

VIII. Daily Drilling Reports

Daily Drilling

COPRC MIRROR LAKE P-20 65-00 126-45

Report Date: 1/24/2014
Report #: 1
Depth Progress: m
Depth End: 0.00mKB
Rig Release Date: 2/23/2014

Rig: Beaver Drilling Ltd. 2

UWI 200/D-020/L094P1699		Surface Legal Location P-20 65-00 126-45		MaxWell Job Number JOB01@2006		License No. EL 470	
Ground Elevation (m) 284.15		Original KB/RT Elevation (m) 289.35		Casing Flange Elevation (m) 283.95		Original Spud Date 1/29/2014	
Days From Spud (days) 1.00							
Job Category DRILLING		Primary Job Type DRILLING ORIGINAL		Actual Start Date 1/24/2014 00:00		End Date 2/23/2014 23:59	
Final Job Status DRILLED		Final Report? Yes					
Daily Cost Total (Cost) 265,023.03		Cumulative Cost (Cost) 265,023.03		Total AFE (Cost) 7,122,600.00		AFE+Supp Amt (Cost) 7,122,600.00	
AFE / RFE / Maint.# 10351812		Estimated Days					
Planned Depth (TMD) (mKB)		Override TVD (mKB)		Head Count 45.0		Personnel Total Hours (hr) 530.00	
Cum Personnel Total Hours (hr) 530.00							
Avg Connection Gas		Avg Background Gas		Avg Trip Gas		Max H2S (ppm)	
Road Condition Ice/Snow		Weather Rain		Temperature (°C) -12		Wind NE 15 kms	
Ops and Depth @ Morning Report Finish tearing out rig prior to moving to P-20 location.							Wellbore Original Hole

Last 24hr Summary

No incidents or accidents. 8 - HID, 0 - OBS and 0 - ASA (all closed out)

Nipple down BOP, pressure test packoff seal assembly, blow out water and pour 2 pails of diesel, install wellhead, clean mud tanks, tear out rig, laydown torque tube, rig out derrick, laydown derrick, tear out rig for rig move. No pressure on backside.

24hr Forecast

Move rig buildings, mud tanks, rentals and miscellaneous loads to P-20 location. Shut down until morning to move wellsite shacks, substructure and derrick.

Daily Contacts

Drilling Superintend, Sheldon Vamplew, 403-999-1302; Drilling Engineer, Mike Greener, 403-771-5039; WS Supervisor, Richard Turgeon, 780-387-1706; WS Supervisor, Dave Oppen, 403-863-8205; Rig Manager, Rick Yavis, 780-718-2962; Command Centre, 403-910-0357

Last Casing String

Conductor, 20.00mKB

Time Log

Start Time	End Time	Dur (hr)	Phase	Op Code	Activity Code	Time P-T-X	Tribl Code	Start Depth (mKB)	End Depth (mKB)	Operation
07:00	07:45	7.75	MIRU	MOVE	DMOB	P		0.00	0.00	Nipple down BOP, pick up and rack in sub, prepare upper casing bowl and install upper well head, tear out rig to move, change heads and liners in mud pump, to 6".
07:45	08:00	0.25	MIRU	MOVE	DMOB	P		0.00	0.00	Crew change and safety meeting, with rig crews, rig manager and Conoco reps
08:00	10:00	2.00	MIRU	MOVE	DMOB	P		0.00	0.00	Finish install well head, tear out rig to move from location, lay down torque tube, prepare to lay down derrick
10:00	10:15	0.25	MIRU	MOVE	DMOB	P		0.00	0.00	Safety meeting with rig moving trucks, prior to moving tanks and tubs off location: E-76 65-10 126-45
10:15	19:00	8.75	MIRU	MOVE	DMOB	P		0.00	0.00	Rig out to move, truck pipe tubs, mud trailers, 400 bl tanks off location, Prepare and inspect derrick prior to laying down, lay down derrick, take off man rider
19:00	19:15	0.25	MIRU	MOVE	DMOB	P		0.00	0.00	Crew change and safety meeting, with rig crews, rig manager and Conoco reps
19:15	00:00	4.75	MIRU	MOVE	DMOB	P		0.00	0.00	Rig out to move off location, prepare derrick, take down prefabs, clean well head and cover with plastic

Fluid/Mud Chks: Mud Engineer: <Mud Engineer?>

Time	Depth (mKB)	Density (kg/m³)	Funnel Viscosity (s/L)	pH	PV Override (Pa·s)	YP Override (Pa)
Low Gravity Solids (%)	MBT (kg/m³)	Oil Water Ratio	Chlorides (mg/L)	Calcium (mg/L)	Lime (kg/m³)	Potassium (mg/L)
Electric Stab (V)	ECD - Manual Entry (k...)	Sand (%)	Solids, Corr. (%)	T Flowline (°C)	HTHP Pressure (kPa)	HTHP Filtrate (mL/30...

API Filtrate (mL/30min)	Mud Lost to Surface (m³)	Mud Lost to Hole (m³)	Daily Mud Field Est (Cost)
Cum Mud Lost to Surface (m³)	Cum Mud Lost to Hole (m³)	Cumulative Mud Cost (Cost)	

Last BOP Drill

Type BOP Drill	Days Last Chk (...)	Last Date	Days Until Next...	Next Check Date
Days Since Lost Time Incident (days)	834.00	Days Since Recordable Incident (days)	834.00	

Incidents

Date	Com	Category

Daily Drilling

COPRC MIRROR LAKE P-20 65-00 126-45

Rig: Beaver Drilling Ltd. 2

Report Date: 1/24/2014
Report #: 1
Depth Progress: m
Depth End: 0.00mKB
Rig Release Date: 2/23/2014

Drill String: BHA # <BHA No.??>

Bit Run	Drill Bit	Length (m)	IADC Bit Dull	TFA (incl Noz) (mm ²)	BHA ROP (m/hr)
Nozzles (mm)	String Length (m)	OD (mm)	Max Rotating Hook Load (daN)		
Depth In (mKB)	Depth Out (mKB)	Avg ROP (m/hr)	Depth This Job (m)	Total Depth Drilled b...	Job Drill Hrs (hr)
					Total Drill Hrs (hr)

Comment

Drill String Components

Item Des	ID (mm)	OD (mm)	Jts	Len (m)	Cum Len (m)

Drilling Parameter: <depthstart> - <depthend> mKB

Cum Depth (m)	Cum Drill...	Int ROP (...)	Flow Rate...	WOB (daN)	RPM (r...)	SPP (kPa)	Drill Str Wt (d...	SO Str Wt (daN)	PU Str Wt (daN)	Off-Btm Str W...	Drill Tq
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Hydraulic Calculations

Bit Hydraulic Powe...	HP/Area (kW/mm²)	% P @ bit (%)	Bit Jet Velocity (m/s)	Bit dP (kPa)	P Drop Annular (kPa)	Mud Density (kg/m³)	ECD End (kg/m³)
Drill String Volume (m³)	Bit to Shoe Volume (m³)	Vol Shoe to Top (m³)	Min Casing AV (m/min)	Max Casing AV (m/min)	Min Open Hole AV (m/...	Max Open Hole AV (m/...	

