333.31°
11:40	12:35	0.92	8186	8200	14	15.27	Sliding	Not effective because it would stall and spike every foot of the slide. Sliding - (WOB:22;GPM :596;TFO:360)

Start Time	End Time	Hours	Start Depth	End Depth	Delta Depth	ROP	Activity Code	COMMENT
12:35	14:20	1.75	8200	8225	25	14.29	Sliding	Good Slide Sliding - (WOB:22;GPM :596;TFO:360)
14:20	14:45	0.42	8225	8281	56	134.40	Drilling	Drilling - (WOB:18;GPM :598;RPM:60)
14:45	15:00	0.25	8281	8281	0	.00	Survey & Conn.	Survey & Conn.@8219' Inc 15.61° Azm 337.25°
15:00	15:05	0.08	8281	8296	15	180.00	Drilling	Drilling - (WOB:18;GPM :598;RPM:60)
15:05	20:00	4.92	8296	8349	53	10.78	Sliding	Sliding - (WOB:22;GPM :596;TFO:-30)
20:00	20:25	0.42	8349	8349	0	.00	Service-Inhol	Work on pumps
20:25	21:00	0.58	8349	8352	3	5.14	Sliding	Sliding - (WOB:22;GPM :596;TFO:-30)
21:00	21:25	0.42	8352	8352	0	.00	Rig repair	Work on pumps
21:25	23:05	1.67	8352	8352	0	.00	Circulating	Circulating
23:05	24:00	0.92	8352	8352	0	.00	POOH	POOH

JOB NO.:	410413HEFMP6213	Report Time:	2400	7 of 28
COMPANY:	Continental Resources Inc.	API JOB #	33-053-04852	
LOCATION:		WORK ORDER#	166165	
RIG NAME:	Patterson 490	FIELD:	Baker	
STATE:	North Dakota	Township:	153N	
COUNTY:	McKenzie	Range/Section	101W	16
WELL NAME:	Columbus Federal 1-16H	Company Man	Chris	
Lead Directional :	Kaleb Smith	2nd Dir Hand :	Hilton Maldonado	

Scientific Drilling

From Wednesday, May 01, 2013 at 0000 to Wednesday, May 01, 2013 at 2400

DAILY TOTALS

Start Depth	0.00
End Depth	0.00
Below Rot Hrs.	24.00
Total Drilled:	0.00
Avg. Total ROP:	NA
Slide Footage:	0.00
Slide Hours	0.00
Avg. Slide ROP:	NA
Rotate Footage:	0.00
Rotary Hours	0.00
Avg. Rot ROP:	NA
Circ Hours	0.00
Ream Hours	0.00
Rotary Hrs%:	NA
Slide Hrs%:	NA
Rotary Ftg%:	NA
Slide Ftg%:	NA

cASING

Size	Lb/Ft	MD

ASSEMBLY TOTALS

BHA #	Motor SN / R.S SN	Slide Ftg	Slide Hrs	Rotate Ftg	Rotate Hrs	Circ Hrs	D & C Hrs	BHA Ftg	Avg ROP
2	2023	422.00	28.50	1,079.00	10.25	7.92	46.67	1,501.00	35.32

Drilling Parameters

WOB:	0
Rot Wt:	157
Pick UP:	170
Slack Off:	140
SPP:	0
Flow:	0 - 0
SPM:	0
Rot. RPM	-
Mot RPM:	-
Incl. In:	0
Azm. In:	0
Incl. Out:	0
Azm. Out:	0

Mud Record

Oil Base

Weight:	9.4
Visc:	49
Chlorides:	50200
YP:	11
PV:	12
PH:	0
GAS:	0
SAND:	0
WL:	0
SOLID:	6.08
BHT°:	170
Flow T°:	0
Oil %:	72

Bit Record

Bit No:	3
Model	Security FX65D
SN.:	11951008
MFG.	OTHER
Type	PDC
IADC	
JETS	6-18
TFA:	1.49
Hole ID:	8.75
Bit Hrs:	38.75
Bit Ftg:	1501.00

PUMPS

Liner	0	0
Stroke	0	0
Effic.	95.00%	95.00%
Gal/Stk	0.00	0.00
BBL/Stk	0.000	0.000

Current BHA # 2

Security FX65D
Hunting - 7/8lobe 5.7stage
6.5" NM Pony
NMDC
Support Sub
Gap Sub
NMDC
9 Jts 6.5" DC
X/O
45 Jts 5" HWDP

COST BREAKDOWN

GENERAL COMMENT

Start Time	End Time	Hours	Start Depth	End Depth	Delta Depth	ROP	Activity Code	COMMENT
00:00	02:15	2.25	8352	8352	0	.00	POOH	POOH
02:15	24:00	21.75	8352	8352	0	.00	Rig repair	Rig repair pump #2

JOB NO.:	410413HEFMP6213	Report Time:	2400	8 of 28
COMPANY:	Continental Resources Inc.	API JOB #	33-053-04852	
LOCATION:		WORK ORDER#	166165	
RIG NAME:	Patterson 490	FIELD:	Baker	
STATE:	North Dakota	Township:	153N	
COUNTY:	McKenzie	Range/Section	101W	16
WELL NAME:	Columbus Federal 1-16H	Company Man	Chris	
Lead Directional :	Kaleb Smith	2nd Dir Hand :	Hilton Maldonado	

Scientific Drilling

From Thursday, May 02, 2013 at 0000 to Thursday, May 02, 2013 at 2400

DAILY TOTALS

Start Depth	8352.00
End Depth	8608.00
Below Rot Hrs.	24.00
Total Drilled:	256.00
Avg. Total ROP:	29.83
Slide Footage:	137.00
Slide Hours	7.50
Avg. Slide ROP:	18.27
Rotate Footage:	119.00
Rotary Hours	1.08
Avg. Rot ROP:	109.85
Circ Hours	0.00
Ream Hours	0.00
Rotary Hrs%:	12.62
Slide Hrs%:	87.38
Rotary Ftg%:	46.48
Slide Ftg%:	53.52

cASING

Size	Lb/Ft	MD

ASSEMBLY TOTALS

BHA #	Motor SN / R.S SN	Slide Ftg	Slide Hrs	Rotate Ftg	Rotate Hrs	Circ Hrs	D & C Hrs	BHA Ftg	Avg ROP
2	2023	422.00	28.50	1,079.00	10.25	7.92	46.67	1,501.00	35.32

Drilling Parameters

WOB:	0
Rot Wt:	168
Pick UP:	189
Slack Off:	140
SPP:	0
Flow:	0 - 598
SPM:	0
Rot. RPM	45 - 60
Mot RPM:	0 - 0
Incl. In:	0
Azm. In:	0
Incl. Out:	0
Azm. Out:	0

Mud Record

Oil Base

Weight:	9.9
Visc:	55
Chlorides:	51000
YP:	8
PV:	14
PH:	0
GAS:	0
SAND:	0
WL:	0
SOLID:	8.59
BHT°:	175
Flow T°:	0
Oil %:	77

Bit Record

Bit No:	3
Model	Security FX65D
SN.:	11951008
MFG.	OTHER
Type	PDC
IADC	
JETS	6-18
TFA:	1.49
Hole ID:	8.75
Bit Hrs:	38.75
Bit Ftg:	1501.00

PUMPS

Liner	0	0
Stroke	0	0
Effic.	95.00%	95.00%
Gal/Stk	0.00	0.00
BBL/Stk	0.000	0.000

Current BHA # 2

Security FX65D
Hunting - 7/8lobe 5.7stage
6.5" NM Pony
NMDC
Support Sub
Gap Sub
NMDC
9 Jts 6.5" DC
X/O
45 Jts 5" HWDP

COST BREAKDOWN

GENERAL COMMENT

Start Time	End Time	Hours	Start Depth	End Depth	Delta Depth	ROP	Activity Code	COMMENT
00:00	08:00	8.00	8352	8352	0	.00	Rig repair	Rig repair/Pump #2
08:00	11:40	3.67	8352	8352	0	.00	TIH	TIH
11:40	11:55	0.25	8352	8352	0	.00	Other	Break Circulation
11:55	12:50	0.92	8352	8377	25	27.27	Sliding	Sliding - (WOB:30;GPM :596;TFO:-30)
12:50	12:55	0.08	8377	8377	0	.00	Survey & Conn.	Survey & Conn.@8315' Inc 15.14° Azm 336.41°
12:55	13:00	0.08	8377	8392	15	180.00	Drilling	Drilling - (WOB:25;GPM :598;RPM:45)
13:00	16:00	3.00	8392	8471	79	26.33	Sliding	Sliding - (WOB:30;GPM :596;TFO:-30)
16:00	16:15	0.25	8471	8471	0	.00	Survey & Conn.	Survey & Conn.@8409' Inc 19.07° Azm 334.04°
16:15	17:05	0.83	8471	8566	95	114.00	Drilling	Drilling - (WOB:25;GPM :598;RPM:60)
17:05	17:10	0.08	8566	8566	0	.00	Survey & Conn.	Survey & Conn.@8504' Inc 18.66° Azm 335.98°
17:10	17:20	0.17	8566	8575	9	54.00	Drilling	Drilling - (WOB:25;GPM :598;RPM:60)
17:20	20:55	3.58	8575	8608	33	9.21	Sliding	Sliding - (WOB:22;GPM :596;TFO:-20)
20:55	24:00	3.08	8608	8608	0	.00	Rig repair	Rig repair / Washed Stand pipe

JOB NO.:	410413HEFMP6213	Report Time:	2400	9 of 28
COMPANY:	Continental Resources Inc.	API JOB #	33-053-04852	
LOCATION:		WORK ORDER#	166165	
RIG NAME:	Patterson 490	FIELD:	Baker	
STATE:	North Dakota	Township:	153N	
COUNTY:	McKenzie	Range/Section	101W	16
WELL NAME:	Columbus Federal 1-16H	Company Man	Chris	
Lead Directional :	Kaleb Smith	2nd Dir Hand :	Hilton Maldonado	

Scientific Drilling

From Friday, May 03, 2013 at 0000 to Friday, May 03, 2013 at 2400

DAILY TOTALS

Start Depth	8608.00
End Depth	9555.00
Below Rot Hrs.	24.00
Total Drilled:	947.00
Avg. Total ROP:	59.19
Slide Footage:	89.00
Slide Hours	8.08
Avg. Slide ROP:	11.01
Rotate Footage:	858.00
Rotary Hours	7.92
Avg. Rot ROP:	108.38
Circ Hours	5.42
Ream Hours	4.17
Rotary Hrs%:	49.48
Slide Hrs%:	50.52
Rotary Ftg%:	90.60
Slide Ftg%:	9.40

cASING

Size	Lb/Ft	MD

ASSEMBLY TOTALS

BHA #	Motor SN / R.S SN	Slide Ftg	Slide Hrs	Rotate Ftg	Rotate Hrs	Circ Hrs	D & C Hrs	BHA Ftg	Avg ROP
2	2023	422.00	28.50	1,079.00	10.25	7.92	46.67	1,501.00	35.32

Drilling Parameters

WOB:	0
Rot Wt:	168
Pick UP:	189
Slack Off:	140
SPP:	0
Flow:	0 - 598
SPM:	0
Rot. RPM	60 - 60
Mot RPM:	0 - 0
Incl. In:	0
Azm. In:	0
Incl. Out:	0
Azm. Out:	0

Mud Record

Oil Base

Weight:	9.9
Visc:	55
Chlorides:	51000
YP:	8
PV:	14
PH:	0
GAS:	0
SAND:	0
WL:	0
SOLID:	8.59
BHT°:	175
Flow T°:	0
Oil %:	77

Bit Record

Bit No:	3
Model	Security FX65D
SN.:	11951008
MFG.	OTHER
Type	PDC
IADC	
JETS	6-18
TFA:	1.49
Hole ID:	8.75
Bit Hrs:	38.75
Bit Ftg:	1501.00

PUMPS

Liner	0	0
Stroke	0	0
Effic.	95.00%	95.00%
Gal/Stk	0.00	0.00
BBL/Stk	0.000	0.000

Current BHA # 2

Security FX65D
Hunting - 7/8lobe 5.7stage
6.5" NM Pony
NMDC
Support Sub
Gap Sub
NMDC
9 Jts 6.5" DC
X/O
45 Jts 5" HWDP

COST BREAKDOWN

GENERAL COMMENT

Start Time	End Time	Hours	Start Depth	End Depth	Delta Depth	ROP	Activity Code	COMMENT
00:00	00:30	0.50	8608	8608	0	.00	Rig repair	Rig repair / Washed Stand Pipe
00:30	04:15	3.75	8608	8660	52	13.87	Sliding	Sliding - (WOB:22;GPM :596;TFO:-30)
04:15	04:30	0.25	8660	8660	0	.00	Survey & Conn.	Survey & Conn.@8598' Inc 18.91° Azm 337.29°
04:30	05:00	0.50	8660	8754	94	188.00	Drilling	Drilling - (WOB:17;GPM :598;RPM:60)
05:00	05:10	0.17	8754	8754	0	.00	Survey & Conn.	Survey & Conn.@8692' Inc 20.1° Azm 338.04°
05:10	05:50	0.67	8754	8848	94	141.00	Drilling	Drilling - (WOB:18;GPM :598;RPM:60)
05:50	06:00	0.17	8848	8848	0	.00	Survey & Conn.	Survey & Conn.@8786' Inc 20.18° Azm 338.12°
06:00	07:00	1.00	8848	8944	96	96.00	Drilling	Drilling - (WOB:18;GPM :598;RPM:60)
07:00	07:10	0.17	8944	8944	0	.00	Survey & Conn.	Survey & Conn.@8882' Inc 19.71° Azm 339.51°
07:10	08:00	0.83	8944	9038	94	112.80	Drilling	Drilling - (WOB:18;GPM :598;RPM:60)
08:00	08:10	0.17	9038	9038	0	.00	Survey & Conn.	Survey & Conn.@8976' Inc 18.64° Azm 341.05°
08:10	09:00	0.83	9038	9133	95	114.00	Drilling	Drilling - (WOB:18;GPM :598;RPM:60)
09:00	09:05	0.08	9133	9133	0	.00	Survey & Conn.	Survey & Conn.@9071' Inc 18.41° Azm 341.62°
09:05	10:10	1.08	9133	9227	94	86.77	Drilling	Drilling - (WOB:18;GPM :598;RPM:60)

Start Time	End Time	Hours	Start Depth	End Depth	Delta Depth	ROP	Activity Code	COMMENT
10:10	10:20	0.17	9227	9227	0	.00	Survey & Conn.	Survey & Conn.@9165' Inc 17.11° Azm 342.15°
10:20	11:25	1.08	9227	9321	94	86.77	Drilling	Drilling - (WOB:18;GPM :598;RPM:60)
11:25	11:30	0.08	9321	9321	0	.00	Survey & Conn.	Survey & Conn.@9259' Inc 16.14° Azm 343.45°
11:30	12:15	0.75	9321	9414	93	124.00	Drilling	Drilling - (WOB:18;GPM :598;RPM:60)
12:15	12:25	0.17	9414	9414	0	.00	Survey & Conn.	Survey & Conn.@9352' Inc 14.6° Azm 343.91°
12:25	13:30	1.08	9414	9508	94	86.77	Drilling	Drilling - (WOB:18;GPM :598;RPM:60)
13:30	13:40	0.17	9508	9508	0	.00	Survey & Conn.	Survey & Conn.@9446' Inc 12.67° Azm 345.08°
13:40	13:45	0.08	9508	9518	10	120.00	Drilling	Drilling - (WOB:18;GPM :598;RPM:60)
13:45	18:05	4.33	9518	9555	37	8.54	Sliding	Sliding - (WOB:22;GPM :596;TFO:-30)
18:05	19:20	1.25	9555	9555	0	.00	Circulating	Circulating
19:20	23:30	4.17	9555	9555	0	.00	Reaming	Ream through salts
23:30	24:00	0.50	9555	9555	0	.00	POOH	POOH

JOB NO.:	410413HEFMP6213	Report Time:	2400	10 of 28
COMPANY:	Continental Resources Inc.	API JOB #	33-053-04852	
LOCATION:		WORK ORDER#	166165	
RIG NAME:	Patterson 490	FIELD:	Baker	
STATE:	North Dakota	Township:	153N	
COUNTY:	McKenzie	Range/Section	101W	16
WELL NAME:	Columbus Federal 1-16H	Company Man	Chris	
Lead Directional :	Kaleb Smith	2nd Dir Hand :	Hilton Maldonado	

Scientific Drilling

From Saturday, May 04, 2013 at 0000 to Saturday, May 04, 2013 at 2400

DAILY TOTALS

Start Depth	9555.00
End Depth	9664.00
Below Rot Hrs.	22.00
Total Drilled:	109.00
Avg. Total ROP:	14.37
Slide Footage:	77.00
Slide Hours	7.33
Avg. Slide ROP:	10.50
Rotate Footage:	32.00
Rotary Hours	0.25
Avg. Rot ROP:	128.00
Circ Hours	1.25
Ream Hours	1.17
Rotary Hrs%:	3.30
Slide Hrs%:	96.70
Rotary Ftg%:	29.36
Slide Ftg%:	70.64

cASING

Size	Lb/Ft	MD

ASSEMBLY TOTALS

BHA #	Motor SN / R.S SN	Slide Ftg	Slide Hrs	Rotate Ftg	Rotate Hrs	Circ Hrs	D & C Hrs	BHA Ftg	Avg ROP
2	2023	422.00	28.50	1,079.00	10.25	7.92	46.67	1,501.00	35.32
3	2124	77.00	7.33	32.00	0.25	1.25	8.83	109.00	0.00

Drilling Parameters

WOB:	27
Rot Wt:	168
Pick UP:	189
Slack Off:	140
SPP:	2900
Flow:	0 - 598
SPM:	200
Rot. RPM	60 - 60
Mot RPM:	0 - 0
Incl. In:	0
Azm. In:	0
Incl. Out:	0
Azm. Out:	0

Mud Record

Oil Base

Weight:	9.9
Visc:	55
Chlorides:	51000
YP:	8
PV:	14
PH:	0
GAS:	0
SAND:	0
WL:	0
SOLID:	8.59
BHT°:	175
Flow T°:	0
Oil %:	77

Bit Record

Bit No:	3rr
Model	Security FX65D
SN.:	11951008
MFG.	OTHER
Type	PDC
IADC	
JETS	6-18
TFA:	1.49
Hole ID:	8.75
Bit Hrs:	38.75
Bit Ftg:	1501.00

PUMPS

Liner	0	0
Stroke	0	0
Effic.	95.00%	95.00%
Gal/Stk	0.00	0.00
BBL/Stk	0.000	0.000

Current BHA # 3

Security FX65D
Hunting - 7/8lobe 5.7stage
6.5" NM Pony
NMDC
Support Sub
Gap Sub
NMDC
X/O
45 Jts 5" HWDP

COST BREAKDOWN

GENERAL COMMENT

Start Time	End Time	Hours	Start Depth	End Depth	Delta Depth	ROP	Activity Code	COMMENT
00:00	05:30	5.50	9555	9555	0	.00	POOH	POOH
05:30	07:30	2.00	9555	9555	0	.00	L/D DP	L/D DC
07:30	09:00	1.50	9555	9555	0	.00	Change BHA	Change BHA
09:00	14:50	5.83	9555	9555	0	.00	TIH	TIH
14:50	16:00	1.17	9555	9555	0	.00	Reaming	Ream salts
16:00	21:55	5.92	9555	9616	61	10.31	Sliding	Sliding - (WOB:22;GPM :596;TFO:-30)
21:55	22:15	0.33	9616	9616	0	.00	Survey & Conn.	Survey & Conn.@9554' Inc 13.31° Azm 343.16°
22:15	22:30	0.25	9616	9648	32	128.00	Drilling	Drilling - (WOB:24;GPM :598;RPM:60)
22:30	22:35	0.08	9648	9648	0	.00	MWD Survey	MWD Survey@9554' Inc 13.31° Azm 343.16°
22:35	24:00	1.42	9648	9664	16	11.29	Sliding	Sliding - (WOB:27;GPM :596;TFO:-30)

JOB NO.:	410413HEFMP6213	Report Time:	2400	11 of 28
COMPANY:	Continental Resources Inc.	API JOB #	33-053-04852	
LOCATION:		WORK ORDER#	166165	
RIG NAME:	Patterson 490	FIELD:	Baker	
STATE:	North Dakota	Township:	153N	
COUNTY:	McKenzie	Range/Section	101W	16
WELL NAME:	Columbus Federal 1-16H	Company Man	Chris	
Lead Directional :	Kaleb Smith	2nd Dir Hand :	Hilton Maldonado	

Scientific Drilling

From Sunday, May 05, 2013 at 0000 to Sunday, May 05, 2013 at 2400

DAILY TOTALS

Start Depth	9664.00
End Depth	10333.00
Below Rot Hrs.	24.00
Total Drilled:	669.00
Avg. Total ROP:	30.64
Slide Footage:	176.00
Slide Hours	15.33
Avg. Slide ROP:	11.48
Rotate Footage:	493.00
Rotary Hours	6.50
Avg. Rot ROP:	75.85
Circ Hours	1.08
Ream Hours	0.00
Rotary Hrs%:	29.77
Slide Hrs%:	70.23
Rotary Ftg%:	73.69
Slide Ftg%:	26.31

cASING

Size	Lb/Ft	MD

ASSEMBLY TOTALS

BHA #	Motor SN / R.S SN	Slide Ftg	Slide Hrs	Rotate Ftg	Rotate Hrs	Circ Hrs	D & C Hrs	BHA Ftg	Avg ROP
3	2124	343.00	30.00	664.00	9.42	2.25	41.67	1,007.00	25.07

Drilling Parameters

WOB:	26
Rot Wt:	168
Pick UP:	189
Slack Off:	140
SPP:	2900
Flow:	0 - 598
SPM:	200
Rot. RPM	45 - 60
Mot RPM:	0 - 0
Incl. In:	0
Azm. In:	0
Incl. Out:	0
Azm. Out:	0

Mud Record

Oil Base

Weight:	10.1
Visc:	44
Chlorides:	51000
YP:	9
PV:	13
PH:	0
GAS:	0
SAND:	0
WL:	0
SOLID:	10.1
BHT°:	193
Flow T°:	0
Oil %:	81

Bit Record

Bit No:	3rr
Model	Security FX65D
SN.:	11951008
MFG.	OTHER
Type	PDC
IADC	
JETS	6-18
TFA:	1.49
Hole ID:	8.75
Bit Hrs:	38.75
Bit Ftg:	1501.00

PUMPS

Liner	0	0
Stroke	0	0
Effic.	95.00%	95.00%
Gal/Stk	0.00	0.00
BBL/Stk	0.000	0.000

Current BHA # 3

Security FX65D
Hunting - 7/8lobe 5.7stage
6.5" NM Pony
NMDC
Support Sub
Gap Sub
NMDC
X/O
45 Jts 5" HWDP

COST BREAKDOWN

GENERAL COMMENT

Start Time	End Time	Hours	Start Depth	End Depth	Delta Depth	ROP	Activity Code	COMMENT
00:00	03:25	3.42	9664	9711	47	13.76	Sliding	Sliding - (WOB:22;GPM :596;TFO:-30)
03:25	03:40	0.25	9711	9711	0	.00	Survey & Conn.	Survey & Conn.@9649' Inc 16.87° Azm 339.67°
03:40	03:55	0.25	9711	9743	32	128.00	Drilling	Drilling - (WOB:27;GPM :598;RPM:60)
03:55	04:00	0.08	9743	9743	0	.00	MWD Survey	MWD Survey@9649' Inc 16.87° Azm 339.67°
04:00	06:15	2.25	9743	9771	28	12.44	Sliding	Sliding - (WOB:24;GPM :596;TFO:-40)
06:15	06:35	0.33	9771	9807	36	108.00	Drilling	Drilling - (WOB:30;GPM :598;RPM:60)
06:35	06:40	0.08	9807	9807	0	.00	Survey & Conn.	Survey & Conn.@9745' Inc 20.08° Azm 335.6°
06:40	06:55	0.25	9807	9836	29	116.00	Drilling	Drilling - (WOB:30;GPM :598;RPM:60)
06:55	09:35	2.67	9836	9866	30	11.25	Sliding	Sliding - (WOB:24;GPM :598;TFO:360)
09:35	09:55	0.33	9866	9899	33	99.00	Drilling	Drilling - (WOB:30;GPM :598;RPM:60)
09:55	10:00	0.08	9899	9899	0	.00	Survey & Conn.	Survey & Conn.@9837' Inc 20.8° Azm 332.04°
10:00	11:05	1.08	9899	9994	95	87.69	Drilling	Drilling - (WOB:30;GPM :598;RPM:60)
11:05	11:15	0.17	9994	9994	0	.00	Survey & Conn.	Survey & Conn.@9932' Inc 20.9° Azm 328.48°
11:15	12:35	1.33	9994	10088	94	70.50	Drilling	Drilling - (WOB:30;GPM :598;RPM:60)

Start Time	End Time	Hours	Start Depth	End Depth	Delta Depth	ROP	Activity Code	COMMENT
12:35	12:40	0.08	10088	10088	0	.00	Survey & Conn.	Survey & Conn.@10026' Inc 20.06° Azm 329.42°
12:40	13:00	0.33	10088	10108	20	60.00	Drilling	Drilling - (WOB:30;GPM :598;RPM:60)
13:00	15:40	2.67	10108	10138	30	11.25	Sliding	Sliding - (WOB:35;GPM :598;TFO:360)
15:40	16:45	1.08	10138	10183	45	41.54	Drilling	Drilling - (WOB:30;GPM :598;RPM:45)
16:45	17:45	1.00	10183	10183	0	.00	Rig Service-Inhol	Rig Service-Inhole
17:45	18:00	0.25	10183	10183	0	.00	Survey & Conn.	Survey & Conn.@10121' Inc 19.48° Azm 327.46°
18:00	19:15	1.25	10183	10277	94	75.20	Drilling	Drilling - (WOB:30;GPM :598;RPM:45)
19:15	19:25	0.17	10277	10277	0	.00	Survey & Conn.	Survey & Conn.@10215' Inc 18.45° Azm 326.26°
19:25	19:40	0.25	10277	10292	15	60.00	Drilling	Drilling - (WOB:30;GPM :598;RPM:45)
19:40	24:00	4.33	10292	10333	41	9.46	Sliding	Sliding - (WOB:26;GPM :598;TFO:50)

JOB NO.:	410413HEFMP6213	Report Time:	2400 — 12 of 28
COMPANY:	Continental Resources Inc.	API JOB #	33-053-04852
LOCATION:		WORK ORDER#	166165
RIG NAME:	Patterson 490	FIELD:	Baker
STATE:	North Dakota	Township:	153N
COUNTY:	McKenzie	Range/Section	101W — 16
WELL NAME:	Columbus Federal 1-16H	Company Man	Chris
Lead Directional :	Kaleb Smith	2nd Dir Hand :	Hilton Maldonado

Scientific Drilling

From Monday, May 06, 2013 at 0000 to Monday, May 06, 2013 at 2400

DAILY TOTALS

Start Depth	10333.00
End Depth	10562.00
Below Rot Hrs.	24.00
Total Drilled:	229.00
Avg. Total ROP:	22.90
Slide Footage:	90.00
Slide Hours	7.33
Avg. Slide ROP:	12.27
Rotate Footage:	139.00
Rotary Hours	2.67
Avg. Rot ROP:	52.13
Circ Hours	0.92
Ream Hours	0.00
Rotary Hrs%:	26.67
Slide Hrs%:	73.33
Rotary Ftg%:	60.70
Slide Ftg%:	39.30

cASING

Size	Lb/Ft	MD

ASSEMBLY TOTALS

BHA #	Motor SN / R.S SN	Slide Ftg	Slide Hrs	Rotate Ftg	Rotate Hrs	Circ Hrs	D & C Hrs	BHA Ftg	Avg ROP
3	2124	343.00	30.00	664.00	9.42	2.25	41.67	1,007.00	25.07
4	6751XD-1026	0.00	0.00	0.00	0.00	.00	0.00	0.00	0.00

Drilling Parameters

WOB:	0
Rot Wt:	168
Pick UP:	189
Slack Off:	140
SPP:	0
Flow:	0 - 598
SPM:	0
Rot. RPM	45 - 45
Mot RPM:	0 - 0
Incl. In:	0
Azm. In:	0
Incl. Out:	0
Azm. Out:	0

Mud Record

Oil Base

Weight:	10.1
Visc:	44
Chlorides:	51000
YP:	9
PV:	13
PH:	0
GAS:	0
SAND:	0
WL:	0
SOLID:	10.1
BHT°:	193
Flow T°:	0
Oil %:	81

Bit Record

Bit No:	4
Model	Security
SN.:	12031577
MFG.	
Type	PDC
IADC	
JETS	5-18
TFA:	1.242
Hole ID:	8.75
Bit Hrs:	17.58
Bit Ftg:	839.00

PUMPS

Liner	0	0
Stroke	0	0
Effic.	95.00%	95.00%
Gal/Stk	0.00	0.00
BBL/Stk	0.000	0.000

Current BHA # 4

Security FXD55M
Leam 7/8lbe,5.0stg 2.25FBH
Float Sub
6.5" NM Pony
NMDC
Support Sub
Gap Sub
6.5" NM Flex
6.5" NM Flex
X/O
45 Jts 5" HWDP

COST BREAKDOWN

GENERAL COMMENT

Start Time	End Time	Hours	Start Depth	End Depth	Delta Depth	ROP	Activity Code	COMMENT
00:00	02:50	2.83	10333	10371	38	13.41	Sliding	Sliding - (WOB:30;GPM :598;TFO:50)
02:50	02:55	0.08	10371	10373	2	24.00	Drilling	Drilling - (WOB:30;GPM :598;RPM:45)
02:55	03:10	0.25	10373	10373	0	.00	Survey & Conn.	Survey & Conn.@10311' Inc 16.98° Azm 326.92°
03:10	04:10	1.00	10373	10436	63	63.00	Drilling	Drilling - (WOB:30;GPM :598;RPM:45)
04:10	04:15	0.08	10436	10436	0	.00	MWD Survey	MWD Survey@10406' Inc 17.69° Azm 331.28°
04:15	06:25	2.17	10436	10468	32	14.77	Sliding	Sliding - (WOB:30;GPM :598;TFO:30)
06:25	06:35	0.17	10468	10468	0	.00	Survey & Conn.	Survey & Conn.@10406' Inc 17.69° Azm 331.28°
06:35	06:55	0.33	10468	10488	20	60.00	Drilling	Drilling - (WOB:30;GPM :598;RPM:45)
06:55	09:15	2.33	10488	10508	20	8.57	Sliding	Sliding - (WOB:30;GPM :598;TFO:30)
09:15	10:30	1.25	10508	10562	54	43.20	Drilling	Drilling - (WOB:30;GPM :598;RPM:45)
10:30	10:35	0.08	10562	10562	0	.00	MWD Survey	MWD Survey@10530' Inc 17.92° Azm 331.94°
10:35	11:20	0.75	10562	10562	0	.00	Circulating	Circulating
11:20	17:00	5.67	10562	10562	0	.00	POOH	POOH
17:00	18:45	1.75	10562	10562	0	.00	Change BHA	Change BHA

Start Time	End Time	Hours	Start Depth	End Depth	Delta Depth	ROP	Activity Code	COMMENT
18:45	24:00	5.25	10562	10562	0	.00	TIH	TIH

	JOB NO.:	410413HEFMP6213	Report Time:	2400	13 of 28
	COMPANY:	Continental Resources Inc.	API JOB #	33-053-04852	
	LOCATION:		WORK ORDER#	166165	
Scientific Drilling	RIG NAME:	Patterson 490	FIELD:	Baker	
	STATE:	North Dakota	Township:	153N	
	COUNTY:	McKenzie	Range/Section	101W	16
	WELL NAME:	Columbus Federal 1-16H	Company Man	Chris	
	Lead Directional :	Kaleb Smith	2nd Dir Hand :	Hilton Maldonado	

From Tuesday, May 07, 2013 at 0000 to Tuesday, May 07, 2013 at 2400

DAILY TOTALS

Start Depth	10562.00
End Depth	11098.00
Below Rot Hrs.	24.00
Total Drilled:	536.00
Avg. Total ROP:	44.36
Slide Footage:	508.00
Slide Hours	11.25
Avg. Slide ROP:	45.16
Rotate Footage:	28.00
Rotary Hours	0.83
Avg. Rot ROP:	33.60
Circ Hours	3.75
Ream Hours	0.50
Rotary Hrs%:	6.90
Slide Hrs%:	93.10
Rotary Ftg%:	5.22
Slide Ftg%:	94.78

cASING

Size	Lb/Ft	MD

ASSEMBLY TOTALS

BHA #	Motor SN / R.S SN	Slide Ftg	Slide Hrs	Rotate Ftg	Rotate Hrs	Circ Hrs	D & C Hrs	BHA Ftg	Avg ROP
4	6751XD-1026	638.00	14.42	201.00	3.17	22.08	39.67	839.00	43.40

Drilling Parameters

WOB:	55
Rot Wt:	168
Pick UP:	189
Slack Off:	140
SPP:	3400
Flow:	0 - 598
SPM:	200
Rot. RPM	30 - 30
Mot RPM:	0 - 30
Incl. In:	0
Azm. In:	0
Incl. Out:	0
Azm. Out:	0

Mud Record

Oil Base

Weight:	10.1
Visc:	44
Chlorides:	51000
YP:	9
PV:	13
PH:	0
GAS:	0
SAND:	0
WL:	0
SOLID:	10.1
BHT°:	193
Flow T°:	0
Oil %:	81

Bit Record

Bit No:	4
Model	Security
SN.:	12031577
MFG.	
Type	PDC
IADC	
JETS	5-18
TFA:	1.242
Hole ID:	8.75
Bit Hrs:	17.58
Bit Ftg:	839.00

PUMPS

Liner	0	0
Stroke	0	0
Effic.	95.00%	95.00%
Gal/Stk	0.00	0.00
BBL/Stk	0.000	0.000

Current BHA # 4

Security FXD55M
Leam 7/8lbe,5.0stg 2.25FBH
Float Sub
6.5" NM Pony
NMDC
Support Sub
Gap Sub
6.5" NM Flex
6.5" NM Flex
X/O
45 Jts 5" HWDP

COST BREAKDOWN

GENERAL COMMENT

Start Time	End Time	Hours	Start Depth	End Depth	Delta Depth	ROP	Activity Code	COMMENT
00:00	05:30	5.50	10562	10562	0	.00	TIH	TIH
05:30	06:00	0.50	10562	10562	0	.00	Reaming	Find bottom and work tool face.
06:00	07:05	1.08	10562	10562	0	.00	Other	Replace rotating head
07:05	07:45	0.67	10562	10588	26	39.00	Sliding	Sliding - (WOB:34;GPM :535;TFO:360)
07:45	07:55	0.17	10588	10588	0	.00	Survey & Conn.	Survey & Conn.@10562' Inc 19.05° Azm 331.83°
07:55	08:50	0.92	10588	10620	32	34.91	Sliding	Sliding - (WOB:38;GPM :535;TFO:360)
08:50	08:55	0.08	10620	10620	0	.00	MWD Survey	MWD Survey@10594' Inc 22.17° Azm 333.17°
08:55	09:05	0.17	10620	10624	4	24.00	Drilling	Drilling - (WOB:20;GPM :598;RPM:30)
09:05	09:45	0.67	10624	10652	28	42.00	Sliding	Sliding - (WOB:38;GPM :535;TFO:360)
09:45	09:55	0.17	10652	10652	0	.00	MWD Survey	MWD Survey@10625' Inc 23.46° Azm 338.26°
09:55	10:00	0.08	10652	10656	4	48.00	Drilling	Drilling - (WOB:20;GPM :598;RPM:30)
10:00	10:40	0.67	10656	10683	27	40.50	Sliding	Sliding - (WOB:38;GPM :598;TFO:360)
10:40	11:40	1.00	10683	10683	0	.00	Rig Service-Inhol	Rig Service-Inhole
11:40	11:45	0.08	10683	10683	0	.00	Survey & Conn.	Survey & Conn.@10657' Inc 26.81° Azm 340.08°

Start Time	End Time	Hours	Start Depth	End Depth	Delta Depth	ROP	Activity Code	COMMENT
11:45	12:40	0.92	10683	10715	32	34.91	Sliding	Sliding - (WOB:40;GPM :598;TFO:-30)
12:40	12:45	0.08	10715	10715	0	.00	MWD Survey	MWD Survey@10689' Inc 28.04° Azm 341.38°
12:45	13:15	0.50	10715	10747	32	64.00	Sliding	Sliding - (WOB:40;GPM :598;TFO:-30)
13:15	13:20	0.08	10747	10747	0	.00	MWD Survey	MWD Survey@10720' Inc 31.57° Azm 340.33°
13:20	14:10	0.83	10747	10778	31	37.20	Sliding	Sliding - (WOB:40;GPM :598;TFO:-30)
14:10	14:20	0.17	10778	10778	0	.00	Survey & Conn.	Survey & Conn.@10752' Inc 35.96° Azm 339.55°
14:20	14:55	0.58	10778	10810	32	54.86	Sliding	Sliding - (WOB:40;GPM :598;TFO:-30)
14:55	15:00	0.08	10810	10810	0	.00	MWD Survey	MWD Survey@10783' Inc 39.93° Azm 336.61°
15:00	15:05	0.08	10810	10813	3	36.00	Drilling	Drilling - (WOB:22;GPM :598;RPM:30)
15:05	15:35	0.50	10813	10813	0	.00	Rig repair	Rig repair
15:35	15:40	0.08	10813	10815	2	24.00	Drilling	Drilling - (WOB:22;GPM :598;RPM:30)
15:40	16:10	0.50	10815	10841	26	52.00	Sliding	Sliding - (WOB:40;GPM :598;TFO:-30)
16:10	16:15	0.08	10841	10841	0	.00	MWD Survey	MWD Survey@10815' Inc 42.13° Azm 335.46°
16:15	16:20	0.08	10841	10846	5	60.00	Drilling	Drilling - (WOB:22;GPM :598;RPM:30)
16:20	16:50	0.50	10846	10873	27	54.00	Sliding	Sliding - (WOB:40;GPM :598;TFO:-30)
16:50	17:05	0.25	10873	10873	0	.00	Survey & Conn.	Survey & Conn.@10846' Inc 45.09° Azm 336.59°
17:05	17:40	0.58	10873	10904	31	53.14	Sliding	Sliding - (WOB:40;GPM :598;TFO:-30)
17:40	17:45	0.08	10904	10904	0	.00	MWD Survey	MWD Survey@10878' Inc 49.05° Azm 334.49°
17:45	18:25	0.67	10904	10936	32	48.00	Sliding	Sliding - (WOB:45;GPM :598;TFO:-30)
18:25	18:30	0.08	10936	10936	0	.00	MWD Survey	MWD Survey@10910' Inc 51.77° Azm 334.93°
18:30	18:35	0.08	10936	10941	5	60.00	Drilling	Drilling - (WOB:22;GPM :598;RPM:30)
18:35	19:05	0.50	10941	10941	0	.00	Circulating	Troubleshoot mwd sig
19:05	19:30	0.42	10941	10968	27	64.80	Sliding	Sliding - (WOB:45;GPM :598;TFO:-40)
19:30	19:40	0.17	10968	10968	0	.00	Survey & Conn.	Survey & Conn.@10942' Inc 54.04° Azm 333.97°
19:40	20:15	0.58	10968	11000	32	54.86	Sliding	Sliding - (WOB:45;GPM :598;TFO:-20)
20:15	20:20	0.08	11000	11000	0	.00	MWD Survey	MWD Survey@10974' Inc 57.84° Azm 330.75°
20:20	20:55	0.58	11000	11032	32	54.86	Sliding	Sliding - (WOB:45;GPM :598;TFO:-30)
20:55	21:00	0.08	11032	11032	0	.00	MWD Survey	MWD Survey@11006' Inc 61.64° Azm 330.77°
21:00	21:15	0.25	11032	11037	5	20.00	Drilling	Drilling - (WOB:22;GPM :598;RPM:30)
21:15	21:50	0.58	11037	11064	27	46.29	Sliding	Sliding - (WOB:55;GPM :598;TFO:-15)
21:50	22:05	0.25	11064	11064	0	.00	Survey & Conn.	Survey & Conn.@11038' Inc 66.36° Azm 330.32°
22:05	22:50	0.75	11064	11064	0	.00	Service-Inhol	Rig Service-Inhole/Fix Pop Off Valve
22:50	23:50	1.00	11064	11096	32	32.00	Sliding	Sliding - (WOB:45;GPM :598;TFO:-15)
23:50	23:55	0.08	11096	11096	0	.00	MWD Survey	MWD Survey@11070' Inc 70.61° Azm 330.21°
23:55	24:00	0.08	11096	11098	2	24.00	Sliding	Sliding - (WOB:55;GPM :598;TFO:-30)

JOB NO.:	410413HEFMP6213	Report Time:	2400	14 of 28
COMPANY:	Continental Resources Inc.	API JOB #	33-053-04852	
LOCATION:		WORK ORDER#	166165	
RIG NAME:	Patterson 490	FIELD:	Baker	
STATE:	North Dakota	Township:	153N	
COUNTY:	McKenzie	Range/Section	101W	16
WELL NAME:	Columbus Federal 1-16H	Company Man	Chris	
Lead Directional :	Kaleb Smith	2nd Dir Hand :	Hilton Maldonado	

Scientific Drilling

From Wednesday, May 08, 2013 at 0000 to Wednesday, May 08, 2013 at 2400

DAILY TOTALS

Start Depth	11098.00
End Depth	11401.00
Below Rot Hrs.	24.00
Total Drilled:	303.00
Avg. Total ROP:	55.09
Slide Footage:	130.00
Slide Hours	3.17
Avg. Slide ROP:	41.05
Rotate Footage:	173.00
Rotary Hours	2.33
Avg. Rot ROP:	74.14
Circ Hours	12.58
Ream Hours	10.67
Rotary Hrs%:	42.42
Slide Hrs%:	57.58
Rotary Ftg%:	57.10
Slide Ftg%:	42.90

cASING

Size	Lb/Ft	MD

ASSEMBLY TOTALS

BHA #	Motor SN / R.S SN	Slide Ftg	Slide Hrs	Rotate Ftg	Rotate Hrs	Circ Hrs	D & C Hrs	BHA Ftg	Avg ROP
4	6751XD-1026	638.00	14.42	201.00	3.17	22.08	39.67	839.00	43.40

Drilling Parameters

WOB:	0
Rot Wt:	168
Pick UP:	189
Slack Off:	140
SPP:	0
Flow:	0 - 598
SPM:	0
Rot. RPM	30 - 30
Mot RPM:	0 - 0
Incl. In:	0
Azm. In:	0
Incl. Out:	0
Azm. Out:	0

Mud Record

Oil Base

Weight:	10.1
Visc:	44
Chlorides:	51000
YP:	9
PV:	13
PH:	0
GAS:	0
SAND:	0
WL:	0
SOLID:	10.1
BHT°:	193
Flow T°:	0
Oil %:	81

Bit Record

Bit No:	4
Model	Security
SN.:	12031577
MFG.	
Type	PDC
IADC	
JETS	5-18
TFA:	1.242
Hole ID:	8.75
Bit Hrs:	17.58
Bit Ftg:	839.00

PUMPS

Liner	0	0
Stroke	0	0
Effic.	95.00%	95.00%
Gal/Stk	0.00	0.00
BBL/Stk	0.000	0.000

Current BHA # 4

Security FXD55M
Leam 7/8lbe,5.0stg 2.25FBH
Float Sub
6.5" NM Pony
NMDC
Support Sub
Gap Sub
6.5" NM Flex
6.5" NM Flex
X/O
45 Jts 5" HWDP

COST BREAKDOWN

GENERAL COMMENT

Start Time	End Time	Hours	Start Depth	End Depth	Delta Depth	ROP	Activity Code	COMMENT
00:00	00:15	0.25	11098	11110	12	48.00	Sliding	Sliding - (WOB:55;GPM :598;TFO:360)
00:15	00:25	0.17	11110	11116	6	36.00	Drilling	Drilling - (WOB:22;GPM :598;RPM:30)
00:25	00:50	0.42	11116	11128	12	28.80	Sliding	Sliding - (WOB:55;GPM :598;TFO:-15)
00:50	00:55	0.08	11128	11128	0	.00	MWD Survey	MWD Survey@11102' Inc 74.61° Azm 329.84°
00:55	01:15	0.33	11128	11160	32	96.00	Drilling	Drilling - (WOB:22;GPM :598;RPM:30)
01:15	01:35	0.33	11160	11160	0	.00	Survey & Conn.	Survey & Conn.@11133' Inc 76.95° Azm 328.8°
01:35	01:50	0.25	11160	11191	31	124.00	Drilling	Drilling - (WOB:22;GPM :598;RPM:30)
01:50	01:55	0.08	11191	11191	0	.00	MWD Survey	MWD Survey@11165' Inc 77.08° Azm 328.58°
01:55	02:15	0.33	11191	11191	0	.00	Logging	Re-log Gamma
02:15	02:25	0.17	11191	11196	5	30.00	Drilling	Drilling - (WOB:22;GPM :598;RPM:30)
02:25	03:00	0.58	11196	11223	27	46.29	Sliding	Sliding - (WOB:45;GPM :598;TFO:360)
03:00	03:05	0.08	11223	11223	0	.00	MWD Survey	MWD Survey@11196' Inc 78.1° Azm 326.89°
03:05	03:10	0.08	11223	11227	4	48.00	Drilling	Drilling - (WOB:22;GPM :598;RPM:30)
03:10	03:40	0.50	11227	11254	27	54.00	Sliding	Sliding - (WOB:45;GPM :598;TFO:30)

Start Time	End Time	Hours	Start Depth	End Depth	Delta Depth	ROP	Activity Code	COMMENT
03:40	03:55	0.25	11254	11254	0	.00	Survey & Conn.	Survey & Conn.@11228' Inc 81.32° Azm 325.37°
03:55	04:00	0.08	11254	11260	6	72.00	Drilling	Drilling - (WOB:22;GPM :598;RPM:30)
04:00	04:40	0.67	11260	11286	26	39.00	Sliding	Sliding - (WOB:45;GPM :598;TFO:30)
04:40	04:45	0.08	11286	11286	0	.00	MWD Survey	MWD Survey@11259' Inc 85.07° Azm 325.44°
04:45	05:30	0.75	11286	11312	26	34.67	Sliding	Sliding - (WOB:45;GPM :598;TFO:30)
05:30	05:40	0.17	11312	11317	5	30.00	Drilling	Drilling - (WOB:22;GPM :598;RPM:30)
05:40	05:55	0.25	11317	11317	0	.00	MWD Survey	MWD Survey@11291' Inc 88.02° Azm 327.44°
05:55	06:20	0.42	11317	11349	32	76.80	Drilling	Drilling - (WOB:22;GPM :598;RPM:30)
06:20	06:30	0.17	11349	11349	0	.00	Survey & Conn.	Survey & Conn.@11343' Inc 90.27° Azm 328.09°
06:30	07:10	0.67	11349	11401	52	78.00	Drilling	Drilling - (WOB:22;GPM :598;RPM:30)
07:10	07:15	0.08	11401	11401	0	.00	MWD Survey	MWD Survey@11343' Inc 90.27° Azm 328.09°
07:15	08:30	1.25	11401	11401	0	.00	Circulating	Circulating
08:30	11:30	3.00	11401	11401	0	.00	Short Trip	Short Trip
11:30	22:10	10.67	11401	11401	0	.00	Reaming	Reaming tight hole in shale and salts
22:10	24:00	1.83	11401	11401	0	.00	Short Trip	Short Trip to top of salts

JOB NO.:	410413HEFMP6213	Report Time:	2400	15 of 28
COMPANY:	Continental Resources Inc.	API JOB #	33-053-04852	
LOCATION:		WORK ORDER#	166165	
RIG NAME:	Patterson 490	FIELD:	Baker	
STATE:	North Dakota	Township:	153N	
COUNTY:	McKenzie	Range/Section	101W	16
WELL NAME:	Columbus Federal 1-16H	Company Man	Chris	
Lead Directional :	Kaleb Smith	2nd Dir Hand :	Hilton Maldonado	

Scientific Drilling

From Thursday, May 09, 2013 at 0000 to Thursday, May 09, 2013 at 2400

DAILY TOTALS

Start Depth	0.00
End Depth	0.00
Below Rot Hrs.	10.83
Total Drilled:	0.00
Avg. Total ROP:	NA
Slide Footage:	0.00
Slide Hours	0.00
Avg. Slide ROP:	NA
Rotate Footage:	0.00
Rotary Hours	0.00
Avg. Rot ROP:	NA
Circ Hours	7.50
Ream Hours	7.50
Rotary Hrs%:	NA
Slide Hrs%:	NA
Rotary Ftg%:	NA
Slide Ftg%:	NA

cASING

Size	Lb/Ft	MD

ASSEMBLY TOTALS

BHA #	Motor SN / R.S SN	Slide Ftg	Slide Hrs	Rotate Ftg	Rotate Hrs	Circ Hrs	D & C Hrs	BHA Ftg	Avg ROP
4	6751XD-1026	638.00	14.42	201.00	3.17	22.08	39.67	839.00	43.40

Drilling Parameters

WOB:	0
Rot Wt:	168
Pick UP:	189
Slack Off:	140
SPP:	0
Flow:	0 - 598
SPM:	0
Rot. RPM	-
Mot RPM:	-
Incl. In:	0
Azm. In:	0
Incl. Out:	0
Azm. Out:	0

Mud Record

Oil Base

Weight:	10.1
Visc:	44
Chlorides:	51000
YP:	9
PV:	13
PH:	0
GAS:	0
SAND:	0
WL:	0
SOLID:	10.1
BHT°:	193
Flow T°:	0
Oil %:	81

Bit Record

Bit No:	4
Model	Security
SN.:	12031577
MFG.	
Type	PDC
IADC	
JETS	5-18
TFA:	1.242
Hole ID:	8.75
Bit Hrs:	17.58
Bit Ftg:	839.00

PUMPS

Liner	0	0
Stroke	0	0
Effic.	95.00%	95.00%
Gal/Stk	0.00	0.00
BBL/Stk	0.000	0.000

Current BHA # 4

Security FXD55M
Leam 7/8lbe,5.0stg 2.25FBH
Float Sub
6.5" NM Pony
NMDC
Support Sub
Gap Sub
6.5" NM Flex
6.5" NM Flex
X/O
45 Jts 5" HWDP

COST BREAKDOWN

GENERAL COMMENT

Start Time	End Time	Hours	Start Depth	End Depth	Delta Depth	ROP	Activity Code	COMMENT
00:00	01:50	1.83	11401	11401	0	.00	Short Trip	Short Trip to top of salts
01:50	09:20	7.50	11401	11401	0	.00	Reaming	Reaming tight hole in shale and salts
09:20	19:00	9.67	11401	11401	0	.00	L/D DP	L/D DP
19:00	20:30	1.50	11401	11401	0	.00	Other	L/D Curve Assembly
20:30	24:00	3.50	11401	11401	0	.00	Standby	Standby / Casing and cement

JOB NO.:	410413HEFMP6213	Report Time:	2400	16 of 28
COMPANY:	Continental Resources Inc.	API JOB #	33-053-04852	
LOCATION:		WORK ORDER#	166165	
RIG NAME:	Patterson 490	FIELD:	Baker	
STATE:	North Dakota	Township:	153N	
COUNTY:	McKenzie	Range/Section	101W	16
WELL NAME:	Columbus Federal 1-16H	Company Man	Chris	
Lead Directional :	Kaleb Smith	2nd Dir Hand :	Hilton Maldonado	

Scientific Drilling

From Friday, May 10, 2013 at 0000 to Friday, May 10, 2013 at 2400

DAILY TOTALS

Start Depth	0.00
End Depth	0.00
Below Rot Hrs.	0.00
Total Drilled:	0.00
Avg. Total ROP:	NA
Slide Footage:	0.00
Slide Hours	0.00
Avg. Slide ROP:	NA
Rotate Footage:	0.00
Rotary Hours	0.00
Avg. Rot ROP:	NA
Circ Hours	0.00
Ream Hours	0.00
Rotary Hrs%:	NA
Slide Hrs%:	NA
Rotary Ftg%:	NA
Slide Ftg%:	NA

cASING

Size	Lb/Ft	MD

ASSEMBLY TOTALS

BHA #	Motor SN / R.S SN	Slide Ftg	Slide Hrs	Rotate Ftg	Rotate Hrs	Circ Hrs	D & C Hrs	BHA Ftg	Avg ROP

Drilling Parameters

WOB:	0
Rot Wt:	168
Pick UP:	189
Slack Off:	140
SPP:	0
Flow:	0 - 0
SPM:	0
Rot. RPM	-
Mot RPM:	-
Incl. In:	0
Azm. In:	0
Incl. Out:	0
Azm. Out:	0

Mud Record

Oil Base

Weight:	10.1
Visc:	44
Chlorides:	51000
YP:	9
PV:	13
PH:	0
GAS:	0
SAND:	0
WL:	0
SOLID:	10.1
BHT°:	193
Flow T°:	0
Oil %:	81

Bit Record

Bit No:	
Model	
SN.:	
MFG.	
Type	
IADC	
JETS	
TFA:	
Hole ID:	N/A
Bit Hrs:	
Bit Ftg:	

PUMPS

Liner	0	0
Stroke	0	0
Effic.	95.00%	95.00%
Gal/Stk	0.00	0.00
BBL/Stk	0.000	0.000

Current BHA # 0

COST BREAKDOWN

GENERAL COMMENT

Start Time	End Time	Hours	Start Depth	End Depth	Delta Depth	ROP	Activity Code	COMMENT
00:00	24:00	24.00	11401	11401	0	.00	Standby	Standby / Wait on casing and cement

JOB NO.:	410413HEFMP6213	Report Time:	2400	17 of 28
COMPANY:	Continental Resources Inc.	API JOB #	33-053-04852	
LOCATION:		WORK ORDER#	166165	
RIG NAME:	Patterson 490	FIELD:	Baker	
STATE:	North Dakota	Township:	153N	
COUNTY:	McKenzie	Range/Section	101W	16
WELL NAME:	Columbus Federal 1-16H	Company Man	Chris	
Lead Directional :	Kaleb Smith	2nd Dir Hand :	Hilton Maldonado	

Scientific Drilling

From Saturday, May 11, 2013 at 0000 to Saturday, May 11, 2013 at 2400

DAILY TOTALS

Start Depth	11401.00
End Depth	11689.00
Below Rot Hrs.	20.50
Total Drilled:	288.00
Avg. Total ROP:	32.30
Slide Footage:	73.00
Slide Hours	2.92
Avg. Slide ROP:	25.03
Rotate Footage:	215.00
Rotary Hours	6.00
Avg. Rot ROP:	35.83
Circ Hours	0.50
Ream Hours	0.00
Rotary Hrs%:	67.29
Slide Hrs%:	32.71
Rotary Ftg%:	74.65
Slide Ftg%:	25.35

cASING

Size	Lb/Ft	MD

ASSEMBLY TOTALS

BHA #	Motor SN / R.S SN	Slide Ftg	Slide Hrs	Rotate Ftg	Rotate Hrs	Circ Hrs	D & C Hrs	BHA Ftg	Avg ROP
5	G582	596.00	22.92	2,421.00	23.92	7.58	54.42	3,017.00	58.87

Drilling Parameters

WOB:	33
Rot Wt:	120
Pick UP:	140
Slack Off:	120
SPP:	1800
Flow:	0 - 598
SPM:	95
Rot. RPM	45 - 60
Mot RPM:	0 - 0
Incl. In:	0
Azm. In:	0
Incl. Out:	0
Azm. Out:	0

Mud Record

Oil Base

Weight:	10.1
Visc:	44
Chlorides:	51000
YP:	9
PV:	13
PH:	0
GAS:	0
SAND:	0
WL:	0
SOLID:	10.1
BHT°:	193
Flow T°:	0
Oil %:	81

Bit Record

Bit No:	5
Model	Smith MDSiZ
SN.:	JG9695
MFG.	SMITH
Type	PDC
IADC	
JETS	3-18,3-22
TFA:	1.858
Hole ID:	6
Bit Hrs:	46.83
Bit Ftg:	3017.00

PUMPS

Liner	0	0
Stroke	0	0
Effic.	95.00%	95.00%
Gal/Stk	0.00	0.00
BBL/Stk	0.000	0.000

Current BHA # 5

Smith MDSiZ
4.75" Bico 5/6lobe 5.4stg
4.75" NM Stab
4.75" NM Pony
4.75" NMDC
4.75" HOC
4.75" NM Stab
4.75" NMDC
X/O

COST BREAKDOWN

GENERAL COMMENT

Start Time	End Time	Hours	Start Depth	End Depth	Delta Depth	ROP	Activity Code	COMMENT
00:00	03:30	3.50	11401	11401	0	.00	Standby	Standby / Wait on casing and cement
03:30	05:00	1.50	11401	11401	0	.00	Change BHA	Change BHA
05:00	10:00	5.00	11401	11401	0	.00	TIH	TIH
10:00	10:30	0.50	11401	11401	0	.00	Other	Install rotating head
10:30	13:00	2.50	11401	11401	0	.00	Other	Slip and cut drill line
13:00	14:00	1.00	11401	11401	0	.00	Other	Test casing
14:00	17:45	3.75	11401	11401	0	.00	Drilling Cement	Drilling - (WOB:5;GPM :203;RPM:35)
17:45	18:00	0.25	11401	11401	0	.00	Other	FIT Test
18:00	18:50	0.83	11401	11465	64	76.80	Drilling	Drilling - (WOB:10;GPM :255;RPM:45)
18:50	18:55	0.08	11465	11465	0	.00	Conn.	Conn.
18:55	19:00	0.08	11465	11465	0	.00	MWD Survey	MWD Survey@11403' Inc 90.92° Azm 327.18°
19:00	19:10	0.17	11465	11481	16	96.00	Drilling	Drilling - (WOB:10;GPM :255;RPM:60)
19:10	20:25	1.25	11481	11502	21	16.80	Sliding	Sliding - (WOB:22;GPM :598;TFO:145)
20:25	20:55	0.50	11502	11556	54	108.00	Drilling	Drilling - (WOB:10;GPM :255;RPM:60)

Start Time	End Time	Hours	Start Depth	End Depth	Delta Depth	ROP	Activity Code	COMMENT
20:55	21:05	0.17	11556	11556	0	.00	Conn.	Conn.
21:05	21:10	0.08	11556	11556	0	.00	MWD Survey	MWD Survey@11494' Inc 90.48° Azm 329.38°
21:10	21:15	0.08	11556	11571	15	180.00	Drilling	Drilling - (WOB:10;GPM :255;RPM:60)
21:15	21:20	0.08	11571	11571	0	.00	MWD Survey	MWD Survey@11494' Inc 90.48° Azm 329.38°
21:20	22:15	0.92	11571	11596	25	27.27	Sliding	Sliding - (WOB:30;GPM :598;TFO:145)
22:15	22:45	0.50	11596	11647	51	102.00	Drilling	Drilling - (WOB:13;GPM :255;RPM:60)
22:45	22:50	0.08	11647	11647	0	.00	Conn.	Conn.
22:50	22:55	0.08	11647	11647	0	.00	MWD Survey	MWD Survey@11585' Inc 89.52° Azm 330.35°
22:55	23:05	0.17	11647	11662	15	90.00	Drilling	Drilling - (WOB:13;GPM :255;RPM:60)
23:05	23:15	0.17	11662	11662	0	.00	MWD Survey	MWD Survey@11585' Inc 89.52° Azm 330.35°
23:15	24:00	0.75	11662	11689	27	36.00	Sliding	Sliding - (WOB:33;GPM :598;TFO:120)

JOB NO.:	410413HEFMP6213	Report Time:	2400 — 18 of 28
COMPANY:	Continental Resources Inc.	API JOB #	33-053-04852
LOCATION:		WORK ORDER#	166165
RIG NAME:	Patterson 490	FIELD:	Baker
STATE:	North Dakota	Township:	153N
COUNTY:	McKenzie	Range/Section	101W — 16
WELL NAME:	Columbus Federal 1-16H	Company Man	Chris
Lead Directional :	Kaleb Smith	2nd Dir Hand :	Hilton Maldonado

Scientific Drilling

From Sunday, May 12, 2013 at 0000 to Sunday, May 12, 2013 at 2400

DAILY TOTALS

Start Depth	11689.00
End Depth	12873.00
Below Rot Hrs.	24.00
Total Drilled:	1184.00
Avg. Total ROP:	57.99
Slide Footage:	387.00
Slide Hours	13.67
Avg. Slide ROP:	28.32
Rotate Footage:	797.00
Rotary Hours	6.75
Avg. Rot ROP:	118.07
Circ Hours	1.33
Ream Hours	0.00
Rotary Hrs%:	33.06
Slide Hrs%:	66.94
Rotary Ftg%:	67.31
Slide Ftg%:	32.69

cASING

Size	Lb/Ft	MD

ASSEMBLY TOTALS

BHA #	Motor SN / R.S SN	Slide Ftg	Slide Hrs	Rotate Ftg	Rotate Hrs	Circ Hrs	D & C Hrs	BHA Ftg	Avg ROP
5	G582	596.00	22.92	2,421.00	23.92	7.58	54.42	3,017.00	58.87

Drilling Parameters

WOB:	29
Rot Wt:	127
Pick UP:	140
Slack Off:	112
SPP:	2200
Flow:	0 - 598
SPM:	95
Rot. RPM	60 - 60
Mot RPM:	0 - 0
Incl. In:	0
Azm. In:	0
Incl. Out:	0
Azm. Out:	0

Mud Record

Water

Weight:	9.75
Visc:	29
Chlorides:	0
YP:	0
PV:	0
PH:	0
GAS:	0
SAND:	0
WL:	0
SOLID:	0
BHT°:	193
Flow T°:	0
Oil %:	0

Bit Record

Bit No:	5
Model	Smith MDSiZ
SN.:	JG9695
MFG.	SMITH
Type	PDC
IADC	
JETS	3-18,3-22
TFA:	1.858
Hole ID:	6
Bit Hrs:	46.83
Bit Ftg:	3017.00

Current BHA # 5

Smith MDSiZ
4.75" Bico 5/6lobe 5.4stg
4.75" NM Stab
4.75" NM Pony
4.75" NMDC
4.75" HOC
4.75" NM Stab
4.75" NMDC
X/O

PUMPS

Liner	0	0
Stroke	0	0
Effic.	95.00%	95.00%
Gal/Stk	0.00	0.00
BBL/Stk	0.000	0.000

COST BREAKDOWN

GENERAL COMMENT

Start Time	End Time	Hours	Start Depth	End Depth	Delta Depth	ROP	Activity Code	COMMENT
00:00	00:25	0.42	11689	11739	50	120.00	Drilling	Drilling - (WOB:13;GPM :255;RPM:60)
00:25	00:35	0.17	11739	11739	0	.00	Conn.	Conn.
00:35	00:40	0.08	11739	11739	0	.00	MWD Survey	MWD Survey@11677' Inc 89.25° Azm 332.89°
00:40	00:50	0.17	11739	11754	15	90.00	Drilling	Drilling - (WOB:13;GPM :255;RPM:60)
00:50	00:55	0.08	11754	11754	0	.00	MWD Survey	MWD Survey@11677' Inc 89.25° Azm 332.89°
00:55	02:00	1.08	11754	11784	30	27.69	Sliding	Sliding - (WOB:30;GPM :598;TFO:120)
02:00	02:25	0.42	11784	11830	46	110.40	Drilling	Drilling - (WOB:10;GPM :255;RPM:60)
02:25	02:30	0.08	11830	11830	0	.00	Conn.	Conn.
02:30	02:35	0.08	11830	11830	0	.00	MWD Survey	MWD Survey@11768' Inc 88.72° Azm 335.97°
02:35	02:40	0.08	11830	11845	15	180.00	Drilling	Drilling - (WOB:10;GPM :255;RPM:60)
02:40	04:00	1.33	11845	11875	30	22.50	Sliding	Sliding - (WOB:30;GPM :598;TFO:110)
04:00	04:25	0.42	11875	11922	47	112.80	Drilling	Drilling - (WOB:10;GPM :255;RPM:60)
04:25	04:35	0.17	11922	11922	0	.00	Conn.	Conn.
04:35	04:40	0.08	11922	11922	0	.00	MWD Survey	MWD Survey@11860' Inc 88.99° Azm 337.29°

Start Time	End Time	Hours	Start Depth	End Depth	Delta Depth	ROP	Activity Code	COMMENT
04:40	04:45	0.08	11922	11937	15	180.00	Drilling	Drilling - (WOB:10;GPM :255;RPM:60)
04:45	05:45	1.00	11937	11967	30	30.00	Sliding	Sliding - (WOB:30;GPM :280;TFO:100)
05:45	06:05	0.33	11967	12014	47	141.00	Drilling	Drilling - (WOB:12;GPM :255;RPM:60)
06:05	06:10	0.08	12014	12014	0	.00	Conn.	Conn.
06:10	06:15	0.08	12014	12014	0	.00	MWD Survey	MWD Survey@11951' Inc 89.6° Azm 341.16°
06:15	06:25	0.17	12014	12029	15	90.00	Drilling	Drilling - (WOB:15;GPM :280;RPM:60)
06:25	07:55	1.50	12029	12059	30	20.00	Sliding	Sliding - (WOB:30;GPM :280;TFO:100)
07:55	08:15	0.33	12059	12105	46	138.00	Drilling	Drilling - (WOB:15;GPM :280;RPM:60)
08:15	08:25	0.17	12105	12105	0	.00	Survey & Conn.	Survey & Conn.@12043' Inc 88.99° Azm 342.39°
08:25	08:35	0.17	12105	12120	15	90.00	Drilling	Drilling - (WOB:15;GPM :280;RPM:60)
08:35	09:35	1.00	12120	12155	35	35.00	Sliding	Sliding - (WOB:30;GPM :280;TFO:90)
09:35	09:50	0.25	12155	12195	40	160.00	Drilling	Drilling - (WOB:15;GPM :280;RPM:60)
09:50	10:00	0.17	12195	12195	0	.00	Survey & Conn.	Survey & Conn.@12133' Inc 90.92° Azm 346.61°
10:00	10:05	0.08	12195	12210	15	180.00	Drilling	Drilling - (WOB:15;GPM :280;RPM:60)
10:05	10:45	0.67	12210	12235	25	37.50	Sliding	Sliding - (WOB:30;GPM :280;TFO:135)
10:45	11:10	0.42	12235	12286	51	122.40	Drilling	Drilling - (WOB:15;GPM :280;RPM:60)
11:10	11:20	0.17	12286	12286	0	.00	Survey & Conn.	Survey & Conn.@12224' Inc 91.19° Azm 348.19°
11:20	11:30	0.17	12286	12301	15	90.00	Drilling	Drilling - (WOB:15;GPM :280;RPM:60)
11:30	11:40	0.17	12301	12306	5	30.00	Sliding	Sliding - (WOB:30;GPM :280;TFO:165)
11:40	12:05	0.42	12306	12306	0	.00	Other	Switch pumps
12:05	12:50	0.75	12306	12321	15	20.00	Sliding	Sliding - (WOB:30;GPM :280;TFO:165)
12:50	13:15	0.42	12321	12378	57	136.80	Drilling	Drilling - (WOB:15;GPM :280;RPM:60)
13:15	13:25	0.17	12378	12378	0	.00	Survey & Conn.	Survey & Conn.@12316' Inc 91.01° Azm 349.86°
13:25	13:35	0.17	12378	12393	15	90.00	Drilling	Drilling - (WOB:15;GPM :280;RPM:60)
13:35	14:35	1.00	12393	12423	30	30.00	Sliding	Sliding - (WOB:30;GPM :280;TFO:165)
14:35	15:00	0.42	12423	12469	46	110.40	Drilling	Drilling - (WOB:15;GPM :280;RPM:60)
15:00	15:10	0.17	12469	12469	0	.00	Survey & Conn.	Survey & Conn.@12407' Inc 90.57° Azm 351.35°
15:10	15:15	0.08	12469	12484	15	180.00	Drilling	Drilling - (WOB:15;GPM :280;RPM:60)
15:15	16:20	1.08	12484	12519	35	32.31	Sliding	Sliding - (WOB:30;GPM :280;TFO:135)
16:20	16:40	0.33	12519	12561	42	126.00	Drilling	Drilling - (WOB:15;GPM :280;RPM:60)
16:40	16:50	0.17	12561	12561	0	.00	Survey & Conn.	Survey & Conn.@12499' Inc 89.25° Azm 354.87°
16:50	17:00	0.17	12561	12576	15	90.00	Drilling	Drilling - (WOB:15;GPM :280;RPM:60)
17:00	17:50	0.83	12576	12606	30	36.00	Sliding	Sliding - (WOB:30;GPM :280;TFO:135)
17:50	18:10	0.33	12606	12653	47	141.00	Drilling	Drilling - (WOB:15;GPM :280;RPM:60)
18:10	18:20	0.17	12653	12653	0	.00	Survey & Conn.	Survey & Conn.@12591' Inc 89.52° Azm 356.1°
18:20	18:35	0.25	12653	12668	15	60.00	Drilling	Drilling - (WOB:15;GPM :280;RPM:60)
18:35	19:45	1.17	12668	12703	35	30.00	Sliding	Sliding - (WOB:34;GPM :280;TFO:130)
19:45	20:10	0.42	12703	12745	42	100.80	Drilling	Drilling - (WOB:17;GPM :280;RPM:60)
20:10	20:55	0.75	12745	12745	0	.00	Rig Service-Inhol	Rig Service-Inhole
20:55	21:00	0.08	12745	12745	0	.00	Conn.	Conn.
21:00	21:05	0.08	12745	12745	0	.00	MWD Survey	MWD Survey@12683' Inc 89.69° Azm 359.44°
21:05	21:10	0.08	12745	12760	15	180.00	Drilling	Drilling - (WOB:13;GPM :280;RPM:60)
21:10	22:30	1.33	12760	12795	35	26.25	Sliding	Sliding - (WOB:27;GPM :280;TFO:130)
22:30	22:55	0.42	12795	12836	41	98.40	Drilling	Drilling - (WOB:14;GPM :280;RPM:60)
22:55	23:00	0.08	12836	12836	0	.00	Conn.	Conn.
23:00	23:05	0.08	12836	12836	0	.00	MWD Survey	MWD Survey@12774' Inc 89.6° Azm 2.51°
23:05	23:15	0.17	12836	12851	15	90.00	Drilling	Drilling - (WOB:14;GPM :280;RPM:60)
23:15	24:00	0.75	12851	12873	22	29.33	Sliding	Sliding - (WOB:29;GPM :280;TFO:145)

JOB NO.:	410413HEFMP6213	Report Time:	2400	19 of 28
COMPANY:	Continental Resources Inc.	API JOB #	33-053-04852	
LOCATION:		WORK ORDER#	166165	
RIG NAME:	Patterson 490	FIELD:	Baker	
STATE:	North Dakota	Township:	153N	
COUNTY:	McKenzie	Range/Section	101W	16
WELL NAME:	Columbus Federal 1-16H	Company Man	Chris	
Lead Directional :	Kaleb Smith	2nd Dir Hand :	Hilton Maldonado	

Scientific Drilling

From Monday, May 13, 2013 at 0000 to Monday, May 13, 2013 at 2400

DAILY TOTALS

Start Depth	12873.00
End Depth	14323.00
Below Rot Hrs.	24.00
Total Drilled:	1450.00
Avg. Total ROP:	78.38
Slide Footage:	120.00
Slide Hours	5.42
Avg. Slide ROP:	22.15
Rotate Footage:	1330.00
Rotary Hours	13.08
Avg. Rot ROP:	101.66
Circ Hours	3.00
Ream Hours	0.00
Rotary Hrs%:	70.72
Slide Hrs%:	29.28
Rotary Ftg%:	91.72
Slide Ftg%:	8.28

cASING

Size	Lb/Ft	MD

ASSEMBLY TOTALS

BHA #	Motor SN / R.S SN	Slide Ftg	Slide Hrs	Rotate Ftg	Rotate Hrs	Circ Hrs	D & C Hrs	BHA Ftg	Avg ROP
5	G582	596.00	22.92	2,421.00	23.92	7.58	54.42	3,017.00	58.87

Drilling Parameters

WOB:	12
Rot Wt:	127
Pick UP:	140
Slack Off:	112
SPP:	2600
Flow:	0 - 280
SPM:	95
Rot. RPM	50 - 60
Mot RPM:	0 - 0
Incl. In:	0
Azm. In:	0
Incl. Out:	0
Azm. Out:	0

Mud Record

Water

Weight:	9.8
Visc:	27
Chlorides:	152000
YP:	1
PV:	1
PH:	0
GAS:	0
SAND:	0
WL:	0
SOLID:	0.9
BHT°:	193
Flow T°:	0
Oil %:	0

Bit Record

Bit No:	5
Model	Smith MDSiZ
SN.:	JG9695
MFG.	SMITH
Type	PDC
IADC	
JETS	3-18,3-22
TFA:	1.858
Hole ID:	6
Bit Hrs:	46.83
Bit Ftg:	3017.00

Current BHA # 5

Smith MDSiZ
4.75" Bico 5/6lobe 5.4stg
4.75" NM Stab
4.75" NM Pony
4.75" NMDC
4.75" HOC
4.75" NM Stab
4.75" NMDC
X/O

PUMPS

Liner	0	0
Stroke	0	0
Effic.	95.00%	95.00%
Gal/Stk	0.00	0.00
BBL/Stk	0.000	0.000

COST BREAKDOWN

GENERAL COMMENT

Start Time	End Time	Hours	Start Depth	End Depth	Delta Depth	ROP	Activity Code	COMMENT
00:00	00:20	0.33	12873	12885	12	36.00	Sliding	Sliding - (WOB:29;GPM :280;TFO:145)
00:20	00:55	0.58	12885	12931	46	78.86	Drilling	Drilling - (WOB:14;GPM :280;RPM:60)
00:55	01:00	0.08	12931	12931	0	.00	Conn.	Conn.
01:00	01:05	0.08	12931	12931	0	.00	MWD Survey	MWD Survey@12869' Inc 88.9° Azm 4.97°
01:05	01:20	0.25	12931	12931	0	.00	Circulating	Change pumps
01:20	02:00	0.67	12931	13025	94	141.00	Drilling	Drilling - (WOB:18;GPM :280;RPM:60)
02:00	02:10	0.17	13025	13025	0	.00	Conn.	Conn.
02:10	02:15	0.08	13025	13025	0	.00	MWD Survey	MWD Survey@12963' Inc 88.99° Azm 7.08°
02:15	02:50	0.58	13025	13119	94	161.14	Drilling	Drilling - (WOB:18;GPM :280;RPM:60)
02:50	03:00	0.17	13119	13119	0	.00	Conn.	Conn.
03:00	03:05	0.08	13119	13119	0	.00	MWD Survey	MWD Survey@13057' Inc 88.9° Azm 6.56°
03:05	03:20	0.25	13119	13151	32	128.00	Drilling	Drilling - (WOB:15;GPM :280;RPM:60)
03:20	03:25	0.08	13151	13151	0	.00	MWD Survey	MWD Survey@13057' Inc 88.9° Azm 6.56°
03:25	04:30	1.08	13151	13173	22	20.31	Sliding	Sliding - (WOB:21;GPM :280;TFO:-15)

Start Time	End Time	Hours	Start Depth	End Depth	Delta Depth	ROP	Activity Code	COMMENT
04:30	04:55	0.42	13173	13214	41	98.40	Drilling	Drilling - (WOB:9;GPM :280;RPM:50)
04:55	05:00	0.08	13214	13214	0	.00	Conn.	Conn.
05:00	05:05	0.08	13214	13214	0	.00	MWD Survey	MWD Survey@13152' Inc 89.43° Azm 6.12°
05:05	05:20	0.25	13214	13246	32	128.00	Drilling	Drilling - (WOB:11;GPM :280;RPM:50)
05:20	05:30	0.17	13246	13246	0	.00	MWD Survey	MWD Survey@13152' Inc 89.43° Azm 6.12°
05:30	06:00	0.50	13246	13310	64	128.00	Drilling	Drilling - (WOB:11;GPM :280;RPM:60)
06:00	06:05	0.08	13310	13310	0	.00	Conn.	Conn.
06:05	06:10	0.08	13310	13310	0	.00	MWD Survey	MWD Survey@13248' Inc 90.57° Azm 6.91°
06:10	06:55	0.75	13310	13404	94	125.33	Drilling	Drilling - (WOB:11;GPM :280;RPM:60)
06:55	07:05	0.17	13404	13404	0	.00	Survey & Conn.	Survey & Conn.@13342' Inc 89.96° Azm 5.41°
07:05	07:35	0.50	13404	13467	63	126.00	Drilling	Drilling - (WOB:11;GPM :280;RPM:60)
07:35	07:45	0.17	13467	13467	0	.00	MWD Survey	MWD Survey@13436' Inc 89.52° Azm 5.24°
07:45	08:50	1.08	13467	13485	18	16.62	Sliding	Sliding - (WOB:28;GPM :280;TFO:-40)
08:50	08:55	0.08	13485	13498	13	156.00	Drilling	Drilling - (WOB:11;GPM :280;RPM:60)
08:55	09:05	0.17	13498	13498	0	.00	Survey & Conn.	Survey & Conn.@13436' Inc 89.52° Azm 5.24°
09:05	09:50	0.75	13498	13593	95	126.67	Drilling	Drilling - (WOB:11;GPM :280;RPM:60)
09:50	10:00	0.17	13593	13593	0	.00	Survey & Conn.	Survey & Conn.@13531' Inc 90.22° Azm 4.89°
10:00	10:15	0.25	13593	13624	31	124.00	Drilling	Drilling - (WOB:11;GPM :280;RPM:60)
10:15	10:25	0.17	13624	13624	0	.00	MWD Survey	MWD Survey@13531' Inc 90.22° Azm 4.89°
10:25	11:25	1.00	13624	13644	20	20.00	Sliding	Sliding - (WOB:28;GPM :280;TFO:-35)
11:25	11:45	0.33	13644	13687	43	129.00	Drilling	Drilling - (WOB:11;GPM :280;RPM:60)
11:45	11:55	0.17	13687	13687	0	.00	Survey & Conn.	Survey & Conn.@13625' Inc 90.4° Azm 4.18°
11:55	12:50	0.92	13687	13782	95	103.64	Drilling	Drilling - (WOB:11;GPM :280;RPM:60)
12:50	13:00	0.17	13782	13782	0	.00	Survey & Conn.	Survey & Conn.@13720' Inc 90.31° Azm 3.66°
13:00	13:15	0.25	13782	13815	33	132.00	Drilling	Drilling - (WOB:11;GPM :280;RPM:60)
13:15	13:25	0.17	13815	13815	0	.00	MWD Survey	MWD Survey@13720' Inc 90.31° Azm 3.66°
13:25	14:05	0.67	13815	13835	20	30.00	Sliding	Sliding - (WOB:28;GPM :280;TFO:-35)
14:05	14:25	0.33	13835	13878	43	129.00	Drilling	Drilling - (WOB:11;GPM :280;RPM:60)
14:25	14:35	0.17	13878	13878	0	.00	Survey & Conn.	Survey & Conn.@13816' Inc 90.57° Azm 3.92°
14:35	15:20	0.75	13878	13972	94	125.33	Drilling	Drilling - (WOB:11;GPM :280;RPM:60)
15:20	16:10	0.83	13972	13972	0	.00	Rig Service-Inhol	Rig Service-Inhole
16:10	16:20	0.17	13972	13972	0	.00	Survey & Conn.	Survey & Conn.@13910' Inc 91.01° Azm 4.53°
16:20	17:10	0.83	13972	14036	64	76.80	Drilling	Drilling - (WOB:11;GPM :280;RPM:60)
17:10	17:20	0.17	14036	14036	0	.00	MWD Survey	MWD Survey@14006' Inc 90.92° Azm 4.36°
17:20	17:45	0.42	14036	14068	32	76.80	Drilling	Drilling - (WOB:10;GPM :280;RPM:60)
17:45	17:50	0.08	14068	14068	0	.00	Conn.	Conn.
17:50	17:55	0.08	14068	14068	0	.00	MWD Survey	MWD Survey@14006' Inc 90.92° Azm 4.36°
17:55	18:40	0.75	14068	14131	63	84.00	Drilling	Drilling - (WOB:10;GPM :280;RPM:60)
18:40	18:55	0.25	14131	14131	0	.00	MWD Survey	MWD Survey@14101' Inc 90.57° Azm 3.57°
18:55	20:10	1.25	14131	14159	28	22.40	Sliding	Sliding - (WOB:36;GPM :280;TFO:-30)
20:10	20:20	0.17	14159	14163	4	24.00	Drilling	Drilling - (WOB:10;GPM :280;RPM:60)
20:20	20:30	0.17	14163	14163	0	.00	Conn.	Conn.
20:30	20:35	0.08	14163	14163	0	.00	MWD Survey	MWD Survey@14101' Inc 90.57° Azm 3.57°
20:35	21:30	0.92	14163	14225	62	67.64	Drilling	Drilling - (WOB:12;GPM :280;RPM:60)
21:30	21:35	0.08	14225	14225	0	.00	MWD Survey	MWD Survey@14195' Inc 91.1° Azm 1.63°
21:35	22:00	0.42	14225	14225	0	.00	Rig repair	Fix stand pipe
22:00	22:30	0.50	14225	14257	32	64.00	Drilling	Drilling - (WOB:12;GPM :280;RPM:60)
22:30	22:35	0.08	14257	14257	0	.00	Conn.	Conn.

