Tundra Oil & Gas Partnership
Legacy Pierson Prov HZNTL 15-32-01-29 WPM
100/15-32-001-29W1/02
License #7447
AFE #TBD
2 Plug Abandonment
Single Well
Confirmed on accumap.
– Check Lic & UWI to confirm.

Prepared by:
Kim Cowan
Tundra Oil and Gas Partnership
Virden, Manitoba
March 2, 2022

Contact Information:

Operator

Name	Location	Phone Number	
Tundra Oil & Gas Ltd.	Winnipeg	204-934-5850 204-934-5820	Ph Fx
	Virden	**204-748-3095** 204-748-1007	Ph Fx

Representatives

Contacts	Virden	Phone Numbers	Ph
Chris Perkins	Workovers Superintendent	204-748-4434 204-851-2146	(O) (C)
Geoff Puckett, P.Eng	Completions Superintendent	204-748-4540 204-512-0162	(O) (C)
Kent Blair, EIT	Completions Engineer	204-748-4439 / 204-851-0794	(O/C)
Shellanne Langlois	Completions Office Admin	204-748-4527	(O)
Chris Elliott	Workovers & Maintenance	204-748-4436 / 204-851-1950	(O/C)
Todd Plaisier, M.Tech		204-748-4452 / 204-851-6589	(O/C)
Brett Howell, EIT		204-748-4537 / 204-851-1409	(O/C)
Dustin Knudsen, P.Eng		204-748-4481 / 306-520-3936	(O/C)
Safety:			
Ryan Potter	Tundra Safety Manager	204-748-4410 204-851-2847	(O) (C)
Dustin Higginbotham	Tundra Field Safety Coordinators	204-748-4133 204-851-3822	(O) (C)
Kevin Holleman		204-748-4147 204-851-6022	(O) (C)
Luke Slater		204-748-4429 204-851-3159	(O) (C)

Emergency Services

Service	Location	Phone Number
Ambulance	Deloraine	911
Fire	Deloraine	911
R.C.M.P.	Deloraine	911
Hospital	Deloraine	911
Tundra Emergency	Virden	204-748-3095

Safety Program:

Health, Safety and Environmental Control Policy

Tundra Oil and Gas (Tundra) believes there is nothing more important than the health and safety of our employees, contractors, subcontractors, suppliers, visitors and the public (our stakeholders). Our culture of **Everyone Home Safe Every Day** and protecting the environment are responsibilities we all share.

Tundra commits to:

- Comply with all applicable health, safety and environmental legislation, not just because we are legally required, but also because we believe it is the responsible way to conduct our business.
- Strive to identify and eliminate hazards by providing education and training to our employees so they have the knowledge, skills, and understanding to perform their responsibilities and duties at the highest level.
- Implement a pro-active and progressive approach to environmental protection and maintenance.
- Maintaining and continuously improving our comprehensive HSE Management System through setting targets, regular inspections, audits, and reviewing and reporting our results.
- Provide resources, training, and technology to meet our HSE objectives.
- Ensure all facilities are designed with safety and environmental protection in mind.
- Ensure that all employees understand that safety is the top priority and no business opportunity will be pursued at the sacrifice of safety.
- Establish maximum cooperation based on a strong sense of personal responsibility.

Tundra firmly believes that in order for the company to be successful, the HSE Management System must be implemented and continually improved upon. This system, our culture, must be owned by all personnel including managers, supervisors, workers and contractors. Tundra will always strive for safe, well-executed operations that project confidence within the company, our contractors, subcontractors, suppliers and the public.

- **Updated ERP to be posted in doghouse & Wellsite Supervisors shack.**

It is the Wellsite Supervisor's responsibility as Tundra Oil & Gas Limited's representative to ensure that all work carried out on location adheres to safe work practices, and that crews and contractors utilize and follow Job Safety Analyses (JSA's). Safety meetings are to be held and recorded as required throughout the duration of the job and any job scope changes as noted in this program, and as required by contractor's safety programs.

- All crew members, contractors, and service hands are required to wear proper PPE (Personal Protective Equipment) at all times on location; hardhats, coveralls, steel toed boots, safety glasses and job specific equipment pertaining to task. Hearing protection should be worn in high noise areas.

- Ensure that all "Green Hands" (inexperienced employees) are closely supervised and properly trained by more experienced crew members. (Mentoring)

- **All near misses, equipment failures, medical aids, injuries, and environmental incidents are to be recorded and reported immediately to Tundra Oil & Gas Limited.**

- All contractor employees are required to complete the Tundra Oil & Gas Limited Safety Orientation program, or an equivalent contractor program that is certified IRP 16 compliant.

- Wellsite Supervisors are to be familiar with the Tundra Oil and Gas Limited Emergency Response Program and follow this plan when dealing with emergency situations.

- A Notice of Supervisor form is to be completed for each well, acknowledged, and signed by all contractors and service hands.

- A safe work permit both signed and reviewed prior to starting any onsite operations by all on-site personnel is required.

NO SAFE WORK PERMIT, NO WORK
NO STAMP, AFE, SIGNATURE, NO PAY

AED Locations:

Area	Location	Building
Sinclair	3-4-8-29W1	Doghouse
Sinclair	14-14-8-29W1	Doghouse
Lyleton	4-1-2-28W1	MCC
Birdtail	8-30-16-27W1	Doghouse
Daly	12-24-10-29W1	Doghouse
Daly	8-28-9-29W1	Doghouse
Daly	13-10-9-28W1	Doghouse
Goodlands	16-10-1-24W1	Doghouse
Waskada	15-21-1-25W1	Doghouse
Waskada	11-30-1-25W1	Doghouse
Regent	2-25-4-22W1	MCC
Steelman	4-15-1-6W2	Doghouse
Taylorton	13-15-1-6W2	Doghouse
Virden Office		Front Office Wall
Virden Warehouse		Wall Outside Lunchroom
Waskada Office		Lunchroom

AREA CONTACTS:

Production Superintendent: brent.lesy@tundraoilandgas.com
Production Engineering Manager: scott.nugent@tundraoilandgas.com

South Manitoba:

Production Engineers
andrew.berke@tundraoilandgas.com
Production Technologist
brett.walker@tundraoilandgas.com
Foreman
Pierson dallas.cook@tundraoilandgas.com
Goodlands: curtis.somerville@tundraoilandgas.com
Waskada: rob.brown@tundraoilandgas.com
Assistant Foremangrant.matthewson@tundraoilandgas.com

Daly:

Production Engineers
nolan.jago@tundraoilandgas.com
Production Technologist
kaylene.clarke@tundraoilandgas.com
Foreman
kent.barkley@tundraoilandgas.com
Assistant Foreman
kevin.boutilier@tundraoilandgas.com

North Manitoba:

Production Technologist
trent.skelton@tundraoilandgas.com
Foreman
jack.forster@tundraoilandgas.com curtis.somerville@tundraoilandgas.com
Assistant Foreman bernard.mckinnon@tundraoilandgas.com ron.bodin@tundraoilandgas.com

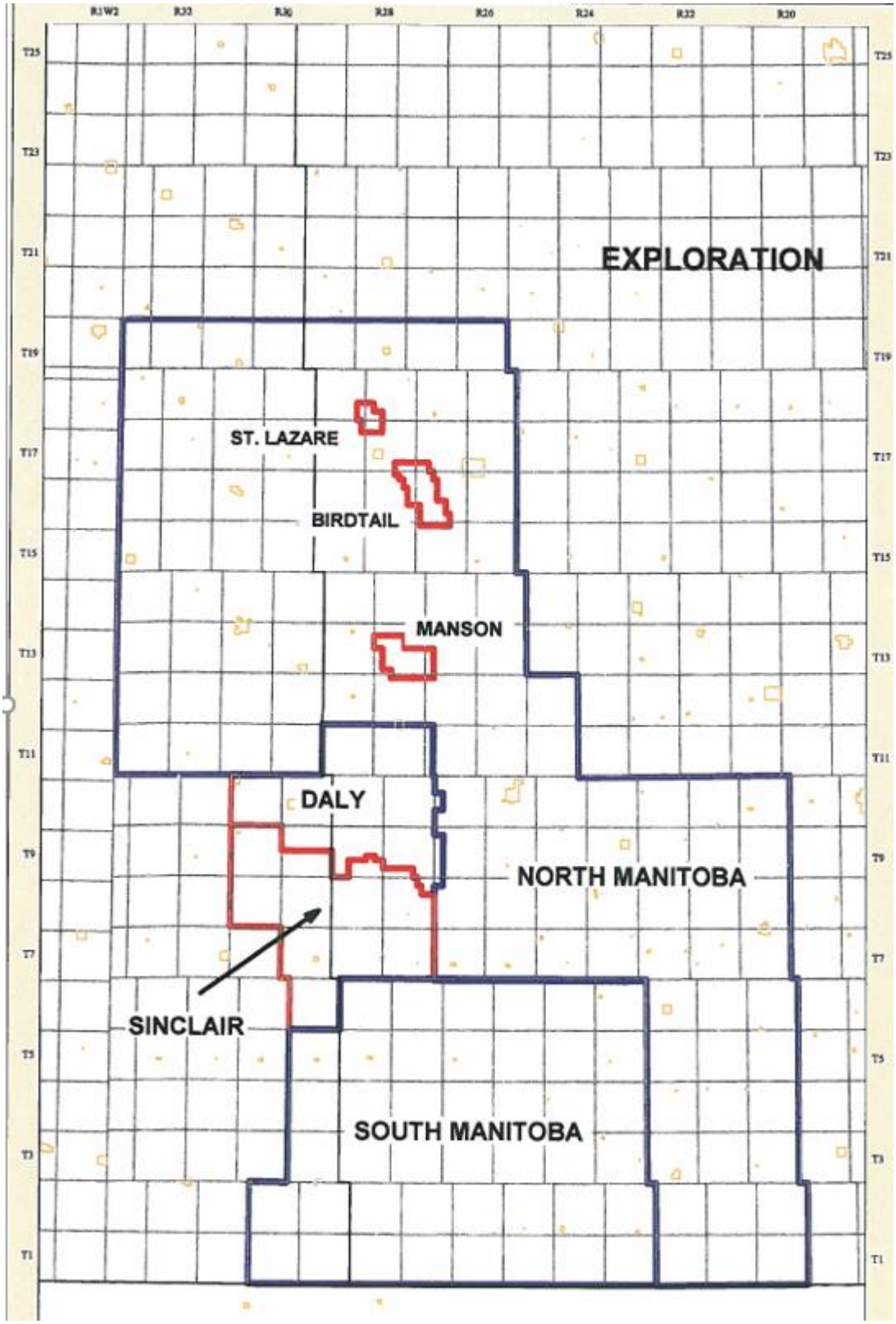
Sinclair:

Production Engineers
jake.coulter@tundraoilandgas.com
brendyn.illchuk@tundraoilandgas.com
Production Technologist
brett.stewart@tundraoilandgas.com
Foreman
doug.simpson@tundraoilandgas.com
Assistant Foreman
wade.flannery@tundraoilandgas.com

SE Sask:

Production Engineers will.young@tundraoilandgas.com
Foreman Edward.McMillen@tundraoilandgas.com
Assistant Foreman grant.hollinger@tundraoilandgas.com

AREA MAP


R1W2
R32
R30
R28
R26
R24
R22
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T25
T23
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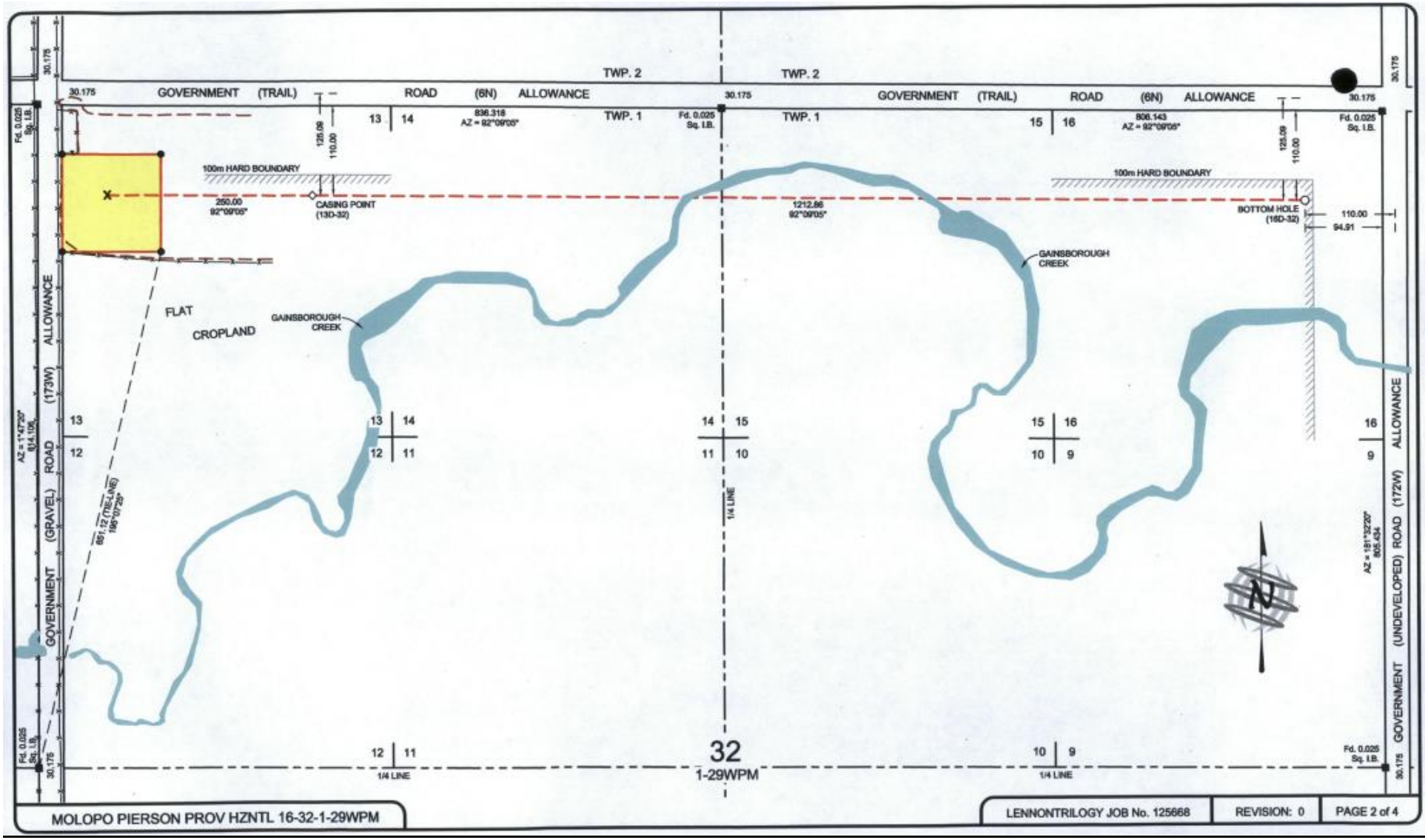
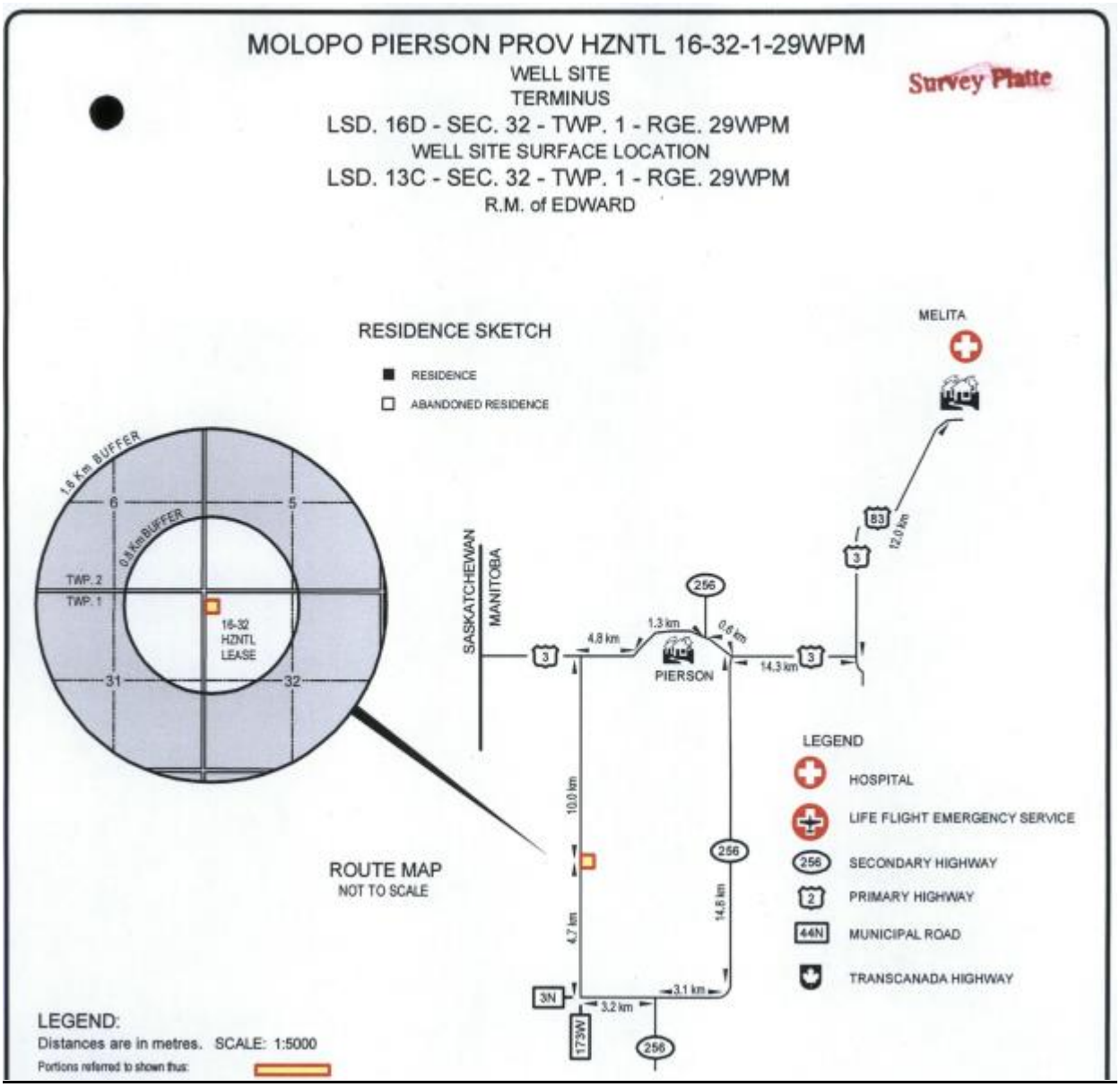
T15
T13
T11
T9
T7
T5
T3
T1
EXPLORATION
ST. LAZARE
BIRDTAIL
MANSON
DALY
NORTH MANITOBA
SINCLAIR
SOUTH MANITOBA

LEASE SITE LAYOUT:



DIRECTIONS TO SITE:

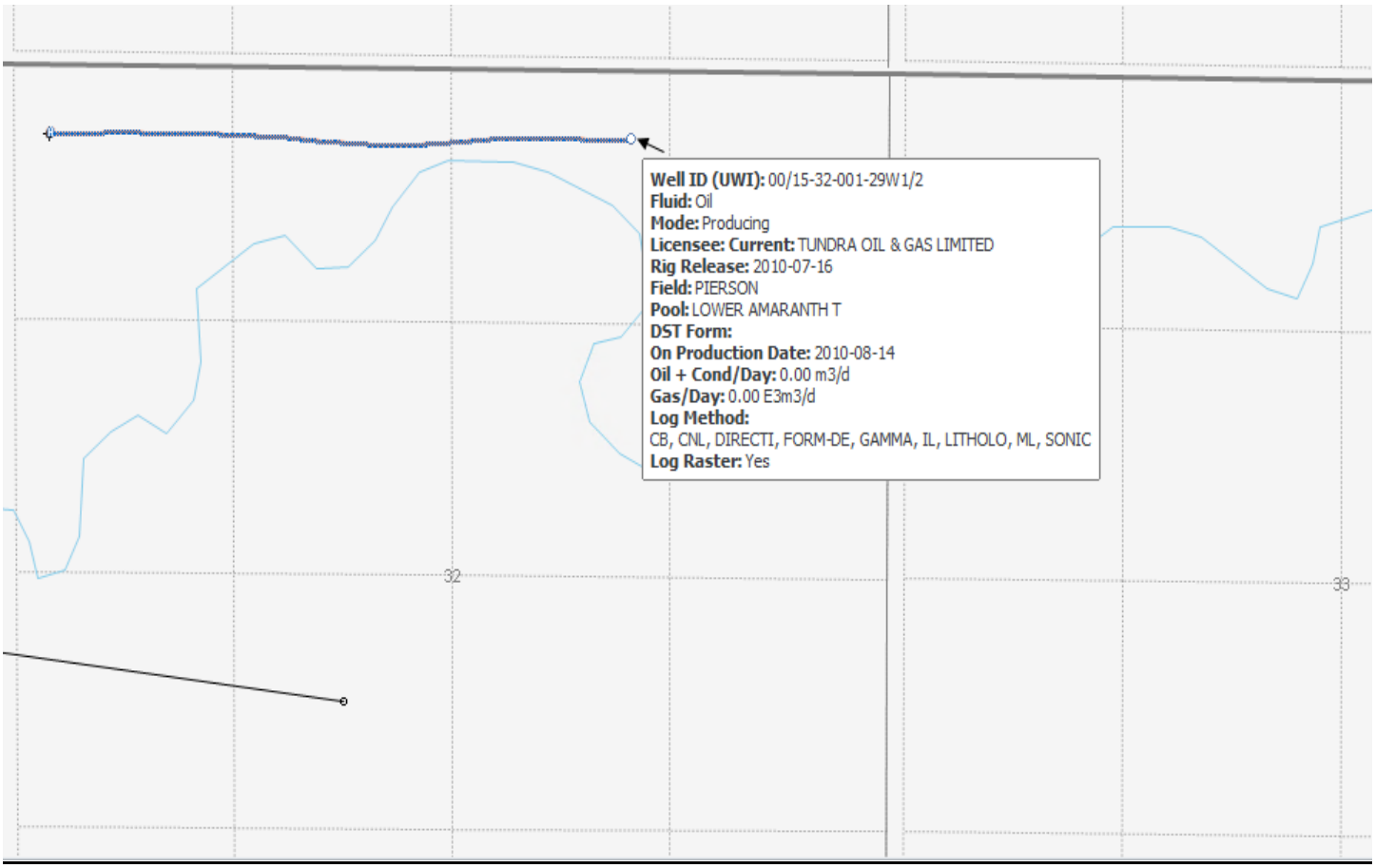


SATELLITE SNIP:

GEOLOGICAL TOPS:

Short Name	TVD (m)	MD (m)	Subsea (m)	Isopach (m)	Por Int (m)	Owner
COLRAD	*453.5*	*453.5*	*21.7*	*100.5*		*IHSM*
2WSPK	*554.0*	*554.0*	*-78.8*	*27.4*		*IHSM*
COLRDL	*581.4*	*581.4*	*-106.2*	*50.4*		*IHSM*
BFSC	*631.8*	*631.8*	*-156.6*	*67.7*		*IHSM*
MANN	*699.5*	*699.5*	*-224.3*	*106.4*		*IHSM*
JURASS	*805.9*	*806.0*	*-330.7*	*114.0*		*IHSM*
RESTON	*919.9*	*928.7*	*-444.7*	*84.7*		*IHSM*
AMRNTHL	*1004.6*	*1059.0*	*-529.4*			*IHSM*

ACCUMAP SNIP:



EQUIPMENT REQUIRED:

- Service rig & support equipment.
- Wireline truck as required
- Empty trailer to lay out BHP/Rods if required
- Empty trailer to lay out production tubing
- Trailer with work string.
- XXXX meters 60.3mm/73 mm good used, Y/Band, or new tubing as required

Ordering tubing add ~5% to total length required to replace any potential tubing failures during the job. **Note**: **If original production tubing passes initial PT and visual inspection, it may be used for work string.**

- Proper rod/tubing handling equipment as required. Check rods & tubing below.
- Abandonment plugs, cement for posts-baling, wireline truck, etc as required for abandonment program.
- XX.Xm3 0.1% (1L/m3) CPF-199 inhibited FW for all operations
- Check production tubing design to ensure s/type elevators are ordered if necessary.
- Casing scraper as required for casing size.
  Scraper run may be by-passed depending on condition of tubing in well (IE: Corrosion, wax) and a gauge rig run prior to setting lower BP instead.

Depending on lease conditions and flowline/header placements catwalks may be utilized if required. **If tubing is 88.9mm or larger a Hydraulic or air assist catwalk is required. In the event that a limited number of 88.9mm joints IE: Polycore, etc joints are in the production string, use your best judgement and utilize winch line if it can be done so safely. Do not utilize IC tubing for work string.**

NOTE: If KDA-L Anchors are in the well, perform 20m3 treated hot H20 job down annulus as well as the 15m3 down the tubing.

BE SURE TO CONFIRM PLUG SETTING DEPTHS, ETC WITH ATTACHED PETROLEUM BRANCH APPROVAL AS DEPTHS MAY VARY SLIGHTLY FROM BRANCH TO PROGRAMED DEPTHS.

WELL DETAILS:

AFE:	TBD	
UWI:	100/15-32-001-29W1/02	
SURFACE LOCATION:	13-32-01-29 WPM	
ELEVATIONS:	Ground Level:	471.00 m
	Rig KB to Ground:	4.20 m
	KB to THF:	3.60 m
	KB Elevation:	475.20 m
	CBF Elevation:	N/A
	TD:	1998.00 m KB
	PBTD:	1994.10 m KB
DRILLING LICENSE:	**7447**	
	Kick off point:	772.00 m KB
	Max TVD:	1035.81 m TVD

CASING DETAILS:

SURFACE:	219.1 mm, 35.72 kg/m, J-55, ST&C. Landed at 202.00 m KB. Cemented w/ 14.0T TSC-1700 + Additives, 3.0 m3 cement returns
INTERMEDIATE:	139.7 mm, 23.07 kg/m, J-55, LT&C Landed at 1998.00 m KB. Cemented w/ 12.0T SBM Hilite-1400 + Additives (Lead) and 30T SBM BRII + Additives (Tail). 2.0 m3 cement returns.

FORMATION: Spearfish

PERFORATIONS: 1345.0-1979.0 m KB

H2S POTENTIAL: Lower but assume High until pull test is conducted.
NOTE: H2S concentrations and readings will vary depending on sample points, state of fluids, positioning in wellbore, etc.

WELL HISTORY:

July 29, 2010 Initial Completion:
MIRU. RIH bit/scraper BHA. Tag PBTD @ 1985.93 m KB (Tallied depth). Circulate over to Spearfish H20 & POOH-Lay out. Tractor in GR/CCL/RBL tools. Tagged PBTD @ 1994.1 m KB (Wireline depth). Log out of hole to surface. RIH with Haliburton Cobra-Jet frac tools on coil. Position, cut, & frac Stage #1 at 1979.0 m KB. Frac 10 stages @ 4-4.5T/stage. POOH Frac tools. Flow well. RIH 73mm production string c/w 139.7mm anchor. Set anchor in 7.5 DAN tension. RIH BHP (25-200-RWAC-20-2) & rods. TOTP.

FRAC INTERVALS:

CURRENT PERFORATION INTERVALS			
ZONE	mKB to mKB	DATE	STATUS
SpearFish	1979		
SpearFish	1925		
SpearFish	1877		
SpearFish	1826		
SpearFish	1789		
SpearFish	1756		
SpearFish	1495		
SpearFish	1444		
SpearFish	1395		
SpearFish	1345		

SNIP OF CASING COLLAR LOG – N/A
L. Amaranth top @ 1004.60 m TVD / 1059.00 m KB MD
1004.60-5.0m – 999.60m TVD – 1054.90 m KB MD
Set permanent BP @ 1054.90 m KB MD

TUBING & PUMP AND ROD DETAILS:

BOTTOM HOLE ASSEMBLY:			
ITEM	DESCRIPTION	LENGTH (m)	Top at (m KB)
1	73 mm bull plug and collar	0.20	776.17
2	1 joint 73 mm J 55 EUE tubing	9.61	766.56
3	1 73 mm perforated pup joint	2.44	764.12
4	7 73 mm API friction seating nipple	0.33	763.79
5	1 joint 73 mm J 55 EUE tubing	9.62	754.17
6	1 139.3 mm x 73 mm Trtion tubing anchor	0.95	753.22
7	78 joints 73 mm J 55 EUE tubing	749.47	3.75
	Tubing strech	0.20	3.55
	KB to THF	3.55	3.55
	Tubing Bottom @	772.82	776.37

NOTE:

PUMP AND ROD ASSEMBLY
Bottomhole Pump - BHP 25-200-RWAC-20-2 (Ring Plunger)
5 - 38.1mm K Bars
50- 19.1mm Plain Grade D-78 Rods
10 - 2.2m Plain D78 Rods
32 - 22mm Scrapered Rods
Polish Rod - 32mm x 7.92m x 19mm

Well Abandonment Procedure:

1. Inform Energy and Mines of impending workover by email at petroleum@gov.mb.ca Provide well name, location, well license number, service rig #, and description of operations (e.g., suspension, clean out, packers plus drill out, etc.)
   CC the following Tundra people on the notification to the government:
   Corresponding area contacts as attachment above.
   Office contact.
   shellanne.langlois@tundraoilandgas.com,

2. TAKE PICTURE OF WELLHEAD AND LEASE PRIOR TO ARRIVAL/SPOTTING EQUIPMENT AND UPON COMPLETION OF JOB. Attach pictures into Wellman.

   Ensure all contractors have been orientated to Tundra Oil and Gas safety program.
   Absolutely NO Backing up without a Spotter.

3. MIRU service rig complete with pump and tank. Spot pump and tank downwind of wellhead a minimum of 25m (Manitoba) & 50m (Saskatchewan) ensuring pump operator has a clear view of wellhead/Driller whenever possible. Hold safety meeting with crew to discuss program, personnel responsibilities and safety hazards. Ensure safe-work permit is reviewed/signed off and everyone is on the sign-in sheet.

4. Move in 60.3mm/73.0mm work string as required for the job. **Note**: **If original production tubing passes initial PT and visual inspection, it may be used for work string also. Be sure to utilize only pressure tested tubing and not tail strings, etc. Do not use any IC tubing for the work string.** If possible, spot tubing trailers or catwalk if applicable after service rig has been positioned.

5. Record casing and tubing pressures. Perform a H2S "pull test" on wellbore gas as per procedure.

6. Secure surface equipment. Disconnect prescoe, environmental protection equipment, etc. Lockout & tag power. Remove H.H./I-jack/Shacks/Etc. Disconnect circulation loop and flowline from wellhead.

7. PT surface casing to 3.5 mPa. If PT fails, notify Tundra Representative.

8. Pressure test down tubing to 7.0 mPa with treated fluid hauled into location. Unseat bottom hole pump. A hot water job will likely be required down tubing if excessive wax conditions exist. Ensure "de-waxer" is added. RECORD Pure Chem WAX Dispersant CHEMICAL ADDED FOR HOT WATER JOB IN WELLMAN.
   If hot H20 is required: Conduct a Hot Water Job using 20.0 m3 Mannville Water w/ 5L/m3 PC-418 wax chemical. Pump 6.0 m3 down the Tubing @ 90C. Switch to the casing and pump 14.0 m3 down the casing @ 90C. Volumes may need to be adjusted depending on down hole equipment sizing & depths.
   Pull and lay down rods onto a trailer or rod boards. Note: Use proper rod handling procedures. Avoid whenever possible, any metal-on-metal contact with the rods. Send pump for repair or junk depending on run life and condition. Be sure to email pump report in.

   EMAIL pump sheet to the following people below for location tracking.
   Shellanne Langlois shellanne.langlois@tundraoilandgas.com
   Chris Murphy Chris.Murphy@dnow.com ;
   Chad Dobbyn chaddobbyn@gmail.com;

9. Reverse circulate well over to 1L/m3 CPF-199 inhibited FW. **Use hot oiler to heat FW if Kash anchor is in string.**

10. Break apart wellhead and inspect for corrosion. Pick up on tubing hanger if equipped to ensure its free from production bowl. Split the hanger and unset tubing anchor if in place in production string. Re-land hanger.

11. Stump test Bop pipe, blinds, & stabbing valve 1.4-14.0mpa for 5 mins each.
    Install and function test BOP's. Ensure all studs are in place and none "short studded"
    Pressure test flange seals using pipe rams 1.4-14.0mpa for 5 mins. **Ensure everyone stays clear of lines and immediate testing area and be made aware of potential "line of fire" hazards as well.**

12. Pull out of hole, visually inspect and lay down production tubing onto a trailer or catwalk. **(88.9mm tubing must be capped)** Stand back "bare" tubing if to be utilized for work string. Ensure all

components of tubing string including bar collar, x-o's, etc are recovered. If tubing condition is in question, send to Fontana's yard for inspection.
Ensure Trucker gets a copy of the Wellview "Material Transfer Report" with full location surface and UWI location and AFE number.
Email a copy to yard@diversifiedoilfield.com & fontrk@mymts.net
This is needed for billing of tubing inspection later.

~~13. Make up, up, tally, drift & RIH with the following work string:~~
This step may be by-passed depending on condition of tubing in well (IE: Corrosion, wax) and a gauge rig run prior to setting lower BP instead.
~~1 –73.0 mm x 139.7 mm casing scraper~~
~~1 – 73.0 mm joint~~
~~1 – 73.0 mm API psn~~
~~??- 73.0 mm joints~~

~~14. Work scraper from 30m intended BP setting depth and down through 30m past if possible.~~

~~15. Attempt to Reverse Circulate the well over to 0.1% CPF-199 inhibited fresh H20. (1L/m3). If unable to establish circulation, perform an annular and tubing volume flush.~~

~~16. POOH, lay down tubing and scraper.~~

17. Rig in EWU. Conduct pre-shoot safety/operations meeting. Ensure all pre-wire requirements are adhered to.
Perform a gauge ring run if scraper run was by-passed.
Run in with coated permanent Wireline BP. Set BP **999.60m TVD – 1054.90 m KB MD**
(5m TVD above lower Amaranth). You should be able to see collars in the logging unit. DO NOT SET BP ON A CASING COLLAR. **Have the Petroleum Branch representative on-site for setting plug.**

18. Pressure test bridge plug to 3500 kPa for 10 minutes with service rig. Have the Petroleum Branch representative witness pressure test.

19. **Wireline bale an 8 Linear meter cement plug above bridge plug.** Volume and number of runs required dependent on casing size. POOH wireline baler.

20. Pressure test the Surface Casing once again at this time to ensure it holds pressure. If it holds, proceed as outlined below. P. test the annulus between the surface and production casing to 3,500 KPa as per P. branch regulations. **If the PT fails, notify the Tundra office** so that a program can be drawn up to perforate 15m below the surface casing and circulate cement. *Additional steps may be necessary; however, this will be dependent on the PT and the Petroleum Branch*.

21. Set a bridge plug at ~207.0 m (5m below casing shoe).

22. Fill the casing with fresh inhibited water and PT to 3.5 MPa for 15 minutes (must be witnessed by Petroleum Branch). *Additional steps may be necessary, however this will be dependent on the PT and the Petroleum Branch*

23. Dump bail 8 linear meters of cement on top of the bridge plug.

24. RO-release EWU. Secure well.

25. ROSR and support equipment. Ensure wellhead and lease are left clean. Take final pictures and perform a walk around.

26. Make sure “Job Complete” dates and times are filled out in Wellview prior to final sync.

27. Notify-email office contacts and operations of job complete.
    Corresponding area contacts as attachment above.
    Office contact.
    shellanne.langlois@tundraoilandgas.com

Programmed by: **Kim Cowan March 2, 2022**

X 

Workovers

Kirt Pizzey Aug 3, 2023
204-851-3369 ABO

Jodi Phillips
C+C 204-741-9327

MEMO TO: FILE **FROM:** L. Fraser

SUBJECT: ABANDONMENT REVIEW **DATE:** 07 / NOV / 2022

LOCATION: Tundra Pierson Prov. HZNTL 100.15-32-01-29 **OPERATOR:** Tundra **LICENCE #** 7447

ACCESS from: **North** **South** **East** **West** **Add'l directions:** Surface Location 13-32-01-29

Surface Casing Data:

219.1 mm casing landed at 202 m 14 tonnes of cement 3 m^3 returns

Production Casing Data:

139.7 mm casing landed at 1998 m 42 tonnes of cement 2 m^3 returns

Cement to surface: yes If no, anticipated cement top: _____

Perforations: Original: 1345 m to 1979 m, _____ to _____, _____ to _____ LAm / Ms

Secondary: _____ to _____, _____ to _____ LAm / Ms

Last PBTD: 1994 m Top of Red Beds: 1011.5 m (TVD) Cased hole abandonment: mechanical plug approx. 5m above top. Open hole: cement from bottom to 15m above top.

Bottom plug max. depth: 1006.5 m (TVD) 1060 m (MD)

Remarks: No concerns with abandonment program.

Flow line licence and segment number: N/A

Status at time of review: N/A

Work Performed:

Downhole equipment pulled: 4 / Aug / 2023

Well inhibited using: 12 m^3 Rate: 500 per minute Pressure: 300 KPa

Bottom plug: Set at 1054.0 m Tested to 3500 KPa ✓ Tagged at / m

Surface casing tested to: 3500 KPa ✓ Witnessed by: LNF/

Top plug: Set at 207 m Tested to 3500 KPa ✓ Tagged at / m

Perf & Circ: Perforated at: _____ m Plug tagged at: _____ m

Remarks:

Final Abandonment Details:

Casing cut-off: Sept / 14 / 2023 Witnessed by: Whitney Baker

Manitoba
Growth, Enterprise and Trade

APPLICATION FOR APPROVAL OF WELL OPERATIONS

In compliance with Section 47 of the Drilling and Production Regulation, application is hereby made for approval of the following operations:

PROPOSED WELL OPERATION: **ABANDON** Planned Commencement Date: Nov 15, 2022

Name of Licensee: Tundra Oil and Gas
Co. Representative: Kim Cowan Phone No: 204-851-0543 Email: kim.cowan@tundraoiland gas.com

WELL INFORMATION:

Licence No.	Surface Location	Unique Well Identifier	Current Status	Casing Issues or Stuck Fish?	Reason for Proposed Operations
7447	13-32-01-29WPM	100.15-32-001-29W1.00	**Shut-in**	**No**	Uneconomic to repair/produce

Legend: COOP - Capable of Oil Production / SWD - Salt Water Disposal / Susp. - Suspended

Casing Details:	Size *(mm)*	Weight *(kg/m)*	Depth *(m)*	Cemented to Surface?
Surface Casing	**219.1**	**35.72**	**202**	Yes
Int. / Production Casing	**139.7**	**23.07**	**1998**	Yes

Perforation Intervals *(m)*	Plugback Total Depth *(m)*	Openhole Interval *(m)*	Total Depth *(m)*
1345.0-1979.0	**1994.1**	**N/A**	**1998**

04-Nov-22
Date


Signature of Applicant

For assistance in completing this form, please call at 1-800-223-5215 (toll free).

FOR DEPARTMENT USE ONLY

This approval expires on: **May 1, 2023**

This application has been approved subject to the following terms and conditions:

1.) The Virden District office is to be notified prior to commencing operations. All pressure tests must be witnessed by an Inspector.

2.) Tundra is to contact the surface owner at least 24 hours prior to entering the lease.

3.) If the pressure test of the surface/production casing annulus fails, then Tundra is to contact a Virden petroleum inspector prior to proceeding with the abandonment.

4.) Tundra is to ensure that proper procedures are exercised to ensure that the surface casing & vent are not frozen off for pressure testing during the winter months.

November 10, 2022
Date of Issue

Reviewed By

Digitally signed by Lori Stevenson
Date: 2022.11.14 14:26:41 -06'00'
Director of Petroleum

#7447

MOLOPO ENERGY CANADA LTD. DAILY COMPLETION/WORKOVER REPORT

WELL NAME	Molopo Pierson Prov Hz (13-32) 16-32-1-29 W1M			UWI #	100/16-32-001-28 W1	REPORT	1
SUPERVISOR	Jesus Pacheco	PHONE	780 919 3332 / 780 691 2649	LICENCE #	7447	DATE	7/29/2010
RIG MANAGER	Matt Annis	PHONE	1-306-575-7767 / 1-306-453-6381	RIG NAME	Eagle Rig 11	PAGES	1

PURPOSE OF JOB:	Spearfish Hz	AFE#	11C0005
ROAD & LEASE CONDITION	Good	WEATHER	Dry
SUMMARY OF LAST 24 HRS:	MIRU Service Rig equipment, install BOP, prepare to RIH with scrappe		
FORECAST OF NEXT 24 HRS:			

CURRENT PERFORATION INTERVALS			
ZONE	mKB to mKB	DATE	STATUS

FLUID MOVEMENT (m3)			
GOV'T EVENT SEQUENCE			00
Oil to loc	0.0	H_2O to loc	0.0
Oil from loc	0.0	H_2O from loc	0.0
Oil in tank	0.0	H_2O in tank	0.0
Non-rec Oil	0.0	Non-rec H_2O	0.0
Daily Oil rec	0.0	Daily H_2O rec	0.0
LOLTR	0.0	LWLTR	0.0
New Oil	N/A	New H_2O	N/A
Service Rig Hours			5.5

S/F	ITEM	AMOUNT
420	Service Rig	$2,750
460	Outlaw Oilfield Hauling	$1,302
		$0
		$0
		$0
		$0
		$0
		$0
		$0
		$0
DAILY COST		$4,093
CUM COST		$4,093
AFE COST		$615,474

REMARKS (Details of Operations)

SITHP (kPa) @ HR SICHP (kPa) @ HR

FROM	TO	
14:30	14:45	Arrived on location, inspect lease for hazards. Held safety, discussed rigging up procedures, pressure testing, BOP, emergency response plan.
14:45	17:00	Spot equipment to Manitoba regulations, stand derrick, secure all guy lines, rig up pump and tank with two lines going to wellhead. Stomp test Pipe Rams and Blind Rams to 21MPa, 10 minutes each test. Remove tubing bonnet, install BOP.
17:00	18:00	Rig up work floor, spot cat-walk, spot tubing on pipe racks. Tally bit and scrapper, x-over sub. *Tally first row of tubing. Rig inspection conducted by Rig Manager.*
18:00	18:30	Secure the well, SDFN

REMARKS (Problems encountered)

Picker scheduled for 12:00 Hrs. Arrived 2 hours late 14:00Hrs.

W

MOLOPO ENERGY CANADA LTD. DAILY COMPLETION/WORKOVER REPORT

WELL NAME	Molopo Pierson Prov Hz (13-32) 16-32-1-29 W1M			UWI #	100/16-32-001-28 W1	REPORT	2
SUPERVISOR	Jesus Pacheco	PHONE	780 919 3332 / 780 691 2649	LICENCE #	7447	DATE	7/30/2010
RIG MANAGER	Matt Annis	PHONE	1-306-575-7767 / 1-306-453-6381	RIG NAME	Eagle Rig 11	PAGES	1

PURPOSE OF JOB:	Spearfish Hz	AFE#	11C0005
ROAD & LEASE CONDITION	Good	WEATHER	Cloudy
SUMMARY OF LAST 24 HRS:	MIRU Equipment.		
FORECAST OF NEXT 24 HRS:	RIH tag PBTD Circulate to produced water, Bond log.		

CURRENT PERFORATION INTERVALS

ZONE	mKB to mKB	DATE	STATUS

FLUID MOVEMENT (m3)

AEUB EVENT SEQUENCE			00
Oil to loc	0.0	H_2O to loc	0.0
Oil from loc	0.0	H_2O from loc	0.0
Oil in tank	0.0	H_2O in tank	0.0
Non-rec Oil	0.0	Non-rec H_2O	0.0
Daily Oil rec	0.0	Daily H_2O rec	0.0
LOLTR	0.0	LWLTR	0.0
New Oil	N/A	New H_2O	N/A
Service Rig Hours			9.5

DAILY COST SUMMARY

Cost Code	ITEM	AMOUNT
420	Service Rig	$6,479
	Three Star Trucking	$1,015
	Supervision	$1,200
		$0
		$0
		$0
		$0
		$0
		$0
		$0

DAILY COST	$8,780
CUM COST	$12,873
AFE COST	$615,474

REMARKS (Details of Operations)

SITHP (kPa): 0 @ HR SICHP (kPa): 0 @ HR

FROM	TO	
07:30	08:00	Arrive on location, Held safety meeting with all personnel on location, discussed RIH with bit and scrapper, depths , circulating over to produced water, dicussed possible hazards, emergency response plan.
08:00	08:10	Check pressures, SICP=0KPa. Prepare 60.3mm handling equipment. Shut in surface casing for 24 Hrs.
08:10	11:30	Make up Bit and Scrapper, RIH with 121mm X.15m bit, 139.7mm X .91m casing scrapper, 1 - 1.88m X 60.3mm pup joint, 130 joints of 60.3mm tubing, 77 joints of 73mm tubing tagged PBTD with total of 197 joints @ 1985.93 mKB. Layed down joint 197 landing bottom of tubing @ 1982.08 mkb.
11:30	12:30	Circulate 24 m3 of Spearfish produced water to the rig tank monitoring returns. Returns look clean with no solids or debris, rig out circulating equipment.
12:30	15:30	P.O.O.H laying down string on catwalk to pipe racks. Outlaw trucking arrived on location to bundle up tubing, move cat-walk to new location.
15:30	16:00	Bit on surface, close Blind Rams. Fill casing with 1.7 m3 of produced water. Three Star Trucking hauled 24 m3 of fres water to Newalta 16-13-5-33W1.
16:00	17:00	Rig out workfloor, remove BOP, Install 73mm X 5000 lbs In tubing bonnet. Rig out pump lines, rig tank, lay over derrick. Prepare equipment to move, secure loads.
17:00	17:30	Lease free of spills and garbage debris. Move equipment to 15-18-1-27W1

REMARKS (Problems encountered)

MOLOPO ENERGY CANADA LTD. DAILY COMPLETION/WORKOVER REPORT

WELL NAME	Molopo Pierson Prov Hz (13-32) 16-32-1-29 W1M			UWI #	100/16-32-001-28 W1	REPORT	3
SUPERVISOR	Jesus Pacheco	PHONE	780 919 3332 / 780 691 2649	LICENCE #	7447	DATE	7/31/2010
RIG MANAGER	Matt Annis	PHONE	1-306-575-7767 / 1-306-453-6381	RIG NAME	Eagle Rig 11	PAGES	1

PURPOSE OF JOB:	Spearfish Hz			AFE#	11C0005
ROAD & LEASE CONDITION	Good	WEATHER	Sunny	DAILY COST SUMMARY	
SUMMARY OF LAST 24 HRS:	RIH confirm PBTD, ciculate over to produced water.			S/F	ITEM / AMOUNT
FORECAST OF NEXT 24 HRS:	Ready for Frac			440	Pure Energy Wireline $12,448
				440	Aker tractor service $15,551

CURRENT PERFORATION INTERVALS				FLUID MOVEMENT (m3)					
ZONE	mKB to mKB	DATE	STATUS	AEUB EVENT SEQUENCE			00		$0
				Oil to loc	0.0	H_2O to loc	0.0		$0
				Oil from loc	0.0	H_2O from loc	0.0		$0
				Oil in tank	0.0	H_2O in tank	0.0		$0
				Non-rec Oil	0.0	Non-rec H_2O	0.0		$0
				Daily Oil rec	0.0	Daily H_2O rec	0.0		$0
				LOLTR	0.0	LWLTR	0.0		$0
				New Oil	N/A	New H_2O	N/A		$0
				Service Rig Hours				DAILY COST	$28,279
								CUM COST	$41,428
								AFE COST	$615,474

REMARKS (Details of Operations)

FROM	TO	SITHP (kPa)	0	@	HR	SICHP (kPa)	0	@	HR

FROM	TO	
07:30	08:00	MIRU Pure Energy wireline truck, Aker tractor tool.
08:00	08:15	Held safety meeting with all personnel on location. Discussed logging procedure and depths.
08:15	08:30	RIH with RBL, CCL, GR, Power Tractor top connector, electric motor adapter, motor, 2 wheel sections, compensator, bottom connector.
08:30	10:30	RIH 40m/min on vertical section and 15 on horizontal section.
10:30	12:30	Log tool tagged PBTD @1994.1m. Log out of the hole as per program from 1991m.1 to suface. 10m/min on horizontal section, 20 on vertical section.
12:30	13:00	Tools on surface, rig out and release Pure Energy wireline and Aker Solutions back to base. Received Hard copy of bond log, gave operator intructions to send a copy to Calgary. Cement looks good on the logs.
13:00	13:30	Install and tighten up 5000 lb X 73mm tubing bonnet, SDFN.

REMARKS (Problems encountered)

Pure Energy wirelie and Aker Solutions is scheduled to log (15-18) 14-17-1-27W @ 10am August 1.

MOLOPO ENERGY LTD. DAILY COMPLETION/WORKOVER REPORT

WELL NAME	Molopo Pierson Prov Hz (13-32) 16-32-1-29 W1M			UWI #	100/16-32-001-28 W1	REPORT	4
SUPERVISOR	Jesus Pacheco	PHONE	780 919 3332 / 780 691 2649	LICENCE #	7447	DATE	8/1/2010
RIG MANAGER	Matt Annis	PHONE	1-306-575-7767 / 1-306-453-6381	RIG NAME	Eagle Rig 11	PAGES	1
PURPOSE OF JOB:	Spearfish Hz				AFE#	11C0005	
ROAD & LEASE CONDITION		WEATHER			DAILY COST SUMMARY		
SUMMARY OF LAST 24 HRS:					S/F	ITEM	AMOUNT
FORECAST OF NEXT 24 HRS:						Pajak	$1,200

CURRENT PERFORATION INTERVALS				FLUID MOVEMENT (m3)					
ZONE	mKB to mKB	DATE	STATUS	AEUB EVENT SEQUENCE			00		$0
				Oil to loc	0.0	H_2O to loc	0.0		$0
				Oil from loc	0.0	H_2O from loc	0.0		$0
				Oil in tank	0.0	H_2O in tank	0.0		$0
				Non-rec Oil	0.0	Non-rec H_2O	0.0		$0
				Daily Oil rec	0.0	Daily H_2O rec	0.0		$0
				LOLTR	0.0	LWLTR	0.0		$0
				New Oil	N/A	New H_2O	N/A		$0
				Service Rig Hours				DAILY COST	$0
								CUM COST	$41,428
								AFE COST	$615,474

REMARKS (Details of Operations)

FROM	TO	SITHP (kPa)		@		HR	SICHP (kPa)		@		HR

Aug 2 2010

13:00 Trucks and tanks started to arrive held tail-gate safety meeting with all personnel
spotted 8 400 bbl tanks and open top flow back tank SDFN

18:00 Threestar trucking started filling tanks

REMARKS (Problems encountered)

MOLOPO ENERGY CANADA LTD. DAILY COMPLETION/WORKOVER REPORT

WELL NAME	Molopo Pierson Prov Hz (13-32) 16-32-1-29 W1M			UWI #	100/16-32-001-28 W1	REPORT	5
SUPERVISOR	Jesus Pacheco	PHONE	780 919 3332 / 780 691 2649	LICENCE #	7447	DATE	8/2/2010
RIG MANAGER	Matt Annis	PHONE	1-306-575-7767 / 1-306-453-6381	RIG NAME	Eagle Rig 11	PAGES	1

PURPOSE OF JOB:	Spearfish Hz			AFE#	11C0005
ROAD & LEASE CONDITION	Dry and soft	WEATHER	Clear	DAILY COST SUMMARY	
SUMMARY OF LAST 24 HRS:				S/F	ITEM / AMOUNT
FORECAST OF NEXT 24 HRS:					Pajak $1,200
					Barber $1,200
					KBY Hotshot $1,720
					Metra $1,425
					$0
					$0
					$0
					$0
					$0
					$0
					$0

CURRENT PERFORATION INTERVALS

ZONE	mKB to mKB	DATE	STATUS

FLUID MOVEMENT (m3)

AEUB EVENT SEQUENCE			00
Oil to loc	0.0	H_2O to loc	0.0
Oil from loc	0.0	H_2O from loc	0.0
Oil in tank	0.0	H_2O in tank	0.0
Non-rec Oil	0.0	Non-rec H_2O	0.0
Daily Oil rec	0.0	Daily H_2O rec	0.0
LOLTR	0.0	LWLTR	0.0
New Oil	N/A	New H_2O	N/A
Service Rig Hours			

DAILY COST	$0
CUM COST	$41,428
AFE COST	$615,474

REMARKS (Details of Operations)

FROM	TO	SITHP (kPa)		@		HR	SICHP (kPa)		@		HR

Aug 3 2010

10:00 Tanks started to arrive held tail-gate wafety meeting with all personnel
Spotted 400 bbl tanks and test equipment
Pre-heated water in tanks to 30 C

13:00 Halliberton coil arrived held operations safety meeting spotted and rigged up equipment

15:00 And bottom hole assemble.

15:00 Wait on frac equipment to arrive aut 4 at noon ? Continued filling and heating tanks

REMARKS (Problems encountered)

MOLOPO ENERGY CANADA LTD. DAILY COMPLETION/WORKOVER REPORT

WELL NAME	Molopo Pierson Prov Hz (13-32) 16-32-1-29 W1M			UWI #	100/16-32-001-28 W1	REPORT	6
SUPERVISOR	Jesus Pacheco	PHONE	780 919 3332 / 780 691 2649	LICENCE #	7447	DATE	Aug 4
RIG MANAGER	Matt Annis	PHONE	1-306-575-7767 / 1-306-453-6381	RIG NAME	Eagle Rig 11	PAGES	1
PURPOSE OF JOB:	Spearfish Hz				AFE#	11C0005	
ROAD & LEASE CONDITION		WEATHER			DAILY COST SUMMARY		
SUMMARY OF LAST 24 HRS:					S/F	ITEM	AMOUNT
FORECAST OF NEXT 24 HRS:						Pajak	$1,200
						Barber	$1,200
						Outlaw	$10,674
							$0
							$0
							$0
							$0
							$0
							$0
							$0
					DAILY COST		$0
					CUM COST		$41,428
					AFE COST		$615,474

CURRENT PERFORATION INTERVALS

ZONE	mKB to mKB	DATE	STATUS

FLUID MOVEMENT (m3)

AEUB EVENT SEQUENCE			00
Oil to loc	0.0	H_2O to loc	0.0
Oil from loc	0.0	H_2O from loc	0.0
Oil in tank	0.0	H_2O in tank	0.0
Non-rec Oil	0.0	Non-rec H_2O	0.0
Daily Oil rec	0.0	Daily H_2O rec	0.0
LOLTR	0.0	LWLTR	0.0
New Oil	N/A	New H_2O	N/A
Service Rig Hours			

REMARKS (Details of Operations)

FROM	TO	SITHP (kPa)		@	HR	SICHP (kPa)		@	HR

FROM	TO	
		Aug 4 2010
07:00	20:00	Wait on frac equipment 20:00 Crew chenge
2000	2200	Wait on frac equipment
2200	2359	Spot Halliburton frac crew and RU as per regulations

REMARKS (Problems encountered)

MOLOPO ENERGY CANADA LTD. DAILY COMPLETION/WORKOVER REPORT

WELL NAME	Molopo Pierson Prov Hz (13-32) 16-32-1-29 W1M			UWI #	100/16-32-001-28 W1	REPORT	7
SUPERVISOR	Jesus Pacheco	PHONE	780 919 3332 / 780 691 2649	LICENCE #	7447	DATE	aug-5-2010
RIG MANAGER	Matt Annis	PHONE	1-306-575-7767 / 1-306-453-6381	RIG NAME	Eagle Rig 11	PAGES	1
PURPOSE OF JOB:	Spearfish Hz				AFE#	11C0005	
ROAD & LEASE CONDITION		WEATHER			DAILY COST SUMMARY		
SUMMARY OF LAST 24 HRS:					S/F	ITEM	AMOUNT
FORECAST OF NEXT 24 HRS:						Pajak	$1,200
						Barber	$1,200
						Halliburton	$0
						HSE (Safety)	$0
						Evergreen	$0
						3 star trucking	$1,957
							$0
							$0
							$0
							$0
					DAILY COST		$0
					CUM COST		$41,428
					AFE COST		$615,474

CURRENT PERFORATION INTERVALS				FLUID MOVEMENT (m3)				
ZONE	mKB to mKB	DATE	STATUS	AEUB EVENT SEQUENCE			00	
				Oil to loc	0.0	H_2O to loc	0.0	
				Oil from loc	0.0	H_2O from loc	0.0	
				Oil in tank	0.0	H_2O in tank	0.0	
				Non-rec Oil	0.0	Non-rec H_2O	0.0	
				Daily Oil rec	0.0	Daily H_2O rec	0.0	
				LOLTR	0.0	LWLTR	0.0	
				New Oil	N/A	New H_2O	N/A	
				Service Rig Hours				

REMARKS (Details of Operations)

FROM	TO	SITHP (kPa)		@		HR	SICHP (kPa)		@		HR

0001	0230	Rig up Halliburton frac crew as per regulations
0230		Held Pre-job safety meeting make up Halliburton Corbra -Jet BHA to 73mm RTU unit ,Pressure test surface equipment to 28 mpa
	07:00	had a leak on spool on top of well below halliburton BOP Assy.Re-tighten all bolts
07:00		Shift change continued working coil at 1711.0 m and could not get down pumped bear lube down casing and the tubing started to move down tagged plug back pulled in to interval 1 at 1979.0 mKB. Brake down 16.6 Mpa, Avg tresting pressure 9.69 Mpa Max treating pressure 11.3 Mpa, Min pressure 8.5 Mpa ISIP 8.3 Mpa.
		Pull up to stage 2 set packer cut window, Started into frac brake down 15.4 Mpa, average pressure 10.3, Max pressure 12.7 Mpa Min pressure 9.05 Mpa, ISIP 12.7 Mpa.
		Pull up to stage 3 set packer cut window, Started into frac brake down 14.4 Mpa, average pressure 10.22, Max pressure 11.3 Mpa Min pressure 8.8 Mpa, ISIP 8.8 Mpa.
	20000	
20000		Pull up to stage 4 (1826 mkb) attempt to set packer &hydra-jet holes but packer would not set attempt to set packe a few times no success POH to ~ 1456 mkb set packer .Unset packe and try To RIH to interval # 4 started to hang up @ ~ 1910 mkb pump Bera-lube to help with friction still cant get past 1610 m .Talk to Molopo was asked to increse rate to 750-800 lpm for 4 me and see if increased rat help To RIH got down to 1668 Pick marker jt @ 1654-1658.9 m to insure accuracy of RTU depth meter .Pick rate back up to 650 lpm and RIH to 1840 m . Space ot tools to Hudra-jet /frac interval #4
		Stage # 4 Hydra-jet interval @ (1826 MKB) Started to frac down casing breakdown @ 14,7 mpa Ave treating pressure 10 mpa Max
2359		treating pressure @ 11.2 mpa ISIP 8.4 mpa Placed 4,5 t 20/40 ottawa sand

REMARKS (Problems encountered)

MOLOPO ENERGY CANADA LTD. DAILY COMPLETION/WORKOVER REPORT

WELL NAME	Molopo Pierson Prov Hz (13-32) 16-32-1-29 W1M			UWI #	100/16-32-001-28 W1	REPORT	8
SUPERVISOR	Jesus Pacheco	PHONE	780 919 3332 / 780 691 2649	LICENCE #	7447	DATE	aug-6-2010
RIG MANAGER	Matt Annis	PHONE	1-306-575-7767 / 1-306-453-6381	RIG NAME	Eagle Rig 11	PAGES	1
PURPOSE OF JOB:	Spearfish Hz				AFE#	11C0005	
ROAD & LEASE CONDITION		WEATHER			DAILY COST SUMMARY		
SUMMARY OF LAST 24 HRS:					S/F	ITEM	AMOUNT
FORECAST OF NEXT 24 HRS:						Pajak	$1,200
						Barber	$1,200
						3 star	$0
						Halliburton	$0
						evergreen	$0
							$0
							$0
							$0
							$0
							$0
					DAILY COST		$0
					CUM COST		$41,428
					AFE COST		$615,474

CURRENT PERFORATION INTERVALS

ZONE	mKB to mKB	DATE	STATUS

FLUID MOVEMENT (m3)

AEUB EVENT SEQUENCE			00
Oil to loc	0.0	H_2O to loc	0.0
Oil from loc	0.0	H_2O from loc	0.0
Oil in tank	0.0	H_2O in tank	0.0
Non-rec Oil	0.0	Non-rec H_2O	0.0
Daily Oil rec	0.0	Daily H_2O rec	0.0
LOLTR	0.0	LWLTR	0.0
New Oil	N/A	New H_2O	N/A
Service Rig Hours			

REMARKS (Details of Operations)

FROM	TO	SITHP (kPa)	@	HR	SICHP (kPa)	@	HR
0001							

Pull up to interval # 5 attempt to set tool and P-test looks like packer set but will not test .flush down casing and try to clean up made a few attempts but packer will not pressure test.Circulate bera-lube down annulus up tubing holding 8500 kpa back pressure .set tool @ 1789 mkb test tool to 14.6 mpa held

Interval # 5 @ 1789 mkb Hydra jet perfs ; breakdown @ 14.8 mpa to 12.2 mpa average treating pressure 9.4 mpa Min treating pressure was 8.4 mpa ISIP was 8.6 mpa placed 4.52 tonnes 20/40 sar average fluid injection rate .62 m3/min

Interval #6 @ 1757 mpa Hydra jet perfs Break down @ # 12.8 to 11.24 mpa average treating pressure was @ 10.1 max treating pressure was at 17.5 mpa ISIP 9.5 mpa Average treating rate .63 m3/min Placed 4.42 tonnes 20/40 sand

Interval # 7 landed at 1497.5 mkb Hydra-jet perfs

Halliburton had trouble with computers had to wait for tec.

REMARKS (Problems encountered)

MOLOPO ENERGY CANADA LTD. DAILY COMPLETION/WORKOVER REPORT

WELL NAME	Molopo Pierson Prov Hz (13-32) 16-32-1-29 W1M			UWI #	100/16-32-001-28 W1	REPORT	9
SUPERVISOR	Jesus Pacheco	PHONE	780 919 3332 / 780 691 2649	LICENCE #	7447	DATE	7/8/2010
RIG MANAGER	Matt Annis	PHONE	1-306-575-7767 / 1-306-453-6381	RIG NAME	Eagle Rig 11	PAGES	1
PURPOSE OF JOB:	Spearfish Hz				AFE#	11C0005	
ROAD & LEASE CONDITION	Dry		WEATHER	Sunny	DAILY COST SUMMARY		
SUMMARY OF LAST 24 HRS:	Completed frac and moved off the equipment				S/F	ITEM	AMOUNT
FORECAST OF NEXT 24 HRS:	Flow back the well at 2 M3 per hr					P tank	$3,481
						Tank trucks	$3,045
						Disposal	$2,375
							$0
							$0
							$0
							$0
							$0
							$0
							$0
					DAILY COST		$8,990
					CUM COST		$51,933
					AFE COST		$615,474

CURRENT PERFORATION INTERVALS

ZONE	mKB to mKB	DATE	STATUS
SpearFish	1979		
SpearFish	1925		
SpearFish	1877		
SpearFish	1826		
SpearFish	1789		
SpearFish	1756		
SpearFish	1495		
SpearFish	1444		
SpearFish	1395		
SpearFish	1345		

FLUID MOVEMENT (m3)

AEUB EVENT SEQUENCE				00
Oil to loc	0.0	H_2O to loc		0.0
Oil from loc	0.0	H_2O from loc		0.0
Oil in tank	0.0	H_2O in tank		0.0
Non-rec Oil	0.0	Non-rec H_2O		0.0
Daily Oil rec	0.0	Daily H_2O rec		0.0
LOLTR	0.0	LWLTR		0.0
New Oil	N/A	New H_2O		N/A
Service Rig Hours				

REMARKS (Details of Operations)

FROM	TO	SITHP (kPa)		@		HR	SICHP (kPa)		@		HR

00:01	Finished rigging in the testers
	Opened the well to the testers
01:00	Flowing on 8/64 th choke
	430 m3 to recover
02:30	Changed choke to 10/64 pressure at 4800 KPA
04::00	Changed choke to 14/64 pressure at 4197 KPA
04:30	Changed choke to 10/64 pressure at 4440 KPA
07:10	Changed choke to 14/64 pressure at 3852 KPA
08:31	Changed choke to 12/64 pressure at 3062 KPA
09:20	Changed Choke to 10/64 pressure at 3134 KPA
13:10	Changed Choke to 8/64 pressure at 2850 KPA
18:01	Changed choke to 10/64 pressure at 2561 KPA
23:59	Still flowing with not alot of sand in the samples
	Pressure at 2019 KPA
	Fluid recovered for the day 47.87 m3
23:59	Still to recover 381.64 m3 of frac wateer

REMARKS (Problems encountered)

MOLOPO ENERGY CANADA LTD. DAILY COMPLETION/WORKOVER REPORT

WELL NAME	Molopo Pierson Prov Hz (13-32) 16-32-1-29 W1M			UWI #	100/16-32-001-28 W1	REPORT	10
SUPERVISOR	Jesus Pacheco	PHONE	780 919 3332 / 780 691 2649	LICENCE #	7447	DATE	8/8/2010
RIG MANAGER	Matt Annis	PHONE	1-306-575-7767 / 1-306-453-6381	RIG NAME	Eagle Rig 11	PAGES	1

PURPOSE OF JOB:	Spearfish Hz	AFE#	11C0005
ROAD & LEASE CONDITION		WEATHER	
SUMMARY OF LAST 24 HRS:			
FORECAST OF NEXT 24 HRS:			

CURRENT PERFORATION INTERVALS

ZONE	mKB to mKB	DATE	STATUS
SpearFish	1979		
SpearFish	1925		
SpearFish	1877		
SpearFish	1826		
SpearFish	1789		
SpearFish	1756		
SpearFish	1495		
SpearFish	1444		
SpearFish	1395		
SpearFish	1345		

FLUID MOVEMENT (m3)

AEUB EVENT SEQUENCE			00
Oil to loc	0.0	H_2O to loc	0.0
Oil from loc	0.0	H_2O from loc	0.0
Oil in tank	0.0	H_2O in tank	0.0
Non-rec Oil	0.0	Non-rec H_2O	0.0
Daily Oil rec	0.0	Daily H_2O rec	0.0
LOLTR	0.0	LWLTR	0.0
New Oil	N/A	New H_2O	N/A
Service Rig Hours			

DAILY COST SUMMARY

S/F	ITEM	AMOUNT
	P tank	$3,481
	Tank trucks	$3,772
	Disposal	$3,900
		$0
		$0
		$0
		$0
		$0
		$0
		$0
	DAILY COST	$11,265
	CUM COST	$63,197
	AFE COST	$615,474

REMARKS (Details of Operations)

FROM	TO	SITHP (kPa)		@	HR	SICHP (kPa)		@	HR

FROM	TO	
01:00		Continued to flow well on 10/64 choke
		Flowed the well all day with just traces of sand
		No oil in the samples
		Total fluid recovered for the day 38.68 m3
		Total left to recover 343.63 m3
	23:59	Pressures started at 2050 KPA and slowly fell to 1282 KPA

REMARKS (Problems encountered)

MOLOPO ENERGY CANADA LTD. DAILY COMPLETION/WORKOVER REPORT

WELL NAME	Molopo Pierson Prov Hz (13-32) 16-32-1-29 W1M			UWI #	100/16-32-001-28 W1	REPORT	11
SUPERVISOR	Jesus Pacheco	PHONE	780 919 3332 / 780 691 2649	LICENCE #	7447	DATE	8/9/2010
RIG MANAGER	Matt Annis	PHONE	1-306-575-7767 / 1-306-453-6381	RIG NAME	Eagle Rig 11	PAGES	1
PURPOSE OF JOB:	Spearfish Hz				AFE#	11C0005	
ROAD & LEASE CONDITION		WEATHER			DAILY COST SUMMARY		
SUMMARY OF LAST 24 HRS:					S/F	ITEM	AMOUNT
FORECAST OF NEXT 24 HRS:						P tank	$3,539
						Tank truck	$870
						Dispopsal	$558
							$0
							$0
							$0
							$0
							$0
							$0
							$0
					DAILY COST		$5,017
					CUM COST		$68,214
					AFE COST		$615,474

CURRENT PERFORATION INTERVALS

ZONE	mKB to mKB	DATE	STATUS
SpearFish	1979		
SpearFish	1925		
SpearFish	1877		
SpearFish	1826		
SpearFish	1789		
SpearFish	1756		
SpearFish	1495		
SpearFish	1444		
SpearFish	1395		
SpearFish	1345		

FLUID MOVEMENT (m3)

AEUB EVENT SEQUENCE			00
Oil to loc	0.0	H_2O to loc	0.0
Oil from loc	0.0	H_2O from loc	0.0
Oil in tank	0.0	H_2O in tank	0.0
Non-rec Oil	0.0	Non-rec H_2O	0.0
Daily Oil rec	0.0	Daily H_2O rec	0.0
LOLTR	0.0	LWLTR	0.0
New Oil	N/A	New H_2O	N/A
Service Rig Hours			

REMARKS (Details of Operations)

FROM	TO	SITHP (kPa)		@		HR	SICHP (kPa)		@		HR

00:01		continued to flow back the well
	10:45	Changed choke size to 14/64 pressure at 1007 KPA
	12:35	Changed choke size to 12/64 pressure at 755 KPA
	16:05	Changed choke size to 14/64 Pressure at 713 KPA
		Flowed wel for the rest of the day at this rate
		Just traces of sand in the samples
		No oil in the samples
		Total recovered for the day 35.82 m3
	23:59	Still to recover 307.81 M3

REMARKS (Problems encountered)

MOLOPO ENERGY CANADA LTD. DAILY COMPLETION/WORKOVER REPORT

WELL NAME	Molopo Pierson Prov Hz (13-32) 16-32-1-29 W1M			UWI #	100/16-32-001-28 W1	REPORT	12
SUPERVISOR	Jesus Pacheco	PHONE	780 919 3332 / 780 691 2649	LICENCE #	7447	DATE	8/10/2010
RIG MANAGER	Matt Annis	PHONE	1-306-575-7767 / 1-306-453-6381	RIG NAME	Eagle Rig 11	PAGES	1
PURPOSE OF JOB:	Spearfish Hz					AFE#	11C0005
ROAD & LEASE CONDITION		WEATHER					
SUMMARY OF LAST 24 HRS:							
FORECAST OF NEXT 24 HRS:							

CURRENT PERFORATION INTERVALS

ZONE	mKB to mKB	DATE	STATUS
SpearFish	1979		
SpearFish	1925		
SpearFish	1877		
SpearFish	1826		
SpearFish	1789		
SpearFish	1756		
SpearFish	1495		
SpearFish	1444		
SpearFish	1395		
SpearFish	1345		

FLUID MOVEMENT (m3)

AEUB EVENT SEQUENCE				00
Oil to loc	0.0	H_2O to loc	0.0	
Oil from loc	0.0	H_2O from loc	0.0	
Oil in tank	0.0	H_2O in tank	0.0	
Non-rec Oil	0.0	Non-rec H_2O	0.0	
Daily Oil rec	0.0	Daily H_2O rec	0.0	
LOLTR	0.0	LWLTR	0.0	
New Oil	N/A	New H_2O	N/A	
Service Rig Hours				

DAILY COST SUMMARY

S/F	ITEM	AMOUNT
	P tank	$3,539
	Tank truck	$1,160
	Disposal	$792
		$0
		$0
		$0
		$0
		$0
		$0
		$0

DAILY COST	$5,918
CUM COST	$74,131
AFE COST	$615,474

REMARKS (Details of Operations)

FROM	TO	SITHP (kPa)		@		HR	SICHP (kPa)		@		HR

00:01	Still flow back
05:05	Changed choke to 16/64 pressures 475 KPA
09:00	Traces of oil in the water
	Nosand
12:01	Changed choke to 18/64 pressures 333 KPA
	Traces of oil in the water
	No sand
21:00	Changed choke to 22/64 pressure 295 KPA
	Traces of oil in the water
	No sand
23:59	Still flowing
	Total fluid recovered for the day 25.78 m3
	Stil to recover 273.46

REMARKS (Problems encountered)

MOLOPO ENERGY CANADA LTD. DAILY COMPLETION/WORKOVER REPORT

WELL NAME	Molopo Pierson Prov Hz (13-32) 16-32-1-29 W1M			UWI #	100/16-32-001-28 W1	REPORT	13
SUPERVISOR	Jesus Pacheco	PHONE	780 919 3332 / 780 691 2649	LICENCE #	7447	DATE	8/11/2010
RIG MANAGER	Matt Annis	PHONE	1-306-575-7767 / 1-306-453-6381	RIG NAME	Eagle Rig 11	PAGES	1
PURPOSE OF JOB:	Spearfish Hz				AFE#	11C0005	
ROAD & LEASE CONDITION			WEATHER		DAILY COST SUMMARY		
SUMMARY OF LAST 24 HRS:					S/F	ITEM	AMOUNT
FORECAST OF NEXT 24 HRS:						P tank	$3,551
						tank truck	$1,160
						Fluid disposal	$576
							$0
							$0
							$0
							$0
							$0
							$0
							$0
					DAILY COST		$5,930
					CUM COST		$80,061
					AFE COST		$615,474

CURRENT PERFORATION INTERVALS

ZONE	mKB to mKB	DATE	STATUS
SpearFish	1979		
SpearFish	1925		
SpearFish	1877		
SpearFish	1826		
SpearFish	1789		
SpearFish	1756		
SpearFish	1495		
SpearFish	1444		
SpearFish	1395		
SpearFish	1345		

FLUID MOVEMENT (m3)

AEUB EVENT SEQUENCE				00
Oil to loc	0.0	H_2O to loc	0.0	
Oil from loc	0.0	H_2O from loc	0.0	
Oil in tank	0.0	H_2O in tank	0.0	
Non-rec Oil	0.0	Non-rec H_2O	0.0	
Daily Oil rec	0.0	Daily H_2O rec	0.0	
LOLTR	0.0	LWLTR	0.0	
New Oil	N/A	New H_2O	N/A	
Service Rig Hours				

REMARKS (Details of Operations)

FROM	TO	SITHP (kPa)	@	HR	SICHP (kPa)	@	HR

00:01		Still flow back
	08:15	Chnaged choke to 28/64 pressure at 137 KPA
		Getting 2% oil ion the samples
		No sand
		Pressures slowly fell to 66 KPA
	16:00	Shut the well in
	20:00	The pressures slowly climbed to 843 kpa
		P tank and lines are rigged out
		total recoverd today 21.97 m3 total oil recovery .67 m3
		Fluid left to recover 251.49 M3

REMARKS (Problems encountered)

MOLOPO ENERGY CANADA LTD. DAILY COMPLETION/WORKOVER REPORT

WELL NAME	Molopo Pierson Prov Hz (13-32) 16-32-1-29 W1M			UWI #	100/16-32-001-28 W1	REPORT	14
SUPERVISOR	Jesus Pacheco	PHONE	780 919 3332 / 780 691 2649	LICENCE #	7447	DATE	8/12/2010
RIG MANAGER	Matt Annis	PHONE	1-306-575-7767 / 1-306-453-6381	RIG NAME	Eagle Rig 11	PAGES	1

PURPOSE OF JOB:	Spearfish Hz	AFE#	11C0005
ROAD & LEASE CONDITION		WEATHER	
SUMMARY OF LAST 24 HRS:			
FORECAST OF NEXT 24 HRS:			

CURRENT PERFORATION INTERVALS

ZONE	mKB to mKB	DATE	STATUS
SpearFish	1979		
SpearFish	1925		
SpearFish	1877		
SpearFish	1826		
SpearFish	1789		
SpearFish	1756		
SpearFish	1495		
SpearFish	1444		
SpearFish	1395		
SpearFish	1345		

FLUID MOVEMENT (m3)

AEUB EVENT SEQUENCE				00
Oil to loc	0.0	H_2O to loc	0.0	
Oil from loc	0.0	H_2O from loc	0.0	
Oil in tank	0.0	H_2O in tank	0.0	
Non-rec Oil	0.0	Non-rec H_2O	0.0	
Daily Oil rec	0.0	Daily H_2O rec	0.0	
LOLTR	0.0	LWLTR	0.0	
New Oil	N/A	New H_2O	N/A	
Service Rig Hours				

DAILY COST SUMMARY

S/F	ITEM	AMOUNT
	Service rig	$1,960
		$0
		$0
		$0
		$0
		$0
		$0
		$0
		$0
	DAILY COST	$1,980
	CUM COST	$82,041
	AFE COST	$615,474

REMARKS (Details of Operations)

FROM	TO	SITHP (kPa)		@		HR	SICHP (kPa)	1200 KPA	@		HR

FROM	TO	
14:00		Moved the service rig to location
		Held a safety and operation meeting on location hazards
		Rigged up the service rig to spec
	17:30	Shut down for the day

REMARKS (Problems encountered)

MOLOPO ENERGY CANADA LTD. DAILY COMPLETION/WORKOVER REPORT

WELL NAME	Molopo Pierson Prov Hz (13-32) 16-32-1-29 W1M			UWI #	100/16-32-001-28 W1	REPORT	15
SUPERVISOR	Jesus Pacheco	PHONE	780 919 3332 / 780 691 2649	LICENCE #	7447	DATE	8/13/2010
RIG MANAGER	Matt Annis	PHONE	1-306-575-7767 / 1-306-453-6381	RIG NAME	Eagle Rig 11	PAGES	1
PURPOSE OF JOB:	Spearfish Hz				AFE#	11C0005	
ROAD & LEASE CONDITION		WEATHER			DAILY COST SUMMARY		
SUMMARY OF LAST 24 HRS:					S/F	ITEM	AMOUNT
FORECAST OF NEXT 24 HRS:	Run BHP and rods , rig out and move off					Service rig	$6,804
CURRENT PERFORATION INTERVALS				FLUID MOVEMENT (m3)		Supervision	$1,300
ZONE	mKB to mKB	DATE	STATUS	AEUB EVENT SEQUENCE	00	Tubing	$15,100
SpearFish	1979			Oil to loc 0.0	H_2O to loc 0.0	Material hauling	$1,270
SpearFish	1925			Oil from loc 0.0	H_2O from loc 0.0	Tank Truck	$1,812
SpearFish	1877			Oil in tank 0.0	H_2O in tank 0.0	Tubing anchor	$2,090
SpearFish	1826			Non-rec Oil 0.0	Non-rec H_2O 0.0	Fluid disposal	$396
SpearFish	1789			Daily Oil rec 0.0	Daily H_2O rec 0.0		$0
SpearFish	1756			LOLTR 0.0	LWLTR 0.0		$0
SpearFish	1495			New Oil N/A	New H_2O N/A		$0
SpearFish	1444			Service Rig Hours		DAILY COST	$0
SpearFish	1395					CUM COST	$82,041
SpearFish	1345					AFE COST	$615,474

REMARKS (Details of Operations)

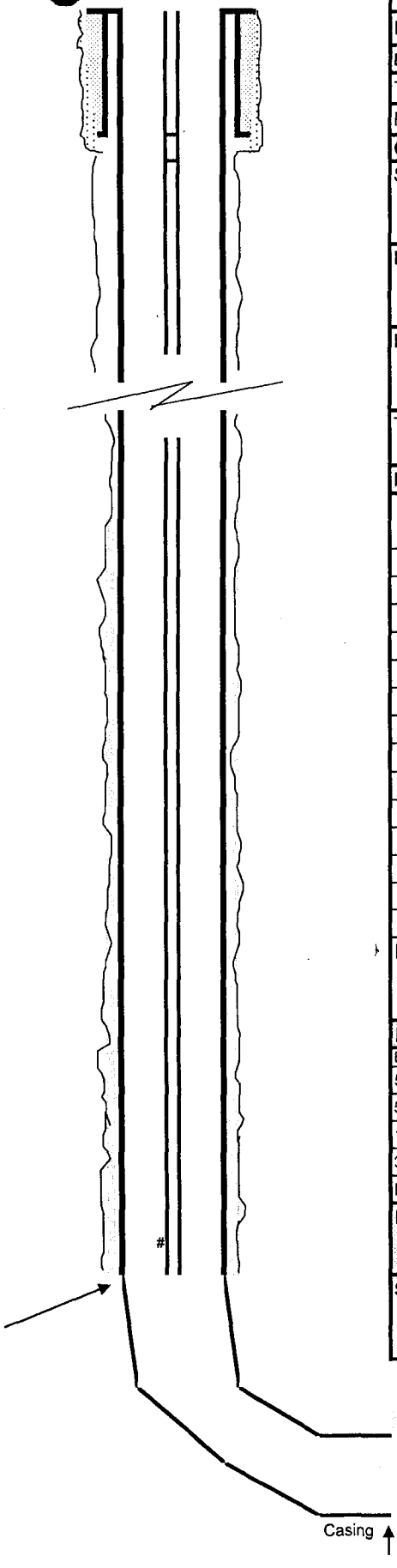
FROM	TO	SITHP (kPa)		@		HR	SICHP (kPa)	1,250	@		HR

07:30	Held lease safey and operational meeting
	Started to bleed the well to the rig tank
	Hooked up water truck to bleed off the well
	The well is flowing back 10% oil
	Flowed and sucked back 12 m3 to get the well dead
	Removed the Mater valve
12:00	Install the BOP'S on the wellhead
	Funtion and pressure tested the BOP'S
12:45	Spotted the tubing trailer
	Start in the hole with the production string ,
	Ran in bull plug, collar, 1 joint 73 mm J 55 tubing, 1 2.44 meter perforated pup joint, PSN,1 joint 73 mm tubing
	Welll is want to kick up the casing
	Triton tubing andchor c/w 50,000 # shear
	Tally and run in the tubing, ran in 78 joints tubing
	Had to pump tubing displacement of water 2 times
17:15	Landed the bottom of the tail joint at 776.37 mKB The PSN is at 763.79
	Removed the BOP'S from the wellhead
	Set the tubing anchor in 7.5 dAN tension
18:00	Made up the wellhead
	Clean up the area
18:30	Shut the well ion for the night

REMARKS (Problems encountered)

WELL DIAGRAM (CURRENT CONFIGURATION)

ALL D[illegible]S ARE mKB



WELL NAME:	**Molopo Pierson Prov Hz (13-32) 16-32-1-29 W1M**			
PREPARED BY:	Chad Melby		DATE:	14-Aug-10
ELEVATIONS (meters):				
TD 1,998.0	KB Elev. 475.20		KB to THF 3.60	
PBTD 1,985.9	Ground Elev. 471.00		KB to Ground 4.60	

CASING/TUBING	SIZE (mm)	WEIGHT (kg/m)	GRADE	DEPTHS (m)
Surface Casing	219.10	35.70	J-55	202.00
Int. Casing				
Prod Casing	139.70	23.10	J-55	1,998.00
Tubing				

BOTTOM HOLE ASSEMBLY:

ITEM	DESCRIPTION	LENGTH (m)	Top at (m KB)
1	73 mm bull plug and collar	0.20	776.17
2	1 joint 73 mm J 55 EUE tubing	9.61	766.56
3	1 73 mm perforated pup joint	2.44	764.12
4	7 73 mm API friction seating nipple	0.33	763.79
5	1 joint 73 mm J 55 EUE tubing	9.62	754.17
6	1 139.3 mm x 73 mm Trtion tubing anchor	0.95	753.22
7	78 joints 73 mm J 55 EUE tubing	749.47	3.75
	Tubing strech	0.20	3.55
	KB to THF	3.55	3.55
	Tubing Bottom @	772.82	776.37

NOTE:

PUMP AND ROD ASSEMBLY

Bottomhole Pump - BHP 25-200-RWAC-20-2 (Ring Plunger)
5 - 38.1mm K Bars
50- 19.1mm Plain Grade D-78 Rods
10 - 2.2m Plain D78 Rods
32 - 22mm Scrapered Rods
Polish Rod - 32mm x 7.92m x 19mm

PERFORATION INTERVALS

See Perf Summary Sheet

Tundra
oil and gas ltd.

DAILY COMPLETION AND WELL SERVICING REPORT

TOGL FILE #: S6250

PURPOSE: ABANDONMENT - CUT AND CAP

Well Name:	Tundra Pierson Prov HZNTL (13C-32) 15-32-01-29 WPM	**Date:**(M/D/Y/)	09/18/2023	**Day:**	1
DRILL LIC:	7447	**Est Cost:**		**Prev.Cost:**	0
Daily Cost:	0	**Cumm. Cost:**	0		

Casing Details:	Size	Weight	Grade	Landed at
Casing #1:				
Casing #2:				
Casing #3:				
Liner:				

Tubing:	Size	Weight	Grade	On Location
#1				
#2				
#3				
Tubing out		Tubing in well		

DAILY FLUID BREAKDOWN

FLUID VOL. M3	OIL	WATER
Total Fluid Pumped		
Recovered Last 24 hours		
Total Fluid Recovered To Date		
Total Hauled To Lease		
Total Hauled From Lease		
Fluid In Tanks		
Non-Recoverable Annular Fluid		
Fluid Lost To Abandonment		
Load To Recover		
Previous Load Fluid		

DAILY COST BREAKDOWN

SERVICES	AMOUNT

ELEVATIONS: **KB:** **GL:** **KB-TH:**

ZONES OF INTEREST

Name:		Perforations:	mKB.
Name:		Perforations:	mKB.
Name:		Perforations:	mKB.

TIME **Detailed Description of Daily Operations**

- Completed Activities: September 14, 2023
- Clearances were sent and received: August 17, 2023
- Dig Permit was issued #1957564
- Day Construction Ltd. performed excavation for well abandonment
- Austin's Welding performed the cut and cap activities
- Procedure supervised by Cole Turner - Good Lands
- Report to follow

Abandonment Complete

Site entered into reclamation program.

Weather/Temp:		**Road Conditions:**		**Safety Co.:**	
Service Rig:		**Rig Manager:**		**Cellular:**	
Prepared By:	Stephanie Burnett	**Res/Motel rm:**		**Cellular:**	
Prepared For:	Ryan Mathieson				

TUNDRA OIL & GAS

Daily Completion and Workover

EVERYONE HOME SAFE EVERY DAY.

Report # 1.0, Report Date: 8/3/2023

Well Name:LEGACY PIERSON PROV. HZNTL 15-32-1-29W1 UWI: 100/15-32-001-29W1/02

UWI	Surface Legal Location	Field Name	License #	Province	Well Configuration Type	Spud Date
100/15-32-001-29W1/02	13-32-001-29 W1M	Pierson	0007447	MANITOBA		7/7/2010

Orig KB Elev (m)	Corrected Gr Elev (m)	KB-Ground Distance (m)	CF Elev (m)	KB-CF (m)	TH Elev (m)	KB-TH (m)	PBTD (All) (mKB)	Total Depth (mKB)
475.23	471.20	4.03						1,998.00

Primary Target Formation	Secondary Target Formation	Start Date/Move On Date	End Date
		8/3/2023	8/8/2023

Primary Job Type	Secondary Job Type
Abandonment	Double Bridge Plug
LSD HZ	Stage Count

Objective
BPx2 Abandonment

Rigs / Coil Tubing Units

Contractor	Rig Number	Rig Start Date
C.D. Oil Well Servicing Ltd.	6	8/3/2023
Rig Subtype	Coil Tubing Size (mm)	Coil Tubing Length (m)

Job Contacts

Contact Name	Title	Phone Mobile
Kirt Pizzey	Wellsite Supervisor	204-851-3369
Contact Name	Title	Phone Mobile
Kim Cowan	Workovers Consultant	204-851-0543

Operations Summary
Rig up,p/t tbg,solid test,unseat,hot water tbg 10m3,pooh rods sideways,remove wellhead and unset tbg anchor,install bops,sdfn
BHP WAS TSM 538

AFE Number	Daily Field Est Total (Cost)	Cum Field Est To Date (Cost)	Field / AFE % (%)
20220414AB	7,357.75	7,357.75	17.9

Daily Readings

Weather	Temperature (°C)	Road Condition	Rig Time (hr)
Clear	30	Good	7.00

Remarks
Rig up,p/t tbg,solid test,unseat,hot water tbg 10m3,pooh rods sideways,remove wellhead and unset tbg anchor,install bops,sdfn
BHP WAS TSM 538

Operations Next Report Period
POOH TBG,RIH SCRAPER,

Time Log

Start Time	End Time	Dur (hr)	Code 1	Code 2	Com
11:30	12:00	0.50	RMOV	Rig Move	Move from 10-34-1-27 to 13-32-1-29
12:00	12:30	0.50	SMTG	Safety Meeting	Issue Tundra swp,erp,notice of supervisor and sign in sheet. Talked about line of fire
12:30	13:30	1.00	SRIG	Rig Up/Down	Perform rig inspection. Stand derrick according OH&S,CD Oilwell and Tundra policies and procedures. Rig in pump lines.
13:30	15:30	2.00	HOIL	Hot Oil Well	Pressure test tbg to 7mpa. Held solid. Unseat and hot water 8m3 down tbg. and 10m3 down annulus
15:30	16:30	1.00	PURP	Pull Rod Pump	Pull rods as follows 1=31.8mm polish rod 7.92 32=22mm 6per x 2.5" tb scrapered rods 10=22mm plain rods 50=19.1mm plain rods 5=38.1mm k bars 40=6per x 2.5" netb 19mm 1=25x200 rwac 20x2 TSM 538
16:30	18:15	1.75	BOPI	Install BOP's	Remove wellhead and unset anchor. Install bops and tighten down.
18:15	18:30	0.25	LOCL	Lock Wellhead & Secure	Secure well and sdfn

Report Fluids Summary

Fluid	To well (m³)	From well (m³)	To lease (m³)	From lease (m³)
Water	18.00	14.50	18.00	14.50

Safety Checks

Time	Des	Type	Com

Logs

Time	Type	Top (mKB)	Btm (mKB)	Cased?

Perforations

Time	Top (mKB)	Btm (mKB)	Current Status	Linked Zone

Stimulations Summary

Type	Subtype	Company
HYDRA-JET		

Stimulation Intervals

Frac Port #	Type	Port Depth (mKB)	Btm (mKB)
1		1,877.00	1,877.00

Daily Completion and Workover

Report # 1.0, Report Date: 8/3/2023

Well Name:LEGACY PIERSON PROV. HZNTL 15-32-1-29W1 UWI: 100/15-32-001-29W1/02

UWI	Surface Legal Location	Field Name	License #	Province	Well Configuration Type	Spud Date
100/15-32-001-29W1/02	13-32-001-29 W1M	Pierson	0007447	MANITOBA		7/7/2010

Orig KB Elev (m)	Corrected Gr Elev (m)	KB-Ground Distance (m)	CF Elev (m)	KB-CF (m)	TH Elev (m)	KB-TH (m)	PBTD (All) (mKB)	Total Depth (mKB)
475.23	471.20	4.03						1,998.00

Stimulation Intervals

Frac Port #	Type	Port Depth (mKB)	Btm (mKB)
2		1,826.00	1,826.00
3		1,979.00	1,979.00
4		1,925.00	1,925.00
5		1,756.00	1,756.00
6		1,495.00	1,495.00
7		1,789.00	1,789.00

Tubing Run

Run Time	Tubing Description	Set Depth (mKB)	String Max Nominal OD (mm)	Weight/Length (kg/m)	String Grade

Tubing Pulled

Pull Time	Tubing Description	Set Depth (mKB)	String Max Nominal OD (mm)	Weight/Length (kg/m)	String Grade

Other in Hole Run (Bridge Plugs, etc)

Run Time	Des	OD (mm)	Top (mKB)	Btm (mKB)

Other in Hole Pulled (Bridge Plugs, etc)

Pull Time	Des	Top (mKB)	Btm (mKB)	OD (mm)

Cement

Start Time	Des	Type	String	Cement Comp

TUNDRA OIL & GAS

Daily Completion and Workover

EVERYONE HOME SAFE EVERY DAY.

Report # 2.0, Report Date: 8/4/2023

Well Name:LEGACY PIERSON PROV. HZNTL 15-32-1-29W1 UWI: 100/15-32-001-29W1/02

UWI	Surface Legal Location	Field Name	License #	Province	Well Configuration Type	Spud Date
100/15-32-001-29W1/02	13-32-001-29 W1M	Pierson	0007447	MANITOBA		7/7/2010

Orig KB Elev (m)	Corrected Gr Elev (m)	KB-Ground Distance (m)	CF Elev (m)	KB-CF (m)	TH Elev (m)	KB-TH (m)	PBTD (All) (mKB)	Total Depth (mKB)
475.23	471.20	4.03						1,998.00

Primary Target Formation	Secondary Target Formation	Start Date/Move On Date	End Date
		8/3/2023	8/8/2023

Primary Job Type	Secondary Job Type
Abandonment	Double Bridge Plug
LSD HZ	Stage Count

Objective: BPx2 Abandonment

Rigs / Coil Tubing Units

Contractor	Rig Number	Rig Start Date
C.D. Oil Well Servicing Ltd.	6	8/3/2023
Rig Subtype	**Coil Tubing Size (mm)**	**Coil Tubing Length (m)**

Job Contacts

Contact Name	Title	Phone Mobile
Kirt Pizzey	Wellsite Supervisor	204-851-3369
Kim Cowan	Workovers Consultant	204-851-0543

Operations Summary: Pooh tbg,rih casing scraper to 1081,circulate wellbore,lay out all tbg,sdfn

AFE Number	Daily Field Est Total (Cost)	Cum Field Est To Date (Cost)	Field / AFE % (%)
20220414AB	15,429.20	22,786.95	55.4

Daily Readings

Weather	Temperature (°C)	Road Condition	Rig Time (hr)
Clear	30	Good	7.00

Remarks: Pooh tbg,rih casing scraper to 1081,circulate wellbore,lay out all tbg,sdfn

Operations Next Report Period: TUESDAY WIRELINE OPERATIONS

Time Log

Start Time	End Time	Dur (hr)	Code 1	Code 2	Com
07:30	08:00	0.50	SMTG	Safety Meeting	Issue Tundra swp and sign in sheet. Talked about clear communication and ask questions if you do not understand
08:00	10:15	2.25	PULT	Pull Tubing	Pull tbg as follows 1=179.9mm x 73mm split tbg hanger 79=73mm tbg 1=139.7mm x 73mm eclipse anchor 40=73mm j-55 eue tbg 1=73mm pump seat nipple 1=73mm perf pup 1=73mm j-55 eue jt 1=73mm bar collar
10:15	11:45	1.50	RUTB	Run Tubing	Run tbg as follows 1=139.7mm casing scraper .75M 113JT= 73MM TBG 1079.15M kb difference= 2.00M Landed bottom tbg @ 1081.90
11:45	12:45	1.00	CIRC	Circulate	Reverse circulate wellbore with 18m3 inhibited fresh water. Broke circulation after 1m3. Returned a total of 17m3 to rig tank.
12:45	14:15	1.50	PULT	Pull Tubing	Pull and lay out tbg onto tbg trailer. TOTAL TBG T.B.I ON TRAILER=110JTS TBG TBG ON TRAILER=194
14:15	14:30	0.25	LOCL	Lock Wellhead & Secure	Secure well and sdfn

Report Fluids Summary

Fluid	To well (m³)	From well (m³)	To lease (m³)	From lease (m³)
Water	18.00	17.00	18.00	17.00

Safety Checks

Time	Des	Type	Com

Logs

Time	Type	Top (mKB)	Btm (mKB)	Cased?

Perforations

Time	Top (mKB)	Btm (mKB)	Current Status	Linked Zone

Stimulations Summary

Type	Subtype	Company
HYDRA-JET		

Daily Completion and Workover

Report # 2.0, Report Date: 8/4/2023

Well Name:LEGACY PIERSON PROV. HZNTL 15-32-1-29W1 UWI: 100/15-32-001-29W1/02

UWI	Surface Legal Location	Field Name	License #	Province	Well Configuration Type	Spud Date
100/15-32-001-29W1/02	13-32-001-29 W1M	Pierson	0007447	MANITOBA		7/7/2010

Orig KB Elev (m)	Corrected Gr Elev (m)	KB-Ground Distance (m)	CF Elev (m)	KB-CF (m)	TH Elev (m)	KB-TH (m)	PBTD (All) (mKB)	Total Depth (mKB)
475.23	471.20	4.03						1,998.00

Stimulation Intervals

Frac Port #	Type	Port Depth (mKB)	Btm (mKB)
1		1,877.00	1,877.00
2		1,826.00	1,826.00
3		1,979.00	1,979.00
4		1,925.00	1,925.00
5		1,756.00	1,756.00
6		1,495.00	1,495.00
7		1,789.00	1,789.00

Tubing Run

Run Time	Tubing Description	Set Depth (mKB)	String Max Nominal OD (mm)	Weight/Length (kg/m)	String Grade

Tubing Pulled

Pull Time	Tubing Description	Set Depth (mKB)	String Max Nominal OD (mm)	Weight/Length (kg/m)	String Grade
07:30	Production Tubing Pulled				

Other in Hole Run (Bridge Plugs, etc)

Run Time	Des	OD (mm)	Top (mKB)	Btm (mKB)

Other in Hole Pulled (Bridge Plugs, etc)

Pull Time	Des	Top (mKB)	Btm (mKB)	OD (mm)

Cement

Start Time	Des	Type	String	Cement Comp

TUNDRA OIL & GAS

Daily Completion and Workover

EVERYONE HOME SAFE EVERY DAY.

Report # 3.0, Report Date: 8/8/2023

Well Name:LEGACY PIERSON PROV. HZNTL 15-32-1-29W1 UWI: 100/15-32-001-29W1/02

UWI	Surface Legal Location	Field Name	License #	Province	Well Configuration Type	Spud Date
100/15-32-001-29W1/02	13-32-001-29 W1M	Pierson	0007447	MANITOBA		7/7/2010

Orig KB Elev (m)	Corrected Gr Elev (m)	KB-Ground Distance (m)	CF Elev (m)	KB-CF (m)	TH Elev (m)	KB-TH (m)	PBTD (All) (mKB)	Total Depth (mKB)
475.23	471.20	4.03						1,998.00

Primary Target Formation	Secondary Target Formation	Start Date/Move On Date	End Date
		8/3/2023	8/8/2023

Primary Job Type	Secondary Job Type
Abandonment	Double Bridge Plug
LSD HZ	Stage Count

Objective: BPx2 Abandonment

Rigs / Coil Tubing Units

Contractor	Rig Number	Rig Start Date
C.D. Oil Well Servicing Ltd.	6	8/3/2023
Rig Subtype	**Coil Tubing Size (mm)**	**Coil Tubing Length (m)**

Job Contacts

Contact Name	Title	Phone Mobile
Kirt Pizzey	Wellsite Supervisor	204-851-3369
Kim Cowan	Workovers Consultant	204-851-0543

Operations Summary
SET BP @ 1054
P/T 139.7MM 3.5MPA SOLID
P/T 219.1MM 3.5MPA SOLID
GOV REP ERIC
DUMP CEMENT 8M ON TOP OF BP
SET SURFACE BP @ 207
DUMP CEMENT 8M ON TOP OF BP

AFE Number	Daily Field Est Total (Cost)	Cum Field Est To Date (Cost)	Field / AFE % (%)
20220414AB	17,403.46	40,190.41	97.8

Daily Readings

Weather	Temperature (°C)	Road Condition	Rig Time (hr)
Clear	28	Good	5.50

Remarks: Wireline bp set/pressure test,dump cement,set surface plug,p/t and dump cement,remove bops,install wellhead,rig out all equipment JOB COMPLETED

Operations Next Report Period: JOB COMPLETED

Time Log

Start Time	End Time	Dur (hr)	Code 1	Code 2	Com
07:30	08:00	0.50	SMTG	Safety Meeting	Issue Tundra swp and sign in sheet. Talked about all transmitting devices to be turn off
08:00	09:15	1.25	WLWK	Wireline	Rih bridge plug. Set plug @ 1054 Pooh wireline
09:15	09:45	0.50	PTST	Pressure Test	Pressure test bridge plug to 3.50mpa. Solid Pressure test surface casing 3.50mpa Solid Gov rep ERIC
09:45	11:30	1.75	WLWK	Wireline	Run in hole dump bailer 8meters cement Pooh wireline Run in hole surface bridge plug. Set @ 207 Pooh wireline P/t 3.5mpa surface plug SOLID Dump bail 8m cement ontop of plug
11:30	12:00	0.50	BOPR	Remove BOP's	Remove working floor and bops. Install wellhead and tighten down
12:00	13:00	1.00	SRIG	Rig Up/Down	Rig out service rig and pump lines. Clean up location. Install fence around wellhead JOB COMPLETED

Report Fluids Summary

Fluid	To well (m³)	From well (m³)	To lease (m³)	From lease (m³)
Water	1.00		1.00	

Safety Checks

Time	Des	Type	Com

Logs

Time	Type	Top (mKB)	Btm (mKB)	Cased?

Perforations

Time	Top (mKB)	Btm (mKB)	Current Status	Linked Zone

Daily Completion and Workover

Report # 3.0, Report Date: 8/8/2023

Well Name:LEGACY PIERSON PROV. HZNTL 15-32-1-29W1 UWI: 100/15-32-001-29W1/02

UWI	Surface Legal Location	Field Name	License #	Province	Well Configuration Type	Spud Date
100/15-32-001-29W1/02	13-32-001-29 W1M	Pierson	0007447	MANITOBA		7/7/2010

Orig KB Elev (m)	Corrected Gr Elev (m)	KB-Ground Distance (m)	CF Elev (m)	KB-CF (m)	TH Elev (m)	KB-TH (m)	PBTD (All) (mKB)	Total Depth (mKB)
475.23	471.20	4.03						1,998.00

Stimulations Summary

Type	Subtype	Company
HYDRA-JET		

Stimulation Intervals

Frac Port #	Type	Port Depth (mKB)	Btm (mKB)
1		1,877.00	1,877.00
2		1,826.00	1,826.00
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4		1,925.00	1,925.00
5		1,756.00	1,756.00
6		1,495.00	1,495.00
7		1,789.00	1,789.00

Tubing Run

Run Time	Tubing Description	Set Depth (mKB)	String Max Nominal OD (mm)	Weight/Length (kg/m)	String Grade

Tubing Pulled

Pull Time	Tubing Description	Set Depth (mKB)	String Max Nominal OD (mm)	Weight/Length (kg/m)	String Grade

Other in Hole Run (Bridge Plugs, etc)

Run Time	Des	OD (mm)	Top (mKB)	Btm (mKB)

Other in Hole Pulled (Bridge Plugs, etc)

Pull Time	Des	Top (mKB)	Btm (mKB)	OD (mm)

Cement

Start Time	Des	Type	String	Cement Comp

Fluid Tracking Summary

TUNDRA OIL & GAS

EVERYONE HOME SAFE EVERY DAY.