Error

Mud Pump: 1, NATIONAL, 8-P-80

Pump Number	Make	Model	Rod Diameter (mm)	Stroke Length (mm)
1	NATIONAL	8-P-80	140.0	216.0

Pump Checks

Date	Depth (mKB)	Q Flow (m ³ /min)	P (kPa)	Strokes (spm)
2/16/2014 16:00	2,209.00	0.608	5,153	78
2/16/2014 16:00	2,209.00	1.045	15,600	134

Pump Operations

Start Date	End Date	Liner Size (mm)	P Max (kPa)	Vol/Stk OR (m ³ /stk)
2/15/2014	2/15/2014	127.0		
2/16/2014	2/16/2014	127.0		

Mud Pump: 2, NATIONAL, 8-P-80

Pump Number	Make	Model	Rod Diameter (mm)	Stroke Length (mm)
2	NATIONAL	8-P-80	140.0	216.0

Pump Checks

Date	Depth (mKB)	Q Flow (m ³ /min)	P (kPa)	Strokes (spm)
2/19/2014 23:45	3,152.00	0.975	12,600	125
2/20/2014 00:00	3,143.00	0.647	6,414	83

Pump Operations

Start Date	End Date	Liner Size (mm)	P Max (kPa)	Vol/Stk OR (m ³ /stk)
2/20/2014	2/20/2014	127.0		
2/21/2014	2/21/2014	127.0		

Shaker Screens

Des	Start Date	End Date	Scr Sz X	Scr Sz Y	Note

Centrifuge/Cyclone: HGS Centrifuge, BOS Solutions, 5500

Number	Make	Model	Diameter (mm)
2	BOS Solutions	5500	

Centrifuge/Cyclone Checks

Date	Hrs (hr)	RPM (rpm)	Dens OF (kg/m ³)	Q OF (L/min)	Dens UF (kg/m ³)	Q UF (L/min)
2/21/2014 00:00	3.00	2100	1,040.0	0.400	1,710.0	0.200

Centrifuge/Cyclone: HGS Centrifuge, BOS Solutions, 5500

Number	Make	Model	Diameter (mm)
1	BOS Solutions	5500	

Centrifuge/Cyclone Checks

Date	Hrs (hr)	RPM (rpm)	Dens OF (kg/m ³)	Q OF (L/min)	Dens UF (kg/m ³)	Q UF (L/min)
2/21/2014 00:00	3.00	2100	1,100.0	0.400	1,790.0	0.200

Fluid / Mud Additive Amounts

Des	Consumed	Cost	Size	Units

Survey Data

Date	MD (mKB)	Incl (°)	Azm (°)	TVD (mKB)	Depart (m)	NS (m)	EW (m)	VS (m)	DLS (°/30m)

Daily Drilling

COPRC MIRROR LAKE P-20 65-00 126-45

Rig: Beaver Drilling Ltd. 2

Report Date: 1/24/2014
Report #: 1
Depth Progress: m
Depth End: 0.00mKE
Rig Release Date: 2/23/2014

Formations	Formation Name	Drill Top MD (mKB)	Drill Top (TVD) (mKB)	Prog Top TVD (mKB)
	Little Bear	43.00	43.00	20.85
	Slater River	207.00	207.00	197.35
	Arctic Red	954.00	953.52	932.35
	Martin House	1,110.00	1,109.49	1,084.35
	Imperial	1,140.00	1,139.48	1,118.35
	KOP (5deg/30m)	1,731.00	1,730.40	1,730.73
	KOP (7deg/30m)	1,817.00	1,815.65	1,816.00
	Upper Canol	1,902.70	1,896.20	1,897.35
	Lower Canol	1,935.80	1,924.43	1,929.35

Daily Drilling

COPRC MIRROR LAKE P-20 65-00 126-45

Report Date: 1/25/2014
Report #: 2
Depth Progress: m
Depth End: 0.00mKB
Rig Release Date: 2/23/2014

Rig: Beaver Drilling Ltd. 2

/ UWI 200/D-020/L094P1699		Surface Legal Location P-20 65-00 126-45		MaxWell Job Number JOB01@2006		License No. EL 470	
Ground Elevation (m) 284.15		Original KB/RT Elevation (m) 289.35		Casing Flange Elevation (m) 283.95		Original Spud Date 1/29/2014	
Days From Spud (days) 2.00		Job Category DRILLING		Primary Job Type DRILLING ORIGINAL		Actual Start Date 1/24/2014 00:00	
End Date 2/23/2014 23:59		Final Job Status DRILLED		Final Report? Yes		Daily Cost Total (Cost) 81,765.03	
Cumulative Cost (Cost) 346,788.06		Total AFE (Cost) 7,122,600.00		AFE+Supp Amt (Cost) 7,122,600.00		AFE / RFE / Maint.# 10351812	
Estimated Days		Planned Depth (TMD) (mKB)		Override TVD (mKB)		Head Count 45.0	
Personnel Total Hours (hr) 530.00		Cum Personnel Total Hours (hr) 1,060.00		Avg Connection Gas		Avg Background Gas	
Avg Trip Gas		Max H2S (ppm)		Road Condition Ice/Snow		Weather Cloudy	
Temperature (°C) -14		Wind Calm		Ops and Depth @ Morning Report Wait on day light, to moving to P-20 location.		Wellbore Original Hole	

Last 24hr Summary No incidents or accidents. 6 - HID, 0 - OBS and 0 - ASA (all closed out)			
Rig out to move off location E-76. Prepare derrick clean well head and cover with plastic, prepare buildings to move, load buildings, sub, matting and rentals and move off location with CANOL trucking			
24hr Forecast Move rig buildings, mud tanks, rentals and miscellaneous loads to P-20 location. Shut down until morning to move wellsite shacks, substructure and derrick.			
Daily Contacts Drilling Superintend, Sheldon Vamplew, 403-999-1302; Drilling Engineer, Mike Greener, 403-771-5039; WS Supervisor, Richard Turgeon, 780-387-1706; WS Supervisor, Dave Oppen, 403-863-8205; Rig Manager, Rick Yavis, 780-718-2962; Command Centre, 403-910-0357			
Last Casing String Conductor, 20.00mKB			