Start Time	End Time	Hours	Start Depth	End Depth	Delta Depth	ROP	Activity Code	COMMENT
22:35	**22:40**	0.08	**14257**	**14257**	0	**.00**	**MWD Survey**	MWD Survey@14195' Inc 91.1° Azm 1.63°
22:40	**24:00**	1.33	**14257**	**14323**	66	**49.50**	**Drilling**	Drilling - (WOB:12;GPM :280;RPM:60)

JOB NO.:	410413HEFMP6213	Report Time:	2400	20 of 28
COMPANY:	Continental Resources Inc.	API JOB #	33-053-04852	
LOCATION:		WORK ORDER#	166165	
RIG NAME:	Patterson 490	FIELD:	Baker	
STATE:	North Dakota	Township:	153N	
COUNTY:	McKenzie	Range/Section	101W	16
WELL NAME:	Columbus Federal 1-16H	Company Man	Chris	
Lead Directional :	Kaleb Smith	2nd Dir Hand :	Hilton Maldonado	

Scientific Drilling

From Tuesday, May 14, 2013 at 0000 to Tuesday, May 14, 2013 at 2400

DAILY TOTALS

Start Depth	14323.00
End Depth	14655.00
Below Rot Hrs.	24.00
Total Drilled:	332.00
Avg. Total ROP:	56.11
Slide Footage:	16.00
Slide Hours	0.92
Avg. Slide ROP:	17.45
Rotate Footage:	316.00
Rotary Hours	5.00
Avg. Rot ROP:	63.20
Circ Hours	2.83
Ream Hours	0.00
Rotary Hrs%:	84.51
Slide Hrs%:	15.49
Rotary Ftg%:	95.18
Slide Ftg%:	4.82

cASING

Size	Lb/Ft	MD

ASSEMBLY TOTALS

BHA #	Motor SN / R.S SN	Slide Ftg	Slide Hrs	Rotate Ftg	Rotate Hrs	Circ Hrs	D & C Hrs	BHA Ftg	Avg ROP
5	G582	596.00	22.92	2,421.00	23.92	7.58	54.42	3,017.00	58.87
6	G585	0.00	0.00	237.00	3.17	1.50	4.67	237.00	0.00

Drilling Parameters

WOB:	13
Rot Wt:	127
Pick UP:	140
Slack Off:	112
SPP:	2600
Flow:	0 - 280
SPM:	95
Rot. RPM	60 - 65
Mot RPM:	0 - 0
Incl. In:	0
Azm. In:	0
Incl. Out:	0
Azm. Out:	0

Mud Record

Water

Weight:	9.8
Visc:	27
Chlorides:	152000
YP:	1
PV:	1
PH:	0
GAS:	0
SAND:	0
WL:	0
SOLID:	0.9
BHT°:	193
Flow T°:	0
Oil %:	0

Bit Record

Bit No:	6
Model	Smith MDSI613
SN.:	JG9419
MFG.	SMITH
Type	PDC
IADC	
JETS	3-18,3-22
TFA:	1.858
Hole ID:	6
Bit Hrs:	103.33
Bit Ftg:	6858.00

Current BHA # 6

Smith MDSI613
4.75" Bico 5/6lobe 5.4stg
4.75" NM Stab
4.75" NM Pony
4.75" NMDC
4.75" HOC
4.75" NM Stab
4.75" NMDC
X/O

PUMPS

Liner	0	0
Stroke	0	0
Effic.	95.00%	95.00%
Gal/Stk	0.00	0.00
BBL/Stk	0.000	0.000

COST BREAKDOWN

GENERAL COMMENT

Start Time	End Time	Hours	Start Depth	End Depth	Delta Depth	ROP	Activity Code	COMMENT
00:00	00:40	0.67	14323	14352	29	43.50	Drilling	Drilling - (WOB:12;GPM :280;RPM:60)
00:40	00:50	0.17	14352	14352	0	.00	Conn.	Conn.
00:50	00:55	0.08	14352	14352	0	.00	Conn.	Conn.
00:55	01:00	0.08	14352	14352	0	.00	MWD Survey	MWD Survey@14290' Inc 91.01° Azm 1.2°
01:00	01:20	0.33	14352	14367	15	45.00	Drilling	Drilling - (WOB:12;GPM :280;RPM:60)
01:20	02:15	0.92	14367	14383	16	17.45	Sliding	Sliding - (WOB:34;GPM :280;TFO:-15)
02:15	03:05	0.83	14383	14418	35	42.00	Drilling	Drilling - (WOB:12;GPM :280;RPM:60)
03:05	03:10	0.08	14418	14418	0	.00	MWD Survey	MWD Survey@14384' Inc 92.33° Azm 1.46°
03:10	03:35	0.42	14418	14418	0	.00	Circulating	Circulating
03:35	10:30	6.92	14418	14418	0	.00	POOH	POOH
10:30	11:45	1.25	14418	14418	0	.00	Change BHA	Change BHA
11:45	17:50	6.08	14418	14418	0	.00	TIH	TIH
17:50	18:10	0.33	14418	14418	0	.00	Other	Break circ
18:10	18:30	0.33	14418	14446	28	84.00	Drilling	Drilling - (WOB:12;GPM :280;RPM:60)

Start Time	End Time	Hours	Start Depth	End Depth	Delta Depth	ROP	Activity Code	COMMENT
18:30	19:40	1.17	14446	14446	0	.00	Circulating	Circulate gas
19:40	19:50	0.17	14446	14446	0	.00	Conn.	Conn.
19:50	19:55	0.08	14446	14446	0	.00	MWD Survey	MWD Survey@14384' Inc 92.33° Azm 1.46°
19:55	20:20	0.42	14446	14478	32	76.80	Drilling	Drilling - (WOB:8;GPM :280;RPM:65)
20:20	20:25	0.08	14478	14478	0	.00	MWD Survey	MWD Survey@14384' Inc 92.33° Azm 1.46°
20:25	22:00	1.58	14478	14542	64	40.42	Drilling	Drilling - (WOB:11;GPM :280;RPM:60)
22:00	22:05	0.08	14542	14542	0	.00	Conn.	Conn.
22:05	22:10	0.08	14542	14542	0	.00	MWD Survey	MWD Survey@14480' Inc 91.45° Azm 2.25°
22:10	22:55	0.75	14542	14637	95	126.67	Drilling	Drilling - (WOB:11;GPM :280;RPM:60)
22:55	23:40	0.75	14637	14637	0	.00	Rig Service-Inhol	Rig Service-Inhole
23:40	23:50	0.17	14637	14637	0	.00	Conn.	Conn.
23:50	23:55	0.08	14637	14637	0	.00	MWD Survey	MWD Survey@14575' Inc 88.9° Azm 1.81°
23:55	24:00	0.08	14637	14655	18	216.00	Drilling	Drilling - (WOB:13;GPM :280;RPM:60)

JOB NO.:	410413HEFMP6213	Report Time:	2400 — 21 of 28
COMPANY:	Continental Resources Inc.	API JOB #	33-053-04852
LOCATION:		WORK ORDER#	166165
RIG NAME:	Patterson 490	FIELD:	Baker
STATE:	North Dakota	Township:	153N
COUNTY:	McKenzie	Range/Section	101W — 16
WELL NAME:	Columbus Federal 1-16H	Company Man	Chris
Lead Directional :	Kaleb Smith	2nd Dir Hand :	Hilton Maldonado

Scientific Drilling

From Wednesday, May 15, 2013 at 0000 to Wednesday, May 15, 2013 at 2400

DAILY TOTALS

Start Depth	14655.00
End Depth	16152.00
Below Rot Hrs.	24.00
Total Drilled:	1497.00
Avg. Total ROP:	76.44
Slide Footage:	189.00
Slide Hours	9.25
Avg. Slide ROP:	20.43
Rotate Footage:	1308.00
Rotary Hours	10.33
Avg. Rot ROP:	126.58
Circ Hours	1.92
Ream Hours	0.00
Rotary Hrs%:	52.77
Slide Hrs%:	47.23
Rotary Ftg%:	87.37
Slide Ftg%:	12.63

cASING

Size	Lb/Ft	MD

ASSEMBLY TOTALS

BHA #	Motor SN / R.S SN	Slide Ftg	Slide Hrs	Rotate Ftg	Rotate Hrs	Circ Hrs	D & C Hrs	BHA Ftg	Avg ROP
6	G585	904.00	45.42	5,954.00	57.92	27.00	130.33	6,858.00	56.02

Drilling Parameters

WOB:	0
Rot Wt:	127
Pick UP:	140
Slack Off:	112
SPP:	2300
Flow:	0 - 280
SPM:	95
Rot. RPM	45 - 65
Mot RPM:	0 - 0
Incl. In:	0
Azm. In:	0
Incl. Out:	0
Azm. Out:	0

Mud Record

Water

Weight:	9.8
Visc:	27
Chlorides:	152000
YP:	1
PV:	1
PH:	0
GAS:	0
SAND:	0
WL:	0
SOLID:	0.9
BHT°:	193
Flow T°:	0
Oil %:	0

Bit Record

Bit No:	6
Model	Smith MDSI613
SN.:	JG9419
MFG.	SMITH
Type	PDC
IADC	
JETS	3-18,3-22
TFA:	1.858
Hole ID:	6
Bit Hrs:	103.33
Bit Ftg:	6858.00

Current BHA # 6

Smith MDSI613
4.75" Bico 5/6lobe 5.4stg
4.75" NM Stab
4.75" NM Pony
4.75" NMDC
4.75" HOC
4.75" NM Stab
4.75" NMDC
X/O

PUMPS

Liner	0	0
Stroke	0	0
Effic.	95.00%	95.00%
Gal/Stk	0.00	0.00
BBL/Stk	0.000	0.000

COST BREAKDOWN

GENERAL COMMENT

Start Time	End Time	Hours	Start Depth	End Depth	Delta Depth	ROP	Activity Code	COMMENT
00:00	00:30	0.50	14655	14731	76	152.00	Drilling	Drilling - (WOB:13;GPM :280;RPM:45)
00:30	00:40	0.17	14731	14731	0	.00	Conn.	Conn.
00:40	00:45	0.08	14731	14731	0	.00	MWD Survey	MWD Survey@14669' Inc 88.46° Azm 2.07°
00:45	00:50	0.08	14731	14746	15	180.00	Drilling	Drilling - (WOB:10;GPM :280;RPM:60)
00:50	02:05	1.25	14746	14763	17	13.60	Sliding	Sliding - (WOB:34;GPM :280;TFO:20)
02:05	02:35	0.50	14763	14826	63	126.00	Drilling	Drilling - (WOB:12;GPM :280;RPM:50)
02:35	02:40	0.08	14826	14826	0	.00	Conn.	Conn.
02:40	02:45	0.08	14826	14826	0	.00	MWD Survey	MWD Survey@14764' Inc 89.52° Azm 2.25°
02:45	03:00	0.25	14826	14847	21	84.00	Drilling	Drilling - (WOB:12;GPM :280;RPM:50)
03:00	03:35	0.58	14847	14862	15	25.71	Sliding	Sliding - (WOB:30;GPM :280;TFO:-20)
03:35	04:05	0.50	14862	14920	58	116.00	Drilling	Drilling - (WOB:12;GPM :280;RPM:60)
04:05	04:15	0.17	14920	14920	0	.00	Conn.	Conn.
04:15	04:20	0.08	14920	14920	0	.00	MWD Survey	MWD Survey@14858' Inc 92.07° Azm 2.69°
04:20	04:45	0.42	14920	14984	64	153.60	Drilling	Drilling - (WOB:12;GPM :280;RPM:65)

Start Time	End Time	Hours	Start Depth	End Depth	Delta Depth	ROP	Activity Code	COMMENT
04:45	04:50	0.08	14984	14984	0	.00	MWD Survey	MWD Survey@14954' Inc 92.42° Azm 2.78°
04:50	05:10	0.33	14984	15016	32	96.00	Drilling	Drilling - (WOB:12;GPM :280;RPM:65)
05:10	05:20	0.17	15016	15016	0	.00	Conn.	Conn.
05:20	05:35	0.25	15016	15016	0	.00	MWD Survey	MWD Survey@14954' Inc 92.42° Azm 2.78°
05:35	05:50	0.25	15016	15048	32	128.00	Drilling	Drilling - (WOB:12;GPM :280;RPM:65)
05:50	06:05	0.25	15048	15048	0	.00	MWD Survey	MWD Survey@14954' Inc 92.42° Azm 2.78°
06:05	07:00	0.92	15048	15070	22	24.00	Sliding	Sliding - (WOB:30;GPM :280;TFO:-135)
07:00	07:20	0.33	15070	15110	40	120.00	Drilling	Drilling - (WOB:13;GPM :280;RPM:65)
07:20	07:30	0.17	15110	15110	0	.00	Survey & Conn.	Survey & Conn.@15048' Inc 91.8° Azm 3.04°
07:30	08:20	0.83	15110	15205	95	114.00	Drilling	Drilling - (WOB:13;GPM :280;RPM:65)
08:20	08:25	0.08	15205	15205	0	.00	Survey & Conn.	Survey & Conn.@15143' Inc 90.31° Azm 2.95°
08:25	09:10	0.75	15205	15300	95	126.67	Drilling	Drilling - (WOB:13;GPM :280;RPM:65)
09:10	09:20	0.17	15300	15300	0	.00	Survey & Conn.	Survey & Conn.@15238' Inc 90.31° Azm 3.39°
09:20	09:50	0.50	15300	15395	95	190.00	Drilling	Drilling - (WOB:13;GPM :280;RPM:65)
09:50	10:05	0.25	15395	15395	0	.00	Survey & Conn.	Survey & Conn.@15333' Inc 90.4° Azm 3.66°
10:05	10:55	0.83	15395	15489	94	112.80	Drilling	Drilling - (WOB:13;GPM :280;RPM:65)
10:55	11:05	0.17	15489	15489	0	.00	Survey & Conn.	Survey & Conn.@15427' Inc 89.78° Azm 3.92°
11:05	11:50	0.75	15489	15584	95	126.67	Drilling	Drilling - (WOB:13;GPM :280;RPM:65)
11:50	12:00	0.17	15584	15584	0	.00	Survey & Conn.	Survey & Conn.@15522' Inc 89.25° Azm 4.89°
12:00	12:10	0.17	15584	15615	31	186.00	Drilling	Drilling - (WOB:13;GPM :280;RPM:65)
12:10	12:25	0.25	15615	15615	0	.00	MWD Survey	MWD Survey@15522' Inc 89.25° Azm 4.89°
12:25	14:05	1.67	15615	15645	30	18.00	Sliding	Sliding - (WOB:30;GPM :280;TFO:-60)
14:05	14:20	0.25	15645	15679	34	136.00	Drilling	Drilling - (WOB:13;GPM :280;RPM:65)
14:20	14:30	0.17	15679	15679	0	.00	Survey & Conn.	Survey & Conn.@15617' Inc 88.9° Azm 5.15°
14:30	15:00	0.50	15679	15742	63	126.00	Drilling	Drilling - (WOB:13;GPM :280;RPM:65)
15:00	15:10	0.17	15742	15742	0	.00	MWD Survey	MWD Survey@15711' Inc 89.78° Azm 4.71°
15:10	16:00	0.83	15742	15772	30	36.00	Sliding	Sliding - (WOB:30;GPM :280;TFO:-45)
16:00	16:25	0.42	15772	15772	0	.00	Survey & Conn.	Survey & Conn.@15711' Inc 89.78° Azm 4.71°
16:25	17:15	0.83	15772	15868	96	115.20	Drilling	Drilling - (WOB:13;GPM :280;RPM:65)
17:15	17:25	0.17	15868	15868	0	.00	Rig Service-Inhol	Rig Service-Inhole
17:25	17:30	0.08	15868	15868	0	.00	Conn.	Conn.
17:30	17:35	0.08	15868	15868	0	.00	MWD Survey	MWD Survey@15806' Inc 91.45° Azm 4.53°
17:35	17:50	0.25	15868	15899	31	124.00	Drilling	Drilling - (WOB:13;GPM :280;RPM:65)
17:50	19:10	1.33	15899	15924	25	18.75	Sliding	Sliding - (WOB:27;GPM :280;TFO:-120)
19:10	19:30	0.33	15924	15963	39	117.00	Drilling	Drilling - (WOB:10;GPM :280;RPM:60)
19:30	19:35	0.08	15963	15963	0	.00	Conn.	Conn.
19:35	19:40	0.08	15963	15963	0	.00	MWD Survey	MWD Survey@15901' Inc 90.92° Azm 4.01°
19:40	19:55	0.25	15963	15994	31	124.00	Drilling	Drilling - (WOB:12;GPM :280;RPM:60)
19:55	20:00	0.08	15994	15994	0	.00	MWD Survey	MWD Survey@15901' Inc 90.92° Azm 4.01°
20:00	21:55	1.92	15994	16029	35	18.26	Sliding	Sliding - (WOB:29;GPM :280;TFO:-75)
21:55	22:10	0.25	16029	16058	29	116.00	Drilling	Drilling - (WOB:15;GPM :280;RPM:50)
22:10	22:15	0.08	16058	16058	0	.00	Conn.	Conn.
22:15	22:20	0.08	16058	16058	0	.00	MWD Survey	MWD Survey@15996' Inc 88.81° Azm 2.34°
22:20	22:40	0.33	16058	16099	41	123.00	Drilling	Drilling - (WOB:15;GPM :280;RPM:50)
22:40	22:45	0.08	16099	16099	0	.00	MWD Survey	MWD Survey@16090' Inc 89.52° Azm 0.4°
22:45	23:30	0.75	16099	16114	15	20.00	Sliding	Sliding - (WOB:30;GPM :280;TFO:-60)
23:30	23:50	0.33	16114	16152	38	114.00	Drilling	Drilling - (WOB:15;GPM :280;RPM:50)
23:50	23:55	0.08	16152	16152	0	.00	Conn.	Conn.

Start Time	End Time	Hours	Start Depth	End Depth	Delta Depth	ROP	Activity Code	COMMENT
23:55	**24:00**	0.08	**16152**	**16152**	0	**.00**	**MWD Survey**	MWD Survey@16090' Inc 89.52° Azm 0.4°

JOB NO.:	410413HEFMP6213	Report Time:	2400 — 22 of 28
COMPANY:	Continental Resources Inc.	API JOB #	33-053-04852
LOCATION:		WORK ORDER#	166165
RIG NAME:	Patterson 490	FIELD:	Baker
STATE:	North Dakota	Township:	153N
COUNTY:	McKenzie	Range/Section	101W — 16
WELL NAME:	Columbus Federal 1-16H	Company Man	Chris
Lead Directional :	Kaleb Smith	2nd Dir Hand :	Hilton Maldonado

Scientific Drilling

From Thursday, May 16, 2013 at 0000 to Thursday, May 16, 2013 at 2400

DAILY TOTALS

Start Depth	16152.00
End Depth	17543.00
Below Rot Hrs.	24.00
Total Drilled:	1391.00
Avg. Total ROP:	72.57
Slide Footage:	168.00
Slide Hours	8.75
Avg. Slide ROP:	19.20
Rotate Footage:	1223.00
Rotary Hours	10.42
Avg. Rot ROP:	117.41
Circ Hours	2.75
Ream Hours	0.00
Rotary Hrs%:	54.35
Slide Hrs%:	45.65
Rotary Ftg%:	87.92
Slide Ftg%:	12.08

cASING

Size	Lb/Ft	MD

ASSEMBLY TOTALS

BHA #	Motor SN / R.S SN	Slide Ftg	Slide Hrs	Rotate Ftg	Rotate Hrs	Circ Hrs	D & C Hrs	BHA Ftg	Avg ROP
6	G585	904.00	45.42	5,954.00	57.92	27.00	130.33	6,858.00	56.02

Drilling Parameters

WOB:	0
Rot Wt:	127
Pick UP:	140
Slack Off:	112
SPP:	2200
Flow:	0 - 280
SPM:	95
Rot. RPM	55 - 65
Mot RPM:	0 - 0
Incl. In:	0
Azm. In:	0
Incl. Out:	0
Azm. Out:	0

Mud Record

Water

Weight:	9.8
Visc:	27
Chlorides:	152000
YP:	1
PV:	1
PH:	0
GAS:	0
SAND:	0
WL:	0
SOLID:	0.9
BHT°:	193
Flow T°:	0
Oil %:	0

Bit Record

Bit No:	6
Model	Smith MDSI613
SN.:	JG9419
MFG.	SMITH
Type	PDC
IADC	
JETS	3-18,3-22
TFA:	1.858
Hole ID:	6
Bit Hrs:	103.33
Bit Ftg:	6858.00

Current BHA # 6

Smith MDSI613
4.75" Bico 5/6lobe 5.4stg
4.75" NM Stab
4.75" NM Pony
4.75" NMDC
4.75" HOC
4.75" NM Stab
4.75" NMDC
X/O

PUMPS

Liner	0	0
Stroke	0	0
Effic.	95.00%	95.00%
Gal/Stk	0.00	0.00
BBL/Stk	0.000	0.000

COST BREAKDOWN

GENERAL COMMENT

Start Time	End Time	Hours	Start Depth	End Depth	Delta Depth	ROP	Activity Code	COMMENT
00:00	00:20	0.33	16152	16184	32	96.00	Drilling	Drilling - (WOB:12;GPM :280;RPM:55)
00:20	00:25	0.08	16184	16184	0	.00	MWD Survey	MWD Survey@16090' Inc 89.52° Azm 0.4°
00:25	01:40	1.25	16184	16216	32	25.60	Sliding	Sliding - (WOB:34;GPM :280;TFO:-60)
01:40	02:00	0.33	16216	16247	31	93.00	Drilling	Drilling - (WOB:14;GPM :280;RPM:60)
02:00	02:05	0.08	16247	16247	0	.00	Conn.	Conn.
02:05	02:10	0.08	16247	16247	0	.00	MWD Survey	MWD Survey@16185' Inc 90.92° Azm 0.23°
02:10	03:00	0.83	16247	16342	95	114.00	Drilling	Drilling - (WOB:17;GPM :280;RPM:65)
03:00	03:05	0.08	16342	16342	0	.00	Conn.	Conn.
03:05	03:10	0.08	16342	16342	0	.00	MWD Survey	MWD Survey@16280' Inc 91.98° Azm 359.35°
03:10	03:45	0.58	16342	16436	94	161.14	Drilling	Drilling - (WOB:11;GPM :280;RPM:65)
03:45	03:55	0.17	16436	16436	0	.00	Conn.	Conn.
03:55	04:00	0.08	16436	16436	0	.00	MWD Survey	MWD Survey@16374' Inc 91.36° Azm 359.79°
04:00	04:50	0.83	16436	16532	96	115.20	Drilling	Drilling - (WOB:15;GPM :280;RPM:60)
04:50	04:55	0.08	16532	16532	0	.00	Conn.	Conn.

Start Time	End Time	Hours	Start Depth	End Depth	Delta Depth	ROP	Activity Code	COMMENT
04:55	05:00	0.08	16532	16532	0	.00	MWD Survey	MWD Survey@16470' Inc 90.57° Azm 0.23°
05:00	05:15	0.25	16532	16552	20	80.00	Drilling	Drilling - (WOB:15;GPM :280;RPM:60)
05:15	06:35	1.33	16552	16582	30	22.50	Sliding	Sliding - (WOB:34;GPM :280;TFO:-75)
06:35	07:00	0.42	16582	16626	44	105.60	Drilling	Drilling - (WOB:17;GPM :280;RPM:55)
07:00	07:05	0.08	16626	16626	0	.00	Conn.	Conn.
07:05	07:10	0.08	16626	16626	0	.00	MWD Survey	MWD Survey@16564' Inc 89.69° Azm 358.73°
07:10	07:25	0.25	16626	16660	34	136.00	Drilling	Drilling - (WOB:11;GPM :280;RPM:55)
07:25	07:30	0.08	16660	16660	0	.00	MWD Survey	MWD Survey@16659' Inc 88.99° Azm 357.68°
07:30	07:55	0.42	16660	16689	29	69.60	Drilling	Drilling - (WOB:11;GPM :280;RPM:55)
07:55	08:00	0.08	16689	16689	0	.00	MWD Survey	MWD Survey@16659' Inc 88.99° Azm 357.68°
08:00	08:50	0.83	16689	16718	29	34.80	Sliding	Sliding - (WOB:34;GPM :280;TFO:30)
08:50	09:50	1.00	16718	16718	0	.00	Rig Service-Inhol	Rig Service-Inhole
09:50	10:00	0.17	16718	16718	0	.00	Survey & Conn.	Survey & Conn.@16659' Inc 88.99° Azm 357.68°
10:00	11:00	1.00	16718	16816	98	98.00	Drilling	Drilling - (WOB:15;GPM :280;RPM:60)
11:00	11:10	0.17	16816	16816	0	.00	Survey & Conn.	Survey & Conn.@16754' Inc 90.57° Azm 357.86°
11:10	11:20	0.17	16816	16848	32	192.00	Drilling	Drilling - (WOB:15;GPM :280;RPM:55)
11:20	11:30	0.17	16848	16848	0	.00	MWD Survey	MWD Survey@16754' Inc 90.57° Azm 357.86°
11:30	11:55	0.42	16848	16911	63	151.20	Drilling	Drilling - (WOB:15;GPM :280;RPM:55)
11:55	12:05	0.17	16911	16911	0	.00	Survey & Conn.	Survey & Conn.@16849' Inc 90.04° Azm 358.82°
12:05	12:50	0.75	16911	17006	95	126.67	Drilling	Drilling - (WOB:15;GPM :280;RPM:55)
12:50	13:20	0.50	17006	17006	0	.00	Survey & Conn.	Survey & Conn.@16944' Inc 88.99° Azm 358.73°
13:20	13:25	0.08	17006	17021	15	180.00	Drilling	Drilling - (WOB:15;GPM :280;RPM:55)
13:25	15:35	2.17	17021	17041	20	9.23	Sliding	Sliding - (WOB:34;GPM :280;TFO:360)
15:35	15:45	0.17	17041	17070	29	174.00	Drilling	Drilling - (WOB:15;GPM :280;RPM:55)
15:45	17:05	1.33	17070	17101	31	23.25	Sliding	Sliding - (WOB:34;GPM :280;TFO:360)
17:05	17:15	0.17	17101	17101	0	.00	Conn.	Conn.
17:15	17:25	0.17	17101	17101	0	.00	MWD Survey	MWD Survey@17039' Inc 87.67° Azm 357.68°
17:25	18:25	1.00	17101	17196	95	95.00	Drilling	Drilling - (WOB:15;GPM :280;RPM:55)
18:25	18:35	0.17	17196	17196	0	.00	Conn.	Conn.
18:35	18:40	0.08	17196	17196	0	.00	MWD Survey	MWD Survey@17134' Inc 90.75° Azm 357.68°
18:40	19:05	0.42	17196	17259	63	151.20	Drilling	Drilling - (WOB:15;GPM :280;RPM:55)
19:05	19:10	0.08	17259	17259	0	.00	MWD Survey	MWD Survey@17229' Inc 91.54° Azm 359.53°
19:10	19:25	0.25	17259	17291	32	128.00	Drilling	Drilling - (WOB:13;GPM :280;RPM:55)
19:25	19:30	0.08	17291	17291	0	.00	Conn.	Conn.
19:30	19:35	0.08	17291	17291	0	.00	MWD Survey	MWD Survey@17229' Inc 91.54° Azm 359.53°
19:35	20:00	0.42	17291	17354	63	151.20	Drilling	Drilling - (WOB:13;GPM :280;RPM:60)
20:00	20:05	0.08	17354	17354	0	.00	MWD Survey	MWD Survey@17324' Inc 90.66° Azm 359.61°
20:05	20:20	0.25	17354	17386	32	128.00	Drilling	Drilling - (WOB:14;GPM :280;RPM:60)
20:20	20:25	0.08	17386	17386	0	.00	Conn.	Conn.
20:25	20:30	0.08	17386	17386	0	.00	MWD Survey	MWD Survey@17324' Inc 90.66° Azm 359.61°
20:30	21:05	0.58	17386	17448	62	106.29	Drilling	Drilling - (WOB:14;GPM :280;RPM:60)
21:05	21:15	0.17	17448	17448	0	.00	MWD Survey	MWD Survey@17417' Inc 90.48° Azm 1.55°
21:15	23:05	1.83	17448	17474	26	14.18	Sliding	Sliding - (WOB:26;GPM :280;TFO:-60)
23:05	23:15	0.17	17474	17479	5	30.00	Drilling	Drilling - (WOB:14;GPM :280;RPM:60)
23:15	23:20	0.08	17479	17479	0	.00	Conn.	Conn.
23:20	23:25	0.08	17479	17479	0	.00	MWD Survey	MWD Survey@17417' Inc 90.48° Azm 1.55°
23:25	23:55	0.50	17479	17543	64	128.00	Drilling	Drilling - (WOB:17;GPM :280;RPM:60)
23:55	24:00	0.08	17543	17543	0	.00	MWD Survey	MWD Survey@17512' Inc 91.45° Azm 0.93°

JOB NO.:	410413HEFMP6213	Report Time:	2400 — 23 of 28
COMPANY:	Continental Resources Inc.	API JOB #	33-053-04852
LOCATION:		WORK ORDER#	166165
RIG NAME:	Patterson 490	FIELD:	Baker
STATE:	North Dakota	Township:	153N
COUNTY:	McKenzie	Range/Section	101W — 16
WELL NAME:	Columbus Federal 1-16H	Company Man	Chris
Lead Directional :	Kaleb Smith	2nd Dir Hand :	Hilton Maldonado

Scientific Drilling

From Friday, May 17, 2013 at 0000 to Friday, May 17, 2013 at 2400

DAILY TOTALS

Start Depth	17543.00
End Depth	18715.00
Below Rot Hrs.	24.00
Total Drilled:	1172.00
Avg. Total ROP:	59.59
Slide Footage:	191.00
Slide Hours	10.75
Avg. Slide ROP:	17.77
Rotate Footage:	981.00
Rotary Hours	8.92
Avg. Rot ROP:	110.02
Circ Hours	2.58
Ream Hours	0.00
Rotary Hrs%:	45.34
Slide Hrs%:	54.66
Rotary Ftg%:	83.70
Slide Ftg%:	16.30

cASING

Size	Lb/Ft	MD

ASSEMBLY TOTALS

BHA #	Motor SN / R.S SN	Slide Ftg	Slide Hrs	Rotate Ftg	Rotate Hrs	Circ Hrs	D & C Hrs	BHA Ftg	Avg ROP
6	G585	904.00	45.42	5,954.00	57.92	27.00	130.33	6,858.00	56.02

Drilling Parameters

WOB:	0
Rot Wt:	127
Pick UP:	140
Slack Off:	112
SPP:	0
Flow:	0 - 280
SPM:	0
Rot. RPM	45 - 60
Mot RPM:	0 - 0
Incl. In:	0
Azm. In:	0
Incl. Out:	0
Azm. Out:	0

Mud Record

Water

Weight:	9.8
Visc:	27
Chlorides:	152000
YP:	1
PV:	1
PH:	0
GAS:	0
SAND:	0
WL:	0
SOLID:	0.9
BHT°:	193
Flow T°:	0
Oil %:	0

Bit Record

Bit No:	6
Model	Smith MDSI613
SN.:	JG9419
MFG.	SMITH
Type	PDC
IADC	
JETS	3-18,3-22
TFA:	1.858
Hole ID:	6
Bit Hrs:	103.33
Bit Ftg:	6858.00

PUMPS

Liner	0	0
Stroke	0	0
Effic.	95.00%	95.00%
Gal/Stk	0.00	0.00
BBL/Stk	0.000	0.000

Current BHA # 6

Smith MDSI613
4.75" Bico 5/6lobe 5.4stg
4.75" NM Stab
4.75" NM Pony
4.75" NMDC
4.75" HOC
4.75" NM Stab
4.75" NMDC
X/O

COST BREAKDOWN

GENERAL COMMENT

Start Time	End Time	Hours	Start Depth	End Depth	Delta Depth	ROP	Activity Code	COMMENT
00:00	00:20	0.33	17543	17574	31	93.00	Drilling	Drilling - (WOB:17;GPM :280;RPM:60)
00:20	00:25	0.08	17574	17574	0	.00	Conn.	Conn.
00:25	00:30	0.08	17574	17574	0	.00	MWD Survey	MWD Survey@17512' Inc 91.45° Azm 0.93°
00:30	00:45	0.25	17574	17594	20	80.00	Drilling	Drilling - (WOB:14;GPM :280;RPM:60)
00:45	02:25	1.67	17594	17632	38	22.80	Sliding	Sliding - (WOB:38;GPM :280;TFO:-70)
02:25	02:40	0.25	17632	17669	37	148.00	Drilling	Drilling - (WOB:12;GPM :280;RPM:60)
02:40	02:50	0.17	17669	17669	0	.00	Conn.	Conn.
02:50	02:55	0.08	17669	17669	0	.00	MWD Survey	MWD Survey@17607' Inc 89.69° Azm 358.82°
02:55	03:20	0.42	17669	17701	32	76.80	Drilling	Drilling - (WOB:14;GPM :280;RPM:60)
03:20	03:25	0.08	17701	17701	0	.00	MWD Survey	MWD Survey@17607' Inc 89.69° Azm 358.82°
03:25	04:25	1.00	17701	17718	17	17.00	Sliding	Sliding - (WOB:38;GPM :280;TFO:-30)
04:25	04:55	0.50	17718	17764	46	92.00	Drilling	Drilling - (WOB:14;GPM :280;RPM:60)
04:55	05:00	0.08	17764	17764	0	.00	Conn.	Conn.
05:00	05:05	0.08	17764	17764	0	.00	MWD Survey	MWD Survey@17702' Inc 90.04° Azm 357.33°

Start Time	End Time	Hours	Start Depth	End Depth	Delta Depth	ROP	Activity Code	COMMENT
05:05	05:55	0.83	17764	17859	95	114.00	Drilling	Drilling - (WOB:16;GPM :280;RPM:60)
05:55	06:00	0.08	17859	17859	0	.00	Conn.	Conn.
06:00	06:05	0.08	17859	17859	0	.00	MWD Survey	MWD Survey@17797' Inc 90.31° Azm 357.42°
06:05	06:20	0.25	17859	17890	31	124.00	Drilling	Drilling - (WOB:16;GPM :280;RPM:60)
06:20	06:25	0.08	17890	17890	0	.00	MWD Survey	MWD Survey@17797' Inc 90.31° Azm 357.42°
06:25	06:55	0.50	17890	17953	63	126.00	Drilling	Drilling - (WOB:16;GPM :280;RPM:60)
06:55	07:00	0.08	17953	17953	0	.00	Conn.	Conn.
07:00	07:05	0.08	17953	17953	0	.00	MWD Survey	MWD Survey@17891' Inc 89.96° Azm 357.86°
07:05	07:15	0.17	17953	17973	20	120.00	Drilling	Drilling - (WOB:16;GPM :280;RPM:60)
07:15	09:25	2.17	17973	17993	20	9.23	Sliding	Sliding - (WOB:38;GPM :280;TFO:360)
09:25	09:45	0.33	17993	18048	55	165.00	Drilling	Drilling - (WOB:16;GPM :280;RPM:60)
09:45	10:30	0.75	18048	18048	0	.00	Rig Service-Inhol	Rig Service-Inhole
10:30	10:35	0.08	18048	18048	0	.00	Survey & Conn.	Survey & Conn.@17986' Inc 88.99° Azm 356.98°
10:35	10:50	0.25	18048	18081	33	132.00	Drilling	Drilling - (WOB:16;GPM :280;RPM:60)
10:50	11:00	0.17	18081	18081	0	.00	MWD Survey	MWD Survey@17986' Inc 88.99° Azm 356.98°
11:00	12:20	1.33	18081	18103	22	16.50	Sliding	Sliding - (WOB:38;GPM :280;TFO:20)
12:20	12:40	0.33	18103	18144	41	123.00	Drilling	Drilling - (WOB:16;GPM :280;RPM:60)
12:40	12:55	0.25	18144	18144	0	.00	Survey & Conn.	Survey & Conn.@18082' Inc 89.25° Azm 358.12°
12:55	13:40	0.75	18144	18239	95	126.67	Drilling	Drilling - (WOB:16;GPM :280;RPM:60)
13:40	13:45	0.08	18239	18239	0	.00	Survey & Conn.	Survey & Conn.@18177' Inc 90.48° Azm 359.96°
13:45	14:25	0.67	18239	18333	94	141.00	Drilling	Drilling - (WOB:16;GPM :280;RPM:60)
14:25	14:35	0.17	18333	18333	0	.00	Survey & Conn.	Survey & Conn.@18271' Inc 90.22° Azm 1.2°
14:35	14:50	0.25	18333	18365	32	128.00	Drilling	Drilling - (WOB:16;GPM :280;RPM:60)
14:50	15:00	0.17	18365	18365	0	.00	MWD Survey	MWD Survey@18271' Inc 90.22° Azm 1.2°
15:00	16:00	1.00	18365	18390	25	25.00	Sliding	Sliding - (WOB:38;GPM :280;TFO:-30)
16:00	16:25	0.42	18390	18429	39	93.60	Drilling	Drilling - (WOB:16;GPM :280;RPM:60)
16:25	16:35	0.17	18429	18429	0	.00	Survey & Conn.	Survey & Conn.@18367' Inc 89.52° Azm 1.72°
16:35	17:45	1.17	18429	18524	95	81.43	Drilling	Drilling - (WOB:16;GPM :280;RPM:60)
17:45	18:00	0.25	18524	18524	0	.00	Survey & Conn.	Survey & Conn.@18462' Inc 89.56° Azm 1.71°
18:00	18:15	0.25	18524	18555	31	124.00	Drilling	Drilling - (WOB:16;GPM :280;RPM:45)
18:15	18:20	0.08	18555	18555	0	.00	MWD Survey	MWD Survey@18462' Inc 89.56° Azm 1.71°
18:20	20:00	1.67	18555	18590	35	21.00	Sliding	Sliding - (WOB:32;GPM :280;TFO:-45)
20:00	20:20	0.33	18590	18620	30	90.00	Drilling	Drilling - (WOB:16;GPM :280;RPM:50)
20:20	20:25	0.08	18620	18620	0	.00	Conn.	Conn.
20:25	20:30	0.08	18620	18620	0	.00	MWD Survey	MWD Survey@18558' Inc 88.99° Azm 1.55°
20:30	20:50	0.33	18620	18652	32	96.00	Drilling	Drilling - (WOB:14;GPM :280;RPM:50)
20:50	20:55	0.08	18652	18652	0	.00	MWD Survey	MWD Survey@18558' Inc 88.99° Azm 1.55°
20:55	21:30	0.58	18652	18661	9	15.43	Sliding	Sliding - (WOB:36;GPM :280;TFO:-60)
21:30	22:10	0.67	18661	18661	0	.00	Rig Service-Inhol	Rig Service-Inhole
22:10	23:30	1.33	18661	18686	25	18.75	Sliding	Sliding - (WOB:36;GPM :280;TFO:-45)
23:30	23:50	0.33	18686	18715	29	87.00	Drilling	Drilling - (WOB:14;GPM :280;RPM:50)
23:50	24:00	0.17	18715	18715	0	.00	Rig repair	Rig repair / Weld fast cap on pump

JOB NO.:	410413HEFMP6213	Report Time:	2400	24 of 28
COMPANY:	Continental Resources Inc.	API JOB #	33-053-04852	
LOCATION:		WORK ORDER#	166165	
RIG NAME:	Patterson 490	FIELD:	Baker	
STATE:	North Dakota	Township:	153N	
COUNTY:	McKenzie	Range/Section	101W	16
WELL NAME:	Columbus Federal 1-16H	Company Man	Chris	
Lead Directional :	Kaleb Smith	2nd Dir Hand :	Hilton Maldonado	

Scientific Drilling

From Saturday, May 18, 2013 at 0000 to Saturday, May 18, 2013 at 2400

DAILY TOTALS

Start Depth	18715.00
End Depth	19947.00
Below Rot Hrs.	24.00
Total Drilled:	1232.00
Avg. Total ROP:	69.41
Slide Footage:	151.00
Slide Hours	7.00
Avg. Slide ROP:	21.57
Rotate Footage:	1081.00
Rotary Hours	10.75
Avg. Rot ROP:	100.56
Circ Hours	2.08
Ream Hours	0.00
Rotary Hrs%:	60.56
Slide Hrs%:	39.44
Rotary Ftg%:	87.74
Slide Ftg%:	12.26

cASING

Size	Lb/Ft	MD

ASSEMBLY TOTALS

BHA #	Motor SN / R.S SN	Slide Ftg	Slide Hrs	Rotate Ftg	Rotate Hrs	Circ Hrs	D & C Hrs	BHA Ftg	Avg ROP
6	G585	904.00	45.42	5,954.00	57.92	27.00	130.33	6,858.00	56.02

Drilling Parameters

WOB:	0
Rot Wt:	127
Pick UP:	140
Slack Off:	112
SPP:	2600
Flow:	0 - 280
SPM:	95
Rot. RPM	45 - 60
Mot RPM:	0 - 0
Incl. In:	0
Azm. In:	0
Incl. Out:	0
Azm. Out:	0

Mud Record

Water

Weight:	9.8
Visc:	27
Chlorides:	152000
YP:	1
PV:	1
PH:	0
GAS:	0
SAND:	0
WL:	0
SOLID:	0.9
BHT°:	193
Flow T°:	0
Oil %:	0

Bit Record

Bit No:	6
Model	Smith MDSI613
SN.:	JG9419
MFG.	SMITH
Type	PDC
IADC	
JETS	3-18,3-22
TFA:	1.858
Hole ID:	6
Bit Hrs:	103.33
Bit Ftg:	6858.00

PUMPS

Liner	0	0
Stroke	0	0
Effic.	95.00%	95.00%
Gal/Stk	0.00	0.00
BBL/Stk	0.000	0.000

Current BHA # 6

Smith MDSI613
4.75" Bico 5/6lobe 5.4stg
4.75" NM Stab
4.75" NM Pony
4.75" NMDC
4.75" HOC
4.75" NM Stab
4.75" NMDC
X/O

COST BREAKDOWN

GENERAL COMMENT

Start Time	End Time	Hours	Start Depth	End Depth	Delta Depth	ROP	Activity Code	COMMENT
00:00	02:05	2.08	18715	18715	0	.00	Rig repair	Rig repair / Weld fast cap on pump
02:05	02:10	0.08	18715	18715	0	.00	Conn.	Conn.
02:10	02:15	0.08	18715	18715	0	.00	MWD Survey	MWD Survey@18653' Inc 90.48° Azm 0.05°
02:15	02:35	0.33	18715	18746	31	93.00	Drilling	Drilling - (WOB:16;GPM :280;RPM:50)
02:35	02:40	0.08	18746	18746	0	.00	MWD Survey	MWD Survey@18653' Inc 90.48° Azm 0.05°
02:40	03:00	0.33	18746	18777	31	93.00	Drilling	Drilling - (WOB:12;GPM :280;RPM:50)
03:00	03:25	0.42	18777	18777	0	.00	Circulating	Circulate gas
03:25	03:30	0.08	18777	18777	0	.00	MWD Survey	MWD Survey@18747' Inc 90.66° Azm 357.94°
03:30	03:50	0.33	18777	18809	32	96.00	Drilling	Drilling - (WOB:15;GPM :280;RPM:50)
03:50	04:00	0.17	18809	18809	0	.00	Conn.	Conn.
04:00	04:05	0.08	18809	18809	0	.00	MWD Survey	MWD Survey@18747' Inc 90.66° Azm 357.94°
04:05	04:20	0.25	18809	18829	20	80.00	Drilling	Drilling - (WOB:15;GPM :280;RPM:50)
04:20	05:45	1.42	18829	18855	26	18.35	Sliding	Sliding - (WOB:40;GPM :280;TFO:-15)
05:45	06:10	0.42	18855	18904	49	117.60	Drilling	Drilling - (WOB:15;GPM :280;RPM:45)

Start Time	End Time	Hours	Start Depth	End Depth	Delta Depth	ROP	Activity Code	COMMENT
06:10	06:15	0.08	18904	18904	0	.00	Conn.	Conn.
06:15	06:20	0.08	18904	18904	0	.00	MWD Survey	MWD Survey@18842' Inc 90.31° Azm 357.77°
06:20	06:50	0.50	18904	18967	63	126.00	Drilling	Drilling - (WOB:15;GPM :280;RPM:45)
06:50	06:55	0.08	18967	18967	0	.00	MWD Survey	MWD Survey@18937' Inc 89.87° Azm 357.94°
06:55	07:15	0.33	18967	18999	32	96.00	Drilling	Drilling - (WOB:15;GPM :280;RPM:45)
07:15	07:20	0.08	18999	18999	0	.00	Survey & Conn.	Survey & Conn.@18937' Inc 89.87° Azm 357.94°
07:20	07:35	0.25	18999	19030	31	124.00	Drilling	Drilling - (WOB:15;GPM :280;RPM:45)
07:35	07:50	0.25	19030	19030	0	.00	MWD Survey	MWD Survey@18937' Inc 89.87° Azm 357.94°
07:50	10:00	2.17	19030	19075	45	20.77	Sliding	Sliding - (WOB:40;GPM :280;TFO:360)
10:00	10:10	0.17	19075	19093	18	108.00	Drilling	Drilling - (WOB:15;GPM :280;RPM:45)
10:10	10:20	0.17	19093	19093	0	.00	Survey & Conn.	Survey & Conn.@19031' Inc 89.34° Azm 358.38°
10:20	11:05	0.75	19093	19188	95	126.67	Drilling	Drilling - (WOB:15;GPM :280;RPM:45)
11:05	11:15	0.17	19188	19188	0	.00	Survey & Conn.	Survey & Conn.@19126' Inc 91.1° Azm 355.39°
11:15	12:15	1.00	19188	19283	95	95.00	Drilling	Drilling - (WOB:15;GPM :280;RPM:45)
12:15	12:25	0.17	19283	19283	0	.00	Survey & Conn.	Survey & Conn.@19221' Inc 89.25° Azm 356.19°
12:25	12:45	0.33	19283	19315	32	96.00	Drilling	Drilling - (WOB:15;GPM :280;RPM:45)
12:45	13:00	0.25	19315	19315	0	.00	MWD Survey	MWD Survey@19221' Inc 89.25° Azm 356.19°
13:00	14:55	1.92	19315	19355	40	20.87	Sliding	Sliding - (WOB:40;GPM :280;TFO:30)
14:55	15:15	0.33	19355	19378	23	69.00	Drilling	Drilling - (WOB:15;GPM :280;RPM:45)
15:15	15:25	0.17	19378	19378	0	.00	Survey & Conn.	Survey & Conn.@19316' Inc 88.72° Azm 356.45°
15:25	16:20	0.92	19378	19472	94	102.55	Drilling	Drilling - (WOB:15;GPM :280;RPM:60)
16:20	16:30	0.17	19472	19472	0	.00	Survey & Conn.	Survey & Conn.@19410' Inc 90.4° Azm 356.89°
16:30	16:35	0.08	19472	19472	0	.00	MWD Survey	MWD Survey@19410' Inc 90.4° Azm 356.89°
16:35	17:35	1.00	19472	19567	95	95.00	Drilling	Drilling - (WOB:15;GPM :280;RPM:60)
17:35	17:45	0.17	19567	19567	0	.00	Survey & Conn.	Survey & Conn.@19505' Inc 89.78° Azm 357.24°
17:45	18:25	0.67	19567	19630	63	94.50	Drilling	Drilling - (WOB:15;GPM :280;RPM:60)
18:25	18:35	0.17	19630	19630	0	.00	MWD Survey	MWD Survey@19600' Inc 89.16° Azm 358.03°
18:35	18:55	0.33	19630	19662	32	96.00	Drilling	Drilling - (WOB:15;GPM :280;RPM:60)
18:55	19:05	0.17	19662	19662	0	.00	Conn.	Conn.
19:05	19:10	0.08	19662	19662	0	.00	MWD Survey	MWD Survey@19600' Inc 89.16° Azm 358.03°
19:10	19:35	0.42	19662	19693	31	74.40	Drilling	Drilling - (WOB:17;GPM :280;RPM:60)
19:35	19:40	0.08	19693	19693	0	.00	MWD Survey	MWD Survey@19600' Inc 89.16° Azm 358.03°
19:40	21:10	1.50	19693	19733	40	26.67	Sliding	Sliding - (WOB:52;GPM :280;TFO:15)
21:10	21:30	0.33	19733	19757	24	72.00	Drilling	Drilling - (WOB:17;GPM :280;RPM:60)
21:30	21:40	0.17	19757	19757	0	.00	Conn.	Conn.
21:40	21:45	0.08	19757	19757	0	.00	MWD Survey	MWD Survey@19695' Inc 89.16° Azm 358.91°
21:45	22:40	0.92	19757	19852	95	103.64	Drilling	Drilling - (WOB:11;GPM :280;RPM:60)
22:40	22:50	0.17	19852	19852	0	.00	Conn.	Conn.
22:50	22:55	0.08	19852	19852	0	.00	MWD Survey	MWD Survey@19790' Inc 90.75° Azm 359.44°
22:55	23:45	0.83	19852	19947	95	114.00	Drilling	Drilling - (WOB:15;GPM :280;RPM:60)
23:45	23:55	0.17	19947	19947	0	.00	Conn.	Conn.
23:55	24:00	0.08	19947	19947	0	.00	MWD Survey	MWD Survey@19885' Inc 89.08° Azm 359.26°

JOB NO.:	410413HEFMP6213	Report Time:	2400 — 25 of 28
COMPANY:	Continental Resources Inc.	API JOB #	33-053-04852
LOCATION:		WORK ORDER#	166165
RIG NAME:	Patterson 490	FIELD:	Baker
STATE:	North Dakota	Township:	153N
COUNTY:	McKenzie	Range/Section	101W — 16
WELL NAME:	Columbus Federal 1-16H	Company Man	Chris
Lead Directional :	Kaleb Smith	2nd Dir Hand :	Hilton Maldonado

Scientific Drilling

From Sunday, May 19, 2013 at 0000 to Sunday, May 19, 2013 at 2400

DAILY TOTALS

Start Depth	19947.00
End Depth	21037.00
Below Rot Hrs.	24.00
Total Drilled:	1090.00
Avg. Total ROP:	52.96
Slide Footage:	205.00
Slide Hours	9.67
Avg. Slide ROP:	21.21
Rotate Footage:	885.00
Rotary Hours	10.92
Avg. Rot ROP:	81.07
Circ Hours	1.83
Ream Hours	0.00
Rotary Hrs%:	53.04
Slide Hrs%:	46.96
Rotary Ftg%:	81.19
Slide Ftg%:	18.81

cASING

Size	Lb/Ft	MD

ASSEMBLY TOTALS

BHA #	Motor SN / R.S SN	Slide Ftg	Slide Hrs	Rotate Ftg	Rotate Hrs	Circ Hrs	D & C Hrs	BHA Ftg	Avg ROP
6	G585	904.00	45.42	5,954.00	57.92	27.00	130.33	6,858.00	56.02

Drilling Parameters

WOB:	15
Rot Wt:	127
Pick UP:	140
Slack Off:	112
SPP:	2600
Flow:	0 - 280
SPM:	95
Rot. RPM	45 - 60
Mot RPM:	0 - 0
Incl. In:	0
Azm. In:	0
Incl. Out:	0
Azm. Out:	0

Mud Record

Water

Weight:	9.8
Visc:	27
Chlorides:	152000
YP:	1
PV:	1
PH:	0
GAS:	0
SAND:	0
WL:	0
SOLID:	0.9
BHT°:	193
Flow T°:	0
Oil %:	0

Bit Record

Bit No:	6
Model	Smith MDSI613
SN.:	JG9419
MFG.	SMITH
Type	PDC
IADC	
JETS	3-18,3-22
TFA:	1.858
Hole ID:	6
Bit Hrs:	103.33
Bit Ftg:	6858.00

Current BHA # 6

Smith MDSI613
4.75" Bico 5/6lobe 5.4stg
4.75" NM Stab
4.75" NM Pony
4.75" NMDC
4.75" HOC
4.75" NM Stab
4.75" NMDC
X/O

PUMPS

Liner	0	0
Stroke	0	0
Effic.	95.00%	95.00%
Gal/Stk	0.00	0.00
BBL/Stk	0.000	0.000

COST BREAKDOWN

GENERAL COMMENT

Start Time	End Time	Hours	Start Depth	End Depth	Delta Depth	ROP	Activity Code	COMMENT
00:00	00:20	0.33	19947	19978	31	93.00	Drilling	Drilling - (WOB:15;GPM :280;RPM:60)
00:20	00:25	0.08	19978	19978	0	.00	MWD Survey	MWD Survey@19885' Inc 89.08° Azm 359.26°
00:25	02:15	1.83	19978	20025	47	25.64	Sliding	Sliding - (WOB:53;GPM :280;TFO:360)
02:15	02:30	0.25	20025	20041	16	64.00	Drilling	Drilling - (WOB:15;GPM :280;RPM:60)
02:30	02:40	0.17	20041	20041	0	.00	Conn.	Conn.
02:40	02:45	0.08	20041	20041	0	.00	MWD Survey	MWD Survey@19979' Inc 87.76° Azm 359.35°
02:45	03:25	0.67	20041	20104	63	94.50	Drilling	Drilling - (WOB:15;GPM :280;RPM:50)
03:25	03:30	0.08	20104	20104	0	.00	MWD Survey	MWD Survey@20074' Inc 90.84° Azm 358.82°
03:30	03:50	0.33	20104	20136	32	96.00	Drilling	Drilling - (WOB:15;GPM :280;RPM:50)
03:50	04:00	0.17	20136	20136	0	.00	Conn.	Conn.
04:00	04:05	0.08	20136	20136	0	.00	MWD Survey	MWD Survey@20074' Inc 90.84° Azm 358.82°
04:05	05:00	0.92	20136	20231	95	103.64	Drilling	Drilling - (WOB:15;GPM :280;RPM:45)
05:00	05:10	0.17	20231	20231	0	.00	Conn.	Conn.
05:10	05:15	0.08	20231	20231	0	.00	MWD Survey	MWD Survey@20169' Inc 89.69° Azm 359.52°

Start Time	End Time	Hours	Start Depth	End Depth	Delta Depth	ROP	Activity Code	COMMENT
05:15	05:25	0.17	20231	20251	20	120.00	Drilling	Drilling - (WOB:15;GPM :280;RPM:45)
05:25	07:15	1.83	20251	20301	50	27.27	Sliding	Sliding - (WOB:53;GPM :280;TFO:-15)
07:15	07:35	0.33	20301	20325	24	72.00	Drilling	Drilling - (WOB:15;GPM :280;RPM:45)
07:35	07:45	0.17	20325	20325	0	.00	Survey & Conn.	Survey & Conn.@20263' Inc 90.22° Azm 359.53°
07:45	08:55	1.17	20325	20420	95	81.43	Drilling	Drilling - (WOB:15;GPM :280;RPM:45)
08:55	09:30	0.58	20420	20420	0	.00	Rig Service-Inhol	Rig Service-Inhole
09:30	09:40	0.17	20420	20420	0	.00	Survey & Conn.	Survey & Conn.@20358' Inc 91.1° Azm 359.17°
09:40	10:55	1.25	20420	20514	94	75.20	Drilling	Drilling - (WOB:15;GPM :280;RPM:45)
10:55	11:05	0.17	20514	20514	0	.00	Survey & Conn.	Survey & Conn.@20452' Inc 89.78° Azm 359°
11:05	12:25	1.33	20514	20609	95	71.25	Drilling	Drilling - (WOB:15;GPM :280;RPM:45)
12:25	12:35	0.17	20609	20609	0	.00	Survey & Conn.	Survey & Conn.@20547' Inc 89.25° Azm 0.05°
12:35	13:35	1.00	20609	20704	95	95.00	Drilling	Drilling - (WOB:15;GPM :280;RPM:45)
13:35	13:45	0.17	20704	20704	0	.00	Survey & Conn.	Survey & Conn.@20642' Inc 87.58° Azm 0.14°
13:45	14:05	0.33	20704	20736	32	96.00	Drilling	Drilling - (WOB:15;GPM :280;RPM:45)
14:05	14:15	0.17	20736	20736	0	.00	MWD Survey	MWD Survey@20642' Inc 87.58° Azm 0.14°
14:15	17:05	2.83	20736	20796	60	21.18	Sliding	Sliding - (WOB:53;GPM :280;TFO:360)
17:05	17:20	0.25	20796	20799	3	12.00	Drilling	Drilling - (WOB:15;GPM :280;RPM:45)
17:20	17:25	0.08	20799	20799	0	.00	Survey & Conn.	Survey & Conn.@20737' Inc 86.53° Azm 0.14°
17:25	18:40	1.25	20799	20894	95	76.00	Drilling	Drilling - (WOB:15;GPM :280;RPM:45)
18:40	18:45	0.08	20894	20894	0	.00	Conn.	Conn.
18:45	18:50	0.08	20894	20894	0	.00	MWD Survey	MWD Survey@20832' Inc 88.37° Azm 0.4°
18:50	19:20	0.50	20894	20926	32	64.00	Drilling	Drilling - (WOB:15;GPM :280;RPM:50)
19:20	19:25	0.08	20926	20926	0	.00	MWD Survey	MWD Survey@20832' Inc 88.37° Azm 0.4°
19:25	22:35	3.17	20926	20974	48	15.16	Sliding	Sliding - (WOB:75;GPM :280;TFO:360)
22:35	22:50	0.25	20974	20989	15	60.00	Drilling	Drilling - (WOB:15;GPM :280;RPM:55)
22:50	23:15	0.42	20989	20989	0	.00	Rig Service-Inhol	Rig Service-Inhole
23:15	23:20	0.08	20989	20989	0	.00	Conn.	Conn.
23:20	23:25	0.08	20989	20989	0	.00	MWD Survey	MWD Survey@20927' Inc 88.46° Azm 0.76°
23:25	24:00	0.58	20989	21037	48	82.29	Drilling	Drilling - (WOB:15;GPM :280;RPM:55)

JOB NO.:	410413HEFMP6213	Report Time:	2400 — 26 of 28
COMPANY:	Continental Resources Inc.	API JOB #	33-053-04852
LOCATION:		WORK ORDER#	166165
RIG NAME:	Patterson 490	FIELD:	Baker
STATE:	North Dakota	Township:	153N
COUNTY:	McKenzie	Range/Section	101W — 16
WELL NAME:	Columbus Federal 1-16H	Company Man	Justin
Lead Directional :	Kaleb Smith	2nd Dir Hand :	Hilton Maldonado

Scientific Drilling

From Monday, May 20, 2013 at 0000 to Monday, May 20, 2013 at 2400

DAILY TOTALS

Start Depth	21037.00
End Depth	21276.00
Below Rot Hrs.	24.00
Total Drilled:	239.00
Avg. Total ROP:	69.95
Slide Footage:	0.00
Slide Hours	0.00
Avg. Slide ROP:	NA
Rotate Footage:	239.00
Rotary Hours	3.42
Avg. Rot ROP:	69.95
Circ Hours	13.92
Ream Hours	0.00
Rotary Hrs%:	100.00
Slide Hrs%:	.00
Rotary Ftg%:	100.00
Slide Ftg%:	.00

cASING

Size	Lb/Ft	MD

ASSEMBLY TOTALS

BHA #	Motor SN / R.S SN	Slide Ftg	Slide Hrs	Rotate Ftg	Rotate Hrs	Circ Hrs	D & C Hrs	BHA Ftg	Avg ROP
6	G585	904.00	45.42	5,954.00	57.92	27.00	130.33	6,858.00	56.02

Drilling Parameters

WOB:	0
Rot Wt:	127
Pick UP:	140
Slack Off:	112
SPP:	0
Flow:	0 - 280
SPM:	0
Rot. RPM	50 - 60
Mot RPM:	-
Incl. In:	0
Azm. In:	0
Incl. Out:	0
Azm. Out:	0

Mud Record

Water

Weight:	9.8
Visc:	27
Chlorides:	152000
YP:	1
PV:	1
PH:	0
GAS:	0
SAND:	0
WL:	0
SOLID:	0.9
BHT°:	193
Flow T°:	0
Oil %:	0

Bit Record

Bit No:	6
Model	Smith MDSI613
SN.:	JG9419
MFG.	SMITH
Type	PDC
IADC	
JETS	3-18,3-22
TFA:	1.858
Hole ID:	6
Bit Hrs:	103.33
Bit Ftg:	6858.00

Current BHA # 6

Smith MDSI613
4.75" Bico 5/6lobe 5.4stg
4.75" NM Stab
4.75" NM Pony
4.75" NMDC
4.75" HOC
4.75" NM Stab
4.75" NMDC
X/O

PUMPS

Liner	0	0
Stroke	0	0
Effic.	95.00%	95.00%
Gal/Stk	0.00	0.00
BBL/Stk	0.000	0.000

COST BREAKDOWN

GENERAL COMMENT

Start Time	End Time	Hours	Start Depth	End Depth	Delta Depth	ROP	Activity Code	COMMENT
00:00	00:20	0.33	21037	21060	23	69.00	Drilling	Drilling - (WOB:15;GPM :280;RPM:55)
00:20	00:40	0.33	21060	21083	23	69.00	Drilling	Drilling - (WOB:15;GPM :280;RPM:55)
00:40	00:50	0.17	21083	21083	0	.00	Conn.	Conn.
00:50	00:55	0.08	21083	21083	0	.00	MWD Survey	MWD Survey@21021' Inc 91.45° Azm 0.49°
00:55	02:15	1.33	21083	21179	96	72.00	Drilling	Drilling - (WOB:11;GPM :280;RPM:60)
02:15	02:25	0.17	21179	21179	0	.00	Conn.	Conn.
02:25	02:30	0.08	21179	21179	0	.00	MWD Survey	MWD Survey@21117' Inc 89.6° Azm 359.52°
02:30	03:20	0.83	21179	21210	31	37.20	Drilling	Drilling - (WOB:11;GPM :280;RPM:50)
03:20	03:30	0.17	21210	21210	0	.00	MWD Survey	MWD Survey@21117' Inc 89.6° Azm 359.52°
03:30	04:00	0.50	21210	21273	63	126.00	Drilling	Drilling - (WOB:11;GPM :280;RPM:50)
04:00	04:20	0.33	21273	21273	0	.00	Rig repair	Rig repair / Work on Top Drive
04:20	04:25	0.08	21273	21273	0	.00	Conn.	Conn.
04:25	04:30	0.08	21273	21273	0	.00	MWD Survey	MWD Survey@21211' Inc 90.22° Azm 1.11°
04:30	04:55	0.42	21273	21273	0	.00	Rig repair	Rig repair / Work on Top Drive

Start Time	End Time	Hours	Start Depth	End Depth	Delta Depth	ROP	Activity Code	COMMENT
04:55	05:00	0.08	21273	21276	3	36.00	Drilling	TD Drilling - (WOB:11;GPM :280;RPM:50)
05:00	18:30	13.50	21276	21276	0	.00	Circulating	Rig repair work on top drive.
18:30	24:00	5.50	21276	21276	0	.00	Short Trip	Wiper trip

JOB NO.:	410413HEFMP6213	Report Time:	2400	27 of 28
COMPANY:	Continental Resources Inc.	API JOB #	33-053-04852	
LOCATION:		WORK ORDER#	166165	
RIG NAME:	Patterson 490	FIELD:	Baker	
STATE:	North Dakota	Township:	153N	
COUNTY:	McKenzie	Range/Section	101W	16
WELL NAME:	Columbus Federal 1-16H	Company Man	Justin	
Lead Directional :	Kaleb Smith	2nd Dir Hand :	Hilton Maldonado	

Scientific Drilling

From Tuesday, May 21, 2013 at 0000 to Tuesday, May 21, 2013 at 2400

DAILY TOTALS

Start Depth	0.00
End Depth	0.00
Below Rot Hrs.	22.33
Total Drilled:	0.00
Avg. Total ROP:	NA
Slide Footage:	0.00
Slide Hours	0.00
Avg. Slide ROP:	NA
Rotate Footage:	0.00
Rotary Hours	0.00
Avg. Rot ROP:	NA
Circ Hours	4.00
Ream Hours	0.00
Rotary Hrs%:	NA
Slide Hrs%:	NA
Rotary Ftg%:	NA
Slide Ftg%:	NA

cASING

Size	Lb/Ft	MD

ASSEMBLY TOTALS

BHA #	Motor SN / R.S SN	Slide Ftg	Slide Hrs	Rotate Ftg	Rotate Hrs	Circ Hrs	D & C Hrs	BHA Ftg	Avg ROP
6	G585	904.00	45.42	5,954.00	57.92	27.00	130.33	6,858.00	56.02

Drilling Parameters

WOB:	0
Rot Wt:	127
Pick UP:	140
Slack Off:	112
SPP:	0
Flow:	0 - 195
SPM:	0
Rot. RPM	-
Mot RPM:	-
Incl. In:	0
Azm. In:	0
Incl. Out:	0
Azm. Out:	0

Mud Record

Water

Weight:	9.8
Visc:	27
Chlorides:	152000
YP:	1
PV:	1
PH:	0
GAS:	0
SAND:	0
WL:	0
SOLID:	0.9
BHT°:	193
Flow T°:	0
Oil %:	0

Bit Record

Bit No:	6
Model	Smith MDSI613
SN.:	JG9419
MFG.	SMITH
Type	PDC
IADC	
JETS	3-18,3-22
TFA:	1.858
Hole ID:	6
Bit Hrs:	103.33
Bit Ftg:	6858.00

PUMPS

Liner	0	0
Stroke	0	0
Effic.	95.00%	95.00%
Gal/Stk	0.00	0.00
BBL/Stk	0.000	0.000

Current BHA # 6

Smith MDSI613
4.75" Bico 5/6lobe 5.4stg
4.75" NM Stab
4.75" NM Pony
4.75" NMDC
4.75" HOC
4.75" NM Stab
4.75" NMDC
X/O

COST BREAKDOWN

GENERAL COMMENT

Start Time	End Time	Hours	Start Depth	End Depth	Delta Depth	ROP	Activity Code	COMMENT
00:00	10:00	10.00	21276	21276	0	.00	Short Trip	Short Trip
10:00	14:00	4.00	21276	21276	0	.00	Circulating	Circulating
14:00	19:30	5.50	21276	21276	0	.00	POOH	POOH to shoe
19:30	22:20	2.83	21276	21276	0	.00	Other	Slip and cut drill line, and rig up laydown truck.
22:20	24:00	1.67	21276	21276	0	.00	L/D DP	L/D DP

JOB NO.:	410413HEFMP6213	Report Time:	2400	28 of 28
COMPANY:	Continental Resources Inc.	API JOB #	33-053-04852	
LOCATION:		WORK ORDER#	166165	
RIG NAME:	Patterson 490	FIELD:	Baker	
STATE:	North Dakota	Township:	153N	
COUNTY:	McKenzie	Range/Section	101W	16
WELL NAME:	Columbus Federal 1-16H	Company Man	Justin	
Lead Directional :	Kaleb Smith	2nd Dir Hand :	Hilton Maldonado	

Scientific Drilling

From Wednesday, May 22, 2013 at 0000 to Wednesday, May 22, 2013 at 2400

DAILY TOTALS

Start Depth	0.00
End Depth	0.00
Below Rot Hrs.	22.33
Total Drilled:	0.00
Avg. Total ROP:	NA
Slide Footage:	0.00
Slide Hours	0.00
Avg. Slide ROP:	NA
Rotate Footage:	0.00
Rotary Hours	0.00
Avg. Rot ROP:	NA
Circ Hours	4.00
Ream Hours	0.00
Rotary Hrs%:	NA
Slide Hrs%:	NA
Rotary Ftg%:	NA
Slide Ftg%:	NA

cASING

Size	Lb/Ft	MD

ASSEMBLY TOTALS

BHA #	Motor SN / R.S SN	Slide Ftg	Slide Hrs	Rotate Ftg	Rotate Hrs	Circ Hrs	D & C Hrs	BHA Ftg	Avg ROP
6	G585	904.00	45.42	5,954.00	57.92	27.00	130.33	6,858.00	56.02

Drilling Parameters

WOB:	0
Rot Wt:	127
Pick UP:	140
Slack Off:	112
SPP:	0
Flow:	0 - 0
SPM:	0
Rot. RPM	-
Mot RPM:	-
Incl. In:	0
Azm. In:	0
Incl. Out:	0
Azm. Out:	0

Mud Record

Water

Weight:	9.8
Visc:	27
Chlorides:	152000
YP:	1
PV:	1
PH:	0
GAS:	0
SAND:	0
WL:	0
SOLID:	0.9
BHT°:	193
Flow T°:	0
Oil %:	0

Bit Record

Bit No:	6
Model	Smith MDSI613
SN.:	JG9419
MFG.	SMITH
Type	PDC
IADC	
JETS	3-18,3-22
TFA:	1.858
Hole ID:	6
Bit Hrs:	103.33
Bit Ftg:	6858.00

PUMPS

Liner	0	0
Stroke	0	0
Effic.	95.00%	95.00%
Gal/Stk	0.00	0.00
BBL/Stk	0.000	0.000

Current BHA # 6

Smith MDSI613
4.75" Bico 5/6lobe 5.4stg
4.75" NM Stab
4.75" NM Pony
4.75" NMDC
4.75" HOC
4.75" NM Stab
4.75" NMDC
X/O

COST BREAKDOWN

GENERAL COMMENT

Start Time	End Time	Hours	Start Depth	End Depth	Delta Depth	ROP	Activity Code	COMMENT
00:00	06:00	6.00	21276	21276	0	.00	L/D DP	L/D DP
06:00	07:00	1.00	21276	21276	0	.00	Other	L/D BHA
07:00	10:00	3.00	21276	21276	0	.00	Other	Rig down equipment, and load out truck.
10:00	24:00	14.00	21276	21276	0	.00	Other	Release

BHA # 1

PDT

Scientific Drilling

JOB NO.:	410413HEFMP6213 **Work Order:** 166165	**FIELD:**	Baker
COMPANY:	Continental Resources Inc.	**Township:**	153N
LOCATION:		**SECT. RANGE:**	16 101W
RIG NAME:	Patterson 490	**Lead DD:**	Kaleb Smith
STATE:	North Dakota	**Co. Man:**	Chris
COUNTY:	McKenzie	**BHA TYPE:**	Steerable Assembly
WELL NAME:	Columbus Federal 1-16H	**BHA WT:**	10889 **Wt @ Jars:** N/A