Well Name: LEGACY PIERSON PROV. HZNTL 15-32-1-29W1 UWI: 100/15-32-001-29W1/02

Report # , Report Date: , AFE # 20220414AB

UWI	Surface Legal Location	License #	Well Configuration Type	Corrected Ground Elevation (m)	Casing Flange Elevation (m)	KB-Ground Distance (m)	KB-Casing Flange Distance (m)
100/15-32-001-29W1/02	13-32-001-29 W1M	0007447		471.20		4.03	

Start Date	Fluid	Fluid Sub Type	To Lease (m³)	Source	From Lease (m³)	Dest	Carrier	Ticket #	Note
8/3/2023	Water	Fresh	18.00	Silverlines Yard			Silverline	116413	
8/3/2023	Water	Recycled			14.50	Daly 13-36-009-29	Silverline	27804	
8/4/2023	Water	Fresh	18.00	Silverlines Yard			Silverline	116415	
8/4/2023	Water	Recycled			17.00	Daly 13-36-009-29	Silverline	27805	
8/8/2023	Water	Fresh	1.00	Silverlines Yard			Silverline	117352	

TUNDRA OIL & GAS

Tubing (Pulled & Ran)

Last Tubing
Pull Date: 8/4/2023

Well Name:LEGACY PIERSON PROV. HZNTL 15-32-1-29W1 UWI: 100/15-32-001-29W1/02

UWI	Surface Legal Location	Field Name	License #	Province	Well Configuration Type	Spud Date
100/15-32-001-29W1/02	13-32-001-29 W1M	Pierson	0007447	MANITOBA		7/7/2010

Orig KB Elev (m)	Corrected Gr Elev (m)	KB-Ground Distance (m)	CF Elev (m)	KB-CF (m)	TH Elev (m)	KB-TH (m)	PBTD (All) (mKB)	Total Depth (mKB)
475.23	471.20	4.03						1,998.00

Tubing Pulled

Tubing Description	Set Depth (mKB)	Run Date	Pull Date
Production Tubing Pulled		12/31/2014	8/4/2023

Jts	Item Des	OD (mm)	Len (m)	Top (mKB)	Btm (mKB)
1	179.9MM X 73MM SPLIT TBG HANGER			0.00	0.00
79	73.0mm J-55	73.0		0.00	0.00
1	139.7MM X 73MM ANCHOR C/W SWIVEL	73.0		0.00	0.00
40	73.0mm J-55	73.0		0.00	0.00
1	PUMP SEAT NIPPLE	73.0		0.00	0.00
1	73.0mm Perf Pup	73.0		0.00	0.00
1	73MM J-55 JT	73.0		0.00	0.00
1	73MM BAR COLLAR	73.0		0.00	0.00

Tubing Ran

Tubing Description	Set Depth (mKB)	Run Date	Pull Date

Jts	Item Des	OD (mm)	Len (m)	Top (mKB)	Btm (mKB)

TUNDRA OIL & GAS

Rods and Pump (Pulled & Ran)

Well Name:LEGACY PIERSON PROV. HZNTL 15-32-1-29W1 UWI: 100/15-32-001-29W1/02

UWI	Surface Legal Location	Field Name	License #	Province	Well Configuration Type	Spud Date
100/15-32-001-29W1/02	13-32-001-29 W1M	Pierson	0007447	MANITOBA		7/7/2010

Orig KB Elev (m)	Corrected Gr Elev (m)	KB-Ground Distance (m)	CF Elev (m)	KB-CF (m)	TH Elev (m)	KB-TH (m)	PBTD (All) (mKB)	Total Depth (mKB)
475.23	471.20	4.03						1,998.00

Rod Description	Set Depth (mKB)	Run Date	Pull Date
Rods Pulled		12/31/2014	8/3/2023

Comment

Rods Pulled

Jts	Item Des	OD (mm)	Len (m)	Top (mKB)	Btm (mKB)	Cond Pull
1	Polish Rod-7.9m x 31.8mm (26')Alloy Polish Rod	31.8	7.92	-1,051.86	-1,043.94	
32	22mm-6x2.5 SB-1 TB Rod-Norris Gr 78	22.0	243.84	-1,043.94	-800.10	
10	22mm-Plain Rod-Norris Gr 78	22.0	76.20	-800.10	-723.90	
50	19mm-Plain Rod-Norris Gr 78	19.0	381.00	-723.90	-342.90	
5	Sinker bars 7/8 x 31.8mm-1.25 x 25 with elevator Neck	31.8	38.10	-342.90	-304.80	
40	19mm-6x2.5 NETB Rod-Norris Gr 78	19.0	304.80	-304.80	0.00	
1	tsm 538	22.0		0.00	0.00	

Rod Description	Set Depth (mKB)	Run Date	Pull Date

Comment

Rods Ran

Jts	Item Des	OD (mm)	Len (m)	Top (mKB)	Btm (mKB)	Cond Run

Pierson Hz (13C-32) 16D-32-1-29W1M Final Surveys
Phoenix Technology Services LP

Molopo Energy Canada Ltd.
Well License # 7447
Pierson
(13C-32) 16D-32-1-29WPM
Molopo Pierson Prov Hz
16-32-001-29W1
10147566 Surveys

Measured Depth (m)	Incl.	Azim.	Vertical Section (m)	Sub-Sea Depth (m)	Dogleg Rate (°/30m)	Vertical Depth (m)	Local Coordinates +N/S- (m)	Local Coordinates +E/W- (m)	UTM Coordinates Northings (m)	Eastings (m)
0.00	0.000		0.000	-475.20	0.00	0.00	0.00	0.00	5439816.183 N	329208.876 E
202.00	0.000		0.000	-273.20	0.00	202.00	0.00	0.00	5439816.183 N	329208.876 E
				Surface Csg. = 202m MD						
212.55	0.400	125.600	0.00	-262.65	1.14	212.55	-0.02	0.03	5439816.161 N	329208.905 E
268.11	0.300	177.300	0.03	-207.09	0.17	268.11	-0.28	0.19	5439815.898 N	329209.062 E
323.57	0.500	178.900	0.20	-151.63	0.11	323.57	-0.67	0.21	5439815.510 N	329209.061 E
335.30	0.520	176.440	0.21	-139.90	0.08	335.30	-0.77	0.21	5439815.406 N	329209.062 E
370.29	0.600	170.300	0.22	-104.91	0.09	370.29	-1.11	0.25	5439815.066 N	329209.093 E
417.82	0.800	176.400	0.26	-57.39	0.13	417.81	-1.69	0.31	5439814.488 N	329209.138 E
436.92	0.400	177.200	0.33	-38.29	0.63	436.91	-1.89	0.33	5439814.288 N	329209.143 E
474.94	0.500	35.500	0.34	-0.27	0.67	474.93	-1.88	0.43	5439814.287 N	329209.246 E
531.59	0.500	12.100	0.44	56.38	0.11	531.58	-1.44	0.62	5439814.724 N	329209.455 E
587.76	0.500	22.700	0.63	112.55	0.05	587.75	-0.97	0.77	5439815.185 N	329209.615 E
634.94	0.600	349.700	0.78	159.72	0.21	634.92	-0.54	0.80	5439815.616 N	329209.664 E
709.50	0.800	183.700	0.81	234.28	0.56	709.48	-0.68	0.70	5439815.484 N	329209.556 E
756.29	0.300	221.500	0.71	281.07	0.38	756.27	-1.10	0.60	5439815.070 N	329209.441 E
765.88	0.300	183.700	0.61	290.66	0.61	765.86	-1.14	0.58	5439815.027 N	329209.421 E
772.00	0.980	106.030	0.59	296.78	4.71	771.98	-1.17	0.63	5439814.995 N	329209.470 E
				KOP = 772m MD						
775.40	1.500	99.800	0.64	300.18	4.73	775.38	-1.18	0.70	5439814.977 N	329209.541 E
784.83	3.300	87.900	0.71	309.60	5.91	784.80	-1.20	1.09	5439814.954 N	329209.933 E
794.43	4.900	83.800	1.10	319.18	5.08	794.38	-1.14	1.78	5439814.987 N	329210.619 E
803.64	6.600	82.100	1.79	328.34	5.56	803.54	-1.03	2.69	5439815.074 N	329211.537 E
813.28	8.500	80.000	2.70	337.89	5.97	813.09	-0.83	3.94	5439815.235 N	329212.793 E
822.57	10.600	82.300	3.95	347.06	6.89	822.26	-0.59	5.47	5439815.422 N	329214.323 E

832.01	12.700	88.200	356.30	831.50	-0.44	7.37	5439815.512 N
329216.224 E		7.37	7.66				
841.50	14.500	94.500	365.52	840.72	-0.50	9.59	5439815.383 N
329218.449 E		9.60	7.36				
850.69	16.400	93.900	374.38	849.58	-0.68	12.03	5439815.129 N
329220.883 E		12.04	6.22				
860.14	18.100	90.200	383.41	858.61	-0.78	14.83	5439814.947 N
329223.678 E		14.84	6.42				
869.37	19.700	85.500	392.14	867.34	-0.66	17.82	5439814.972 N
329226.666 E		17.82	7.17				
878.87	22.100	84.000	401.01	876.21	-0.35	21.19	5439815.180 N
329230.048 E		21.19	7.76				
888.48	24.300	85.800	409.85	885.05	-0.02	24.96	5439815.397 N
329233.827 E		24.96	7.22				
897.71	27.000	88.300	418.17	893.37	0.19	28.95	5439815.476 N
329237.820 E		28.95	9.45				
907.18	29.600	91.000	426.50	901.70	0.21	33.44	5439815.360 N
329242.307 E		33.44	9.18				
916.57	31.800	90.800	434.58	909.78	0.13	38.23	5439815.137 N
329247.095 E		38.23	7.04				
925.83	33.700	90.600	442.37	917.57	0.07	43.24	5439814.922 N
329252.100 E		43.24	6.17				
935.30	36.100	91.100	450.13	925.33	-0.01	48.66	5439814.673 N
329257.512 E		48.66	7.66				
944.76	38.400	90.500	457.66	932.86	-0.09	54.38	5439814.418 N
329263.232 E		54.38	7.38				
954.23	40.800	89.900	464.96	940.16	-0.11	60.42	5439814.211 N
329269.264 E		60.42	7.70				
963.69	43.200	89.200	471.99	947.19	-0.06	66.75	5439814.066 N
329275.592 E		66.75	7.75				
973.14	45.500	88.300	478.74	953.94	0.09	73.35	5439814.008 N
329282.197 E		73.35	7.57				
982.59	47.700	88.300	485.24	960.44	0.29	80.22	5439814.000 N
329289.063 E		80.21	6.98				
991.96	49.300	88.700	491.45	966.65	0.48	87.23	5439813.966 N
329296.080 E		87.23	5.21				
1001.16	51.400	88.300	497.32	972.52	0.66	94.31	5439813.934 N
329303.163 E		94.31	6.92				
1010.32	52.900	88.900	502.94	978.14	0.84	101.54	5439813.887 N
329310.396 E		101.53	5.15				
1019.49	54.100	90.100	508.39	983.59	0.90	108.91	5439813.723 N
329317.765 E		108.90	5.04				
1028.68	55.800	90.100	513.67	988.87	0.89	116.44	5439813.478 N
329325.284 E		116.43	5.55				
1037.92	57.000	89.500	518.78	993.98	0.92	124.13	5439813.267 N
329332.977 E		124.12	4.22				
1047.15	59.200	89.300	523.66	998.86	1.00	131.97	5439813.108 N
329340.811 E		131.96	7.17				
1056.36	61.500	89.900	528.21	1003.41	1.05	139.97	5439812.916 N
329348.812 E		139.96	7.68				
1065.82	64.200	90.300	532.53	1007.73	1.04	148.39	5439812.641 N
329357.225 E		148.38	8.64				
1075.02	66.800	90.300	536.35	1011.55	0.99	156.76	5439812.339 N
329365.590 E		156.75	8.48				
1084.23	69.400	91.300	539.78	1014.98	0.87	165.30	5439811.956 N
329374.126 E		165.29	8.99				
1093.67	72.300	92.600	542.88	1018.08	0.57	174.21	5439811.377 N
329383.024 E		174.21	10.01				
1102.88	73.400	92.100	545.59	1020.79	0.21	183.01	5439810.745 N
329391.801 E		183.00	3.91				
1112.09	73.000	92.700	548.26	1023.46	-0.16	191.81	5439810.104 N
329400.595 E		191.81	2.28				
1121.65	75.600	92.800	550.84	1026.04	-0.60	201.01	5439809.379 N

329409.769 E		201.01	8.16				
1131.20	78.200	91.000	553.01	1028.21	-0.91	210.30	5439808.785 N
329419.050 E		210.30	9.85				
1140.64	81.100	89.700	554.70	1029.90	-0.97	219.59	5439808.442 N
329428.329 E		219.59	10.07				
1149.88	84.100	88.800	555.89	1031.09	-0.85	228.75	5439808.279 N
329437.489 E		228.75	10.16				
1159.34	87.400	89.100	556.59	1031.79	-0.67	238.18	5439808.161 N
329446.921 E		238.18	10.51				
1168.80	89.000	89.500	556.89	1032.09	-0.56	247.63	5439807.985 N
329456.374 E		247.63	5.23				
1178.26	88.400	89.400	557.10	1032.30	-0.47	257.09	5439807.784 N
329465.830 E		257.09	1.93				
1187.70	88.300	88.900	557.38	1032.58	-0.33	266.53	5439807.632 N
329475.265 E		266.52	1.62				
1197.18	90.100	90.800	557.51	1032.71	-0.30	276.00	5439807.365 N
329484.739 E		276.00	8.28				
1206.62	90.900	92.200	557.43	1032.63	-0.55	285.44	5439806.827 N
329494.163 E		285.44	5.12				
1216.13	91.100	92.500	557.26	1032.46	-0.94	294.94	5439806.144 N
329503.647 E		294.94	1.14				
1225.72	90.700	92.300	557.11	1032.31	-1.34	304.52	5439805.447 N
329513.211 E		304.52	1.40				
1235.32	89.900	92.200	557.06	1032.26	-1.72	314.11	5439804.774 N
329522.787 E		314.12	2.52				
1244.77	89.700	92.100	557.09	1032.29	-2.07	323.56	5439804.128 N
329532.215 E		323.56	0.71				
1254.00	89.500	91.400	557.16	1032.36	-2.35	332.78	5439803.562 N
329541.427 E		332.79	2.37				
1263.26	89.000	91.000	557.28	1032.48	-2.55	342.04	5439803.082 N
329550.674 E		342.05	2.07				
1272.30	89.100	91.200	557.43	1032.63	-2.72	351.08	5439802.630 N
329559.701 E		351.09	0.74				
1282.20	90.000	92.300	557.51	1032.71	-3.02	360.97	5439802.023 N
329569.582 E		360.98	4.31				
1291.75	90.600	92.600	557.46	1032.66	-3.43	370.51	5439801.320 N
329579.106 E		370.53	2.11				
1301.18	91.400	93.700	557.29	1032.49	-3.95	379.93	5439800.512 N
329588.499 E		379.94	4.33				
1310.72	91.200	93.700	557.08	1032.28	-4.56	389.44	5439799.603 N
329597.994 E		389.47	0.63				
1320.34	90.900	93.400	556.90	1032.10	-5.16	399.04	5439798.712 N
329607.571 E		399.07	1.32				
1329.58	90.600	93.700	556.78	1031.98	-5.73	408.27	5439797.855 N
329616.770 E		408.29	1.38				
1339.03	89.700	92.800	556.75	1031.95	-6.27	417.70	5439797.029 N
329626.184 E		417.73	4.04				
1348.62	89.300	92.300	556.84	1032.04	-6.69	427.28	5439796.306 N
329635.746 E		427.32	2.00				
1357.86	89.700	92.600	556.92	1032.12	-7.09	436.51	5439795.627 N
329644.960 E		436.55	1.62				
1367.30	90.100	94.500	556.93	1032.13	-7.67	445.93	5439794.752 N
329654.359 E		445.97	6.17				
1376.71	89.800	94.700	556.94	1032.14	-8.43	455.31	5439793.708 N
329663.711 E		455.36	1.15				
1386.17	89.500	94.100	557.00	1032.20	-9.15	464.74	5439792.692 N
329673.116 E		464.79	2.13				
1395.51	89.600	94.700	557.07	1032.27	-9.87	474.06	5439791.688 N
329682.402 E		474.11	1.95				
1404.73	90.200	96.100	557.09	1032.29	-10.74	483.24	5439790.538 N
329691.550 E		483.30	4.96				
1413.90	91.000	95.800	556.99	1032.19	-11.69	492.36	5439789.306 N
329700.636 E		492.42	2.80				

1423.25	90.100	93.700	556.90	1032.10	-12.46	501.67	5439788.245 N
329709.924 E		501.74	7.33				
1432.60	90.200	93.400	556.88	1032.08	-13.04	511.00	5439787.378 N
329719.234 E		511.08	1.01				
1441.86	90.100	93.000	556.85	1032.05	-13.56	520.25	5439786.576 N
329728.459 E		520.33	1.34				
1451.11	89.800	92.900	556.86	1032.06	-14.04	529.49	5439785.815 N
329737.678 E		529.57	1.03				
1460.48	89.600	95.100	556.91	1032.11	-14.69	538.83	5439784.874 N
329747.000 E		538.92	7.07				
1469.75	89.500	94.800	556.98	1032.18	-15.49	548.07	5439783.789 N
329756.206 E		548.16	1.02				
1479.16	88.200	93.500	557.17	1032.37	-16.17	557.45	5439782.819 N
329765.563 E		557.55	5.86				
1488.45	87.900	92.700	557.49	1032.69	-16.67	566.72	5439782.031 N
329774.814 E		566.82	2.76				
1497.88	87.000	92.400	557.91	1033.11	-17.09	576.13	5439781.322 N
329784.208 E		576.24	3.02				
1507.11	87.100	92.600	558.38	1033.58	-17.49	585.34	5439780.636 N
329793.400 E		585.45	0.73				
1516.33	86.800	93.200	558.87	1034.07	-17.96	594.54	5439779.887 N
329802.577 E		594.64	2.18				
1525.57	87.600	92.800	559.33	1034.53	-18.44	603.75	5439779.120 N
329811.774 E		603.86	2.90				
1534.93	88.000	91.100	559.69	1034.89	-18.76	613.10	5439778.513 N
329821.107 E		613.21	5.59				
1544.14	87.800	89.900	560.02	1035.22	-18.84	622.30	5439778.149 N
329830.303 E		622.42	3.96				
1553.51	89.200	90.200	560.27	1035.47	-18.85	631.67	5439777.852 N
329839.665 E		631.78	4.58				
1562.88	89.400	90.100	560.38	1035.58	-18.87	641.04	5439777.538 N
329849.029 E		641.15	0.72				
1572.08	89.000	88.900	560.51	1035.71	-18.79	650.24	5439777.334 N
329858.226 E		650.35	4.12				
1581.37	89.800	88.700	560.61	1035.81	-18.60	659.53	5439777.242 N
329867.515 E		659.64	2.66				
1590.44	90.600	88.600	560.58	1035.78	-18.38	668.59	5439777.176 N
329876.584 E		668.70	2.67				
1599.87	90.400	88.300	560.49	1035.69	-18.13	678.02	5439777.140 N
329886.014 E		678.13	1.15				
1609.22	89.700	87.500	560.49	1035.69	-17.79	687.36	5439777.194 N
329895.364 E		687.47	3.41				
1618.59	89.700	86.900	560.54	1035.74	-17.33	696.72	5439777.363 N
329904.732 E		696.82	1.92				
1627.83	90.000	87.000	560.56	1035.76	-16.84	705.95	5439777.570 N
329913.969 E		706.05	1.03				
1637.19	91.300	87.600	560.45	1035.65	-16.40	715.30	5439777.722 N
329923.327 E		715.39	4.59				
1646.56	90.900	87.200	560.27	1035.47	-15.97	724.66	5439777.858 N
329932.695 E		724.75	1.81				
1655.70	90.800	86.900	560.14	1035.34	-15.50	733.78	5439778.046 N
329941.832 E		733.87	1.04				
1664.92	90.900	86.200	560.00	1035.20	-14.95	742.99	5439778.317 N
329951.047 E		743.07	2.30				
1674.14	90.600	85.600	559.88	1035.08	-14.29	752.18	5439778.692 N
329960.258 E		752.26	2.18				
1683.29	90.300	84.400	559.81	1035.01	-13.49	761.30	5439779.208 N
329969.393 E		761.37	4.06				
1692.70	91.400	84.400	559.67	1034.87	-12.57	770.66	5439779.836 N
329978.781 E		770.73	3.51				
1701.93	93.300	85.200	559.29	1034.49	-11.74	779.84	5439780.388 N
329987.986 E		779.90	6.70				
1711.18	93.800	85.800	558.72	1033.92	-11.01	789.05	5439780.828 N

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329997.208 E		789.10	2.53					
1720.55	93.800	87.100	558.10	1033.30	-10.43	798.38	5439781.119 N	
330006.553 E		798.43	4.15					
1729.92	93.200	88.200	557.52	1032.72	-10.05	807.72	5439781.214 N	
330015.904 E		807.77	4.01					
1739.30	92.900	88.100	557.03	1032.23	-9.75	817.08	5439781.227 N	
330025.271 E		817.13	1.01					
1748.67	91.700	88.700	556.65	1031.85	-9.49	826.44	5439781.200 N	
330034.633 E		826.49	4.29					
1757.96	91.300	88.900	556.41	1031.61	-9.29	835.73	5439781.108 N	
330043.920 E		835.77	1.44					
1767.27	91.100	89.300	556.21	1031.41	-9.14	845.04	5439780.967 N	
330053.226 E		845.08	1.44					
1776.52	91.100	89.700	556.03	1031.23	-9.06	854.28	5439780.762 N	
330062.472 E		854.32	1.30					
1785.72	89.600	90.200	555.98	1031.18	-9.06	863.48	5439780.486 N	
330071.668 E		863.52	5.16					
1794.94	89.400	90.000	556.06	1031.26	-9.07	872.70	5439780.186 N	
330080.883 E		872.74	0.92					
1804.33	89.200	89.600	556.17	1031.37	-9.04	882.09	5439779.929 N	
330090.268 E		882.13	1.43					
1813.57	89.100	89.500	556.31	1031.51	-8.97	891.33	5439779.716 N	
330099.505 E		891.37	0.46					
1822.82	89.100	89.300	556.46	1031.66	-8.87	900.58	5439779.528 N	
330108.752 E		900.62	0.65					
1832.23	89.600	90.400	556.56	1031.76	-8.85	909.99	5439779.262 N	
330118.157 E		910.03	3.85					
1841.57	88.800	90.100	556.69	1031.89	-8.89	919.33	5439778.933 N	
330127.491 E		919.37	2.74					
1850.83	88.600	90.100	556.90	1032.10	-8.90	928.58	5439778.631 N	
330136.743 E		928.62	0.65					
1860.27	88.100	88.600	557.17	1032.37	-8.80	938.02	5439778.447 N	
330146.177 E		938.06	5.02					
1869.52	88.400	90.000	557.46	1032.66	-8.68	947.26	5439778.275 N	
330155.421 E		947.30	4.64					
1878.44	89.200	90.700	557.64	1032.84	-8.74	956.18	5439777.945 N	
330164.333 E		956.22	3.57					
1887.84	90.100	91.300	557.70	1032.90	-8.90	965.58	5439777.491 N	
330173.722 E		965.62	3.45					
1897.21	90.300	92.100	557.67	1032.87	-9.18	974.95	5439776.924 N	
330183.074 E		974.99	2.64					
1906.46	89.800	92.200	557.66	1032.86	-9.53	984.19	5439776.292 N	
330192.303 E		984.23	1.65					
1915.67	89.700	91.700	557.70	1032.90	-9.84	993.39	5439775.695 N	
330201.493 E		993.44	1.66					
1924.83	89.600	91.700	557.76	1032.96	-10.11	1002.55	5439775.141 N	
330210.636 E		1002.59	0.33					
1934.33	90.600	91.200	557.74	1032.94	-10.35	1012.05	5439774.607 N	
330220.121 E		1012.09	3.53					
1943.70	91.600	91.100	557.56	1032.76	-10.54	1021.41	5439774.130 N	
330229.477 E		1021.46	3.22					
1952.95	91.400	90.700	557.32	1032.52	-10.68	1030.66	5439773.700 N	
330238.714 E		1030.71	1.45					
1962.41	91.300	90.500	557.10	1032.30	-10.78	1040.12	5439773.309 N	
330248.163 E		1040.16	0.71					
1971.61	92.000	90.700	556.83	1032.03	-10.88	1049.31	5439772.929 N	
330257.351 E		1049.36	2.37					
1981.06	92.300	90.500	556.48	1031.68	-10.98	1058.75	5439772.539 N	
330266.787 E		1058.80	1.14	Last Survey = 1981m MD				
1998.00	92.100	90.500	555.83	1031.03	-11.13	1075.68	5439771.869 N	
330283.701 E		1075.73	0.35	Ext. to TD = 1998m MD				

Pierson Hz (13C-32) 16D-32-1-29W1M Final Surveys

All data are in meters unless otherwise stated. Directions and coordinates are relative to True North.
Vertical depths are relative to Actual KB. Northings and Eastings are relative to Site.

The Dogleg Severity is in Degrees per 30 meter.
Vertical Section is from Slot and calculated along an Azimuth of 90.384° (True).

Coordinate System is North American Datum 1983 Universal Transverse Mercator, Zone 14N (102 W to 96 W).
Grid Convergence at Surface is -1.768°.

Based upon Minimum Curvature type calculations, at a Measured Depth of 1998.00m., the Bottom Hole Displacement is 1075.74m., in the Direction of 90.384° (True).

Lic # 7447

Job Number: 10147566R
Company: Molopo Energy CAnada Ltd
Lease/Well: Molopo Pierson Prov Hz
Location: (13C-32)16D-32-1-29WPM
Rig Name: Advance 1
RKB: 475.2
G.L. or M.S.L.: 471

State/Country: Manitoba
Declination: 7.26
Grid: -1.77
File name: C:\WINSERVE\10147566.SVY
Date/Time: 15-Jul-10 / 15:47
Curve Name: Molopo Pierson (13C-32)16D-32-1-29WPM

WINSERVE SURVEY CALCULATIONS
Minimum Curvature Method
Vertical Section Plane 90.38
Vertical Section Referenced to Wellhead
Rectangular Coordinates Referenced to Wellhead

Measured Depth Meters	Incl Angle Deg	Drift Direction Deg	True Vertical Depth	N-S Meters	E-W Meters	Vertical Section Meters	CLOSURE Distance Meters	CLOSURE Direction Deg	Dogleg Severity Deg/30
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
Surface Casing Tie On									
202.00	.00	.00	202.00	.00	.00	.00	.00	.00	.00
212.55	.40	125.60	212.55	-.02	.03	.03	.04	125.58	1.14
268.11	.30	177.30	268.11	-.28	.19	.20	.34	145.18	.17
323.57	.50	178.90	323.57	-.67	.21	.21	.70	162.83	.11
335.30	.52	176.44	335.30	-.77	.21	.22	.80	164.75	.08
370.29	.60	170.30	370.29	-1.11	.25	.26	1.14	167.27	.08
417.82	.80	176.40	417.81	-1.69	.31	.33	1.72	169.47	.13
436.92	.40	177.20	436.91	-1.89	.33	.34	1.92	170.22	.63
474.94	.50	35.50	474.93	-1.89	.43	.44	1.93	167.20	.67
531.59	.50	12.10	531.58	-1.44	.62	.63	1.57	156.61	.11
587.76	.50	22.70	587.75	-.98	.77	.78	1.24	141.76	.05
634.94	.60	349.70	634.92	-.54	.80	.81	.97	124.03	.21
709.50	.80	183.70	709.48	-.68	.70	.71	.98	134.06	.56
756.29	.30	221.50	756.27	-1.10	.60	.61	1.25	151.34	.38
765.88	.30	183.70	765.86	-1.14	.58	.59	1.28	153.00	.61
Interpolated Kick Off Point									
772.00	.98	106.03	771.98	-1.17	.63	.64	1.33	151.70	4.72
775.40	1.50	99.80	775.38	-1.19	.70	.71	1.38	149.38	4.72
784.83	3.30	87.90	784.80	-1.20	1.10	1.10	1.62	137.56	5.91
794.43	4.90	83.80	794.38	-1.14	1.78	1.79	2.11	122.73	5.08
803.64	6.60	82.10	803.54	-1.03	2.69	2.70	2.88	110.88	5.56
813.28	8.50	80.00	813.09	-.83	3.94	3.95	4.03	101.86	5.97
822.57	10.60	82.30	822.26	-.59	5.47	5.47	5.50	96.20	6.89

Measured Depth Meters	Incl Angle Deg	Drift Direction Deg	True Vertical Depth	N-S Meters	E-W Meters	Vertical Section Meters	CLOSURE Distance Meters	CLOSURE Direction Deg	Dogleg Severity Deg/30
832.01	12.70	88.20	831.50	-.45	7.37	7.37	7.38	93.46	7.66
841.50	14.50	94.50	840.72	-.51	9.59	9.60	9.61	93.02	7.36
850.69	16.40	93.90	849.58	-.68	12.03	12.04	12.05	93.25	6.22
860.14	18.10	90.20	858.61	-.78	14.83	14.84	14.85	93.01	6.42
869.37	19.70	85.50	867.34	-.66	17.82	17.82	17.83	92.13	7.17
878.87	22.10	84.00	876.21	-.35	21.19	21.19	21.20	90.95	7.76
888.48	24.30	85.80	885.05	-.02	24.96	24.96	24.96	90.04	7.22
897.71	27.00	88.30	893.37	.18	28.95	28.95	28.95	89.64	9.45
907.18	29.60	91.00	901.70	.21	33.44	33.44	33.44	89.64	9.18
916.57	31.80	90.80	909.78	.13	38.23	38.23	38.23	89.80	7.04
925.83	33.70	90.60	917.57	.07	43.24	43.24	43.24	89.91	6.17
935.30	36.10	91.10	925.33	-.01	48.66	48.66	48.66	90.01	7.66
944.76	38.40	90.50	932.86	-.09	54.38	54.38	54.38	90.09	7.38
954.23	40.80	89.90	940.16	-.11	60.42	60.42	60.42	90.10	7.70
963.69	43.20	89.20	947.19	-.06	66.75	66.75	66.75	90.05	7.75
973.14	45.50	88.30	953.94	.09	73.35	73.35	73.35	89.93	7.57
982.59	47.70	88.30	960.44	.29	80.22	80.21	80.22	89.79	6.98
991.96	49.30	88.70	966.65	.47	87.23	87.23	87.23	89.69	5.21
1001.16	51.40	88.30	972.52	.66	94.31	94.31	94.31	89.60	6.92
1010.32	52.90	88.90	978.14	.84	101.54	101.53	101.55	89.53	5.15
1019.49	54.10	90.10	983.59	.90	108.91	108.90	108.92	89.53	5.04
1028.68	55.80	90.10	988.87	.89	116.44	116.43	116.44	89.56	5.55
1037.92	57.00	89.50	993.98	.91	124.13	124.12	124.14	89.58	4.22
1047.15	59.20	89.30	998.86	1.00	131.97	131.96	131.97	89.57	7.17
1056.36	61.50	89.90	1003.41	1.05	139.97	139.96	139.97	89.57	7.68
1065.82	64.20	90.30	1007.73	1.04	148.39	148.38	148.39	89.60	8.64
1075.02	66.80	90.30	1011.55	.99	156.76	156.75	156.76	89.64	8.48
1084.23	69.40	91.30	1014.98	.87	165.30	165.29	165.30	89.70	8.99
1093.67	72.30	92.60	1018.08	.57	174.21	174.21	174.21	89.81	10.01
1102.88	73.40	92.10	1020.79	.21	183.01	183.00	183.01	89.94	3.91
1112.09	73.00	92.70	1023.46	-.16	191.82	191.81	191.82	90.05	2.28
1121.65	75.60	92.80	1026.04	-.60	201.01	201.01	201.01	90.17	8.16
1131.20	78.20	91.00	1028.21	-.91	210.30	210.30	210.30	90.25	9.85
1140.64	81.10	89.70	1029.90	-.97	219.59	219.59	219.59	90.25	10.07
1149.88	84.10	88.80	1031.09	-.85	228.75	228.75	228.75	90.21	10.16
1159.34	87.40	89.10	1031.79	-.67	238.18	238.18	238.18	90.16	10.51
Landing Point									
1168.80	89.00	89.50	1032.09	-.56	247.63	247.63	247.63	90.13	5.23
1178.26	88.40	89.40	1032.30	-.47	257.09	257.09	257.09	90.10	1.93
1187.70	88.30	88.90	1032.58	-.33	266.53	266.52	266.53	90.07	1.62
1197.18	90.10	90.80	1032.71	-.30	276.00	276.00	276.00	90.06	8.28
1206.62	90.90	92.20	1032.63	-.55	285.44	285.44	285.44	90.11	5.12
1216.13	91.10	92.50	1032.46	-.94	294.94	294.94	294.94	90.18	1.14
1225.72	90.70	92.30	1032.31	-1.34	304.52	304.52	304.52	90.25	1.40
1235.32	89.90	92.20	1032.26	-1.72	314.11	314.12	314.12	90.31	2.52

Measured Depth Meters	Incl Angle Deg	Drift Direction Deg	True Vertical Depth	N-S Meters	E-W Meters	Vertical Section Meters	CLOSURE Distance Meters	CLOSURE Direction Deg	Dogleg Severity Deg/30
1244.77	89.70	92.10	1032.29	-2.07	323.56	323.56	323.56	90.37	.71
1254.00	89.50	91.40	1032.36	-2.35	332.78	332.79	332.79	90.41	2.37
1263.26	89.00	91.00	1032.48	-2.55	342.04	342.05	342.05	90.43	2.07
1272.30	89.10	91.20	1032.63	-2.72	351.08	351.09	351.09	90.44	.74
1282.20	90.00	92.30	1032.71	-3.02	360.97	360.98	360.98	90.48	4.31
1291.75	90.60	92.60	1032.66	-3.43	370.51	370.53	370.53	90.53	2.11
1301.18	91.40	93.70	1032.49	-3.95	379.93	379.94	379.95	90.60	4.33
1310.72	91.20	93.70	1032.28	-4.57	389.44	389.47	389.47	90.67	.63
1320.34	90.90	93.40	1032.10	-5.16	399.04	399.07	399.08	90.74	1.32
1329.58	90.60	93.70	1031.98	-5.73	408.27	408.29	408.31	90.80	1.38
1339.03	89.70	92.80	1031.95	-6.27	417.70	417.73	417.75	90.86	4.04
1348.62	89.30	92.30	1032.04	-6.70	427.28	427.32	427.33	90.90	2.00
1357.86	89.70	92.60	1032.12	-7.09	436.51	436.55	436.57	90.93	1.62
1367.30	90.10	94.50	1032.13	-7.68	445.93	445.97	446.00	90.99	6.17
1376.71	89.80	94.70	1032.14	-8.43	455.31	455.36	455.39	91.06	1.15
1386.17	89.50	94.10	1032.20	-9.16	464.74	464.79	464.83	91.13	2.13
1395.51	89.60	94.70	1032.27	-9.87	474.06	474.11	474.16	91.19	1.95
1404.73	90.20	96.10	1032.29	-10.74	483.24	483.30	483.35	91.27	4.96
1413.90	91.00	95.80	1032.19	-11.69	492.36	492.42	492.49	91.36	2.80
1423.25	90.10	93.70	1032.10	-12.47	501.67	501.74	501.83	91.42	7.33
1432.60	90.20	93.40	1032.08	-13.04	511.00	511.08	511.17	91.46	1.01
1441.86	90.10	93.00	1032.05	-13.56	520.25	520.33	520.43	91.49	1.34
1451.11	89.80	92.90	1032.06	-14.04	529.49	529.57	529.67	91.52	1.03
1460.48	89.60	95.10	1032.11	-14.69	538.83	538.92	539.03	91.56	7.07
1469.75	89.50	94.80	1032.18	-15.49	548.07	548.16	548.29	91.62	1.02
1479.16	88.20	93.50	1032.37	-16.17	557.45	557.55	557.69	91.66	5.86
1488.45	87.90	92.70	1032.69	-16.67	566.72	566.82	566.97	91.69	2.76
1497.88	87.00	92.40	1033.11	-17.09	576.13	576.23	576.39	91.70	3.02
1507.11	87.10	92.60	1033.58	-17.49	585.34	585.45	585.60	91.71	.73
1516.33	86.80	93.20	1034.07	-17.96	594.54	594.64	594.81	91.73	2.18
1525.57	87.60	92.80	1034.53	-18.44	603.75	603.86	604.04	91.75	2.90
1534.93	88.00	91.10	1034.89	-18.76	613.10	613.21	613.39	91.75	5.59
1544.14	87.80	89.90	1035.22	-18.84	622.31	622.42	622.59	91.73	3.96
1553.51	89.20	90.20	1035.47	-18.85	631.67	631.78	631.95	91.71	4.58
1562.88	89.40	90.10	1035.58	-18.87	641.04	641.15	641.32	91.69	.72
1572.08	89.00	88.90	1035.71	-18.79	650.24	650.35	650.51	91.66	4.12
1581.37	89.80	88.70	1035.81	-18.60	659.53	659.64	659.79	91.62	2.66
1590.44	90.60	88.60	1035.78	-18.39	668.59	668.70	668.85	91.58	2.67
1599.87	90.40	88.30	1035.69	-18.13	678.02	678.13	678.26	91.53	1.15
1609.22	89.70	87.50	1035.69	-17.79	687.36	687.47	687.59	91.48	3.41
1618.59	89.70	86.90	1035.74	-17.33	696.72	696.82	696.94	91.42	1.92
1627.83	90.00	87.00	1035.76	-16.84	705.95	706.05	706.15	91.37	1.03
1637.19	91.30	87.60	1035.65	-16.40	715.30	715.39	715.49	91.31	4.59
1646.56	90.90	87.20	1035.47	-15.97	724.66	724.75	724.83	91.26	1.81
1655.70	90.80	86.90	1035.34	-15.50	733.78	733.87	733.95	91.21	1.04

Measured Depth Meters	Incl Angle Deg	Drift Direction Deg	True Vertical Depth	N-S Meters	E-W Meters	Vertical Section Meters	CLOSURE Distance Meters	CLOSURE Direction Deg	Dogleg Severity Deg/30
1664.92	90.90	86.20	1035.20	-14.95	742.99	743.07	743.14	91.15	2.30
1674.14	90.60	85.60	1035.08	-14.29	752.18	752.26	752.32	91.09	2.18
1683.29	90.30	84.40	1035.01	-13.49	761.30	761.37	761.42	91.02	4.06
1692.70	91.40	84.40	1034.87	-12.57	770.66	770.73	770.76	90.93	3.51
1701.93	93.30	85.20	1034.49	-11.74	779.84	779.90	779.93	90.86	6.70
1711.18	93.80	85.80	1033.92	-11.01	789.05	789.10	789.12	90.80	2.53
1720.55	93.80	87.10	1033.30	-10.43	798.38	798.43	798.45	90.75	4.15
1729.92	93.20	88.20	1032.72	-10.05	807.72	807.77	807.79	90.71	4.01
1739.30	92.90	88.10	1032.23	-9.75	817.09	817.13	817.14	90.68	1.01
1748.67	91.70	88.70	1031.85	-9.49	826.44	826.49	826.50	90.66	4.29
1757.96	91.30	88.90	1031.61	-9.29	835.73	835.77	835.78	90.64	1.44
1767.27	91.10	89.30	1031.41	-9.15	845.04	845.08	845.08	90.62	1.44
1776.52	91.10	89.70	1031.23	-9.07	854.28	854.32	854.33	90.61	1.30
1785.72	89.60	90.20	1031.18	-9.06	863.48	863.52	863.53	90.60	5.16
1794.94	89.40	90.00	1031.26	-9.07	872.70	872.74	872.75	90.60	.92
1804.33	89.20	89.60	1031.37	-9.04	882.09	882.13	882.14	90.59	1.43
1813.57	89.10	89.50	1031.51	-8.97	891.33	891.37	891.38	90.58	.46
1822.82	89.10	89.30	1031.66	-8.87	900.58	900.62	900.62	90.56	.65
1832.23	89.60	90.40	1031.76	-8.85	909.99	910.03	910.03	90.56	3.85
1841.57	88.80	90.10	1031.89	-8.89	919.33	919.37	919.37	90.55	2.74
1850.83	88.60	90.10	1032.10	-8.90	928.58	928.62	928.63	90.55	.65
1860.27	88.10	88.60	1032.37	-8.80	938.02	938.06	938.06	90.54	5.02
1869.52	88.40	90.00	1032.66	-8.68	947.26	947.30	947.30	90.53	4.64
1878.44	89.20	90.70	1032.84	-8.74	956.18	956.22	956.22	90.52	3.57
1887.84	90.10	91.30	1032.90	-8.90	965.58	965.62	965.62	90.53	3.45
1897.21	90.30	92.10	1032.87	-9.18	974.95	974.99	974.99	90.54	2.64
1906.46	89.80	92.20	1032.86	-9.53	984.19	984.23	984.24	90.55	1.65
1915.67	89.70	91.70	1032.90	-9.84	993.39	993.44	993.44	90.57	1.66
1924.83	89.60	91.70	1032.96	-10.11	1002.55	1002.59	1002.60	90.58	.33
1934.33	90.60	91.20	1032.94	-10.35	1012.05	1012.09	1012.10	90.59	3.53
1943.70	91.60	91.10	1032.76	-10.54	1021.41	1021.46	1021.47	90.59	3.22
1952.95	91.40	90.70	1032.52	-10.69	1030.66	1030.71	1030.71	90.59	1.45
1962.41	91.30	90.50	1032.30	-10.79	1040.12	1040.16	1040.17	90.59	.71
1971.61	92.00	90.70	1032.03	-10.88	1049.31	1049.36	1049.37	90.59	2.37
1981.06	92.30	90.50	1031.68	-10.98	1058.75	1058.80	1058.81	90.59	1.14
Extrapolate to TD									
1998.00	92.10	90.50	1031.03	-11.13	1075.68	1075.73	1075.74	90.59	.35

Drilling Info

Manitoba
Innovation, Energy and Mines

New Well Summary - Horizontal

Licence: 7447

Well Name & Location: Molopo Pierson Prov Hrztl 16-32-1-29 WPM
(as noted on well licence)

Elevations:
Ground Elev: 471.2
Cut or fill: -.2
Revised GE: 471
Rig K.B.: 4.2
Well KB: 475.2

Surface Location: 13C-32-1--29 WPM

Engineer: Mark Mazurat
Phone: 204-856-3534
Push: Gary Millions

With: Molopo
Email/Fax: markmaz@inethome.ca
Rig Name: Advance 1 and Number

SPUD DATE & TIME: 2010/07/07 @ 11:00 hrs. IE & M notified? Yes

SURFACE CASING: IE & M Notified? Yes Surface TD: 202m

Casing run: 2010/07/08 # of Joints: 16 Size: 219.1mm
Weight: 35.72kg/m Grade: J-55 Landed at: 202m
Cement: 14t of ~~Slurry~~ TSC 1760 & _____ % $CaCl_2$ Returns: 3m^3
Plug Down: 5:55 hrs Cement Co: Halliburton Kick-Off Point for Build: 782m

INTERMEDIATE/PRODUCTION CASING: IE & M Notified? Yes TD Date: _____ TD: _____m

Casing run: _____/_____/_____ # of Joints: _____ Size: _____mm
Weight: _____kg/m Grade: _____ Landed at: _____m
Fill: _____t of _____ Tail: _____t of _____
Calc. Cement Top: _____ m Cement Co: _____ Returns: _____m Plug Down: _____ hrs

FIRST LEG: Date: 2010/07/15 Kick-Off Point: 782m

TD Date & Time: 2010/07/15 @ 14:30hrs TD: 1998m TVD: 1031m
Bottom Hole Co-ordinates: 1075.68 m West of Surface LSD -11.13 m North
Misc. Details: _____

LINER DETAILS: IE & M Notified? Yes **LINER HUNG:** No **LINER CEMENTED:** Yes

Liner run: 2010/07/16 # of Joints: 157 Size: 139.7mm
Weight: 23.07kg/m Grade: J-55 Liner Top: 0 m MD Liner Bottom: 1998 m MD
Fill: 12t of SBM Hilite 1400 Tail: 30t of SBM BR II
Calc. Cement Top: Surface m Cement Co: Halliburton Plug Down: 17:10 hrs
Packer Depth: 1. _____ m MD 2. _____ m MD

SECOND LEG: Date: _____/_____/_____ Kick-Off Point: _____m

TD Date & Time: _____/_____/_____ @ _____hrs TD: _____m TVD: _____m
Bottom Hole Co-ordinates: _____ m West of Surface LSD _____ m North
Misc. Details: _____

LINER DETAILS: IE & M Notified? Yes **LINER HUNG:** Yes **LINER CEMENTED:** Yes

Liner run: _____/_____/_____ # of Joints: _____ Size: _____mm
Weight: _____kg/m Grade: _____ Liner Top: _____ m MD Liner Bottom: _____ m MD
Fill: _____t of _____ Tail: _____t of _____
Calc. Cement Top: _____ m Cement Co: _____ Plug Down: _____ hrs
Packer Depth: 1. _____ m MD 2. _____ m MD

Submit Directional Surveys with tours

Fluid Loss: NO Volume: _____ Depth: _____

Displacement Fluid: _____ Bridge Plug Set at: _____m

Rig Release: 2010/07/16 @ 22:00hrs Well Status: Waiting on service rig
(Waiting on Service Rig or Plugged & Abandoned Dry)

Rig Moving To: 4-34-1-27 Lic.#7474

Weekly Report:
2010/07/19 @ 0800: _____
(Date)

2010/07/19 - Wkly -
2010/08/03 - Wkly - WOSR Compl

IE & M – Petroleum Branch – Virden (204)748-4260 - Fax (204)748-2208 Waskada (204)673-2472 – Fax (204)673-2767

Remarks: _____

Tours ✓ Sample _____ Well Check 2010/08/27

PROVINCE OF MANITOBA
PETROLEUM BRANCH
JUL 13 2010
WASKADA OFFICE

Manitoba
Innovation, Energy and Mines

New Well Summary - Vertical

Licence: 7447

Well Name & Location: Molopo Pierson Prov HZNTL 16-32-1-29 WPM
(as noted on well licence)
Surface Location: 13C-32-1-29 WPM

(STRAT)

Elevations:
Ground Elev: 471.2 m

Cut or fill: -.2 m
Revised GE: 471 m
Rig K.B.: 4.2 m
Well KB: 475.2 m

Engineer: Mark Mazurat With: Molopo
Phone: 204-856-3534 Email/Fax: markmaz@inethome.ca
Push: Gary Millions Rig Name and Number: Advance 1

SPUD DATE & TIME: 2010/07/07 @ 11:00 hrs. Branch Notified? Yes

SURFACE CASING: Branch Notified? Yes Surface TD: 202m

Casing run: 2010/07/08 # of Joints: 16 Size: 219.1mm

Weight: 35.72kg/m Grade: J-55 Landed at: 202m

Cement: 14t of Slurry 1750 & _____ % $CaCl_2$ Returns: 3m^3 Plug Down: 5:55 hrs

Cement Co: Halliburton Branch Notified: YES Dept. Witness: _____

CORES: DATE INTERVAL RECOVERY

_____/_____/_____ _____(top) _____(bottom) _____
_____/_____/_____ _____(top) _____(bottom) _____
_____/_____/_____ _____(top) _____(bottom) _____

FINISHED DRILLING: Date: 2010/07/09 @ 20:00hrs TD: 1082m

LOGS: Date: 2010/07/10 Logging Company: Weatherford

Description: STI,SPED,CNS,GR,BCS

PROVINCE OF MANITOBA
PETROLEUM BRANCH
JUL 12 2010
WASKADA OFFICE

DST's: 1) Date: _____/_____/_____ Branch Notified: Yes Interval: N/Am

Times: _____/_____/_____/_____ Recovery: _____

Initial Pressures: Preflow: _____ Flowing: _____ SI: _____ Hyd: _____

Final Pressures: Flowing: _____ SI: _____ Hyd: _____

2) Date: _____/_____/_____ Branch Notified: Yes Interval: _____m

Times: _____/_____/_____/_____ Recovery: _____

Initial Pressures: Preflow: _____ Flowing: _____ SI: _____ Hyd: _____

Final Pressures: Flowing: _____ SI: _____ Hyd: _____

LONGSTRING: Casing Run: _____/_____/_____ # of Joints: _____ Size: _____ mm

Weight: _____ kg/m Grade: _____ Landed at: _____ m

Cement: _____ t of _____ & _____ Tail: _____t of _____ & _____

Returns: _____ m^3 Plug down: _____ hrs Cement Co.: _____

Calculated Cement Top: _____ m IT & M Notified: Yes Dept. Witness: NONE

Fluid Loss: NO Volume: M3 Depth: ~~_____~~ 2010/07/10

Rig Release: 2010/07/11 @ 11:00 hrs Well Status: Plug Back F/1082 - 724m
(Waiting on Service Rig) or (Plugged & Abandoned - Dry) 2 plugs

Rig Moving To: _____

Weekly Report:
2010//07/12 @ 0800: _____ 2010/07/12 - Wkly
(Date)

STE&M – Petroleum Branch – Virden (204)748-4260 - Fax (204)748-2208 or Waskada (204)673-2472 – Fax (204)673-2767

Remarks: _____

Tours _____ Sample _____ Logs _____ Well check: _____/_____/_____

Molopo Energy Canada Ltd.

Project: Pierson
Site: (13C-32) 16D-32-1-29WPM
Well: Molopo Pierson Prov Hz
Wellbore: 16-32-001-29W1
Design: 10147566R Surveys

Well License #: 7447

PHOENIX TECHNOLOGY SERVICES LP

Ground Elevation: 471.23m
KB Elevation: 475.20m

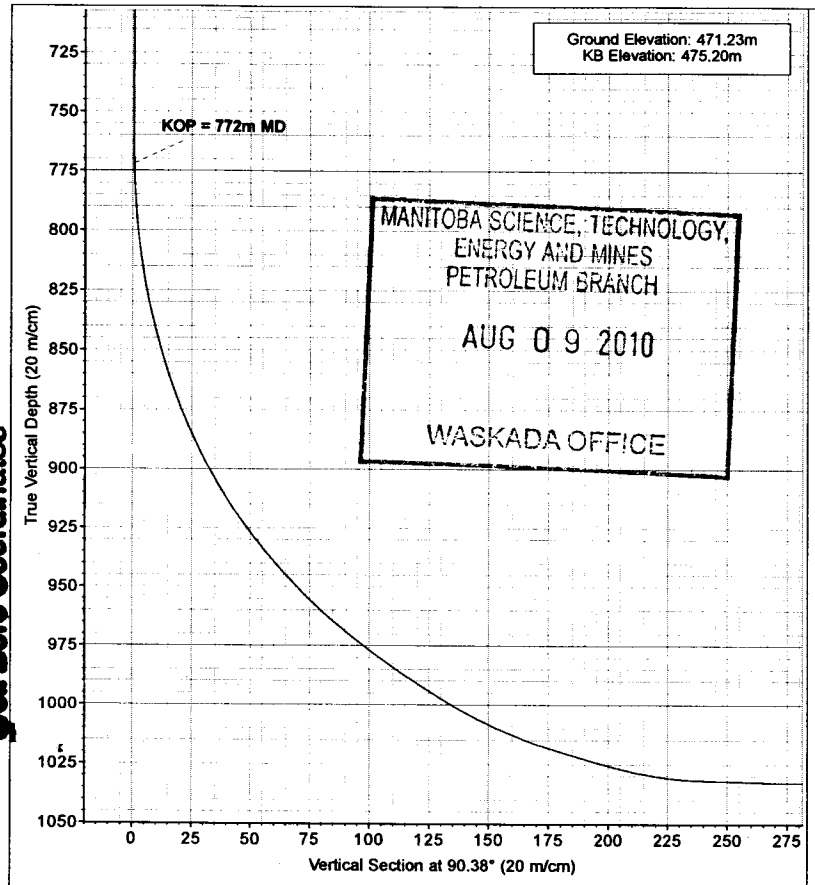
Surface Co-ordinates
110.00m S of N Boundary
55.00m E of W Boundary, Sec. 32

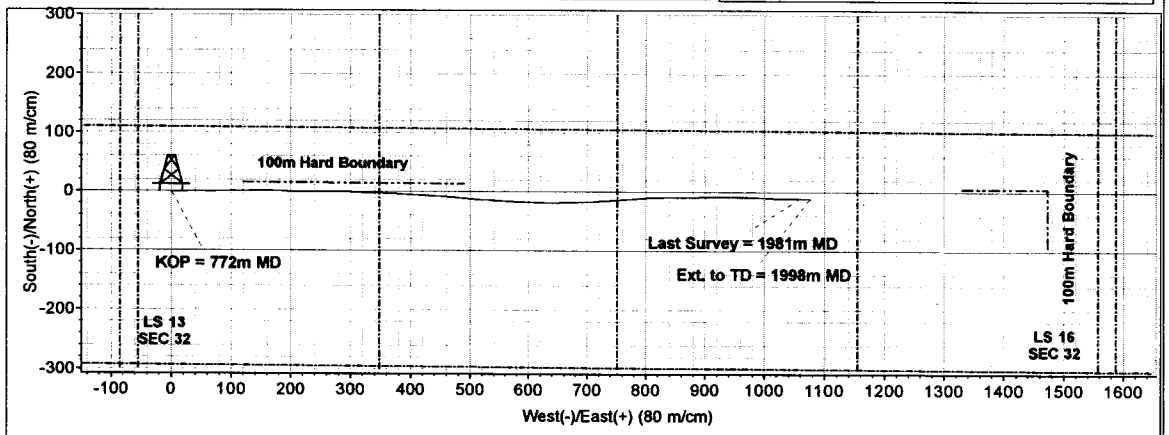
Azimuths to True North
Magnetic North: 7.26°

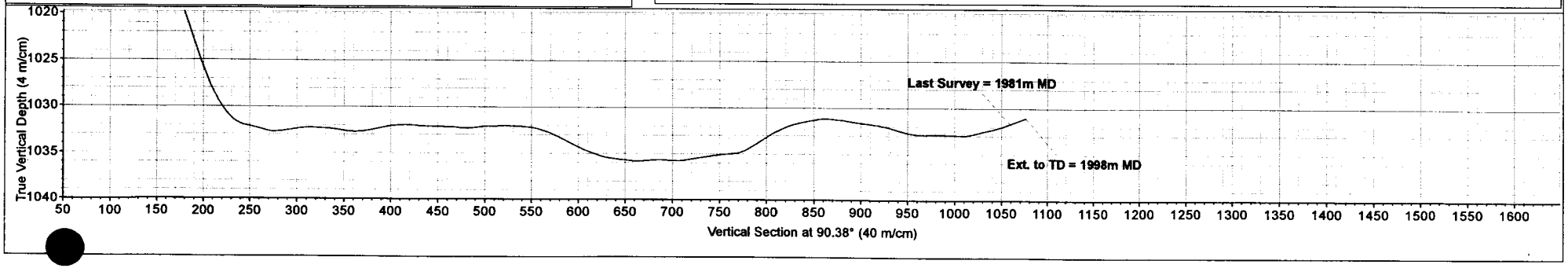
Magnetic Field
Strength: 57357.8snT
Dip Angle: 74.22°
Date: 28/06/2010
Model: IGRF2010_14

ANNOTATIONS

TVD	MD	Annotation
202.00	202.00	Surface Csg. = 202m MD
771.98	772.00	KOP = 772m MD
1031.68	1981.06	Last Survey = 1981m MD
1031.03	1998.00	Ext. to TD = 1998m MD







Well Bore Coordinates

Phoenix Technology Services LP

Survey Report

Database:	PHXDB Compass	Local Co-ordinate Reference:	Site (13C-32) 16D-32-1-29WPM
Company:	Molopo Energy Canada Ltd.	TVD Reference:	Actual KB @ 475.20m
Project:	Pierson	MD Reference:	Actual KB @ 475.20m
Site:	(13C-32) 16D-32-1-29WPM	North Reference:	True
Well:	Molopo Pierson Prov Hz	Survey Calculation Method:	Minimum Curvature
Wellbore:	16-32-001-29W1		
Design:	10147566R Surveys		

Project Pierson

Map System:	Universal Transverse Mercator	**System Datum:**	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	Zone 14N (102 W to 96 W)		

Site (13C-32) 16D-32-1-29WPM

Site Position:		**Northing:**	5,439,816.18 m	**Latitude:**	49.09
From:	Map	**Easting:**	329,208.87 m	**Longitude:**	-101.34
Position Uncertainty:	0.00 m	**Slot Radius:**	mm	**Grid Convergence:**	-1.77 °

Well Molopo Pierson Prov Hz

Well Position	**+N/-S**	0.00 m	**Northing:**	5,439,816.18 m	**Latitude:**	49° 5' 14.933 N
	+E/-W	0.00 m	**Easting:**	329,208.87 m	**Longitude:**	101° 20' 21.252 W
Position Uncertainty		0.00 m	**Wellhead Elevation:**	m	**Ground Level:**	471.23 m

Wellbore 16-32-001-29W1

Magnetic Model	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
IGRF2010_14	28/06/2010	7.26	74.22	57,358

Design 10147566R Surveys

Audit Notes: Well License # 7447

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

Vertical Section:	Depth From (TVD) (m)	+N/-S (m)	+E/-W (m)	Direction (°)
	0.00	0.00	0.00	90.38

Survey Program **Date** 16/07/2010

From (m)	To (m)	Survey (Wellbore)	Tool Name	Description
0.00	1,998.00	10147566 Surveys (16-32-001-29W1)	MWD	MWD - Standard

Survey

Measured Depth (m)	Inclination (°)	Azimuth (°)	Vertical Depth (m)	Subsea Depth (m)	+N/-S (m)	+E/-W (m)	Vertical Section (m)	Dogleg Rate (°/30m)	Build Rate (°/30m)	Turn Rate (°/30m)
0.00	0.00	0.00	0.00	475.20	0.00	0.00	0.00	0.000	0.000	0.000
Surface Csg. = 202m MD										
202.00	0.00	0.00	202.00	273.20	0.00	0.00	0.00	0.000	0.000	0.000
212.55	0.40	125.60	212.55	262.65	-0.02	0.03	0.03	1.137	1.137	0.000
268.11	0.30	177.30	268.11	207.09	-0.28	0.19	0.20	0.172	-0.054	27.916
323.57	0.50	178.90	323.57	151.63	-0.67	0.21	0.21	0.108	0.108	0.865
335.30	0.52	176.44	335.30	139.90	-0.77	0.21	0.22	0.076	0.051	-6.292
370.29	0.60	170.30	370.29	104.91	-1.11	0.25	0.26	0.086	0.069	-5.264
417.82	0.80	176.40	417.81	57.39	-1.69	0.31	0.33	0.135	0.126	3.850

Phoenix Technology Services LP

Survey Report

Database:	PHXDB Compass	Local Co-ordinate Reference:	Site (13C-32) 16D-32-1-29WPM
Company:	Molopo Energy Canada Ltd.	TVD Reference:	Actual KB @ 475.20m
Project:	Pierson	MD Reference:	Actual KB @ 475.20m
Site:	(13C-32) 16D-32-1-29WPM	North Reference:	True
Well:	Molopo Pierson Prov Hz	Survey Calculation Method:	Minimum Curvature
Wellbore:	16-32-001-29W1		
Design:	10147566R Surveys		

Survey

Measured Depth (m)	Inclination (°)	Azimuth (°)	Vertical Depth (m)	Subsea Depth (m)	+N/-S (m)	+E/-W (m)	Vertical Section (m)	Dogleg Rate (°/30m)	Build Rate (°/30m)	Turn Rate (°/30m)
436.92	0.40	177.20	436.91	38.29	-1.89	0.33	0.34	0.628	-0.628	1.257
474.94	0.50	35.50	474.93	0.27	-1.88	0.43	0.44	0.671	0.079	-111.810
531.59	0.50	12.10	531.58	-56.38	-1.44	0.62	0.63	0.107	0.000	-12.392
587.76	0.50	22.70	587.75	-112.55	-0.97	0.77	0.78	0.049	0.000	5.661
634.94	0.60	349.70	634.92	-159.72	-0.54	0.80	0.81	0.208	0.064	-20.983
709.50	0.80	183.70	709.48	-234.28	-0.68	0.70	0.71	0.559	0.080	-66.792
756.29	0.30	221.50	756.27	-281.07	-1.10	0.60	0.61	0.380	-0.321	24 236
765.88	0.30	183.70	765.86	-290.66	-1.14	0.58	0.59	0.608	0.000	-118.248
KOP = 772m MD										
772.00	0.98	106.03	771.98	-296.78	-1.17	0.63	0.64	4.714	3.333	-380.735
775.40	1.50	99.80	775.38	-300.18	-1.18	0.70	0.71	4.733	4.588	-54.971
784.83	3.30	87.90	784.80	-309.60	-1.20	1.09	1.10	5.911	5.726	-37.858
794.43	4.90	83.80	794.38	-319.18	-1.14	1.78	1.79	5.080	5.000	-12.812
803.64	6.60	82.10	803.54	-328.34	-1.03	2.69	2.70	5.565	5.537	-5.537
813.28	8.50	80.00	813.09	-337.89	-0.83	3.94	3.95	5.974	5.913	-6.535
822.57	10.60	82.30	822.26	-347.06	-0.59	5.47	5.47	6.891	6.781	7.427
832.01	12.70	88.20	831.50	-356.30	-0.44	7.37	7.37	7.665	6.674	18.750
841.50	14.50	94.50	840.72	-365.52	-0.50	9.59	9.60	7.362	5.690	19.916
850.69	16.40	93.90	849.58	-374.38	-0.68	12.03	12.04	6.224	6.202	-1.959
860.14	18.10	90.20	858.61	-383.41	-0.78	14.83	14.84	6.421	5.397	-11.746
869.37	19.70	85.50	867.34	-392.14	-0.66	17.82	17.82	7.175	5.200	-15.276
878.87	22.10	84.00	876.21	-401.01	-0.35	21.19	21.19	7.764	7.579	-4 737
888.48	24.30	85.80	885.05	-409.85	-0.02	24.96	24.96	7.215	6.868	5.619
897.71	27.00	88.30	893.37	-418.17	0.19	28.95	28.95	9.453	8.776	8.126
907.18	29.60	91.00	901.70	-426.50	0.21	33.44	33.44	9.179	8.237	8.553
916.57	31.80	90.80	909.78	-434.58	0.13	38.23	38.23	7.036	7.029	-0 639
925.83	33.70	90.60	917.57	-442.37	0.07	43.24	43.24	6.165	6.156	-0.648
935.30	36.10	91.10	925.33	-450.13	-0.01	48.66	48.66	7.657	7.603	1.584
944.76	38.40	90.50	932.86	-457.66	-0.09	54.38	54.38	7.384	7.294	-1.903
954.23	40.80	89.90	940.16	-464.96	-0.11	60.42	60.42	7.699	7.603	-1.901
963.69	43.20	89.20	947.19	-471.99	-0.06	66.75	66.75	7.754	7.611	-2.220
973.14	45.50	88.30	953.94	-478.74	0.09	73.35	73.35	7.570	7.302	-2.857
982.59	47.70	88.30	960.44	-485.24	0.29	80.22	80.21	6.984	6.984	0.000
991.96	49.30	88.70	966.65	-491.45	0.48	87.23	87.23	5.212	5.123	1.281
1,001.16	51.40	88.30	972.52	-497.32	0.66	94.31	94.31	6.921	6.848	-1.304
1,010.32	52.90	88.90	978.14	-502.94	0.84	101.54	101.53	5.152	4.913	1.965
1,019.49	54.10	90.10	983.59	-508.39	0.90	108.91	108.90	5.037	3.926	3.926
1,028.68	55.80	90.10	988.87	-513.67	0.89	116.44	116.43	5.550	5.550	0.000
1,037.92	57.00	89.50	993.98	-518.78	0.92	124.13	124.12	4.220	3.896	-1.948
1,047.15	59.20	89.30	998.86	-523.66	1.00	131.97	131.96	7.172	7.151	-0.650
1,056.36	61.50	89.90	1,003.41	-528.21	1.05	139.97	139.96	7.682	7.492	1.954
1,065.82	64.20	90.30	1,007.73	-532.53	1.04	148.39	148.38	8.636	8.562	1.268
1,075.02	66.80	90.30	1,011.55	-536.35	0.99	156.76	156.75	8.478	8.478	0.000

Phoenix Technology Services LP

Survey Report

Database:	PHXDB Compass	Local Co-ordinate Reference:	Site (13C-32) 16D-32-1-29WPM
Company:	Molopo Energy Canada Ltd.	TVD Reference:	Actual KB @ 475.20m
Project:	Pierson	MD Reference:	Actual KB @ 475.20m
Site:	(13C-32) 16D-32-1-29WPM	North Reference:	True
Well:	Molopo Pierson Prov Hz	Survey Calculation Method:	Minimum Curvature
Wellbore:	16-32-001-29W1		
Design:	10147566R Surveys		

Survey

Measured Depth (m)	Inclination (°)	Azimuth (°)	Vertical Depth (m)	Subsea Depth (m)	+N/-S (m)	+E/-W (m)	Vertical Section (m)	Dogleg Rate (°/30m)	Build Rate (°/30m)	Turn Rate (°/30m)
1,084.23	69.40	91.30	1,014.98	-539.78	0.87	165.30	165.29	8.992	8.469	3.257
1,093.67	72.30	92.60	1,018.08	-542.88	0.57	174.21	174.21	10.008	9.216	4.131
1,102.88	73.40	92.10	1,020.79	-545.59	0.21	183.01	183.00	3.906	3.583	-1.629
1,112.09	73.00	92.70	1,023.46	-548.26	-0.16	191.81	191.81	2.280	-1.303	1.954
1,121.65	75.60	92.80	1,026.04	-550.84	-0.60	201.01	201.01	8.165	8.159	0.314
1,131.20	78.20	91.00	1,028.21	-553.01	-0.91	210.30	210.30	9.851	8.168	-5.654
1,140.64	81.10	89.70	1,029.90	-554.70	-0.97	219.59	219.59	10.072	9.216	-4.131
1,149.88	84.10	88.80	1,031.09	-555.89	-0.85	228.75	228.75	10.162	9.740	-2.922
1,159.34	87.40	89.10	1,031.79	-556.59	-0.67	238.18	238.18	10.508	10.465	0.951
1,168.80	89.00	89.50	1,032.09	-556.89	-0.56	247.63	247.63	5.230	5.074	1.268
1,178.26	88.40	89.40	1,032.30	-557.10	-0.47	257.09	257.09	1.929	-1.903	-0.317
1,187.70	88.30	88.90	1,032.58	-557.38	-0.33	266.53	266.52	1.620	-0.318	-1.589
1,197.18	90.10	90.80	1,032.71	-557.51	-0.30	276.00	276.00	8.282	5.696	6.013
1,206.62	90.90	92.20	1,032.63	-557.43	-0.55	285.44	285.44	5.124	2.542	4.449
1,216.13	91.10	92.50	1,032.46	-557.26	-0.94	294.94	294.94	1.137	0.631	0.946
1,225.72	90.70	92.30	1,032.31	-557.11	-1.34	304.52	304.52	1.399	-1.251	-0.626
1,235.32	89.90	92.20	1,032.26	-557.06	-1.72	314.11	314.12	2.519	-2.500	-0.312
1,244.77	89.70	92.10	1,032.29	-557.09	-2.07	323.56	323.56	0.710	-0.635	-0.317
1,254.00	89.50	91.40	1,032.36	-557.16	-2.35	332.78	332.79	2.366	-0.650	-2.275
1,263.26	89.00	91.00	1,032.48	-557.28	-2.55	342.04	342.05	2.074	-1.620	-1.296
1,272.30	89.10	91.20	1,032.63	-557.43	-2.72	351.08	351.09	0.742	0.332	0.664
1,282.20	90.00	92.30	1,032.71	-557.51	-3.02	360.97	360.98	4.307	2.727	3.333
1,291.75	90.60	92.60	1,032.66	-557.46	-3.43	370.51	370.53	2.107	1.885	0.942
1,301.18	91.40	93.70	1,032.49	-557.29	-3.95	379.93	379.94	4.327	2.545	3.499
1,310.72	91.20	93.70	1,032.28	-557.08	-4.56	389.44	389.47	0.629	-0.629	0.000
1,320.34	90.90	93.40	1,032.10	-556.90	-5.16	399.04	399.07	1.323	-0.936	-0.936
1,329.58	90.60	93.70	1,031.98	-556.78	-5.73	408.27	408.29	1.377	-0.974	0.974
1,339.03	89.70	92.80	1,031.95	-556.75	-6.27	417.70	417.73	4.041	-2.857	-2.857
1,348.62	89.30	92.30	1,032.04	-556.84	-6.69	427.28	427.32	2.003	-1.251	-1.564
1,357.86	89.70	92.60	1,032.12	-556.92	-7.09	436.51	436.55	1.623	1.299	0.974
1,367.30	90.10	94.50	1,032.13	-556.93	-7.67	445.93	445.97	6.170	1.271	6.038
1,376.71	89.80	94.70	1,032.14	-556.94	-8.43	455.31	455.36	1.149	-0.956	0.638
1,386.17	89.50	94.10	1,032.20	-557.00	-9.15	464.74	464.79	2.127	-0.951	-1.903
1,395.51	89.60	94.70	1,032.27	-557.07	-9.87	474.06	474.11	1.954	0.321	1.927
1,404.73	90.20	96.10	1,032.29	-557.09	-10.74	483.24	483.30	4.956	1.952	4.555
1,413.90	91.00	95.80	1,032.19	-556.99	-11.69	492.36	492.42	2.795	2.617	-0.981
1,423.25	90.10	93.70	1,032.10	-556.90	-12.46	501.67	501.74	7.330	-2.888	-6.738
1,432.60	90.20	93.40	1,032.08	-556.88	-13.04	511.00	511.08	1.015	0.321	-0.963
1,441.86	90.10	93.00	1,032.05	-556.85	-13.56	520.25	520.33	1.336	-0.324	-1.296
1,451.11	89.80	92.90	1,032.06	-556.86	-14.04	529.49	529.57	1.026	-0.973	-0.324
1,460.48	89.60	95.10	1,032.11	-556.91	-14.69	538.83	538.92	7.073	-0.640	7.044
1,469.75	89.50	94.80	1,032.18	-556.98	-15.49	548.07	548.16	1.023	-0.324	-0.971

Database:	PHXDB Compass	Local Co-ordinate Reference:	Site (13C-32) 16D-32-1-29WPM
Company:	Molopo Energy Canada Ltd.	TVD Reference:	Actual KB @ 475.20m
Project:	Pierson	MD Reference:	Actual KB @ 475.20m
Site:	(13C-32) 16D-32-1-29WPM	North Reference:	True
Well:	Molopo Pierson Prov Hz	Survey Calculation Method:	Minimum Curvature
Wellbore:	16-32-001-29W1		
Design:	10147566R Surveys		

Survey

Measured Depth (m)	Inclination (°)	Azimuth (°)	Vertical Depth (m)	Subsea Depth (m)	+N/-S (m)	+E/-W (m)	Vertical Section (m)	Dogleg Rate (°/30m)	Build Rate (°/30m)	Turn Rate (°/30m)
1,479.16	88.20	93.50	1,032.37	-557.17	-16.17	557.45	557.55	5.861	-4.145	-4.145
1,488.45	87.90	92.70	1,032.69	-557.49	-16.67	566.72	566.82	2.758	-0.969	-2.583
1,497.88	87.00	92.40	1,033.11	-557.91	-17.09	576.13	576.24	3.018	-2.863	-0.954
1,507.11	87.10	92.60	1,033.58	-558.38	-17.49	585.34	585.45	0.726	0.325	0.650
1,516.33	86.80	93.20	1,034.07	-558.87	-17.96	594.54	594.64	2.180	-0.976	1.952
1,525.57	87.60	92.80	1,034.53	-559.33	-18.44	603.75	603.86	2.903	2.597	-1.299
1,534.93	88.00	91.10	1,034.89	-559.69	-18.76	613.10	613.21	5.594	1.282	-5.449
1,544.14	87.80	89.90	1,035.22	-560.02	-18.84	622.30	622.42	3.960	-0.651	-3.909
1,553.51	89.20	90.20	1,035.47	-560.27	-18.85	631.67	631.78	4.584	4.482	0.961
1,562.88	89.40	90.10	1,035.58	-560.38	-18.87	641.04	641.15	0.716	0.640	-0.320
1,572.08	89.00	88.90	1,035.71	-560.51	-18.79	650.24	650.35	4.124	-1.304	-3.913
1,581.37	89.80	88.70	1,035.81	-560.61	-18.60	659.53	659.64	2.663	2.583	-0.646
1,590.44	90.60	88.60	1,035.78	-560.58	-18.38	668.59	668.70	2.667	2.646	-0.331
1,599.87	90.40	88.30	1,035.69	-560.49	-18.13	678.02	678.13	1.147	-0.636	-0.954
1,609.22	89.70	87.50	1,035.69	-560.49	-17.79	687.36	687.47	3.411	-2.246	-2.567
1,618.59	89.70	86.90	1,035.74	-560.54	-17.33	696.72	696.82	1.921	0.000	-1.921
1,627.83	90.00	87.00	1,035.76	-560.56	-16.84	705.95	706.05	1.027	0.974	0.325
1,637.19	91.30	87.60	1,035.65	-560.45	-16.40	715.30	715.39	4.589	4.167	1.923
1,646.56	90.90	87.20	1,035.47	-560.27	-15.97	724.66	724.75	1.811	-1.281	-1.281
1,655.70	90.80	86.90	1,035.34	-560.14	-15.50	733.78	733.87	1.038	-0.328	-0.985
1,664.92	90.90	86.20	1,035.20	-560.00	-14.95	742.99	743.07	2.301	0.325	-2.278
1,674.14	90.60	85.60	1,035.08	-559.88	-14.29	752.18	752.26	2.183	-0.976	-1.952
1,683.29	90.30	84.40	1,035.01	-559.81	-13.49	761.30	761.37	4.055	-0.984	-3.934
1,692.70	91.40	84.40	1,034.87	-559.67	-12.57	770.66	770.73	3.507	3.507	0.000
1,701.93	93.30	85.20	1,034.49	-559.29	-11.74	779.84	779.90	6.700	6.176	2.600
1,711.18	93.80	85.80	1,033.92	-558.72	-11.01	789.05	789.10	2.530	1.622	1.946
1,720.55	93.80	87.10	1,033.30	-558.10	-10.43	798.38	798.43	4.153	0.000	4.162
1,729.92	93.20	88.20	1,032.72	-557.52	-10.05	807.72	807.77	4.006	-1.921	3.522
1,739.30	92.90	88.10	1,032.23	-557.03	-9.75	817.08	817.13	1.011	-0.959	-0.320
1,748.67	91.70	88.70	1,031.85	-556.65	-9.49	826.44	826.49	4.295	-3.842	1.921
1,757.96	91.30	88.90	1,031.61	-556.41	-9.29	835.73	835.77	1.444	-1.292	0.646
1,767.27	91.10	89.30	1,031.41	-556.21	-9.14	845.04	845.08	1.441	-0.644	1.289
1,776.52	91.10	89.70	1,031.23	-556.03	-9.06	854.28	854.32	1.297	0.000	1.297
1,785.72	89.60	90.20	1,031.18	-555.98	-9.06	863.48	863.52	5.156	-4.891	1.630
1,794.94	89.40	90.00	1,031.26	-556.06	-9.07	872.70	872.74	0.920	-0.651	-0.651
1,804.33	89.20	89.60	1,031.37	-556.17	-9.04	882.09	882.13	1.429	-0.639	-1.278
1,813.57	89.10	89.50	1,031.51	-556.31	-8.97	891.33	891.37	0.459	-0.325	-0.325
1,822.82	89.10	89.30	1,031.66	-556.46	-8.87	900.58	900.62	0.649	0.000	-0.649
1,832.23	89.60	90.40	1,031.76	-556.56	-8.85	909.99	910.03	3.852	1.594	3.507
1,841.57	88.80	90.10	1,031.89	-556.69	-8.89	919.33	919.37	2.744	-2.570	-0.964
1,850.83	88.60	90.10	1,032.10	-556.90	-8.90	928.58	928.62	0.648	-0.648	0.000
1,860.27	88.10	88.60	1,032.37	-557.17	-8.80	938.02	938.06	5.023	-1.589	-4.767
1,869.52	88.40	90.00	1,032.66	-557.46	-8.68	947.26	947.30	4.642	0.973	4.541

Phoenix Technology Services LP

Survey Report

Database:	PHXDB Compass	Local Co-ordinate Reference:	Site (13C-32) 16D-32-1-29WPM
Company:	Molopo Energy Canada Ltd.	TVD Reference:	Actual KB @ 475.20m
Project:	Pierson	MD Reference:	Actual KB @ 475.20m
Site:	(13C-32) 16D-32-1-29WPM	North Reference:	True
Well:	Molopo Pierson Prov Hz	Survey Calculation Method:	Minimum Curvature
Wellbore:	16-32-001-29W1		
Design:	10147566R Surveys		

Survey

Measured Depth (m)	Inclination (°)	Azimuth (°)	Vertical Depth (m)	Subsea Depth (m)	+N/-S (m)	+E/-W (m)	Vertical Section (m)	Dogleg Rate (°/30m)	Build Rate (°/30m)	Turn Rate (°/30m)
1,878.44	89.20	90.70	1,032.84	-557.64	-8.74	956.18	956.22	3.575	2.691	2.354
1,887.84	90.10	91.30	1,032.90	-557.70	-8.90	965.58	965.62	3.452	2.872	1.915
1,897.21	90.30	92.10	1,032.87	-557.67	-9.18	974.95	974.99	2.640	0.640	2.561
1,906.46	89.80	92.20	1,032.86	-557.66	-9.53	984.19	984.23	1.654	-1.622	0.324
1,915.67	89.70	91.70	1,032.90	-557.70	-9.84	993.39	993.44	1.661	-0.326	-1.629
1,924.83	89.60	91.70	1,032.96	-557.76	-10.11	1,002.55	1,002.59	0.328	-0.328	0.000
1,934.33	90.60	91.20	1,032.94	-557.74	-10.35	1,012.05	1,012.09	3.531	3.158	-1.579
1,943.70	91.60	91.10	1,032.76	-557.56	-10.54	1,021.41	1,021.46	3.218	3.202	-0.320
1,952.95	91.40	90.70	1,032.52	-557.32	-10.68	1,030.66	1,030.71	1.450	-0.649	-1.297
1,962.41	91.30	90.50	1,032.30	-557.10	-10.78	1,040.12	1,040.16	0.709	-0.317	-0.634
1,971.61	92.00	90.70	1,032.03	-556.83	-10.88	1,049.31	1,049.36	2.374	2.283	0.652
Last Survey = 1981m MD										
1,981.06	92.30	90.50	1,031.68	-556.48	-10.98	1,058.75	1,058.80	1.144	0.952	-0.635
Ext. to TD = 1998m MD										
1,998.00	92.10	90.50	1,031.03	-555.83	-11.13	1,075.68	1,075.73	0.354	-0.354	0.000

Survey Annotations

Measured Depth ()	Vertical Depth ()	Local Coordinates +N/-S ()	Local Coordinates +E/-W ()	Comment
202.00	202.00	0.00	0.00	Surface Csg. = 202m MD
772.00	771.98	-1.17	0.63	KOP = 772m MD
1,981.06	1,031.68	-10.98	1,058.75	Last Survey = 1981m MD
1,998.00	1,031.03	-11.13	1,075.68	Ext. to TD = 1998m MD

Checked By: _____ Approved By: _____ Date: _____

Pierson Hz (13C-32) 16D-32-1-29W1M Final Surveys (MB)

Well License # 7447
Survey_Date: 09-Jul-2010
Company: Molopo Energy Canada Ltd.

Curve_Type: Minimum Curvature
Calculated_Angle: True North = -1.7683
Dog_Leg_Interval_(metres): °/30m
Vertical_Section_Azimuth: 90.38

MD,Incl,Azim,TVD,Dogleg,V.Sect,Northing_metres,Easting_metres,Sub_Sea,Northing,Easting,Extrapolated,Build_Rate

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,330164.33 ,N,2.69
1887.84,90.10,91.3,1032.90,3.5 ,965.62,-8.90 ,965.58 ,557.70,5439777.49
,330173.72 ,N,2.87
1897.21,90.30,92.1,1032.87,2.6 ,974.99,-9.18 ,974.95 ,557.67,5439776.92
,330183.07 ,N,0.64
1906.46,89.80,92.2,1032.86,1.7 ,984.23,-9.53 ,984.19 ,557.66,5439776.29
,330192.30 ,N,-1.62
1915.67,89.70,91.7,1032.90,1.7 ,993.44,-9.84 ,993.39 ,557.70,5439775.69
,330201.49 ,N,-0.33
1924.83,89.60,91.7,1032.96,0.3 ,1002.59,-10.11 ,1002.55,557.76,5439775.14
,330210.64 ,N,-0.33
1934.33,90.60,91.2,1032.94,3.5 ,1012.09,-10.35 ,1012.05,557.74,5439774.61
,330220.12 ,N,3.16
1943.70,91.60,91.1,1032.76,3.2 ,1021.46,-10.54 ,1021.41,557.56,5439774.13
,330229.48 ,N,3.20
1952.95,91.40,90.7,1032.52,1.5 ,1030.71,-10.68 ,1030.66,557.32,5439773.70
,330238.71 ,N,-0.65
1962.41,91.30,90.5,1032.30,0.7 ,1040.16,-10.78 ,1040.12,557.10,5439773.31
,330248.16 ,N,-0.32
1971.61,92.00,90.7,1032.03,2.4 ,1049.36,-10.88 ,1049.31,556.83,5439772.93
,330257.35 ,N,2.28
1981.06,92.30,90.5,1031.68,1.1 ,1058.80,-10.98 ,1058.75,556.48,5439772.54
,330266.79 ,N,0.95
1998.00,92.10,90.5,1031.03,0.4 ,1075.73,-11.13 ,1075.68,555.83,5439771.87
,330283.70 ,N,-0.35

Lic # 7447

Job Number: 10147566R
Company: Molopo Energy CAnada Ltd
Lease/Well: Molopo Pierson Prov Hz
Location: (13C-32)16D-32-1-29WPM
Rig Name: Advance 1
RKB: 475.2
G.L. or M.S.L.: 471

State/Country: Manitoba
Declination: 7.26
Grid: -1.77
File name: C:\WINSERVE\10147566.SVY
Date/Time: 15-Jul-10 / 15:47
Curve Name: Molopo Pierson (13C-32)16D-32-1-29WPM

WINSERVE SURVEY CALCULATIONS
Minimum Curvature Method
Vertical Section Plane 90.38
Vertical Section Referenced to Wellhead
Rectangular Coordinates Referenced to Wellhead

Measured Depth Meters	Incl Angle Deg	Drift Direction Deg	True Vertical Depth	N-S Meters	E-W Meters	Vertical Section Meters	CLOSURE Distance Meters	CLOSURE Direction Deg	Dogleg Severity Deg/30
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
Surface Casing Tie On									
202.00	.00	.00	202.00	.00	.00	.00	.00	.00	.00
212.55	.40	125.60	212.55	-.02	.03	.03	.04	125.58	1.14
268.11	.30	177.30	268.11	-.28	.19	.20	.34	145.18	.17
323.57	.50	178.90	323.57	-.67	.21	.21	.70	162.83	.11
335.30	.52	176.44	335.30	-.77	.21	.22	.80	164.75	.08
370.29	.60	170.30	370.29	-1.11	.25	.26	1.14	167.27	.08
417.82	.80	176.40	417.81	-1.69	.31	.33	1.72	169.47	.13
436.92	.40	177.20	436.91	-1.89	.33	.34	1.92	170.22	.63
474.94	.50	35.50	474.93	-1.89	.43	.44	1.93	167.20	.67
531.59	.50	12.10	531.58	-1.44	.62	.63	1.57	156.61	.11
587.76	.50	22.70	587.75	-.98	.77	.78	1.24	141.76	.05
634.94	.60	349.70	634.92	-.54	.80	.81	.97	124.03	.21
709.50	.80	183.70	709.48	-.68	.70	.71	.98	134.06	.56
756.29	.30	221.50	756.27	-1.10	.60	.61	1.25	151.34	.38
765.88	.30	183.70	765.86	-1.14	.58	.59	1.28	153.00	.61
Interpolated Kick Off Point									
772.00	.98	106.03	771.98	-1.17	.63	.64	1.33	151.70	4.72
775.40	1.50	99.80	775.38	-1.19	.70	.71	1.38	149.38	4.72
784.83	3.30	87.90	784.80	-1.20	1.10	1.10	1.62	137.56	5.91
794.43	4.90	83.80	794.38	-1.14	1.78	1.79	2.11	122.73	5.08
803.64	6.60	82.10	803.54	-1.03	2.69	2.70	2.88	110.88	5.56
813.28	8.50	80.00	813.09	-.83	3.94	3.95	4.03	101.86	5.97
822.57	10.60	82.30	822.26	-.59	5.47	5.47	5.50	96.20	6.89

Measured Depth Meters	Incl Angle Deg	Drift Direction Deg	True Vertical Depth	N-S Meters	E-W Meters	Vertical Section Meters	CLOSURE Distance Meters	CLOSURE Direction Deg	Dogleg Severity Deg/30
832.01	12.70	88.20	831.50	-.45	7.37	7.37	7.38	93.46	7.66
841.50	14.50	94.50	840.72	-.51	9.59	9.60	9.61	93.02	7.36
850.69	16.40	93.90	849.58	-.68	12.03	12.04	12.05	93.25	6.22
860.14	18.10	90.20	858.61	-.78	14.83	14.84	14.85	93.01	6.42
869.37	19.70	85.50	867.34	-.66	17.82	17.82	17.83	92.13	7.17
878.87	22.10	84.00	876.21	-.35	21.19	21.19	21.20	90.95	7.76
888.48	24.30	85.80	885.05	-.02	24.96	24.96	24.96	90.04	7.22
897.71	27.00	88.30	893.37	.18	28.95	28.95	28.95	89.64	9.45
907.18	29.60	91.00	901.70	.21	33.44	33.44	33.44	89.64	9.18
916.57	31.80	90.80	909.78	.13	38.23	38.23	38.23	89.80	7.04
925.83	33.70	90.60	917.57	.07	43.24	43.24	43.24	89.91	6.17
935.30	36.10	91.10	925.33	-.01	48.66	48.66	48.66	90.01	7.66
944.76	38.40	90.50	932.86	-.09	54.38	54.38	54.38	90.09	7.38
954.23	40.80	89.90	940.16	-.11	60.42	60.42	60.42	90.10	7.70
963.69	43.20	89.20	947.19	-.06	66.75	66.75	66.75	90.05	7.75
973.14	45.50	88.30	953.94	.09	73.35	73.35	73.35	89.93	7.57
982.59	47.70	88.30	960.44	.29	80.22	80.21	80.22	89.79	6.98
991.96	49.30	88.70	966.65	.47	87.23	87.23	87.23	89.69	5.21
1001.16	51.40	88.30	972.52	.66	94.31	94.31	94.31	89.60	6.92
1010.32	52.90	88.90	978.14	.84	101.54	101.53	101.55	89.53	5.15
1019.49	54.10	90.10	983.59	.90	108.91	108.90	108.92	89.53	5.04
1028.68	55.80	90.10	988.87	.89	116.44	116.43	116.44	89.56	5.55
1037.92	57.00	89.50	993.98	.91	124.13	124.12	124.14	89.58	4.22
1047.15	59.20	89.30	998.86	1.00	131.97	131.96	131.97	89.57	7.17
1056.36	61.50	89.90	1003.41	1.05	139.97	139.96	139.97	89.57	7.68
1065.82	64.20	90.30	1007.73	1.04	148.39	148.38	148.39	89.60	8.64
1075.02	66.80	90.30	1011.55	.99	156.76	156.75	156.76	89.64	8.48
1084.23	69.40	91.30	1014.98	.87	165.30	165.29	165.30	89.70	8.99
1093.67	72.30	92.60	1018.08	.57	174.21	174.21	174.21	89.81	10.01
1102.88	73.40	92.10	1020.79	.21	183.01	183.00	183.01	89.94	3.91
1112.09	73.00	92.70	1023.46	-.16	191.82	191.81	191.82	90.05	2.28
1121.65	75.60	92.80	1026.04	-.60	201.01	201.01	201.01	90.17	8.16
1131.20	78.20	91.00	1028.21	-.91	210.30	210.30	210.30	90.25	9.85
1140.64	81.10	89.70	1029.90	-.97	219.59	219.59	219.59	90.25	10.07
1149.88	84.10	88.80	1031.09	-.85	228.75	228.75	228.75	90.21	10.16
1159.34	87.40	89.10	1031.79	-.67	238.18	238.18	238.18	90.16	10.51
Landing Point									
1168.80	89.00	89.50	1032.09	-.56	247.63	247.63	247.63	90.13	5.23
1178.26	88.40	89.40	1032.30	-.47	257.09	257.09	257.09	90.10	1.93
1187.70	88.30	88.90	1032.58	-.33	266.53	266.52	266.53	90.07	1.62
1197.18	90.10	90.80	1032.71	-.30	276.00	276.00	276.00	90.06	8.28
1206.62	90.90	92.20	1032.63	-.55	285.44	285.44	285.44	90.11	5.12
1216.13	91.10	92.50	1032.46	-.94	294.94	294.94	294.94	90.18	1.14
1225.72	90.70	92.30	1032.31	-1.34	304.52	304.52	304.52	90.25	1.40
1235.32	89.90	92.20	1032.26	-1.72	314.11	314.12	314.12	90.31	2.52

Measured Depth Meters	Incl Angle Deg	Drift Direction Deg	True Vertical Depth	N-S Meters	E-W Meters	Vertical Section Meters	CLOSURE Distance Meters	CLOSURE Direction Deg	Dogleg Severity Deg/30
1244.77	89.70	92.10	1032.29	-2.07	323.56	323.56	323.56	90.37	.71
1254.00	89.50	91.40	1032.36	-2.35	332.78	332.79	332.79	90.41	2.37
1263.26	89.00	91.00	1032.48	-2.55	342.04	342.05	342.05	90.43	2.07
1272.30	89.10	91.20	1032.63	-2.72	351.08	351.09	351.09	90.44	.74
1282.20	90.00	92.30	1032.71	-3.02	360.97	360.98	360.98	90.48	4.31
1291.75	90.60	92.60	1032.66	-3.43	370.51	370.53	370.53	90.53	2.11
1301.18	91.40	93.70	1032.49	-3.95	379.93	379.94	379.95	90.60	4.33
1310.72	91.20	93.70	1032.28	-4.57	389.44	389.47	389.47	90.67	.63
1320.34	90.90	93.40	1032.10	-5.16	399.04	399.07	399.08	90.74	1.32
1329.58	90.60	93.70	1031.98	-5.73	408.27	408.29	408.31	90.80	1.38
1339.03	89.70	92.80	1031.95	-6.27	417.70	417.73	417.75	90.86	4.04
1348.62	89.30	92.30	1032.04	-6.70	427.28	427.32	427.33	90.90	2.00
1357.86	89.70	92.60	1032.12	-7.09	436.51	436.55	436.57	90.93	1.62
1367.30	90.10	94.50	1032.13	-7.68	445.93	445.97	446.00	90.99	6.17
1376.71	89.80	94.70	1032.14	-8.43	455.31	455.36	455.39	91.06	1.15
1386.17	89.50	94.10	1032.20	-9.16	464.74	464.79	464.83	91.13	2.13
1395.51	89.60	94.70	1032.27	-9.87	474.06	474.11	474.16	91.19	1.95
1404.73	90.20	96.10	1032.29	-10.74	483.24	483.30	483.35	91.27	4.96
1413.90	91.00	95.80	1032.19	-11.69	492.36	492.42	492.49	91.36	2.80
1423.25	90.10	93.70	1032.10	-12.47	501.67	501.74	501.83	91.42	7.33
1432.60	90.20	93.40	1032.08	-13.04	511.00	511.08	511.17	91.46	1.01
1441.86	90.10	93.00	1032.05	-13.56	520.25	520.33	520.43	91.49	1.34
1451.11	89.80	92.90	1032.06	-14.04	529.49	529.57	529.67	91.52	1.03
1460.48	89.60	95.10	1032.11	-14.69	538.83	538.92	539.03	91.56	7.07
1469.75	89.50	94.80	1032.18	-15.49	548.07	548.16	548.29	91.62	1.02
1479.16	88.20	93.50	1032.37	-16.17	557.45	557.55	557.69	91.66	5.86
1488.45	87.90	92.70	1032.69	-16.67	566.72	566.82	566.97	91.69	2.76
1497.88	87.00	92.40	1033.11	-17.09	576.13	576.23	576.39	91.70	3.02
1507.11	87.10	92.60	1033.58	-17.49	585.34	585.45	585.60	91.71	.73
1516.33	86.80	93.20	1034.07	-17.96	594.54	594.64	594.81	91.73	2.18
1525.57	87.60	92.80	1034.53	-18.44	603.75	603.86	604.04	91.75	2.90
1534.93	88.00	91.10	1034.89	-18.76	613.10	613.21	613.39	91.75	5.59
1544.14	87.80	89.90	1035.22	-18.84	622.31	622.42	622.59	91.73	3.96
1553.51	89.20	90.20	1035.47	-18.85	631.67	631.78	631.95	91.71	4.58
1562.88	89.40	90.10	1035.58	-18.87	641.04	641.15	641.32	91.69	.72
1572.08	89.00	88.90	1035.71	-18.79	650.24	650.35	650.51	91.66	4.12
1581.37	89.80	88.70	1035.81	-18.60	659.53	659.64	659.79	91.62	2.66
1590.44	90.60	88.60	1035.78	-18.39	668.59	668.70	668.85	91.58	2.67
1599.87	90.40	88.30	1035.69	-18.13	678.02	678.13	678.26	91.53	1.15
1609.22	89.70	87.50	1035.69	-17.79	687.36	687.47	687.59	91.48	3.41
1618.59	89.70	86.90	1035.74	-17.33	696.72	696.82	696.94	91.42	1.92
1627.83	90.00	87.00	1035.76	-16.84	705.95	706.05	706.15	91.37	1.03
1637.19	91.30	87.60	1035.65	-16.40	715.30	715.39	715.49	91.31	4.59
1646.56	90.90	87.20	1035.47	-15.97	724.66	724.75	724.83	91.26	1.81
1655.70	90.80	86.90	1035.34	-15.50	733.78	733.87	733.95	91.21	1.04

Measured Depth Meters	Incl Angle Deg	Drift Direction Deg	True Vertical Depth	N-S Meters	E-W Meters	Vertical Section Meters	CLOSURE Distance Meters	CLOSURE Direction Deg	Dogleg Severity Deg/30
1664.92	90.90	86.20	1035.20	-14.95	742.99	743.07	743.14	91.15	2.30
1674.14	90.60	85.60	1035.08	-14.29	752.18	752.26	752.32	91.09	2.18
1683.29	90.30	84.40	1035.01	-13.49	761.30	761.37	761.42	91.02	4.06
1692.70	91.40	84.40	1034.87	-12.57	770.66	770.73	770.76	90.93	3.51
1701.93	93.30	85.20	1034.49	-11.74	779.84	779.90	779.93	90.86	6.70
1711.18	93.80	85.80	1033.92	-11.01	789.05	789.10	789.12	90.80	2.53
1720.55	93.80	87.10	1033.30	-10.43	798.38	798.43	798.45	90.75	4.15
1729.92	93.20	88.20	1032.72	-10.05	807.72	807.77	807.79	90.71	4.01
1739.30	92.90	88.10	1032.23	-9.75	817.09	817.13	817.14	90.68	1.01
1748.67	91.70	88.70	1031.85	-9.49	826.44	826.49	826.50	90.66	4.29
1757.96	91.30	88.90	1031.61	-9.29	835.73	835.77	835.78	90.64	1.44
1767.27	91.10	89.30	1031.41	-9.15	845.04	845.08	845.08	90.62	1.44
1776.52	91.10	89.70	1031.23	-9.07	854.28	854.32	854.33	90.61	1.30
1785.72	89.60	90.20	1031.18	-9.06	863.48	863.52	863.53	90.60	5.16
1794.94	89.40	90.00	1031.26	-9.07	872.70	872.74	872.75	90.60	.92
1804.33	89.20	89.60	1031.37	-9.04	882.09	882.13	882.14	90.59	1.43
1813.57	89.10	89.50	1031.51	-8.97	891.33	891.37	891.38	90.58	.46
1822.82	89.10	89.30	1031.66	-8.87	900.58	900.62	900.62	90.56	.65
1832.23	89.60	90.40	1031.76	-8.85	909.99	910.03	910.03	90.56	3.85
1841.57	88.80	90.10	1031.89	-8.89	919.33	919.37	919.37	90.55	2.74
1850.83	88.60	90.10	1032.10	-8.90	928.58	928.62	928.63	90.55	.65
1860.27	88.10	88.60	1032.37	-8.80	938.02	938.06	938.06	90.54	5.02
1869.52	88.40	90.00	1032.66	-8.68	947.26	947.30	947.30	90.53	4.64
1878.44	89.20	90.70	1032.84	-8.74	956.18	956.22	956.22	90.52	3.57
1887.84	90.10	91.30	1032.90	-8.90	965.58	965.62	965.62	90.53	3.45
1897.21	90.30	92.10	1032.87	-9.18	974.95	974.99	974.99	90.54	2.64
1906.46	89.80	92.20	1032.86	-9.53	984.19	984.23	984.24	90.55	1.65
1915.67	89.70	91.70	1032.90	-9.84	993.39	993.44	993.44	90.57	1.66
1924.83	89.60	91.70	1032.96	-10.11	1002.55	1002.59	1002.60	90.58	.33
1934.33	90.60	91.20	1032.94	-10.35	1012.05	1012.09	1012.10	90.59	3.53
1943.70	91.60	91.10	1032.76	-10.54	1021.41	1021.46	1021.47	90.59	3.22
1952.95	91.40	90.70	1032.52	-10.69	1030.66	1030.71	1030.71	90.59	1.45
1962.41	91.30	90.50	1032.30	-10.79	1040.12	1040.16	1040.17	90.59	.71
1971.61	92.00	90.70	1032.03	-10.88	1049.31	1049.36	1049.37	90.59	2.37
1981.06	92.30	90.50	1031.68	-10.98	1058.75	1058.80	1058.81	90.59	1.14
Extrapolate to TD									
1998.00	92.10	90.50	1031.03	-11.13	1075.68	1075.73	1075.74	90.59	.35

SURVEYS

Job Number: 10147566R

Company: Molopo Energy CAnada Ltd

Lease/Well: Molopo Pierson Prov Hz

Location: (13C-32)16D-32-1-29WPM
C:\WINSERVE\10147566.SVY
Rig Name: Advance 1 Lic #7447

RKB: 475.2
(13C-32)16D-32-1-29WPM
G.L. or M.S.L.: 471

State/Country: Manitoba

Declination: 7.26

Grid: -1.77

File name:

Date/Time: 15-Jul-10 / 15:44

Curve Name: Molopo Pierson

WINSERVE SURVEY CALCULATIONS

Minimum Curvature Method

Vertical Section Plane 90.38

Vertical Section Referenced to Wellhead

Rectangular Coordinates Referenced to Wellhead

Measured Depth Meters	Incl Angle Deg	Drift Direction Deg	Dogleg Severity Deg/30	True Vertical Depth	N-S Meters	E-W Meters	Vertical Section Meters	CLOSURE Distance Meters	CLOSURE Direction Deg
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
Surface Casing Tie On									
202.00	.00	.00	.00	202.00	.00	.00	.00	.00	.00
212.55	.40	125.60	1.14	212.55	-.02	.03	.03	.04	125.58
268.11	.30	177.30	.17	268.11	-.28	.19	.20	.34	145.18
323.57	.50	178.90	.11	323.57	-.67	.21	.21	.70	162.83
335.30	.52	176.44	.08	335.30	-.77	.21	.22	.80	164.75
370.29	.60	170.30	.08	370.29	-1.11	.25	.26	1.14	167.27
417.82	.80	176.40	.13	417.81	-1.69	.31	.33	1.72	169.47

SURVEYS

	436.92	.40	177.20	436.91	-1.89	.33	.34
1.92	170.22	.63					
	474.94	.50	35.50	474.93	-1.89	.43	.44
1.93	167.20	.67					
	531.59	.50	12.10	531.58	-1.44	.62	.63
1.57	156.61	.11					
	587.76	.50	22.70	587.75	-.98	.77	.78
1.24	141.76	.05					
	634.94	.60	349.70	634.92	-.54	.80	.81
.97	124.03	.21					
	709.50	.80	183.70	709.48	-.68	.70	.71
.98	134.06	.56					
	756.29	.30	221.50	756.27	-1.10	.60	.61
1.25	151.34	.38					
	765.88	.30	183.70	765.86	-1.14	.58	.59
1.28	153.00	.61					
Interpolated Kick Off Point							
	772.00	.98	106.03	771.98	-1.17	.63	.64
1.33	151.70	4.72					
	775.40	1.50	99.80	775.38	-1.19	.70	.71
1.38	149.38	4.72					
	784.83	3.30	87.90	784.80	-1.20	1.10	1.10
1.62	137.56	5.91					
	794.43	4.90	83.80	794.38	-1.14	1.78	1.79
2.11	122.73	5.08					
	803.64	6.60	82.10	803.54	-1.03	2.69	2.70
2.88	110.88	5.56					
	813.28	8.50	80.00	813.09	-.83	3.94	3.95
4.03	101.86	5.97					
	822.57	10.60	82.30	822.26	-.59	5.47	5.47
5.50	96.20	6.89					
	832.01	12.70	88.20	831.50	-.45	7.37	7.37
7.38	93.46	7.66					
	841.50	14.50	94.50	840.72	-.51	9.59	9.60
9.61	93.02	7.36					

SURVEYS

Measured Depth Meters	Incl Angle Deg	Drift Direction Deg	True Vertical Depth	N-S Meters	E-W Meters	Vertical Section Meters	CLOSURE Distance Meters	CLOSURE Direction Deg	Dogleg Severity Deg/30
850.69	16.40	93.90	849.58	-.68	12.03	12.04	12.05	93.25	6.22
860.14	18.10	90.20	858.61	-.78	14.83	14.84	14.85	93.01	6.42
869.37	19.70	85.50	867.34	-.66	17.82	17.82	17.83	92.13	7.17
878.87	22.10	84.00	876.21	-.35	21.19	21.19	21.20	90.95	7.76
888.48	24.30	85.80	885.05	-.02	24.96	24.96	24.96	90.04	7.22
897.71	27.00	88.30	893.37	.18	28.95	28.95	28.95	89.64	9.45
907.18	29.60	91.00	901.70	.21	33.44	33.44	33.44	89.64	9.18
916.57	31.80	90.80	909.78	.13	38.23	38.23	38.23	89.80	7.04
925.83	33.70	90.60	917.57	.07	43.24	43.24	43.24	89.91	6.17
935.30	36.10	91.10	925.33	-.01	48.66	48.66	48.66	90.01	7.66
944.76	38.40	90.50	932.86	-.09	54.38	54.38	54.38	90.09	7.38
954.23	40.80	89.90	940.16	-.11	60.42	60.42	60.42	90.10	7.70
963.69	43.20	89.20	947.19	-.06	66.75	66.75	66.75	90.05	7.75
973.14	45.50	88.30	953.94	.09	73.35	73.35	73.35	89.93	7.57
982.59	47.70	88.30	960.44	.29	80.22	80.21	80.22	89.79	6.98
991.96	49.30	88.70	966.65	.47	87.23	87.23	87.23	89.69	5.21
1001.16	51.40	88.30	972.52	.66	94.31	94.31	94.31	89.60	6.92
1010.32	52.90	88.90	978.14	.84	101.54	101.53	101.55	89.53	5.15
1019.49	54.10	90.10	983.59	.90	108.91	108.90	108.92	89.53	5.04
1028.68	55.80	90.10	988.87	.89	116.44	116.43	116.44	89.56	5.55
1037.92	57.00	89.50	993.98	.91	124.13	124.12	124.14	89.58	4.22

1047.15	59.20	89.30	998.86	1.00	131.97	131.96
131.97	89.57	7.17				
1056.36	61.50	89.90	1003.41	1.05	139.97	139.96
139.97	89.57	7.68				
1065.82	64.20	90.30	1007.73	1.04	148.39	148.38
148.39	89.60	8.64				
1075.02	66.80	90.30	1011.55	.99	156.76	156.75
156.76	89.64	8.48				
1084.23	69.40	91.30	1014.98	.87	165.30	165.29
165.30	89.70	8.99				
1093.67	72.30	92.60	1018.08	.57	174.21	174.21
174.21	89.81	10.01				
1102.88	73.40	92.10	1020.79	.21	183.01	183.00
183.01	89.94	3.91				
1112.09	73.00	92.70	1023.46	-.16	191.82	191.81
191.82	90.05	2.28				
1121.65	75.60	92.80	1026.04	-.60	201.01	201.01
201.01	90.17	8.16				
1131.20	78.20	91.00	1028.21	-.91	210.30	210.30
210.30	90.25	9.85				
1140.64	81.10	89.70	1029.90	-.97	219.59	219.59
219.59	90.25	10.07				
1149.88	84.10	88.80	1031.09	-.85	228.75	228.75
228.75	90.21	10.16				
1159.34	87.40	89.10	1031.79	-.67	238.18	238.18
238.18	90.16	10.51				
Landing Point						
1168.80	89.00	89.50	1032.09	-.56	247.63	247.63
247.63	90.13	5.23				
1178.26	88.40	89.40	1032.30	-.47	257.09	257.09
257.09	90.10	1.93				
1187.70	88.30	88.90	1032.58	-.33	266.53	266.52
266.53	90.07	1.62				
1197.18	90.10	90.80	1032.71	-.30	276.00	276.00
276.00	90.06	8.28				
1206.62	90.90	92.20	1032.63	-.55	285.44	285.44
285.44	90.11	5.12				
1216.13	91.10	92.50	1032.46	-.94	294.94	294.94
294.94	90.18	1.14				

Measured Depth Meters	Incl Angle Deg	Drift Direction Deg	True Vertical Depth	N-S Meters	E-W Meters	Vertical Section Meters	CLOSURE Distance Meters	CLOSURE Direction Deg	Dogleg Severity Deg/30
1225.72	90.70	92.30	1032.31	-1.34	304.52	304.52	304.52	90.25	1.40
1235.32	89.90	92.20	1032.26	-1.72	314.11	314.12	314.12	90.31	2.52
1244.77	89.70	92.10	1032.29	-2.07	323.56	323.56	323.56	90.37	.71
1254.00	89.50	91.40	1032.36	-2.35	332.78	332.79	332.79	90.41	2.37
1263.26	89.00	91.00	1032.48	-2.55	342.04	342.05	342.05	90.43	2.07
1272.30	89.10	91.20	1032.63	-2.72	351.08	351.09	351.09	90.44	.74
1282.20	90.00	92.30	1032.71	-3.02	360.97	360.98	360.98	90.48	4.31
1291.75	90.60	92.60	1032.66	-3.43	370.51	370.53	370.53	90.53	2.11
1301.18	91.40	93.70	1032.49	-3.95	379.93	379.94	379.95	90.60	4.33
1310.72	91.20	93.70	1032.28	-4.57	389.44	389.47	389.47	90.67	.63
1320.34	90.90	93.40	1032.10	-5.16	399.04	399.07	399.08	90.74	1.32
1329.58	90.60	93.70	1031.98	-5.73	408.27	408.29	408.31	90.80	1.38
1339.03	89.70	92.80	1031.95	-6.27	417.70	417.73	417.75	90.86	4.04
1348.62	89.30	92.30	1032.04	-6.70	427.28	427.32	427.33	90.90	2.00
1357.86	89.70	92.60	1032.12	-7.09	436.51	436.55	436.57	90.93	1.62
1367.30	90.10	94.50	1032.13	-7.68	445.93	445.97	446.00	90.99	6.17
1376.71	89.80	94.70	1032.14	-8.43	455.31	455.36	455.39	91.06	1.15
1386.17	89.50	94.10	1032.20	-9.16	464.74	464.79	464.83	91.13	2.13
1395.51	89.60	94.70	1032.27	-9.87	474.06	474.11	474.16	91.19	1.95
1404.73	90.20	96.10	1032.29	-10.74	483.24	483.30	483.35	91.27	4.96

1413.90	91.00	95.80	1032.19	-11.69	492.36	492.42
492.49	91.36	2.80				
1423.25	90.10	93.70	1032.10	-12.47	501.67	501.74
501.83	91.42	7.33				
1432.60	90.20	93.40	1032.08	-13.04	511.00	511.08
511.17	91.46	1.01				
1441.86	90.10	93.00	1032.05	-13.56	520.25	520.33
520.43	91.49	1.34				
1451.11	89.80	92.90	1032.06	-14.04	529.49	529.57
529.67	91.52	1.03				
1460.48	89.60	95.10	1032.11	-14.69	538.83	538.92
539.03	91.56	7.07				
1469.75	89.50	94.80	1032.18	-15.49	548.07	548.16
548.29	91.62	1.02				
1479.16	88.20	93.50	1032.37	-16.17	557.45	557.55
557.69	91.66	5.86				
1488.45	87.90	92.70	1032.69	-16.67	566.72	566.82
566.97	91.69	2.76				
1497.88	87.00	92.40	1033.11	-17.09	576.13	576.23
576.39	91.70	3.02				
1507.11	87.10	92.60	1033.58	-17.49	585.34	585.45
585.60	91.71	.73				
1516.33	86.80	93.20	1034.07	-17.96	594.54	594.64
594.81	91.73	2.18				
1525.57	87.60	92.80	1034.53	-18.44	603.75	603.86
604.04	91.75	2.90				
1534.93	88.00	91.10	1034.89	-18.76	613.10	613.21
613.39	91.75	5.59				
1544.14	87.80	89.90	1035.22	-18.84	622.31	622.42
622.59	91.73	3.96				
1553.51	89.20	90.20	1035.47	-18.85	631.67	631.78
631.95	91.71	4.58				
1562.88	89.40	90.10	1035.58	-18.87	641.04	641.15
641.32	91.69	.72				
1572.08	89.00	88.90	1035.71	-18.79	650.24	650.35
650.51	91.66	4.12				
1581.37	89.80	88.70	1035.81	-18.60	659.53	659.64
659.79	91.62	2.66				
1590.44	90.60	88.60	1035.78	-18.39	668.59	668.70
668.85	91.58	2.67				
1599.87	90.40	88.30	1035.69	-18.13	678.02	678.13
678.26	91.53	1.15				
1609.22	89.70	87.50	1035.69	-17.79	687.36	687.47
687.59	91.48	3.41				

Measured Depth Meters	Incl CLOSURE Angle Deg	Drift Direction Deg	True Vertical Depth	N-S Meters	E-W Meters	Vertical Section Meters	CLOSURE Distance Meters	CLOSURE Direction Deg	Dogleg Severity Deg/30
1618.59	89.70	86.90	1035.74	-17.33	696.72	696.82	696.94	91.42	1.92
1627.83	90.00	87.00	1035.76	-16.84	705.95	706.05	706.15	91.37	1.03
1637.19	91.30	87.60	1035.65	-16.40	715.30	715.39	715.49	91.31	4.59
1646.56	90.90	87.20	1035.47	-15.97	724.66	724.75	724.83	91.26	1.81
1655.70	90.80	86.90	1035.34	-15.50	733.78	733.87	733.95	91.21	1.04
1664.92	90.90	86.20	1035.20	-14.95	742.99	743.07	743.14	91.15	2.30
1674.14	90.60	85.60	1035.08	-14.29	752.18	752.26	752.32	91.09	2.18
1683.29	90.30	84.40	1035.01	-13.49	761.30	761.37	761.42	91.02	4.06
1692.70	91.40	84.40	1034.87	-12.57	770.66	770.73	770.76	90.93	3.51
1701.93	93.30	85.20	1034.49	-11.74	779.84	779.90	779.93	90.86	6.70
1711.18	93.80	85.80	1033.92	-11.01	789.05	789.10	789.12	90.80	2.53
1720.55	93.80	87.10	1033.30	-10.43	798.38	798.43	798.45	90.75	4.15
1729.92	93.20	88.20	1032.72	-10.05	807.72	807.77	807.79	90.71	4.01
1739.30	92.90	88.10	1032.23	-9.75	817.09	817.13	817.14	90.68	1.01
1748.67	91.70	88.70	1031.85	-9.49	826.44	826.49	826.50	90.66	4.29
1757.96	91.30	88.90	1031.61	-9.29	835.73	835.77	835.78	90.64	1.44

1767.27	91.10	89.30	1031.41	-9.15	845.04	845.08
845.08	90.62	1.44				
1776.52	91.10	89.70	1031.23	-9.07	854.28	854.32
854.33	90.61	1.30				
1785.72	89.60	90.20	1031.18	-9.06	863.48	863.52
863.53	90.60	5.16				
1794.94	89.40	90.00	1031.26	-9.07	872.70	872.74
872.75	90.60	.92				
1804.33	89.20	89.60	1031.37	-9.04	882.09	882.13
882.14	90.59	1.43				
1813.57	89.10	89.50	1031.51	-8.97	891.33	891.37
891.38	90.58	.46				
1822.82	89.10	89.30	1031.66	-8.87	900.58	900.62
900.62	90.56	.65				
1832.23	89.60	90.40	1031.76	-8.85	909.99	910.03
910.03	90.56	3.85				
1841.57	88.80	90.10	1031.89	-8.89	919.33	919.37
919.37	90.55	2.74				
1850.83	88.60	90.10	1032.10	-8.90	928.58	928.62
928.63	90.55	.65				
1860.27	88.10	88.60	1032.37	-8.80	938.02	938.06
938.06	90.54	5.02				
1869.52	88.40	90.00	1032.66	-8.68	947.26	947.30
947.30	90.53	4.64				
1878.44	89.20	90.70	1032.84	-8.74	956.18	956.22
956.22	90.52	3.57				
1887.84	90.10	91.30	1032.90	-8.90	965.58	965.62
965.62	90.53	3.45				
1897.21	90.30	92.10	1032.87	-9.18	974.95	974.99
974.99	90.54	2.64				
1906.46	89.80	92.20	1032.86	-9.53	984.19	984.23
984.24	90.55	1.65				
1915.67	89.70	91.70	1032.90	-9.84	993.39	993.44
993.44	90.57	1.66				
1924.83	89.60	91.70	1032.96	-10.11	1002.55	1002.59
1002.60	90.58	.33				
1934.33	90.60	91.20	1032.94	-10.35	1012.05	1012.09
1012.10	90.59	3.53				
1943.70	91.60	91.10	1032.76	-10.54	1021.41	1021.46
1021.47	90.59	3.22				
1952.95	91.40	90.70	1032.52	-10.69	1030.66	1030.71
1030.71	90.59	1.45				
1962.41	91.30	90.50	1032.30	-10.79	1040.12	1040.16
1040.17	90.59	.71				
1971.61	92.00	90.70	1032.03	-10.88	1049.31	1049.36
1049.37	90.59	2.37				
1981.06	92.30	90.50	1031.68	-10.98	1058.75	1058.80
1058.81	90.59	1.14				

Extrapolate to TD

Measured Depth Meters	Incl Angle Deg	Drift Direction Deg	True Vertical Depth	N-S Meters	E-W Meters	Vertical Section Meters	CLOSURE Distance Meters	CLOSURE Direction Deg	Dogleg Severity Deg/30
1998.00	92.10	90.50	1031.03	-11.13	1075.68	1075.73	1075.74	90.59	.35

Manitoba

Innovation, Energy and Mines

Petroleum Branch
360-1395 Ellice Ave, Winnipeg MB R3G 3P2
T 204-945-6577 F 204-945-0586
www.gov.mb.ca/stem/petroleum

February 11, 2011

Molopo Energy Canada Ltd.
c/o Legacy Oil & Gas Inc.
3900, Bow Valley Square II
205 – 5th Avenue S.W.
Calgary, AB T2P 2V7

Well Bore Coordinates

Attention: Ms. Darilyn Fortuna

Re: Lic. No. 7447 Molopo Pierson Prov. HZNTL 15-32-1-29 (WPM)

The Petroleum Branch has determined the allocation for each spacing unit in the drainage unit for the subject horizontal well in accordance with Subsection 3(2) and Schedule F of the Crown Royalty and Incentives Regulation.