Time Log			
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Start Time	End Time	Dur (hr)	Phase	Op Code	Activity Code	Time P-T-X	Trbl Code	Start Depth (mKB)	End Depth (mKB)	Operation
07:00	07:00	7.00	MIRU	MOVE	MOB	P		0.00	0.00	Tear out rig to move off location, prepare derrick, clean and cover well head, fold up dog house wings and walk ways on buildings
07:00	07:15	0.25	MIRU	MOVE	MOB	P		0.00	0.00	Crew change safety meeting with rig crews, rig manager and Conoco reps
07:15	09:30	2.25	MIRU	MOVE	MOB	P		0.00	0.00	Wait on CANOL trucks
09:30	09:45	0.25	MIRU	MOVE	SFTY	P		0.00	0.00	Pre-move safety meeting with rig crew, rig manager, Conoco safety and SimOps, well site supervisor and CANOL truckers
09:45	16:00	6.25	MIRU	MOVE	MOB	P		0.00	0.00	Load out rig buildings and rentals, lift derrick off sub, load sub and move off location E-76
16:00	19:00	3.00	MIRU	MOVE	MOB	P		0.00	0.00	Lift matting, move off E-76
19:00	00:00	5.00	MIRU	MOVE	MOB	P		0.00	0.00	Boiler watch w/ 2 men

Fluid/Mud Chks: Mud Engineer: <Mud Engineer?>							
Time	Depth (mKB)	Density (kg/m³)	Funnel Viscosity (s/L)	pH	PV Override (Pa·s)	YP Override (Pa)	
Low Gravity Solids (%)	MBT (kg/m³)	Oil Water Ratio	Chlorides (mg/L)	Calcium (mg/L)	Lime (kg/m³)	Potassium (mg/L)	
Electric Stab (V)	ECD - Manual Entry (k...)	Sand (%)	Solids, Corr. (%)	T Flowline (°C)	HTHP Pressure (kPa)	HTHP Filtrate (mL/30...)	

API Filtrate (mL/30min)	Mud Lost to Surface (m³)	Mud Lost to Hole (m³)	Daily Mud Field Est (Cost)
Cum Mud Lost to Surface (m³)	Cum Mud Lost to Hole (m³)	Cumulative Mud Cost (Cost)	

Last BOP Drill			
Type BOP Drill	Days Last Chk (...)	Last Date	Days Until Next... Next Check Date
Days Since Lost Time Incident (days)	835.00	Days Since Recordable Incident (days)	835.00

Safety Incidents		
Date	Com	Category

Daily Drilling

COPRC MIRROR LAKE P-20 65-00 126-45

Rig: Beaver Drilling Ltd. 2

Report Date: 1/25/2014
Report #: 2
Depth Progress: m
Depth End: 0.00mKB
Rig Release Date: 2/23/2014

Drill String: BHA # <BHA No.??>

Bit Run	Drill Bit	Length (m)	IADC Bit Dull	TFA (incl Noz) (mm ²)	BHA ROP (m/hr)
Nozzles (mm)	String Length (m)	OD (mm)	Max Rotating Hook Load (daN)		
Depth In (mKB)	Depth Out (mKB)	Avg ROP (m/hr)	Depth This Job (m)	Total Depth Drilled b...	Job Drill Hrs (hr)
					Total Drill Hrs (hr)

Comment

Drill String Components

Item Des	ID (mm)	OD (mm)	Jts	Len (m)	Cum Len (m)

Drilling Parameter: <depthstart> - <depthend> mKB

Cum Depth (m)	Cum Drill...	Int ROP (...)	Flow Rate...	WOB (daN)	RPM (r...)	SPP (kPa)	Drill Str Wt (d...	SO Str Wt (daN)	PU Str Wt (daN)	Off-Btm Str W...	Drill Tq
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Hydraulic Calculations

Bit Hydraulic Powe...	HP/Area (kW/mm²)	% P @ bit (%)	Bit Jet Velocity (m/s)	Bit dP (kPa)	P Drop Annular (kPa)	Mud Density (kg/m³)	ECD End (kg/m³)
Drill String Volume (m³)	Bit to Shoe Volume (m³)	Vol Shoe to Top (m³)	Min Casing AV (m/min)	Max Casing AV (m/min)	Min Open Hole AV (m/...	Max Open Hole AV (m/...	

Error

Mud Pump: 1, NATIONAL, 8-P-80

Pump Number	Make	Model	Rod Diameter (mm)	Stroke Length (mm)
1	NATIONAL	8-P-80	140.0	216.0

Pump Checks

Date	Depth (mKB)	Q Flow (m ³ /min)	P (kPa)	Strokes (spm)
2/16/2014 16:00	2,209.00	0.608	5,153	78
2/16/2014 16:00	2,209.00	1.045	15,600	134

Pump Operations

Start Date	End Date	Liner Size (mm)	P Max (kPa)	Vol/Stk OR (m ³ /st)
2/15/2014	2/15/2014	127.0		
2/16/2014	2/16/2014	127.0		

Mud Pump: 2, NATIONAL, 8-P-80

Pump Number	Make	Model	Rod Diameter (mm)	Stroke Length (mm)
2	NATIONAL	8-P-80	140.0	216.0

Pump Checks

Date	Depth (mKB)	Q Flow (m ³ /min)	P (kPa)	Strokes (spm)
2/19/2014 23:45	3,152.00	0.975	12,600	125
2/20/2014 00:00	3,143.00	0.647	6,414	83

Pump Operations

Start Date	End Date	Liner Size (mm)	P Max (kPa)	Vol/Stk OR (m ³ /st)
2/20/2014	2/20/2014	127.0		
2/21/2014	2/21/2014	127.0		

Shaker Screens

Des	Start Date	End Date	Scr Sz X	Scr Sz Y	Note

Centrifuge/Cyclone: HGS Centrifuge, BOS Solutions, 5500

Number	Make	Model	Diameter (mm)
2	BOS Solutions	5500	

Centrifuge/Cyclone Checks

Date	Hrs (hr)	RPM (rpm)	Dens OF (kg/m ³)	Q OF (L/min)	Dens UF (kg/m ³)	Q UF (L/min)
2/21/2014 00:00	3.00	2100	1,040.0	0.400	1,710.0	0.200

Centrifuge/Cyclone: HGS Centrifuge, BOS Solutions, 5500

Number	Make	Model	Diameter (mm)
1	BOS Solutions	5500	

Centrifuge/Cyclone Checks

Date	Hrs (hr)	RPM (rpm)	Dens OF (kg/m ³)	Q OF (L/min)	Dens UF (kg/m ³)	Q UF (L/min)
2/21/2014 00:00	3.00	2100	1,100.0	0.400	1,790.0	0.200

Fluid / Mud Additive Amounts

Des	Consumed	Cost	Size	Units

Survey Data

Date	MD (mKB)	Incl (°)	Azm (°)	TVD (mKB)	Depart (m)	NS (m)	EW (m)	VS (m)	DLS (°/30m)