Time and Depths

Date In:	27-Apr-13 @ 03:30
Date Out:	29-Apr-13 @ 19:35
Hrs In Hole:	64.08
Start Depth:	1947.00
End Depth:	8054.00
Total Drilled:	6107.00
Avg. Total ROP:	171.63
Circ Hrs: Tot/Only	37.92 / 2.33
Percent Slide:	17.01
Percent Hrs:	46.60
Slide Hours:	16.58
Total Sliding:	1039.00
Avg. Slide ROP:	62.65
Percent Rotary:	82.99
Percent Hrs:	53.40
Rotary Hours:	19.00
Total Rotary:	5068.00
Avg. Rotary ROP:	266.74
Reason POOH:	BHA

MOTOR DATA

Hunting - 7/8lobe, 5.7stage,

MFG.:	Hunting		
PAD OD:	6.825		
NB Stab:	8.625		
Bit to Bend:	5.75		
Bent Hsg/Sub °:	1.5 /		
Lobe/Stage:	7/8 /	5.7	
Rev/GAL:	0.24		
Rotor Jet:	0		
Prop BUR:			
Act BUR:			

Drilling Parameters

SO/PU:	0 - 0 / 0-0
Rot Strg Wt:	0-0
WOB:	0 - 29
TORQ:	0 - 0
SPP:	2100 - 2800
Motor RPM:	120
Rotary RPM:	60 - 65
Flow Rate:	500 - 500
Avg Diff:	
Stall Pres.:	
Off Bot Pres.:	

Mud Data

Type

WT:	0	**GAS:**	0
Vis:	0	**PV:**	0
WL:	0	**PH:**	0
SOL:	0	**SAND:**	0
Oil %:	0	**T °:**	0
Chlor:	0	**YP:**	0

Bit Record

OTHER / Security FX65D

Run #:	2
Type Bit:	PDC
IADC#:	**TFA:** 1.49
JETS:	6-18
Bit Drop:	0 PSI @ 500 GPM
Cond.:	Needs Repair

MWD Spacing

Gamma: 0	**Restiv:** 0	**Sensor:** 0
GYRO: 0	**DNSC:** 0	**Sonic:** 0

Last Casing O.D.:

Shoe @: **Hanger @:**

INC IN: .0 **INC OUT:** .0 **AZM IN:** .00 **AZM OUT:** .00

Hunting - 7/8lobe, 5.7 stage, 1.5 FBH, 0.24 RPG, 8 5/8 NB stab

Bit to Survey - 52'

Reason POOH: Remove Stabilizers

Bit Grade: 2/6/LT/S/A/X/0/BT/BHA

BHA Detail

Description	Serial #	I.D.	O.D.	Length	Sum	Top Conn	MFG.
Security FX65D	12158419		8.75	1.00	1.00	4 1/2 REGP	
Hunting - 7/8lobe 5.7stage	2812		6.75	31.65	32.65	4 1/2 XHB	
NM Stab 8 5/8	SD26970	3.25	6.5	5.02	37.67	4 1/2 XHB	
NMDC	122-022	3.25	6.75	30.80	68.47	4 1/2 XHB	
Support Sub	8-727	3.25	6.75	1.92	70.39	4 1/2 XHB	
Gap Sub	69-737	3.25	6.75	4.85	75.24	4 1/2 XHB	
NM Stab 8 5/8	SD29174	3.25	6.5	6.72	81.96	4 1/2 XHB	
NMDC	122-269	3.25	6.75	30.85	112.81	4 1/2 XHB	
Stab 8 5/8	SD17502	3.25	6.5	5.33	118.14	4 1/2 XHB	
9 Jts 6.5" DC				274.15	392.29		
X/O				2.62	394.91		
39 Jts 5" HWDP				7,659.09	8054.00		

WinSURV II BHA Report - License: NP2245

Scientific Drilling

JOB NO.:	410413HEFMP6213	**FIELD:**	Baker
COMPANY:	Continental Resources Inc.	**Township:**	153N
LOCATION:		**Range**	101W
RIG NAME:	Patterson 490		
STATE:	North Dakota		
COUNTY:	Country		
WELL NAME:	Columbus Federal 1-16H		

MOTOR INFORMATION

Desc: Hunting - 7/8lobe, 5.7stage, 1.5FBH

Bent Hsg/Sub: 1.5 / 0 **Bit to Bend: 5.75**

PAD OD: 6.825 **NB Stab:**

Slide Report for BHA # 1

Note: Surveys listed are interpolated from the actual surveys

#	Date	Drill Mode	Start Time	End Time	Hours	Start MD	End MD	Depth Drilled	WOB	ROP	RPM	Surf. Torque	Flow Rate	SPP	TFO	INC	AZM	DLS	Note
1	27-Apr	Drilling	11:40	11:55	0.25	1947	2022	75	5	300.0	65	0	500	2200		1.51	161.00	8.97	
1	27-Apr	Sliding	12:10	12:25	0.25	2022	2052	30	8	120.0	0	0	500	2200	333	1.89	265.00	8.97	
1	27-Apr	Sliding	12:30	12:45	0.25	2052	2115	63	8	252.0	0	0	500	2200	333	6.73	348.00	6.04	
1	27-Apr	Drilling	12:45	12:55	0.17	2115	2147	32	5	192.0	65	0	500	2200		8.65	350.00	6.04	
1	27-Apr	Sliding	13:00	13:10	0.17	2147	2172	25	8	150.0	0	0	500	2200	360	10.15	351.00	6.04	
1	27-Apr	Drilling	13:10	13:25	0.25	2172	2241	69	10	276.0	65	0	500	2300		11.12	341.00	0.14	
1	27-Apr	Drilling	13:30	13:45	0.25	2241	2336	95	12	380.0	65	0	500	2400		12.32	344.00	2.93	
1	27-Apr	Sliding	13:55	14:00	0.08	2336	2356	20	10	240.0	0	0	500	2400	330	12.82	346.00	2.93	
1	27-Apr	Drilling	14:00	14:10	0.17	2356	2430	74	12	444.0	65	0	500	2500		13.41	333.00	0.21	
1	27-Apr	Drilling	14:20	14:35	0.25	2430	2524	94	12	376.0	65	0	500	2500		14.74	335.00	2.91	
1	27-Apr	Sliding	14:40	14:50	0.17	2524	2549	25	10	150.0	0	0	500	2500	360	15.38	337.00	2.91	
1	27-Apr	Drilling	14:50	15:00	0.17	2549	2619	70	12	420.0	65	0	500	2600		15.87	327.00	0.14	
1	27-Apr	Drilling	15:15	15:30	0.25	2619	2714	95	12	380.0	65	0	500	2600		17.57	331.00	3.80	
1	27-Apr	Sliding	15:50	16:00	0.17	2714	2744	30	10	180.0	0	0	500	2600	20	18.56	332.00	3.80	
1	27-Apr	Drilling	16:00	16:10	0.17	2744	2809	65	12	390.0	65	0	500	2600		18.90	333.00	0.17	
1	27-Apr	Drilling	16:20	16:30	0.17	2809	2903	94	12	564.0	65	0	500	2600		19.26	334.00	0.91	
1	27-Apr	Drilling	16:40	16:55	0.25	2903	2998	95	12	380.0	65	0	500	2600		19.56	335.00	0.51	
1	27-Apr	Drilling	17:05	17:15	0.17	2998	3092	94	16	564.0	60	0	500	2600		18.86	337.00	1.54	
1	27-Apr	Drilling	17:25	17:35	0.17	3092	3188	96	13	576.0	60	0	500	2600		18.08	334.00	0.51	
1	27-Apr	Drilling	17:45	17:55	0.17	3188	3282	94	16	564.0	60	0	500	2600		17.95	333.00	0.40	
1	27-Apr	Drilling	18:05	18:20	0.25	3282	3378	96	16	384.0	65	0	500	2600		17.91	332.00	0.34	
1	27-Apr	Drilling	18:30	18:45	0.25	3378	3472	94	16	376.0	65	0	500	2600		17.85	331.00	0.23	
1	27-Apr	Drilling	18:50	19:10	0.33	3472	3567	95	16	285.0	65	0	500	2600		18.00	333.00	1.85	
1	27-Apr	Sliding	19:20	19:25	0.08	3567	3585	18	10	216.0	0	0	500	2600	75	18.06	334.00	1.85	
1	27-Apr	Drilling	19:25	19:40	0.25	3585	3662	77	16	308.0	65	0	500	2600		17.60	336.00	1.14	
1	27-Apr	Drilling	19:45	20:00	0.25	3662	3756	94	16	376.0	60	0	500	2600		16.57	337.00	1.13	

Slide Report for BHA # 1

Note: Surveys listed are interpolated from the actual surveys

#	Date	Drill Mode	Start Time	End Time	Hours	Start MD	End MD	Depth Drilled	WOB	ROP	RPM	Surf. Torque	Flow Rate	SPP	TFO	INC	AZM	DLS	Note
1	27-Apr	Drilling	20:05	20:20	0.25	3756	3851	95	16	380.0	60	0	500	2600		16.02	341.00	2.18	
1	27-Apr	Sliding	20:30	20:40	0.17	3851	3869	18	12	108.0	0	0	500	2600	-50	16.01	342.00	2.18	
1	27-Apr	Drilling	20:40	20:55	0.25	3869	3946	77	16	308.0	60	0	500	2600		15.64	330.00	0.73	
1	27-Apr	Drilling	21:05	21:15	0.17	3946	4041	95	16	570.0	60	0	500	2600		15.77	329.00	0.85	
1	27-Apr	Sliding	21:25	21:40	0.25	4041	4059	18	12	72.0	0	0	500	2600	20	15.93	329.00	0.85	
1	27-Apr	Drilling	21:40	21:50	0.17	4059	4135	76	29	456.0	60	0	500	2600		15.06	331.00	2.33	
1	27-Apr	Drilling	22:00	22:20	0.33	4135	4230	95	29	285.0	60	0	500	2600		14.84	329.00	2.16	
1	27-Apr	Sliding	22:30	22:45	0.25	4230	4262	32	12	128.0	0	0	500	2600	30	15.29	331.00	2.16	
1	27-Apr	Drilling	22:45	22:50	0.08	4262	4293	31	29	372.0	60	0	500	2600		16.16	333.00	3.72	
1	27-Apr	Sliding	22:50	23:05	0.25	4293	4313	20	12	80.0	0	0	500	2600	360	16.87	334.00	3.72	
1	27-Apr	Drilling	23:05	23:10	0.08	4313	4324	11	29	132.0	60	0	500	2600		17.25	334.00	3.72	
1	27-Apr	Drilling	23:20	23:25	0.08	4324	4356	32	29	384.0	60	0	500	2600		18.39	335.00	3.72	
1	27-Apr	Sliding	23:30	23:40	0.17	4356	4378	22	12	132.0	0	0	500	2600	360	18.72	336.00	0.79	
1	27-Apr	Drilling	23:40	23:45	0.08	4378	4419	41	29	492.0	60	0	500	2600		18.49	336.00	0.79	
1	27-Apr	Drilling	23:55	24:00	0.08	4419	4471	52	29	624.0	60	0	500	2600		18.23	334.00	0.99	
1	28-Apr	Drilling	00:00	00:05	0.08	4471	4514	43	29	516.0	60	0	500	2600		18.16	335.00	0.99	
1	28-Apr	Sliding	00:15	00:35	0.33	4514	4539	25	12	75.0	0	0	500	2500	360	18.11	336.00	0.99	
1	28-Apr	Drilling	00:35	00:50	0.25	4539	4607	68	29	272.0	60	0	500	2700		18.04	331.00	0.35	
1	28-Apr	Sliding	01:00	01:20	0.33	4607	4638	31	15	93.0	0	0	500	2500	360	18.01	332.00	0.35	
1	28-Apr	Drilling	01:20	01:30	0.17	4638	4701	63	29	378.0	60	0	500	2700		18.49	334.00	1.45	
1	28-Apr	Sliding	01:40	02:00	0.33	4701	4732	31	15	93.0	0	0	500	2500	15	18.78	335.00	1.45	
1	28-Apr	Drilling	02:00	02:10	0.17	4732	4796	64	20	384.0	60	0	500	2700		17.57	336.00	2.57	
1	28-Apr	Drilling	02:15	02:30	0.25	4796	4890	94	20	376.0	60	0	500	2700		17.15	334.00	1.24	
1	28-Apr	Sliding	02:40	02:50	0.17	4890	4922	32	11	192.0	0	0	500	2500	15	17.55	334.00	1.24	
1	28-Apr	Drilling	02:50	03:00	0.17	4922	4953	31	20	186.0	60	0	500	2700		17.53	334.00	0.73	
1	28-Apr	Sliding	03:00	03:15	0.25	4953	4975	22	11	88.0	0	0	500	2500	15	17.38	335.00	0.73	
1	28-Apr	Drilling	03:15	03:20	0.08	4975	4984	9	29	108.0	60	0	500	2700		17.31	335.00	0.73	
1	28-Apr	Drilling	03:25	03:35	0.17	4984	5079	95	29	570.0	60	0	500	2700		17.94	334.00	1.81	
1	28-Apr	Sliding	03:45	04:05	0.33	5079	5115	36	11	108.0	0	0	500	2500	15	18.58	335.00	1.81	
1	28-Apr	Drilling	04:05	04:15	0.17	5115	5152	37	29	222.0	60	0	500	2700		18.98	333.00	1.02	
1	28-Apr	Sliding	04:15	04:35	0.33	5152	5174	22	11	66.0	0	0	500	2500	360	19.18	333.00	1.02	
1	28-Apr	Sliding	04:50	05:00	0.17	5174	5194	20	11	120.0	0	0	500	2500	360	19.37	333.00	1.02	
1	28-Apr	Drilling	05:00	05:15	0.25	5194	5270	76	29	304.0	60	0	500	2700		18.15	332.00	2.79	
1	28-Apr	Drilling	05:30	05:45	0.25	5270	5365	95	29	380.0	60	0	500	2700		17.16	331.00	0.49	
1	28-Apr	Sliding	06:00	06:20	0.33	5365	5396	31	11	93.0	0	0	500	2500	15	17.28	331.00	0.49	

Slide Report for BHA # 1

Note: Surveys listed are interpolated from the actual surveys

#	Date	Drill Mode	Start Time	End Time	Hours	Start MD	End MD	Depth Drilled	WOB	ROP	RPM	Surf. Torque	Flow Rate	SPP	TFO	INC	AZM	DLS	Note
1	28-Apr	Drilling	06:20	06:30	0.17	5396	5427	31	29	186.0	60	0	500	2700		17.26	329.00	0.37	
1	28-Apr	Sliding	06:30	06:55	0.42	5427	5443	16	18	38.4	0	0	500	2500	25	17.22	329.00	0.37	
1	28-Apr	Drilling	06:55	07:00	0.08	5443	5459	16	29	192.0	60	0	500	2700		17.18	330.00	0.37	
1	28-Apr	Drilling	07:15	07:30	0.25	5459	5559	100	28	400.0	60	0	500	2800		19.10	330.00	3.52	
1	28-Apr	Sliding	07:50	08:20	0.50	5559	5609	50	18	100.0	0	0	500	2500	10	20.36	331.00	0.71	
1	28-Apr	Drilling	08:20	08:25	0.08	5609	5648	39	28	468.0	60	0	500	2800		20.23	331.00	0.71	
1	28-Apr	Drilling	08:40	09:00	0.33	5648	5742	94	28	282.0	60	0	500	2800		19.36	329.00	1.47	
1	28-Apr	Drilling	09:15	09:30	0.25	5742	5834	92	28	368.0	60	0	500	2800		18.04	330.00	1.44	
1	28-Apr	Drilling	09:40	10:00	0.33	5834	5930	96	28	288.0	60	0	500	2800		17.96	331.00	1.10	
1	28-Apr	Sliding	10:10	10:40	0.50	5930	5980	50	18	100.0	0	0	500	2500	20	18.45	329.00	0.48	
1	28-Apr	Drilling	10:40	10:50	0.17	5980	6024	44	28	264.0	60	0	500	2800		18.65	329.00	0.48	
1	28-Apr	Drilling	11:00	11:15	0.25	6024	6118	94	28	376.0	60	0	500	2800		17.27	333.00	3.79	
1	28-Apr	Sliding	11:25	12:25	1.00	6118	6158	40	20	40.0	0	0	500	2500	360	16.11	336.00	3.79	
1	28-Apr	Drilling	12:25	12:35	0.17	6158	6214	56	28	336.0	60	0	500	2800		15.20	337.00	1.59	
1	28-Apr	Drilling	12:45	13:15	0.50	6214	6308	94	28	188.0	60	0	500	2800		15.45	343.00	3.16	
1	28-Apr	Sliding	13:45	14:20	0.58	6308	6368	60	20	102.9	0	0	500	2500	330	16.59	329.00	2.18	
1	28-Apr	Drilling	14:20	14:30	0.17	6368	6403	35	28	210.0	60	0	500	2800		17.26	331.00	2.18	
1	28-Apr	Sliding	14:40	16:00	1.33	6403	6448	45	20	33.8	0	0	500	2500	15	18.13	325.00	2.38	
1	28-Apr	Drilling	16:00	16:10	0.17	6448	6498	50	28	300.0	60	0	500	2800		19.24	327.00	2.38	
1	28-Apr	Sliding	16:25	17:20	0.92	6498	6558	60	20	65.5	0	0	500	2500	20	19.81	328.00	2.54	
1	28-Apr	Drilling	17:20	17:30	0.17	6558	6594	36	28	216.0	60	0	500	2800		18.90	328.00	2.54	
1	28-Apr	Drilling	17:45	18:15	0.50	6594	6688	94	28	188.0	60	0	500	2800		18.76	329.00	1.94	
1	28-Apr	Sliding	18:30	20:35	2.08	6688	6751	63	18	30.2	0	0	500	2400	30	20.58	332.00	5.96	
1	28-Apr	Drilling	20:35	20:50	0.25	6751	6783	32	22	128.0	60	0	500	2700		22.29	334.00	5.96	
1	28-Apr	Sliding	21:00	23:15	2.25	6783	6845	62	16	27.6	0	0	500	2500	30	24.82	337.00	1.50	
1	28-Apr	Drilling	23:15	23:30	0.25	6845	6877	32	22	128.0	60	0	500	2700		25.22	338.00	1.50	
1	29-Apr	Drilling	00:05	00:35	0.50	6877	6971	94	18	188.0	60	0	500	2300		25.52	339.00	0.54	
1	29-Apr	Drilling	00:55	01:00	0.08	6971	7003	32	18	384.0	60	0	500	2300		25.39	339.00	0.54	
1	29-Apr	Drilling	01:35	02:00	0.42	7003	7066	63	18	151.2	60	0	500	2300		25.28	338.00	0.41	
1	29-Apr	Drilling	02:20	02:55	0.58	7066	7161	95	18	162.9	60	0	500	2300		24.81	339.00	0.90	
1	29-Apr	Drilling	03:05	03:40	0.58	7161	7255	94	18	161.1	60	0	500	2300		24.40	338.00	0.28	
1	29-Apr	Drilling	03:50	04:30	0.67	7255	7349	94	18	141.0	60	0	500	2200		24.49	338.00	0.46	
1	29-Apr	Drilling	04:40	05:05	0.42	7349	7444	95	18	228.0	60	0	500	2200		24.30	338.00	0.60	
1	29-Apr	Drilling	05:25	06:00	0.58	7444	7537	93	22	159.4	60	0	500	2800		22.90	339.00	2.28	
1	29-Apr	Drilling	06:15	06:45	0.50	7537	7630	93	22	186.0	60	0	500	2800		21.29	337.00	1.35	

Slide Report for BHA # 1

Note: Surveys listed are interpolated from the actual surveys

#	Date	Drill Mode	Start Time	End Time	Hours	Start MD	End MD	Depth Drilled	WOB	ROP	RPM	Surf. Torque	Flow Rate	SPP	TFO	INC	AZM	DLS	Note
1	29-Apr	Drilling	07:00	07:40	0.67	7630	7725	95	22	142.5	60	0	500	2800		20.62	337.00	0.29	
1	29-Apr	Drilling	07:50	08:30	0.67	7725	7819	94	22	141.0	60	0	500	2800		20.38	338.00	0.60	
1	29-Apr	Drilling	08:40	09:15	0.58	7819	7915	96	22	164.6	60	0	500	2800		18.89	337.00	2.63	
1	29-Apr	Drilling	09:25	10:00	0.58	7915	8010	95	22	162.9	60	0	500	2800		16.35	336.00	2.86	
1	29-Apr	Sliding	10:10	11:05	0.92	8010	8020	10	18	10.9	0	0	500	2600	360	16.08	336.00	2.86	
1	29-Apr	Drilling	11:05	11:10	0.08	8020	8042	22	22	264.0	60	0	500	2800		15.66	332.00	1.32	
1	29-Apr	Sliding	11:10	12:25	1.25	8042	8054	12	18	9.6	0	0	500	2600	360	15.51	332.00	1.32	

Total Drilled:	6107	**Avg. Total ROP:**	171.63		**DEPTH% - TIME %**
Total Rotary Drilled:	5068	**Avg. Rotary ROP:**	266.74	**Percent Rotary:**	82.99 - 53.40
Total Drilled Sliding:	1039	**Avg. Slide ROP:**	62.65	**Percent Slide:**	17.01 - 46.60

BHA # 2

PDT

Scientific Drilling

JOB NO.:	410413HEFMP6213 **Work Order:** 166165	**FIELD:**	Baker
COMPANY:	Continental Resources Inc.	**Township:**	153N
LOCATION:		**SECT. RANGE:**	16 101W
RIG NAME:	Patterson 490	**Lead DD:**	Kaleb Smith
STATE:	North Dakota	**Co. Man:**	Chris
COUNTY:	McKenzie	**BHA TYPE:**	Steerable Assembly
WELL NAME:	Columbus Federal 1-16H	**BHA WT:** 8753	**Wt @ Jars:** N/A

Time and Depths

Date In:	29-Apr-13 @ 19:35
Date Out:	04-May-13 @ 07:30
Hrs In Hole:	105.92
Start Depth:	8054.00
End Depth:	9555.00
Total Drilled:	1501.00
Avg. Total ROP:	38.74
Circ Hrs: Tot/Only	47.08 / 8.33
Percent Slide:	28.11
Percent Hrs:	73.55
Slide Hours:	28.50
Total Sliding:	422.00
Avg. Slide ROP:	14.81
Percent Rotary:	71.89
Percent Hrs:	26.45
Rotary Hours:	10.25
Total Rotary:	1079.00
Avg. Rotary ROP:	105.27
Reason POOH:	BHA

MOTOR DATA

Hunting - 7/8lobe, 5.7stage,

MFG.:	Hunting
PAD OD:	7
NB Stab:	0
Bit to Bend:	5.75
Bent Hsg/Sub °:	1.5 /
Lobe/Stage:	7/8 / 5.7
Rev/GAL:	0.24
Rotor Jet:	0
Prop BUR:	
Act BUR:	

Drilling Parameters

SO/PU:	0 - 140 / 0-189
Rot Strg Wt:	0-168
WOB:	0 - 30
TORQ:	0 - 0
SPP:	726 - 3500
Motor RPM:	143
Rotary RPM:	45 - 60
Flow Rate:	255 - 598
Avg Diff:	
Stall Pres.:	
Off Bot Pres.:	

Mud Data

Type Oil Base

WT:	9.9	**GAS:**	0
Vis:	55	**PV:**	14
WL:	0	**PH:**	0
SOL:	8.59	**SAND:**	0
Oil %:	77	**T °:**	175
Chlor:	51000	**YP:**	8

Bit Record

OTHER / Security FX65D

Run #:	3		
Type Bit:	PDC		
IADC#:		**TFA:**	1.49
JETS:	6-18		
Bit Drop:	147 PSI @ 598 GPM		
Cond.:			

MWD Spacing

Gamma: 0	**Restiv:** 0	**Sensor:** 0
GYRO: 0	**DNSC:** 8054	**Sonic:** 0

Last Casing O.D.:

Shoe @: **Hanger @:**

INC IN: .0 **INC OUT:** .0 **AZM IN:** .00 **AZM OUT:** .00

Hunting - 7/8lobe, 5.7 stage, 1.5 FBH, 0.24 RPG

Bit to Sensor - 60.02'
Bit to Survey - 62.00'

Reason Pulled: Low ROP and Motor Stalls

Bit Grade:1-1-A-X-O-BHA will re-run

'

BHA Detail

Description	Serial #	I.D.	O.D.	Length	Sum	Top Conn	MFG.
Security FX65D	11951008		8.75	1.00	1.00	4 1/2 REGP	
Hunting - 7/8lobe 5.7stage	2023		6.75	31.76	32.76	4 1/2 XHB	
6.5" NM Pony	125-283	3.25	6.5	10.13	42.89	4 1/2 XHB	
NMDC	122-022	3.25	6.75	30.80	73.69	4 1/2 XHB	
Support Sub	8-727	3.25	6.75	1.92	75.61	4 1/2 XHB	
Gap Sub	69-737	3.25	6.75	4.85	80.46	4 1/2 XHB	
NMDC	122-269	3.25	6.75	30.85	111.31	4 1/2 XHB	
9 Jts 6.5" DC				274.15	385.46		
X/O				2.62	388.08		
45 Jts 5" HWDP				9,166.92	9555.00		

Scientific Drilling

JOB NO.:	410413HEFMP6213	**FIELD:**	Baker
COMPANY:	Continental Resources Inc.	**Township:**	153N
LOCATION:		**Range**	101W
RIG NAME:	Patterson 490		
STATE:	North Dakota		
COUNTY:	Country		
WELL NAME:	Columbus Federal 1-16H		

MOTOR INFORMATION

Desc: Hunting - 7/8lobe, 5.7stage, 1.5FBH

Bent Hsg/Sub: 1.5 / 0 **Bit to Bend: 5.75**

PAD OD: 7 **NB Stab:**

Slide Report for BHA # 2

Note: Surveys listed are interpolated from the actual surveys

#	Date	Drill Mode	Start Time	End Time	Hours	Start MD	End MD	Depth Drilled	WOB	ROP	RPM	Surf. Torque	Flow Rate	SPP	TFO	INC	AZM	DLS	Note
2	30-Apr	Drilling	05:00	05:40	0.67	8054	8060	6	18	9.0	60	0	500	2200		15.43	333.00	1.32	
2	30-Apr	Sliding	05:40	07:45	2.08	8060	8098	38	18	18.2	0	0	596	3050	360	14.94	333.00	1.32	
2	30-Apr	Drilling	07:55	08:00	0.08	8098	8123	25	18	300.0	45	0	500	3250		14.62	333.00	1.32	
2	30-Apr	Sliding	08:00	09:15	1.25	8123	8144	21	22	16.8	0	0	596	3050	360	14.81	334.00	1.51	
2	30-Apr	Sliding	10:05	11:30	1.42	8144	8186	42	22	29.6	0	0	596	3050	360	15.25	336.00	1.51	
2	30-Apr	Sliding	11:40	12:35	0.92	8186	8200	14	22	15.3	0	0	596	3050	360	15.40	337.00	1.51	
2	30-Apr	Sliding	12:35	14:20	1.75	8200	8225	25	22	14.3	0	0	596	3050	360	15.58	337.00	0.54	
2	30-Apr	Drilling	14:20	14:45	0.42	8225	8281	56	18	134.4	45	0	598	3250		15.31	338.00	0.54	
2	30-Apr	Drilling	15:00	15:05	0.08	8281	8296	15	18	180.0	45	0	598	3250		15.23	338.00	0.54	
2	30-Apr	Sliding	15:05	20:00	4.92	8296	8349	53	22	10.8	0	0	596	2900	-30	16.56	337.00	4.25	
2	30-Apr	Sliding	20:25	21:00	0.58	8349	8352	3	22	5.1	0	0	596	2900	-30	16.68	337.00	4.25	
2	2-May	Sliding	11:55	12:50	0.92	8352	8377	25	30	27.3	0	0	596	3200	-30	17.73	338.00	4.25	
2	2-May	Drilling	12:55	13:00	0.08	8377	8392	15	25	180.0	45	0	598	3400		18.36	338.00	4.25	
2	2-May	Sliding	13:00	16:00	3.00	8392	8471	79	30	26.3	0	0	596	3200	-30	18.80	335.00	0.79	
2	2-May	Drilling	16:15	17:05	0.83	8471	8566	95	25	114.0	60	0	598	3200		18.82	337.00	0.52	
2	2-May	Drilling	17:10	17:20	0.17	8566	8575	9	25	54.0	60	0	598	3200		18.85	337.00	0.52	
2	2-May	Sliding	17:20	20:55	3.58	8575	8608	33	22	9.2	0	0	596	3000	-20	19.04	337.00	1.29	
2	3-May	Sliding	00:30	04:15	3.75	8608	8660	52	22	13.9	0	0	596	2900	-30	19.69	338.00	1.29	
2	3-May	Drilling	04:30	05:00	0.50	8660	8754	94	17	188.0	60	0	598	3500		20.15	338.00	0.09	
2	3-May	Drilling	05:10	05:50	0.67	8754	8848	94	18	141.0	60	0	598	3500		19.88	339.00	0.70	
2	3-May	Drilling	06:00	07:00	1.00	8848	8944	96	18	96.0	60	0	598	3500		19.00	341.00	1.26	
2	3-May	Drilling	07:10	08:00	0.83	8944	9038	94	18	112.8	60	0	598	3500		18.49	341.00	0.31	
2	3-May	Drilling	08:10	09:00	0.83	9038	9133	95	18	114.0	60	0	598	3500		17.55	342.00	1.39	
2	3-May	Drilling	09:05	10:10	1.08	9133	9227	94	18	86.8	60	0	598	3500		16.47	343.00	1.11	
2	3-May	Drilling	10:20	11:25	1.08	9227	9321	94	18	86.8	60	0	598	3500		15.11	344.00	1.66	
2	3-May	Drilling	11:30	12:15	0.75	9321	9414	93	18	124.0	60	0	598	3500		13.33	345.00	2.07	

Slide Report for BHA # 2

Note: Surveys listed are interpolated from the actual surveys

#	Date	Drill Mode	Start Time	End Time	Hours	Start MD	End MD	Depth Drilled	WOB	ROP	RPM	Surf. Torque	Flow Rate	SPP	TFO	INC	AZM	DLS	Note
2	3-May	Drilling	12:25	13:30	1.08	9414	9508	94	18	86.8	60	0	598	3500		12.76	346.00	0.27	
2	3-May	Drilling	13:40	13:45	0.08	9508	9518	10	18	120.0	60	0	598	3500		12.77	346.00	0.27	
2	3-May	Sliding	13:45	18:05	4.33	9518	9555	37	22	8.5	0	0	596	3400	-30	13.35	343.00	3.87	

Total Drilled: 1501 **Avg. Total ROP:** 38.74 **DEPTH% - TIME %**

Total Rotary Drilled: 1079 **Avg. Rotary ROP:** 105.27 **Percent Rotary:** 71.89 - 26.45

Total Drilled Sliding: 422 **Avg. Slide ROP:** 14.81 **Percent Slide:** 28.11 - 73.55

BHA # 3

PDT

Scientific Drilling

JOB NO.:	410413HEFMP6213 **Work Order:** 166165	**FIELD:**	Baker
COMPANY:	Continental Resources Inc.	**Township:**	153N
LOCATION:		**SECT. RANGE:**	16 101W
RIG NAME:	Patterson 490	**Lead DD:**	Kaleb Smith
STATE:	North Dakota	**Co. Man:**	Chris
COUNTY:	McKenzie	**BHA TYPE:**	Steerable Assembly
WELL NAME:	Columbus Federal 1-16H	**BHA WT:**	8727 **Wt @ Jars:** N/A

Time and Depths

Date In:	04-May-13 @ 07:30
Date Out:	06-May-13 @ 17:00
Hrs In Hole:	57.50
Start Depth:	9555.00
End Depth:	10562.00
Total Drilled:	1007.00
Avg. Total ROP:	25.55
Circ Hrs: Tot/Only	42.67 / 3.25
Percent Slide:	34.06
Percent Hrs:	76.11
Slide Hours:	30.00
Total Sliding:	343.00
Avg. Slide ROP:	11.43
Percent Rotary:	65.94
Percent Hrs:	23.89
Rotary Hours:	9.42
Total Rotary:	664.00
Avg. Rotary ROP:	70.51
Reason POOH:	BHA

MOTOR DATA

Hunting - 7/8lobe, 5.7stage,

MFG.:	Hunting		
PAD OD:		7	
NB Stab:		0	
Bit to Bend:		6.18	
Bent Hsg/Sub °:	1.5 /		
Lobe/Stage:	7/8 /	5.7	
Rev/GAL:		0.24	
Rotor Jet:		0	
Prop BUR:			
Act BUR:			

Drilling Parameters

SO/PU:	140 - 140 / 189-189
Rot Strg Wt:	168-168
WOB:	0 - 35
TORQ:	0 - 0
SPP:	2700 - 3400
Motor RPM:	143 - 144
Rotary RPM:	45 - 60
Flow Rate:	596 - 598
Avg Diff:	
Stall Pres.:	
Off Bot Pres.:	

Mud Data

Type Oil Base

WT:	10.1	**GAS:**	0
Vis:	44	**PV:**	13
WL:	0	**PH:**	0
SOL:	10.1	**SAND:**	0
Oil %:	81	**T °:**	193
Chlor:	51000	**YP:**	9

Bit Record

OTHER / Security FX65D

Run #:	3rr		
Type Bit:	PDC		
IADC#:		**TFA:**	1.49
JETS:	6-18		
Bit Drop:	150 PSI @ 598 GPM		
Cond.:	Needs Repair		

MWD Spacing

Gamma: 0	**Restiv:** 0	**Sensor:** 0
GYRO: 0	**DNSC:** 9555	**Sonic:** 0

Last Casing O.D.:

Shoe @: **Hanger @:**

INC IN: .0 **INC OUT:** .0 **AZM IN:** .00 **AZM OUT:** .00

Hunting - 7/8lobe, 5.7 stage, 1.5 FBH, 0.24 RPG

Bit to Sensor - 60.08"
Bit to Survey - 62.00"

Reason Pulled: Finished Straight Hole

Bit Grade:1/3/CT/S/X/.0625/WT/BHA

BHA Detail

Description	Serial #	I.D.	O.D.	Length	Sum	Top Conn	MFG.
Security FX65D	11951008		8.75	1.00	1.00	4 1/2 REGP	
Hunting - 7/8lobe 5.7stage	2124		6.75	31.82	32.82	4 1/2 XHB	
6.5" NM Pony	125-283	3.25	6.5	10.13	42.95	4 1/2 XHB	
NMDC	122-022	3.25	6.75	30.80	73.75	4 1/2 XHB	
Support Sub	8-727	3.25	6.75	1.92	75.67	4 1/2 XHB	
Gap Sub	69-737	3.25	6.75	4.85	80.52	4 1/2 XHB	
NMDC	122-269	3.25	6.75	30.85	111.37	4 1/2 XHB	
X/O				2.62	113.99		
45 Jts 5" HWDP				10,448.01	10562.00		

Scientific Drilling

JOB NO.:	410413HEFMP6213	**FIELD:**	Baker
COMPANY:	Continental Resources Inc.	**Township:**	153N
LOCATION:		**Range**	101W
RIG NAME:	Patterson 490		
STATE:	North Dakota		
COUNTY:	Country		
WELL NAME:	Columbus Federal 1-16H		

MOTOR INFORMATION

Desc: Hunting - 7/8lobe, 5.7stage, 1.5FBH

Bent Hsg/Sub: 1.5 / 0 **Bit to Bend: 6.18**

PAD OD: 7 **NB Stab:**

Slide Report for BHA # 3

Note: Surveys listed are interpolated from the actual surveys

#	Date	Drill Mode	Start Time	End Time	Hours	Start MD	End MD	Depth Drilled	WOB	ROP	RPM	Surf. Torque	Flow Rate	SPP	TFO	INC	AZM	DLS	Note
3	4-May	Sliding	16:00	21:55	5.92	9555	9616	61	22	10.3	0	0	596	2700	-30	15.63	346.00	3.87	
3	4-May	Drilling	22:15	22:30	0.25	9616	9648	32	24	128.0	60	0	598	3000		16.83	347.00	3.87	
3	4-May	Sliding	22:35	24:00	1.42	9648	9664	16	27	11.3	0	0	596	2900	-30	17.37	340.00	3.60	
3	5-May	Sliding	00:00	03:25	3.42	9664	9711	47	27	13.8	0	0	596	2900	-30	18.93	342.00	3.60	
3	5-May	Drilling	03:40	03:55	0.25	9711	9743	32	27	128.0	60	0	598	3400		20.01	344.00	3.60	
3	5-May	Sliding	04:00	06:15	2.25	9743	9771	28	24	12.4	0	0	596	2900	-40	20.28	337.00	1.56	
3	5-May	Drilling	06:15	06:35	0.33	9771	9807	36	30	108.0	60	0	598	3400		20.56	338.00	1.56	
3	5-May	Drilling	06:40	06:55	0.25	9807	9836	29	30	116.0	60	0	598	3400		20.79	339.00	1.56	
3	5-May	Sliding	06:55	09:35	2.67	9836	9866	30	24	11.3	0	0	598	3400	360	20.82	333.00	1.34	
3	5-May	Drilling	09:35	09:55	0.33	9866	9899	33	30	99.0	60	0	598	3400		20.86	334.00	1.34	
3	5-May	Drilling	10:00	11:05	1.08	9899	9994	95	30	87.7	60	0	598	3400		20.35	329.00	0.96	
3	5-May	Drilling	11:15	12:35	1.33	9994	10088	94	30	70.5	60	0	598	3400		19.68	331.00	0.93	
3	5-May	Drilling	12:40	13:00	0.33	10088	10108	20	30	60.0	60	0	598	3400		19.56	331.00	0.93	
3	5-May	Sliding	13:00	15:40	2.67	10108	10138	30	35	11.3	0	0	598	3200	360	19.29	328.00	1.17	
3	5-May	Drilling	15:40	16:45	1.08	10138	10183	45	30	41.5	45	0	598	3300		18.80	328.00	1.17	
3	5-May	Drilling	18:00	19:15	1.25	10183	10277	94	30	75.2	45	0	598	3300		17.50	327.00	1.55	
3	5-May	Drilling	19:25	19:40	0.25	10277	10292	15	30	60.0	45	0	598	3100		17.27	327.00	1.55	
3	5-May	Sliding	19:40	24:00	4.33	10292	10333	41	26	9.5	0	0	598	2900	50	17.14	328.00	1.56	
3	6-May	Sliding	00:00	02:50	2.83	10333	10371	38	30	13.4	0	0	598	2900	50	17.42	330.00	1.56	
3	6-May	Drilling	02:50	02:55	0.08	10371	10373	2	30	24.0	45	0	598	3200		17.43	330.00	1.56	
3	6-May	Drilling	03:10	04:10	1.00	10373	10436	63	30	63.0	45	0	598	3200		17.92	331.00	0.78	
3	6-May	Sliding	04:15	06:25	2.17	10436	10468	32	30	14.8	0	0	598	3000	30	18.17	331.00	0.78	
3	6-May	Drilling	06:35	06:55	0.33	10468	10488	20	30	60.0	45	0	598	3200		18.33	331.00	0.78	
3	6-May	Sliding	06:55	09:15	2.33	10488	10508	20	30	8.6	0	0	598	3200	30	18.29	332.00	1.76	
3	6-May	Drilling	09:15	10:30	1.25	10508	10562	54	30	43.2	45	0	598	3400		19.05	332.00	3.53	

Slide Report for BHA # 3

Note: Surveys listed are interpolated from the actual surveys

#	Date	Drill Mode	Start Time	End Time	Hours	Start MD	End MD	Depth Drilled	WOB	ROP	RPM	Surf. Torque	Flow Rate	SPP	TFO	INC	AZM	DLS	Note

Total Drilled:	1007	**Avg. Total ROP:**	25.55		**DEPTH% - TIME %**
Total Rotary Drilled:	664	**Avg. Rotary ROP:**	70.51	**Percent Rotary:**	65.94 - 23.89
Total Drilled Sliding:	343	**Avg. Slide ROP:**	11.43	**Percent Slide:**	34.06 - 76.11

BHA # 4

PDT

Scientific Drilling

JOB NO.:	410413HEFMP6213	**Work Order:** 166165	**FIELD:**	Baker	
COMPANY:	Continental Resources Inc.		**Township:**	153N	
LOCATION:			**SECT. RANGE:**	16	101W
RIG NAME:	Patterson 490		**Lead DD:**	Kaleb Smith	
STATE:	North Dakota		**Co. Man:**	Chris	
COUNTY:	McKenzie		**BHA TYPE:**	Steerable Assembly	
WELL NAME:	Columbus Federal 1-16H		**BHA WT:**	10319	**Wt @ Jars:** N/A

Time and Depths

Date In:	06-May-13 @ 17:00
Date Out:	09-May-13 @ 20:30
Hrs In Hole:	65.83
Start Depth:	10562.00
End Depth:	11401.00
Total Drilled:	839.00
Avg. Total ROP:	47.72
Circ Hrs: Tot/Only	41.42 / 23.83
Percent Slide:	76.04
Percent Hrs:	81.99
Slide Hours:	14.42
Total Sliding:	638.00
Avg. Slide ROP:	44.25
Percent Rotary:	23.96
Percent Hrs:	18.01
Rotary Hours:	3.17
Total Rotary:	201.00
Avg. Rotary ROP:	63.47
Reason POOH:	

MOTOR DATA

Leam 7/8 Lobe 5 Stage 2.25 FBH

MFG.:	Leam
PAD OD:	7 1/16
NB Stab:	0
Bit to Bend:	4.8
Bent Hsg/Sub °:	2.25 /
Lobe/Stage:	7/8 / 5
Rev/GAL:	0.29
Rotor Jet:	0
Prop BUR:	
Act BUR:	

Drilling Parameters

SO/PU:	140 - 140 / 189-189
Rot Strg Wt:	168-168
WOB:	0 - 55
TORQ:	0 - 0
SPP:	3200 - 3500
Motor RPM:	155 - 173
Rotary RPM:	30 - 30
Flow Rate:	535 - 598
Avg Diff:	
Stall Pres.:	
Off Bot Pres.:	

Mud Data

Type	Oil Base		
WT:	10.1	**GAS:**	0
Vis:	44	**PV:**	13
WL:	0	**PH:**	0
SOL:	10.1	**SAND:**	0
Oil %:	81	**T °:**	193
Chlor:	51000	**YP:**	9

Bit Record

/ Security FXD55M

Run #:	4		
Type Bit:	PDC		
IADC#:		**TFA:**	1.242
JETS:	5-18		
Bit Drop:	216 PSI @ 598 GPM		
Cond.:			

MWD Spacing

Gamma: 0	**Restiv:** 0	**Sensor:** 0	
GYRO: 0	**DNSC:** 10562	**Sonic:** 0	

Last Casing O.D.:

Shoe @: **Hanger @:**

INC IN: .0 **INC OUT:** .0 **AZM IN:** .00 **AZM OUT:** .00

Leam - 7/8lobe, 5 stage, 2.25 FBH, 0.29 RPG

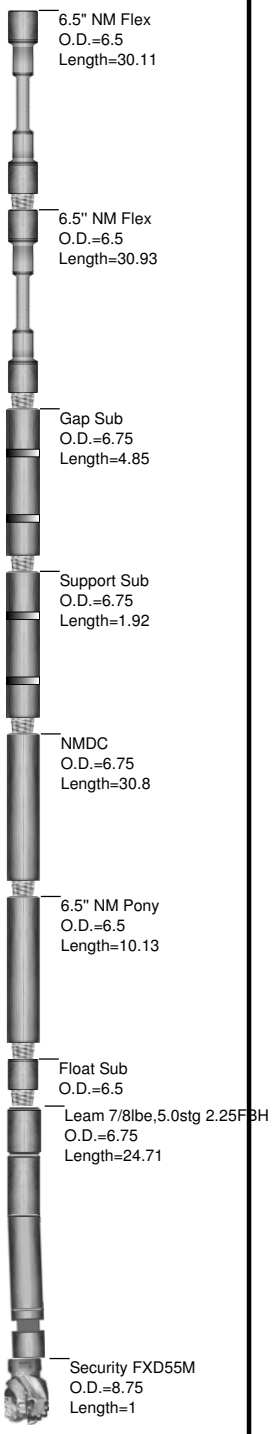
Bit to Sensor - 55.50
Bit to Survey - 58.00
Bit to Gamma - 46.24

Reason Pulled: Landed Curve

Bit Grade:

BHA Detail

Description	Serial #	I.D.	O.D.	Length	Sum	Top Conn	MFG.
Security FXD55M	12031577		8.75	1.00	1.00	4 1/2 REGP	
Leam 7/8lbe,5.0stg 2.25FBH	6751XD-1026		6.75	24.71	25.71	4 1/2 IFB	
Float Sub	650X014	3.25	6.5	2.93	28.64	4 1/2 XHB	
6.5" NM Pony	125-283	3.25	6.5	10.13	38.77	4 1/2 XHB	
NMDC	122-022	3.25	6.75	30.80	69.57	4 1/2 XHB	
Support Sub	8-727	3.25	6.75	1.92	71.49	4 1/2 XHB	
Gap Sub	69-737	3.25	6.75	4.85	76.34	4 1/2 XHB	
6.5" NM Flex	122-631F	3.25	6.5	30.93	107.27	4 1/2 XHB	
6.5" NM Flex	122-180F	3.25	6.5	30.11	137.38	4 1/2 XHB	
X/O				2.62	140.00		
45 Jts 5" HWDP				11,261.00	11401.00		



Scientific Drilling

JOB NO.:	410413HEFMP6213	**FIELD:**	Baker
COMPANY:	Continental Resources Inc.	**Township:**	153N
LOCATION:		**Range**	101W
RIG NAME:	Patterson 490		
STATE:	North Dakota		
COUNTY:	Country		
WELL NAME:	Columbus Federal 1-16H		

MOTOR INFORMATION

Desc: Leam 7/8 Lobe 5 Stage 2.25 FBH

Bent Hsg/Sub: 2.25 / 0 **Bit to Bend: 4.8**

PAD OD: 7 1/16 **NB Stab:**

Slide Report for BHA # 4

Note: Surveys listed are interpolated from the actual surveys

#	Date	Drill Mode	Start Time	End Time	Hours	Start MD	End MD	Depth Drilled	WOB	ROP	RPM	Surf. Torque	Flow Rate	SPP	TFO	INC	AZM	DLS	Note
4	7-May	Sliding	07:05	07:45	0.67	10562	10588	26	34	39.0	0	0	535	3200	360	21.58	333.00	9.86	
4	7-May	Sliding	07:55	08:50	0.92	10588	10620	32	38	34.9	0	0	535	3200	360	23.24	337.00	7.60	
4	7-May	Drilling	08:55	09:05	0.17	10620	10624	4	20	24.0	30	0	598	3400		23.42	338.00	7.60	
4	7-May	Sliding	09:05	09:45	0.67	10624	10652	28	38	42.0	0	0	598	3200	360	26.29	340.00	10.74	
4	7-May	Drilling	09:55	10:00	0.08	10652	10656	4	20	48.0	30	0	598	3500		26.71	340.00	10.74	
4	7-May	Sliding	10:00	10:40	0.67	10656	10683	27	40	40.5	0	0	598	3400	360	27.81	341.00	4.27	
4	7-May	Sliding	11:45	12:40	0.92	10683	10715	32	40	34.9	0	0	598	3400	-30	31.00	342.00	11.51	
4	7-May	Sliding	12:45	13:15	0.50	10715	10747	32	40	64.0	0	0	598	3400	-30	35.27	341.00	13.79	
4	7-May	Sliding	13:20	14:10	0.83	10747	10778	31	40	37.2	0	0	598	3400	-30	39.28	342.00	14.07	
4	7-May	Sliding	14:20	14:55	0.58	10778	10810	32	40	54.9	0	0	598	3400	-30	41.79	338.00	7.27	
4	7-May	Drilling	15:00	15:05	0.08	10810	10813	3	22	36.0	30	0	598	3500		41.99	338.00	7.27	
4	7-May	Drilling	15:35	15:40	0.08	10813	10815	2	22	24.0	30	0	598	3500		42.13	338.00	7.27	
4	7-May	Sliding	15:40	16:10	0.50	10815	10841	26	40	52.0	30	0	598	3400	-30	44.61	336.00	9.87	
4	7-May	Drilling	16:15	16:20	0.08	10841	10846	5	22	60.0	30	0	598	3500		45.09	337.00	9.87	
4	7-May	Sliding	16:20	16:50	0.50	10846	10873	27	40	54.0	0	0	598	3400	-30	48.43	338.00	13.27	
4	7-May	Sliding	17:05	17:40	0.58	10873	10904	31	40	53.1	0	0	598	3400	-30	51.26	335.00	8.57	
4	7-May	Sliding	17:45	18:25	0.67	10904	10936	32	45	48.0	0	0	598	3400	-30	53.61	336.00	7.49	
4	7-May	Drilling	18:30	18:35	0.08	10936	10941	5	22	60.0	30	0	598	3400		53.97	336.00	7.49	
4	7-May	Sliding	19:05	19:30	0.42	10941	10968	27	45	64.8	0	0	598	3400	-40	57.12	337.00	14.51	
4	7-May	Sliding	19:40	20:15	0.58	10968	11000	32	45	54.9	0	0	598	3400	-20	60.93	331.00	11.88	
4	7-May	Sliding	20:20	20:55	0.58	11000	11032	32	45	54.9	0	0	598	3400	-30	65.47	331.00	14.80	
4	7-May	Drilling	21:00	21:15	0.25	11032	11037	5	22	20.0	30	0	598	3400		66.21	331.00	14.80	
4	7-May	Sliding	21:15	21:50	0.58	11037	11064	27	55	46.3	30	0	598	3400	-15	69.81	330.00	13.29	
4	7-May	Sliding	22:50	23:50	1.00	11064	11096	32	55	32.0	0	0	598	3400	-30	73.86	331.00	12.55	
4	7-May	Sliding	23:55	24:00	0.08	11096	11098	2	55	24.0	0	0	598	3400	-30	74.11	331.00	12.55	
4	8-May	Sliding	00:00	00:15	0.25	11098	11110	12	55	48.0	0	0	598	3400	360	75.21	330.00	8.22	

Slide Report for BHA # 4

Note: Surveys listed are interpolated from the actual surveys

#	Date	Drill Mode	Start Time	End Time	Hours	Start MD	End MD	Depth Drilled	WOB	ROP	RPM	Surf. Torque	Flow Rate	SPP	TFO	INC	AZM	DLS	Note
4	8-May	Drilling	00:15	00:25	0.17	11110	11116	6	22	36.0	30	0	598	3400		75.67	330.00	8.22	
4	8-May	Sliding	00:25	00:50	0.42	11116	11128	12	55	28.8	0	0	598	3400	-15	76.57	331.00	8.22	
4	8-May	Drilling	00:55	01:15	0.33	11128	11160	32	22	96.0	30	0	598	3400		77.06	329.00	0.78	
4	8-May	Drilling	01:35	01:50	0.25	11160	11191	31	22	124.0	30	0	598	3400		77.93	330.00	6.26	
4	8-May	Drilling	02:15	02:25	0.17	11191	11196	5	22	30.0	30	0	598	3400		78.10	330.00	6.26	
4	8-May	Sliding	02:25	03:00	0.58	11196	11223	27	45	46.3	0	0	598	3400	360	80.82	328.00	11.09	
4	8-May	Drilling	03:05	03:10	0.08	11223	11227	4	22	48.0	30	0	598	3400		81.22	328.00	11.09	
4	8-May	Sliding	03:10	03:40	0.50	11227	11254	27	45	54.0	0	0	598	3400	30	84.47	325.00	12.10	
4	8-May	Drilling	03:55	04:00	0.08	11254	11260	6	22	72.0	30	0	598	3400		85.16	326.00	11.13	
4	8-May	Sliding	04:00	04:40	0.67	11260	11286	26	45	39.0	0	0	598	3400	30	87.56	327.00	11.13	
4	8-May	Sliding	04:45	05:30	0.75	11286	11312	26	45	34.7	0	0	598	3400	30	89.43	328.00	8.02	
4	8-May	Drilling	05:30	05:40	0.17	11312	11317	5	22	30.0	30	0	598	3400		89.76	329.00	8.02	
4	8-May	Drilling	05:55	06:20	0.42	11317	11349	32	22	76.8	30	0	598	3400		90.34	328.00	1.86	
4	8-May	Drilling	06:30	07:10	0.67	11349	11401	52	22	78.0	30	0	598	3400		90.90	329.00	1.86	

Total Drilled:	839	**Avg. Total ROP:**	47.72		**DEPTH% - TIME %**
Total Rotary Drilled:	201	**Avg. Rotary ROP:**	63.47	**Percent Rotary:**	23.96 - 18.01
Total Drilled Sliding:	638	**Avg. Slide ROP:**	44.25	**Percent Slide:**	76.04 - 81.99

BHA # 5

PDT

Scientific Drilling

JOB NO.:	410413HEFMP6213 **Work Order:** 166165	**FIELD:**	Baker
COMPANY:	Continental Resources Inc.	**Township:**	153N
LOCATION:		**SECT. RANGE:**	16 101W
RIG NAME:	Patterson 490	**Lead DD:**	Kaleb Smith
STATE:	North Dakota	**Co. Man:**	Chris
COUNTY:	McKenzie	**BHA TYPE:**	Steerable Assembly
WELL NAME:	Columbus Federal 1-16H	**BHA WT:** 4404	**Wt @ Jars:** N/A

Time and Depths

Date In:	11-May-13 @ 03:30
Date Out:	14-May-13 @ 10:30
Hrs In Hole:	79.00
Start Depth:	11401.00
End Depth:	14418.00
Total Drilled:	3017.00
Avg. Total ROP:	59.64
Circ Hrs: Tot/Only	56.00 / 5.42
Percent Slide:	19.75
Percent Hrs:	45.30
Slide Hours:	22.92
Total Sliding:	596.00
Avg. Slide ROP:	26.01
Percent Rotary:	80.25
Percent Hrs:	54.70
Rotary Hours:	27.67
Total Rotary:	2421.00
Avg. Rotary ROP:	87.51
Reason POOH:	DMF

MOTOR DATA

4.75" Bico 5/6lobe 5.4stg 1.5fbh

MFG.:	Bico
PAD OD:	5
NB Stab:	0
Bit to Bend:	6.24
Bent Hsg/Sub °:	1.5 /
Lobe/Stage:	5/6 / 5.4
Rev/GAL:	1.125
Rotor Jet:	0
Prop BUR:	
Act BUR:	

Drilling Parameters

SO/PU:	112 - 140 / 140-189
Rot Strg Wt:	120-168
WOB:	0 - 36
TORQ:	0 - 0
SPP:	1100 - 2600
Motor RPM:	315 - 673
Rotary RPM:	45 - 60
Flow Rate:	203 - 598
Avg Diff:	
Stall Pres.:	
Off Bot Pres.:	

Mud Data

Type Water

WT:	9.8	**GAS:**	0
Vis:	27	**PV:**	1
WL:	0	**PH:**	0
SOL:	0.9	**SAND:**	0
Oil %:	0	**T °:**	193
Chlor:	152000	**YP:**	1

Bit Record

SMITH / Smith MDSiZ

Run #:	5		
Type Bit:	PDC		
IADC#:		**TFA:**	1.858
JETS:	3-18,3-22		
Bit Drop:	93 PSI @ 598 GPM		
Cond.:	Re-runable		

MWD Spacing

Gamma: 0	**Restiv:** 0	**Sensor:** 0	
GYRO: 0	**DNSC:** 11401	**Sonic:** 0	

Last Casing O.D.:

Shoe @: **Hanger @:**

INC IN: .0 **INC OUT:** .0 **AZM IN:** .00 **AZM OUT:** .00

4.75" Bico 5/6lobe 5.4stg 1.5fbh

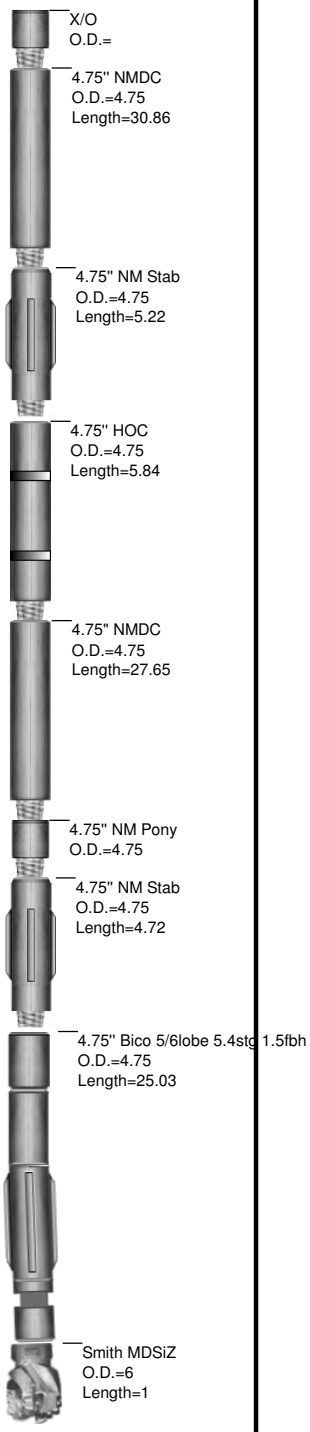
Bit to Sensor - 60.29
Bit to Survey - 62.00
Bit to Gamma - 51.03

Reason Pulled:Low ROP and Frequent Motor Stalls

Bit Grade:1/1/PN/A/X/0/NO/DMF

BHA Detail

Description	Serial #	I.D.	O.D.	Length	Sum	Top Conn	MFG.
Smith MDSiZ	JG9695		6	1.00	1.00	3 1/2 REGP	
4.75" Bico 5/6lobe 5.4stg 1.5fbh	G582		4.75	25.03	26.03	3 1/2 XHB	
4.75" NM Stab	DR15438	2.25	4.75	4.72	30.75	3 1/2 XHB	
4.75" NM Pony	17-083	2.25	4.75	10.72	41.47	3 1/2 XHB	
4.75" NMDC	121-015	2.25	4.75	27.65	69.12	3 1/2 XHB	
4.75" HOC	65-226	2.25	4.75	5.84	74.96	3 1/2 XHB	
4.75" NM Stab	DR15471	2.25	4.75	5.22	80.18	3 1/2 XHB	
4.75" NMDC	121-383	2.25	4.75	30.86	111.04	3 1/2 XHB	
X/O	Rig			3.12	114.16	B	



Scientific Drilling

JOB NO.:	410413HEFMP6213	**FIELD:**	Baker
COMPANY:	Continental Resources Inc.	**Township:**	153N
LOCATION:		**Range**	101W
RIG NAME:	Patterson 490		
STATE:	North Dakota		
COUNTY:	Country		
WELL NAME:	Columbus Federal 1-16H		

MOTOR INFORMATION

Desc: 4.75" Bico 5/6lobe 5.4stg 1.5fbh

Bent Hsg/Sub: 1.5 / 0 **Bit to Bend: 6.24**

PAD OD: 5 **NB Stab:**

Slide Report for BHA # 5

Note: Surveys listed are interpolated from the actual surveys

#	Date	Drill Mode	Start Time	End Time	Hours	Start MD	End MD	Depth Drilled	WOB	ROP	RPM	Surf. Torque	Flow Rate	SPP	TFO	INC	AZM	DLS	Note
5	11-May	Drilling	18:00	18:50	0.83	11401	11465	64	10	76.8	45	0	255	1900		90.62	329.00	2.47	
5	11-May	Drilling	19:00	19:10	0.17	11465	11481	16	10	96.0	60	0	255	2000		90.54	329.00	2.47	
5	11-May	Sliding	19:10	20:25	1.25	11481	11502	21	22	16.8	0	0	598	1600	145	90.40	329.00	1.50	
5	11-May	Drilling	20:25	20:55	0.50	11502	11556	54	10	108.0	60	0	255	2000		89.83	330.00	1.50	
5	11-May	Drilling	21:10	21:15	0.08	11556	11571	15	10	180.0	60	0	255	2000		89.67	330.00	1.50	
5	11-May	Sliding	21:20	22:15	0.92	11571	11596	25	30	27.3	0	0	598	1750	130	89.49	331.00	2.78	
5	11-May	Drilling	22:15	22:45	0.50	11596	11647	51	13	102.0	60	0	255	2200		89.34	332.00	2.78	
5	11-May	Drilling	22:55	23:05	0.17	11647	11662	15	13	90.0	60	0	255	2100		89.29	332.00	2.78	
5	11-May	Sliding	23:15	24:00	0.75	11662	11689	27	33	36.0	0	0	598	1800	120	89.18	333.00	3.43	
5	12-May	Drilling	00:00	00:25	0.42	11689	11739	50	13	120.0	60	0	255	2100		88.89	335.00	3.43	
5	12-May	Drilling	00:40	00:50	0.17	11739	11754	15	13	90.0	60	0	255	2200		88.80	335.00	3.43	
5	12-May	Sliding	00:55	02:00	1.08	11754	11784	30	30	27.7	0	0	598	1750	120	88.77	336.00	1.46	
5	12-May	Drilling	02:00	02:25	0.42	11784	11830	46	10	110.4	60	0	255	2200		88.90	337.00	1.46	
5	12-May	Drilling	02:35	02:40	0.08	11830	11845	15	10	180.0	60	0	255	2200		88.95	337.00	1.46	
5	12-May	Sliding	02:40	04:00	1.33	11845	11875	30	30	22.5	0	0	598	1800	110	89.09	338.00	4.30	
5	12-May	Drilling	04:00	04:25	0.42	11875	11922	47	10	112.8	60	0	255	2200		89.41	340.00	4.30	
5	12-May	Drilling	04:40	04:45	0.08	11922	11937	15	10	180.0	60	0	255	2200		89.51	341.00	4.30	
5	12-May	Sliding	04:45	05:45	1.00	11937	11967	30	30	30.0	0	0	280	1800	100	89.49	341.00	1.49	
5	12-May	Drilling	05:45	06:05	0.33	11967	12014	47	12	141.0	60	0	255	2200		89.18	342.00	1.49	
5	12-May	Drilling	06:15	06:25	0.17	12014	12029	15	15	90.0	60	0	280	2300		89.08	342.00	1.49	
5	12-May	Sliding	06:25	07:55	1.50	12029	12059	30	30	20.0	0	0	280	2000	100	89.33	343.00	5.16	
5	12-May	Drilling	07:55	08:15	0.33	12059	12105	46	15	138.0	60	0	280	2300		90.32	345.00	5.16	
5	12-May	Drilling	08:25	08:35	0.17	12105	12120	15	15	90.0	60	0	280	2300		90.64	346.00	5.16	
5	12-May	Sliding	08:35	09:35	1.00	12120	12155	35	30	35.0	0	0	280	2000	90	90.99	347.00	1.76	
5	12-May	Drilling	09:35	09:50	0.25	12155	12195	40	15	160.0	60	0	280	2300		91.10	348.00	1.76	
5	12-May	Drilling	10:00	10:05	0.08	12195	12210	15	15	180.0	60	0	280	2300		91.15	348.00	1.76	

Slide Report for BHA # 5

Note: Surveys listed are interpolated from the actual surveys

#	Date	Drill Mode	Start Time	End Time	Hours	Start MD	End MD	Depth Drilled	WOB	ROP	RPM	Surf. Torque	Flow Rate	SPP	TFO	INC	AZM	DLS	Note
5	12-May	Sliding	10:05	10:45	0.67	12210	12235	25	30	37.5	0	0	280	2000	135	91.17	348.00	1.83	
5	12-May	Drilling	10:45	11:10	0.42	12235	12286	51	15	122.4	60	0	280	2300		91.07	349.00	1.83	
5	12-May	Drilling	11:20	11:30	0.17	12286	12301	15	15	90.0	60	0	280	2300		91.04	350.00	1.83	
5	12-May	Sliding	11:30	11:40	0.17	12301	12306	5	30	30.0	0	0	280	2000	165	91.03	350.00	1.83	
5	12-May	Sliding	12:05	12:50	0.75	12306	12321	15	30	20.0	0	0	280	2000	165	90.99	350.00	1.71	
5	12-May	Drilling	12:50	13:15	0.42	12321	12378	57	15	136.8	60	0	280	2300		90.71	351.00	1.71	
5	12-May	Drilling	13:25	13:35	0.17	12378	12393	15	15	90.0	60	0	280	2300		90.64	351.00	1.71	
5	12-May	Sliding	13:35	14:35	1.00	12393	12423	30	30	30.0	0	0	280	2000	165	90.34	352.00	4.09	
5	12-May	Drilling	14:35	15:00	0.42	12423	12469	46	15	110.4	60	0	280	2300		89.68	354.00	4.09	
5	12-May	Drilling	15:10	15:15	0.08	12469	12484	15	15	180.0	60	0	280	2300		89.47	354.00	4.09	
5	12-May	Sliding	15:15	16:20	1.08	12484	12519	35	30	32.3	0	0	280	2000	135	89.31	355.00	1.37	
5	12-May	Drilling	16:20	16:40	0.33	12519	12561	42	15	126.0	60	0	280	2300		89.43	356.00	1.37	
5	12-May	Drilling	16:50	17:00	0.17	12561	12576	15	15	90.0	60	0	280	2300		89.48	356.00	1.37	
5	12-May	Sliding	17:00	17:50	0.83	12576	12606	30	30	36.0	0	0	280	2000	120	89.55	357.00	3.64	
5	12-May	Drilling	17:50	18:10	0.33	12606	12653	47	15	141.0	60	0	280	2300		89.63	358.00	3.64	
5	12-May	Drilling	18:20	18:35	0.25	12653	12668	15	15	60.0	60	0	280	2400		89.66	359.00	3.64	
5	12-May	Sliding	18:35	19:45	1.17	12668	12703	35	34	30.0	0	0	280	2250	130	89.67	0.00	3.38	
5	12-May	Drilling	19:45	20:10	0.42	12703	12745	42	17	100.8	60	0	280	2600		89.63	2.00	3.38	
5	12-May	Drilling	21:05	21:10	0.08	12745	12760	15	13	180.0	60	0	280	2500		89.61	2.00	3.38	
5	12-May	Sliding	21:10	22:30	1.33	12760	12795	35	27	26.3	0	0	280	2300	130	89.45	3.00	2.69	
5	12-May	Drilling	22:30	22:55	0.42	12795	12836	41	14	98.4	60	0	280	2600		89.14	4.00	2.69	
5	12-May	Drilling	23:05	23:15	0.17	12836	12851	15	14	90.0	60	0	280	2500		89.03	5.00	2.69	
5	12-May	Sliding	23:15	24:00	0.75	12851	12873	22	29	29.3	0	0	280	2200	145	88.90	5.00	2.25	
5	13-May	Sliding	00:00	00:20	0.33	12873	12885	12	29	36.0	0	0	280	2200	145	88.92	5.00	2.25	
5	13-May	Drilling	00:20	00:55	0.58	12885	12931	46	14	78.9	60	0	280	2500		88.96	6.00	2.25	
5	13-May	Drilling	01:20	02:00	0.67	12931	13025	94	18	141.0	60	0	280	2500		88.93	7.00	0.56	
5	13-May	Drilling	02:15	02:50	0.58	13025	13119	94	18	161.1	60	0	280	2600		89.25	7.00	0.73	
5	13-May	Drilling	03:05	03:20	0.25	13119	13151	32	15	128.0	60	0	280	2600		89.42	7.00	0.73	
5	13-May	Sliding	03:25	04:30	1.08	13151	13173	22	21	20.3	0	0	280	2200	-15	89.68	6.00	1.44	
5	13-May	Drilling	04:30	04:55	0.42	13173	13214	41	9	98.4	50	0	280	2600		90.17	7.00	1.44	
5	13-May	Drilling	05:05	05:20	0.25	13214	13246	32	11	128.0	50	0	280	2600		90.55	7.00	1.44	
5	13-May	Drilling	05:30	06:00	0.50	13246	13310	64	11	128.0	60	0	280	2600		90.17	8.00	1.72	
5	13-May	Drilling	06:10	06:55	0.75	13310	13404	94	11	125.3	60	0	280	2300		89.67	6.00	0.50	
5	13-May	Drilling	07:05	07:35	0.50	13404	13467	63	11	126.0	60	0	280	2300		89.75	5.00	0.82	
5	13-May	Sliding	07:45	08:50	1.08	13467	13485	18	28	16.6	0	0	280	2300	-40	89.88	5.00	0.82	

Slide Report for BHA # 5

Note: Surveys listed are interpolated from the actual surveys

#	Date	Drill Mode	Start Time	End Time	Hours	Start MD	End MD	Depth Drilled	WOB	ROP	RPM	Surf. Torque	Flow Rate	SPP	TFO	INC	AZM	DLS	Note
5	13-May	Drilling	08:50	08:55	0.08	13485	13498	13	11	156.0	60	0	280	2600		89.98	5.00	0.82	
5	13-May	Drilling	09:05	09:50	0.75	13498	13593	95	11	126.7	60	0	280	2600		90.34	5.00	0.78	
5	13-May	Drilling	10:00	10:15	0.25	13593	13624	31	11	124.0	60	0	280	2600		90.40	6.00	0.78	
5	13-May	Sliding	10:25	11:25	1.00	13624	13644	20	28	20.0	0	0	280	2300	-35	90.38	4.00	0.56	
5	13-May	Drilling	11:25	11:45	0.33	13644	13687	43	11	129.0	60	0	280	2600		90.34	5.00	0.56	
5	13-May	Drilling	11:55	12:50	0.92	13687	13782	95	11	103.6	60	0	280	2600		90.48	4.00	0.38	
5	13-May	Drilling	13:00	13:15	0.25	13782	13815	33	11	132.0	60	0	280	2600		90.57	4.00	0.38	
5	13-May	Sliding	13:25	14:05	0.67	13815	13835	20	28	30.0	0	0	280	2300	-35	90.66	4.00	0.80	
5	13-May	Drilling	14:05	14:25	0.33	13835	13878	43	11	129.0	60	0	280	2600		90.86	4.00	0.80	
5	13-May	Drilling	14:35	15:20	0.75	13878	13972	94	11	125.3	60	0	280	2600		90.95	5.00	0.20	
5	13-May	Drilling	16:20	17:10	0.83	13972	14036	64	11	76.8	60	0	280	2600		90.81	5.00	0.91	
5	13-May	Drilling	17:20	17:45	0.42	14036	14068	32	10	76.8	60	0	280	2500		90.69	5.00	0.91	
5	13-May	Drilling	17:55	18:40	0.75	14068	14131	63	10	84.0	60	0	280	2500		90.74	4.00	2.14	
5	13-May	Sliding	18:55	20:10	1.25	14131	14159	28	36	22.4	0	0	280	2300	-30	90.90	5.00	2.14	
5	13-May	Drilling	20:10	20:20	0.17	14159	14163	4	10	24.0	60	0	280	2500		90.92	5.00	2.14	
5	13-May	Drilling	20:35	21:30	0.92	14163	14225	62	12	67.6	60	0	280	2500		91.07	2.00	0.46	
5	13-May	Drilling	22:00	22:30	0.50	14225	14257	32	12	64.0	60	0	280	2600		91.04	2.00	0.46	
5	13-May	Drilling	22:40	24:00	1.33	14257	14323	66	12	49.5	60	0	280	2600		91.47	1.00	1.43	
5	14-May	Drilling	00:00	00:40	0.67	14323	14352	29	12	43.5	60	0	280	2600		91.88	1.00	1.43	
5	14-May	Drilling	01:00	01:20	0.33	14352	14367	15	12	45.0	60	0	280	2600		92.09	1.00	1.43	
5	14-May	Sliding	01:20	02:15	0.92	14367	14383	16	34	17.5	0	0	280	2200	-15	92.32	1.00	1.43	
5	14-May	Drilling	02:15	03:05	0.83	14383	14418	35	12	42.0	60	0	280	2600		92.02	2.00	1.23	

Total Drilled: 3017 **Avg. Total ROP:** 59.64 **DEPTH% - TIME %**

Total Rotary Drilled: 2421 **Avg. Rotary ROP:** 87.51 **Percent Rotary:** 80.25 - 54.70

Total Drilled Sliding: 596 **Avg. Slide ROP:** 26.01 **Percent Slide:** 19.75 - 45.30

BHA # 6

PDT

Scientific Drilling

JOB NO.:	410413HEFMP6213 **Work Order:** 166165	**FIELD:**	Baker
COMPANY:	Continental Resources Inc.	**Township:**	153N
LOCATION:		**SECT. RANGE:**	16 101W
RIG NAME:	Patterson 490	**Lead DD:**	Kaleb Smith
STATE:	North Dakota	**Co. Man:**	Justin
COUNTY:	McKenzie	**BHA TYPE:**	Steerable Assembly
WELL NAME:	Columbus Federal 1-16H	**BHA WT:** 4404	**Wt @ Jars:** N/A

Time and Depths

Date In:	14-May-13 @ 10:30
Date Out:	22-May-13 @ 06:00
Hrs In Hole:	179.83
Start Depth:	14418.00
End Depth:	21276.00
Total Drilled:	6858.00
Avg. Total ROP:	66.37
Circ Hrs: Tot/Only	134.67 / 31.33
Percent Slide:	13.18
Percent Hrs:	43.95
Slide Hours:	45.42
Total Sliding:	904.00
Avg. Slide ROP:	19.90
Percent Rotary:	86.82
Percent Hrs:	56.05
Rotary Hours:	57.92
Total Rotary:	5954.00
Avg. Rotary ROP:	102.80
Reason POOH:	

MOTOR DATA

4.75" Bico 5/6lobe 5.4stg 1.5fbh

MFG.:	Bico		
PAD OD:	5		
NB Stab:	0		
Bit to Bend:	6.2		
Bent Hsg/Sub °:	1.5 /		
Lobe/Stage:	5/6 / 5.4		
Rev/GAL:	1.125		
Rotor Jet:	0		
Prop BUR:			
Act BUR:			

Mud Data

Type	Water		
WT:	9.8	**GAS:**	0
Vis:	27	**PV:**	1
WL:	0	**PH:**	0
SOL:	0.9	**SAND:**	0
Oil %:	0	**T °:**	193
Chlor:	152000	**YP:**	1

Drilling Parameters

SO/PU:	112 - 112 / 140-140
Rot Strg Wt:	127-127
WOB:	0 - 75
TORQ:	0 - 0
SPP:	1100 - 3100
Motor RPM:	315
Rotary RPM:	45 - 65
Flow Rate:	194 - 280
Avg Diff:	
Stall Pres.:	
Off Bot Pres.:	

Bit Record

SMITH / Smith MDSI613

Run #:	6		
Type Bit:	PDC		
IADC#:		**TFA:**	1.858
JETS:	3-18,3-22		
Bit Drop:	20 PSI @ 280 GPM		
Cond.:			

MWD Spacing			
Gamma: 0	**Restiv:** 0	**Sensor:** 0	
GYRO: 0	**DNSC:** 14418	**Sonic:** 0	

Last Casing O.D.:
Shoe @: **Hanger @:**

INC IN: .0 **INC OUT:** .0 **AZM IN:** .00 **AZM OUT:** .00

4.75" Bico 5/6lobe 5.4stg 1.5fbh

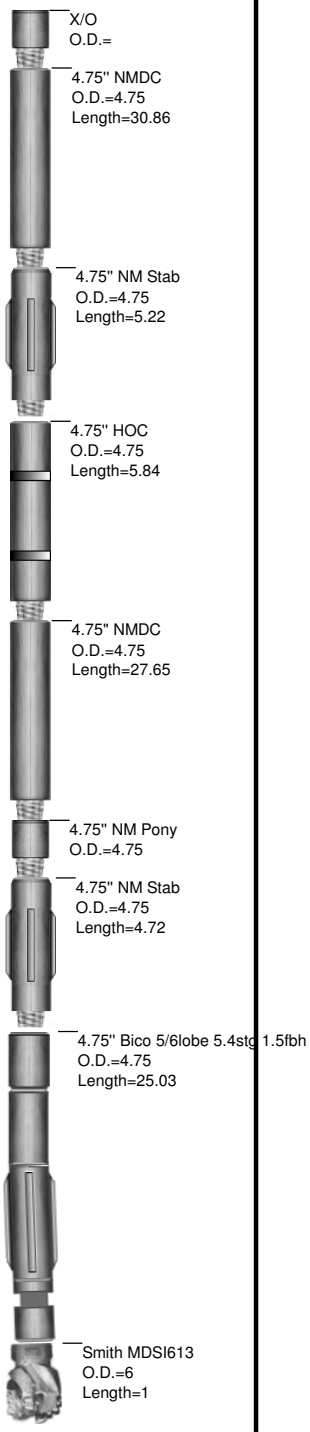
Bit to Sensor - 60.29
Bit to Survey - 62.00
Bit to Gamma - 51.03

Reason Pulled: Reached TD @ 21276' motor did have a lot of stalls while drilling.