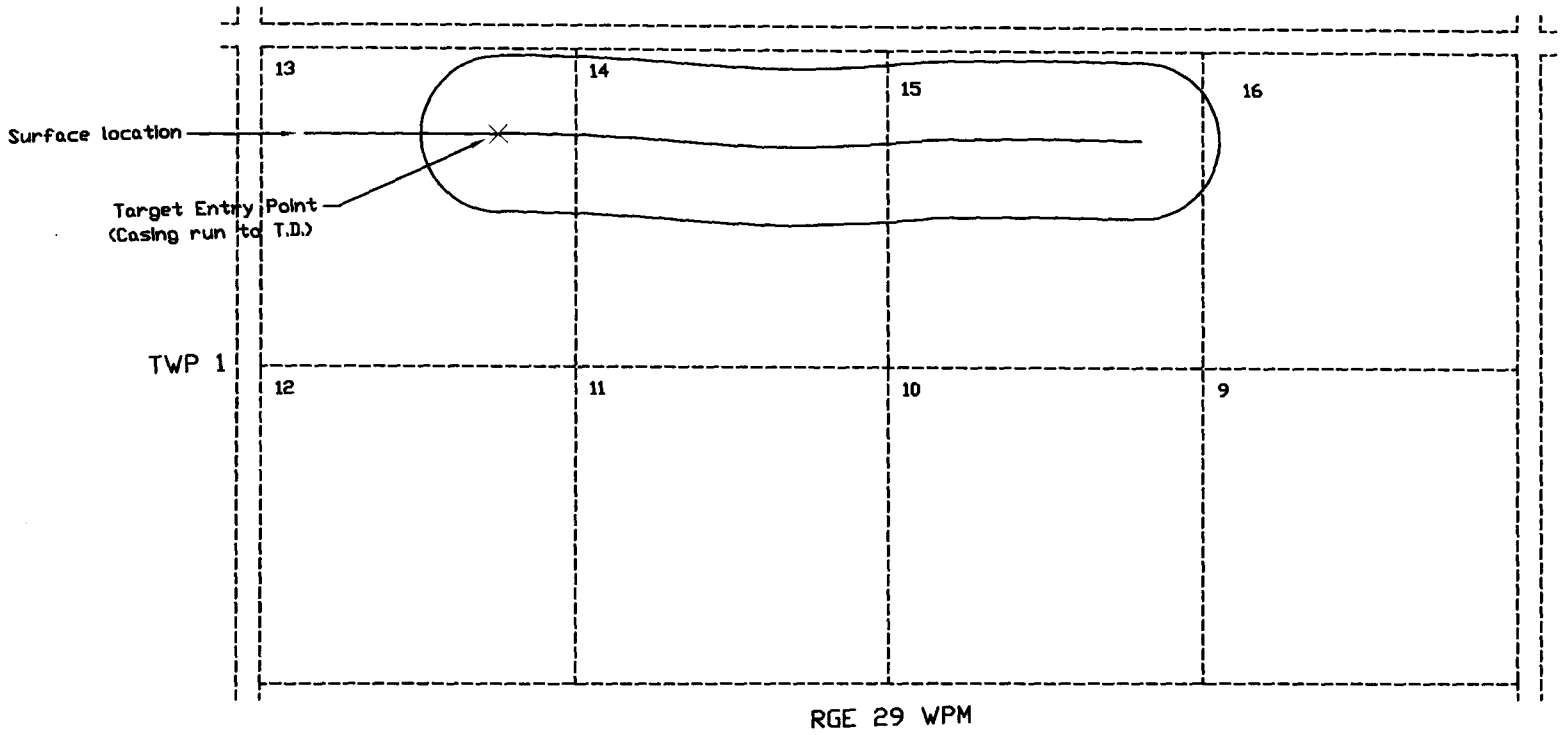
LSD	Production Allocation (% of total well production)
13-32-1-29	18.14
14-32-1-29	40.96
15-32-1-29	39.99
16-32-1-29	0.91
Total	100.00

Calculations of the producing area of the horizontal well and the producing area within each spacing unit are based on the final directional survey submitted to the Branch. Attached is an outline of the drainage unit.

If you have any questions please contact the undersigned at (204) 945-8102.

Yours truly,

Dan Surzyshyn
Senior Petroleum Technologist



Lic. No. 7447
Molopo Pierson Prov. HZNTL
15-32-1-29 WPM

Area	% Total	Area (m2)
13-32-1-29	18.14	35 785.5331
14-32-1-29	40.96	80 810.3277
15-32-1-29	39.99	78 891.1859
16-32-1-29	0.91	1 795.6426
Total	100.00	197 282.6893

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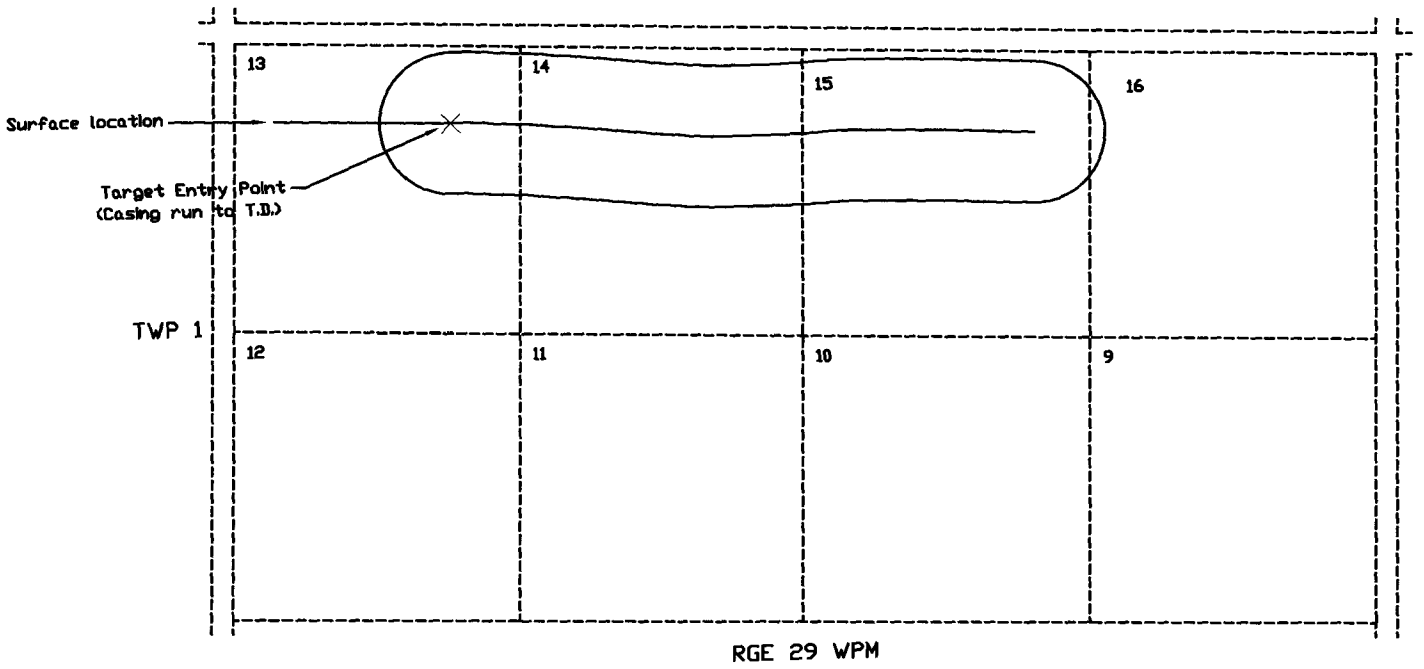
Petroleum Branch

Dec./10



Lic. No. 7447
Molopo Pierson Prov. HZNTL
15-32-1-29 WPM

Area	% Total	Area (m2)	Minerals (Fr/Cr)
13-32-1-29	18.14	35 785.5331	Cr
14-32-1-29	40.96	80 810.3277	Cr
15-32-1-29	39.99	78 891.1859	Cr
16-32-1-29	0.91	1 795.6426	Cr
Total	100.00	197 282.6893	

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Energy and Mines
Petroleum Branch

Dec/10

#7447

AGAT® Laboratories

GAS ANALYSIS

Container Identification
8000202

Operator Name	Laboratory Number
MOLOPO ENERGY CANADA LTD.	10GS441209A

Unique Well Identifier	Well Name
13-32-001-29W1 5TH	PIERSON 13-32-1-29

Field or Area	Pool or Zone	Sampler's Company
PIERSON	NOT AVAILABLE	AGAT/ESTEVAN

Well License	Elevation	Test Type	Test No.	Name of Sampler
7447	KB m / GRD m			

Test Interval or Perfs mKB	Sampling Point
	WELLHEAD CASING

	Separator	Reservoir	Source	Sampled	Received
Pressure (kPa)			350	350	320
Temperature			17	17	21

Date Sampled	Date Received	Date Analyzed	Date Reported	Entered By	Certified By
Oct 05, 2010	Oct 07, 2010	Oct 18, 2010	Oct 18, 2010	Gerry Ecker	Gerry Ecker

Other Information

** Results relate only to the items tested*

Note: Sampling Point, Unique Well Identifier and/or Pool or Zone information was unavailable at time of reporting. This information is integral to AGAT's WebFLUIDs, a comparison, history and trending analysis system.

COMP	MOLE FRACTION		PETROLEUM LIQUID
	AIR FREE AS RECEIVED	AIR FREE ACID GAS FREE	mL / m³
H2	TRACE	TRACE	
He	0.0001	0.0001	
N2	0.0268	0.0268	
CO2	0.0012	0.0000	
H2S	0.0000	0.0000	
C1	0.5732	0.5740	
C2	0.1943	0.1945	
C3	0.1266	0.1268	465.2
IC4	0.0150	0.0150	65.5
NC4	0.0366	0.0366	154.0
IC5	0.0072	0.0072	35.1
NC5	0.0082	0.0082	39.7
C6	0.0064	0.0064	35.1
C7+	0.0044	0.0044	28.4
Total	1.0000	1.0000	823.0

GROSS HEATING VALUE MJ/m³
15° C AND 101.325 kPa

Air Free As Received	Moisture & Acid Gas Free	C7+, Air Free As Received
57.33	57.40	0.95

RELATIVE DENSITY (CALCULATED) **DENSITY**

Moisture Free	Moisture & Acid Gas Free	C7+, Moisture Free	C7+, Portion Whole Density	C7+ Density (kg/m3)	Total Sample Density(kg/m3)
0.917	0.916	3.658	0.016	696.1	1.123

PSEUDO CRITICAL PROPERTIES (CALCULATED)

As Sampled		Acid Gas Free	
pPc (abs) kPa	pTc K	pPc (abs) kPa	pTc K
4497.1	253.6	4493.8	253.6

RELATIVE MOLECULAR MASS

Total Gas	C_7^+
26.6	105.9

VAPOUR PRESSURE (Pentanes +): 82.16 kPa

H2S g/m³: 0.00

#7447

Geological Report

MOLOPO ENERGY CANADA LTD.

MOLOPO PIERSON PROV. HZ (13-32) 16-32-1-29W1

Strat: 100/13-32-001-29W1/00
HZ: 100/16-32-001-29W1/00

VERTICAL PILOT
AND HORIZONTAL OIL WELL

WELL LICENCE NO: 7447

WELLSITE GEOLOGICAL REPORT

FOR

TODD NEELY

MOLOPO ENERGY CANADA LTD

GEOLOGY BY:

REHMAT ULLAH (M.Sc)
SHAHZAD AFZAL (M.Sc)

July 16, 2010

SERPA PETROLEUM CONSULTING LTD.

• 403 OAKSIDE CIRCLE S.W. • CALGARY, ALBERTA T2V 4P1 •
(403) 861-6753 • EMAIL afran@telusplanet.net •

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CD includes:
Well Report
Vertical, Build & Lateral Striplogs
Directional Surveys
Gamma Ray Files
Pason ROP & Gas Files

WELL ABSTRACT

The vertical exploration well MOLOPO PIERSON PROV. HZ (13-32) 16-32-1-29W1was spudded on July 07, 2010 @ 11:15 hrs with a 311mm bit and drilled to 202.0m. 16 joints of 219.0mm surface casing were run and set at 202.0m and cemented. The cement hardened before displacement was completed causing the entire surface casing to be filled with cement. The cement was drilled out from surface and drilling of the main hole resumed July 08, 2010 @ 15:15 hrs with a 200.0mm bit and continued down to a total depth of 1082.0m without incident. The main Hole took 25.00 hrs to complete.

Weatherford logs (SP-Induction, Neutron-Density Porosity, and Borehole Compensated Sonic) were run from TD to surface casing. Following logging, a cement plug was run from 1082m to 870m & 870m to 720m.

The 200mm build section kicked off from the vertical pilot on July 11, 2010 @ 12:30 hrs from 772.0m and was drilled to a depth of 1168.80m MD, 1032.09m TVD, -556.86m S.S. @ 20:30 hrs July 12, 2010. The target Waskada zone was penetrated at 1032.3mTVD, -557.1m SS in the vertical pilot hole. This target was also picked at 1032.3mTVD, -557.1m SS in the build section too.

The 200mm lateral section was begun at 20:30 hrs on July 12, 2010 without trip out and bit change. The lateral was drilled from 1168.80m MD to 1998.0m MD without pipe swap.

A Pason Gas Detector was operated in the main hole with no problems.

Phoenix Technology Services were used for directional and MWD tools. An EM gamma tool was run in this well. The data was of best quality throughout the Build & lateral section.

The above well was drilled as an exploration well in order to evaluate the Spearfish Fm in the Waskada area of Manitoba. The target Waskada zone was penetrated at 1032.3mTVD, -557.1m SS in the vertical pilot hole. The Waskada Zone was 24.7m thick and consisted of primarily interbedded **SANDSTONE** with red **SILTSTONE** with apparent fair to good porosity and an unconsolidated, medium to coarse grained quartzose **SANDSTONE** with apparent good porosity. The zone displayed fast streaming light blue yellow gold milky cuts, best towards the base, and gas kicks of between 200 and 516 units. Subsequent logging suggested potential oil shows in the Waskada zone.

Status: Potential Oil.

WELL DATA SUMMARY

WELL NAME:	*MOLOPO PIERSON PROV. HZ (13-32) 16-32-1-29W1*
OPERATOR:	*Molopo Energy Canada Ltd*
SURFACE LOCATION:	*LSD 13-32-1-29W1*
BOTTOMHOLE LOCATION:	*11.13m S & 1075.68m E of Wellhead*
WELL OBJECTIVE	*To evaluate and drill a horizontal well in the Spearfish Fm*
SURFACE CO-ORDINATES:	*110.00m South of North & 55.00m East of West of Section 32*
BOTTOMHOLE CO-ORDINATES	*11.13m S & 1075.68m E of Wellhead*
PROVINCE:	*Manitoba*
FIELD:	*Coulter*
LICENCE NO.:	*7447*
AFE NO.:	*11D0043*
GROUND ELEVATION:	*471.03m*
K.B. ELEVATION:	*475.23m*
SPUD DATE:	*July 07, 2010 @ 11:15 hrs*
DRILL AHEAD FROM SURFACE CASING:	*July 08, 2010 @ 15:15 hrs*
TOTAL DEPTH VERTICAL PILOT:	*1082.00m TVD, -606.80m SS, July 09, 2010 @ 20:00 hrs*
KICK OFF FROM PILOT:	*July 11, 2010 @ 12:30 hrs*
TOTAL DEPTH BUILD:	*1168.80m MD, 1032.09m TVD, -556.86m S.S.* *July 12, 2010 @ 20:30 hrs*
TOTAL DEPTH LATERAL:	*1998.0m MD, 1031.03 TVD, -555.83SS*
TOTAL DEPTH DATE:	*July 15, 2010 @ 16:30 hrs*
RIG RELEASE DATE:	*July 16, 2010*
GEOLOGICAL SUPERVISION:	*Rehmat Ullah, M.Sc / Shahzad Afzal M.Sc*
SAMPLE REQUIREMENTS:	*5m interval from SC to TD of vertical; 5m interval build and 10m lateral*
TOTAL GAS DETECTION:	*SC to TD*
TARGET FORMATIONS:	*Spearfish Fm - Waskada Zone*

ENGINEERING SUMMARY

DRILLING CONTRACTOR:	*ADVANCE DRILLING LTD Rig #1*
RIG MANAGER:	*Unknown*
DRILLING SUPERVISOR:	*Mark Mazarat*
HOLE SIZE:	*Surface: 311.0 mm from 0-202.0m*
	Vertical: 200.0 mm from202.0-1082.0m
	Build: 200.0 mm from 772-1168.80m
	Lateral: 200mm from 1168.80m - 1998 m
CASING SIZE:	*Surface: 219.0 mm x 35.76 kg/m landed at 202.0m*
	Main: 139.0 mm x 23.07 kg/m landed at 1999.0m
CORING:	*None*
DRILL STEM TESTS:	*None*
LOGGING COMPANY:	*Open Hole: Weatherford*
	MWD: Phoenix Technology Services
LOGS:	*Vertical: PEX, TNPH, DPHI, PEFSA, BHCS, Ind, GR, SP*
	Build & Lateral: Gamma while drilling,
MUD RECORD:	*H2O: 0-1019.0m.,*
	H2O: 772m-1044 for build section
	Polymer; 1044m -1998m
WELL SATUS:	*Cased for production*

FORMATION TOP SUMMARY

Grd. Elev: 471.03m K.B.: 475.23m

VERTICAL PILOT

FORMATION TOP	PROG (TVD)	PROG (SS)	SAMPLE (TVD)	SAMPLE (SS)	LOG (TVD)	LOG (SS)	DIFF FROM PROG
Colorado Sh	460.5	14.7	460.5	14.7	473.9	1.3	13.4
SWS	551.5	-76.3	551.5	-76.3	563.7	-88.5	12.2
Lw Colorado Sh	578.5	-103.3	578.5	-103.3	579.7	-104.5	1.2
BFS	627.5	-152.3	627.5	-152.3	631.8	-156.6	4.3
Mannville	689.5	-214.3	689.5	-214.3	699.0	-223.8	9.5
Jurassic	789.5	-314.3	789.5	-314.3	782.9	-307.7	-6.6
Lwr Gravel	929.5	-454.3	927.5	-452.3	927.0	-451.8	-2.5
Amaranth Evap	964.5	-489.3	963.7	-488.5	963.0	-487.8	-1.5
Spearfish	1009.5	-534.3	1009.7	-534.5	1009.0	-533.8	-0.5
Marine B	1016.5	-541.3	1016.4	-541.2	1016.0	-540.8	-0.5
Marine A	1021.5	-546.3	1024.0	-548.8	1023.0	-547.8	1.5
Waskada Zone	1024.5	-549.3	1032.9	-557.7	1032.3	-557.1	7.8
Manor Zone	1041.5	-566.3	1048.0	-572.8	1047.0	-571.8	5.5
Miss UC	1050.5	-575.3	1051.7	-576.5	1050.9	-575.7	0.4
TD	1080.0	-604.8	1082.0	-606.8	1081.5	-606.3	1.5

BUILD & LATERAL

FORMATION TOP	PROG (MD)	PROG (TVD)	PROG (SS)	SAMPLE (MD)	SAMPLE (TVD)	LOG (MD)	LOG (TVD)	LOG (SS)
Kick off Point	772.0	772.0	-296.8	772.0	772.0	772.0	772.0	-296.8
Jurassic	787.7	787.7	-312.5	783.7	783.7	783.7	783.7	-308.5
Lower Gravel	940.0	927.7	-452.5	938.9	928.2	938.9	928.2	-453.0
Amaranth Evap	989.0	962.7	-487.5	983.2	960.9	983.2	960.9	-485.7
Spearfish	1082.1	1007.7	-532.5	1067.8	1008.6	1067.8	1008.6	-533.4
Marine B	1107.7	1014.7	-539.5	1089.4	1016.8	1089.4	1016.8	-541.6
Marine A	1128.2	1019.7	-544.5	1114.0	1024.0	1114.0	1024.0	-548.8
Waskada Zone	1145.2	1022.7	-547.5	1178.26	1032.3	1178.26	1032.3	-557.1
ICP	1180.2	1025.2	-550.0	1168.8	1032.09	1168.8	1132.09	-556.86
TD Lateral	2378.0	1023.7	-548.5	1998	1031.03	1998	1031.03	-555.83

DAILY DRILLING HISTORY

DATE	DEPTH 24:00	DAYS FROM SPUD	METRES DRILLED	DRILL HOURS	AVG ROP	OPERATIONS
07-July-10	202	2	202	5.25	38.47	Safety meeting, rig move, rig up, accumulated drilling from 0.0m to 202m, accumulated surveys, condition mud and circulate, wiper trip.
08-July-10	540	3	338	8.00	42.42	POOH for casing, rig to run casing, cementing, wait on cement, accumulated drilling from 202m to 540m, accumulated surveys.
09-July-10	1082	4	542	14.00	38.71	Rig service, accumulated drilling from 540-m to 1082m, accumulated surveys. Circulate bottom sample, wiper trip 47 stands, directional work, RIH Slick.
10-July-10	772	5	0	0	0	POOH for logs, Wireline logging, rig service, finish logging, trip in open ended for plug, rig in and pump plug#1 from 1082m to 870m, hoist pipe slow out of plug#1, pump plu#2 fro, 870m to 720m, hoist pipe slow out of plug#2, circulate and condition mud.
11-July-10	920	6	148	9.50	15.58	Wait on cement, make up directional tools, trip in Hole, time drilling from 782m to 791m, accumulated drilling from 772-m to 540m, accumulated surveys
12-July-10	1222	7	302	19.5	15.5	Drill from 920 to 1222m MD.
13-July-10	1550	8	328	18.75	17.5	Drill from 1222 to 1550m MD.
14-July-10	1866	9	316	19	16.6	Drill from 1550 to 1866m MD.
15-July-10	1998	10	132	9.75	13.5	Drill 200mm lateral section from 1866m to 1998 m TD, condition mud and circulate, trip out of hole.
16-July-10	1998	11	0	0	0	Condition mud & circulate, pump pills, drift casing. Run casing.

BIT RECORD

BIT #	SIZE (mm)	MAKE	TYPE	IN	OUT	CUT	HRS	ROP m/hr	CONDITION Ti-To-MDC-LOC-B-GG-ODC-RSN
1A	311	SECURITY	GT11	0	199	199	5.25	37.90	-
2A	311	SECURITY	LW888	199	202	3	0.25	12.00	-
1	200	R.B.I	KX513	202	1082	880	24.50	35.92	-
1HZ	200	R.B.I Cont..	KX513	772	1998	1224	94.5	22.28	- Total Cut : 2106 meters

Total Drilling Hours: 94.5 hrs.

DEVIATION SURVEYS OF PILOT HOLE

Surface Pilot Hole

Depth	Deviation (Degrees)	Depth	Deviation (Degrees)
32.00	0.50	850.00	0.70
59.00	0.50	896.00	0.60
94.00	0.50		
120.00	0.25		
148.00	0.75		
175.00	1.00		
194.00	1.00		
284.00	0.30		
384.00	0.60		
490.00	0.50		
537.00	0.50		
590.00	0.50		
650.00	0.50		
708.00	0.80		
755.00	0.20		
801.00	0.30		

DIRECTIONAL SURVEYS

Measured Depth Meters	Incl Angle Deg	Drift Direction Deg	TRUE Vertical Depth	N-S Meters	E-W Meters	Vertical Section Meters	Dogleg Distance Meters	Direction Deg	Severity Deg/30
0	0	0	0	0	0	0	0	0	0
202	0	0	202	0	0	0	0	0	0
212.55	0.4	125.6	212.55	-0.02	0.03	0.03	0.04	125.58	1.14
268.11	0.3	177.3	268.11	-0.28	0.19	0.2	0.34	145.18	0.17
323.57	0.5	178.9	323.57	-0.67	0.21	0.21	0.7	162.83	0.11
335.3	0.52	176.44	335.3	-0.77	0.21	0.22	0.8	164.75	0.08
370.29	0.6	170.3	370.29	-1.11	0.25	0.26	1.14	167.27	0.08
417.82	0.8	176.4	417.81	-1.69	0.31	0.33	1.72	169.47	0.13
436.92	0.4	177.2	436.91	-1.89	0.33	0.34	1.92	170.22	0.63
474.94	0.5	35.5	474.93	-1.89	0.43	0.44	1.93	167.2	0.67
531.59	0.5	12.1	531.58	-1.44	0.62	0.63	1.57	156.61	0.11
587.76	0.5	22.7	587.75	-0.98	0.77	0.78	1.24	141.76	0.05
634.94	0.6	349.7	634.92	-0.54	0.8	0.81	0.97	124.03	0.21
709.5	0.8	183.7	709.48	-0.68	0.7	0.71	0.98	134.06	0.56
756.29	0.3	221.5	756.27	-1.1	0.6	0.61	1.25	151.34	0.38
765.88	0.3	183.7	765.86	-1.14	0.58	0.59	1.28	153	0.61
772	0.98	106.03	771.98	-1.17	0.63	0.64	1.33	151.7	4.72
775.4	1.5	99.8	775.38	-1.19	0.7	0.71	1.38	149.38	4.72
784.83	3.3	87.9	784.8	-1.2	1.1	1.1	1.62	137.56	5.91
794.43	4.9	83.8	794.38	-1.14	1.78	1.79	2.11	122.73	5.08
803.64	6.6	82.1	803.54	-1.03	2.69	2.7	2.88	110.88	5.56
813.28	8.5	80	813.09	-0.83	3.94	3.95	4.03	101.86	5.97
822.57	10.6	82.3	822.26	-0.59	5.47	5.47	5.5	96.2	6.89
832.01	12.7	88.2	831.5	-0.45	7.37	7.37	7.38	93.46	7.66
841.5	14.5	94.5	840.72	-0.51	9.59	9.6	9.61	93.02	7.36
850.69	16.4	93.9	849.58	-0.68	12.03	12.04	12.05	93.25	6.22
860.14	18.1	90.2	858.61	-0.78	14.83	14.84	14.85	93.01	6.42
869.37	19.7	85.5	867.34	-0.66	17.82	17.82	17.83	92.13	7.17
878.87	22.1	84	876.21	-0.35	21.19	21.19	21.2	90.95	7.76
888.48	24.3	85.8	885.05	-0.02	24.96	24.96	24.96	90.04	7.22
897.71	27	88.3	893.37	0.18	28.95	28.95	28.95	89.64	9.45
907.18	29.6	91	901.7	0.21	33.44	33.44	33.44	89.64	9.18
916.57	31.8	90.8	909.78	0.13	38.23	38.23	38.23	89.8	7.04
925.83	33.7	90.6	917.57	0.07	43.24	43.24	43.24	89.91	6.17
935.3	36.1	91.1	925.33	-0.01	48.66	48.66	48.66	90.01	7.66
944.76	38.4	90.5	932.86	-0.09	54.38	54.38	54.38	90.09	7.38
954.23	40.8	89.9	940.16	-0.11	60.42	60.42	60.42	90.1	7.7
963.69	43.2	89.2	947.19	-0.06	66.75	66.75	66.75	90.05	7.75
973.14	45.5	88.3	953.94	0.09	73.35	73.35	73.35	89.93	7.57
982.59	47.7	88.3	960.44	0.29	80.22	80.21	80.22	89.79	6.98

991.96	49.3	88.7	966.65	0.47	87.23	87.23	87.23	89.69	5.21
1001.16	51.4	88.3	972.52	0.66	94.31	94.31	94.31	89.6	6.92
1010.32	52.9	88.9	978.14	0.84	101.54	101.53	101.55	89.53	5.15
1019.49	54.1	90.1	983.59	0.9	108.91	108.9	108.92	89.53	5.04
1028.68	55.8	90.1	988.87	0.89	116.44	116.43	116.44	89.56	5.55
1037.92	57	89.5	993.98	0.91	124.13	124.12	124.14	89.58	4.22
1047.15	59.2	89.3	998.86	1	131.97	131.96	131.97	89.57	7.17
1056.36	61.5	89.9	1003.41	1.05	139.97	139.96	139.97	89.57	7.68
1065.82	64.2	90.3	1007.73	1.04	148.39	148.38	148.39	89.6	8.64
1075.02	66.8	90.3	1011.55	0.99	156.76	156.75	156.76	89.64	8.48
1084.23	69.4	91.3	1014.98	0.87	165.3	165.29	165.3	89.7	8.99
1093.67	72.3	92.6	1018.08	0.57	174.21	174.21	174.21	89.81	10.01
1102.88	73.4	92.1	1020.79	0.21	183.01	183	183.01	89.94	3.91
1112.09	73	92.7	1023.46	-0.16	191.82	191.81	191.82	90.05	2.28
1121.65	75.6	92.8	1026.04	-0.6	201.01	201.01	201.01	90.17	8.16
1131.2	78.2	91	1028.21	-0.91	210.3	210.3	210.3	90.25	9.85
1140.64	81.1	89.7	1029.9	-0.97	219.59	219.59	219.59	90.25	10.07
1149.88	84.1	88.8	1031.09	-0.85	228.75	228.75	228.75	90.21	10.16
1159.34	87.4	89.1	1031.79	-0.67	238.18	238.18	238.18	90.16	10.51
1168.8	89	89.5	1032.09	-0.56	247.63	247.63	247.63	90.13	5.23
1178.26	88.4	89.4	1032.3	-0.47	257.09	257.09	257.09	90.1	1.93
1187.7	88.3	88.9	1032.58	-0.33	266.53	266.52	266.53	90.07	1.62
1197.18	90.1	90.8	1032.71	-0.3	276	276	276	90.06	8.28
1206.62	90.9	92.2	1032.63	-0.55	285.44	285.44	285.44	90.11	5.12
1216.13	91.1	92.5	1032.46	-0.94	294.94	294.94	294.94	90.18	1.14
1225.72	90.7	92.3	1032.31	-1.34	304.52	304.52	304.52	90.25	1.4
1235.32	89.9	92.2	1032.26	-1.72	314.11	314.12	314.12	90.31	2.52
1244.77	89.7	92.1	1032.29	-2.07	323.56	323.56	323.56	90.37	0.71
1254	89.5	91.4	1032.36	-2.35	332.78	332.79	332.79	90.41	2.37
1263.26	89	91	1032.48	-2.55	342.04	342.05	342.05	90.43	2.07
1272.3	89.1	91.2	1032.63	-2.72	351.08	351.09	351.09	90.44	0.74
1282.2	90	92.3	1032.71	-3.02	360.97	360.98	360.98	90.48	4.31
1291.75	90.6	92.6	1032.66	-3.43	370.51	370.53	370.53	90.53	2.11
1301.18	91.4	93.7	1032.49	-3.95	379.93	379.94	379.95	90.6	4.33
1310.72	91.2	93.7	1032.28	-4.57	389.44	389.47	389.47	90.67	0.63
1320.34	90.9	93.4	1032.1	-5.16	399.04	399.07	399.08	90.74	1.32
1329.58	90.6	93.7	1031.98	-5.73	408.27	408.29	408.31	90.8	1.38
1339.03	89.7	92.8	1031.95	-6.27	417.7	417.73	417.75	90.86	4.04
1348.62	89.3	92.3	1032.04	-6.7	427.28	427.32	427.33	90.9	2
1357.86	89.7	92.6	1032.12	-7.09	436.51	436.55	436.57	90.93	1.62
1367.3	90.1	94.5	1032.13	-7.68	445.93	445.97	446	90.99	6.17
1376.71	89.8	94.7	1032.14	-8.43	455.31	455.36	455.39	91.06	1.15
1386.17	89.5	94.1	1032.2	-9.16	464.74	464.79	464.83	91.13	2.13
1395.51	89.6	94.7	1032.27	-9.87	474.06	474.11	474.16	91.19	1.95

1404.73	90.2	96.1	1032.29	-10.74	483.24	483.3	483.35	91.27	4.96
1413.9	91	95.8	1032.19	-11.69	492.36	492.42	492.49	91.36	2.8
1423.25	90.1	93.7	1032.1	-12.47	501.67	501.74	501.83	91.42	7.33
1432.6	90.2	93.4	1032.08	-13.04	511	511.08	511.17	91.46	1.01
1441.86	90.1	93	1032.05	-13.56	520.25	520.33	520.43	91.49	1.34
1451.11	89.8	92.9	1032.06	-14.04	529.49	529.57	529.67	91.52	1.03
1460.48	89.6	95.1	1032.11	-14.69	538.83	538.92	539.03	91.56	7.07
1469.75	89.5	94.8	1032.18	-15.49	548.07	548.16	548.29	91.62	1.02
1479.16	88.2	93.5	1032.37	-16.17	557.45	557.55	557.69	91.66	5.86
1488.45	87.9	92.7	1032.69	-16.67	566.72	566.82	566.97	91.69	2.76
1497.88	87	92.4	1033.11	-17.09	576.13	576.23	576.39	91.7	3.02
1507.11	87.1	92.6	1033.58	-17.49	585.34	585.45	585.6	91.71	0.73
1516.33	86.8	93.2	1034.07	-17.96	594.54	594.64	594.81	91.73	2.18
1525.57	87.6	92.8	1034.53	-18.44	603.75	603.86	604.04	91.75	2.9
1534.93	88	91.1	1034.89	-18.76	613.1	613.21	613.39	91.75	5.59
1544.14	87.8	89.9	1035.22	-18.84	622.31	622.42	622.59	91.73	3.96
1553.51	89.2	90.2	1035.47	-18.85	631.67	631.78	631.95	91.71	4.58
1562.88	89.4	90.1	1035.58	-18.87	641.04	641.15	641.32	91.69	0.72
1572.08	89	88.9	1035.71	-18.79	650.24	650.35	650.51	91.66	4.12
1581.37	89.8	88.7	1035.81	-18.6	659.53	659.64	659.79	91.62	2.66
1590.44	90.6	88.6	1035.78	-18.39	668.59	668.7	668.85	91.58	2.67
1599.87	90.4	88.3	1035.69	-18.13	678.02	678.13	678.26	91.53	1.15
1609.22	89.7	87.5	1035.69	-17.79	687.36	687.47	687.59	91.48	3.41
1618.59	89.7	86.9	1035.74	-17.33	696.72	696.82	696.94	91.42	1.92
1627.83	90	87	1035.76	-16.84	705.95	706.05	706.15	91.37	1.03
1637.19	91.3	87.6	1035.65	-16.4	715.3	715.39	715.49	91.31	4.59
1646.56	90.9	87.2	1035.47	-15.97	724.66	724.75	724.83	91.26	1.81
1655.7	90.8	86.9	1035.34	-15.5	733.78	733.87	733.95	91.21	1.04
1664.92	90.9	86.2	1035.2	-14.95	742.99	743.07	743.14	91.15	2.3
1674.14	90.6	85.6	1035.08	-14.29	752.18	752.26	752.32	91.09	2.18
1683.29	90.3	84.4	1035.01	-13.49	761.3	761.37	761.42	91.02	4.06
1692.7	91.4	84.4	1034.87	-12.57	770.66	770.73	770.76	90.93	3.51
1701.93	93.3	85.2	1034.49	-11.74	779.84	779.9	779.93	90.86	6.7
1711.18	93.8	85.8	1033.92	-11.01	789.05	789.1	789.12	90.8	2.53
1720.55	93.8	87.1	1033.3	-10.43	798.38	798.43	798.45	90.75	4.15
1729.92	93.2	88.2	1032.72	-10.05	807.72	807.77	807.79	90.71	4.01
1739.3	92.9	88.1	1032.23	-9.75	817.09	817.13	817.14	90.68	1.01
1748.67	91.7	88.7	1031.85	-9.49	826.44	826.49	826.5	90.66	4.29
1757.96	91.3	88.9	1031.61	-9.29	835.73	835.77	835.78	90.64	1.44
1767.27	91.1	89.3	1031.41	-9.15	845.04	845.08	845.08	90.62	1.44
1776.52	91.1	89.7	1031.23	-9.07	854.28	854.32	854.33	90.61	1.3
1785.72	89.6	90.2	1031.18	-9.06	863.48	863.52	863.53	90.6	5.16
1794.94	89.4	90	1031.26	-9.07	872.7	872.74	872.75	90.6	0.92

1804.33	89.2	89.6	1031.37	-9.04	882.09	882.13	882.14	90.59	1.43
1813.57	89.1	89.5	1031.51	-8.97	891.33	891.37	891.38	90.58	0.46
1822.82	89.1	89.3	1031.66	-8.87	900.58	900.62	900.62	90.56	0.65
1832.23	89.6	90.4	1031.76	-8.85	909.99	910.03	910.03	90.56	3.85
1841.57	88.8	90.1	1031.89	-8.89	919.33	919.37	919.37	90.55	2.74
1850.83	88.6	90.1	1032.1	-8.9	928.58	928.62	928.63	90.55	0.65
1860.27	88.1	88.6	1032.37	-8.8	938.02	938.06	938.06	90.54	5.02
1869.52	88.4	90	1032.66	-8.68	947.26	947.3	947.3	90.53	4.64
1878.44	89.2	90.7	1032.84	-8.74	956.18	956.22	956.22	90.52	3.57
1887.84	90.1	91.3	1032.9	-8.9	965.58	965.62	965.62	90.53	3.45
1897.21	90.3	92.1	1032.87	-9.18	974.95	974.99	974.99	90.54	2.64
1906.46	89.8	92.2	1032.86	-9.53	984.19	984.23	984.24	90.55	1.65
1915.67	89.7	91.7	1032.9	-9.84	993.39	993.44	993.44	90.57	1.66
1924.83	89.6	91.7	1032.96	-10.11	1002.55	1002.59	1002.6	90.58	0.33
1934.33	90.6	91.2	1032.94	-10.35	1012.05	1012.09	1012.1	90.59	3.53
1943.7	91.6	91.1	1032.76	-10.54	1021.41	1021.46	1021.47	90.59	3.22
1952.95	91.4	90.7	1032.52	-10.69	1030.66	1030.71	1030.71	90.59	1.45
1962.41	91.3	90.5	1032.3	-10.79	1040.12	1040.16	1040.17	90.59	0.71
1971.61	92	90.7	1032.03	-10.88	1049.31	1049.36	1049.37	90.59	2.37
1981.06	92.3	90.5	1031.68	-10.98	1058.75	1058.8	1058.81	90.59	1.14
1998	92.1	90.5	1031.03	-11.13	1075.68	1075.73	1075.74	90.59	0.35

WIRELINE LOGGING SUMMARY

LOGGING COMPANY:	*Weatherford*
LOGGING ENGINEER:	*E. Karamehic*
UNIT #:	*13090*
DRILLING STOPPED:	*20:00 hrs July 09/2010*
ARRIVED ON SITE:	*04:00 hrs July 10/2010*
CIRCULATION STOPPED:	*02:15 hrs July 10/2010*
BEGAN LOGGING:	*05:00 July 10/2010*
COMPLETED LOGGING:	*08:00 July 20/2010*
RELEASED LOGGERS:	*09:30 July 20/2010*
TOTAL DEPTH DRILLER:	*1082.0m*
TOTAL DEPTH LOGGER:	*1081.5m*
CASING SHOE DRILLER:	*202.0m*
CASING SHOE LOGGER:	*202.0m*
HOLE CONDITIONS:	*Good*
LOGS RUN:	*SII, HBC, SPED, CNT, GR, r-CAL*
COMMENTS:	*None*

VERTICAL PILOT

COMMENCE SAMPLE DESCRIPTION AT 950.0m.
Samples taken every 5m to 1082.0m.

LOWER GRAVELBOURG 927.0m TVD, -451.8m SS

925-935 **LIMESTONE** (75%) off white, minor buff, firm, chalky, cryptocrystalline, sandy in part, dense, no porosity, no shows.
DOLOMITE (10%) buff to light brown, hard, cryptocrystalline, tight, no shows.
SHALE (15%) medium gray, green-gray, minor brown and red, micromicaceous, dull, moderately hard, platy, sub-fissile to fissile, trace disseminated pyrite, dolomitic in part.

935-945 **LIMESTONE** (80%) off white, minor buff, firm, chalky, cryptocrystalline, sandy in part, dense, no porosity, no shows.
DOLOMITE (10%) buff to light brown, hard, cryptocrystalline, tight, no shows.
SHALE (10%) medium gray, green-gray, micromicaceous, dull, moderately hard, platy, sub-fissile to fissile, trace disseminated pyrite, dolomitic in part.

945-955 **LIMESTONE** (85%) off white, minor buff, firm, chalky, cryptocrystalline, sandy in part, dense, no porosity, no shows.
DOLOMITE (10%) buff to light brown, hard, cryptocrystalline, tight, no shows.
SHALE (5%) medium gray, green-gray, micromicaceous, dull, moderately hard, platy, sub-fissile to fissile, trace disseminated pyrite, dolomitic in part.

955-965 **LIMESTONE** (80%) off white, minor buff, firm, chalky, cryptocrystalline, sandy in part, dense, no porosity, no shows.
DOLOMITE (10%) buff to light brown, hard, cryptocrystalline, tight, no shows.
ANHYDRITE (5%) white to clear, fine crystalline, sucrosic, minor microcrystalline, tight.
SHALE (5%) medium gray, green-gray, micromicaceous, dull, moderately hard, platy, sub-fissile to fissile, trace disseminated pyrite, dolomitic in part.

AMARANTH EVAP 963.0m TVD, -487.8m SS

965-975 **ANHYDRITE** (60%) white to clear, fine crystalline, sucrosic, minor microcrystalline, tight.
SHALE (30%) medium gray, green-gray, micromicaceous, dull, moderately hard, platy, sub fissile to fissile, trace disseminated pyrite, dolomitic in part.
DOLOMITE (10%) off white, minor buff, firm, chalky, cryptocrystalline, sandy in part, dense, no porosity, no shows.

975-985 **ANHYDRITE** (70%) white to clear, fine crystalline, sucrosic, minor microcrystalline, tight.
DOLOMITE (20%) off white, minor buff, firm, chalky, cryptocrystalline, sandy in part, dense, no porosity, no shows.
SHALE (10%) medium gray, green-gray, micromicaceous, dull, moderately hard, platy, sub fissile to fissile, trace disseminated pyrite, dolomitic in part.

985-995 **ANHYDRITE** (70%) white to clear, fine crystalline, sucrosic, minor microcrystalline, tight.
DOLOMITE (20%) off white, minor buff, firm, chalky, cryptocrystalline, sandy in part, dense, no porosity, no shows.
SHALE (10%) medium gray, green-gray, micromicaceous, dull, moderately hard, platy, sub-fissile to fissile, trace disseminated pyrite, dolomitic in part.

995-1010 **ANHYDRITE** (70%) white to clear, fine crystalline, sucrosic, minor microcrystalline, tight.

DOLOMITE (20%) off white, minor buff, firm, chalky, cryptocrystalline, sandy in part, dense, no porosity, no shows.
SHALE (10%) medium gray, green-gray, micromicaceous, dull, moderately hard, platy, sub-fissile to fissile, trace disseminated pyrite, dolomitic in part.

SPEARFISH: 1009.0m TVD, -533.8m SS

1010-1015 **SILTSTONE** (70%) orange-brown, minor light gray-brown, friable, firm, blocky, argillaceous, silica cement, grading to **SANDSTONE**, fair intergranular porosity <6%, patchy oil staining, 70 to 80% predominantly pale yellow white to dull gold brown fluorescence, slow slightly yellow milky cut, **ANHYDRITE** (10%) , **DOLOMITE** (10%), as above

MARINE B: 1016.0m TVD, -540.8m SS

1015-1022.5 **SILTSTONE** (70%) as above 70 to 80% predominantly pale yellow white to dull gold brown fluorescence, slow slightly yellow milky cut. **SHALE** (20%), **ANHYDRITE** (10%) , **DOLOMITE** (10%) as above

1022.5-1025 **SILTSTONE** (70%) as above, 40 to 50% predominantly pale yellow white to dull gold brown fluorescence, slow slightly yellow milky cut. SHALE (20%) , ANHYDRITE (10%) as above

MARINE A: 1023.0m TVD, -547.8m SS

1025-1027.5 **SANDSTONE** (70%) white, clear, and frosted quartz, upper fine to lower medium grained, unconsolidated, sub angular to rounded, inferred good intergranular porosity <18%. 40 to 50% predominantly pale yellow white to dull gold brown fluorescence, no cut, **SILTSTONE** (30%) as above

1027.5-1030 as above

WASKADA ZONE: 1032.3mTVD, -557.1m SS

1030-1032.5 **SANDSTONE** (70%) white, clear, and frosted quartz, upper fine to lower medium grained, unconsolidated, sub angular to rounded, inferred good intergranular porosity <18, 40 to 50% predominantly pale yellow gold brown fluorescence, fast streaming yellow gold to light blue cut, good hydrocarbon odor in wash water, **SILTSTONE** (30%) as above.

1032.5-1035 **SANDSTONE** (70%) as above 30 to 40% predominantly pale yellow gold brown fluorescence, slow streaming milky cut, good hydrocarbon odor in wash water, **SILTSTONE** as above.

1035-1037.5 **SANDSTONE** (90%) as above, 60 to 70% predominantly pale yellow gold brown fluorescence, fast streaming yellow gold to light blue cut, good hydrocarbon odor in wash water, **SILTSTONE** (10%) as above.

1037.5-1040 **SANDSTONE** (90%) as above, 70 to 75% predominantly pale yellow gold brown fluorescence, fast streaming yellow gold to light blue cut, good hydrocarbon odor in wash water, **SILTSTONE** (10%) as above.

1040-1042.5 **SANDSTONE** (90%) as above, 70 to 75% predominantly pale yellow gold brown fluorescence, fast streaming yellow gold to light blue cut, good hydrocarbon odor in wash water, **SILTSTONE** (10%) as above.

1042.5-1045 **SANDSTONE** (90%) as above, 70 to 75% predominantly pale yellow gold brown fluorescence, fast streaming yellow gold to light blue cut, good hydrocarbon odor in wash water, **SILTSTONE** (10%) as above.

MANOR ZONE: 1047.0m TVD, -571.8m SS

1045-1052 **SANDSTONE** (100%) white, clear, and frosted quartz, upper fine to lower medium grained, unconsolidated, sub angular to rounded, inferred good intergranular porosity <18, 60 to 70% predominantly pale yellow gold brown fluorescence, moderate streaming yellow gold to milky cut, good hydrocarbon odor in wash water.

MISSISSIPPIAN UC: 1050.9m TVD, -575.7m SS

1052-1060 **DOLOMITES** (90%) off white, minor buff, firm, chalky, cryptocrystalline, sandy in part, dense, intercrystalline porosity 6 to 9%, 60 to 70% predominantly pale yellow gold brown fluorescence, faint milky cut.
LIMESTONE (10%) off white to buff, cryptocrystalline to microcrystalline, chalky in parts.

1060-1070 **LIMESTONE** (80%) off white to buff, cryptocrystalline to microcrystalline, chalky in parts, 60 to 70% predominantly pale yellow gold brown fluorescence, no cut.
DOLOMITE (20%) off white, minor buff, firm, chalky, cryptocrystalline, sandy in part, dense.

1070-1082 **LIMESTONE** (90%) off white to buff, cryptocrystalline to microcrystalline, chalky , 30 to 40% predominantly pale yellow gold brown fluorescence, no cut.
DOLOMITE (10%) off white, minor buff, firm, chalky, cryptocrystalline, sandy in part, dense.

TOTAL DEPTH OF 1082.0m TVD REACHED AT 20:00 HRS JULY 09/10.

GEOLOGICAL SAMPLE DESCRIPTIONS

BUILD SECTION

COMMENCE SAMPLE DESCRIPTION AT 965m.
Samples taken every 5 m from 900m to 1170m.

SPEARFISH: 1067.8m MD, 1008.6m TVD, -533.4m SS

1065-1075 **SILTSTONE** (\60%) orange-brown, minor light gray-brown, friable, firm, blocky, argillaceous, silica cement, grading to **SANDSTONE**, fair intergranular porosity <6%, patchy oil staining, 30 to 40% dull gold brown fluorescence, no cut, **ANHYDRITE** (10%) , **DOLOMITE** (10%), as above.
SHALE (20%) medium gray, green to gray, minor brown and red, micromicaceous, dull, moderately hard, platy, sub to fissile to fissile, trace disseminated pyrite, dolomitic in part.

1075-1085 **SILTSTONE** (70%) orange to brown, minor light gray to brown, friable, firm, blocky, argillaceous, silica cement, grading to **SANDSTONE**, fair intergranular porosity <6%, 30 to 40% dull gold brown fluorescence, no cut,
SHALE (30%) medium gray, green to gray, minor brown and red, micromicaceous, dull, moderately hard, platy, sub to fissile to fissile, trace disseminated pyrite, dolomitic in part.

1085-1090 **SILTSTONE** (70%) orange to brown, minor light gray to brown, friable, firm, blocky, argillaceous, silica cement, grading to **SANDSTONE**, fair intergranular porosity <6%, 30 to 40% dull gold brown fluorescence, no cut,
SHALE (30%) medium gray, green to gray, minor brown and red, micromicaceous, dull, moderately hard, platy, sub to fissile to fissile, trace disseminated pyrite, dolomitic in part.

MARINE B: 1089.4m MD, 1016.8m TVD, -541.6m SS.

1090-1100 **SILTSTONE** (80%) orange to brown, minor light gray to brown, friable, firm, blocky, argillaceous, silica cement, grading to **SANDSTONE**, fair intergranular porosity <6, 30 to 40% dull yellow gold brown fluorescence, no cut.
SHALE (20%) medium gray, green to gray, minor brown and red, micromicaceous, dull, moderately hard (.Described as carvings)

1100-1115 **SILTSTONE** (80%) orange to brown, minor light gray to brown, friable, firm, blocky, argillaceous, silica cement, grading to **SANDSTONE**, fair intergranular porosity <6, 40 to 50% dull yellow gold brown fluorescence, no cut.
SHALE (20%) medium gray, green to gray, minor brown and red, micromicaceous, dull, moderately hard (.Described as carvings)

MARINE A: 1114.0m MD, 1024.0m TVD, - 548.8m SS

1115-1125 **SANDSTONE** (70%) white, clear, and frosted quartz, upper fine to lower medium grained, unconsolidated, sub angular to rounded, inferred good intergranular porosity <18%. 40 to 50% predominantly pale yellow white to dull gold brown fluorescence, no cut.
SILTSTONE (30%) orange to brown, minor light gray to brown, friable, firm, blocky, argillaceous, silica cement, grading to **SANDSTONE**, fair intergranular porosity <6, 40 to 50% dull yellow gold brown fluorescence, no cut.

1125-1135 **SANDSTONE** (70%) white, clear, and frosted quartz, upper fine to lower medium grained, unconsolidated, sub angular to rounded, inferred good intergranular porosity <18%. 40 to 50% predominantly pale yellow white to dull gold brown fluorescence, no cut.
SILTSTONE (30%) orange to brown, minor light gray to brown, friable, firm, blocky argillaceous, silica cement, grading to **SANDSTONE**, fair intergranular porosity <6, 40 to 50% dull yellow gold

brown fluorescence, no cut.

1135-1145 **SANDSTONE** (75%) white, clear, and frosted quartz, upper fine to lower medium grained, unconsolidated, sub angular to rounded, inferred good intergranular porosity <18%. 40 to 50% predominantly pale yellow white to dull gold brown fluorescence, no cut.
SILTSTONE (25%) orange to brown, minor light gray to brown, friable, firm, blocky argillaceous, silica cement, grading to **SANDSTONE**, fair intergranular porosity <6, 40 to 50% dull yellow gold brown fluorescence, no cut.

1145-1155 **SANDSTONE** (75%) white, clear, and frosted quartz, upper fine to lower medium grained, unconsolidated, sub angular to rounded, inferred good intergranular porosity <18%. 40 to 50% predominantly pale yellow white to dull gold brown fluorescence, slow streaming milky cut.
SILTSTONE (25%) orange to brown, minor light gray to brown, friable, firm, blocky argillaceous, silica cement, grading to **SANDSTONE**, fair intergranular porosity <6, 40 to 50% dull yellow gold brown fluorescence, , slow streaming milky cut.

1155-1165 **SANDSTONE** (75%) white, clear, and frosted quartz, upper fine to lower medium grained, unconsolidated, sub angular to rounded, inferred good intergranular porosity <18%. 40 to 50% predominantly pale yellow white to dull gold brown fluorescence, slow streaming milky cut.
SILTSTONE (25%) orange to brown, minor light gray to brown, friable, firm, blocky argillaceous, silica cement, grading to **SANDSTONE**, fair intergranular porosity <6, 40 to 50% dull yellow gold brown fluorescence, , slow streaming milky cut.

1165-1177 **SANDSTONE** (80%) white, clear, and frosted quartz, upper fine to lower medium grained, unconsolidated, sub angular to rounded, inferred good intergranular porosity <18%. 50 to 60% predominantly pale yellow white to dull gold brown fluorescence, moderate streaming dull yellow milky cut.
SILTSTONE (20%) orange to brown, minor light gray to brown, friable, firm, blocky argillaceous, silica cement, grading to **SANDSTONE**, fair intergranular porosity <6, 50 to 60% dull yellow gold brown fluorescence, , , moderate streaming dull yellow milky cut.

WASKADA ZONE: 1177.3m MD, 1032.3mTVD, -557.1m SS (Picked in HZ Section)

1177-1210 **SANDSTONE** (90%) white, clear, and frosted quartz, upper fine to lower medium grained, unconsolidated, sub angular to rounded, inferred good intergranular porosity <18, 80 to 90% predominantly pale yellow gold brown fluorescence, fast streaming yellow gold to light blue cut, good hydrocarbon odor in wash water.
SILTSTONE (10%) reddish to brown to orange to brown, upper fine grained, friable, firm, blocky, argillaceous, good silica cement, sandy in part, moderate intergranular porosity <5%, 80 to 90% predominantly pale yellow gold brown fluorescence, fast streaming yellow gold to light blue cut, good hydrocarbon odor in wash water.

CONTINUED AS HORIZONTAL SECTION

GEOLOGICAL SAMPLE DESCRIPTIONS

HORIZONTAL SECTION
COMMENCE SAMPLE DESCRIPTION AT 1170m.
Samples taken every10 m from 1170m to 1998m.

1177-1210 **SANDSTONE** (90%) white, clear, and frosted quartz, upper fine to lower medium grained, unconsolidated, sub angular to rounded, inferred good intergranular porosity <18, 80 to 90% predominantly pale yellow gold brown fluorescence, fast streaming yellow gold to light blue cut, good hydrocarbon odor in wash water.
SILTSTONE (10%) reddish to brown to orange to brown, upper fine grained, friable, firm, blocky, argillaceous, good silica cement, sandy in part, moderate intergranular porosity <5%, 80 to 90% predominantly pale yellow gold brown fluorescence, fast streaming yellow gold to light blue cut, good hydrocarbon odor in wash water.

1210-1230 **SANDSTONE** (80%) quartz, white, clear to frosted, upper fine to lower medium grained, upper medium in part, unconsolidated, sub angular to rounded, inferred good intergranular porosity <18, 80% predominantly pale yellow gold brown fluorescence, fast streaming yellow gold to light blue cut, good hydrocarbon odor in wash water.
SILTSTONE (20%) reddish to brown, orange to brown, upper fine grained, friable, firm, blocky, argillaceous, dolomitic cement, sandy in part, moderate intergranular porosity 6 to 9%, 80 to 90% predominantly pale yellow gold brown fluorescence, fast streaming yellow gold to light blue cut, good hydrocarbon odor in wash water.

1230-1260 **SANDSTONE** (70%) quartz, white, clear to frosted, upper fine to lower medium grained, upper medium in part, unconsolidated, sub angular to rounded, inferred good intergranular porosity <18, 50% predominantly pale yellow gold brown fluorescence, moderately fast streaming yellow gold to light blue cut, slightly hydrocarbon odor in wash water.
SILTSTONE (30%) reddish to brown, orange to brown, upper fine grained, friable, firm, blocky, argillaceous, dolomitic cement, sandy in part, moderate intergranular porosity 6 to 9%, 50% predominantly pale yellow gold brown fluorescence, moderately fast streaming yellow gold to light blue cut, slightly hydrocarbon odor in wash water.

1260-1290 **SANDSTONE** (90%) white, clear, and frosted quartz, upper fine to lower medium grained, unconsolidated, sub angular to rounded, inferred good intergranular porosity <18, 80 to 90% predominantly pale yellow gold brown fluorescence, fast streaming yellow gold to light blue cut, good hydrocarbon odor in wash water.
SILTSTONE (10%) reddish to brown to orange to brown, upper fine grained, friable, firm, blocky, argillaceous, good silica cement, sandy in part, moderate intergranular porosity <7%, 80 to 90% predominantly pale yellow gold brown fluorescence, fast streaming yellow gold to light blue cut, good hydrocarbon odor in wash water.

1290-1310 **SANDSTONE** (80%) quartz, white, clear to frosted, upper fine to lower medium grained, upper medium in part, unconsolidated, sub angular to rounded, inferred good intergranular porosity <18, 50% predominantly pale yellow gold brown fluorescence, moderately fast streaming yellow gold to light blue cut, slightly hydrocarbon odor in wash water.
SILTSTONE (20%) reddish to brown, orange to brown, upper fine grained, friable, firm, blocky, argillaceous, dolomitic cement, sandy in part, moderate intergranular porosity 6%, 50% predominantly pale yellow gold brown fluorescence, moderately fast streaming yellow gold to light blue cut, slightly hydrocarbon odor in wash water.

1310-1330 **SANDSTONE** (75%) quartz, white, clear to frosted, upper fine to lower medium grained, upper medium in part, unconsolidated, sub angular to rounded, inferred good intergranular porosity 15 to 18%, 40% predominantly pale yellow gold brown fluorescence, moderately dull yellow gold to light blue cut.
SILTSTONE (25%) reddish to brown, orange to brown, upper fine grained, friable, firm, blocky, argillaceous, dolomitic cement, sandy in part, poor to fair intergranular porosity 3 to 6%, 40% predominantly pale yellow gold brown fluorescence, moderately dull blue cut.

1330-1350 **SANDSTONE** (75%) quartz, white, clear to frosted, upper fine to lower medium grained, upper medium in part, unconsolidated, sub angular to rounded, inferred good intergranular porosity 15 to 18%, 40% predominantly pale yellow gold brown fluorescence, moderately dull yellow gold to light blue cut.
SILTSTONE (25%) reddish to brown, orange to brown, upper fine grained, friable, firm, blocky, argillaceous, dolomitic cement, sandy in part, poor to fair intergranular porosity 3 to 6%, 40% predominantly pale yellow gold brown fluorescence, moderately dull blue cut.

1350-1380 **SANDSTONE** (90%) white, clear, and frosted quartz, upper fine to lower medium grained, unconsolidated, sub angular to rounded, inferred good intergranular porosity <18, 80 to 90% predominantly pale yellow gold brown fluorescence, fast streaming yellow gold to light blue cut, good hydrocarbon odor in wash water.
SILTSTONE (10%) reddish to brown to orange to brown, upper fine grained, friable, firm, blocky, argillaceous, good silica cement, sandy in part, moderate intergranular porosity <7%, 80 to 90% predominantly pale yellow gold brown fluorescence, fast streaming yellow gold to light blue cut, good hydrocarbon odor in wash water.

1380-1410 **SANDSTONE** (90%) white, clear, and frosted quartz, upper fine to lower medium grained, unconsolidated, sub angular to rounded, inferred good intergranular porosity <18, 80 to 90% predominantly pale yellow gold brown fluorescence, fast streaming yellow gold to light blue cut, good hydrocarbon odor in wash water.
SILTSTONE (10%) reddish to brown to orange to brown, upper fine grained, friable, firm, blocky, argillaceous, good silica cement, sandy in part, moderate intergranular porosity <7%, 80 to 90% predominantly pale yellow gold brown fluorescence, fast streaming yellow gold to light blue cut, good hydrocarbon odor in wash water.

1410-1440 **SANDSTONE** (90%) white, clear, and frosted quartz, upper fine to lower medium grained, unconsolidated, sub angular to rounded, inferred good intergranular porosity <18, 80 to 90% predominantly pale yellow gold brown fluorescence, fast streaming yellow gold to light blue cut, good hydrocarbon odor in wash water.
SILTSTONE (10%) reddish to brown to orange to brown, upper fine grained, friable, firm, blocky, argillaceous, good silica cement, sandy in part, moderate intergranular porosity <7%, 80 to 90% predominantly pale yellow gold brown fluorescence, fast streaming yellow gold to light blue cut, good hydrocarbon odor in wash water.

1440-1470 **SANDSTONE** (90%) white, clear, and frosted quartz, upper fine to lower medium grained, unconsolidated, sub angular to rounded, inferred good intergranular porosity <18, 80 to 90% predominantly pale yellow gold brown fluorescence, fast streaming yellow gold to light blue cut, good hydrocarbon odor in wash water.

SILTSTONE (10%) reddish to brown to orange to brown, upper fine grained, friable, firm, blocky, argillaceous, good silica cement, sandy in part, moderate intergranular porosity <7%, 80 to 90% predominantly pale yellow gold brown fluorescence, fast streaming yellow gold to light blue cut, good hydrocarbon odor in wash water.

1470-1490 **SANDSTONE** (60%) quartz, white, clear to frosted, upper fine to lower medium grained, upper medium in part, unconsolidated, sub angular to rounded, inferred good intergranular porosity 15 to 18%, 40% predominantly pale yellow gold brown fluorescence, moderately dull yellow gold to light blue cut.

SILTSTONE (40%) reddish to brown, orange to brown, argillaceous, upper fine grained, friable, firm, blocky, argillaceous, dolomitic cement, sandy in part, poor to fair intergranular porosity 3 to 6%, 40% predominantly pale yellow gold brown fluorescence, moderately dull blue cut.

1490-1520 **SANDSTONE** (80%) quartz, white, clear to frosted, upper fine to lower medium grained, upper medium in part, unconsolidated, sub angular to rounded, inferred good intergranular porosity 15 to 18%, 20% predominantly pale yellow fluorescence, slow dull yellow gold to light blue cut.

SILTSTONE (20%) reddish to brown, orange to brown, argillaceous, upper fine grained, friable, firm, blocky, argillaceous, dolomitic cement, sandy in part, poor to fair intergranular porosity 3 to 6%, 20% predominantly pale yellow fluorescence, slow dull yellow gold to light blue cut.

1520-1550 **SANDSTONE** (60%) quartz, white, clear to frosted, upper fine to lower medium grained, upper medium in part, unconsolidated, sub angular to rounded, inferred good intergranular porosity 15 to 18%, 20% predominantly pale yellow fluorescence, moderately dull yellow gold to light blue cut.

SILTSTONE (40%) reddish to brown, orange to brown, argillaceous, upper fine grained, friable, firm, blocky, argillaceous, dolomitic cement, sandy in part, poor to fair intergranular porosity 3 to 5%, 20% predominantly pale yellow fluorescence, moderately dull yellow gold to light blue cut.

1550-1580 **SANDSTONE** (90%) white, clear, and frosted quartz, upper fine to lower medium grained, unconsolidated, sub angular to rounded, inferred good intergranular porosity <18, 50% predominantly pale yellow gold brown fluorescence, fast streaming yellow gold to light blue cut, good hydrocarbon odor in wash water.

SILTSTONE (10%) reddish to brown to orange to brown, upper fine grained, friable, firm, blocky, argillaceous, silica and dolomitic cement, sandy in part, moderate intergranular porosity <7%, 50% predominantly pale yellow gold brown fluorescence, fast streaming yellow gold to light blue cut, good hydrocarbon odor in wash water.

1580-1600 **SANDSTONE** (90%) white, clear, and frosted quartz, upper fine to lower medium grained, unconsolidated, sub angular to rounded, inferred good intergranular porosity <18, 50% predominantly pale yellow gold brown fluorescence, fast streaming yellow gold to light blue cut, good hydrocarbon odor in wash water.

SILTSTONE (10%) reddish to brown to orange to brown, upper fine grained, friable, firm, blocky, slightly argillaceous, silica and dolomitic cement, sandy in part, moderate intergranular porosity <7%, 50% predominantly pale yellow gold brown fluorescence, fast streaming yellow gold to light blue cut, good hydrocarbon odor in wash water.

1600-1630 **SANDSTONE** (90%) white, clear, and frosted quartz, upper fine to lower medium grained, unconsolidated, sub angular to rounded, inferred good intergranular porosity <18, 50% predominantly pale yellow gold brown fluorescence, fast streaming yellow gold to light blue cut, good hydrocarbon odor in wash water.

SILTSTONE (10%) reddish to brown to orange to brown, upper fine grained, friable, firm, blocky, slightly argillaceous, silica and dolomitic cement, sandy in part, moderate intergranular porosity <7%, 50% predominantly pale yellow gold brown fluorescence, fast streaming yellow gold to light blue cut, good hydrocarbon odor in wash water.

1630-1650 **SANDSTONE** (80%) white, clear, and frosted quartz, upper fine to lower medium grained, unconsolidated, sub angular to rounded, inferred good intergranular porosity <18, 50% predominantly pale yellow gold brown fluorescence, fast streaming yellow gold to light blue cut, good hydrocarbon odor in wash water.

SILTSTONE (20%) reddish to brown to orange to brown, upper fine grained, friable, firm, blocky, slightly argillaceous, silica and dolomitic cement, sandy in part, moderate intergranular porosity <7%, 50% predominantly pale yellow gold brown fluorescence, fast streaming yellow gold to light blue cut, good hydrocarbon odor in wash water.

1650-1680 **SANDSTONE** (80%) white, clear, and frosted quartz, upper fine to lower medium grained, unconsolidated, sub angular to rounded, inferred good intergranular porosity <18, 60% predominantly pale yellow gold brown fluorescence, fast streaming yellow gold to light blue cut, good hydrocarbon odor in wash water.

SILTSTONE (20%) reddish to brown to orange to brown, upper fine grained, friable, firm, blocky, slightly argillaceous, silica and dolomitic cement, sandy in part, moderate intergranular porosity <7%, 60% predominantly pale yellow gold brown fluorescence, fast streaming yellow gold to light blue cut, good hydrocarbon odor in wash water.

1680-1710 **SANDSTONE** (80%) white, clear, and frosted quartz, upper fine to lower medium grained, unconsolidated, sub angular to rounded, inferred good intergranular porosity <18, 60% predominantly pale yellow gold brown fluorescence, fast streaming yellow gold to light blue cut, good hydrocarbon odor in wash water.

SILTSTONE (20%) reddish to brown to orange to brown, upper fine grained, friable, firm, blocky, slightly argillaceous, silica and dolomitic cement, sandy in part, moderate intergranular porosity <7%, 60% predominantly pale yellow gold brown fluorescence, fast streaming yellow gold to light blue cut, good hydrocarbon odor in wash water.

1710-1740 **SANDSTONE**(60%) quartz, white, clear to frosted, upper fine to lower medium grained, upper medium in part, unconsolidated, sub angular to rounded, inferred good intergranular porosity 15 to 18%, 20% predominantly pale yellow fluorescence, moderately dull yellow gold to light blue cut.

SILTSTONE (40%) reddish to brown, orange to brown, argillaceous, upper fine grained, friable, firm, blocky, argillaceous, dolomitic cement, sandy in part, poor to fair intergranular porosity 3 to 5%, 20% predominantly pale yellow fluorescence, moderately dull yellow gold to light blue cut.

1740-1770 **SANDSTONE** (60%) quartz, white, clear to frosted, upper fine to lower medium grained, upper medium in part, unconsolidated, sub angular to rounded, inferred good intergranular porosity 15 to 18%, 40% predominantly pale yellow gold brown fluorescence, moderately dull yellow gold to light blue cut.

SILTSTONE (40%) reddish to brown, orange to brown, argillaceous, upper fine grained, friable, firm, blocky, argillaceous, dolomitic cement, sandy in part, poor to fair intergranular porosity 3 to 6%, 40% predominantly pale yellow gold brown fluorescence, moderately dull blue cut.

1770-1800 **SANDSTONE** (60%) quartz, white, clear to frosted, upper fine to lower medium grained, upper medium in part, unconsolidated, sub angular to rounded, inferred good intergranular porosity 15 to 18%, 40 to 50% predominantly pale yellow gold brown fluorescence, moderately fast dull yellow gold to light blue cut.

SILTSTONE (40%) reddish to brown, orange to brown, argillaceous, upper fine grained, friable, firm, blocky, argillaceous, dolomitic cement, sandy in part, poor to fair intergranular porosity 3 to 6%, 40 to 50% predominantly pale yellow gold brown fluorescence, moderately fast dull blue cut.

1800-1830 **SANDSTONE** (60%) quartz, white, clear to frosted, upper fine to lower medium grained, upper medium in part, unconsolidated, sub angular to rounded, inferred good intergranular porosity 15 to 18%, 40 to 50% predominantly pale yellow gold brown fluorescence, moderately fast dull yellow gold to light blue cut.

SILTSTONE (40%) reddish to brown, orange to brown, argillaceous, upper fine grained, friable, firm, blocky, argillaceous, dolomitic cement, sandy in part, poor to fair intergranular porosity 3 to 6%, 40 to 50% predominantly pale yellow gold brown fluorescence, moderately fast dull blue cut.

1830-1850 **SANDSTONE** (60%) quartz, white, clear to frosted, upper fine to lower medium grained, upper medium in part, unconsolidated, sub angular to rounded, rare pyrite and glauconite, inferred good intergranular porosity 15 to 18%, 40 to 50% predominantly pale yellow gold brown fluorescence, moderately fast dull yellow gold to light blue cut.

SILTSTONE (40%) reddish to brown, orange to brown, argillaceous, upper fine grained, friable, firm, blocky, argillaceous, dolomitic cement, sandy in part, poor to fair intergranular porosity 3 to 6%, 40 to 50% predominantly pale yellow gold brown fluorescence, moderately fast dull blue cut.

1850-1870 **SANDSTONE** (60%) quartz, white, clear to frosted, upper fine to lower medium grained, upper medium in part, unconsolidated, sub angular to rounded, rare pyrite and glauconite, inferred good intergranular porosity 15 to 18%, 30% predominantly pale yellow gold brown fluorescence, moderately fast dull yellow cut.

SILTSTONE (40%) reddish to brown, orange to brown, argillaceous, upper fine grained, friable, firm, blocky, argillaceous, dolomitic cement, sandy in part, poor to fair intergranular porosity 3 to 6%, 30% predominantly pale yellow gold brown fluorescence, moderately fast dull yellow cut.

1870-1900 **SANDSTONE** (60%) quartz, white, clear to frosted, upper fine to lower medium grained, upper medium in part, unconsolidated, sub angular to rounded, argillaceous, rare pyrite and glauconite, inferred good intergranular porosity 15 to 18%, 30% predominantly pale yellow gold brown fluorescence, moderately fast dull yellow cut.

SILTSTONE (40%) reddish to brown, orange to brown, argillaceous, upper fine grained, friable, firm, blocky, argillaceous, dolomitic cement, sandy in part, poor to fair intergranular porosity 3 to 6%, 30% predominantly pale yellow gold brown fluorescence, moderately fast dull yellow cut.

1900-1930 **SANDSTONE** (50%) quartz, white, clear to frosted, rare varicolored upper fine to lower medium grained, upper medium in part, unconsolidated, sub angular to rounded, argillaceous, rare pyrite, inferred good intergranular porosity 15 to 18%, 30% predominantly pale yellow gold brown fluorescence, moderately fast dull blue cut.

SILTSTONE (50%) reddish to brown, orange to brown, argillaceous, upper fine grained, friable, firm, blocky, argillaceous, dolomitic cement, sandy in part, poor to fair intergranular porosity 3 to 6%, 30% predominantly pale yellow gold brown fluorescence, moderately fast dull blue cut.

1930-1960 **SANDSTONE** (60%) quartz, white, clear to frosted, upper fine to lower medium grained, upper medium in part, unconsolidated, sub angular to rounded, argillaceous, rare pyrite and glauconite, inferred good intergranular porosity 15 to 18%, 30% predominantly pale yellow gold brown fluorescence, moderately fast dull yellow cut.

SILTSTONE (40%) reddish to brown, orange to brown, argillaceous, upper fine grained, friable, firm, blocky, argillaceous, dolomitic cement, sandy in part, poor to fair intergranular porosity 3 to 6%, 30% predominantly pale yellow gold brown fluorescence, moderately fast dull yellow cut.

1960-1980 **SANDSTONE** (60%) quartz, white, clear to frosted, upper fine to lower medium grained, upper medium in part, unconsolidated, sub angular to rounded, argillaceous, rare pyrite and glauconite, inferred good intergranular porosity 15 to 18%, 30% predominantly pale yellow gold brown fluorescence, moderately fast dull yellow cut.

SILTSTONE (40%) reddish to brown, orange to brown, argillaceous, upper fine grained, friable, firm, blocky, argillaceous, dolomitic cement, sandy in part, poor to fair intergranular porosity 3 to 6%, 30% predominantly pale yellow gold brown fluorescence, moderately fast dull yellow cut.

1980-1998 **SANDSTONE** (60%) quartz, white, clear to frosted, upper fine to lower medium grained, upper medium in part, unconsolidated, sub angular to rounded, argillaceous, rare pyrite and glauconite, inferred good intergranular porosity 15 to 18%, 30% predominantly pale yellow gold brown fluorescence, moderately fast dull yellow cut.

SILTSTONE (40%) reddish to brown, orange to brown, argillaceous, upper fine grained, friable, firm, blocky, argillaceous, dolomitic cement, sandy in part, poor to fair intergranular porosity 3 to 6%, 30% predominantly pale yellow gold brown fluorescence, moderately fast dull yellow cut.

TOTAL DEPTH OF 1998.0m MD REACHED AT 16:30 HRS JULY 15/10

Geological Report

Licence No.: 7447	**UWI:** 100.13-32-001-29W1.00	**TVD:**	1082.0
Date: July 10, 2010	**Geologist:** FULTONREGULA	**FM depth at TD:**	1051.0
Formation at TD: Charles	**Deviation:** ☑ Vertical ☐ Directional ☒ Horizontal	**Max temp °C**	40
Formation depth penetration at TD 31.0	**Date Entered into MOGWIS:**	**September 7, 2010**	
KB Elev: 475.23			

Era/Formation	Faulted	?	Eroded	MD	TVD	Isopach	Subsea	Top Code	Geologist
MESOZOIC								**MESO**	FULTONREGULA
Cretaceous								**CRET**	FULTONREGULA
Pierre Shale								PIERRE	FULTONREGULA
Coulter Member								COULTER	FULTONREGULA
Odanah Member								ODANAH	FULTONREGULA
Millwood Member				347.0	347.0	48.0	128.2	MILLWOOD	FULTONREGULA
Pembina Member				395.0	395.0	21.0	80.2	PEMBINA	FULTONREGULA
Gammon Ferruginous Member				416.0	416.0	47.5	59.2	GAMMON	FULTONREGULA
Carlile Formation				463.5	463.5	91.0	11.7	CARLILE	FULTONREGULA
Boyne Member (former Niobrara)				463.5	463.5	56.5	11.7	BOYNE	FULTONREGULA
Morden Member				520.0	520.0	34.5	-44.8	MORDEN	FULTONREGULA
Favel Formation (2nd White Specks)				554.5	554.5	27.0	-79.3	FAVEL	FULTONREGULA
Assiniboine Member				554.5	554.5	17.0	-79.3	ASSIN	FULTONREGULA
Keld Member				571.5	571.5	10.0	-96.3	KELD	FULTONREGULA
Ashville Formation				581.5	581.5	118.0	-106.3	ASHVILLE	FULTONREGULA
upper Ashville Formation				581.5	581.5	50.0	-106.3	ASHU	FULTONREGULA
Belle Fourche Member				581.5	581.5	50.0	-106.3	BELLE	FULTONREGULA
"X" bentonite				586.5	586.5	N/A	-111.3	XBENTONITE	FULTONREGULA
top of Fish-scale zone				613.5	613.5	18.0	-138.3	FSC	FULTONREGULA
base of Fish-scale marker				631.5	631.5	N/A	-156.3	BFS	FULTONREGULA
lower Ashville Formation				631.5	631.5	68.0	-156.3	ASHL	FULTONREGULA
Westgate Member				631.5	631.5	22.5	-156.3	WEST	FULTONREGULA
Newcastle Member (Ashville								NEWCAS	FULTONREGULA
Skull Creek Member				654.0	654.0	45.5	-178.8	SKULLCRK	FULTONREGULA
Swan River Formation				699.5	699.5	105.5	-224.3	SWANR	FULTONREGULA
									FULTONREGULA
Jurassic			Y	805.0	805.0	246.0	-329.8	**JUR**	FULTONREGULA
Waskada Formation			Y	805.0	805.0		-329.8	WASKADA	FULTONREGULA
Melita Formation			Y	805.0	805.0	122.0	-329.8	MELITA	FULTONREGULA
upper Melita Member			Y	805.0	805.0	61.5	-329.8	MELITAU	FULTONREGULA
lower Melita Member				866.5	866.5	60.5	-391.3	MELITAL	FULTONREGULA
Reston Formation		Y		927.0	927.0	48.0	-451.8	RESTON	FULTONREGULA
Amaranth Formation				975.0	975.0	76.0	-499.8	AMAR	FULTONREGULA
Upper (Evaporites) Member				975.0	975.0	36.5	-499.8	AMAREVAP	FULTONREGULA
Lower (Red Beds) Member				1011.5	1011.5	39.5	-536.3	AMARRBDS	FULTONREGULA
upper shaly unit				1011.5	1011.5	21.0	-536.3	USHALE	FULTONREGULA
lower sandy unit				1032.5	1032.5	18.5	-557.3	LSANDY	FULTONREGULA
"B" sand				1032.5	1032.5	1.0	-557.3	BSAND	FULTONREGULA
base of "B" sand				1033.5	1033.5	N/A	-558.3	BSANDBS	FULTONREGULA
"A" sand				1036.0	1036.0	1.5	-560.8	ASAND	FULTONREGULA
base of "A" sand				1037.5	1037.5	N/A	-562.3	ASANDBS	FULTONREGULA
main sand				1039.0	1039.0	4.5	-563.8	MAINSAND	FULTONREGULA
base of main sand				1043.5	1043.5	N/A	-568.3	MAINSANDBS	FULTONREGULA
lower sand				1047.5	1047.5	3.0	-572.3	LSAND	FULTONREGULA
base of lower sand				1050.5	1050.5	N/A	-575.3	LSANDBS	FULTONREGULA
									FULTONREGULA

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Formation TD: Charles		**Deviation:**	☑ Vertical ☐ Directional ☒ Horizontal	**Max temp °C**	40
Formation depth penetration at TD 31.0		**Date Entered into MOGWIS:**		September 7, 2010	
KB Elev: 475.23					

Era/Formation	Faulted	?	Eroded	MD	TVD	Isopach	Subsea	Top Code	Geologist
PALEOZOIC			Y	1051.0	1051.0		-575.8	**PALEO**	FULTONREGULA
Mississippian			Y	1051.0	1051.0		-575.8	**MISS**	FULTONREGULA
Madison Group			Y	1051.0	1051.0		-575.8	MADISON	FULTONREGULA
alteration zone								MISSALTER	FULTONREGULA
base of alteration zone						N/A		MISSALTERBS	FULTONREGULA
Charles Formation			Y	1051.0	1051.0		-575.8	CHARLES	FULTONREGULA
Mission Canyon Formation								MISSION	FULTONREGULA
MC-3 Member								MC3	FULTONREGULA
MC-3b								MC3B	FULTONREGULA
MC-3 marker						N/A		MC3MRK	FULTONREGULA
Dando Evaporite								DANDO	FULTONREGULA
base of Dando Evaporite						N/A		DANDOBS	FULTONREGULA
MC-3a								MC3A	FULTONREGULA
MC-2 Member								MC2	FULTONREGULA
upper MC-2								MC2U	FULTONREGULA
MC-2 marker						N/A		MC2MRK	FULTONREGULA
lower MC-2								MC2L	FULTONREGULA
MC-1 Member								MC1	FULTONREGULA
Lodgepole Formation			Y					LODGPL	FULTONREGULA
upper Lodgepole Formation			Y					LODGPLU	FULTONREGULA
Flossie Lake Member			Y					FLOSSLK	FULTONREGULA
Whitewater Lake Member								WHWTLK	FULTONREGULA
Upper Whitewater								WHWTLKU	FULTONREGULA
Lower Whitewater								WHWTLKL	FULTONREGULA
lower Lodgepole Formation								LODGPLL	FULTONREGULA
Virden Member								VIRDEN	FULTONREGULA
Upper Virden Member								VIRDENU	FULTONREGULA
Lower Virden Member								VIRDENL	FULTONREGULA
Sandhill								SANDHILL	FULTONREGULA
First Oolite								OOLITE1	FULTONREGULA
base of First Oolite						N/A		OOLITE1BS	FULTONREGULA
Second Oolite								OOLITE2	FULTONREGULA
base of Second						N/A		OOLITE2BS	FULTONREGULA
Third Oolite								OOLITE3	FULTONREGULA
base of Third						N/A		OOLITE3BS	FULTONREGULA
Fourth Oolite								OOLITE4	FULTONREGULA
base of Fourth						N/A		OOLITE4BS	FULTONREGULA
Scallion Member (cherty)								SCALLION	FULTONREGULA
Routledge Shale facies								ROUTLEDGE	FULTONREGULA
Daly Member		Y						DALY	FULTONREGULA
upper Daly Member		Y						DALYU	FULTONREGULA
lower Lodgepole Formation		Y						LODGPLL	FULTONREGULA
middle Daly Member		Y						DALYM	FULTONREGULA
lower Daly Member		Y						DALYL	FULTONREGULA
Cruickshank Shale facies		Y						CRUICKSHALE	FULTONREGULA
Cruickshank Crinoidal		Y						CRUICKCRIN	FULTONREGULA
Cromer Shale facies								CROMER	FULTONREGULA
Basal Limestone facies								BASALLMS	FULTONREGULA
base of Madison Group						N/A		MADISONBS	FULTONREGULA
Bakken Formation								BAKK	FULTONREGULA
Upper Bakken Member								BAKKU	FULTONREGULA
Middle Bakken Member								BAKKM	FULTONREGULA
Lower Bakken Member								BAKKL	FULTONREGULA

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Formation at TD: Charles	**Deviation:** ☑ Vertical ☐ Directional ☒ Horizontal	**Max temp °C** 40
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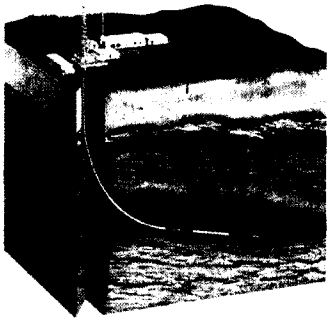
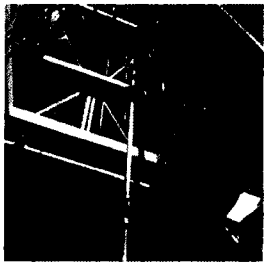
Era/Formation	Faulted	?	Eroded	MD	TVD	Isopach	Subsea	Top Code	Geologist
									FULTONREGULA
Devonian			Y					DEV	FULTONREGULA
Qu'Appelle Group			Y					QUAPPELLE	FULTONREGULA
Three Forks Formation			Y					TFRKS	FULTONREGULA
Saskatchewan Group								SASK	FULTONREGULA
Birdbear Formation								BDBEAR	FULTONREGULA
upper Birdbear								BDBEARU	FULTONREGULA
lower Birdbear								BDBEARL	FULTONREGULA
Duperow Formation								DUPEROW	FULTONREGULA
Seward Member									FULTONREGULA
Flat Lake Member									FULTONREGULA
Wymark Member									FULTONREGULA
upper Wymark									FULTONREGULA
middle Wymark									FULTONREGULA
lower Wymark									FULTONREGULA
Manitoba Group								MAN	FULTONREGULA
Souris River Formation								SOURIS	FULTONREGULA
Hatfield Member									FULTONREGULA
Souris River marker						N/A		SOURISMRK	FULTONREGULA
Harris Member									FULTONREGULA
Davidson Member									FULTONREGULA
First Red Beds								RBD1	FULTONREGULA
Dawson Bay Formation								DAWSONB	FULTONREGULA
Neely Member									FULTONREGULA
Burr Member									FULTONREGULA
Second Red Bed Member								RBD2	FULTONREGULA
Elk Point Group								ELKPT	FULTONREGULA
Prairie Formation								PRAIRIE	FULTONREGULA
Top of Whitebear Member								WHTBEAR	FULTONREGULA
Base of Whitebear Member						N/A		WHTBEARBS	FULTONREGULA
Top of Esterhazy Member								ESTERHAZY	FULTONREGULA
Base of Esterhazy Member						N/A		ESTERHAZYBS	FULTONREGULA
base of halite/potash						N/A		SALTBS	FULTONREGULA
Winnipegosis Formation								WPGOSIS	FULTONREGULA
Transitional Beds								TRANSITIONAL	FULTONREGULA
Upper Member (reef/inter-								WPGOSISU	FULTONREGULA
Lower Member (platform)								WPGOSISL	FULTONREGULA
Ashern Formation								ASHERN	FULTONREGULA
									FULTONREGULA
Silurian								SIL	FULTONREGULA
Interlake Group								INTERLK	FULTONREGULA
upper Interlake									FULTONREGULA
lower Interlake									FULTONREGULA
Stonewall Formation								STNWALL	FULTONREGULA
upper Stonewall Formation								STNWALLU	FULTONREGULA
T-marker								TMRK	FULTONREGULA
									FULTONREGULA
Ordovician (base of T-marker)								ORD	FULTONREGULA
lower Stonewall Formation								STNWALLL	FULTONREGULA
Williams Member								WILLIAMS	FULTONREGULA
Stony Mountain Formation								STNYMTN	FULTONREGULA
upper Stony Mountain								STNYMTNU	FULTONREGULA
Gunton Member								GUNTON	FULTONREGULA
lower Stony Mountain								STNYMTNL	FULTONREGULA
Gunn Member (Stony								GUNN	FULTONREGULA
Hartaven Member								HARTAVEN	FULTONREGULA

#7447

END OF WELL REPORT

Molopo Energy Canada Ltd.
Molopo Pierson Prov Hzntl
13C-32/16D-32-1-29WPM
Job: 10147566R
Well License #7447

Submitted By: Jeff Shafer

PHOENIX
TECHNOLOGY SERVICES LP

Survey Report

PHOENIX
TECHNOLOGY SERVICES LP

Phoenix Technology Services LP

Survey Report

Database:	PHXDB Compass	**Local Co-ordinate Reference:**	Site (13C-32) 16D-32-1-29WPM
Company:	Molopo Energy Canada Ltd.	**TVD Reference:**	Actual KB @ 475.20m
Project:	Pierson	**MD Reference:**	Actual KB @ 475.20m
Site:	(13C-32) 16D-32-1-29WPM	**North Reference:**	True
Well:	Molopo Pierson Prov Hz	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	16-32-001-29W1		
Design:	10147566R Surveys		

Project Pierson

Map System:	Universal Transverse Mercator	**System Datum:**	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	Zone 14N (102 W to 96 W)		

Site (13C-32) 16D-32-1-29WPM

Site Position:		**Northing:**	5,439,816.18 m	**Latitude:**	49.09
From:	Map	**Easting:**	329,208.87 m	**Longitude:**	-101.34
Position Uncertainty:	0.00 m	**Slot Radius:**	mm	**Grid Convergence:**	-1.77 °

Well Molopo Pierson Prov Hz

Well Position	**+N/-S**	0.00 m	**Northing:**	5,439,816.18 m	**Latitude:**	49° 5' 14.933 N
	+E/-W	0.00 m	**Easting:**	329,208.87 m	**Longitude:**	101° 20' 21.252 W
Position Uncertainty		0.00 m	**Wellhead Elevation:**	m	**Ground Level:**	471.23 m

Wellbore 16-32-001-29W1

Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010_14	28/06/2010	7.26	74.22	57,358

Design 10147566R Surveys

Audit Notes: Well License # 7447

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

Vertical Section:	Depth From (TVD) (m)	+N/-S (m)	+E/-W (m)	Direction (°)
	0.00	0.00	0.00	90.38

Survey Program Date 16/07/2010

From ()	To (m)	Survey (Wellbore)	Tool Name	Description
0.00	1,998.00	10147566 Surveys (16-32-001-29W1)	MWD	MWD - Standard

Survey

Measured Depth (m)	Inclination (°)	Azimuth (°)	Vertical Depth (m)	Subsea Depth (m)	+N/-S (m)	+E/-W (m)	Vertical Section (m)	Dogleg Rate (°/30m)	Build Rate (°/30m)	Turn Rate (°/30m)
0.00	0.00	0.00	0.00	475.20	0.00	0.00	0.00	0.000	0.000	0.000
Surface Csg. = 202m MD										
202.00	0.00	0.00	202.00	273.20	0.00	0.00	0.00	0.000	0.000	0.000
212.55	0.40	125.60	212.55	262.65	-0.02	0.03	0.03	1.137	1.137	0.000
268.11	0.30	177.30	268.11	207.09	-0.28	0.19	0.20	0.172	-0.054	27.916
323.57	0.50	178.90	323.57	151.63	-0.67	0.21	0.21	0.108	0.108	0.865
335.30	0.52	176.44	335.30	139.90	-0.77	0.21	0.22	0.076	0.051	-6.292
370.29	0.60	170.30	370.29	104.91	-1.11	0.25	0.26	0.086	0.069	-5.264
417.82	0.80	176.40	417.81	57.39	-1.69	0.31	0.33	0.135	0.126	3.850

Phoenix Technology Services LP

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Project:	Pierson	**MD Reference:**	Actual KB @ 475.20m
Site:	(13C-32) 16D-32-1-29WPM	**North Reference:**	True
Well:	Molopo Pierson Prov Hz	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	16-32-001-29W1		
Design:	10147566R Surveys		