Daily Drilling

COPRC MIRROR LAKE P-20 65-00 126-45

Rig: Beaver Drilling Ltd. 2

Report Date: 1/25/2014

Report #: 2

Depth Progress: m

Depth End: 0.00mKB

Rig Release Date: 2/23/2014

Formations	Formation Name	Drill Top MD (mKB)	Drill Top (TVD) (mKB)	Prog Top TVD (mKB)
	Little Bear	43.00	43.00	20.85
	Slater River	207.00	207.00	197.35
	Arctic Red	954.00	953.52	932.35
	Martin House	1,110.00	1,109.49	1,084.35
	Imperial	1,140.00	1,139.48	1,118.35
	KOP (5deg/30m)	1,731.00	1,730.40	1,730.73
	KOP (7deg/30m)	1,817.00	1,815.65	1,816.00
	Upper Canol	1,902.70	1,896.20	1,897.35
	Lower Canol	1,935.80	1,924.43	1,929.35

Daily Drilling

COPRC MIRROR LAKE P-20 65-00 126-45

Report Date: 1/26/2014

Report #: 3

Depth Progress: m

Depth End: 0.00mKB

Rig Release Date: 2/23/2014

Rig: Beaver Drilling Ltd. 2

/ UWI 200/D-020/L094P1699		Surface Legal Location P-20 65-00 126-45		MaxWell Job Number JOB01@2006		License No. EL 470	
Ground Elevation (m) 284.15		Original KB/RT Elevation (m) 289.35		Casing Flange Elevation (m) 283.95		Original Spud Date 1/29/2014	
						Days From Spud (days) 3.00	
Job Category DRILLING		Primary Job Type DRILLING ORIGINAL		Actual Start Date 1/24/2014 00:00		End Date 2/23/2014 23:59	
						Final Job Status DRILLED	
						Final Report? Yes	
Daily Cost Total (Cost) 83,065.03		Cumulative Cost (Cost) 429,853.09		Total AFE (Cost) 7,122,600.00		AFE+Supp Amt (Cost) 7,122,600.00	
						AFE / RFE / Maint.# 10351812	
Planned Depth (TMD) (mKB)		Override TVD (mKB)		Head Count 44.0		Personnel Total Hours (hr) 518.00	
						Cum Personnel Total Hours (hr) 1,578.00	

Avg Connection Gas		Avg Background Gas		Avg Trip Gas		Max H2S (ppm)	
Road Condition Ice/Snow		Weather Clear		Temperature (°C) -18		Wind SE 10 kms	

Ops and Depth @ Morning Report
Wait on day light, to finish moving and set up on P-20 65-00 126-45 location.

Last 24hr Summary
No incidents or accidents. 6 - HID, 0 - OBS and 0 - ASA (all closed out)

Move rig onto location P-20 location with CANOL trucking, lay matting, spot sub and buildings, pin derrick and rig up

24hr Forecast
Spot rentals, Dress and inspect derrick, raise derrick, rig to spud

Daily Contacts
Drilling Superintendent, Sheldon Vamplew, 403-999-1302; Drilling Engineer, Mike Greener, 403-771-5039; WS Supervisor, Richard Turgeon, 780-387-1706; WS Supervisor, Dave Oppen, 403-863-8205; Rig Manager, Rick Yavis, 780-718-2962; Command Centre, 403-910-0357

Last Casing String
Conductor, 20.00mKB

Time Log										
Start Time	End Time	Dur (hr)	Phase	Op Code	Activity Code	Time P-T-X	Trbl Code	Start Depth (mKB)	End Depth (mKB)	Operation
00:00	08:00	8.00	MIRU	MOVE	MOB	P		0.00	0.00	Boiler watch w/2 men
08:00	09:00	1.00	MIRU	MOVE	MOB	P		0.00	0.00	Wait on canol trucks
09:00	09:15	0.25	MIRU	MOVE	SFTY	P		0.00	0.00	Safety meeting with rig crews, rig manager, SimOps, safety hands and Conoco reps
09:15	16:00	6.75	MIRU	MOVE	RURD	P		0.00	0.00	Spot matting, sub, inspect and pin derrick, spot buildings and cat-walk
16:00	19:00	3.00	MIRU	MOVE	RURD	P		0.00	0.00	Spot rig & buildings
19:00	00:00	5.00	MIRU	MOVE	MOB	P		0.00	0.00	Boiler watch and rig up steam lines

Fluid/Mud Chks: Mud Engineer: <Mud Engineer?>							
Time	Depth (mKB)	Density (kg/m³)	Funnel Viscosity (s/L)	pH	PV Override (Pa·s)	YP Override (Pa)	
Low Gravity Solids (%)	MBT (kg/m³)	Oil Water Ratio	Chlorides (mg/L)	Calcium (mg/L)	Lime (kg/m³)	Potassium (mg/L)	
Electric Stab (V)	ECD - Manual Entry (k...)	Sand (%)	Solids, Corr. (%)	T Flowline (°C)	HTHP Pressure (kPa)	HTHP Filtrate (mL/30...)	
API Filtrate (mL/30min)		Mud Lost to Surface (m³)		Mud Lost to Hole (m³)		Daily Mud Field Est (Cost)	
Cum Mud Lost to Surface (m³)		Cum Mud Lost to Hole (m³)		Cumulative Mud Cost (Cost)			

Last BOP Drill			
Type BOP Drill	Days Last Chk (...)	Last Date	Days Until Next... Next Check Date
Days Since Lost Time Incident (days)		Days Since Recordable Incident (days)	
836.00		836.00	

Safety Incidents	
Date	Com
	Category

Drill String: BHA # <BHA No.??>							
Bit Run	Drill Bit	Length (m)	IADC Bit Dull	TFA (incl Noz) (mm²)	BHA ROP (m/hr)		
Nozzles (mm)		String Length (m)		OD (mm)		Max Rotating Hook Load (daN)	
In (mKB)	Depth Out (mKB)	Avg ROP (m/hr)	Depth This Job (m)	Total Depth Drilled b...	Job Drill Hrs (hr)	Total Drill Hrs (hr)	

Comment

Drill String Components					
Item Des	ID (mm)	OD (mm)	Jts	Len (m)	Cum Len (m)

Daily Drilling

COPRC MIRROR LAKE P-20 65-00 126-45

Rig: Beaver Drilling Ltd. 2

Report Date: 1/26/2014
Report #: 3
Depth Progress: m
Depth End: 0.00mKB
Rig Release Date: 2/23/2014

Drilling Parameter: <depthstart> - <depthend> mKB

Cum Depth (m)	Cum Drill...	Int ROP (...)	Flow Rate...	WOB (daN)	RPM (r...	SPP (kPa)	Drill Str Wt (d...	SO Str Wt (daN)	PU Str Wt (daN)	Off-Btm Str W...	Drill Tq
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Hydraulic Calculations