Bit Grade:2/4/PN/A/X/0/NO/TD

BHA Detail

Description	Serial #	I.D.	O.D.	Length	Sum	Top Conn	MFG.
Smith MDSI613	JG9419		6	1.00	1.00	3 1/2 REGP	
4.75" Bico 5/6lobe 5.4stg 1.5fbh	G585		4.75	25.03	26.03	3 1/2 IFB	
4.75" NM Stab	DR15438	2.25	4.75	4.72	30.75	3 1/2 XHB	
4.75" NM Pony	17-083	2.25	4.75	10.72	41.47	3 1/2 XHB	
4.75" NMDC	121-015	2.25	4.75	27.65	69.12	3 1/2 XHB	
4.75" HOC	65-226	2.25	4.75	5.84	74.96	3 1/2 XHB	
4.75" NM Stab	DR15471	2.25	4.75	5.22	80.18	3 1/2 XHB	
4.75" NMDC	121-383	2.25	4.75	30.86	111.04	3 1/2 XHB	
X/O	Rig			3.12	114.16	B	



Scientific Drilling

JOB NO.:	410413HEFMP6213	**FIELD:**	Baker
COMPANY:	Continental Resources Inc.	**Township:**	153N
LOCATION:		**Range**	101W
RIG NAME:	Patterson 490		
STATE:	North Dakota		
COUNTY:	Country		
WELL NAME:	Columbus Federal 1-16H		

MOTOR INFORMATION

Desc: 4.75" Bico 5/6lobe 5.4stg 1.5fbh

Bent Hsg/Sub: 1.5 / 0 **Bit to Bend: 6.2**

PAD OD: 5 **NB Stab:**

Slide Report for BHA # 6

Note: Surveys listed are interpolated from the actual surveys

#	Date	Drill Mode	Start Time	End Time	Hours	Start MD	End MD	Depth Drilled	WOB	ROP	RPM	Surf. Torque	Flow Rate	SPP	TFO	INC	AZM	DLS	Note
6	14-May	Drilling	18:10	18:30	0.33	14418	14446	28	8	84.0	60	0	280	2400		91.76	2.00	1.23	
6	14-May	Drilling	19:55	20:20	0.42	14446	14478	32	8	76.8	65	0	280	2600		91.47	2.00	1.23	
6	14-May	Drilling	20:25	22:00	1.58	14478	14542	64	11	40.4	60	0	280	2600		89.79	3.00	2.72	
6	14-May	Drilling	22:10	22:55	0.75	14542	14637	95	13	126.7	60	0	280	2600		88.61	2.00	0.54	
6	14-May	Drilling	23:55	24:00	0.08	14637	14655	18	13	216.0	60	0	280	2600		88.53	2.00	0.54	
6	15-May	Drilling	00:00	00:30	0.50	14655	14731	76	13	152.0	45	0	280	2600		89.15	2.00	1.13	
6	15-May	Drilling	00:45	00:50	0.08	14731	14746	15	10	180.0	60	0	280	2800		89.32	2.00	1.13	
6	15-May	Sliding	00:50	02:05	1.25	14746	14763	17	34	13.6	0	0	280	2300	20	89.51	2.00	1.13	
6	15-May	Drilling	02:05	02:35	0.50	14763	14826	63	12	126.0	50	0	280	2700		91.20	3.00	2.75	
6	15-May	Drilling	02:45	03:00	0.25	14826	14847	21	12	84.0	50	0	280	2600		91.77	3.00	2.75	
6	15-May	Sliding	03:00	03:35	0.58	14847	14862	15	30	25.7	0	0	280	2200	-20	92.08	3.00	0.38	
6	15-May	Drilling	03:35	04:05	0.50	14862	14920	58	12	116.0	60	0	280	2700		92.30	3.00	0.38	
6	15-May	Drilling	04:20	04:45	0.42	14920	14984	64	12	153.6	65	0	280	2700		92.22	3.00	0.72	
6	15-May	Drilling	04:50	05:10	0.33	14984	15016	32	12	96.0	65	0	280	2700		92.01	3.00	0.72	
6	15-May	Drilling	05:35	05:50	0.25	15016	15048	32	13	128.0	65	0	280	2700		91.80	3.00	0.72	
6	15-May	Sliding	06:05	07:00	0.92	15048	15070	22	30	24.0	0	0	280	2400	-135	91.45	3.00	1.57	
6	15-May	Drilling	07:00	07:20	0.33	15070	15110	40	13	120.0	65	0	280	2700		90.83	3.00	1.57	
6	15-May	Drilling	07:30	08:20	0.83	15110	15205	95	13	114.0	65	0	280	2700		90.31	3.00	0.46	
6	15-May	Drilling	08:25	09:10	0.75	15205	15300	95	13	126.7	65	0	280	2700		90.37	4.00	0.30	
6	15-May	Drilling	09:20	09:50	0.50	15300	15395	95	13	190.0	65	0	280	2700		89.99	4.00	0.72	
6	15-May	Drilling	10:05	10:55	0.83	15395	15489	94	13	112.8	65	0	280	2700		89.43	5.00	1.16	
6	15-May	Drilling	11:05	11:50	0.75	15489	15584	95	13	126.7	65	0	280	2700		89.02	5.00	0.46	
6	15-May	Drilling	12:00	12:10	0.17	15584	15615	31	13	186.0	65	0	280	2700		88.91	5.00	0.46	
6	15-May	Sliding	12:25	14:05	1.67	15615	15645	30	30	18.0	0	0	280	2400	-60	89.16	5.00	1.05	
6	15-May	Drilling	14:05	14:20	0.25	15645	15679	34	13	136.0	65	0	280	2700		89.48	5.00	1.05	
6	15-May	Drilling	14:30	15:00	0.50	15679	15742	63	13	126.0	65	0	280	2700		90.32	5.00	1.77	

Slide Report for BHA # 6

Note: Surveys listed are interpolated from the actual surveys

#	Date	Drill Mode	Start Time	End Time	Hours	Start MD	End MD	Depth Drilled	WOB	ROP	RPM	Surf. Torque	Flow Rate	SPP	TFO	INC	AZM	DLS	Note
6	15-May	Sliding	15:10	16:00	0.83	15742	15772	30	30	36.0	0	0	280	2400	-45	90.85	5.00	1.77	
6	15-May	Drilling	16:25	17:15	0.83	15772	15868	96	13	115.2	65	0	280	2700		91.10	5.00	0.78	
6	15-May	Drilling	17:35	17:50	0.25	15868	15899	31	13	124.0	65	0	280	2700		90.93	5.00	0.78	
6	15-May	Sliding	17:50	19:10	1.33	15899	15924	25	27	18.8	0	0	280	2300	-120	90.41	4.00	2.83	
6	15-May	Drilling	19:10	19:30	0.33	15924	15963	39	10	117.0	60	0	280	2700		89.54	5.00	2.83	
6	15-May	Drilling	19:40	19:55	0.25	15963	15994	31	12	124.0	60	0	280	2700		88.85	6.00	2.83	
6	15-May	Sliding	20:00	21:55	1.92	15994	16029	35	29	18.3	0	0	280	2300	-75	89.06	3.00	2.20	
6	15-May	Drilling	21:55	22:10	0.25	16029	16058	29	15	116.0	50	0	280	2700		89.28	4.00	2.20	
6	15-May	Drilling	22:20	22:40	0.33	16058	16099	41	15	123.0	50	0	280	2700		89.65	0.00	1.48	
6	15-May	Sliding	22:45	23:30	0.75	16099	16114	15	30	20.0	0	0	280	2300	-60	89.87	0.00	1.48	
6	15-May	Drilling	23:30	23:50	0.33	16114	16152	38	15	114.0	50	0	280	2700		90.43	1.00	1.48	
6	16-May	Drilling	00:00	00:20	0.33	16152	16184	32	12	96.0	55	0	280	2600		90.91	1.00	1.48	
6	16-May	Sliding	00:25	01:40	1.25	16184	16216	32	34	25.6	0	0	280	2300	-60	91.27	1.00	1.45	
6	16-May	Drilling	01:40	02:00	0.33	16216	16247	31	14	93.0	60	0	280	2700		91.61	1.00	1.45	
6	16-May	Drilling	02:10	03:00	0.83	16247	16342	95	17	114.0	65	0	280	2500		91.57	0.00	0.81	
6	16-May	Drilling	03:10	03:45	0.58	16342	16436	94	11	161.1	65	0	280	2600		90.85	0.00	0.94	
6	16-May	Drilling	04:00	04:50	0.83	16436	16532	96	15	115.2	60	0	280	2500		89.99	1.00	1.85	
6	16-May	Drilling	05:00	05:15	0.25	16532	16552	20	15	80.0	60	0	280	2500		89.80	2.00	1.85	
6	16-May	Sliding	05:15	06:35	1.33	16552	16582	30	34	22.5	0	0	280	2300	-75	89.56	359.00	1.33	
6	16-May	Drilling	06:35	07:00	0.42	16582	16626	44	17	105.6	55	0	280	2700		89.23	359.00	1.33	
6	16-May	Drilling	07:10	07:25	0.25	16626	16660	34	11	136.0	55	0	280	2600		89.01	358.00	1.67	
6	16-May	Drilling	07:30	07:55	0.42	16660	16689	29	11	69.6	55	0	280	2600		89.49	358.00	1.67	
6	16-May	Sliding	08:00	08:50	0.83	16689	16718	29	34	34.8	0	0	280	2400	30	89.97	358.00	1.67	
6	16-May	Drilling	10:00	11:00	1.00	16718	16816	98	15	98.0	55	0	280	2700		90.22	358.00	1.15	
6	16-May	Drilling	11:10	11:20	0.17	16816	16848	32	15	192.0	55	0	280	2700		90.05	359.00	1.15	
6	16-May	Drilling	11:30	11:55	0.42	16848	16911	63	15	151.2	55	0	280	2700		89.35	359.00	1.11	
6	16-May	Drilling	12:05	12:50	0.75	16911	17006	95	15	126.7	55	0	280	2700		88.13	359.00	1.78	
6	16-May	Drilling	13:20	13:25	0.08	17006	17021	15	15	180.0	55	0	280	2700		87.92	0.00	1.78	
6	16-May	Sliding	13:25	15:35	2.17	17021	17041	20	34	9.2	0	0	280	2300	360	87.73	358.00	3.24	
6	16-May	Drilling	15:35	15:45	0.17	17041	17070	29	15	174.0	55	0	280	2700		88.68	358.00	3.24	
6	16-May	Sliding	15:45	17:05	1.33	17070	17101	31	34	23.3	0	0	280	2700	360	89.68	358.00	3.24	
6	16-May	Drilling	17:25	18:25	1.00	17101	17196	95	15	95.0	55	0	280	2700		91.27	359.00	2.12	
6	16-May	Drilling	18:40	19:05	0.42	17196	17259	63	15	151.2	55	0	280	2700		91.26	0.00	0.93	
6	16-May	Drilling	19:10	19:25	0.25	17259	17291	32	13	128.0	55	0	280	2800		90.97	0.00	0.93	
6	16-May	Drilling	19:35	20:00	0.42	17291	17354	63	13	151.2	60	0	280	2800		90.60	0.00	2.09	

Slide Report for BHA # 6

Note: Surveys listed are interpolated from the actual surveys

#	Date	Drill Mode	Start Time	End Time	Hours	Start MD	End MD	Depth Drilled	WOB	ROP	RPM	Surf. Torque	Flow Rate	SPP	TFO	INC	AZM	DLS	Note
6	16-May	Drilling	20:05	20:20	0.25	17354	17386	32	14	128.0	60	0	280	2800		90.54	1.00	2.09	
6	16-May	Drilling	20:30	21:05	0.58	17386	17448	62	14	106.3	60	0	280	2800		90.80	2.00	1.21	
6	16-May	Sliding	21:15	23:05	1.83	17448	17474	26	26	14.2	0	0	280	2350	-60	91.06	2.00	1.21	
6	16-May	Drilling	23:05	23:15	0.17	17474	17479	5	14	30.0	60	0	280	2800		91.11	2.00	1.21	
6	16-May	Drilling	23:25	23:55	0.50	17479	17543	64	17	128.0	60	0	280	2700		90.88	2.00	2.89	
6	17-May	Drilling	00:00	00:20	0.33	17543	17574	31	17	93.0	60	0	280	2800		90.30	2.00	2.89	
6	17-May	Drilling	00:30	00:45	0.25	17574	17594	20	14	80.0	60	0	280	2700		89.93	3.00	2.89	
6	17-May	Sliding	00:45	02:25	1.67	17594	17632	38	38	22.8	0	0	280	2600	-70	89.78	359.00	1.61	
6	17-May	Drilling	02:25	02:40	0.25	17632	17669	37	12	148.0	60	0	280	3000		89.92	0.00	1.61	
6	17-May	Drilling	02:55	03:20	0.42	17669	17701	32	14	76.8	60	0	280	2800		90.04	0.00	1.61	
6	17-May	Sliding	03:25	04:25	1.00	17701	17718	17	38	17.0	0	0	280	2500	-30	90.09	357.00	0.30	
6	17-May	Drilling	04:25	04:55	0.50	17718	17764	46	18	92.0	60	0	280	2900		90.22	357.00	0.30	
6	17-May	Drilling	05:05	05:55	0.83	17764	17859	95	16	114.0	60	0	280	2800		90.08	358.00	0.60	
6	17-May	Drilling	06:05	06:20	0.25	17859	17890	31	16	124.0	60	0	280	2900		89.96	358.00	0.60	
6	17-May	Drilling	06:25	06:55	0.50	17890	17953	63	16	126.0	60	0	280	2900		89.33	358.00	1.38	
6	17-May	Drilling	07:05	07:15	0.17	17953	17973	20	16	120.0	60	0	280	2900		89.12	359.00	1.38	
6	17-May	Sliding	07:15	09:25	2.17	17973	17993	20	38	9.2	0	0	280	2600	360	89.01	357.00	1.22	
6	17-May	Drilling	09:25	09:45	0.33	17993	18048	55	16	165.0	60	0	280	2900		89.16	358.00	1.22	
6	17-May	Drilling	10:35	10:50	0.25	18048	18081	33	16	132.0	60	0	280	2900		89.25	358.00	1.22	
6	17-May	Sliding	11:00	12:20	1.33	18081	18103	22	38	16.5	0	0	280	2600	20	89.52	359.00	2.33	
6	17-May	Drilling	12:20	12:40	0.33	18103	18144	41	16	123.0	60	0	280	2900		90.05	359.00	2.33	
6	17-May	Drilling	12:55	13:40	0.75	18144	18239	95	16	126.7	60	0	280	2900		90.31	1.00	1.35	
6	17-May	Drilling	13:45	14:25	0.67	18239	18333	94	16	141.0	60	0	280	2900		89.77	2.00	0.91	
6	17-May	Drilling	14:35	14:50	0.25	18333	18365	32	16	128.0	60	0	280	2900		89.53	2.00	0.91	
6	17-May	Sliding	15:00	16:00	1.00	18365	18390	25	38	25.0	0	0	280	2600	-30	89.53	2.00	0.04	
6	17-May	Drilling	16:00	16:25	0.42	18390	18429	39	16	93.6	60	0	280	2900		89.55	2.00	0.04	
6	17-May	Drilling	16:35	17:45	1.17	18429	18524	95	16	81.4	60	0	280	2900		89.19	2.00	0.62	
6	17-May	Drilling	18:00	18:15	0.25	18524	18555	31	16	124.0	45	0	280	2900		89.01	2.00	0.62	
6	17-May	Sliding	18:20	20:00	1.67	18555	18590	35	32	21.0	0	0	280	2600	-45	89.49	2.00	2.23	
6	17-May	Drilling	20:00	20:20	0.33	18590	18620	30	16	90.0	50	0	280	2900		89.96	3.00	2.23	
6	17-May	Drilling	20:30	20:50	0.33	18620	18652	32	14	96.0	50	0	280	2900		90.46	3.00	2.23	
6	17-May	Sliding	20:55	21:30	0.58	18652	18661	9	36	15.4	0	0	280	2600	-60	90.50	0.00	2.25	
6	17-May	Sliding	22:10	23:30	1.33	18661	18686	25	36	18.8	0	0	280	2600	-45	90.54	1.00	2.25	
6	17-May	Drilling	23:30	23:50	0.33	18686	18715	29	14	87.0	50	0	280	3100		90.60	1.00	2.25	
6	18-May	Drilling	02:15	02:35	0.33	18715	18746	31	16	93.0	50	0	280	2900		90.66	2.00	2.25	

Slide Report for BHA # 6

Note: Surveys listed are interpolated from the actual surveys

#	Date	Drill Mode	Start Time	End Time	Hours	Start MD	End MD	Depth Drilled	WOB	ROP	RPM	Surf. Torque	Flow Rate	SPP	TFO	INC	AZM	DLS	Note
6	18-May	Drilling	02:40	03:00	0.33	18746	18777	31	12	93.0	50	0	280	2900		90.55	358.00	0.41	
6	18-May	Drilling	03:30	03:50	0.33	18777	18809	32	15	96.0	50	0	280	2900		90.43	358.00	0.41	
6	18-May	Drilling	04:05	04:20	0.25	18809	18829	20	15	80.0	50	0	280	2900		90.36	358.00	0.41	
6	18-May	Sliding	04:20	05:45	1.42	18829	18855	26	40	18.4	0	0	280	2600	-15	90.25	358.00	0.50	
6	18-May	Drilling	05:45	06:10	0.42	18855	18904	49	15	117.6	45	0	280	3100		90.02	358.00	0.50	
6	18-May	Drilling	06:20	06:50	0.50	18904	18967	63	15	126.0	45	0	280	3100		89.70	358.00	0.73	
6	18-May	Drilling	06:55	07:15	0.33	18967	18999	32	15	96.0	45	0	280	3100		89.52	358.00	0.73	
6	18-May	Drilling	07:20	07:35	0.25	18999	19030	31	15	124.0	45	0	280	3100		89.35	358.00	0.73	
6	18-May	Sliding	07:50	10:00	2.17	19030	19075	45	40	20.8	0	0	280	2700	360	90.16	0.00	3.65	
6	18-May	Drilling	10:00	10:10	0.17	19075	19093	18	15	108.0	45	0	280	3100		90.49	0.00	3.65	
6	18-May	Drilling	10:20	11:05	0.75	19093	19188	95	15	126.7	45	0	280	3100		89.89	356.00	2.12	
6	18-May	Drilling	11:15	12:15	1.00	19188	19283	95	15	95.0	45	0	280	3100		88.90	356.00	0.62	
6	18-May	Drilling	12:25	12:45	0.33	19283	19315	32	15	96.0	45	0	280	3100		88.73	356.00	0.62	
6	18-May	Sliding	13:00	14:55	1.92	19315	19355	40	40	20.9	0	0	280	2700	30	89.42	357.00	1.85	
6	18-May	Drilling	14:55	15:15	0.33	19355	19378	23	15	69.0	45	0	280	3100		89.83	357.00	1.85	
6	18-May	Drilling	15:25	16:20	0.92	19378	19472	94	15	102.5	60	0	280	3100		90.00	357.00	0.75	
6	18-May	Drilling	16:35	17:35	1.00	19472	19567	95	15	95.0	60	0	280	3100		89.38	358.00	1.06	
6	18-May	Drilling	17:45	18:25	0.67	19567	19630	63	15	94.5	60	0	280	3100		89.16	358.00	0.93	
6	18-May	Drilling	18:35	18:55	0.33	19630	19662	32	15	96.0	60	0	280	3100		89.16	359.00	0.93	
6	18-May	Drilling	19:10	19:35	0.42	19662	19693	31	17	74.4	60	0	280	3100		89.16	359.00	0.93	
6	18-May	Sliding	19:40	21:10	1.50	19693	19733	40	52	26.7	0	0	280	2600	15	89.80	359.00	1.76	
6	18-May	Drilling	21:10	21:30	0.33	19733	19757	24	17	72.0	60	0	280	3100		90.20	359.00	1.76	
6	18-May	Drilling	21:45	22:40	0.92	19757	19852	95	11	103.6	60	0	280	2900		89.66	0.00	1.77	
6	18-May	Drilling	22:55	23:45	0.83	19852	19947	95	15	114.0	60	0	280	2900		88.21	359.00	1.41	
6	19-May	Drilling	00:00	00:20	0.33	19947	19978	31	15	93.0	60	0	280	2900		87.77	359.00	1.41	
6	19-May	Sliding	00:25	02:15	1.83	19978	20025	47	53	25.6	0	0	280	2600	360	89.25	0.00	3.29	
6	19-May	Drilling	02:15	02:30	0.25	20025	20041	16	15	64.0	60	0	280	2900		89.77	0.00	3.29	
6	19-May	Drilling	02:45	03:25	0.67	20041	20104	63	15	94.5	50	0	280	2900		90.48	359.00	1.42	
6	19-May	Drilling	03:30	03:50	0.33	20104	20136	32	15	96.0	50	0	280	2900		90.09	359.00	1.42	
6	19-May	Drilling	04:05	05:00	0.92	20136	20231	95	15	103.6	45	0	280	2900		90.04	0.00	0.56	
6	19-May	Drilling	05:15	05:25	0.17	20231	20251	20	15	120.0	45	0	280	2900		90.15	0.00	0.56	
6	19-May	Sliding	05:25	07:15	1.83	20251	20301	50	53	27.3	0	0	280	2400	-15	90.57	0.00	1.00	
6	19-May	Drilling	07:15	07:35	0.33	20301	20325	24	15	72.0	45	0	280	2900		90.79	0.00	1.00	
6	19-May	Drilling	07:45	08:55	1.17	20325	20420	95	15	81.4	45	0	280	2900		90.23	359.00	1.42	
6	19-May	Drilling	09:40	10:55	1.25	20420	20514	94	15	75.2	45	0	280	2900		89.43	0.00	1.24	

Slide Report for BHA # 6

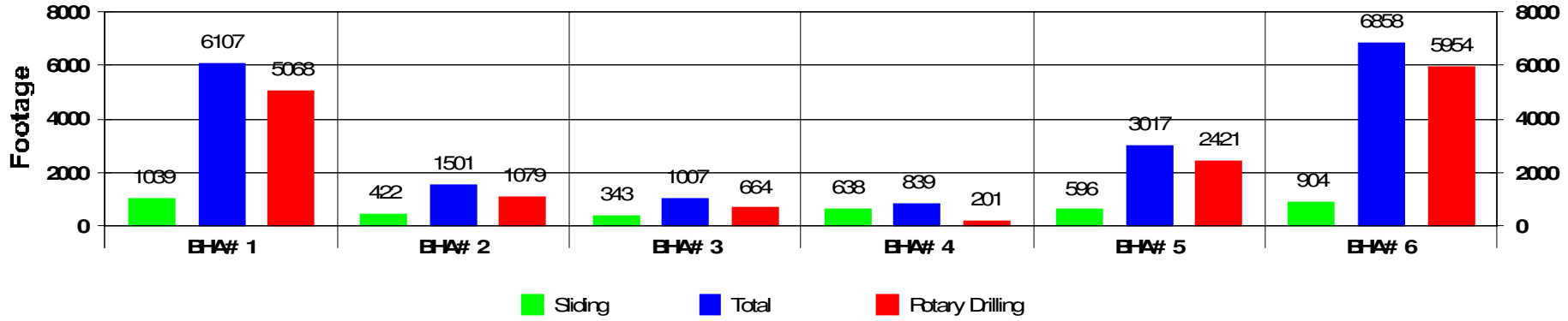
Note: Surveys listed are interpolated from the actual surveys

#	Date	Drill Mode	Start Time	End Time	Hours	Start MD	End MD	Depth Drilled	WOB	ROP	RPM	Surf. Torque	Flow Rate	SPP	TFO	INC	AZM	DLS	Note
6	19-May	Drilling	11:05	12:25	1.33	20514	20609	95	15	71.3	45	0	280	2900		88.16	0.00	1.76	
6	19-May	Drilling	12:35	13:35	1.00	20609	20704	95	15	95.0	45	0	280	2900		86.89	0.00	1.11	
6	19-May	Drilling	13:45	14:05	0.33	20704	20736	32	15	96.0	45	0	280	2900		86.54	0.00	1.11	
6	19-May	Sliding	14:15	17:05	2.83	20736	20796	60	53	21.2	0	0	280	2500	360	87.67	0.00	1.96	
6	19-May	Drilling	17:05	17:20	0.25	20796	20799	3	15	12.0	45	0	280	2900		87.73	0.00	1.96	
6	19-May	Drilling	17:25	18:40	1.25	20799	20894	95	15	76.0	45	0	280	2900		88.43	1.00	0.39	
6	19-May	Drilling	18:50	19:20	0.50	20894	20926	32	15	64.0	50	0	280	2900		88.46	1.00	0.39	
6	19-May	Sliding	19:25	22:35	3.17	20926	20974	48	75	15.2	0	0	280	2600	360	89.96	1.00	3.19	
6	19-May	Drilling	22:35	22:50	0.25	20974	20989	15	15	60.0	55	0	280	2900		90.43	1.00	3.19	
6	19-May	Drilling	23:25	24:00	0.58	20989	21037	48	15	82.3	55	0	280	2600		91.14	1.00	2.18	
6	20-May	Drilling	00:00	00:20	0.33	21037	21060	23	15	69.0	55	0	280	2900		90.70	1.00	2.18	
6	20-May	Drilling	00:20	00:40	0.33	21060	21083	23	15	69.0	55	0	280	2900		90.26	1.00	2.18	
6	20-May	Drilling	00:55	02:15	1.33	21083	21179	96	11	72.0	60	0	280	2900		90.01	1.00	1.82	
6	20-May	Drilling	02:30	03:20	0.83	21179	21210	31	11	37.2	50	0	280	2900		90.21	1.00	1.82	
6	20-May	Drilling	03:30	04:00	0.50	21210	21273	63	11	126.0	50	0	280	2900		90.22	1.00	0.00	
6	20-May	Drilling	04:55	05:00	0.08	21273	21276	3	11	36.0	50	0	280	2900		90.22	1.00	0.00	

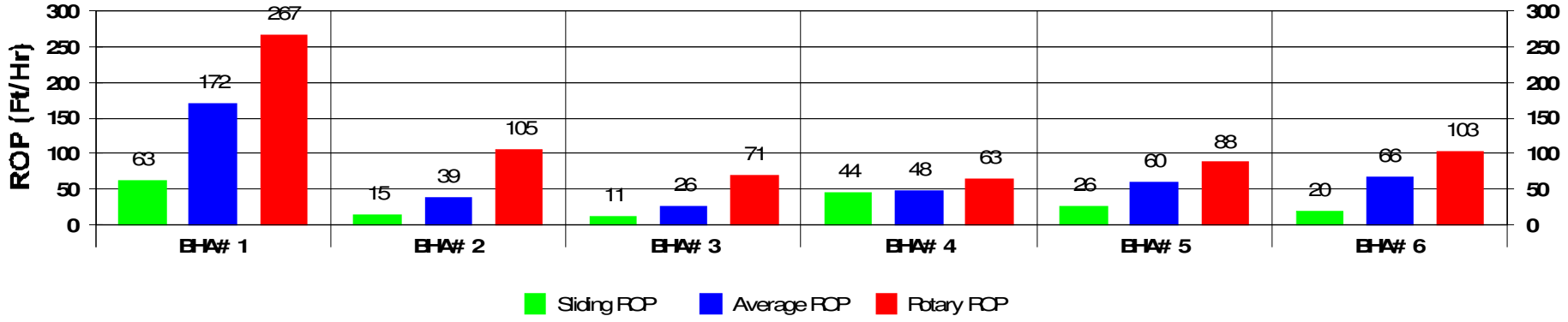
Total Drilled:	6858	**Avg. Total ROP:**	66.37		**DEPTH% - TIME %**
Total Rotary Drilled:	5954	**Avg. Rotary ROP:**	102.80	**Percent Rotary:**	86.82 - 56.05
Total Drilled Sliding:	904	**Avg. Slide ROP:**	19.90	**Percent Slide:**	13.18 - 43.95

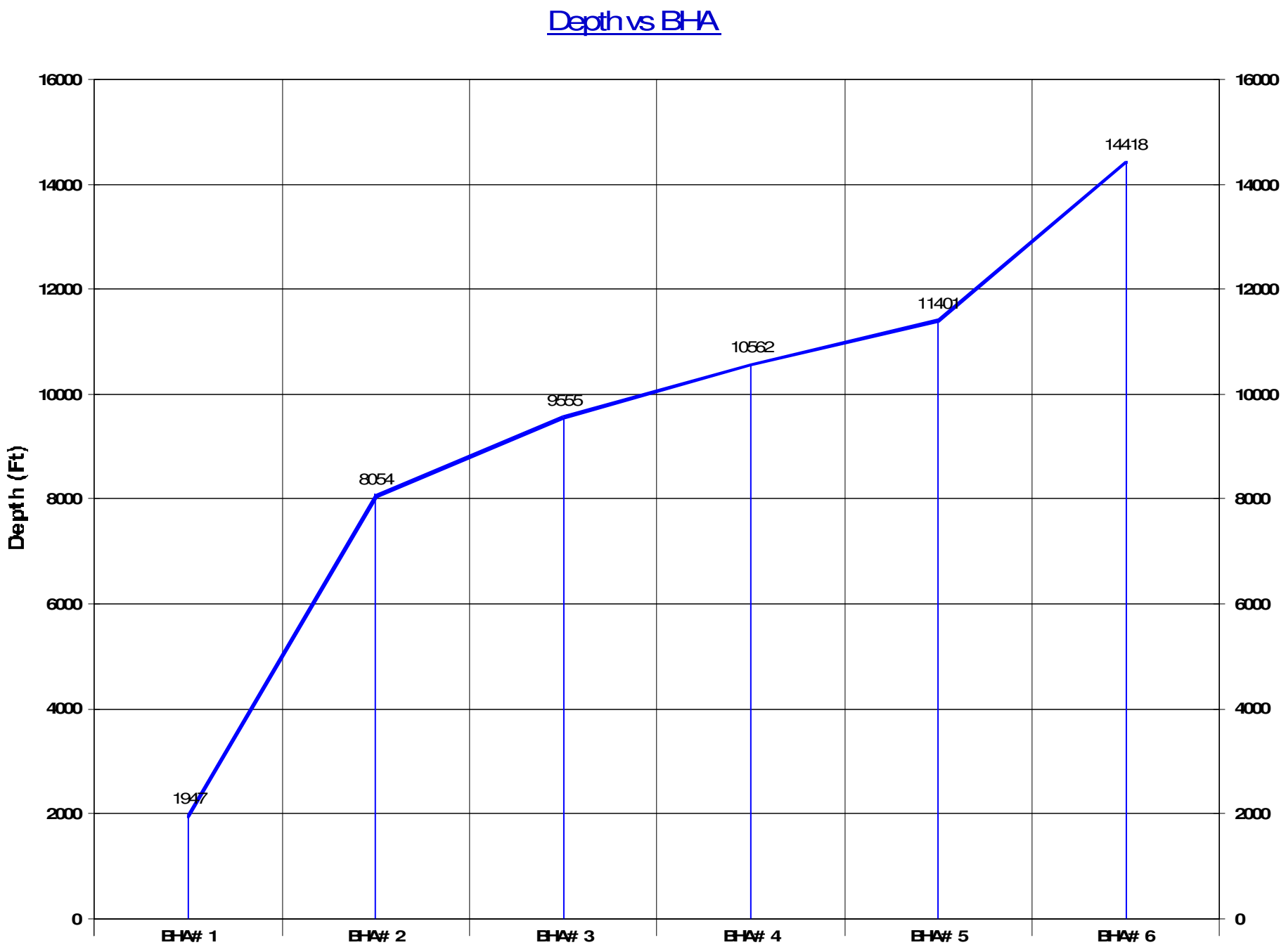
JOB NO.:	410413HEFMP6213	FIELD:	Baker	
COMPANY:	Continental Resources Inc.	Township:	153N	
LOCATION:		SECT\RANGE:	16	101W
RIG NAME:	Patterson 490	COMMENT		
STATE:	North Dakota			
COUNTY:	McKenzie			
WELL NAME:	Columbus Federal 1-16H			

Footage Drilled with BHA

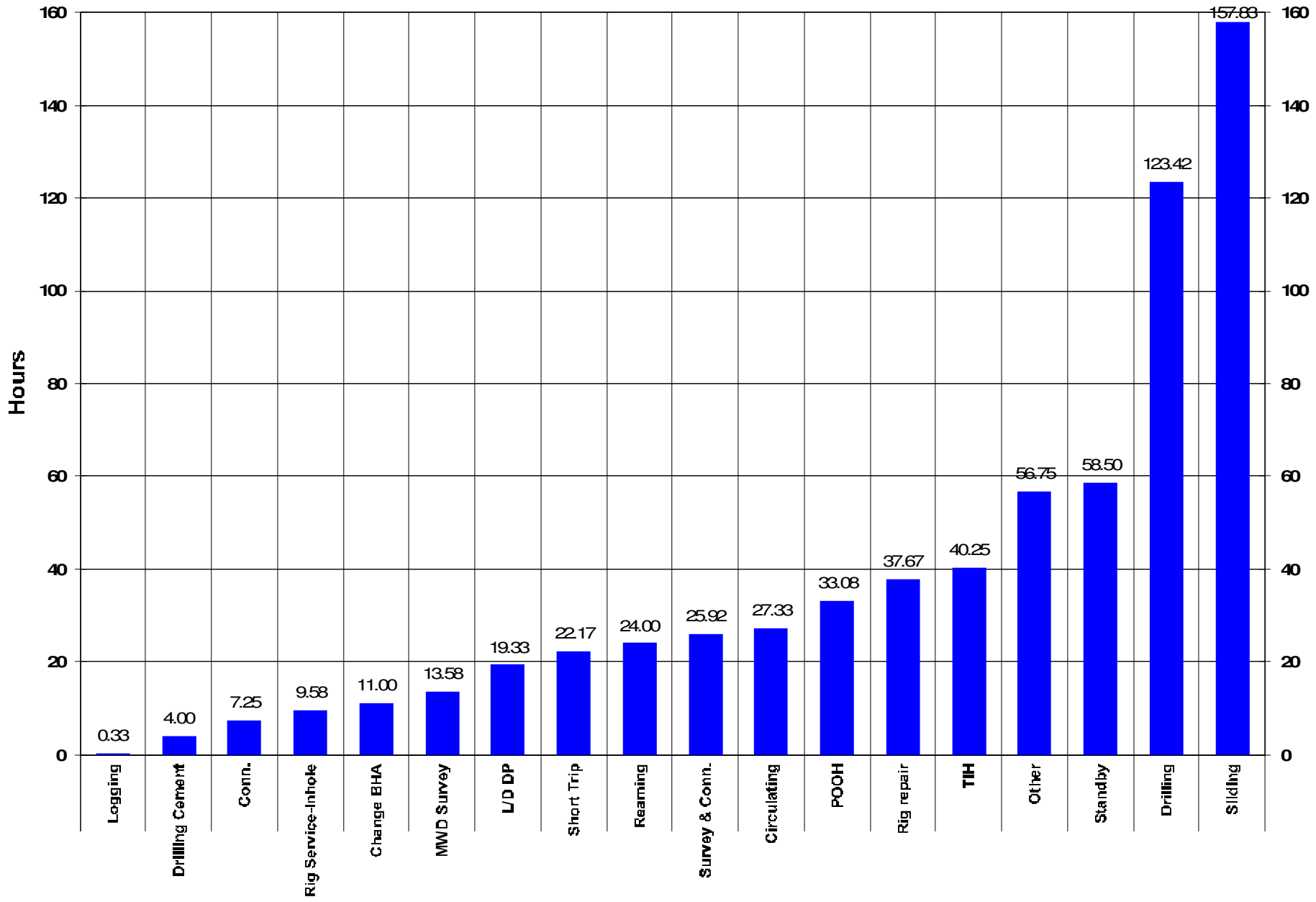


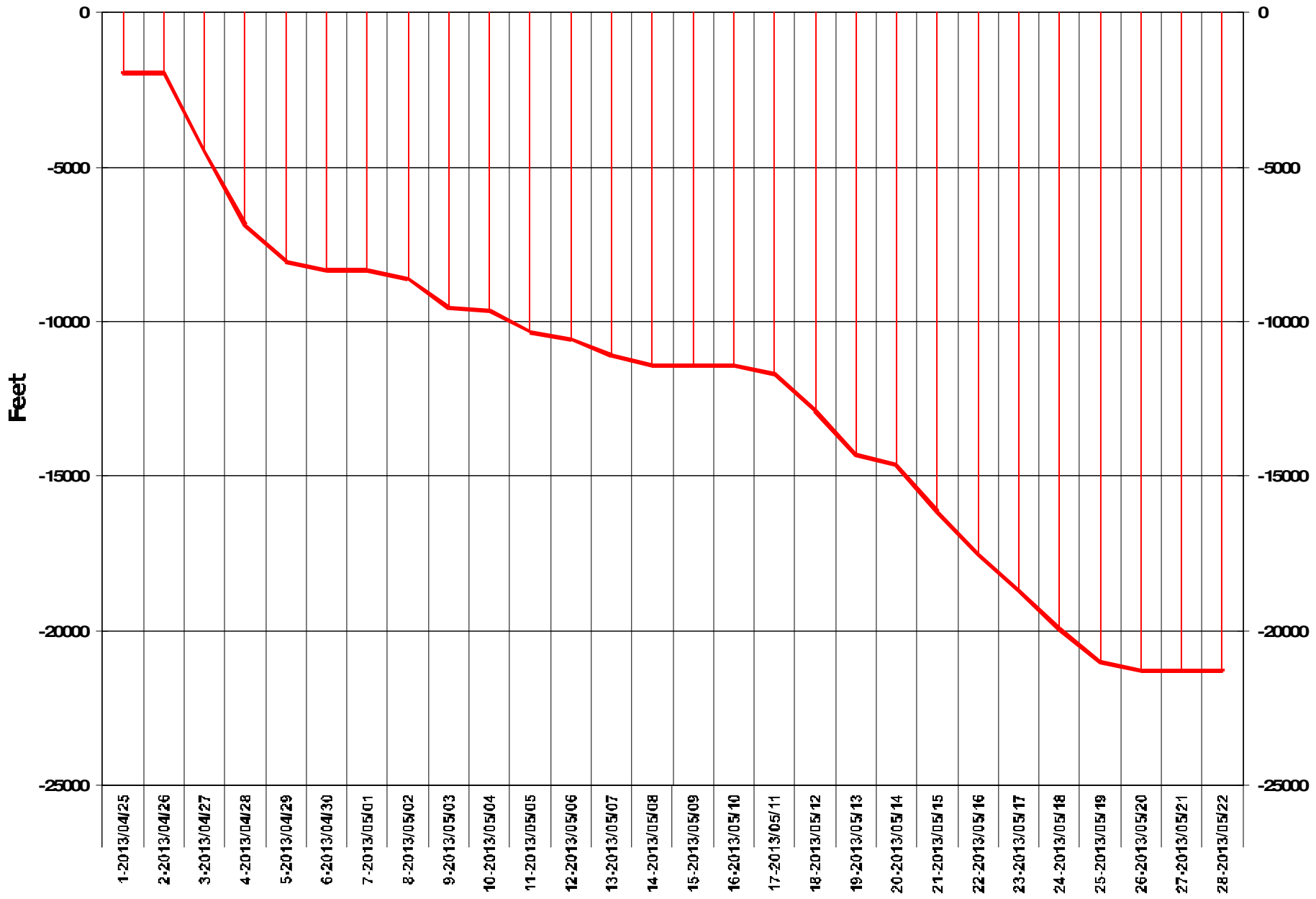
ROP vs BHA



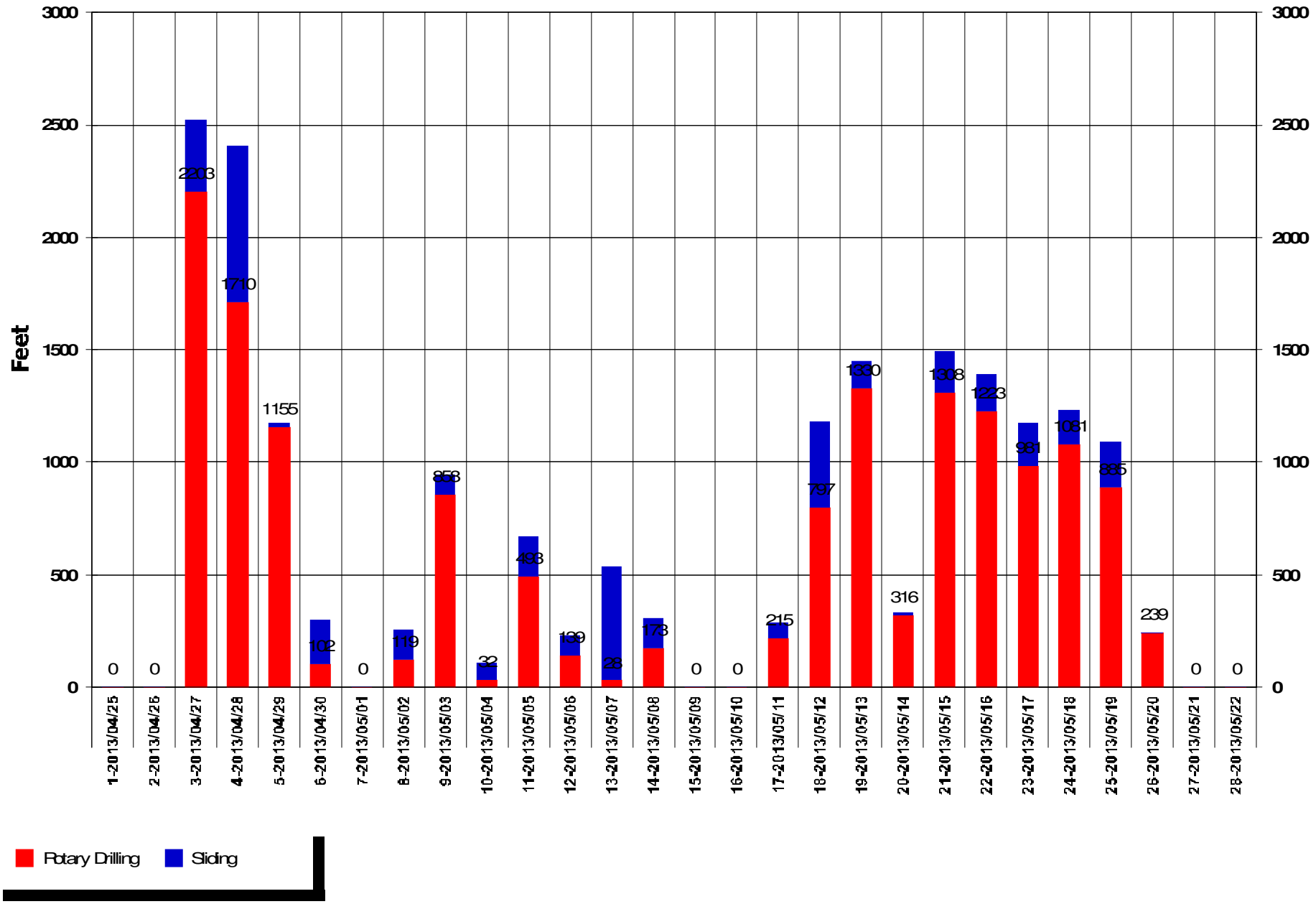

Depth vs BHA
Depth (Ft)
16000
14000
12000
10000
8000
6000
4000
2000
0
1947
8054
9555
10562
11401
14418
BHA# 1
BHA# 2
BHA# 3
BHA# 4
BHA# 5
BHA# 6

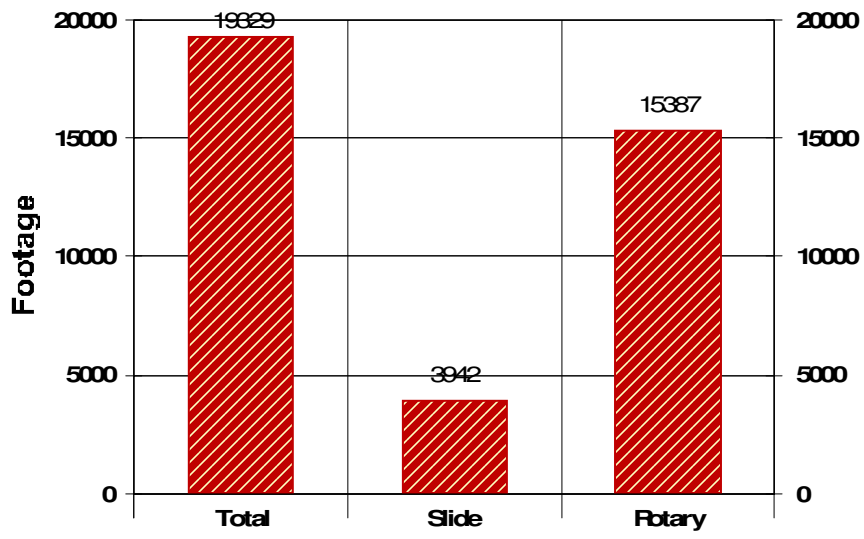
Activity Histograph




Measured Depth vs Days
Feet
0
-5000
-10000
-15000
-20000
-25000
1-2013/04/25
2-2013/04/26
3-2013/04/27
4-2013/04/28
5-2013/04/29
6-2013/04/30
7-2013/05/01
8-2013/05/02
9-2013/05/03
10-2013/05/04
11-2013/05/05
12-2013/05/06
13-2013/05/07
14-2013/05/08
15-2013/05/09
16-2013/05/10
17-2013/05/11
18-2013/05/12
19-2013/05/13
20-2013/05/14
21-2013/05/15
22-2013/05/16
23-2013/05/17
24-2013/05/18
25-2013/05/19
26-2013/05/20
27-2013/05/21
28-2013/05/22

Daily Footage




Footage Drilled Totals
Footage
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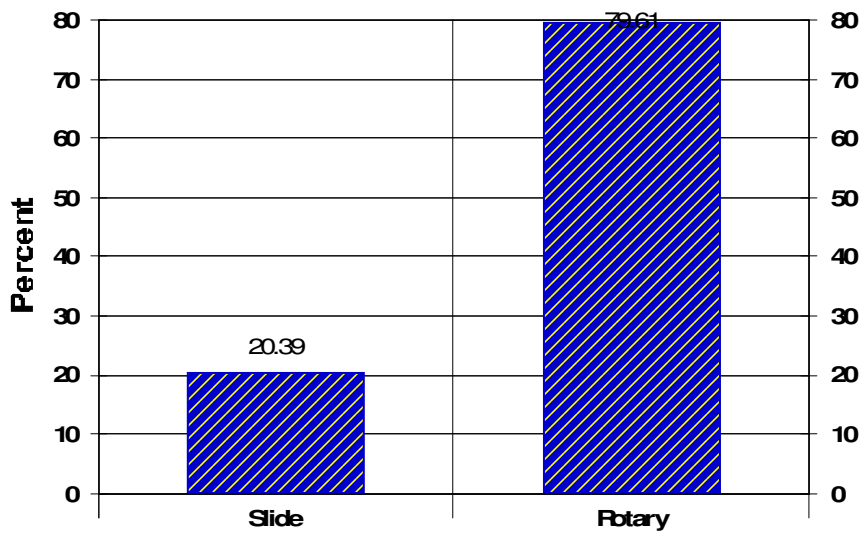
15000
10000
5000
0
19829
3942
15387
Total
Slide
Rotary


Footage Percent
Percent
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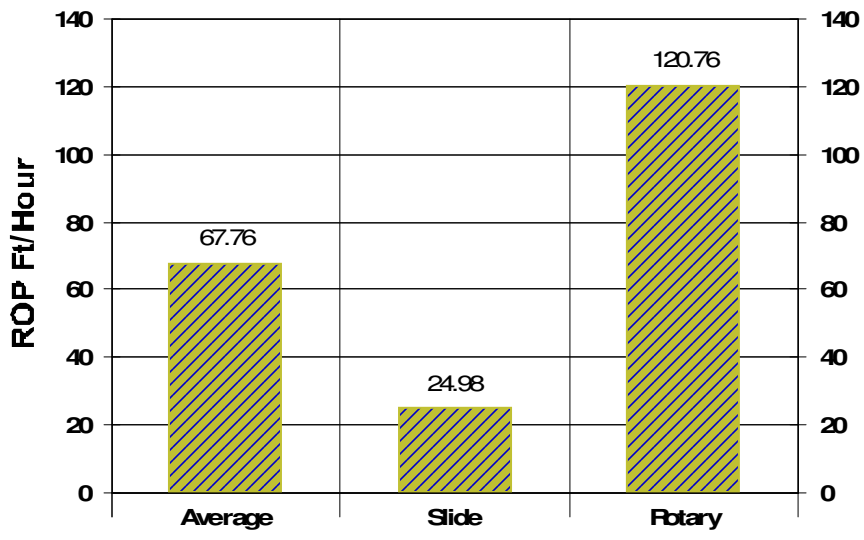
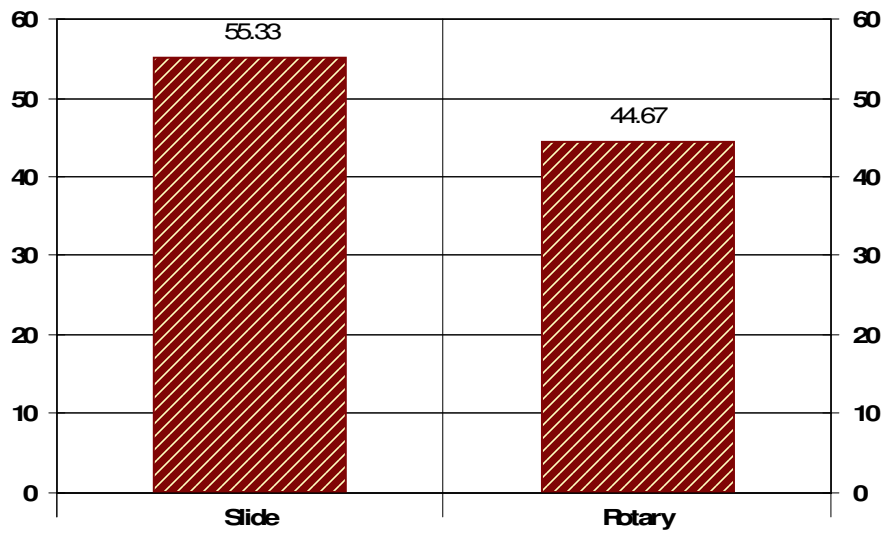
70
60
50
40
30
20
10
0
20.39
79.61
Slide
Rotary


Rate of Penetration Totals
ROP Ft/Hour
140
120
100
80
60
40
20
0
67.76
24.98
120.76
Average
Slide
Rotary


Time Percent
60
50
40
30
20
10
0
55.33
44.67
Slide
Rotary

SUPPORT STAFF

D'Arcy Quinn - Northern USA Region Manager
(307) 472-6621
darcy.quinn@scientificdrilling.com

Dee Bailey – Casper, WY Base Manager
(307) 472-6621
dee.bailey@scientificdrilling.com

Jack Potter – Grand Junction, CO Base Manager
(970) 245-9447
jack.potter@scientificdrilling.com

Mark Houston – Farmington, NM Base Manager
(505) 325-1787
mark.houston@scientificdrilling.com

Directional Drillers:
K. Smith, H. Maldinado

MWD Operators:
C. Collins, J. Biley

7237 W. Barton Rd., Casper, WY 82604
P.O. Box 1600, Mills, WY 82644
(307) 472-6621

MONACO SERVICES

GEOLOGICAL REPORT

CONTINENTAL RESOURCES, INC.
Columbus Federal 1-16H
API 33-053-04852
SHL: 2593' FSL 318' FEL S16 T153N R101W
BHL: 402' FNL 1998' FEL S4 T153N R101W
McKenzie County, North Dakota

Monaco Services Geologist
Dan Jacobs

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WELL DATA

OPERATOR:	CONTINENTAL RESOURCES, INC
WELL NAME:	Columbus Federal 1-36H
API NUMBER:	33-053-04852
SURFACE LOCATION:	SHL: 2593' FSL 318' FEL S16 T153N R101W
7” INTERMEDIATE CSG:	MD 11371 TVD 10532 231' FSL 1742' FEL S9 T153N R101W
BOTTOM HOLE:	MD 21276 TVD 10535 402' FNL 1998’ FEL S4 T153N R101W
ELEVATIONS:	GL=1920’ KB=1941’
WELL TYPE:	Extended Reach Horizontal in the Middle Bakken Formation
REGION:	Williston Basin, North Dakota
COUNTY:	McKenzie
PROSPECT:	Williston
FIELD:	Baker
SPUD DATE:	April 22, 2013
TOTAL DEPTH DATE:	May 20, 2013
CUTTINGS SAMPLING:	30' samples 8600’ to 11400’ 50’ samples 11450’ to TD @ 21276’ Lagged samples caught by rig crews. Invert and mud lubricant contaminated samples cleaned with PC-CitraSolve
HOLE SIZE:	13.5” to 1947’ 8.75” to 11401’ 6” TO 21276’
CASING:	9 5/8" 36# J55 STC to 1947’ 7” 26#, 29# & 32# P110, LTC to 11371’
LINER:	4 ½” 11.6# P110 BTC (10385’ to 20988’)

WELLSITE PERSONNEL INFORMATION

CONTINENTAL RESOURCES, INC.	
GEOLOGIST:	Doug Pollitt
MONACO SERVICES	
GEOLOGIST:	Dan Jacobs
MUDLOGGING:	Monaco Services, Inc.
EQUIPMENT/TECHNOLOGY:	BH 0585 IR Total Gas + IR Chromat. MSI 2100 Extractor @ 40 PSIG
PERSONNEL:	Rich Cihak
DRILLING CONTRACTOR:	Patterson 490
TOOLPUSHERS:	Jacob Bruhn, Andrew Betts
DRILLING SUPERVISORS:	Aaron Buscher, Justin Potter
DRILLING FLUIDS:	GEO Drilling Fluids, Inc. Bakersfield, CA
MUD ENGINEER:	John Rickard, Matt Sparks
MUD TYPE:	Fresh Water to SFC CSG, Diesel Invert through build curve, Saltwater to TD
MWD:	Scientific Drilling International
MWD ENGINEERS:	Calvin Collins, Jeremy Biley
DIRECTIONAL:	Scientific Drilling International
DIRECTIONAL DRILLERS:	Kaleb Smith, Hilton Maldonado

GEOLOGIST'S SUMMARY

INTRODUCTION

The Continental Resources, Inc. Columbus Federal 1-16H, SHL: 2593' FSL 318' FEL, S16 T153N R101W is located approximately 2 miles west and 7 miles South of Williston, North Dakota just south of the Missouri River. The Columbus Federal 1-16H is a horizontal well in the Baker Field drilling under the Lewis and Clark State Wildlife Management Area. The well was planned for one 9951' long northerly transect drilled structurally up dip in the middle member of the Bakken Formation. The terminus of the lateral bore was expected to be 15' TVD higher than the landing point of the curve.

The geological objective was to remain in the 10' thick Target Zone of the Middle Bakken, stratigraphically situated from 15' to 25' beneath the base of the Upper Bakken Shale. The drilling plan included a vertical hole to be drilled to MD 2674', then hold an inclination of 19.02° with and azimuth of 333.85° until kick-off point was reached in the Lodgepole Formation at MD 10594'. Directional tools were utilized to build a curve and land within the legal setbacks of Section 9 in the middle member of the Bakken Formation. 7" intermediate casing was run to MD 11371', TVD 10532', 231' FSL 1742' FEL in S9 T153N R101W. A single 6" horizontal lateral was then drilled along a 333.85° azimuth and a turn to 0.0° at MD 12277', with a projected bottom hole termination at MD 21356', TVD 10522', 200' FNL 1980' FEL in S4 T153N R100W.

OFFSET INFORMATION

Control for developing a prognosis of formation tops and in determining a structure model for the target zone along the course of the lateral was obtained from the Continental Resources regional structural mapping and the #1 Mildred and the #1 FLB Morris 11-23 wells noted on the figure below. Formation tops and structural relationships between the control wells and the Columbus Federal 1-16H are shown in the table below.

DRILLING OPERATIONS

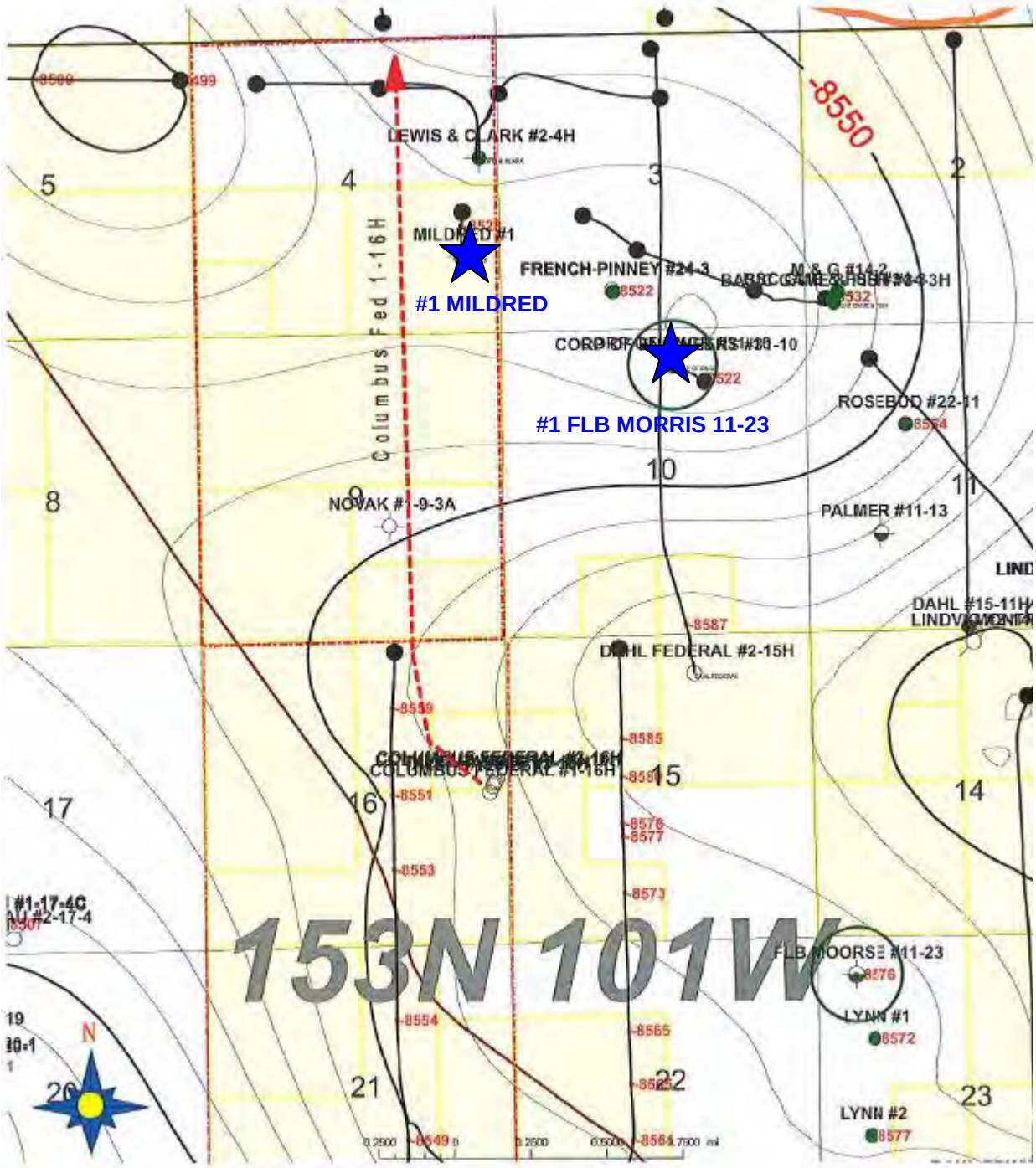
Vertical and Curve

Patterson 490 spudded the Columbus Federal 1-16H on April 22, 2013. A 13 5/8″ hole was drilled with fresh water to 1947', isolated with 9 5/8" 36# J55 STC casing, and cemented to surface. After surface casing operations were concluded, drilling fluid was changed to diesel invert for the remaining vertical hole and curve build sections. An 8 ¾" PDC and mud motor was used to drill out of the surface casing to kickoff point at MD 10563'. Directional tools employing a Leam 2.25 bent assembly and a Security FXD55M to land the build curve at MD 11401' TVD 10532' with a projected inclination of 90.90º. 7", 26#, 29#, & 32# HCP-110, LTC intermediate casing was then run to MD 11371' and cemented.

Lateral

Diesel invert mud used while drilling the vertical and curve portions of the hole was replaced with 9.7 to 9.95 # sodium chloride brine for the remainder of drilling operations. A Security FX64 6" bit and 1.5 Deg. steerable motor assembly was used to drill the lateral section.

WELLSITE LOCATION MAP



GEOLOGICAL EVALUATION

Well site geological supervision of Columbus 1-16H was provided by Monaco Services, Inc., with one wellsite geologist and one mudlogger. Monaco personnel obtained gas quantification utilizing a Bloodhound unit 0585 and a MSI 2100 gas extractor. WITS information was imported from the drilling rig Pason EDR system. Rig crews caught lagged 30' samples from MD 8600' to 11400' and 50' samples from 11450' to TD at MD 21276'. Samples were examined microscopically with plain and UV light as caught.

LITHOLOGY AND HYDROCARBON SHOWS

Vertical and Curve

Geologic evaluation began at 8600' above the **Charles Formation**. The Top of the Charles was encountered at MD 8660' TVD 8320' (-6379'), 13' structurally higher than the prognosis. The Base of the Last Charles Salt was encountered at MD 9417' TVD 9040' (-7099'), 9' structurally lower than the prognosis and 46' lower than the nearest Control well, the #1 Mildred. While drilling through the Ratcliffe Interval, trace pinpoint vuggy porosity with a trace of black hydrocarbon stain was observed. Gas increased from 160 units to 214 units and a faint slow milky yellow cut was also observed.

The top of the **Mission Canyon Formation** was encountered at MD 9628' TVD 9246' (-7305'), 9' high to the prognosis and 40' structurally low to the #1 Mildred. Shows were observed at MD10020' TVD 9614' (-7673), gas increased from 265 units to 586'. Samples had a trace show and consisted of WACKESTONE: cream to very light brown mottled firm microcrystalline porosity trace asphaltic staining faint slow milky yellow cut.

The **Lodgepole Formation** was observed at MD 10210' TVD 9793' (-7852'), 28' high to the prognosis and 8' structurally low to the #1 Mildred and the well was "kicked-off" at 10562'. Five gamma markers were selected and used to calculate the landing point while drilling through the formation. The "False Bakken" was observed at MD 11104' TVD 10501' (-8560'). Total gas increased from 300 units to 400 units while in this interval The Scallion Zone was observed to exist between MD 11108' and 11136', samples had a good show and consisted of MUDSTONE light gray subhard dense microcrystalline no visible porosity very pale yellow fluorescence slow faint milky pale yellow cut. Due to possible fracturing, total gas shot up immediately from 340 units to over 2500 units while drilling through the Scallion Interval with the chromatograms indicating the presence of oil with a change in gas composition.

The **Bakken Formation Upper Shale** was encountered at MD 11142' TVD 10509' (-8568'), 1' high to the prognosis and 3' structurally low to the #1 Mildred. Samples consisted of CARBONACEOUS SHALE black to very dark graybrown firm blocky brittle non-calcareous non-fluorescent slow milky to streaming pale yellow cut. Total gas in the Bakken Formation Upper Shale ranged between 460 to 1433 units.

The **Middle Member of the Bakken Formation** was encountered at MD 11215' TVD 10525' (-8584'), 3' high to the prognosis and 3' structurally low to the #1 Mildred. Samples observed while drilling downward through the 15' of section above the top of the target zone consisted of SILTACEOUS CALCAREOUS DOLOMITE- light to medium gray graybrown firm microcrystalline moderately argillaceous dolomitic pale yellow green fluorescence immediate milky and slow streaming pale green cut, as well as SILTACEOUS CALCAREOUS DOLOMITE- light to medium gray graybrown firm microcrystalline moderately argillaceous dolomitic pale yellow green fluorescence immediate milky and slow streaming yellow green cut The first encounter with the top of the **Target Zone** was at MD 12093' TVD 10538' (-8597'), and consisted of ARENACEOUS CALCAREOUS DOLOMITE- light gray brown sub-hard fine grained moderately well sorted subangular sand grains in light gray moderately calcareous dolomitic cement trace intercrystalline porosity faint pale yellow fluorescence immediate milky yellow cut

The curve was landed in the Middle Member of the Bakken Formation at MD 11371' TVD 10532' with a projected inclination of 90.57°. The landing point of the curve was approximately 7 vertical feet above the Top of the Target Zone.

Lateral Samples Shows

Samples observed along the course of the lateral when the well path was in the Target was Arenaceous Dolomite. Gamma values observed while drilling through the target varied from 42 to 72 API. Samples from directly above the top of the Target Zone consisted of SILTACEOUS CALCAREOUS DOLOMITE- light gray brown firm very fine sucrosic silty to very fine arenaceous trace intercrystalline porosity faint dull yellow green fluorescence trace dark brown spotty hydrocarbon stain immediate pale yellow green milky cut, and above that was SILTACEOUS CALCAREOUS DOLOMITE- light gray brown firm very fine sucrosic silty to very fine arenaceous trace intercrystalline porosity faint dull yellow green fluorescence trace dark brown spotty hydrocarbon stain immediate pale yellow green milky cut The lithology and gamma signatures throughout the well were fairly consistent and often identified through the lateral. Total Gas readings while drilling through the Target Zone ranged from 1200 to 2600 background units in the first half of the lateral and increasing to 2500 to 3500 background units in the second half. A green frothy oil was observed in the possum belly and on the shakers throughout the lateral while drilling. The lateral was completed in two runs so the only trip gas was 3531 units@ MD 14418'.The Gas Buster was on the entire lateral and the flares were consistently 3-8' and peaking as high as 20'.

GEO STEERING

The Target Zone within the Middle Member of the Bakken Formation is 10 vertical feet thick and is directly beneath approximately 3-4 vertical feet of higher gamma slightly siltaceous calcareous dolomite. The top of the target exists 15' beneath the base of the Upper Bakken Shale, the bottom of the target exists 25' beneath the base of the Upper Bakken Shale. The initial well plan was to land in the Target Zone approximately 15' below the top of the Upper Bakken Shale and drill the lateral up dip at 90.09º. The curve was landed approximately 8' below the base of the Upper Bakken Shale at MD 11371' TVD 10532' at a projected inclination of 90.57º. Upon landing the curve, steering inputs were implemented as required to maintain the upward trajectory of the wellbore, verify formation dip, and maximize ROP and exposure to favorable reservoir rock.

FORMATION TOPS AND CORRELATION

	Dahl Federal 2-15H			#1 FLB Morris 11-23			#1 Mildred			Columbus Fed. 1-16H							
	TVD kb=2073	ss tvd	Dist to Tgt.	TVD kb=2144	ss tvd	Dist to Tgt.	TVD kb=1871	ss tvd	Dist to Tgt.	TVD kb=1941	ss tvd	Struc to Mildred	PROG Vs Drilled	PROG	Dist to Tgt.	Mildred LAND AT	TARGET
Charles	8437	-6364	2258	8530	-6386	2226				8320	-6379		13	8333	2215	10546	10546
BLCS	9165	-7092	1530	9226	-7082	1530	8924	-7053	1548	9040	-7099	-46	-9	9031	1517	10588	10546
Mission C	9374	-7301	1321	9432	-7288	1324	9136	-7265	1336	9246	-7305	-40	9	9255	1293	10582	10546
Lodgepole X	9946	-7873	749	10000	-7856	756	9715	-7844	757	9793	-7852	-8	28	9821	727	10550	10546
LP1	10106	-8033	589	10156	-8012	600	9882	-8011	590	9951	-8010	1				10541	10541
LP2	10287	-8214	408	10326	-8182	430	10060	-8189	412	10129	-8188	1				10541	10541
LP3	10422	-8349	273	10469	-8325	287	10198	-8327	274	10267	-8326	1				10541	10541
LP4	10512	-8439	183	10567	-8423	189	10292	-8421	180	10360	-8419	2				10540	10541
LP5	10608	-8535	87	10646	-8502	110	10386	-8515	86	10456	-8515	0				10542	10541
False Bkn	10652	-8579	43	10710	-8566	46	10428	-8557	44	10501	-8560	-3				10545	10545
Upper Bkn	10660	-8587	35	10719	-8575	37	10437	-8566	35	10510	-8569	-3	1	10511	37	10545	10545
Middle Bkn	10675	-8602	20	10736	-8592	20	10452	-8581	20	10525	-8584	-3	3	10528	20	10545	10545
Target Top	10690	-8617	5	10751	-8607	5	10467	-8596	5					10543	5		
Target	10695	-8622	0	10756	-8612	0	10472	-8601	0						0		
End Lateral																	

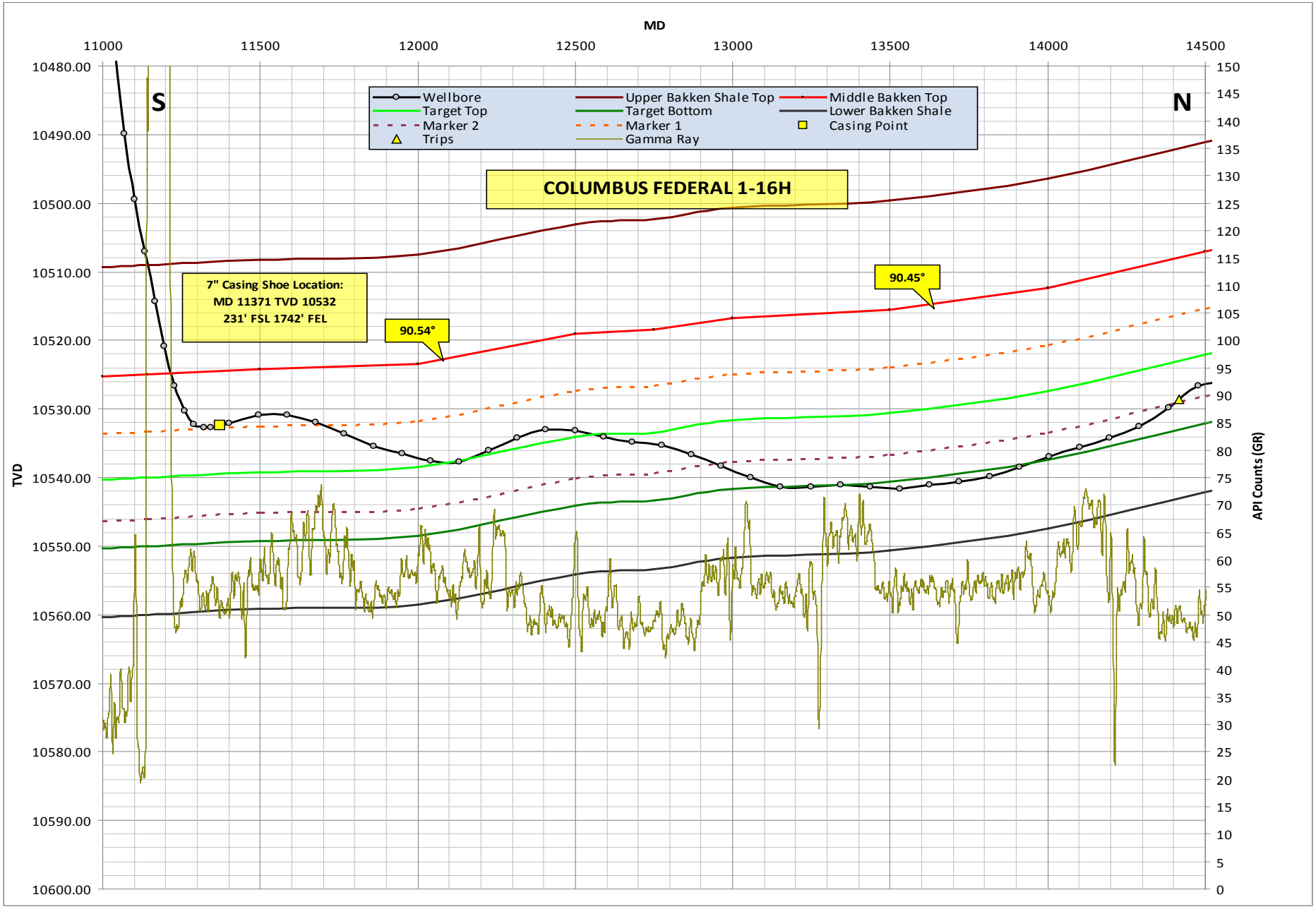


Figure 1. Landing the Curve

As depicted in Fig. 1 above, the lateral was landed 7' above the top of the Target Zone. The BHA exited the casing shoe at 90.57º and drilled ahead encountering the Target Top at MD 12011 and again at MD 12258' establishing initial formation dip at 90.54º.

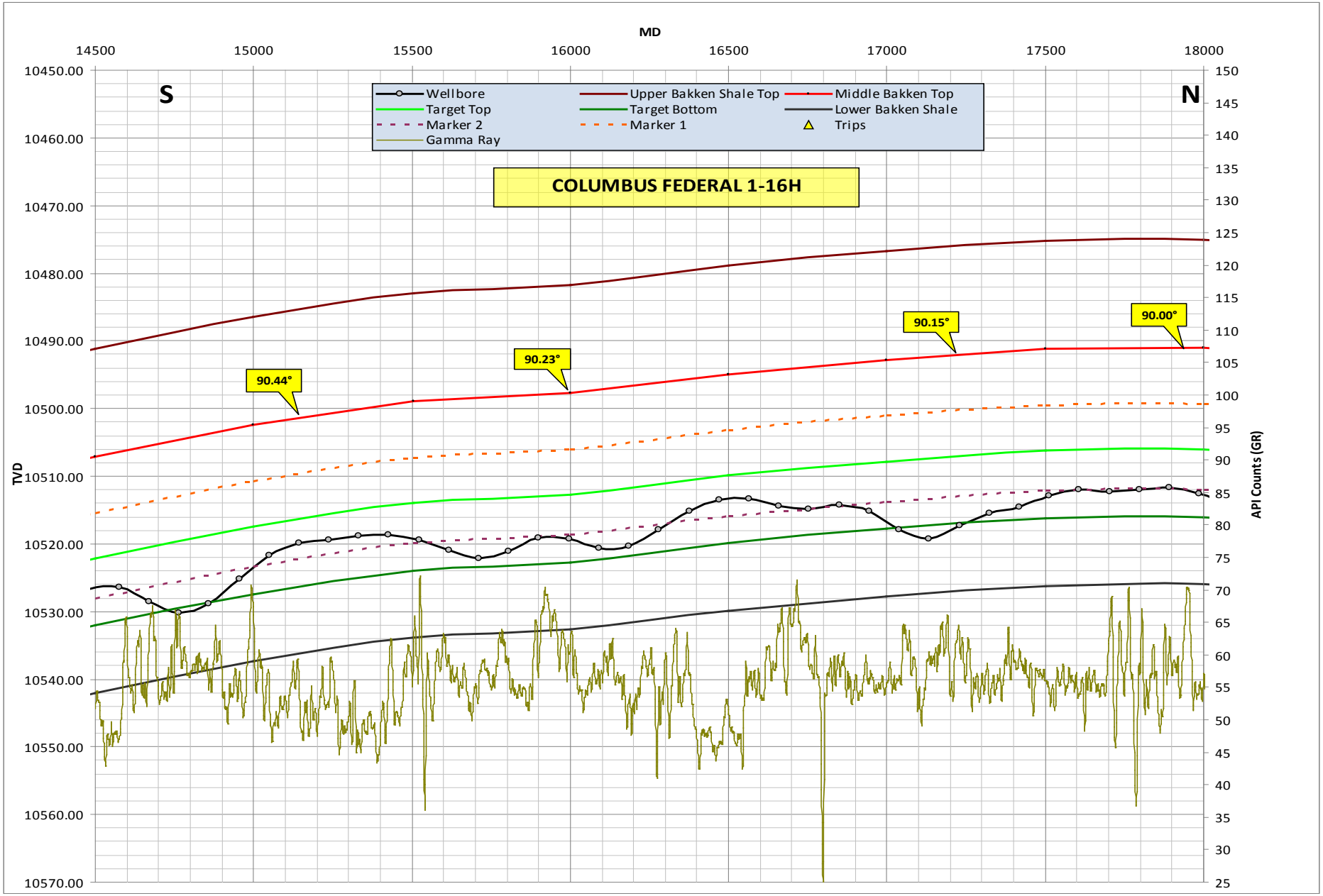


Figure 2. Lateral 14500' to 18000'

As depicted in Fig. 2, upward trajectory was maintained and multiply Marker 2 encounters indicated a formation dip change as it gradually lowered our dip from 90.44º to 90.00º.