Survey

Measured Depth (m)	Inclination (°)	Azimuth (°)	Vertical Depth (m)	Subsea Depth (m)	+N/-S (m)	+E/-W (m)	Vertical Section (m)	Dogleg Rate (°/30m)	Build Rate (°/30m)	Turn Rate (°/30m)
436.92	0.40	177.20	436.91	38.29	-1.89	0.33	0.34	0.628	-0.628	1.257
474.94	0.50	35.50	474.93	0.27	-1.88	0.43	0.44	0.671	0.079	-111.810
531.59	0.50	12.10	531.58	-56.38	-1.44	0.62	0.63	0.107	0.000	-12.392
587.76	0.50	22.70	587.75	-112.55	-0.97	0.77	0.78	0.049	0.000	5.661
634.94	0.60	349.70	634.92	-159.72	-0.54	0.80	0.81	0.208	0.064	-20.983
709.50	0.80	183.70	709.48	-234.28	-0.68	0.70	0.71	0.559	0.080	-66.792
756.29	0.30	221.50	756.27	-281.07	-1.10	0.60	0.61	0.380	-0.321	24.236
765.88	0.30	183.70	765.86	-290.66	-1.14	0.58	0.59	0.608	0.000	-118.248
KOP = 772m MD										
772.00	0.98	106.03	771.98	-296.78	-1.17	0.63	0.64	4.714	3.333	-380.735
775.40	1.50	99.80	775.38	-300.18	-1.18	0.70	0.71	4.733	4.588	-54.971
784.83	3.30	87.90	784.80	-309.60	-1.20	1.09	1.10	5.911	5.726	-37.858
794.43	4.90	83.80	794.38	-319.18	-1.14	1.78	1.79	5.080	5.000	-12.812
803.64	6.60	82.10	803.54	-328.34	-1.03	2.69	2.70	5.565	5.537	-5.537
813.28	8.50	80.00	813.09	-337.89	-0.83	3.94	3.95	5.974	5.913	-6.535
822.57	10.60	82.30	822.26	-347.06	-0.59	5.47	5.47	6.891	6.781	7.427
832.01	12.70	88.20	831.50	-356.30	-0.44	7.37	7.37	7.665	6.674	18.750
841.50	14.50	94.50	840.72	-365.52	-0.50	9.59	9.60	7.362	5.690	19.916
850.69	16.40	93.90	849.58	-374.38	-0.68	12.03	12.04	6.224	6.202	-1.959
860.14	18.10	90.20	858.61	-383.41	-0.78	14.83	14.84	6.421	5.397	-11.746
869.37	19.70	85.50	867.34	-392.14	-0.66	17.82	17.82	7.175	5.200	-15.276
878.87	22.10	84.00	876.21	-401.01	-0.35	21.19	21.19	7.764	7.579	-4.737
888.48	24.30	85.80	885.05	-409.85	-0.02	24.96	24.96	7.215	6.868	5.619
897.71	27.00	88.30	893.37	-418.17	0.19	28.95	28.95	9.453	8.776	8.126
907.18	29.60	91.00	901.70	-426.50	0.21	33.44	33.44	9.179	8.237	8.553
916.57	31.80	90.80	909.78	-434.58	0.13	38.23	38.23	7.036	7.029	-0.639
925.83	33.70	90.60	917.57	-442.37	0.07	43.24	43.24	6.165	6.156	-0.648
935.30	36.10	91.10	925.33	-450.13	-0.01	48.66	48.66	7.657	7.603	1.584
944.76	38.40	90.50	932.86	-457.66	-0.09	54.38	54.38	7.384	7.294	-1.903
954.23	40.80	89.90	940.16	-464.96	-0.11	60.42	60.42	7.699	7.603	-1.901
963.69	43.20	89.20	947.19	-471.99	-0.06	66.75	66.75	7.754	7.611	-2.220
973.14	45.50	88.30	953.94	-478.74	0.09	73.35	73.35	7.570	7.302	-2.357
982.59	47.70	88.30	960.44	-485.24	0.29	80.22	80.21	6.984	6.984	0.000
991.96	49.30	88.70	966.65	-491.45	0.48	87.23	87.23	5.212	5.123	1.281
1,001.16	51.40	88.30	972.52	-497.32	0.66	94.31	94.31	6.921	6.848	-1.304
1,010.32	52.90	88.90	978.14	-502.94	0.84	101.54	101.53	5.152	4.913	1.965
1,019.49	54.10	90.10	983.59	-508.39	0.90	108.91	108.90	5.037	3.926	3.926
1,028.68	55.80	90.10	988.87	-513.67	0.89	116.44	116.43	5.550	5.550	0.000
1,037.92	57.00	89.50	993.98	-518.78	0.92	124.13	124.12	4.220	3.896	-1.948
1,047.15	59.20	89.30	998.86	-523.66	1.00	131.97	131.96	7.172	7.151	-0.650
1,056.36	61.50	89.90	1,003.41	-528.21	1.05	139.97	139.96	7.682	7.492	1.954
1,065.82	64.20	90.30	1,007.73	-532.53	1.04	148.39	148.38	8.636	8.562	1.268
1,075.02	66.80	90.30	1,011.55	-536.35	0.99	156.76	156.75	8.478	8.478	0.000

Phoenix Technology Services LP

Survey Report

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Project:	Pierson	**MD Reference:**	Actual KB @ 475.20m
Site:	(13C-32) 16D-32-1-29WPM	**North Reference:**	True
Well:	Molopo Pierson Prov Hz	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	16-32-001-29W1		
Design:	10147566R Surveys		

Survey

Measured Depth (m)	Inclination (°)	Azimuth (°)	Vertical Depth (m)	Subsea Depth (m)	+N/-S (m)	+E/-W (m)	Vertical Section (m)	Dogleg Rate (°/30m)	Build Rate (°/30m)	Turn Rate (°/30m)
1,084.23	69.40	91.30	1,014.98	-539.78	0.87	165.30	165.29	8.992	8.469	3.257
1,093.67	72.30	92.60	1,018.08	-542.88	0.57	174.21	174.21	10.008	9.216	4.131
1,102.88	73.40	92.10	1,020.79	-545.59	0.21	183.01	183.00	3.906	3.583	-1.629
1,112.09	73.00	92.70	1,023.46	-548.26	-0.16	191.81	191.81	2.280	-1.303	1.954
1,121.65	75.60	92.80	1,026.04	-550.84	-0.60	201.01	201.01	8.165	8.159	0.314
1,131.20	78.20	91.00	1,028.21	-553.01	-0.91	210.30	210.30	9.851	8.168	-5.654
1,140.64	81.10	89.70	1,029.90	-554.70	-0.97	219.59	219.59	10.072	9.216	-4.131
1,149.88	84.10	88.80	1,031.09	-555.89	-0.85	228.75	228.75	10.162	9.740	-2.922
1,159.34	87.40	89.10	1,031.79	-556.59	-0.67	238.18	238.18	10.508	10.465	0.951
1,168.80	89.00	89.50	1,032.09	-556.89	-0.56	247.63	247.63	5.230	5.074	1.268
1,178.26	88.40	89.40	1,032.30	-557.10	-0.47	257.09	257.09	1.929	-1.903	-0.317
1,187.70	88.30	88.90	1,032.58	-557.38	-0.33	266.53	266.52	1.620	-0.318	-1.589
1,197.18	90.10	90.80	1,032.71	-557.51	-0.30	276.00	276.00	8.282	5.696	6.013
1,206.62	90.90	92.20	1,032.63	-557.43	-0.55	285.44	285.44	5.124	2.542	4.449
1,216.13	91.10	92.50	1,032.46	-557.26	-0.94	294.94	294.94	1.137	0.631	0.946
1,225.72	90.70	92.30	1,032.31	-557.11	-1.34	304.52	304.52	1.399	-1.251	-0.626
1,235.32	89.90	92.20	1,032.26	-557.06	-1.72	314.11	314.12	2.519	-2.500	-0.312
1,244.77	89.70	92.10	1,032.29	-557.09	-2.07	323.56	323.56	0.710	-0.635	-0.317
1,254.00	89.50	91.40	1,032.36	-557.16	-2.35	332.78	332.79	2.366	-0.650	-2.275
1,263.26	89.00	91.00	1,032.48	-557.28	-2.55	342.04	342.05	2.074	-1.620	-1.296
1,272.30	89.10	91.20	1,032.63	-557.43	-2.72	351.08	351.09	0.742	0.332	0.664
1,282.20	90.00	92.30	1,032.71	-557.51	-3.02	360.97	360.98	4.307	2.727	3.333
1,291.75	90.60	92.60	1,032.66	-557.46	-3.43	370.51	370.53	2.107	1.885	0.942
1,301.18	91.40	93.70	1,032.49	-557.29	-3.95	379.93	379.94	4.327	2.545	3.499
1,310.72	91.20	93.70	1,032.28	-557.08	-4.56	389.44	389.47	0.629	-0.629	0.000
1,320.34	90.90	93.40	1,032.10	-556.90	-5.16	399.04	399.07	1.323	-0.936	-0.936
1,329.58	90.60	93.70	1,031.98	-556.78	-5.73	408.27	408.29	1.377	-0.974	0.974
1,339.03	89.70	92.80	1,031.95	-556.75	-6.27	417.70	417.73	4.041	-2.857	-2.857
1,348.62	89.30	92.30	1,032.04	-556.84	-6.69	427.28	427.32	2.003	-1.251	-1.564
1,357.86	89.70	92.60	1,032.12	-556.92	-7.09	436.51	436.55	1.623	1.299	0.974
1,367.30	90.10	94.50	1,032.13	-556.93	-7.67	445.93	445.97	6.170	1.271	6.038
1,376.71	89.80	94.70	1,032.14	-556.94	-8.43	455.31	455.36	1.149	-0.956	0.638
1,386.17	89.50	94.10	1,032.20	-557.00	-9.15	464.74	464.79	2.127	-0.951	-1.903
1,395.51	89.60	94.70	1,032.27	-557.07	-9.87	474.06	474.11	1.954	0.321	1.927
1,404.73	90.20	96.10	1,032.29	-557.09	-10.74	483.24	483.30	4.956	1.952	4.555
1,413.90	91.00	95.80	1,032.19	-556.99	-11.69	492.36	492.42	2.795	2.617	-0.981
1,423.25	90.10	93.70	1,032.10	-556.90	-12.46	501.67	501.74	7.330	-2.888	-6.738
1,432.60	90.20	93.40	1,032.08	-556.88	-13.04	511.00	511.08	1.015	0.321	-0.963
1,441.86	90.10	93.00	1,032.05	-556.85	-13.56	520.25	520.33	1.336	-0.324	-1.296
1,451.11	89.80	92.90	1,032.06	-556.86	-14.04	529.49	529.57	1.026	-0.973	-0.324
1,460.48	89.60	95.10	1,032.11	-556.91	-14.69	538.83	538.92	7.073	-0.640	7.044
1,469.75	89.50	94.80	1,032.18	-556.98	-15.49	548.07	548.16	1.023	-0.324	-0.971

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Wellbore:	16-32-001-29W1		
Design:	10147566R Surveys		

Survey

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1,479.16	88.20	93.50	1,032.37	-557.17	-16.17	557.45	557.55	5.861	-4.145	-4.145
1,488.45	87.90	92.70	1,032.69	-557.49	-16.67	566.72	566.82	2.758	-0.969	-2.583
1,497.88	87.00	92.40	1,033.11	-557.91	-17.09	576.13	576.24	3.018	-2.863	-0.954
1,507.11	87.10	92.60	1,033.58	-558.38	-17.49	585.34	585.45	0.726	0.325	0.650
1,516.33	86.80	93.20	1,034.07	-558.87	-17.96	594.54	594.64	2.180	-0.976	1.952
1,525.57	87.60	92.80	1,034.53	-559.33	-18.44	603.75	603.86	2.903	2.597	-1.299
1,534.93	88.00	91.10	1,034.89	-559.69	-18.76	613.10	613.21	5.594	1.282	-5.449
1,544.14	87.80	89.90	1,035.22	-560.02	-18.84	622.30	622.42	3.960	-0.651	-3.909
1,553.51	89.20	90.20	1,035.47	-560.27	-18.85	631.67	631.78	4.584	4.482	0.961
1,562.88	89.40	90.10	1,035.58	-560.38	-18.87	641.04	641.15	0.716	0.640	-0.320
1,572.08	89.00	88.90	1,035.71	-560.51	-18.79	650.24	650.35	4.124	-1.304	-3.913
1,581.37	89.80	88.70	1,035.81	-560.61	-18.60	659.53	659.64	2.663	2.583	-0.646
1,590.44	90.60	88.60	1,035.78	-560.58	-18.38	668.59	668.70	2.667	2.646	-0.331
1,599.87	90.40	88.30	1,035.69	-560.49	-18.13	678.02	678.13	1.147	-0.636	-0.954
1,609.22	89.70	87.50	1,035.69	-560.49	-17.79	687.36	687.47	3.411	-2.246	-2.567
1,618.59	89.70	86.90	1,035.74	-560.54	-17.33	696.72	696.82	1.921	0.000	-1.921
1,627.83	90.00	87.00	1,035.76	-560.56	-16.84	705.95	706.05	1.027	0.974	0.325
1,637.19	91.30	87.60	1,035.65	-560.45	-16.40	715.30	715.39	4.589	4.167	1.923
1,646.56	90.90	87.20	1,035.47	-560.27	-15.97	724.66	724.75	1.811	-1.281	-1.281
1,655.70	90.80	86.90	1,035.34	-560.14	-15.50	733.78	733.87	1.038	-0.328	-0.985
1,664.92	90.90	86.20	1,035.20	-560.00	-14.95	742.99	743.07	2.301	0.325	-2.278
1,674.14	90.60	85.60	1,035.08	-559.88	-14.29	752.18	752.26	2.183	-0.976	-1.952
1,683.29	90.30	84.40	1,035.01	-559.81	-13.49	761.30	761.37	4.055	-0.984	-3.934
1,692.70	91.40	84.40	1,034.87	-559.67	-12.57	770.66	770.73	3.507	3.507	0.000
1,701.93	93.30	85.20	1,034.49	-559.29	-11.74	779.84	779.90	6.700	6.176	2.600
1,711.18	93.80	85.80	1,033.92	-558.72	-11.01	789.05	789.10	2.530	1.622	1.946
1,720.55	93.80	87.10	1,033.30	-558.10	-10.43	798.38	798.43	4.153	0.000	4.162
1,729.92	93.20	88.20	1,032.72	-557.52	-10.05	807.72	807.77	4.006	-1.921	3.522
1,739.30	92.90	88.10	1,032.23	-557.03	-9.75	817.08	817.13	1.011	-0.959	-0.320
1,748.67	91.70	88.70	1,031.85	-556.65	-9.49	826.44	826.49	4.295	-3.842	1.921
1,757.96	91.30	88.90	1,031.61	-556.41	-9.29	835.73	835.77	1.444	-1.292	0.646
1,767.27	91.10	89.30	1,031.41	-556.21	-9.14	845.04	845.08	1.441	-0.644	1.289
1,776.52	91.10	89.70	1,031.23	-556.03	-9.06	854.28	854.32	1.297	0.000	1.297
1,785.72	89.60	90.20	1,031.18	-555.98	-9.06	863.48	863.52	5.156	-4.891	1.630
1,794.94	89.40	90.00	1,031.26	-556.06	-9.07	872.70	872.74	0.920	-0.651	-0.651
1,804.33	89.20	89.60	1,031.37	-556.17	-9.04	882.09	882.13	1.429	-0.639	-1.278
1,813.57	89.10	89.50	1,031.51	-556.31	-8.97	891.33	891.37	0.459	-0.325	-0.325
1,822.82	89.10	89.30	1,031.66	-556.46	-8.87	900.58	900.62	0.649	0.000	-0.649
1,832.23	89.60	90.40	1,031.76	-556.56	-8.85	909.99	910.03	3.852	1.594	3.507
1,841.57	88.80	90.10	1,031.89	-556.69	-8.89	919.33	919.37	2.744	-2.570	-0.964
1,850.83	88.60	90.10	1,032.10	-556.90	-8.90	928.58	928.62	0.648	-0.648	0.000
1,860.27	88.10	88.60	1,032.37	-557.17	-8.80	938.02	938.06	5.023	-1.589	-4.767
1,869.52	88.40	90.00	1,032.66	-557.46	-8.68	947.26	947.30	4.642	0.973	4.541

Phoenix Technology Services LP

Survey Report

Database:	PHXDB Compass	**Local Co-ordinate Reference:**	Site (13C-32) 16D-32-1-29WPM
Company:	Molopo Energy Canada Ltd.	**TVD Reference:**	Actual KB @ 475.20m
Project:	Pierson	**MD Reference:**	Actual KB @ 475.20m
Site:	(13C-32) 16D-32-1-29WPM	**North Reference:**	True
Well:	Molopo Pierson Prov Hz	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	16-32-001-29W1		
Design:	10147566R Surveys		

Survey

Measured Depth (m)	Inclination (°)	Azimuth (°)	Vertical Depth (m)	Subsea Depth (m)	+N/-S (m)	+E/-W (m)	Vertical Section (m)	Dogleg Rate (°/30m)	Build Rate (°/30m)	Turn Rate (°/30m)
1,878.44	89.20	90.70	1,032.84	-557.64	-8.74	956.18	956.22	3.575	2.691	2.354
1,887.84	90.10	91.30	1,032.90	-557.70	-8.90	965.58	965.62	3.452	2.872	1.915
1,897.21	90.30	92.10	1,032.87	-557.67	-9.18	974.95	974.99	2.640	0.640	2.561
1,906.46	89.80	92.20	1,032.86	-557.66	-9.53	984.19	984.23	1.654	-1.622	0.324
1,915.67	89.70	91.70	1,032.90	-557.70	-9.84	993.39	993.44	1.661	-0.326	-1.629
1,924.83	89.60	91.70	1,032.96	-557.76	-10.11	1,002.55	1,002.59	0.328	-0.328	0.000
1,934.33	90.60	91.20	1,032.94	-557.74	-10.35	1,012.05	1,012.09	3.531	3.158	-1.579
1,943.70	91.60	91.10	1,032.76	-557.56	-10.54	1,021.41	1,021.46	3.218	3.202	-0.320
1,952.95	91.40	90.70	1,032.52	-557.32	-10.68	1,030.66	1,030.71	1.450	-0.649	-1.297
1,962.41	91.30	90.50	1,032.30	-557.10	-10.78	1,040.12	1,040.16	0.709	-0.317	-0.634
1,971.61	92.00	90.70	1,032.03	-556.83	-10.88	1,049.31	1,049.36	2.374	2.283	0.652
Last Survey = 1981m MD										
1,981.06	92.30	90.50	1,031.68	-556.48	-10.98	1,058.75	1,058.80	1.144	0.952	-0.635
Ext. to TD = 1998m MD										
1,998.00	92.10	90.50	1,031.03	-555.83	-11.13	1,075.68	1,075.73	0.354	-0.354	0.000

Survey Annotations

Measured Depth ()	Vertical Depth ()	Local Coordinates +N/-S ()	Local Coordinates +E/-W ()	Comment
202.00	202.00	0.00	0.00	Surface Csg. = 202m MD
772.00	771.98	-1.17	0.63	KOP = 772m MD
1,981.06	1,031.68	-10.98	1,058.75	Last Survey = 1981m MD
1,998.00	1,031.03	-11.13	1,075.68	Ext. to TD = 1998m MD

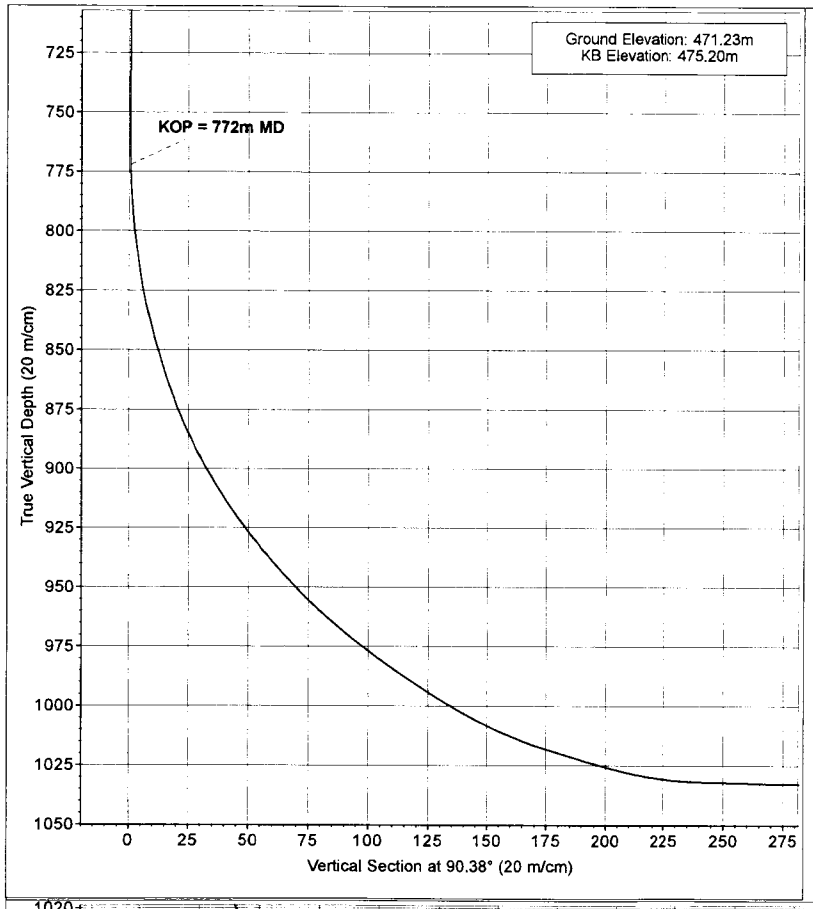
Checked By: _____ Approved By: _____ Date: _____

Molopo Energy Canada Ltd.

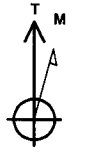
Project: Pierson
Site: (13C-32) 16D-32-1-29WPM
Well: Molopo Pierson Prov Hz
Wellbore: 16-32-001-29W1
Design: 10147566R Surveys

Well License #: 7447

PHOENIX TECHNOLOGY SERVICES LP



Surface Co-ordinates
110.00m S of N Boundary
55.00m E of W Boundary, Sec. 32

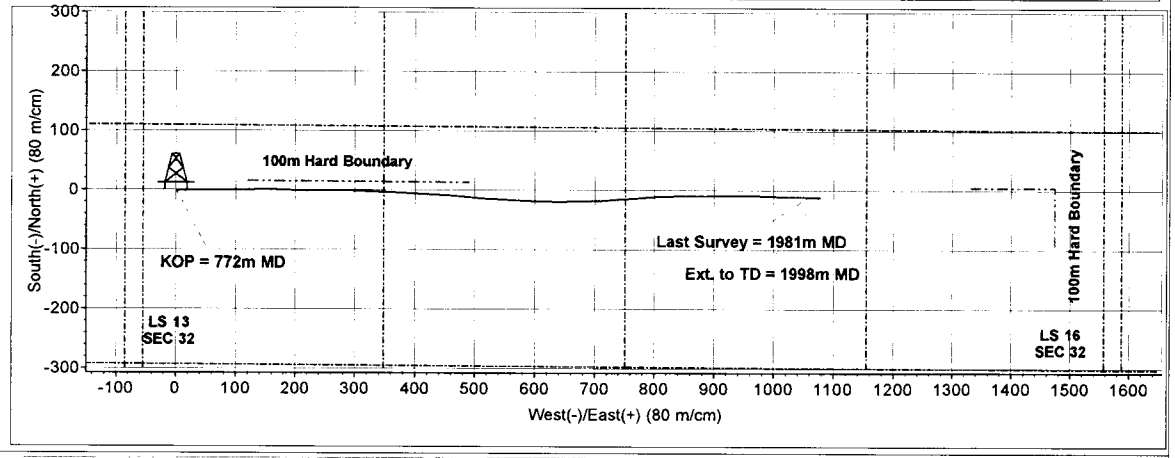


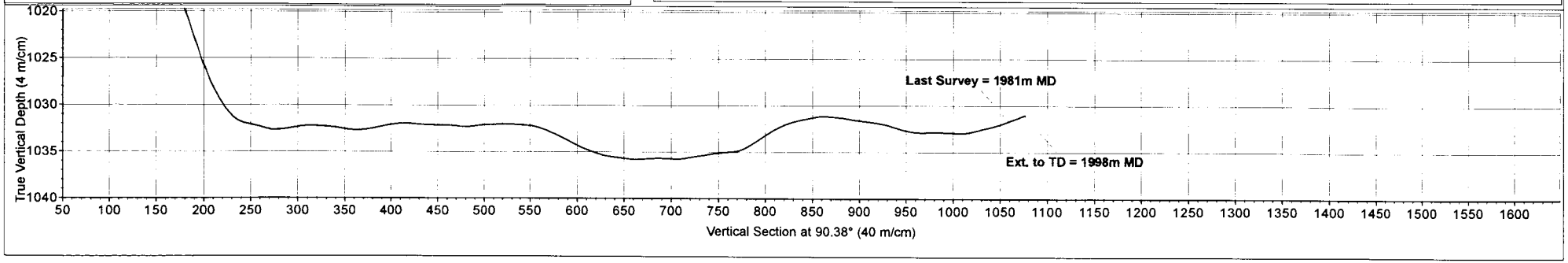
Azimuths to True North
Magnetic North: 7.26°

Magnetic Field
Strength: 57357.8snT
Dip Angle: 74.22°
Date: 28/06/2010
Model: IGRF2010_14

ANNOTATIONS

TVD	MD	Annotation
202.00	202.00	Surface Csg. = 202m MD
771.98	772.00	KOP = 772m MD
1031.68	1981.06	Last Survey = 1981m MD
1031.03	1998.00	Ext. to TD = 1998m MD





Bottom Hole Assemblies

PHOENIX
TECHNOLOGY SERVICES LP

PHOENIX TECHNOLOGY SERVICES LP

Client: Molopo Energy Canada Ltd.
Well Name: Molopo Pierson Prov Hz
Job Number: 10147566R
Well Type: HZ Strat Monobore
KB: 475.2

Date In: July 8, 2010
Date Out: July 9, 2010
Depth In: 202.00
Depth Out: 1082.00

Total Meters Drilled: 880.00

Bit No.	Serial #	Description	Sub Description	OD	ID	Pin	Box	Strap	Total
Bit	Z72679A	KX513	RBI Canada	200		4 1/2 Reg		0.20	0.20
1	24XH165166PTS	Mud Motor	6 3/4in 7/8 lb 5.0 stg HR	162		4 1/2 Reg	4 1/2 H90	9.54	9.74
2	Q165060	Orient Sub		162	72	4 1/2 H90	4 1/2 H90	1.00	10.74
3	FS65066	Float Sub		160	59	4 1/2 H90	4 1/2 H90	0.78	11.52
4	FL165003	Flex Monel		150	80	4 1/2 H90	4 1/2 H90	8.82	20.34
5	FL165006	Flex Monel		151	81	4 1/2 H90	4 1/2 H90	9.15	29.49
6	FL165080	Flex Monel		156	70	4 1/2 H90	4 1/2 H90	8.99	38.48
7	XO020	Crossover Sub		153	66	4 1/2 H90	4 FH	0.65	39.13
8	DP					4 FH	4 FH	1350.84	1389.97
9	HWDP					4 FH	4 FH	557.45	1947.42
10									
11									
12									
13									
14									
15									
16									
17									
18									
19									
								TOTAL	1947.42

Run	Serial #	Description	Sub Description	MFG /AJD deg	Lobe	Flow Rate	Rpm	Meters	Drill Hrs	Circ. Hr	Total
1	24XH165166PTS	Mud Motor	6 3/4in 7/8 lb 5.0 stg	National/1.5	7/8	1.2	103	880.00	24.75	4.25	29.00
Pump Press.	8100	Differential Pressure:	2400	Poppit Size:	1.128		Orfice Size:	1.35			29.00

No	MFG / SER #	IADC Code	Jets	Type	Size	Depth in	Depth out	Meters	Hrs	Cond.	TFA
1	RBI Canada / Z72679A		7 x 11.1	KX513	200mm	202.00	1082.00	880.00	24.75	4.25	

Mud Type:	Polymere	Solid Control	Centifuge		Vis.:	48	% Oil	N/A	% Sol.	N/A
Mud Comments:					Temp	N/A	P.V.	N/A	Den.	1110
					Y.P.	N/A	% Sand	N/A	P.H.	N/A

TFO	48.224	Jars	UP	N/A	DOWN	N/A

PHOENIX TECHNOLOGY SERVICES

Client: Molopo Energy Canada Ltd.
Well Name: Molopo Pierson Prov Hz
Job Number: 10147566R
Well Type: HZ Strat Monobore
KB: 475.2

Date In: July 12, 2010
Date Out: July 15, 2010
Depth In: 754.00
Depth Out: 1998.00

Total Meters Drilled: 1244.00

Bit No.	Serial #	Description	Sub Description	OD	ID	Pin	Box	Strap	Total
Bit	Z72679A	KX513	RBI Canada	200		4 1/2 Reg		0.20	0.20
1	24XH165166PTS	Mud Motor	6 3/4in 7/8 lb 5.0 stg HR	162		4 1/2 Reg	4 1/2 H90	9.54	9.74
2	Q165060	Orient Sub		162	72	4 1/2 H90	4 1/2 H90	1.00	10.74
3	FS65066	Float Sub		160	59	4 1/2 H90	4 1/2 H90	0.78	11.52
4	FL165003	Flex Monel		150	80	4 1/2 H90	4 1/2 H90	8.82	20.34
5	FL165006	Flex Monel		151	81	4 1/2 H90	4 1/2 H90	9.15	29.49
6	FL165080	Flex Monel		156	70	4 1/2 H90	4 1/2 H90	8.99	38.48
7	XO020	Crossover Sub		153	66	4 1/2 H90	4 FH	0.65	39.13
8									
9									
10									
11									
12									
13									
14									
15									
16									
17									
18									
19									
								TOTAL	39.13

Run	Serial #	Description	Sub Description	MFG /AJD deg	Lobe	Flow Rate	Rpm	Meters	Drill Hrs	Circ. Hr	Total
2	24XH165166PTS	Mud Motor	6 3/4in 7/8 lb 5.0 stg	National/1.83	7/8	1.2	103		78.25	14.25	92.50
Pump Press.	10500	**Differential Pressure:**	2500	**Poppit Size:**	1.128			**Orfice Size:**	1.35		92.50

No	MFG / SER #	IADC Code	Jets	Type	Size	Depth in	Depth out	Meters	Hrs	Cond.	TFA
1	RBI Canada / Z72679A		7 x 11.1	KX513	200mm	754.00	1998.00	1244.00	78.25		

Mud Type:	Polymere	**Solid Control**	Centifuge		**Vis.:**	50	**% Oil**	nil	**% Sol.**	0.067
Mud Comments:					**Temp**	41	**P.V.**	32	**Den.**	1110
					Y.P.	7	**% Sand**	Trace	**P.H.**	9

TFO	114.677	**Jars**	**UP**	N/A	**DOWN**	N/A

Daily Tours

PHOENIX
TECHNOLOGY SERVICES

PHOENIX TECHNOLOGY SERVICES LP

Client: Molopo Energy Canada Ltd.
Well Name: Molopo Pierson Prov Hz
Location: 13C-32/16D-32-1-29WPM
Well Type: HZ Strat Monobore
Job Number: 10147566R
Well License Number: 7447
AFE Number: 11D0043

Drilling Contractor: Advance 1
Drill Collars: 4 1/2 XH
HWDP: 4 FH
Pipe: 4 FH
KB: 475.2

Date: 8-Jul-10

Guidance Type: MWD
Kit Number: 157
Gamma Kit: 12

Item	BHA # 1	BHA #
Bit	KX513	
1	Mud Motor	
2	QBHO	
3	Float Sub	
4	Monel	
5	Monel	
6	Monel	
7	XO	
8	DP	
9		
10		

	BIT # 1	BIT #
Serial Number	Z72679A	
Size	200mm	
Type	KX513	
Jets	7 x 11.1	
Press.	5,500	
WOB	5	
RPM	120	
Hours	8.25	
From	202	
To	540	
Penetration Rate	40.97	

Time	Code	Description	Comment	Depth	Trip Hrs
12:15	25	Other	Mobilize. Setup Shack		
12:30	21	Safety Meeting			
13:30	20	Directional Work	Pickup Tools		
14:00	6	Trips	RIH pickup 8 Singles		
15:00	2	Drill Actual	Drill Out Cement/Float & Shoe		1
15:15	7	Rig Service			
16:00	2	Drill Actual	200mm Hole F/202m	210	0.25
16:15	21	Safety Meeting			
16:30	7	Rig Service			
23:30	2	Drill Actual	Drill 200mm Fr/210 - 540m	540	7
24:00	10	Dev. Surveys	Acc Surveys & Connections		0.5

6:00am Info Sent By 7:00am

Depth:	846	Activity:	Drilling Strat	Drlg kop w/tools:	✓
Inc:	0.7	Pen Rate:	N/a	Build:	
Azm:	186	Build Req:	N/A	Lateral/Tangent:	

Shift	Directional Driller	MWD Personal
Day	Bob Christie	Justin Halliday
Night	Ray Jarvis	

Motor No.	Serial Number	Description	Sub Description		Size	Angle Set @	Daily Drlg.	Daily Circ.	Daily Total	Total Drlg.	Total Circ.	Total Hrs.	Down hole
1	24XH165166PTS	Mud Motor	6 3/4in 7/8 lb 5.0 stg HR	National	6.75	1.5	8.25	1	9.25	8.25	1	9.25	
2													
3													
4													
5													
6													

Pump Num.	Man.	Model	Liner	Stroke	SPM	Flow.
1	Emsco	F-800	140	229	120	1.20

Type:	H2O	Vis.:	N/A	Chlor:	N/A
% Solids:	N/A	WL:	N/A	Dens:	N/A
% Sands:	N/A	PH:	N/A	P.V.	N/A
% Oils:	N/A	Temp:	N/A	Y.P.	N/A

Signature:

Initials:

PHOENIX TECHNOLOGY SERVICES LP

Client: Molopo Energy Canada Ltd.
Well Name: Molopo Pierson Prov Hz
Location: 13C-32/16D-32-1-29WPM
Well Type: HZ Strat Monobore
Job Number: 10147566R
Well License Number: 7447
AFE Number: 11D0043

Drilling Contractor: Advance 1
Drill Collars: 4 1/2 XH
HWDP: 4 FH
Pipe: 4 FH
KB: 475.2

Date: 9-Jul-10

Guidance Type: MWD
Kit Number: 157
Gamma Kit: 12

Item	BHA # 1	BHA #
Bit	KX513	
1	Mud Motor	
2	QBHO	
3	Float Sub	
4	Monel	
5	Monel	
6	Monel	
7	XO	
8	DP	
9		
10		

	BIT # 1	BIT #
Serial Number	Z72679A	
Size	200mm	
Type	KX513	
Jets	7 x 11.1	
Press.	5,500	
WOB	5	
RPM	120	
Hours	24.75	
From	202	
To	1082	
Penetration Rate	35.25	

Time	Code	Description	Comment	Depth	Trip Hrs
00:15	21	Safety Meeting			
00:30	7	Rig Service			
7:00	2	Drill Actual	Drill 200mm Fr/540 - 846m	846	6.5
8:00	10	Dev. Surveys	Acc Surveys & Connections		1
8:15	21	Safety Meeting			
8:30	7	Rig Service			
14:45	2	Drill Actual	Drill 200mm Fr/846 - 1015m	1015	6.25
16:00	10	Dev. Surveys	Acc Surveys & Connections		1.25
16:15	21	Safety Meeting			
20:00	2	Drill Actual	Drill 200mm Fr/1015 - 1082	1082	3.75
20:30	5	Condition Mud & Circulate	Circulate Btm Hole Sample		1
23:00	6	Trips	POOH To Lay Down Dir Tools		
24:00	20	Directional Work	Lay Down Dir Tools		

Shift	Directional Driller	MWD Personal
Day	Bob Christie	Justin Halliday
Night	Ray Jarvis	

6:00am Info Sent By 7:00am

Depth:	1082	Activity:	WOC	Drlg kop w/tools:	✓
Inc:	N/A	Pen Rate:	N/A	Build:	
Azm:	N/A	Build Req:	N/A	Lateral/Tangent:	

Motor No.	Serial Number	Description	Sub Description		Size	Angle Set @	Daily Drlg.	Daily Circ.	Daily Total	Total Drlg.	Total Circ.	Total Hrs.	Down hole
1	24XH165166PTS	Mud Motor	6 3/4in 7/8 lb 5.0 stg HR	National	6.75	1.5	16.5	3.25	19.75	24.75	4.25	29	
2													
3													
4													
5													
6													

Pump Num.	Man.	Model	Liner	Stroke	SPM	Flow.
1	Emsco	F-800	140	229	120	1.20

Type:	Polymere	Vis.:	48	Chlor:	N/A
% Solids:	N/A	WL:	N/A	Dens:	1110
% Sands:	N/A	PH:	N/A	P.V.	N/A
% Oils:	N/A	Temp:	N/A	Y.P.	N/A

Signature:

Initials:

PHOENIX TECHNOLOGY SERVICES LP

Client: Molopo Energy Canada Ltd.
Well Name: Molopo Pierson Prov Hz
Location: 13C-32/16D-32-1-29WPM
Well Type: HZ Strat Monobore
Job Number: 10147566R
Well License Number: 7447
AFE Number: 11D0043

Drilling Contractor: Advance 1
Drill Collars: 4 1/2 XH
HWDP: 4 FH
Pipe: 4 FH
KB: 475.2

Date: 10-Jul-10

Guidance Type: MWD
Kit Number: 157
Gamma Kit: 12

Item	BHA # 1	BHA #
Bit	KX513	
1	Mud Motor	
2	QBHO	
3	Float Sub	
4	Monel	
5	Monel	
6	Monel	
7	XO	
8	DP	
9		
10		

	BIT # 1	BIT #
Serial Number	Z72679A	
Size	200mm	
Type	KX513	
Jets	7 x 11.1	
Press.	5,500	
WOB	5	
RPM	120	
Hours	24.75	
From	202	
To	1082	
Penetration Rate	35.56	

Time	Code	Description	Comment	Depth	Trip Hrs
24:00	25	Other	Log, WOC		

Shift	Directional Driller	MWD Personal
Day	Bob Christie	Justin Halliday
Night	Ray Jarvis	

6:00am Info Sent By 7:00am

Depth:	1882	Activity:	WOC	Drlg kop w/tools:	✓
Inc:	N/A	Pen Rate:	N/A	Build:	
Azm:	N/A	Build Req:	N/A	Lateral/Tangent:	

Motor No.	Serial Number	Description	Sub Description		Size	Angle Set @	Daily Drlg.	Daily Circ.	Daily Total	Total Drlg.	Total Circ.	Total Hrs.	Down hole
1	24XH165166PTS	Mud Motor	6 3/4in 7/8 lb 5.0 stg HR	National	6.75	1.5				24.75	4.25	29	✓
2													
3													
4													
5													
6													

Pump Num.	Man.	Model	Liner	Stroke	SPM	Flow.
1	Emsco	F-800	140	229	120	1.20

Type:	Polymere	Vis.:	48	Chlor:	N/A
% Solids:	N/A	WL:	N/A	Dens:	1110
% Sands:	N/A	PH:	N/A	P.V.	N/A
% Oils:	N/A	Temp:	N/A	Y.P.	N/A

Signature:

Initials:

PHOENIX TECHNOLOGY SERVICES LP

Client: Molopo Energy Canada Ltd.
Well Name: Molopo Pierson Prov Hz
Location: 13C-32/16D-32-1-29WPM
Well Type: HZ Strat Monobore
Job Number: 10147566R
Well License Number: 7447
AFE Number: 11D0043

Drilling Contractor: Advance 1
Drill Collars: 4 1/2 XH
HWDP: 4 FH
Pipe: 4 FH
KB: 475.2

Date: 11-Jul-10

Guidance Type: MWD
Kit Number: 157
Gamma Kit: 12

Item	BHA # 2	BHA #
Bit	KX513	
1	Mud Motor	
2	QBHO	
3	Float Sub	
4	Monel	
5	Monel	
6	Monel	
7	XO	
8	DP	
9		
10		

	BIT # 1R	BIT #
Serial Number	Z72679A	
Size	200mm	
Type	KX513	
Jets	7 x 11.1	
Press.	6,300	
WOB	4	
RPM	120	
Hours	10.75	
From	772	
To	920	
Penetration Rate	13.77	

Time	Code	Description	Comment	Depth	Trip Hrs
07:00	25	Other	Wait On Cement		
07:15	21	Safety Meeting	Picking up Tools		
08:00	20	Directional Work	Pick Up Tools		
08:15	21	Safety Meeting			
08:30	7	Rig Service			
09:15	20	Directional Work	Pick Up Tools		
11:15	6	Trips	RIH/Pulse Test/Clean To Bottom	Circ	1
12:30	2	Drill Actual	Polish Plug from 754	772	1.25
15:30	2	Drill Actual	200mm Hole F/772 - 791m	791	3
16:00	10	Dev. Surveys	Acc Surveys & Connections		0.5
16:15	21	Safety Meeting			
16:30	7	Rig Service			
23:00	2	Drill Actual	Drill 200mm Fr/791 - 920m	920	6.5
24:00	10	Dev. Surveys	Acc Surveys & Connections		1

Shift	Directional Driller	MWD Personal
Day	Bob Christie	Justin Halliday
Night	Ray Jarvis	

6:00am Info Sent By 7:00am

Depth:	1100	Activity:	Drl Bld	Drlg kop w/tools:	
Inc:	75	Pen Rate:	15	Build:	
Azm:	90.5	Build Req:	7	Lateral/Tangent:	

Motor No.	Serial Number	Description	Sub Description		Size	Angle Set @	Daily Drlg.	Daily Circ.	Daily Total	Total Drlg.	Total Circ.	Total Hrs.	Down hole
1	24XH165166PTS	Mud Motor	6 3/4in 7/8 lb 5.0 stg HR	National	6.75	1.5	10.75	2.5	13.25	35.5	6.75	42.25	
2													
3													
4													
5													
6													

Pump Num.	Man.	Model	Liner	Stroke	SPM	Flow.
1	Emsco	F-800	140	229	120	1.20

Type:	Polymere	Vis.:	36	Chlor:	1100
% Solids:	0.048	WL:	9	Dens:	1080
% Sands:	Trace	PH:	10	P.V.	17
% Oils:	nil	Temp:	N/A	Y.P.	3.5

Polish Plug From 754m to 772m KOP -772m Time Drill 2-3m/hr F/ 785m -791m

Signature:

Initials:

PHOENIX TECHNOLOGY SERVICES LP

Client: Molopo Energy Canada Ltd.
Well Name: Molopo Pierson Prov Hz
Location: 13C-32/16D-32-1-29WPM
Well Type: HZ Strat Monobore
Job Number: 10147566R
Well License Number: 7447
AFE Number: 11D0043

Drilling Contractor: Advance 1
Drill Collars: 4 1/2 XH
HWDP: 4 FH
Pipe: 4 FH
KB: 475.2

Date: 12-Jul-10

Guidance Type: MWD
Kit Number: 157
Gamma Kit: 12

Item	BHA # 2	BHA #
Bit	KX513	
1	Mud Motor	
2	QBHO	
3	Float Sub	
4	Monel	
5	Monel	
6	Monel	
7	XO	
8	DP	
9		
10		

	BIT # 1R	BIT #
Serial Number	Z72679A	
Size	200mm	
Type	KX513	
Jets	7 x 11.1	
Press.	7.500	
WOB	15	
RPM	35	
Hours	19.5	
From	920	
To	1222	
Penetration Rate	14.46	

Time	Code	Description	Comment	Depth	Trip Hrs
00:15	21	Safety Meeting			
00:30	7	Rig Service			
07:00	2	Drill Actual	200mm Hole F/ 920m -1017m	1017	6.5
08:00	10	Dev. Surveys	Acc Surveys & Connections	Circ	1
08:15	21	Safety Meeting			
08:30	7	Rig Service			
15:00	2	Drill Actual	Drill 200mm Fr/1017 - 1091m	1091	6.5
16:00	10	Dev. Surveys	Acc Surveys & Connections	Circ	1
16:15	21	Safety Meeting			
16:30	7	Rig Service			
23:00	2	Drill Actual	Drill 200mm Fr/1091 - 1222m	1222	6.5
24:00	10	Dev. Surveys	Acc Surveys & Connections	Circ	1

6:00am Info Sent By 7:00am

Depth:	1360	Activity:	Drl Lat	Drlg kop w/tools:	
Inc:	90.1	Pen Rate:	16	Build:	
Azm:	92.5	Build Req:	0.1	Lateral/Tangent:	

Shift	Directional Driller	MWD Personal
Day	Bob Christie	Justin Halliday
Night	Ray Jarvis	

Motor No.	Serial Number	Description	Sub Description		Size	Angle Set @	Daily Drlg.	Daily Circ.	Daily Total	Total Drlg.	Total Circ.	Total Hrs.	Down hole
1	24XH165166PTS	Mud Motor	6 3/4in 7/8 lb 5.0 stg HR	National	6.75	1.5	19.5	3	22.5	55	9.75	64.75	
2													
3													
4													
5													
6													

Pump Num.	Man.	Model	Liner	Stroke	SPM	Flow.
1	Emsco	F-800	140	229	120	1.20

Type:	Polymere	Vis.:	53	Chlor:	1100
% Solids:	0.051	WL:	9	Dens:	1110
% Sands:	Trace	PH:	9	P.V.	17
% Oils:	nil	Temp:	N/A	Y.P.	3.5

Companyman agreed to change tangent section f/ 20m @ 75 deg to 10m @ 75 deg to hit target change f/ TVD1032m to 1031.6m
10m Tangent From 1105m to 1115m

Signature:

Initials:

PHOENIX TECHNOLOGY SERVICES LP

Client: Molopo Energy Canada Ltd.
Well Name: Molopo Pierson Prov Hz
Location: 13C-32/16D-32-1-29WPM
Well Type: HZ Strat Monobore
Job Number: 10147566R
Well License Number: 7447
AFE Number: 11D0043

Drilling Contractor: Advance 1
Drill Collars: 4 1/2 XH
HWDP: 4 FH
Pipe: 4 FH
KB: 475.2

Date: 13-Jul-10

Guidance Type: MWD
Kit Number: 157
Gamma Kit: 12

Item	BHA # 2	BHA #
Bit	KX513	
1	Mud Motor	
2	QBHO	
3	Float Sub	
4	Monel	
5	Monel	
6	Monel	
7	XO	
8	DP	
9		
10		

	BIT # 1R	BIT #
Serial Number	Z72679A	
Size	200mm	
Type	KX513	
Jets	7 x 11.1	
Press.	9,500	
WOB	17	
RPM	35	
Hours	19.25	
From	1383	
To	1550	
Penetration Rate	8.05	

Time	Code	Description	Comment	Depth	Trip Hrs
00:15	21	Safety Meeting			
00:30	7	Rig Service			
6:45	2	Drill Actual	Drill 200mm Fr/1222 - 1383m	1383	6.25
8:00	10	Dev. Surveys	Acc Surveys & Connections	Cir	1.25
8:15	21	Safety Meeting			
8:30	7	Rig Service			
15:00	2	Drill Actual	Drill 200mm Fr/1383 - 1448m	1448	6.5
16:00	10	Dev. Surveys	Acc Surveys & Connections	Cir	1
16:15	21	Safety Meeting			
16:30	7	Rig Service			
23:00	2	Drill Actual	Drill 200mm Fr/1448 - 1550m	1550	6.5
24:00	10	Dev. Surveys	Acc Surveys & Connections	Cir	1

Shift	Directional Driller	MWD Personal
Day	Bob Christie	Justin Halliday
Night	Ray Jarvis	

6:00am Info Sent By 7:00am

Depth:	1645	Activity:	Drl Lat	Drlg kop w/tools:	
Inc:	90	Pen Rate:	9	Build:	
Azm:	87	Build Req:	0.1	Lateral/Tangent:	✓

Motor No.	Serial Number	Description	Sub Description		Size	Angle Set @	Daily Drlg.	Daily Circ.	Daily Total	Total Drlg.	Total Circ.	Total Hrs.	Down hole
1	24XH165166PTS	Mud Motor	6 3/4in 7/8 lb 5.0 stg HR	National	6.75	1.5	19.25	3.25	22.5	74.25	13	87.25	✓
2													
3													
4													
5													
6													

Pump Num.	Man.	Model	Liner	Stroke	SPM	Flow.
1	Emsco	F-800	140	229	120	1.20

Type:	Polymere	Vis.:	51	Chlor:	2100
% Solids:	0.067	WL:	11	Dens:	1110
% Sands:	Trace	PH:	9.5	P.V.	32
% Oils:	nil	Temp:	41	Y.P.	6.5

Signature:

Initials:

PHOENIX TECHNOLOGY SERVICES

Client: Molopo Energy Canada Ltd.
Well Name: Molopo Pierson Prov Hz
Location: 13C-32/16D-32-1-29WPM
Well Type: HZ Strat Monobore
Job Number: 10147566R
Well License Number: 7447
AFE Number: 11D0043

Drilling Contractor: Advance 1
Drill Collars: 4 1/2 XH
HWDP: 4 FH
Pipe: 4 FH
KB: 475.2

Date: 14-Jul-10

Guidance Type: MWD
Kit Number: 157
Gamma Kit: 12

Item	BHA # 2	BHA #
Bit	KX513	
1	Mud Motor	
2	QBHO	
3	Float Sub	
4	Monel	
5	Monel	
6	Monel	
7	XO	
8	DP	
9		
10		

	BIT # 1R	BIT #
Serial Number	Z72679A	
Size	200mm	
Type	KX513	
Jets	7 x 11.1	
Press.	10,500	
WOB	23	
RPM	40	
Hours	19	
From	1550	
To	1886	
Penetration Rate	17.88	

Time	Code	Description	Comment	Depth	Trip Hrs
00:15	21	Safety Meeting			
00:30	7	Rig Service			
07:00	2	Drill Actual	Drill 200mm Fr/1550 - 1662m	1662	6.5
08:00	10	Dev. Surveys	Acc Surveys & Connections	Circ	1
08:15	21	Safety Meeting			
08:30	7	Rig Service			
11:30	2	Drill Actual	Drill 200mm Fr/1662 - 1700m	1700	3
12:00	8	Repair Rig	Change Head in Pump		
15:00	2	Drill Actual	Drill 200mm Fr/1700 - 1736m	1736	3
16:00	10	Dev. Surveys	Acc Surveys & Connections	Circ	1
16:15	21	Safety Meeting			
16:30	7	Rig Service			
23:00	2	Drill Actual	Drill 200mm Fr/1736 - 1886m	1886	6.5
24:00	10	Dev. Surveys	Acc Surveys & Connections	Circ	1

Shift	Directional Driller	MWD Personal
Day	Bob Christie	Justin Halliday
Night	Ray Jarvis	

6:00am Info Sent By 7:00am

Depth:	1950	Activity:	Drl Lat	Drlg kop w/tools:	
Inc:	92	Pen Rate:	17.5	Build:	
Azm:	90	Build Req:	0.1	Lateral/Tangent:	

Motor No.	Serial Number	Description	Sub Description		Size	Angle Set @	Daily Drlg.	Daily Circ.	Daily Total	Total Drlg.	Total Circ.	Total Hrs.	Down hole
1	24XH165166PTS	Mud Motor	6 3/4in 7/8 lb 5.0 stg HR	National	6.75	1.5	19	3	22	93.25	16	109.25	
2													
3													
4													
5													
6													

Pump Num.	Man.	Model	Liner	Stroke	SPM	Flow.
1	Emsco	F-800	140	229	120	1.20

Type:	Polymere	Vis.: 50	Chlor: 2100
% Solids:	0.067	WL: 8	Dens: 1110
% Sands:	Trace	PH: 9	P.V. 32
% Oils:	nil	Temp: 41	Y.P. 6.5

Signature:

Initials:

PHOENIX TECHNOLOGY SERVICES LP

Client: Molopo Energy Canada Ltd.
Well Name: Molopo Pierson Prov Hz
Location: 13C-32/16D-32-1-29WPM
Well Type: HZ Strat Monobore
Job Number: 10147566R
Well License Number: 7447
AFE Number: 11D0043

Drilling Contractor: Advance 1
Drill Collars: 4 1/2 XH
HWDP: 4 FH
Pipe: 4 FH
KB: 475.2

Date: 15-Jul-10

Guidance Type: MWD
Kit Number: 157
Gamma Kit: 12

Item	BHA # 2	BHA #
Bit	KX513	
1	Mud Motor	
2	QBHO	
3	Float Sub	
4	Monel	
5	Monel	
6	Monel	
7	XO	
8	DP	
9		
10		

	BIT # 1R	BIT #
Serial Number	Z72679A	
Size	200mm	
Type	KX513	
Jets	7 x 11.1	
Press.	10,500	
WOB	12	
RPM	40	
Hours	9.75	
From	1866	
To	1913	
Penetration Rate	4.82	

Time	Code	Description	Comment	Depth	Trip Hrs
00:15	21	Safety Meeting			
00:30	7	Rig Service			
4:00	2	Drill Actual	200mm Hole F/ 1866	1900	3.5
05:45	8	Repair Rig	Weld Standpipe		
06:00	7	Rig Service			
07:00	2	Drill Actual	200mm Hole F/ 1900	1913	1
08:00	10	Dev. Surveys		Circ	1
08:15	21	Safety Meeting			
08:30	7	Rig Service			
13:45	2	Drill Actual	200mm Hole F/ 1913	1978	5.25
14:30	10	Dev. Surveys		Circ	0.75
15:15	5	Condition Mud & Circulate		Circ	0.75
16:00	6	Trips	POOH to Lay Down Tools		
19:00	6	Trips	POOH to Lay Down Tools		
20:00	20	Directional Work			

6:00am Info Sent By 7:00am

Depth:		Activity:		Drlg kop w/tools:	
Inc:		Pen Rate:		Build:	
Azm:		Build Req:		Lateral/Tangent:	✓

Shift	Directional Driller	MWD Personal
Day	Bob Christie	Justin Halliday
Night	Ray Jarvis	

Motor No.	Serial Number	Description	Sub Description		Size	Angle Set @	Daily Drlg.	Daily Circ.	Daily Total	Total Drlg.	Total Circ.	Total Hrs.	Down hole
1	24XH165166PTS	Mud Motor	6 3/4in 7/8 lb 5.0 stg HR	National	6.75	1.5	9.75	2.5	12.25	103	18.5	121.5	✓
2													
3													
4													
5													
6													

Pump Num.	Man.	Model	Liner	Stroke	SPM	Flow.
1	Emsco	F-800	140	229	120	1.20

Type:	Polymere	Vis.:	45	Chlor:	3100
% Solids:	0.067	WL:	8	Dens:	1110
% Sands:	Trace	PH:	10	P.V.	26
% Oils:	nil	Temp:	42	Y.P.	14.5

Signature:

Initials:

#7447
Confidential
until
09-Jul-2011

Manitoba
Innovation, Energy and Mines

INITIAL PRODUCTION REPORT

Two (2) copies of this report are to be completed and submitted to the district office within days following the fifth after the well has been placed on normal production.

Well Name: Molopo Pierson Prov Hz 16-32-1-29W1 License Number: 7447
Operating Company: Molopo Energy Canada Ltd.
Battery Well Produced To (name & locations): SWB @ Surface 13-32-1-29W1

Completion Interval(s): 1345 m to 1979 m ____ m to ____ m
MW: 1031.03 to 1035.81

Open Hole: ☐ Perforated: ☒ Formation: ~~Spearfish~~ Lama

Completion Oil:

Source of Completion Oil (Co. & location):
Volume Supplied: m^3

Date Supplied:* / /
YY MM DD

Date YY MM DD	Completion Oil Used (m^3)	Completion Oil Recovered (m^3)	Completion Oil To Be Recovered (m^3)	Water Produces (m^3)

(Continue on separate sheet if necessary)

Disposition of Recovered Completion Oil: _____ m^3 to _____
(Co. & location)

On-Production Date:* 10 / 09 / 14
YY MM DD

* Official on-production date (i.e. date of first new oil production after completion oil recovered).
* Date in which the well produces oil in excess of the volume of completion oil used.

Production Test:

Date YY MM DD	Hours Produced	Oil Produced m^3	Water Produced m^3	Pumping	Flowing	Gas-Oil Ratio (m^3/m^3)	Oil Density (kg/m^3)
10 8 14	16	2.24	25.76	Yes			840
10 8 15	24	4.9	44.1	Yes			840
10 8 16	24	7.52	39.48	Yes			840
10 8 17	24	8.48	44.52	Yes			840
10 8 18	24	8.48	44.51	Yes			840
Totals	112	31.62	198.37				

Pamela MacDonald (Submitted By) Sr,. Eng. Tech. (Position) 403-264-9778 (Telephone)

Remarks:
F/Pools: 07 x -> 07 35A
Designated by IPFC 24/2/2011.

Licence

Manitoba
Innovation, Energy and Mines

APPLICATION FOR WELL LICENCE

In compliance with The Oil and Gas Act and the Drilling and Production Regulation, application is hereby made for a well licence for:

Molopo Pierson Prov Hzntl 16-32-001-29WPM
(well name and location)

By: Molopo Energy Canada Ltd.
(name of well owner)

Manitoba Corporation No. 5975230

#1400, 444 - 5th Avenue SW Calgary, AB T2P 2T8 (403) 264-9778 (403) 264-9903
(address of well owner) (telephone) (fax)

Surface Location: Lsd 13 Section 32 Township 1 Range 29 WPM

Ground Elevation: 471.23 metres above sea level

Surface Co-ordinates

110.00 metres ☐ North of South ☒ South of North boundary of Section 32

55.00 metres ☒ East of West ☐ West Of East boundary of Section 32

Directional or Horizontal Well Bottomhole Co-ordinates

110.00 metres ☐ North of South ☒ South of North boundary of Section 32

94.91 metres ☐ East of West ☒ West Of East boundary of Section 32

Surface Owner: William Carey Murray, Ian Glen Murray, & William Keith Murray Occupant: None

Royalty Owner(s): _____

Freehold Oil and Gas Rights Leased By: _____
(Name of Oil and Gas Lease Agent and Corporation)

Crown Reservation or Lease No.: L051-2415

Type of Well: Oil and Gas Oil Other _____
(specify)

Projected Total Depth: 1100 metres in the Mississipian Uncon Formation

	Casing Size O.D. mm	Weight Kg/m	Grade	From	To	Estimated Cemented Interval
1.	219.10	35.72	J-55	Surface	200	To Surface
2.	139.70	23.07	J-55	Surface	2378.0	To Surface
3.						

Drilling Contractor: Totem Drilling Ltd. Rig No. 3

Expected Spud Date: 2010/ 8 / 03
YYYY MM DD

Responsible Agent of Company at Well: Al Biette (306)634-3362.
(telephone)

6/28/2010
(Date) M/d/yyyy

P. McCracken
(Signature of applicant)

For assistance in completing this form contact Paulette Seymour at (204) 945-6575 or Dan Surzyshyn at (204) 945-8102.

For Department Use Only

Well Licence No.: 7447

UWI: 100.13-32-001-29W1.00 – Stratigraphic Testhole
UWI: 100.16-32-001-29W1.02 – Horizontal Section
Well Classification: Confidential Exploratory (Outpost) Well

A licence to drill a well known as Molopo Pierson Prov. HZNTL 16-32-1-29 (WPM) is hereby granted to Molopo Energy Canada Ltd.

.../2

The Licensee shall comply with all the provisions of the Oil and Gas Act, the Drilling and Production Regulation and the following terms and conditions:

1. The Petroleum Branch will forward a copy of the surface lease for the above location to the Surface Rights Board to satisfy the requirements of Section 15 of the Surface Rights Act.

2. Molopo is required to provide drill cutting samples taken at 5m intervals from the surface shoe to T.D. in the vertical section and at 10m intervals for the horizontal section. The samples are to be washed and vialed in accordance with Subsection 111(2) of the Regulation and shipped to the Rock Preparation Lab at 10 Midland Street in Winnipeg. As well, Molopo will supply copies of the Geological Report and detailed strip logs, **in paper and digital format**, which show the well trajectory, rates of penetration and any other information recorded as per Informational Notice 05-05.

3. Molopo must ensure that the cover of each sample cutting trays are labeled with the licence #, location and intervals for that particular tray.

4. Molopo is to run open hole logs for the vertical portion of the well and submit two copies of all logs to the Waskada District Office.

5. Two copies of the final directional survey are to be submitted to the Branch with the drilling tour reports as soon as drilling is finished. If the well is found to be less than 100 m from any of the boundaries of the North Half of Section 32, then an off-target penalty may apply as per Section 13 and 14 of the Drilling and Production regulations.

6. Molopo is to submit a copy of the final directional survey in digital format as per Informational Notice 08-03.

7. The proposed drainage unit for the well includes Lsd's 13, 14, 15 and 16 of Section 32-1-29 (WPM).

8. H_2S may be encountered during the drilling of this well. Crews are to be made aware of the possible hazards.

9. If produced gas vented from the well contains H_2S, Molopo shall ensure that the concentration of hydrogen sulphide beyond the well site does not exceed the levels set out in Schedule G. However, due to the proximity of the residence, if H_2S odours are detected off-lease, Molopo may be required to install equipment to eliminate the odours.

10. Molopo is to exercise minimal disturbance on this site as it contains a habitat area for nesting and foraging for the Baird's Sparrow, the Loggerhead Shrike and the Sprague's Pipit birds.

July 2, 2010
Date of Issue

Reviewed by:

Director of Petroleum

.../3

Lic. No. 7447 Molopo Pierson Prov. HZNTL 16-32-1-29 (WPM)

MANITOBA SUBMISSION REQUIREMENTS FOR NEW WELLS

The following notifications and information must be provided to the appropriate district office.

OPERATIONS IN TOWNSHIPS 1 TO 6
Dept. of Science, Technology, Energy and Mines
Petroleum Branch
Box 220
23 Railway Avenue
Waskada MB R0M 2E0
Phone: 204-673-2472 (24 hour service)
Fax: 204-673-2767

OPERATIONS NORTH OF TOWNSHIP 6
Dept. of Science, Technology, Energy and Mines
Petroleum Branch
Box 1359
227 King Street West
Virden MB R0M 2C0
204-748-4260 (24 hour service)
204-748-2208

FOR DEPT. USE ONLY

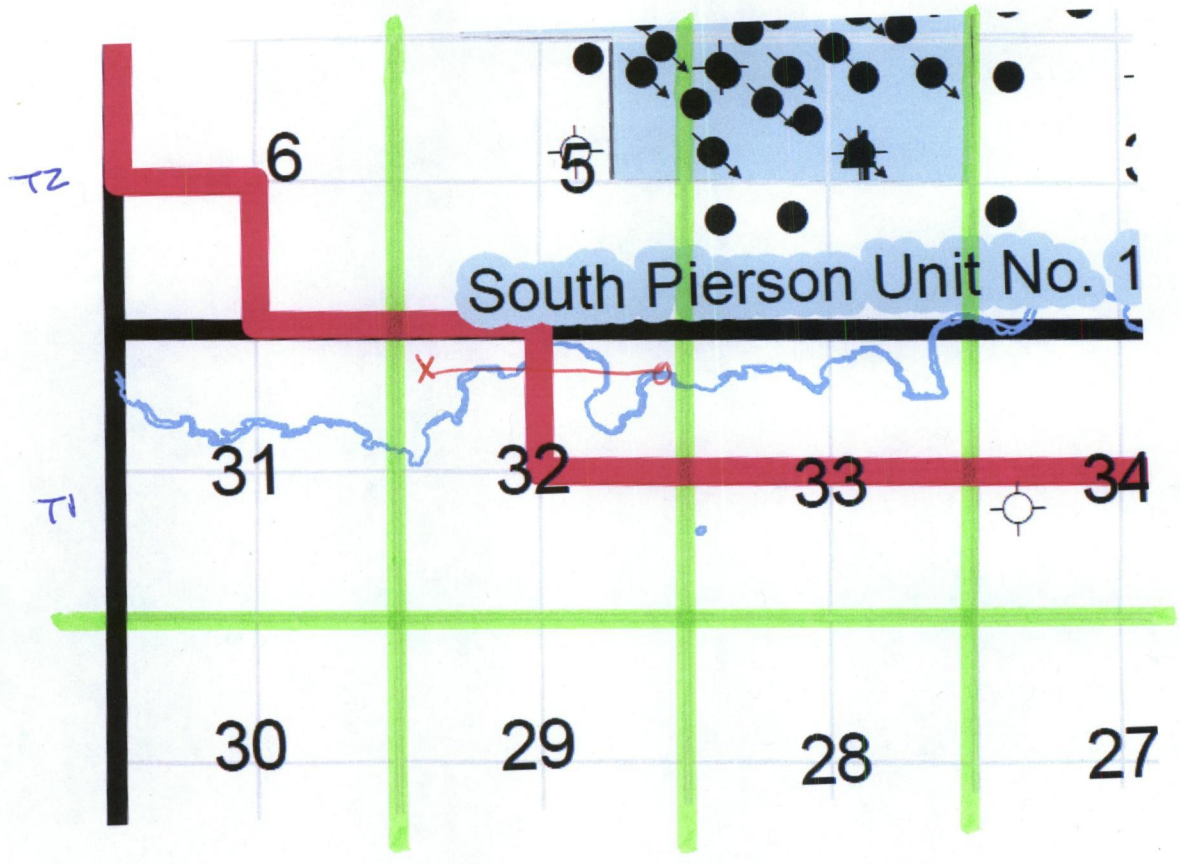
DRILLING, COMPLETION AND INITIAL PRODUCTION SUBMISSION REQUIREMENTS

RECEIVED

COMPANY REPRESENTATIVE AT WELLSITE IS RESPONSIBLE FOR ITEMS 1 TO 9.

1.	24 hours advance notice of intent to spud a well.	_____
2.	2 hours advance notice of intent to run and cement surface casing or production casing.	_____
3.	2 hours advance notice of intent to pull pipe after running a DST.	_____
4.	2 hours advance notice of a dry hole abandonment. Verbal approval to abandon must be obtained from the district office.	_____
5.	Weekly status reports on all activities up to rig release. Reports to be called in each MONDAY MORNING prior to 9 a.m.	_____
6.	A complete copy of the drilling tours.	_____
7.	Two (2) copies of field prints of all logs.	_____
8.	Tagged image files of all open hole logs and cased hole logs and LAS (Log ASCII) Files) for any log that may be represented in LAS format (submitted on 1.44 floppy disk, CD or DVD format) as per Informational Notice 05-05.	_____
9.	Two (2) copies of any directional surveys run (submitted in digital format as per Informational Notice 08-03).	_____
10.	A one (1) litre sample of drilling fluids. Squeezing of a pit is not to proceed without the consent of the district office.	_____
11.	Any drill cutting samples and cores are to be shipped to: Rock Preparation Lab, 10 Midland Street, Winnipeg MB, R3E 2Y6.	_____
12.	Two (2) copies of all reports of drill stem tests, core analyses or of any other test. (e.g. fluid analyses, pressure surveys, etc.)	_____
13.	Two (2) copies of any Geological Report.	_____
14.	Chronological report of all completion operations including full details.	_____
15.	Two (2) copies of all completion logs.	_____
16.	Two (2) copies of the Initial Production Report (forms attached).	_____

16-32-1-29



Bottomhole: 16D-32-1-29
Surface: 13C-32-1-29

Drawing
Lsd's 13, 14, 15
and 16 Sec. 32

Inspected? Yes

No
cavings

Add:
- H_2S
- odor

Target
zone:
Mississippian

10-5-2-29 # 4600 Ariel Dry

5-4-2-29 # 6041 coop

Vertical
portion is
going to be a
stratigraphic
test hole

Molopo Energy Canada Ltd

Hz Drilling Program

WELL NAME:	Molopo Pierson Prov Hzntl (31-32) 16-32-001-29 W1M
Surface:	13-32-001-29 W1M
Bottomhole:	16-32-001-29 W1M

AFE#:	11D0043
Licence #:	
Rig:	Totem #3

ELEVATION:	**GL:**	471.2m
KB-GL:	4.9 m	**KB:**	476.1m

MUD

Surface Hole
Mud System: Native Clays

Main Hole
Mud System: Enviroflo water w/ Polydrill
Mud Up @~600mKB
Prairie Drill Polymer to TD.
Density 1060 - 1080 kg/m³
Viscosity 45-50 sec/L
Yield Point 5-8Pa
Water Loss: 6-8 cm³
pH: 9 - 9.5

FORMATION

	Surface: 200.0m	
	Name	**mKBTVD** / **mSSTVD**
	Colorado Shale	16 / 16
	SWS	551 / -75
	Lower Colorado	578 / -102
	Base Fish Scales	627 / -151
	Mud-up Pt	617 / -141
	Mannville	689 / -213
	KOP	792 / -316
	MIEM Sample Pt	1000 / -524
	Jurassic	789 / -313
	Lower Gravel	929 / -453
	Amaranth Evaporite	964 / -488
	Spearfish	1009 / -533
	Marine B Cycle	1016 / -540
	Marine A Cycle	1021 / -545
*	**Waskada Zone**	1024 / -548
	Hz Target Heel	1027 / -551
	Target @ TD	1025 / -549
	Total Depth (MD)	**2378mMD**
	Manor Zone	1041 / -565
	Mississippian Unconf	1050 / -574
	Strat Hz Total Depth	1100 / -624

WELLHEAD

279 x 219.1 mm x 21,000kPa casing bowl

Survey every 150m. Max allow dev'n is 3o. Max allow rate of change is 1o/100m. From KOP survey as per directional company.

Surface Hole:(311 mm hole)
Casing: 219.1mm, 35.72kg/m, J-55, ST&C @ 200m
Cement : SwiftCem W1. 50% excess.

Survey at 20mKB, then every 30m. Max allow dev'n is 1.5°. Max rate of change 1°/30m.

MACP (200 mm)	*Mud Wt.*
1658	1000
1580	1040
1501	1080
1462	1100
1423	1120
1383	1140
1344	1160
1305	1180
1266	1200
1226	1220
1187	1240
1148	1260
1109	1280
1069	1300

HOLE PROBLEMS:

Lost Circulation: Possible on Surface hole. Not expected on main hole.

Abnormal Pressure: Normal pressures expected throughout. Waskada zone 10,000kPa. Refer to information Notice 05-03 regarding surface hole blowout at 16-36-3-29 W1.

Tight hole/Reaming: Colorado shale can be problematic, stabilize with Polydrill. Control drill Mannville due to unconsolidation, **Do not over-pump**. Ensure hole is cleaning properly prior to tripping.

Amaranth Evaporite: Pre-treat with Soda Ash to prevent issues.

Main Hole: (200mm hole)
Casing: 139.7mm, 23.07kg/m, J-55: 0 - 2378m
Cement:
Fill: 750m to Sfc: EconoCem W6
Tail: TD to 750m: ExtendaCem W5
See detailed cement program.

GEOLOGICAL EVALUATION:

Samples:
Molopo: N/a
Government: From 1250m to TD

Coring: None planned.

Drillstem Test: None planned.

Logging: N/a

Gas Detector: From Surface shoe to TD (Including horizontal section).

Sour Zones: Mississippian contains low level H2S.

DIRECTIONAL DETAILS:

Kick-off Point:	775.0 m
Build rate:	7 degrees/30m
Int. Csg Pt:	N/a
Leg #1	
Bottomhole Location:	
16-32-1-29 W1	
Horizontal Length:	
1198	
Total Depth (MD):	
2378	

Directional Company: Phoenix Directional

SEE DIRECTIONAL PROGRAM FOR DETAILS.

Plugback Program:
Abandonment Cement: Class G + 1% CFR-3 from TD to 870mKB
Whipstock Cement: Class G + 1% CFR-3 from 870mKB to 720mKB (2100kg/m³)
See detailed cement program.

Use a Hughes Sidetrack Bit to drill off plug. Past experience has shown that conventional sidetrack methods increase the risk of having to run a second plug.

** Primary Objective
* Secondary Objective

Objective Formations	Reservoir Pressure
Waskada	10,000kPa

OFFSET WELLS:

(5-28) 8-28-1-28 W1
(13-26) 13-27-1-28 W1
(1-7) 1-8-2-28 W1

Emergency Contacts:

Drilling Supervisor:	Ed Hackman	306-485-7448
Rig Manager:	Glenn Hofos	306-577-7541
MIEM District Office	Waskada	204-673-2472
RCMP	Estevan	306-637-4400
Hospital:	Estevan	306-634-3604
Ambulance/Fire		911
County	R.M. of Edward	

MOLOPO PERSONNEL	OFFICE	CELL	HOME
Chad Melby	403-264-9778 ext 225	403-813-4834	403-209-0322
Curtis Schoenfeld	403-264-9778 ext 201	403-862-5524	
Todd Neely	403-264-9778 ext 204	403-620-4082	403-283-3217
Al Biette	306-634-3362	306-461-9599	

6/28/2010

MOLOPO ENERGY CANADA LTD.

MOLOPO ENERGY CANADA LTD.
GENERIC SPEARFISH STRATIGRAPHIC - HZ
DRILLING PROGRAM

June 2010

Prepared by: Chad Melby

I. General Well Data

(See Individual Stick Diagram for Well Specific Details)

CLASSIFICATION:: Development (C)
DRILLING RIG: See Stick Diagram

MUD SYSTEM:

Surface	Water (If lost circulation occurs mud up). Utilize Native Clays to build viscosity.
Main:	Floc water w/ Polymer to 600mKB. Mud up to a Polymer mud system and drill to Total depth.
Mud-up Point:	600mKB

PRIMARY OBJECTIVES: Spearfish

GEOLOGICAL REQUIREMENTS: **Samples:** As per well licence. **Gas Detection:** Sfc shoe to Total depth. **Coring/DST's**: N/a **Logging:** As per geology.

CASING AND CEMENTING:

Hole Size	Casing	Depth	Cement
311mm	219.1 mm, 35.72 kg/m, J-55, ST&C	Refer to Stick Diagram	Surface Slurry 1750 (50% excess) - **Halliburton**
200mm	139.7mm, 23.07 kg/m, J-55, ST&C		Preflush: 4.0 m^3 Water Scavenger: Hilite 1400 XLT + 0.2%Halad 447 (1250kg/m^3) Cement: Lead - Hilite 1400 XLT + 0.2% Halad 447– 1400kg/m^3 (30% excess, increase if hole conditions dictate) Tail: BR II + 0.3% Halad 447 + 0.3% HR-4 + 0.15% FWCA + 0.2% CFR-3 1600kg/m^3 (40% excess, increase if hole conditions dictate) – **Halliburton**

DRILLING SERVICES:

SERVICE	COMPANY	SERVICE CENTRE	CONTACT	TELEPHONE
Contractor	See Stick Diagram			
Wellsite Shack	Field			
Directional	See Directional Plan	See Directional Plan	See Directional Plan	See Directional Plan
Mud Service	See Mud Program	See Mud Program	See Mud Program	See Mud Program
Vacuum Truck	Field			
Water Truck	Field			
Casing & Float Equipment	AJ Industries	Calgary		403-262-8900
Casing Trucking	L&C Trucking	Estevan	Dispatch	306-634-7341
Cementing	Halliburton	Red Deer	Dispatch	1-800-335-6333
Wellhead	AJ Industries	Calgary		403-262-8900
Logging	Weatherford	Estevan	Dispatch	306-634-4726
Environmental	Epic Environmental		Call Al to set up	

CONTACTS:		**OFFICE**	**CELL**	**HOME**
D & C Manager:	Chad Melby	(403) 264-9778 ext 225	(403) 813-4834	(403) 209-0322
VP of Engineering	Curtis Schoenfeld	(403) 264-9778 ext 201	(403)862-5524	
Geology:	Todd Neely	(403) 264-9778 ext 204	(403) 620-4082	(403) 283-3217
Construction:	Al Biette	(306)634-3362	(306) 461-9599	
Ambulance	911			
Hospital	(306) 634-3604			
RCMP	(306) 637-4400			

II. DRILLING PROGRAM

This proposed drilling program provides general guidelines for drilling procedures with detailed descriptions of items such as casings, cementing programs, testing programs, safety procedures, expected pressure information, mud program details and general drilling information for the use of the drilling supervisor. The drilling program is a guideline only and the drilling supervisor should always be on the alert for areas that can be improved upon. Planning ahead and discussions with the office personnel about safety issues, cost savings, penetration rate, rigging in of equipment and alert responses to situations can enhance the drilling function.

The goal of Molopo Energy Canada Ltd. is to meet or exceed all recommendations, requirements, and regulations as set forth by the Manitoba government, OH&S and other applicable government agencies. It is the Company's desire to maintain the highest of drilling standards to provide safety for the public and all of the personnel involved in the drilling effort. The wellsite supervisor is to check and ensure that the criteria as set forth by the various governing bodies are followed during the drilling of this well. It is essential that the equipment requirements, qualifications of equipment and the procedures that are set out in the program are reviewed, discussed and followed by on-site personnel.

PROGRAM SUMMARY

1. Move-in drilling rig and rig-up.
2. Drill 311 mm surface hole to ~ 200m KB.
3. Run 219.1 mm casing and cement.
4. Install 229 mm x 219.1 mm x 21MPa casing bowl. Nipple up and pressure test BOP's. Drill vertical strat test 30m into the Mississippian Unconformity with Floc water to 600mKB. Mud-up.
5. Run open hole logs and evaluate as per geology. Decision to either abandon or plug back and drill horizontal. If abandoning, follow MIEM guidelines for abandonment. If proceeding, go to next step.
6. RI open ended to run cement plug. WOC as per program. PU directional tools (Drill pipe only, PU HWDP later), drill to KOP and kick off cement plug. Directionally drill 200mm main hole as per directional program. PU HWDP at ~1400mMD to provide weight to drill to total depth.
7. At total depth, wiper trip and prepare to run casing. Run and cement 139.7mm production casing string and cement as per program.
8. Release rig

HOLE PROBLEM CONSIDERATIONS

Lost Circulation: Lost circulation and gravel seams are **possible** on surface hole. If severe lost circulation is encountered run 1 bag celloflake per cubic meter in the first 5 to 10 m^3 of slurry. Stage in last half of displacement if returns are not seen. Document Hz leg mud losses in Daily Report (Include total losses per leg in the comments on final report).

Deviation: Deviation has occurred on offset wells.

Abnormal pressure: Abnormal pressure is not expected (Waskada zone is 10,000kPa). However, Information Notice 05-03 summarizes a blowout that occurred on surface hole at 16-36-3-29 W1. Gas kick occurred while tripping out on surface hole eventually resulting in a blowout. **Ensure hole is not swabbing on wiper trips or bit trips and hole is kept full at all times.**

Tight hole/Reaming: Mud rings are common on surface, SAPP may be necessary to prevent. The upper sections in this hole have experienced bridging problems. Ensure pipe is not left static for any length of time and that pipe is moving prior to kicking in pump. **Bentonitic shales in area have provided some issues, treat accordingly.**

Blairmore/Mannville: This section is an unconsolidated sandstone in the area. **Control drill through zone and reduce pump rates to prevent problems.**

Amaranth Evaporite: Pretreat with Soda Ash to prevent issues from occurring.

A DRILLING PROCEDURE

1. SURFACE HOLE

1. Move in and rig up onto location as per MIEM guidelines.

2. Phone MIEM branch at 1-204-673-2472 (24 hour service) within 24 hours of spudding. Record this notification in the daily reports.

3. Post drilling stick diagram in the doghouse. ENSURE THAT REGULAR RIG INSPECTIONS ARE CONDUCTED AND THAT EQUIPMENT IS MAINTAINED TO THE STANDARDS SET FORTH IN THE MIEM DRILLING AND PRODUCTION REGULATIONS.

4. Spud surface hole with water. If hole conditions dictate, mud up.

5. Drill ahead to casing point, survey at 20mKb then every 30m to total depth. Maximum allowable deviation is 1.5 degree. If the hole indicates an unconsolidated zone at the programmed casing point depth, drill ahead to the next competent formation.

6. Dummy trip and strap out of hole one single from surface hole TD. RIH and drill additional hole as required to give the proper stickup at surface when the surface casing is ran. Make allowances in surface tally for the pin by pin sub threaded into the bowl. Upon reaching surface hole TD, circulate/condition mud for casing, drop survey and pull out of hole.

7. Run 219.1 mm, 35.72 kg/m, J-55, ST&C, Range 3 surface casing and cement to surface as outlined in the Drilling Program General Information. Notify the MIEM district office no less that 2 hours prior to cementing as pe Drilling and Production regulations.

8. Observe returns carefully. Slow or stop displacement when good cement returns are noted. Continue displacement to bump the plug if no slumping of annulus cement is observed. Continue with 0.5 m3 stages if slumping is observed in the annulus. **Do not over displace the plug by more than 0.125m^3 (1/2 shoe joint volume). It is much better to drill out extra cement in casing than risk a poorly cemented shoe joint.** If no cement returns are observed, notify the Calgary before this remedial action is undertaken. This procedure is regulated by the MB Gov't. and requires approval from the MB Gov't. Record all volumes and comments carefully in DAILY REPORT and TOUR SHEET.

9. After cementing, WOC minimum of 4 hours, then slack off, cut off casing, and install casing bowl: SIZE **229 mm X 219.1 mm X 21,000** kPa.

INCLUDE SIZE & SERIAL NUMBER OF CASING BOWL ON MORNING REPORT IN REMARKS.

1. Install BOP's as per MB Regulations. Notify the MIEM district office no less than 24 hours prior to conducting the pressure test.
2. Pressure test BOPs and manifold to 1,400 kPa. low, and 7,000 kPa. high for l0 minutes each segment before drilling. Test stabbing valve, kelly cocks, etc. Use test plug when testing BOP.
3. Ensure all crews are knowledgeable and practiced in emergency procedures, and that all emergency equipment is in proper working order. **DO NOT PROCEED UNTIL ALL BOP TESTS HAVE BEEN COMPLETED SATISFACTORILY.**

   All work to meet MIEM & WH&S requirements.
4. Check & report KB to GL, the correct KB elevation, and KB to top of casing bowl. Also advise if ground level has changed from original survey during lease construction. Calculate sump capacity & sump volume and include on final drilling report.

2. MA[redacted]HOLE

200 mm Strat Test (SC – 988mKB)

1. Post MACP chart in doghouse and manifold shack. Post stick diagram in doghouse. Run in with 200mm PDC bit and pendulum BHA (Discuss motor usage w/ Calgary). Drill out float and shoe after 12 hours W.O.C. (or until samples are hard) with reduced rotary speed and reduced weight on bit until drill collars are below surface casing shoe. Rig in PVT and Flow Show and ensure they are working accurately. Caliper and record the OD's and ID's of all DC's and tools prior to running in the hole.

2. Drill ahead with floc water as per program. Mud up to Polymer system at ~600mKB as per mud program. Check with Calgary regarding mud rheology. Work pipe and control drill rubble sections and/or any tight hole/connections. Continuously use solids removal equipment to ensure a low drilled solids mud system. Ensure all solids control equipment is in good operational condition. Run the finest shaker screens possible. Ensure fluid loss is controlled to protect the zone and density is kept as low as possible.

3. Fast tripping of the drill string is to be avoided in order to eliminate pressure surges and swabbing effects, which contribute to lost circulation, sloughing or influx of formation fluid. Work connections at half pump rate. Care should be taken to start pump slowly while breaking circulation and it is suggested the pump be run at a reduced rate until circulating free. On all trips out of the hole, take flow check before pulling off bottom, after pulling 5% of the pipe, at midpoint of the well, before pulling drill collars and when out of the hole. When tripping in, flow checks should be performed upon reaching the surface casing shoe with the drill string and at mid-point depth of wellbore. The rig manager or the drilling supervisor must be on location when tripping after penetrating a hydocarbon bearing zone. Bottoms must be circulated up prior to tripping after penetrating a hydrocarbon bearing zone. Circulate from the bubble point depth (600-700 m) on each trip. A trip sheet is to be filled out and a record is to be kept of the actual and calculated fill volumes. Maintain full hole conditions at all times. Fill hole every 5 stands on trips while pulling drill pipe and every stand while pulling drill collars. **Review flow check procedures with all drillers prior to drillout and penetration of the primary and secondary zones.**

5. Drill ahead to strat TD @ 988mKB. At total depth, circulate and condition mud prior to logging. Ensure the hole is conditioned as per program and in consultation w/ Calgary office.

6. Run logs and evaluate. Decision will be made to either abandon or proceed with horizontal. Run in open ended and condition for cement plugs. If the well is to be abandoned, abandon as per Manitoba government requirements then release the rig. Otherwise, set whipstock plug as per attached cement program. POOH. Allow cement to set up for a minimum of 24 hours prior to polishing. **Use Hughes sidetrack bit to kick-off the plug**. Past experience has shown that conventional sidetrack methods increase the chance of having to re-set the cement plug.

200 mm MONOBORE HOLE (KOP – TMD (2300 m)

1. PU and RIH with 200 mm ***PDC*** bit, motor set at 1.83 degrees, float sub, and drill pipe for performance drilling. *Be sure to have Gamma, inc and az survey equipment on BHA. PU HWDP at ~1400mMD, depending on hole conditions, to provide weight to drill to TD. This prevents the need for a pipe swap and offset wells have been successful in drilling the build section with drill pipe.

2. Directionally drill ahead with Polymer mud system, making sure to reduce pump rate 25% prior to Mannville and control drill no faster than 20 min/Kelly to avoid losses. Drill with caution and monitor for sloughing.***BE SURE TO EASE THROUGH THE JURASSIC.*** Directionally drill build section as per site specific directional plan. The goal is to drill the entire monobore in one run, therefore, it is important that we make the programmed build rates.

3. After reaching landing pt, continue drilling lateral section if hole is cleaning good with no torque or drag witnessed at surface. Otherwise trip to change bit and motor.

4. Drill 200 mm HZ section to TMD as per geologist. Walnut shells may be needed to reduce torque and drag if sliding becomes difficult. From KOP to TMD, 45-50 m/min annular velocity around drill pipe will be required to drill build and HZ.

5. **After the monobore hole is TD'd, perform wiper trip up inside the surface casing, run back down and perform the cleanout trip to condition the wellbore to run monobore production casing.**

6. If logs are required; rig up loggers and log the well as per the geological prognosis (contact Geological Department to confirm the logging tool configurations and logging program prior to commencement of logging operations). Have the cement volume log integrated. Logs are to be transmitted immediately after logging run. If any significant hole problems occur (tight hole, sloughing, deviation, etc.), discuss with Logging Engineer prior to running logging tools.

7. Run the casing in the hole as follows:

   i. Float shoe (threadlocked)
   ii. One joint of casing
   iii. Float collar (threadlocked)
   iv. Casing to surface. Discuss what completion tools are to be run in the casing string for Calgary. They will be run every 50m through the lateral section unless otherwise specified.
   v. Centralization will depend on what tools are run in the string for completion. Discuss centralization with Calgary.

Run the casing as outlined in the Drilling Program General Information.

8. Condition the hole and cement the casing to surface as outlined in the Drilling Program General Information. Refer to the attached cement program for cement details.

9. Set casing slips.

10. Release rig.

11. NOTE: ENSURE THE FOLLOWING IS DETAILED ON THE FINAL MORNING REPORT:

   vi. Rig release time
   vii. Boiler shutdown (when applicable)
   viii. Camp shutdown (when applicable)
   ix. Rentals returned when and how

. CASING AND CEMENTING

1. SURFACE CASING AND CEMENTING

1. Surface Casing and Accessories Cost Breakdown

   - **219.1 mm, 35.72 kg/m, J-55: $66.56/m**
   - 219.1 mm Guide Shoe: $324.50
   - 219.1 mm Float Collar: $663.75
   - 219.1 mm Centralizers: $75.23
   - 219.1 mm Stop Collar: $16.96
   - 219.1 mm Thread Lock: $36.88

   Remove thread protectors and clean threads (boxes and pins) and casing pin protectors. API drift all casing Reinstall pin protectors.

2. Run surface casing in the hole as follows:

   i. 219.1 mm Guide shoe (threadlocked)
   ii. 219.1 mm joint of casing
   iii. 219.1 mmFloat collar (threadlocked)
   iv. 219.1 mm, 35.72 kg/m, J-55 Casing to surface.

   API modified pipe dope to be used on all casing threads.

3. Ensure casing is adequately centralized to ensure a good cement job. Centralization will depend upon the tools run in the string for completion purposes. **Discuss centralization with Calgary.**

4. Molopo Energy Canada Ltd. requires that rig hands clear the V-door area completely and move to rear area of catwalk, well away from the movement of tubulars as they are being hoisted into the derrick (as per OH&S Regulations).

5. Fill casing while running in. Break circulation while lowering the last joint. Ensure bottom is tagged. Circulate a minimum of two hole volumes until returns are clean of cuttings. Reciprocate casing 3 to 5 meters while circulating and cementing.

6. Cement the surface casing to surface as follows:

   a. Ensure the mix water temperature is between 15°C and 30°C to prevent viscous cement slurries. Ensure a mix water sample is forwarded to cementing company prior to cementing to ensure compatibility. Ensure samples of mix water and dryblend cement are obtained prior to mixing cement slurry. Obtain slurry samples during the job and retain all samples until cement job has proven to be satifactory.

   b. Install plug loading cement head complete with rubber top plug.

   c. Pump a 4.0 m^3 water ahead as preflush.

   d. Mix and pump cement plus additives at a rate of at least 1.0 m^3/minute. If losses were experienced while drilling surface hole add celloflake to the slurry.

   e. Immediately prior to displacing top plug, lower casing to landing position and chain down. Land casing just off bottom in tension (pick up buoyed casing weight).

f. Release the top plug and displace cement with water at a rate of 1.0 m^3/min. (reduce to a minimum for lost circulation problems). Final volumes to be determined on location.

g. Bump plug to 3500 kPa over pumping pressure. Release pressure and check for back-flow. If plug fails to hold rebump and check again and if necessary hold 3500 kPa on the casing for four hours. Install a gauge on the casing and monitor the pressure to ensure it does not build beyond 7000 kPa.

h. If good cement returns are not obtained at surface, or if cement top drops, it will be necessary to re-cement from surface using 1¼" pipe.

2. PRODUCTION CASING AND CEMENTING

1. Production Casing and Accessories Cost Breakdown:
   - **139.7 mm, 23.07 kg/m, J-55: $43.66/m**
   - 139.7 mm Float Shoe: $350.31
   - 139.7 mm Float Collar: $390.88
   - 139.7 mm Centralizers: $56.05
   - 139.7 mm Stop Collar: $13.28
   - 139.7 mm Turbolizers: $84.08
   - 139.7 mm Thread Lock: $36.88

2. Remove thread protectors and clean threads (boxes and pins) and casing pin protectors. API drift all casing. Reinstall pin protectors.

3. Run the production casing in the hole as follows:
   i. 139.7 mm Float shoe (threadlocked)
   ii. 139.7 mm joint of casing
   iii. 139.7 mm Float collar (threadlocked)
   iv. 139.7 mm, 23.07 kg/m, J-55 Casing to surface. Discuss what completion tools are to be run in the casing string for Calgary. They will be run every 50m through the lateral section unless otherwise specified.

   After making up Float shoe, shoe joint, Float collar and one joint of casing, check floats to ensure they are holding. API modified pipe dope to be used on all casing threads. Ensure thread protectors are returned to supplier.

4. Molopo Energy Canada Ltd. requires that rig hands clear the V-door area completely and move to rear area of catwalk, well away from the movement of tubulars as they are being hoisted into the derrick (as per OH&S Regulations).

5. Ensure casing is spaced out so a collar is not set near the bowl as the wellhead valve will be fastened directly to production casing (Look at one of the area wellhead's to clarify concept).

6. Install a turbolizer midway on the shoe joint. Install turbolizers above and below zones of interest. Install casing centralizers every 50m to the last casing shoe.

7. Fill casing while running in. Do not exceed 30 sec/joint running speed. Break circulation while lowering the last joint. Adjust pump speed to have the same annular velocity prior to laying down drill pipe. **Use landing joint to land casing.** Ensure bottom is tagged. Circulate a minimum of two hole volumes until returns are clean of cuttings and hole condition is stable. Reciprocate casing 3 to 5 meters while circulating.

8. Prior to cementing reduce viscosity to 40 to 45 seconds per litre and decrease yield point to 3.5 to 4.0.

9. Remove the circulating head and insert bottom wiper plug.

10. Use a positive displacement manifold type plug loading head. Ensure top plug is installed and release mechanism is operational.

11. Ensure the mix water temperature is between 15°C and 30°C to prevent viscouse cement slurries. Ensure a mix water sample is forwarded to cementing company prior to cementing to ensure compatibility. Ensure samples of mix water and dryblend cement are obtained prior to mixing cement slurry. Obtain a minimum of three slurry samples spaced out during the job and retain all samples until cement job has proven to be satisfactory.

12. Install casing wiper plug and pump 4.0 m^3 of water ahead as preflush. Follow with 3.0 m^3 of Scavenger cement. Scavenger slurry to be mixed to a density of 1250 kg/m^3.

13. Mix and pump Fill cement – EconoCem W6. Cement is to be mixed at a Density of 1414 kg/m^3. Mix and pump Tail cement – ExtendaCem W6. Cement is to be mixed at a Density of 1618 kg/m^3.

14. Chain down casing and drop plug on the fly. **Recommended pump rate to be 1.0 m^3/min.**

15. Displace casing with water. All mix and displacing volumes to be calculated and verified on site by the Drilling Supervisor.

16. Bump plug(s) with 3500 kPa over pumping pressure. **To control gas migration, pressure is to be held on the cement column for ~2 hours.** Please see Annular Pressure Apparatus Procedure.

17. Notify AJ Tubulars and have wellhead installed, chained and locked prior to any rig release of drilling rig (Want to protect the wellbore downhole at all times until completion equipment arrives).

18. Tear-out and Release rig.

3. ABANDONMENT CEMENTING

The MIEM requires each porous interval to be isolated with a cement plug. The following parameters should be followed:

1. The plug is required to be no less than 30m long or a minimum of 15 m above or below the zone.

2. A cement plug of a minimum length of 30 m is placed across the surface casing shoe.

3. The interval between plugs should be filled with drilling mud.

4. All cement plugs are placed in the hole by circulating them through drill pipe or by any method approved by an inspector.

5. A cement plug must be able to withstand 18kN when probed with drill pipe after allowing the cement to cure for 6 hours, unless otherwise authorized by an inspector. When a cement plug is probed with an approved wireline tool, a strip log showing the calculated and measured cement top is submitted to the district office on the completion of the log. Cement plugs are to be reset if they fail to withstand the required force or are found to be placed in the wrong spot.

6. Surface casing is to be cut off at least 1.5m below ground level and have a steel plate welded on to close off the well bore.

C. WELL CONTROL:

1. Minimum BOP stack layout and bleed-off system are shown in the MIEM Drilling and Production Regulations.

2. Ensure flarelines are staked or adequately weighted down. Choke line and line back to the degasser are to be steam traced in the winter.

3. Drill string blowout prevention equipment needed:
   a. -drill pipe inside BOP with removable handles
   b. -drill pipe stabbing valve with removable handles (in open position)
   c. -upper and lower kelly cocks (with wrenches)

4. Test the annular preventer, the HRC valve, and all rams by cycling each item from both the rig floor and remote control stations and seeing full and correct action occurs.

5. Test the accumulator operation by:
   a. Fully opening the annular preventer and rams.
   b. Charging the accumulator to full working pressure then disconnecting the charge pump.
   c. Opening the HCR valve and closing the annular preventer fully. Check closure is within 60 seconds and that accumulator pressure remains above 8.4 mPa.
   d. Reconnecting the charge pump and checking that full working pressure is recovered within 5 minutes.
   e. Closing each set of rams in turn and checking that closing time is less than 30 seconds (from full accumulator working pressure and with charge pump disabled).

6. Check that each nitrogen bottle is charged to at least 12.5 mPa. Ensure a gauge is readily available to check precharge.

7. Pressure test the BOP system with water. Each test to last 10 minutes at 1.4 mPa then 10 minutes at 7 mPa.
   a. Flush the system of all mud prior to testing.
   b. Any indication of leakage or a pressure loss of more that 10% of the test pressure, over a 10 minute period is a failure and requires corrective action. This assumes a test plug is not in place.
   c. Pressure is to be applied in the same direction that a kick would pressurize the item being tested.
   d. All valves downstream of the item being tested are to be open. Pressure test the kill line and each valve on that line by increasing pressure upstream of the check valve.
   e. If test pressure exceeds 67% of casing burst pressure, use a hanger test plug.
   f. The following must be recorded in tour book:
      i. BOP component tested
      ii. Test duration
      iii. Test pressure observed at the start and the finish of each test

8. Test
   a. each ram
   b. the annular preventer against drill pipe
   c. each valve on the drilling spool
   d. each valve and full closing choke in the bleed off manifold
   e. the drill string inside BOP
   f. the drill string stabbing valve
   g. the kelly cocks
   h. the kill line
   i. casing after drilling the shoe joint with water to 3 to 5 m above the guide shoe prior to drilling out.

9. **ALL FLANGES AND FITTINGS THROUGHOUT THE BOP SYSTEM (STACK MANIFOLD AND ASSOCIATED LINES) ARE TO BE TIGHTENED UPON COMPLETION OF THE PRESSURE TESTING.**

10. Air shut-offs on all diesel motors to be tested prior to drillout and every week thereafter.

11. The following checks are be completed as detailed below and recorded in the tour book:

a. Daily:

   i. Measure standpipe pressure at the well-kill pump speed and update the Kick Control Worksheet. Post Kick Control Sheet in doghouse upon completion.
   ii. Close and open each BOP.

b. At least weekly:

   i. Driller's engine shut-offs are to be tested.
   ii. A blow out prevention drill is to be held with each crew while drilling, tripping and out of the hole.

c. On each trip:

   i. Complete a Trip Worksheet for each trip and forward to Molopo's Calgary Office.
   ii. Close and open the blind rams after each trip out of hole.

12. Kick Control Worksheet to be completed daily and posted in the doghouse and manifold shack.

13. Drillers to hold current PITS "First Line Supervisor" certificate and one person on the lease to hold a current PITS "Second Line Supervisor" certificate. Record names and dates of last certification.

14. All rig crews to be trained in operating the BOP equipment and a rig blowout prevention drill held for each crew.

15. Drillstring pressure gauge to be hooked up at all times at the choke manifold.

16. Record all BOP test results and all BOP drills and checks on Molopo's "Daily Drilling Report".

In the event of a well control problem, refer to the Corporate Emergency Response Plan.

III. GENERAL INFORMATION

1. SUPERVISOR RESPONSIBILITIES

1. This drilling program is intended to be a guide for drilling the well and may need to be modified as hole conditions dictate. All modifications must be discussed and approved by the Drilling Manager.

2. A pre-spud safety meeting must be held with the crews and recorded in the tour book.

3. Operations must be accurately recorded in the daily tour reports and morning reports. Also ensure that hole fill records and flow checks are recorded in the tour book.

4. Caliper the BHA (ID, OD and length) prior to running through the rotary table. Gauge all stabilizers on each trip in the hole. Rotate top and bottom joints of drill collars.

5. Maintain a current well control worksheet. Updates must be made with all significant hole, drill string and depth changes. Reduced speed pump pressure (RSPP) to be noted on the daily well report. BOP tests are to be conducted upon nipple-up, changes in BOP control equipment, every 7 days to well completion and as often as required to ensure crews are capable of maintaining well control

6. The use of drugs and alcohol will not be tolerated. Anyone not following this instruction will be released immediately.

7. Ensure all operations conform to current MIEM regulations, OH&S standards and Industry Recommended Practices. Any operations not following these regulations will be suspended immediately and reported to Anderson's office.

8. If any hole problems develop (i.e., stuck, fishing, loss of circulation, etc.), immediately contact the Molopo representative on call.

9. Morning reports are to be in by 07:00 hours for the previous 24-hour period. Reports will be from midnight to midnight, with a 06:00 update. Please report current operation at 06:00 hrs.

10. Ensure crews are familiar with all aspects of the well, potential hole problems, kick detection, BOP operating procedures and company expectations.

11. Ensure an emergency phone list is posted in the doghouse and the Rig Manager's well site trailer.

12. All invoices are to be stamped and signed by the supervisor. An AFE number, well name, location and date are also to be included. **Payment will be delayed for invoices missing any of this data.** Address all invoices as per the following:

Send invoices to:
Molopo Energy Canada Ltd.
1400, 444 – 5th Ave. S.W.
Calgary, AB T2P 2T8
Attention: Chad Melby

2. SAFETY, ENVIRONMENT AND REGULATORY COMPLIANCE

1. **All contract** personnel working on a Molopo site must receive a safety orientation. The orientation includes discussion on safety, accompanied by a booklet of Molopo's safety requirements (These booklets will come with the field package). A Molopo representative must give this orientation to each contractor's supervisor. It is up to Molopo representative discretion to decide who gives the orientation to the rest of the personnel for that contractor. When the orientation is complete, the acknowledgement form, found at the back of the booklet, is filled out and returned to the Molopo supervisor.

2. The Molopo supervisor is to hold and record a pre-spud meeting w/ crews on location. Weekly meetings and pre-job meetings are to be held thereafter. The Molopo Supervisor is to confirm that the rig crews are trained in the operation of BOP's, minimum safety training and that, for drilling rigs, all Drillers have a valid first line supervisor's well control certificate. **The Molopo Supervisor should be aware of the experience level of the all personnel working on a Molpo site.** The following outlines critical meeting times:

Operation	Critical Personnel
Prior to rig move and rig mobilization	Trucking contractor, rig contractor personnel, and construction personnel.
Prior to Spud	Rig crew and all other onsite personnel.
Prior to casing & cementing operations	Rig crew, service personnel, and all other on-site personnel.
Prior to testing: Coring, DST's, and logging	Rig crew, service personnel, and all other on-site personnel.
Prior to penetrating the first sour formation	Rig crew, service personnel, H_2S personnel and all other on-site personnel.
Prior to initiating safety/well control procedures	Rig crew, service personnel, H_2S personnel and all other on-site personnel.

3. **All accidents and near-miss/hazardous** incidents must be reported, investigated and recorded on the appropriate Molopo form. Submit all reports to Molopo's Calgary office within 24 hours. Also, report all environmental incidents or near misses and forward to Calgary.

4. Personal Protective Equipment requirements for all contractors and service personnel includes CSA approved hard hats, outer layer fire retardant clothing, safety glasses with side shields and steel toe boots. Inner layer clothing should be made of cotton or wool fabric. Nylon or static producing fabrics are not allowed. Additional safety equipment (ie. hearing protection, gloves, face shield, etc.) are to be worn in designated areas.

5. All hazardous materials are to be labeled and handled as per WHMIS regulations.

6. For further information refer to the Molopo HSE Operations manual.

7. Conduct rig inspection personally in addition to CAODC inspections performed by toolpush/rig foreman.

b. MISCELLANEOUS REQUIREMENTS

DELEGATION OF AUTHORITY: When the Drilling Supervisor leaves the location for any reason, he is required to delegate an individual (usually the rig toolpush) to act on his behalf to ensure all OH&S and MIEM guidelines and rules are strictly adhered to by all lease personnel. This individual shall hold a valid Second Line Supervisor's Well Control Certificate. This is to be discussed and recorded prior to spudding the well. <u>This notice must be posted in the doghouse</u>.

RIG INSPECTION REPORTS

Rig Inspection Reports are to be completed and signed by Toolpush and Supervisor at:

- rig up
- after BOP nipple up, prior to drilling out
- weekly thereafter.

Daily rig walkarounds to be completed by Toolpush and Supervisor and recorded in the tour book.

WHMIS REQUIREMENTS:

- Ensure Toolpusher has adequately educated all rig personnel with the policies and procedures outlined in WHMIS.
- All Material Safety Data Sheets (MSDS) are to be stored in the doghouse.
- MSDS sheets to be supplied by the mud company
- Ensure all related mud products are labeled.
- WHMIS meetings to be held with each crew weekly and recorded in the tour book
- If any DSTs are to be run, all personnel on location must wear approved fire-resistant coveralls.

3. REPORTING REQUIREMENTS

a. TOUR SHEETS

Ensure the following information is detailed on the morning tour sheets.