Bit Hydraulic Powe...	HP/Area (kW/mm²)	% P @ bit (%)	Bit Jet Velocity (m/s)	Bit dP (kPa)	P Drop Annular (kPa)	Mud Density (kg/m³)	ECD End (kg/m³)
Drill String Volume (m³)	Bit to Shoe Volume (m³)	Vol Shoe to Top (m³)	Min Casing AV (m/min)	Max Casing AV (m/min)	Min Open Hole AV (m/...	Max Open Hole AV (m/...	
Error							

Mud Pump: 1, NATIONAL, 8-P-80

Pump Number	Make	Model	Rod Diameter (mm)	Stroke Length (mm)
1	NATIONAL	8-P-80	140.0	216.0

Pump Checks

Date	Depth (mKB)	Q Flow (m³/min)	P (kPa)	Strokes (spm)
2/16/2014 16:00	2,209.00	0.608	5,153	78
2/16/2014 16:00	2,209.00	1.045	15,600	134

Pump Operations

Start Date	End Date	Liner Size (mm)	P Max (kPa)	Vol/Stk OR (m³/stk)
2/15/2014	2/15/2014	127.0		
2/16/2014	2/16/2014	127.0		

Mud Pump: 2, NATIONAL, 8-P-80

Pump Number	Make	Model	Rod Diameter (mm)	Stroke Length (mm)
2	NATIONAL	8-P-80	140.0	216.0

Pump Checks

Date	Depth (mKB)	Q Flow (m³/min)	P (kPa)	Strokes (spm)
2/19/2014 23:45	3,152.00	0.975	12,600	125
2/20/2014 00:00	3,143.00	0.647	6,414	83

Pump Operations

Start Date	End Date	Liner Size (mm)	P Max (kPa)	Vol/Stk OR (m³/stk)
2/20/2014	2/20/2014	127.0		
2/21/2014	2/21/2014	127.0		

Shaker Screens

Des	Start Date	End Date	Scr Sz X	Scr Sz Y	Note

Centrifuge/Cyclone: HGS Centrifuge, BOS Solutions, 5500

Number	Make	Model	Diameter (mm)
2	BOS Solutions	5500	

Centrifuge/Cyclone Checks

Date	Hrs (hr)	RPM (rpm)	Dens OF (kg/m³)	Q OF (L/min)	Dens UF (kg/m³)	Q UF (L/min)
2/21/2014 00:00	3.00	2100	1,040.0	0.400	1,710.0	0.200

Centrifuge/Cyclone: HGS Centrifuge, BOS Solutions, 5500

Number	Make	Model	Diameter (mm)
1	BOS Solutions	5500	

Centrifuge/Cyclone Checks

Date	Hrs (hr)	RPM (rpm)	Dens OF (kg/m³)	Q OF (L/min)	Dens UF (kg/m³)	Q UF (L/min)
2/21/2014 00:00	3.00	2100	1,100.0	0.400	1,790.0	0.200

Fluid / Mud Additive Amounts

Des	Consumed	Cost	Size	Units

Survey Data

Date	MD (mKB)	Incl (°)	Azm (°)	TVD (mKB)	Depart (m)	NS (m)	EW (m)	VS (m)	DLS (°/30m)

Formations

Formation Name	Drill Top MD (mKB)	Drill Top (TVD) (mKB)	Prog Top TVD (mKB)
Little Bear	43.00	43.00	20.85
Slater River	207.00	207.00	197.35
Arctic Red	954.00	953.52	932.35
Martin House	1,110.00	1,109.49	1,084.35
Imperial	1,140.00	1,139.48	1,111.35
KOP (5deg/30m)	1,731.00	1,730.40	1,716.35
KOP (7deg/30m)	1,817.00	1,815.65	1,816.00
Upper Canol	1,902.70	1,896.20	1,897.35
Lower Canol	1,935.80	1,924.43	1,929.35

Daily Drilling

COPRC MIRROR LAKE P-20 65-00 126-45

Report Date: 1/27/2014

Report #: 4

Depth Progress: m

Depth End: 0.00mKB

Rig Release Date: 2/23/2014

Rig: Beaver Drilling Ltd. 2

UWI 200/D-020/L094P1699		Surface Legal Location P-20 65-00 126-45		MaxWell Job Number JOB01@2006		License No. EL 470	
Ground Elevation (m) 284.15		Original KB/RT Elevation (m) 289.35		Casing Flange Elevation (m) 283.95		Original Spud Date 1/29/2014	
Days From Spud (days) 4.00		Job Category DRILLING		Primary Job Type DRILLING ORIGINAL		Actual Start Date 1/24/2014 00:00	
End Date 2/23/2014 23:59		Final Job Status DRILLED		Final Report? Yes		Daily Cost Total (Cost) 105,791.03	
Cumulative Cost (Cost) 535,644.12		Total AFE (Cost) 7,122,600.00		AFE+Supp Amt (Cost) 7,122,600.00		AFE / RFE / Maint.# 10351812	
Estimated Days		Planned Depth (TMD) (mKB)		Override TVD (mKB)		Head Count 51.0	
Personnel Total Hours (hr) 592.00		Cum Personnel Total Hours (hr) 2,170.00		Avg Connection Gas		Avg Background Gas	
Avg Trip Gas		Max H2S (ppm)		Road Condition Ice/Snow		Weather Cloudy	
Temperature (°C) -20		Wind SE 10 kms		Ops and Depth @ Morning Report Install Diverter system and pre-mix spud mud			

Wellbore
Original Hole

Last 24hr Summary
No incidents or accidents. 6 - HID, 0 - OBS and 0 - ASA (all closed out)
Safety meeting prior to raise derrick, inspect derrick, raise and pin derrick, spot cuttings bins, pipe and mud trailers, install torque tube and top drive

24hr Forecast
Install diverter system, Pick up 9" collars, install 311mm bit, spud and drill surface hole

Daily Contacts
Drilling Superintendent, Sheldon Vamplew, 403-999-1302; Drilling Engineer, Mike Greener, 403-771-5039; WS Supervisor, Richard Turgeon, 780-387-1706; WS Supervisor, Dave Oppen, 403-863-8205; Rig Manager, Rick Yavis, 780-718-2962; Command Centre, 403-910-0357

Last Casing String
Conductor, 20.00mKB

Time Log										
Start Time	End Time	Dur (hr)	Phase	Op Code	Activity Code	Time P-T-X	Trbl Code	Start Depth (mKB)	End Depth (mKB)	Operation
00:00	00:15	0.25	MIRU	RIGMNT	SVRG	P		0.00	0.00	Rig service
00:15	07:00	6.75	MIRU	MOVE	MOB	P		0.00	0.00	Boiler watch, rig in hoses and cords
07:00	07:15	0.25	MIRU	MOVE	SFTY	P		0.00	0.00	Crew change and safety meeting with crews, rig manager and Conoco reps
07:15	08:00	0.75	MIRU	MOVE	RURD	P		0.00	0.00	Rig up and dress derrick prior to raise
08:00	08:45	0.75	MIRU	MOVE	SFTY	P		0.00	0.00	Safety inspection of derrick before raising RY,BB,DS,ER,SM
08:45	09:00	0.25	MIRU	MOVE	SFTY	P		0.00	0.00	Prejob safety meeting on raising derrick
09:00	09:15	0.25	MIRU	MOVE	RURD	P		0.00	0.00	Raise derrick & pin same
09:15	16:00	6.75	MIRU	MOVE	RURD	P		0.00	0.00	Spot 400 barrel tanks & rental mud trailers and casing
16:00	16:15	0.25	MIRU	RIGMNT	SVRG	P		0.00	0.00	Rig service, grease moving parts, check oil in floor motor and HPU
16:15	00:00	7.75	MIRU	MOVE	RURD	P		0.00	0.00	Rig up torque tube and Top drive