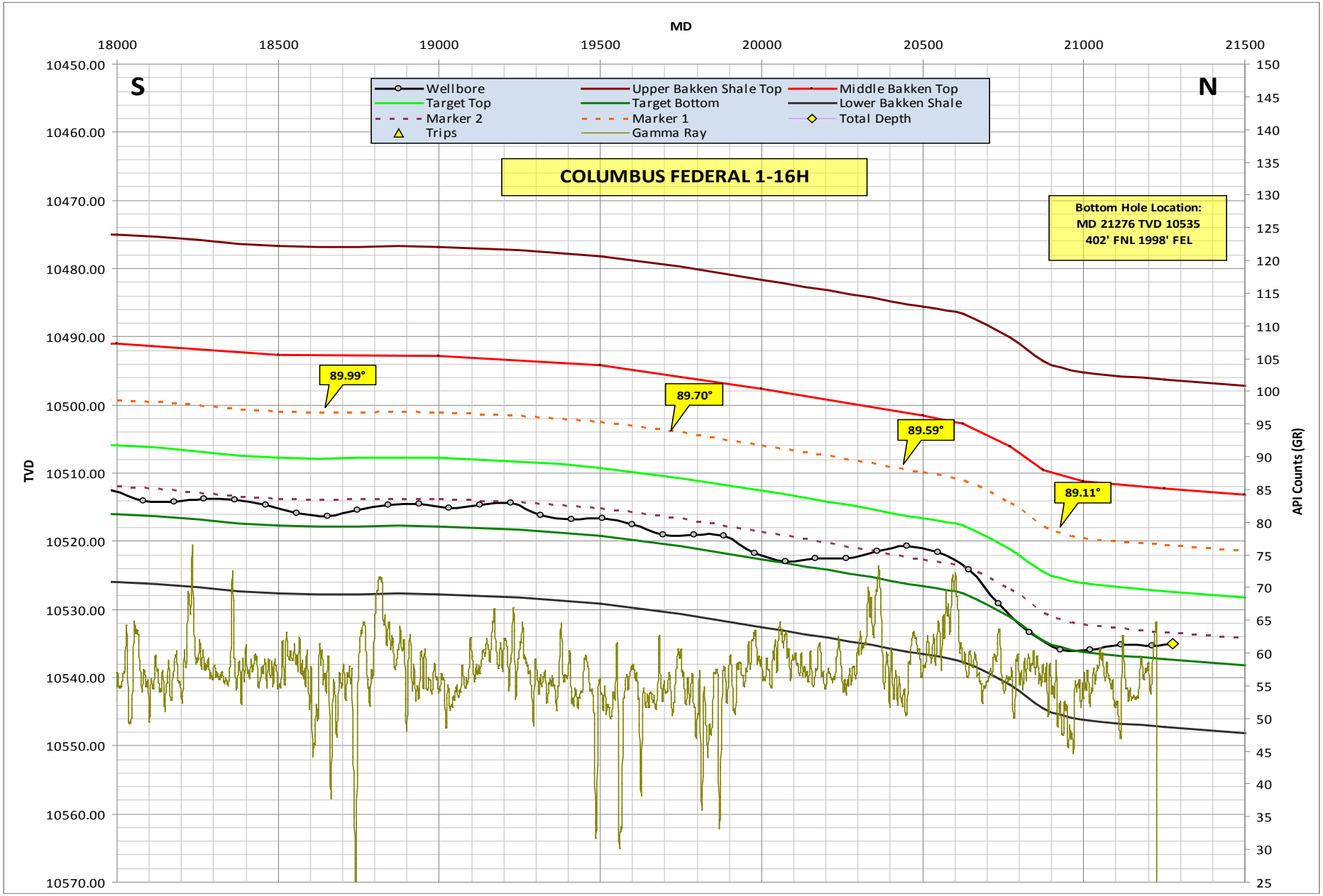
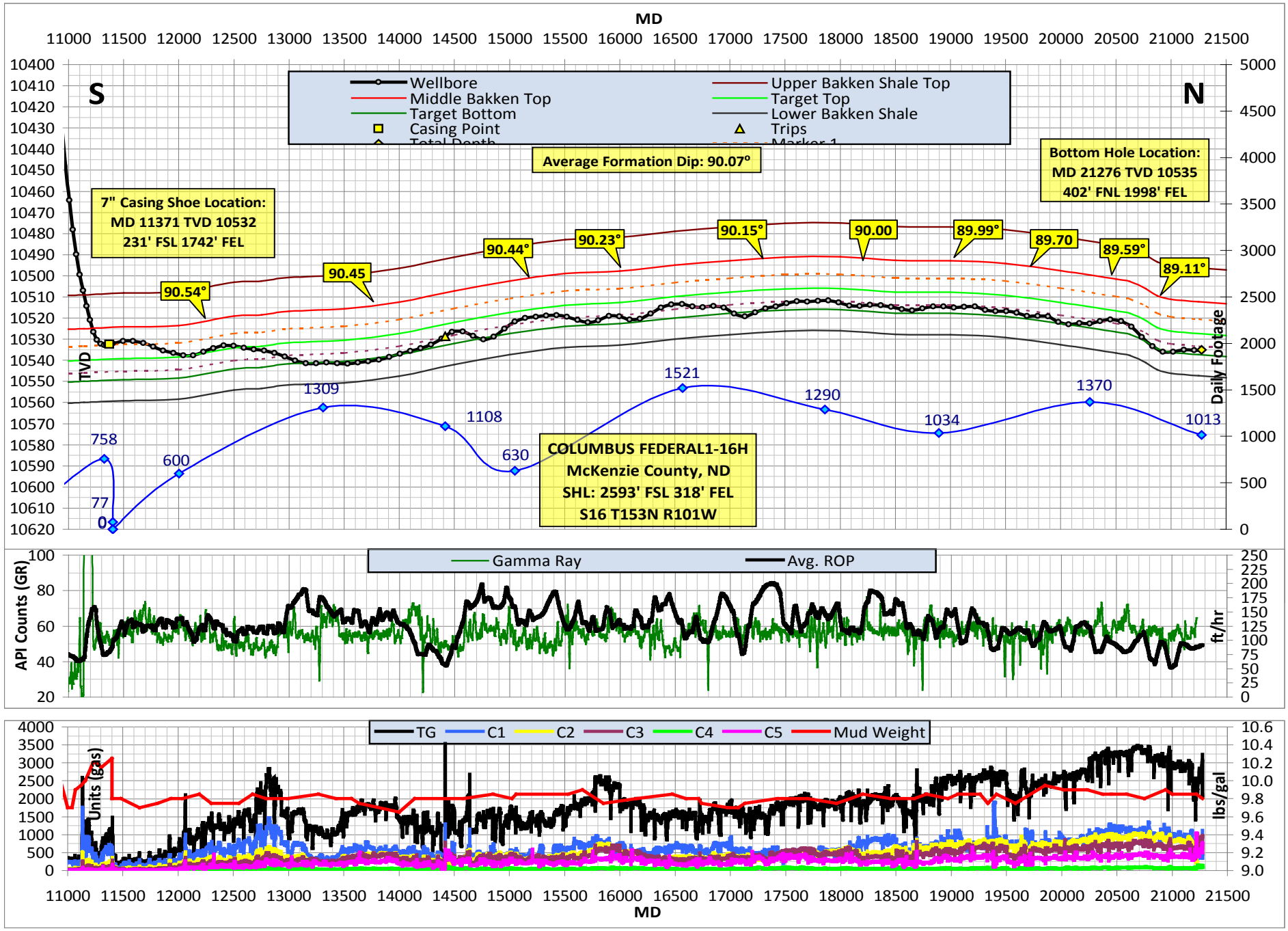


Figure 3. Lateral 18000' to TD at 21276'

As depicted in Fig. 3, dip started on a downward trajectory at MD 18000' and dip continued to decrease from an 89.99º to an 89.11º before the formation flattened out slightly at the end of the lateral. The average formation dip over the course of the lateral was calculated at 90.07º.

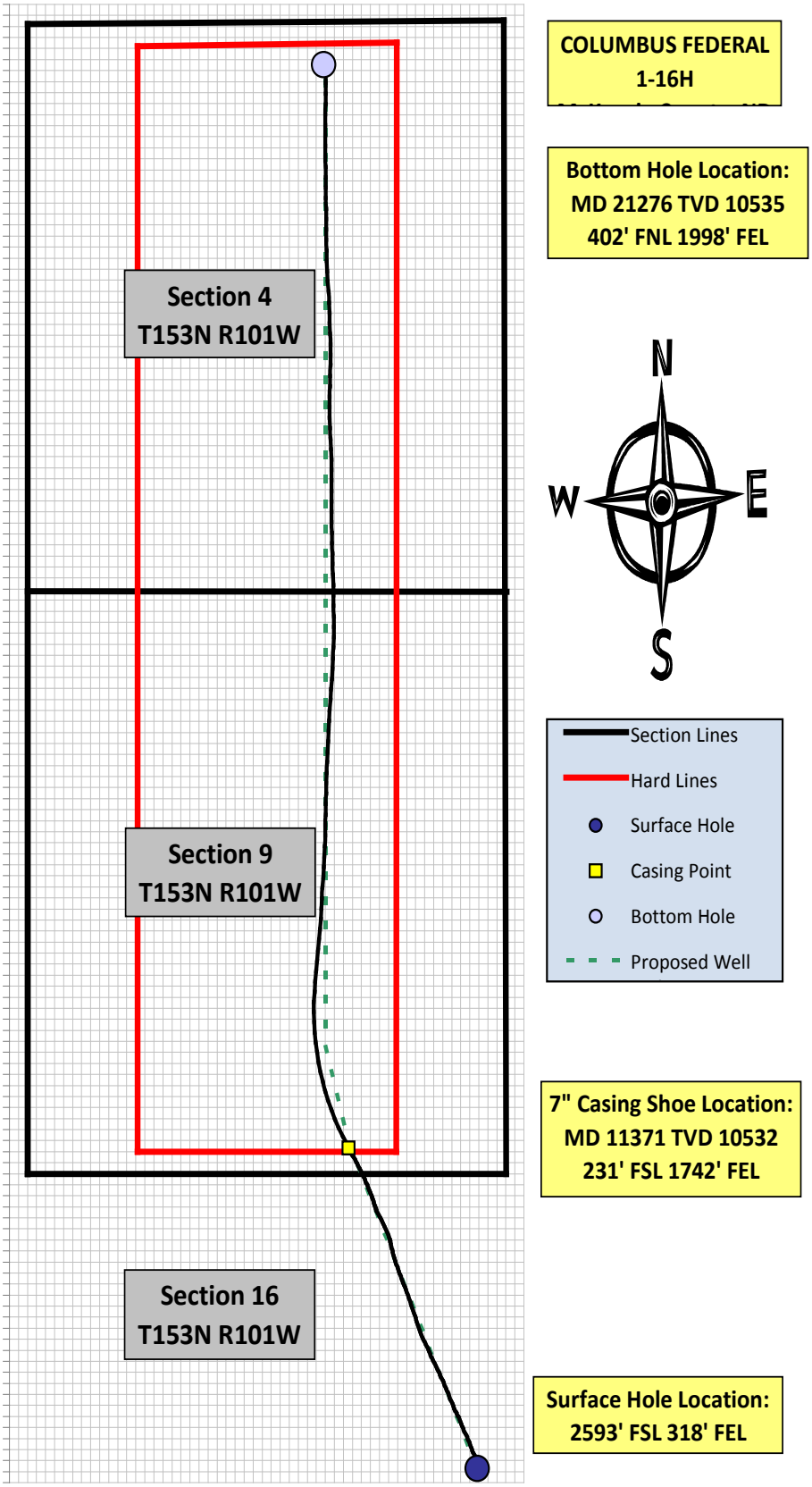
INTERPRETIVE CROSS SECTION



GEOLOGIST'S CONCLUSIONS

The oil and gas shows observed while drilling the Columbus Federal 1-16H were consistently good. A maximum of 8% oil was present in the mud at the shaker during the lateral. The gas shows did not increase until the last quarter of the hole's vertical section and were still unimpressive. Possible fractured intervals were encountered while drilling the curve, however not apparent in the lateral. The Scallion Interval appeared to be fractured with over 2550 units of gas encountered before entering the Upper Bakken Shale. If you consider that the Gas Buster was on for the entirety of the lateral, the gas shows were actually impressive averaging ~1500 units to 2200 units for the majority of the lateral and over 3400 units near the end of the lateral. Subsurface structural control utilizing cuttings evaluation and MWD gamma was sufficient to allow drilling the hole with low potential for stratigraphic positional misinterpretation. Unique sample and gamma signatures from the beds directly adjacent to the Target Zone aided geological interpretation; however, it was not always consistent throughout the lateral. Steering to correct for inclination or azimuth was possible for the entire length of the lateral, but became difficult near the end of the lateral. The well bore remained in the Middle Bakken Target Zone for 8051' (81%), above the Target Zone for 1079' (11%), and below the Target Zone for 775' (8%) of the lateral. Columbus Federal 1-16H will be completed with a multi-stage fracture stimulation after which its production potential will be revealed.

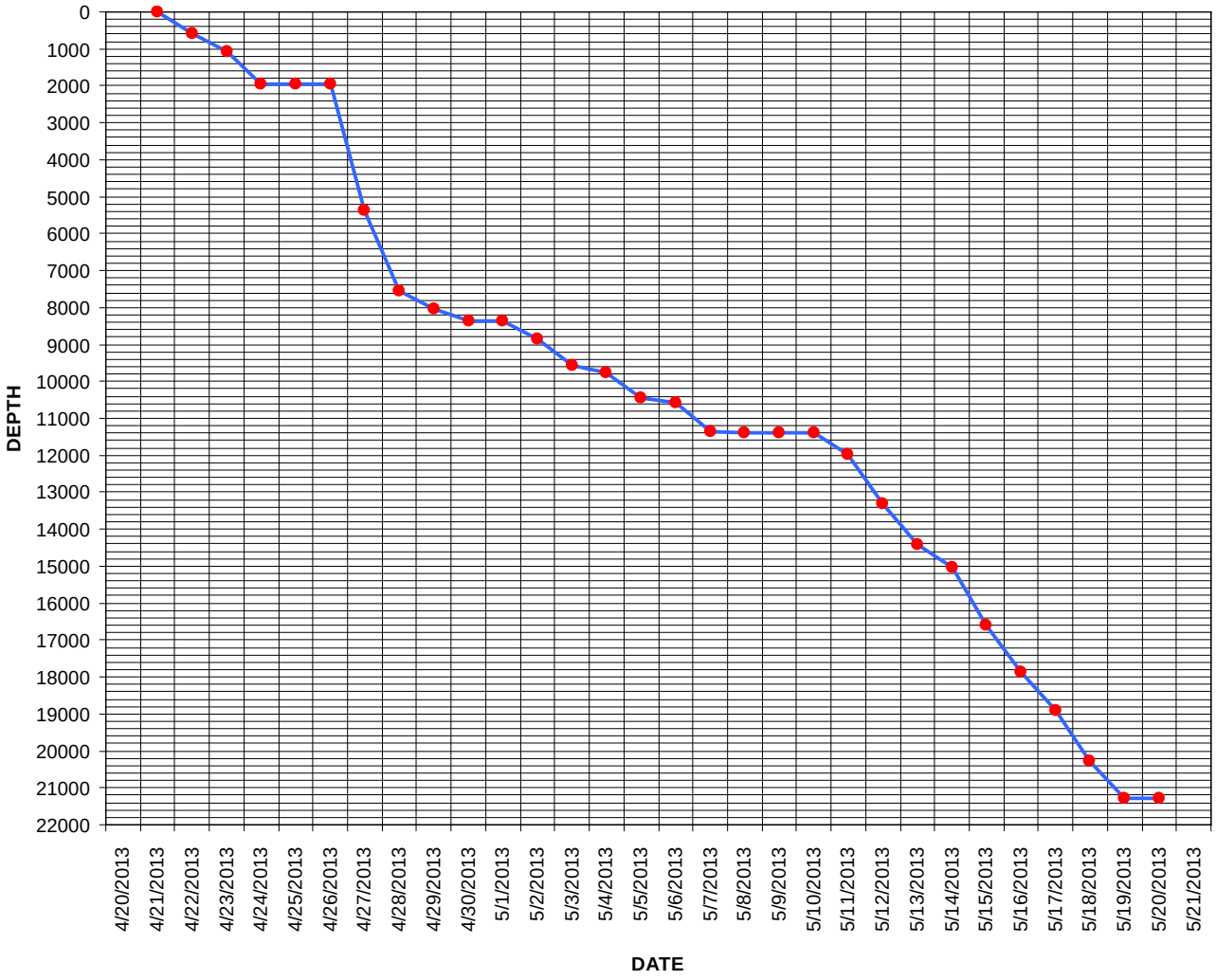
PLAT VIEW


COLUMBUS FEDERAL
1-16H
Bottom Hole Location:
MD 21276 TVD 10535
402' FNL 1998' FEL
Section 4
T153N R101W
N
W
E
S
Section Lines
Hard Lines
Surface Hole
Casing Point
Bottom Hole
Proposed Well
Section 9
T153N R101W
7" Casing Shoe Location:
MD 11371 TVD 10532
231' FSL 1742' FEL
Section 16
T153N R101W
Surface Hole Location:
2593' FSL 318' FEL

DAILY DRILLING CHRONOLOGY

DATE	DEPTH	DRILLING DAY	FOOTAGE DRILLED	RIG ACTIVITY
4/21/13	0	0	0	RIG UP, PRE-SPUD INSPECTION, LUBRICATE RIG
4/22/13	578	1	578	SPUD DATE, DRILL SURFACE TO MD 578' WITH BIT #1 SECURITY FX65D & HUNTING 1.5, CIRCULATE HOLE CLEAN TOOH- DERRICKHAND 100% TIE OFF WC RM CHECK COM S/M W/ AMERICAN CASING, R/U CASERS AND RUN 13.5" CASING R/D CASERS,LUBRICATE RIG
4/23/13	1067	2	489	CONDITION MUD & CIRCULATE, CEMENT HELD S/M &RIGGED UP, RIGGING DOWN SCHUMBERGER, CUT CASING, LUBRICATE RIG, PUT NEW BIT ON - BIT NO. 2 SIZE 12 1/4 IADC CODE SMITH MANUFACTURER TYPE XR+CR SERIAL NO. P11413 JETS 4-24, WAIT ON CEMENT, WAIT ON CEMENT, DRILL OUT FLOAT COLLAR @ 535' AND SHOE @ 575', DRILL TO MD 1067', LUBRICATE RIG
4/24/13	1947	3	880	DRILL TO MD 1947' SURFACE TD REACHED 4/24/13 @ 21:07, CIRCULATE OUT CUTTINGS, TOOH FOR MWD TOOL/WIPER DERRICKMAN,, TIH FOR WIPER TRIP DERRICKMAN 100% TIEOFF LM MM DW CWA AF (COMCHECK)
4/25/13	1947	4	0	TOOH TO CASING DM 100% TIED OFF MS,WS,MB (COM CHECK OK), TIH DM 100% TIED OFF MS,WS,MB (COM CHECK OK), CONDITION MUD & CIRCULATE AND DROP SURVEY TOOL, TOOH DM 100% TIED OFF MS,WS,MB (COM CHECK OK), RUN 9 5/8" CASING
4/26/13	1947	5	0	WAIT ON CEMENT, CUT OFF CASING AND INSTALL WELL HEAD, NIPPLE UP B.O.P. INSTALL DUBBLE STUD PICK BOP OFF, STAND STAB ON TO WELL HEAD, INSTALLED ROTARY HEAD HAMMERED UP DUBBLE STUD AND WELL TO BOP AND WELL HEAD, CEMENT DROPED 18.5 FEET A.M.C CAME OUT AND PUMPED CEMENT AROUND TOP OF CSG, RIGGED UP TESTER AND TESTED BOP, BLM HAND CAME OUT AND DID INSP ON RIG FUNCTION TEST ACC BOP AND CHOKE
4/27/13	5365	6	3418	CUT OFF CASING AND INSTALL WELL HEAD, LUBRICATE RIG 0215,TRIP IN HOLE DM 100% TIED OFF RF, WS MB, CONDITION MUD & CIRCULATE DISPLACE SW WITH INVERT, DRILL ACTUAL DRILL OUT SHOE AND CEMENT, CHANGE VALVE ON #2 PUMP PER CO MAN REQUEST 0214, DRILL TO MD 5365'
4/28/13	7537	7	2172	DRILL TO MD 7537'
4/29/13	8054	8	517	DRILL TO MD 8054', TRIP OUT OF HOLE FOR SCHEDULED BHA REPLACEMENT, LAY DOWN BHA X/O MOTOR AND BIT PICK UP BHA #2 SECURITY FX65D & HUNTING 1.5, PICK UP 6JNTS 5"HWDP, INSTALL ROTATE RUBER TIH DERRICK MAN 100% TIE OFF LM,DW,CWA,AF COM CHECK
4/30/13	8352	9	298	DRILL TO MD 8147' , REPIAR PUMP BAD SWAB STOPED DRILLING PER CO REQUEST, DRILL TO MD 8334', LUBRICATE RIG GREASED TD, DRILL TO MD 8352', CIRCULATE, SPOT WEIGHT SLUG, TOOH TO SHOE DERRICKMAN, LUBRICATE RIG, WAIT ON PUMP DRIVE FOR PUMP #2, CIRCULATE W/PUMP#1
5/1/13	8352	10	0	WORK ON PUMP 2 DRIVE SHAFT, BUILD 4" STANDS FOR LATERAL, LUBRICATE RIG
5/2/13	8848	11	496	FINISH PUTTING TOGETHER #2 PUMP DRIVE SHAFT, DRILLED TO MD 8608', CIRCULATE AND WAIT ON WELDER TO REPAIR STAND PIPE, DRILLED TO MD 8848'
5/3/13	9552	12	704	DRILLED TO MD 9552', CIRCULATE OUT CUTTINGS AND SEND PILL, TOOH FOR NEW BHA, REAM OUT SALTS ZONE, CIRCULATE BOTTOMS UP AND SEND PILL
5/4/13	9775	13	223	DIR. WORK CHANGE OUT BHA MOTOR AND TOOL, TIH WITH NEW BHA #3 SECURITY FX 65D & HUNTING 1.5, REAM LAST 6 STANDS TO BOTTOM, DRILL TO MD 9775'
5/5/13	10436	14	661	DRILL TO MD 10436'
5/6/13	10562	15	126	DRILL TO MD 10562', CONDITION MUD & CIRCULATE PUMP PILL, TOOH CHANGE OUT BHA, DIR. WORK CHANGE OUT BHA, BIT, MOTOR, AND TOOL, PICK UP BHA FOR CURVE ASSEMBLY, TIH WITH NEW BHA #4 SECURITY FXD55M & LEAM2.25, CUT OFF DRILLING LINE AND SLIP ON 115', REAM OUT THE SALTS, REAM TO FIND BOTTOM
5/7/13	11349	16	787	CHANGE OUT ROTATING HEAD, DRILL TO MD 11349'
5/8/13	11401	17	52	DRILL TO MD 11401', CIRCULATE HOLE CLEAN AND MIX PILL, REAM OUT OF AND BACK THROUGH SALT, FILL PIPE, CIRCULATE BOTTOMS UP, TIGHT SPOT IN SHALE, P/U 6 JTS AND CIRC. AT BOTTOM OF SHALE TO CLEAN HOLE, WAIT ON SOLTEX/WORKING PIPE AT THE BOTTOM OF THE SHALE, CIRCULATE BOTTOMS UP & WORK PIPE
5/9/13	11401	18	0	REAM FROM MD 11100' TO MD 11401', CIRCULATE HOLE CLEAN AND WORK PIPE, TOOH 10 STNDS TO KOP AND L/D 5" DP, TIH 10 STNDS, PULL WEAR RING, LUBRICATE RIG, RIG UP AMERCAIN CASING, RUN CASING
5/10/13	11401	19	0	RUN/CEMENT 7" CASING, FLUSH OUT STACK WITH SALT WATER, RIG DOWN SCHLUMBERGER, SET PACKER & BIT GUIDE & TEST TO 5000 PSI 15 MINS, RIG DOWN CASING ELEVATORS & BAIL, CLEANING MUD TANKS&CHANGING SHARKER SCREENS
5/11/13	11984	20	583	TEST CASING TO 3000PSI- HOLD FOR 30 MINS, TIH WITH BHA #5 SMITH MDSIZ & BICO SS170 1.5, TAG CEMENT @ 11069, WASH DOWN AND DRILL FLOAT COLLAR AND SHOE, FIT TEST @11392 1100PSI FOR 15 MINS, DRILL TO MD 11984'
5/12/13	13310	21	1326	DRILL TO MD 13310'
5/13/13	14418	22	1108	DRILL TO MD 14418', CONDITION MUD & CIRCULATE
5/14/13	15048	23	630	TOOH FOR MOTOR, L/D MONEL AND REPLACE MUDMOTOR, BIT, AND DIR TOOL, TIH WITH BHA #6 SMITH MDSI613 & BICO SS170 1.5, CIRCULATE GAS OUT & LAYDOWN WASHOUT 4"DP, DRILL TO 15048'
5/15/13	16594	24	1546	DRILL TO MD 16594'
5/16/13	17859	25	1265	DRILL TO MD 17859'
5/17/13	18904	26	1045	DRILL TO MD 18715', SHUT IN WELL CLOSED ANNULAR, REPAIR PUMPS #1 WELD ON POD, DRILL TO MD 18904'
5/18/13	20262	27	1358	DRILL TO MD 20262'
5/19/13	21273	28	1011	DRILL TO MD 21273', REPAIR TOP DRIVE/WAIT ON TOP DRIVE TECH
5/20/13	21276	29	3	DRILL TO MD 21276', TD CALLED AT 15:36, REPAIR TOP DRIVE- CHECK SERVICE LOOPS, FOUND TO BE BAD, SPLIT AND LAY THEM DOWN, WAIT ON NEW LOOPS, HANG NEW SERVICE LOOPS AND HOOK UP T/D, DIGNOSE PROBLEMS

DATE DEPTH GRAPH



NON-CERTIFIED FIELD DIRECTIONAL SURVEYS
ORIGINAL WELLBORE

No.	Tool Type	MD (ft)	INC (°)	AZI (°)	CL (ft)	TVD (ft)	VS (ft)	Coordinates N/S (ft)		E/W (ft)	
0	TIE-IN	**0**	**0**	**0**	0	**0.00**	**0.00**	0.00	N	0.00	E
1	MWD	**88**	**0.36**	**28.26**	88	**88.00**	**0.22**	0.24	N	0.13	E
2	MWD	**181**	**0.59**	**20.13**	93	**181.00**	**0.89**	0.95	N	0.43	E
3	MWD	**274**	**0.68**	**24.6**	93	**273.99**	**1.78**	1.90	N	0.83	E
4	MWD	**367**	**0.78**	**27.41**	93	**366.98**	**2.77**	2.97	N	1.35	E
5	MWD	**460**	**0.71**	**34.82**	93	**459.97**	**3.72**	4.00	N	1.97	E
6	MWD	**553**	**0.53**	**41.5**	93	**552.97**	**4.43**	4.80	N	2.58	E
7	MWD	**646**	**0.43**	**44.86**	93	**645.97**	**4.92**	5.37	N	3.12	E
8	MWD	**739**	**0.45**	**34.93**	93	**738.96**	**5.41**	5.91	N	3.57	E
9	MWD	**832**	**0.45**	**47.03**	93	**831.96**	**5.89**	6.46	N	4.05	E
10	MWD	**925**	**0.42**	**51.24**	93	**924.96**	**6.28**	6.92	N	4.58	E
11	MWD	**1018**	**0.41**	**64.65**	93	**1017.96**	**6.56**	7.28	N	5.15	E
12	MWD	**1111**	**0.64**	**73**	93	**1110.95**	**6.75**	7.57	N	5.94	E
13	MWD	**1204**	**0.78**	**66.41**	93	**1203.94**	**7.02**	7.98	N	7.02	E
14	MWD	**1297**	**1.01**	**78.49**	93	**1296.93**	**7.25**	8.39	N	8.40	E
15	MWD	**1390**	**1.3**	**99.37**	93	**1389.91**	**7.01**	8.39	N	10.25	E
16	MWD	**1483**	**1.49**	**108.13**	93	**1482.89**	**6.19**	7.84	N	12.44	E
17	MWD	**1576**	**1.82**	**119.24**	93	**1575.85**	**4.79**	6.74	N	14.88	E
18	MWD	**1669**	**2.2**	**123.2**	93	**1668.79**	**2.74**	5.04	N	17.66	E
19	MWD	**1762**	**2.76**	**131.39**	93	**1761.70**	**-0.10**	2.58	N	20.83	E
20	MWD	**1855**	**3.35**	**137.4**	93	**1854.57**	**-4.00**	-0.90	S	24.35	E
21	MWD	**1902**	**3.55**	**142.55**	47	**1901.49**	**-6.38**	-3.06	S	26.16	E
22	MWD	**2000**	**3.25**	**136.99**	98	**1999.31**	**-11.26**	-7.50	S	29.90	E
23	MWD	**2095**	**5.54**	**346.19**	95	**2094.19**	**-8.89**	-5.01	S	30.65	E
24	MWD	**2189**	**11.17**	**340.63**	94	**2187.16**	**4.54**	7.99	N	26.54	E
25	MWD	**2284**	**11.08**	**340.1**	95	**2280.37**	**22.45**	25.26	N	20.38	E
26	MWD	**2378**	**13.37**	**332.81**	94	**2372.24**	**41.49**	43.42	N	12.34	E
27	MWD	**2472**	**13.45**	**332.02**	94	**2463.68**	**61.94**	62.74	N	2.25	E
28	MWD	**2567**	**15.84**	**326.49**	95	**2555.59**	**83.92**	83.31	N	-10.10	W
29	MWD	**2662**	**15.9**	**326.92**	95	**2646.97**	**107.28**	105.03	N	-24.36	W
30	MWD	**2757**	**18.99**	**333.16**	95	**2737.59**	**133.58**	129.73	N	-38.44	W
31	MWD	**2851**	**18.83**	**333.15**	94	**2826.52**	**162.29**	156.91	N	-52.20	W
32	MWD	**2946**	**19.61**	**334.3**	95	**2916.23**	**191.88**	184.96	N	-66.04	W
33	MWD	**3040**	**19.52**	**335.71**	94	**3004.80**	**221.87**	213.48	N	-79.34	W
34	MWD	**3136**	**18.31**	**333.07**	96	**3095.61**	**251.42**	241.55	N	-92.77	W
35	MWD	**3230**	**17.9**	**332.25**	94	**3184.96**	**278.87**	267.50	N	-106.18	W
36	MWD	**3326**	**18**	**331.04**	96	**3276.29**	**306.49**	293.53	N	-120.23	W

37	MWD	**3420**	**17.83**	**330.16**	94	**3365.73**	**333.28**	318.72	N	-134.43	W
38	MWD	**3515**	**17.87**	**329.45**	95	**3456.16**	**360.12**	343.89	N	-149.07	W
39	MWD	**3610**	**18.15**	**335.05**	95	**3546.51**	**387.62**	369.86	N	-162.72	W
40	MWD	**3704**	**17.15**	**336.28**	94	**3636.08**	**414.87**	395.82	N	-174.47	W
41	MWD	**3799**	**16.09**	**336.88**	95	**3727.11**	**440.98**	420.76	N	-185.28	W
42	MWD	**3894**	**16.02**	**329.4**	95	**3818.42**	**465.69**	444.15	N	-197.12	W
43	MWD	**3989**	**15.33**	**329.03**	95	**3909.88**	**489.24**	466.20	N	-210.26	W
44	MWD	**4084**	**16.14**	**329.09**	95	**4001.32**	**512.85**	488.30	N	-223.50	W
45	MWD	**4178**	**14.16**	**325.49**	94	**4092.05**	**535.06**	508.98	N	-236.73	W
46	MWD	**4272**	**15.43**	**331.69**	94	**4182.94**	**556.96**	529.47	N	-249.17	W
47	MWD	**4367**	**18.78**	**335.51**	95	**4273.73**	**583.38**	554.52	N	-261.51	W
48	MWD	**4462**	**18.25**	**333.82**	95	**4363.81**	**612.08**	581.78	N	-274.41	W
49	MWD	**4555**	**18.09**	**330.9**	93	**4452.18**	**639.27**	607.47	N	-287.86	W
50	MWD	**4649**	**18**	**331.93**	94	**4541.55**	**666.41**	633.04	N	-301.79	W
51	MWD	**4744**	**18.9**	**335.24**	95	**4631.67**	**694.82**	659.96	N	-315.14	W
52	MWD	**4838**	**16.5**	**334.25**	94	**4721.22**	**722.01**	685.81	N	-327.32	W
53	MWD	**4932**	**17.67**	**334.31**	94	**4811.07**	**748.22**	710.69	N	-339.30	W
54	MWD	**5027**	**17.02**	**333.54**	95	**4901.75**	**775.04**	736.13	N	-351.75	W
55	MWD	**5122**	**18.7**	**332.34**	95	**4992.17**	**802.46**	762.07	N	-365.02	W
56	MWD	**5218**	**19.59**	**331.1**	96	**5082.86**	**831.86**	789.79	N	-379.94	W
57	MWD	**5313**	**16.96**	**330.16**	95	**5173.06**	**859.48**	815.76	N	-394.53	W
58	MWD	**5407**	**17.32**	**329.2**	94	**5262.88**	**884.98**	839.67	N	-408.52	W
59	MWD	**5501**	**17.06**	**329.99**	94	**5352.68**	**910.54**	863.63	N	-422.58	W
60	MWD	**5596**	**20.4**	**330.52**	95	**5442.64**	**938.74**	890.12	N	-437.70	W
61	MWD	**5690**	**20.1**	**328.8**	94	**5530.83**	**968.69**	918.19	N	-454.13	W
62	MWD	**5782**	**18.79**	**329.78**	92	**5617.58**	**996.80**	944.52	N	-469.78	W
63	MWD	**5878**	**17.41**	**330.13**	96	**5708.83**	**1024.31**	970.34	N	-484.71	W
64	MWD	**5972**	**18.41**	**329.26**	94	**5798.27**	**1050.92**	995.29	N	-499.30	W
65	MWD	**6066**	**18.85**	**328.9**	94	**5887.35**	**1078.44**	1021.05	N	-514.74	W
66	MWD	**6162**	**16**	**336.5**	96	**5978.94**	**1105.35**	1046.47	N	-528.03	W
67	MWD	**6256**	**14.56**	**338.06**	94	**6069.62**	**1129.23**	1069.31	N	-537.61	W
68	MWD	**6351**	**16.27**	**328.76**	95	**6161.21**	**1152.96**	1091.77	N	-548.97	W
69	MWD	**6446**	**18.09**	**325.43**	95	**6251.97**	**1178.24**	1115.30	N	-564.25	W
70	MWD	**6542**	**20.22**	**327.97**	96	**6342.65**	**1206.57**	1141.64	N	-581.50	W
71	MWD	**6636**	**17.83**	**327.97**	94	**6431.51**	**1234.41**	1167.61	N	-597.75	W
72	MWD	**6731**	**19.53**	**330.17**	95	**6521.50**	**1262.30**	1193.72	N	-613.37	W
73	MWD	**6825**	**24.58**	**336.68**	94	**6608.61**	**1295.64**	1225.33	N	-628.94	W
74	MWD	**6919**	**25.74**	**338.56**	94	**6693.69**	**1334.23**	1262.28	N	-644.14	W
75	MWD	**7014**	**25.34**	**337.82**	95	**6779.41**	**1373.89**	1300.31	N	-659.35	W
76	MWD	**7109**	**25.23**	**338.7**	95	**6865.31**	**1413.19**	1338.00	N	-674.38	W
77	MWD	**7203**	**24.47**	**337.82**	94	**6950.60**	**1451.45**	1374.69	N	-689.01	W
78	MWD	**7297**	**24.35**	**337.26**	94	**7036.20**	**1488.96**	1410.59	N	-703.85	W

79	MWD	**7392**	**24.61**	**338.11**	95	**7122.66**	**1526.98**	1447.01	N	-718.79	W
80	MWD	**7485**	**24.06**	**337.87**	93	**7207.40**	**1564.06**	1482.54	N	-733.16	W
81	MWD	**7578**	**21.99**	**336.66**	93	**7292.99**	**1599.13**	1516.09	N	-747.20	W
82	MWD	**7673**	**20.71**	**336.48**	95	**7381.46**	**1632.36**	1547.83	N	-760.95	W
83	MWD	**7767**	**20.55**	**337.09**	94	**7469.44**	**1664.21**	1578.26	N	-774.00	W
84	MWD	**7863**	**20.23**	**335.72**	96	**7559.42**	**1696.32**	1608.91	N	-787.39	W
85	MWD	**7958**	**17.78**	**334.15**	95	**7649.24**	**1725.80**	1636.94	N	-800.47	W
86	MWD	**8029**	**15.83**	**332.19**	71	**7717.20**	**1745.15**	1655.27	N	-809.71	W
87	MWD	**8124**	**14.61**	**333.31**	95	**7808.87**	**1768.59**	1677.43	N	-821.14	W
88	MWD	**8219**	**15.61**	**337.25**	95	**7900.59**	**1792.22**	1699.93	N	-831.46	W
89	MWD	**8315**	**15.14**	**336.41**	96	**7993.15**	**1816.71**	1723.33	N	-841.48	W
90	MWD	**8409**	**19.07**	**334.04**	94	**8082.98**	**1843.06**	1748.39	N	-853.12	W
91	MWD	**8504**	**18.66**	**335.98**	95	**8172.87**	**1872.32**	1776.23	N	-866.10	W
92	MWD	**8598**	**18.91**	**337.29**	94	**8261.87**	**1901.42**	1804.01	N	-878.10	W
93	MWD	**8692**	**20.1**	**338.04**	94	**8350.47**	**1931.73**	1833.05	N	-890.02	W
94	MWD	**8786**	**20.18**	**338.12**	94	**8438.72**	**1963.06**	1863.07	N	-902.10	W
95	MWD	**8882**	**19.71**	**339.51**	96	**8528.96**	**1994.85**	1893.60	N	-913.94	W
96	MWD	**8976**	**18.64**	**341.05**	94	**8617.75**	**2025.00**	1922.66	N	-924.37	W
97	MWD	**9071**	**18.41**	**341.62**	95	**8707.83**	**2054.59**	1951.26	N	-934.03	W
98	MWD	**9165**	**17.11**	**342.15**	94	**8797.35**	**2082.76**	1978.51	N	-942.95	W
99	MWD	**9259**	**16.14**	**343.45**	94	**8887.41**	**2109.25**	2004.19	N	-950.91	W
100	MWD	**9352**	**14.6**	**343.91**	93	**8977.09**	**2133.60**	2027.85	N	-957.84	W
101	MWD	**9446**	**12.67**	**345.08**	94	**9068.43**	**2155.53**	2049.19	N	-963.78	W
102	MWD	**9522**	**12.78**	**344.29**	76	**9142.57**	**2172.11**	2065.34	N	-968.20	W
103	MWD	**9554**	**13.31**	**343.16**	32	**9173.74**	**2179.24**	2072.27	N	-970.22	W
104	MWD	**9649**	**16.87**	**339.67**	95	**9265.45**	**2203.47**	2095.67	N	-978.18	W
105	MWD	**9745**	**20.08**	**335.6**	96	**9356.50**	**2232.81**	2123.75	N	-989.83	W
106	MWD	**9837**	**20.8**	**332.04**	92	**9442.71**	**2263.19**	2152.56	N	-1004.02	W
107	MWD	**9932**	**20.9**	**328.48**	95	**9531.49**	**2294.44**	2181.91	N	-1020.79	W
108	MWD	**10026**	**20.06**	**329.42**	94	**9619.55**	**2324.55**	2210.08	N	-1037.75	W
109	MWD	**10121**	**19.48**	**327.46**	95	**9708.95**	**2353.85**	2237.46	N	-1054.56	W
110	MWD	**10215**	**18.45**	**326.26**	94	**9797.84**	**2381.36**	2263.04	N	-1071.26	W
111	MWD	**10311**	**16.98**	**326.92**	96	**9889.29**	**2407.59**	2287.42	N	-1087.34	W
112	MWD	**10406**	**17.69**	**331.28**	95	**9979.98**	**2433.53**	2311.71	N	-1101.85	W
113	MWD	**10500**	**18.42**	**331.41**	94	**10069.35**	**2460.67**	2337.27	N	-1115.82	W
114	MWD	**10530**	**17.92**	**331.94**	30	**10097.85**	**2469.41**	2345.51	N	-1120.26	W
115	MWD	**10562**	**19.05**	**331.83**	32	**10128.20**	**2478.89**	2354.45	N	-1125.04	W
116	MWD	**10594**	**22.17**	**333.17**	32	**10158.15**	**2489.47**	2364.45	N	-1130.23	W
117	MWD	**10625**	**23.46**	**338.26**	31	**10186.73**	**2500.96**	2375.40	N	-1135.16	W
118	MWD	**10657**	**26.81**	**340.08**	32	**10215.69**	**2514.18**	2388.11	N	-1139.98	W
119	MWD	**10689**	**28.04**	**341.38**	32	**10244.10**	**2528.60**	2402.02	N	-1144.84	W
120	MWD	**10720**	**31.57**	**340.33**	31	**10270.99**	**2543.68**	2416.57	N	-1149.90	W
121	MWD	**10752**	**35.96**	**339.55**	32	**10297.59**	**2561.02**	2433.27	N	-1156.01	W

122	MWD	**10783**	**39.93**	**336.61**	31	**10322.03**	**2579.45**	2450.94	N	-1163.14	W
123	MWD	**10815**	**42.13**	**335.46**	32	**10346.17**	**2599.58**	2470.13	N	-1171.67	W
124	MWD	**10846**	**45.09**	**336.59**	31	**10368.61**	**2620.06**	2489.67	N	-1180.36	W
125	MWD	**10878**	**49.05**	**334.49**	32	**10390.41**	**2642.44**	2510.98	N	-1190.07	W
126	MWD	**10910**	**51.77**	**334.93**	32	**10410.80**	**2665.90**	2533.28	N	-1200.60	W
127	MWD	**10942**	**54.04**	**333.97**	32	**10430.10**	**2690.15**	2556.30	N	-1211.61	W
128	MWD	**10974**	**57.84**	**330.75**	32	**10448.02**	**2714.99**	2579.77	N	-1223.92	W
129	MWD	**11006**	**61.64**	**330.77**	32	**10464.14**	**2740.63**	2603.88	N	-1237.42	W
130	MWD	**11038**	**66.36**	**330.32**	32	**10478.17**	**2767.27**	2628.92	N	-1251.56	W
131	MWD	**11070**	**70.61**	**330.21**	32	**10489.90**	**2794.79**	2654.76	N	-1266.32	W
132	MWD	**11102**	**74.61**	**329.84**	32	**10499.46**	**2822.97**	2681.21	N	-1281.58	W
133	MWD	**11133**	**76.95**	**328.80**	31	**10507.07**	**2850.56**	2707.05	N	-1296.91	W
134	MWD	**11165**	**77.08**	**328.58**	32	**10514.27**	**2879.05**	2733.69	N	-1313.11	W
135	MWD	**11196**	**78.1**	**326.89**	31	**10520.93**	**2906.50**	2759.29	N	-1329.27	W
136	MWD	**11228**	**81.32**	**325.37**	32	**10526.64**	**2934.67**	2785.43	N	-1346.82	W
137	MWD	**11259**	**85.07**	**325.44**	31	**10530.32**	**2962.03**	2810.76	N	-1364.29	W
138	MWD	**11291**	**88.02**	**327.44**	32	**10532.24**	**2990.68**	2837.37	N	-1381.95	W
139	MWD	**11322**	**90.10**	**328.80**	31	**10532.75**	**3018.87**	2863.69	N	-1398.32	W
140	MWD	**11343**	**90.27**	**328.09**	21	**10532.69**	**3038.02**	2881.59	N	-1409.31	W
141	MWD	**11403**	**90.92**	**327.18**	60	**10532.06**	**3092.39**	2932.26	N	-1441.42	W
142	MWD	**11494**	**90.48**	**329.38**	91	**10530.95**	**3175.26**	3009.66	N	-1489.26	W
143	MWD	**11585**	**89.52**	**330.35**	91	**10530.95**	**3259.15**	3088.36	N	-1534.95	W
144	MWD	**11677**	**89.25**	**332.89**	92	**10531.94**	**3345.01**	3169.29	N	-1578.67	W
145	MWD	**11768**	**88.72**	**335.97**	91	**10533.55**	**3431.41**	3251.35	N	-1617.94	W
146	MWD	**11860**	**88.99**	**337.29**	92	**10535.39**	**3519.82**	3335.79	N	-1654.42	W
147	MWD	**11952**	**89.60**	**341.16**	92	**10536.52**	**3609.28**	3421.78	N	-1687.04	W
148	MWD	**12043**	**88.99**	**342.39**	91	**10537.64**	**3698.63**	3508.21	N	-1715.50	W
149	MWD	**12133**	**90.92**	**346.61**	90	**10537.71**	**3787.69**	3594.91	N	-1739.55	W
150	MWD	**12224**	**91.19**	**348.19**	91	**10536.04**	**3878.29**	3683.70	N	-1759.39	W
151	MWD	**12316**	**91.01**	**349.86**	92	**10534.27**	**3970.09**	3774.00	N	-1776.90	W
152	MWD	**12407**	**90.57**	**351.35**	91	**10533.01**	**4061.02**	3863.77	N	-1791.76	W
153	MWD	**12499**	**89.25**	**354.87**	92	**10533.16**	**4153.00**	3955.09	N	-1802.79	W
154	MWD	**12591**	**89.52**	**356.10**	92	**10534.15**	**4244.88**	4046.80	N	-1810.03	W
155	MWD	**12683**	**89.69**	**359.44**	92	**10534.78**	**4336.50**	4138.71	N	-1813.61	W
156	MWD	**12774**	**89.60**	**2.51**	91	**10535.35**	**4426.53**	4229.68	N	-1812.06	W
157	MWD	**12869**	**88.9**	**4.97**	95	**10536.59**	**4519.74**	4324.47	N	-1805.87	W
158	MWD	**12963**	**88.99**	**7.08**	94	**10538.32**	**4611.18**	4417.93	N	-1796.00	W
159	MWD	**13057**	**88.9**	**6.56**	94	**10540.05**	**4702.30**	4511.24	N	-1784.84	W
160	MWD	**13152**	**89.43**	**6.12**	95	**10541.44**	**4794.60**	4605.65	N	-1774.35	W
161	MWD	**13248**	**90.57**	**6.91**	96	**10541.44**	**4887.80**	4701.03	N	-1763.46	W
162	MWD	**13342**	**89.96**	**5.41**	94	**10541.00**	**4979.20**	4794.48	N	-1753.38	W
163	MWD	**13436**	**89.52**	**5.24**	94	**10541.43**	**5070.91**	4888.08	N	-1744.65	W
164	MWD	**13531**	**90.22**	**4.89**	95	**10541.64**	**5163.69**	4982.71	N	-1736.27	W

165	MWD	**13625**	**90.40**	**4.18**	94	**10541.13**	**5255.68**	5076.41	N	-1728.83	W
166	MWD	**13719**	**90.31**	**3.66**	94	**10540.55**	**5347.87**	5170.19	N	-1722.41	W
167	MWD	**13816**	**90.57**	**3.92**	97	**10539.81**	**5443.04**	5266.97	N	-1716.00	W
168	MWD	**13910**	**91.01**	**4.53**	94	**10538.51**	**5535.12**	5360.71	N	-1709.07	W
169	MWD	**14006**	**90.92**	**4.36**	96	**10536.89**	**5629.09**	5456.40	N	-1701.63	W
170	MWD	**14101**	**90.57**	**3.57**	95	**10535.66**	**5722.24**	5551.17	N	-1695.06	W
171	MWD	**14195**	**91.10**	**1.63**	94	**10534.29**	**5814.81**	5645.06	N	-1690.80	W
172	MWD	**14290**	**91.01**	**1.20**	95	**10532.54**	**5908.69**	5740.01	N	-1688.45	W
173	MWD	**14384**	**92.33**	**1.46**	94	**10529.80**	**6001.57**	5833.94	N	-1686.27	W
174	MWD	**14480**	**91.45**	**2.25**	96	**10526.63**	**6096.28**	5929.84	N	-1683.17	W
175	MWD	**14575**	**88.90**	**1.81**	95	**10526.34**	**6190.01**	6024.77	N	-1679.80	W
176	MWD	**14669**	**88.46**	**2.07**	94	**10528.51**	**6282.75**	6118.69	N	-1676.62	W
177	MWD	**14764**	**89.52**	**2.25**	95	**10530.18**	**6376.43**	6213.61	N	-1673.04	W
178	MWD	**14858**	**92.07**	**2.69**	94	**10528.88**	**6469.04**	6307.50	N	-1668.99	W
179	MWD	**14954**	**92.42**	**2.78**	96	**10525.12**	**6563.49**	6403.32	N	-1664.41	W
180	MWD	**15048**	**91.80**	**3.04**	94	**10521.66**	**6655.93**	6497.14	N	-1659.65	W
181	MWD	**15143**	**90.31**	**2.95**	95	**10519.91**	**6749.37**	6591.99	N	-1654.68	W
182	MWD	**15238**	**90.31**	**3.39**	95	**10519.39**	**6842.77**	6686.84	N	-1649.43	W
183	MWD	**15333**	**90.40**	**3.66**	95	**10518.81**	**6936.07**	6781.66	N	-1643.59	W
184	MWD	**15427**	**89.78**	**3.92**	94	**10518.66**	**7028.30**	6875.45	N	-1637.38	W
185	MWD	**15522**	**89.25**	**4.89**	95	**10519.46**	**7121.30**	6970.17	N	-1630.08	W
186	MWD	**15617**	**88.90**	**5.15**	95	**10521.00**	**7214.09**	7064.79	N	-1621.77	W
187	MWD	**15711**	**89.78**	**4.71**	94	**10522.08**	**7305.94**	7158.43	N	-1613.69	W
188	MWD	**15806**	**91.45**	**4.53**	95	**10521.06**	**7398.86**	7253.12	N	-1606.04	W
189	MWD	**15901**	**90.92**	**4.01**	95	**10519.09**	**7491.90**	7347.83	N	-1598.97	W
190	MWD	**15996**	**88.81**	**2.34**	95	**10519.32**	**7585.30**	7442.68	N	-1593.71	W
191	MWD	**16091**	**89.52**	**0.40**	95	**10520.70**	**7679.19**	7537.64	N	-1591.43	W
192	MWD	**16185**	**90.92**	**0.23**	94	**10520.34**	**7772.34**	7631.63	N	-1590.92	W
193	MWD	**16280**	**91.98**	**359.35**	95	**10517.94**	**7866.58**	7726.60	N	-1591.27	W
194	MWD	**16375**	**91.36**	**356.79**	95	**10515.17**	**7961.11**	7821.50	N	-1594.46	W
195	MWD	**16470**	**90.57**	**0.23**	95	**10513.57**	**8055.58**	7916.43	N	-1596.93	W
196	MWD	**16564**	**89.69**	**358.73**	94	**10513.36**	**8148.91**	8010.43	N	-1597.79	W
197	MWD	**16659**	**88.99**	**357.68**	95	**10514.45**	**8243.46**	8105.37	N	-1600.76	W
198	MWD	**16754**	**90.57**	**357.86**	95	**10514.81**	**8338.08**	8200.30	N	-1604.46	W
199	MWD	**16849**	**90.04**	**358.82**	95	**10514.31**	**8432.61**	8295.25	N	-1607.21	W
200	MWD	**16944**	**88.99**	**358.73**	95	**10515.11**	**8527.07**	8390.23	N	-1609.24	W
201	MWD	**17039**	**87.67**	**357.68**	95	**10517.88**	**8621.58**	8485.14	N	-1612.22	W
202	MWD	**17134**	**90.75**	**357.68**	95	**10519.19**	**8716.19**	8580.04	N	-1616.06	W
203	MWD	**17229**	**91.54**	**359.52**	95	**10517.29**	**8810.66**	8674.99	N	-1618.38	W
204	MWD	**17324**	**90.66**	**359.61**	95	**10515.47**	**8904.95**	8769.97	N	-1619.10	W
205	MWD	**17417**	**90.48**	**1.55**	93	**10514.54**	**8997.06**	8862.95	N	-1618.16	W
206	MWD	**17512**	**91.45**	**0.93**	95	**10512.94**	**9090.98**	8957.91	N	-1616.10	W
207	MWD	**17607**	**89.69**	**358.82**	95	**10512.00**	**9185.21**	9052.90	N	-1616.31	W

208	MWD	**17702**	**90.04**	**357.33**	95	**10512.22**	**9279.78**	9147.84	N	-1619.50	W
209	MWD	**17797**	**90.31**	**357.42**	95	**10511.93**	**9374.46**	9242.74	N	-1623.85	W
210	MWD	**17891**	**89.96**	**357.86**	94	**10511.71**	**9468.11**	9336.66	N	-1627.72	W
211	MWD	**17986**	**88.99**	**356.98**	95	**10512.58**	**9562.77**	9431.56	N	-1632.00	W
212	MWD	**18082**	**89.25**	**358.12**	96	**10514.06**	**9658.41**	9527.46	N	-1636.10	W
213	MWD	**18177**	**90.48**	**359.96**	95	**10514.28**	**9752.82**	9622.44	N	-1637.70	W
214	MWD	**18271**	**90.22**	**1.20**	94	**10513.71**	**9845.92**	9716.43	N	-1636.74	W
215	MWD	**18367**	**89.52**	**1.72**	96	**10513.92**	**9940.78**	9812.40	N	-1634.30	W
216	MWD	**18462**	**89.56**	**1.71**	95	**10514.69**	**10034.60**	9907.35	N	-1631.46	W
217	MWD	**18558**	**88.99**	**1.55**	96	**10515.90**	**10129.42**	10003.31	N	-1628.72	W
218	MWD	**18653**	**90.48**	**0.05**	95	**10516.34**	**10223.45**	10098.29	N	-1627.40	W
219	MWD	**18747**	**90.66**	**357.94**	94	**10515.41**	**10316.87**	10192.27	N	-1629.05	W
220	MWD	**18842**	**90.31**	**357.77**	95	**10514.60**	**10411.47**	10287.20	N	-1632.60	W
221	MWD	**18937**	**89.87**	**357.94**	95	**10514.45**	**10506.08**	10382.13	N	-1636.16	W
222	MWD	**19031**	**89.34**	**358.38**	94	**10515.10**	**10599.65**	10476.08	N	-1639.18	W
223	MWD	**19126**	**91.10**	**355.39**	95	**10514.73**	**10694.37**	10570.92	N	-1644.34	W
224	MWD	**19221**	**89.25**	**356.19**	95	**10514.44**	**10789.23**	10665.66	N	-1651.31	W
225	MWD	**19316**	**88.72**	**356.45**	95	**10516.13**	**10884.02**	10760.45	N	-1657.41	W
226	MWD	**19410**	**90.40**	**356.89**	94	**10516.85**	**10977.78**	10854.28	N	-1662.87	W
227	MWD	**19505**	**89.78**	**357.24**	95	**10516.70**	**11072.50**	10949.16	N	-1667.73	W
228	MWD	**19600**	**89.16**	**358.03**	95	**10517.58**	**11167.14**	11044.07	N	-1671.65	W
229	MWD	**19695**	**89.16**	**358.91**	95	**10518.97**	**11261.64**	11139.03	N	-1674.19	W
230	MWD	**19790**	**90.75**	**359.44**	95	**10519.05**	**11356.02**	11234.01	N	-1675.56	W
231	MWD	**19885**	**89.08**	**359.26**	95	**10519.19**	**11450.37**	11329.01	N	-1676.63	W
232	MWD	**19979**	**87.76**	**359.35**	94	**10521.78**	**11543.70**	11422.96	N	-1677.77	W
233	MWD	**20074**	**90.84**	**358.82**	95	**10522.94**	**11638.09**	11517.93	N	-1679.29	W
234	MWD	**20169**	**89.69**	**359.53**	95	**10522.50**	**11732.47**	11612.92	N	-1680.66	W
235	MWD	**20263**	**90.22**	**359.53**	94	**10522.57**	**11825.79**	11706.91	N	-1681.43	W
236	MWD	**20358**	**91.10**	**359.17**	95	**10521.48**	**11920.14**	11801.90	N	-1682.51	W
237	MWD	**20452**	**89.78**	**359.00**	94	**10520.76**	**12013.55**	11895.88	N	-1684.01	W
238	MWD	**20547**	**89.25**	**0.05**	95	**10521.56**	**12107.86**	11990.87	N	-1684.80	W
239	MWD	**20642**	**87.58**	**0.14**	95	**10524.19**	**12202.02**	12085.83	N	-1684.64	W
240	MWD	**20737**	**86.53**	**0.14**	95	**10529.07**	**12296.09**	12180.71	N	-1684.41	W
241	MWD	**20832**	**88.37**	**0.40**	95	**10533.30**	**12390.15**	12275.61	N	-1683.96	W
242	MWD	**20927**	**88.46**	**0.76**	95	**10535.92**	**12484.21**	12370.57	N	-1683.00	W
243	MWD	**21021**	**91.45**	**0.49**	94	**10536.00**	**12577.29**	12464.55	N	-1681.97	W
244	MWD	**21117**	**89.60**	**359.53**	96	**10535.12**	**12672.50**	12560.54	N	-1681.96	W
245	MWD	**21211**	**90.22**	**1.11**	94	**10535.27**	**12765.65**	12654.54	N	-1681.43	W
246	PTB	**21276**	**90.22**	**1.11**	65	**10535.02**	**12829.95**	12719.52	N	-1680.17	W

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)

MAY 2013 RECEIVED ND OIL & GAS DIVISION

Well File No. 25156

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

- [x] Notice of Intent — Approximate Start Date: **August 6, 2013**
- [ ] Report of Work Done — Date Work Completed:
- [ ] 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
- [ ] Redrilling or Repair
- [ ] Casing or Liner
- [ ] Plug Well
- [ ] Supplemental History
- [ ] Temporarily Abandon
- [x] Other **Flow back exemption**
- [ ] Spill Report
- [ ] Shooting
- [ ] Acidizing
- [ ] Fracture Treatment
- [ ] Change Production Method
- [ ] Reclamation

Well Name and Number					
Columbus Federal 1-16H					
Footages	Qtr-Qtr	Section	Township	Range	
2593 F S L 318 F E L	NESE	16	153 N	101 W	
Field	Pool	County			
Baker	Bakken	McKenzie			

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		Telephone Number
Continental Resources, Inc.		405-234-9000
Address		
P.O. Box 269000		
City	State	Zip Code
Oklahoma City	OK	73126
Signature	Printed Name	
	Jim Landrigan	
Title	Date	
Completion Engineer	May 17, 2013	

FOR STATE USE ONLY

[ ] Received	[x] Approved
Date	June 5, 2013
By	
Title	PETROLEUM ENGINEER

MS Energy Services

742 W. White Ave
Grand Junction, Colorado 81501

970.257.1911 (office)
970.257.1947(fax)
www.msenergyservices.com

May 17, 2013

North Dakota Industrial Commission
Oil & Gas Division
600 North Boulevard Ave
Department 405
Bismarck, North Dakota 58505

RE: Continental Resources
Columbus Federal 1-16H
McKenzie County, ND
Rig: Patterson #490

Dear North Dakota Industrial Commission:

Please find enclosed the original certified Rate Gyro Surveys run from Surface to a depth of 1,902' M.D. on the above mentioned well.

If I can be of any further assistance, please do not hesitate to call me at 936-442-2566.

Sincerely,

Larae Townsend
MS Survey

3335 Pollok Drive
Conroe, Texas 77303

936.442.2500 (office)
936.442.2599 (fax)
www.msenergyservices.com

Surveyor Certification Form

Survey Company: MS ENERGY SERVICES
Surveyors Name: GARRY FOWLER
Survey Job Type: RATE GYRO
Customer: CONTINENTAL RESOURCES
Well: COLUMBUS FEDERAL 1-16H
API: 33-053-04852
Surveyed from: SURFACE TO A DEPTH OF 1902'MD
Survey Run Date: 4-25-13 to 4-25-13
Surface Location: MCKENZIE COUNTY, ND

I certify that the data is true, correct, and complete and within the limitations of the tool set forth by MS Energy Services; that I am authorized and qualified to make this report; and that I have reviewed this report and find that it conforms to the principles and procedures as set forth by MS Energy Services.

Garry Fowler

Digitally signed by Garry Fowler
DN: cn=Garry Fowler, o=MS Energy Services, ou=MS Survey, email=gfowler@msenergyservices.com, c=US
Date: 2013.01.02 15:23:30 -06'00'

MS Energy Services

Job Number: SVGJ-130391
Company: Continental Resources
Lease/Well: Columbus Federal 1-16H
Location: McKenzie County, ND
Rig Name: Patterson #490
RKB: 22.43'
G.L. or M.S.L.: GL

State/Country: North Dakota/USA
Declination: 8.49°
Grid: East To True North
File name: F:\SURVEY\2013SU~1\CONTIN~1\GJ\COLUMB~1\1-16H.SVY
Date/Time: 26-Apr-13 / 14:46
Curve Name: Surface - 1902' M.D. (Rate Gyro)

WINSERVE SURVEY CALCULATIONS
Minimum Curvature Method
Vertical Section Plane .00
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	CLOSURE Distance FT	CLOSURE Direction Deg	Dogleg Severity Deg/100
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
88.00	.36	28.26	88.00	.24	.13	.24	.28	28.26	.41
181.00	.59	20.13	181.00	.95	.43	.95	1.04	24.54	.26
274.00	.68	24.60	273.99	1.90	.83	1.90	2.07	23.54	.11
367.00	.78	27.41	366.98	2.97	1.35	2.97	3.26	24.47	.11
460.00	.71	34.82	459.98	4.00	1.97	4.00	4.46	26.22	.13
553.00	.53	41.50	552.97	4.80	2.58	4.80	5.45	28.32	.21
646.00	.43	44.86	645.97	5.37	3.12	5.37	6.20	30.14	.11
739.00	.45	34.93	738.96	5.91	3.57	5.91	6.91	31.13	.08
832.00	.45	47.03	831.96	6.46	4.05	6.46	7.62	32.06	.10

Measured Depth FT	Incl Angle Deg	Drift Direction Deg	True Vertical Depth	N-S FT	E-W FT	Vertical Section FT	CLOSURE Distance FT	CLOSURE Direction Deg	Dogleg Severity Deg/100
925.00	.42	51.24	924.96	6.92	4.58	6.92	8.30	33.49	.05
1018.00	.41	64.65	1017.96	7.28	5.15	7.28	8.91	35.26	.10
1111.00	.64	73.00	1110.95	7.57	5.94	7.57	9.63	38.13	.26
1204.00	.78	66.41	1203.94	7.98	7.02	7.98	10.63	41.35	.17
1297.00	1.01	78.49	1296.93	8.39	8.40	8.39	11.88	45.03	.32
1390.00	1.30	99.37	1389.91	8.39	10.25	8.39	13.24	50.70	.54
1483.00	1.49	108.13	1482.89	7.84	12.44	7.84	14.70	57.78	.31
1576.00	1.82	119.24	1575.85	6.74	14.88	6.74	16.33	65.62	.49
1669.00	2.20	123.20	1668.79	5.04	17.66	5.04	18.36	74.06	.43
1762.00	2.76	131.39	1761.70	2.58	20.83	2.58	20.99	82.93	.71
1855.00	3.35	137.40	1854.57	-.90	24.35	-.90	24.37	92.11	.72
Last Survey Depth Recorded									
1902.00	3.55	142.55	1901.49	-3.06	26.16	-3.06	26.34	96.68	.78

Surface - 1902' M.D. (Rate Gyro) File: F:\SURVEY\2013SU~1\CONTIN~1\GJ\COLUMB~1\1-16H.SVY

Scientific Drilling

Survey Certification

7327 West Barton Road
Casper, WY 82604
(307)-472-6621 Fax (307) 472-5439

Operator	Continental Resources Inc.
Well Name & No.	Columbus Federal 1-16H
County & State	McKenzie County, ND
SDI Job No.	410413HEFMP6213
Rig	Patterson 490
Survey Date	25-Apr-2013

I, Seth M. Burstad, having personal knowledge of all the facts, hereby certify that the attached directional survey run from a measured depth of 1902 feet to a measured depth of 21276 feet is true and correct as determined from all available records.

Seth Burstad
Signature

23-May-2013
Date

Seth M. Burstad
Rockies Region Well Planner
Scientific Drilling - Rocky Mountain District

Continental Resources Inc.