1. Well Data:	Well name, location, contractor, rig number and KB elevation.
2. BOP Tests:	Details of all and choke manifold pressure tests (including equipment tested), test duration initial and final test pressures. Details of daily mechanical tests.
3. Drlg Information:	Spud date, bit size, depth of hole at beginning or end of **INFORMATION** each tour, deviation surveys, performance motor serial number, directional surveys, fishing details, total depth, rig release date.
4. Drlg Occurrences:	Lost Circulation: Depth and interval, density and volume of fluid lost, amount and types of materials used. Gas Kick: Depth, shut-in and circulating pressures, influx volume, control procedures. Water Flow: Depth, pressures, volume control procedures.
5. Formation Tests:	Drill-stem Test: Test number, interval, valve open time, gas, oil or water to surface times and flow rates, recovery. Wireline Tests: Test number, depth, duration, recovery. Flow Tests: Depths, recoveries, fluid levels, flow rates. Swab Tests: Depths, recoveries, fluid levels.
6. Cores:	Core number, interval, size, recovery.
7. Logs:	Types of logs run and corresponding intervals.
8. Abnd. or Plug Back:	Plug number, interval, plug downtime, amount of cement and additives, slurry weights, felt at (time and depth) drilled-out depth. Bridge Plugs: Setting depth, pressure test details, amount of cement in cap. Surface Abandonment: Details, including cutting of casing, cement cap or welding on plate.

9. Casing & Liners: Number of joints run, size, setting depth, liner top, weight, grade, collar type, **LINERS** new or used (if mixed string is run, this information is required for each section).

10. Csg Cementing: Amount and type of cement and additives, slurry weight, slurry volume, returns to surface, cement top (if determined).

b. CASING AND CEMENTING REPORTS

These forms must be filled out immediately after the casing and cementing has been done. These forms should be sent to Calgary office with morning report.

c. MATERIAL TRANSFER SHEETS

The form is to be used for the transfer of tubular and wellhead equipment only. List all serial numbers and give a good description of the equipment.

d. WASTE MANAGEMENT FORM

To be completed at end of well and sent in with final report.

e. CONTAINMENT OF LEASE FLUIDS

Ensure lease is properly diked to prevent release of any fluids (runoff or otherwise). Under no circumstances are any fluids to be pumped off the lease. **If a release does occur, immediately notify Calgary personnel and the MIEM.**

f. GENERAL HOUSEKEEPING

All vehicles must remain within the boundaries of the marked access and lease

Ensure all toxic waste and garbage are properly disposed of in waste bin.

Location must be cleaned of all garbage and debris prior to leaving location.

g. FIELD TICKETS

All field tickets must be approved in the field by the wellsite supervisor. The wellsite supervisor is to retain backup copies of field tickets for a period of one year.

Ensure the service companies forward invoices along with the field tickets to the attention of:

Molopo Energy Canada Ltd.
1400, 444 – 5th Ave. S.W.
Calgary, AB T2P 2T8
Attention: Chad Melby

Ensure the following information is recorded on the field tickets and appears on the invoice:

- Wellname and location
- AFE Number
- Subfeature the item is charged to
- Wellsite supervisor name printed and their signature

NOTE: The above guidelines are very brief. If the Drilling Supervisor requires additional, more complete instruction, please contact Molopo's Calgary Office.

Licence

Date: June 2, 2010
File No: XX-XX-001-28W1.SURF
Price Book: 15-Jun-08
Ship To:
Sold To:
Quote:

HALLIBURTON

Molopo Canada

444 5th Ave SW
Calgary, AB
T2P 2T8

Attention: Mr. Chad Melby
Phone: (403) 264-9778
CMelby@molopocanada.com

Generic Manitoba Surface

XX-XX-001-28W1

SURFACE CASING CEMENT PROPOSAL

EconoCem Cementing System EUB Code = 3

For further information regarding this program, please contact:

Account Representative:	Mike Exner
Phone:	(403) 231-9363
Cellular:	(403) 836-8685
Technical Representative:	Mike Exner
Phone:	(403) 231-9363
Fax:	(403) 263-9366

Halliburton Field Contact:

Customer Service Centre: 1-800-335-6333
Red Deer, AB

HALLIBURTON

SURFACE CASING CEMENT

Generic Manitoba Surface XX-XX-001-28W1

HALLIBURTON

Well Data

Hole	311.15 mm	
Casing	219.08 mm	35.72 kg/m J-55
TD	200 m	
Csg/Hole factor	0.0383 m^3/m	
Csg Vol. factor	0.0332 m^3/m	
Excess Volume	50% over gauge	

Temperature

BHST	12	°C estimated
BHCT	15	°C estimated

Preflush

3 m3 Water

Surface Cement

SwiftCem W1

Optimum Density	1702	kg/m^3
Yield	0.99	m^3/tonne
Water Requirements	0.66	m^3/tonne
Hydrostatic Gradient	16.7	kpa/m

Thickening Time	3:20	hrs @	15	°C	
Compressive Strength	3.5	MPa in	20	hrs @	15 °C

Calculated Slurry Volume	=	**11.9 m^3**
Total Cement (inc. excess)	=	**12.1 tonnes**
Mix Water Required	=	**8.0 m^3**
Estimated Displacement	=	**6.3 m^3**
Estimated Pump Time (@ 1 m3/min + safety factor)	=	**45 min**

NOTE: Document PM-CA-HES-CMT-400 of the Halliburton Management System (HMS) will be followed to maintain the Safety of all personnel and ensure the highest level of Service Quality is attained.

RECOMMENDED PROCEDURE

1. Run casing, condition mud and hole to ensure successful cement placement while maintaining hole stability.
2. Safely spot units and rig up cementing equipment, performing a QC check on all materials and equipment.
3. Hold a pre-job Safety and Procedure meeting with all personel on location.
4. Pressure Test surface treating lines to 20 MPa or 10% above the maximum expected pressure.

   CAUTION: THE MAXIMUM PRESSURE REACHED, INCLUDING PRESSURE TESTING, **WILL NOT EXCEED** THE WORKING PRESSURE OF THE LOWEST RATED COMPONENT IN THE SYSTEM BEING PRESSURIZED.
5. Establish circulation and reciprocate the casing with a 3 to 4 m stroke throughout the cementing operation.
6. Pump the following at 1 m3/min:

   3 m3 Water

   11.9 m3 SwiftCem W1 mixed at 1702 kg/m3

   NOTE: If Lost Circulation problems occurred while drilling the following may be performed:
   - *** Mix Flocele on the fly @ 4 kg/m^3**
   - *** Stage displacement and monitor fall back**
   - *** Change Water wash to Visco Flush**
7. Release the TOP plug and displace with 6.3 m3 water. Slow down rate prior to bumping plug and pressure up to 3.5 MPa above displacement pressure.
8. Hold pressure for 3 minutes after landing the plug, then bleed off the pressure and ensure the float is holding. If float equipment does not hold, repressure to 1 MPa above displacement pressure and close valve on head. Install a pressure guage. Monitor and maintain this pressure as required while waiting on cement eight hours.

Note: A 4 L sample of mixing water will be obtained in order to test production casing cement.

This recommendation is to be used as a guide only.

Job conditions and field experience must dictate actual job procedures.

For an Optimum Slurry Temperature the Mixing Water should be 20 °C.

During any Cement job slurry should not be allowed to remain static in the annulus for longer than 20 minutes.

A real risk of having the cement gel exists and precautions must be taken.

June 2, 2010
XX-XX-001-28W1 SURF

Molopo Canada
Generic Manitoba Surface
XX-XX-001-28W1
Mr. Chad Melby
(403) 264-9778
CMelby@molopocanada.com

HALLIBURTON
Customer Service Center
1-800-335-6333
Mike Exner
(403) 231-9363
(403) 836-8685

SURFACE CASING CEMENT

Well Parameters

311.15 mm Hole
219.08 mm
35.72 kg/m
J-55
0.0383 m3/m csg/hole factor
0.0332 m3/m csg factor

Preflush

3 m3 Water

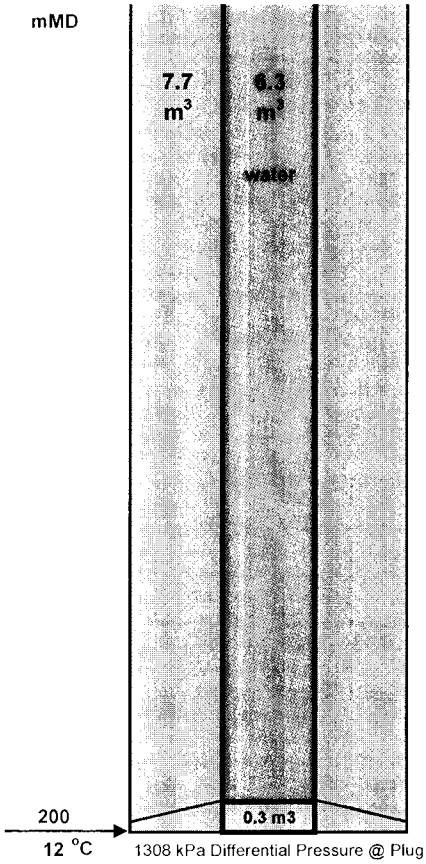
Surface Cement 0 m to 200 m

SwiftCem W1

50% excess over gauge
1702 kg/m3 density
0.99 m3/t yield
0.66 m3/t water requirement
16.7 kPa/m hydrostatic gradient
3:20 hrs Thickening Time 15 °C
3.5 MPa Comp. Strength in 20 hrs

11.9 m3 Slurry Volume (inc. excess)

12.1 Tonnes Cement Required



Recommended Pump Rate = 1.00 m3/min OR as well conditions dictate.

COMMENTS

The bottom hole temperature given above is estimated and may vary from actual depending upon methods used in drilling the well.
ie. Motor drilling can increase the bottom hole temperature drastically.
If Lost Circulation problems occur during drilling, the following may be performed:
Change water wash to Visco Flush
Mix Flocele on the fly @ 4 kg/m3
Stage Displacement and monitor fall back
NOTE: Mud lines are NOT to be used for flush 'the stack' and only used open ended (no valve that would allow hoses to pressure up)

"Halliburton excellence means integrating Health Safety Environment into all of our business activities and creating an incident-free workplace"

Generic Manitoba Surface XX-XX-001-28W1

HALLIBURTON

Molopo Canada - SURFACE CASING CEMENT

SURFACE CASING CEMENT COST ESTIMATE (BOM # 7521)

EQUIPMENT CHARGES — **AREA 1**

SAP	Description	Quantity	UOM	Unit Price	TOTALS
121838	Casing/Liner - Single Pump Unit	1st 8 hrs	per unit	$ 1,378.72	$ 1,378.72
553732	Equipment Travel - Hourly	1 @ 3.8	units*hour	$ 296.00	$ 1,124.80
123175	Associated Equipment Package	1	each	$ 195.16	$ 195.16
					$ 2,698.68

MATERIAL CHARGES — **AREA 1**

	CEMENT				
452992	**EconoCem Cementing System**				
452990	**SwiftCem W1**	12.1	t	$ 268.61	$ 3,250.18
3965	Cement Handle and Dump	12.1	per ton / un	$ 42.00	$ 508.20
565212	Delivery - Cement and Materials	4.8	hour	$ 275.00	$ 1,320.00
101227839	219.08 mm Top HWE Plug	1	each	$ 202.44	$ 202.44
7	Environmental Charge (Mandatory)	1		$ 50.00	$ 50.00
					$ 5,330.82

TOTAL FOR CEMENT SERVICE: $ 8,029.50

If required, additional items will be charged as per Halliburtons Price Book 72% discount
With the Exception of those Non-Discounted Services (ie. Personnel Charges, Travel, Fuel Surcharges, Etc.)
Please refer to the current price book for clarification for any additional items charged

Third Party Charges — Cost plus 25%

Pricing based on AREA 1, and 3.8 hours travelled from Estevan.

Price Book: 15 June 2008

Payment Terms: NET 20 Days

The above mileage / hours is only an estimate. Actual kilometres / hours driven will be shown at the time of invoicing

Pricing on this quote will be honoured for 90 days

Pricing on this quote is in effect providing Halliburton is able to supply manpower and equipment

The Goods and Services Tax will be calculated on the total value of the invoice and will be shown on a separate line at the time of invoicing

All other Government taxes, including Provincial Sales Tax, will be added at the time of invoicing

Halliburton Energy Services' Goods and Services Tax Registration No. is R130640444

All services performed, equipment employed and materials sold are provided in accordance with the Terms and Conditions specified on the Halliburton Field Ticket unless a signed service or sales contract governing the services, equipment and materials exists between your company and Halliburton Energy Services.

Revision 1

Date: June 22, 2010
File No: XX-XX-001-28W1.PRD.R1
Price Book: 15-Jun-08
Ship To:
Sold To:
Quote:

HALLIBURTON

Molopo Canada

444 5th Ave SW
Calgary, AB
T2P 2T8

Attention: Mr. Chad Melby
Phone: (403) 264-9778
CMelby@molopocanada.com

Canadian Generic Manitoba Production (long reach)

XX-XX-001-28W1

PRODUCTION CASING CEMENT PROPOSAL

Hilite XLT with class G cement

EconoCem Cementing System	Hilite 1400 XLT EUB Code = 42
ExtendaCem Cementing System	BR II EUB Code = 4

For further information regarding this program, please contact:

Account Representative:	Mike Exner
Phone:	(403) 231-9363
Cellular:	(403) 836-8685
Technical Representative:	Mike Exner
Phone:	(403) 231-9363
Fax:	(403) 263-9366

Halliburton Field Contact:

Customer Service Centre: 1-800-335-6333
Red Deer, AB

HALLIBURTON

DUCTION CASING CEMENT — adian Generic Manitoba Production (long reach) XX-XX-001-2 — HALLIBURTON

Well Data

Previous Casing	219.08 mm	35.72 kg/m	J-55
Previous Csg TD	200 m		
Hole	200.03 mm		
Casing	139.70 mm	23.07 kg/m	J-55
MD	2400 m		
TVD	970 m		
KOP	750 m		

Volume Factors

Csg/Csg factor	0.0179 m^3/m		
Csg/Hole factor	0.0161 m^3/m		
Csg Vol. factor	0.0124 m^3/m		
Excess Volume	lead	30%	over gauge
	tail	40%	over gauge

Temperature

BHST	43	°C estimated
BHCT	41	°C estimated

Mud Type

POLYMER @ 1100 kg/m3

PREFLUSH

4 m3 Water

SCAVENGER LEAD CEMENT

Volume	3.0	m^3
Density	1250	kg/m^3
Yield	2.36	m^3/tonne
WR	1.95	m^3/tonne

LEAD CEMENT

Interval 0 m to 750 m

Hilite 1400 XLT + 0.2% Halad 447

Optimum Density	1400	kg/m^3				
Yield	1.52	m^3/tonne				
Water Requirements	1.12	m^3/tonne				
Hydrostatic Gradient	13.7	kpa/m				
Thickening Time	5:47	hrs @	41	°C		
Compressive Strength	3.5	MPa in	36	hrs @	34	°C

Calculated Slurry Volume	=	**15.1 m^3**
Total Cement (inc. exs+scav)	=	**11.3 tonnes**
Mix Water Required	=	**13.7 m^3**

TAIL CEMENT

Interval 750 m to 2400 m

BR II + 0.3% Halad 447 + 0.3% HR-4 + 0.15% FWCA + 0.2% CFR-3

Optimum Density	1600	kg/m^3				
Yield	1.02	m^3/tonne				
Water Requirements	0.61	m^3/tonne				
Hydrostatic Gradient	15.7	kpa/m				
Thickening Time	5:12	hrs @	41	°C		
Compressive Strength	3.5	MPa in	16	hrs @	43	°C

Calculated Slurry Volume	=	**37.3 m^3**
Total Cement (inc. excess)	=	**36.6 tonnes**
Mix Water Required	=	**22.3 m^3**

Estimated Displacement = 29.7 m^3 **Estimated Pump Time (@ 1 m3/min + safety factor) = 155 min**

"Halliburton excellence means integrating Health Safety Environment into all of our business activities and creating an incident-free workplace"

NOTE: Document PM-CA-HES-CMT-400 of the Halliburton Management System (HMS) will be followed to maintain the Safety of all personnel and ensure the highest level of Service Quality is attained.

RECOMMENDED PROCEDURE

1. Run casing, condition mud and hole to ensure successful cement placement while maintaining hole stability.
2. Safely spot units and rig up cementing equipment, performing a QC check on all materials and equipment.
3. Hold a pre-job Safety and Procedure meeting with all personel on location.
4. Pressure Test surface treating lines to 20 MPa or 10% above the maximum expected pressure.

   CAUTION: THE MAXIMUM PRESSURE REACHED, INCLUDING PRESSURE TESTING, **WILL NOT EXCEED** THE WORKING PRESSURE OF THE LOWEST RATED COMPONENT IN THE SYSTEM BEING PRESSURIZED.
5. Establish circulation and reciprocate the casing with a 3 to 4 m stroke throughout the cementing operation.
6. Release a Bottom wiper plug (if required) and pump the following at 1 m3/min:

   4 m3 Water
   3 m3 Scavenger Hilite 1400 XLT + 0.2% Halad 447 mixed at 1250 kg/m3 (Yield = 2.36 and WR = 1.95)
   15.1 m3 Hilite 1400 XLT + 0.2% Halad 447 mixed at 1400 kg/m3
   37.3 m3 BR II + 0.3% Halad 447 + 0.3% HR-4 + 0.15% FWCA + 0.2% CFR-3 mixed at 1600 kg/m3
7. Pump out surface lines through pump-out tee.
   1) Stop mixing and empty tub.
   2) Shut in valve on plug loading head and open valve on pump-out tee.
   3) Pump fresh water through tub to ensure tub will not set up during displacement period.
   4) Shut in recirculation valve on mix tub and set valves on unit to boost displacement from displacement tanks.
   5) Boost the HT400's and pump out through the secured lines at 500L/min until there is clean fresh water emerging from the pump out line.
   6) Shut valve on pump out tee and open valve on plug loading head and release the plug.
   7) Manually record the volume pumped while displacing.
8. Release the Top wiper plug and displace 29.7m3 water. Slow down rate prior to bumping plug to 3.5 MPa above displacement pressure.
9. Hold pressure for 3 minutes after landing the plug, then bleed off the pressure and ensure the float is holding. If float equipment does not hold, repressure to 1 MPa above displacement pressure and close valve on head. Install a pressure guage. Monitor and maintain this pressure as required while waiting on cement eight hours.

Note: This recommendation is to be used as a guide only.
Job conditions and field experience must dictate actual job procedures.
For an Optimum Slurry Temperature the Mixing Water should be 20 °C.
During any Cement job slurry should not be allowed to remain static in the annulus for longer than 20 minutes.
A real risk of having the cement gel exists and precautions must be taken.

Revision 1
June 22, 2010
XX-XX-001-28W1 PRD R1

Molopo Canada
Canadian Generic Manitoba Production (long reach)
XX-XX-001-28W1
Mr. Chad Melby
(403) 264-9778
CMelby@molopocanada.com

HALLIBURTON
Customer Service Center
1-800-335-6333
Mike Exner
(403) 231-9363
(403) 836-8685

PRODUCTION CASING CEMENT

Well Parameters

219.08	mm Prev Csg	0.0179	m3/m csg/csg factor
35.72	kg/m Prev Csg	0.0161	m3/m csg/hole factor
J-55		0.0124	m3/m csg factor
200.03	mm Hole		
139.70	mm		
23.07	kg/m		
J-55			

Mud
POLYMER @ 1100 kg/m3

Preflush
4 m3 Water

Scavenger Cement
3 m3 @ 1250 kg/m3 density
2.36 m3/tonne yield

Lead Cement 0 m to 750 m

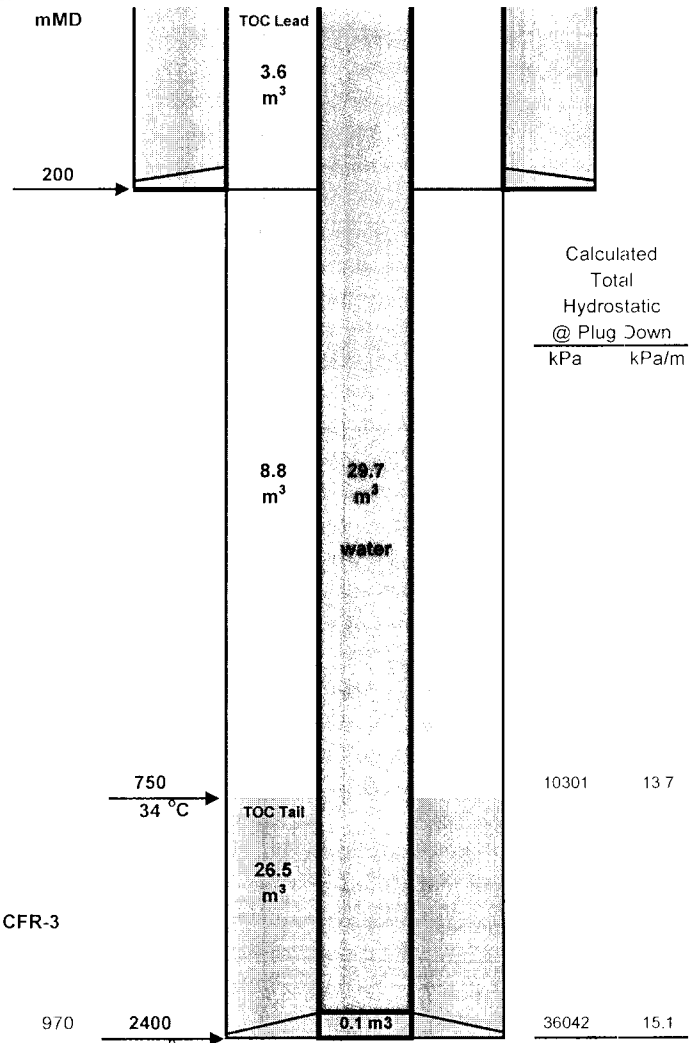
Hilite 1400 XLT + 0.2% Halad 447

30%	excess over gauge
1400	kg/m3 density
1.52	m3/t yield
1.12	m3/t water requirement
13.7	kPa/m hydrostatic gradient
5:47	*hrs Thickening Time 41 °C*
3.5	*MPa Comp. Strength in 36 hrs*
130	*cc Fluid Loss/30 min - API corrected*
15.1	m3 Slurry Volume (inc. excess)
1.3	Tonnes of Scavenger Cement
11.3	Total Tonnes Cement Required

Tail Cement 750 m to 2400 m

BR II + 0.3% Halad 447 + 0.3% HR-4 + 0.15% FWCA + 0.2% CFR-3

40%	excess over gauge
1600	kg/m3 density
1.02	m3/t yield
0.61	m3/t water requirement
15.7	kPa/m hydrostatic gradient
5:12	*hrs Thickening Time 41 °C*
3.5	*MPa Comp. Strength in 16 hrs*
92	*cc Fluid Loss/30 min - API corrected*
37.3	m3 Slurry Volume (inc. excess)
36.6	Total Tonnes Cement Required



Recommended Pump Rate = 1.00 m3/min OR as well conditions dictate

COMMENTS

NOTE Mud lines are NOT to be used for flush 'the stack' and only used open ended (no valve that would allow hoses to pressure up)

"Halliburton excellence means integrating Health Safety Environment into all of our business activities and creating an incident-free workplace"

Canadian Generic Manitoba Production (long reach) XX-XX-001-28W1 HALLIBURTON

Molopo Canada - PRODUCTION CASING CEMENT

PRODUCTION CASING CEMENT COST ESTIMATE (BOM # 7523)

	EQUIPMENT CHARGES			AREA 1			
SAP	Description	Quantity		UOM	Unit Price		TOTALS
16091	Casing/Liner - Twin Pump Unit		1st 8 hrs	per unit	$ 1,990.24	$	1,990.24
553732	Equipment Travel - Hourly	1 @	3.8	units*hour	$ 296.00	$	1,124.80
123175	Associated Equipment Package		1	each	$ 195.16	$	195.16
						$	**3,310.20**
	MATERIAL CHARGES			**AREA 1**			
	CEMENT						
452992	**EconoCem Cementing System**						
58500	**Hilite 1400 XLT**		11.3	t	$ 518.28	$	5,856.56
100003799	0.2% Halad 447		22.6	kg	$ 11.51	$	260.08
452981	**ExtendaCem Cementing System**						
116405	**BR II**		36.6	t	$ 252.28	$	9,233.45
100003799	0.3% Halad 447		109.8	kg	$ 11.51	$	1,263.58
100005056	0.3% HR-4		109.8	kg	$ 4.04	$	443.33
100003714	0.15% FWCA		54.9	kg	$ 22.56	$	1,238.37
100003653	0.2% CFR-3		73.2	kg	$ 5.66	$	414.02
3965	Cement Handle and Dump		48.3	per ton / un	$ 42.00	$	2,028.60
565212	Delivery - Cement and Materials		14.4	hour	$ 275.00	$	3,960.00
101237390	139.7 mm Top HWE Plug		1	each	$ 60.48	$	60.48
101237389	139.7 mm Bottom HWE Plug		1	each	$ 54.32	$	54.32
7	Environmental Charge (Mandatory)		1		$ 50.00	$	50.00
						$	**24,862.79**

TOTAL FOR CEMENT SERVICE: $ 28,172.99

If required, additional items will be charged as per Halliburtons Price Book 72% discount
With the Exception of those Non-Discounted Services (ie. Personnel Charges, Travel, Fuel Surcharges, Etc.)
Please refer to the current price book for clarification for any additional items charged

Third Party Charges — Cost plus 25%

Pricing based on AREA 1, and 3.8 hours travelled from Estevan.

Price Book: 15 June 2008

Payment Terms: NET 20 Days

The above mileage / hours is only an estimate. Actual kilometres / hours driven will be shown at the time of invoicing.

Pricing on this quote will be honoured for 90 days.

Pricing on this quote is in effect providing Halliburton is able to supply manpower and equipment.

The Goods and Services Tax will be calculated on the total value of the invoice and will be shown on a separate line at the time of invoicing.

All other Government taxes, including Provincial Sales Tax, will be added at the time of invoicing.

Halliburton Energy Services' Goods and Services Tax Registration No. is R130640444

All services performed, equipment employed and materials sold are provided in accordance with the Terms and Conditions specified on the Halliburton Field Ticket unless a signed service or sales contract governing the services, equipment and materials exists between your company and Halliburton Energy Services.

"Halliburton excellence means integrating Health Safety Environment into all of our business activities and creating an incident-free workplace"

Licence

Prairie Mud Service
#1560, 727 - 7th Avenue S.W., Calgary, AB, T2P 0Z5
Ph: 403-237-7323 Fx: 403-263-7355

SUGGESTED MUD PROGRAM

MOLOPO CANADA SPEARFISH PROJECT
TWP. 1 RGES. 27, 28 & 29WPM PIERSON, MB.

Recommended Drilling Fluid Program

Operator:	**MOLOPO ENERGY CANADA LTD.** **MOLOPO** ENERGY LIMITED
Project:	**MOLOPO CANADA SPEARFISH PROJECT**
Well Name:	**MOLOPO PIERSON STRAT**
Well Location:	**GENERIC TWP. 01 RGES. 27, 28 &-29WPM**
Status:	**TIGHT HOLE - EXPLORATION**
Program Prepared For:	**MR. CHAD MELBY** **Drilling & Completions Manager**
Program Prepared By:	**MR. CHUCK HAINES** **Technical Sales & Operations** 24-hr. cellular 403.860.4660
Anticipated Spud:	June, 2010
Date of Preparation:	June 3, 2010
Warehouse & Trucking:	**PRAIRIE MUD SERVICE** Estevan, Saskatchewan 306.634.3411 – 24 Hours

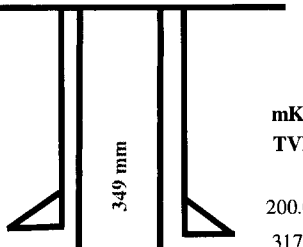
Prairie Mud Service
#1560, 727 - 7th Avenue S.W., Calgary, AB, T2P 0Z5
Ph: 403-237-7323 Fx: 403-263-7355

SUGGESTED MUD PROGRAM

MOLOPO CANADA SPEARFISH PROJECT
TWP. 1 RGES. 27, 28 & 29WPM PIERSON, MB.

MOLOPO PIERSON 5-27-1-28WPM

ELEVATION:
GL: 457.4 m
KB: 459.00 m



	mKB TVD
Surface Casing	200.00
Milk River	317.00
Colorado Shale	430.00
Second White Specks	528.00
Lwr Colorado Shale	550.00
Base Fish Scales	597.00
Mannville	659.00
Jurassic	727.00
Lower Gravelbourg	898.00
Amaranth Evaporite	932.00
Spearifish	963.00
Marine B Cycle	966.00
Marine A Cycle	978.00
Waskada Zone	984.00
Manor Zone	995.00
Mississippian Unconf.	1005.00
Total Depth	1035.00

Reference Wells

Molopo Peirson Monobore Hz 5-28/8-28-1-28 W1
No problems on surface, top hole, or build

Molopo Peirson Monobore Hz 16-26/13-27-1-28 W1
No problems on surface, top hole or build

Molopo Peirson Monobore HZ 1-7/1-8-2-28 W1
No problems on surface, top hole, or build

Recommended Drilling Fluid Properties - Comments and Potential Problems

0 - 200 m TVD: NATIVE CLAYS
349 mm Hole
244.5 mm Surface Casing

Density	1080 - 1100 kg/m^3
Viscosity - Drilling	40 - 45 sec/L
Viscosity - Casing	60 sec/L
pH	9.0 - 9.5
Water Loss	no control

- Spud with fresh water allowing native clays to build viscosity. Add Gel as required to raise viscosity for better hole cleaning .
- Viscosity builds rapidly; maintain 40 - 45 sec/L to avoid mud rings. SAPP or Soap Sticks will disperse.
- While making reamer run, allow viscosity to climb to 60 sec/L for running casing.

200 - 850 m TVD:
POLYDRILL FLOC WATER
222 mm Hole

Viscosity	600 - 800 mg/L
pH	natural
Water Loss	no control
Density	1010 - 1020 kg/m^3

- Utilize Envirofloc for calcium source.
- Inject Hyperdrill 204 to centrifuges at rate required to achieve clear H_2O at overflow discharges.
- Add PolyDrill 1330 @ 1 pail per 100 m and Polydrill Kion @ 1 pail per 50 m to both inhibit and encapsulate shale to improve upper hole stability.
- Drill out of tanks allowing solids to settle. Drill cuttings and fluid may be land-spread while drilling.
- **Reduce pump rate 25% prior to Mannville and control drill no faster than 20 mins/kelly to avoid losses. Monitor returns at shaker to be sure hole is cleaning. Drill with caution and monitor for sloughing.**

850 - 1035.0 m TVD Total Depth
GEL POLYMER
222 mm Hole

Density	1060 - 1100 kg/m^3
Drilling Viscosity	45 - 50 sec/L
Logging Viscosity	90 - 100 sec/L
Water Loss	8 - 10 cm^3
pH	9.0 - 9.5

- Mud up at approx. 850 m for best hole conditions.
- Continue adding PolyDrill 1330 @ 1 pail per 150 m of new hole drilled.
- Treat anhydrite in Amaranth with Soda Ash. pH @ 10.5 to lessen anhydrite solubility. Once through Watrous, allow pH to drop back to 9 - 9.5
- Suggest wiper trip into surface at total depth to clear any ledges or bridges and be sure hole is in best condition for logging.

Hydraulics

200 - 850 m TVD: Drill out with 50 - 60 m/min annular velocity around drill pipe. Bit nozzles no smaller than 12.7 mm tri-cone/9.5 mm PDC to avoid overjetting upper shales. Reduce pump 25% for 38 - 42 m/min annular prior to penetrating Mannville or risk hole sloughing and erosion. Drill no faster thans 20 mins/kelly and work connections to allow hole to clean. Once through Mannville, resume 50 m/min up to mud up depth.
850 - 1035 m TVD: Suggest 45 - 48 m/min annular velocity around drill pipe with mud in the hole.

Pressure

No abnormal pressure expected; no nearby injection. Perform regular flow cks. & monitor tk levels.

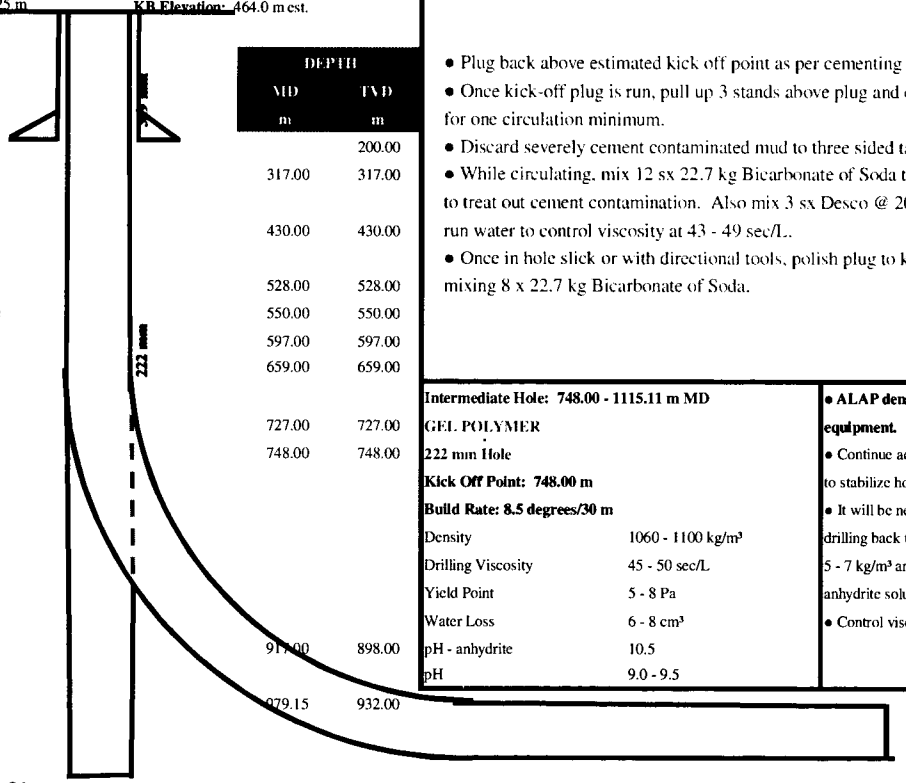
Prairie Mud Service
#1560, 727 - 7th Avenue S.W., Calgary, AB, T2P 0Z5
Ph: 403-237-7323 Fx: 403-263-7355

SUGGESTED MUD PROGRAM

MOLOPO CANADA SPEARFISH PROJECT
TWP. 1 RGES. 27, 28 & 29WPM PIERSON, MB.

PIERSON HZNTL 8-27-1-28WPM

GR. Elevation: 460.25 m **KB Elevation:** 464.0 m est.



	DEPTH MD m	DEPTH TVD m
Surface Casing		200.00
Milk River	317.00	317.00
Colorado Shale	430.00	430.00
Second White Specks	528.00	528.00
Lower Colorado Shale	550.00	550.00
Base Fish Scales	597.00	597.00
Mannville	659.00	659.00
Jurassic	727.00	727.00
Kick Off Point	748.00	748.00
Lower Gravelbourg	917.00	898.00
Amaranth Evaporite	979.15	932.00
Start Horizontal - Spearfish	1115.11	963.00
End of Lateral	2255.11	963.00
Marine B Cycle		966.00

Recommended Drilling Fluid Properties - Comments and Potential Problems

- Plug back above estimated kick off point as per cementing program.
- Once kick-off plug is run, pull up 3 stands above plug and circulate for one circulation minimum.
- Discard severely cement contaminated mud to three sided tank.
- While circulating, mix 12 sx 22.7 kg Bicarbonate of Soda through hopper to treat out cement contamination. Also mix 3 sx Desco @ 20 mins/sx and run water to control viscosity at 43 - 49 sec/L.
- Once in hole slick or with directional tools, polish plug to kick off point mixing 8 x 22.7 kg Bicarbonate of Soda.

Intermediate Hole: 748.00 - 1115.11 m MD
GEL POLYMER
222 mm Hole
Kick Off Point: 748.00 m
Build Rate: 8.5 degrees/30 m

Density	1060 - 1100 kg/m³
Drilling Viscosity	45 - 50 sec/L
Yield Point	5 - 8 Pa
Water Loss	6 - 8 cm³
pH - anhydrite	10.5
pH	9.0 - 9.5

- **ALAP density utilizing solids control equipment.**
- Continue adding Polydrill 1330 @ 1 pail per 100 m to stabilize hole and also so aid slide through build.
- It will be necessary to again treat anhydrite when drilling back through Amaranth. Add Soda Ash 5 - 7 kg/m³ and increase pH to 10.5 to lessen anhydrite solubility.
- Control viscosity with Desco and water.

200 mm

Main Hole HZ: 1115.11 - 2255.11 m MD
PRAIRIEDRILL POLYMER
200 mm Hole, 139.7 mm Production Csg

Density	1040 - 1080 kg/m³
Drilling Viscosity	40 - 50 sec/L
Drilling Yield Point	4 - 5 Pa
Casing Viscosity	50 - 55 sec/L
Casing Yield Point	12 - 13 Pa
Water Loss	6 - 8 cm³
pH	9 - 9.5

- Displace to premixed PrairieDrill Polymer system once on bottom with lateral assembly.
- **Utilize all solids control equipment to maintain density as low as possible.**
- Walnut Shells Med. may be added @ 5 - 10 kg/m³ to to reduce torque & drag if sliding becomes difficult.
- Raise viscosity with PrairieDrill R & HP 3:1 for drilling and running casing.
- Prior to coming off bottom to run casing, spot pill in lateral using exsisting mud mixed with 30 kg/m3 Walnut Med & 9 L/m3 Lubrislide
- Once on bottom with casing, thin mud to 50 sec/L viscosity and 10 Pa Yield Point if needed.

Hydraulics

748.00 - 2255.11 m MD:
45 - 50 m/min annular velocity around drill pipe to drill build and horizontal.

Reference Wells

Molopo Peirson Monobore Hz 5-28/8-28-1-28 W1
Excellent hole conditions on lateral. No problems with Casing

Molopo Peirson Monobore Hz 16-26/13-27-1-28 W1
Mechanical issues requiring to POOH at 1374m. No further prob

Molopo Peirson Monobore HZ 1-7/1-8-2-28 W1
No problems on lateral nor with running Casing.

Company Contacts - 24-Hour Office 306.634.3411

Chad Stewart, Mud Technician	c. 306.421.5198
Ken Harder, Warehouse Manager	c. 306.421.0101
Darwin Frehlick, Enviro. Manager	c. 306.421.0491
Chuck Haines, Tech. Sales/Ops.	c. 403.860.4660

Prairie Mud Service
#1560, 727 - 7th Avenue S.W., Calgary, AB, T2P 0Z5
Ph: 403-237-7323 Fx: 403-263-7355

SUGGESTED MUD PROGRAM

MOLOPO CANADA SPEARFISH PROJECT
TWP. 1 RGES. 27, 28 & 29WPM PIERSON, MB.

SURFACE HOLE: 0 – 200 mKB TVD
349 mm Hole, 244.5 mm Surface Casing

1. Spud with fresh water and allow native clays to build viscosity to 40 – 45 sec/L. Native clays build viscosity rapidly; control to avoid mud rings forming. While making reamer run, allow viscosity to build to 60 sec/L to run casing.

2. Gravel and sand are common in this area. If encountered on surface hole and an increase in viscosity is required to clean the hole, add Gel and Lime 20:1. Small additions of Lime will slightly flocculate Gel to give a desired increase funnel viscosity. If circulation is lost, increase funnel viscosity with Gel and Lime to 50 - 60 sec/L and slug with Sawdust and Primaseal 4:1, until achieving full returns.

3. High annular velocity on surface hole will increase rate of penetration.

TOP HOLE: 200 – 850 mKB TVD
222 mm Hole

1. Circulate through floc. tank to allow for settling of solids. Mix 15 sx. Envirofloc to surface mud and dewater with Hyperdrill 204. Mix additional Envirofloc to raise Calcium to 600 – 800 mg/L. Drill fast hole mixing 5 sx Envirofloc per tour to maintain constant Calcium level. Inject Hyperdrill 204 to centrifuges at necessary rate to achieve clear water at overflow discharges.

2. Begin add PolyDrill 1330 @ 1 pail per 100 m and Polydrill Kion @ 1 pail per 50 m to inhibit and encapsulate shale thereby improving hole stability.

3. Monitor shale returns at shaker to avoid any mud ring build up. Soap Sticks or Drilling Detergent may be used to combat mud ring build up.

MAIN HOLE STRAT: 850 – 1035.0 mKB TVD
BUILD SECTION OF HORIZONTAL: 748.00 - 1115.11 mKB MD
222 mm Hole

1. Mud up with Gel Polymer mud system adding 55 – 60 kg/m^3 Gel, or as required, to achieve viscosity. Run water at 10 – 15 L/min to control density. Treat anhydrite in Amaranth with 5 - 7 kg/m^3 Soda Ash and carry 10.5 pH to lessen anhydrite solubility.

2. Continue adding PolyDrill 1330 @ 1 pail per 100 m on vertical and build sections to improve hole stability and also to aid slide.

3. Treat out cement contamination during plug back with Sodium Bicarbonate.

HORIZONTAL: 1115.11 – 2255.11 m MD
200 mm Open Hole, 139.7 mm Production Casing

1. Displace to premixed PrairieDrill Polymer system once on bottom with lateral assembly. Maintain 9.0 – 9.5 pH in polymer mud for optimum yield of PrairieDrill products.

2. Utilize all solids control equipment to maintain density as low as possible.

3. Walnut Shells Med. may be added @ 5 – 10 kg/m^3 to reduce torque and drag if sliding becomes difficult.

4. Raise viscosity with PrairieDrill R & HP 3:1 for drilling and running casing. Once on bottom with casing, thin mud to 50 sec/L viscosity and 10 Pa Yield Point if needed.

Prairie Mud Service
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Ph: 403-237-7323 Fx: 403-263-7355

SUGGESTED MUD PROGRAM

MOLOPO CANADA SPEARFISH PROJECT
TWP. 1 RGES. 27, 28 & 29WPM PIERSON, MB.

GEL POLYMER Properties -
Mud Up to Start Hz:

Mud Density
Maintain Mud Density at 1060 - 1100 kg/m^3 with fresh water additions, solids removal equipment and dumping of tanks as necessary. Run 4 - 6 L/min of water to hold density at 1100 kg/m^3 or less.

a. Control solids in active mud system with centrifuge able to handle 1500 – 1650 litres/min. Mud cleaners should utilize as fine a screen as possible.

b. Close all gates between tank compartments and pit equalizers should be as high as possible.

Funnel Viscosity
Drilling Viscosity for vertical and build section should be 45 – 50 sec/L .

Plastic Viscosity
Plastic Viscosity will correlate to solids makeup in the mud system. Keep at a minimum with water dilution and solids removal equipment. Initial Plastic Viscosity should be 12 mPa.

Yield Point
Yield Point should be approximately 4 Pa for drilling pilot hole and build section of horizontal.

Gel Strengths
Keep Gel Strengths at a minimum to prevent any swabbing and/or pressure surges while tripping. Initial Gel Strength should be 2 - 6 Pa and 10 Minute Gels at 6 - 10 Pa.

pH
Maintain pH at 9.0 – 9.5 with Caustic Soda once through Amaranth anhydrite. The pH of the fluid will affect hydrations of specific clays and shales, so any severe changes in alkalinity should be eliminated.

Fluid Loss
Maintain Fluid Loss with Staflo ExLo at 8 - 10 cm^3 from mud up to total depth of vertical then lower to 6 – 8 cm^3 for drilling build section.

Hole Stability
Additions of Polydrill Kion Pottasium Inhibitor and Polydrill 1330 Polymer Encapsulator will stabilize bentonitic clay found in shale and prevent from hydrating.

Prairie Mud Service
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Ph: 403-237-7323 Fx: 403-263-7355

SUGGESTED MUD PROGRAM

MOLOPO CANADA SPEARFISH PROJECT
TWP. 1 RGES. 27, 28 & 29WPM PIERSON, MB.

PRAIRIEDRILL POLYMER Properties - Horizontal:

Mud Density
Maintain density at 1040 - 1080 kg/m^3 with fresh water, solids removal equipment and dumping tanks as necessary.

a. Run 4 - 6 L/min fresh water to hold density at 1080 kg/m^3 or less.
b. Run centrifuge to control solids in active mud system. Centrifuge should be able to handle 1500 - 1650 litres/min. Mud cleaners should utilize as fine a screens as possible.
c. Close all gates between tank compartments and pit equalizers should be as high as possible.

Funnel Viscosity
Maintain Funnel Viscosity at 40 - 50 sec/L with PrairieDrill "R" and "HP" for good hole cleaning while drilling. then increasing to 50 – 55 sec/L for running production casing.

Plastic Viscosity
Plastic Viscosity will correlate to the solids makeup in the mud system. It should be kept at a minimum with fresh water dilution and solids removal equipment in the range of 4 - 8 mPa.

Yield Point
Yield Point should be 2 - 4 Pa and may be adjusted with additions of PrairieDrill products.

pH
Carry a 9.0 – 9.5 pH for optimum yield of PrairieDrill R and HP.

Fluid Loss
Maintain Fluid Loss at 6 – 8 cm^3 with tourly additions of Starpak.

PrairieDrill
PrairieDrill "R" and PrairieDrill "HP" – Unique polysaccharides that provide rheology and fluid loss control as well as lubricity.
Starpak – Double derivitized starch fluid loss control agent capable of enhancing rheology and providing lubricity when used in conjunction with PrairieDrill "R" and "HP".

Inhibition
Prairie K is an effective chloride free clay inhibitor developed for use in water sensitive formations to block water hydration.

ESTIMATED PRODUCT USAGE & COST

Interval	# of Units	Wt/Unit	Product Name	Unit Price	Totals
Surface	10	45.45 kg	Gel	10.88	108.80
	1	22.72 kg	Caustic Soda	35.68	35.68
	10	18.18 kg	Sawdust	5.82	58.20
				Interval Total	**202.68**
Top Hole	15	36.36 kg	Envirofloc	50.40	756.00
	2	25.00 kg	HyperDrill AF204RD	215.31	430.62
	11	20.00 L	Polydrill Kion	259.68	2,856.48
	6	20.00 L	Polydrill 1330	249.60	1,497.60
				Interval Total	**5,540.70**
Main Vertical Strat	60	45.45 kg	Gel	10.88	652.80
	3	22.72 kg	Caustic Soda	35.68	107.04
	2	20.00 L	Polydrill 1330	249.60	499.20
	1	25.00 kg	Polyxan	432.00	432.00
	1	11.36 kg	Desco	71.40	71.40
	2	22.72 kg	Staflo Reg	213.84	427.68
	15	40.00 kg	Soda Ash	27.92	418.80
				Interval Total	**2,608.92**
Plug Back Build	20	45.45 kg	Gel	10.88	217.60
	20	22.72 kg	Bicarbonate of Soda	30.87	617.40
	4	22.72 kg	Caustic Soda	35.68	142.72
	3	22.72 kg	Staflo Reg	213.84	641.52
	8	40.00 kg	Soda Ash	27.92	223.36
	2	20.00 L	Polydrill 1330	249.60	499.20
	9	20.00 ltr	PrairieDrill "R"	180.00	1,620.00
	3	25.00 kg	PrairieDrill "HP"	192.00	576.00
				Interval Total	**4,537.80**
Lateral	35	20.00 L	PrairieDrill "R"	180.00	6,300.00
	55	22.72 kg	Starpak	100.80	5,544.00
	15	25.00 kg	PrairieDrill "HP"	192.00	2,880.00
	8	22.72 kg	Caustic Soda	35.68	285.44
				Interval Total	**15,009.44**
				Estimated Product Cost	**27,899.54**

Miscellaneous Charges per Well	
Trucking Semi & Van (4.5 hours @ 125.00/hr)	562.50
Van Rent (10 days @ $50.00)	500.00
Load/Unload Mud Van	0.00
Pallets and Stretch Wrap	0.00
Environmental Fee (bag disposal, clean up)	100.00
Estimated Cost per Well	$1,162.50

Contingency Products	
Soap Stick	$12.24
Lime (20.00 kg)	11.04
PC Lubrislide (1.0 litre)	3.20
Walnut Shell (22.72 kg)	28.00
Calcium Carbonate (25.00 kg)	6.72

- Your assigned Mud Technician will provide a minimum of mud check daily and remain available to you 24 hours to service all your drilling fluid needs.
- Product usage is based on 1140 m horizontal leg and will vary accordingly with length and well occurrence.
- Prairie Mud supplies Gel in 45.45 kg bags and Soda Ash in 40 kg unit rather than the standard 40 kg and 25 kg units.
- Prairie Mud owns our own fleet of trucks and vans enabling us to offer the most to you in economical trucking rates and time rather than contracting third party services.

Prairie Mud Service appreciates the opportunity to submit this proposal on your drilling fluid needs. If you have any questions, comments, or need any additional information, please contact me any time in our Calgary office at (403) 237-7323, on 24 hour cellular (403) 860-4660, or our Estevan office is also available to you at (306) 634-3411. We are grateful for the support of Molopo Canada together with West Rock Energy Consultants and are hoping very much to be of service on this Manitoba drilling project.

Sincerely,

Mr. Chuck Haines
TECHNICAL SALES & OPERATIONS
PRAIRIE MUD SERVICE

CH/jl

PHOENIX TECHNOLOGY SERVICES LP

ANNOTATIONS		
TVD	MD	Annotation
774.50	774.50	KOP = 775m MD
1011.69	1095.93	Hold 75° Inc = 1096m MD
1016.86	1115.93	Resume Build = 1116m MD
1025.23	1180.22	Land Pt. = 1180m MD
1025.23	1181.30	Hold 90.07° Inc = 1181m MD
1023.73	2378.03	TD = 2378m MD

Molopo Energy Canada Ltd.

Project: Pierson
Site: (13C-32) 16D-32-1-29WPM
Well: Molopo Pierson Prov Hz
Wellbore: 16-32-001-29W1
Design: 10147566R P1 (JS/JH)

Well License #:

T M

Azimuths to True North
Magnetic North: 7.26°

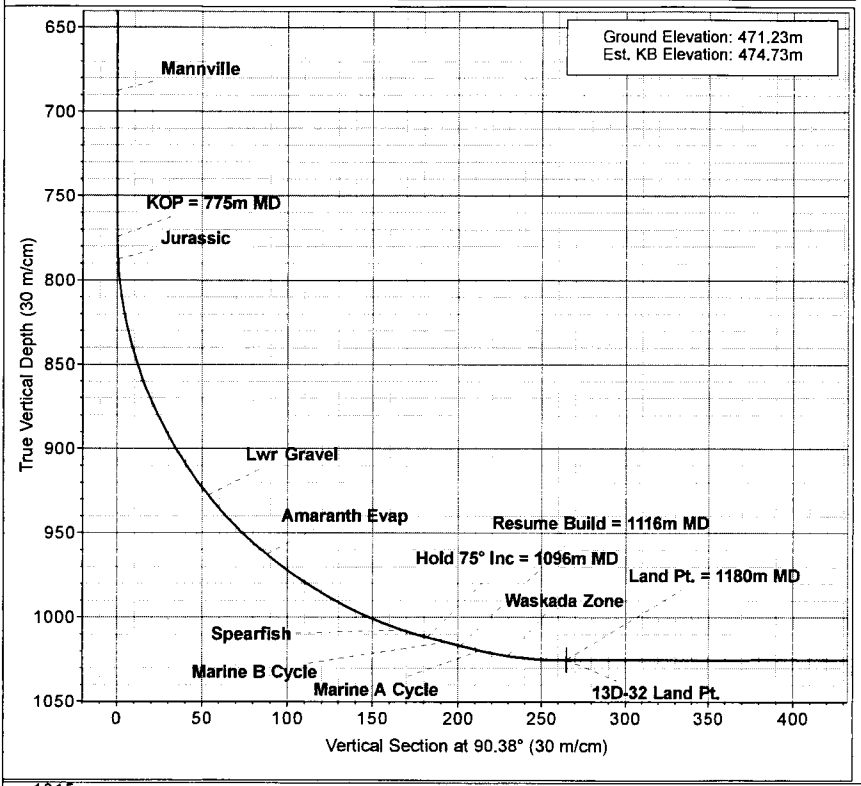
Magnetic Field
Strength: 57357.8snT
Dip Angle: 74.22°
Date: 28/06/2010
Model: IGRF2010_14

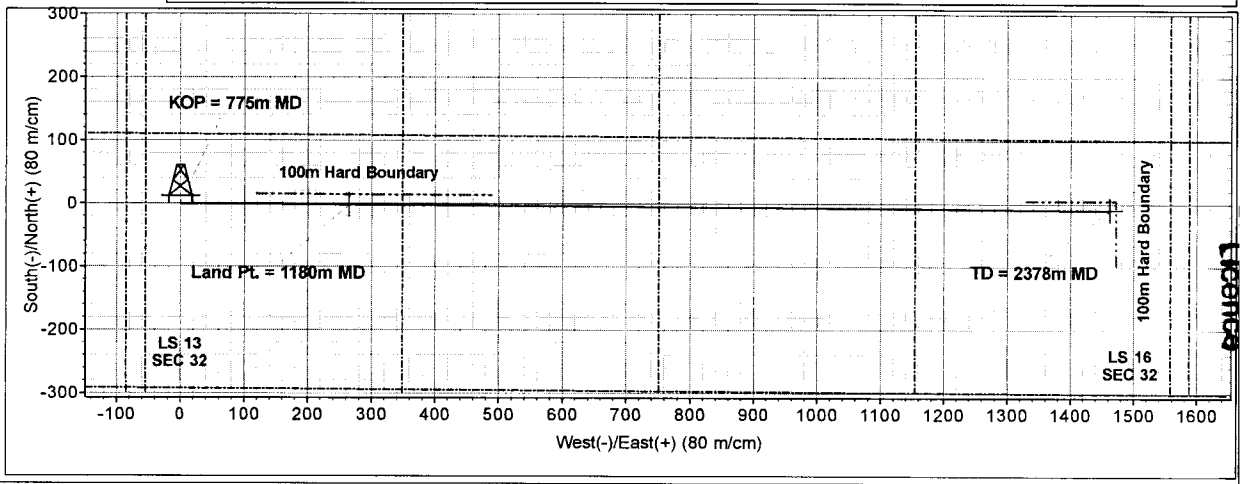
Surface Co-ordinates
110.00m S of N Boundary
55.00m E of W Boundary, Sec. 32

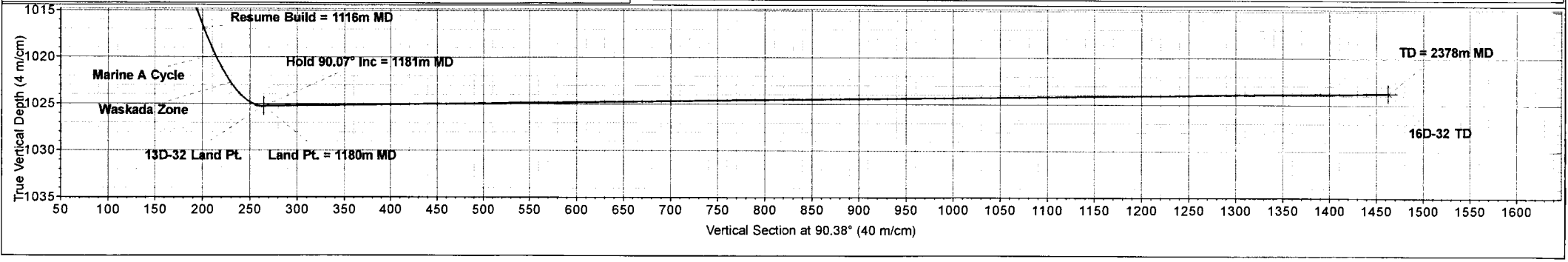
Landing Point Co-ordinates
m S of N Boundary
m W of E Boundary, Sec.

TD Co-ordinates
110.00m S of N Boundary
94.91m W of E Boundary, Sec. 32

SECTION DETAILS										
Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	DLeg	TFace	VSec	Target
1	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.00	0.00	
2	774.50	0.00	0.00	774.50	0.00	0.00	0.000	0.00	0.00	
3	1095.93	75.00	90.38	1011.69	-1.21	182.00	7.000	90.38	182.00	
4	1115.93	75.00	90.38	1016.86	-1.34	201.32	0.000	0.00	201.32	
5	1180.22	90.00	90.38	1025.23	-1.76	264.87	7.000	0.00	264.88	13D-32 Land Pt.
6	1181.30	90.07	90.38	1025.23	-1.77	265.95	2.000	2.86	265.95	
7	2378.03	90.07	90.38	1023.73	-9.79	1462.65	0.000	0.00	1462.69	16D-32 TD







Phoenix Technology Services LP

Planning Report

Database:	PHXDB Compass	**Local Co-ordinate Reference:**	Well Molopo Pierson Prov Hz
Company:	Molopo Energy Canada Ltd.	**TVD Reference:**	KB Est @ 474.73m (Estimated KB Elevation)
Project:	Pierson	**MD Reference:**	KB Est @ 474.73m (Estimated KB Elevation)
Site:	(13C-32) 16D-32-1-29WPM	**North Reference:**	True
Well:	Molopo Pierson Prov Hz	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	16-32-001-29W1		
Design:	10147566R P1 (JS/JH)		

Project Pierson

Map System:	Universal Transverse Mercator	**System Datum:**	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	Zone 14N (102 W to 96 W)		

Site (13C-32) 16D-32-1-29WPM

Site Position:		**Northing:**	5,439,816.18 m	**Latitude:**	49° 5' 14.933 N
From:	Map	**Easting:**	329,208.87 m	**Longitude:**	101° 20' 21.252 W
Position Uncertainty:	0.00 m	**Slot Radius:**		**Grid Convergence:**	-1.77 °

Well Molopo Pierson Prov Hz

Well Position	**+N/-S**	0.00 m	**Northing:**	5,439,816.18 m	**Latitude:**	49° 5' 14.933 N
	+E/-W	0.00 m	**Easting:**	329,208.87 m	**Longitude:**	101° 20' 21.252 W
Position Uncertainty		0.00 m	**Wellhead Elevation:**		**Ground Level:**	471.23 m

Wellbore 16-32-001-29W1

Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010_14	28/06/2010	7.26	74.22	57,358

Design 10147566R P1 (JS/JH)

Audit Notes:

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

Vertical Section:	Depth From (TVD) (m)	+N/-S (m)	+E/-W (m)	Direction (°)
	0.00	0.00	0.00	90.38

Plan Sections

Measured Depth (m)	Inclination (°)	Azimuth (°)	Vertical Depth (m)	+N/-S (m)	+E/-W (m)	Dogleg Rate (°/30m)	Build Rate (°/30m)	Turn Rate (°/30m)	TFO (°)	Target
0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.00	
774.50	0.00	0.00	774.50	0.00	0.00	0.000	0.000	0.000	0.00	
1,095.93	75.00	90.38	1,011.69	-1.21	182.00	7.000	7.000	0.000	90.38	
1,115.93	75.00	90.38	1,016.86	-1.34	201.32	0.000	0.000	0.000	0.00	
1,180.22	90.00	90.38	1,025.23	-1.76	264.87	7.000	7.000	0.000	0.00	13D-32 Land Pt
1,181.30	90.07	90.38	1,025.23	-1.77	265.95	2.000	1.998	0.100	2.86	
2,378.03	90.07	90.38	1,023.73	-9.79	1,462.65	0.000	0.000	0.000	0.00	16D-32 TD

Database:	PHXDB Compass	**Local Co-ordinate Reference:**	Well Molopo Pierson Prov Hz
Company:	Molopo Energy Canada Ltd.	**TVD Reference:**	KB Est @ 474.73m (Estimated KB Elevation)
Project:	Pierson	**MD Reference:**	KB Est @ 474.73m (Estimated KB Elevation)
Site:	(13C-32) 16D-32-1-29WPM	**North Reference:**	True
Well:	Molopo Pierson Prov Hz	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	16-32-001-29W1		
Design:	10147566R P1 (JS/JH)		

Planned Survey

Measured Depth (m)	Inclination (°)	Azimuth (°)	Vertical Depth (m)	Subsea Depth (m)	+N/-S (m)	+E/-W (m)	Vertical Section (m)	Dogleg Rate (°/30m)
0.00	0.00	0.00	0.00	474.73	0.00	0.00	0.00	0.000
Colorado Sh								
458.73	0.00	0.00	458.73	16.00	0.00	0.00	0.00	0.000
Second White Specks								
549.73	0.00	0.00	549.73	-75.00	0.00	0.00	0.00	0.000
Lw Colorado Sh								
576.73	0.00	0.00	576.73	-102.00	0.00	0.00	0.00	0.000
BFS								
625.73	0.00	0.00	625.73	-151.00	0.00	0.00	0.00	0.000
Mannville								
687.73	0.00	0.00	687.73	-213.00	0.00	0.00	0.00	0.000
KOP = 775m MD								
774.50	0.00	0.00	774.50	-299.77	0.00	0.00	0.00	0.000
780.00	1.28	90.38	780.00	-305.27	0.00	0.06	0.06	7.000
Jurassic								
787.74	3.09	90.38	787.73	-313.00	0.00	0.36	0.36	7.000
810.00	8.28	90.38	809.88	-335.15	-0.02	2.56	2.56	7.000
840.00	15.28	90.38	839.23	-364.50	-0.06	8.68	8.68	7.000
870.00	22.28	90.38	867.61	-392.88	-0.12	18.34	18.34	7.000
900.00	29.28	90.38	894.61	-419.88	-0.21	31.38	31.38	7.000
930.00	36.28	90.38	919.81	-445.08	-0.32	47.61	47.61	7.000
Lwr Gravel								
939.97	38.61	90.38	927.73	-453.00	-0.36	53.68	53.68	7.000
960.00	43.28	90.38	942.85	-468.12	-0.44	66.80	66.80	7.000
Amaranth Evap								
988.98	50.05	90.38	962.73	-488.00	-0.58	87.86	87.87	7.000
990.00	50.28	90.38	963.38	-488.65	-0.59	88.65	88.65	7.000
1,020.00	57.28	90.38	981.10	-506.37	-0.75	112.83	112.84	7.000
1,050.00	64.28	90.38	995.73	-521.00	-0.92	139.00	139.00	7.000
1,080.00	71.28	90.38	1,007.07	-532.34	-1.11	166.76	166.76	7.000
Spearfish								
1,082.09	71.77	90.38	1,007.73	-533.00	-1.12	168.74	168.74	7.000
Hold 75° Inc = 1096m MD								
1,095.93	75.00	90.38	1,011.69	-536.96	-1.21	182.00	182.00	7.000
Marine B Cycle								
1,107.69	75.00	90.38	1,014.73	-540.00	-1.28	193.36	193.36	0.000
1,110.00	75.00	90.38	1,015.33	-540.60	-1.30	195.59	195.59	0.000
Resume Build = 1116m MD								
1,115.93	75.00	90.38	1,016.86	-542.13	-1.34	201.32	201.32	0.000
Marine A Cycle								
1,128.15	77.85	90.38	1,019.73	-545.00	-1.42	213.19	213.20	7.000
1,140.00	80.62	90.38	1,021.94	-547.21	-1.49	224.83	224.84	7.000
Waskada Zone								
1,145.15	81.82	90.38	1,022.73	-548.00	-1.53	229.92	229.93	7.000
1,170.00	87.62	90.38	1,025.02	-550.29	-1.69	254.66	254.66	7.000
Land Pt. = 1180m MD								
1,180.22	90.00	90.38	1,025.23	-550.50	-1.76	264.87	264.88	7.000
Hold 90.07° Inc = 1181m MD								
1,181.30	90.07	90.38	1,025.23	-550.50	-1.77	265.95	265.95	2.000
1,200.00	90.07	90.38	1,025.21	-550.48	-1.89	284.65	284.66	0.000
1,230.00	90.07	90.38	1,025.17	-550.44	-2.09	314.65	314.66	0.000

Database:	PHXDB Compass	**Local Co-ordinate Reference:**	Well Molopo Pierson Prov Hz
Company:	Molopo Energy Canada Ltd.	**TVD Reference:**	KB Est @ 474.73m (Estimated KB Elevation)
Project:	Pierson	**MD Reference:**	KB Est @ 474.73m (Estimated KB Elevation)
Site:	(13C-32) 16D-32-1-29WPM	**North Reference:**	True
Well:	Molopo Pierson Prov Hz	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	16-32-001-29W1		
Design:	10147566R P1 (JS/JH)		

Planned Survey

Measured Depth (m)	Inclination (°)	Azimuth (°)	Vertical Depth (m)	Subsea Depth (m)	+N/-S (m)	+E/-W (m)	Vertical Section (m)	Dogleg Rate (°/30m)
1,260.00	90.07	90.38	1,025.13	-550.40	-2.30	344.65	344.66	0.000
1,290.00	90.07	90.38	1,025.09	-550.36	-2.50	374.65	374.66	0.000
1,320.00	90.07	90.38	1,025.06	-550.33	-2.70	404.65	404.66	0.000
1,350.00	90.07	90.38	1,025.02	-550.29	-2.90	434.65	434.66	0.000
1,380.00	90.07	90.38	1,024.98	-550.25	-3.10	464.65	464.66	0.000
1,410.00	90.07	90.38	1,024.94	-550.21	-3.30	494.65	494.66	0.000
1,440.00	90.07	90.38	1,024.91	-550.18	-3.50	524.65	524.66	0.000
1,470.00	90.07	90.38	1,024.87	-550.14	-3.70	554.65	554.66	0.000
1,500.00	90.07	90.38	1,024.83	-550.10	-3.90	584.64	584.66	0.000
1,530.00	90.07	90.38	1,024.79	-550.06	-4.11	614.64	614.66	0.000
1,560.00	90.07	90.38	1,024.75	-550.02	-4.31	644.64	644.66	0.000
1,590.00	90.07	90.38	1,024.72	-549.99	-4.51	674.64	674.66	0.000
1,620.00	90.07	90.38	1,024.68	-549.95	-4.71	704.64	704.66	0.000
1,650.00	90.07	90.38	1,024.64	-549.91	-4.91	734.64	734.66	0.000
1,680.00	90.07	90.38	1,024.60	-549.87	-5.11	764.64	764.66	0.000
1,710.00	90.07	90.38	1,024.57	-549.84	-5.31	794.64	794.66	0.000
1,740.00	90.07	90.38	1,024.53	-549.80	-5.51	824.64	824.66	0.000
1,770.00	90.07	90.38	1,024.49	-549.76	-5.72	854.64	854.66	0.000
1,800.00	90.07	90.38	1,024.45	-549.72	-5.92	884.64	884.66	0.000
1,830.00	90.07	90.38	1,024.42	-549.69	-6.12	914.64	914.66	0.000
1,860.00	90.07	90.38	1,024.38	-549.65	-6.32	944.64	944.66	0.000
1,890.00	90.07	90.38	1,024.34	-549.61	-6.52	974.64	974.66	0.000
1,920.00	90.07	90.38	1,024.30	-549.57	-6.72	1,004.64	1,004.66	0.000
1,950.00	90.07	90.38	1,024.27	-549.54	-6.92	1,034.63	1,034.66	0.000
1,980.00	90.07	90.38	1,024.23	-549.50	-7.12	1,064.63	1,064.66	0.000
2,010.00	90.07	90.38	1,024.19	-549.46	-7.33	1,094.63	1,094.66	0.000
2,040.00	90.07	90.38	1,024.15	-549.42	-7.53	1,124.63	1,124.66	0.000
2,070.00	90.07	90.38	1,024.12	-549.39	-7.73	1,154.63	1,154.66	0.000
2,100.00	90.07	90.38	1,024.08	-549.35	-7.93	1,184.63	1,184.66	0.000
2,130.00	90.07	90.38	1,024.04	-549.31	-8.13	1,214.63	1,214.66	0.000
2,160.00	90.07	90.38	1,024.00	-549.27	-8.33	1,244.63	1,244.66	0.000
2,190.00	90.07	90.38	1,023.97	-549.24	-8.53	1,274.63	1,274.66	0.000
2,220.00	90.07	90.38	1,023.93	-549.20	-8.73	1,304.63	1,304.66	0.000
2,250.00	90.07	90.38	1,023.89	-549.16	-8.94	1,334.63	1,334.66	0.000
2,280.00	90.07	90.38	1,023.85	-549.12	-9.14	1,364.63	1,364.66	0.000
2,310.00	90.07	90.38	1,023.82	-549.09	-9.34	1,394.63	1,394.66	0.000
2,340.00	90.07	90.38	1,023.78	-549.05	-9.54	1,424.63	1,424.66	0.000
2,370.00	90.07	90.38	1,023.74	-549.01	-9.74	1,454.62	1,454.66	0.000
TD = 2378m MD								
2,378.03	90.07	90.38	1,023.73	-549.00	-9.79	1,462.65	1,462.69	0.000

Database:	PHXDB Compass	**Local Co-ordinate Reference:**	Well Molopo Pierson Prov Hz
Company:	Molopo Energy Canada Ltd.	**TVD Reference:**	KB Est @ 474.73m (Estimated KB Elevation)
Project:	Pierson	**MD Reference:**	KB Est @ 474.73m (Estimated KB Elevation)
Site:	(13C-32) 16D-32-1-29WPM	**North Reference:**	True
Well:	Molopo Pierson Prov Hz	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	16-32-001-29W1		
Design:	10147566R P1 (JS/JH)		

Design Targets

Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (m)	+N/-S (m)	+E/-W (m)	Northing (m)	Easting (m)	Latitude	Longitude
16D-32 TD - plan hits target center - Point	0.00	0.00	1,023.73	-9.79	1,462.65	5,439,761.26	330,670.53	49° 5' 14.609 N	101° 19' 9.161 W
13D-32 Land Pt. - plan hits target center - Point	0.00	0.00	1,025.23	-1.76	264.87	5,439,806.25	329,473.56	49° 5' 14.875 N	101° 20' 8.197 W

Formations

Measured Depth (m)	Vertical Depth (m)	Name	Lithology	Dip (°)	Dip Direction (°)
458.73	458.73	Colorado Sh		0.00	
549.73	549.73	Second White Specks		0.00	
576.73	576.73	Lw Colorado Sh		0.00	
625.73	625.73	BFS		0.00	
687.73	687.73	Mannville		0.00	
787.74	787.73	Jurassic		0.00	
939.97	927.73	Lwr Gravel		0.00	
988.98	962.73	Amaranth Evap		0.00	
1,082.09	1,007.73	Spearfish		0.00	
1,107.69	1,014.73	Marine B Cycle		0.00	
1,128.15	1,019.73	Marine A Cycle		0.00	
1,145.15	1,022.73	Waskada Zone		0.00	

Plan Annotations

Measured Depth (m)	Vertical Depth (m)	Local Coordinates +N/-S (m)	Local Coordinates +E/-W (m)	Comment
774.50	774.50	0.00	0.00	KOP = 775m MD
1,095.93	1,011.69	-1.21	182.00	Hold 75° Inc = 1096m MD
1,115.93	1,016.86	-1.34	201.32	Resume Build = 1116m MD
1,180.22	1,025.23	-1.76	264.87	Land Pt. = 1180m MD
1,181.30	1,025.23	-1.77	265.95	Hold 90.07° Inc = 1181m MD
2,378.03	1,023.73	-9.79	1,462.65	TD = 2378m MD

Licence

Tech.

RURAL MUNICIPALITY OF EDWARD

Incorporated 1905

Box 100
Pierson, Manitoba
R0M 1S0

Ralph J Wang, Reeve

Audrey Bird, CAO

June 18, 2010

Brady Land Services Ltd
310 Gardiner Park court
Regina, SK
SRV 1R9

Via Email

RE: Approach Approval
NW 32-1-29W
Your File: Molopo 68

Approval is hereby given to Molopo Energy Canada Ltd, to construct an approach to access the well site as shown on your survey plan. Approval is given with the following conditions:

1. Gravel surface on approach
2. Culvert not required.

If you have any questions, please contact the councillor for Ward 1 Carey Murray 649-2345 or you can call the office.

Yours truly,

Audrey Bird, CAO
Rural Municipality of Edward
Phone: 204-634-2231
Fax: 204-634-2479
Email: rmofedw@inethome.ca

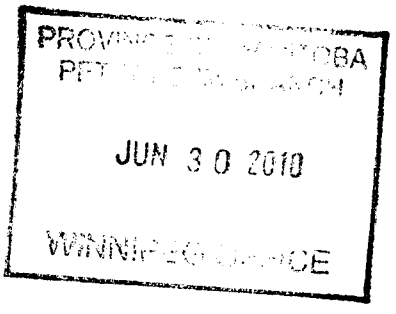
Pierson HomeComing 2010
July 9, 10, 11, 2010
COME JOIN US

Licence

MOLOPO ENERGY CANADA LTD.

1400, 444 – 5 Avenue SW Calgary, Alberta T2P 2T8
TELEPHONE: 403-264-9778 FACSIMILE: 403-264-9903

TRANSMITTAL



Date: June 28, 2010

To: Manitoba Innovation, Energy and Mines
Petroleum Branch
#360, 1395 Ellice Avenue
Winnipeg, MB R3G 3P2

Attention: Paulette Seymour

Re: Molopo Pierson Prov Hzntl 16-32-1-29W1W1 (Strat)

Attached for your records please find following data in support of our Well Licence Application:

- Well Licence Application – 2 copies
- Survey Plan with Photo Mosaic – 2 copies
- Surface Lease Agreement – 2 copies
- Proximity Consents
- Approach Approval
- Mineral Lease Agreements with Assignments
- Drilling Stick Diagram w/ Geological Prognosis
- Generic Spearfish Stratigraphic HZ Drilling Program
- Cement Program
- Drilling Fluids Program
- Directional Drilling Proposal

Please deduct the Well Licence Application Fee from our Account.

Regards,
Rhonda

Should you have any questions with regards to this data, please contact Pamela MacDonald at 403-264-9778 or via e-mail at pmacdonald@molopocanada.com.

*7447

AGAT® Laboratories

OIL ANALYSIS

Container Identification
PB6

Operator Name	Laboratory Number
MOLOPO ENERGY CANADA LTD.	10OS441209D

Unique Well Identifier	Well Name
13-32-001-29W1 SW	PIERSON 13-32-1-29

Field or Area	Pool or Zone	Sampler's Company
PIERSON	NOT AVAILABLE	NORTHERN SPIRIT RESOURCES

Well License	Elevation	Test Type	Test No.	Name of Sampler
7447	KB m GRD m			

Test Interval or Perfs mKB		Sampling Point
		WELLHEAD TUBING

	Separator	Reservoir	Source	Sampled	Received
Pressure (kPa)					
Temperature					

Date Sampled	Date Received	Date Analyzed	Date Reported	Entered By	Certified By
Oct 05, 2010	Oct 07, 2010	Oct 20, 2010	Oct 20, 2010	Nada Todorovic	Valentina Strelnikova

Other Information

** Results relate only to the items tested*

Note: Sampling Point, Unique Well Identifier and/or Pool or Zone information was unavailable at time of reporting. This information is integral to AGAT's WebFLUIDs, a comparison, history and trending analysis system.

Sample Properties

Colour of Clean Oil	Colour Number ASTM D-1500
Dk. Brown	D8 A.S.T.M.

B.S.& W. (Volume Fraction)

Water	Sediment	Total
0.008	Trace	0.008

Free Water
88.10 vol %

Density - After Cleaning

API Gravity @ 15°C	Relative	Absolute (kg/m³)
36.12	0.8442	843.4

Total Sulphur Mass Fraction	Pour Point (°C) (A.S.T.M. D-97)
0.00726	-9

Viscosity

Temp °C	Absolute (mPa*s)	Kinematic (mm²/s)
25	4.40	5.26
38	3.08	3.72
50	2.32	2.83

Other Comments:

BS&W performed on oil portion only. The distillation temperatures have been corrected to 101.3 kPa (abs).

Distillation

Volume Fraction	Temp (°C)
0.05	90.9
0.10	113.1
0.15	131.3
0.20	150.5
0.25	171.7
0.30	195.0
0.35	218.2
0.40	243.5
0.45	268.7
0.50	294.0
0.55	319.3

Method
A.S.T.M. -D86*

Initial Boiling Point (°C)
54.5

Absolute Barometric Pressure (kPa)
89.4

Room Temp (°C)
22.0

Final Boiling Point (°C)	Characterization Factor
356.7	11.8

200 °C Naphtha	275 °C Kerosene	350 °C Light Gas Oil
0.31	0.15	0.17

Recovered	Residue	Distillation Loss
0.65	0.34	0.01

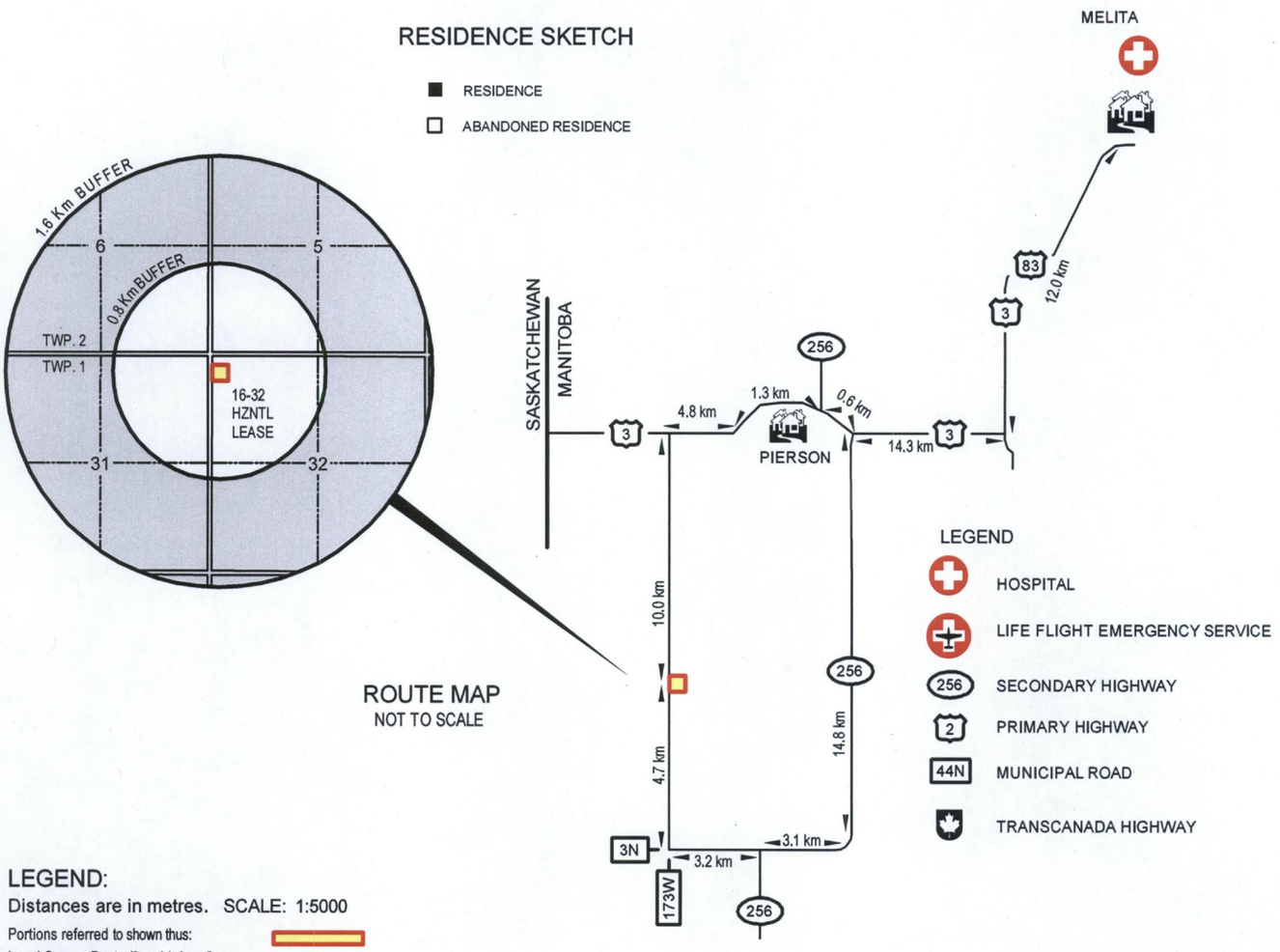
MOLOPO PIERSON PROV HZNTL 16-32-1-29WPM

WELL SITE
TERMINUS
LSD. 16D - SEC. 32 - TWP. 1 - RGE. 29WPM
WELL SITE SURFACE LOCATION
LSD. 13C - SEC. 32 - TWP. 1 - RGE. 29WPM
R.M. of EDWARD

Survey Platte

RESIDENCE SKETCH

■ RESIDENCE
□ ABANDONED RESIDENCE



ROUTE MAP
NOT TO SCALE

LEGEND:

Distances are in metres. SCALE: 1:5000

Portions referred to shown thus:
Legal Survey Posts (found / placed)
Planted Wood Hub
Fence Lines
Oil / Gas Lines
Overhead Power Lines
Buried Power Cables
Buried Telecom Cables
Bush
Low Area / Slough
Water Covered Area

Surveyed Well Centre
Standing Well
Producer
Abandoned Producer
Abandoned Dry
Injection Well
Injection Well (Former Producer)
Abandoned Water Injection
Abandoned Water Injection (Former Producer)
Salt Water Disposal

Salt Water Disposal (Former Producer)
Abandoned Salt Water Disposal
Abd. Salt Water Disposal (Former Prod.)
Dual Completion
Abandoned Dual Completion
Junked and Abandoned
Surface Location - Horizontal / Directional / Slant
Water Supply Well
Abandoned Water Supply Well
Abandoned Structure Test Hole

OPERATOR:

MOLOPO ENERGY CANADA LTD.

WELL LICENCE INFORMATION
THE PROPOSED WELL CENTRE IS:

	YES	NO
-At least 1.5 km from the Corporate Limits of a City, Town or Village	■	□
- At least 75m from any shoreline	■	□
-At least 75m from any Surface Improvements	■	□
-At least 45m from any surveyed road	■	□
-At least 75m from any aircraft runway or taxiway	■	□
-At least 75m from any water well	■	□

-Approximately 11.2 km from the nearest urban centre (Pierson)
-Approximately 1.2 km from the nearest residence (NW¼ 5-2-29WPM)

CALL BEFORE YOU DIG

FACILITIES SHOWN ON THIS PLAN ARE FOR INFORMATIONAL PURPOSES ONLY. PRIOR TO ANY CONSTRUCTION ON LEASE OR ACCESS ROAD, MOLOPO ENERGY CANADA LTD. , MTS COMMUNICATIONS INC., MANITOBA HYDRO, AND MANITOBA HYDRO-GAS OPERATIONS **MUST** BE CONTACTED FOR LOCATION OF ANY UNDERGROUND FACILITIES THAT MAY EXIST.

There are no surface or underground improvements within 76m of well centre except as shown. OTHER FACILITIES MAY EXIST, OF WHICH WE WERE UNAWARE OF OR UNABLE TO LOCATE.

LENNON TRILOGY
PROFESSIONAL LAND SURVEYORS
BRANDON / VIRDEN
Toll Free: 1-877-748-6860
MEMBER

All distances shown are horizontal and at ground level.

All bearings are NAD 83 (Zone 14) UTM grid bearings.
The Combined Scale Factor derived is 0.999882

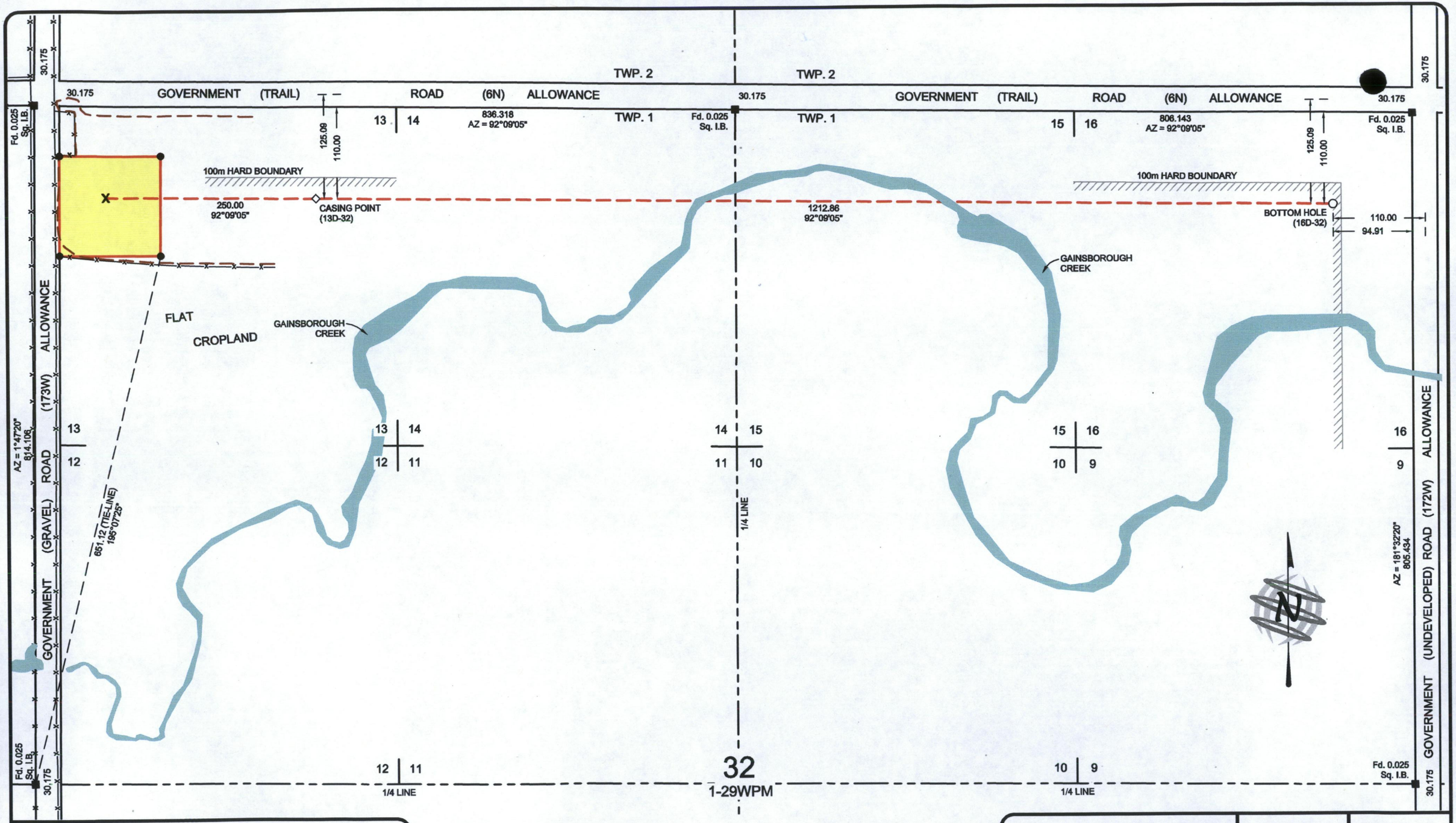
FIELD BOOK
V29
PAGE(S)
N/A

Surveyed by: KD
Drafted by: AV
Checked by: PFS

No.	DATE	DESCRIPTION	DWN	CKD
0	June 11, 2010	ISSUED	AV	PFS
-	June 10, 2010	ISSUED FOR REVIEW	AV	PFS

REVISIONS

Client File: N/A
NTS SHEET: 62 F/3
LENNON TRILOGY File: 125668



MOLOPO PIERSON PROV HZNTL 16-32-1-29WPM

LENNONTRILOGY JOB No. 125668 | REVISION: 0 | PAGE 2 of 4

SURFACE
(13C-32)

LOCAL CO-ORDINATES
110.00 S of N } Sec 32
55.00 E of W }

UTM CO-ORDINATES (NAD 83)
5439816.183 N }
329208.876 E } CSRS

UTM CO-ORDINATES (NAD 27)
5439594.217 N }
329235.317 E } CSRS

LATITUDE / LONGITUDE(LL83)
49° 05' 14.933" }
101° 20' 21.252" } CSRS

CASING POINT
(13D-32)

LOCAL CO-ORDINATES
110.00 S of N } Sec 32
305.00 E of W }

UTM CO-ORDINATES (NAD 83)
5439806.796 N }
329458.670 E } CSRS

UTM CO-ORDINATES (NAD 27)
5439584.833 N }
329485.112 E } CSRS

LATITUDE / LONGITUDE(LL83)
49° 05' 14.878" }
101° 20' 08.932" } CSRS

BOTTOM HOLE
(16D-32)

LOCAL CO-ORDINATES
110.00 S of N } Sec 32
94.91 W of E }

UTM CO-ORDINATES (NAD 83)
5439761.260 N }
330670.531 E } CSRS

UTM CO-ORDINATES (NAD 27)
5439539.331 N }
330696.996 E } CSRS

LATITUDE / LONGITUDE(LL83)
49° 05' 14.609" }
101° 19' 09.161" } CSRS

CARTESIAN CO-ORDINATES (NAD83)

Note:
All distances are cartesian referenced to the UTM GRID, NAD 83, ZONE 14

Casing Point is
9.39 South
249.82 East
of surface location

Bottom Hole is
54.93 South
1461.83 East
of surface location

CARTESIAN CO-ORDINATES (TRUE NORTH)

Note:
All distances are cartesian referenced to True North (Grid Convergence = -1.7678°)

Casing Point is
1.68 South
249.99 East
of surface location

Bottom Hole is
9.81 South
1462.83 East
of surface location

WELL CENTRE ELEVATION: 471.23

Elevations shown are in Geodetic Datum from the Province of Manitoba Mon. #82R760

CERTIFICATE OF TITLE

NW¼ 32-1-29WPM CT No. 1918615

Owners: William Carey Murray (1/3 Interest)
Ian Glen Murray (1/3 Interest)
William Keith Murray (1/3 Interest)

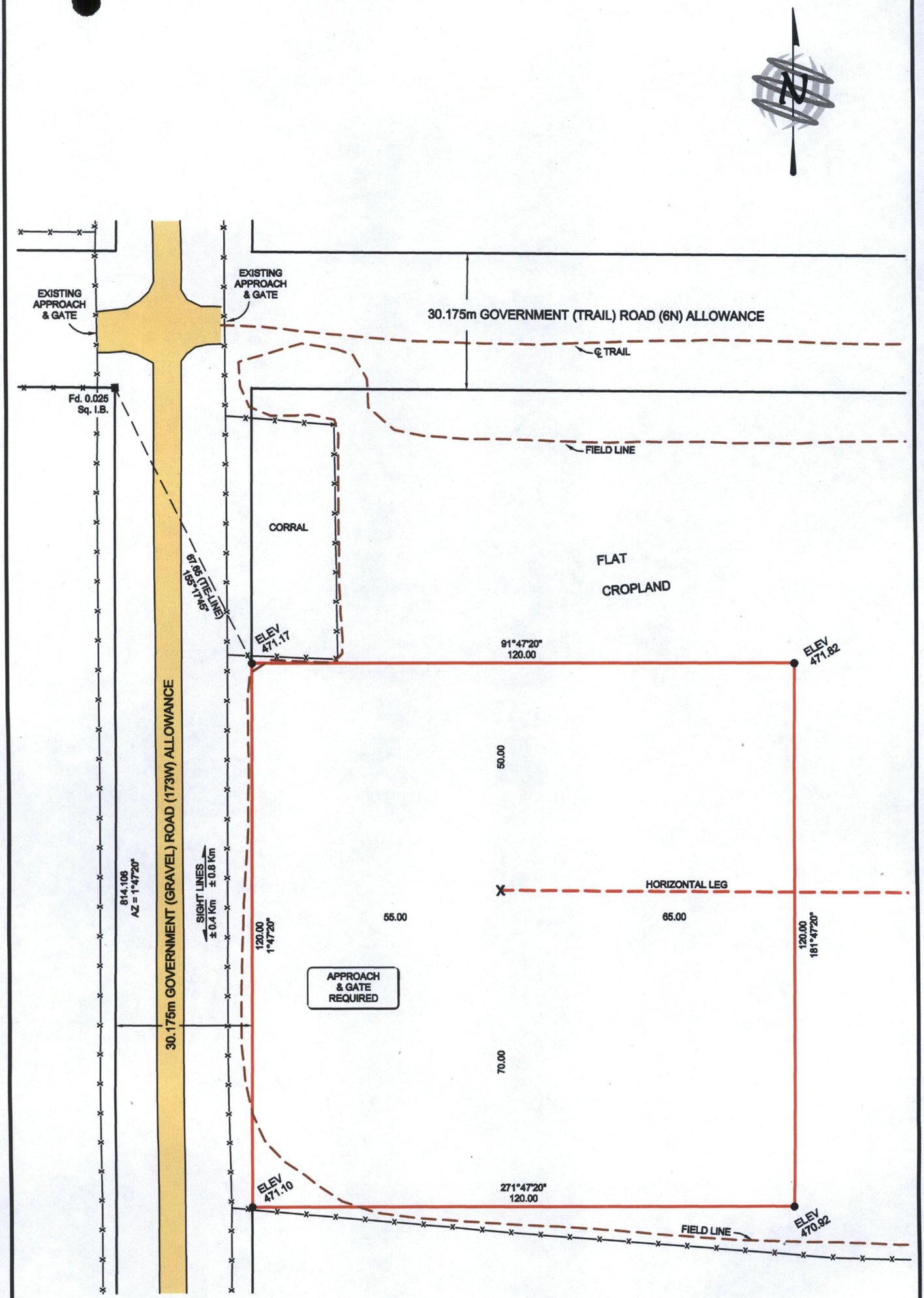
AREAS:

WELL SITE	1.440 ha	3.56 ac
TOTAL	1.440 ha	3.56 ac

I certify that the survey represented by this plan is correct to the best of my knowledge and was completed on the 3rd day of June, 2010.

MANITOBA LAND SURVEYOR

Witness



DETAIL AT HZNTL 16-32 (13-32 SURFACE)
SCALE 1:1000

MOLOPO PIERSON PROV HZNTL 16-32-1-29WPM
WELL SITE

LENNON TRILOGY PROFESSIONAL LAND SURVEYORS APEGS MEMBER

0 REVISION

125668
PAGE 4 of 4

MOLOPO ENERGY CANADA LTD.