Fluid/Mud Chks: Mud Engineer: <Mud Engineer?>							
Time	Depth (mKB)	Density (kg/m³)	Funnel Viscosity (s/L)	pH	PV Override (Pa*s)	YP Override (Pa)	
Low Gravity Solids (%)	MBT (kg/m³)	Oil Water Ratio	Chlorides (mg/L)	Calcium (mg/L)	Lime (kg/m³)	Potassium (mg/L)	
Electric Stab (V)	ECD - Manual Entry (k...)	Sand (%)	Solids, Corr. (%)	T Flowline (°C)	HTHP Pressure (kPa)	HTHP Filtrate (mL/30...	

API Filtrate (mL/30min)	Mud Lost to Surface (m³)	Mud Lost to Hole (m³)	Daily Mud Field Est (Cost)
Cum Mud Lost to Surface (m³)	Cum Mud Lost to Hole (m³)	Cumulative Mud Cost (Cost)	

Last BOP Drill			
Type BOP Drill	Days Last Chk (...)	Last Date	Days Until Next... Next Check Date
Days Since Last Time Incident (days)	837.00	Days Since Recordable Incident (days)	837.00

Safety Incidents		
Date	Com	Category

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Daily Drilling

COPRC MIRROR LAKE P-20 65-00 126-45

Rig: Beaver Drilling Ltd. 2

Report Date: 1/27/2014
Report #: 4
Depth Progress: m
Depth End: 0.00mKB
Rig Release Date: 2/23/2014

Drill String: BHA # <BHA No.??>

Bit Run	Drill Bit	Length (m)	IADC Bit Dull	TFA (incl Noz) (mm ²)	BHA ROP (m/hr)
Nozzles (mm)	String Length (m)	OD (mm)	Max Rotating Hook Load (daN)		
Depth In (mKB)	Depth Out (mKB)	Avg ROP (m/hr)	Depth This Job (m)	Total Depth Drilled b...	Job Drill Hrs (hr)
					Total Drill Hrs (hr)

Comment

Drill String Components

Item Des	ID (mm)	OD (mm)	Jts	Len (m)	Cum Len (m)

Drilling Parameter: <depthstart> - <depthend> mKB

Cum Depth (m)	Cum Drill...	Int ROP (...)	Flow Rate...	WOB (daN)	RPM (r...	SPP (kPa)	Drill Str Wt (d...	SO Str Wt (daN)	PU Str Wt (daN)	Off-Btm Str W...	Drill Tq
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Hydraulic Calculations

Bit Hydraulic Powe...	HP/Area (kW/mm ²)	% P @ bit (%)	Bit Jet Velocity (m/s)	Bit dP (kPa)	P Drop Annular (kPa)	Mud Density (kg/m ³)	ECD End (kg/m ³)
Drill String Volume (m ³)	Bit to Shoe Volume (m ³)	Vol Shoe to Top (m ³)	Min Casing AV (m/min)	Max Casing AV (m/min)	Min Open Hole AV (m/...	Max Open Hole AV (m/...	

Error

Mud Pump: 1, NATIONAL, 8-P-80

Pump Number	Make	Model	Rod Diameter (mm)	Stroke Length (mm)
1	NATIONAL	8-P-80	140.0	216.0

Pump Checks

Date	Depth (mKB)	Q Flow (m ³ /min)	P (kPa)	Strokes (spm)
2/16/2014 16:00	2,209.00	0.608	5,153	78
2/16/2014 16:00	2,209.00	1.045	15,600	134

Pump Operations

Start Date	End Date	Liner Size (mm)	P Max (kPa)	Vol/Stk OR (m ³ /stkr
2/15/2014	2/15/2014	127.0		
2/16/2014	2/16/2014	127.0		

Mud Pump: 2, NATIONAL, 8-P-80

Pump Number	Make	Model	Rod Diameter (mm)	Stroke Length (mm)
2	NATIONAL	8-P-80	140.0	216.0

Pump Checks

Date	Depth (mKB)	Q Flow (m ³ /min)	P (kPa)	Strokes (spm)
2/19/2014 23:45	3,152.00	0.975	12,600	125
2/20/2014 00:00	3,143.00	0.647	6,414	83

Pump Operations

Start Date	End Date	Liner Size (mm)	P Max (kPa)	Vol/Stk OR (m ³ /stkr
2/20/2014	2/20/2014	127.0		
2/21/2014	2/21/2014	127.0		

Shaker Screens

Des	Start Date	End Date	Scr Sz X	Scr Sz Y	Note

Centrifuge/Cyclone: HGS Centrifuge, BOS Solutions, 5500

Number	Make	Model	Diameter (mm)
2	BOS Solutions	5500	

Centrifuge/Cyclone Checks

Date	Hrs (hr)	RPM (rpm)	Dens OF (kg/m ³)	Q OF (L/min)	Dens UF (kg/m ³)	Q UF (L/min)
2/21/2014 00:00	3.00	2100	1,040.0	0.400	1,710.0	0.200

Centrifuge/Cyclone: HGS Centrifuge, BOS Solutions, 5500

Number	Make	Model	Diameter (mm)
1	BOS Solutions	5500	

Centrifuge/Cyclone Checks

Date	Hrs (hr)	RPM (rpm)	Dens OF (kg/m ³)	Q OF (L/min)	Dens UF (kg/m ³)	Q UF (L/min)
2/21/2014 00:00	3.00	2100	1,100.0	0.400	1,790.0	0.200

Fluid / Mud Additive Amounts

Des	Consumed	Cost	Size	Units

Survey Data

Date	MD (mKB)	Incl (°)	Azm (°)	TVD (mKB)	Depart (m)	NS (m)	EW (m)	VS (m)	DLS (°/30m)



Daily Drilling

COPRC MIRROR LAKE P-20 65-00 126-45

Rig: Beaver Drilling Ltd. 2

Report Date: 1/27/2014
Report #: 4
Depth Progress: m
Depth End: 0.00mKB
Rig Release Date: 2/23/2014