McKenzie County, ND NAD83
Columbus Federal
Columbus Federal 1-16H

OH

Design: OH

Standard Survey Report

23 May, 2013

Scientific Drilling International

Survey Report

Company:	Continental Resources Inc.	**Local Co-ordinate Reference:**	Well Columbus Federal 1-16H
Project:	McKenzie County, ND NAD83	**TVD Reference:**	GL1920' & KB 22' @ 1942.00ft (Patterson 490)
Site:	Columbus Federal	**MD Reference:**	GL1920' & KB 22' @ 1942.00ft (Patterson 490)
Well:	Columbus Federal 1-16H	**North Reference:**	True
Wellbore:	OH	**Survey Calculation Method:**	Minimum Curvature
Design:	OH	**Database:**	Casper District

Project McKenzie County, ND NAD83

Map System:	US State Plane 1983	**System Datum:**	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	North Dakota Northern Zone		

Site Columbus Federal

Site Position:		**Northing:**	408,041.66 usft	**Latitude:**	48° 4' 29.665 N
From:	Lat/Long	**Easting:**	1,193,719.94 usft	**Longitude:**	103° 40' 12.754 W
Position Uncertainty:	0.00 ft	**Slot Radius:**	13.200 in	**Grid Convergence:**	-2.36 °

Well Columbus Federal 1-16H, 2669' FNL 318' FEL Sec 16 T153N R101W

Well Position	**+N/-S**	0.00 ft	**Northing:**	408,041.65 usft	**Latitude:**	48° 4' 29.665 N
	+E/-W	0.00 ft	**Easting:**	1,193,719.94 usft	**Longitude:**	103° 40' 12.754 W
Position Uncertainty		0.00 ft	**Wellhead Elevation:**	ft	**Ground Level:**	1,920.00 ft

Wellbore OH

Magnetics	**Model Name**	**Sample Date**	**Declination (°)**	**Dip Angle (°)**	**Field Strength (nT)**
	IGRF2010	3/28/2013	8.50	73.04	56,559
	IGRF2010	4/24/2013	8.49	73.04	56,551

Design OH

Audit Notes:

Version:	1.0	**Phase:**	ACTUAL	**Tie On Depth:**	0.00

Vertical Section:	**Depth From (TVD) (ft)**	**+N/-S (ft)**	**+E/-W (ft)**	**Direction (°)**
	0.00	0.00	0.00	352.50

Survey Program **Date** 5/23/2013

From (ft)	**To (ft)**	**Survey (Wellbore)**	**Tool Name**	**Description**
88.00	10,562.00	Survey #1 - Vertical (OH)	MWD SDI	MWD - Standard ver 1.0.1
10,594.00	11,343.00	Survey #2 - Curve (OH)	MWD SDI	MWD - Standard ver 1.0.1
11,403.00	21,276.00	Survey #3 - Lateral (OH)	MWD SDI	MWD - Standard ver 1.0.1

Survey

Measured Depth (ft)	**Inclination (°)**	**Azimuth (°)**	**Vertical Depth (ft)**	**+N/-S (ft)**	**+E/-W (ft)**	**Vertical Section (ft)**	**Dogleg Rate (°/100ft)**	**Build Rate (°/100ft)**	**Turn Rate (°/100ft)**
1,902.00	3.55	142.55	1,901.49	-3.06	26.16	-6.45	0.78	0.43	10.96
2,000.00	3.25	136.99	1,999.31	-7.50	29.90	-11.34	0.45	-0.31	-5.67
2,095.00	5.54	346.19	2,094.19	-5.01	30.65	-8.97	8.97	2.41	-158.74
2,189.00	11.17	340.63	2,187.16	7.99	26.54	4.46	6.04	5.99	-5.91
2,284.00	11.08	340.10	2,280.37	25.26	20.38	22.38	0.14	-0.09	-0.56
2,378.00	13.37	332.81	2,372.24	43.42	12.34	41.44	2.93	2.44	-7.76
2,472.00	13.45	332.02	2,463.68	62.74	2.25	61.91	0.21	0.09	-0.84
2,567.00	15.84	326.49	2,555.59	83.31	-10.10	83.92	2.91	2.52	-5.82

Scientific Drilling International

Survey Report

Company:	Continental Resources Inc.	**Local Co-ordinate Reference:**	Well Columbus Federal 1-16H
Project:	McKenzie County, ND NAD83	**TVD Reference:**	GL1920' & KB 22' @ 1942.00ft (Patterson 490)
Site:	Columbus Federal	**MD Reference:**	GL1920' & KB 22' @ 1942.00ft (Patterson 490)
Well:	Columbus Federal 1-16H	**North Reference:**	True
Wellbore:	OH	**Survey Calculation Method:**	Minimum Curvature
Design:	OH	**Database:**	Casper District

Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
2,662.00	15.90	326.92	2,646.97	105.03	-24.36	107.31	0.14	0.06	0.45
2,757.00	18.99	333.16	2,737.60	129.73	-38.44	133.64	3.80	3.25	6.57
2,851.00	18.83	333.15	2,826.52	156.91	-52.20	162.38	0.17	-0.17	-0.01
2,946.00	19.61	334.30	2,916.23	184.96	-66.04	191.99	0.91	0.82	1.21
3,040.00	19.52	335.71	3,004.80	213.48	-79.34	222.02	0.51	-0.10	1.50
3,136.00	18.31	333.07	3,095.62	241.55	-92.77	251.59	1.54	-1.26	-2.75
3,230.00	17.90	332.25	3,184.96	267.50	-106.18	279.07	0.51	-0.44	-0.87
3,326.00	18.00	331.04	3,276.29	293.53	-120.23	306.72	0.40	0.10	-1.26
3,420.00	17.83	330.16	3,365.73	318.72	-134.43	333.55	0.34	-0.18	-0.94
3,515.00	17.87	329.45	3,456.16	343.89	-149.07	360.41	0.23	0.04	-0.75
3,610.00	18.15	335.05	3,546.51	369.86	-162.72	387.94	1.85	0.29	5.89
3,704.00	17.15	336.28	3,636.08	395.82	-174.47	415.22	1.14	-1.06	1.31
3,799.00	16.09	336.88	3,727.11	420.76	-185.28	441.35	1.13	-1.12	0.63
3,894.00	16.02	329.40	3,818.42	444.15	-197.12	466.08	2.18	-0.07	-7.87
3,989.00	15.33	329.03	3,909.89	466.20	-210.26	489.66	0.73	-0.73	-0.39
4,084.00	16.14	329.09	4,001.32	488.30	-223.50	513.30	0.85	0.85	0.06
4,178.00	14.16	325.49	4,092.06	508.98	-236.73	535.54	2.33	-2.11	-3.83
4,272.00	15.43	331.69	4,182.94	529.47	-249.17	557.47	2.16	1.35	6.60
4,367.00	18.78	335.51	4,273.73	554.52	-261.51	583.92	3.72	3.53	4.02
4,462.00	18.25	333.82	4,363.81	581.78	-274.41	612.63	0.79	-0.56	-1.78
4,555.00	18.09	330.90	4,452.18	607.47	-287.86	639.86	0.99	-0.17	-3.14
4,649.00	18.00	331.93	4,541.56	633.04	-301.79	667.02	0.35	-0.10	1.10
4,744.00	18.90	335.24	4,631.67	659.96	-315.14	695.46	1.45	0.95	3.48
4,838.00	16.50	334.25	4,721.22	685.81	-327.32	722.68	2.57	-2.55	-1.05
4,932.00	17.67	334.31	4,811.07	710.69	-339.30	748.91	1.24	1.24	0.06
5,027.00	17.02	333.54	4,901.75	736.13	-351.75	775.76	0.73	-0.68	-0.81
5,122.00	18.70	332.34	4,992.17	762.07	-365.02	803.21	1.81	1.77	-1.26
5,218.00	19.59	331.10	5,082.86	789.79	-379.94	832.64	1.02	0.93	-1.29
5,313.00	16.96	330.16	5,173.06	815.76	-394.53	860.29	2.79	-2.77	-0.99
5,407.00	17.32	329.20	5,262.88	839.67	-408.52	885.82	0.49	0.38	-1.02
5,501.00	17.06	329.99	5,352.68	863.63	-422.58	911.41	0.37	-0.28	0.84
5,596.00	20.40	330.52	5,442.64	890.12	-437.70	939.65	3.52	3.52	0.56
5,690.00	20.10	328.80	5,530.83	918.19	-454.13	969.63	0.71	-0.32	-1.83
5,782.00	18.79	329.78	5,617.58	944.52	-469.78	997.77	1.47	-1.42	1.07
5,878.00	17.41	330.13	5,708.83	970.34	-484.71	1,025.32	1.44	-1.44	0.36
5,972.00	18.41	329.26	5,798.27	995.29	-499.31	1,051.96	1.10	1.06	-0.93
6,066.00	18.85	328.90	5,887.35	1,021.05	-514.74	1,079.52	0.48	0.47	-0.38
6,162.00	16.00	336.50	5,978.94	1,046.47	-528.03	1,106.46	3.79	-2.97	7.92
6,256.00	14.56	338.06	6,069.62	1,069.31	-537.61	1,130.35	1.59	-1.53	1.66
6,351.00	16.27	328.76	6,161.21	1,091.77	-548.97	1,154.11	3.16	1.80	-9.79
6,446.00	18.09	325.43	6,251.97	1,115.30	-564.25	1,179.42	2.18	1.92	-3.51
6,542.00	20.22	327.97	6,342.65	1,141.64	-581.50	1,207.79	2.38	2.22	2.65
6,636.00	17.83	327.97	6,431.51	1,167.61	-597.75	1,235.67	2.54	-2.54	0.00

Scientific Drilling International

Survey Report

Company:	Continental Resources Inc.	**Local Co-ordinate Reference:**	Well Columbus Federal 1-16H
Project:	McKenzie County, ND NAD83	**TVD Reference:**	GL1920' & KB 22' @ 1942.00ft (Patterson 490)
Site:	Columbus Federal	**MD Reference:**	GL1920' & KB 22' @ 1942.00ft (Patterson 490)
Well:	Columbus Federal 1-16H	**North Reference:**	True
Wellbore:	OH	**Survey Calculation Method:**	Minimum Curvature
Design:	OH	**Database:**	Casper District

Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
6,731.00	19.53	330.17	6,521.51	1,193.72	-613.37	1,263.59	1.94	1.79	2.32
6,825.00	24.58	336.68	6,608.61	1,225.33	-628.94	1,296.96	5.96	5.37	6.93
6,919.00	25.74	338.56	6,693.69	1,262.28	-644.14	1,335.58	1.50	1.23	2.00
7,014.00	25.34	337.82	6,779.41	1,300.31	-659.35	1,375.27	0.54	-0.42	-0.78
7,109.00	25.23	338.70	6,865.31	1,338.00	-674.38	1,414.60	0.41	-0.12	0.93
7,203.00	24.47	337.82	6,950.61	1,374.69	-689.01	1,452.89	0.90	-0.81	-0.94
7,297.00	24.35	337.26	7,036.20	1,410.59	-703.85	1,490.42	0.28	-0.13	-0.60
7,392.00	24.61	338.11	7,122.66	1,447.01	-718.79	1,528.48	0.46	0.27	0.89
7,485.00	24.06	337.87	7,207.40	1,482.54	-733.16	1,565.58	0.60	-0.59	-0.26
7,578.00	21.99	336.66	7,292.99	1,516.09	-747.20	1,600.68	2.28	-2.23	-1.30
7,673.00	20.71	336.48	7,381.47	1,547.83	-760.95	1,633.93	1.35	-1.35	-0.19
7,767.00	20.55	337.09	7,469.44	1,578.26	-774.00	1,665.82	0.29	-0.17	0.65
7,863.00	20.23	335.72	7,559.42	1,608.91	-787.39	1,697.95	0.60	-0.33	-1.43
7,958.00	17.78	334.15	7,649.24	1,636.94	-800.47	1,727.45	2.63	-2.58	-1.65
8,029.00	15.83	332.19	7,717.20	1,655.27	-809.71	1,746.82	2.86	-2.75	-2.76
8,124.00	14.61	333.31	7,808.87	1,677.43	-821.14	1,770.29	1.32	-1.28	1.18
8,219.00	15.61	337.25	7,900.59	1,699.93	-831.46	1,793.94	1.51	1.05	4.15
8,315.00	15.14	336.41	7,993.15	1,723.33	-841.48	1,818.45	0.54	-0.49	-0.88
8,409.00	19.07	334.04	8,082.98	1,748.39	-853.12	1,844.82	4.25	4.18	-2.52
8,504.00	18.66	335.98	8,172.87	1,776.23	-866.10	1,874.11	0.79	-0.43	2.04
8,598.00	18.91	337.29	8,261.87	1,804.02	-878.10	1,903.23	0.52	0.27	1.39
8,692.00	20.10	338.04	8,350.47	1,833.05	-890.02	1,933.57	1.29	1.27	0.80
8,786.00	20.18	338.12	8,438.72	1,863.07	-902.10	1,964.91	0.09	0.09	0.09
8,882.00	19.71	339.51	8,528.97	1,893.60	-913.94	1,996.73	0.70	-0.49	1.45
8,976.00	18.64	341.05	8,617.75	1,922.66	-924.37	2,026.90	1.26	-1.14	1.64
9,071.00	18.41	341.62	8,707.83	1,951.26	-934.03	2,056.51	0.31	-0.24	0.60
9,165.00	17.11	342.15	8,797.35	1,978.51	-942.95	2,084.69	1.39	-1.38	0.56
9,259.00	16.14	343.45	8,887.42	2,004.19	-950.91	2,111.20	1.11	-1.03	1.38
9,352.00	14.60	343.91	8,977.09	2,027.85	-957.84	2,135.55	1.66	-1.66	0.49
9,446.00	12.67	345.08	9,068.43	2,049.19	-963.78	2,157.49	2.07	-2.05	1.24
9,522.00	12.78	344.29	9,142.57	2,065.34	-968.20	2,174.08	0.27	0.14	-1.04
9,554.00	13.31	343.16	9,173.74	2,072.27	-970.22	2,181.21	1.84	1.66	-3.53
9,649.00	16.87	339.67	9,265.45	2,095.67	-978.18	2,205.45	3.87	3.75	-3.67
9,745.00	20.08	335.60	9,356.50	2,123.75	-989.83	2,234.81	3.60	3.34	-4.24
9,837.00	20.80	332.04	9,442.71	2,152.56	-1,004.02	2,265.23	1.56	0.78	-3.87
9,932.00	20.90	328.48	9,531.49	2,181.91	-1,020.79	2,296.51	1.34	0.11	-3.75
10,026.00	20.06	329.42	9,619.55	2,210.08	-1,037.75	2,326.66	0.96	-0.89	1.00
10,121.00	19.48	327.46	9,708.95	2,237.46	-1,054.56	2,356.00	0.93	-0.61	-2.06
10,215.00	18.45	326.26	9,797.85	2,263.04	-1,071.26	2,383.55	1.17	-1.10	-1.28
10,311.00	16.98	326.92	9,889.29	2,287.42	-1,087.34	2,409.82	1.55	-1.53	0.69
10,406.00	17.69	331.28	9,979.98	2,311.71	-1,101.85	2,435.79	1.56	0.75	4.59
10,500.00	18.42	331.41	10,069.35	2,337.27	-1,115.82	2,462.96	0.78	0.78	0.14
10,530.00	17.92	331.94	10,097.85	2,345.51	-1,120.26	2,471.70	1.76	-1.67	1.77

Scientific Drilling International

Survey Report

Company:	Continental Resources Inc.	**Local Co-ordinate Reference:**	Well Columbus Federal 1-16H
Project:	McKenzie County, ND NAD83	**TVD Reference:**	GL1920' & KB 22' @ 1942.00ft (Patterson 490)
Site:	Columbus Federal	**MD Reference:**	GL1920' & KB 22' @ 1942.00ft (Patterson 490)
Well:	Columbus Federal 1-16H	**North Reference:**	True
Wellbore:	OH	**Survey Calculation Method:**	Minimum Curvature
Design:	OH	**Database:**	Casper District

Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
10,562.00	19.05	331.83	10,128.20	2,354.45	-1,125.04	2,481.20	3.53	3.53	-0.34
10,594.00	22.17	333.17	10,158.15	2,364.45	-1,130.23	2,491.78	9.86	9.75	4.19
10,625.00	23.46	338.26	10,186.73	2,375.40	-1,135.16	2,503.29	7.60	4.16	16.42
10,657.00	26.81	340.08	10,215.69	2,388.11	-1,139.98	2,516.51	10.74	10.47	5.69
10,689.00	28.04	341.38	10,244.10	2,402.02	-1,144.84	2,530.94	4.27	3.84	4.06
10,720.00	31.57	340.33	10,270.99	2,416.57	-1,149.90	2,546.03	11.51	11.39	-3.39
10,752.00	35.96	339.55	10,297.59	2,433.27	-1,156.01	2,563.38	13.79	13.72	-2.44
10,783.00	39.93	336.61	10,322.03	2,450.94	-1,163.14	2,581.83	14.07	12.81	-9.48
10,815.00	42.13	335.46	10,346.17	2,470.13	-1,171.67	2,601.97	7.27	6.88	-3.59
10,846.00	45.09	336.59	10,368.61	2,489.67	-1,180.36	2,622.47	9.87	9.55	3.65
10,878.00	49.05	334.49	10,390.41	2,510.98	-1,190.07	2,644.87	13.27	12.38	-6.56
10,910.00	51.77	334.93	10,410.80	2,533.28	-1,200.60	2,668.35	8.57	8.50	1.38
10,942.00	54.04	333.97	10,430.10	2,556.30	-1,211.61	2,692.62	7.49	7.09	-3.00
10,974.00	57.84	330.75	10,448.02	2,579.77	-1,223.92	2,717.49	14.51	11.88	-10.06
11,006.00	61.64	330.77	10,464.14	2,603.88	-1,237.42	2,743.16	11.88	11.88	0.06
11,038.00	66.36	330.32	10,478.17	2,628.92	-1,251.56	2,769.83	14.80	14.75	-1.41
11,070.00	70.61	330.21	10,489.90	2,654.76	-1,266.32	2,797.38	13.29	13.28	-0.34
11,102.00	74.61	329.84	10,499.46	2,681.21	-1,281.58	2,825.59	12.55	12.50	-1.16
11,133.00	76.95	328.80	10,507.08	2,707.05	-1,296.91	2,853.22	8.22	7.55	-3.35
11,165.00	77.08	328.58	10,514.27	2,733.69	-1,313.11	2,881.74	0.78	0.41	-0.69
11,196.00	78.10	326.89	10,520.93	2,759.29	-1,329.27	2,909.23	6.26	3.29	-5.45
11,228.00	81.32	325.37	10,526.64	2,785.43	-1,346.82	2,937.44	11.09	10.06	-4.75
11,259.00	85.07	325.44	10,530.32	2,810.76	-1,364.29	2,964.84	12.10	12.10	0.23
11,291.00	88.02	327.44	10,532.25	2,837.38	-1,381.95	2,993.53	11.13	9.22	6.25
11,322.00	90.10	328.80	10,532.75	2,863.69	-1,398.32	3,021.76	8.02	6.71	4.39
11,343.00	90.27	328.09	10,532.69	2,881.59	-1,409.31	3,040.94	3.48	0.81	-3.38
Last Survey in 8 3/4" Hole									
11,403.00	90.92	327.18	10,532.06	2,932.26	-1,441.42	3,095.37	1.86	1.08	-1.52
First Survey in 6" Hole									
11,494.00	90.48	329.38	10,530.95	3,009.66	-1,489.26	3,178.35	2.47	-0.48	2.42
11,585.00	89.52	330.35	10,530.95	3,088.36	-1,534.95	3,262.34	1.50	-1.05	1.07
11,677.00	89.25	332.89	10,531.94	3,169.29	-1,578.67	3,348.29	2.78	-0.29	2.76
11,768.00	88.72	335.97	10,533.55	3,251.36	-1,617.94	3,434.78	3.43	-0.58	3.38
11,860.00	88.99	337.29	10,535.39	3,335.79	-1,654.42	3,523.25	1.46	0.29	1.43
11,951.00	89.60	341.16	10,536.51	3,420.85	-1,686.69	3,611.80	4.30	0.67	4.25
12,043.00	88.99	342.39	10,537.64	3,508.23	-1,715.46	3,702.18	1.49	-0.66	1.34
12,133.00	90.92	346.61	10,537.71	3,594.93	-1,739.50	3,791.28	5.16	2.14	4.69
12,224.00	91.19	348.19	10,536.04	3,683.72	-1,759.35	3,881.91	1.76	0.30	1.74
12,316.00	91.01	349.86	10,534.27	3,774.02	-1,776.86	3,973.72	1.83	-0.20	1.82
12,407.00	90.57	351.35	10,533.02	3,863.78	-1,791.72	4,064.65	1.71	-0.48	1.64
12,499.00	89.25	354.87	10,533.16	3,955.10	-1,802.75	4,156.63	4.09	-1.43	3.83
12,591.00	89.52	356.10	10,534.15	4,046.81	-1,809.99	4,248.50	1.37	0.29	1.34
12,683.00	89.69	359.44	10,534.78	4,138.73	-1,813.57	4,340.10	3.64	0.18	3.63
12,774.00	89.60	2.51	10,535.35	4,229.70	-1,812.02	4,430.09	3.38	-0.10	3.37

Company:	Continental Resources Inc.	**Local Co-ordinate Reference:**	Well Columbus Federal 1-16H
Project:	McKenzie County, ND NAD83	**TVD Reference:**	GL1920' & KB 22' @ 1942.00ft (Patterson 490)
Site:	Columbus Federal	**MD Reference:**	GL1920' & KB 22' @ 1942.00ft (Patterson 490)
Well:	Columbus Federal 1-16H	**North Reference:**	True
Wellbore:	OH	**Survey Calculation Method:**	Minimum Curvature
Design:	OH	**Database:**	Casper District

Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
12,869.00	88.90	4.97	10,536.59	4,324.48	-1,805.83	4,523.25	2.69	-0.74	2.59
12,963.00	88.99	7.08	10,538.32	4,417.94	-1,795.96	4,614.62	2.25	0.10	2.24
13,057.00	88.90	6.56	10,540.05	4,511.26	-1,784.80	4,705.68	0.56	-0.10	-0.55
13,152.00	89.43	6.12	10,541.44	4,605.67	-1,774.31	4,797.92	0.73	0.56	-0.46
13,248.00	90.57	6.91	10,541.44	4,701.05	-1,763.42	4,891.05	1.44	1.19	0.82
13,342.00	89.96	5.41	10,541.00	4,794.50	-1,753.33	4,982.39	1.72	-0.65	-1.60
13,436.00	89.52	5.24	10,541.43	4,888.09	-1,744.61	5,074.04	0.50	-0.47	-0.18
13,531.00	90.22	4.89	10,541.64	4,982.72	-1,736.22	5,166.77	0.82	0.74	-0.37
13,625.00	90.40	4.18	10,541.14	5,076.42	-1,728.79	5,258.70	0.78	0.19	-0.76
13,720.00	90.31	3.66	10,540.55	5,171.20	-1,722.30	5,351.81	0.56	-0.09	-0.55
13,816.00	90.57	3.92	10,539.81	5,266.99	-1,715.95	5,445.95	0.38	0.27	0.27
13,910.00	91.01	4.53	10,538.51	5,360.72	-1,709.03	5,537.98	0.80	0.47	0.65
14,006.00	90.92	4.36	10,536.90	5,456.42	-1,701.59	5,631.89	0.20	-0.09	-0.18
14,101.00	90.57	3.57	10,535.66	5,551.18	-1,695.02	5,724.98	0.91	-0.37	-0.83
14,195.00	91.10	1.63	10,534.29	5,645.07	-1,690.76	5,817.51	2.14	0.56	-2.06
14,290.00	91.01	1.20	10,532.54	5,740.03	-1,688.41	5,911.35	0.46	-0.09	-0.45
14,384.00	92.33	1.46	10,529.80	5,833.96	-1,686.23	6,004.19	1.43	1.40	0.28
14,480.00	91.45	2.25	10,526.64	5,929.85	-1,683.12	6,098.86	1.23	-0.92	0.82
14,575.00	88.90	1.81	10,526.35	6,024.79	-1,679.76	6,192.54	2.72	-2.68	-0.46
14,669.00	88.46	2.07	10,528.51	6,118.71	-1,676.58	6,285.24	0.54	-0.47	0.28
14,764.00	89.52	2.25	10,530.19	6,213.62	-1,673.00	6,378.88	1.13	1.12	0.19
14,858.00	92.07	2.69	10,528.88	6,307.52	-1,668.95	6,471.44	2.75	2.71	0.47
14,954.00	92.42	2.78	10,525.12	6,403.34	-1,664.37	6,565.84	0.38	0.36	0.09
15,048.00	91.80	3.04	10,521.66	6,497.15	-1,659.60	6,658.23	0.72	-0.66	0.28
15,143.00	90.31	2.95	10,519.91	6,592.00	-1,654.64	6,751.62	1.57	-1.57	-0.09
15,238.00	90.31	3.39	10,519.40	6,686.86	-1,649.39	6,844.97	0.46	0.00	0.46
15,333.00	90.40	3.66	10,518.81	6,781.67	-1,643.54	6,938.22	0.30	0.09	0.28
15,427.00	89.78	3.92	10,518.66	6,875.47	-1,637.33	7,030.40	0.72	-0.66	0.28
15,522.00	89.25	4.89	10,519.47	6,970.18	-1,630.04	7,123.35	1.16	-0.56	1.02
15,617.00	88.90	5.15	10,521.00	7,064.81	-1,621.72	7,216.07	0.46	-0.37	0.27
15,711.00	89.78	4.71	10,522.08	7,158.45	-1,613.65	7,307.86	1.05	0.94	-0.47
15,806.00	91.45	4.53	10,521.06	7,253.13	-1,605.99	7,400.74	1.77	1.76	-0.19
15,901.00	90.92	4.01	10,519.10	7,347.85	-1,598.92	7,493.72	0.78	-0.56	-0.55
15,996.00	88.81	2.34	10,519.32	7,442.69	-1,593.66	7,587.06	2.83	-2.22	-1.76
16,090.00	89.52	0.40	10,520.69	7,536.65	-1,591.41	7,679.92	2.20	0.76	-2.06
16,185.00	90.92	0.23	10,520.33	7,631.65	-1,590.89	7,774.04	1.48	1.47	-0.18
16,280.00	91.98	359.35	10,517.92	7,726.61	-1,591.24	7,868.24	1.45	1.12	-0.93
16,374.00	91.36	359.79	10,515.18	7,820.57	-1,591.95	7,961.48	0.81	-0.66	0.47
16,470.00	90.57	0.23	10,513.57	7,916.56	-1,591.93	8,056.64	0.94	-0.82	0.46
16,564.00	89.69	358.73	10,513.35	8,010.55	-1,592.78	8,149.94	1.85	-0.94	-1.60
16,659.00	88.99	357.68	10,514.45	8,105.49	-1,595.76	8,244.46	1.33	-0.74	-1.11
16,754.00	90.57	357.86	10,514.81	8,200.42	-1,599.45	8,339.06	1.67	1.66	0.19
16,849.00	90.04	358.82	10,514.31	8,295.37	-1,602.21	8,433.56	1.15	-0.56	1.01

Company:	Continental Resources Inc.	**Local Co-ordinate Reference:**	Well Columbus Federal 1-16H
Project:	McKenzie County, ND NAD83	**TVD Reference:**	GL1920' & KB 22' @ 1942.00ft (Patterson 490)
Site:	Columbus Federal	**MD Reference:**	GL1920' & KB 22' @ 1942.00ft (Patterson 490)
Well:	Columbus Federal 1-16H	**North Reference:**	True
Wellbore:	OH	**Survey Calculation Method:**	Minimum Curvature
Design:	OH	**Database:**	Casper District

Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
16,944.00	88.99	358.73	10,515.11	8,390.35	-1,604.24	8,527.99	1.11	-1.11	-0.09
17,039.00	87.67	357.68	10,517.88	8,485.26	-1,607.21	8,622.47	1.78	-1.39	-1.11
17,134.00	90.75	357.68	10,519.19	8,580.16	-1,611.06	8,717.06	3.24	3.24	0.00
17,229.00	91.54	359.53	10,517.29	8,675.11	-1,613.37	8,811.50	2.12	0.83	1.95
17,324.00	90.66	359.61	10,515.47	8,770.09	-1,614.08	8,905.76	0.93	-0.93	0.08
17,417.00	90.48	1.55	10,514.54	8,863.07	-1,613.14	8,997.83	2.09	-0.19	2.09
17,512.00	91.45	0.93	10,512.94	8,958.04	-1,611.08	9,091.71	1.21	1.02	-0.65
17,607.00	89.69	358.82	10,512.00	9,053.02	-1,611.29	9,185.91	2.89	-1.85	-2.22
17,702.00	90.04	357.33	10,512.22	9,147.96	-1,614.48	9,280.45	1.61	0.37	-1.57
17,797.00	90.31	357.42	10,511.93	9,242.86	-1,618.83	9,375.11	0.30	0.28	0.09
17,891.00	89.96	357.86	10,511.71	9,336.78	-1,622.70	9,468.73	0.60	-0.37	0.47
17,986.00	88.99	356.98	10,512.58	9,431.68	-1,626.98	9,563.37	1.38	-1.02	-0.93
18,082.00	89.25	358.12	10,514.05	9,527.58	-1,631.08	9,658.99	1.22	0.27	1.19
18,177.00	90.48	359.96	10,514.28	9,622.56	-1,632.67	9,753.36	2.33	1.29	1.94
18,271.00	90.22	1.20	10,513.70	9,716.55	-1,631.72	9,846.43	1.35	-0.28	1.32
18,367.00	89.52	1.72	10,513.92	9,812.52	-1,629.28	9,941.25	0.91	-0.73	0.54
18,462.00	89.56	1.71	10,514.68	9,907.47	-1,626.43	10,035.02	0.04	0.04	-0.01
18,558.00	88.99	1.55	10,515.90	10,003.43	-1,623.70	10,129.80	0.62	-0.59	-0.17
18,653.00	90.48	0.05	10,516.34	10,098.41	-1,622.38	10,223.80	2.23	1.57	-1.58
18,747.00	90.66	357.94	10,515.40	10,192.39	-1,624.03	10,317.18	2.25	0.19	-2.24
18,842.00	90.31	357.77	10,514.60	10,287.32	-1,627.58	10,411.76	0.41	-0.37	-0.18
18,937.00	89.87	357.94	10,514.45	10,382.25	-1,631.14	10,506.35	0.50	-0.46	0.18
19,031.00	89.34	358.38	10,515.10	10,476.20	-1,634.16	10,599.89	0.73	-0.56	0.47
19,126.00	91.10	355.39	10,514.73	10,571.04	-1,639.32	10,694.59	3.65	1.85	-3.15
19,221.00	89.25	356.19	10,514.44	10,665.78	-1,646.29	10,789.43	2.12	-1.95	0.84
19,316.00	88.72	356.45	10,516.13	10,760.57	-1,652.39	10,884.20	0.62	-0.56	0.27
19,410.00	90.40	356.89	10,516.85	10,854.41	-1,657.85	10,977.95	1.85	1.79	0.47
19,505.00	89.78	357.24	10,516.70	10,949.28	-1,662.71	11,072.65	0.75	-0.65	0.37
19,600.00	89.16	358.03	10,517.58	11,044.19	-1,666.63	11,167.26	1.06	-0.65	0.83
19,695.00	89.16	358.91	10,518.97	11,139.15	-1,669.17	11,261.73	0.93	0.00	0.93
19,790.00	90.75	359.44	10,519.04	11,234.14	-1,670.53	11,356.08	1.76	1.67	0.56
19,885.00	89.08	359.26	10,519.18	11,329.13	-1,671.61	11,450.40	1.77	-1.76	-0.19
19,979.00	87.76	359.35	10,521.78	11,423.08	-1,672.75	11,543.70	1.41	-1.40	0.10
20,074.00	90.84	358.82	10,522.94	11,518.05	-1,674.27	11,638.06	3.29	3.24	-0.56
20,169.00	89.69	359.52	10,522.50	11,613.04	-1,675.65	11,732.41	1.42	-1.21	0.74
20,263.00	90.22	359.53	10,522.57	11,707.03	-1,676.42	11,825.70	0.56	0.56	0.01
20,358.00	91.10	359.17	10,521.48	11,802.02	-1,677.50	11,920.02	1.00	0.93	-0.38
20,452.00	89.78	359.00	10,520.76	11,896.00	-1,679.00	12,013.39	1.42	-1.40	-0.18
20,547.00	89.25	0.05	10,521.56	11,991.00	-1,679.79	12,107.67	1.24	-0.56	1.11
20,642.00	87.58	0.14	10,524.19	12,085.96	-1,679.63	12,201.80	1.76	-1.76	0.09
20,737.00	86.53	0.14	10,529.07	12,180.83	-1,679.40	12,295.83	1.11	-1.11	0.00
20,832.00	88.37	0.40	10,533.29	12,275.73	-1,678.95	12,389.86	1.96	1.94	0.27
20,927.00	88.46	0.76	10,535.92	12,370.69	-1,677.99	12,483.88	0.39	0.09	0.38
21,021.00	91.45	0.49	10,536.00	12,464.67	-1,676.97	12,576.92	3.19	3.18	-0.29

Scientific Drilling International

Survey Report

Company:	Continental Resources Inc.	**Local Co-ordinate Reference:**	Well Columbus Federal 1-16H
Project:	McKenzie County, ND NAD83	**TVD Reference:**	GL1920' & KB 22' @ 1942.00ft (Patterson 490)
Site:	Columbus Federal	**MD Reference:**	GL1920' & KB 22' @ 1942.00ft (Patterson 490)
Well:	Columbus Federal 1-16H	**North Reference:**	True
Wellbore:	OH	**Survey Calculation Method:**	Minimum Curvature
Design:	OH	**Database:**	Casper District

Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
21,117.00	89.60	359.52	10,535.12	12,560.66	-1,676.96	12,672.09	2.18	-1.93	-1.01
21,211.00	90.22	1.11	10,535.26	12,654.66	-1,676.44	12,765.21	1.82	0.66	1.69
Last SDI MWD Survey									
21,276.00	90.22	1.11	10,535.01	12,719.64	-1,675.18	12,829.48	0.00	0.00	0.00
Projection to TD									

Design Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates +N/-S (ft)	Local Coordinates +E/-W (ft)	Comment
88.00	88.00	0.24	0.13	First SDI MWD Survey
11,343.00	10,532.69	2,881.59	-1,409.31	Last Survey in 8 3/4" Hole
11,403.00	10,532.06	2,932.26	-1,441.42	First Survey in 6" Hole
21,211.00	10,535.26	12,654.66	-1,676.44	Last SDI MWD Survey
21,276.00	10,535.01	12,719.64	-1,675.18	Projection to TD

Checked By: _____ Approved By: _____ Date: _____

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. 25156

RECEIVED MAY 2013 ND OIL & GAS DIVISION

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
- [ ] 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 **Open Hole Log Waiver**

Well Name and Number					
Columbus Federal 1-16H					
Footages	Qtr-Qtr	Section	Township	Range	
2593 F N L 318 F E L	SENE	16	153 N	101 W	
Field	Pool	County			
Indian Hill	Bakken	McKenzie			

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 Nance Petroleum, Corp of Engr 31-10, Sec 10-153N-101W, Williams Co.,ND.

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

* Approved Per logs run on # 10710 - Novak 1-7-3A

Company		Telephone Number
Continental Resources, Inc		580-233-8955
Address		
P.O. Box 1032		
City	State	Zip Code
Enid	OK	73702
Signature	Printed Name	
Terry L. Olson	Terry L. Olson	
Title	Date	
Regulatory Compliance Specialist	November 20, 2012	
Email Address		
terryolson@contres.com		

FOR STATE USE ONLY

- [ ] Received
- [x] Approved

Date 5-3-2013

By

Title Richard A. Suggs
Geologist

SUNDRY NOTICES AND REPORTS ON WELLS - FORM 4

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

Well File No. **25156**

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
☐ 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 **Change in Casing String & Add Tangent**	

Well Name and Number					
Columbus Federal 1-16H					
Footages	Qtr-Qtr	Section	Township	Range	
2593 F S L 318 F E L	NESE	16	N	W	
Field	Pool	County			
Baker	Bakken	McKenzie			

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. plans to add a freshwater string to the already-approved casing string. The freshwater string will be 13-3/8" 48# H-40 set to a depth of 500' and cemented to surface. CRI also proposes the following changes to the directional plan. CRI plans to build at 3°/100 ft to 19° Inc starting at 2,040' MD and hold the 19° tangent at an azimuth of 334 to a depth of 10,595' KOP will be 10,595' MD 10,151' TVD building at 10°/100 ft and landing at the target formation at 11,305' MD 10,537' TVD. Intermediate casing pt will be located at 2,898' N and 1,423' W of SHL. Modified directional plan and casing program are attached.

Company: **Continental Resources, Inc.**		Telephone Number: **405-234-9000**
Address: **P.O. Box 268870**		
City: **Oklahoma City**	State: **OK**	Zip Code: **73126**
Signature: Terry L. Olson	Printed Name: **Terry L. Olson**	
Title: **Regulatory Compliance Specialist**	Date: **April 17, 2013**	
Email Address: **Terry.Olson@clr.com**		

FOR STATE USE ONLY

☐ Received	☒ Approved
Date: 4-19-13	
By: Nathaniel Erbele	
Title: Petroleum Resource Specialist	

4/17/2013

PRELIMINARY DRILLING PROGRAM

Lease and Well No. Columbus Federal 1-16H

MUD PROGRAM

Depth	Type	Weight	Remarks
0 ' - 1940 '	Freshwater	8.4-8.8	Add Soap Sticks for Mud Rings
1940 ' - 6500 '	Invert	9.3-9.5	35-50 sec, 10-30 cc's
6500 ' - 11305 '	Invert	9.6-10.0	40-55 sec, 10-15 cc's O/W 70/30 to 80/20
11305 ' - TD	Brine	8.7-10.0	29 Vis, No control, Dry Cuttings

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 "	1940 '	1940 '	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
		2000 '	1920 '	7 "	7", 26#, P-110 IC, LTC	ERW	BCI & Drift
		2720 '	720 '	7 "	7", 32#, P-110 IC, LTC	Seamless	BCI & Drift
		8490 '	5770 '	7 "	7", 29#, P-110 IC, LTC	ERW	BCI & Drift
		9610 '	1120 '	7 "	7", 32#, P-110 IC, LTC	Seamless	BCI & Drift
		11305 '	1695 '	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 "	21180 '	11070 '	4 1/2 "	4-1/2", 11.6 #, P-110, BTC		
Tubing		10150 '	10150 '	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: Guage hole + 55% excess, tail 30% of length, lead to surface.)								
		Lead	1360 '	0 '	431	35/65 Poz/Class "C", 3% CaCl, 12% gel	2.39	12
Surf	1940	Tail	1940 '	1360 '	301	Class "C", 2% CaCl	1.46	14.3
(Basis: Guage hole + 55% excess, tail 30% of length, lead to surface.)								
Int	11305	Lead	7850 '	0 '	461	35/65 Poz/Class "C", 3% KCl, 5 #/sk Silica	3.21	11.3
		Tail	11305 '	7850 '	425	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)								

Continental RESOURCES

Project: McKenzie County, ND NAD83
Site: Columbus Federal
Well: Columbus Federal 1-16H
Wellbore: OH
Design: Plan 7
Rig: Patterson 490

Plan: Plan 7 (Columbus Federal 1-16H/OH)

Created By: Seth Burstad
Date: 15:13, April 09 2013

Scientific Drilling

SECTION DETAILS

MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSect
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2040.00	0.00	0.00	2040.00	0.00	0.00	0.00	0.00	0.00
2674.00	19.02	333.85	2662.42	93.60	-45.95	3.00	333.85	98.70
10594.82	19.02	333.85	10150.80	2410.76	-1183.63	0.00	0.00	2542.17
11305.36	90.08	333.85	10537.00	2897.67	-1422.69	10.00	0.00	3055.62
11405.36	90.08	333.85	10536.86	2987.43	-1466.76	0.00	0.00	3150.28
12277.08	90.08	0.00	10535.62	3829.20	-1662.25	3.00	89.98	4010.12
21355.89	90.09	0.00	10522.00	12908.00	-1662.00	0.00	0.00	13014.56

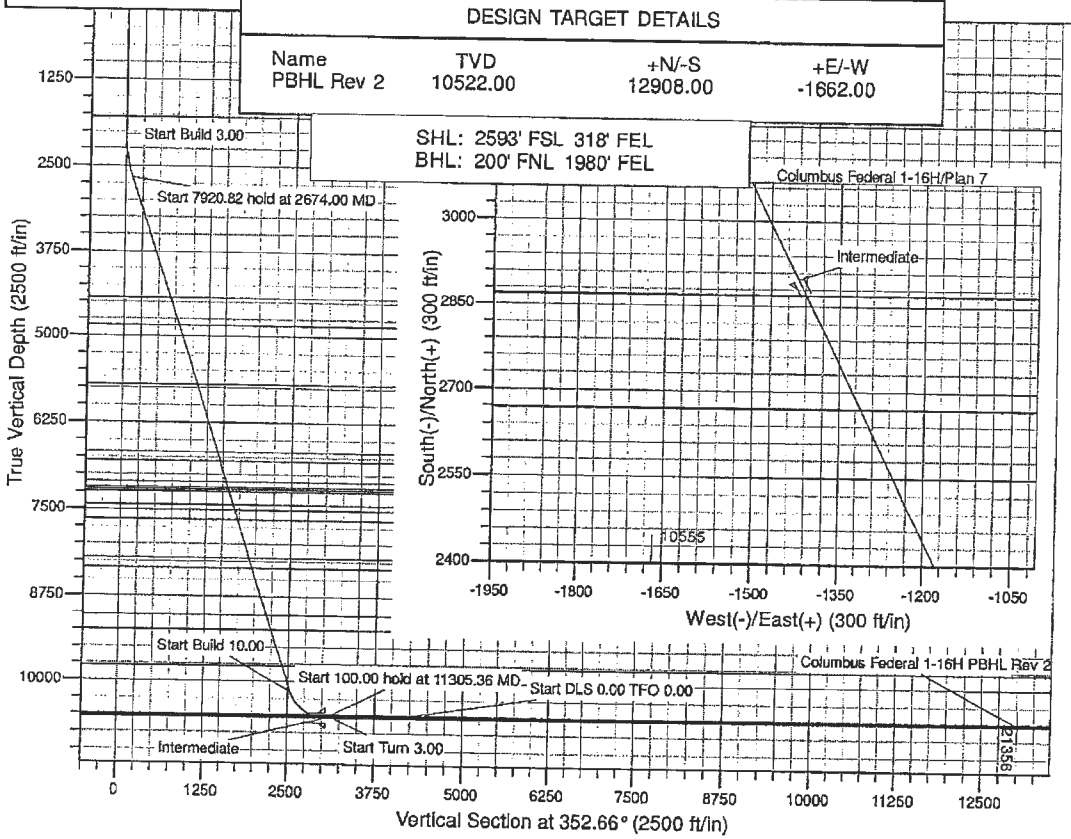
DESIGN TARGET DETAILS

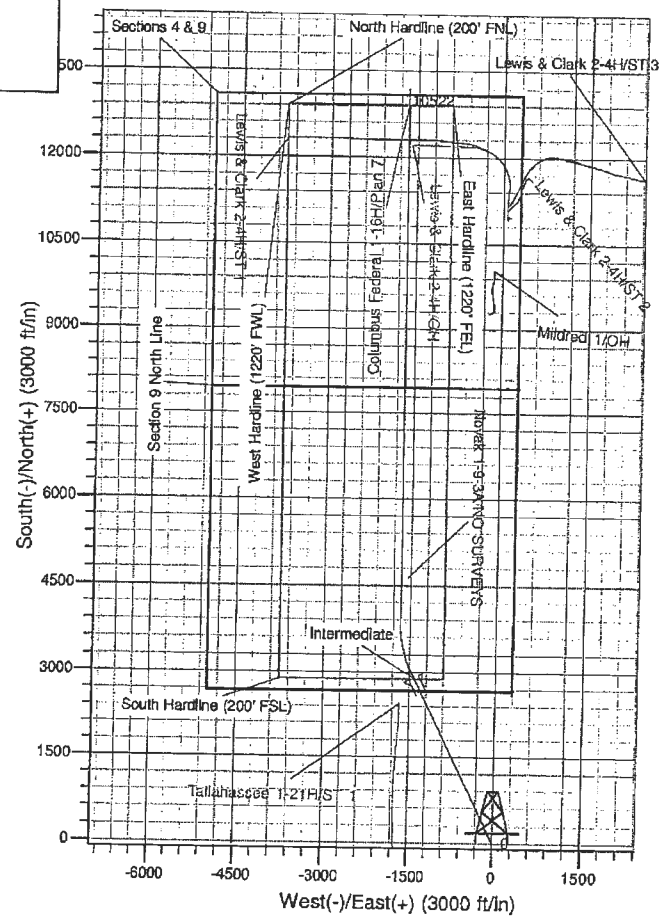
Name	TVD	+N/-S	+E/-W
PBHL Rev 2	10522.00	12908.00	-1662.00

SHL: 2593' FSL 318' FEL
BHL: 200' FNL 1980' FEL

T M Azimuths to True North
Magnetic North: 8.50°

Magnetic Field
Strength: 56558.5snT
Dip Angle: 73.04°
Date: 3/28/2013
Model: IGRF2010





Continental Resources Inc.

McKenzie County, ND NAD83
Columbus Federal
Columbus Federal 1-16H

OH

Plan: Plan 7

Standard Planning Report

09 April, 2013

Scientific Drilling International

Planning Report

Database:	Casper District	**Local Co-ordinate Reference:**	Well Columbus Federal 1-16H
Company:	Continental Resources Inc.	**TVD Reference:**	GL1920' & KB 22' @ 1942.00ft (Patterson 490)
Project:	McKenzie County, ND NAD83	**MD Reference:**	GL1920' & KB 22' @ 1942.00ft (Patterson 490)
Site:	Columbus Federal	**North Reference:**	True
Well:	Columbus Federal 1-16H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	OH		
Design:	Plan 7		

Project McKenzie County, ND NAD83

Map System:	US State Plane 1983	**System Datum:**	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	North Dakota Northern Zone		

Site Columbus Federal

Site Position:		**Northing:**	408,041.66 usft	**Latitude:**	48° 4' 29.665 N
From:	Lat/Long	**Easting:**	1,193,719.94 usft	**Longitude:**	103° 40' 12.754 W
Position Uncertainty:	0.00 ft	**Slot Radius:**	13.200 in	**Grid Convergence:**	-2.36 °

Well Columbus Federal 1-18H, 2669' FNL 318' FEL Sec 16 T153N R101W

Well Position	**+N/-S**	-0.01 ft	**Northing:**	408,041.65 usft	**Latitude:**	48° 4' 29.665 N
	+E/-W	0.00 ft	**Easting:**	1,193,719.94 usft	**Longitude:**	103° 40' 12.754 W
Position Uncertainty		0.00 ft	**Wellhead Elevation:**		**Ground Level:**	1,920.00 ft

Wellbore OH

Magnetics	**Model Name**	**Sample Date**	**Declination (°)**	**Dip Angle (°)**	**Field Strength (nT)**
	IGRF2010	3/28/2013	8.50	73.04	56,559

Design Plan 7

Audit Notes:

Version:		**Phase:**	PLAN	**Tie On Depth:**	0.00

Vertical Section:	**Depth From (TVD) (ft)**	**+N/-S (ft)**	**+E/-W (ft)**	**Direction (°)**
	0.00	0.00	0.00	352.66

Plan Sections

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	TFO (°)	Target
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
2,040.00	0.00	0.00	2,040.00	0.00	0.00	0.00	0.00	0.00	0.00	
2,874.00	19.02	333.85	2,662.42	93.60	-45.95	3.00	3.00	0.00	333.85	
10,594.82	19.02	333.85	10,150.80	2,410.76	-1,183.63	0.00	0.00	0.00	0.00	
11,305.36	90.08	333.85	10,537.00	2,897.67	-1,422.69	10.00	10.00	0.00	0.00	
11,405.36	90.08	333.85	10,536.86	2,987.43	-1,466.76	0.00	0.00	0.00	0.00	
12,277.08	90.08	0.00	10,535.62	3,829.20	-1,662.25	3.00	0.00	3.00	89.98	Columbus Federal 1-'
21,355.88	90.09	0.00	10,522.00	12,908.00	-1,662.00	0.00	0.00	0.00	0.00	Columbus Federal 1-'

Scientific Drilling International

Planning Report

Database:	Casper District	**Local Co-ordinate Reference:**	Well Columbus Federal 1-16H
Company:	Continental Resources Inc.	**TVD Reference:**	GL1920' & KB 22' @ 1942.00ft (Patterson 490)
Project:	McKenzie County, ND NAD83	**MD Reference:**	GL1920' & KB 22' @ 1942.00ft (Patterson 490)
Site:	Columbus Federal	**North Reference:**	True
Well:	Columbus Federal 1-16H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	OH		
Design:	Plan 7		

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
100.00	0.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00
200.00	0.00	0.00	200.00	0.00	0.00	0.00	0.00	0.00	0.00
300.00	0.00	0.00	300.00	0.00	0.00	0.00	0.00	0.00	0.00
400.00	0.00	0.00	400.00	0.00	0.00	0.00	0.00	0.00	0.00
500.00	0.00	0.00	500.00	0.00	0.00	0.00	0.00	0.00	0.00
600.00	0.00	0.00	600.00	0.00	0.00	0.00	0.00	0.00	0.00
700.00	0.00	0.00	700.00	0.00	0.00	0.00	0.00	0.00	0.00
800.00	0.00	0.00	800.00	0.00	0.00	0.00	0.00	0.00	0.00
900.00	0.00	0.00	900.00	0.00	0.00	0.00	0.00	0.00	0.00
1,000.00	0.00	0.00	1,000.00	0.00	0.00	0.00	0.00	0.00	0.00
1,100.00	0.00	0.00	1,100.00	0.00	0.00	0.00	0.00	0.00	0.00
1,200.00	0.00	0.00	1,200.00	0.00	0.00	0.00	0.00	0.00	0.00
1,300.00	0.00	0.00	1,300.00	0.00	0.00	0.00	0.00	0.00	0.00
1,400.00	0.00	0.00	1,400.00	0.00	0.00	0.00	0.00	0.00	0.00
1,500.00	0.00	0.00	1,500.00	0.00	0.00	0.00	0.00	0.00	0.00
1,600.00	0.00	0.00	1,600.00	0.00	0.00	0.00	0.00	0.00	0.00
1,700.00	0.00	0.00	1,700.00	0.00	0.00	0.00	0.00	0.00	0.00
1,792.00	0.00	0.00	1,792.00	0.00	0.00	0.00	0.00	0.00	0.00
Pierre Shale									
1,800.00	0.00	0.00	1,800.00	0.00	0.00	0.00	0.00	0.00	0.00
1,900.00	0.00	0.00	1,900.00	0.00	0.00	0.00	0.00	0.00	0.00
2,000.00	0.00	0.00	2,000.00	0.00	0.00	0.00	0.00	0.00	0.00
2,040.00	0.00	0.00	2,040.00	0.00	0.00	0.00	0.00	0.00	0.00
Start Build 3.00									
2,100.00	1.80	333.85	2,099.99	0.85	-0.42	0.89	3.00	3.00	0.00
2,200.00	4.80	333.85	2,199.81	6.01	-2.95	6.34	3.00	3.00	0.00
2,300.00	7.80	333.85	2,299.20	15.86	-7.79	16.73	3.00	3.00	0.00
2,400.00	10.80	333.85	2,397.87	30.37	-14.91	32.02	3.00	3.00	0.00
2,500.00	13.80	333.85	2,495.57	49.49	-24.30	52.18	3.00	3.00	0.00
2,600.00	16.80	333.85	2,592.01	73.17	-35.92	77.16	3.00	3.00	0.00
2,674.00	19.02	333.85	2,662.42	93.60	-45.95	98.70	3.00	3.00	0.00
Start 7920.82 hold at 2674.00 MD									
2,700.00	19.02	333.85	2,687.00	101.20	-49.69	106.72	0.00	0.00	0.00
2,800.00	19.02	333.85	2,781.54	130.46	-64.05	137.57	0.00	0.00	0.00
2,900.00	19.02	333.85	2,876.08	159.71	-78.41	168.42	0.00	0.00	0.00
3,000.00	19.02	333.85	2,970.62	188.96	-92.78	199.27	0.00	0.00	0.00
3,100.00	19.02	333.85	3,065.16	218.22	-107.14	230.11	0.00	0.00	0.00
3,200.00	19.02	333.85	3,159.70	247.47	-121.50	260.96	0.00	0.00	0.00
3,300.00	19.02	333.85	3,254.24	276.73	-135.87	291.81	0.00	0.00	0.00
3,400.00	19.02	333.85	3,348.78	305.98	-150.23	322.66	0.00	0.00	0.00
3,500.00	19.02	333.85	3,443.32	335.23	-164.59	353.51	0.00	0.00	0.00
3,600.00	19.02	333.85	3,537.86	364.49	-178.96	384.36	0.00	0.00	0.00
3,700.00	19.02	333.85	3,632.41	393.74	-193.32	415.21	0.00	0.00	0.00
3,800.00	19.02	333.85	3,726.95	423.00	-207.68	446.06	0.00	0.00	0.00
3,900.00	19.02	333.85	3,821.49	452.25	-222.04	476.90	0.00	0.00	0.00
4,000.00	19.02	333.85	3,916.03	481.50	-236.41	507.75	0.00	0.00	0.00
4,100.00	19.02	333.85	4,010.57	510.76	-250.77	538.60	0.00	0.00	0.00
4,200.00	19.02	333.85	4,105.11	540.01	-265.13	569.45	0.00	0.00	0.00
4,300.00	19.02	333.85	4,199.65	569.27	-279.50	600.30	0.00	0.00	0.00
4,400.00	19.02	333.85	4,294.19	598.52	-293.86	631.15	0.00	0.00	0.00
4,500.00	19.02	333.85	4,388.73	627.78	-308.22	662.00	0.00	0.00	0.00

Scientific Drilling International

Planning Report

Database:	Casper District	**Local Co-ordinate Reference:**	Well Columbus Federal 1-16H
Company:	Continental Resources Inc.	**TVD Reference:**	GL1920' & KB 22' @ 1942.00ft (Patterson 490)
Project:	McKenzie County, ND NAD83	**MD Reference:**	GL1920' & KB 22' @ 1942.00ft (Patterson 490)
Site:	Columbus Federal	**North Reference:**	True
Well:	Columbus Federal 1-16H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	OH		
Design:	Plan 7		

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
4,560.58	19.02	333.85	4,446.00	645.50	-316.92	680.68	0.00	0.00	0.00
Greenhorn									
4,600.00	19.02	333.85	4,483.27	657.03	-322.59	692.84	0.00	0.00	0.00
4,700.00	19.02	333.85	4,577.81	686.28	-336.95	723.69	0.00	0.00	0.00
4,800.00	19.02	333.85	4,672.35	715.54	-351.31	754.54	0.00	0.00	0.00
4,900.00	19.02	333.85	4,766.89	744.79	-365.68	785.39	0.00	0.00	0.00
4,981.58	19.02	333.85	4,844.00	768.65	-377.39	810.55	0.00	0.00	0.00
Dakota Group (Mowry)									
5,000.00	19.02	333.85	4,861.43	774.05	-380.04	816.24	0.00	0.00	0.00
5,100.00	19.02	333.85	4,955.97	803.30	-394.40	847.09	0.00	0.00	0.00
5,200.00	19.02	333.85	5,050.51	832.55	-408.76	877.94	0.00	0.00	0.00
5,300.00	19.02	333.85	5,145.05	861.81	-423.13	908.79	0.00	0.00	0.00
5,400.00	19.02	333.85	5,239.59	891.06	-437.49	939.63	0.00	0.00	0.00
5,500.00	19.02	333.85	5,334.13	920.32	-451.85	970.48	0.00	0.00	0.00
5,600.00	19.02	333.85	5,428.67	949.57	-466.22	1,001.33	0.00	0.00	0.00
5,700.00	19.02	333.85	5,523.21	978.82	-480.58	1,032.18	0.00	0.00	0.00
5,800.00	19.02	333.85	5,617.76	1,008.08	-494.94	1,063.03	0.00	0.00	0.00
5,899.69	19.02	333.85	5,712.00	1,037.24	-509.26	1,093.78	0.00	0.00	0.00
Base of Dakota Sand									
5,900.00	19.02	333.85	5,712.30	1,037.33	-509.31	1,093.88	0.00	0.00	0.00
6,000.00	19.02	333.85	5,806.84	1,066.59	-523.67	1,124.73	0.00	0.00	0.00
6,100.00	19.02	333.85	5,901.38	1,095.84	-538.03	1,155.58	0.00	0.00	0.00
6,200.00	19.02	333.85	5,995.92	1,125.09	-552.40	1,186.42	0.00	0.00	0.00
6,300.00	19.02	333.85	6,090.46	1,154.35	-566.76	1,217.27	0.00	0.00	0.00
6,400.00	19.02	333.85	6,185.00	1,183.60	-581.12	1,248.12	0.00	0.00	0.00
6,500.00	19.02	333.85	6,279.54	1,212.86	-595.48	1,278.97	0.00	0.00	0.00
6,600.00	19.02	333.85	6,374.08	1,242.11	-609.85	1,309.82	0.00	0.00	0.00
6,700.00	19.02	333.85	6,468.62	1,271.36	-624.21	1,340.67	0.00	0.00	0.00
6,800.00	19.02	333.85	6,563.16	1,300.62	-638.57	1,371.52	0.00	0.00	0.00
6,900.00	19.02	333.85	6,657.70	1,329.87	-652.94	1,402.37	0.00	0.00	0.00
6,923.59	19.02	333.85	6,680.00	1,336.77	-656.32	1,409.64	0.00	0.00	0.00
Dunham Salt Top									
7,000.00	19.02	333.85	6,752.24	1,359.13	-667.30	1,433.21	0.00	0.00	0.00
7,063.21	19.02	333.85	6,812.00	1,377.62	-676.38	1,452.71	0.00	0.00	0.00
Dunham Salt Base									
7,100.00	19.02	333.85	6,846.78	1,388.38	-681.66	1,464.06	0.00	0.00	0.00
7,200.00	19.02	333.85	6,941.32	1,417.63	-696.03	1,494.91	0.00	0.00	0.00
7,300.00	19.02	333.85	7,035.86	1,446.89	-710.39	1,525.76	0.00	0.00	0.00
7,378.42	19.02	333.85	7,110.00	1,469.83	-721.65	1,549.95	0.00	0.00	0.00
Pine Salt Top									
7,400.00	19.02	333.85	7,130.40	1,476.14	-724.75	1,556.61	0.00	0.00	0.00
7,456.69	19.02	333.85	7,184.00	1,492.73	-732.90	1,574.10	0.00	0.00	0.00
Pine Salt Base									
7,461.98	19.02	333.85	7,189.00	1,494.27	-733.65	1,575.73	0.00	0.00	0.00
Minnekahta									
7,488.42	19.02	333.85	7,214.00	1,502.01	-737.45	1,583.89	0.00	0.00	0.00
Opeche Salt Top									
7,500.00	19.02	333.85	7,224.94	1,505.40	-739.12	1,587.46	0.00	0.00	0.00
7,520.16	19.02	333.85	7,244.00	1,511.29	-742.01	1,593.68	0.00	0.00	0.00
Opeche Salt Base									
7,600.00	19.02	333.85	7,319.48	1,534.65	-753.48	1,618.31	0.00	0.00	0.00

Scientific Drilling International

Planning Report

Database:	Casper District	**Local Co-ordinate Reference:**	Well Columbus Federal 1-16H
Company:	Continental Resources Inc.	**TVD Reference:**	GL1920' & KB 22' @ 1942.00ft (Patterson 490)
Project:	McKenzie County, ND NAD83	**MD Reference:**	GL1920' & KB 22' @ 1942.00ft (Patterson 490)
Site:	Columbus Federal	**North Reference:**	True
Well:	Columbus Federal 1-16H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	OH		
Design:	Plan 7		

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
7,700.00	19.02	333.85	7,414.02	1,563.90	-767.84	1,649.16	0.00	0.00	0.00
7,723.24	19.02	333.85	7,436.00	1,570.70	-771.18	1,656.33	0.00	0.00	0.00
Minnelusa Group									
7,800.00	19.02	333.85	7,508.57	1,593.16	-782.20	1,680.00	0.00	0.00	0.00
7,900.00	19.02	333.85	7,603.11	1,622.41	-796.57	1,710.85	0.00	0.00	0.00
7,949.60	19.02	333.85	7,650.00	1,636.92	-803.69	1,726.15	0.00	0.00	0.00
Tyler									
8,000.00	19.02	333.85	7,697.65	1,651.67	-810.93	1,741.70	0.00	0.00	0.00
8,100.00	19.02	333.85	7,792.19	1,680.92	-825.29	1,772.55	0.00	0.00	0.00
8,200.00	19.02	333.85	7,886.73	1,710.17	-839.66	1,803.40	0.00	0.00	0.00
8,300.00	19.02	333.85	7,981.27	1,739.43	-854.02	1,834.25	0.00	0.00	0.00
8,400.00	19.02	333.85	8,075.81	1,768.68	-868.38	1,865.10	0.00	0.00	0.00
8,500.00	19.02	333.85	8,170.35	1,797.94	-882.75	1,895.95	0.00	0.00	0.00
8,533.48	19.02	333.85	8,202.00	1,807.73	-887.55	1,906.27	0.00	0.00	0.00
Kibbey									
8,600.00	19.02	333.85	8,264.89	1,827.19	-897.11	1,926.79	0.00	0.00	0.00
8,684.74	19.02	333.85	8,345.00	1,851.98	-909.28	1,952.93	0.00	0.00	0.00
Top Charles									
8,700.00	19.02	333.85	8,359.43	1,856.44	-911.47	1,957.64	0.00	0.00	0.00
8,800.00	19.02	333.85	8,453.97	1,885.70	-925.84	1,988.49	0.00	0.00	0.00
8,900.00	19.02	333.85	8,548.51	1,914.95	-940.20	2,019.34	0.00	0.00	0.00
9,000.00	19.02	333.85	8,643.05	1,944.21	-954.56	2,050.19	0.00	0.00	0.00
9,100.00	19.02	333.85	8,737.59	1,973.46	-968.92	2,081.04	0.00	0.00	0.00
9,200.00	19.02	333.85	8,832.13	2,002.71	-983.29	2,111.89	0.00	0.00	0.00
9,300.00	19.02	333.85	8,926.67	2,031.97	-997.65	2,142.73	0.00	0.00	0.00
9,400.00	19.02	333.85	9,021.21	2,061.22	-1,012.01	2,173.58	0.00	0.00	0.00
9,408.24	19.02	333.85	9,029.00	2,063.63	-1,013.20	2,176.12	0.00	0.00	0.00
Base Last Charles Salt									
9,500.00	19.02	333.85	9,115.75	2,090.48	-1,026.38	2,204.43	0.00	0.00	0.00
9,600.00	19.02	333.85	9,210.29	2,119.73	-1,040.74	2,235.28	0.00	0.00	0.00
9,642.00	19.02	333.85	9,250.00	2,132.02	-1,046.77	2,248.24	0.00	0.00	0.00
Mission Canyon									
9,700.00	19.02	333.85	9,304.83	2,148.98	-1,055.10	2,266.13	0.00	0.00	0.00
9,800.00	19.02	333.85	9,399.38	2,178.24	-1,069.47	2,296.98	0.00	0.00	0.00
9,900.00	19.02	333.85	9,493.92	2,207.49	-1,083.83	2,327.83	0.00	0.00	0.00
10,000.00	19.02	333.85	9,588.46	2,236.75	-1,098.19	2,358.68	0.00	0.00	0.00
10,100.00	19.02	333.85	9,683.00	2,266.00	-1,112.56	2,389.52	0.00	0.00	0.00
10,200.00	19.02	333.85	9,777.54	2,295.25	-1,126.92	2,420.37	0.00	0.00	0.00
10,210.01	19.02	333.85	9,787.00	2,298.18	-1,128.36	2,423.46	0.00	0.00	0.00
Lodgepole									
10,300.00	19.02	333.85	9,872.08	2,324.51	-1,141.28	2,451.22	0.00	0.00	0.00
10,400.00	19.02	333.85	9,966.62	2,353.76	-1,155.64	2,482.07	0.00	0.00	0.00
10,500.00	19.02	333.85	10,061.16	2,383.02	-1,170.01	2,512.92	0.00	0.00	0.00
10,594.82	19.02	333.85	10,150.80	2,410.76	-1,183.63	2,542.17	0.00	0.00	0.00
Start Build 10.00									
10,600.00	19.54	333.85	10,155.69	2,412.29	-1,184.38	2,543.79	10.00	10.00	0.00
10,700.00	29.54	333.85	10,246.54	2,449.52	-1,202.66	2,583.05	10.00	10.00	0.00
10,800.00	39.54	333.85	10,328.81	2,500.35	-1,227.62	2,638.65	10.00	10.00	0.00
10,900.00	49.54	333.85	10,400.00	2,563.23	-1,258.49	2,702.96	10.00	10.00	0.00
11,000.00	59.54	333.85	10,457.94	2,636.26	-1,294.34	2,779.96	10.00	10.00	0.00
11,100.00	69.54	333.85	10,500.87	2,717.20	-1,334.09	2,865.32	10.00	10.00	0.00

Scientific Drilling International

Planning Report

Database:	Casper District	**Local Co-ordinate Reference:**	Well Columbus Federal 1-16H
Company:	Continental Resources Inc.	**TVD Reference:**	GL1920' & KB 22' @ 1942.00ft (Patterson 490)
Project:	McKenzie County, ND NAD83	**MD Reference:**	GL1920' & KB 22' @ 1942.00ft (Patterson 490)
Site:	Columbus Federal	**North Reference:**	True
Well:	Columbus Federal 1-16H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	OH		
Design:	Plan 7		

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
11,103.27	69.87	333.85	10,502.00	2,719.95	-1,335.44	2,868.22	10.00	10.00	0.00
Upper Bakken Shale									
11,152.73	74.82	333.85	10,517.00	2,762.25	-1,356.20	2,912.83	10.00	10.00	0.00
Middle Bakken Member									
11,200.00	79.54	333.85	10,527.49	2,803.61	-1,376.51	2,956.44	10.00	10.00	0.00
11,300.00	89.54	333.85	10,536.98	2,892.85	-1,420.33	3,050.55	10.00	10.00	0.00
11,305.20	90.08	333.85	10,537.00	2,897.52	-1,422.62	3,055.47	10.00	10.00	0.00
Intermediate									
11,305.36	90.08	333.85	10,537.00	2,897.67	-1,422.69	3,055.62	10.00	10.00	0.00
Start 100.00 hold at 11305.36 MD - Middle Bakken Target									
11,400.00	90.08	333.85	10,536.87	2,982.62	-1,464.40	3,145.21	0.00	0.00	0.00
11,405.36	90.08	333.85	10,536.86	2,987.43	-1,466.76	3,150.28	0.00	0.00	0.00
Start Turn 3.00									
11,500.00	90.08	336.69	10,536.73	3,073.38	-1,506.35	3,240.58	3.00	0.00	3.00
11,600.00	90.08	339.69	10,536.59	3,166.21	-1,543.50	3,337.40	3.00	0.00	3.00
11,700.00	90.08	342.69	10,536.44	3,260.86	-1,575.74	3,435.39	3.00	0.00	3.00
11,800.00	90.08	345.69	10,536.30	3,357.07	-1,602.98	3,534.29	3.00	0.00	3.00
11,900.00	90.08	348.69	10,536.16	3,454.57	-1,625.15	3,633.82	3.00	0.00	3.00
12,000.00	90.08	351.69	10,536.01	3,553.09	-1,642.19	3,733.71	3.00	0.00	3.00
12,100.00	90.08	354.69	10,535.87	3,652.37	-1,654.05	3,833.70	3.00	0.00	3.00
12,200.00	90.08	357.69	10,535.73	3,752.14	-1,660.69	3,933.50	3.00	0.00	3.00
12,277.08	90.08	0.00	10,535.62	3,829.20	-1,662.25	4,010.12	3.00	0.00	3.00
Start DLS 0.00 TFO 0.00									
12,300.00	90.08	0.00	10,535.59	3,852.12	-1,662.25	4,032.86	0.00	0.00	0.00
12,400.00	90.08	0.00	10,535.45	3,952.12	-1,662.24	4,132.04	0.00	0.00	0.00
12,500.00	90.08	0.00	10,535.31	4,052.12	-1,662.24	4,231.22	0.00	0.00	0.00
12,600.00	90.08	0.00	10,535.17	4,152.12	-1,662.24	4,330.40	0.00	0.00	0.00
12,700.00	90.08	0.00	10,535.03	4,252.12	-1,662.24	4,429.58	0.00	0.00	0.00
12,800.00	90.08	0.00	10,534.89	4,352.12	-1,662.23	4,528.76	0.00	0.00	0.00
12,900.00	90.08	0.00	10,534.75	4,452.12	-1,662.23	4,627.94	0.00	0.00	0.00
13,000.00	90.08	0.00	10,534.61	4,552.12	-1,662.23	4,727.12	0.00	0.00	0.00
13,100.00	90.08	0.00	10,534.47	4,652.12	-1,662.23	4,826.30	0.00	0.00	0.00
13,200.00	90.08	0.00	10,534.32	4,752.12	-1,662.22	4,925.48	0.00	0.00	0.00
13,300.00	90.08	0.00	10,534.18	4,852.12	-1,662.22	5,024.66	0.00	0.00	0.00
13,400.00	90.08	0.00	10,534.04	4,952.12	-1,662.22	5,123.84	0.00	0.00	0.00
13,500.00	90.08	0.00	10,533.90	5,052.12	-1,662.21	5,223.03	0.00	0.00	0.00
13,600.00	90.08	0.00	10,533.75	5,152.12	-1,662.21	5,322.21	0.00	0.00	0.00
13,700.00	90.08	0.00	10,533.61	5,252.12	-1,662.21	5,421.39	0.00	0.00	0.00
13,800.00	90.08	0.00	10,533.47	5,352.12	-1,662.21	5,520.57	0.00	0.00	0.00
13,900.00	90.08	0.00	10,533.33	5,452.12	-1,662.20	5,619.75	0.00	0.00	0.00
14,000.00	90.08	0.00	10,533.18	5,552.12	-1,662.20	5,718.93	0.00	0.00	0.00
14,100.00	90.08	0.00	10,533.04	5,652.12	-1,662.20	5,818.11	0.00	0.00	0.00
14,200.00	90.08	0.00	10,532.89	5,752.12	-1,662.20	5,917.29	0.00	0.00	0.00
14,300.00	90.08	0.00	10,532.75	5,852.12	-1,662.19	6,016.47	0.00	0.00	0.00
14,400.00	90.08	0.00	10,532.61	5,952.12	-1,662.19	6,115.65	0.00	0.00	0.00
14,500.00	90.08	0.00	10,532.46	6,052.12	-1,662.19	6,214.83	0.00	0.00	0.00
14,600.00	90.08	0.00	10,532.32	6,152.12	-1,662.18	6,314.01	0.00	0.00	0.00
14,700.00	90.08	0.00	10,532.17	6,252.12	-1,662.18	6,413.19	0.00	0.00	0.00
14,800.00	90.08	0.00	10,532.03	6,352.12	-1,662.18	6,512.38	0.00	0.00	0.00
14,900.00	90.08	0.00	10,531.88	6,452.12	-1,662.18	6,611.56	0.00	0.00	0.00
15,000.00	90.08	0.00	10,531.73	6,552.12	-1,662.17	6,710.74	0.00	0.00	0.00

Scientific Drilling International

Planning Report

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Company:	Continental Resources Inc.	**TVD Reference:**	GL1920' & KB 22' @ 1942.00ft (Patterson 490)
Project:	McKenzie County, ND NAD83	**MD Reference:**	GL1920' & KB 22' @ 1942.00ft (Patterson 490)
Site:	Columbus Federal	**North Reference:**	True
Well:	Columbus Federal 1-16H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	OH		
Design:	Plan 7		

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
15,100.00	90.08	0.00	10,531.59	6,652.12	-1,662.17	6,809.92	0.00	0.00	0.00
15,200.00	90.08	0.00	10,531.44	6,752.12	-1,662.17	6,909.10	0.00	0.00	0.00
15,300.00	90.08	0.00	10,531.30	6,852.12	-1,662.17	7,008.28	0.00	0.00	0.00
15,400.00	90.08	0.00	10,531.15	6,952.12	-1,662.16	7,107.46	0.00	0.00	0.00
15,500.00	90.08	0.00	10,531.00	7,052.12	-1,662.16	7,206.64	0.00	0.00	0.00
15,600.00	90.08	0.00	10,530.86	7,152.12	-1,662.16	7,305.82	0.00	0.00	0.00
15,700.00	90.08	0.00	10,530.71	7,252.12	-1,662.15	7,405.00	0.00	0.00	0.00
15,800.00	90.08	0.00	10,530.56	7,352.12	-1,662.15	7,504.18	0.00	0.00	0.00
15,900.00	90.08	0.00	10,530.41	7,452.12	-1,662.15	7,603.36	0.00	0.00	0.00
16,000.00	90.08	0.00	10,530.26	7,552.12	-1,662.15	7,702.55	0.00	0.00	0.00
16,100.00	90.09	0.00	10,530.12	7,652.12	-1,662.14	7,801.73	0.00	0.00	0.00
16,200.00	90.09	0.00	10,529.97	7,752.12	-1,662.14	7,900.91	0.00	0.00	0.00
16,300.00	90.09	0.00	10,529.82	7,852.12	-1,662.14	8,000.09	0.00	0.00	0.00
16,400.00	90.09	0.00	10,529.67	7,952.12	-1,662.14	8,099.27	0.00	0.00	0.00
16,500.00	90.09	0.00	10,529.52	8,052.12	-1,662.13	8,198.45	0.00	0.00	0.00
16,600.00	90.09	0.00	10,529.37	8,152.12	-1,662.13	8,297.63	0.00	0.00	0.00
16,700.00	90.09	0.00	10,529.22	8,252.12	-1,662.13	8,396.81	0.00	0.00	0.00
16,800.00	90.09	0.00	10,529.07	8,352.12	-1,662.12	8,495.99	0.00	0.00	0.00
16,900.00	90.09	0.00	10,528.92	8,452.12	-1,662.12	8,595.17	0.00	0.00	0.00
17,000.00	90.09	0.00	10,528.77	8,552.12	-1,662.12	8,694.35	0.00	0.00	0.00
17,100.00	90.09	0.00	10,528.62	8,652.12	-1,662.12	8,793.53	0.00	0.00	0.00
17,200.00	90.09	0.00	10,528.47	8,752.12	-1,662.11	8,892.71	0.00	0.00	0.00
17,300.00	90.09	0.00	10,528.32	8,852.12	-1,662.11	8,991.90	0.00	0.00	0.00
17,400.00	90.09	0.00	10,528.17	8,952.12	-1,662.11	9,091.08	0.00	0.00	0.00
17,500.00	90.09	0.00	10,528.02	9,052.12	-1,662.11	9,190.26	0.00	0.00	0.00
17,600.00	90.09	0.00	10,527.86	9,152.12	-1,662.10	9,289.44	0.00	0.00	0.00
17,700.00	90.09	0.00	10,527.71	9,252.12	-1,662.10	9,388.62	0.00	0.00	0.00
17,800.00	90.09	0.00	10,527.56	9,352.12	-1,662.10	9,487.80	0.00	0.00	0.00
17,900.00	90.09	0.00	10,527.41	9,452.12	-1,662.09	9,586.98	0.00	0.00	0.00
18,000.00	90.09	0.00	10,527.26	9,552.12	-1,662.09	9,686.16	0.00	0.00	0.00
18,100.00	90.09	0.00	10,527.10	9,852.11	-1,662.09	9,785.34	0.00	0.00	0.00
18,200.00	90.09	0.00	10,526.95	9,752.11	-1,662.09	9,884.52	0.00	0.00	0.00
18,300.00	90.09	0.00	10,526.80	9,852.11	-1,662.08	9,983.70	0.00	0.00	0.00
18,400.00	90.09	0.00	10,526.64	9,952.11	-1,662.08	10,082.88	0.00	0.00	0.00
18,500.00	90.09	0.00	10,526.49	10,052.11	-1,662.08	10,182.06	0.00	0.00	0.00
18,600.00	90.09	0.00	10,526.33	10,152.11	-1,662.08	10,281.25	0.00	0.00	0.00
18,700.00	90.09	0.00	10,526.18	10,252.11	-1,662.07	10,380.43	0.00	0.00	0.00
18,800.00	90.09	0.00	10,526.03	10,352.11	-1,662.07	10,479.61	0.00	0.00	0.00
18,900.00	90.09	0.00	10,525.87	10,452.11	-1,662.07	10,578.79	0.00	0.00	0.00
19,000.00	90.09	0.00	10,525.72	10,552.11	-1,662.06	10,677.97	0.00	0.00	0.00
19,100.00	90.09	0.00	10,525.56	10,652.11	-1,662.06	10,777.15	0.00	0.00	0.00
19,200.00	90.09	0.00	10,525.41	10,752.11	-1,662.06	10,876.33	0.00	0.00	0.00
19,300.00	90.09	0.00	10,525.25	10,852.11	-1,662.06	10,975.51	0.00	0.00	0.00
19,400.00	90.09	0.00	10,525.09	10,952.11	-1,662.05	11,074.69	0.00	0.00	0.00
19,500.00	90.09	0.00	10,524.94	11,052.11	-1,662.05	11,173.87	0.00	0.00	0.00
19,600.00	90.09	0.00	10,524.78	11,152.11	-1,662.05	11,273.05	0.00	0.00	0.00
19,700.00	90.09	0.00	10,524.63	11,252.11	-1,662.05	11,372.23	0.00	0.00	0.00
19,800.00	90.09	0.00	10,524.47	11,352.11	-1,662.04	11,471.41	0.00	0.00	0.00
19,900.00	90.09	0.00	10,524.31	11,452.11	-1,662.04	11,570.60	0.00	0.00	0.00
20,000.00	90.09	0.00	10,524.15	11,552.11	-1,662.04	11,669.78	0.00	0.00	0.00
20,100.00	90.09	0.00	10,524.00	11,652.11	-1,662.03	11,768.96	0.00	0.00	0.00
20,200.00	90.09	0.00	10,523.84	11,752.11	-1,662.03	11,868.14	0.00	0.00	0.00

Scientific Drilling International

Planning Report

Database:	Casper District	**Local Co-ordinate Reference:**	Well Columbus Federal 1-16H
Company:	Continental Resources Inc.	**TVD Reference:**	GL1920' & KB 22' @ 1942.00ft (Patterson 490)
Project:	McKenzie County, ND NAD83	**MD Reference:**	GL1920' & KB 22' @ 1942.00ft (Patterson 490)
Site:	Columbus Federal	**North Reference:**	True
Well:	Columbus Federal 1-16H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	OH		
Design:	Plan 7		

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
20,300.00	90.09	0.00	10,523.68	11,852.11	-1,662.03	11,967.32	0.00	0.00	0.00
20,400.00	90.09	0.00	10,523.52	11,952.11	-1,662.03	12,066.50	0.00	0.00	0.00
20,500.00	90.09	0.00	10,523.37	12,052.11	-1,662.02	12,165.68	0.00	0.00	0.00
20,600.00	90.09	0.00	10,523.21	12,152.11	-1,662.02	12,264.86	0.00	0.00	0.00
20,700.00	90.09	0.00	10,523.05	12,252.11	-1,662.02	12,364.04	0.00	0.00	0.00
20,800.00	90.09	0.00	10,522.89	12,352.11	-1,662.02	12,463.22	0.00	0.00	0.00
20,900.00	90.09	0.00	10,522.73	12,452.11	-1,662.01	12,562.40	0.00	0.00	0.00
21,000.00	90.09	0.00	10,522.57	12,552.11	-1,662.01	12,661.58	0.00	0.00	0.00
21,100.00	90.09	0.00	10,522.41	12,652.11	-1,662.01	12,760.76	0.00	0.00	0.00
21,200.00	90.09	0.00	10,522.25	12,752.11	-1,662.00	12,859.95	0.00	0.00	0.00
21,300.00	90.09	0.00	10,522.09	12,852.11	-1,662.00	12,959.13	0.00	0.00	0.00
21,355.89	90.09	0.00	10,522.00	12,908.00	-1,662.00	13,014.56	0.00	0.00	0.00
TD at 21355.89									

Design Targets

Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (usft)	Easting (usft)	Latitude	Longitude
Columbus Federal 1-16H - plan hits target center - Point	0.00	0.00	10,522.00	12,908.00	-1,662.00	421,007.10	1,192,590.67	48° 6' 37.053 N	103° 40' 37.246 W

Casing Points

Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (in)	Hole Diameter (in)
11,305.20	10,537.00	Intermediate	7.000	8.750

Scientific Drilling International

Planning Report

Database:	Casper District	**Local Co-ordinate Reference:**	Well Columbus Federal 1-16H
Company:	Continental Resources Inc.	**TVD Reference:**	GL1920' & KB 22' @ 1942.00ft (Patterson 490)
Project:	McKenzie County, ND NAD83	**MD Reference:**	GL1920' & KB 22' @ 1942.00ft (Patterson 490)
Site:	Columbus Federal	**North Reference:**	True
Well:	Columbus Federal 1-16H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	OH		
Design:	Plan 7		

Formations

Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)
1,792.00	1,792.00	Pierre Shale		0.00	
4,560.58	4,446.00	Greenhorn		0.00	
4,981.56	4,844.00	Dakota Group (Mowry)		0.00	
5,899.69	5,712.00	Base of Dakota Sand		0.00	
6,923.59	6,680.00	Dunham Salt Top		0.00	
7,063.21	6,812.00	Dunham Salt Base		0.00	
7,378.42	7,110.00	Pine Salt Top		0.00	
7,456.69	7,184.00	Pine Salt Base		0.00	
7,461.98	7,189.00	Minnekahta		0.00	
7,488.42	7,214.00	Opeche Salt Top		0.00	
7,520.16	7,244.00	Opeche Salt Base		0.00	
7,723.24	7,436.00	Minnelusa Group		0.00	
7,949.60	7,650.00	Tyler		0.00	
8,533.48	8,202.00	Kibbey		0.00	
8,684.74	8,345.00	Top Charles		0.00	
9,408.24	9,029.00	Base Last Charles Salt		0.00	
9,642.00	9,250.00	Mission Canyon		0.00	
10,210.01	9,787.00	Lodgepole		0.00	
11,103.27	10,502.00	Upper Bakken Shale		0.00	
11,152.73	10,517.00	Middle Bakken Member		0.00	
11,305.36	10,537.00	Middle Bakken Target		0.00	

Plan Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates +N/-S (ft)	Local Coordinates +E/-W (ft)	Comment
2,040.00	2,040.00	0.00	0.00	Start Build 3.00
2,674.00	2,662.42	93.60	-45.95	Start 7920.82 hold at 2674.00 MD
10,594.82	10,150.60	2,410.76	-1,183.63	Start Build 10.00
11,305.36	10,537.00	2,897.67	-1,422.69	Start 100.00 hold at 11305.36 MD
11,405.36	10,536.86	2,987.43	-1,466.76	Start Turn 3.00
12,277.08	10,535.62	3,829.20	-1,662.25	Start DLS 0.00 TFO 0.00
21,355.89	10,522.00	12,908.00	-1,662.00	TD at 21355.89

25156

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.dmr.nd.gov/oilgas

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

Date: **3/18/2013**

RE: CORES AND SAMPLES

Well Name: **COLUMBUS FEDERAL 1-16H** Well File No.: **25156**
Location: **NESE 16-153-101** County: MCKENZIE
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

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

March 11, 2013

Terry L. Olson
Regulatory Compliance Specialist
CONTINENTAL RESOURCES, INC.
P.O. Box 268870
Oklahoma City, OK 73126

RE: HORIZONTAL WELL
COLUMBUS FEDERAL 1-16H
NESE Section 16-153N-101W
McKenzie County
Well File # 25156

Dear Terry:

Pursuant to Commission Order No. 21551, 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 **200' setback** from the north & south boundaries and **1220' setback** (per Commission policy) from the east & west boundaries within the 1280 acre spacing unit consisting of Sections 4 & 9-T153N-R101W.

PERMIT STIPULATIONS: No Drilling Pit will be allowed. The Rat and Mouse hole must be cemented. In cases where a spacing unit is accessed from an off-site drill pad, an affidavit must be provided affirming that the surface owner of the multi-well pad agrees to accept burial on their property of the cuttings generated from drilling the well(s) into an offsite spacing/drilling unit. Due to surficial water adjacent to the well site, a dike is required surrounding the entire location. CONTINENTAL RESOURCES, INC. must run open hole logs to include a porosity and resistivity log from KOP to the base of the surface casing. Liner required under the location. Spill contingency plan must be in place prior to spud. CONTINENTAL RESOURCES must contact NDIC Field Inspector Richard Dunn at 701-770-3554 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 coordinates from the well head at casing point are: 2869' N & 902' W. Also, based on the azimuth of the proposed lateral the maximum legal coordinate from the well head is: 12908' N and a minimum legal coordinate from the well head of 902' W.

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.

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 Thank you for your cooperation.