Plan Showing Photo Mosaic of

MOLOPO PIERSON PROV HZNTL 16-32-1-29WPM

from a Surface Location in

L.S. 13 - Sec. 32 - Twp. 1 - Rge. 29WPM

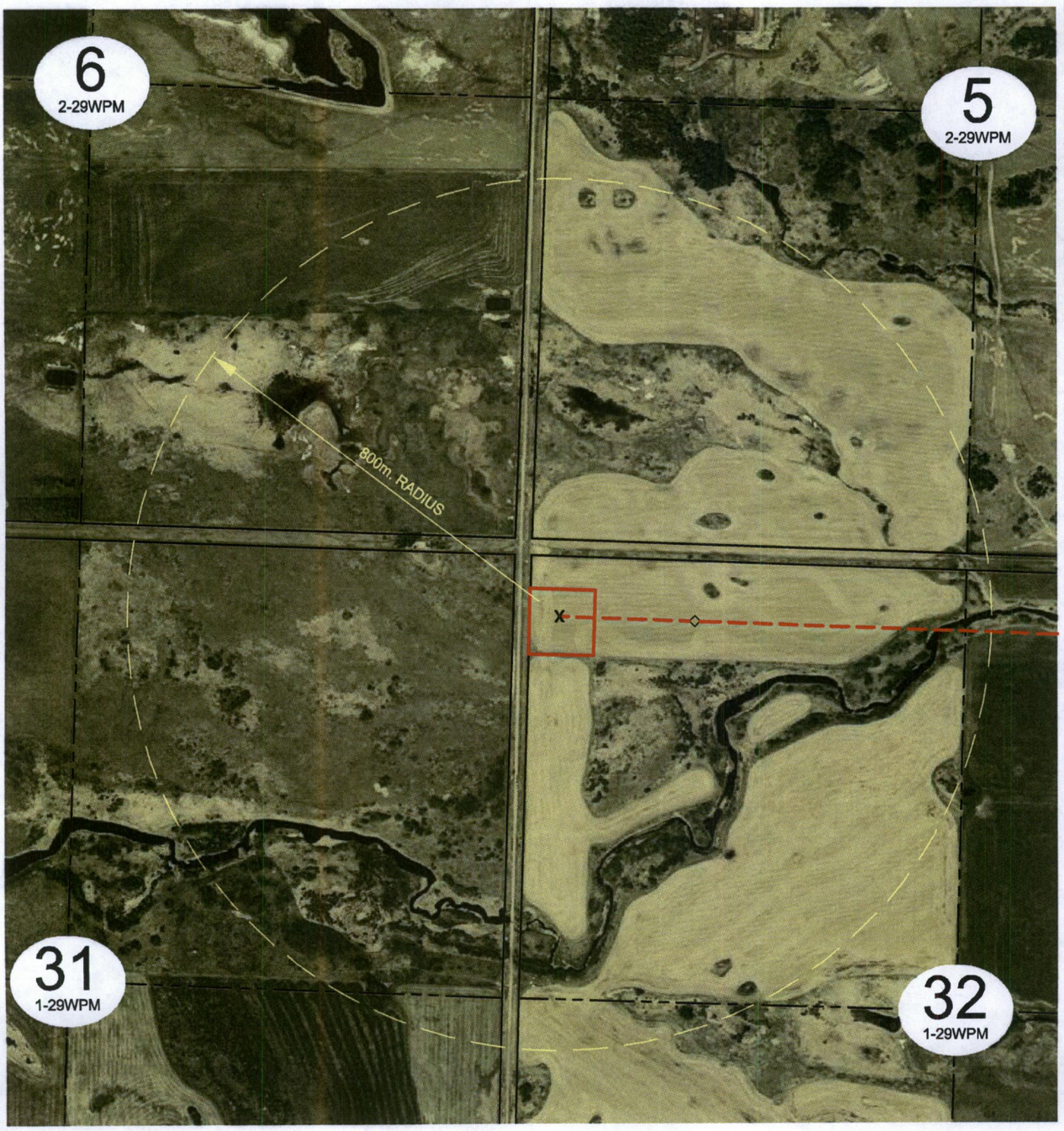


Photo Date : May 20, 2006.
Photo No. : Orthographic Photo

WELL SITE PHOTO PLAN

0 50 100 200 300 400 500

SCALE - 1:10,000

LENNON TRILOGY
PROFESSIONAL LAND SURVEYORS
BRANDON / VIRDEN
Toll Free: 1-877-748-6860
APEGS MEMBER

Client File No:		
REV. 0	Revision:	
	Date: June 10, 2010	Job No.: 125668-V
	File: 125668W	Initials: KD - AV - PFS

Lic # 7447

Job Number: 10147566R
Company: Molopo Energy CAnada Ltd
Lease/Well: Molopo Pierson Prov Hz
Location: (13C-32)16D-32-1-29WPM
Rig Name: Advance 1
RKB: 475.2
G.L. or M.S.L.: 471

State/Country: Manitoba
Declination: 7.26
Grid: -1.77
File name: C:\WINSERVE\10147566.SVY
Date/Time: 15-Jul-10 / 15:47
Curve Name: Molopo Pierson (13C-32)16D-32-1-29WPM

WINSERVE SURVEY CALCULATIONS
Minimum Curvature Method
Vertical Section Plane 90.38
Vertical Section Referenced to Wellhead
Rectangular Coordinates Referenced to Wellhead

Measured Depth Meters	Incl Angle Deg	Drift Direction Deg	True Vertical Depth	N-S Meters	E-W Meters	Vertical Section Meters	CLOSURE Distance Meters	CLOSURE Direction Deg	Dogleg Severity Deg/30
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
Surface Casing Tie On									
202.00	.00	.00	202.00	.00	.00	.00	.00	.00	.00
212.55	.40	125.60	212.55	-.02	.03	.03	.04	125.58	1.14
268.11	.30	177.30	268.11	-.28	.19	.20	.34	145.18	.17
323.57	.50	178.90	323.57	-.67	.21	.21	.70	162.83	.11
335.30	.52	176.44	335.30	-.77	.21	.22	.80	164.75	.08
370.29	.60	170.30	370.29	-1.11	.25	.26	1.14	167.27	.08
417.82	.80	176.40	417.81	-1.69	.31	.33	1.72	169.47	.13
436.92	.40	177.20	436.91	-1.89	.33	.34	1.92	170.22	.63
474.94	.50	35.50	474.93	-1.89	.43	.44	1.93	167.20	.67
531.59	.50	12.10	531.58	-1.44	.62	.63	1.57	156.61	.11
587.76	.50	22.70	587.75	-.98	.77	.78	1.24	141.76	.05
634.94	.60	349.70	634.92	-.54	.80	.81	.97	124.03	.21
709.50	.80	183.70	709.48	-.68	.70	.71	.98	134.06	.56
756.29	.30	221.50	756.27	-1.10	.60	.61	1.25	151.34	.38
765.88	.30	183.70	765.86	-1.14	.58	.59	1.28	153.00	.61
Interpolated Kick Off Point									
772.00	.98	106.03	771.98	-1.17	.63	.64	1.33	151.70	4.72
775.40	1.50	99.80	775.38	-1.19	.70	.71	1.38	149.38	4.72
784.83	3.30	87.90	784.80	-1.20	1.10	1.10	1.62	137.56	5.91
794.43	4.90	83.80	794.38	-1.14	1.78	1.79	2.11	122.73	5.08
803.64	6.60	82.10	803.54	-1.03	2.69	2.70	2.88	110.88	5.56
813.28	8.50	80.00	813.09	-.83	3.94	3.95	4.03	101.86	5.97
822.57	10.60	82.30	822.26	-.59	5.47	5.47	5.50	96.20	6.89

Measured Depth Meters	Incl Angle Deg	Drift Direction Deg	True Vertical Depth	N-S Meters	E-W Meters	Vertical Section Meters	CLOSURE Distance Meters	CLOSURE Direction Deg	Dogleg Severity Deg/30
832.01	12.70	88.20	831.50	-.45	7.37	7.37	7.38	93.46	7.66
841.50	14.50	94.50	840.72	-.51	9.59	9.60	9.61	93.02	7.36
850.69	16.40	93.90	849.58	-.68	12.03	12.04	12.05	93.25	6.22
860.14	18.10	90.20	858.61	-.78	14.83	14.84	14.85	93.01	6.42
869.37	19.70	85.50	867.34	-.66	17.82	17.82	17.83	92.13	7.17
878.87	22.10	84.00	876.21	-.35	21.19	21.19	21.20	90.95	7.76
888.48	24.30	85.80	885.05	-.02	24.96	24.96	24.96	90.04	7.22
897.71	27.00	88.30	893.37	.18	28.95	28.95	28.95	89.64	9.45
907.18	29.60	91.00	901.70	.21	33.44	33.44	33.44	89.64	9.18
916.57	31.80	90.80	909.78	.13	38.23	38.23	38.23	89.80	7.04
925.83	33.70	90.60	917.57	.07	43.24	43.24	43.24	89.91	6.17
935.30	36.10	91.10	925.33	-.01	48.66	48.66	48.66	90.01	7.66
944.76	38.40	90.50	932.86	-.09	54.38	54.38	54.38	90.09	7.38
954.23	40.80	89.90	940.16	-.11	60.42	60.42	60.42	90.10	7.70
963.69	43.20	89.20	947.19	-.06	66.75	66.75	66.75	90.05	7.75
973.14	45.50	88.30	953.94	.09	73.35	73.35	73.35	89.93	7.57
982.59	47.70	88.30	960.44	.29	80.22	80.21	80.22	89.79	6.98
991.96	49.30	88.70	966.65	.47	87.23	87.23	87.23	89.69	5.21
1001.16	51.40	88.30	972.52	.66	94.31	94.31	94.31	89.60	6.92
1010.32	52.90	88.90	978.14	.84	101.54	101.53	101.55	89.53	5.15
1019.49	54.10	90.10	983.59	.90	108.91	108.90	108.92	89.53	5.04
1028.68	55.80	90.10	988.87	.89	116.44	116.43	116.44	89.56	5.55
1037.92	57.00	89.50	993.98	.91	124.13	124.12	124.14	89.58	4.22
1047.15	59.20	89.30	998.86	1.00	131.97	131.96	131.97	89.57	7.17
1056.36	61.50	89.90	1003.41	1.05	139.97	139.96	139.97	89.57	7.68
1065.82	64.20	90.30	1007.73	1.04	148.39	148.38	148.39	89.60	8.64
1075.02	66.80	90.30	1011.55	.99	156.76	156.75	156.76	89.64	8.48
1084.23	69.40	91.30	1014.98	.87	165.30	165.29	165.30	89.70	8.99
1093.67	72.30	92.60	1018.08	.57	174.21	174.21	174.21	89.81	10.01
1102.88	73.40	92.10	1020.79	.21	183.01	183.00	183.01	89.94	3.91
1112.09	73.00	92.70	1023.46	-.16	191.82	191.81	191.82	90.05	2.28
1121.65	75.60	92.80	1026.04	-.60	201.01	201.01	201.01	90.17	8.16
1131.20	78.20	91.00	1028.21	-.91	210.30	210.30	210.30	90.25	9.85
1140.64	81.10	89.70	1029.90	-.97	219.59	219.59	219.59	90.25	10.07
1149.88	84.10	88.80	1031.09	-.85	228.75	228.75	228.75	90.21	10.16
1159.34	87.40	89.10	1031.79	-.67	238.18	238.18	238.18	90.16	10.51
Landing Point									
1168.80	89.00	89.50	1032.09	-.56	247.63	247.63	247.63	90.13	5.23
1178.26	88.40	89.40	1032.30	-.47	257.09	257.09	257.09	90.10	1.93
1187.70	88.30	88.90	1032.58	-.33	266.53	266.52	266.53	90.07	1.62
1197.18	90.10	90.80	1032.71	-.30	276.00	276.00	276.00	90.06	8.28
1206.62	90.90	92.20	1032.63	-.55	285.44	285.44	285.44	90.11	5.12
1216.13	91.10	92.50	1032.46	-.94	294.94	294.94	294.94	90.18	1.14
1225.72	90.70	92.30	1032.31	-1.34	304.52	304.52	304.52	90.25	1.40
1235.32	89.90	92.20	1032.26	-1.72	314.11	314.12	314.12	90.31	2.52

Measured Depth Meters	Incl Angle Deg	Drift Direction Deg	True Vertical Depth	N-S Meters	E-W Meters	Vertical Section Meters	CLOSURE Distance Meters	CLOSURE Direction Deg	Dogleg Severity Deg/30
1244.77	89.70	92.10	1032.29	-2.07	323.56	323.56	323.56	90.37	.71
1254.00	89.50	91.40	1032.36	-2.35	332.78	332.79	332.79	90.41	2.37
1263.26	89.00	91.00	1032.48	-2.55	342.04	342.05	342.05	90.43	2.07
1272.30	89.10	91.20	1032.63	-2.72	351.08	351.09	351.09	90.44	.74
1282.20	90.00	92.30	1032.71	-3.02	360.97	360.98	360.98	90.48	4.31
1291.75	90.60	92.60	1032.66	-3.43	370.51	370.53	370.53	90.53	2.11
1301.18	91.40	93.70	1032.49	-3.95	379.93	379.94	379.95	90.60	4.33
1310.72	91.20	93.70	1032.28	-4.57	389.44	389.47	389.47	90.67	.63
1320.34	90.90	93.40	1032.10	-5.16	399.04	399.07	399.08	90.74	1.32
1329.58	90.60	93.70	1031.98	-5.73	408.27	408.29	408.31	90.80	1.38
1339.03	89.70	92.80	1031.95	-6.27	417.70	417.73	417.75	90.86	4.04
1348.62	89.30	92.30	1032.04	-6.70	427.28	427.32	427.33	90.90	2.00
1357.86	89.70	92.60	1032.12	-7.09	436.51	436.55	436.57	90.93	1.62
1367.30	90.10	94.50	1032.13	-7.68	445.93	445.97	446.00	90.99	6.17
1376.71	89.80	94.70	1032.14	-8.43	455.31	455.36	455.39	91.06	1.15
1386.17	89.50	94.10	1032.20	-9.16	464.74	464.79	464.83	91.13	2.13
1395.51	89.60	94.70	1032.27	-9.87	474.06	474.11	474.16	91.19	1.95
1404.73	90.20	96.10	1032.29	-10.74	483.24	483.30	483.35	91.27	4.96
1413.90	91.00	95.80	1032.19	-11.69	492.36	492.42	492.49	91.36	2.80
1423.25	90.10	93.70	1032.10	-12.47	501.67	501.74	501.83	91.42	7.33
1432.60	90.20	93.40	1032.08	-13.04	511.00	511.08	511.17	91.46	1.01
1441.86	90.10	93.00	1032.05	-13.56	520.25	520.33	520.43	91.49	1.34
1451.11	89.80	92.90	1032.06	-14.04	529.49	529.57	529.67	91.52	1.03
1460.48	89.60	95.10	1032.11	-14.69	538.83	538.92	539.03	91.56	7.07
1469.75	89.50	94.80	1032.18	-15.49	548.07	548.16	548.29	91.62	1.02
1479.16	88.20	93.50	1032.37	-16.17	557.45	557.55	557.69	91.66	5.86
1488.45	87.90	92.70	1032.69	-16.67	566.72	566.82	566.97	91.69	2.76
1497.88	87.00	92.40	1033.11	-17.09	576.13	576.23	576.39	91.70	3.02
1507.11	87.10	92.60	1033.58	-17.49	585.34	585.45	585.60	91.71	.73
1516.33	86.80	93.20	1034.07	-17.96	594.54	594.64	594.81	91.73	2.18
1525.57	87.60	92.80	1034.53	-18.44	603.75	603.86	604.04	91.75	2.90
1534.93	88.00	91.10	1034.89	-18.76	613.10	613.21	613.39	91.75	5.59
1544.14	87.80	89.90	1035.22	-18.84	622.31	622.42	622.59	91.73	3.96
1553.51	89.20	90.20	1035.47	-18.85	631.67	631.78	631.95	91.71	4.58
1562.88	89.40	90.10	1035.58	-18.87	641.04	641.15	641.32	91.69	.72
1572.08	89.00	88.90	1035.71	-18.79	650.24	650.35	650.51	91.66	4.12
1581.37	89.80	88.70	1035.81	-18.60	659.53	659.64	659.79	91.62	2.66
1590.44	90.60	88.60	1035.78	-18.39	668.59	668.70	668.85	91.58	2.67
1599.87	90.40	88.30	1035.69	-18.13	678.02	678.13	678.26	91.53	1.15
1609.22	89.70	87.50	1035.69	-17.79	687.36	687.47	687.59	91.48	3.41
1618.59	89.70	86.90	1035.74	-17.33	696.72	696.82	696.94	91.42	1.92
1627.83	90.00	87.00	1035.76	-16.84	705.95	706.05	706.15	91.37	1.03
1637.19	91.30	87.60	1035.65	-16.40	715.30	715.39	715.49	91.31	4.59
1646.56	90.90	87.20	1035.47	-15.97	724.66	724.75	724.83	91.26	1.81
1655.70	90.80	86.90	1035.34	-15.50	733.78	733.87	733.95	91.21	1.04

Measured Depth Meters	Incl Angle Deg	Drift Direction Deg	True Vertical Depth	N-S Meters	E-W Meters	Vertical Section Meters	CLOSURE Distance Meters	CLOSURE Direction Deg	Dogleg Severity Deg/30
1664.92	90.90	86.20	1035.20	-14.95	742.99	743.07	743.14	91.15	2.30
1674.14	90.60	85.60	1035.08	-14.29	752.18	752.26	752.32	91.09	2.18
1683.29	90.30	84.40	1035.01	-13.49	761.30	761.37	761.42	91.02	4.06
1692.70	91.40	84.40	1034.87	-12.57	770.66	770.73	770.76	90.93	3.51
1701.93	93.30	85.20	1034.49	-11.74	779.84	779.90	779.93	90.86	6.70
1711.18	93.80	85.80	1033.92	-11.01	789.05	789.10	789.12	90.80	2.53
1720.55	93.80	87.10	1033.30	-10.43	798.38	798.43	798.45	90.75	4.15
1729.92	93.20	88.20	1032.72	-10.05	807.72	807.77	807.79	90.71	4.01
1739.30	92.90	88.10	1032.23	-9.75	817.09	817.13	817.14	90.68	1.01
1748.67	91.70	88.70	1031.85	-9.49	826.44	826.49	826.50	90.66	4.29
1757.96	91.30	88.90	1031.61	-9.29	835.73	835.77	835.78	90.64	1.44
1767.27	91.10	89.30	1031.41	-9.15	845.04	845.08	845.08	90.62	1.44
1776.52	91.10	89.70	1031.23	-9.07	854.28	854.32	854.33	90.61	1.30
1785.72	89.60	90.20	1031.18	-9.06	863.48	863.52	863.53	90.60	5.16
1794.94	89.40	90.00	1031.26	-9.07	872.70	872.74	872.75	90.60	.92
1804.33	89.20	89.60	1031.37	-9.04	882.09	882.13	882.14	90.59	1.43
1813.57	89.10	89.50	1031.51	-8.97	891.33	891.37	891.38	90.58	.46
1822.82	89.10	89.30	1031.66	-8.87	900.58	900.62	900.62	90.56	.65
1832.23	89.60	90.40	1031.76	-8.85	909.99	910.03	910.03	90.56	3.85
1841.57	88.80	90.10	1031.89	-8.89	919.33	919.37	919.37	90.55	2.74
1850.83	88.60	90.10	1032.10	-8.90	928.58	928.62	928.63	90.55	.65
1860.27	88.10	88.60	1032.37	-8.80	938.02	938.06	938.06	90.54	5.02
1869.52	88.40	90.00	1032.66	-8.68	947.26	947.30	947.30	90.53	4.64
1878.44	89.20	90.70	1032.84	-8.74	956.18	956.22	956.22	90.52	3.57
1887.84	90.10	91.30	1032.90	-8.90	965.58	965.62	965.62	90.53	3.45
1897.21	90.30	92.10	1032.87	-9.18	974.95	974.99	974.99	90.54	2.64
1906.46	89.80	92.20	1032.86	-9.53	984.19	984.23	984.24	90.55	1.65
1915.67	89.70	91.70	1032.90	-9.84	993.39	993.44	993.44	90.57	1.66
1924.83	89.60	91.70	1032.96	-10.11	1002.55	1002.59	1002.60	90.58	.33
1934.33	90.60	91.20	1032.94	-10.35	1012.05	1012.09	1012.10	90.59	3.53
1943.70	91.60	91.10	1032.76	-10.54	1021.41	1021.46	1021.47	90.59	3.22
1952.95	91.40	90.70	1032.52	-10.69	1030.66	1030.71	1030.71	90.59	1.45
1962.41	91.30	90.50	1032.30	-10.79	1040.12	1040.16	1040.17	90.59	.71
1971.61	92.00	90.70	1032.03	-10.88	1049.31	1049.36	1049.37	90.59	2.37
1981.06	92.30	90.50	1031.68	-10.98	1058.75	1058.80	1058.81	90.59	1.14
Extrapolate to TD									
1998.00	92.10	90.50	1031.03	-11.13	1075.68	1075.73	1075.74	90.59	.35

Pierson Hz (13C-32) 16D-32-1-29W1M Final Surveys
Phoenix Technology Services LP

Molopo Energy Canada Ltd.
Well License # 7447
Pierson
(13C-32) 16D-32-1-29WPM
Molopo Pierson Prov Hz
16-32-001-29W1
10147566 Surveys

Measured Depth (m)	Incl.	Azim.	Vertical Section (m)	Sub-Sea Depth (m)	Dogleg Rate (°/30m)	Vertical Depth (m)	Local Coordinates +N/S- (m)	Local Coordinates +E/W- (m)	UTM Coordinates Northings (m)	Eastings (m)
0.00	0.000		0.000	-475.20	0.00	0.00	0.00	0.00	5439816.183 N	329208.876 E
202.00	0.000		0.000	-273.20	0.00	202.00	0.00	0.00	5439816.183 N	329208.876 E
				Surface Csg. = 202m MD						
212.55	0.400	125.600	0.00	-262.65	1.14	212.55	-0.02	0.03	5439816.161 N	329208.905 E
268.11	0.300	177.300	0.03	-207.09	0.17	268.11	-0.28	0.19	5439815.898 N	329209.062 E
323.57	0.500	178.900	0.20	-151.63	0.11	323.57	-0.67	0.21	5439815.510 N	329209.061 E
335.30	0.520	176.440	0.21	-139.90	0.08	335.30	-0.77	0.21	5439815.406 N	329209.062 E
370.29	0.600	170.300	0.22	-104.91	0.09	370.29	-1.11	0.25	5439815.066 N	329209.093 E
417.82	0.800	176.400	0.26	-57.39	0.13	417.81	-1.69	0.31	5439814.488 N	329209.138 E
436.92	0.400	177.200	0.33	-38.29	0.63	436.91	-1.89	0.33	5439814.288 N	329209.143 E
474.94	0.500	35.500	0.34	-0.27	0.67	474.93	-1.88	0.43	5439814.287 N	329209.246 E
531.59	0.500	12.100	0.44	56.38	0.11	531.58	-1.44	0.62	5439814.724 N	329209.455 E
587.76	0.500	22.700	0.63	112.55	0.05	587.75	-0.97	0.77	5439815.185 N	329209.615 E
634.94	0.600	349.700	0.78	159.72	0.21	634.92	-0.54	0.80	5439815.616 N	329209.664 E
709.50	0.800	183.700	0.81	234.28	0.56	709.48	-0.68	0.70	5439815.484 N	329209.556 E
756.29	0.300	221.500	0.71	281.07	0.38	756.27	-1.10	0.60	5439815.070 N	329209.441 E
765.88	0.300	183.700	0.61	290.66	0.61	765.86	-1.14	0.58	5439815.027 N	329209.421 E
772.00	0.980	106.030	0.59	296.78	4.71	771.98	-1.17	0.63	5439814.995 N	329209.470 E
				KOP = 772m MD						
775.40	1.500	99.800	0.64	300.18	4.73	775.38	-1.18	0.70	5439814.977 N	329209.541 E
784.83	3.300	87.900	0.71	309.60	5.91	784.80	-1.20	1.09	5439814.954 N	329209.933 E
794.43	4.900	83.800	1.10	319.18	5.08	794.38	-1.14	1.78	5439814.987 N	329210.619 E
803.64	6.600	82.100	1.79	328.34	5.56	803.54	-1.03	2.69	5439815.074 N	329211.537 E
813.28	8.500	80.000	2.70	337.89	5.97	813.09	-0.83	3.94	5439815.235 N	329212.793 E
822.57	10.600	82.300	3.95	347.06	6.89	822.26	-0.59	5.47	5439815.422 N	329214.323 E

832.01	12.700	88.200	356.30	831.50	-0.44	7.37	5439815.512 N
329216.224 E		7.37	7.66				
841.50	14.500	94.500	365.52	840.72	-0.50	9.59	5439815.383 N
329218.449 E		9.60	7.36				
850.69	16.400	93.900	374.38	849.58	-0.68	12.03	5439815.129 N
329220.883 E		12.04	6.22				
860.14	18.100	90.200	383.41	858.61	-0.78	14.83	5439814.947 N
329223.678 E		14.84	6.42				
869.37	19.700	85.500	392.14	867.34	-0.66	17.82	5439814.972 N
329226.666 E		17.82	7.17				
878.87	22.100	84.000	401.01	876.21	-0.35	21.19	5439815.180 N
329230.048 E		21.19	7.76				
888.48	24.300	85.800	409.85	885.05	-0.02	24.96	5439815.397 N
329233.827 E		24.96	7.22				
897.71	27.000	88.300	418.17	893.37	0.19	28.95	5439815.476 N
329237.820 E		28.95	9.45				
907.18	29.600	91.000	426.50	901.70	0.21	33.44	5439815.360 N
329242.307 E		33.44	9.18				
916.57	31.800	90.800	434.58	909.78	0.13	38.23	5439815.137 N
329247.095 E		38.23	7.04				
925.83	33.700	90.600	442.37	917.57	0.07	43.24	5439814.922 N
329252.100 E		43.24	6.17				
935.30	36.100	91.100	450.13	925.33	-0.01	48.66	5439814.673 N
329257.512 E		48.66	7.66				
944.76	38.400	90.500	457.66	932.86	-0.09	54.38	5439814.418 N
329263.232 E		54.38	7.38				
954.23	40.800	89.900	464.96	940.16	-0.11	60.42	5439814.211 N
329269.264 E		60.42	7.70				
963.69	43.200	89.200	471.99	947.19	-0.06	66.75	5439814.066 N
329275.592 E		66.75	7.75				
973.14	45.500	88.300	478.74	953.94	0.09	73.35	5439814.008 N
329282.197 E		73.35	7.57				
982.59	47.700	88.300	485.24	960.44	0.29	80.22	5439814.000 N
329289.063 E		80.21	6.98				
991.96	49.300	88.700	491.45	966.65	0.48	87.23	5439813.966 N
329296.080 E		87.23	5.21				
1001.16	51.400	88.300	497.32	972.52	0.66	94.31	5439813.934 N
329303.163 E		94.31	6.92				
1010.32	52.900	88.900	502.94	978.14	0.84	101.54	5439813.887 N
329310.396 E		101.53	5.15				
1019.49	54.100	90.100	508.39	983.59	0.90	108.91	5439813.723 N
329317.765 E		108.90	5.04				
1028.68	55.800	90.100	513.67	988.87	0.89	116.44	5439813.478 N
329325.284 E		116.43	5.55				
1037.92	57.000	89.500	518.78	993.98	0.92	124.13	5439813.267 N
329332.977 E		124.12	4.22				
1047.15	59.200	89.300	523.66	998.86	1.00	131.97	5439813.108 N
329340.811 E		131.96	7.17				
1056.36	61.500	89.900	528.21	1003.41	1.05	139.97	5439812.916 N
329348.812 E		139.96	7.68				
1065.82	64.200	90.300	532.53	1007.73	1.04	148.39	5439812.641 N
329357.225 E		148.38	8.64				
1075.02	66.800	90.300	536.35	1011.55	0.99	156.76	5439812.339 N
329365.590 E		156.75	8.48				
1084.23	69.400	91.300	539.78	1014.98	0.87	165.30	5439811.956 N
329374.126 E		165.29	8.99				
1093.67	72.300	92.600	542.88	1018.08	0.57	174.21	5439811.377 N
329383.024 E		174.21	10.01				
1102.88	73.400	92.100	545.59	1020.79	0.21	183.01	5439810.745 N
329391.801 E		183.00	3.91				
1112.09	73.000	92.700	548.26	1023.46	-0.16	191.81	5439810.104 N
329400.595 E		191.81	2.28				
1121.65	75.600	92.800	550.84	1026.04	-0.60	201.01	5439809.379 N

329409.769 E		201.01	8.16				
1131.20	78.200	91.000	553.01	1028.21	-0.91	210.30	5439808.785 N
329419.050 E		210.30	9.85				
1140.64	81.100	89.700	554.70	1029.90	-0.97	219.59	5439808.442 N
329428.329 E		219.59	10.07				
1149.88	84.100	88.800	555.89	1031.09	-0.85	228.75	5439808.279 N
329437.489 E		228.75	10.16				
1159.34	87.400	89.100	556.59	1031.79	-0.67	238.18	5439808.161 N
329446.921 E		238.18	10.51				
1168.80	89.000	89.500	556.89	1032.09	-0.56	247.63	5439807.985 N
329456.374 E		247.63	5.23				
1178.26	88.400	89.400	557.10	1032.30	-0.47	257.09	5439807.784 N
329465.830 E		257.09	1.93				
1187.70	88.300	88.900	557.38	1032.58	-0.33	266.53	5439807.632 N
329475.265 E		266.52	1.62				
1197.18	90.100	90.800	557.51	1032.71	-0.30	276.00	5439807.365 N
329484.739 E		276.00	8.28				
1206.62	90.900	92.200	557.43	1032.63	-0.55	285.44	5439806.827 N
329494.163 E		285.44	5.12				
1216.13	91.100	92.500	557.26	1032.46	-0.94	294.94	5439806.144 N
329503.647 E		294.94	1.14				
1225.72	90.700	92.300	557.11	1032.31	-1.34	304.52	5439805.447 N
329513.211 E		304.52	1.40				
1235.32	89.900	92.200	557.06	1032.26	-1.72	314.11	5439804.774 N
329522.787 E		314.12	2.52				
1244.77	89.700	92.100	557.09	1032.29	-2.07	323.56	5439804.128 N
329532.215 E		323.56	0.71				
1254.00	89.500	91.400	557.16	1032.36	-2.35	332.78	5439803.562 N
329541.427 E		332.79	2.37				
1263.26	89.000	91.000	557.28	1032.48	-2.55	342.04	5439803.082 N
329550.674 E		342.05	2.07				
1272.30	89.100	91.200	557.43	1032.63	-2.72	351.08	5439802.630 N
329559.701 E		351.09	0.74				
1282.20	90.000	92.300	557.51	1032.71	-3.02	360.97	5439802.023 N
329569.582 E		360.98	4.31				
1291.75	90.600	92.600	557.46	1032.66	-3.43	370.51	5439801.320 N
329579.106 E		370.53	2.11				
1301.18	91.400	93.700	557.29	1032.49	-3.95	379.93	5439800.512 N
329588.499 E		379.94	4.33				
1310.72	91.200	93.700	557.08	1032.28	-4.56	389.44	5439799.603 N
329597.994 E		389.47	0.63				
1320.34	90.900	93.400	556.90	1032.10	-5.16	399.04	5439798.712 N
329607.571 E		399.07	1.32				
1329.58	90.600	93.700	556.78	1031.98	-5.73	408.27	5439797.855 N
329616.770 E		408.29	1.38				
1339.03	89.700	92.800	556.75	1031.95	-6.27	417.70	5439797.029 N
329626.184 E		417.73	4.04				
1348.62	89.300	92.300	556.84	1032.04	-6.69	427.28	5439796.306 N
329635.746 E		427.32	2.00				
1357.86	89.700	92.600	556.92	1032.12	-7.09	436.51	5439795.627 N
329644.960 E		436.55	1.62				
1367.30	90.100	94.500	556.93	1032.13	-7.67	445.93	5439794.752 N
329654.359 E		445.97	6.17				
1376.71	89.800	94.700	556.94	1032.14	-8.43	455.31	5439793.708 N
329663.711 E		455.36	1.15				
1386.17	89.500	94.100	557.00	1032.20	-9.15	464.74	5439792.692 N
329673.116 E		464.79	2.13				
1395.51	89.600	94.700	557.07	1032.27	-9.87	474.06	5439791.688 N
329682.402 E		474.11	1.95				
1404.73	90.200	96.100	557.09	1032.29	-10.74	483.24	5439790.538 N
329691.550 E		483.30	4.96				
1413.90	91.000	95.800	556.99	1032.19	-11.69	492.36	5439789.306 N
329700.636 E		492.42	2.80				

1423.25	90.100	93.700	556.90	1032.10	-12.46	501.67	5439788.245 N
329709.924 E		501.74	7.33				
1432.60	90.200	93.400	556.88	1032.08	-13.04	511.00	5439787.378 N
329719.234 E		511.08	1.01				
1441.86	90.100	93.000	556.85	1032.05	-13.56	520.25	5439786.576 N
329728.459 E		520.33	1.34				
1451.11	89.800	92.900	556.86	1032.06	-14.04	529.49	5439785.815 N
329737.678 E		529.57	1.03				
1460.48	89.600	95.100	556.91	1032.11	-14.69	538.83	5439784.874 N
329747.000 E		538.92	7.07				
1469.75	89.500	94.800	556.98	1032.18	-15.49	548.07	5439783.789 N
329756.206 E		548.16	1.02				
1479.16	88.200	93.500	557.17	1032.37	-16.17	557.45	5439782.819 N
329765.563 E		557.55	5.86				
1488.45	87.900	92.700	557.49	1032.69	-16.67	566.72	5439782.031 N
329774.814 E		566.82	2.76				
1497.88	87.000	92.400	557.91	1033.11	-17.09	576.13	5439781.322 N
329784.208 E		576.24	3.02				
1507.11	87.100	92.600	558.38	1033.58	-17.49	585.34	5439780.636 N
329793.400 E		585.45	0.73				
1516.33	86.800	93.200	558.87	1034.07	-17.96	594.54	5439779.887 N
329802.577 E		594.64	2.18				
1525.57	87.600	92.800	559.33	1034.53	-18.44	603.75	5439779.120 N
329811.774 E		603.86	2.90				
1534.93	88.000	91.100	559.69	1034.89	-18.76	613.10	5439778.513 N
329821.107 E		613.21	5.59				
1544.14	87.800	89.900	560.02	1035.22	-18.84	622.30	5439778.149 N
329830.303 E		622.42	3.96				
1553.51	89.200	90.200	560.27	1035.47	-18.85	631.67	5439777.852 N
329839.665 E		631.78	4.58				
1562.88	89.400	90.100	560.38	1035.58	-18.87	641.04	5439777.538 N
329849.029 E		641.15	0.72				
1572.08	89.000	88.900	560.51	1035.71	-18.79	650.24	5439777.334 N
329858.226 E		650.35	4.12				
1581.37	89.800	88.700	560.61	1035.81	-18.60	659.53	5439777.242 N
329867.515 E		659.64	2.66				
1590.44	90.600	88.600	560.58	1035.78	-18.38	668.59	5439777.176 N
329876.584 E		668.70	2.67				
1599.87	90.400	88.300	560.49	1035.69	-18.13	678.02	5439777.140 N
329886.014 E		678.13	1.15				
1609.22	89.700	87.500	560.49	1035.69	-17.79	687.36	5439777.194 N
329895.364 E		687.47	3.41				
1618.59	89.700	86.900	560.54	1035.74	-17.33	696.72	5439777.363 N
329904.732 E		696.82	1.92				
1627.83	90.000	87.000	560.56	1035.76	-16.84	705.95	5439777.570 N
329913.969 E		706.05	1.03				
1637.19	91.300	87.600	560.45	1035.65	-16.40	715.30	5439777.722 N
329923.327 E		715.39	4.59				
1646.56	90.900	87.200	560.27	1035.47	-15.97	724.66	5439777.858 N
329932.695 E		724.75	1.81				
1655.70	90.800	86.900	560.14	1035.34	-15.50	733.78	5439778.046 N
329941.832 E		733.87	1.04				
1664.92	90.900	86.200	560.00	1035.20	-14.95	742.99	5439778.317 N
329951.047 E		743.07	2.30				
1674.14	90.600	85.600	559.88	1035.08	-14.29	752.18	5439778.692 N
329960.258 E		752.26	2.18				
1683.29	90.300	84.400	559.81	1035.01	-13.49	761.30	5439779.208 N
329969.393 E		761.37	4.06				
1692.70	91.400	84.400	559.67	1034.87	-12.57	770.66	5439779.836 N
329978.781 E		770.73	3.51				
1701.93	93.300	85.200	559.29	1034.49	-11.74	779.84	5439780.388 N
329987.986 E		779.90	6.70				
1711.18	93.800	85.800	558.72	1033.92	-11.01	789.05	5439780.828 N

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329997.208 E		789.10	2.53					
1720.55	93.800	87.100	558.10	1033.30	-10.43	798.38	5439781.119 N	
330006.553 E		798.43	4.15					
1729.92	93.200	88.200	557.52	1032.72	-10.05	807.72	5439781.214 N	
330015.904 E		807.77	4.01					
1739.30	92.900	88.100	557.03	1032.23	-9.75	817.08	5439781.227 N	
330025.271 E		817.13	1.01					
1748.67	91.700	88.700	556.65	1031.85	-9.49	826.44	5439781.200 N	
330034.633 E		826.49	4.29					
1757.96	91.300	88.900	556.41	1031.61	-9.29	835.73	5439781.108 N	
330043.920 E		835.77	1.44					
1767.27	91.100	89.300	556.21	1031.41	-9.14	845.04	5439780.967 N	
330053.226 E		845.08	1.44					
1776.52	91.100	89.700	556.03	1031.23	-9.06	854.28	5439780.762 N	
330062.472 E		854.32	1.30					
1785.72	89.600	90.200	555.98	1031.18	-9.06	863.48	5439780.486 N	
330071.668 E		863.52	5.16					
1794.94	89.400	90.000	556.06	1031.26	-9.07	872.70	5439780.186 N	
330080.883 E		872.74	0.92					
1804.33	89.200	89.600	556.17	1031.37	-9.04	882.09	5439779.929 N	
330090.268 E		882.13	1.43					
1813.57	89.100	89.500	556.31	1031.51	-8.97	891.33	5439779.716 N	
330099.505 E		891.37	0.46					
1822.82	89.100	89.300	556.46	1031.66	-8.87	900.58	5439779.528 N	
330108.752 E		900.62	0.65					
1832.23	89.600	90.400	556.56	1031.76	-8.85	909.99	5439779.262 N	
330118.157 E		910.03	3.85					
1841.57	88.800	90.100	556.69	1031.89	-8.89	919.33	5439778.933 N	
330127.491 E		919.37	2.74					
1850.83	88.600	90.100	556.90	1032.10	-8.90	928.58	5439778.631 N	
330136.743 E		928.62	0.65					
1860.27	88.100	88.600	557.17	1032.37	-8.80	938.02	5439778.447 N	
330146.177 E		938.06	5.02					
1869.52	88.400	90.000	557.46	1032.66	-8.68	947.26	5439778.275 N	
330155.421 E		947.30	4.64					
1878.44	89.200	90.700	557.64	1032.84	-8.74	956.18	5439777.945 N	
330164.333 E		956.22	3.57					
1887.84	90.100	91.300	557.70	1032.90	-8.90	965.58	5439777.491 N	
330173.722 E		965.62	3.45					
1897.21	90.300	92.100	557.67	1032.87	-9.18	974.95	5439776.924 N	
330183.074 E		974.99	2.64					
1906.46	89.800	92.200	557.66	1032.86	-9.53	984.19	5439776.292 N	
330192.303 E		984.23	1.65					
1915.67	89.700	91.700	557.70	1032.90	-9.84	993.39	5439775.695 N	
330201.493 E		993.44	1.66					
1924.83	89.600	91.700	557.76	1032.96	-10.11	1002.55	5439775.141 N	
330210.636 E		1002.59	0.33					
1934.33	90.600	91.200	557.74	1032.94	-10.35	1012.05	5439774.607 N	
330220.121 E		1012.09	3.53					
1943.70	91.600	91.100	557.56	1032.76	-10.54	1021.41	5439774.130 N	
330229.477 E		1021.46	3.22					
1952.95	91.400	90.700	557.32	1032.52	-10.68	1030.66	5439773.700 N	
330238.714 E		1030.71	1.45					
1962.41	91.300	90.500	557.10	1032.30	-10.78	1040.12	5439773.309 N	
330248.163 E		1040.16	0.71					
1971.61	92.000	90.700	556.83	1032.03	-10.88	1049.31	5439772.929 N	
330257.351 E		1049.36	2.37					
1981.06	92.300	90.500	556.48	1031.68	-10.98	1058.75	5439772.539 N	
330266.787 E		1058.80	1.14	Last Survey = 1981m MD				
1998.00	92.100	90.500	555.83	1031.03	-11.13	1075.68	5439771.869 N	
330283.701 E		1075.73	0.35	Ext. to TD = 1998m MD				

Pierson Hz (13C-32) 16D-32-1-29W1M Final Surveys

All data are in meters unless otherwise stated. Directions and coordinates are relative to True North.
Vertical depths are relative to Actual KB. Northings and Eastings are relative to Site.

The Dogleg Severity is in Degrees per 30 meter.
Vertical Section is from Slot and calculated along an Azimuth of 90.384° (True).

Coordinate System is North American Datum 1983 Universal Transverse Mercator, Zone 14N (102 W to 96 W).
Grid Convergence at Surface is -1.768°.

Based upon Minimum Curvature type calculations, at a Measured Depth of 1998.00m., the Bottom Hole Displacement is 1075.74m., in the Direction of 90.384° (True).

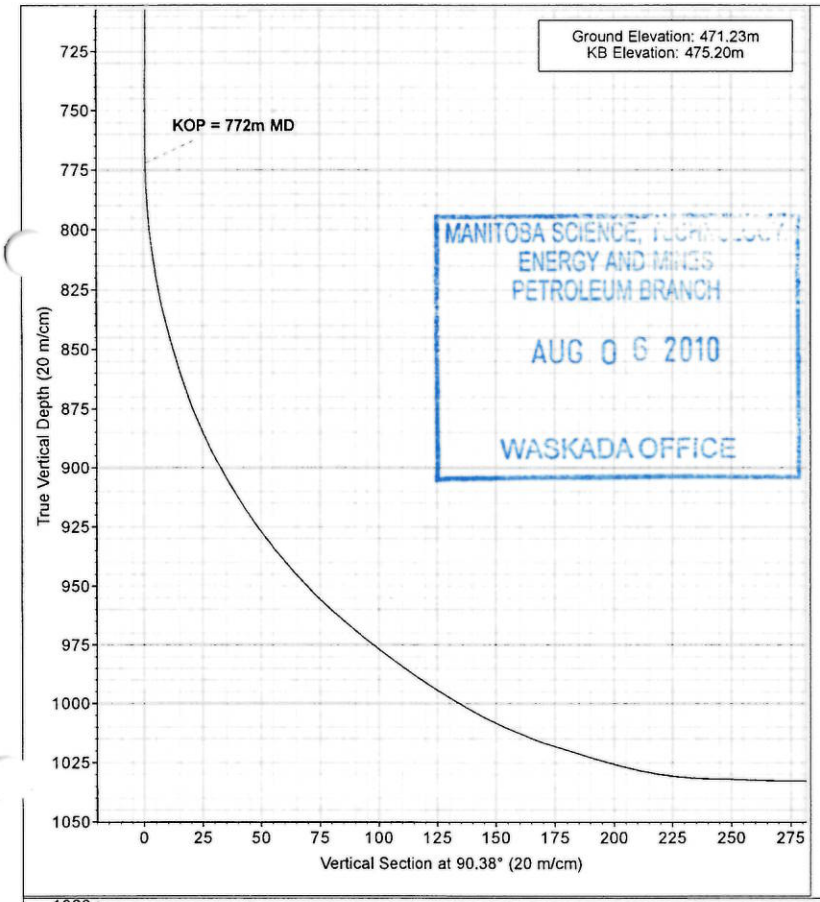
Molopo Energy Canada Ltd.

Project: Pierson
Site: (13C-32) 16D-32-1-29WPM
Well: Molopo Pierson Prov Hz
Wellbore: 16-32-001-29W1
Design: 10147566R Surveys

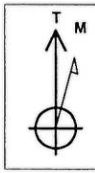
Well License #: 7447

PHOENIX TECHNOLOGY SERVICES LP

Ground Elevation: 471.23m
KB Elevation: 475.20m



Surface Co-ordinates
110.00m S of N Boundary
55.00m E of W Boundary, Sec. 32

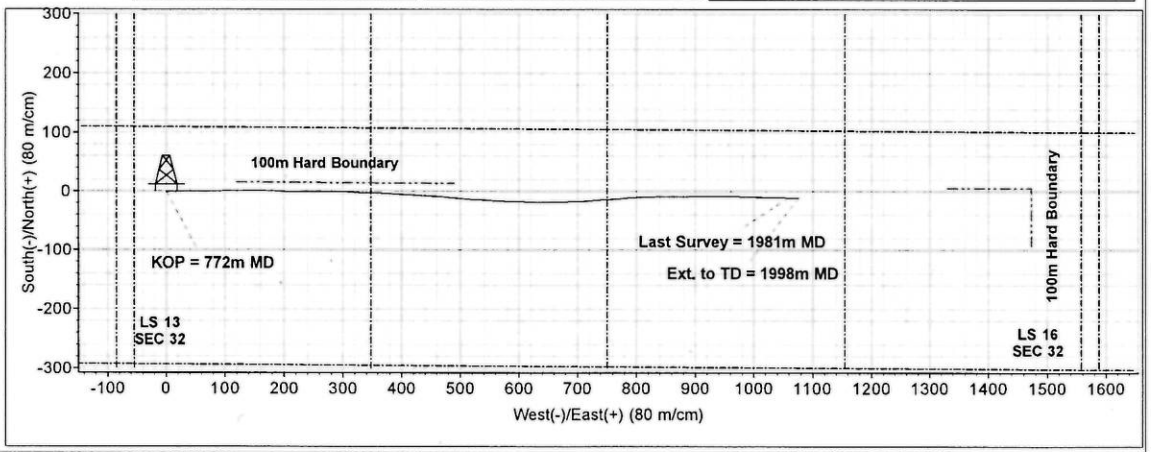


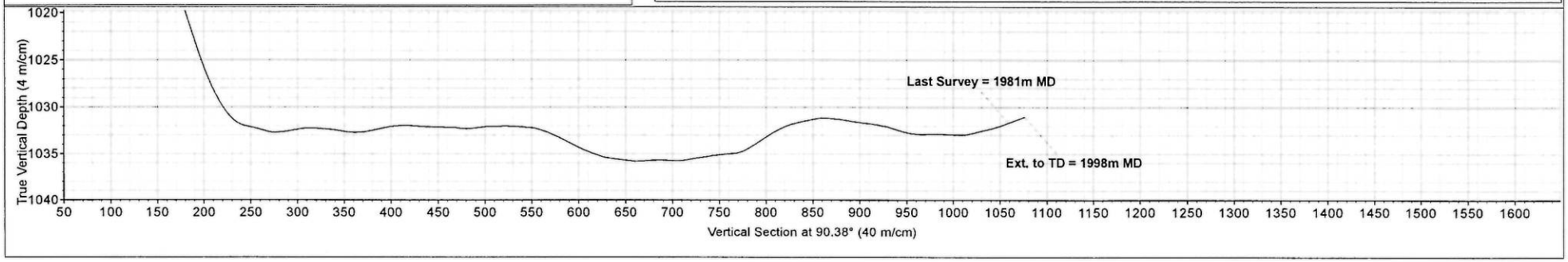
Azimuths to True North
Magnetic North: 7.26°

Magnetic Field
Strength: 57357.8snT
Dip Angle: 74.22°
Date: 28/06/2010
Model: IGRF2010_14

ANNOTATIONS

TVD	MD	Annotation
202.00	202.00	Surface Csg. = 202m MD
771.98	772.00	KOP = 772m MD
1031.68	1981.06	Last Survey = 1981m MD
1031.03	1998.00	Ext. to TD = 1998m MD





Phoenix Technology Services LP

Survey Report

Database:	PHXDB Compass	**Local Co-ordinate Reference:**	Site (13C-32) 16D-32-1-29WPM
Company:	Molopo Energy Canada Ltd.	**TVD Reference:**	Actual KB @ 475.20m
Project:	Pierson	**MD Reference:**	Actual KB @ 475.20m
Site:	(13C-32) 16D-32-1-29WPM	**North Reference:**	True
Well:	Molopo Pierson Prov Hz	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	16-32-001-29W1		
Design:	10147566R Surveys		

Project Pierson

Map System:	Universal Transverse Mercator	**System Datum:**	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	Zone 14N (102 W to 96 W)		

Site (13C-32) 16D-32-1-29WPM

Site Position:		**Northing:**	5,439,816.18 m	**Latitude:**	49.09
From:	Map	**Easting:**	329,208.87 m	**Longitude:**	-101.34
Position Uncertainty:	0.00 m	**Slot Radius:**	mm	**Grid Convergence:**	-1.77 °

Well Molopo Pierson Prov Hz

Well Position	**+N/-S**	0.00 m	**Northing:**	5,439,816.18 m	**Latitude:**	49° 5' 14.933 N
	+E/-W	0.00 m	**Easting:**	329,208.87 m	**Longitude:**	101° 20' 21.252 W
Position Uncertainty		0.00 m	**Wellhead Elevation:**	m	**Ground Level:**	471.23 m

Wellbore 16-32-001-29W1

Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010_14	28/06/2010	7.26	74.22	57,358

Design 10147566R Surveys

Audit Notes: Well License # 7447

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

Vertical Section:	Depth From (TVD) (m)	+N/-S (m)	+E/-W (m)	Direction (°)
	0.00	0.00	0.00	90.38

Survey Program **Date** 16/07/2010

From ()	To (m)	Survey (Wellbore)	Tool Name	Description
0.00	1,998.00	10147566 Surveys (16-32-001-29W1)	MWD	MWD - Standard

Survey

Measured Depth (m)	Inclination (°)	Azimuth (°)	Vertical Depth (m)	Subsea Depth (m)	+N/-S (m)	+E/-W (m)	Vertical Section (m)	Dogleg Rate (°/30m)	Build Rate (°/30m)	Turn Rate (°/30m)
0.00	0.00	0.00	0.00	475.20	0.00	0.00	0.00	0.000	0.000	0.000
Surface Csg. = 202m MD										
202.00	0.00	0.00	202.00	273.20	0.00	0.00	0.00	0.000	0.000	0.000
212.55	0.40	125.60	212.55	262.65	-0.02	0.03	0.03	1.137	1.137	0.000
268.11	0.30	177.30	268.11	207.09	-0.28	0.19	0.20	0.172	-0.054	27.916
323.57	0.50	178.90	323.57	151.63	-0.67	0.21	0.21	0.108	0.108	0.865
335.30	0.52	176.44	335.30	139.90	-0.77	0.21	0.22	0.076	0.051	-6.292
370.29	0.60	170.30	370.29	104.91	-1.11	0.25	0.26	0.086	0.069	-5.264
417.82	0.80	176.40	417.81	57.39	-1.69	0.31	0.33	0.135	0.126	3.850

Phoenix Technology Services LP

Survey Report

Database:	PHXDB Compass	**Local Co-ordinate Reference:**	Site (13C-32) 16D-32-1-29WPM
Company:	Molopo Energy Canada Ltd.	**TVD Reference:**	Actual KB @ 475.20m
Project:	Pierson	**MD Reference:**	Actual KB @ 475.20m
Site:	(13C-32) 16D-32-1-29WPM	**North Reference:**	True
Well:	Molopo Pierson Prov Hz	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	16-32-001-29W1		
Design:	10147566R Surveys		

Survey

Measured Depth (m)	Inclination (°)	Azimuth (°)	Vertical Depth (m)	Subsea Depth (m)	+N/-S (m)	+E/-W (m)	Vertical Section (m)	Dogleg Rate (°/30m)	Build Rate (°/30m)	Turn Rate (°/30m)
436.92	0.40	177.20	436.91	38.29	-1.89	0.33	0.34	0.628	-0.628	1.257
474.94	0.50	35.50	474.93	0.27	-1.88	0.43	0.44	0.671	0.079	-111.810
531.59	0.50	12.10	531.58	-56.38	-1.44	0.62	0.63	0.107	0.000	-12.392
587.76	0.50	22.70	587.75	-112.55	-0.97	0.77	0.78	0.049	0.000	5.661
634.94	0.60	349.70	634.92	-159.72	-0.54	0.80	0.81	0.208	0.064	-20.983
709.50	0.80	183.70	709.48	-234.28	-0.68	0.70	0.71	0.559	0.080	-66.792
756.29	0.30	221.50	756.27	-281.07	-1.10	0.60	0.61	0.380	-0.321	24.236
765.88	0.30	183.70	765.86	-290.66	-1.14	0.58	0.59	0.608	0.000	-118.248
KOP = 772m MD										
772.00	0.98	106.03	771.98	-296.78	-1.17	0.63	0.64	4.714	3.333	-380.735
775.40	1.50	99.80	775.38	-300.18	-1.18	0.70	0.71	4.733	4.588	-54.971
784.83	3.30	87.90	784.80	-309.60	-1.20	1.09	1.10	5.911	5.726	-37.858
794.43	4.90	83.80	794.38	-319.18	-1.14	1.78	1.79	5.080	5.000	-12.812
803.64	6.60	82.10	803.54	-328.34	-1.03	2.69	2.70	5.565	5.537	-5.537
813.28	8.50	80.00	813.09	-337.89	-0.83	3.94	3.95	5.974	5.913	-6.535
822.57	10.60	82.30	822.26	-347.06	-0.59	5.47	5.47	6.891	6.781	7.427
832.01	12.70	88.20	831.50	-356.30	-0.44	7.37	7.37	7.665	6.674	18.750
841.50	14.50	94.50	840.72	-365.52	-0.50	9.59	9.60	7.362	5.690	19.916
850.69	16.40	93.90	849.58	-374.38	-0.68	12.03	12.04	6.224	6.202	-1.959
860.14	18.10	90.20	858.61	-383.41	-0.78	14.83	14.84	6.421	5.397	-11.746
869.37	19.70	85.50	867.34	-392.14	-0.66	17.82	17.82	7.175	5.200	-15.276
878.87	22.10	84.00	876.21	-401.01	-0.35	21.19	21.19	7.764	7.579	-4.737
888.48	24.30	85.80	885.05	-409.85	-0.02	24.96	24.96	7.215	6.868	5.619
897.71	27.00	88.30	893.37	-418.17	0.19	28.95	28.95	9.453	8.776	8.126
907.18	29.60	91.00	901.70	-426.50	0.21	33.44	33.44	9.179	8.237	8.553
916.57	31.80	90.80	909.78	-434.58	0.13	38.23	38.23	7.036	7.029	-0.639
925.83	33.70	90.60	917.57	-442.37	0.07	43.24	43.24	6.165	6.156	-0.648
935.30	36.10	91.10	925.33	-450.13	-0.01	48.66	48.66	7.657	7.603	1.584
944.76	38.40	90.50	932.86	-457.66	-0.09	54.38	54.38	7.384	7.294	-1.903
954.23	40.80	89.90	940.16	-464.96	-0.11	60.42	60.42	7.699	7.603	-1.901
963.69	43.20	89.20	947.19	-471.99	-0.06	66.75	66.75	7.754	7.611	-2.220
973.14	45.50	88.30	953.94	-478.74	0.09	73.35	73.35	7.570	7.302	-2.857
982.59	47.70	88.30	960.44	-485.24	0.29	80.22	80.21	6.984	6.984	0.000
991.96	49.30	88.70	966.65	-491.45	0.48	87.23	87.23	5.212	5.123	1.281
1,001.16	51.40	88.30	972.52	-497.32	0.66	94.31	94.31	6.921	6.848	-1.304
1,010.32	52.90	88.90	978.14	-502.94	0.84	101.54	101.53	5.152	4.913	1.965
1,019.49	54.10	90.10	983.59	-508.39	0.90	108.91	108.90	5.037	3.926	3.926
1,028.68	55.80	90.10	988.87	-513.67	0.89	116.44	116.43	5.550	5.550	0.000
1,037.92	57.00	89.50	993.98	-518.78	0.92	124.13	124.12	4.220	3.896	-1.948
1,047.15	59.20	89.30	998.86	-523.66	1.00	131.97	131.96	7.172	7.151	-0.650
1,056.36	61.50	89.90	1,003.41	-528.21	1.05	139.97	139.96	7.682	7.492	1.954
1,065.82	64.20	90.30	1,007.73	-532.53	1.04	148.39	148.38	8.636	8.562	1.268
1,075.02	66.80	90.30	1,011.55	-536.35	0.99	156.76	156.75	8.478	8.478	0.000

Phoenix Technology Services LP

Survey Report

Database:	PHXDB Compass	**Local Co-ordinate Reference:**	Site (13C-32) 16D-32-1-29WPM
Company:	Molopo Energy Canada Ltd.	**TVD Reference:**	Actual KB @ 475.20m
Project:	Pierson	**MD Reference:**	Actual KB @ 475.20m
Site:	(13C-32) 16D-32-1-29WPM	**North Reference:**	True
Well:	Molopo Pierson Prov Hz	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	16-32-001-29W1		
Design:	10147566R Surveys		

Survey

Measured Depth (m)	Inclination (°)	Azimuth (°)	Vertical Depth (m)	Subsea Depth (m)	+N/-S (m)	+E/-W (m)	Vertical Section (m)	Dogleg Rate (°/30m)	Build Rate (°/30m)	Turn Rate (°/30m)
1,084.23	69.40	91.30	1,014.98	-539.78	0.87	165.30	165.29	8.992	8.469	3.257
1,093.67	72.30	92.60	1,018.08	-542.88	0.57	174.21	174.21	10.008	9.216	4.131
1,102.88	73.40	92.10	1,020.79	-545.59	0.21	183.01	183.00	3.906	3.583	-1.629
1,112.09	73.00	92.70	1,023.46	-548.26	-0.16	191.81	191.81	2.280	-1.303	1.954
1,121.65	75.60	92.80	1,026.04	-550.84	-0.60	201.01	201.01	8.165	8.159	0.314
1,131.20	78.20	91.00	1,028.21	-553.01	-0.91	210.30	210.30	9.851	8.168	-5.654
1,140.64	81.10	89.70	1,029.90	-554.70	-0.97	219.59	219.59	10.072	9.216	-4.131
1,149.88	84.10	88.80	1,031.09	-555.89	-0.85	228.75	228.75	10.162	9.740	-2.922
1,159.34	87.40	89.10	1,031.79	-556.59	-0.67	238.18	238.18	10.508	10.465	0.951
1,168.80	89.00	89.50	1,032.09	-556.89	-0.56	247.63	247.63	5.230	5.074	1.268
1,178.26	88.40	89.40	1,032.30	-557.10	-0.47	257.09	257.09	1.929	-1.903	-0.317
1,187.70	88.30	88.90	1,032.58	-557.38	-0.33	266.53	266.52	1.620	-0.318	-1.589
1,197.18	90.10	90.80	1,032.71	-557.51	-0.30	276.00	276.00	8.282	5.696	6.013
1,206.62	90.90	92.20	1,032.63	-557.43	-0.55	285.44	285.44	5.124	2.542	4.449
1,216.13	91.10	92.50	1,032.46	-557.26	-0.94	294.94	294.94	1.137	0.631	0.946
1,225.72	90.70	92.30	1,032.31	-557.11	-1.34	304.52	304.52	1.399	-1.251	-0.626
1,235.32	89.90	92.20	1,032.26	-557.06	-1.72	314.11	314.12	2.519	-2.500	-0.312
1,244.77	89.70	92.10	1,032.29	-557.09	-2.07	323.56	323.56	0.710	-0.635	-0.317
1,254.00	89.50	91.40	1,032.36	-557.16	-2.35	332.78	332.79	2.366	-0.650	-2.275
1,263.26	89.00	91.00	1,032.48	-557.28	-2.55	342.04	342.05	2.074	-1.620	-1.296
1,272.30	89.10	91.20	1,032.63	-557.43	-2.72	351.08	351.09	0.742	0.332	0.664
1,282.20	90.00	92.30	1,032.71	-557.51	-3.02	360.97	360.98	4.307	2.727	3.333
1,291.75	90.60	92.60	1,032.66	-557.46	-3.43	370.51	370.53	2.107	1.885	0.942
1,301.18	91.40	93.70	1,032.49	-557.29	-3.95	379.93	379.94	4.327	2.545	3.499
1,310.72	91.20	93.70	1,032.28	-557.08	-4.56	389.44	389.47	0.629	-0.629	0.000
1,320.34	90.90	93.40	1,032.10	-556.90	-5.16	399.04	399.07	1.323	-0.936	-0.936
1,329.58	90.60	93.70	1,031.98	-556.78	-5.73	408.27	408.29	1.377	-0.974	0.974
1,339.03	89.70	92.80	1,031.95	-556.75	-6.27	417.70	417.73	4.041	-2.857	-2.857
1,348.62	89.30	92.30	1,032.04	-556.84	-6.69	427.28	427.32	2.003	-1.251	-1.564
1,357.86	89.70	92.60	1,032.12	-556.92	-7.09	436.51	436.55	1.623	1.299	0.974
1,367.30	90.10	94.50	1,032.13	-556.93	-7.67	445.93	445.97	6.170	1.271	6.038
1,376.71	89.80	94.70	1,032.14	-556.94	-8.43	455.31	455.36	1.149	-0.956	0.638
1,386.17	89.50	94.10	1,032.20	-557.00	-9.15	464.74	464.79	2.127	-0.951	-1.903
1,395.51	89.60	94.70	1,032.27	-557.07	-9.87	474.06	474.11	1.954	0.321	1.927
1,404.73	90.20	96.10	1,032.29	-557.09	-10.74	483.24	483.30	4.956	1.952	4.555
1,413.90	91.00	95.80	1,032.19	-556.99	-11.69	492.36	492.42	2.795	2.617	-0.981
1,423.25	90.10	93.70	1,032.10	-556.90	-12.46	501.67	501.74	7.330	-2.888	-6.738
1,432.60	90.20	93.40	1,032.08	-556.88	-13.04	511.00	511.08	1.015	0.321	-0.963
1,441.86	90.10	93.00	1,032.05	-556.85	-13.56	520.25	520.33	1.336	-0.324	-1.296
1,451.11	89.80	92.90	1,032.06	-556.86	-14.04	529.49	529.57	1.026	-0.973	-0.324
1,460.48	89.60	95.10	1,032.11	-556.91	-14.69	538.83	538.92	7.073	-0.640	7.044
1,469.75	89.50	94.80	1,032.18	-556.98	-15.49	548.07	548.16	1.023	-0.324	-0.971

Phoenix Technology Services LP

Survey Report

Database:	PHXDB Compass	**Local Co-ordinate Reference:**	Site (13C-32) 16D-32-1-29WPM
Company:	Molopo Energy Canada Ltd.	**TVD Reference:**	Actual KB @ 475.20m
Project:	Pierson	**MD Reference:**	Actual KB @ 475.20m
Site:	(13C-32) 16D-32-1-29WPM	**North Reference:**	True
Well:	Molopo Pierson Prov Hz	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	16-32-001-29W1		
Design:	10147566R Surveys		

Survey

Measured Depth (m)	Inclination (°)	Azimuth (°)	Vertical Depth (m)	Subsea Depth (m)	+N/-S (m)	+E/-W (m)	Vertical Section (m)	Dogleg Rate (°/30m)	Build Rate (°/30m)	Turn Rate (°/30m)
1,479.16	88.20	93.50	1,032.37	-557.17	-16.17	557.45	557.55	5.861	-4.145	-4.145
1,488.45	87.90	92.70	1,032.69	-557.49	-16.67	566.72	566.82	2.758	-0.969	-2.583
1,497.88	87.00	92.40	1,033.11	-557.91	-17.09	576.13	576.24	3.018	-2.863	-0.954
1,507.11	87.10	92.60	1,033.58	-558.38	-17.49	585.34	585.45	0.726	0.325	0.650
1,516.33	86.80	93.20	1,034.07	-558.87	-17.96	594.54	594.64	2.180	-0.976	1.952
1,525.57	87.60	92.80	1,034.53	-559.33	-18.44	603.75	603.86	2.903	2.597	-1.299
1,534.93	88.00	91.10	1,034.89	-559.69	-18.76	613.10	613.21	5.594	1.282	-5.449
1,544.14	87.80	89.90	1,035.22	-560.02	-18.84	622.30	622.42	3.960	-0.651	-3.909
1,553.51	89.20	90.20	1,035.47	-560.27	-18.85	631.67	631.78	4.584	4.482	0.961
1,562.88	89.40	90.10	1,035.58	-560.38	-18.87	641.04	641.15	0.716	0.640	-0.320
1,572.08	89.00	88.90	1,035.71	-560.51	-18.79	650.24	650.35	4.124	-1.304	-3.913
1,581.37	89.80	88.70	1,035.81	-560.61	-18.60	659.53	659.64	2.663	2.583	-0.646
1,590.44	90.60	88.60	1,035.78	-560.58	-18.38	668.59	668.70	2.667	2.646	-0.331
1,599.87	90.40	88.30	1,035.69	-560.49	-18.13	678.02	678.13	1.147	-0.636	-0.954
1,609.22	89.70	87.50	1,035.69	-560.49	-17.79	687.36	687.47	3.411	-2.246	-2.567
1,618.59	89.70	86.90	1,035.74	-560.54	-17.33	696.72	696.82	1.921	0.000	-1.921
1,627.83	90.00	87.00	1,035.76	-560.56	-16.84	705.95	706.05	1.027	0.974	0.325
1,637.19	91.30	87.60	1,035.65	-560.45	-16.40	715.30	715.39	4.589	4.167	1.923
1,646.56	90.90	87.20	1,035.47	-560.27	-15.97	724.66	724.75	1.811	-1.281	-1.281
1,655.70	90.80	86.90	1,035.34	-560.14	-15.50	733.78	733.87	1.038	-0.328	-0.985
1,664.92	90.90	86.20	1,035.20	-560.00	-14.95	742.99	743.07	2.301	0.325	-2.278
1,674.14	90.60	85.60	1,035.08	-559.88	-14.29	752.18	752.26	2.183	-0.976	-1.952
1,683.29	90.30	84.40	1,035.01	-559.81	-13.49	761.30	761.37	4.055	-0.984	-3.934
1,692.70	91.40	84.40	1,034.87	-559.67	-12.57	770.66	770.73	3.507	3.507	0.000
1,701.93	93.30	85.20	1,034.49	-559.29	-11.74	779.84	779.90	6.700	6.176	2.600
1,711.18	93.80	85.80	1,033.92	-558.72	-11.01	789.05	789.10	2.530	1.622	1.946
1,720.55	93.80	87.10	1,033.30	-558.10	-10.43	798.38	798.43	4.153	0.000	4.162
1,729.92	93.20	88.20	1,032.72	-557.52	-10.05	807.72	807.77	4.006	-1.921	3.522
1,739.30	92.90	88.10	1,032.23	-557.03	-9.75	817.08	817.13	1.011	-0.959	-0.320
1,748.67	91.70	88.70	1,031.85	-556.65	-9.49	826.44	826.49	4.295	-3.842	1.921
1,757.96	91.30	88.90	1,031.61	-556.41	-9.29	835.73	835.77	1.444	-1.292	0.646
1,767.27	91.10	89.30	1,031.41	-556.21	-9.14	845.04	845.08	1.441	-0.644	1.289
1,776.52	91.10	89.70	1,031.23	-556.03	-9.06	854.28	854.32	1.297	0.000	1.297
1,785.72	89.60	90.20	1,031.18	-555.98	-9.06	863.48	863.52	5.156	-4.891	1.630
1,794.94	89.40	90.00	1,031.26	-556.06	-9.07	872.70	872.74	0.920	-0.651	-0.651
1,804.33	89.20	89.60	1,031.37	-556.17	-9.04	882.09	882.13	1.429	-0.639	-1.278
1,813.57	89.10	89.50	1,031.51	-556.31	-8.97	891.33	891.37	0.459	-0.325	-0.325
1,822.82	89.10	89.30	1,031.66	-556.46	-8.87	900.58	900.62	0.649	0.000	-0.649
1,832.23	89.60	90.40	1,031.76	-556.56	-8.85	909.99	910.03	3.852	1.594	3.507
1,841.57	88.80	90.10	1,031.89	-556.69	-8.89	919.33	919.37	2.744	-2.570	-0.964
1,850.83	88.60	90.10	1,032.10	-556.90	-8.90	928.58	928.62	0.648	-0.648	0.000
1,860.27	88.10	88.60	1,032.37	-557.17	-8.80	938.02	938.06	5.023	-1.589	-4.767
1,869.52	88.40	90.00	1,032.66	-557.46	-8.68	947.26	947.30	4.642	0.973	4.541

Phoenix Technology Services LP

Survey Report

Database:	PHXDB Compass	**Local Co-ordinate Reference:**	Site (13C-32) 16D-32-1-29WPM
Company:	Molopo Energy Canada Ltd.	**TVD Reference:**	Actual KB @ 475.20m
Project:	Pierson	**MD Reference:**	Actual KB @ 475.20m
Site:	(13C-32) 16D-32-1-29WPM	**North Reference:**	True
Well:	Molopo Pierson Prov Hz	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	16-32-001-29W1		
Design:	10147566R Surveys		

Survey

Measured Depth (m)	Inclination (°)	Azimuth (°)	Vertical Depth (m)	Subsea Depth (m)	+N/-S (m)	+E/-W (m)	Vertical Section (m)	Dogleg Rate (°/30m)	Build Rate (°/30m)	Turn Rate (°/30m)
1,878.44	89.20	90.70	1,032.84	-557.64	-8.74	956.18	956.22	3.575	2.691	2.354
1,887.84	90.10	91.30	1,032.90	-557.70	-8.90	965.58	965.62	3.452	2.872	1.915
1,897.21	90.30	92.10	1,032.87	-557.67	-9.18	974.95	974.99	2.640	0.640	2.561
1,906.46	89.80	92.20	1,032.86	-557.66	-9.53	984.19	984.23	1.654	-1.622	0.324
1,915.67	89.70	91.70	1,032.90	-557.70	-9.84	993.39	993.44	1.661	-0.326	-1.629
1,924.83	89.60	91.70	1,032.96	-557.76	-10.11	1,002.55	1,002.59	0.328	-0.328	0.000
1,934.33	90.60	91.20	1,032.94	-557.74	-10.35	1,012.05	1,012.09	3.531	3.158	-1.579
1,943.70	91.60	91.10	1,032.76	-557.56	-10.54	1,021.41	1,021.46	3.218	3.202	-0.320
1,952.95	91.40	90.70	1,032.52	-557.32	-10.68	1,030.66	1,030.71	1.450	-0.649	-1.297
1,962.41	91.30	90.50	1,032.30	-557.10	-10.78	1,040.12	1,040.16	0.709	-0.317	-0.634
1,971.61	92.00	90.70	1,032.03	-556.83	-10.88	1,049.31	1,049.36	2.374	2.283	0.652
Last Survey = 1981m MD										
1,981.06	92.30	90.50	1,031.68	-556.48	-10.98	1,058.75	1,058.80	1.144	0.952	-0.635
Ext. to TD = 1998m MD										
1,998.00	92.10	90.50	1,031.03	-555.83	-11.13	1,075.68	1,075.73	0.354	-0.354	0.000

Survey Annotations

Measured Depth ()	Vertical Depth ()	Local Coordinates +N/-S ()	Local Coordinates +E/-W ()	Comment
202.00	202.00	0.00	0.00	Surface Csg. = 202m MD
772.00	771.98	-1.17	0.63	KOP = 772m MD
1,981.06	1,031.68	-10.98	1,058.75	Last Survey = 1981m MD
1,998.00	1,031.03	-11.13	1,075.68	Ext. to TD = 1998m MD

Checked By: _____ Approved By: _____ Date: _____

Manitoba
Innovation, Energy and Mines

WELL CARD

Lic. No.: 7447	**Well Name & Location:** Molopo Pierson Prov HZNTL 16-32-1-29 WPM	**Surface Co-ord.:** -110.00m S; 55m E	**K.B.:** 475.2m	**Rig K.B.:** 4.2m
	Surface Location: 13C-32-1-29	**Bottom Hole Co-ord.:**	**G.E.:** 471.2m (Revised 471m)	
	Field: WASKADA	**Leg 1:** 1075.68m E; -11.13m S	**T.V.D. (1):** 1031m	**TMD (1):** 1998m
		Leg 2: ;	**T.V.D. (2):**	**TMD (2):**
Drlg. Contr.: Advance 1	**Spudded:** 2010/07/07 @11:00 hrs	**Fin. Drlg.:** 2010/07/15 @14:30 hrs	**Rig Rel.:**2010/07/16 @22:00 hrs	**P.B.T.D.:**

CORES	Date	Interval (m)	Recovery
1.			
2.			
3.			

LOGS:	Date	Run By	Description
YES	2010/07/10	Weatherford	SO-CN-LD-GR/TI
			BHCS/MINIPLOT
YES	2010/07/31	Pure Energy	RADIAL BOND-GR

D.S.T.'S	Date	Interval (m)	VO	SI	Recovery	FBHP	SIBHP	HYD. HD.
1.								
2.								
3.								

Formation	Top (m)	S.S. (m)

ABD. PLUGS	Date	Interval (m)	Cement (t)	Felt At (m)	Witnessed
1.					
2.					
3.					
4.					

CASING:	Date	No. of Joints	Size (mm)	Weight (kg/m)	Grade	Set At (m)	Cement (t) (%$CaCl_2$) (% Gel)	Plug Down	Returns	Cement Company	Status
SURFACE	2010/07/08	16	219.1	35.72	J-55	202	14t Slurry 1750	5:55	3m3	Halliburton	Standing – On Prod. –
INTERMED	2010/07/	122	139.7	23.07	J-55	1998	12t SBM Hilite 1400 Tail : 30t SBM BR II	17 :10		Halliburton	Other – Abandoned -

Synoptic

Drilling Tours

FRONT PAGE SUMMARY

Tour Sheet Serial Number	Vendor Software Version	Yes	Month	Day
	Pason	2010	07	16

Rig No	Well Name	Surface Location	Prov	Loc Type	Unique Well Id	Kelly Bushing
1	[redacted]	13-32-001-29W1	MB	DLS		4

License No	Operator	Contractor	Well Type	Re-Entry
7447	MCLOPS ENERGY CANADA LTD	ADVANCE DRILLING LTD	HORIZ	☐
	Operator's AFE	Contractor's Job No	Spud Date	Time
		19-10-394	2010.07.07	11:00
	Signature of Operator Representative	Signature of Contractor's Rig manager	Rig Release Date	Time

DAILY CHECKS

	OP	RM
1) Daily Walk Around Inspection	mech	GM
2) Derrick Inspection - Weekly (Upon Crews Last)	mech	GM
3) H2S Signs Posted if Required	mech	GM
4) Well Licence & Stack Diagram Posted	mech	GM
5) Flare Lines Spaced	mech	GM
6) BOP Drills Performed		
7) Visually Inspected BOP) - Flare Lines & Degasser Lines		GM
1) Pre Tour Health & Safety Meeting completed/attended		
2) COSHH Pre Safety Inspection Checklist completed		
3) Visual Inspection before Repairs or Lowering		GM
4) Crown Saver Checked		GM
5) Mixer Rills Checked		GM

FUEL @ 08:00 HOURS

Rig	45
Boiler	0
On Fuel	2400

WEATHER

Time	06:00
Temp	15
Current Conditions	PARTLY CLOUDY
Wind Direction	NW
Wind Strength	CALM
Road Condition	GOOD

DRILL PIPE

Category	Thread Type	Grade	OD (mm)	ID (mm)	Linear Mass (kg/m)	No. of Joints	Total Joint OD (mm)
DC	4 S XH		159	57	135.02	14	159
DP	4 FH	E	102	85	20.83	180	102
HW	4 FH		102	85	44.10	60	102

MUD PUMPS

No	Make	Stroke Length (mm)
1	EMSCO	229

GENERAL EQUIPMENT & SERVICES

Description	Hours

Pason

CASING

Category	Make	Grade	OD (mm)	ID (mm)	Linear Mass (kg/m)	No. of Joints	Total Length (m)	KB to CSG Head (m)	KB to CSG Bottom (m)
SURFACE	EVRAZ	J-55	219	208	35.72	16	202	4	202
PRODUCTION	EVRAZ	J-55	139	126	23.07	157	1999	4	1999

SHALE SHAKERS

No	Top Screen			Middle Screen			Middle Screen			Bottom Screen		
	Size	Changed	New	Size	Changed	New	Size	Changed	New	Size	Changed	New
1	210	☐	☐	210	☐	☐	210	☐	☐		☐	☐
		☐	☐		☐	☐		☐	☐		☐	☐

TOUR 1

SIGNATURE OF DRILLER: DEREK LAURENT — START TIME: 00:00 — END TIME: 08:00

DRILLING ASSEMBLY

No	Component	OD (mm)	ID (mm)	Length (m)
1	BIT	0		0.25
2	BIT SUB	0		0.88
3	X/O	0		0.55
4	[redacted]	180		1.78
5	144 DP	0		1350.84
6	60 HWDP	0		557.45
0	Drill Pipe	Stands (m)		0.00
5	Drill Pipe	Singles (m)		46.58
Weight of DC (kdaN)		Kelly Down (m)		0.00
Weight of string (kdaN)	31	Total (m)		1958.33

BITS

Bit Number	1A
Size (mm)	311
IADC Code	
Manufacturer	SECURITY
Type	GT11
Serial No	6022831
Jets (mm)	19 19
Depth Out (m)	202
Depth In (m)	0
Total Drilled (m)	202
Hrs Run Today	
Cumulative Hrs Run	5.25
Entry Date	

DULL GRADE

T		Cage (mm)	
T_x		ODC	
MDC		Reason Pulled	
LOC		Total Run (m/hr)	38.48
BRG			

MUD RECORD

Mud Type	Water ☑	Oil ☐	Other ☐	
Time				
Density (kg/m³)				
Funnel Viscosity (s/l)				
Fluid Loss (cm³)				
pH				
Location				
Depth (m)				
PVT (m³)				

MUD MATERIALS ADDED

Product	Amount	Type
WALNUT	15	SX
ENERPAC REGULAR	9	SX
MINERAL OIL	1	TOTE

METRES DRILLED

From (m)	To (m)	D-R-C	RPM	WOB (kdaN)

REDUCED PUMP SPEED

No.	Pressure (kpa)	Strokes/min	Depth (m)
	@	@	
	@	@	
	@	@	

CIRCULATION

Pump	Type	Liner Size (mm)	SPM	Pressure (kpa)	Hours Run
1		140	120	7000	8

Remarks

SOLIDS CONTROL

Equipment Name	Hours Run	Intake Density (kg/m³)	Over Flow Density (kg/m³)	Under Flow Density (kg/m³)

SAFETY

Safety Topic	MEHL (kdaN)	MACP (kpa)

HOLE CONDITION

Hole Drag Up (kdaN)	
Hole Drag Down (kdaN)	
Torque at Bottom (kNm)	
Fill on Bottom (m)	

BOILER

No.	Hours Run	pH	Stack Temp (°C)

DEVIATION SURVEYS

Time	Depth (m)	Deviation	Direction	Type

TIME LOG

From	To	Elapsed	Code	Details of Operations in Sequence & Remarks
00:00	00:15	0.25	21	SAFETY MEETING DRILLER HAND OFF
00:15	02:30	2.25	5	CONDITION MUD & CIRCULATE STRAP AND DRIFT CASING
02:30	03:00	0.50	5	PUMP PILL
03:00	03:15	0.25	7	RIG SERVICE F/T ANNULAR AND CROWN SAVER
03:15	06:30	3.25	6	LAY DOWN PIPE
06:30	06:45	0.25	21	SAFETY MEETING WITH GREAT WESTERN
06:45	08:00	1.25	12	DRIFT CASING AND RIG IN TONG HAND

Remarks

TOUR 2

SIGNATURE OF DRILLER: KELLY MILLIONS — START TIME: 08:00 — END TIME: 16:00

DRILLING ASSEMBLY

No.	Component	OD (mm)	ID (mm)	Length (m)
	Drill Pipe	Stands (m)		
	Drill Pipe	Singles (m)		
Weight of DC (kdaN)		Kelly Down (m)		
Weight of string (kdaN)		Total (m)		

BITS

Bit Number	
Size (mm)	
IADC Code	
Manufacturer	
Type	
Serial No	
Jets (mm)	
Depth Out (m)	
Depth In (m)	
Total Drilled (m)	
Hrs Run Today	
Cumulative Hrs Run	
Entry Date	

DULL GRADE

T		Cage (mm)	
T_x		ODC	
MDC		Reason Pulled	
LOC		Total Run (m/hr)	
BRG			

MUD RECORD

Mud Type	Water ☑	Oil ☐	Other ☐	
Time				
Density (kg/m³)				
Funnel Viscosity (s/l)				
Fluid Loss (cm³)				
pH				
Location				
Depth (m)				
PVT (m³)				

MUD MATERIALS ADDED

Product	Amount	Type
DESCO	4	SX

METRES DRILLED

From (m)	To (m)	D-R-C	RPM	WOB (kdaN)

REDUCED PUMP SPEED

No.	Pressure (kpa)	Strokes/min	Depth (m)
	@	@	
	@	@	
	@	@	

CIRCULATION

Pump	Type	Liner Size (mm)	SPM	Pressure (kpa)	Hours Run
1		140	70	2000	0

Remarks

SOLIDS CONTROL

Equipment Name	Hours Run	Intake Density (kg/m³)	Over Flow Density (kg/m³)	Under Flow Density (kg/m³)

SAFETY

Safety Topic	MEHL (kdaN)	MACP (kpa)
RUN CASING		

HOLE CONDITION

Hole Drag Up (kdaN)	
Hole Drag Down (kdaN)	
Torque at Bottom (kNm)	
Fill on Bottom (m)	

BOILER

No.	Hours Run	pH	Stack Temp (°C)

DEVIATION SURVEYS

Time	Depth (m)	Deviation	Direction	Type

TIME LOG

From	To	Elapsed	Code	Details of Operations in Sequence & Remarks
08:00	08:15	0.25	7	RIG SERVICE
08:15	12:15	4.00	12	RUN CASING
12:15	14:30	2.25	5	CONDITION MUD & CIRCULATE
14:30	14:45	0.25	21	SAFETY MEETING WITH HALIBURTON
14:45	16:00	1.25	12C	CEMENT AND DISPLACE

Remarks

TOUR 3

SIGNATURE OF DRILLER: JARET LAURENT — START TIME: 16:00 — END TIME: 24:00

DRILLING ASSEMBLY

No	Component	OD (mm)	ID (mm)	Length (m)
	Drill Pipe	Stands (m)		
	Drill Pipe	Singles (m)		
Weight of DC (kdaN)		Kelly Down (m)		
Weight of string (kdaN)		Total (m)		

BITS

Bit Number	
Size (mm)	
IADC Code	
Manufacturer	
Type	
Serial No	
Jets (mm)	
Depth Out (m)	
Depth In (m)	
Total Drilled (m)	
Hrs Run Today	
Cumulative Hrs Run	
Entry Date	

DULL GRADE

T		Cage (mm)	
T_x		ODC	
MDC		Reason Pulled	
LOC		Total Run (m/hr)	
BRG			

MUD RECORD

Mud Type	Water ☐	Oil ☐	Other ☐	
Time				
Density (kg/m³)				
Funnel Viscosity (s/l)				
Fluid Loss (cm³)				
pH				
Location				
Depth (m)				
PVT (m³)				

MUD MATERIALS ADDED

Product	Amount	Type

METRES DRILLED

From (m)	To (m)	D-R-C	RPM	WOB (kdaN)

REDUCED PUMP SPEED

No.	Pressure (kpa)	Strokes/min	Depth (m)
	@	@	
	@	@	
	@	@	

CIRCULATION

Pump	Type	Liner Size (mm)	SPM	Pressure (kpa)	Hours Run
1		140	0	0	0

Remarks

SOLIDS CONTROL

Equipment Name	Hours Run	Intake Density (kg/m³)	Over Flow Density (kg/m³)	Under Flow Density (kg/m³)

SAFETY

Safety Topic	MEHL (kdaN)	MACP (kpa)

HOLE CONDITION

Hole Drag Up (kdaN)	
Hole Drag Down (kdaN)	
Torque at Bottom (kNm)	
Fill on Bottom (m)	

BOILER

No	Hours Run	pH	Stack Temp (°C)

DEVIATION SURVEYS

Time	Depth (m)	Deviation	Direction	Type

TIME LOG

From	To	Elapsed	Code	Details of Operations in Sequence & Remarks
16:00	16:15	0.25	21	SAFETY MEETING AND DRILLER HANDOFF
16:15	17:00	0.75	12C	CEMENT CASING W/12 T SBM HILITE LEAD, AND 30 T SBM BR II TAIL, DISPLACE W/25M3 FRESH WATER, BUMP PLUG @17:10HRS, FLOAT HELD OK LANDED @1998M, W 2M3 CEMENT RETURNS
17:00	21:00	4.00	14B	NIPPLE DOWN BOPS AND INSTALL WELLHEAD
21:00	24:00	3.00	22	TEAR OUT RIG,CLEAN TANKS,SLIP AND CUT

Remarks: CARTAGE - 16 HRS @ $115 HR = $1840
FUEL - 1976 LTRES
RIG RELEASE 2200 HRS - JULY 16, '10

FRONT PAGE SUMMARY

Tour Sheet Serial Number	Vendor Software Version	Year	Month	Day
0XG31_20100715_1A	Pason	2010	07	15

Rig No	Well Name	Surface Location	Prov	Loc Type	Unique Well id	Kelly Bushing
1	MOLOPO PIERSON PROV 13-32-1-29W1	13-32-001-29W1	MB	DLS		4

License No	Operator	Contractor	Well Type	Re-Entry
7447	MOLOPO ENERGY CANADA LTD	ADVANCE DRILLING LTD	HORIZ	
	Operator's AFE	Contractor's Job No	Spud Date	Time
		19-10-394	2010/07/07	11:00
	Signature of Operator Representative	Signature of Contractor's Rig manager	Rig Release Date	Time
	Mark Mazurat	GARY MILLIONS		

DAILY CHECKS

	OP	RM
1) Daily Walk Around Inspection	msm	GM
2) Detailed Inspection - Weekly (Using Check List)		
3) H2S Signs Posted if Required	msm	GM
4) Well Licence & Stick Diagram Posted	msm	GM
5) Flare Lines Staked	msm	GM
6) BOP Drills Performed		
7) Visually Inspected BOPs - Flare Lines & Degasser Lines		GM
1) Rig Site Health & Safety Meeting (one/crew/month)		
2) CAODC Rig Safety Inspection Checklist (one/rig/month)		
3) Mast Inspection before Raising or Lowering		
4) Crown Saver Checked		GM
5) Motor Kills Checked		GM

FUEL @ 08:00 HOURS

Rig	75
Boiler	0
On Fuel	2480

WEATHER

Time	06:00
Temp	17
Current Conditions	PARTLY CLOUDY
Wind Direction	NW
Wind Strength	CALM
Road Condition	GOOD

DRILL PIPE

Category	Thread Type	Grade	OD (mm)	ID (mm)	Linear Mass (kg/m)	No. of Joints	Tool Joint OD (mm)
DC	4.5 XH		159	57	135.02	14	159
DP	4 FH	E	102	85	20.83	180	102
HW	4 FH		102	85	44.10	60	102

MUD PUMPS

No.	Make	Stroke Length (mm)
1	EMSCO	229

GENERAL EQUIPMENT & SERVICES

Description	Hours

CAODC Pason

CASING

Category	Make	Grade	OD (mm)	ID (mm)	Linear Mass (kg/m)	No. of Joints	Total Length (m)	KB to CSG Head (m)	KB to CSG Bottom (m)
SURFACE	EVRAZ	J-55	219	206	35.72	16	202	4	202

SHALE SHAKERS

No	Top Screen Size	Changed	New	Middle Screen Size	Changed	New	Middle Screen Size	Changed	New	Bottom Screen Size	Changed	New
1	210	☒	☒	210	☒	☒	210	☒	☒		☐	☐

TOUR 1

SIGNATURE OF DRILLER: DEREK LAURENT — START TIME 00:00 — END TIME 08:00

DRILLING ASSEMBLY

No.	Component	OD (mm)	ID (mm)	Length (m)
1	BIT & TOOLS	0		39.13
2	144 DP	0		1350.84
0	Drill Pipe	Stands (m)		0.00
55	Drill Pipe	Singles (m)		511.04
Weight of DC (kdaN)		Kelly Down (m)		11.99
Weight of string (kdaN)	31	Total (m)		1913.00

BITS

Bit Number	1A
Size (mm)	311
IADC Code	
Manufacturer	SECURITY
Type	GT11
Serial No	8022801
Jets (mm)	19.1 19.1
Depth Out (m)	202
Depth In (m)	0
Total Drilled (m)	202
Hrs Run Today	
Cumulative Hrs Run	5.25
Entry Date	

DULL GRADE

T_i		Gage (mm)	
T_o		ODC	
MDC		Reason Pulled	
LOC		Total Run (m/hr)	38.48
BRG			

MUD RECORD

Mud Type: Water ☒ Oil ☐ Other

Time	00:00	03:00
Density (kg/m³)	1110	1100
Funnel Viscosity (s/l)	53	50
Fluid Loss (cm³)	8.0	8.0
pH	10	10
Location		
Depth (m)		
PVT (m³)		

MUD MATERIALS ADDED

Product	Amount	Type
WALNUT	5	SX
ENERPAC REGULAR	1	SX

SOLIDS CONTROL

Equipment Name	Hours Run	Intake Density (kg/m³)	Over Flow Density (kg/m³)	Under Flow Density (kg/m³)

SAFETY

Safety Topic	MEHL (kdaN)	MACP (kpa)

METRES DRILLED

From (m)	To (m)	D-R-C	RPM	WOB (kdaN)
1866	1913	DRILL	45	18

REDUCED PUMP SPEED

No.	Pressure (kpa)	Strokes/min	Depth (m)

CIRCULATION

Pump	Type	Liner Size (mm)	SPM	Pressure (kpa)	Hours Run
1	SINGLE	140	125	9900	8

Remarks

HOLE CONDITION

Hole Drag Up (kdaN)	
Hole Drag Down (kdaN)	
Torque at Bottom (Nm)	
Fill on Bottom (m)	

BOILER

No.	Hours Run	pH	Stack Temp (°C)

DEVIATION SURVEYS

Time	Depth (m)	Deviation	Direction	Type

TIME LOG

From	To	Elapsed	Code	Details of Operations in Sequence & Remarks
00:00	00:15	0.25	21	SAFETY MEETING DRILLER HAND OFF
00:15	00:30	0.25	7	RIG SERVICE F/T MOTOR KILL AND CROWN SAVER
00:30	04:00	3.50	2	ACCUM DRILL
04:00	05:45	1.75	8	RIG REPAIR WELD STANDPIPE
05:45	06:00	0.25	7	RIG SERVICE
06:00	07:00	1.00	2	ACCUM DRILL
07:00	08:00	1.00	10	ACCUM MWD SURVEYS AND CONNECTIONS

Remarks

TOUR 2

SIGNATURE OF DRILLER: KELLY MILLIONS — START TIME 08:00 — END TIME 16:00

DRILLING ASSEMBLY

No	Component	OD (mm)	ID (mm)	Length (m)
1	BIT & TOOLS	0		39.13
2	144 DP	0		1350.84
3	60 HWDP	0		557.45
0	Drill Pipe	Stands (m)		0.00
5	Drill Pipe	Singles (m)		46.58
Weight of DC (kdaN)		Kelly Down (m)		4.00
Weight of string (kdaN)	31	Total (m)		1998.00

BITS

Bit Number	1A
Size (mm)	311
IADC Code	
Manufacturer	SECURITY
Type	GT11
Serial No	8022801
Jets (mm)	19.1 19.1
Depth Out (m)	202
Depth In (m)	202
Total Drilled (m)	0
Hrs Run Today	
Cumulative Hrs Run	5.25
Entry Date	

DULL GRADE

T_i		Gage (mm)	
T_o		ODC	
MDC		Reason Pulled	
LOC		Total Run (m/hr)	0.00
BRG			

MUD RECORD

Mud Type: Water ☒ Oil ☐ Other

Time	08:00	11:00	14:00
Density (kg/m³)	1090	1110	1100
Funnel Viscosity (s/l)	53	45	53
Fluid Loss (cm³)	8.0	8.0	8.0
pH	9	10	10
Location			
Depth (m)			
PVT (m³)			

MUD MATERIALS ADDED

Product	Amount	Type
WALNUT	13	SX

SOLIDS CONTROL

Equipment Name	Hours Run	Intake Density (kg/m³)	Over Flow Density (kg/m³)	Under Flow Density (kg/m³)

SAFETY

Safety Topic	MEHL (kdaN)	MACP (kpa)
TUGGER	62	1497

METRES DRILLED

From (m)	To (m)	D-R-C	RPM	WOB (kdaN)
1913	1998	DRILL	45	15

REDUCED PUMP SPEED

No.	Pressure (kpa)	Strokes/min	Depth (m)

CIRCULATION

Pump	Type	Liner Size (mm)	SPM	Pressure (kpa)	Hours Run
1		140	125	10400	8

Remarks

HOLE CONDITION

Hole Drag Up (kdaN)	
Hole Drag Down (kdaN)	
Torque at Bottom (Nm)	
Fill on Bottom (m)	

BOILER

No.	Hours Run	pH	Stack Temp (°C)

DEVIATION SURVEYS

Time	Depth (m)	Deviation	Direction	Type

TIME LOG

From	To	Elapsed	Code	Details of Operations in Sequence & Remarks
08:00	08:15	0.25	21	SAFETY MEETING AND DRILLER HANDOFF
08:15	08:30	0.25	7	RIG SERVICE F/T CROWN SAVER - MOTOR KILLS - ANNULAR
08:30	13:45	5.25	2	DRILL
13:45	14:30	0.75	10	ACCUM SURVEYS AND CONN TIME
14:30	15:15	0.75	5	CONDITION MUD & CIRCULATE
15:15	16:00	0.75	6B	TRIP OUT OF HOLE

Remarks

TOUR 3

SIGNATURE OF DRILLER: JARET LAURENT — START TIME 16:00 — END TIME 24:00

DRILLING ASSEMBLY

No.	Component	OD (mm)	ID (mm)	Length (m)
1	BIT	0		0.25
2	BIT SUB	0		0.88
3	X-O	0		0.55
4	REAMER 3 PT ROLLER	180		1.78
5	144 DP	0		1350.84
6	60 HWDP	0		557.45
0	Drill Pipe	Stands (m)		0.00
5	Drill Pipe	Singles (m)		46.58
Weight of DC (kdaN)		Kelly Down (m)		0.00
Weight of string (kdaN)	31	Total (m)		1958.33

BITS

Bit Number	1A
Size (mm)	311
IADC Code	
Manufacturer	SECURITY
Type	GT11
Serial No	8022801
Jets (mm)	19.1 19.1
Depth Out (m)	202
Depth In (m)	202
Total Drilled (m)	0
Hrs Run Today	
Cumulative Hrs Run	5.25
Entry Date	

DULL GRADE

T_i		Gage (mm)	
T_o		ODC	
MDC		Reason Pulled	
LOC		Total Run (m/hr)	0.00
BRG			

MUD RECORD

Mud Type: Water ☐ Oil ☐ Other

Time	
Density (kg/m³)	
Funnel Viscosity (s/l)	
Fluid Loss (cm³)	
pH	
Location	
Depth (m)	
PVT (m³)	

MUD MATERIALS ADDED

Product	Amount	Type

SOLIDS CONTROL

Equipment Name	Hours Run	Intake Density (kg/m³)	Over Flow Density (kg/m³)	Under Flow Density (kg/m³)

SAFETY

Safety Topic	MEHL (kdaN)	MACP (kpa)

METRES DRILLED

From (m)	To (m)	D-R-C	RPM	WOB (kdaN)

REDUCED PUMP SPEED

No.	Pressure (kpa)	Strokes/min	Depth (m)

CIRCULATION

Pump	Type	Liner Size (mm)	SPM	Pressure (kpa)	Hours Run
1	SINGLE	140	120	6900	8

Remarks

HOLE CONDITION

Hole Drag Up (kdaN)	
Hole Drag Down (kdaN)	
Torque at Bottom (Nm)	
Fill on Bottom (m)	

BOILER

No.	Hours Run	pH	Stack Temp (°C)

DEVIATION SURVEYS

Time	Depth (m)	Deviation	Direction	Type

TIME LOG

From	To	Elapsed	Code	Details of Operations in Sequence & Remarks
16:00	16:15	0.25	21	SAFETY MEETING AND DRILLER HANDOFF
16:15	18:00	1.75	6	P.O.O.H FOR REAMER
18:00	18:15	0.25	21	SAFETY MEETING WITH PHOENIX
18:15	19:15	1.00	20D	LAY DOWN DIR. TOOLS
19:15	19:30	0.25	7	RIG SERVICE-F/T BLIND RAMS AND CROWN SAVER
19:30	22:00	2.50	6	MAKE UP BIT AND REAMER-RIH/ PICK UP 4 SIGLES
22:00	24:00	2.00	5	CONDITION MUD & CIRCULATE - STRAP , DRIFT, DRESS CASING

Remarks

FRONT PAGE SUMMARY

Tour Sheet Serial Number	Vendor Software Version	Year	Month	Day
DXG31_20100714_1A	Pason	2010	07	14

Rig No	Well Name	Surface Location	Prov	Loc Type	Unique Well Id	Kelly Bushing
1	MOLOPO PEIGEN 2HZ-[illegible]	13-32-001-29W1	MB	DLS		4

License No	Operator	Contractor	Well Type	Re-Entry
7447	MOLOPO ENERGY CANADA LTD	ADVANCE DRILLING LTD	HORIZ	☐
	Operator's AFE	Contractor's Job No	Spud Date	Time
		19-10-394	2010/07/07	11:00
	Signature of Operator Representative	Signature of Contractor's Rig manager	Rig Release Date	Time
	Mark Mazurat	GARY MILLIONS		

DAILY CHECKS

	OP	RM
1) Daily Walk Around Inspection	man	GM
2) Derailed Inspection - Weekly (Using Check List)	man	GM
3) H2S Show Present / Anticipated	man	GM
4) Well Licences & Rig Diagram Posted	man	GM
5) Flare Lines Staked	man	GM
6) BOP Drills Performed	man	GM
7) Visually Inspected BOPs - Flare Lines & Diverter Lines	man	GM
1) Pre Tour Health & Safety Meeting (crew/contractor)		
2) CAODC Pre Safety Inspection Checklist (crew/contractor)		
3) Meet inspection before Rigging or Unrigging		
4) Crown Saver Checked		GM
5) Mouse Hole Checked		GM

FUEL @ 08:00 HOURS

Rig	31
Boiler	0
On Fuel	2800

WEATHER

Time	06:00
Temp	17
Current Conditions	PARTLY CLOUDY
Wind Direction	NW
Wind Strength	CALM
Road Condition	GOOD

DRILL PIPE

Category	Thread Type	Grade	OD (mm)	ID (mm)	Linear Mass (kg/m)	No. of Joints	Tool Joint OD (mm)
DC	4.5 XH		159	57	135.02	14	159
DP	4 FH	E	102	85	20.83	180	102
HW	4 FH		102	85	44.10	60	102

CASING

Category	Make	Grade	OD (mm)	ID (mm)	Linear Mass (kg/m)	No. of Joints	Total Length (m)	KB to CSG Head (m)	KB to CSG Bottom (m)
SURFACE	EVRAZ	J-55	219	206	35.72	16	202	4	202

MUD PUMPS

No.	Make	Stroke Length (mm)
1	EMSCO	229

GENERAL EQUIPMENT & SERVICES

Description	Hours

SHALE SHAKERS

No	Top Screen			Middle Screen			Middle Screen			Bottom Screen		
	Size	Changed	Mesh	Size	Changed	Mesh	Size	Changed	Mesh	Size	Changed	Mesh
1	210	☐	80	210	☐	80	210	☐	80		☐	
		☐			☐			☐			☐	

Pason

TOUR 1

SIGNATURE OF DRILLER: KELLY MILLIONS — START TIME: 00:00 — END TIME: 08:00

DRILLING ASSEMBLY

No	Component	OD (mm)	ID (mm)	Length (m)
1	BIT & TOOLS	0		39.13
2	144 DP	0		1350.84

0	Drill Pipe	Stands (m)	0.00
28	Drill Pipe	Singles (m)	260.39
Weight of DC (kdaN)		Kelly Down (m)	11.84
Weight of string (kdaN)	31	Total (m)	1662.00

BITS

Bit Number	1A
Size (mm)	311
IADC Code	
Manufacturer	SECURITY
Type	GT11
Serial No	8022801
Jets (mm)	19.1 19.1
Depth Out (m)	202
Depth In (m)	0
Total Drilled (m)	202
Hrs Run Today	
Cumulative Hrs Run	5.25
Entry Date	

DULL GRADE

T_1		Gage (mm)	
T_2		ODC	
MDC		Reason Pulled	
LOC		Total Run (m/hr)	38.48
BRG			

MUD RECORD

Mud Type	Water ☑	Oil ☐	Other ☐
Time	00:00	03:00	06:00
Density (kg/m³)	1100	1110	1100
Funnel Viscosity (s/l)	48	48	48
Fluid Loss (cm³)	10.0	10.0	10.0
pH	10	9	10
Location			
Depth (m)			
PVT (m³)			

MUD MATERIALS ADDED

Product	Amount	Type
ENERPAC LO VIS	1	SX
WALNUT	18	SX
CAUSTIC	2	SX

SOLIDS CONTROL

Equipment Name	Hours Run	Intake Density (kg/m³)	Over Flow Density (kg/m³)	Under Flow Density (kg/m³)

SAFETY

Safety Topic	MEHL (kdaN)	MACP (kpa)
ROTARY	42	1500

METRES DRILLED

From (m)	To (m)	D-R-C	RPM	WOB (kdaN)
1550	1662	DRILL	45	16

REDUCED PUMP SPEED

No.	Pressure (kpa)	Strokes/min	Depth (m)

CIRCULATION

Pump	Type	Liner Size (mm)	SPM	Pressure (kpa)	Hours Run
1		140	125	8500	8

Remarks

HOLE CONDITION

Hole Drag Up (kdaN)	
Hole Drag Down (kdaN)	
Torque at Bottom (kNm)	
Fill on Bottom (m)	

BOILER

No.	Hours Run	pH	Stack Temp (°C)

DEVIATION SURVEYS

Time	Depth (m)	Deviation	Direction	Type

TIME LOG

From	To	Elapsed	Code	Details of Operations in Sequence & Remarks
00:00	00:15	0.25	21	SAFETY MEETING AND DRILLER HANDOFF
00:15	00:30	0.25	7	RIG SERVICE F/T CROWN SAVER - F/T PIPE RAMS
00:30	07:00	6.50	2	DRILL
07:00	08:00	1.00	10	ACCUM SURVEYS AND CONN TIME

Remarks

TOUR 2

SIGNATURE OF DRILLER: JASON HAINES — START TIME: 08:00 — END TIME: 16:00

DRILLING ASSEMBLY

No.	Component	OD (mm)	ID (mm)	Length (m)
1	BIT & TOOLS	0		39.13
2	144 DP	0		1350.84

0	Drill Pipe	Stands (m)	0.00
36	Drill Pipe	Singles (m)	334.38
Weight of DC (kdaN)		Kelly Down (m)	11.84
Weight of string (kdaN)	31	Total (m)	1738.00

BITS

Bit Number	1A
Size (mm)	311
IADC Code	
Manufacturer	SECURITY
Type	GT11
Serial No	8022801
Jets (mm)	19.1 19.1
Depth Out (m)	202
Depth In (m)	0
Total Drilled (m)	202
Hrs Run Today	
Cumulative Hrs Run	5.25
Entry Date	

DULL GRADE

T_1		Gage (mm)	
T_2		ODC	
MDC		Reason Pulled	
LOC		Total Run (m/hr)	38.48
BRG			

MUD RECORD

Mud Type	Water ☑	Oil ☐	Other ☐
Time	08:00	11:00	13:30
Density (kg/m³)	1100	1100	1100
Funnel Viscosity (s/l)	48	46	48
Fluid Loss (cm³)	10.0	10.0	10.0
pH	10	9	10
Location			
Depth (m)			
PVT (m³)			

MUD MATERIALS ADDED

Product	Amount	Type
WALNUT	18	SX
ENERPAC REGULAR	3	SX
CAUSTIC	1	SX

SOLIDS CONTROL

Equipment Name	Hours Run	Intake Density (kg/m³)	Over Flow Density (kg/m³)	Under Flow Density (kg/m³)

SAFETY

Safety Topic	MEHL (kdaN)	MACP (kpa)

METRES DRILLED

From (m)	To (m)	D-R-C	RPM	WOB (kdaN)
1662	1736	DRILL	40	14

REDUCED PUMP SPEED

No.	Pressure (kpa)	Strokes/min	Depth (m)

CIRCULATION

Pump	Type	Liner Size (mm)	SPM	Pressure (kpa)	Hours Run
1		140	125	8700	8

Remarks

HOLE CONDITION

Hole Drag Up (kdaN)	
Hole Drag Down (kdaN)	
Torque at Bottom (kNm)	
Fill on Bottom (m)	

BOILER

No.	Hours Run	pH	Stack Temp (°C)

DEVIATION SURVEYS

Time	Depth (m)	Deviation	Direction	Type

TIME LOG

From	To	Elapsed	Code	Details of Operations in Sequence & Remarks
08:00	08:15	0.25	21	SAFETY MEETING DRILLER HAND OFF
08:15	08:30	0.25	7	RIG SERVICE
08:30	11:30	3.00	2	DRILL
11:30	12:00	0.50	8C	DOWNTIME - MUD PUMP CHANGE HEAD & LINE SUMP SIDE
12:00	15:00	3.00	2	DRILL
15:00	16:00	1.00	10	ACCUM SURVEYS & CONNECTION TIME

Remarks

TOUR 3

SIGNATURE OF DRILLER: JARET LAURENT — START TIME: 16:00 — END TIME: 24:00

DRILLING ASSEMBLY

No.	Component	OD (mm)	ID (mm)	Length (m)
1	BIT & TOOLS	0		39.13
2	144 DP	0		1350.84

0	Drill Pipe	Stands (m)	0.00
51	Drill Pipe	Singles (m)	464.66
Weight of DC (kdaN)		Kelly Down (m)	11.37
Weight of string (kdaN)	31	Total (m)	1666.00

BITS

Bit Number	1A
Size (mm)	311
IADC Code	
Manufacturer	SECURITY
Type	GT11
Serial No	8022801
Jets (mm)	19.1 19.1
Depth Out (m)	202
Depth In (m)	0
Total Drilled (m)	202
Hrs Run Today	
Cumulative Hrs Run	5.25
Entry Date	

DULL GRADE

T_1		Gage (mm)	
T_2		ODC	
MDC		Reason Pulled	
LOC		Total Run (m/hr)	38.48
BRG			

MUD RECORD

Mud Type	Water ☑	Oil ☐	Other ☐
Time	16:00	20:00	23:00
Density (kg/m³)	1110	1110	1110
Funnel Viscosity (s/l)	45	55	50
Fluid Loss (cm³)	9.0	8.0	8.0
pH	10	10	9
Location			
Depth (m)			
PVT (m³)			

MUD MATERIALS ADDED

Product	Amount	Type
ENERPAC REGULAR	4	SX
WALNUT	16	SX
CAUSTIC	1	SX

SOLIDS CONTROL

Equipment Name	Hours Run	Intake Density (kg/m³)	Over Flow Density (kg/m³)	Under Flow Density (kg/m³)

SAFETY

Safety Topic	MEHL (kdaN)	MACP (kpa)
BOPS	42	1500

METRES DRILLED

From (m)	To (m)	D-R-C	RPM	WOB (kdaN)
1736	1866	DRILL	45	18

REDUCED PUMP SPEED

No.	Pressure (kpa)	Strokes/min	Depth (m)

CIRCULATION

Pump	Type	Liner Size (mm)	SPM	Pressure (kpa)	Hours Run
1		140	125	9200	8

Remarks

HOLE CONDITION

Hole Drag Up (kdaN)	
Hole Drag Down (kdaN)	
Torque at Bottom (kNm)	
Fill on Bottom (m)	

BOILER

No.	Hours Run	pH	Stack Temp (°C)

DEVIATION SURVEYS

Time	Depth (m)	Deviation	Direction	Type

TIME LOG

From	To	Elapsed	Code	Details of Operations in Sequence & Remarks
16:00	16:15	0.25	21	SAFETY MEETING AND DRILLER HANDOFF
16:15	16:30	0.25	7	RIG SERVICE- F/T ANNULAR AND CROWN SAVER
16:30	23:00	6.50	2	ACCUM DRILL
23:00	24:00	1.00	10	ACCUM MWD SURVEYS AND CONNECTIONS

Remarks

FRONT PAGE SUMMARY

Tour Sheet Serial Number	Vendor Software Version	Year	Month	Day
DXG31_20100713_*A	Pason	2010	07	13

Rig No	Well Name	Surface Location	Prov	Loc Type	Unique Well Id	Kelly Bushing
1	MOLOPO PRESQ PARC HZ 13-32-001-29W1	13-32-001-29W1	MB	DLS		4

License No	Operator	Contractor	Well Type	Re-Entry
7447	MOLOPO ENERGY CANADA LTD	ADVANCE DRILLING LTD	HORIZ	☐
	Operator's AFE	Contractor's Job No	Spud Date	Time
		19-13-394	2010/07/07	11:00
	Signature of Operator Representative	Signature of Contractor's Rig manager	Rig Release Date	Time
	Mark Mazurak	GARY MILLIONS		

DAILY CHECKS

	OP	RM
1) Daily Walk Around Inspection	mark	GM
2) Detailed Inspection - Weekly (Using Check List)	mark	GM
3) H2S Safety Posted if Required	mark	GM
4) Well Licence & Block Diagram Posted	mark	GM
5) Flare Lines Spaced	mark	GM
6) BOP Drills Performed		
7) Visually Inspected BOPs - Flare Lines & Diameter Lines	mark	GM
1) Rig Site Health & Safety Meeting completed/attended		
2) COOC Rig Safety Inspection Checklist (every 14 days)		
3) Blind Inspection before Reeling or Lowering		
4) Crown Saver Checked		GM
5) Master Kills Checked		GM

FUEL @ 08:00 HOURS

Rig	69
Boiler	0
On Fuel	2320

WEATHER

Time	06:00
Temp	17
Current Conditions	PARTLY CLOUDY
Wind Direction	NW
Wind Strength	CALM
Road Condition	GOOD

DRILL PIPE

Category	Thread Type	Grade	OD (mm)	ID (mm)	Linear Mass (kg/m)	No. of Joints	Total Joint OD (mm)
DC	4 5 XH		159	57	135.02	14	159
DP	4 FH	E	102	85	20.83	180	102
HW	4 FH		102	65	44.10	60	102

MUD PUMPS

No.	Make	Stroke Length (mm)
1	EMSCO	229

GENERAL EQUIPMENT & SERVICES

Description	Hours

Pason

CASING

Category	Make	Grade	OD (mm)	ID (mm)	Linear Mass (kg/m)	No. of Joints	Total Length (m)	KB to CSG Head (m)	KB to CSG Bottom (m)
SURFACE	EVRAZ	J-55	219	206	35.72	16	202	4	202

SHALE SHAKERS

No	Top Screen Size	Top Screen Changed	Top Screen New	Middle Screen Size	Middle Screen Changed	Middle Screen New	Middle Screen Size	Middle Screen Changed	Middle Screen New	Bottom Screen Size	Bottom Screen Changed	Bottom Screen New
1	210	☐	☑	210	☐	☑	210	☐	☑		☐	☐

TOUR 1

SIGNATURE OF DRILLER: KELLY MILLIONS — START TIME: 00:00 — END TIME: 08:00

DRILLING ASSEMBLY

No	Component	OD (mm)	ID (mm)	Length (m)
1	BIT & TOOLS	0		39.13

0	Drill Pipe	Stands (m)	0.00
142	Drill Pipe	Singles (m)	1331.97
Weight of DC (kdaN)		Kelly Down (m)	11.90
Weight of string (kdaN)	24	Total (m)	1383.00

BITS

Bit Number	1A
Size (mm)	311
IADC Code	
Manufacturer	SECURITY
Type	GT11
Serial No	8022801
Jets (mm)	19 1 19 1
Depth Out (m)	202
Depth In (m)	0
Total Drilled (m)	202
Hrs Run Today	
Cumulative Hrs Run	5.25
Entry Date	