Formations

Formation Name	Drill Top MD (mKB)	Drill Top (TVD) (mKB)	Prog Top TVD (mKB)
Little Bear	43.00	43.00	20.85
Slater River	207.00	207.00	197.35
Arctic Red	954.00	953.52	932.35
Martin House	1,110.00	1,109.49	1,084.35
Imperial	1,140.00	1,139.48	1,118.35
KOP (5deg/30m)	1,731.00	1,730.40	1,730.73
KOP (7deg/30m)	1,817.00	1,815.65	1,816.00
Upper Canol	1,902.70	1,896.20	1,897.35
Lower Canol	1,935.80	1,924.43	1,929.35

Daily Drilling

COPRC MIRROR LAKE P-20 65-00 126-45

Report Date: 1/28/2014
Report #: 5
Depth Progress: 2.00m
Depth End: 20.00mKB
Rig Release Date: 2/23/2014

Rig: Beaver Drilling Ltd. 2

/ UWI 200/D-020/L094P1699		Surface Legal Location P-20 65-00 126-45		MaxWell Job Number JOB01@2006		License No. EL 470					
Ground Elevation (m) 284.15		Original KB/RT Elevation (m) 289.35		Casing Flange Elevation (m) 283.95		Original Spud Date 1/29/2014		Days From Spud (days) 5.00			
Job Category DRILLING		Primary Job Type DRILLING ORIGINAL		Actual Start Date 1/24/2014 00:00		End Date 2/23/2014 23:59		Final Job Status DRILLED		Final Report? Yes	
Daily Cost Total (Cost) 93,395.03		Cumulative Cost (Cost) 629,039.15		Total AFE (Cost) 7,122,600.00		AFE+Supp Amt (Cost) 7,122,600.00		AFE / RFE / Maint.# 10351812		Estimated Days	
Planned Depth (TMD) (mKB)		Override TVD (mKB)		Head Count 51.0		Personnel Total Hours (hr) 592.00		Cum Personnel Total Hours (hr) 2,762.00			
Avg Connection Gas		Avg Background Gas			Avg Trip Gas			Max H2S (ppm)			
Road Condition Ice/Snow		Weather Clear			Temperature (°C) -25			Wind SE 10 kms			
Ops and Depth @ Morning Report Rotary Drill 311mm surface hole to 58m. Last Survey at 56m was 0.6 deg.									Wellbore Original Hole		

Last 24hr Summary

No incidents or accidents. 5 - HID, 0 - OBS and 0 - ASA (all closed out)

Rig in Diverter system, Pre-spud inspection, hazard hunt and safety meeting,

24hr Forecast

Pick up 9" collars, install 311mm bit, spud and rotary drill 311mm surface hole.

Daily Contacts

Drilling Superintendent, Sheldon Vamplew, 403-999-1302; Drilling Engineer, Mike Greener, 403-771-5039; WS Supervisor, Richard Turgeon, 780-387-1706; WS Supervisor, Dave Oppen, 403-863-8205; Rig Manager, Rick Yavis, 780-718-2962; Command Centre, 403-910-0357

Last Casing String

Conductor, 20.00mKB

Time Log

Start Time	End Time	Dur (hr)	Phase	Op Code	Activity Code	Time P-T-X	Trbl Code	Start Depth (mKB)	End Depth (mKB)	Operation
00:00	00:15	0.25	MIRU	RIGMNT	SVRG	P		0.00	0.00	Rig service function test rig smart function test crown saver
5	08:00	7.75	MIRU	MOVE	RURD	P		0.00	0.00	Cut conductor and prepare diverter system weld on flange and nipple up diverter system, fill mud tanks hook up flair lines.
08:00	08:15	0.25	MIRU	RIGMNT	SVRG	P		0.00	0.00	Rig service function test rig smart function test crown saver
08:15	16:00	7.75	MIRU	MOVE	RURD	P		0.00	0.00	Weld and nipple up diverter system, hook up flare lines
16:00	18:00	2.00	MIRU	MOVE	RURD	P		0.00	0.00	Weld and nipple up diverter system, hook up air lines to diverter valves and function test
18:00	18:15	0.25	MIRU	RIGMNT	SVRG	P		0.00	0.00	Rig service, function tested rig smart anti-collision system, function tested crown saver, checked oil and greased all moving parts
18:15	18:45	0.50	MIRU	MOVE	RURD	P		0.00	0.00	Pick up and prepare 311mm Mi616 Smith PDC bit
18:45	19:00	0.25	MIRU	MOVE	SFTY	P		0.00	0.00	Crew handover meeting with rig crews, rig manger and Conoco rep. present
19:00	21:30	2.50	SURFAC	DRILL	PULD	P		0.00	0.00	Make up 311mm Mi616 Smith PDC bit, 9inch drill collar and bit sub, Finish flair stack
21:30	23:00	1.50	SURFAC	DRILL	TRIP	P		0.00	0.00	Ran 311mm Mi616 Smith PDC bit in, tagged ice in conductor, make 9" collar conection with drill sub, drill out ice in conductor barrel, ran in and tagged conductor cement
23:00	23:15	0.25	SURFAC	DRILL	SFTY	P		0.00	0.00	Pre-spud safety inspection with rig crew
23:15	23:30	0.25	SURFAC	DRILL	SFTY	P		0.00	0.00	Diverter drill with crews review task and positions
23:30	00:00	0.50	SURFAC	DRILL	DRLG	P		20.00	20.00	Drill out cement in bottom of conductor

Fluid/Mud Chks: Mud Engineer: <Mud Engineer?>

Time 23:15	Depth (mKB)	Density (kg/m³)	Funnel Viscosity (s/L)	pH	PV Override (Pa*s)	YP Override (Pa)
Low Gravity Solids (%)	MBT (kg/m³)	Oil Water Ratio	Chlorides (mg/L)	Calcium (mg/L)	Lime (kg/m³)	Potassium (mg/L)
Electric Stab (V)	ECD - Manual Entry (k...)	Sand (%)	Solids, Corr. (%)	T Flowline (°C)	HTHP Pressure (kPa)	HTHP Filtrate (mL/30...
AP Filtrate (mL/30min)		Mud Lost to Surface (m³)		Mud Lost to Hole (m³)		Daily Mud Field Est (Cost)
Cum. Mud Lost to Surface (m³)		Cum Mud Lost to Hole (m³)		Cumulative Mud Cost (Cost)		

Daily Drilling

COPRC MIRROR LAKE P-20 65-00 126-45

Rig: Beaver Drilling Ltd. 2

Report Date: 1/28/2014
Report #: 5
Depth Progress: 2.00m
Depth End: 20.00mKB
Rig Release Date: 2/23/2014

Last BOP Drill

Type BOP Drill	Days Last Chk (...)	Last Date	Days Until Next...	Next Check Date
Days Since Lost Time Incident (days)	838.00		Days Since Recordable Incident (days)	838.00