Sincerely,

David Tabor
Engineering Technician IV

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	Type of Well	Approximate Date Work Will Start	Confidential Status
New Location	Oil & Gas	12 / 1 / 2012	Yes

Operator	Telephone Number
CONTINENTAL RESOURCES, INC.	405-234-9000

Address	City	State	Zip Code
P.O. Box 268870	Oklahoma City	OK	73126

☑ 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	Well Number
COLUMBUS FEDERAL	1-16H

Surface Footages	Qtr-Qtr	Section	Township	Range	County
2593 F S L 318 F E L	NESE	16	153 N	101 W	McKenzie

Longstring Casing Point Footages	Qtr-Qtr	Section	Township	Range	County
203 F S L 1733 F E L	SWSE	9	153 N	101 W	McKenzie

Longstring Casing Point Coordinates From Well Head	Azimuth	Longstring Total Depth
2872 N From WH 1415 W From WH	334 °	13555 Feet MD 10543 Feet TVD

Bottom Hole Footages From Nearest Section Line	Qtr-Qtr	Section	Township	Range	County
200 F N L 1980 F E L	NWNE	4	153 N	101 W	McKenzie

Bottom Hole Coordinates From Well Head	KOP Lateral 1	Azimuth Lateral 1	Estimated Total Depth Lateral 1
12908 N From WH 1662 W From WH	10102 Feet MD	360 °	23633 Feet MD 10543 Feet TVD

Latitude of Well Head	Longitude of Well Head	NAD Reference	Description of (Subject to NDIC Approval)
48 ° 04 ' 29.67 "	-103 ° 40 ' 12.75 "	NAD83	Spacing Unit: Sections 4 & 9-T153N-R101W

Ground Elevation	Acres in Spacing/Drilling Unit	Spacing/Drilling Unit Setback Requirement	Industrial Commission Order
1928 Feet Above S.L.	1280	200 Feet N/S 1220 Feet E/W	21551

North Line of Spacing/Drilling Unit	South Line of Spacing/Drilling Unit	East Line of Spacing/Drilling Unit	West Line of Spacing/Drilling Unit
5279 Feet	5303 Feet	10455 Feet	10422 Feet

Objective Horizons	Pierre Shale Top
Middle Bakken	1841

Proposed	Size	Weight	Depth	Cement Volume	
Surface Casing	9 - 5/8 "	36 Lb./Ft.	1940 Feet	732 Sacks	NOTE: Surface hole must be drilled with fresh water and surface casing must be cemented back to surface.

Proposed	Size	Weight(s)	Longstring Total Depth	Cement Volume	Cement Top	Top Dakota Sand
Longstring Casing	7 - "	26-32 Lb./Ft.	13555 Feet MD 10543 Feet TVD	1163 Sacks	0 Feet	4826 Feet

Base Last Charles Salt (If Applicable)	
9031 Feet	NOTE: Intermediate or longstring casing string must be cemented above the top Dakota Group Sand.

Proposed Logs
CBL/GR from deepest depth obtainable to ground surface.

Drilling Mud Type (Vertical Hole - Below Surface Casing)	Drilling Mud Type (Lateral)
Invert	Brine

Survey Type in Vertical Portion of Well	Survey Frequency: Build Section	Survey Frequency: Lateral	Survey Contractor
MWD Every 100 Feet	30 Feet	90 Feet	LEAM Drilling Systems

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

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 N	Range W / County
Bottom Hole Footages From Nearest Section Line F L / F L	Qtr-Qtr	Section	Township N	Range W / 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 N	Range W / County
Bottom Hole Footages From Nearest Section Line F L / F L	Qtr-Qtr	Section	Township N	Range W / 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 N	Range W / County
Bottom Hole Footages From Nearest Section Line F L / F L	Qtr-Qtr	Section	Township N	Range W / 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 N	Range W / County
Bottom Hole Footages From Nearest Section Line F L / F L	Qtr-Qtr	Section	Township N	Range W / County

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

Date: 11 / 20 / 2012

ePermit	Printed Name: Terry L. Olson	Title: Regulatory Compliance Specialist

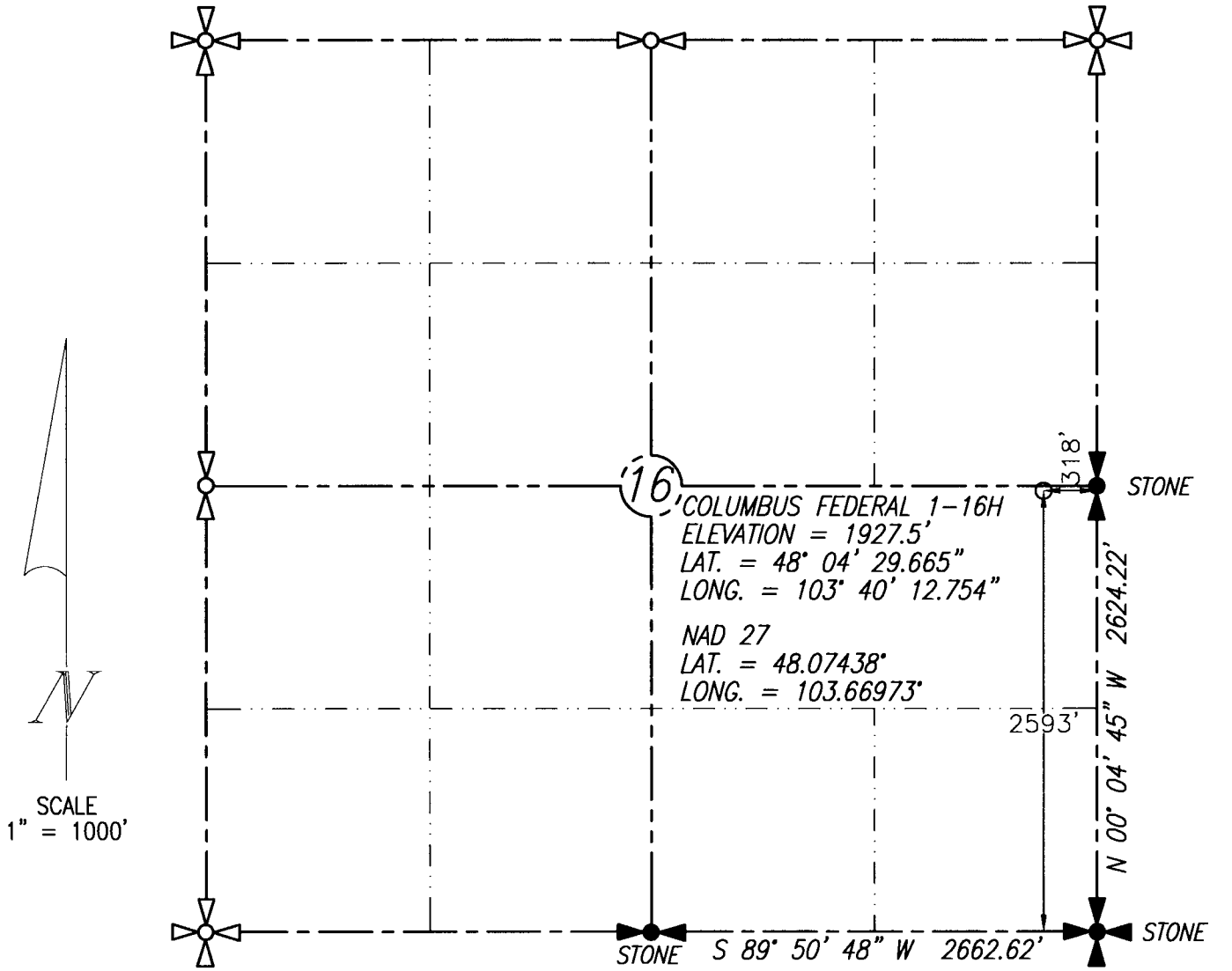
FOR STATE USE ONLY

Permit and File Number	API Number
25156	33 - 053 - 04852
Field: BAKER	
Pool: BAKKEN	Permit Type: DEVELOPMENT

FOR STATE USE ONLY

Date Approved
3 / 11 / 2013
By: David Tabor
Title: Engineering Technician IV

WELL LOCATION PLAT
CONTINENTAL RESOURCES INC.
COLUMBUS FEDERAL 1-16H
SECTION 16, T153N, R101W
MCKENZIE COUNTY, NORTH DAKOTA
2593' FSL & 318' FEL



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

3-8-13

JOHN PAULSON, R.L.S. 3366

JOHN PAULSON REGISTERED LAND SURVEYOR L.S. 3366 NORTH DAKOTA

DATE STAKED: 1-4-2012

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

DRILLING PROGNOSIS

Well Name: Columbus 1-16H
Rig: Cyclone
Prospect: Williston
Target: Middle Bakken
Spacing: 1280

☐ Pre-Staked
☑ Staked

SHL: 2593' FSL & 318' FEL
Sec. 16 - 153N - 101W
McKenzie , ND

BHL: 200' FNL & 1980' FEL
Sec. 4 - 153N - 101W
McKenzie , ND

Rig Grade Elevation: 1920'
KB: **21'**
RKB: **1941'**

FORMATION	SUBSEA	TVD	Comment
Pierre Shale	100	**1,841**	
Greenhorn	-2,484	**4,425**	
Dakota Group (fka Mowry)	-2,885	**4,826**	
Base of Dakota Sand	-3,764	**5,705**	
Dunham Salt Top	-4,792	**6,733**	
Dunham Salt Base	-4,852	**6,793**	
Pine Salt Top	-5,162	**7,103**	
Pine Salt Base	-5,218	**7,159**	
Minnekahta	-5,244	**7,185**	
Opeche Salt Top	NA	**NA**	
Opeche Salt Base	NA	**NA**	
Minnelusa Group	-5,530	**7,471**	
Tyler	-5,686	**7,627**	
Kibbey	-6,238	**8,179**	
Top Charles	-6,392	**8,333**	
Base Last Charles Salt	-7,090	**9,031**	
Mission Canyon	-7,314	**9,255**	
Lodgepole	-7,880	**9,821**	
Upper Bakken Shale	-8,570	**10,511**	
Middle Bakken Member	-8,587	**10,528**	
Middle Bakken Target	-8,602	**10,543**	
End of Lateral	-8,602	**10,543**	

11/15/2012

PRELIMINARY DRILLING PROGRAM

Lease and Well No. Columbus Federal 1-16H

MUD PROGRAM

Depth	Type	Weight	Remarks
0 ' - 1940 '	Freshwater	8.4-8.8	Freshwater
1940 ' - 6500 '	Invert	9.3-9.5	35-50 sec, 10-30 cc's
6500 ' - 13555 '	Invert	9.6-10.0	40-55 sec, 10-15 cc's O/W 70/30 to 80/20
13555 ' - TD	Brine	8.7-10.0	Cuttings only

TUBULAR PROGRAM

String Type	Hole Size	Depth	Feet	Casing Diameter	Weight, Grade, Connection	ERW/ Seamless	Critical Inspection
Surf	13 1/2 "	1940 '	1940 '	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
		8130 '	4130 '	7 "	7", 29#, P-110 IC, LTC	ERW	BCI & Drift
		9230 '	1100 '	7 "	7", 32#, P-110 IC, LTC	ERW	BCI & Drift
		13555 '	4325 '	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 "	23450 '	13390 '	4 1/2 "	4-1/2", 11.6 #, P-110, BTC		
Tubing		10100 '	10100 '	2 7/8 "	2-7/8", 6.5 #, L-80, EUE		

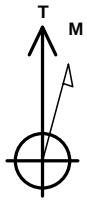
Notes: Pipe to end up in hole from top to bottom as shown.

CEMENT PROGRAM

String Type	SHOE/DV Depth	Stage Lead/Tail	Cement Bottom	Cement Top	No Sacks	Cement System	Cement Yield	Cement Weight
		Lead	1360 '	0 '	431	35/65 Poz/Class "C", 3% CaCl, 12% gel	2.39	12
Surf	1940	Tail	1940 '	1360 '	301	Class "C", 2% CaCl	1.46	14.3
(Basis: Guage hole + 55% excess, tail 30% of length, lead to surface.)								
Int	13555	Lead	7830 '	0 '	459	35/65 Poz/Class "G", 3% KCl, 5 #/sk Silica	3.21	11.3
		Tail	13555 '	7830 '	704	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)								

Continental Resources

Project: McKenzie County, ND
Site: Columbus Federal 1
Well: 1-16H
Wellbore: OH
Design: Plan #3c



Azimuths to True North
Magnetic North: 8.56°

Magnetic Field
Strength: 56596.1snT
Dip Angle: 73.06°
Date: 11/19/2012
Model: IGRF2010

SITE DETAILS: Columbus Federal 1

SHL
Sec. 16 - T153N - R101W
2593' FSL & 318' FEL

PBHL
Sec 4 - T153N - R101W
200' FNL & 1980' FEL

Site Centre Latitude: 48° 4' 29.665 N
Longitude: 103° 40' 12.754 W

Ground Level: 1920'
KB: 21.00'

CASING DETAILS

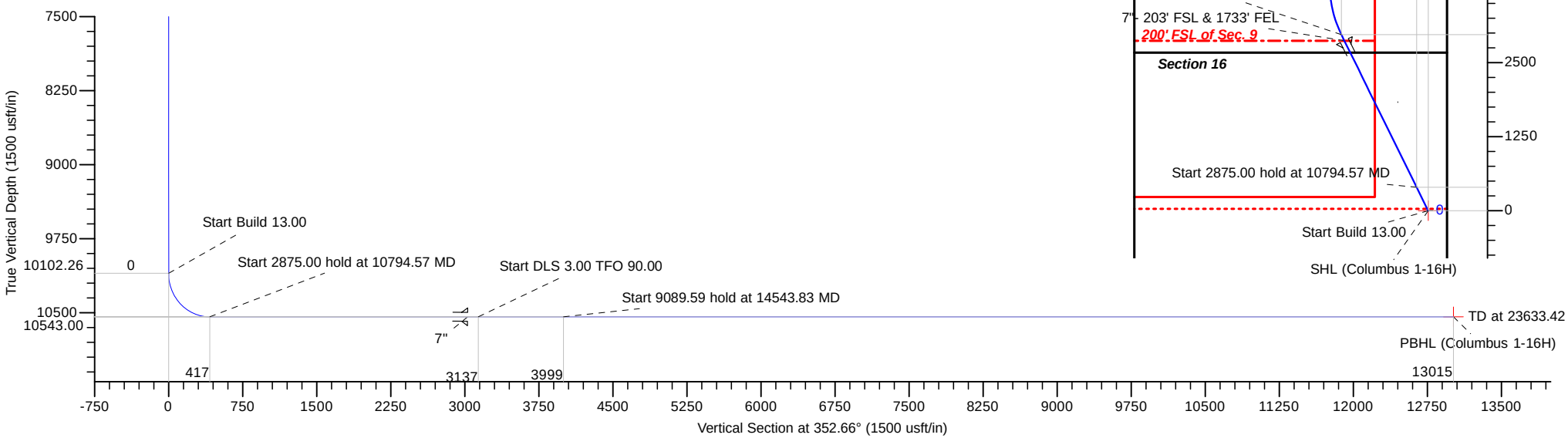
TVD	MD	Name	Size
10543.00	13555.00	7"	7

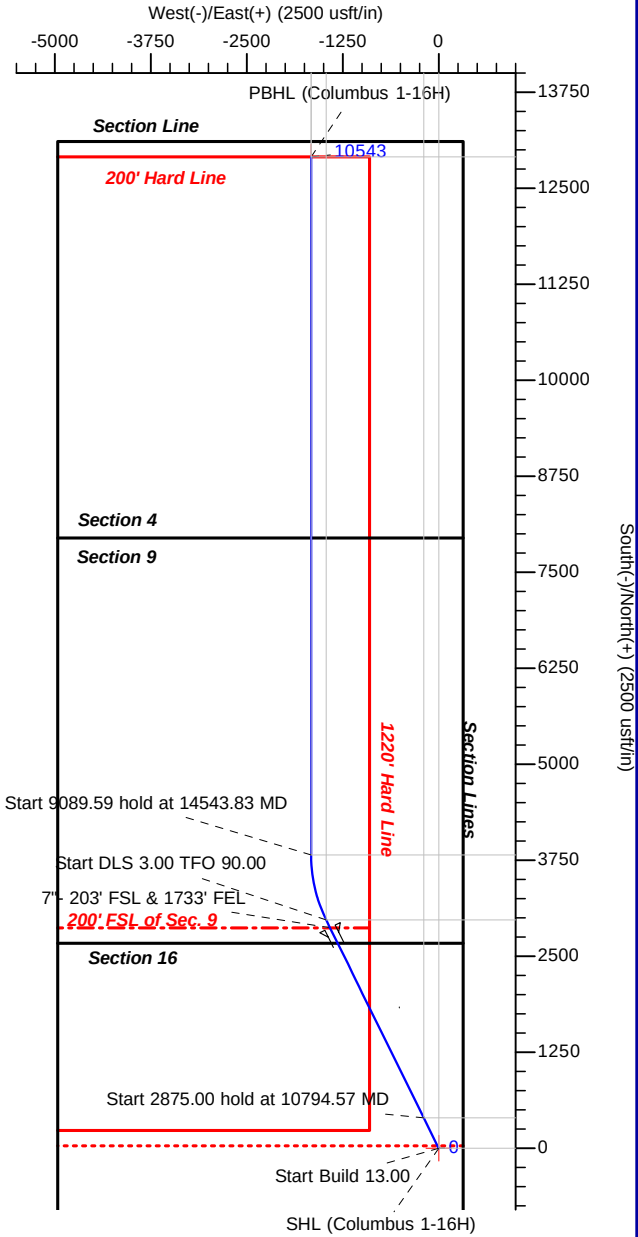
DESIGN TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
SHL (Columbus 1-16H)	0.00	0.00	0.00	408041.65	1193719.94	48° 4' 29.665 N	103° 40' 12.754 W
PBHL (Columbus 1-16H)	10543.00	12908.00	-1662.00	421007.12	1192590.67	48° 6' 37.053 N	103° 40' 37.246 W

SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSect	Target
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
2	10102.26	0.00	0.00	10102.26	0.00	0.00	0.00	0.00	0.00	
3	10794.57	90.00	333.77	10543.00	395.36	-194.78	13.00	333.77	417.00	
4	13669.57	90.00	333.77	10543.00	2974.36	-1465.37	0.00	0.00	3137.20	
5	14543.83	90.00	0.00	10543.00	3818.41	-1662.00	3.00	90.00	3999.45	
6	23633.42	90.00	0.00	10543.00	12908.00	-1662.00	0.00	0.00	13014.56	PBHL (Columbus 1-16H)





LEAM Drilling Systems LLC

LEAM DRILLING SYSTEMS LLC
2010 East Davis, Conroe, Texas 77301
Phone: 936/756-7577, Fax: 936/756-7595

Plan: Plan #3c (1-16H/OH)
Columbus Federal 1
Created By: Heber Claros Date: 11:17, March 11 2013
Date: _____
Approved: _____ Date: _____

LEAM Drilling Systems LLC

Planning Report

Database:	EDM 5000.1 Single User Db	**Local Co-ordinate Reference:**	Well 1-16H
Company:	Continental Resources	**TVD Reference:**	GL 1920+KB 21 @ 1941.00usft (Cyclone 20)
Project:	McKenzie County, ND	**MD Reference:**	GL 1920+KB 21 @ 1941.00usft (Cyclone 20)
Site:	Columbus Federal 1	**North Reference:**	True
Well:	1-16H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	OH		
Design:	Plan #3c		

Project McKenzie County, ND

Map System:	US State Plane 1983	**System Datum:**	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	North Dakota Northern Zone		

Site Columbus Federal 1, Sec. 16 - T153N - R101W

Site Position:		**Northing:**	408,041.65 usft	**Latitude:**	48° 4' 29.665 N
From:	Lat/Long	**Easting:**	1,193,719.94 usft	**Longitude:**	103° 40' 12.754 W
Position Uncertainty:	0.00 usft	**Slot Radius:**	0 "	**Grid Convergence:**	-2.36 °

Well 1-16H

Well Position	**+N/-S**	0.00 usft	**Northing:**	408,041.65 usft	**Latitude:**	48° 4' 29.665 N
	+E/-W	0.00 usft	**Easting:**	1,193,719.94 usft	**Longitude:**	103° 40' 12.754 W
Position Uncertainty		0.00 usft	**Wellhead Elevation:**		**Ground Level:**	1,920.00 usft

Wellbore OH

Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	11/19/2012	8.56	73.06	56,596

Design Plan #3c

Audit Notes:

Version:	1	**Phase:**	PLAN	**Tie On Depth:**	0.00

Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
	0.00	0.00	0.00	352.66

Plan Sections

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	TFO (°)	Target
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
10,102.26	0.00	0.00	10,102.26	0.00	0.00	0.00	0.00	0.00	0.00	
10,794.57	90.00	333.77	10,543.00	395.36	-194.78	13.00	13.00	0.00	333.77	
13,669.57	90.00	333.77	10,543.00	2,974.36	-1,465.37	0.00	0.00	0.00	0.00	
14,543.83	90.00	0.00	10,543.00	3,818.41	-1,662.00	3.00	0.00	3.00	90.00	
23,633.42	90.00	0.00	10,543.00	12,908.00	-1,662.00	0.00	0.00	0.00	0.00	PBHL (Columbus 1-1(

Database:	EDM 5000.1 Single User Db	**Local Co-ordinate Reference:**	Well 1-16H
Company:	Continental Resources	**TVD Reference:**	GL 1920+KB 21 @ 1941.00usft (Cyclone 20)
Project:	McKenzie County, ND	**MD Reference:**	GL 1920+KB 21 @ 1941.00usft (Cyclone 20)
Site:	Columbus Federal 1	**North Reference:**	True
Well:	1-16H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	OH		
Design:	Plan #3c		

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
10,102.26	0.00	0.00	10,102.26	0.00	0.00	0.00	0.00	0.00	0.00
10,125.00	2.96	333.77	10,124.99	0.53	-0.26	0.55	13.00	13.00	0.00
10,150.00	6.21	333.77	10,149.91	2.32	-1.14	2.44	13.00	13.00	0.00
10,175.00	9.46	333.77	10,174.67	5.37	-2.65	5.67	13.00	13.00	0.00
10,200.00	12.71	333.77	10,199.20	9.68	-4.77	10.21	13.00	13.00	0.00
10,225.00	15.96	333.77	10,223.42	15.23	-7.50	16.07	13.00	13.00	0.00
10,250.00	19.21	333.77	10,247.25	22.01	-10.84	23.21	13.00	13.00	0.00
10,275.00	22.46	333.77	10,270.61	29.98	-14.77	31.62	13.00	13.00	0.00
10,300.00	25.71	333.77	10,293.43	39.13	-19.28	41.27	13.00	13.00	0.00
10,325.00	28.96	333.77	10,315.64	49.42	-24.35	52.13	13.00	13.00	0.00
10,350.00	32.21	333.77	10,337.16	60.83	-29.97	64.16	13.00	13.00	0.00
10,375.00	35.46	333.77	10,357.92	73.32	-36.12	77.33	13.00	13.00	0.00
10,400.00	38.71	333.77	10,377.86	86.84	-42.78	91.59	13.00	13.00	0.00
10,425.00	41.96	333.77	10,396.92	101.35	-49.93	106.90	13.00	13.00	0.00
10,450.00	45.21	333.77	10,415.03	116.81	-57.55	123.20	13.00	13.00	0.00
10,475.00	48.46	333.77	10,432.13	133.16	-65.60	140.45	13.00	13.00	0.00
10,500.00	51.71	333.77	10,448.17	150.36	-74.08	158.59	13.00	13.00	0.00
10,525.00	54.96	333.77	10,463.10	168.34	-82.94	177.56	13.00	13.00	0.00
10,550.00	58.21	333.77	10,476.86	187.06	-92.16	197.30	13.00	13.00	0.00
10,575.00	61.46	333.77	10,489.43	206.45	-101.71	217.75	13.00	13.00	0.00
10,600.00	64.71	333.77	10,500.74	226.44	-111.56	238.84	13.00	13.00	0.00
10,625.00	67.96	333.77	10,510.78	246.98	-121.68	260.50	13.00	13.00	0.00
10,625.59	68.03	333.77	10,511.00	247.47	-121.92	261.02	13.00	13.00	0.00
Upper Bakken Shale									
10,650.00	71.21	333.77	10,519.50	267.99	-132.03	282.66	13.00	13.00	0.00
10,675.00	74.46	333.77	10,526.88	289.41	-142.58	305.26	13.00	13.00	0.00
10,679.27	75.01	333.77	10,528.00	293.11	-144.40	309.15	13.00	13.00	0.00
Middle Bakken Member									
10,700.00	77.71	333.77	10,532.89	311.18	-153.31	328.21	13.00	13.00	0.00
10,725.00	80.96	333.77	10,537.52	333.21	-164.16	351.46	13.00	13.00	0.00
10,750.00	84.21	333.77	10,540.74	355.45	-175.12	374.91	13.00	13.00	0.00
10,775.00	87.46	333.77	10,542.56	377.81	-186.14	398.50	13.00	13.00	0.00
10,794.55	90.00	333.77	10,543.00	395.34	-194.77	416.99	13.00	13.00	0.00
Middle Bakken Target									
10,794.57	90.00	333.77	10,543.00	395.36	-194.78	417.00	13.00	13.00	0.00
10,800.00	90.00	333.77	10,543.00	400.23	-197.18	422.15	0.00	0.00	0.00
10,900.00	90.00	333.77	10,543.00	489.94	-241.38	516.76	0.00	0.00	0.00
11,000.00	90.00	333.77	10,543.00	579.64	-285.57	611.38	0.00	0.00	0.00
11,100.00	90.00	333.77	10,543.00	669.35	-329.76	705.99	0.00	0.00	0.00
11,200.00	90.00	333.77	10,543.00	759.05	-373.96	800.61	0.00	0.00	0.00
11,300.00	90.00	333.77	10,543.00	848.76	-418.15	895.22	0.00	0.00	0.00
11,400.00	90.00	333.77	10,543.00	938.46	-462.35	989.84	0.00	0.00	0.00
11,500.00	90.00	333.77	10,543.00	1,028.16	-506.54	1,084.45	0.00	0.00	0.00
11,600.00	90.00	333.77	10,543.00	1,117.87	-550.74	1,179.07	0.00	0.00	0.00
11,700.00	90.00	333.77	10,543.00	1,207.57	-594.93	1,273.68	0.00	0.00	0.00
11,800.00	90.00	333.77	10,543.00	1,297.28	-639.12	1,368.30	0.00	0.00	0.00
11,900.00	90.00	333.77	10,543.00	1,386.98	-683.32	1,462.91	0.00	0.00	0.00
12,000.00	90.00	333.77	10,543.00	1,476.69	-727.51	1,557.53	0.00	0.00	0.00
12,100.00	90.00	333.77	10,543.00	1,566.39	-771.71	1,652.14	0.00	0.00	0.00
12,200.00	90.00	333.77	10,543.00	1,656.09	-815.90	1,746.76	0.00	0.00	0.00
12,300.00	90.00	333.77	10,543.00	1,745.80	-860.10	1,841.38	0.00	0.00	0.00
12,400.00	90.00	333.77	10,543.00	1,835.50	-904.29	1,935.99	0.00	0.00	0.00
12,500.00	90.00	333.77	10,543.00	1,925.21	-948.48	2,030.61	0.00	0.00	0.00

Database:	EDM 5000.1 Single User Db	**Local Co-ordinate Reference:**	Well 1-16H
Company:	Continental Resources	**TVD Reference:**	GL 1920+KB 21 @ 1941.00usft (Cyclone 20)
Project:	McKenzie County, ND	**MD Reference:**	GL 1920+KB 21 @ 1941.00usft (Cyclone 20)
Site:	Columbus Federal 1	**North Reference:**	True
Well:	1-16H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	OH		
Design:	Plan #3c		

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
12,600.00	90.00	333.77	10,543.00	2,014.91	-992.68	2,125.22	0.00	0.00	0.00
12,700.00	90.00	333.77	10,543.00	2,104.62	-1,036.87	2,219.84	0.00	0.00	0.00
12,800.00	90.00	333.77	10,543.00	2,194.32	-1,081.07	2,314.45	0.00	0.00	0.00
12,900.00	90.00	333.77	10,543.00	2,284.02	-1,125.26	2,409.07	0.00	0.00	0.00
13,000.00	90.00	333.77	10,543.00	2,373.73	-1,169.46	2,503.68	0.00	0.00	0.00
13,100.00	90.00	333.77	10,543.00	2,463.43	-1,213.65	2,598.30	0.00	0.00	0.00
13,200.00	90.00	333.77	10,543.00	2,553.14	-1,257.84	2,692.91	0.00	0.00	0.00
13,300.00	90.00	333.77	10,543.00	2,642.84	-1,302.04	2,787.53	0.00	0.00	0.00
13,400.00	90.00	333.77	10,543.00	2,732.55	-1,346.23	2,882.14	0.00	0.00	0.00
13,500.00	90.00	333.77	10,543.00	2,822.25	-1,390.43	2,976.76	0.00	0.00	0.00
13,555.00	90.00	333.77	10,543.00	2,871.59	-1,414.73	3,028.80	0.00	0.00	0.00
7"									
13,600.00	90.00	333.77	10,543.00	2,911.95	-1,434.62	3,071.38	0.00	0.00	0.00
13,669.57	90.00	333.77	10,543.00	2,974.36	-1,465.37	3,137.20	0.00	0.00	0.00
13,700.00	90.00	334.69	10,543.00	3,001.76	-1,478.60	3,166.07	3.00	0.00	3.00
13,800.00	90.00	337.69	10,543.00	3,093.24	-1,518.97	3,261.95	3.00	0.00	3.00
13,900.00	90.00	340.69	10,543.00	3,186.70	-1,554.50	3,359.19	3.00	0.00	3.00
14,000.00	90.00	343.69	10,543.00	3,281.90	-1,585.09	3,457.51	3.00	0.00	3.00
14,100.00	90.00	346.69	10,543.00	3,378.56	-1,610.66	3,556.65	3.00	0.00	3.00
14,200.00	90.00	349.69	10,543.00	3,476.43	-1,631.13	3,656.33	3.00	0.00	3.00
14,300.00	90.00	352.69	10,543.00	3,575.24	-1,646.45	3,756.29	3.00	0.00	3.00
14,400.00	90.00	355.69	10,543.00	3,674.71	-1,656.58	3,856.24	3.00	0.00	3.00
14,500.00	90.00	358.69	10,543.00	3,774.58	-1,661.50	3,955.92	3.00	0.00	3.00
14,543.83	90.00	0.00	10,543.00	3,818.41	-1,662.00	3,999.45	3.00	0.00	3.00
14,600.00	90.00	0.00	10,543.00	3,874.58	-1,662.00	4,055.16	0.00	0.00	0.00
14,700.00	90.00	0.00	10,543.00	3,974.58	-1,662.00	4,154.34	0.00	0.00	0.00
14,800.00	90.00	0.00	10,543.00	4,074.58	-1,662.00	4,253.52	0.00	0.00	0.00
14,900.00	90.00	0.00	10,543.00	4,174.58	-1,662.00	4,352.70	0.00	0.00	0.00
15,000.00	90.00	0.00	10,543.00	4,274.58	-1,662.00	4,451.88	0.00	0.00	0.00
15,100.00	90.00	0.00	10,543.00	4,374.58	-1,662.00	4,551.06	0.00	0.00	0.00
15,200.00	90.00	0.00	10,543.00	4,474.58	-1,662.00	4,650.24	0.00	0.00	0.00
15,300.00	90.00	0.00	10,543.00	4,574.58	-1,662.00	4,749.42	0.00	0.00	0.00
15,400.00	90.00	0.00	10,543.00	4,674.58	-1,662.00	4,848.60	0.00	0.00	0.00
15,500.00	90.00	0.00	10,543.00	4,774.58	-1,662.00	4,947.78	0.00	0.00	0.00
15,600.00	90.00	0.00	10,543.00	4,874.58	-1,662.00	5,046.96	0.00	0.00	0.00
15,700.00	90.00	0.00	10,543.00	4,974.58	-1,662.00	5,146.15	0.00	0.00	0.00
15,800.00	90.00	0.00	10,543.00	5,074.58	-1,662.00	5,245.33	0.00	0.00	0.00
15,900.00	90.00	0.00	10,543.00	5,174.58	-1,662.00	5,344.51	0.00	0.00	0.00
16,000.00	90.00	0.00	10,543.00	5,274.58	-1,662.00	5,443.69	0.00	0.00	0.00
16,100.00	90.00	0.00	10,543.00	5,374.58	-1,662.00	5,542.87	0.00	0.00	0.00
16,200.00	90.00	0.00	10,543.00	5,474.58	-1,662.00	5,642.05	0.00	0.00	0.00
16,300.00	90.00	0.00	10,543.00	5,574.58	-1,662.00	5,741.23	0.00	0.00	0.00
16,400.00	90.00	0.00	10,543.00	5,674.58	-1,662.00	5,840.41	0.00	0.00	0.00
16,500.00	90.00	0.00	10,543.00	5,774.58	-1,662.00	5,939.59	0.00	0.00	0.00
16,600.00	90.00	0.00	10,543.00	5,874.58	-1,662.00	6,038.77	0.00	0.00	0.00
16,700.00	90.00	0.00	10,543.00	5,974.58	-1,662.00	6,137.95	0.00	0.00	0.00
16,800.00	90.00	0.00	10,543.00	6,074.58	-1,662.00	6,237.13	0.00	0.00	0.00
16,900.00	90.00	0.00	10,543.00	6,174.58	-1,662.00	6,336.31	0.00	0.00	0.00
17,000.00	90.00	0.00	10,543.00	6,274.58	-1,662.00	6,435.49	0.00	0.00	0.00
17,100.00	90.00	0.00	10,543.00	6,374.58	-1,662.00	6,534.67	0.00	0.00	0.00
17,200.00	90.00	0.00	10,543.00	6,474.58	-1,662.00	6,633.85	0.00	0.00	0.00
17,300.00	90.00	0.00	10,543.00	6,574.58	-1,662.00	6,733.03	0.00	0.00	0.00
17,400.00	90.00	0.00	10,543.00	6,674.58	-1,662.00	6,832.21	0.00	0.00	0.00
17,500.00	90.00	0.00	10,543.00	6,774.58	-1,662.00	6,931.40	0.00	0.00	0.00

Database:	EDM 5000.1 Single User Db	**Local Co-ordinate Reference:**	Well 1-16H
Company:	Continental Resources	**TVD Reference:**	GL 1920+KB 21 @ 1941.00usft (Cyclone 20)
Project:	McKenzie County, ND	**MD Reference:**	GL 1920+KB 21 @ 1941.00usft (Cyclone 20)
Site:	Columbus Federal 1	**North Reference:**	True
Well:	1-16H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	OH		
Design:	Plan #3c		

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
17,600.00	90.00	0.00	10,543.00	6,874.58	-1,662.00	7,030.58	0.00	0.00	0.00
17,700.00	90.00	0.00	10,543.00	6,974.58	-1,662.00	7,129.76	0.00	0.00	0.00
17,800.00	90.00	0.00	10,543.00	7,074.58	-1,662.00	7,228.94	0.00	0.00	0.00
17,900.00	90.00	0.00	10,543.00	7,174.58	-1,662.00	7,328.12	0.00	0.00	0.00
18,000.00	90.00	0.00	10,543.00	7,274.58	-1,662.00	7,427.30	0.00	0.00	0.00
18,100.00	90.00	0.00	10,543.00	7,374.58	-1,662.00	7,526.48	0.00	0.00	0.00
18,200.00	90.00	0.00	10,543.00	7,474.58	-1,662.00	7,625.66	0.00	0.00	0.00
18,300.00	90.00	0.00	10,543.00	7,574.58	-1,662.00	7,724.84	0.00	0.00	0.00
18,400.00	90.00	0.00	10,543.00	7,674.58	-1,662.00	7,824.02	0.00	0.00	0.00
18,500.00	90.00	0.00	10,543.00	7,774.58	-1,662.00	7,923.20	0.00	0.00	0.00
18,600.00	90.00	0.00	10,543.00	7,874.58	-1,662.00	8,022.38	0.00	0.00	0.00
18,700.00	90.00	0.00	10,543.00	7,974.58	-1,662.00	8,121.56	0.00	0.00	0.00
18,800.00	90.00	0.00	10,543.00	8,074.58	-1,662.00	8,220.74	0.00	0.00	0.00
18,900.00	90.00	0.00	10,543.00	8,174.58	-1,662.00	8,319.92	0.00	0.00	0.00
19,000.00	90.00	0.00	10,543.00	8,274.58	-1,662.00	8,419.10	0.00	0.00	0.00
19,100.00	90.00	0.00	10,543.00	8,374.58	-1,662.00	8,518.28	0.00	0.00	0.00
19,200.00	90.00	0.00	10,543.00	8,474.58	-1,662.00	8,617.46	0.00	0.00	0.00
19,300.00	90.00	0.00	10,543.00	8,574.58	-1,662.00	8,716.64	0.00	0.00	0.00
19,400.00	90.00	0.00	10,543.00	8,674.58	-1,662.00	8,815.83	0.00	0.00	0.00
19,500.00	90.00	0.00	10,543.00	8,774.58	-1,662.00	8,915.01	0.00	0.00	0.00
19,600.00	90.00	0.00	10,543.00	8,874.58	-1,662.00	9,014.19	0.00	0.00	0.00
19,700.00	90.00	0.00	10,543.00	8,974.58	-1,662.00	9,113.37	0.00	0.00	0.00
19,800.00	90.00	0.00	10,543.00	9,074.58	-1,662.00	9,212.55	0.00	0.00	0.00
19,900.00	90.00	0.00	10,543.00	9,174.58	-1,662.00	9,311.73	0.00	0.00	0.00
20,000.00	90.00	0.00	10,543.00	9,274.58	-1,662.00	9,410.91	0.00	0.00	0.00
20,100.00	90.00	0.00	10,543.00	9,374.58	-1,662.00	9,510.09	0.00	0.00	0.00
20,200.00	90.00	0.00	10,543.00	9,474.58	-1,662.00	9,609.27	0.00	0.00	0.00
20,300.00	90.00	0.00	10,543.00	9,574.58	-1,662.00	9,708.45	0.00	0.00	0.00
20,400.00	90.00	0.00	10,543.00	9,674.58	-1,662.00	9,807.63	0.00	0.00	0.00
20,500.00	90.00	0.00	10,543.00	9,774.58	-1,662.00	9,906.81	0.00	0.00	0.00
20,600.00	90.00	0.00	10,543.00	9,874.58	-1,662.00	10,005.99	0.00	0.00	0.00
20,700.00	90.00	0.00	10,543.00	9,974.58	-1,662.00	10,105.17	0.00	0.00	0.00
20,800.00	90.00	0.00	10,543.00	10,074.58	-1,662.00	10,204.35	0.00	0.00	0.00
20,900.00	90.00	0.00	10,543.00	10,174.58	-1,662.00	10,303.53	0.00	0.00	0.00
21,000.00	90.00	0.00	10,543.00	10,274.58	-1,662.00	10,402.71	0.00	0.00	0.00
21,100.00	90.00	0.00	10,543.00	10,374.58	-1,662.00	10,501.89	0.00	0.00	0.00
21,200.00	90.00	0.00	10,543.00	10,474.58	-1,662.00	10,601.08	0.00	0.00	0.00
21,300.00	90.00	0.00	10,543.00	10,574.58	-1,662.00	10,700.26	0.00	0.00	0.00
21,400.00	90.00	0.00	10,543.00	10,674.58	-1,662.00	10,799.44	0.00	0.00	0.00
21,500.00	90.00	0.00	10,543.00	10,774.58	-1,662.00	10,898.62	0.00	0.00	0.00
21,600.00	90.00	0.00	10,543.00	10,874.58	-1,662.00	10,997.80	0.00	0.00	0.00
21,700.00	90.00	0.00	10,543.00	10,974.58	-1,662.00	11,096.98	0.00	0.00	0.00
21,800.00	90.00	0.00	10,543.00	11,074.58	-1,662.00	11,196.16	0.00	0.00	0.00
21,900.00	90.00	0.00	10,543.00	11,174.58	-1,662.00	11,295.34	0.00	0.00	0.00
22,000.00	90.00	0.00	10,543.00	11,274.58	-1,662.00	11,394.52	0.00	0.00	0.00
22,100.00	90.00	0.00	10,543.00	11,374.58	-1,662.00	11,493.70	0.00	0.00	0.00
22,200.00	90.00	0.00	10,543.00	11,474.58	-1,662.00	11,592.88	0.00	0.00	0.00
22,300.00	90.00	0.00	10,543.00	11,574.58	-1,662.00	11,692.06	0.00	0.00	0.00
22,400.00	90.00	0.00	10,543.00	11,674.58	-1,662.00	11,791.24	0.00	0.00	0.00
22,500.00	90.00	0.00	10,543.00	11,774.58	-1,662.00	11,890.42	0.00	0.00	0.00
22,600.00	90.00	0.00	10,543.00	11,874.58	-1,662.00	11,989.60	0.00	0.00	0.00
22,700.00	90.00	0.00	10,543.00	11,974.58	-1,662.00	12,088.78	0.00	0.00	0.00
22,800.00	90.00	0.00	10,543.00	12,074.58	-1,662.00	12,187.96	0.00	0.00	0.00
22,900.00	90.00	0.00	10,543.00	12,174.58	-1,662.00	12,287.14	0.00	0.00	0.00

Database:	EDM 5000.1 Single User Db	**Local Co-ordinate Reference:**	Well 1-16H
Company:	Continental Resources	**TVD Reference:**	GL 1920+KB 21 @ 1941.00usft (Cyclone 20)
Project:	McKenzie County, ND	**MD Reference:**	GL 1920+KB 21 @ 1941.00usft (Cyclone 20)
Site:	Columbus Federal 1	**North Reference:**	True
Well:	1-16H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	OH		
Design:	Plan #3c		

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
23,000.00	90.00	0.00	10,543.00	12,274.58	-1,662.00	12,386.33	0.00	0.00	0.00
23,100.00	90.00	0.00	10,543.00	12,374.58	-1,662.00	12,485.51	0.00	0.00	0.00
23,200.00	90.00	0.00	10,543.00	12,474.58	-1,662.00	12,584.69	0.00	0.00	0.00
23,300.00	90.00	0.00	10,543.00	12,574.58	-1,662.00	12,683.87	0.00	0.00	0.00
23,400.00	90.00	0.00	10,543.00	12,674.58	-1,662.00	12,783.05	0.00	0.00	0.00
23,500.00	90.00	0.00	10,543.00	12,774.58	-1,662.00	12,882.23	0.00	0.00	0.00
23,600.00	90.00	0.00	10,543.00	12,874.58	-1,662.00	12,981.41	0.00	0.00	0.00
23,633.42	90.00	0.00	10,543.00	12,908.00	-1,662.00	13,014.56	0.00	0.00	0.00
PBHL (Columbus 1-16H)									

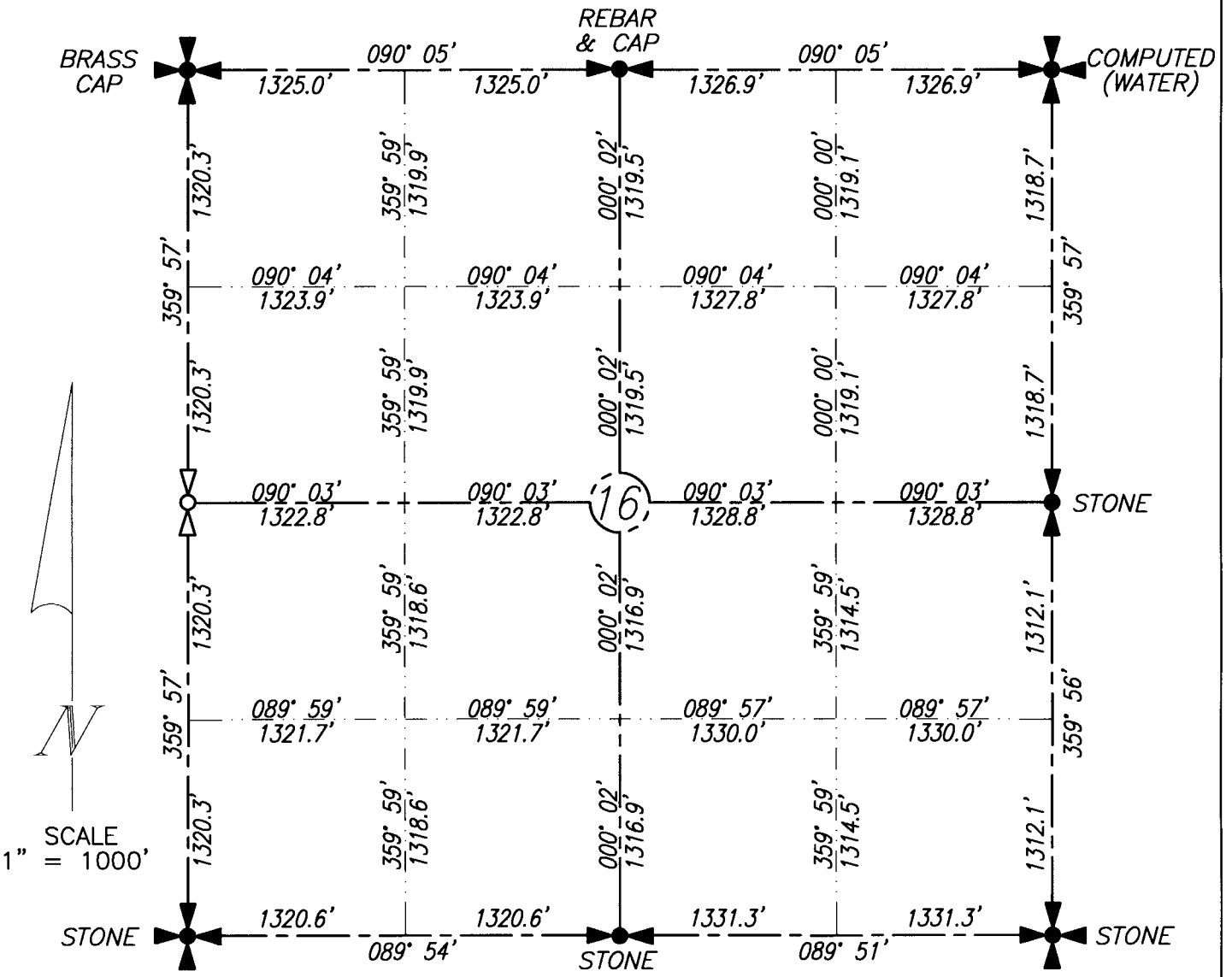
Design Targets

Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
SHL (Columbus 1-16H)	0.00	0.00	0.00	0.00	0.00	408,041.65	1,193,719.94	48° 4' 29.665 N	103° 40' 12.754 W
- plan misses target center by 10102.26usft at 10102.26usft MD (10102.26 TVD, 0.00 N, 0.00 E)									
- Point									
PBHL (Columbus 1-16H	0.00	0.00	10,543.00	12,908.00	-1,662.00	421,007.12	1,192,590.67	48° 6' 37.053 N	103° 40' 37.246 W
- plan hits target center									
- Point									

Casing Points

Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
13,555.00	10,543.00	7"	7	8-1/2

HORIZONTAL SECTION PLAT
CONTINENTAL RESOURCES INC.
COLUMBUS FEDERAL 1-16H
SECTION 16, 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 BY ME OR UNDER MY RESPONSIBLE CHARGE, AND IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF

JOHN PAULSON REGISTERED LAND SURVEYOR 3366 NORTH DAKOTA

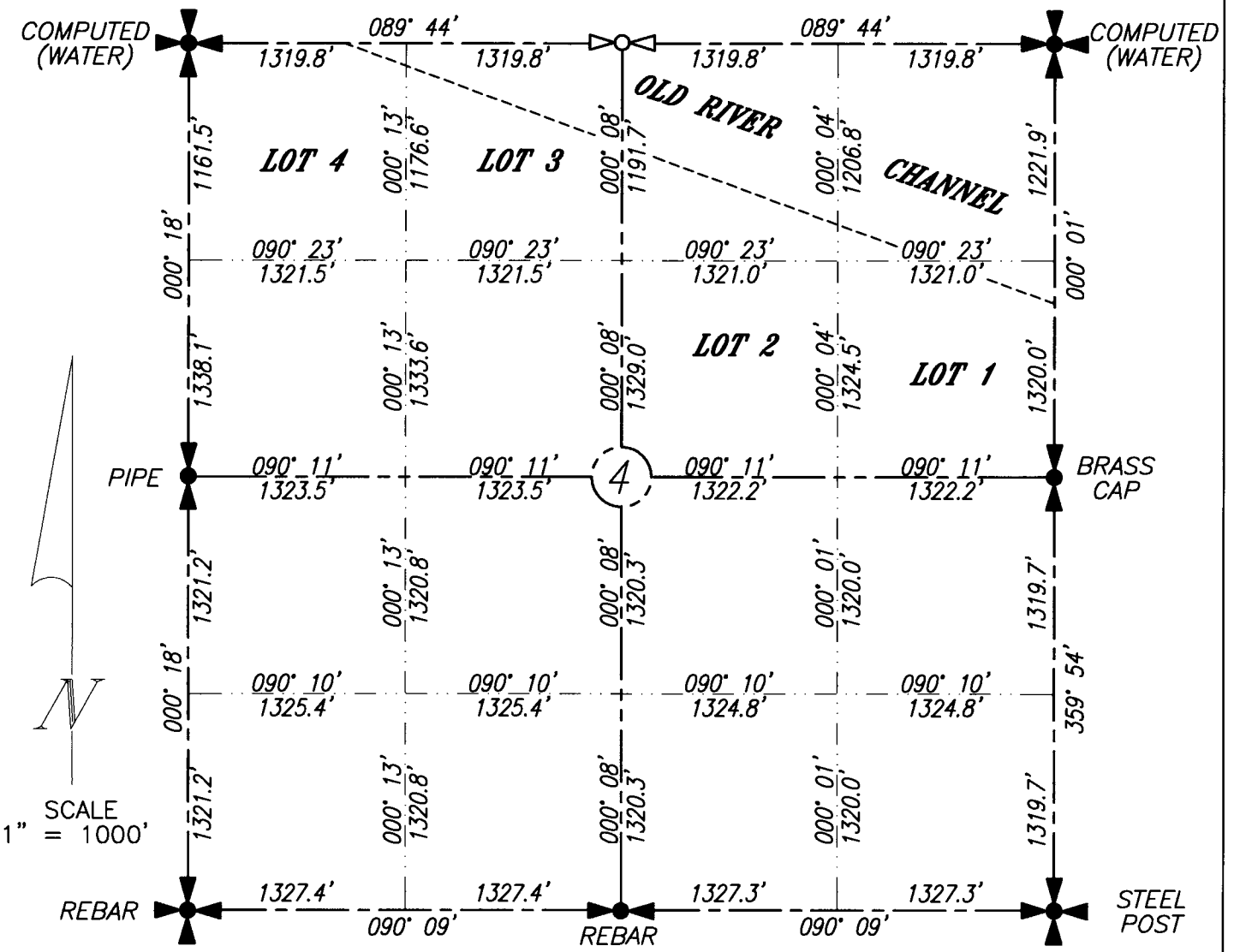
4-11-12

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.
COLUMBUS FEDERAL 1-16H
SECTION 4, 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 BY ME OR UNDER MY RESPONSIBLE CHARGE, AND IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF

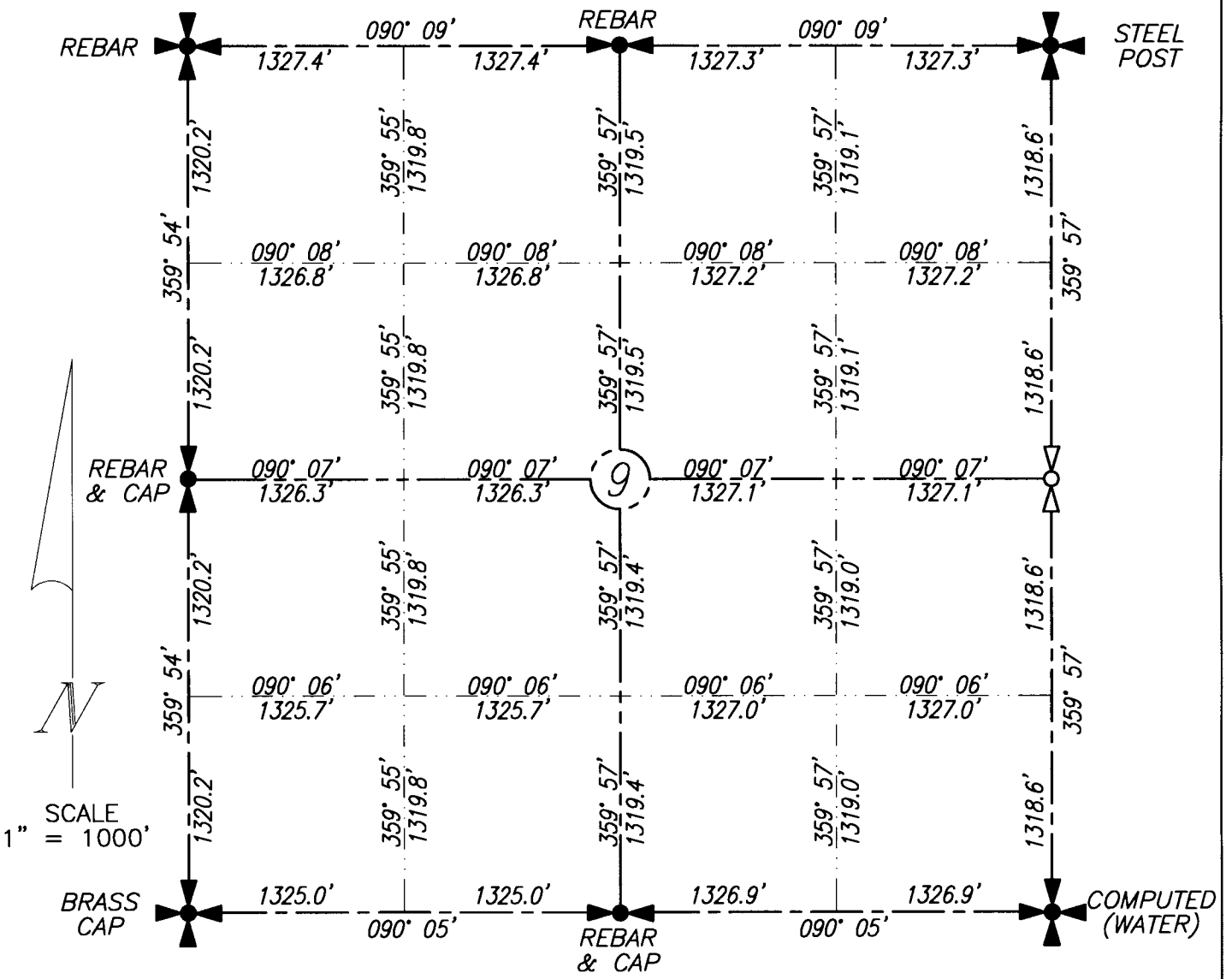
JOHN PAULSON, R.L.S. 3366

JOHN PAULSON REGISTERED LAND SURVEYOR 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.
COLUMBUS FEDERAL 1-16H
SECTION 9, 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 BY ME OR UNDER MY RESPONSIBLE CHARGE, AND IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF

JOHN PAULSON REGISTERED LAND SURVEYOR L.S. 3366 NORTH DAKOTA

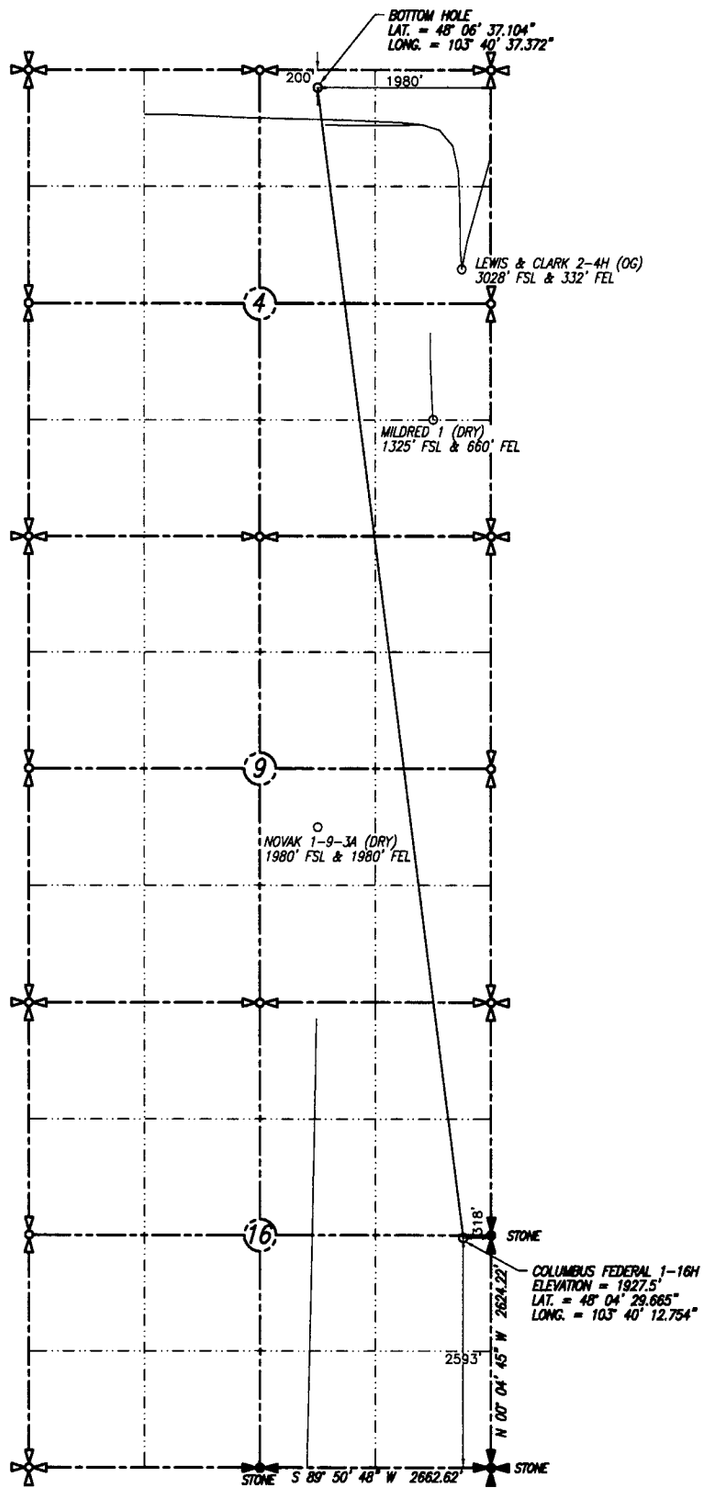
4-11-12

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

BOTTOM HOLE LOCATION PLAT
CONTINENTAL RESOURCES INC.
COLUMBUS FEDERAL 1-16H
SECTION 16, T153N, R101W
MCKENZIE COUNTY, NORTH DAKOTA
2593' FSL & 318' FEL



N

SCALE
1" = 2000'

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

3-8-13

JOHN PAULSON R.L.S. 3366

REGISTERED LAND SURVEYOR L.S. 3366 NORTH DAKOTA

DATE STAKED: 1-4-2012

BASIS OF VERTICAL DATUM: NAVD 1988 GEOID 09

PERSON AUTHORIZING SURVEY; CHAD NEWBY

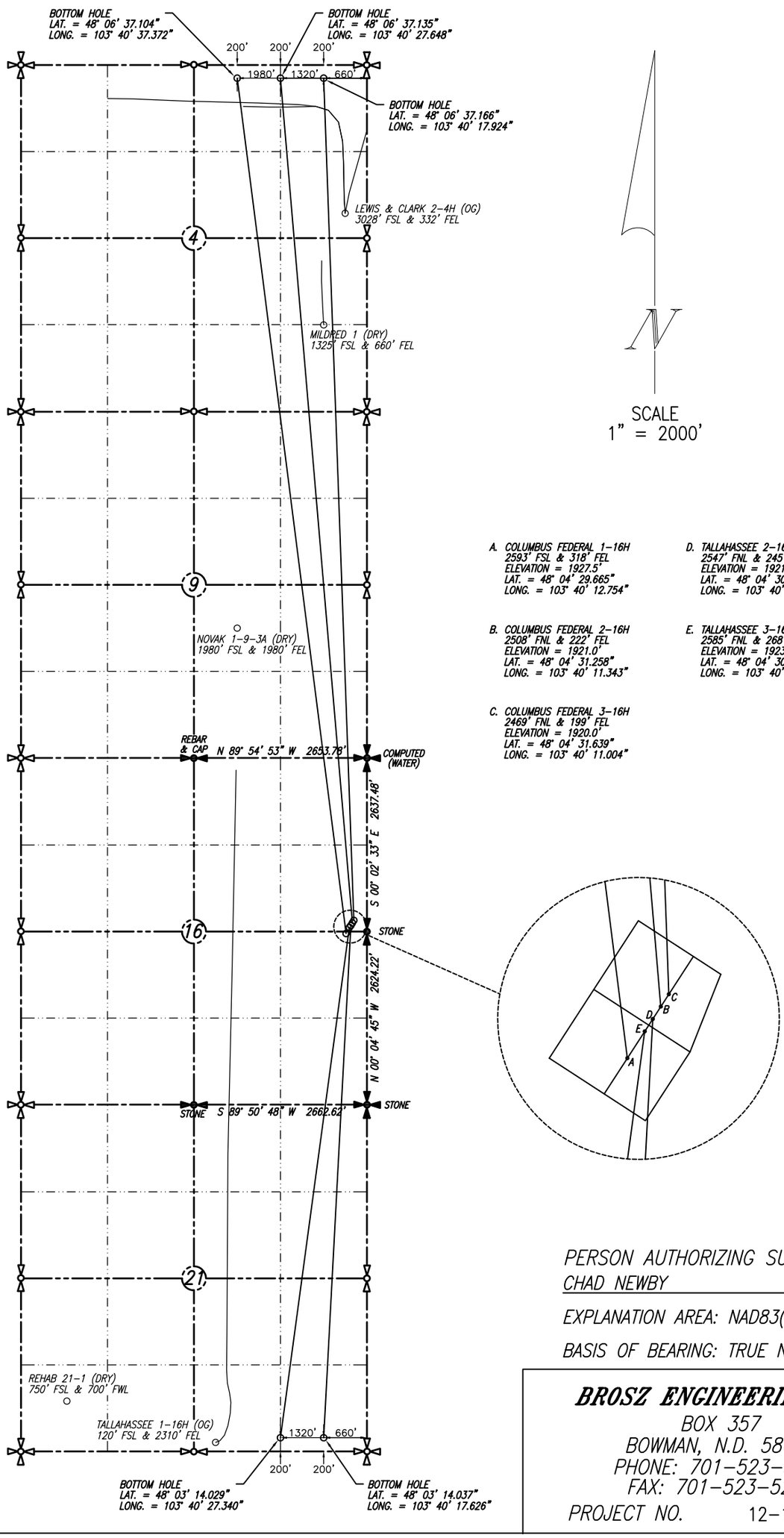
EXPLANATION AREA: NAD83(CORS96)

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

BOTTOM HOLE LOCATION PLAT
CONTINENTAL RESOURCES INC.
COLUMBUS FEDERAL 1, 2, & 3 – TALLAHASSEE 2 & 3 ECO PAD
SECTION 16, T153N, R101W
MCKENZIE COUNTY, NORTH DAKOTA



A. COLUMBUS FEDERAL 1-16H
2593' FSL & 318' FEL
ELEVATION = 1927.5'
LAT. = 48° 04' 29.665"
LONG. = 103° 40' 12.754"

B. COLUMBUS FEDERAL 2-16H
2508' FNL & 222' FEL
ELEVATION = 1921.0'
LAT. = 48° 04' 31.258"
LONG. = 103° 40' 11.343"

C. COLUMBUS FEDERAL 3-16H
2469' FNL & 199' FEL
ELEVATION = 1920.0'
LAT. = 48° 04' 31.639"
LONG. = 103° 40' 11.004"

D. TALLAHASSEE 2-16H
2547' FNL & 245' FEL
ELEVATION = 1921.7'
LAT. = 48° 04' 30.876"
LONG. = 103° 40' 11.681"

E. TALLAHASSEE 3-16H
2585' FNL & 268' FEL
ELEVATION = 1923.9'
LAT. = 48° 04' 30.494"
LONG. = 103° 40' 12.019"

PERSON AUTHORIZING SURVEY;
CHAD NEWBY

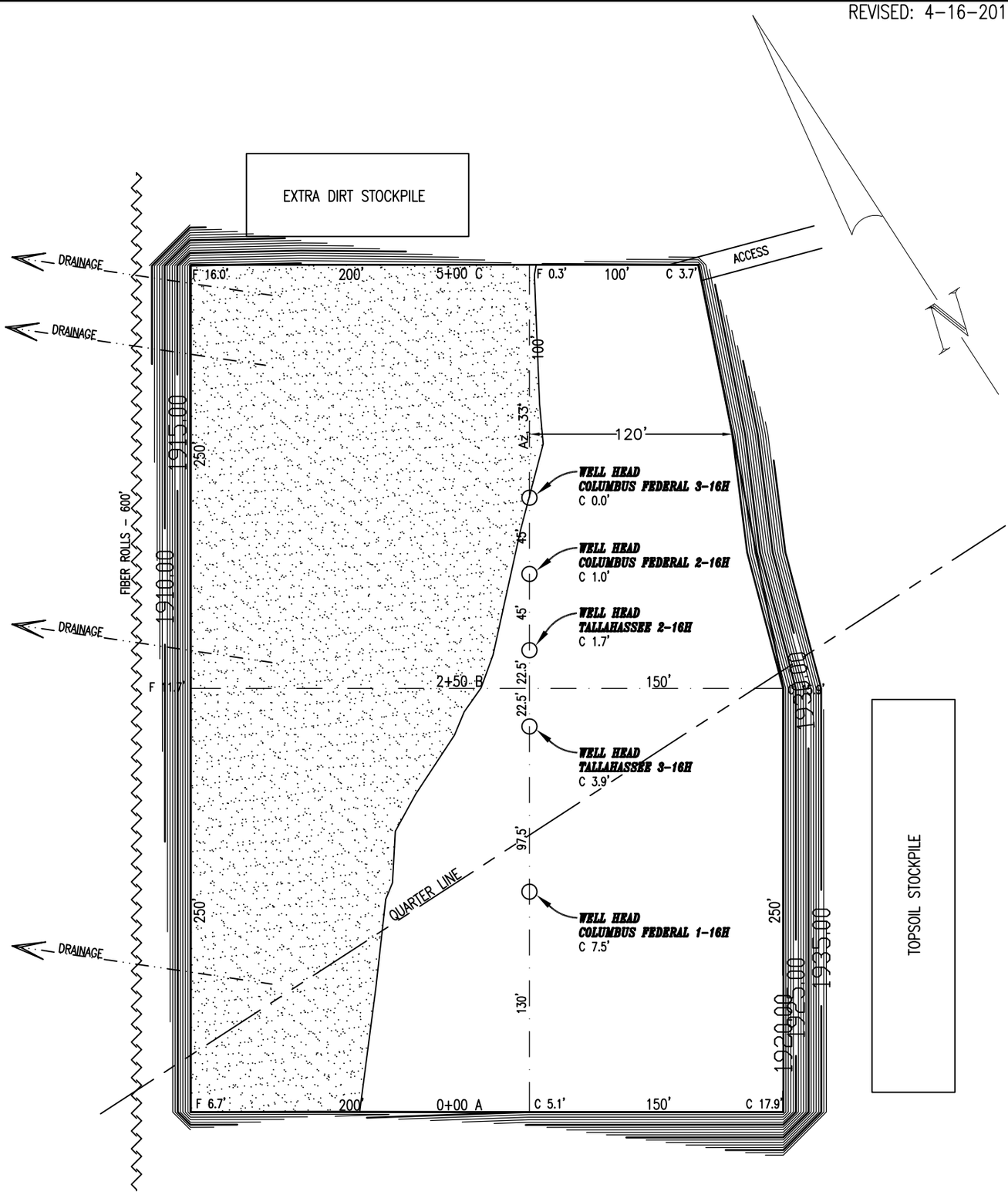
EXPLANATION AREA: NAD83(CORS96)

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

REVISED: 4-16-2012



CONTINENTAL RESOURCES INC.
PO BOX 1032
ENID, OKLAHOMA 73702

CUT & FILL
EXHIBIT 6

COLUMBUS FEDERAL 1-16H
SECTION 16, T153N, R101W
MCKENZIE COUNTY, NORTH DAKOTA

ESTIMATED EARTH QUANTITIES

TOP-SOIL:	3,125	CUBIC YARDS
SUB-SOIL:	28,719	CUBIC YARDS
TOTAL CUT:	31,844	CUBIC YARDS
TOTAL FILL:	27,716	CUBIC YARDS

Use excess materials in access road fill

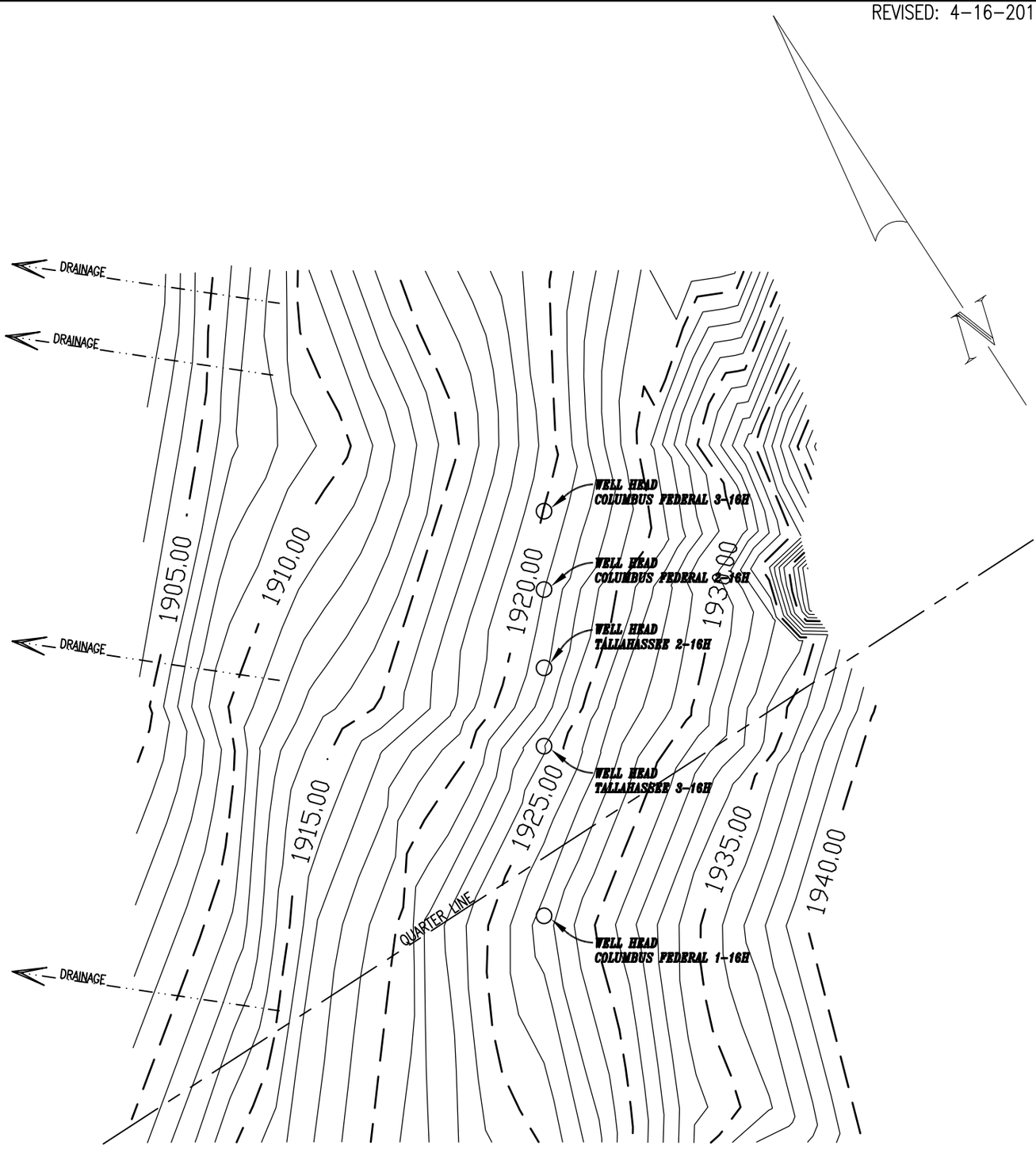
ALL INDICATED CUTS & FILLS ARE STAKED GRADE ELEVATIONS.

BACKSLOPES ASSUMED AT 1 1/2 : 1 %

Ground Elevation at Well Head: 1927.5 ft. ASL
Finished Rig Grade Elevation: 1920.0 ft. ASL

DRAFT: HEDGE	SCALE 1" = 80'	DATE: 1-4-2012	PROJECT NO. 12-10

REVISED: 4-16-2012



CONTINENTAL RESOURCES INC.
PO BOX 1032
ENID, OKLAHOMA 73702

FINAL RECLAMATION
EXHIBIT 11

COLUMBUS FEDERAL 1-16H
SECTION 16, T153N, R101W
MCKENZIE COUNTY, NORTH DAKOTA

ESTIMATED EARTH QUANTITIES

TOP-SOIL:	3,125	CUBIC YARDS
SUB-SOIL:	28,719	CUBIC YARDS
TOTAL CUT:	31,844	CUBIC YARDS
TOTAL FILL:	27,716	CUBIC YARDS

Use excess materials in access road fill

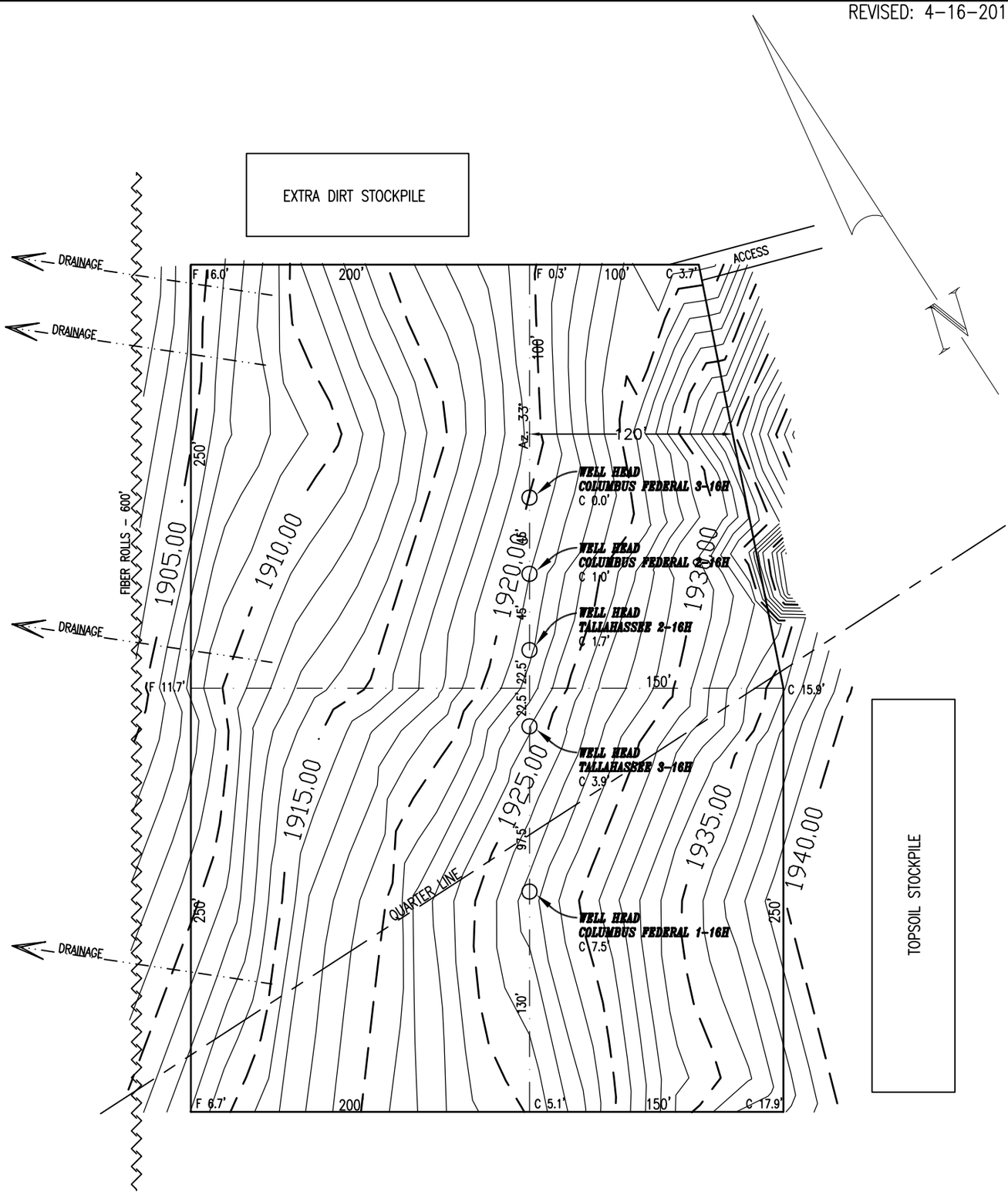
ALL INDICATED CUTS & FILLS ARE STAKED GRADE ELEVATIONS.