DULL GRADE

T		Gage (mm/d)	
T_2		ODC	
MDC		Reason Pulled	
LDC		Total Run (m/hr)	38.48
BRG			

MUD RECORD

Mud Type	Water ☑	Oil ☐	Other ☐	
Time	00:00	03:00	06:00	
Density (kg/m³)	1095	1100	1100	
Funnel Viscosity (s/l)	52	55	55	
Fluid Loss (cm³)	9.0	10.0	11.0	
pH	9	9	8	
Location				
Depth (m)				
PVT (m³)				

MUD MATERIALS ADDED

Product	Amount	Type
CAUSTIC	2	SX
ENERPAC REGULAR	1	SX
ENERPAC LO VIS	1	SX

METRES DRILLED

From (m)	To (m)	D-R-C	RPM	WOB (kdaN)
1222	1383	DRILL	45	16

REDUCED PUMP SPEED

No	Pressure (kpa)	Strokes/min	Depth (m)
	●	●	
	●	●	
	●	●	

CIRCULATION

Pump	Type	Liner Size (mm)	SPM	Pressure (kpa)	Hours Run
1		140	125	6400	8

Remarks

HOLE CONDITION

Hole Drag Up (kdaN)	
Hole Drag Down (kdaN)	
Torque at Bottom (klbs)	
Fill on Bottom (m)	

BOILER

No.	Hours Run	pH	Stack Temp (°C)

DEVIATION SURVEYS

Time	Depth (m)	Deviation	Direction	Type

SOLIDS CONTROL

Equipment Name	Hours Run	Intake Density (kg/m³)	Over Flow Density (kg/m³)	Under Flow Density (kg/m³)

SAFETY

Safety Topic	MEHL (kdaN)	MACP (kpa)
PIPE HYDRAULICS	38	1520

TIME LOG

From	To	Elapsed	Code	Details of Operations in Sequence & Remarks
00:00	00:15	0.25	21	SAFETY MEETING AND DRILLER HAND OFF
00:15	00:30	0.25	7	RIG SERVICE F/T CROWN SAVER - VISUALLY INSPECT MANIFOLD
00:30	06:45	6.25	2	DRILL
06:45	08:00	1.25	10	ACCUM SURVEYS

Remarks

TOUR 2

SIGNATURE OF DRILLER: JASON HAINES — START TIME: 08:00 — END TIME: 16:00

DRILLING ASSEMBLY

No.	Component	OD (mm)	ID (mm)	Length (m)
1	BIT & TOOLS	0		39.13
2	144 DP	0		1350.84

0	Drill Pipe	Stands (m)	0.00
5	Drill Pipe	Singles (m)	48.43
Weight of DC (kdaN)		Kelly Down (m)	11.60
Weight of string (kdaN)	24	Total (m)	1448.00

BITS

Bit Number	1A
Size (mm)	311
IADC Code	
Manufacturer	SECURITY
Type	GT11
Serial No	8022801
Jets (mm)	19 1 19 1
Depth Out (m)	202
Depth In (m)	0
Total Drilled (m)	202
Hrs Run Today	0.00
Cumulative Hrs Run	5.25
Entry Date	

DULL GRADE

T		Gage (mm/d)	
T_2		ODC	
MDC		Reason Pulled	
LDC		Total Run (m/hr)	38.48
BRG			

MUD RECORD

Mud Type	Water ☑	Oil ☐	Other ☐	
Time	08:00	11:00	13:30	
Density (kg/m³)	1105	1110	1100	
Funnel Viscosity (s/l)	46	51	58	
Fluid Loss (cm³)	10.5	11.0	9.5	
pH	10	10		
Location				
Depth (m)				
PVT (m³)				

MUD MATERIALS ADDED

Product	Amount	Type
WALNUT	12	SX
ENERPAC LO VIS	2	SX
ENERPAC REGULAR	1	SX

METRES DRILLED

From (m)	To (m)	D-R-C	RPM	WOB (kdaN)
1383	1448	DRILL	40	14

REDUCED PUMP SPEED

No.	Pressure (kpa)	Strokes/min	Depth (m)
	●	●	
	●	●	
	●	●	

CIRCULATION

Pump	Type	Liner Size (mm)	SPM	Pressure (kpa)	Hours Run
1		140	130	6900	8

Remarks

HOLE CONDITION

Hole Drag Up (kdaN)	
Hole Drag Down (kdaN)	
Torque at Bottom (klbs)	
Fill on Bottom (m)	

BOILER

No.	Hours Run	pH	Stack Temp (°C)

DEVIATION SURVEYS

Time	Depth (m)	Deviation	Direction	Type

SOLIDS CONTROL

Equipment Name	Hours Run	Intake Density (kg/m³)	Over Flow Density (kg/m³)	Under Flow Density (kg/m³)

SAFETY

Safety Topic	MEHL (kdaN)	MACP (kpa)
	40	1500

TIME LOG

From	To	Elapsed	Code	Details of Operations in Sequence & Remarks
08:00	08:15	0.25	21	SAFETY MEETING DRILLER HAND OFF
08:15	08:30	0.25	7	RIG SERVICE F/T HORN - MOTOR KILLS
08:30	13:30	5.00	2	DRILL
13:30	14:00	0.50	8C	DOWNTIME - MUD PUMP CHANGED SEAL ON LINER-MIDDLE
14:00	15:00	1.00	2	DRILL
15:00	16:00	1.00	10	ACCUM SURVEYS & CONNECTION TIME

Remarks

TOUR 3

SIGNATURE OF DRILLER: JARET LAURENT — START TIME: 16:00 — END TIME: 24:00

DRILLING ASSEMBLY

No.	Component	OD (mm)	ID (mm)	Length (m)
1	BIT & TOOLS	0		39.13
2	144 DP	0		1350.84

0	Drill Pipe	Stands (m)	0.00
16	Drill Pipe	Singles (m)	148.76
Weight of DC (kdaN)		Kelly Down (m)	11.37
Weight of string (kdaN)	24	Total (m)	1550.00

BITS

Bit Number	1A
Size (mm)	311
IADC Code	
Manufacturer	SECURITY
Type	GT11
Serial No	8022801
Jets (mm)	19 1 19 1
Depth Out (m)	202
Depth In (m)	0
Total Drilled (m)	202
Hrs Run Today	
Cumulative Hrs Run	5.25
Entry Date	

DULL GRADE

T		Gage (mm/d)	
T_2		ODC	
MDC		Reason Pulled	
LDC		Total Run (m/hr)	38.48
BRG			

MUD RECORD

Mud Type	Water ☑	Oil ☐	Other ☐	
Time	16:00	20:00	23:00	
Density (kg/m³)	1100	1105	1110	
Funnel Viscosity (s/l)	49	50	49	
Fluid Loss (cm³)	9.0	11.0	10.0	
pH	10	8	9	
Location				
Depth (m)				
PVT (m³)				

MUD MATERIALS ADDED

Product	Amount	Type
WALNUT	12	SX
ENERPAC LO VIS	2	SX
CAUSTIC	2	SX

METRES DRILLED

From (m)	To (m)	D-R-C	RPM	WOB (kdaN)
1448	1550	DRILL	45	15

REDUCED PUMP SPEED

No.	Pressure (kpa)	Strokes/min	Depth (m)
	●	●	
	●	●	
	●	●	

CIRCULATION

Pump	Type	Liner Size (mm)	SPM	Pressure (kpa)	Hours Run
1		140	128	7800	8

Remarks

HOLE CONDITION

Hole Drag Up (kdaN)	
Hole Drag Down (kdaN)	
Torque at Bottom (klbs)	
Fill on Bottom (m)	

BOILER

No.	Hours Run	pH	Stack Temp (°C)

DEVIATION SURVEYS

Time	Depth (m)	Deviation	Direction	Type

SOLIDS CONTROL

Equipment Name	Hours Run	Intake Density (kg/m³)	Over Flow Density (kg/m³)	Under Flow Density (kg/m³)

SAFETY

Safety Topic	MEHL (kdaN)	MACP (kpa)
MIXING	38	1500

TIME LOG

From	To	Elapsed	Code	Details of Operations in Sequence & Remarks
16:00	16:15	0.25	21	SAFETY MEETING AND DRILLER HANDOFF
16:15	16:30	0.25	7	RIG SERVICE - F/T HCR AND CROWN SAVER
16:30	23:00	6.50	2	DRILL
23:30	24:00	1.00	10	ACCUM MWD SURVEYS AND CONNECTIONS

Remarks

FRONT PAGE SUMMARY

Tour Sheet Serial Number	Vendor Software Version	Year	Month	Day
0XG31_20100712_10	Pason	2010	07	12

Rig No	Well Name	Surface Location	Prov	Loc Type	Unique Well Id	Kelly Bushing
-	MOLOPO PRESCO PAD 07-32-001-29W1	13-32-001-29W1	MB	DLS		4

License No	Operator	Contractor	Well Type	Re-Entry
7444	MOLOPO ENERGY CANADA LTD	ADVANCE DRILLING LTD	HORIZ	☐
	Operator's AFE	Contractor's Job No	Spud Date	Time
		19-10-394	2010.07.07	11:00
	Signature of Operator Representative	Signature of Contractor's Rig manager	Rig Release Date	Time
	Mark Magurat	GARY MILLIONS		

DAILY CHECKS

	OP	RM
1) Daily Walk Around Inspection	mech	GM
2) Detailed Inspection - Weekly (Using Check List)	mech	GM
3) H2S Alarms Passed if Required	mech	GM
4) Well Licence & Stick Diagram Posted	mech	GM
5) Flare Lines Tested	mech	GM
6) BOP Drills Performed	mech	GM
7) Visually Inspected BOPs - Flare Lines & Diverter Lines	mech	GM
1) Rig Site Hazard & Safety Meeting (prejob/newcrew/pm)		
2) CAODC Pre Safety Inspection Checklist (prior to spud)		
3) Mast Inspection before Raising or Lowering		
4) Crown Saver Checked		GM
5) Mast Bolts Checked		GM

FUEL @ 08:00 HOURS

Rig	28
Boiler	0
Op Fuel	1760

WEATHER

Time	06:00
Temp	+9
Current Conditions	CLEAR
Wind Direction	NW
Wind Strength	CALM
Road Condition	GOOD

DRILL PIPE

Category	Thread Type	Grade	OD (mm)	ID (mm)	Linear Mass (kg/m)	No. of Joints	Total Joint OD (mm)
DC	4 5 XH		159	57	135.02	14	159
DP	4 FH	E	102	85	20.83	180	102
HW	4 FH		102	85	44.10	60	102

MUD PUMPS

No.	Make	Stroke Length (mm)
1	EMSCO	229

GENERAL EQUIPMENT & SERVICES

Description	Hours

CAODC Pason

CASING

Category	Make	Grade	OD (mm)	ID (mm)	Linear Mass (kg/m)	No. of Joints	Total Length (m)	KB to CSG Head (m)	KB to CSG Bottom (m)
SURFACE	EVRAZ	J-55	219	206	35.72	16	202	4	202

SHALE SHAKERS

No	Top Screen			Middle Screen			Middle Screen			Bottom Screen		
	Size	Changed	New	Size	Changed	New	Size	Changed	New	Size	Changed	New
1	175	☐	☒	175	☒	☐	175	☐	☐		☐	☐
		☐	☐		☐	☐		☐	☐		☐	☐

TOUR 1

SIGNATURE OF DRILLER: KELLY MILLIONS — START TIME: 00:00 — END TIME: 08:00

DRILLING ASSEMBLY

No.	Component	OD (mm)	ID (mm)	Length (m)
1	BIT & TOOLS	0		39.13

0	Drill Pipe	Stands (m)	0.00
103	Drill Pipe	Singles (m)	965.83
Weight of DC (klbf#)		Kelly Down (m)	12.04
Weight of string (klbf#)	24	Total (m)	1017.00

BITS

Bit Number	1A
Size (mm)	311
IADC Code	
Manufacturer	SECURITY
Type	GT11
Serial No	8022801
Jets (mm)	19.1 19.1
Depth Out (m)	202
Depth In (m)	0
Total Drilled (m)	202
Hrs Run Today	0.00
Cumulative Hrs Run	5.25
Entry Date	

DULL GRADE

T1		Gage (mm)	
T2		ODC	
MDC		Reason Pulled	
LOC		Total Run (m/hr)	38.48
BRG			

MUD RECORD

Mud Type	Water	Oil	Other	
Time	00:00	03:00	06:00	
Density (kg/m³)	1080	1080	1090	
Funnel Viscosity (s/l)	52	50	48	
Fluid Loss (cm³)	9.0	9.0	9.0	
pH	10	10	10	
Location				
Depth (m)				
PVT (m³)				

MUD MATERIALS ADDED

Product	Amount	Type
SODA ASH	6	SX

METRES DRILLED

From (m)	To (m)	D-R-C	RPM	WOB (klbf#)
920	1017	DRILL	35	6

HOLE CONDITION

Hole Drag Up (klbf#)	
Hole Drag Down (klbf#)	
Torque at Bottom (kNm)	
Fill on Bottom (m)	

REDUCED PUMP SPEED

No.	Pressure (kpa)	Strokes/min	Depth (m)

BOILER

No.	Hours Run	pH	Stack Temp (°C)

SOLIDS CONTROL

Equipment Name	Hours Run	Intake Density (kg/m³)	Over Flow Density (kg/m³)	Under Flow Density (kg/m³)

CIRCULATION

Pump	Type	Liner Size (mm)	SPM	Pressure (kpa)	Hours Run
1		140	125	8200	8

Remarks:

DEVIATION SURVEYS

Time	Depth (m)	Deviation	Direction	Type

SAFETY

Safety Topic	MEHL (klbf#)	MACP (kpa)
CONNECTIONS	30	1581

TIME LOG

From	To	Elapsed	Code	Details of Operations in Sequence & Remarks
00:00	00:15	0.25	21	SAFETY MEETING AND DRILLER HAND OFF
00:15	00:30	0.25	7	RIG SERVICE F/T CROWN SAVER - F/T PIPE RAMS
00:30	07:00	6.50	2	DRILL
07:00	08:00	1.00	10	ACCUM SURVEYS

TOUR 2

SIGNATURE OF DRILLER: JASON HAINES — START TIME: 08:00 — END TIME: 16:00

DRILLING ASSEMBLY

No.	Component	OD (mm)	ID (mm)	Length (m)
1	BIT & TOOLS	0		39.13

0	Drill Pipe	Stands (m)	0.00
111	Drill Pipe	Singles (m)	1039.69
Weight of DC (klbf#)		Kelly Down (m)	12.18
Weight of string (klbf#)	24	Total (m)	1091.00

BITS

Bit Number	1A
Size (mm)	311
IADC Code	
Manufacturer	SECURITY
Type	GT11
Serial No	8022801
Jets (mm)	19.1 19.1
Depth Out (m)	202
Depth In (m)	0
Total Drilled (m)	202
Hrs Run Today	
Cumulative Hrs Run	5.25
Entry Date	

DULL GRADE

T1		Gage (mm)	
T2		ODC	
MDC		Reason Pulled	
LOC		Total Run (m/hr)	38.48
BRG			

MUD RECORD

Mud Type	Water	Oil	Other	
Time	08:00	11:00	13:30	
Density (kg/m³)	1100	1100	1100	
Funnel Viscosity (s/l)	60	58	58	
Fluid Loss (cm³)	10.0	10.5	10.0	
pH	10	10	10	
Location				
Depth (m)				
PVT (m³)				

MUD MATERIALS ADDED

Product	Amount	Type
CAUSTIC	1	SX
ENERPAC LO VIS	1	SX

METRES DRILLED

From (m)	To (m)	D-R-C	RPM	WOB (klbf#)
1017	1091	DRILL	40	9

HOLE CONDITION

Hole Drag Up (klbf#)	
Hole Drag Down (klbf#)	
Torque at Bottom (kNm)	
Fill on Bottom (m)	

REDUCED PUMP SPEED

No.	Pressure (kpa)	Strokes/min	Depth (m)

BOILER

No.	Hours Run	pH	Stack Temp (°C)

SOLIDS CONTROL

Equipment Name	Hours Run	Intake Density (kg/m³)	Over Flow Density (kg/m³)	Under Flow Density (kg/m³)

CIRCULATION

Pump	Type	Liner Size (mm)	SPM	Pressure (kpa)	Hours Run
1		140	120	5800	8

Remarks:

DEVIATION SURVEYS

Time	Depth (m)	Deviation	Direction	Type

SAFETY

Safety Topic	MEHL (klbf#)	MACP (kpa)
LOADER	30	1520

TIME LOG

From	To	Elapsed	Code	Details of Operations in Sequence & Remarks
08:00	08:15	0.25	21	SAFETY MEETING DRILLER HAND OFF
08:15	08:30	0.25	7	RIG SERVICE
08:30	15:00	6.50	2	DRILL
15:00	16:00	1.00	10	ACCUM SURVEYS & CONNECTION TIME

TOUR 3

SIGNATURE OF DRILLER: JARET LAURENT — START TIME: 16:00 — END TIME: 24:00

DRILLING ASSEMBLY

No.	Component	OD (mm)	ID (mm)	Length (m)
1	BIT & TOOLS	0		39.13

0	Drill Pipe	Stands (m)	0.00
125	Drill Pipe	Singles (m)	1171.29
Weight of DC (klbf#)		Kelly Down (m)	11.58
Weight of string (klbf#)	24	Total (m)	1222.00

BITS

Bit Number	1A
Size (mm)	311
IADC Code	
Manufacturer	SECURITY
Type	GT11
Serial No	8022801
Jets (mm)	19.1 19.1
Depth Out (m)	202
Depth In (m)	0
Total Drilled (m)	202
Hrs Run Today	
Cumulative Hrs Run	5.25
Entry Date	

DULL GRADE

T1		Gage (mm)	
T2		ODC	
MDC		Reason Pulled	
LOC		Total Run (m/hr)	38.48
BRG			

MUD RECORD

Mud Type	Water	Oil	Other	
Time	16:00	19:00	23:00	
Density (kg/m³)	1100	1100	1110	
Funnel Viscosity (s/l)	49	46	53	
Fluid Loss (cm³)	11.0	9.0	9.0	
pH	10	9	9	
Location				
Depth (m)				
PVT (m³)				

MUD MATERIALS ADDED

Product	Amount	Type
ENERPAC LO VIS	1	SX
ENERPAC REGULAR	2	SX

METRES DRILLED

From (m)	To (m)	D-R-C	RPM	WOB (klbf#)
1091	1222	DRILL	40	14

HOLE CONDITION

Hole Drag Up (klbf#)	
Hole Drag Down (klbf#)	
Torque at Bottom (kNm)	
Fill on Bottom (m)	

REDUCED PUMP SPEED

No.	Pressure (kpa)	Strokes/min	Depth (m)

BOILER

No.	Hours Run	pH	Stack Temp (°C)

SOLIDS CONTROL

Equipment Name	Hours Run	Intake Density (kg/m³)	Over Flow Density (kg/m³)	Under Flow Density (kg/m³)

CIRCULATION

Pump	Type	Liner Size (mm)	SPM	Pressure (kpa)	Hours Run
1		140	115	5100	8

Remarks:

DEVIATION SURVEYS

Time	Depth (m)	Deviation	Direction	Type

SAFETY

Safety Topic	MEHL (klbf#)	MACP (kpa)
TUGGER	33	1523

TIME LOG

From	To	Elapsed	Code	Details of Operations in Sequence & Remarks
16:00	16:15	0.25	21	SAFETY MEETING AND DRILLER HANDOFF
16:15	16:30	0.25	7	RIG SERVICE - F/T CROWN SAVER AND ANNULAR
16:30	23:00	6.50	2	ACCUM DRILL
23:00	24:00	1.00	10	ACCUM MWD SURVEYS

FRONT PAGE SUMMARY

Tour Sheet Serial Number	Vendor Software Version	Year	Month	Day
DX331_20100711_1B	Pason	2010	07	11

Rig No.	Well Name	Surface Location	Prov	Loc Type	Unique Well Id	Kelly Bushing
-	DCDC PRESCO PROV 02-32-001-29W1	13-32-001-29W1	MB	DLS		4

License No.	Operator	Contractor	Well Type	Rig Entry
"447	MOLOPO ENERGY CANADA LTD	ADVANCE DRILLING LTD	HORIZ	

Operator's AFE	Contractor's Job No	Spud Date	Time
	19-10-394	2010/07/07	11:00

Signature of Operator Representative	Signature of Contractor's Rig manager	Rig Release Date	Time
Mark Mazurat	GARY MILLIONS		

DAILY CHECKS

	OP	RM
1) Daily Walk Around Inspection	mem	GM
2) Derrick Inspection - Weekly (Gains Check Lab	mem	GM
3) H2S Sensor Posted if Required	mem	GM
4) Well Licences & Stock Clearance Posted	mem	GM
5) Fire Lines Tested	mem	GM
6) BOP Drills Performed		
7) Vessels Inspected BOPs - Flare Lines & Degasser Lines		GM
1) Rig Site Health & Safety Meetings (weekly/monthly)		
2) CAODC Rig Safety Inspection Checklist (new/renewal)		
3) Meet Inspection before Raising or Lowering		
4) Crown Saver Checked		GM
5) Mayor Kills Checked		GM

FUEL @ 08:00 HOURS

Rig	55
Boiler	0
Op Fuel	2000

WEATHER

Time	08:00
Temp	15
Current Conditions	CLEAR
Wind Direction	NW
Wind Strength	CALM
Road Condition	GOOD

DRILL PIPE

Category	Thread Type	Grade	OD (mm)	ID (mm)	Linear Mass (kg/m)	No. of Joints	Tool Joint OD (mm)
DC	4 5 XH		159	57	135.02	14	159
DP	4 FH	E	102	85	20.83	180	102
HW	4 FH		102	85	44.10	60	102

MUD PUMPS

No.	Make	Stroke Length (mm)
1	EMSCO	229

GENERAL EQUIPMENT & SERVICES

Description	Hours

CASING

Category	Make	Grade	OD (mm)	ID (mm)	Linear Mass (kg/m)	No. of Joints	Total Length (m)	KB to CSG Head (m)	KB to CSG Bottom (m)
SURFACE	EVRAZ	J-55	219	206	35.72	16	202	4	202

SHALE SHAKERS

No	Top Screen			Middle Screen			Middle Screen			Bottom Screen		
	Size	Changed	New	Size	Changed	New	Size	Changed	New	Size	Changed	New
1	175	☐	☒	175	☐	☒	175	☐	☒		☐	☐
		☐	☐		☐	☐		☐	☐		☐	☐

TOUR 1

SIGNATURE OF DRILLER: DEREK LAURENT

START TIME: 00:00 END TIME: 08:00

DRILLING ASSEMBLY

No	Component	OD (mm)	ID (mm)	Length (m)
1	BIT & TOOLS	0		39.13

0	Drill Pipe	Stands (m)	0.00
75	Drill Pipe	Singles (m)	701.88
Weight of DC (klbf#)		Kelly Down (m)	6.99
Weight of string (klbf#)		Total (m)	748.00

BITS

Bit Number	
Size (mm)	
IADC Code	
Manufacturer	
Type	
Serial No	
Jets (mm)	
Depth Out (m)	
Depth In (m)	
Total Drilled (m)	
Hrs Run Today	
Cumulative Hrs Run	
Entry Date	

DULL GRADE

T		Gage (mm)	
T		ODC	
MDC		Reason Pulled	
LOC		Total Run (m/hr)	
BRG			

MUD RECORD

Mud Type	Water ☐	Oil ☐	Other ☐
Time			
Density (kg/m³)			
Funnel Viscosity (s/l)			
Fluid Loss (cm³)			
pH			
Location			
Depth (m)			
PVT (m³)			

MUD MATERIALS ADDED

Product	Amount	Type

SOLIDS CONTROL

Equipment Name	Hours Run	Intake Density (kg/m³)	Over Flow Density (kg/m³)	Under Flow Density (kg/m³)

SAFETY

Safety Topic	MEHL (kdaN)	MWCP (kpa)

METRES DRILLED

From (m)	To (m)	D-R-C	RPM	WOB (kdaN)

REDUCED PUMP SPEED

No.	Pressure (kpa)	Strokes/min	Depth (m)
	●	●	
	●	●	
	●	●	

CIRCULATION

Pump	Type	Liner Size (mm)	SPM	Pressure (kpa)	Hours Run
1	SING.E	140	90	1200	8

Remarks

HOLE CONDITION

Hole Drag Up (kdaN)	
Hole Drag Down (kdaN)	
Torque at Bottom (daNm)	
Fill on Bottom (m)	

BOILER

No.	Hours Run	pH	Stack Temp (°C)

DEVIATION SURVEYS

Time	Depth (m)	Deviation	Direction	Type

TIME LOG

From	To	Elapsed	Code	Details of Operations in Sequence & Remarks
00:00	00:15	0.25	21	SAFETY MEETING DRILLER HAND OFF
00:15	00:30	0.25	5	CONDITION MUD & CIRCULATE TOP OF PLUG
00:30	01:30	1.00	8	LAY DOWN 40 S/NGLES AND RACK 20 STANDS
01:30	01:45	0.25	7	RIG SERVICE F/T BLIND RAMS AND CROWN SAVER
01:45	07:00	5.25	13	WAIT ON CEMENT
07:00	07:15	0.25	21	SAFETY MEETING WITH DIRECTIONAL HANDS
07:15	08:00	0.75	200	MAKE UP DIRECTIONAL TOOLS

Remarks

TOUR 2

SIGNATURE OF DRILLER: JASON HAINES

START TIME: 08:00 END TIME: 16:00

DRILLING ASSEMBLY

No.	Component	OD (mm)	ID (mm)	Length (m)
1	BIT & TOOLS	0		39.13

0	Drill Pipe	Stands (m)	0.00
79	Drill Pipe	Singles (m)	740.07
Weight of DC (klbf#)		Kelly Down (m)	11.80
Weight of string (klbf#)		Total (m)	791.00

BITS

Bit Number	1A
Size (mm)	311
IADC Code	
Manufacturer	SECURITY
Type	GT11
Serial No	8022801
Jets (mm)	19 1 19 1
Depth Out (m)	
Depth In (m)	0
Total Drilled (m)	202
Hrs Run Today	0.00
Cumulative Hrs Run	5.25
Entry Date	

DULL GRADE

T		Gage (mm)	
T		ODC	
MDC		Reason Pulled	
LOC		Total Run (m/hr)	
BRG			

MUD RECORD

Mud Type	Water ☒	Oil ☐	Other ☐
Time	08:00	11:30	13:30
Density (kg/m³)	1080	1080	1110
Funnel Viscosity (s/l)	36	36	46
Fluid Loss (cm³)	10.0	10.0	8.0
pH	9	9	12
Location			
Depth (m)			
PVT (m³)			

MUD MATERIALS ADDED

Product	Amount	Type
ENERPAC REGULAR	4	SX
BICARB	9	SX

SOLIDS CONTROL

Equipment Name	Hours Run	Intake Density (kg/m³)	Over Flow Density (kg/m³)	Under Flow Density (kg/m³)

SAFETY

Safety Topic	MEHL (kdaN)	MWCP (kpa)
PIPE SPINNER	30	

METRES DRILLED

From (m)	To (m)	D-R-C	RPM	WOB (kdaN)
772	791	DRILL	30	2

REDUCED PUMP SPEED

No.	Pressure (kpa)	Strokes/min	Depth (m)
	●	●	
	●	●	
	●	●	

CIRCULATION

Pump	Type	Liner Size (mm)	SPM	Pressure (kpa)	Hours Run
1		140	108	4800	8

Remarks

HOLE CONDITION

Hole Drag Up (kdaN)	
Hole Drag Down (kdaN)	
Torque at Bottom (daNm)	
Fill on Bottom (m)	

BOILER

No	Hours Run	pH	Stack Temp (°C)

DEVIATION SURVEYS

Time	Depth (m)	Deviation	Direction	Type

TIME LOG

From	To	Elapsed	Code	Details of Operations in Sequence & Remarks
08:00	08:15	0.25	21	SAFETY MEETING DRILLER HAND OFF
08:15	08:30	0.25	7	RIG SERVICE
08:30	09:15	0.75	20	DIRECTIONAL WORK MAKE UP BIT & TOOLS
09:15	11:15	2.00	6A	TRIP IN HOLE PULSE TEST 10 STANDS IN-R I H-CLEANED TO BOTTOM TAG PLUG @724M
11:15	12:30	1.25	2C	DRILL CEMENT PLUG TO K O P @782M
12:30	15:30	3.00	2	TIME DRILL F/782 - 791M
15:30	16:00	0.50	10	ACCUM SURVEYS & CONNECTION TIME

Remarks

TOUR 3

SIGNATURE OF DRILLER: JARET LAURENT

START TIME: 16:00 END TIME: 24:00

DRILLING ASSEMBLY

No.	Component	OD (mm)	ID (mm)	Length (m)
1	BIT & TOOLS	0		39.13

0	Drill Pipe	Stands (m)	0.00
93	Drill Pipe	Singles (m)	871.85
Weight of DC (klbf#)		Kelly Down (m)	9.02
Weight of string (klbf#)	28	Total (m)	920.00

BITS

Bit Number	1A
Size (mm)	311
IADC Code	
Manufacturer	SECURITY
Type	GT11
Serial No	8022801
Jets (mm)	19 1 19 1
Depth Out (m)	202
Depth In (m)	0
Total Drilled (m)	
Hrs Run Today	
Cumulative Hrs Run	5.25
Entry Date	

DULL GRADE

T		Gage (mm)	
T		ODC	
MDC		Reason Pulled	
LOC		Total Run (m/hr)	38.48
BRG			

MUD RECORD

Mud Type	Water ☒	Oil ☐	Other ☐
Time	16:00	19:00	22:00
Density (kg/m³)	1080	1080	1090
Funnel Viscosity (s/l)	60	50	50
Fluid Loss (cm³)	8.0	8.0	8.0
pH	12	10	10
Location			
Depth (m)			
PVT (m³)			

MUD MATERIALS ADDED

Product	Amount	Type
BICARB	6	SX

SOLIDS CONTROL

Equipment Name	Hours Run	Intake Density (kg/m³)	Over Flow Density (kg/m³)	Under Flow Density (kg/m³)

SAFETY

Safety Topic	MEHL (kdaN)	MWCP (kpa)
PAINTING	28	1561

METRES DRILLED

From (m)	To (m)	D-R-C	RPM	WOB (kdaN)
791	920	DRILL	40	8

REDUCED PUMP SPEED

No.	Pressure (kpa)	Strokes/min	Depth (m)
	●	●	
	●	●	
	●	●	

CIRCULATION

Pump	Type	Liner Size (mm)	SPM	Pressure (kpa)	Hours Run
1		140	124	5000	8

Remarks

HOLE CONDITION

Hole Drag Up (kdaN)	
Hole Drag Down (kdaN)	
Torque at Bottom (daNm)	
Fill on Bottom (m)	

BOILER

No	Hours Run	pH	Stack Temp (°C)

DEVIATION SURVEYS

Time	Depth (m)	Deviation	Direction	Type

TIME LOG

From	To	Elapsed	Code	Details of Operations in Sequence & Remarks
16:00	16:15	0.25	21	SAFETY MEETING AND DRILLER HANDOFF
16:15	16:30	0.25	7	RIG SERVICE - F/T PIPE RAMS AND CROWN SAVER
16:30	23:00	6.50	2	ACCUM DRILL
23:00	24:00	1.00	10	ACCUM MWD SURVEYS AND CONNECTIONS

Remarks

FRONT PAGE SUMMARY

Tour Sheet Serial Number	Vendor Software Version	Year	Month	Day
0XG31_20100710_1A	Pason	2010	07	10

Rig No	Well Name	Surface Location	Prov	Loc Type	Unique Well Id	Kelly Bushing
1	MOLOPO PIERSON PROV HZ 13-32-1-29 W1	13-32-001-29W1	MB	DLS		4

Licence No	Operator	Contractor	Well Type	Re-Entry
7447	MOLOPO ENERGY CANADA LTD	ADVANCE DRILLING LTD	HORIZ	☐
	Operator's AFE	Contractor's Job No	Spud Date	Time
		19-10-394	2010/07/07	11:00
	Signature of Operator Representative	Signature of Contractor's Rig manager	Rig Release Date	Time
	Mark Mazurat	GARY MILLIONS		

DAILY CHECKS

	OP	RM
1) Daily Walk Around Inspection	msm	GM
2) Detailed Inspection - Weekly (Using Check List)		
3) H2S Signs Posted if Required	msm	GM
4) Well Licence & Stick Diagram Posted	msm	GM
5) Flare Lines Staked	msm	GM
6) BOP Drills Performed		
7) Visually Inspected BOPs - Flare Lines & Degasser Lines	msm	GM
1) Rig Site Health & Safety Meeting (one/crew/month)		
2) CAODC Rig Safety Inspection Checklist (one/rig/month)		
3) Mast Inspection before Raising or Lowering		
4) Crown Saver Checked		GM
5) Motor Kills Checked		GM

FUEL @ 08:00 HOURS

Rig	75
Boiler	0
Op Fuel	2000

WEATHER

Time	06:00
Temp	15
Current Conditions	CLEAR
Wind Direction	NW
Wind Strength	CALM
Road Condition	GOOD

DRILL PIPE

Category	Thread Type	Grade	OD (mm)	ID (mm)	Linear Mass (kg/m)	No. of Joints	Tool Joint OD (mm)
DC	4.5 XH		159	57	135.02	14	159
DP	4 FH	E	102	85	20.83	180	102
HW	4 FH		102	85	44.10	60	102

CASING

Category	Make	Grade	OD (mm)	ID (mm)	Linear Mass (kg/m)	No. of Joints	Total Length (m)	KB to CSG Head (m)	KB to CSG Bottom (m)
SURFACE	EVRAZ	J-55	219	206	35.72	16	202	4	202

MUD PUMPS

No.	Make	Stroke Length (mm)
1	EMSCO	229

GENERAL EQUIPMENT & SERVICES

Description	Hours

CAODC Pason

SHALE SHAKERS

No	Top Screen Size	Changed	New	Middle Screen Size	Changed	New	Middle Screen Size	Changed	New	Bottom Screen Size	Changed	New
1	175	☒	☒	175	☒	☐	175	☒	☐		☐	☐

TOUR 1

SIGNATURE OF DRILLER: DEREK LAURENT — START TIME 00:00 — END TIME 08:00

DRILLING ASSEMBLY

No	Component	OD (mm)	ID (mm)	Length (m)
1	BIT	0		0.25
2	BIT SUB	0		0.88
3	X/O	0		0.55
0	Drill Pipe		Stands (m)	0.00
115	Drill Pipe		Singles (m)	1076.23
Weight of DC (daN)			Kelly Down (m)	4.09
Weight of string (daN)			Total (m)	1082.00

BITS

Bit Number	1A
Size (mm)	311
IADC Code	
Manufacturer	SECURITY
Type	GT11
Serial No	8022801
Jets (mm)	19.1 / 19.1
Depth Out (m)	202
Depth In (m)	0
Total Drilled (m)	202
Hrs Run Today	0.00
Cumulative Hrs Run	5.25
Entry Date	2010/07/10

DULL GRADE

T1		Gage (mm)	
T2		ODC	
MDC		Reason Pulled	
LOC		Total Run (m/hr)	38.48
BRG			

MUD RECORD

Mud Type: Water ☒ Oil ☐ Other

Time	02:00
Density (kg/m³)	1140
Funnel Viscosity (s/l)	110
Fluid Loss (cm³)	10.0
pH	9
Location	
Depth (m)	
PVT (m³)	

MUD MATERIALS ADDED

Product	Amount	Type
ENERPAC REGULAR	3	SX

SOLIDS CONTROL

Equipment Name	Hours Run	Intake Density (kg/m³)	Over Flow Density (kg/m³)	Under Flow Density (kg/m³)

SAFETY

Safety Topic	MEHL (daN)	MACP (kpa)

METRES DRILLED

From (m)	To (m)	D-R-C	RPM	WOB (daN)

HOLE CONDITION

Hole Drag Up (daN)	
Hole Drag Down (daN)	
Torque at Bottom (Nm)	
Fill on Bottom (m)	

REDUCED PUMP SPEED

No.	Pressure (kpa)	Strokes/min	Depth (m)

BOILER

No.	Hours Run	pH	Stack Temp (°C)

CIRCULATION

Pump	Type	Liner Size (mm)	SPM	Pressure (kpa)	Hours Run
1	SINGLE	140	120	4100	8

Remarks:

DEVIATION SURVEYS

Time	Depth (m)	Deviation	Direction	Type

TIME LOG

From	To	Elapsed	Code	Details of Operations in Sequence & Remarks
00:00	01:00	1.00	6	FINISH RIH AND REAM TO BOTTOM
01:00	02:15	1.25	5	CONDITION MUD & CIRCULATE
02:15	02:30	0.25	7	RIG SERVICE F/T MOTOR KILLS AND CROWN SAVER
02:30	03:45	1.25	6	POOH FOR LOGS
03:45	04:00	0.25	21	SAFETY MEETING WITH WEATHERFORD
04:00	08:00	4.00	11	WIRELINE LOGS STI, SPED,CNS,GR,BCS

Remarks:

TOUR 2

SIGNATURE OF DRILLER: JASON HAINES — START TIME 08:00 — END TIME 16:00

DRILLING ASSEMBLY

No.	Component	OD (mm)	ID (mm)	Length (m)
0	Drill Pipe		Stands (m)	0.00
115	Drill Pipe		Singles (m)	1076.23
Weight of DC (daN)			Kelly Down (m)	5.77
Weight of string (daN)			Total (m)	1082.00

BITS

Bit Number	1A
Size (mm)	311
IADC Code	
Manufacturer	SECURITY
Type	GT11
Serial No	8022801
Jets (mm)	19.1 / 19.1
Depth Out (m)	202
Depth In (m)	0
Total Drilled (m)	202
Hrs Run Today	0.00
Cumulative Hrs Run	5.25
Entry Date	2010/07/10

DULL GRADE

T1		Gage (mm)	
T2		ODC	
MDC		Reason Pulled	
LOC		Total Run (m/hr)	38.48
BRG			

MUD RECORD

Mud Type: Water ☒ Oil ☐ Other

Time	12:00	14:30
Density (kg/m³)	1140	1145
Funnel Viscosity (s/l)	125	59
Fluid Loss (cm³)	9.5	
pH	7	7
Location		
Depth (m)		
PVT (m³)		

MUD MATERIALS ADDED

Product	Amount	Type
DESCO	1	SX

SOLIDS CONTROL

Equipment Name	Hours Run	Intake Density (kg/m³)	Over Flow Density (kg/m³)	Under Flow Density (kg/m³)

SAFETY

Safety Topic	MEHL (daN)	MACP (kpa)
TONGS	26	1439

METRES DRILLED

From (m)	To (m)	D-R-C	RPM	WOB (daN)

HOLE CONDITION

Hole Drag Up (daN)	
Hole Drag Down (daN)	
Torque at Bottom (Nm)	
Fill on Bottom (m)	

REDUCED PUMP SPEED

No.	Pressure (kpa)	Strokes/min	Depth (m)

BOILER

No.	Hours Run	pH	Stack Temp (°C)

CIRCULATION

Pump	Type	Liner Size (mm)	SPM	Pressure (kpa)	Hours Run
1		140	105	2600	8

Remarks

DEVIATION SURVEYS

Time	Depth (m)	Deviation	Direction	Type

TIME LOG

From	To	Elapsed	Code	Details of Operations in Sequence & Remarks
08:00	08:15	0.25	21	SAFETY MEETING DRILLER HAND OFF
08:15	08:30	0.25	7	RIG SERVICE
08:30	09:00	0.50	11	FINISH WIRELINE LOGS
09:00	10:15	1.25	23E	W/O ORDERS
10:15	11:15	1.00	6A	TRIP IN HOLE OPEN ENDED FOR PLUG
11:15	14:45	3.50	5	CONDITION MUD & CIRCULATE
14:45	15:00	0.25	21	SAFETY MEETING WITH CEMENTERS
15:00	15:30	0.50	12F	RIG IN AND PUMP PLUG #1 1082 - 870M w/10.2t Class "G"
15:30	16:00	0.50	6B	HOIST PIPE SLOW OUT OF PLUG

Remarks:

TOUR 3

SIGNATURE OF DRILLER: THOMAS FLOREK — START TIME 16:00 — END TIME 24:00

DRILLING ASSEMBLY

No.	Component	OD (mm)	ID (mm)	Length (m)
0	Drill Pipe		Stands (m)	0.00
115	Drill Pipe		Singles (m)	1076.23
Weight of DC (daN)			Kelly Down (m)	5.77
Weight of string (daN)			Total (m)	1082.00

BITS

Bit Number	1
Size (mm)	200
IADC Code	
Manufacturer	R.B.I.
Type	KX513
Serial No	Z72679A
Jets (mm)	11.1 / 11.1 / 11.1 / 11.1 / 11.1 / 11.1 / 11.1
Depth Out (m)	1082
Depth In (m)	202
Total Drilled (m)	880
Hrs Run Today	
Cumulative Hrs Run	24.50
Entry Date	2010/07/10

DULL GRADE

T1		Gage (mm)	
T2		ODC	
MDC		Reason Pulled	
LOC		Total Run (m/hr)	35.92
BRG			

MUD RECORD

Mud Type: Water ☒ Oil ☐ Other

Time	16:00	19:00	22:00
Density (kg/m³)	1140	1100	1080
Funnel Viscosity (s/l)	59	46	47
Fluid Loss (cm³)		20.0	10.0
pH		10	10
Location			
Depth (m)			
PVT (m³)			

MUD MATERIALS ADDED

Product	Amount	Type
ENERPAC LO VIS	2	SX
ENERPAC REGULAR	2	SX
BICARB	6	SX

SOLIDS CONTROL

Equipment Name	Hours Run	Intake Density (kg/m³)	Over Flow Density (kg/m³)	Under Flow Density (kg/m³)

SAFETY

Safety Topic	MEHL (daN)	MACP (kpa)
CEMENTING	22	1520

METRES DRILLED

From (m)	To (m)	D-R-C	RPM	WOB (daN)

HOLE CONDITION

Hole Drag Up (daN)	
Hole Drag Down (daN)	
Torque at Bottom (Nm)	
Fill on Bottom (m)	

REDUCED PUMP SPEED

No.	Pressure (kpa)	Strokes/min	Depth (m)

BOILER

No.	Hours Run	pH	Stack Temp (°C)

CIRCULATION

Pump	Type	Liner Size (mm)	SPM	Pressure (kpa)	Hours Run
1	SINGLE	140	90	1300	6.5

Remarks

DEVIATION SURVEYS

Time	Depth (m)	Deviation	Direction	Type

TIME LOG

From	To	Elapsed	Code	Details of Operations in Sequence & Remarks
16:00	16:15	0.25	6B	HOIST SLOW OUT OF PLUG #1
16:15	16:30	0.25	12F	PUMP PLUG #2 870 - 720M w/8.2t Class "G"
16:30	17:00	0.50	6B	HOIST SLOW OUT OF PLUG #2
17:00	17:15	0.25	21	SAFETY MEETING
17:15	17:30	0.25	7	RIG SERVICE
17:30	24:00	6.50	5D	CIRCULATE AND CONDITION

Remarks: DWA VISUALLY INSPECTED BOP

FRONT PAGE SUMMARY

Tour Sheet Serial Number	Vendor Software Version	Year	Month	Day
0XG31_20100709_1A	Pason	2010	07	09

Rig No	Well Name	Surface Location	Prov	Loc Type	Unique Well Id	Kelly Bushing
1	MOLOPO PIERSON PROV 07-13-32-1-29-W1	13-32-001-29W1	MB	DLS		4

License No	Operator	Contractor	Well Type	Re-Entry
7447	MOLOPO ENERGY CANADA LTD	ADVANCE DRILLING LTD	HORIZ	☐
	Operator's AFE	Contractor's Job No	Spud Date	Time
		19-10-394	2010/07/07	11:00
	Signature of Operator Representative	Signature of Contractor's Rig manager	Rig Release Date	Time
	Mark Mazurat	GARY MILLIONS		

DAILY CHECKS

	OP	RM
1) Daily Walk Around Inspection		
2) Detailed Inspection - Weekly (Using Check List)		
3) H2S Signs Posted If Required		
4) Well Licence & Stick Diagram Posted		
5) Flare Lines Staked		
6) BOP Drills Performed		
7) Visually Inspected BOPs - Flare Lines & Degasser Lines		
1) Rig Site Health & Safety Meeting (one/crew/month)		
2) CAODC Rig Safety Inspection Checklist (one/rig/month)		
3) Mast Inspection before Raising or Lowering		
4) Crown Saver Checked		
5) Mezz Kills Checked		

FUEL @ 08:00 HOURS

Rig	20
Boiler	0
Op Fuel	1520

WEATHER

Time	06:00
Temp	13
Current Conditions	CLEAR
Wind Direction	NW
Wind Strength	CALM
Road Condition	FAIR

DRILL PIPE

Category	Thread Type	Grade	OD (mm)	ID (mm)	Linear Mass (kg/m)	No. of Joints	Tool Joint OD (mm)
DC	4.5 XH		159	57	135.02	14	159
DP	4 FH	E	102	85	20.83	180	102
HW	4 FH		102	85	44.10	60	102

MUD PUMPS

No.	Make	Stroke Length (mm)
1	EMSCO	229

GENERAL EQUIPMENT & SERVICES

Description	Hours

CAODC Pason

CASING

Category	Make	Grade	OD (mm)	ID (mm)	Linear Mass (kg/m)	No. of Joints	Total Length (m)	KB to CSG Head (m)	KB to CSG Bottom (m)
SURFACE	EVRAZ	J-55	219	206	35.72	16	202	4	202

SHALE SHAKERS

No	Top Screen Size	Changed	New	Middle Screen Size	Changed	New	Middle Screen Size	Changed	New	Bottom Screen Size	Changed	New
1	175	☐	☑	S175	☐	☐	175	☐	☐		☐	☐

TOUR 1 — SIGNATURE OF DRILLER: KELLY MILLIONS — START TIME 00:00 — END TIME 08:00

DRILLING ASSEMBLY

No	Component	OD (mm)	ID (mm)	Length (m)
1	BIT & TOOLS	0		39.13
0	Drill Pipe	Stands (m)		0.00
86	Drill Pipe	Singles (m)		795.02
Weight of DC (daN)		Kelly Down (m)		11.85
Weight of string (daN)	22	Total (m)		846.00

BITS

Bit Number	1A
Size (mm)	311
IADC Code	
Manufacturer	SECURITY
Type	GT11
Serial No	802280?
Jets (mm)	19.1 19.1
Depth Out (m)	202
Depth In (m)	0
Total Drilled (m)	202
Hrs Run Today	0.00
Cumulative Hrs Run	5.25
Entry Date	

DULL GRADE

T1		Gage (mm)	
T2		ODC	
MDC		Reason Pulled	
LOC		Total Run (m/hr)	38.48
BRG			

MUD RECORD

Mud Type: Water ☒ Oil ☐ Other

Time	03:00	06:00	
Density (kg/m³)	1070	1080	
Funnel Viscosity (s/l)	32	35	
Fluid Loss (cm³)			
pH			
Location			
Depth (m)			
PVT (m³)			

MUD MATERIALS ADDED

Product	Amount	Type
CALCIUM NITRATE	3	SX
HYPERDRILL 204	1	SX
ENERPAC REGULAR	3	SX
SODA ASH	6	SX

SOLIDS CONTROL

Equipment Name	Hours Run	Intake Density (kg/m³)	Over Flow Density (kg/m³)	Under Flow Density (kg/m³)

SAFETY

Safety Topic	MEHL (daN)	MACP (kpa)
TONGS	35	2132

METRES DRILLED

From (m)	To (m)	D-R-C	RPM	WOB (daN)
540	846	DRILL	45	9

REDUCED PUMP SPEED

No.	Pressure (kpa)	Strokes/min	Depth (m)

CIRCULATION

Pump	Type	Liner Size (mm)	SPM	Pressure (kpa)	Hours Run
1		140	125	5600	8

Remarks

HOLE CONDITION

Hole Drag Up (daN)	
Hole Drag Down (daN)	
Torque at Bottom (Nm)	
Fill on Bottom (m)	

BOILER

No.	Hours Run	pH	Stack Temp (°C)

DEVIATION SURVEYS

Time	Depth (m)	Deviation	Direction	Type
00:15	590.00	0.5	23	DIRECTIONAL
01:00	650.00	0.5	350	DIRECTIONAL
02:45	708.00	0.8	184	DIRECTIONAL
04:00	755.00	0.2	200	DIRECTIONAL
05:00	801.00	0.3	179	DIRECTIONAL

TIME LOG

From	To	Elapsed	Code	Details of Operations in Sequence & Remarks
00:00	00:15	0.25	21	SAFETY MEETING AND DRILLER HANDOFF
00:15	00:30	0.25	7	RIG SERVICE F/T PIPE RAMS - CROWN SAVER
00:30	07:00	6.50	2	DRILL
07:00	08:00	1.00	10	ACUM MWD SURVEYS AND CONN TIME

Remarks

TOUR 2 — SIGNATURE OF DRILLER: JASON HAINES — START TIME 08:00 — END TIME 16:00

DRILLING ASSEMBLY

No.	Component	OD (mm)	ID (mm)	Length (m)
1	BIT & TOOLS	0		39.13
0	Drill Pipe	Stands (m)		0.00
103	Drill Pipe	Singles (m)		964.15
Weight of DC (daN)		Kelly Down (m)		11.72
Weight of string (daN)	25	Total (m)		1015.00

BITS

Bit Number	1A
Size (mm)	311
IADC Code	
Manufacturer	SECURITY
Type	GT11
Serial No	8022801
Jets (mm)	19.1 19.1
Depth Out (m)	202
Depth In (m)	0
Total Drilled (m)	202
Hrs Run Today	0.00
Cumulative Hrs Run	5.25
Entry Date	

DULL GRADE

T1		Gage (mm)	
T2		ODC	
MDC		Reason Pulled	
LOC		Total Run (m/hr)	38.46
BRG			

MUD RECORD

Mud Type: Water ☒ Oil ☐ Other

Time	08:00	11:30	13:30
Density (kg/m³)	1050	1100	1110
Funnel Viscosity (s/l)	38	45	48
Fluid Loss (cm³)			
pH			
Location			
Depth (m)			
PVT (m³)			

MUD MATERIALS ADDED

Product	Amount	Type
SODA ASH	6	SX

SOLIDS CONTROL

Equipment Name	Hours Run	Intake Density (kg/m³)	Over Flow Density (kg/m³)	Under Flow Density (kg/m³)

SAFETY

Safety Topic	MEHL (daN)	MACP (kpa)
MIXING	32	1520

METRES DRILLED

From (m)	To (m)	D-R-C	RPM	WOB (daN)
846	1015	DRILL	40	10

REDUCED PUMP SPEED

No.	Pressure (kpa)	Strokes/min	Depth (m)

CIRCULATION

Pump	Type	Liner Size (mm)	SPM	Pressure (kpa)	Hours Run
1		140	125	6600	8

Remarks

HOLE CONDITION

Hole Drag Up (daN)	
Hole Drag Down (daN)	
Torque at Bottom (Nm)	
Fill on Bottom (m)	

BOILER

No.	Hours Run	pH	Stack Temp (°C)

DEVIATION SURVEYS

Time	Depth (m)	Deviation	Direction	Type
08:00	850.00	0.7	25	DIRECTIONAL
09:45	898.00	0.6	327	DIRECTIONAL

TIME LOG

From	To	Elapsed	Code	Details of Operations in Sequence & Remarks
08:00	08:15	0.25	21	SAFETY MEETING DRILLER HAND OFF
08:15	08:30	0.25	7	RIG SERVICE F/T MOTOR KILL
08:30	14:45	6.25	2	DRILL
14:45	16:00	1.25	10	ACCUM SURVEYS & CONNECTION TIME

Remarks:

TOUR 3 — SIGNATURE OF DRILLER: JARET LAURENT — START TIME 16:00 — END TIME 24:00

DRILLING ASSEMBLY

No.	Component	OD (mm)	ID (mm)	Length (m)
1	BIT & TOOLS	0		39.13
0	Drill Pipe	Stands (m)		0.00
1[illegible]	Drill Pipe	Singles (m)		1038.65
Weight of DC (daN)		Kelly Down (m)		4.22
Weight of string (daN)	27	Total (m)		1082.00

BITS

Bit Number	1A
Size (mm)	311
IADC Code	
Manufacturer	SECURITY
Type	GT11
Serial No	8022801
Jets (mm)	19.1 19.1
Depth Out (m)	202
Depth In (m)	0
Total Drilled (m)	202
Hrs Run Today	
Cumulative Hrs Run	5.25
Entry Date	

DULL GRADE

T1		Gage (mm)	
T2		ODC	
MDC		Reason Pulled	
LOC		Total Run (m/hr)	38.48
BRG			

MUD RECORD

Mud Type: Water ☐ Oil ☐ Other

Time	16:00	20:00	
Density (kg/m³)	1120	1140	
Funnel Viscosity (s/l)	45	70	
Fluid Loss (cm³)	15.0	12.0	
pH	8	9	
Location			
Depth (m)			
PVT (m³)			

MUD MATERIALS ADDED

Product	Amount	Type
ENERPAC LO VIS	1	SX
ENERPAC REGULAR	4	SX
CAUSTIC	1	SX

SOLIDS CONTROL

Equipment Name	Hours Run	Intake Density (kg/m³)	Over Flow Density (kg/m³)	Under Flow Density (kg/m³)

SAFETY

Safety Topic	MEHL (daN)	MACP (kpa)
GREEN FLOORHANDS	45	

METRES DRILLED

From (m)	To (m)	D-R-C	RPM	WOB (daN)
1015	1082	DRILL	40	10

REDUCED PUMP SPEED

No.	Pressure (kpa)	Strokes/min	Depth (m)

CIRCULATION

Pump	Type	Liner Size (mm)	SPM	Pressure (kpa)	Hours Run
1	SINGLE	140	124	5400	8

Remarks

HOLE CONDITION

Hole Drag Up (daN)	
Hole Drag Down (daN)	
Torque at Bottom (Nm)	
Fill on Bottom (m)	

BOILER

No.	Hours Run	pH	Stack Temp (°C)

DEVIATION SURVEYS

Time	Depth (m)	Deviation	Direction	Type

TIME LOG

From	To	Elapsed	Code	Details of Operations in Sequence & Remarks
16:00	16:15	0.25	21	SAFETY MEETING AND DRILLER HANDOFF
16:15	18:45	2.50	2	CONTROL DRILL @ 20 M/HR FR 1015M T0 1061 M
18:45	20:00	1.25	2	DRILL
20:00	20:30	0.50	5	CIRCULATE BOTTOM HOLE SAMPLE
20:30	20:45	0.25	7	RIG SERVICE - F/T ANNULAR AND CROWN SAVER
20:45	22:00	1.25	6	WIPER TRIP- 47 STANDS
22:00	22:15	0.25	21	SAFETY MEETING WITH DIRECTIONAL
22:15	23:15	1.00	20	DIRECTIONAL WORK- LAY DOWN DIR. TOOLS
23:15	24:00	0.75	6	RIH SLICK

Remarks

FRONT PAGE SUMMARY

Tour Sheet Serial Number	Vendor Software Version	Year	Month	Day
DXG31_23100708_1A	Pason	2010	07	08

Rig No.	Well Name	Surface Location	Prov	Loc Type	Unique Well Id	Kelly Bushing
1	MOLOPO FIREBIRD PROV HZ LSD 08-01	13-32-001-29W1	MB	DLS		4

License No.	Operator	Contractor	Well Type	Re-Entry
7447	MOLOPO ENERGY CANADA LTD	ADVANCE DRILLING LTD	HORIZ	☐
	Operator's AFE	Contractor's Job No	Spud Date	Time
		19-10-394	2010-07-07	11:00
	Signature of Operator Representative	Signature of Contractor's Rig manager	Rig Release Date	Time
	Mark Mazurat	GARY MILLIONS		

DAILY CHECKS

	OP	RM
1) Daily Walk Around Inspection	mach	GM
2) Derrick Inspection - Weekly (Using Check List)		
3) H2S Scan Packet if Required	mach	GM
4) Wind Indicator & Sock Inspected Replaced	mach	GM
5) Flare Lines Tested	mach	GM
6) BOP Drills Performed	mach	GM
7) Visually Inspected BOPs - Flare Lines & Diagnoser Lines	mach	GM
1) Rig Site Health & Safety Meeting conducted/recorded		
2) CAODC Rig Safety Inspection Checklist completed/amended		
3) Motor Inspection before Rigging or Lowering		
4) Crown Saver Checked		GM
5) Motor RPM Checked		GM

FUEL @ 08:00 HOURS

Rig	20
Boiler	0
Op Fuel	1520

WEATHER

Time	06:00
Temp	13
Current Conditions	CLEAR
Wind Direction	NW
Wind Strength	CALM
Road Condition	FAIR

DRILL PIPE

Category	Thread Type	Grade	OD (mm)	ID (mm)	Linear Mass (kg/m)	No. of Joints	Tool Joint OD (mm)
DC	4 5 XH		159	57	135.02	14	159
DP	4 FH	E	102	85	20.83	180	102
HW	4 FH		102	85	44.10	60	102

MUD PUMPS

No.	Make	Stroke Length (mm)
1	EMSCO	229

GENERAL EQUIPMENT & SERVICES

Description	Hours

CAODC Pason

CASING

Category	Make	Grade	OD (mm)	ID (mm)	Linear Mass (kg/m)	No. of Joints	Total Length (m)	KB to CSG Head (m)	KB to CSG Bottom (m)
SURFACE	EVRAZ	J-55	219	208	35.72	16	202	4	202

SHALE SHAKERS

No	Top Screen			Middle Screen			Middle Screen			Bottom Screen		
	Size	Changed	New	Size	Changed	New	Size	Changed	New	Size	Changed	New
1	50	☒	☐	50	☒	☐	50	☒	☐		☐	☐
		☐	☐		☐	☐		☐	☐		☐	☐

TOUR 1

SIGNATURE OF DRILLER: KELLY MILLIONS — START TIME: 00:00 — END TIME: 08:00

DRILLING ASSEMBLY

No.	Component	OD (mm)	ID (mm)	Length (m)
1	BIT	0		0.35
1	BELL SUB	0		1.15
1	X/O	0		0.55
12	D/Cs	0		107.80
1	[illegible]	0		0.96
0	Drill Pipe	Stands (m)		0.00
9	Drill Pipe	Singles (m)		84.31
Weight of DC (klbf#)	17	Kelly Down (m)		6.88
Weight of string (klbf#)	18	Total (m)		202.00

BITS

Bit Number	1A
Size (mm)	311
IADC Code	
Manufacturer	SECURITY
Type	GT11
Serial No	8022801
Jets (mm)	19 1 19 1
Depth Out (m)	202
Depth In (m)	0
Total Drilled (m)	202
Hrs Run Today	
Cumulative Hrs Run	5.25
Entry Date	

DULL GRADE

T_1		Gage (mm)	
T_2		ODC	
MDC		Reason Pulled	
LOC		Total Run (m/hr)	38.48
BRG			

MUD RECORD

Mud Type	Water ☐	Oil ☐	Other ☐	
Time				
Density (kg/m³)				
Funnel Viscosity (s/l)				
Fluid Loss (cm³)				
pH				
Location				
Depth (m)				
PVT (m³)				

MUD MATERIALS ADDED

Product	Amount	Type

SOLIDS CONTROL

Equipment Name	Hours Run	Intake Density (kg/m³)	Over Flow Density (kg/m³)	Under Flow Density (kg/m³)

SAFETY

Safety Topic	MEHL (klbf#)	MACP (kpa)

METRES DRILLED

From (m)	To (m)	D-R-C	RPM	WOB (klbf#)

REDUCED PUMP SPEED

No.	Pressure (kpa)	Strokes/min	Depth (m)
	●	●	
	●	●	
	●	●	

CIRCULATION

Pump	Type	Liner Size (mm)	SPM	Pressure (kpa)	Hours Run
1		140	150	3100	0

Remarks

HOLE CONDITION

Hole Drag Up (klbf#)	
Hole Drag Down (klbf#)	
Torque at Bottom (klbf)	
Fill on Bottom (m)	

BOILER

No.	Hours Run	pH	Stack Temp (°C)

DEVIATION SURVEYS

Time	Depth (m)	Deviation	Direction	Type

TIME LOG

From	To	Elapsed	Code	Details of Operations in Sequence & Remarks
00:00	00:15	0.25	5	CONDITION MUD & CIRCULATE
00:15	00:30	0.25	8	P.O.O.H FOR CASING
00:30	00:45	0.25	21	SAFETY MEETING RUN CASING - F/T CROWN SAVER
00:45	02:00	1.25	12	RIG TO AND RUN 16 JOINTS 219.1mm, 35.72kgm, J-55 CASING LENGTH 202.5m
02:00	05:00	3.00	5	CIRCULATE AND WAIT ON CEMENTERS
05:00	05:15	0.25	21	SAFETY MEETING WITH CEMENTERS200
05:15	06:00	0.75	12C	CEMENT CASING W/ 14T SURFACE SLURRY 1750, DISPLACE W 6.5M3 FRESH WATER, BUMP
				PLUG @5.5 HRS, FLOAT HELD OK, LANDED @202m, W 3M3 GOOD CEMENT RETURNS
06:00	08:00	2.00	13	WAIT ON CEMENT

Remarks

TOUR 2

SIGNATURE OF DRILLER: JASON HAINES — START TIME: 08:00 — END TIME: 16:00

DRILLING ASSEMBLY

No.	Component	OD (mm)	ID (mm)	Length (m)
1	BIT & TOOLS	0		39.13
0	Drill Pipe	Stands (m)		0.00
17	Drill Pipe	Singles (m)		158.73
Weight of DC (klbf#)		Kelly Down (m)		12.14
Weight of string (klbf#)		Total (m)		210.00

BITS

Bit Number	1A
Size (mm)	311
IADC Code	
Manufacturer	SECURITY
Type	GT11
Serial No	8022801
Jets (mm)	19 1 19 1
Depth Out (m)	202
Depth In (m)	0
Total Drilled (m)	202
Hrs Run Today	0.00
Cumulative Hrs Run	5.25
Entry Date	

DULL GRADE

T_1		Gage (mm)	
T_2		ODC	
MDC		Reason Pulled	
LOC		Total Run (m/hr)	38.48
BRG			

MUD RECORD

Mud Type	Water ☒	Oil ☐	Other ☐	
Time				
Density (kg/m³)				
Funnel Viscosity (s/l)				
Fluid Loss (cm³)				
pH				
Location				
Depth (m)				
PVT (m³)				

MUD MATERIALS ADDED

Product	Amount	Type
CALCIUM NITRATE	15	SX

SOLIDS CONTROL

Equipment Name	Hours Run	Intake Density (kg/m³)	Over Flow Density (kg/m³)	Under Flow Density (kg/m³)

SAFETY

Safety Topic	MEHL (klbf#)	MACP (kpa)

METRES DRILLED

From (m)	To (m)	D-R-C	RPM	WOB (klbf#)
202	210	DRILL	45	2

REDUCED PUMP SPEED

No.	Pressure (kpa)	Strokes/min	Depth (m)
	●	●	
	●	●	
	●	●	

CIRCULATION

Pump	Type	Liner Size (mm)	SPM	Pressure (kpa)	Hours Run
1		140	105	2100	8

Remarks

HOLE CONDITION

Hole Drag Up (klbf#)	
Hole Drag Down (klbf#)	
Torque at Bottom (klbf)	
Fill on Bottom (m)	

BOILER

No.	Hours Run	pH	Stack Temp (°C)

DEVIATION SURVEYS

Time	Depth (m)	Deviation	Direction	Type

TIME LOG

From	To	Elapsed	Code	Details of Operations in Sequence & Remarks
08:00	08:15	0.25	21	SAFETY MEETING DRILLER HAND OFF
08:15	08:30	0.25	13	WAIT ON CEMENT
08:30	09:30	1.00	25	CUT CASING WELD BOWL SER# YB090652
09:30	10:00	0.50	14A	NIPPLE UP BOPS
10:00	10:45	0.75	15A	PRESSURE TEST BOPS AND MANIFOLD
10:45	11:00	0.25	6	R I H COLLARS OPEN ENDED
11:00	11:45	0.75	15A	PRESSURE TEST BOPS AND MANIFOLD
11:45	12:15	0.50	6	LAY DOWN COLLARS
12:15	12:30	0.25	21	SAFETY MEETING WITH PHOENIX
12:30	13:30	1.00	20	DIRECTIONAL WORK MAKE UP BIT & TOOLS MOTOR SETTING 1.5 DEG
13:30	14:00	0.50	6	R I H PICK UP 8 SINGLES
14:00	15:00	1.00	2C	DRILL CEMENT/DRILL OUT CEMENT/DRILL FLOAT&SHOE
15:00	15:15	0.25	7	RIG SERVICE

Remarks

TOUR 3

SIGNATURE OF DRILLER: JARET LAURENT — START TIME: 16:00 — END TIME: 24:00

DRILLING ASSEMBLY

No.	Component	OD (mm)	ID (mm)	Length (m)
1	BIT & TOOLS	0		39.13
0	Drill Pipe	Stands (m)		0.00
53	Drill Pipe	Singles (m)		496.25
Weight of DC (klbf#)		Kelly Down (m)		4.59
Weight of string (klbf#)		Total (m)		540.00

BITS

Bit Number	1A
Size (mm)	200
IADC Code	
Manufacturer	SECURITY
Type	GT11
Serial No	5022501
Jets (mm)	19 1 19 1
Depth Out (m)	202
Depth In (m)	0
Total Drilled (m)	202
Hrs Run Today	
Cumulative Hrs Run	5.25
Entry Date	

DULL GRADE

T_1		Gage (mm)	
T_2		ODC	
MDC		Reason Pulled	
LOC		Total Run (m/hr)	38.48
BRG			

MUD RECORD

Mud Type	Water ☒	Oil ☐	Other ☐	
Time				
Density (kg/m³)				
Funnel Viscosity (s/l)				
Fluid Loss (cm³)				
pH				
Location				
Depth (m)				
PVT (m³)				

MUD MATERIALS ADDED

Product	Amount	Type
HYPERDRILL 204	2	SX
CALCIUM NITRATE	4	SX

SOLIDS CONTROL

Equipment Name	Hours Run	Intake Density (kg/m³)	Over Flow Density (kg/m³)	Under Flow Density (kg/m³)

SAFETY

Safety Topic	MEHL (klbf#)	MACP (kpa)
BOOM LINE	16	1724

METRES DRILLED

From (m)	To (m)	D-R-C	RPM	WOB (klbf#)
210	540	DRILL	45	6

REDUCED PUMP SPEED

No.	Pressure (kpa)	Strokes/min	Depth (m)
	●	●	
	●	●	
	●	●	

CIRCULATION

Pump	Type	Liner Size (mm)	SPM	Pressure (kpa)	Hours Run
1	SKYTE	140	124	4000	8

Remarks

HOLE CONDITION

Hole Drag Up (klbf#)	
Hole Drag Down (klbf#)	
Torque at Bottom (klbf)	
Fill on Bottom (m)	

BOILER

No.	Hours Run	pH	Stack Temp (°C)

DEVIATION SURVEYS

Time	Depth (m)	Deviation	Direction	Type
17:15	284.00	0.3	177	DIRECTIONAL
19:30	384.00	0.6	170	DIRECTIONAL
22:03	490.00	2.5	36	DIRECTIONAL
23:15	537.00	0.5	12	DIRECTIONAL

TIME LOG

From	To	Elapsed	Code	Details of Operations in Sequence & Remarks
16:00	16:15	0.25	21	SAFETY MEETING AND DRILLER HANDOFF
16:15	16:30	0.25	7	RIG SERVICE - F/T CROWN SAVER AND MOTOR KILLS
16:30	23:30	7.00	2	ACCUM DRILL
23:30	24:00	0.50	10	ACCUM MWD SURVEYS

Remarks

FRONT PAGE SUMMARY

Tour Sheet Serial Number	Vendor Software Version	Year	Month	Day
DXG31_20100707_1A	Pason	2010	07	07

Rig No	Well Name	Surface Location	Prov	Loc Type	Unique Well Id	Kelly Bushing
1	MCL CPD PERSON PROV [07-13-32-001-29W1]	13-32-001-29W1	MB	DLS		4

License No	Operator	Contractor	Well Type	Re-Entry
7447	MOLOPO ENERGY CANADA LTD	ADVANCE DRILLING LTD	HORIZ	☐

Operator's AFE	Contractor's Job No	Spud Date	Time
	19-10-394	2010/07/07	11:00

Signature of Operator Representative	Signature of Contractor's Rig manager	Rig Release Date	Time
Mark Mazurat	GARY MILLIONS		

DAILY CHECKS

	OP	RM
1) Daily Walk Around Inspection	(mm/d)	GM
2) Derailed Inspection - Weekly Using Check List	(mm/d)	GM
3) H2S Alarm Systems / Response	(mm/d)	GM
4) Well Licence & Slick Diagram Posted	(mm/d)	GM
5) Flare Lines Staked	(mm/d)	GM
6) BOP Drills Performed		
7) Visually Inspected BOPs - Flare Lines & Degasser Lines		
1) Rig Site Health & Safety Meeting (one/crew/month)		
2) CAODC Rig Safety Inspection Checklist (one/rig/month)		
3) Mast Inspection before Raising or Lowering		GM
4) Crown Saver Checked		
5) Mast Bolts Checked		

FUEL @ 08:00 HOURS

Rig	39
Boiler	0
Op Fuel	0

WEATHER

Time	05:00
Temp	12
Current Conditions	CLEAR
Wind Direction	NW
Wind Strength	CALM
Road Condition	FAIR

DRILL PIPE

Category	Thread Type	Grade	OD (mm)	ID (mm)	Linear Mass (kg/m)	No. of Joints	Tool Joint OD (mm)
DC	4.5 XH		159	57	135.02	14	159
DP	4 FH	E	102	85	20.83	180	102
HW	4 FH		102	85	44.10	60	102

MUD PUMPS

No.	Make	Stroke Length (mm)
1	EMSCO	229

GENERAL EQUIPMENT & SERVICES

Description	Hours

CASING

Category	Make	Grade	OD (mm)	ID (mm)	Linear Mass (kg/m)	No. of Joints	Total Length (m)	KB to CSG Head (m)	KB to CSG Bottom (m)

SHALE SHAKERS

No	Top Screen			Middle Screen			Middle Screen			Bottom Screen		
	Size	Changed	New	Size	Changed	New	Size	Changed	New	Size	Changed	New
1	50	☒	☐	50	☒	☐	50	☒	☐		☐	☐
		☐	☐		☐	☐		☐	☐		☐	☐

Pason

TOUR 1

SIGNATURE OF DRILLER: KELLY MILLIONS — START TIME: 00:00 — END TIME: 08:00

DRILLING ASSEMBLY

No.	Component	OD (mm)	ID (mm)	Length (m)

	Drill Pipe	Stands (m)	
	Drill Pipe	Singles (m)	
Weight of DC (kdaN)		Kelly Down (m)	
Weight of string (kdaN)		Total (m)	

BITS

Bit Number	
Size (mm)	
IADC Code	
Manufacturer	
Type	
Serial No.	
Jets (mm)	
Depth Out (m)	
Depth In (m)	
Total Drilled (m)	
Hrs Run Today	
Cumulative Hrs Run	
Entry Date	

DULL GRADE

T_i		Gage (mm)	
T_f		ODC	
MDC		Reason Pulled	
LDC		Total Run (m/hr)	
BRG			

MUD RECORD

Mud Type	Water ☐	Oil ☐	Other ☐	
Time				
Density (kg/m³)				
Funnel Viscosity (s/l)				
Fluid Loss (cm³)				
pH				
Location				
Depth (m)				
PVT (m³)				

MUD MATERIALS ADDED

Product	Amount	Type

METRES DRILLED

From (m)	To (m)	D-R-C	RPM	WOB (kdaN)

REDUCED PUMP SPEED

No.	Pressure (kpa)	Strokes/min	Depth (m)
	@	@	
	@	@	
	@	@	

HOLE CONDITION

Hole Drag Up (kdaN)	
Hole Drag Down (kdaN)	
Torque at Bottom (klbf)	
Fill on Bottom (m)	

BOILER

No.	Hours Run	pH	Stack Temp (°C)

SOLIDS CONTROL

Equipment Name	Hours Run	Intake Density (kg/m³)	Over Flow Density (kg/m³)	Under Flow Density (kg/m³)

CIRCULATION

Pump	Type	Liner Size (mm)	SPM	Pressure (kpa)	Hours Run
1		140	0	0	0

Remarks

DEVIATION SURVEYS

Time	Depth (m)	Deviation	Direction	Type

SAFETY

Safety Topic	MEHL (kdaN)	MACP (kpa)

TIME LOG

From	To	Elapsed	Code	Details of Operations in Sequence & Remarks
00:00	08:00	8.00	24	RIG WATCH

Remarks: GRAVEYARDS WORKED DAYLIGHTS - MOVED RIG & RIG UP

TOUR 2

SIGNATURE OF DRILLER: JASON HAINES — START TIME: 08:00 — END TIME: 16:00

DRILLING ASSEMBLY

No.	Component	OD (mm)	ID (mm)	Length (m)
1	BIT	0		0.35
1	BELL SUB	0		1.15
1	X/O	0		0.55
12	D/C's	0		107.80
0	Drill Pipe	Stands (m)		0.00
0	Drill Pipe	Singles (m)		0.00
Weight of DC (kdaN)	17	Kelly Down (m)		12.15
Weight of string (kdaN)		Total (m)		122.00

BITS

Bit Number	1
Size (mm)	311
IADC Code	
Manufacturer	SECURITY
Type	GT11
Serial No.	8022801
Jets (mm)	19 | 19 |
Depth Out (m)	122
Depth In (m)	0
Total Drilled (m)	122
Hrs Run Today	3.50
Cumulative Hrs Run	3.50
Entry Date	

DULL GRADE

T_i		Gage (mm)	
T_f		ODC	
MDC		Reason Pulled	
LDC		Total Run (m/hr)	34.86
BRG			

MUD RECORD

Mud Type	Water ☒	Oil ☐	Other ☐	
Time				
Density (kg/m³)				
Funnel Viscosity (s/l)				
Fluid Loss (cm³)				
pH				
Location				
Depth (m)				
PVT (m³)				

MUD MATERIALS ADDED

Product	Amount	Type
CAUSTIC	1	SX
GEL	15	SX
LIME	1	SX

METRES DRILLED

From (m)	To (m)	D-R-C	RPM	WOB (kdaN)
0	122	DRILL	250	4

REDUCED PUMP SPEED

No.	Pressure (kpa)	Strokes/min	Depth (m)
	@	@	
	@	@	
	@	@	

HOLE CONDITION

Hole Drag Up (kdaN)	
Hole Drag Down (kdaN)	
Torque at Bottom (klbf)	
Fill on Bottom (m)	

BOILER

No.	Hours Run	pH	Stack Temp (°C)

SOLIDS CONTROL

Equipment Name	Hours Run	Intake Density (kg/m³)	Over Flow Density (kg/m³)	Under Flow Density (kg/m³)

CIRCULATION

Pump	Type	Liner Size (mm)	SPM	Pressure (kpa)	Hours Run
1		140	145	1000	8

Remarks

DEVIATION SURVEYS

Time	Depth (m)	Deviation	Direction	Type
12:00	32.00	0.5	0	
12:30	59.00	0.5	0	
14:00	94.00	0.5	0	
15:30	120.00	0.2	0	

SAFETY

Safety Topic	MEHL (kdaN)	MACP (kpa)

TIME LOG

From	To	Elapsed	Code	Details of Operations in Sequence & Remarks
08:00	08:15	0.25	21	SAFETY MEETING W/TH FAST TRUCKING
08:15	11:00	2.75	1A	MOVE RIG & RIG UP - RIGGED READY TO SPUD - SPUD TIME IS 1100 HRS
11:00	11:15	0.25	21	SAFETY MEETING - PRE DRILL
11:15	11:45	0.50	2	DRILL
11:45	12:00	0.25	10	DEVIATION SURVEY @ 32M 1/2 DEG
12:00	12:30	0.50	2	DRILL
12:30	12:45	0.25	10	DEVIATION SURVEY @ 59M 1/2 DEG
12:45	14:00	1.25	2	DRILL
14:00	14:15	0.25	10	DEVIATION SURVEY @ 94M 1/2 DEG
14:15	15:30	1.25	2	DRILL
15:30	15:45	0.25	10	DEVIATION SURVEY @ 120 M 25 DEG
15:45	16:00	0.25	7	RIG SERVICE

Remarks

TOUR 3

SIGNATURE OF DRILLER: JARET LAURENT — START TIME: 16:00 — END TIME: 24:00

DRILLING ASSEMBLY

No.	Component	OD (mm)	ID (mm)	Length (m)
1	BIT	0		0.35
1	BELL SUB	0		1.15
1	X/O	0		0.55
12	D/C's	0		107.80
1	reamer	0		0.96
0	Drill Pipe	Stands (m)		0.00
14	Drill Pipe	Singles (m)		84.31
Weight of DC (kdaN)	17	Kelly Down (m)		6.88
Weight of string (kdaN)	18	Total (m)		202.00

BITS

Bit Number	1
Size (mm)	311
IADC Code	
Manufacturer	SECURITY
Type	GT11
Serial No.	8022801
Jets (mm)	19 | 19 |
Depth Out (m)	202
Depth In (m)	0
Total Drilled (m)	202
Hrs Run Today	1.75
Cumulative Hrs Run	5.25
Entry Date	

DULL GRADE

T_i		Gage (mm)	
T_f		ODC	
MDC		Reason Pulled	
LDC		Total Run (m/hr)	38.48
BRG			

MUD RECORD

Mud Type	Water ☒	Oil ☐	Other ☐	
Time				
Density (kg/m³)				
Funnel Viscosity (s/l)				
Fluid Loss (cm³)				
pH				
Location				
Depth (m)				
PVT (m³)				

MUD MATERIALS ADDED

Product	Amount	Type
GEL	15	SX
LIME	4	SX
SAWDUST	6	SX

METRES DRILLED

From (m)	To (m)	D-R-C	RPM	WOB (kdaN)
122	202	DRILL	275	5

REDUCED PUMP SPEED

No.	Pressure (kpa)	Strokes/min	Depth (m)
	@	@	
	@	@	
	@	@	

HOLE CONDITION

Hole Drag Up (kdaN)	
Hole Drag Down (kdaN)	
Torque at Bottom (klbf)	
Fill on Bottom (m)	

BOILER

No.	Hours Run	pH	Stack Temp (°C)

SOLIDS CONTROL

Equipment Name	Hours Run	Intake Density (kg/m³)	Over Flow Density (kg/m³)	Under Flow Density (kg/m³)

CIRCULATION

Pump	Type	Liner Size (mm)	SPM	Pressure (kpa)	Hours Run
1		140	145	3500	8

Remarks

DEVIATION SURVEYS

Time	Depth (m)	Deviation	Direction	Type
16:30	148.00	0.8	0	
17:45	175.00	1.0	0	
	194.00	1.0	0	

SAFETY

Safety Topic	MEHL (kdaN)	MACP (kpa)

TIME LOG

From	To	Elapsed	Code	Details of Operations in Sequence & Remarks
16:00	16:15	0.25	21	SAFETY MEETING AND DRILLER HANDOFF
16:15	16:30	0.25	2	DRILL
16:30	16:45	0.25	10	DEVIATION SURVEY @ 148 M 3/4 DEG
16:45	17:00	0.25	7	RIG SERVICE
17:00	17:45	0.75	2	DRILL
17:45	18:00	0.25	10	DEVIATION SURVEY @ 175 M 1 DEG
18:00	18:30	0.50	2	DRILL
18:30	21:45	3.25	6	REAMER TRIP - CLEAN TIGHT SPOTS REAM TO BOTTOM
21:45	22:00	0.25	2	DRILL
22:00	22:30	0.50	5	CONDITION MUD & CIRCULATE
22:30	22:45	0.25	10	DEVIATION SURVEY @ 194 M 1 DEG
22:45	24:00	1.25	6	WIPER TRIP

Remarks

Drilling Tours

FRONT PAGE SUMMARY

Tour Sheet Serial Number	Vendor Software Version	Yes	Month	Day
	Pason	2010	07	16

Rig No	Well Name	Surface Location	Prov	Loc Type	Unique Well Id	Kelly Bushing
1	[redacted]	13-32-001-29W1	MB	DLS		4

License No	Operator	Contractor	Well Type	Re-Entry
7447	MCLOPS ENERGY CANADA LTD	ADVANCE DRILLING LTD	HORIZ	☐
	Operator's AFE	Contractor's Job No	Spud Date	Time
		19-10-394	2010.07.07	11:00
	Signature of Operator Representative	Signature of Contractor's Rig manager	Rig Release Date	Time

DAILY CHECKS

	OP	RM
1) Daily Walk Around Inspection	mech	GM
2) Derrick Inspection - Weekly (Upon Crews Last)	mech	GM
3) H2S Signs Posted if Required	mech	GM
4) Well Licence & Stack Diagram Posted	mech	GM
5) Flare Lines Spaced	mech	GM
6) BOP Drills Performed		
7) Visually Inspected BOP) - Flare Lines & Degasser Lines		GM
1) Pre Tour Health & Safety Meeting completed/attended		
2) COSHH Pre Safety Inspection Checklist completed		
3) Visual Inspection before Repairs or Lowering		GM
4) Crown Saver Checked		GM
5) Mixer Rills Checked		GM

FUEL @ 08:00 HOURS

Rig	45
Boiler	0
On Fuel	2400

WEATHER

Time	06:00
Temp	15
Current Conditions	PARTLY CLOUDY
Wind Direction	NW
Wind Strength	CALM
Road Condition	GOOD

DRILL PIPE

Category	Thread Type	Grade	OD (mm)	ID (mm)	Linear Mass (kg/m)	No. of Joints	Total Joint OD (mm)
DC	4 S XH		159	57	135.02	14	159
DP	4 FH	E	102	85	20.83	180	102
HW	4 FH		102	85	44.10	60	102

MUD PUMPS

No	Make	Stroke Length (mm)
1	EMSCO	229

GENERAL EQUIPMENT & SERVICES

Description	Hours

Pason

CASING

Category	Make	Grade	OD (mm)	ID (mm)	Linear Mass (kg/m)	No. of Joints	Total Length (m)	KB to CSG Head (m)	KB to CSG Bottom (m)
SURFACE	EVRAZ	J-55	219	208	35.72	16	202	4	202
PRODUCTION	EVRAZ	J-55	139	126	23.07	157	1999	4	1999

SHALE SHAKERS

No	Top Screen			Middle Screen			Middle Screen			Bottom Screen		
	Size	Changed	New	Size	Changed	New	Size	Changed	New	Size	Changed	New
1	210	☐	☐	210	☐	☐	210	☐	☐		☐	☐
		☐	☐		☐	☐		☐	☐		☐	☐

TOUR 1

SIGNATURE OF DRILLER: DEREK LAURENT — START TIME: 00:00 — END TIME: 08:00

DRILLING ASSEMBLY

No	Component	OD (mm)	ID (mm)	Length (m)
1	BIT	0		0.25
2	BIT SUB	0		0.88
3	X/O	0		0.55
4	[redacted]	180		1.78
5	144 DP	0		1350.84
6	60 HWDP	0		557.45
0	Drill Pipe	Stands (m)		0.00
5	Drill Pipe	Singles (m)		46.58
Weight of DC (kdaN)		Kelly Down (m)		0.00
Weight of string (kdaN)	31	Total (m)		1958.33

BITS

Bit Number	1A
Size (mm)	311
IADC Code	
Manufacturer	SECURITY
Type	GT11
Serial No	6022831
Jets (mm)	19 19
Depth Out (m)	202
Depth In (m)	0
Total Drilled (m)	202
Hrs Run Today	
Cumulative Hrs Run	5.25
Entry Date	

DULL GRADE

T		Cage (mm)	
T_x		ODC	
MDC		Reason Pulled	
LOC		Total Run (m/hr)	38.48
BRG			

MUD RECORD

Mud Type	Water ☑	Oil ☐	Other ☐	
Time				
Density (kg/m³)				
Funnel Viscosity (s/l)				
Fluid Loss (cm³)				
pH				
Location				
Depth (m)				
PVT (m³)				

MUD MATERIALS ADDED

Product	Amount	Type
WALNUT	15	SX
ENERPAC REGULAR	9	SX
MINERAL OIL	1	TOTE

METRES DRILLED

From (m)	To (m)	D-R-C	RPM	WOB (kdaN)

REDUCED PUMP SPEED

No.	Pressure (kpa)	Strokes/min	Depth (m)
	@	@	
	@	@	
	@	@	

CIRCULATION

Pump	Type	Liner Size (mm)	SPM	Pressure (kpa)	Hours Run
1		140	120	7000	8

Remarks

SOLIDS CONTROL

Equipment Name	Hours Run	Intake Density (kg/m³)	Over Flow Density (kg/m³)	Under Flow Density (kg/m³)

SAFETY

Safety Topic	MEHL (kdaN)	MACP (kpa)

HOLE CONDITION

Hole Drag Up (kdaN)	
Hole Drag Down (kdaN)	
Torque at Bottom (kNm)	
Fill on Bottom (m)	

BOILER

No.	Hours Run	pH	Stack Temp (°C)

DEVIATION SURVEYS

Time	Depth (m)	Deviation	Direction	Type

TIME LOG

From	To	Elapsed	Code	Details of Operations in Sequence & Remarks
00:00	00:15	0.25	21	SAFETY MEETING DRILLER HAND OFF
00:15	02:30	2.25	5	CONDITION MUD & CIRCULATE STRAP AND DRIFT CASING
02:30	03:00	0.50	5	PUMP PILL
03:00	03:15	0.25	7	RIG SERVICE F/T ANNULAR AND CROWN SAVER
03:15	06:30	3.25	6	LAY DOWN PIPE
06:30	06:45	0.25	21	SAFETY MEETING WITH GREAT WESTERN
06:45	08:00	1.25	12	DRIFT CASING AND RIG IN TONG HAND

Remarks

TOUR 2

SIGNATURE OF DRILLER: KELLY MILLIONS — START TIME: 08:00 — END TIME: 16:00

DRILLING ASSEMBLY

No.	Component	OD (mm)	ID (mm)	Length (m)
	Drill Pipe	Stands (m)		
	Drill Pipe	Singles (m)		
Weight of DC (kdaN)		Kelly Down (m)		
Weight of string (kdaN)		Total (m)		

BITS

Bit Number	
Size (mm)	
IADC Code	
Manufacturer	
Type	
Serial No	
Jets (mm)	
Depth Out (m)	
Depth In (m)	
Total Drilled (m)	
Hrs Run Today	
Cumulative Hrs Run	
Entry Date	

DULL GRADE

T		Cage (mm)	
T_x		ODC	
MDC		Reason Pulled	
LOC		Total Run (m/hr)	
BRG			

MUD RECORD

Mud Type	Water ☑	Oil ☐	Other ☐	
Time				
Density (kg/m³)				
Funnel Viscosity (s/l)				
Fluid Loss (cm³)				
pH				
Location				
Depth (m)				
PVT (m³)				

MUD MATERIALS ADDED

Product	Amount	Type
DESCO	4	SX

METRES DRILLED

From (m)	To (m)	D-R-C	RPM	WOB (kdaN)

REDUCED PUMP SPEED

No.	Pressure (kpa)	Strokes/min	Depth (m)
	@	@	
	@	@	
	@	@	

CIRCULATION

Pump	Type	Liner Size (mm)	SPM	Pressure (kpa)	Hours Run
1		140	70	2000	0

Remarks

SOLIDS CONTROL

Equipment Name	Hours Run	Intake Density (kg/m³)	Over Flow Density (kg/m³)	Under Flow Density (kg/m³)

SAFETY

Safety Topic	MEHL (kdaN)	MACP (kpa)
RUN CASING		

HOLE CONDITION

Hole Drag Up (kdaN)	
Hole Drag Down (kdaN)	
Torque at Bottom (kNm)	
Fill on Bottom (m)	

BOILER

No.	Hours Run	pH	Stack Temp (°C)

DEVIATION SURVEYS

Time	Depth (m)	Deviation	Direction	Type

TIME LOG

From	To	Elapsed	Code	Details of Operations in Sequence & Remarks
08:00	08:15	0.25	7	RIG SERVICE
08:15	12:15	4.00	12	RUN CASING
12:15	14:30	2.25	5	CONDITION MUD & CIRCULATE
14:30	14:45	0.25	21	SAFETY MEETING WITH HALIBURTON
14:45	16:00	1.25	12C	CEMENT AND DISPLACE

Remarks

TOUR 3

SIGNATURE OF DRILLER: JARET LAURENT — START TIME: 16:00 — END TIME: 24:00

DRILLING ASSEMBLY

No	Component	OD (mm)	ID (mm)	Length (m)
	Drill Pipe	Stands (m)		
	Drill Pipe	Singles (m)		
Weight of DC (kdaN)		Kelly Down (m)		
Weight of string (kdaN)		Total (m)		

BITS

Bit Number	
Size (mm)	
IADC Code	
Manufacturer	
Type	
Serial No	
Jets (mm)	
Depth Out (m)	
Depth In (m)	
Total Drilled (m)	
Hrs Run Today	
Cumulative Hrs Run	
Entry Date	

DULL GRADE

T		Cage (mm)	
T_x		ODC	
MDC		Reason Pulled	
LOC		Total Run (m/hr)	
BRG			

MUD RECORD

Mud Type	Water ☐	Oil ☐	Other ☐	
Time				
Density (kg/m³)				
Funnel Viscosity (s/l)				
Fluid Loss (cm³)				
pH				
Location				
Depth (m)				
PVT (m³)				

MUD MATERIALS ADDED

Product	Amount	Type

METRES DRILLED

From (m)	To (m)	D-R-C	RPM	WOB (kdaN)

REDUCED PUMP SPEED

No.	Pressure (kpa)	Strokes/min	Depth (m)
	@	@	
	@	@	
	@	@	

CIRCULATION

Pump	Type	Liner Size (mm)	SPM	Pressure (kpa)	Hours Run
1		140	0	0	0

Remarks

SOLIDS CONTROL

Equipment Name	Hours Run	Intake Density (kg/m³)	Over Flow Density (kg/m³)	Under Flow Density (kg/m³)

SAFETY

Safety Topic	MEHL (kdaN)	MACP (kpa)

HOLE CONDITION

Hole Drag Up (kdaN)	
Hole Drag Down (kdaN)	
Torque at Bottom (kNm)	
Fill on Bottom (m)	

BOILER

No	Hours Run	pH	Stack Temp (°C)

DEVIATION SURVEYS

Time	Depth (m)	Deviation	Direction	Type

TIME LOG

From	To	Elapsed	Code	Details of Operations in Sequence & Remarks
16:00	16:15	0.25	21	SAFETY MEETING AND DRILLER HANDOFF
16:15	17:00	0.75	12C	CEMENT CASING W/12 T SBM HILITE LEAD, AND 30 T SBM BR II TAIL, DISPLACE W/25M3 FRESH WATER, BUMP PLUG @17:10HRS, FLOAT HELD OK LANDED @1998M, W 2M3 CEMENT RETURNS
17:00	21:00	4.00	14B	NIPPLE DOWN BOPS AND INSTALL WELLHEAD
21:00	24:00	3.00	22	TEAR OUT RIG,CLEAN TANKS,SLIP AND CUT

Remarks: CARTAGE - 16 HRS @ $115 HR = $1840
FUEL - 1976 LTRES
RIG RELEASE 2200 HRS - JULY 16, '10

FRONT PAGE SUMMARY

Tour Sheet Serial Number	Vendor Software Version	Year	Month	Day
0XG31_20100715_1A	Pason	2010	07	15

Rig No	Well Name	Surface Location	Prov	Loc Type	Unique Well Id	Kelly Bushing
1	MOLOPO PIERSON PROV 13-32-1-29W1	13-32-001-29W1	MB	DLS		4

License No	Operator	Contractor	Well Type	Re-Entry
7447	MOLOPO ENERGY CANADA LTD	ADVANCE DRILLING LTD	HORIZ	☐
	Operator's AFE	Contractor's Job No	Spud Date	Time
		19-10-394	2010/07/07	11:00
	Signature of Operator Representative	Signature of Contractor's Rig manager	Rig Release Date	Time
	Mark Mazurat	GARY MILLIONS		

DAILY CHECKS

	OP	RM
1) Daily Walk Around Inspection	msm	GM
2) Detailed Inspection - Weekly (Using Check List)		
3) H2S Signs Posted if Required	msm	GM
4) Well Licence & Stick Diagram Posted	msm	GM
5) Flare Lines Staked	msm	GM
6) BOP Drills Performed		
7) Visually Inspected BOPs - Flare Lines & Degasser Lines		GM
1) Rig Site Health & Safety Meeting (one/crew/month)		
2) CAODC Rig Safety Inspection Checklist (one/rig/month)		
3) Mast Inspection before Raising or Lowering		
4) Crown Saver Checked		GM
5) Motor Kills Checked		GM

FUEL @ 08:00 HOURS

Rig	75
Boiler	0
On Fuel	2480

WEATHER

Time	06:00
Temp	17
Current Conditions	PARTLY CLOUDY
Wind Direction	NW
Wind Strength	CALM
Road Condition	GOOD

DRILL PIPE

Category	Thread Type	Grade	OD (mm)	ID (mm)	Linear Mass (kg/m)	No. of Joints	Tool Joint OD (mm)
DC	4.5 XH		159	57	135.02	14	159
DP	4 FH	E	102	85	20.83	180	102
HW	4 FH		102	85	44.10	60	102

MUD PUMPS

No.	Make	Stroke Length (mm)
1	EMSCO	229

GENERAL EQUIPMENT & SERVICES

Description	Hours

CAODC

Pason

CASING

Category	Make	Grade	OD (mm)	ID (mm)	Linear Mass (kg/m)	No. of Joints	Total Length (m)	KB to CSG Head (m)	KB to CSG Bottom (m)
SURFACE	EVRAZ	J-55	219	206	35.72	16	202	4	202

SHALE SHAKERS

No	Top Screen Size	Top Changed	Top New	Middle Screen Size	Middle Changed	Middle New	Middle Screen Size	Middle Changed	Middle New	Bottom Screen Size	Bottom Changed	Bottom New
1	210	☒	☒	210	☒	☒	210	☒	☒		☐	☐

TOUR 1

SIGNATURE OF DRILLER: DEREK LAURENT — START TIME 00:00 — END TIME 08:00

DRILLING ASSEMBLY

No.	Component	OD (mm)	ID (mm)	Length (m)
1	BIT & TOOLS	0		39.13
2	144 DP	0		1350.84
0	Drill Pipe	Stands (m)		0.00
55	Drill Pipe	Singles (m)		511.04
Weight of DC (kdaN)		Kelly Down (m)		11.99
Weight of string (kdaN)	31	Total (m)		1913.00

BITS

Bit Number	1A
Size (mm)	311
IADC Code	
Manufacturer	SECURITY
Type	GT11
Serial No	8022801
Jets (mm)	19.1 19.1
Depth Out (m)	202
Depth In (m)	0
Total Drilled (m)	202
Hrs Run Today	
Cumulative Hrs Run	5.25
Entry Date	

DULL GRADE

T_1		Gage (mm)	
T_2		ODC	
MDC		Reason Pulled	
LOC		Total Run (m/hr)	38.48
BRG			

MUD RECORD

Mud Type	Water ☒ Oil ☐ Other		
Time	00:00	03:00	
Density (kg/m³)	1110	1100	
Funnel Viscosity (s/l)	53	50	
Fluid Loss (cm³)	8.0	8.0	
pH	10	10	
Location			
Depth (m)			
PVT (m³)			

MUD MATERIALS ADDED

Product	Amount	Type
WALNUT	5	SX
ENERPAC REGULAR	1	SX

SOLIDS CONTROL

Equipment Name	Hours Run	Intake Density (kg/m³)	Over Flow Density (kg/m³)	Under Flow Density (kg/m³)

SAFETY

Safety Topic	MEHL (kdaN)	MACP (kpa)

METRES DRILLED

From (m)	To (m)	D-R-C	RPM	WOB (kdaN)
1866	1913	DRILL	45	18

REDUCED PUMP SPEED

No.	Pressure (kpa)	Strokes/min	Depth (m)

CIRCULATION

Pump	Type	Liner Size (mm)	SPM	Pressure (kpa)	Hours Run
1	SINGLE	140	125	9900	8

Remarks

HOLE CONDITION

Hole Drag Up (kdaN)	
Hole Drag Down (kdaN)	
Torque at Bottom (Nm)	
Fill on Bottom (m)	

BOILER

No.	Hours Run	pH	Stack Temp (°C)

DEVIATION SURVEYS

Time	Depth (m)	Deviation	Direction	Type

TIME LOG

From	To	Elapsed	Code	Details of Operations in Sequence & Remarks
00:00	00:15	0.25	21	SAFETY MEETING DRILLER HAND OFF
00:15	00:30	0.25	7	RIG SERVICE F/T MOTOR KILL AND CROWN SAVER
00:30	04:00	3.50	2	ACCUM DRILL
04:00	05:45	1.75	8	RIG REPAIR WELD STANDPIPE
05:45	06:00	0.25	7	RIG SERVICE
06:00	07:00	1.00	2	ACCUM DRILL
07:00	08:00	1.00	10	ACCUM MWD SURVEYS AND CONNECTIONS

Remarks

TOUR 2

SIGNATURE OF DRILLER: KELLY MILLIONS — START TIME 08:00 — END TIME 16:00

DRILLING ASSEMBLY

No	Component	OD (mm)	ID (mm)	Length (m)
1	BIT & TOOLS	0		39.13
2	144 DP	0		1350.84
3	60 HWDP	0		557.45
0	Drill Pipe	Stands (m)		0.00
5	Drill Pipe	Singles (m)		46.58
Weight of DC (kdaN)		Kelly Down (m)		4.00
Weight of string (kdaN)	31	Total (m)		1998.00

BITS

Bit Number	1A
Size (mm)	311
IADC Code	
Manufacturer	SECURITY
Type	GT11
Serial No	8022801
Jets (mm)	19.1 19.1
Depth Out (m)	202
Depth In (m)	202
Total Drilled (m)	0
Hrs Run Today	
Cumulative Hrs Run	5.25
Entry Date	

DULL GRADE

T_1		Gage (mm)	
T_2		ODC	
MDC		Reason Pulled	
LOC		Total Run (m/hr)	0.00
BRG			

MUD RECORD

Mud Type	Water ☒ Oil ☐ Other		
Time	08:00	11:00	14:00
Density (kg/m³)	1090	1110	1100
Funnel Viscosity (s/l)	53	45	53
Fluid Loss (cm³)	8.0	8.0	8.0
pH	9	10	10
Location			
Depth (m)			
PVT (m³)			

MUD MATERIALS ADDED

Product	Amount	Type
WALNUT	13	SX

SOLIDS CONTROL

Equipment Name	Hours Run	Intake Density (kg/m³)	Over Flow Density (kg/m³)	Under Flow Density (kg/m³)

SAFETY

Safety Topic	MEHL (kdaN)	MACP (kpa)
TUGGER	62	1497

METRES DRILLED

From (m)	To (m)	D-R-C	RPM	WOB (kdaN)
1913	1998	DRILL	45	15

REDUCED PUMP SPEED

No.	Pressure (kpa)	Strokes/min	Depth (m)

CIRCULATION

Pump	Type	Liner Size (mm)	SPM	Pressure (kpa)	Hours Run
1		140	125	10400	8

Remarks

HOLE CONDITION

Hole Drag Up (kdaN)	
Hole Drag Down (kdaN)	
Torque at Bottom (Nm)	
Fill on Bottom (m)	

BOILER

No.	Hours Run	pH	Stack Temp (°C)

DEVIATION SURVEYS

Time	Depth (m)	Deviation	Direction	Type

TIME LOG

From	To	Elapsed	Code	Details of Operations in Sequence & Remarks
08:00	08:15	0.25	21	SAFETY MEETING AND DRILLER HANDOFF
08:15	08:30	0.25	7	RIG SERVICE F/T CROWN SAVER - MOTOR KILLS - ANNULAR
08:30	13:45	5.25	2	DRILL
13:45	14:30	0.75	10	ACCUM SURVEYS AND CONN TIME
14:30	15:15	0.75	5	CONDITION MUD & CIRCULATE
15:15	16:00	0.75	6B	TRIP OUT OF HOLE

Remarks

TOUR 3

SIGNATURE OF DRILLER: JARET LAURENT — START TIME 16:00 — END TIME 24:00

DRILLING ASSEMBLY

No.	Component	OD (mm)	ID (mm)	Length (m)
1	BIT	0		0.25
2	BIT SUB	0		0.88
3	X-O	0		0.55
4	REAMER 3PT ROLLER	180		1.78
5	144 DP	0		1350.84
6	60 HWDP	0		557.45
0	Drill Pipe	Stands (m)		0.00
5	Drill Pipe	Singles (m)		46.58
Weight of DC (kdaN)		Kelly Down (m)		0.00
Weight of string (kdaN)	31	Total (m)		1958.33

BITS

Bit Number	1A
Size (mm)	311
IADC Code	
Manufacturer	SECURITY
Type	GT11
Serial No	8022801
Jets (mm)	19.1 19.1
Depth Out (m)	202
Depth In (m)	202
Total Drilled (m)	0
Hrs Run Today	
Cumulative Hrs Run	5.25
Entry Date	

DULL GRADE

T_1		Gage (mm)	
T_2		ODC	
MDC		Reason Pulled	
LOC		Total Run (m/hr)	0.00
BRG			

MUD RECORD

Mud Type	Water ☐ Oil ☐ Other		
Time			
Density (kg/m³)			
Funnel Viscosity (s/l)			
Fluid Loss (cm³)			
pH			
Location			
Depth (m)			
PVT (m³)			

MUD MATERIALS ADDED

Product	Amount	Type

SOLIDS CONTROL

Equipment Name	Hours Run	Intake Density (kg/m³)	Over Flow Density (kg/m³)	Under Flow Density (kg/m³)

SAFETY

Safety Topic	MEHL (kdaN)	MACP (kpa)

METRES DRILLED

From (m)	To (m)	D-R-C	RPM	WOB (kdaN)

REDUCED PUMP SPEED

No.	Pressure (kpa)	Strokes/min	Depth (m)

CIRCULATION

Pump	Type	Liner Size (mm)	SPM	Pressure (kpa)	Hours Run
1	SINGLE	140	120	6900	8

Remarks

HOLE CONDITION

Hole Drag Up (kdaN)	
Hole Drag Down (kdaN)	
Torque at Bottom (Nm)	
Fill on Bottom (m)	

BOILER

No.	Hours Run	pH	Stack Temp (°C)

DEVIATION SURVEYS

Time	Depth (m)	Deviation	Direction	Type

TIME LOG

From	To	Elapsed	Code	Details of Operations in Sequence & Remarks
16:00	16:15	0.25	21	SAFETY MEETING AND DRILLER HANDOFF
16:15	18:00	1.75	6	P.O.O.H FOR REAMER
18:00	18:15	0.25	21	SAFETY MEETING WITH PHOENIX
18:15	19:15	1.00	20D	LAY DOWN DIR. TOOLS
19:15	19:30	0.25	7	RIG SERVICE-F/T BLIND RAMS AND CROWN SAVER
19:30	22:00	2.50	6	MAKE UP BIT AND REAMER-RIH/ PICK UP 4 SIGLES
22:00	24:00	2.00	5	CONDITION MUD & CIRCULATE - STRAP , DRIFT, DRESS CASING

Remarks

FRONT PAGE SUMMARY

Tour Sheet Serial Number	Vendor Software Version	Year	Month	Day
DXG31_20100714_1A	Pason	2010	07	14

Rig No	Well Name	Surface Location	Prov	Loc Type	Unique Well Id	Kelly Bushing
1	MOLOPO PEIGEN 2HZ-[illegible]	13-32-001-29W1	MB	DLS		4

License No	Operator	Contractor	Well Type	Re-Entry
7447	MOLOPO ENERGY CANADA LTD	ADVANCE DRILLING LTD	HORIZ	☐
	Operator's AFE	Contractor's Job No	Spud Date	Time
		19-10-394	2010/07/07	11:00
	Signature of Operator Representative	Signature of Contractor's Rig manager	Rig Release Date	Time
	Mark Mazurat	GARY MILLIONS		

DAILY CHECKS

	OP	RM
1) Daily Walk Around Inspection	man	GM
2) Derailed Inspection - Weekly (Using Check List)	man	GM
3) H2S Show Present / Anticipated	man	GM
4) Well Licences & Rig Diagram Posted	man	GM
5) Flare Lines Staked	man	GM
6) BOP Drills Performed	man	GM
7) Visually Inspected BOPs - Flare Lines & Diverter Lines	man	GM
1) Pre Tour Health & Safety Meeting (crew/contractor)		
2) CAODC Pre Safety Inspection Checklist (crew/contractor)		
3) Meet inspection before Rigging or Unrigging		
4) Crown Saver Checked		GM
5) Mouse Hole Checked		GM

FUEL @ 08:00 HOURS

Rig	31
Boiler	0
On Fuel	2800

WEATHER

Time	06:00
Temp	17
Current Conditions	PARTLY CLOUDY
Wind Direction	NW
Wind Strength	CALM
Road Condition	GOOD

DRILL PIPE

Category	Thread Type	Grade	OD (mm)	ID (mm)	Linear Mass (kg/m)	No. of Joints	Tool Joint OD (mm)
DC	4.5 XH		159	57	135.02	14	159
DP	4 FH	E	102	85	20.83	180	102
HW	4 FH		102	85	44.10	60	102

CASING

Category	Make	Grade	OD (mm)	ID (mm)	Linear Mass (kg/m)	No. of Joints	Total Length (m)	KB to CSG Head (m)	KB to CSG Bottom (m)
SURFACE	EVRAZ	J-55	219	206	35.72	16	202	4	202

MUD PUMPS

No.	Make	Stroke Length (mm)
1	EMSCO	229

GENERAL EQUIPMENT & SERVICES

Description	Hours

SHALE SHAKERS

No	Top Screen			Middle Screen			Middle Screen			Bottom Screen		
	Size	Changed	Mesh	Size	Changed	Mesh	Size	Changed	Mesh	Size	Changed	Mesh
1	210	☐	80	210	☐	80	210	☐	80		☐	
		☐			☐			☐			☐	

Pason

TOUR 1

SIGNATURE OF DRILLER: KELLY MILLIONS — START TIME: 00:00 — END TIME: 08:00

DRILLING ASSEMBLY

No	Component	OD (mm)	ID (mm)	Length (m)
1	BIT & TOOLS	0		39.13
2	144 DP	0		1350.84

0	Drill Pipe	Stands (m)	0.00
28	Drill Pipe	Singles (m)	260.39
Weight of DC (kdaN)		Kelly Down (m)	11.84
Weight of string (kdaN)	31	Total (m)	1662.00

BITS

Bit Number	1A
Size (mm)	311
IADC Code	
Manufacturer	SECURITY
Type	GT11
Serial No	8022801
Jets (mm)	19.1 19.1
Depth Out (m)	202
Depth In (m)	0
Total Drilled (m)	202
Hrs Run Today	
Cumulative Hrs Run	5.25
Entry Date	

DULL GRADE

T_1		Gage (mm)	
T_2		ODC	
MDC		Reason Pulled	
LOC		Total Run (m/hr)	38.48
BRG			

MUD RECORD

Mud Type	Water ☑	Oil ☐	Other ☐
Time	00:00	03:00	06:00
Density (kg/m³)	1100	1110	1100
Funnel Viscosity (s/l)	48	48	48
Fluid Loss (cm³)	10.0	10.0	10.0
pH	10	9	10
Location			
Depth (m)			
PVT (m³)			

MUD MATERIALS ADDED

Product	Amount	Type
ENERPAC LO VIS	1	SX
WALNUT	18	SX
CAUSTIC	2	SX

SOLIDS CONTROL

Equipment Name	Hours Run	Intake Density (kg/m³)	Over Flow Density (kg/m³)	Under Flow Density (kg/m³)

SAFETY

Safety Topic	MEHL (kdaN)	MACP (kpa)
ROTARY	42	1500

METRES DRILLED

From (m)	To (m)	D-R-C	RPM	WOB (kdaN)
1550	1662	DRILL	45	16

REDUCED PUMP SPEED

No.	Pressure (kpa)	Strokes/min	Depth (m)

CIRCULATION

Pump	Type	Liner Size (mm)	SPM	Pressure (kpa)	Hours Run
1		140	125	8500	8

Remarks

HOLE CONDITION

Hole Drag Up (kdaN)	
Hole Drag Down (kdaN)	
Torque at Bottom (kNm)	
Fill on Bottom (m)	

BOILER

No.	Hours Run	pH	Stack Temp (°C)

DEVIATION SURVEYS

Time	Depth (m)	Deviation	Direction	Type

TIME LOG

From	To	Elapsed	Code	Details of Operations in Sequence & Remarks
00:00	00:15	0.25	21	SAFETY MEETING AND DRILLER HANDOFF
00:15	00:30	0.25	7	RIG SERVICE F/T CROWN SAVER - F/T PIPE RAMS
00:30	07:00	6.50	2	DRILL
07:00	08:00	1.00	10	ACCUM SURVEYS AND CONN TIME

Remarks

TOUR 2

SIGNATURE OF DRILLER: JASON HAINES — START TIME: 08:00 — END TIME: 16:00

DRILLING ASSEMBLY

No.	Component	OD (mm)	ID (mm)	Length (m)
1	BIT & TOOLS	0		39.13
2	144 DP	0		1350.84

0	Drill Pipe	Stands (m)	0.00
36	Drill Pipe	Singles (m)	334.38
Weight of DC (kdaN)		Kelly Down (m)	11.84
Weight of string (kdaN)	31	Total (m)	1738.00

BITS

Bit Number	1A
Size (mm)	311
IADC Code	
Manufacturer	SECURITY
Type	GT11
Serial No	8022801
Jets (mm)	19.1 19.1
Depth Out (m)	202
Depth In (m)	0
Total Drilled (m)	202
Hrs Run Today	
Cumulative Hrs Run	5.25
Entry Date	

DULL GRADE

T_1		Gage (mm)	
T_2		ODC	
MDC		Reason Pulled	
LOC		Total Run (m/hr)	38.48
BRG			

MUD RECORD

Mud Type	Water ☑	Oil ☐	Other ☐
Time	08:00	11:00	13:30
Density (kg/m³)	1100	1100	1100
Funnel Viscosity (s/l)	48	46	48
Fluid Loss (cm³)	10.0	10.0	10.0
pH	10	9	10
Location			
Depth (m)			
PVT (m³)			

MUD MATERIALS ADDED

Product	Amount	Type
WALNUT	18	SX
ENERPAC REGULAR	3	SX
CAUSTIC	1	SX

SOLIDS CONTROL

Equipment Name	Hours Run	Intake Density (kg/m³)	Over Flow Density (kg/m³)	Under Flow Density (kg/m³)

SAFETY

Safety Topic	MEHL (kdaN)	MACP (kpa)

METRES DRILLED

From (m)	To (m)	D-R-C	RPM	WOB (kdaN)
1662	1736	DRILL	40	14

REDUCED PUMP SPEED

No.	Pressure (kpa)	Strokes/min	Depth (m)

CIRCULATION

Pump	Type	Liner Size (mm)	SPM	Pressure (kpa)	Hours Run
1		140	125	8700	8

Remarks

HOLE CONDITION

Hole Drag Up (kdaN)	
Hole Drag Down (kdaN)	
Torque at Bottom (kNm)	
Fill on Bottom (m)	

BOILER

No.	Hours Run	pH	Stack Temp (°C)

DEVIATION SURVEYS

Time	Depth (m)	Deviation	Direction	Type

TIME LOG

From	To	Elapsed	Code	Details of Operations in Sequence & Remarks
08:00	08:15	0.25	21	SAFETY MEETING DRILLER HAND OFF
08:15	08:30	0.25	7	RIG SERVICE
08:30	11:30	3.00	2	DRILL
11:30	12:00	0.50	8C	DOWNTIME - MUD PUMP CHANGE HEAD & LINE SUMP SIDE
12:00	15:00	3.00	2	DRILL
15:00	16:00	1.00	10	ACCUM SURVEYS & CONNECTION TIME

Remarks

TOUR 3

SIGNATURE OF DRILLER: JARET LAURENT — START TIME: 16:00 — END TIME: 24:00

DRILLING ASSEMBLY

No.	Component	OD (mm)	ID (mm)	Length (m)
1	BIT & TOOLS	0		39.13
2	144 DP	0		1350.84

0	Drill Pipe	Stands (m)	0.00
51	Drill Pipe	Singles (m)	464.66
Weight of DC (kdaN)		Kelly Down (m)	11.37
Weight of string (kdaN)	31	Total (m)	1666.00

BITS

Bit Number	1A
Size (mm)	311
IADC Code	
Manufacturer	SECURITY
Type	GT11
Serial No	8022801
Jets (mm)	19.1 19.1
Depth Out (m)	202
Depth In (m)	0
Total Drilled (m)	202
Hrs Run Today	
Cumulative Hrs Run	5.25
Entry Date	

DULL GRADE

T_1		Gage (mm)	
T_2		ODC	
MDC		Reason Pulled	
LOC		Total Run (m/hr)	38.48
BRG			

MUD RECORD

Mud Type	Water ☑	Oil ☐	Other ☐
Time	16:00	20:00	23:00
Density (kg/m³)	1110	1110	1110
Funnel Viscosity (s/l)	45	55	50
Fluid Loss (cm³)	9.0	8.0	8.0
pH	10	10	9
Location			
Depth (m)			
PVT (m³)			

MUD MATERIALS ADDED

Product	Amount	Type
ENERPAC REGULAR	4	SX
WALNUT	16	SX
CAUSTIC	1	SX

SOLIDS CONTROL

Equipment Name	Hours Run	Intake Density (kg/m³)	Over Flow Density (kg/m³)	Under Flow Density (kg/m³)

SAFETY

Safety Topic	MEHL (kdaN)	MACP (kpa)
BOPS	42	1500

METRES DRILLED

From (m)	To (m)	D-R-C	RPM	WOB (kdaN)
1736	1866	DRILL	45	18

REDUCED PUMP SPEED

No.	Pressure (kpa)	Strokes/min	Depth (m)

CIRCULATION

Pump	Type	Liner Size (mm)	SPM	Pressure (kpa)	Hours Run
1		140	125	9200	8

Remarks

HOLE CONDITION

Hole Drag Up (kdaN)	
Hole Drag Down (kdaN)	
Torque at Bottom (kNm)	
Fill on Bottom (m)	

BOILER

No.	Hours Run	pH	Stack Temp (°C)

DEVIATION SURVEYS

Time	Depth (m)	Deviation	Direction	Type

TIME LOG

From	To	Elapsed	Code	Details of Operations in Sequence & Remarks
16:00	16:15	0.25	21	SAFETY MEETING AND DRILLER HANDOFF
16:15	16:30	0.25	7	RIG SERVICE- F/T ANNULAR AND CROWN SAVER
16:30	23:00	6.50	2	ACCUM DRILL
23:00	24:00	1.00	10	ACCUM MWD SURVEYS AND CONNECTIONS

Remarks

FRONT PAGE SUMMARY

Tour Sheet Serial Number	Vendor Software Version	Year	Month	Day
DXG31_20100713_*A	Pason	2010	07	13

Rig No	Well Name	Surface Location	Prov	Loc Type	Unique Well Id	Kelly Bushing
1	MOLOPO PRESQ PARC HZ 13-32-001-29W1	13-32-001-29W1	MB	DLS		4

License No	Operator	Contractor	Well Type	Re-Entry
7447	MOLOPO ENERGY CANADA LTD	ADVANCE DRILLING LTD	HORIZ	☐
	Operator's AFE	Contractor's Job No	Spud Date	Time
		19-13-394	2010/07/07	11:00
	Signature of Operator Representative	Signature of Contractor's Rig manager	Rig Release Date	Time
	Mark Mazurak	GARY MILLIONS		

DAILY CHECKS

	OP	RM
1) Daily Walk Around Inspection	mark	GM
2) Detailed Inspection - Weekly (Using Check List)	mark	GM
3) H2S Safety Posted if Required	mark	GM
4) Well Licence & Block Diagram Posted	mark	GM
5) Flare Lines Spaced	mark	GM
6) BOP Drills Performed		
7) Visually Inspected BOPs - Flare Lines & Diameter Lines	mark	GM
1) Rig Site Health & Safety Meeting completed/attended		
2) COOC Rig Safety Inspection Checklist (every 14 days)		
3) Blind Inspection before Reeling or Lowering		
4) Crown Saver Checked		GM
5) Master Kills Checked		GM

FUEL @ 08:00 HOURS

Rig	69
Boiler	0
On Fuel	2320

WEATHER

Time	06:00
Temp	17
Current Conditions	PARTLY CLOUDY
Wind Direction	NW
Wind Strength	CALM
Road Condition	GOOD

DRILL PIPE

Category	Thread Type	Grade	OD (mm)	ID (mm)	Linear Mass (kg/m)	No. of Joints	Total Joint OD (mm)
DC	4 5 XH		159	57	135.02	14	159
DP	4 FH	E	102	85	20.83	180	102
HW	4 FH		102	65	44.10	60	102

MUD PUMPS

No.	Make	Stroke Length (mm)
1	EMSCO	229

GENERAL EQUIPMENT & SERVICES

Description	Hours

Pason

CASING

Category	Make	Grade	OD (mm)	ID (mm)	Linear Mass (kg/m)	No. of Joints	Total Length (m)	KB to CSG Head (m)	KB to CSG Bottom (m)
SURFACE	EVRAZ	J-55	219	206	35.72	16	202	4	202

SHALE SHAKERS

No	Top Screen Size	Top Screen Changed	Top Screen New	Middle Screen Size	Middle Screen Changed	Middle Screen New	Middle Screen Size	Middle Screen Changed	Middle Screen New	Bottom Screen Size	Bottom Screen Changed	Bottom Screen New
1	210	☐	☑	210	☐	☑	210	☐	☑		☐	☐

TOUR 1

SIGNATURE OF DRILLER: KELLY MILLIONS — START TIME: 00:00 — END TIME: 08:00

DRILLING ASSEMBLY

No	Component	OD (mm)	ID (mm)	Length (m)
1	BIT & TOOLS	0		39.13

0	Drill Pipe	Stands (m)	0.00
142	Drill Pipe	Singles (m)	1331.97
Weight of DC (kdaN)		Kelly Down (m)	11.90
Weight of string (kdaN)	24	Total (m)	1383.00

BITS

Bit Number	1A
Size (mm)	311
IADC Code	
Manufacturer	SECURITY
Type	GT11
Serial No	8022801
Jets (mm)	19 1 19 1
Depth Out (m)	202
Depth In (m)	0
Total Drilled (m)	202
Hrs Run Today	
Cumulative Hrs Run	5.25
Entry Date	

DULL GRADE

T		Gage (mm/d)	
T_2		ODC	
MDC		Reason Pulled	
LDC		Total Run (m/hr)	38.48
BRG			

MUD RECORD

Mud Type	Water ☑	Oil ☐	Other ☐	
Time	00:00	03:00	06:00	
Density (kg/m³)	1095	1100	1100	
Funnel Viscosity (s/l)	52	55	55	
Fluid Loss (cm³)	9.0	10.0	11.0	
pH	9	9	8	
Location				
Depth (m)				
PVT (m³)				

MUD MATERIALS ADDED

Product	Amount	Type
CAUSTIC	2	SX
ENERPAC REGULAR	1	SX
ENERPAC LO VIS	1	SX

METRES DRILLED

From (m)	To (m)	D-R-C	RPM	WOB (kdaN)
1222	1383	DRILL	45	16

REDUCED PUMP SPEED

No	Pressure (kpa)	Strokes/min	Depth (m)
	●	●	
	●	●	
	●	●	

CIRCULATION

Pump	Type	Liner Size (mm)	SPM	Pressure (kpa)	Hours Run
1		140	125	6400	8

Remarks

HOLE CONDITION

Hole Drag Up (kdaN)	
Hole Drag Down (kdaN)	
Torque at Bottom (klbs)	
Fill on Bottom (m)	

BOILER

No.	Hours Run	pH	Stack Temp (°C)

DEVIATION SURVEYS

Time	Depth (m)	Deviation	Direction	Type

SOLIDS CONTROL

Equipment Name	Hours Run	Intake Density (kg/m³)	Over Flow Density (kg/m³)	Under Flow Density (kg/m³)

SAFETY

Safety Topic	MEHL (kdaN)	MACP (kpa)
PIPE HYDRAULICS	38	1520

TIME LOG

From	To	Elapsed	Code	Details of Operations in Sequence & Remarks
00:00	00:15	0.25	21	SAFETY MEETING AND DRILLER HAND OFF
00:15	00:30	0.25	7	RIG SERVICE F/T CROWN SAVER - VISUALLY INSPECT MANIFOLD
00:30	06:45	6.25	2	DRILL
06:45	08:00	1.25	10	ACCUM SURVEYS

Remarks

TOUR 2

SIGNATURE OF DRILLER: JASON HAINES — START TIME: 08:00 — END TIME: 16:00

DRILLING ASSEMBLY

No.	Component	OD (mm)	ID (mm)	Length (m)
1	BIT & TOOLS	0		39.13
2	144 DP	0		1350.84

0	Drill Pipe	Stands (m)	0.00
5	Drill Pipe	Singles (m)	48.43
Weight of DC (kdaN)		Kelly Down (m)	11.60
Weight of string (kdaN)	24	Total (m)	1448.00

BITS

Bit Number	1A
Size (mm)	311
IADC Code	
Manufacturer	SECURITY
Type	GT11
Serial No	8022801
Jets (mm)	19 1 19 1
Depth Out (m)	202
Depth In (m)	0
Total Drilled (m)	202
Hrs Run Today	0.00
Cumulative Hrs Run	5.25
Entry Date	

DULL GRADE

T		Gage (mm/d)	
T_2		ODC	
MDC		Reason Pulled	
LDC		Total Run (m/hr)	38.48
BRG			

MUD RECORD

Mud Type	Water ☑	Oil ☐	Other ☐	
Time	08:00	11:00	13:30	
Density (kg/m³)	1105	1110	1100	
Funnel Viscosity (s/l)	46	51	58	
Fluid Loss (cm³)	10.5	11.0	9.5	
pH	10	10		
Location				
Depth (m)				
PVT (m³)				

MUD MATERIALS ADDED

Product	Amount	Type
WALNUT	12	SX
ENERPAC LO VIS	2	SX
ENERPAC REGULAR	1	SX

METRES DRILLED

From (m)	To (m)	D-R-C	RPM	WOB (kdaN)
1383	1448	DRILL	40	14

REDUCED PUMP SPEED

No.	Pressure (kpa)	Strokes/min	Depth (m)
	●	●	
	●	●	
	●	●	

CIRCULATION

Pump	Type	Liner Size (mm)	SPM	Pressure (kpa)	Hours Run
1		140	130	6900	8

Remarks

HOLE CONDITION

Hole Drag Up (kdaN)	
Hole Drag Down (kdaN)	
Torque at Bottom (klbs)	
Fill on Bottom (m)	

BOILER

No.	Hours Run	pH	Stack Temp (°C)

DEVIATION SURVEYS

Time	Depth (m)	Deviation	Direction	Type

SOLIDS CONTROL

Equipment Name	Hours Run	Intake Density (kg/m³)	Over Flow Density (kg/m³)	Under Flow Density (kg/m³)

SAFETY

Safety Topic	MEHL (kdaN)	MACP (kpa)
	40	1500

TIME LOG

From	To	Elapsed	Code	Details of Operations in Sequence & Remarks
08:00	08:15	0.25	21	SAFETY MEETING DRILLER HAND OFF
08:15	08:30	0.25	7	RIG SERVICE F/T HORN - MOTOR KILLS
08:30	13:30	5.00	2	DRILL
13:30	14:00	0.50	8C	DOWNTIME - MUD PUMP CHANGED SEAL ON LINER-MIDDLE
14:00	15:00	1.00	2	DRILL
15:00	16:00	1.00	10	ACCUM SURVEYS & CONNECTION TIME

Remarks

TOUR 3

SIGNATURE OF DRILLER: JARET LAURENT — START TIME: 16:00 — END TIME: 24:00

DRILLING ASSEMBLY

No.	Component	OD (mm)	ID (mm)	Length (m)
1	BIT & TOOLS	0		39.13
2	144 DP	0		1350.84

0	Drill Pipe	Stands (m)	0.00
16	Drill Pipe	Singles (m)	148.76
Weight of DC (kdaN)		Kelly Down (m)	11.37
Weight of string (kdaN)	24	Total (m)	1550.00

BITS

Bit Number	1A
Size (mm)	311
IADC Code	
Manufacturer	SECURITY
Type	GT11
Serial No	8022801
Jets (mm)	19 1 19 1
Depth Out (m)	202
Depth In (m)	0
Total Drilled (m)	202
Hrs Run Today	
Cumulative Hrs Run	5.25
Entry Date	

DULL GRADE

T		Gage (mm/d)	
T_2		ODC	
MDC		Reason Pulled	
LDC		Total Run (m/hr)	38.48
BRG			

MUD RECORD

Mud Type	Water ☑	Oil ☐	Other ☐	
Time	16:00	20:00	23:00	
Density (kg/m³)	1100	1105	1110	
Funnel Viscosity (s/l)	49	50	49	
Fluid Loss (cm³)	9.0	11.0	10.0	
pH	10	8	9	
Location				
Depth (m)				
PVT (m³)				

MUD MATERIALS ADDED

Product	Amount	Type
WALNUT	12	SX
ENERPAC LO VIS	2	SX
CAUSTIC	2	SX

METRES DRILLED

From (m)	To (m)	D-R-C	RPM	WOB (kdaN)
1448	1550	DRILL	45	15

REDUCED PUMP SPEED

No.	Pressure (kpa)	Strokes/min	Depth (m)
	●	●	
	●	●	
	●	●	

CIRCULATION

Pump	Type	Liner Size (mm)	SPM	Pressure (kpa)	Hours Run
1		140	128	7800	8

Remarks

HOLE CONDITION

Hole Drag Up (kdaN)	
Hole Drag Down (kdaN)	
Torque at Bottom (klbs)	
Fill on Bottom (m)	

BOILER

No.	Hours Run	pH	Stack Temp (°C)

DEVIATION SURVEYS

Time	Depth (m)	Deviation	Direction	Type

SOLIDS CONTROL

Equipment Name	Hours Run	Intake Density (kg/m³)	Over Flow Density (kg/m³)	Under Flow Density (kg/m³)

SAFETY

Safety Topic	MEHL (kdaN)	MACP (kpa)
MIXING	38	1500

TIME LOG

From	To	Elapsed	Code	Details of Operations in Sequence & Remarks
16:00	16:15	0.25	21	SAFETY MEETING AND DRILLER HANDOFF
16:15	16:30	0.25	7	RIG SERVICE - F/T HCR AND CROWN SAVER
16:30	23:00	6.50	2	DRILL
23:30	24:00	1.00	10	ACCUM MWD SURVEYS AND CONNECTIONS

Remarks

FRONT PAGE SUMMARY

Tour Sheet Serial Number	Vendor Software Version	Year	Month	Day
0XG31_20100712_10	Pason	2010	07	12

Rig No	Well Name	Surface Location	Prov	Loc Type	Unique Well Id	Kelly Bushing
-	MOLOPO PRESCO PAD 07-32-001-29W1	13-32-001-29W1	MB	DLS		4

License No	Operator	Contractor	Well Type	Re-Entry
7444	MOLOPO ENERGY CANADA LTD	ADVANCE DRILLING LTD	HORIZ	☐
	Operator's AFE	Contractor's Job No	Spud Date	Time
		19-10-394	2010.07.07	11:00
	Signature of Operator Representative	Signature of Contractor's Rig manager	Rig Release Date	Time
	Mark Magurat	GARY MILLIONS		

DAILY CHECKS

	OP	RM
1) Daily Walk Around Inspection	mech	GM
2) Detailed Inspection - Weekly (Using Check List)	mech	GM
3) H2S Alarms Passed if Required	mech	GM
4) Well Licence & Stick Diagram Posted	mech	GM
5) Flare Lines Tested	mech	GM
6) BOP Drills Performed	mech	GM
7) Visually Inspected BOPs - Flare Lines & Diverter Lines	mech	GM
1) Rig Site Hazard & Safety Meeting (prejob/newcrew/pm)		
2) CAODC Pre Safety Inspection Checklist (prior to spud)		
3) Mast Inspection before Raising or Lowering		
4) Crown Saver Checked		GM
5) Mast Bolts Checked		GM

FUEL @ 08:00 HOURS

Rig	28
Boiler	0
Op Fuel	1760

WEATHER

Time	06:00
Temp	+9
Current Conditions	CLEAR
Wind Direction	NW
Wind Strength	CALM
Road Condition	GOOD

DRILL PIPE

Category	Thread Type	Grade	OD (mm)	ID (mm)	Linear Mass (kg/m)	No. of Joints	Total Joint OD (mm)
DC	4 5 XH		159	57	135.02	14	159
DP	4 FH	E	102	85	20.83	180	102
HW	4 FH		102	85	44.10	60	102

MUD PUMPS

No.	Make	Stroke Length (mm)
1	EMSCO	229

GENERAL EQUIPMENT & SERVICES

Description	Hours

CAODC Pason

CASING

Category	Make	Grade	OD (mm)	ID (mm)	Linear Mass (kg/m)	No. of Joints	Total Length (m)	KB to CSG Head (m)	KB to CSG Bottom (m)
SURFACE	EVRAZ	J-55	219	206	35.72	16	202	4	202

SHALE SHAKERS

No	Top Screen			Middle Screen			Middle Screen			Bottom Screen		
	Size	Changed	New	Size	Changed	New	Size	Changed	New	Size	Changed	New
1	175	☐	☒	175	☒	☐	175	☐	☐		☐	☐
		☐	☐		☐	☐		☐	☐		☐	☐

TOUR 1

SIGNATURE OF DRILLER: KELLY MILLIONS — START TIME: 00:00 — END TIME: 08:00

DRILLING ASSEMBLY

No.	Component	OD (mm)	ID (mm)	Length (m)
1	BIT & TOOLS	0		39.13

0	Drill Pipe	Stands (m)	0.00
103	Drill Pipe	Singles (m)	965.83
Weight of DC (klbf#)		Kelly Down (m)	12.04
Weight of string (klbf#)	24	Total (m)	1017.00

BITS

Bit Number	1A
Size (mm)	311
IADC Code	
Manufacturer	SECURITY
Type	GT11
Serial No	8022801
Jets (mm)	19.1 19.1
Depth Out (m)	202
Depth In (m)	0
Total Drilled (m)	202
Hrs Run Today	0.00
Cumulative Hrs Run	5.25
Entry Date	

DULL GRADE

T1		Gage (mm)	
T2		ODC	
MDC		Reason Pulled	
LOC		Total Run (m/hr)	38.48
BRG			

MUD RECORD

Mud Type	Water	Oil	Other	
Time	00:00	03:00	06:00	
Density (kg/m³)	1080	1080	1090	
Funnel Viscosity (s/l)	52	50	48	
Fluid Loss (cm³)	9.0	9.0	9.0	
pH	10	10	10	
Location				
Depth (m)				
PVT (m³)				

MUD MATERIALS ADDED

Product	Amount	Type
SODA ASH	6	SX

METRES DRILLED

From (m)	To (m)	D-R-C	RPM	WOB (klbf#)
920	1017	DRILL	35	6

HOLE CONDITION

Hole Drag Up (klbf#)	
Hole Drag Down (klbf#)	
Torque at Bottom (kNm)	
Fill on Bottom (m)	

REDUCED PUMP SPEED

No.	Pressure (kpa)	Strokes/min	Depth (m)

BOILER

No.	Hours Run	pH	Stack Temp (°C)

SOLIDS CONTROL

Equipment Name	Hours Run	Intake Density (kg/m³)	Over Flow Density (kg/m³)	Under Flow Density (kg/m³)

CIRCULATION

Pump	Type	Liner Size (mm)	SPM	Pressure (kpa)	Hours Run
1		140	125	8200	8

Remarks:

DEVIATION SURVEYS

Time	Depth (m)	Deviation	Direction	Type

SAFETY

Safety Topic	MEHL (klbf#)	MACP (kpa)
CONNECTIONS	30	1581

TIME LOG

From	To	Elapsed	Code	Details of Operations in Sequence & Remarks
00:00	00:15	0.25	21	SAFETY MEETING AND DRILLER HAND OFF
00:15	00:30	0.25	7	RIG SERVICE F/T CROWN SAVER - F/T PIPE RAMS
00:30	07:00	6.50	2	DRILL
07:00	08:00	1.00	10	ACCUM SURVEYS

TOUR 2

SIGNATURE OF DRILLER: JASON HAINES — START TIME: 08:00 — END TIME: 16:00

DRILLING ASSEMBLY

No.	Component	OD (mm)	ID (mm)	Length (m)
1	BIT & TOOLS	0		39.13

0	Drill Pipe	Stands (m)	0.00
111	Drill Pipe	Singles (m)	1039.69
Weight of DC (klbf#)		Kelly Down (m)	12.18
Weight of string (klbf#)	24	Total (m)	1091.00

BITS

Bit Number	1A
Size (mm)	311
IADC Code	
Manufacturer	SECURITY
Type	GT11
Serial No	8022801
Jets (mm)	19.1 19.1
Depth Out (m)	202
Depth In (m)	0
Total Drilled (m)	202
Hrs Run Today	
Cumulative Hrs Run	5.25
Entry Date	

DULL GRADE

T1		Gage (mm)	
T2		ODC	
MDC		Reason Pulled	
LOC		Total Run (m/hr)	38.48
BRG			

MUD RECORD

Mud Type	Water	Oil	Other	
Time	08:00	11:00	13:30	
Density (kg/m³)	1100	1100	1100	
Funnel Viscosity (s/l)	60	58	58	
Fluid Loss (cm³)	10.0	10.5	10.0	
pH	10	10	10	
Location				
Depth (m)				
PVT (m³)				

MUD MATERIALS ADDED

Product	Amount	Type
CAUSTIC	1	SX
ENERPAC LO VIS	1	SX

METRES DRILLED

From (m)	To (m)	D-R-C	RPM	WOB (klbf#)
1017	1091	DRILL	40	9

HOLE CONDITION

Hole Drag Up (klbf#)	
Hole Drag Down (klbf#)	
Torque at Bottom (kNm)	
Fill on Bottom (m)	

REDUCED PUMP SPEED

No.	Pressure (kpa)	Strokes/min	Depth (m)

BOILER

No.	Hours Run	pH	Stack Temp (°C)

SOLIDS CONTROL

Equipment Name	Hours Run	Intake Density (kg/m³)	Over Flow Density (kg/m³)	Under Flow Density (kg/m³)

CIRCULATION

Pump	Type	Liner Size (mm)	SPM	Pressure (kpa)	Hours Run
1		140	120	5800	8

Remarks:

DEVIATION SURVEYS

Time	Depth (m)	Deviation	Direction	Type

SAFETY

Safety Topic	MEHL (klbf#)	MACP (kpa)
LOADER	30	1520

TIME LOG

From	To	Elapsed	Code	Details of Operations in Sequence & Remarks
08:00	08:15	0.25	21	SAFETY MEETING DRILLER HAND OFF
08:15	08:30	0.25	7	RIG SERVICE
08:30	15:00	6.50	2	DRILL
15:00	16:00	1.00	10	ACCUM SURVEYS & CONNECTION TIME

TOUR 3

SIGNATURE OF DRILLER: JARET LAURENT — START TIME: 16:00 — END TIME: 24:00

DRILLING ASSEMBLY

No.	Component	OD (mm)	ID (mm)	Length (m)
1	BIT & TOOLS	0		39.13

0	Drill Pipe	Stands (m)	0.00
125	Drill Pipe	Singles (m)	1171.29
Weight of DC (klbf#)		Kelly Down (m)	11.58
Weight of string (klbf#)	24	Total (m)	1222.00

BITS

Bit Number	1A
Size (mm)	311
IADC Code	
Manufacturer	SECURITY
Type	GT11
Serial No	8022801
Jets (mm)	19.1 19.1
Depth Out (m)	202
Depth In (m)	0
Total Drilled (m)	202
Hrs Run Today	
Cumulative Hrs Run	5.25
Entry Date	

DULL GRADE

T1		Gage (mm)	
T2		ODC	
MDC		Reason Pulled	
LOC		Total Run (m/hr)	38.48
BRG			

MUD RECORD

Mud Type	Water	Oil	Other	
Time	16:00	19:00	23:00	
Density (kg/m³)	1100	1100	1110	
Funnel Viscosity (s/l)	49	46	53	
Fluid Loss (cm³)	11.0	9.0	9.0	
pH	10	9	9	
Location				
Depth (m)				
PVT (m³)				

MUD MATERIALS ADDED

Product	Amount	Type
ENERPAC LO VIS	1	SX
ENERPAC REGULAR	2	SX

METRES DRILLED

From (m)	To (m)	D-R-C	RPM	WOB (klbf#)
1091	1222	DRILL	40	14

HOLE CONDITION

Hole Drag Up (klbf#)	
Hole Drag Down (klbf#)	
Torque at Bottom (kNm)	
Fill on Bottom (m)	

REDUCED PUMP SPEED

No.	Pressure (kpa)	Strokes/min	Depth (m)

BOILER

No.	Hours Run	pH	Stack Temp (°C)

SOLIDS CONTROL

Equipment Name	Hours Run	Intake Density (kg/m³)	Over Flow Density (kg/m³)	Under Flow Density (kg/m³)

CIRCULATION

Pump	Type	Liner Size (mm)	SPM	Pressure (kpa)	Hours Run
1		140	115	5100	8

Remarks:

DEVIATION SURVEYS

Time	Depth (m)	Deviation	Direction	Type

SAFETY

Safety Topic	MEHL (klbf#)	MACP (kpa)
TUGGER	33	1523

TIME LOG

From	To	Elapsed	Code	Details of Operations in Sequence & Remarks
16:00	16:15	0.25	21	SAFETY MEETING AND DRILLER HANDOFF
16:15	16:30	0.25	7	RIG SERVICE - F/T CROWN SAVER AND ANNULAR
16:30	23:00	6.50	2	ACCUM DRILL
23:00	24:00	1.00	10	ACCUM MWD SURVEYS

FRONT PAGE SUMMARY

Tour Sheet Serial Number	Vendor Software Version	Year	Month	Day
DX331_20100711_1B	Pason	2010	07	11

Rig No.	Well Name	Surface Location	Prov	Loc Type	Unique Well Id	Kelly Bushing
-	DCDC PRESCO PROV 02-32-001-29W1	13-32-001-29W1	MB	DLS		4

License No.	Operator	Contractor	Well Type	Rig Entry
"447	MOLOPO ENERGY CANADA LTD	ADVANCE DRILLING LTD	HORIZ	

Operator's AFE	Contractor's Job No	Spud Date	Time
	19-10-394	2010/07/07	11:00

Signature of Operator Representative	Signature of Contractor's Rig manager	Rig Release Date	Time
Mark Mazurat	GARY MILLIONS		

DAILY CHECKS

	OP	RM
1) Daily Walk Around Inspection	mem	GM
2) Derrick Inspection - Weekly (Gains Check Lab	mem	GM
3) H2S Sensor Posted if Required	mem	GM
4) Well Licences & Stock Clearance Posted	mem	GM
5) Fire Lines Tested	mem	GM
6) BOP Drills Performed		
7) Vessels Inspected BOPs - Flare Lines & Degasser Lines		GM
1) Rig Site Health & Safety Meetings (weekly/monthly)		
2) CAODC Rig Safety Inspection Checklist (new/renewal)		
3) Meet Inspection before Raising or Lowering		
4) Crown Saver Checked		GM
5) Mayor Kills Checked		GM

FUEL @ 08:00 HOURS

Rig	55
Boiler	0
Op Fuel	2000

WEATHER

Time	08:00
Temp	15
Current Conditions	CLEAR
Wind Direction	NW
Wind Strength	CALM
Road Condition	GOOD

DRILL PIPE

Category	Thread Type	Grade	OD (mm)	ID (mm)	Linear Mass (kg/m)	No. of Joints	Tool Joint OD (mm)
DC	4 5 XH		159	57	135.02	14	159
DP	4 FH	E	102	85	20.83	180	102
HW	4 FH		102	85	44.10	60	102

MUD PUMPS

No.	Make	Stroke Length (mm)
1	EMSCO	229

GENERAL EQUIPMENT & SERVICES

Description	Hours

CASING

Category	Make	Grade	OD (mm)	ID (mm)	Linear Mass (kg/m)	No. of Joints	Total Length (m)	KB to CSG Head (m)	KB to CSG Bottom (m)
SURFACE	EVRAZ	J-55	219	206	35.72	16	202	4	202

SHALE SHAKERS

No	Top Screen			Middle Screen			Middle Screen			Bottom Screen		
	Size	Changed	New	Size	Changed	New	Size	Changed	New	Size	Changed	New
1	175	☐	☒	175	☐	☒	175	☐	☒		☐	☐
		☐	☐		☐	☐		☐	☐		☐	☐

TOUR 1

SIGNATURE OF DRILLER: DEREK LAURENT

START TIME: 00:00 END TIME: 08:00

DRILLING ASSEMBLY

No	Component	OD (mm)	ID (mm)	Length (m)
1	BIT & TOOLS	0		39.13

0	Drill Pipe	Stands (m)	0.00
75	Drill Pipe	Singles (m)	701.88
Weight of DC (klbf#)		Kelly Down (m)	6.99
Weight of string (klbf#)		Total (m)	748.00

BITS

Bit Number	
Size (mm)	
IADC Code	
Manufacturer	
Type	
Serial No	
Jets (mm)	
Depth Out (m)	
Depth In (m)	
Total Drilled (m)	
Hrs Run Today	
Cumulative Hrs Run	
Entry Date	

DULL GRADE

T		Gage (mm)	
T		ODC	
MDC		Reason Pulled	
LOC		Total Run (m/hr)	
BRG			

MUD RECORD

Mud Type	Water ☐	Oil ☐	Other ☐
Time			
Density (kg/m³)			
Funnel Viscosity (s/l)			
Fluid Loss (cm³)			
pH			
Location			
Depth (m)			
PVT (m³)			

MUD MATERIALS ADDED

Product	Amount	Type

SOLIDS CONTROL

Equipment Name	Hours Run	Intake Density (kg/m³)	Over Flow Density (kg/m³)	Under Flow Density (kg/m³)

SAFETY

Safety Topic	MEHL (kdaN)	MWCP (kpa)

METRES DRILLED

From (m)	To (m)	D-R-C	RPM	WOB (kdaN)

REDUCED PUMP SPEED

No.	Pressure (kpa)	Strokes/min	Depth (m)
	●	●	
	●	●	
	●	●	

CIRCULATION

Pump	Type	Liner Size (mm)	SPM	Pressure (kpa)	Hours Run
1	SING.E	140	90	1200	8

Remarks

HOLE CONDITION

Hole Drag Up (kdaN)	
Hole Drag Down (kdaN)	
Torque at Bottom (daNm)	
Fill on Bottom (m)	

BOILER

No.	Hours Run	pH	Stack Temp (°C)

DEVIATION SURVEYS

Time	Depth (m)	Deviation	Direction	Type

TIME LOG

From	To	Elapsed	Code	Details of Operations in Sequence & Remarks
00:00	00:15	0.25	21	SAFETY MEETING DRILLER HAND OFF
00:15	00:30	0.25	5	CONDITION MUD & CIRCULATE TOP OF PLUG
00:30	01:30	1.00	8	LAY DOWN 40 S/NGLES AND RACK 20 STANDS
01:30	01:45	0.25	7	RIG SERVICE F/T BLIND RAMS AND CROWN SAVER
01:45	07:00	5.25	13	WAIT ON CEMENT
07:00	07:15	0.25	21	SAFETY MEETING WITH DIRECTIONAL HANDS
07:15	08:00	0.75	200	MAKE UP DIRECTIONAL TOOLS

Remarks

TOUR 2

SIGNATURE OF DRILLER: JASON HAINES

START TIME: 08:00 END TIME: 16:00

DRILLING ASSEMBLY

No.	Component	OD (mm)	ID (mm)	Length (m)
1	BIT & TOOLS	0		39.13

0	Drill Pipe	Stands (m)	0.00
79	Drill Pipe	Singles (m)	740.07
Weight of DC (klbf#)		Kelly Down (m)	11.80
Weight of string (klbf#)		Total (m)	791.00

BITS

Bit Number	1A
Size (mm)	311
IADC Code	
Manufacturer	SECURITY
Type	GT11
Serial No	8022801
Jets (mm)	19 1 19 1
Depth Out (m)	
Depth In (m)	0
Total Drilled (m)	202
Hrs Run Today	0.00
Cumulative Hrs Run	5.25
Entry Date	

DULL GRADE

T		Gage (mm)	
T		ODC	
MDC		Reason Pulled	
LOC		Total Run (m/hr)	
BRG			

MUD RECORD

Mud Type	Water ☒	Oil ☐	Other ☐
Time	08:00	11:30	13:30
Density (kg/m³)	1080	1080	1110
Funnel Viscosity (s/l)	36	36	46
Fluid Loss (cm³)	10.0	10.0	8.0
pH	9	9	12
Location			
Depth (m)			
PVT (m³)			

MUD MATERIALS ADDED

Product	Amount	Type
ENERPAC REGULAR	4	SX
BICARB	9	SX

SOLIDS CONTROL

Equipment Name	Hours Run	Intake Density (kg/m³)	Over Flow Density (kg/m³)	Under Flow Density (kg/m³)

SAFETY

Safety Topic	MEHL (kdaN)	MWCP (kpa)
PIPE SPINNER	30	

METRES DRILLED

From (m)	To (m)	D-R-C	RPM	WOB (kdaN)
772	791	DRILL	30	2

REDUCED PUMP SPEED

No.	Pressure (kpa)	Strokes/min	Depth (m)
	●	●	
	●	●	
	●	●	

CIRCULATION

Pump	Type	Liner Size (mm)	SPM	Pressure (kpa)	Hours Run
1		140	108	4800	8

Remarks

HOLE CONDITION

Hole Drag Up (kdaN)	
Hole Drag Down (kdaN)	
Torque at Bottom (daNm)	
Fill on Bottom (m)	

BOILER

No	Hours Run	pH	Stack Temp (°C)

DEVIATION SURVEYS

Time	Depth (m)	Deviation	Direction	Type

TIME LOG

From	To	Elapsed	Code	Details of Operations in Sequence & Remarks
08:00	08:15	0.25	21	SAFETY MEETING DRILLER HAND OFF
08:15	08:30	0.25	7	RIG SERVICE
08:30	09:15	0.75	20	DIRECTIONAL WORK MAKE UP BIT & TOOLS
09:15	11:15	2.00	6A	TRIP IN HOLE PULSE TEST 10 STANDS IN-R I H-CLEANED TO BOTTOM TAG PLUG @724M
11:15	12:30	1.25	2C	DRILL CEMENT PLUG TO K O P @782M
12:30	15:30	3.00	2	TIME DRILL F/782 - 791M
15:30	16:00	0.50	10	ACCUM SURVEYS & CONNECTION TIME

Remarks

TOUR 3

SIGNATURE OF DRILLER: JARET LAURENT

START TIME: 16:00 END TIME: 24:00

DRILLING ASSEMBLY

No.	Component	OD (mm)	ID (mm)	Length (m)
1	BIT & TOOLS	0		39.13

0	Drill Pipe	Stands (m)	0.00
93	Drill Pipe	Singles (m)	871.85
Weight of DC (klbf#)		Kelly Down (m)	9.02
Weight of string (klbf#)	28	Total (m)	920.00

BITS

Bit Number	1A
Size (mm)	311
IADC Code	
Manufacturer	SECURITY
Type	GT11
Serial No	8022801
Jets (mm)	19 1 19 1
Depth Out (m)	202
Depth In (m)	0
Total Drilled (m)	
Hrs Run Today	
Cumulative Hrs Run	5.25
Entry Date	

DULL GRADE

T		Gage (mm)	
T		ODC	
MDC		Reason Pulled	
LOC		Total Run (m/hr)	38.48
BRG			

MUD RECORD

Mud Type	Water ☒	Oil ☐	Other ☐
Time	16:00	19:00	22:00
Density (kg/m³)	1080	1080	1090
Funnel Viscosity (s/l)	60	50	50
Fluid Loss (cm³)	8.0	8.0	8.0
pH	12	10	10
Location			
Depth (m)			
PVT (m³)			

MUD MATERIALS ADDED

Product	Amount	Type
BICARB	6	SX

SOLIDS CONTROL

Equipment Name	Hours Run	Intake Density (kg/m³)	Over Flow Density (kg/m³)	Under Flow Density (kg/m³)

SAFETY

Safety Topic	MEHL (kdaN)	MWCP (kpa)
PAINTING	28	1561

METRES DRILLED

From (m)	To (m)	D-R-C	RPM	WOB (kdaN)
791	920	DRILL	40	8

REDUCED PUMP SPEED

No.	Pressure (kpa)	Strokes/min	Depth (m)
	●	●	
	●	●	
	●	●	

CIRCULATION

Pump	Type	Liner Size (mm)	SPM	Pressure (kpa)	Hours Run
1		140	124	5000	8

Remarks

HOLE CONDITION

Hole Drag Up (kdaN)	
Hole Drag Down (kdaN)	
Torque at Bottom (daNm)	
Fill on Bottom (m)	

BOILER

No	Hours Run	pH	Stack Temp (°C)

DEVIATION SURVEYS

Time	Depth (m)	Deviation	Direction	Type

TIME LOG

From	To	Elapsed	Code	Details of Operations in Sequence & Remarks
16:00	16:15	0.25	21	SAFETY MEETING AND DRILLER HANDOFF
16:15	16:30	0.25	7	RIG SERVICE - F/T PIPE RAMS AND CROWN SAVER
16:30	23:00	6.50	2	ACCUM DRILL
23:00	24:00	1.00	10	ACCUM MWD SURVEYS AND CONNECTIONS

Remarks

FRONT PAGE SUMMARY

Tour Sheet Serial Number	Vendor Software Version	Year	Month	Day
0xG31_20100710_1A	Pason	2010	07	10

Rig No	Well Name	Surface Location	Prov	Loc Type	Unique Well Id	Kelly Bushing
1	MOLOPO PIERSON PROV	13-32-001-29W1	MB	DLS		4

Licence No	Operator	Contractor	Well Type	Re-Entry
7447	MOLOPO ENERGY CANADA LTD	ADVANCE DRILLING LTD	HORIZ	☐
	Operator's AFE	Contractor's Job No	Spud Date	Time
		19-10-394	2010/07/07	11:00
	Signature of Operator Representative	Signature of Contractor's Rig manager	Rig Release Date	Time
	Mark Mazurat	GARY MILLIONS		

DAILY CHECKS

	OP	RM
1) Daily Walk Around Inspection	msm	GM
2) Detailed Inspection - Weekly Using Check List		
3) H2S Signs Posted if Required	msm	GM
4) Well Licence & Stick Diagram Posted	msm	GM
5) Flare Lines Staked	msm	GM
6) BOP Drills Performed		
7) Visually Inspected BOPs - Flare Lines & Degasser Lines	msm	GM
1) Rig Site Health & Safety Meeting (one/crew/month)		
2) CAODC Rig Safety Inspection Checklist (one/rig/month)		
3) Mast Inspection before Raising or Lowering		
4) Crown Saver Checked		GM
5) Motor Kills Checked		GM

FUEL @ 08:00 HOURS

Rig	75
Boiler	0
Op Fuel	2000

WEATHER

Time	06:00
Temp	15
Current Conditions	CLEAR
Wind Direction	NW
Wind Strength	CALM
Road Condition	GOOD

DRILL PIPE

Category	Thread Type	Grade	OD (mm)	ID (mm)	Linear Mass (kg/m)	No. of Joints	Tool Joint OD (mm)
DC	4.5 XH		159	57	135.02	14	159
DP	4 FH	E	102	85	20.83	180	102
HW	4 FH		102	85	44.10	60	102

CASING

Category	Make	Grade	OD (mm)	ID (mm)	Linear Mass (kg/m)	No. of Joints	Total Length (m)	KB to CSG Head (m)	KB to CSG Bottom (m)
SURFACE	EVRAZ	J-55	219	206	35.72	16	202	4	202

MUD PUMPS

No.	Make	Stroke Length (mm)
1	EMSCO	229

GENERAL EQUIPMENT & SERVICES

Description	Hours

CAODC
Pason

SHALE SHAKERS

No	Top Screen Size	Changed	New	Middle Screen Size	Changed	New	Middle Screen Size	Changed	New	Bottom Screen Size	Changed	New
1	175	☒	☒	175	☒	☐	175	☒	☐		☐	☐

TOUR 1

SIGNATURE OF DRILLER: DEREK LAURENT — START TIME 00:00 — END TIME 08:00

DRILLING ASSEMBLY

No	Component	OD (mm)	ID (mm)	Length (m)
1	BIT	0		0.25
2	BIT SUB	0		0.88
3	X/O	0		0.55
0	Drill Pipe		Stands (m)	0.00
115	Drill Pipe		Singles (m)	1076.23
Weight of DC (daN)			Kelly Down (m)	4.09
Weight of string (daN)			Total (m)	1082.00

BITS

Bit Number	1A
Size (mm)	311
IADC Code	
Manufacturer	SECURITY
Type	GT11
Serial No	8022801
Jets (mm)	19.1, 19.1
Depth Out (m)	202
Depth In (m)	0
Total Drilled (m)	202
Hrs Run Today	0.00
Cumulative Hrs Run	5.25
Entry Date	2010/07/10

DULL GRADE

T_I		Gage (mm)	
T_O		ODC	
MDC		Reason Pulled	
LOC		Total Run (m/hr)	38.48
BRG			

MUD RECORD

Mud Type: Water ☒ Oil ☐ Other

Time	02:00
Density (kg/m³)	1140
Funnel Viscosity (s/l)	110
Fluid Loss (cm³)	10.0
pH	9
Location	
Depth (m)	
PVT (m³)	

MUD MATERIALS ADDED

Product	Amount	Type
ENERPAC REGULAR	3	SX

SOLIDS CONTROL

Equipment Name	Hours Run	Intake Density (kg/m³)	Over Flow Density (kg/m³)	Under Flow Density (kg/m³)

SAFETY

Safety Topic	MEHL (daN)	MACP (kpa)

METRES DRILLED

From (m)	To (m)	D-R-C	RPM	WOB (daN)

REDUCED PUMP SPEED

No.	Pressure (kpa)	Strokes/min	Depth (m)
	@	@	

CIRCULATION

Pump	Type	Liner Size (mm)	SPM	Pressure (kpa)	Hours Run
1	SINGLE	140	120	4100	8

Remarks:

HOLE CONDITION

Hole Drag Up (daN)	
Hole Drag Down (daN)	
Torque at Bottom (Nm)	
Fill on Bottom (m)	

BOILER

No.	Hours Run	pH	Stack Temp (°C)

DEVIATION SURVEYS

Time	Depth (m)	Deviation	Direction	Type

TIME LOG

From	To	Elapsed	Code	Details of Operations in Sequence & Remarks
00:00	01:00	1.00	6	FINISH RIH AND REAM TO BOTTOM
01:00	02:15	1.25	5	CONDITION MUD & CIRCULATE
02:15	02:30	0.25	7	RIG SERVICE F/T MOTOR KILLS AND CROWN SAVER
02:30	03:45	1.25	6	POOH FOR LOGS
03:45	04:00	0.25	21	SAFETY MEETING WITH WEATHERFORD
04:00	08:00	4.00	11	WIRELINE LOGS STI, SPED,CNS,GR,BCS

Remarks:

TOUR 2

SIGNATURE OF DRILLER: JASON HAINES — START TIME 08:00 — END TIME 16:00

DRILLING ASSEMBLY

No.	Component	OD (mm)	ID (mm)	Length (m)
0	Drill Pipe		Stands (m)	0.00
115	Drill Pipe		Singles (m)	1076.23
Weight of DC (daN)			Kelly Down (m)	5.77
Weight of string (daN)			Total (m)	1082.00

BITS

Bit Number	1A
Size (mm)	311
IADC Code	
Manufacturer	SECURITY
Type	GT11
Serial No	8022801
Jets (mm)	19.1, 19.1
Depth Out (m)	202
Depth In (m)	0
Total Drilled (m)	202
Hrs Run Today	0.00
Cumulative Hrs Run	5.25
Entry Date	2010/07/10

DULL GRADE

T_I		Gage (mm)	
T_O		ODC	
MDC		Reason Pulled	
LOC		Total Run (m/hr)	38.48
BRG			

MUD RECORD

Mud Type: Water ☒ Oil ☐ Other

Time	12:00	14:30
Density (kg/m³)	1140	1145
Funnel Viscosity (s/l)	125	59
Fluid Loss (cm³)	9.5	
pH	7	7
Location		
Depth (m)		
PVT (m³)		

MUD MATERIALS ADDED

Product	Amount	Type
DESCO	1	SX

SOLIDS CONTROL

Equipment Name	Hours Run	Intake Density (kg/m³)	Over Flow Density (kg/m³)	Under Flow Density (kg/m³)

SAFETY

Safety Topic	MEHL (daN)	MACP (kpa)
TONGS	26	1439

METRES DRILLED

From (m)	To (m)	D-R-C	RPM	WOB (daN)

REDUCED PUMP SPEED

No.	Pressure (kpa)	Strokes/min	Depth (m)
	@	@	

CIRCULATION

Pump	Type	Liner Size (mm)	SPM	Pressure (kpa)	Hours Run
1		140	105	2600	8

Remarks

HOLE CONDITION

Hole Drag Up (daN)	
Hole Drag Down (daN)	
Torque at Bottom (Nm)	
Fill on Bottom (m)	

BOILER

No.	Hours Run	pH	Stack Temp (°C)

DEVIATION SURVEYS

Time	Depth (m)	Deviation	Direction	Type

TIME LOG

From	To	Elapsed	Code	Details of Operations in Sequence & Remarks
08:00	08:15	0.25	21	SAFETY MEETING DRILLER HAND OFF
08:15	08:30	0.25	7	RIG SERVICE
08:30	09:00	0.50	11	FINISH WIRELINE LOGS
09:00	10:15	1.25	23E	W/O ORDERS
10:15	11:15	1.00	6A	TRIP IN HOLE OPEN ENDED FOR PLUG
11:15	14:45	3.50	5	CONDITION MUD & CIRCULATE
14:45	15:00	0.25	21	SAFETY MEETING WITH CEMENTERS
15:00	15:30	0.50	12F	RIG IN AND PUMP PLUG #1 1082 - 870M w/10.2t Class "G"
15:30	16:00	0.50	6B	HOIST PIPE SLOW OUT OF PLUG

Remarks:

TOUR 3

SIGNATURE OF DRILLER: THOMAS FLOREK — START TIME 16:00 — END TIME 24:00

DRILLING ASSEMBLY

No.	Component	OD (mm)	ID (mm)	Length (m)
0	Drill Pipe		Stands (m)	0.00
115	Drill Pipe		Singles (m)	1076.23
Weight of DC (daN)			Kelly Down (m)	5.77
Weight of string (daN)			Total (m)	1082.00

BITS

Bit Number	1
Size (mm)	200
IADC Code	
Manufacturer	R.B.I.
Type	KX513
Serial No	Z72679A
Jets (mm)	11.1, 11.1, 11.1, 11.1, 11.1, 11.1, 11.1
Depth Out (m)	1082
Depth In (m)	202
Total Drilled (m)	880
Hrs Run Today	
Cumulative Hrs Run	24.50
Entry Date	2010/07/10

DULL GRADE

T_I		Gage (mm)	
T_O		ODC	
MDC		Reason Pulled	
LOC		Total Run (m/hr)	35.92
BRG			

MUD RECORD

Mud Type: Water ☒ Oil ☐ Other

Time	16:00	19:00	22:00
Density (kg/m³)	1140	1100	1080
Funnel Viscosity (s/l)	59	46	47
Fluid Loss (cm³)		20.0	10.0
pH		10	10
Location			
Depth (m)			
PVT (m³)			

MUD MATERIALS ADDED

Product	Amount	Type
ENERPAC LO VIS	2	SX
ENERPAC REGULAR	2	SX
BICARB	6	SX

SOLIDS CONTROL

Equipment Name	Hours Run	Intake Density (kg/m³)	Over Flow Density (kg/m³)	Under Flow Density (kg/m³)

SAFETY

Safety Topic	MEHL (daN)	MACP (kpa)
CEMENTING	22	1520

METRES DRILLED

From (m)	To (m)	D-R-C	RPM	WOB (daN)

REDUCED PUMP SPEED

No.	Pressure (kpa)	Strokes/min	Depth (m)
	@	@	

CIRCULATION

Pump	Type	Liner Size (mm)	SPM	Pressure (kpa)	Hours Run
1	SINGLE	140	90	1300	6.5

Remarks

HOLE CONDITION

Hole Drag Up (daN)	
Hole Drag Down (daN)	
Torque at Bottom (Nm)	
Fill on Bottom (m)	

BOILER

No.	Hours Run	pH	Stack Temp (°C)

DEVIATION SURVEYS

Time	Depth (m)	Deviation	Direction	Type

TIME LOG

From	To	Elapsed	Code	Details of Operations in Sequence & Remarks
16:00	16:15	0.25	6B	HOIST SLOW OUT OF PLUG #1
16:15	16:30	0.25	12F	PUMP PLUG #2 870 - 720M w/8.2t Class "G"
16:30	17:00	0.50	6B	HOIST SLOW OUT OF PLUG #2
17:00	17:15	0.25	21	SAFETY MEETING
17:15	17:30	0.25	7	RIG SERVICE
17:30	24:00	6.50	5D	CIRCULATE AND CONDITION

Remarks: DWA VISUALLY INSPECTED BOP

FRONT PAGE SUMMARY

Tour Sheet Serial Number	Vendor Software Version	Year	Month	Day
0XG31_20100709_1A	Pason	2010	07	09

Rig No	Well Name	Surface Location	Prov	Loc Type	Unique Well Id	Kelly Bushing
1	MOLOPO PIERSON PRO[illegible]	13-32-001-29W1	MB	DLS		4

License No	Operator	Contractor	Well Type	Re-Entry
7447	MOLOPO ENERGY CANADA LTD	ADVANCE DRILLING LTD	HORIZ	☐
	Operator's AFE	Contractor's Job No	Spud Date	Time
		19-10-394	2010/07/07	11 00
	Signature of Operator Representative	Signature of Contractor's Rig manager	Rig Release Date	Time
	Mark Mazurat	GARY MILLIONS		

DAILY CHECKS

	OP	RM
1) Daily Walk Around Inspection		
2) Detailed Inspection - Weekly (Using Check List)		
3) H2S Signs Posted if Required		
4) Well Licence & Stick Diagram Posted		
5) Flare Lines Staked		
6) BOP Drills Performed		
7) Visually Inspected BOPs - Flare Lines & Degasser Lines		
1) Rig Site Health & Safety Meeting (one/crew/month)		
2) CAODC Rig Safety Inspection Checklist (one/rig/month)		
3) Mast Inspection before Raising or Lowering		
4) Crown Saver Checked		
5) Mesy Kills Checked		

FUEL @ 08:00 HOURS

Rig	20
Boiler	0
Op Fuel	1520

WEATHER

Time	06 00
Temp	13
Current Conditions	CLEAR
Wind Direction	NW
Wind Strength	CALM
Road Condition	FAIR

DRILL PIPE

Category	Thread Type	Grade	OD (mm)	ID (mm)	Linear Mass (kg/m)	No. of Joints	Tool Joint OD (mm)
DC	4 5 XH		159	57	135 02	14	159
DP	4 FH	E	102	85	20 83	180	102
HW	4 FH		102	85	44 10	60	102

MUD PUMPS

No.	Make	Stroke Length (mm)
1	EMSCO	229

GENERAL EQUIPMENT & SERVICES

Description	Hours

CAODC

Pason

CASING

Category	Make	Grade	OD (mm)	ID (mm)	Linear Mass (kg/m)	No. of Joints	Total Length (m)	KB to CSG Head (m)	KB to CSG Bottom (m)
SURFACE	EVRAZ	J-55	219	206	35 72	16	202	4	202

SHALE SHAKERS

No	Top Screen Size	Top Screen Changed	Top Screen New	Middle Screen Size	Middle Screen Changed	Middle Screen New	Middle Screen Size	Middle Screen Changed	Middle Screen New	Bottom Screen Size	Bottom Screen Changed	Bottom Screen New
1	175	☒	☒	5175	☒	☒	175	☐	☒		☐	☐

TOUR 1

SIGNATURE OF DRILLER: KELLY MILLIONS — START TIME 00 00 — END TIME 08 00

DRILLING ASSEMBLY

No	Component	OD (mm)	ID (mm)	Length (m)
1	BIT & TOOLS	0		39 13
0	Drill Pipe		Stands (m)	0 00
86	Drill Pipe		Singles (m)	795 02
Weight of DC (kdaN)			Kelly Down (m)	11.85
Weight of string (kdaN)	22		Total (m)	846 00

BITS

Bit Number	1A
Size (mm)	311
IADC Code	
Manufacturer	SECURITY
Type	GT11
Serial No	802280*
Jets (mm)	19 1, 19 1
Depth Out (m)	202
Depth In (m)	0
Total Drilled (m)	202
Hrs Run Today	0 00
Cumulative Hrs Run	5 25
Entry Date	

DULL GRADE

T_i		Gage (mm)	
T_o		ODC	
MDC		Reason Pulled	
LOC		Total Run (m/hr)	38.48
BRG			

MUD RECORD

Mud Type: Water ☒ Oil ☐ Other

Time	03 00	06 00
Density (kg/m³)	1070	1060
Funnel Viscosity (s/l)	32	35
Fluid Loss (cm³)		
pH		
Location		
Depth (m)		
PVT (m³)		

MUD MATERIALS ADDED

Product	Amount	Type
CALCIUM NITRATE	3	SX
HYPERDRILL 204	1	SX
ENERPAC REGULAR	3	SX
SODA ASH	6	SX

SOLIDS CONTROL

Equipment Name	Hours Run	Intake Density (kg/m³)	Over Flow Density (kg/m³)	Under Flow Density (kg/m³)

SAFETY

Safety Topic	MEHL (kdaN)	MACP (kpa)
TONGS	35	2132

METRES DRILLED

From (m)	To (m)	D-R-C	RPM	WOB (kdaN)
540	846	DRILL	45	9

REDUCED PUMP SPEED

No.	Pressure (kpa)	Strokes/min	Depth (m)

CIRCULATION

Pump	Type	Liner Size (mm)	SPM	Pressure (kpa)	Hours Run
1		140	125	5600	8

Remarks

HOLE CONDITION

Hole Drag Up (kdaN)	
Hole Drag Down (kdaN)	
Torque at Bottom (Nm)	
Fill on Bottom (m)	

BOILER

No.	Hours Run	pH	Stack Temp (°C)

DEVIATION SURVEYS

Time	Depth (m)	Deviation	Direction	Type
00 15	590 00	0 5	23	DIRECTIONAL
01:00	650.00	0 5	350	DIRECTIONAL
02:45	708 00	0.8	184	DIRECTIONAL
04:00	755.00	0.2	200	DIRECTIONAL
05:00	801.00	0.3	179	DIRECTIONAL

TIME LOG

From	To	Elapsed	Code	Details of Operations in Sequence & Remarks
00 00	00 15	0 25	21	SAFETY MEETING AND DRILLER HANDOFF
00:15	00 30	0 25	7	RIG SERVICE F/T PIPE RAMS - CROWN SAVER
00 30	07 00	6 50	2	DRILL
07:00	08 00	1.00	10	ACUM MWD SURVEYS AND CONN TIME

Remarks

TOUR 2

SIGNATURE OF DRILLER: JASON HAINES — START TIME 08 00 — END TIME 16:00

DRILLING ASSEMBLY

No.	Component	OD (mm)	ID (mm)	Length (m)
1	BIT & TOOLS	0		39 13
0	Drill Pipe		Stands (m)	0 00
103	Drill Pipe		Singles (m)	964 15
Weight of DC (kdaN)			Kelly Down (m)	11.72
Weight of string (kdaN)	25		Total (m)	1015.00

BITS

Bit Number	1A
Size (mm)	311
IADC Code	
Manufacturer	SECURITY
Type	GT11
Serial No	8022801
Jets (mm)	19 1, 19 1
Depth Out (m)	202
Depth In (m)	0
Total Drilled (m)	202
Hrs Run Today	0.00
Cumulative Hrs Run	5.25
Entry Date	

DULL GRADE

T_i		Gage (mm)	
T_o		ODC	
MDC		Reason Pulled	
LOC		Total Run (m/hr)	38.48
BRG			

MUD RECORD

Mud Type: Water ☒ Oil ☐ Other

Time	08 00	11:30	13 30
Density (kg/m³)	1050	1100	1110
Funnel Viscosity (s/l)	38	45	48
Fluid Loss (cm³)			
pH			
Location			
Depth (m)			
PVT (m³)			

MUD MATERIALS ADDED

Product	Amount	Type
SODA ASH	6	SX

SOLIDS CONTROL

Equipment Name	Hours Run	Intake Density (kg/m³)	Over Flow Density (kg/m³)	Under Flow Density (kg/m³)

SAFETY

Safety Topic	MEHL (kdaN)	MACP (kpa)
MIXING	32	1520

METRES DRILLED

From (m)	To (m)	D-R-C	RPM	WOB (kdaN)
846	1015	DRILL	40	10

REDUCED PUMP SPEED

No.	Pressure (kpa)	Strokes/min	Depth (m)

CIRCULATION

Pump	Type	Liner Size (mm)	SPM	Pressure (kpa)	Hours Run
1		140	125	6600	8

Remarks

HOLE CONDITION

Hole Drag Up (kdaN)	
Hole Drag Down (kdaN)	
Torque at Bottom (Nm)	
Fill on Bottom (m)	

BOILER

No.	Hours Run	pH	Stack Temp (°C)

DEVIATION SURVEYS

Time	Depth (m)	Deviation	Direction	Type
08:00	850 00	0 7	25	DIRECTIONAL
09 45	898 00	0.6	327	DIRECTIONAL

TIME LOG

From	To	Elapsed	Code	Details of Operations in Sequence & Remarks
08 00	08 15	0 25	21	SAFETY MEETING DRILLER HAND OFF
08:15	08:30	0 25	7	RIG SERVICE F/T MOTOR KILL
08:30	14:45	6 25	2	DRILL
14:45	16:00	1 25	10	ACCUM SURVEYS & CONNECTION TIME

Remarks:

TOUR 3

SIGNATURE OF DRILLER: JARET LAURENT — START TIME 16:00 — END TIME 24 00

DRILLING ASSEMBLY

No.	Component	OD (mm)	ID (mm)	Length (m)
1	BIT & TOOLS	0		39 13
0	Drill Pipe		Stands (m)	0 00
[illegible]	Drill Pipe		Singles (m)	1038 65
Weight of DC (kdaN)			Kelly Down (m)	4 22
Weight of string (kdaN)	27		Total (m)	1082 00

BITS

Bit Number	1A
Size (mm)	311
IADC Code	
Manufacturer	SECURITY
Type	GT11
Serial No	8022801
Jets (mm)	19 1, 19 1
Depth Out (m)	202
Depth In (m)	0
Total Drilled (m)	202
Hrs Run Today	
Cumulative Hrs Run	5 25
Entry Date	

DULL GRADE

T_i		Gage (mm)	
T_o		ODC	
MDC		Reason Pulled	
LOC		Total Run (m/hr)	38.48
BRG			

MUD RECORD

Mud Type: Water ☒ Oil ☐ Other

Time	16:00	20.00
Density (kg/m³)	1120	1140
Funnel Viscosity (s/l)	45	70
Fluid Loss (cm³)	15 0	12 0
pH	8	9
Location		
Depth (m)		
PVT (m³)		

MUD MATERIALS ADDED

Product	Amount	Type
ENERPAC LO VIS	1	SX
ENERPAC REGULAR	4	SX
CAUSTIC	1	SX

SOLIDS CONTROL

Equipment Name	Hours Run	Intake Density (kg/m³)	Over Flow Density (kg/m³)	Under Flow Density (kg/m³)

SAFETY

Safety Topic	MEHL (kdaN)	MACP (kpa)
GREEN FLOORHANDS	45	

METRES DRILLED

From (m)	To (m)	D-R-C	RPM	WOB (kdaN)
1015	1082	DRILL	40	10

REDUCED PUMP SPEED

No.	Pressure (kpa)	Strokes/min	Depth (m)

CIRCULATION

Pump	Type	Liner Size (mm)	SPM	Pressure (kpa)	Hours Run
1	SINGLE	140	124	5400	8

Remarks

HOLE CONDITION

Hole Drag Up (kdaN)	
Hole Drag Down (kdaN)	
Torque at Bottom (Nm)	
Fill on Bottom (m)	

BOILER

No.	Hours Run	pH	Stack Temp (°C)

DEVIATION SURVEYS

Time	Depth (m)	Deviation	Direction	Type

TIME LOG

From	To	Elapsed	Code	Details of Operations in Sequence & Remarks
16.00	16:15	0 25	21	SAFETY MEETING AND DRILLER HANDOFF
16:15	18:45	2 50	2	CONTROL DRILL @ 20 M/HR FR 1015M T0 1061 M
18 45	20 00	1 25	2	DRILL
20.00	20.30	0 50	5	CIRCULATE BOTTOM HOLE SAMPLE
20 30	20 45	0 25	7	RIG SERVICE - F/T ANNULAR AND CROWN SAVER
20 45	22 00	1 25	6	WIPER TRIP- 47 STANDS
22 00	22 15	0 25	21	SAFETY MEETING WITH DIRECTIONAL
22 15	23 15	1 00	20	DIRECTIONAL WORK- LAY DOWN DIR. TOOLS
23 15	24 00	0 75	6	RIH SLICK

Remarks

FRONT PAGE SUMMARY

Tour Sheet Serial Number	Vendor Software Version	Year	Month	Day
DXG31_23100708_1A	Pason	2010	07	08

Rig No.	Well Name	Surface Location	Prov	Loc Type	Unique Well Id	Kelly Bushing
1	MOLOPO FIREBIRD PROV HZ LSD 08-01	13-32-001-29W1	MB	DLS		4

License No.	Operator	Contractor	Well Type	Re-Entry
7447	MOLOPO ENERGY CANADA LTD	ADVANCE DRILLING LTD	HORIZ	☐
	Operator's AFE	Contractor's Job No	Spud Date	Time
		19-10-394	2010-07-07	11:00
	Signature of Operator Representative	Signature of Contractor's Rig manager	Rig Release Date	Time
	Mark Mazurat	GARY MILLIONS		

DAILY CHECKS

	OP	RM
1) Daily Walk Around Inspection	mach	GM
2) Derrick Inspection - Weekly (Using Check List)		
3) H2S Scan Packet if Required	mach	GM
4) Wind Indicator & Sock Inspected Replaced	mach	GM
5) Flare Lines Tested	mach	GM
6) BOP Drills Performed	mach	GM
7) Visually Inspected BOPs - Flare Lines & Diagnoser Lines	mach	GM
1) Rig Site Health & Safety Meeting conducted/recorded		
2) CAODC Rig Safety Inspection Checklist completed/amended		
3) Motor Inspection before Rigging or Lowering		
4) Crown Saver Checked		GM
5) Motor RPM Checked		GM

FUEL @ 08:00 HOURS

Rig	20
Boiler	0
Op Fuel	1520

WEATHER

Time	06:00
Temp	13
Current Conditions	CLEAR
Wind Direction	NW
Wind Strength	CALM
Road Condition	FAIR

DRILL PIPE

Category	Thread Type	Grade	OD (mm)	ID (mm)	Linear Mass (kg/m)	No. of Joints	Tool Joint OD (mm)
DC	4 5 XH		159	57	135.02	14	159
DP	4 FH	E	102	85	20.83	180	102
HW	4 FH		102	85	44.10	60	102

MUD PUMPS

No.	Make	Stroke Length (mm)
1	EMSCO	229

GENERAL EQUIPMENT & SERVICES

Description	Hours

CAODC Pason

CASING

Category	Make	Grade	OD (mm)	ID (mm)	Linear Mass (kg/m)	No. of Joints	Total Length (m)	KB to CSG Head (m)	KB to CSG Bottom (m)
SURFACE	EVRAZ	J-55	219	208	35.72	16	202	4	202

SHALE SHAKERS

No	Top Screen			Middle Screen			Middle Screen			Bottom Screen		
	Size	Changed	New	Size	Changed	New	Size	Changed	New	Size	Changed	New
1	50	☒	☐	50	☒	☐	50	☒	☐		☐	☐
		☐	☐		☐	☐		☐	☐		☐	☐

TOUR 1

SIGNATURE OF DRILLER: KELLY MILLIONS — START TIME: 00:00 — END TIME: 08:00

DRILLING ASSEMBLY

No.	Component	OD (mm)	ID (mm)	Length (m)
1	BIT	0		0.35
1	BELL SUB	0		1.15
1	X/O	0		0.55
12	D/Cs	0		107.80
1	[illegible]	0		0.96
0	Drill Pipe	Stands (m)		0.00
9	Drill Pipe	Singles (m)		84.31
Weight of DC (klbf#)	17	Kelly Down (m)		6.88
Weight of string (klbf#)	18	Total (m)		202.00

BITS

Bit Number	1A
Size (mm)	311
IADC Code	
Manufacturer	SECURITY
Type	GT11
Serial No	8022801
Jets (mm)	19 1 19 1
Depth Out (m)	202
Depth In (m)	0
Total Drilled (m)	202
Hrs Run Today	
Cumulative Hrs Run	5.25
Entry Date	

DULL GRADE

T_1		Gage (mm)	
T_2		ODC	
MDC		Reason Pulled	
LOC		Total Run (m/hr)	38.48
BRG			

MUD RECORD

Mud Type	Water ☐	Oil ☐	Other ☐	
Time				
Density (kg/m³)				
Funnel Viscosity (s/l)				
Fluid Loss (cm³)				
pH				
Location				
Depth (m)				
PVT (m³)				

MUD MATERIALS ADDED

Product	Amount	Type

SOLIDS CONTROL

Equipment Name	Hours Run	Intake Density (kg/m³)	Over Flow Density (kg/m³)	Under Flow Density (kg/m³)

SAFETY

Safety Topic	MEHL (klbf#)	MACP (kpa)

METRES DRILLED

From (m)	To (m)	D-R-C	RPM	WOB (klbf#)

REDUCED PUMP SPEED

No.	Pressure (kpa)	Strokes/min	Depth (m)
	●	●	
	●	●	
	●	●	

CIRCULATION

Pump	Type	Liner Size (mm)	SPM	Pressure (kpa)	Hours Run
1		140	150	3100	0

Remarks

HOLE CONDITION

Hole Drag Up (klbf#)	
Hole Drag Down (klbf#)	
Torque at Bottom (klbf)	
Fill on Bottom (m)	

BOILER

No.	Hours Run	pH	Stack Temp (°C)

DEVIATION SURVEYS

Time	Depth (m)	Deviation	Direction	Type

TIME LOG

From	To	Elapsed	Code	Details of Operations in Sequence & Remarks
00:00	00:15	0.25	5	CONDITION MUD & CIRCULATE
00:15	00:30	0.25	8	P.O.O.H FOR CASING
00:30	00:45	0.25	21	SAFETY MEETING RUN CASING - F/T CROWN SAVER
00:45	02:00	1.25	12	RIG TO AND RUN 16 JOINTS 219.1mm, 35.72kgm, J-55 CASING LENGTH 202.5m
02:00	05:00	3.00	5	CIRCULATE AND WAIT ON CEMENTERS
05:00	05:15	0.25	21	SAFETY MEETING WITH CEMENTERS200
05:15	06:00	0.75	12C	CEMENT CASING W/ 14T SURFACE SLURRY 1750, DISPLACE W 6.5M3 FRESH WATER, BUMP
				PLUG @5.5 HRS, FLOAT HELD OK, LANDED @202m, W 3M3 GOOD CEMENT RETURNS
06:00	08:00	2.00	13	WAIT ON CEMENT

Remarks

TOUR 2

SIGNATURE OF DRILLER: JASON HAINES — START TIME: 08:00 — END TIME: 16:00

DRILLING ASSEMBLY

No.	Component	OD (mm)	ID (mm)	Length (m)
1	BIT & TOOLS	0		39.13
0	Drill Pipe	Stands (m)		0.00
17	Drill Pipe	Singles (m)		158.73
Weight of DC (klbf#)		Kelly Down (m)		12.14
Weight of string (klbf#)		Total (m)		210.00

BITS

Bit Number	1A
Size (mm)	311
IADC Code	
Manufacturer	SECURITY
Type	GT11
Serial No	8022801
Jets (mm)	19 1 19 1
Depth Out (m)	202
Depth In (m)	0
Total Drilled (m)	202
Hrs Run Today	0.00
Cumulative Hrs Run	5.25
Entry Date	

DULL GRADE

T_1		Gage (mm)	
T_2		ODC	
MDC		Reason Pulled	
LOC		Total Run (m/hr)	38.48
BRG			

MUD RECORD

Mud Type	Water ☒	Oil ☐	Other ☐	
Time				
Density (kg/m³)				
Funnel Viscosity (s/l)				
Fluid Loss (cm³)				
pH				
Location				
Depth (m)				
PVT (m³)				

MUD MATERIALS ADDED

Product	Amount	Type
CALCIUM NITRATE	15	SX

SOLIDS CONTROL

Equipment Name	Hours Run	Intake Density (kg/m³)	Over Flow Density (kg/m³)	Under Flow Density (kg/m³)

SAFETY

Safety Topic	MEHL (klbf#)	MACP (kpa)

METRES DRILLED

From (m)	To (m)	D-R-C	RPM	WOB (klbf#)
202	210	DRILL	45	2

REDUCED PUMP SPEED

No.	Pressure (kpa)	Strokes/min	Depth (m)
	●	●	
	●	●	
	●	●	

CIRCULATION

Pump	Type	Liner Size (mm)	SPM	Pressure (kpa)	Hours Run
1		140	105	2100	8

Remarks

HOLE CONDITION

Hole Drag Up (klbf#)	
Hole Drag Down (klbf#)	
Torque at Bottom (klbf)	
Fill on Bottom (m)	

BOILER

No.	Hours Run	pH	Stack Temp (°C)

DEVIATION SURVEYS

Time	Depth (m)	Deviation	Direction	Type

TIME LOG

From	To	Elapsed	Code	Details of Operations in Sequence & Remarks
08:00	08:15	0.25	21	SAFETY MEETING DRILLER HAND OFF
08:15	08:30	0.25	13	WAIT ON CEMENT
08:30	09:30	1.00	25	CUT CASING WELD BOWL SER# YB090652
09:30	10:00	0.50	14A	NIPPLE UP BOPS
10:00	10:45	0.75	15A	PRESSURE TEST BOPS AND MANIFOLD
10:45	11:00	0.25	6	R I H COLLARS OPEN ENDED
11:00	11:45	0.75	15A	PRESSURE TEST BOPS AND MANIFOLD
11:45	12:15	0.50	6	LAY DOWN COLLARS
12:15	12:30	0.25	21	SAFETY MEETING WITH PHOENIX
12:30	13:30	1.00	20	DIRECTIONAL WORK MAKE UP BIT & TOOLS MOTOR SETTING 1.5 DEG
13:30	14:00	0.50	6	R I H PICK UP 8 SINGLES
14:00	15:00	1.00	2C	DRILL CEMENT/DRILL OUT CEMENT/DRILL FLOAT&SHOE
15:00	15:15	0.25	7	RIG SERVICE

Remarks

TOUR 3

SIGNATURE OF DRILLER: JARET LAURENT — START TIME: 16:00 — END TIME: 24:00

DRILLING ASSEMBLY

No.	Component	OD (mm)	ID (mm)	Length (m)
1	BIT & TOOLS	0		39.13
0	Drill Pipe	Stands (m)		0.00
53	Drill Pipe	Singles (m)		496.25
Weight of DC (klbf#)		Kelly Down (m)		4.59
Weight of string (klbf#)		Total (m)		540.00

BITS

Bit Number	1A
Size (mm)	200
IADC Code	
Manufacturer	SECURITY
Type	GT11
Serial No	5022501
Jets (mm)	19 1 19 1
Depth Out (m)	202
Depth In (m)	0
Total Drilled (m)	202
Hrs Run Today	
Cumulative Hrs Run	5.25
Entry Date	

DULL GRADE

T_1		Gage (mm)	
T_2		ODC	
MDC		Reason Pulled	
LOC		Total Run (m/hr)	38.48
BRG			

MUD RECORD

Mud Type	Water ☒	Oil ☐	Other ☐	
Time				
Density (kg/m³)				
Funnel Viscosity (s/l)				
Fluid Loss (cm³)				
pH				
Location				
Depth (m)				
PVT (m³)				

MUD MATERIALS ADDED

Product	Amount	Type
HYPERDRILL 204	2	SX
CALCIUM NITRATE	4	SX

SOLIDS CONTROL

Equipment Name	Hours Run	Intake Density (kg/m³)	Over Flow Density (kg/m³)	Under Flow Density (kg/m³)

SAFETY

Safety Topic	MEHL (klbf#)	MACP (kpa)
BOOM LINE	16	1724

METRES DRILLED

From (m)	To (m)	D-R-C	RPM	WOB (klbf#)
210	540	DRILL	45	6

REDUCED PUMP SPEED

No.	Pressure (kpa)	Strokes/min	Depth (m)
	●	●	
	●	●	
	●	●	

CIRCULATION

Pump	Type	Liner Size (mm)	SPM	Pressure (kpa)	Hours Run
1	SKYTE	140	124	4000	8

Remarks

HOLE CONDITION

Hole Drag Up (klbf#)	
Hole Drag Down (klbf#)	
Torque at Bottom (klbf)	
Fill on Bottom (m)	

BOILER

No.	Hours Run	pH	Stack Temp (°C)

DEVIATION SURVEYS

Time	Depth (m)	Deviation	Direction	Type
17:15	284.00	0.3	177	DIRECTIONAL
19:30	384.00	0.6	170	DIRECTIONAL
22:03	490.00	2.5	36	DIRECTIONAL
23:15	537.00	0.5	12	DIRECTIONAL

TIME LOG

From	To	Elapsed	Code	Details of Operations in Sequence & Remarks
16:00	16:15	0.25	21	SAFETY MEETING AND DRILLER HANDOFF
16:15	16:30	0.25	7	RIG SERVICE - F/T CROWN SAVER AND MOTOR KILLS
16:30	23:30	7.00	2	ACCUM DRILL
23:30	24:00	0.50	10	ACCUM MWD SURVEYS

Remarks

FRONT PAGE SUMMARY

Tour Sheet Serial Number	Vendor Software Version	Year	Month	Day
DXG31_20100707_1A	Pason	2010	07	07

Rig No	Well Name	Surface Location	Prov	Loc Type	Unique Well Id	Kelly Bushing
1	MCL CPD PERSON PROV [07-13-32-001-29W1]	13-32-001-29W1	MB	DLS		4

License No	Operator	Contractor	Well Type	Re-Entry
7447	MOLOPO ENERGY CANADA LTD	ADVANCE DRILLING LTD	HORIZ	☐

Operator's AFE	Contractor's Job No	Spud Date	Time
	19-10-394	2010/07/07	11:00

Signature of Operator Representative	Signature of Contractor's Rig manager	Rig Release Date	Time
Mark Mazurat	GARY MILLIONS		

DAILY CHECKS

	OP	RM
1) Daily Walk Around Inspection	(mm/d)	GM
2) Derailed Inspection - Weekly Using Check List	(mm/d)	GM
3) H2S Alarm Systems / Response	(mm/d)	GM
4) Well Licence & Slick Diagram Posted	(mm/d)	GM
5) Flare Lines Staked	(mm/d)	GM
6) BOP Drills Performed		
7) Visually Inspected BOPs - Flare Lines & Degasser Lines		
1) Rig Site Health & Safety Meeting (one/crew/month)		
2) CAODC Rig Safety Inspection Checklist (one/rig/month)		
3) Mast Inspection before Raising or Lowering		GM
4) Crown Saver Checked		
5) Mast Bolts Checked		

FUEL @ 08:00 HOURS

Rig	39
Boiler	0
Op Fuel	0

WEATHER

Time	05:00
Temp	12
Current Conditions	CLEAR
Wind Direction	NW
Wind Strength	CALM
Road Condition	FAIR

DRILL PIPE

Category	Thread Type	Grade	OD (mm)	ID (mm)	Linear Mass (kg/m)	No. of Joints	Tool Joint OD (mm)
DC	4.5 XH		159	57	135.02	14	159
DP	4 FH	E	102	85	20.83	180	102
HW	4 FH		102	85	44.10	60	102

MUD PUMPS

No.	Make	Stroke Length (mm)
1	EMSCO	229

GENERAL EQUIPMENT & SERVICES

Description	Hours

CASING

Category	Make	Grade	OD (mm)	ID (mm)	Linear Mass (kg/m)	No. of Joints	Total Length (m)	KB to CSG Head (m)	KB to CSG Bottom (m)

SHALE SHAKERS

No	Top Screen			Middle Screen			Middle Screen			Bottom Screen		
	Size	Changed	New	Size	Changed	New	Size	Changed	New	Size	Changed	New
1	50	☒	☐	50	☒	☐	50	☒	☐		☐	☐
		☐	☐		☐	☐		☐	☐		☐	☐

Pason

TOUR 1

SIGNATURE OF DRILLER: KELLY MILLIONS — START TIME: 00:00 — END TIME: 08:00

DRILLING ASSEMBLY

No.	Component	OD (mm)	ID (mm)	Length (m)

	Drill Pipe	Stands (m)	
	Drill Pipe	Singles (m)	
Weight of DC (kdaN)		Kelly Down (m)	
Weight of string (kdaN)		Total (m)	

BITS

Bit Number	
Size (mm)	
IADC Code	
Manufacturer	
Type	
Serial No.	
Jets (mm)	
Depth Out (m)	
Depth In (m)	
Total Drilled (m)	
Hrs Run Today	
Cumulative Hrs Run	
Entry Date	

DULL GRADE

T_i		Gage (mm)	
T_f		ODC	
MDC		Reason Pulled	
LDC		Total Run (m/hr)	
BRG			

MUD RECORD

Mud Type	Water ☐	Oil ☐	Other ☐	
Time				
Density (kg/m³)				
Funnel Viscosity (s/l)				
Fluid Loss (cm³)				
pH				
Location				
Depth (m)				
PVT (m³)				

MUD MATERIALS ADDED

Product	Amount	Type

METRES DRILLED

From (m)	To (m)	D-R-C	RPM	WOB (kdaN)

REDUCED PUMP SPEED

No.	Pressure (kpa)	Strokes/min	Depth (m)
	@	@	
	@	@	
	@	@	

HOLE CONDITION

Hole Drag Up (kdaN)	
Hole Drag Down (kdaN)	
Torque at Bottom (klbf)	
Fill on Bottom (m)	

BOILER

No.	Hours Run	pH	Stack Temp (°C)

SOLIDS CONTROL

Equipment Name	Hours Run	Intake Density (kg/m³)	Over Flow Density (kg/m³)	Under Flow Density (kg/m³)

CIRCULATION

Pump	Type	Liner Size (mm)	SPM	Pressure (kpa)	Hours Run
1		140	0	0	0

Remarks

DEVIATION SURVEYS

Time	Depth (m)	Deviation	Direction	Type

SAFETY

Safety Topic	MEHL (kdaN)	MACP (kpa)

TIME LOG

From	To	Elapsed	Code	Details of Operations in Sequence & Remarks
00:00	08:00	8.00	24	RIG WATCH

Remarks: GRAVEYARDS WORKED DAYLIGHTS - MOVED RIG & RIG UP

TOUR 2

SIGNATURE OF DRILLER: JASON HAINES — START TIME: 08:00 — END TIME: 16:00

DRILLING ASSEMBLY

No.	Component	OD (mm)	ID (mm)	Length (m)
1	BIT	0		0.35
1	BELL SUB	0		1.15
1	X/O	0		0.55
12	D/C's	0		107.80
0	Drill Pipe	Stands (m)		0.00
0	Drill Pipe	Singles (m)		0.00
Weight of DC (kdaN)	17	Kelly Down (m)		12.15
Weight of string (kdaN)		Total (m)		122.00

BITS

Bit Number	1
Size (mm)	311
IADC Code	
Manufacturer	SECURITY
Type	GT11
Serial No.	8022801
Jets (mm)	19 | 19 |
Depth Out (m)	122
Depth In (m)	0
Total Drilled (m)	122
Hrs Run Today	3.50
Cumulative Hrs Run	3.50
Entry Date	

DULL GRADE

T_i		Gage (mm)	
T_f		ODC	
MDC		Reason Pulled	
LDC		Total Run (m/hr)	34.86
BRG			

MUD RECORD

Mud Type	Water ☒	Oil ☐	Other ☐	
Time				
Density (kg/m³)				
Funnel Viscosity (s/l)				
Fluid Loss (cm³)				
pH				
Location				
Depth (m)				
PVT (m³)				

MUD MATERIALS ADDED

Product	Amount	Type
CAUSTIC	1	SX
GEL	15	SX
LIME	1	SX

METRES DRILLED

From (m)	To (m)	D-R-C	RPM	WOB (kdaN)
0	122	DRILL	250	4

REDUCED PUMP SPEED

No.	Pressure (kpa)	Strokes/min	Depth (m)
	@	@	
	@	@	
	@	@	

HOLE CONDITION

Hole Drag Up (kdaN)	
Hole Drag Down (kdaN)	
Torque at Bottom (klbf)	
Fill on Bottom (m)	

BOILER

No.	Hours Run	pH	Stack Temp (°C)

SOLIDS CONTROL

Equipment Name	Hours Run	Intake Density (kg/m³)	Over Flow Density (kg/m³)	Under Flow Density (kg/m³)

CIRCULATION

Pump	Type	Liner Size (mm)	SPM	Pressure (kpa)	Hours Run
1		140	145	1000	8

Remarks

DEVIATION SURVEYS

Time	Depth (m)	Deviation	Direction	Type
12:00	32.00	0.5	0	
12:30	59.00	0.5	0	
14:00	94.00	0.5	0	
15:30	120.00	0.2	0	

SAFETY

Safety Topic	MEHL (kdaN)	MACP (kpa)

TIME LOG

From	To	Elapsed	Code	Details of Operations in Sequence & Remarks
08:00	08:15	0.25	21	SAFETY MEETING W/TH FAST TRUCKING
08:15	11:00	2.75	1A	MOVE RIG & RIG UP - RIGGED READY TO SPUD - SPUD TIME IS 1100 HRS
11:00	11:15	0.25	21	SAFETY MEETING - PRE DRILL
11:15	11:45	0.50	2	DRILL
11:45	12:00	0.25	10	DEVIATION SURVEY @ 32M 1/2 DEG
12:00	12:30	0.50	2	DRILL
12:30	12:45	0.25	10	DEVIATION SURVEY @ 59M 1/2 DEG
12:45	14:00	1.25	2	DRILL
14:00	14:15	0.25	10	DEVIATION SURVEY @ 94M 1/2 DEG
14:15	15:30	1.25	2	DRILL
15:30	15:45	0.25	10	DEVIATION SURVEY @ 120 M 25 DEG
15:45	16:00	0.25	7	RIG SERVICE

Remarks

TOUR 3

SIGNATURE OF DRILLER: JARET LAURENT — START TIME: 16:00 — END TIME: 24:00

DRILLING ASSEMBLY

No.	Component	OD (mm)	ID (mm)	Length (m)
1	BIT	0		0.35
1	BELL SUB	0		1.15
1	X/O	0		0.55
12	D/C's	0		107.80
1	reamer	0		0.96
0	Drill Pipe	Stands (m)		0.00
14	Drill Pipe	Singles (m)		84.31
Weight of DC (kdaN)	17	Kelly Down (m)		6.88
Weight of string (kdaN)	18	Total (m)		202.00

BITS

Bit Number	1
Size (mm)	311
IADC Code	
Manufacturer	SECURITY
Type	GT11
Serial No.	8022801
Jets (mm)	19 | 19 |
Depth Out (m)	202
Depth In (m)	0
Total Drilled (m)	202
Hrs Run Today	1.75
Cumulative Hrs Run	5.25
Entry Date	

DULL GRADE

T_i		Gage (mm)	
T_f		ODC	
MDC		Reason Pulled	
LDC		Total Run (m/hr)	38.48
BRG			

MUD RECORD

Mud Type	Water ☒	Oil ☐	Other ☐	
Time				
Density (kg/m³)				
Funnel Viscosity (s/l)				
Fluid Loss (cm³)				
pH				
Location				
Depth (m)				
PVT (m³)				

MUD MATERIALS ADDED

Product	Amount	Type
GEL	15	SX
LIME	4	SX
SAWDUST	6	SX

METRES DRILLED

From (m)	To (m)	D-R-C	RPM	WOB (kdaN)
122	202	DRILL	275	5

REDUCED PUMP SPEED

No.	Pressure (kpa)	Strokes/min	Depth (m)
	@	@	
	@	@	
	@	@	

HOLE CONDITION

Hole Drag Up (kdaN)	
Hole Drag Down (kdaN)	
Torque at Bottom (klbf)	
Fill on Bottom (m)	

BOILER

No.	Hours Run	pH	Stack Temp (°C)

SOLIDS CONTROL

Equipment Name	Hours Run	Intake Density (kg/m³)	Over Flow Density (kg/m³)	Under Flow Density (kg/m³)

CIRCULATION

Pump	Type	Liner Size (mm)	SPM	Pressure (kpa)	Hours Run
1		140	145	3500	8

Remarks

DEVIATION SURVEYS

Time	Depth (m)	Deviation	Direction	Type
16:30	148.00	0.8	0	
17:45	175.00	1.0	0	
	194.00	1.0	0	

SAFETY

Safety Topic	MEHL (kdaN)	MACP (kpa)

TIME LOG

From	To	Elapsed	Code	Details of Operations in Sequence & Remarks
16:00	16:15	0.25	21	SAFETY MEETING AND DRILLER HANDOFF
16:15	16:30	0.25	2	DRILL
16:30	16:45	0.25	10	DEVIATION SURVEY @ 148 M 3/4 DEG
16:45	17:00	0.25	7	RIG SERVICE
17:00	17:45	0.75	2	DRILL
17:45	18:00	0.25	10	DEVIATION SURVEY @ 175 M 1 DEG
18:00	18:30	0.50	2	DRILL
18:30	21:45	3.25	6	REAMER TRIP - CLEAN TIGHT SPOTS REAM TO BOTTOM
21:45	22:00	0.25	2	DRILL
22:00	22:30	0.50	5	CONDITION MUD & CIRCULATE
22:30	22:45	0.25	10	DEVIATION SURVEY @ 194 M 1 DEG
22:45	24:00	1.25	6	WIPER TRIP

Remarks

WATER ANALYSIS

109 - 2		007447	52134-2010-3173
CONTAINER IDENTITY	METER ID	WELL LICENSE NUMBER	LABORATORY FILE NUMBER

Molopo Energy Canada Ltd. — OPERATOR — PAGE 6

100/16-32-001-29W1/00	Molopo Pierson 16-32-1-29	475.20	
LOCATION (UWI)	WELL NAME	KB ELEV (m)	GR ELEV (m)

Pierson		1st Rate Energy
FIELD OR AREA	POOL OR ZONE	SAMPLER

TEST TYPE AND NO. — TEST RECOVERY

Flowline — POINT OF SAMPLE — SAMPLE POINT ID

PUMPING — FLOWING — GAS LIFT — SWAB

WATER m³/d — OIL m³/d — GAS m³/d

TEST INTERVAL or PERFS (meters)

SEPARATOR — RESERVOIR — OTHER — @ °C CONTAINER WHEN SAMPLED — @ °C CONTAINER WHEN RECEIVED — Pressures, kPa (gauge)

SEPARATOR — OTHER — Temperatures, °C

15:00 Hrs					
2010 08 11	2010 08 30	2010 09 08	DT		@ °C
DATE SAMPLED (Y/M/D)	DATE RECEIVED (Y/M/D)	DATE ANALYZED (Y/M/D)	ANALYST	AMT. AND TYPE CUSHION	MUD RESISTIVITY

CATIONS

ION	mg/L	mg Fraction	meq/L
Na	26,270	0.3353	1,142.7
K	99	0.0013	2.5
Ca	2,460	0.0314	122.8
Mg	389	0.0050	32.0
Ba			
Sr			
Fe	N.D.		
Mn			

ANIONS

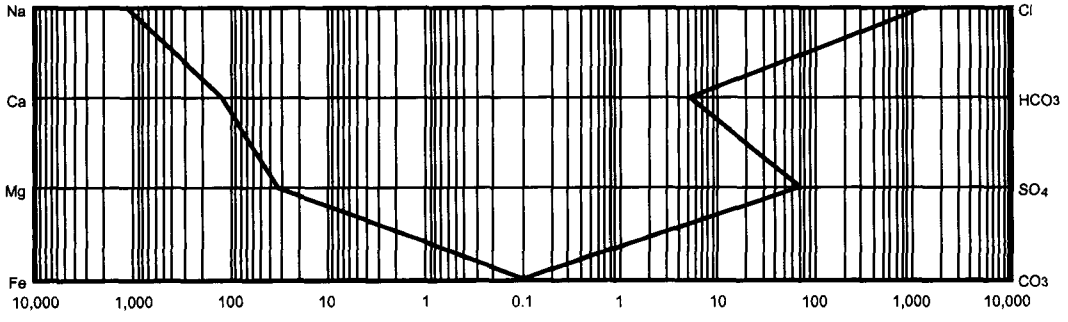
ION	mg/L	mg Fraction	meq/L
Cl	45,428	0.5798	1,281.4
Br			
I			
HCO_3	309	0.0039	5.1
SO_4	3,397	0.0434	70.7
CO_3	0.00	0.0000	0.0
OH	0.00	0.0000	0.0
H_2S	N.D.		

Total Dissolved Solids (mg/L)

Not Requested	Not Requested
By Evaporation @ 110 °C	By Evaporation @ 180 °C
	78352 Calculated
1.0587 @ 15.6 °C Specific Gravity	1.3464 @ 23 °C Refractive Index (n_D)
6.3 @ 25.0 °C pH	0.094 @ 25 °C Resistivity (Ohm-Meters)

LOGARITHMIC PATTERNS OF DISSOLVED IONS

meq/L



REMARKS: N.D.- Not Detected. Pres.- Analyte Present.

#7497

Water Analyses

WATER ANALYSIS

109 - 2		007447	52134-2010-3173
CONTAINER IDENTITY	METER ID	WELL LICENSE NUMBER	LABORATORY FILE NUMBER

Molopo Energy Canada Ltd. — OPERATOR

6 — PAGE

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Flowline — POINT OF SAMPLE — SAMPLE POINT ID

PUMPING — FLOWING — GAS LIFT — SWAB

WATER m³/d — OIL m³/d — GAS m³/d

TEST INTERVAL or PERFS (meters)

SEPARATOR — RESERVOIR — OTHER — @ °C CONTAINER WHEN SAMPLED — @ °C CONTAINER WHEN RECEIVED

Pressures, kPa (gauge)

SEPARATOR — OTHER

Temperatures, °C

15:00 Hrs

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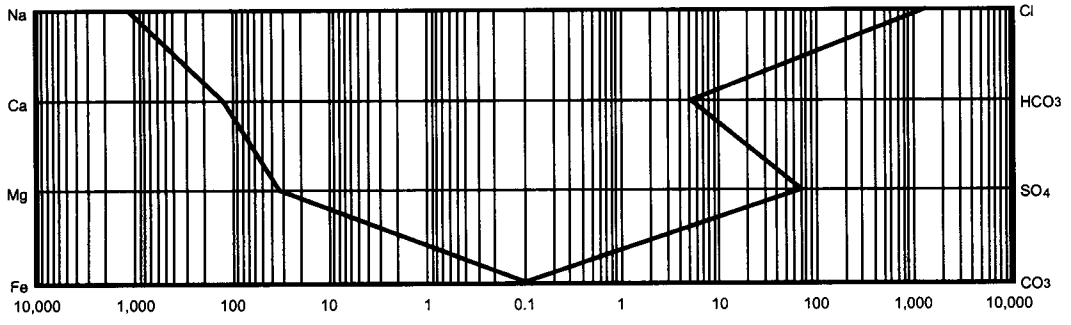

REMARKS: N.D.- Not Detected. Pres.- Analyte Present.

#7447

AGAT® Laboratories

Water Analyses

WATER ANALYSIS

Container Identification
PB7

Operator Name	Laboratory Number
MOLOPO ENERGY CANADA LTD.	10WS441209D

Unique Well Identifier	Well Name
13-32-001-29W1 STH	PIERSON 13-32-1-29

Field or Area	Pool or Zone	Sampler's Company
PIERSON	NOT AVAILABLE	AGAT/ESTEVAN

Well License	Elevation	Test Type	Test No.	Name of Sampler
7447	KB m / GRD m			

Test Interval or Perfs mKB	Sampling Point
	WELLHEAD TUBING

	Separator	Reservoir	Source	Sampled	Received
Pressure (kPa)					
Temperature					

Date Sampled	Date Received	Date Analyzed	Date Reported	Entered By	Certified By
Oct 05, 2010	Oct 07, 2010	Oct 20, 2010	Oct 20, 2010	Maria Raymundo	Maria Raymundo

Other Information

** Results relate only to the items tested*

Note: Sampling Point, Unique Well Identifier and/or Pool or Zone information was unavailable at time of reporting. This information is integral to AGAT's WebFLUIDs, a comparison, history and trending analysis system.

Cations

ION	mg/L	mmol/L	meq/L
Na	37000.0	1609.4	1609.4
K	83.2	2.1	2.1
Ca	2380.0	59.4	118.8
Mg	730.0	30.0	60.1
Fe	TRACE	0.0	TRACE
Total Cations			1790.4

Anions

ION	mg/L	mmol/L	meq/L
Cl	62231.0	1755.3	1755.3
HCO3	238.3	3.9	3.9
SO4	4000.0	41.6	83.3
CO3	Nil	Nil	Nil
OH	Nil	Nil	Nil
Total Anions			1842.5

Other Measurements

Measurement	Value
Total Dissolved Solids (Calculated) mg/L	106541
Observed pH	7.64
H2S (25°C) mg/L	N/D
Relative Density (25°C)	1.078
Resistivity/OHM·m (25°C)	0.086
Salinity %	10.43
Total Alkalinity as CaCO3 mg/L	195.33

Stiff Diagram (meq/L)