BACKSLOPES ASSUMED AT 1 1/2 : 1 %

Ground Elevation at Well Head: 1927.5 ft. ASL
Finished Rig Grade Elevation: 1920.0 ft. ASL

DRAFT: HEDGE	SCALE 1" = 80'	DATE: 1-4-2012	PROJECT NO. 12-10

REVISED: 4-16-2012



CONTINENTAL RESOURCES INC.
PO BOX 1032
ENID, OKLAHOMA 73702

ORIGINAL CONTOURS
EXHIBIT 5

COLUMBUS FEDERAL 1-16H
SECTION 16, T153N, R101W
MCKENZIE COUNTY, NORTH DAKOTA

ESTIMATED EARTH QUANTITIES

TOP-SOIL:	3,125	CUBIC YARDS
SUB-SOIL:	28,719	CUBIC YARDS
TOTAL CUT:	31,844	CUBIC YARDS
TOTAL FILL:	27,716	CUBIC YARDS

Use excess materials in access road fill

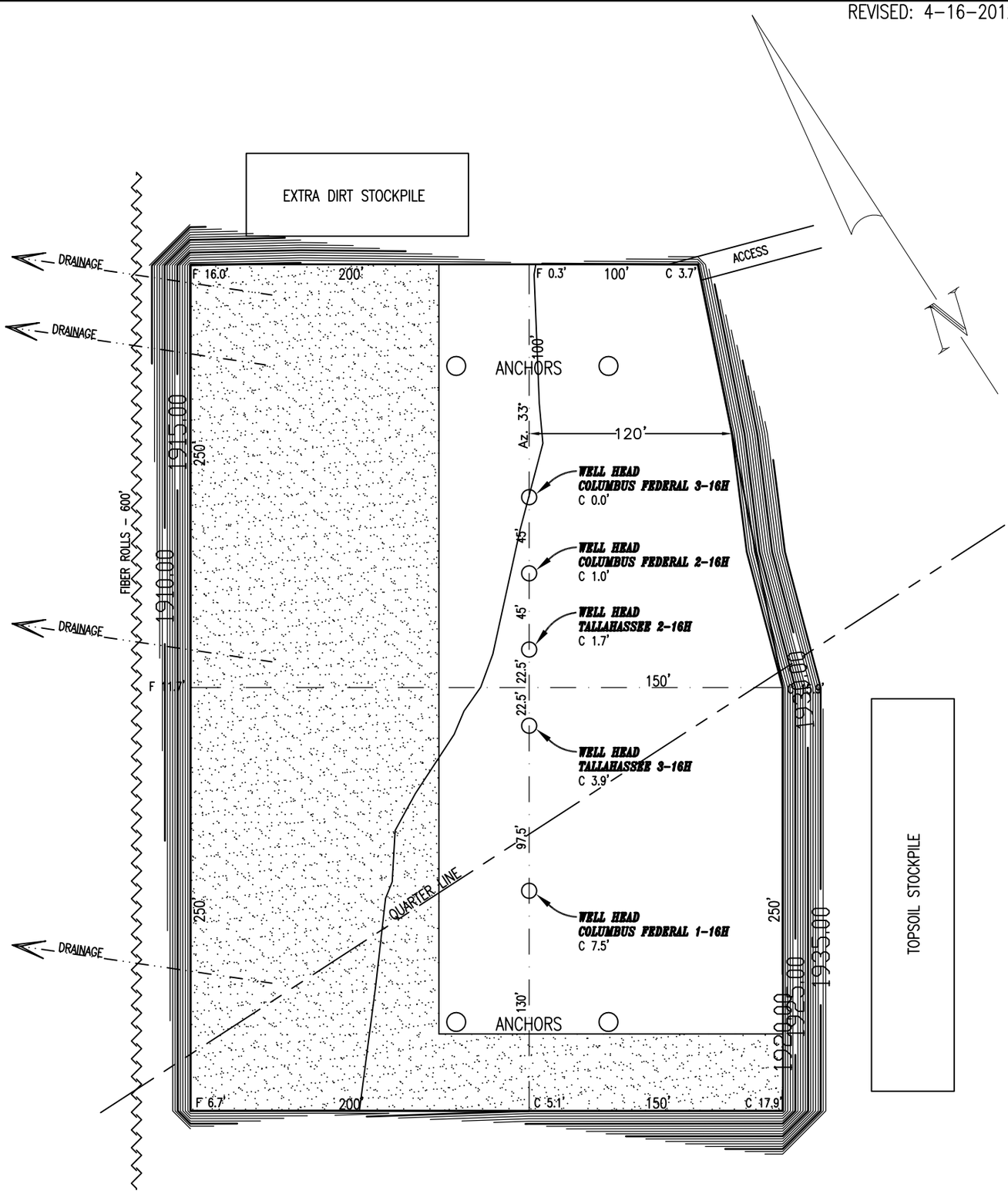
ALL INDICATED CUTS & FILLS ARE STAKED GRADE ELEVATIONS.

BACKSLOPES ASSUMED AT 1 1/2 : 1 %

Ground Elevation at Well Head: 1927.5 ft. ASL
Finished Rig Grade Elevation: 1920.0 ft. ASL

DRAFT: HEDGE	SCALE 1" = 80'	DATE: 1-4-2012	PROJECT NO. 12-10

REVISED: 4-16-2012



CONTINENTAL RESOURCES INC.
PO BOX 1032
ENID, OKLAHOMA 73702

PRODUCTION FACILITY
EXHIBIT 9

COLUMBUS FEDERAL 1-16H
SECTION 16, T153N, R101W
MCKENZIE COUNTY, NORTH DAKOTA

ESTIMATED EARTH QUANTITIES

TOP-SOIL:	3,125	CUBIC YARDS
SUB-SOIL:	28,719	CUBIC YARDS
TOTAL CUT:	31,844	CUBIC YARDS
TOTAL FILL:	27,716	CUBIC YARDS

Use excess materials in access road fill

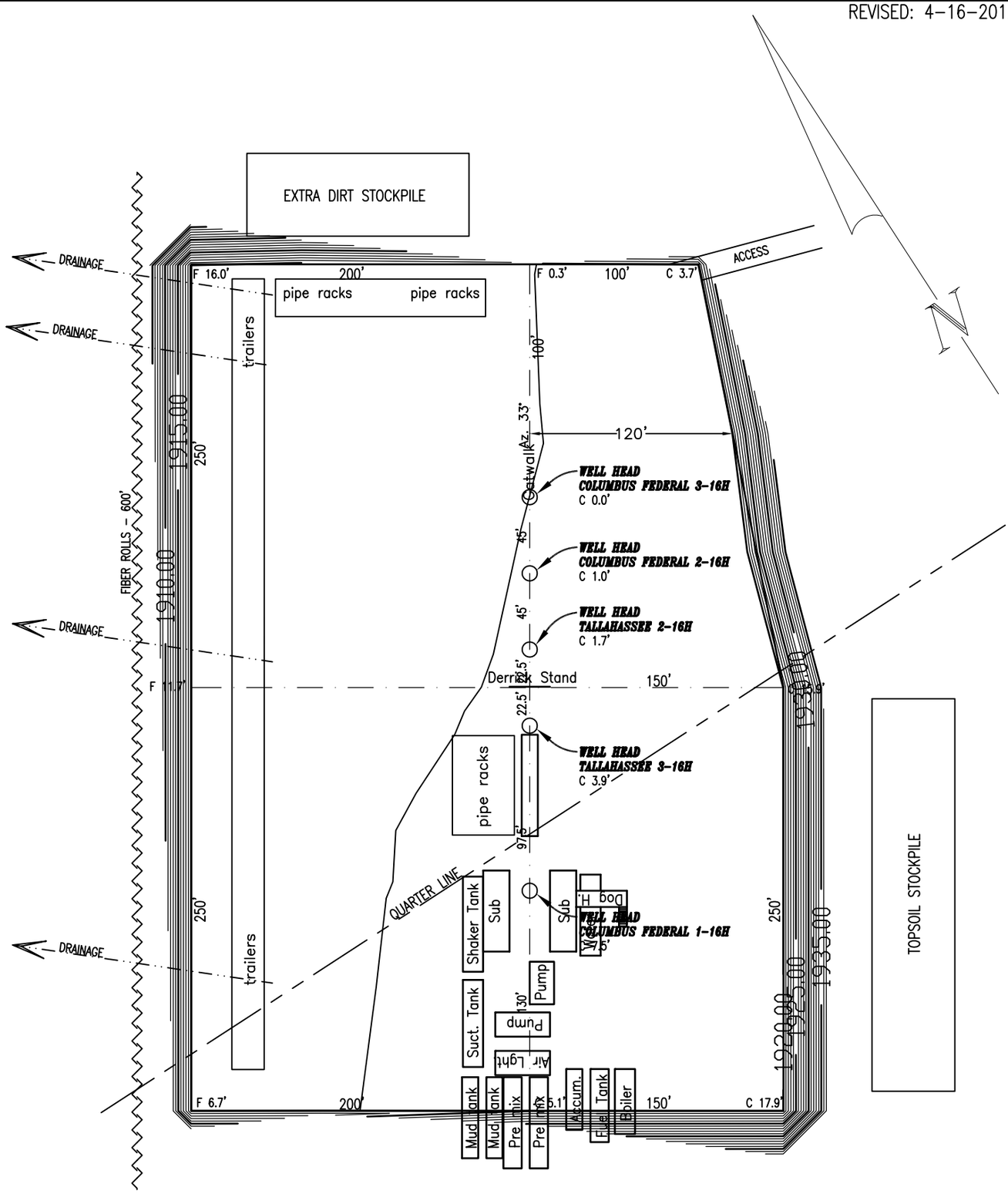
ALL INDICATED CUTS & FILLS ARE STAKED GRADE ELEVATIONS.

BACKSLOPES ASSUMED AT 1 1/2 : 1 %

Ground Elevation at Well Head: 1927.5 ft. ASL
Finished Rig Grade Elevation: 1920.0 ft. ASL

DRAFT: HEDGE	SCALE 1" = 80'	DATE: 1-4-2012	PROJECT NO. 12-10

REVISED: 4-16-2012



CONTINENTAL RESOURCES INC.
PO BOX 1032
ENID, OKLAHOMA 73702

DRILLING RIG LAYOUT
EXHIBIT 8

COLUMBUS FEDERAL 1-16H
SECTION 16, T153N, R101W
MCKENZIE COUNTY, NORTH DAKOTA

ESTIMATED EARTH QUANTITIES

TOP-SOIL:	3,125	CUBIC YARDS
SUB-SOIL:	28,719	CUBIC YARDS
TOTAL CUT:	31,844	CUBIC YARDS
TOTAL FILL:	27,716	CUBIC YARDS

Use excess materials in access road fill

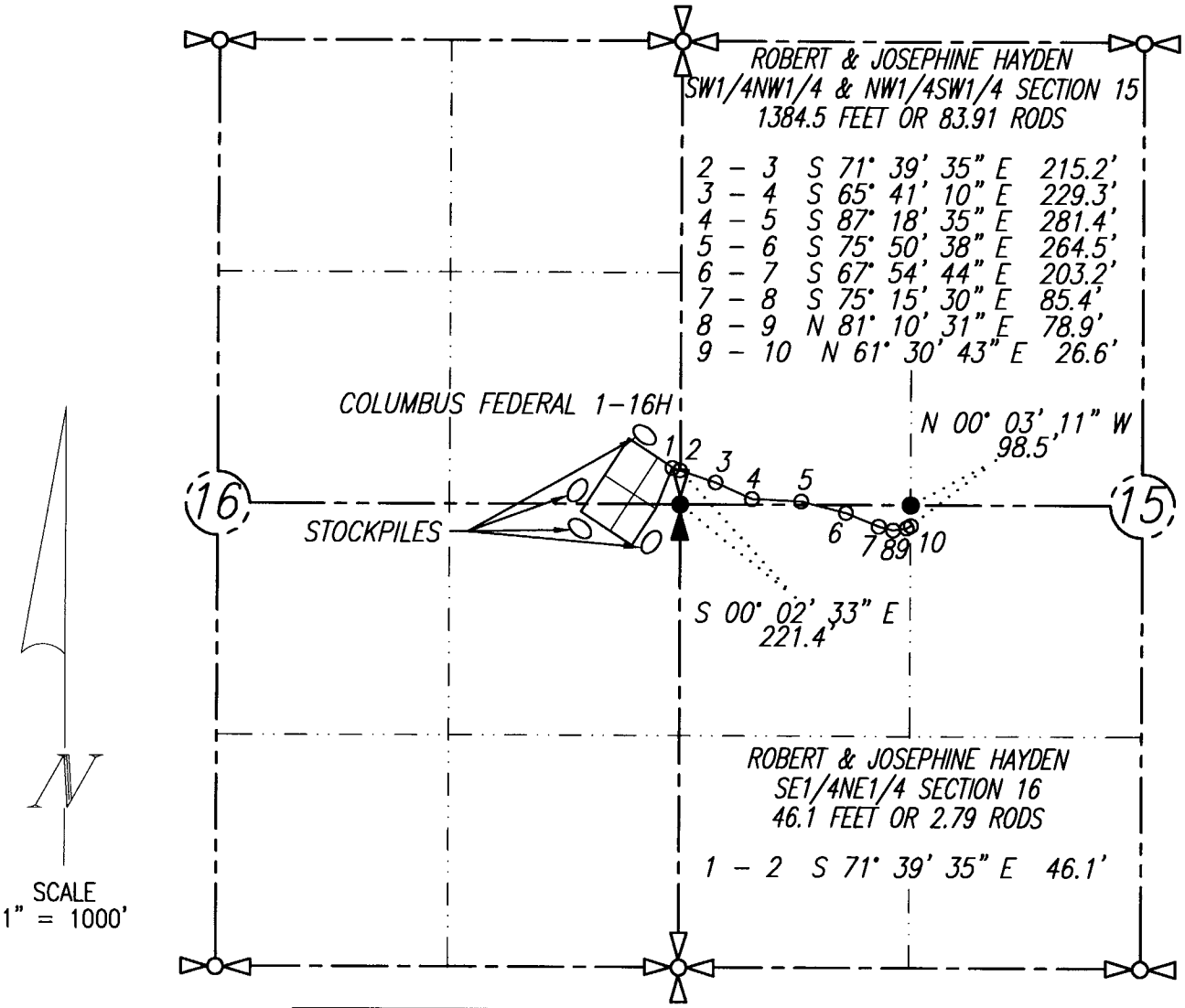
ALL INDICATED CUTS & FILLS ARE STAKED GRADE ELEVATIONS.

BACKSLOPES ASSUMED AT 1 1/2 : 1 %

Ground Elevation at Well Head: 1927.5 ft. ASL
Finished Rig Grade Elevation: 1920.0 ft. ASL

DRAFT: HEDGE	SCALE 1" = 80'	DATE: 1-4-2012	PROJECT NO. 12-10

DRILL SITE LOCATION & ROAD LOCATION PLAT
CONTINENTAL RESOURCES INC.
COLUMBUS FEDERAL 1-16H
SECTIONS 15 & 16, T153N, R101W
MCKENZIE COUNTY, NORTH DAKOTA



NOTE: THERE IS A PIPELINE AND POWERLINE EASEMENT LYING ON BOTH SIDES OF THE WELL ROAD EASEMENT.

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

JOHN PAULSON, R.L.S. 3366

REGISTERED LAND SURVEYOR L.S. 3366 NORTH DAKOTA

DATE STAKED: 1-4-2012

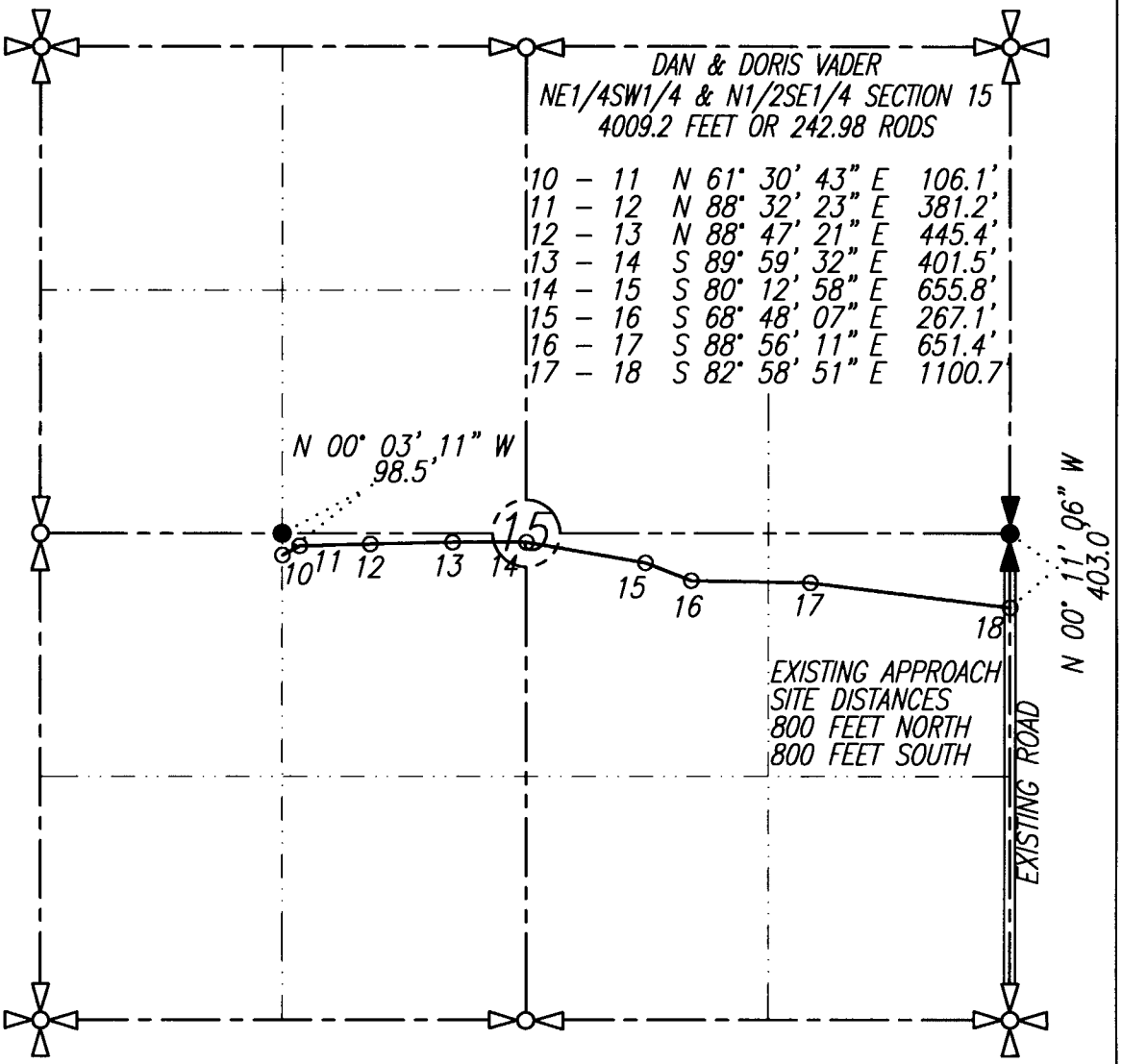
PERSON AUTHORIZING SURVEY;
CHAD NEWBY

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

ROAD LOCATION PLAT
CONTINENTAL RESOURCES INC.
COLUMBUS FEDERAL 1-16H
SECTION 15, T153N, R101W
MCKENZIE COUNTY, NORTH DAKOTA



SCALE
1" = 1000'

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

4-11-12

JOHN PAULSON R.L.S. 3366

REGISTERED LAND SURVEYOR L.S. 3366 NORTH DAKOTA

DATE STAKED: 1-4-2012

PERSON AUTHORIZING SURVEY;
CHAD NEWBY

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

GIS WELL SYMBOL MENU

= LOCATION OR DRILLING WELL

= PRODUCING OIL WELL (POW)

= PRODUCING GAS WELL (PGW)

= PRODUCING OIL & GAS WELL

= PLUGGED & ABANDONED (P&A)

= P & A OIL WELL

= P & A GAS WELL

= P & A OIL & GAS WELL

= P & A SHOW OF GAS

= P & A SHOW OF OIL

= P & A SHOW OF OIL & GAS

= ABANDONED WELL - CONVERTED TO WATER INJECTION (WIW)

= ABANDONED OIL WELL - CONVERTED TO WATER INJECTION (WIW)

=ABANDONDED GAS WELL - CONVERTED TO WATER INJECTION (WIW)

= DRILLED WATER INJECTION WELL (WIW)

= TEMPORARILY ABANDONED (TA)

= DRILLING SHUT-IN (DSI)

= DRILLED WATER SOURCE WELL (WSW)

= ABANDONED WELL - CONVERTED WATER SOURCE WELL (WSW)

=ABANDONDED OIL WELL - CONVERTED WATER SOURCE WELL (WSW)

= ABANDONDED GAS WELL - CONVERTED WATER SOURCE WELL (WSW)

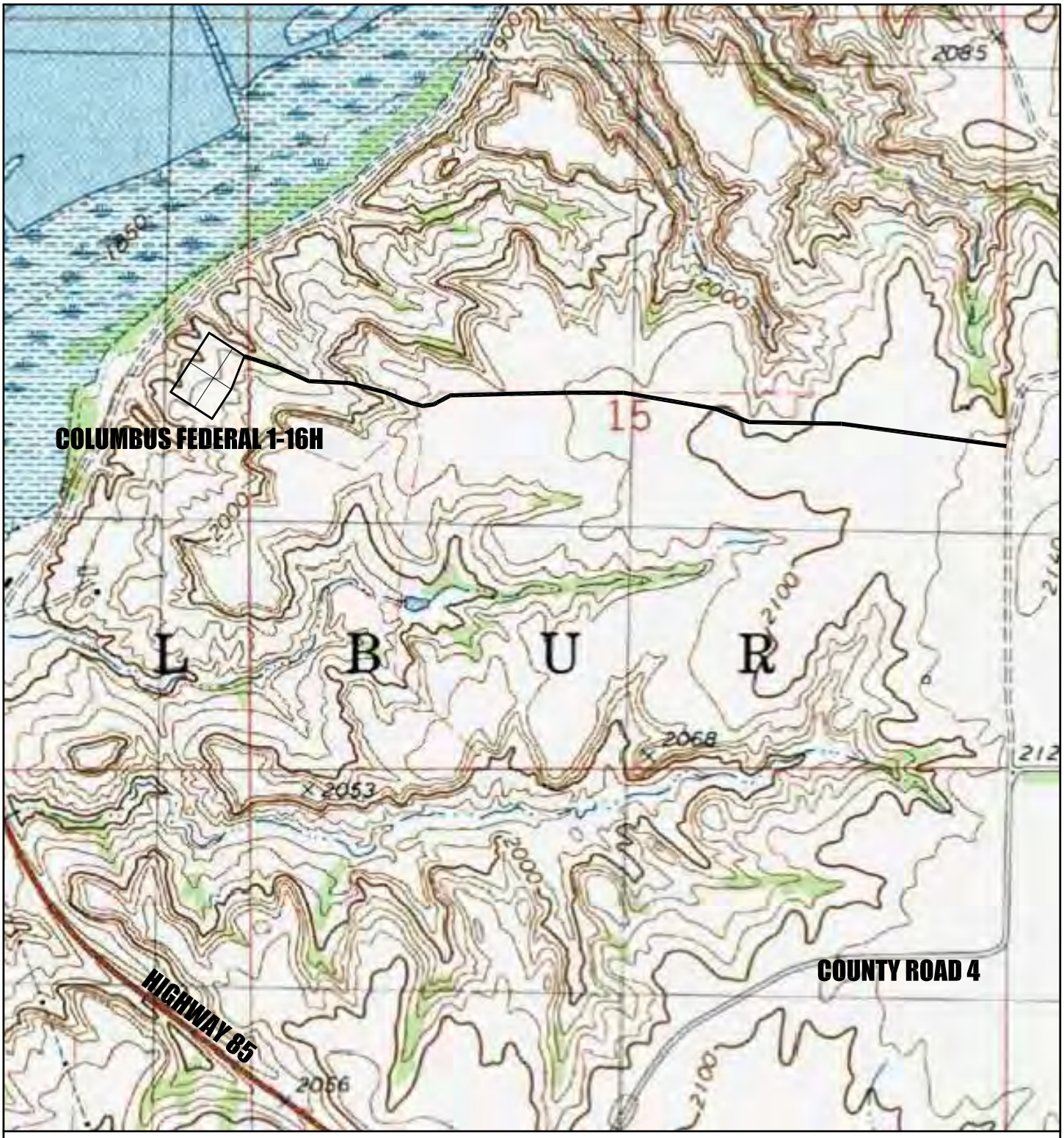
= GAS INJECTION WELL (GIW)

= WATER DISPOSAL WELL (WDW)

× = BOTTOM HOLE LOCATION (DEVIATED HOLE)

GIS WELL SYMBOLS

EXHIBIT 4



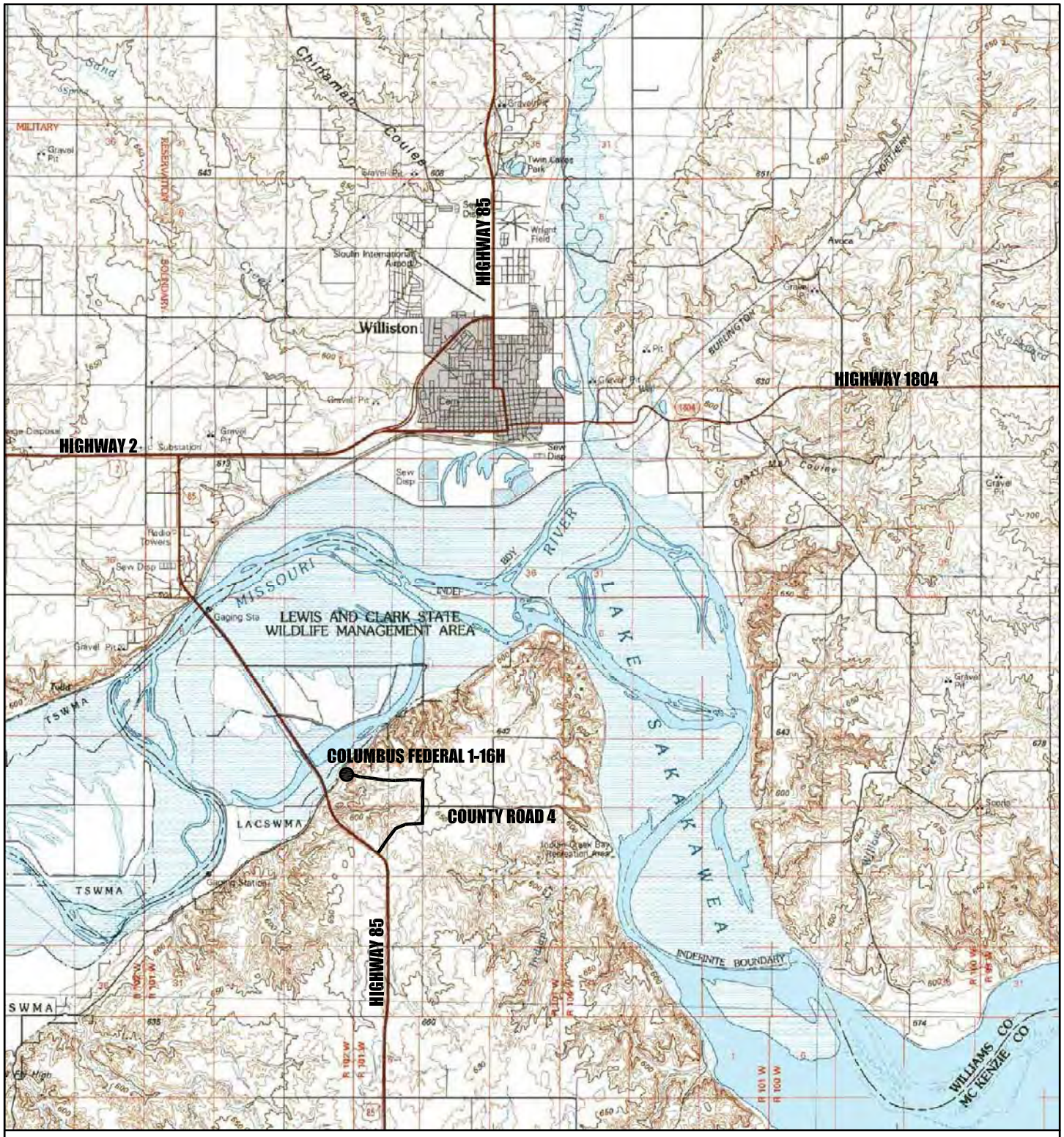
CONTINENTAL RESOURCES INC.

EXHIBIT 2

QUAD ACCESS

COLUMBUS FEDERAL 1-16H
SECTION 16, T153N, R101W
MCKENZIE COUNTY, NORTH DAKOTA

N

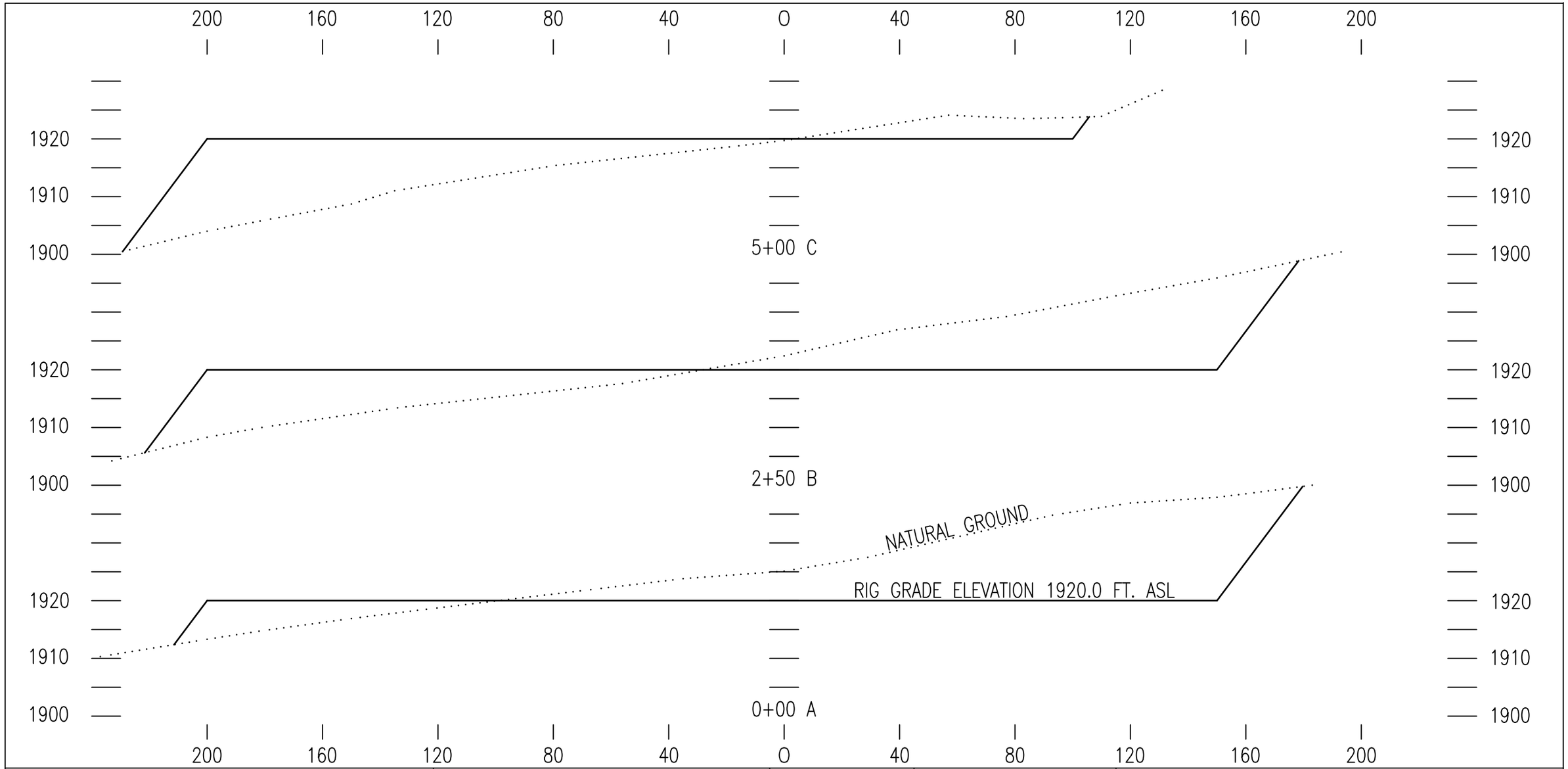


CONTINENTAL RESOURCES INC.

EXHIBIT 1

VICINITY MAP

COLUMBUS FEDERAL 1-16H
SECTION 16, T153N, R101W
MCKENZIE COUNTY, NORTH DAKOTA



CONTINENTAL RESOURCES INC.
PO BOX 1032
ENID, OKLAHOMA 73702

DRILL PAD PROFILE
EXHIBIT 7

COLUMBUS FEDERAL 1-16H
SECTION 16, T153N, R101W
MCKENZIE COUNTY, NORTH DAKOTA

DRAWN BY: JH | PROJ. NO. 12-10

SCALE: Horz. 1" = 40' Vert: 1" =20'

BROSZ ENGINEERING INC.
BOX 357
BOWMAN, N.D. 58623
PHONE: 701-523-3340

ESTIMATED QUANTITIES

TOP-SOIL:	3,125	CUBIC YARDS
SUB-SOIL:	28,719	CUBIC YARDS
TOTAL CUT:	31,844	CUBIC YARDS
TOTAL FILL:	27,716	CUBIC YARDS

Tabor, David

From: Tabor, David
Sent: Wednesday, March 06, 2013 2:25 PM
To: Tabor, David
Subject: FW: Columbus Federal 3-16H and pad.

From: Robert Sandbo [mailto:Robert.Sandbo@clr.com]
Sent: Friday, March 01, 2013 4:48 PM
To: Tabor, David
Subject: RE: Columbus Federal 3-16H and pad.

Thanks David. I got the email. Here is our schedule for the pad as of right now:

Columbus Federal 1-16H to spud on 3/24/2013 (may spud with the small rig around one week earlier if possible). We had planned on drilling the Columbus 1-16H first and then come back in a year or so and drill the other 4 but if we get the permits for all and the order on the 1280 allows us to drill them all back to back, we will most likely go ahead and drill them all at once. We will take a look at the 1280 order that covers the Columbus 1-16H and see if we can batch drill them.

You should have everything on the 3-16H and the affidavit sometime Monday.

Thanks for the help,

Bob Sandbo
Regulatory Compliance Supervisor

Continental Resources, Inc.
20 N. Broadway
OKC, OK 73102
P: 405-234-9020
F: 405-234-9562
C: 405-708-0691
robert.sandbo@clr.com
www.**clr**.com

Continental
RESOURCES

March 7, 2013

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 Columbus Federal 1-16H, 2-16H & 3-16H1, and the Tallahassee 2-21H & 3-21H1

Township 153N, Range 101W
Section 16, NE/4 SE/4 & SE/4 NE/4 McKenzie County, North Dakota.

The Columbus Federal and Tallahassee well(s) are located in an environmentally sensitive area in close proximity to the Missouri River. Therefore, Continental Resources Inc. would like to propose the following automatic shut down equipment and level sensing monitoring equipment be deployed on the site to aid in the prevention of any accidental release or safety issue. A schematic diagram and pictures of an existing tank battery with emergency shutdown equipment has been included with this affidavit.

1) Tank Side (oil & water tanks)
    a. ABB Levelmaster dual float
    b. High level switch as backup
    c. Battery box with solar backup

2) Treater & Separator
    a. Temperature device in each vessel
    b. Pressure transducer in each vessel
    c. Level switch in each vessel
    d. Battery box with solar backup

3) Wellhead
    a. TotalFlow Controller
    b. Emergency Shutdown Valve Package
    c. Battery box with solar backup
    d. Pressure transducer on casing & tubing

4) Flare
    a. Scrubber pot high level switch
    b. Monitoring flare for low temp output – alarm if flare goes out

5) 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.

Don Kennedy

Don Kennedy, Sr. Production Engineer
Continental Resources, Inc.

STATE OF OKLAHOMA)
)ss:
COUNTY OF OKLAHOMA)

On the 7th day of March, 2013, before me, a Notary Public in and for said County and State, personally appeared **Don Kennedy**, known to me to be the Sr. Production Engineer 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

Oklahoma County, Oklahoma

My Commission Expires: 7/5/2015

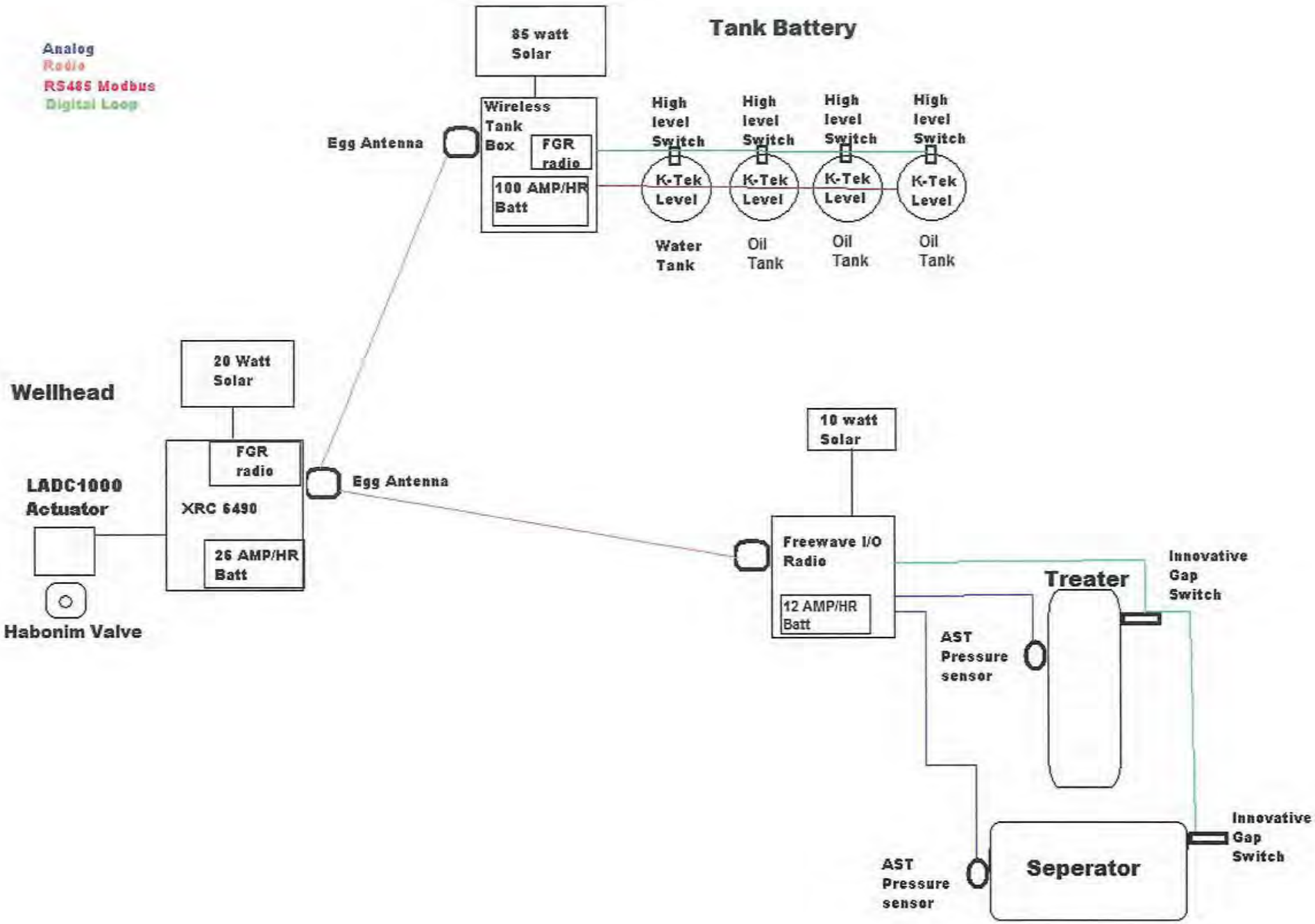
Commission No.: 11006023

BECKY BARNES
NOTARY
11006023
EXP. 7/5/2015
PUBLIC
STATE OF OKLAHOMA

Sincerely,

CONTINENTAL RESOURCES, INC.

Becky Barnes
Regulatory Compliance Specialist


Analog
Radio
RS485 Modbus
Digital Loop
85 watt Solar
Tank Battery
Wireless Tank Box
FGR radio
100 AMP/HR Batt
Egg Antenna
High level Switch
High level Switch
High level Switch
High level Switch
K-Tek Level
K-Tek Level
K-Tek Level
K-Tek Level
Water Tank
Oil Tank
Oil Tank
Oil Tank
Wellhead
20 Watt Solar
FGR radio
XRC 6490
26 AMP/HR Batt
LADC1000 Actuator
Habonim Valve
Egg Antenna
10 watt Solar
Freewave I/O Radio
12 AMP/HR Batt
Treater
Innovative Gap Switch
AST Pressure sensor
Seperator
Innovative Gap Switch
AST Pressure sensor

U003 Gap Switch and AST 4600 Transducer monitor pressures and liquid content of Flare and Sales Lines, transmitted to XRC via FreeWave Radio.

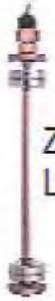
ABB TotalFlow XRC 6490

All well information is passed to your SCADA system via FreeWave Network (Future)

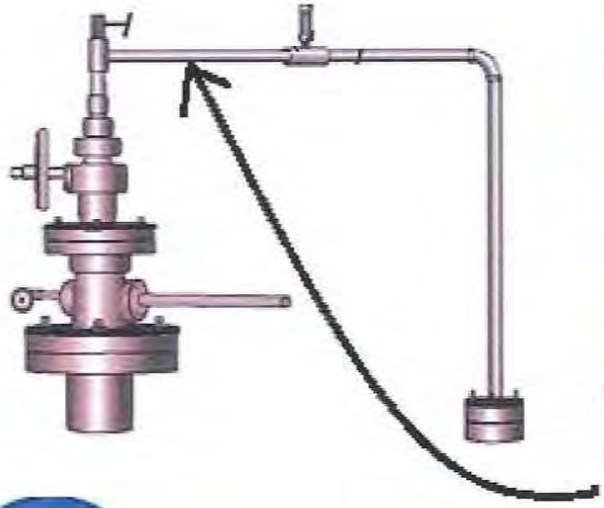
Winn-Marion's Well Hea Kit with FGRIO Radio and Power Supply

Tank Level information is passed from Tank Battery to XRC via FreeWave Radio

K-Tek MT5100 Guided Wave Radar



Z-Bend High Level Switch



ESD Valve Package
Standard Port Ball Valve rated to 6000 psi topped with a 12 VDC Actuator w/ Battery Backup

Winn-Marion, Inc.

Continental Resources, Inc. (CRI) respectfully submits the following information concerning the prevention of a wellbore collision while drilling the Columbus Federal 3-16H, SENE of Sec. 16, T153N, R101W, Dunn County, North Dakota.

The Mildred 1, NDIC File No. 12306, is a plugged and abandoned, Red River formation, directional well with a SHL of 1325' FSL, 660' FEL of Sec. 4, T153N, R101W. The directional wellbore lies approximately 660' FEL of Sec. 4, T153N, R101W, terminating at a BHL 769' N. of SHL, 2094' FSL of Sec. 4, T153N, R101W. Bottom hole TVD of the existing directional well is 13451'. The deepest casing string is 8-5/8" set at a depth of 3035' TVD.

The proposed Columbus Federal 3-16H is a horizontal well targeting the Middle Bakken formation. Surface hole location for the Columbus Federal 3-16H is 2469' FSL and 199' FEL of Sec. 16, T153N, R101W. The majority of the Columbus Federal 3-16H lateral will lie 760' FEL in order to avoid the existing Mildred 1 wellbore by approximately 100'. The lateral will taper back to 660' FEL, at 10155' N. of SHL, after adequately clearing the segment of the Mildred 1 wellbore within this Baker-Bakken pool.

The Baker-Bakken pool, as defined by NDIC Order No. 21551, is the interval from 50 feet above the top of the Bakken Formation to above the top of the Birdbear Formation. CRI has assessed the geology of the area and has determined this Bakken interval to be approximately 10461' TVD to 10,771' TVD. On the surface planar, the Mildred 1 wellbore exist in this interval for approximately 38', from 1874' FSL to 1912' FSL of Sec. 4, T153N, R94W.

The completion of the Columbus Federal 3-16H will protect the integrity of the Mildred 1 wellbore. Stimulation plans will be made to include a buffer zone with swell packers of a minimum 500' from either side of the Mildred 1 wellbore existing within the Baker-Bakken pool. This zone will not be perforated or completed.

CRI believes adequate precautions have been taken to prevent the possibility of a wellbore collision and accepts all responsibility should such a collision occur.

Sarah Madden, PD Engineer
Continental Resources, Inc.

STATE OF OKLAHOMA)
)ss:
COUNTY OF OKLAHOMA)

On the 6th day of March 2013, before me, a Notary Public in and for said County and State, personally appeared **Sarah Madden**, known to me to be a PD Engineer 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

Oklahoma County, Oklahoma

My Commission Expires: 7/5/2015

Commission No.: 11006023

BECKY BARNES
NOTARY
11006023
EXP. 7/5/2015
PUBLIC
STATE OF OKLAHOMA

CLR Spill Trailer Inventory

(To be Checked After Each Use)

Supplies	Quantity	Actual	Supplies	Quantity	Actual
Personal Protection			**Miscellaneous**		
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	
Containment			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	
Miscellaneous			Metal T-Posts	6	
Antifreeze	2		Bungee Cords	3	
Push Broom	2		Wire - 25' roll - smooth	1	
Shovels	2		Fire Extinquisher	1	
Rake	5		Equipment Hooks	6	
Squeegees	2		Shelving	4	
Scoop	2		Drawers	1	
Spark Resistant Scoop	1		Misc. Building Supplies	1	

Continental Resources, Inc. (CRI) respectfully submits the following information concerning the drilling of the Columbus Federal 1-16H, 2-16H and 3-16H and the Tallahassee 2-16H and 3-16H, Sec. 16, T153N, R101W, Williams County, North Dakota.

CRI would like to propose the following safeguards and precautions to be taken while drilling the Columbus Federal-Tallahassee wells to prevent any contamination to freshwater sources during the drilling and completion of the wells:

1) During construction of the location, the entire location will be constructed per NDIC permit stipulations, ensuring any spills or runoff which occur on location do not penetrate the fresh ground water and are contained on the surface of the location. These modifications include, but are not limited to, the inclusion of a liner being placed under the location, and cementing of the rathole and mousehole.
2) Drainage will be re-routed to avoid the location, and erosion controls will be employed, as appropriate, around the site to reduce erosion and the resulting 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 1940', 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 rig specific Spill Prevention Containment and Countermeasure Plan to prepare for any event which may occur during drilling and completion operations. A spill trailer will be located on location for spill response, if necessary.

CRI believes adequate planning and precautions are being taken to prevent any contamination to ground water and surface waters.

Sarah Madden, Project Development Engineer
Continental Resources, Inc.

STATE OF OKLAHOMA)
)ss:
COUNTY OF OKLAHOMA)

On the 7th day of March 2013, before me, a Notary Public in and for said County and State, personally appeared **Sarah Madden**, known to me to be a Project Development Engineer of Continental Resources, Inc., the Corporation that executed the within instrument, and acknowledged to me that such Corporation executed the same.

Notary Public

Oklahoma County, Oklahoma

My Commission Expires: 7/5/2015

Commission No.: 11006023

BECKY BARNES NOTARY # 11006023 EXP. 7/5/2015 PUBLIC STATE OF OKLAHOMA

SPILL PREVENTION CONTAINMENT

AND COUNTERMEASURE PLAN

FOR

CYCLONE DRILLING, INC.
P.O. BOX 908
GILLETTE, WYOMING 82717-908

PREPARED BY;

TOP LINE ENGINEERING, LLC
12635 HWY 200, P.O. BOX 884
SIDNEY, MONTANA 59270
PH; (701)570-2844

REGISTERED PROFESSIONAL ENGINEER
PHILIP W. ROSENDAHL
PE-8111
DATE 10-3-12
NORTH DAKOTA

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APPENDIX

TYPICAL DRILL RIG LOCATION PLAN

DISCHARGE REPORTING FORM

DISCHARGE SOURCE INSPECTION RECORD

SPILL PREVENTION CONTAINMENT
AND COUNTERMEASURE PLAN (SPCC)

PER 40 CFR 112.7 DATED: SEPTEMBER 14, 2012

This plan will follow the guidelines and format of 40 CFR part 112.7 and will replace the self-certified plan currently in affect.

112.7(a)(1) Discussion of facilities' conformance with the requirements listed in this part. The storage tanks on site store petroleum based drilling mud, diesel fuel, the invert tanks being the base for the drilling mud, salt water tanks, fresh water tanks, crude oil storage tanks and empty tanks for emergency storage. In addition to the storage tanks, other operations that can produce contaminants are the drilling operation itself and the cuttings drying operation. It is the purpose of this plan to define the prevention containment and countermeasure plan for discharges from any of these sources on the site. All the actions taken in this regard are per approved policies of this part of 40 CFR 112. Universally and in setting up the drilling operation on the site prevention measures are taken by grading the site to contain discharges, building in effective valves and other related operational and control mechanisms to prevent discharges. This equipment is installed and tested prior to beginning drilling operations. The tanks and equipment are installed within secondary containment berms and containment trenches and sumps are installed around the facilities prior to beginning drilling operations with capacity to contain with freeboard a rupture of the largest vessel associated with the containment. In the event of a discharge the sites are equipped with vacuums that are capable of picking up the spilled material and loading it into containers where it can be transferred to an approved disposal location. In the event of a discharge larger than can be handled by Cyclone and other manpower on location or that leaks offsite and potentially into navigable waters of the US, the operator, under his directions will arrange for trained contract personnel to immediately contain and clean-up the discharge.

112.7(a)(2) This plan will comply with all applicable items of this part. With no deviations anticipated.

112.7(a)(3) The attached sketch shows a typical layout of the drill rig sites depicting the location, size and contents of the tanks. There are no underground tanks nor are there any mobile or portable containers associated with these drilling locations. The site is prepared in advance of the drill rig coming onto the site. The sites are designed and constructed to contain spills and tank ruptures on the site. The drill rig and associated tanks and equipment are laid out in an efficient and effective manner to streamline the drilling operation. Frack tanks are located in such a manner that they have easy access to the mud tanks with valves located on both ends of transfer lines. The drilling mud tanks are plumbed to the drill rig with valves appropriately located to

stop flow from the tanks to the rig or from the rig to the tanks. The cuttings from the drilling operation are screened from the recycled drilling mud and directed to a container were they are dried using fly ash or some other equally effective absorbent material and are then transferred to the lined cuttings disposal pit onsite. The fuel tank is tied into the fuel lines providing fuel flow to the generators. Blowout preventers are placed over the drill hole casing and tested prior to beginning the drilling.

112.7(a)(3)(i) The type of oil in each fixed container and its storage capacity. No mobile or portable containers anticipated.

SOURCE	MAJOR TYPE OF FAILURE	TOTAL CAP. (BBLS.) (Type Fluid)	RATE (BBLS/MIN)	DIRECTION OF FLOW	SECONDARY CONTAINMENT
Diesel Fuel Tank	Leak or rupture	14,000 Maximum (Diesel)	Depends on size	Dams and/or Trenches	Site Perimeter Containment
Pumps & Engines	Leakage	½ - gal/hr. (lube oil)	½ - 1 gal/hr.	Drip Pans or Trenches	Site Perimeter Containment
Crude Oil Tanks	Rupture or Leak	400 BBLS	Depends on Type of Failure	Contained within Berm	Tank Battery Berm
Mud Tanks, Vibrator Rotary Hoses	Leak or rupture	450 BBLS Maximum per tank (Petroleum based drilling fluid)	Varies	Drip Pans for Hoses, Trench & Sump or Berms for Tanks	Site Perimeter Containment
Wellhead Blowout Preventer	Blowout or kicking well	Depends on severity (Well bore fluids)	Will vary	Away from well head to Trench and Sump	Site Perimeter Containment

112.7(a)(3)(ii) Discharge Prevention Measures including procedures for routine handling of products (loading, unloading and facility transfers, etc.); Before the drill rig moves on, the site is prepared for discharges associated with tank ruptures, as the site is graded to contain all discharges and storm runoff. When the rig is moved onto the site and set up additional discharge prevention and containment measures are taken. Equipment inspection records

are reviewed and the equipment is inspected following written procedures, the written procedures are attached in the appendix of the plan. A dated record of the inspection, signed by the appropriate supervisor or inspector is recorded and filed with time sheets or safety meeting minutes, when the drill rig changes locations and notes of deficiencies or acceptance are included. Operation and maintenance of equipment is designed to prevent discharges. Personnel are trained and made aware of the discharge prevention procedures and applicable pollution control laws, rules and regulations. The tool pusher in charge of the drill rig will have in his possession a copy of the Cyclone Drilling SPCC Plan and it is his responsibility to instruct the employees and make them aware of the discharge prevention measures contained in the plan. Scheduled briefings and refreshers are to be conducted with all the employees prior to and during rig up operations, such briefings are to be held during regularly scheduled safety meetings.

Employees are assigned to make routine inspections of valves, hose connections and other fluid connections for leaks. These inspections are made and documented on a monthly basis at a minimum. These leaks are provided drip pans and reported to the appropriate personnel for repair. If repairs cannot be readily made then regular emptying of the drip pans is required until the repairs can be made. Inspections of trenches and sumps are made on a regular basis to insure that they are free flowing and functional. The containment berms are also inspected periodically to insure their stability and function.

112.7(a)(3)(iii) Discharge or drainage controls such as secondary containment around containers and other structures, equipment, and procedures for the control of the discharge; Containment berms are placed around the tanks containing crude oil, the invert drilling fluid, salt water tanks and the empty tanks to be used for emergency storage, as secondary containment. The containment berms are of adequate height to contain a rupture and total failure of the largest tank contained within it amounting to 400 BBLS requiring a containment capacity of 3,000 cu. ft. Similarly, berms are built around the crude oil storage tanks on the site and requiring the same containment volume. Berms or trenches and sumps are constructed around the drill rig itself, the drilling mud tanks and diesel fuel tank, the sumps and trenches are sized to contain the volume of the largest tank in the case of a rupture and complete failure. Additionally, drip pans are placed under leaking valves, hose joints and other sources of small leaks until the item can be replaced or repaired to not leak. Regular inspections of these facilities are made to insure that they will function per plan.

112.7(a)(3)(iv) Countermeasures for discharge discovery, response, and cleanup (both the facility's capability and those that might be required of a contractor); Regular inspections may reveal a discharge such as a leaking valve or hose joint. These instances can readily be cleaned up by employees of Cyclone Drilling using on site vacuums and containers. Larger spills up to and

beyond the reporting limits can also be handled by Cyclone Drilling employees. Spills that exceed the limitations of the onsite cleanup equipment or in the event of a spill migrating offsite, will require the tool pushers' notification of the operator/owner of the site and they will contact the clean-up contractor thay have contracted with to contain and clean-up such events.

112.7(a)(3)(v) Methods of disposal of recovered materials in accordance with applicable legal requirements: When spills occur the fluids will be either soaked up with absorptive material and placed in a container for transporting to an approved disposal site or vacuumed up and placed in a storage container for transportation to an approved disposal site. It is understood by all Cyclone Drilling employees that there is not an approved disposal site on or around the drilling rig to dispose of these recovered materials or fluids, other than drying drilling cuttings and disposing of them in the cuttings pit.

112.7(a)(3)(vi) Contact list and phone numbers for the facility response coordinator, National Response Center, cleanup contractors with whom operator has an agreement for response, and all appropriate Federal, State, and local agencies who must be contacted in the event of a discharge as described in § 112.1(b). Facility Response Coordinator for Cyclone Drilling HSE Dept. (Ph. 307-682-4161) is responsible for contacting the operators environmental group so they can contact the appropriate Federal, State and Local personnel in the event of a discharge as described in § 112.1(b).

112.7(a)(4) Information and procedures to enable a person reporting a discharge as described in § 112.1(b) to relate information on the exact address or location and phone number of the facility; the date and time of the discharge, the type of material discharged; estimates of the total quantity discharged; estimates of the quantity discharged as described in § 112.1(b); the source of the discharge: a description of all affected media; the cause of the discharge; any damages or injuries caused by the discharge; actions being used to stop, remove, and mitigate the effects of the discharge; whether an evacuation may be needed; and, the names of individuals and/or organizations who have also been contacted. In the event of a discharge as described in §112.1(b) it is the responsibility of the tool pusher to relate the above information to the operators environmental group so they can contact, any emergency organizations and provide the reporting necessary to the Federal, State and Local agencies that require reporting of such a discharge. The tool pusher on the rig is the person in charge and either he or the drilling superintendent have the responsibility of reporting the answers to the above questions. These questions are spelled out on a "Discharge Reporting Form" that each has at his disposal in the appendix of "Cyclone Drilling Oil Spill Contingency Plan" In reporting a discharge a list of all individuals and or organizations that received the report will be listed.

112.7(a)(5) Plan procedures to be used when a discharge occurs:

1) Immediately extinguish any heater or fire that may ignite the spill.
2) No smoking during spill control operations.
3) Close all associated valves.
4) Direct discharge to ditches or drains that will carry the discharge to a safe holding sump or reserve pit.
5) Distribute hill, fibertex, gel, barite, or any other absorptive material available as required to contain the discharge not entering the ditch, sump or reserve pit.
6) Inspect area to ensure that all of the discharge is contained in ditches, sumps or reserve pits. Add ditches or diversion structures as required to contain the discharge onsite.
7) Start jet or sump pumps and transfer discharged material from sumps to reserve pit or holding tanks.
8) After discharge is stopped, collect all used hulls, fibertex and similar absorptive material for disposal per instruction from the drilling superintendent or the tool pusher. No oil is to remain in the ditches or sumps that may create a fire hazard.
9) Hold collected discharged material for hauling and disposal in an approved location.
10) If discharge migrates from the drill rig location Cyclone Drilling personnel will use these same procedures stop and recover the discharge. Additionally the tool pusher will notify the owners representative to notify the contract clean-up company for clean-up and mitigation of the offsite discharge migration.
11) Fill out Site Discharge Reporting Form and distribute to appropriate agencies and personnel. (Form included in Appendix of Plan)

112.7(a)(5)(b) Flow diagram of potential discharges from significant sources as a result of facilities failure: Flow diagrams and quantities included in appendix of the plan.

112.7(a)(5)(c) Site discharge containment system: The site discharge containment system for the Cyclone Drilling Rigs is a combination of containment berms, confinement trenches, sumps and reserve pits. Drip pans will be used for small discharges until repairs are make or equipment replaced. (See typical site plan included in appendix.)

112.7(a)(5)(d) Not applicable as all measures spelled out in this part are practical as describe in each section.

112.7(a)(5)(e) Inspections, tests and records: Written procedures are provided on the "Discharge Source Inspection Record", these inspections are recorded at least on a monthly basis or whenever a leak or discharge is detected and reported, using the "Discharge Source Inspection Record" in the appendix. These records are signed by the tool pusher onsite and maintained by Cyclone Drilling for a period of 3 years.

112.7(a)(5)(f) Personnel Training and Discharge Prevention Procedures: The personnel working on the drilling crews are trained in the maintenance and operation of all the equipment to prevent discharges, the discharge procedures and general facility operations. They are also made aware of the contents of the SPCC Plan. The tool pusher on each crew is the person on the location who is accountable for discharge prevention and who reports to the Cyclone Drilling Management. The tool pusher is responsible for conducting discharge prevention briefings and assuring an adequate understanding of the Cyclone Drilling SPCC Plan for the facility and any recent developments of new precautionary measures due to failures or malfunctions are implemented.

112.7(a)(5)(g) Site Security: All persons entering the site are required to check in with the tool pusher of the on duty crew. Unauthorized persons are not allowed on the site. Unauthorized visitors are easily detected, questioned regarding there presents and appropriately escorted to take care of their business.

112.7(a)(5)(h) Facility Tank Truck Loading/Unloading: The tank truck loading and unloading areas on the Cyclone Drilling Sites are located adjacent to the frack tank or crude oil tank batteries the area adjacent to the tank battery, where tank trucks are loaded and unloaded will be graded to drain into the containment trenches and associated sump, surrounding the drill rig, mud tanks, fuel tank, etc. Wheel chocks are used to prevent the truck from moving while connected to the tanks during loading/unloading operations. Before departure the vehicle is inspected for leaks in the lowermost drains and outlets and if they are any detected the associated valves are tightened or adjusted to prevent discharge while in transit. All above ground containers are checked and evaluated for risk of discharge or failure and as necessary appropriate action shall be taken.

APPENDIX

Continental
RESOURCES

November 20, 2012

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

Re: Columbus Federal 1-16H

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 405-234-9139 or email the following Terry.Olson@clr.com.

Sincerely,

CONTINENTAL RESOURCES, INC.

Terry L. Olson

Terry L. Olson
Regulatory Compliance Specialist

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

Existing Wells Within Spacing Unit

Continental Resources, Inc. has identified the following wells which currently exist in the spacing unit consisting of:

Sect 4 & 9 - T153N - 101W

McKenzie County, ND

File Number	API Number	Location	Well Name	Footages		Wellbore
10710	3305301814	NWSE 9-153N-101W	Novak 1-9-3A	1980 FSL	1980 FEL	Vertical
12306	3305302220	NESE 4-153N-101W	Mildred 1	1325 FSL	660 FEL	Directional
15358	3305302556	SENE 4-153N-101W	Lewis and Clark 2-4H	3028 FSL	332 FEL	Horizontal

CRI has determined that the identified existing wells in the spacing unit specified above are not within 500' of the proposed Columbus Federal 1-16H wellbore and do not pose any collision threats during drilling or completion operations.

DAMAGE SETTLEMENT AND ROAD USE AGREEMENT

Columbus 1-16H, et al.

KNOW ALL MEN BY THESE PRESENT:

WHEREAS, Continental Resources, Inc., whose address is P.O. Box 1032, Enid, OK 73702-1032, hereinafter referred to as OPERATOR, desires to use the following described lands located in McKenzie County, State of North Dakota, in order to access and develop an oil and gas well drillsite for the drilling of multiple wells:

Township 153 North, Range 101 West of the 5th P.M.
Section 15: SW¼NW¼, NW¼SW¼
Section 16: SE¼NE¼, NE¼SE¼, and EXCEPTING THEREFROM that portion owned by the United States of America or any governmental subdivision thereof.

SEE ATTACHED SURVEYORS PLATS

WHEREAS, Robert P. Hayden and Josephine A. Hayden, husband and wife, of 4512 Highway 85 N, Williston, ND 58801 is the OWNER(s) of the surface of said land, and

WHEREAS, said OWNER and the above said OPERATOR, after diligent inquiry into the matter, have agreed upon a reasonable and proper single lump sum amount as compensation for surface damages, disruption, annual loss of production, lost land value, lost use of and access to a portion of said land, and lost value of any improvements as a result of the drilling of the Columbus 1-16H and other wells and the construction, building, maintenance or utilization of roads and multiple well location site thereon in connection therewith, or any other drilling or operational activities conducted by said OPERATOR upon said lands in connection with the drilling, completing, and/or plugging and abandonment of the Columbus 1-16H and other wells.

NOW, THEREFORE, in consideration of Ten and 00/100---------- Dollars ($ 10.00) and other good and valuable consideration paid to OWNER by OPERATOR, the receipt and sufficiency of which is hereby acknowledged, OWNER does hereby accept as compensation for NORMAL damages, disruption, lost land value, lost use of and access to a portion of said land, lost value of any improvements, and loss of production and income sustained by OWNER and/or OWNER'S tenant caused by drilling and production operations for the Columbus 1-16H well and up to four additional wells.

OWNER, in exchange for the compensation set forth above and other valuable consideration, does hereby grant an easement for the use of the land as identified on the attached surveyor's plat to access and develop an oil and gas wellsite (pad) for the captioned well and up to four additional wells, to build a road (as indicated on the attached plat) and allow improvements to be made to construct a usable access road and wellsite as listed above and does hereby, further, release OPERATOR, its agents, contractors, employees, successors and assigns, from any and all claims, demands and causes of action arising under the law or growing out of what may be considered any NORMAL damages of any kind, character or description that are sustained to the land, whether now apparent or known to them or which may hereafter develop, as a result of the operations conducted with the intent of building a pad and access road for the drilling and completing an oil and/or gas well on the above described lands which shall consist of, but not be limited to, the construction of roads accessing the drilling site, and the moving of earth to provide the placement of the drilling rig, storage batteries or facilities, ponds, reserve pit, or equipment necessary for and related to said drilling operations. The production facility may include, but will not necessarily be limited to a tank battery, treater, pumping unit, reserve pit, pipelines, electric lines, and other production facilities and/or plugging and abandonment of the aforementioned wells.

This agreement specifically prohibits the conversion of the captioned well or any other located on this site to a saltwater disposal well or injection well without the further agreement and written consent of the OWNER, their successors or assigns.

For the same consideration recited above, this agreement shall and does include and grant, from the OWNER to OPERATOR, an easement for the laying of electric transmission lines and pipelines from the drillsite in the proximity of the ditch along the entire length of the access road to tie in to other collection pipelines, which pipelines are utilized solely, specifically and only for the wells drilled on the drillsite as outlined on the attached plat while they are being operated as oil or gas wells. Owner shall be supplied with thirty day prior written notice of any pipelines to be installed and shall be supplied with a copy of the final plat for the same and said plat shall be recorded with the recorders' office for said county and state as notice that said pipeline has been installed subject to the provisions of this agreement.

OPERATOR agrees that upon proven production, if adequate electrical power is available within a distance of two mile or less, that within a reasonable period of time, an Electric Pumping Unit will be utilized and installed on the said well to help maintain noise to a minimum.

OWNER shall allow for storage on site, of cuttings within the reclaimed reserve pit, from drilling the wells permitted on this drillsite, only if permitted and authorized by the NDIC.

OWNER shall waive any and all yearly site rentals for the captioned well and up to four additional wells while they are being operated as oil or gas wells.

OPERATOR agrees to assign to Owners, their successors and assigns, a perpetual shared use agreement, at no cost to OWNERS, for that certain Road Easement recorded as Document No. 425514 and OPERATOR shall prepare and record such assignment as approved by the OWNERS. AND further, the Owners, their successors and assigns, reserve cost free, the shared use of the road constructed pursuant to the easement contained herein for the access road granted, by OWNERS to OPERATOR, for access to and through the above described lands as identified on the attached plat. OPERATOR agrees to maintain the roads above mentioned in a good and usable condition at all times at their sole expense.

OPERATOR shall indemnify and agrees to fully defend, protect and hold harmless OWNERS their successors and assigns, employees and agents, from and against each and every claim, demand, action, cause of action or lawsuit, and any liability, cost, expense, damage, action, cause of action or lawsuit, and any liability, cost, expense, damage or loss (including environmental), including attorneys' fees and court costs, that may be asserted against OWNER and/or OPERATOR by any third party, including OPERATOR's employees and agents, arising from or on account of any operations conducted by OPERATOR or for the benefit of the OPERATOR on the captioned premises

OPERATOR agrees to maintain the site, access roads and ditches, and to keep the same free from refuse and weeds. OPERATOR further agrees to utilize colors for the tanks, pumping unit and other equipment that will tend to blend with surrounding terrain (similar or like the colors used for equipment on federal or BLM leases), to fence the well site and to maintain said fence if requested by OWNER; and to install cattle guards where necessary if needed or requested by the OWNER.

OWNERS acknowledge receipt of written notice in conformity with any and all applicable statutes and regulations of the captioned well location, proposed spud date, nature and extent of drilling, activities, access route and their right to compensation for damage to the surface. Notice shall be provided as recited above for pipelines and utility lines for the captioned well, however, Owner waives any right to receive written notice of any other future operation conducted within the access road and well site, installation, both above ground and underground for the captioned well. Owner further acknowledges that the specific location of the well site and access road as finally constructed may vary slightly from that indicated prior to the execution of this agreement and expressly waives any additional notice of such variance prior to commencement of construction, and agrees that the consideration recited herein covers all damages regardless of the variance in location.

IN WITNESS WHEREOF:
This Damage Settlement and Road Use Agreement is executed this 16 day of February, 2012.

SURFACE OWNER(S):

X Robert P. Hayden
Robert P. Hayden

X Josephine A. Hayden
Josephine A. Hayden

OPERATOR:
Continental Resources, Inc.

By: _____

STATE OF NORTH DAKOTA)
) SS ACKNOWLEDGMENT
COUNTY OF WILLIAMS)

BE IT REMEMBERED, That on this 16th day of February, 2012, before me, a Notary Public, personally appeared Robert P. Hayden & Josephine A. Hayden, husband and wife, to me known to be the identical person(s) described in and who executed the within and foregoing instrument and acknowledged that they executed the same as their free and voluntary act and deed in the capacity as noted, for the uses and purposes therein set forth.

IN WITNESS WHEREOF, I have hereunto set my official signature and affixed my notary seal, the day and year first above written.

EFROSINIA GOSTEVSKY
Notary Public
State of North Dakota
My Commission Expires June 3, 2016

_____
Notary Public
My Commission Expires:

STATE OF ND)
) SS **CORPORATE ACKNOWLEDGMENT**
COUNTY OF WILLIAMS)

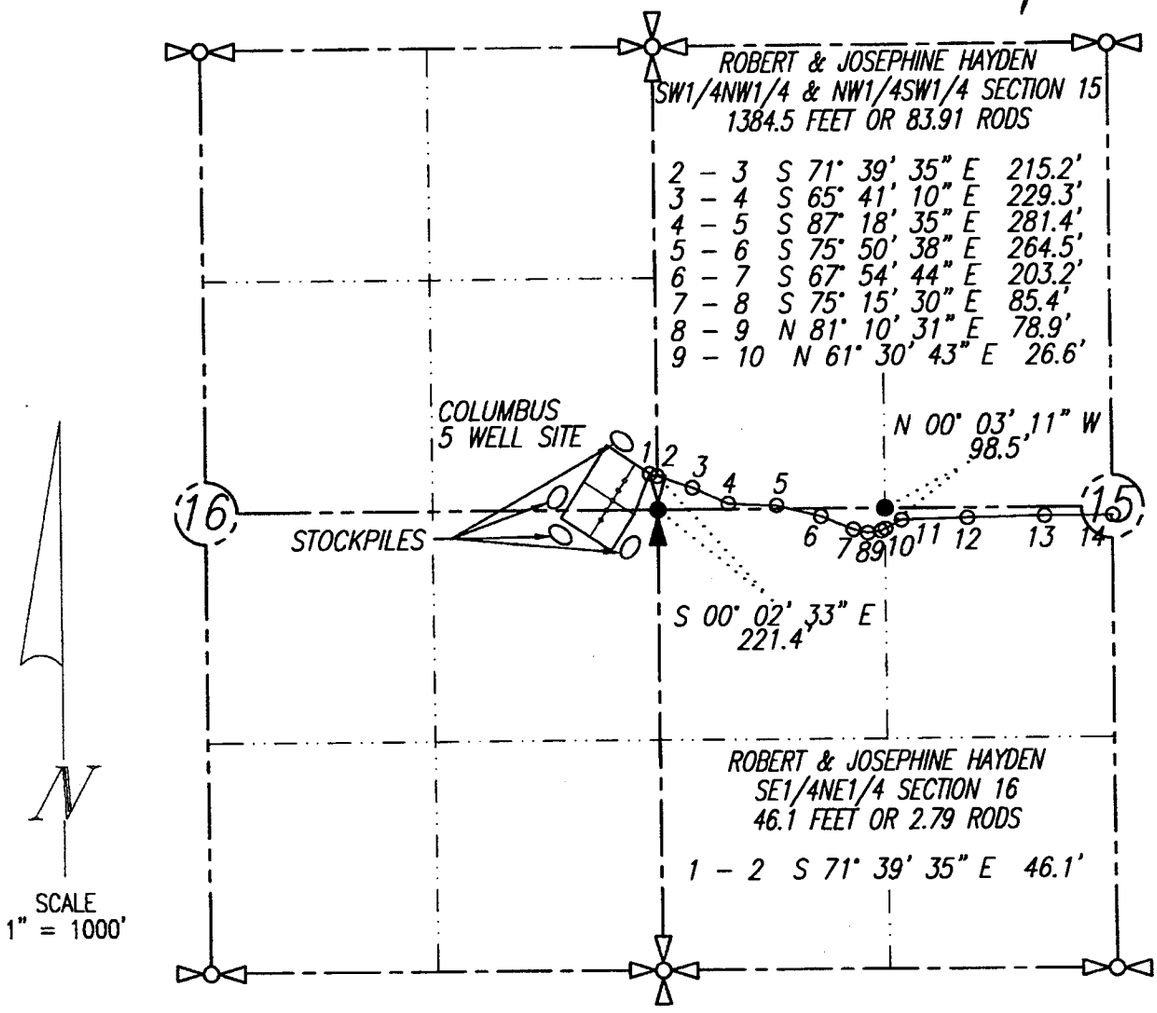
On this 21 day of FEB., 2012, before me appeared ALAN MCNALLY, to me known to be the DRLG. MANAGER NORTH DIVISION of Continental Resources, Inc., who acknowledged to me that he executed this instrument on behalf of said corporation.

IN WITNESS WHEREOF, I have hereunto set my official signature and affixed my notary seal, the day and year first above written.

_____
Notary Public
My commission expires

RON LUND
Notary Public
State of North Dakota
My Commission Expires July 23, 2016

DRILL SITE LOCATION & ROAD LOCATION PLAT
CONTINENTAL RESOURCES INC.
COLUMBUS 1-16H & OTHERS
SECTIONS 15 & 16, T153N, R101W
MCKENZIE COUNTY, NORTH DAKOTA



NOTE: THERE IS A PIPELINE AND POWERLINE EASEMENT LYING ALONG THE SIDE OF THE ACCESS ROAD EASEMENT.

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 PRESTON R.L.S. 3366

REGISTERED LAND SURVEYOR L.S. 3366 NORTH DAKOTA

DATE STAKED: 1-4-2012

PERSON AUTHORIZING SURVEY;
CHAD NEWBY

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