Safety Incidents

Date	Com	Category

Drill String: BHA # 1

Bit Run 1	Drill Bit 311.0mm, mi616, JD3509	Length (m) 0.35	IADC Bit Dull 1-1-NO-G-X--WT-HP	TFA (incl Noz) (mm²) 1,283	BHA ROP (m/hr) 14.9
Nozzles (mm) 14.3/14.3/14.3/14.3/14.3/14.3/14.3/14.3	String Length (m) 450.51	OD (mm) 311.0	Max Rotating Hook Load (daN) 44,000		
Depth In (mKB) 18.00	Depth Out (mKB) 450.00	Avg ROP (m/hr) 14.9	Depth This Job (m) 432.00	Total Depth Drilled b... 432.00	Job Drill Hrs (hr) 29.00
Comment Rotary drill 311mm slick		Total Drill Hrs (hr) 29.00			

Drill String Components

Item Des	ID (mm)	OD (mm)	Jts	Len (m)	Cum Len (m)
4" H.W	65.0	101.0	34	317.07	450.51
X/O 4" H-90	62.0	162.0	1	0.80	133.44
6" D.C	60.0	160.0	12	111.84	132.64
Bell sub	69.0	232.0	1	0.66	20.80
9" D.C	71.0	233.0	2	18.50	20.14
Bit sub	70.0	235.0	1	0.94	1.64
PDC 311mm bit	67.0	311.0	1	0.35	0.70

Drilling Parameter: 18.00 - 20.00 mKB

Cum Depth (m) 2.00	Cum Drill... 0.25	Int ROP (...) 8.0	Flow Rate... 2.600	WOB (daN) 3,000	RPM (r... 120	SPP (kPa) 1,200	Drill Str Wt (d... 25,000	SO Str Wt (daN) 25,000	PU Str Wt (daN) 25,000	Off-Btm Str W... 25,000	Drill Tq
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Hydraulic Calculations

Bit Hydraulic Powe... 0.08	HPI/Area (kW/mm²)	% P @ bit (%) 0	Bit Jet Velocity (m/s) 33.8	Bit dP (kPa) 0.0	P Drop Annular (kPa)	Mud Density (kg/m³) 0.0	ECD End (kg/m³)
Drill String Volume (m³) 0.08	Bit to Shoe Volume (m³)	Vol Shoe to Top (m³)	Min Casing AV (m/min) 0.0	Max Casing AV (m/min) 0.0	Min Open Hole AV (m/min) 78.0	Max Open Hole AV (m/min) 79.8	

Error

Unable to calculate annular pressure drop because pressure drop data is missing from AV calc

Mud Pump: 1, NATIONAL, 8-P-80

Pump Number 1	Make NATIONAL	Model 8-P-80	Rod Diameter (mm) 140.0	Stroke Length (mm) 216.0
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Pump Checks

Date	Depth (mKB)	Q Flow (m³/min)	P (kPa)	Strokes (spm)
2/16/2014 16:00	2,209.00	0.608	5,153	78
2/16/2014 16:00	2,209.00	1.045	15,600	134

Pump Operations

Start Date	End Date	Liner Size (mm)	P Max (kPa)	Vol/Stk OR (m³/stk)
2/15/2014	2/15/2014	127.0		
2/16/2014	2/16/2014	127.0		

Mud Pump: 2, NATIONAL, 8-P-80

Pump Number 2	Make NATIONAL	Model 8-P-80	Rod Diameter (mm) 140.0	Stroke Length (mm) 216.0
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Pump Checks

Date	Depth (mKB)	Q Flow (m³/min)	P (kPa)	Strokes (spm)
2/19/2014 23:45	3,152.00	0.975	12,600	125
2/20/2014 00:00	3,143.00	0.647	6,414	83

Pump Operations

Start Date	End Date	Liner Size (mm)	P Max (kPa)	Vol/Stk OR (m³/stk)
2/20/2014	2/20/2014	127.0		
2/21/2014	2/21/2014	127.0		

Shaker Screens

Des	Start Date	End Date	Scr Sz X	Scr Sz Y	Note

Centrifuge/Cyclone: HGS Centrifuge, BOS Solutions, 5500

Number 2	Make BOS Solutions	Model 5500	Diameter (mm)
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Daily Drilling

COPRC MIRROR LAKE P-20 65-00 126-45

Rig: Beaver Drilling Ltd. 2

Report Date: 1/28/2014
Report #: 5
Depth Progress: 2.00m
Depth End: 20.00mKB
Rig Release Date: 2/23/2014

Centrifuge/Cyclone Checks

Date	Hrs (hr)	RPM (rpm)	Dens OF (kg/m³)	Q OF (L/min)	Dens UF (kg/m³)	Q UF (L/min)
2/21/2014 00:00	3.00	2100	1,040.0	0.400	1,710.0	0.200

Centrifuge/Cyclone: HGS Centrifuge, BOS Solutions, 5500

Number	Make	Model	Diameter (mm)
1	BOS Solutions	5500	

Centrifuge/Cyclone Checks

Date	Hrs (hr)	RPM (rpm)	Dens OF (kg/m³)	Q OF (L/min)	Dens UF (kg/m³)	Q UF (L/min)
2/21/2014 00:00	3.00	2100	1,100.0	0.400	1,790.0	0.200

Fluid / Mud Additive Amounts

Des	Consumed	Cost	Size	Units

Survey Data

Date	MD (mKB)	Incl (°)	Azm (°)	TVD (mKB)	Depart (m)	NS (m)	EW (m)	VS (m)	DLS (°/30m)

Formations

Formation Name	Drill Top MD (mKB)	Drill Top (TVD) (mKB)	Prog Top TVD (mKB)
Little Bear	43.00	43.00	20.85
Slater River	207.00	207.00	197.35
Arctic Red	954.00	953.52	932.35
Martin House	1,110.00	1,109.49	1,084.35
Imperial	1,140.00	1,139.48	1,118.35
KOP (5deg/30m)	1,731.00	1,730.40	1,730.73
KOP (7deg/30m)	1,817.00	1,815.65	1,816.00
Upper Canol	1,902.70	1,896.20	1,897.35
Lower Canol	1,935.80	1,924.43	1,929.35

Daily Drilling

COPRC MIRROR LAKE P-20 65-00 126-45

Report Date: 1/29/2014
Report #: 6
Depth Progress: 243.00m
Depth End: 263.00mKB
Rig Release Date: 2/23/2014

Rig: Beaver Drilling Ltd. 2

/UWI 200/D-020/L094P1699		Surface Legal Location P-20 65-00 126-45		MaxWell Job Number JOB01@2006		License No. EL 470					
Ground Elevation (m) 284.15		Original KB/RT Elevation (m) 289.35		Casing Flange Elevation (m) 283.95		Original Spud Date 1/29/2014		Days From Spud (days) 6.00			
Job Category DRILLING		Primary Job Type DRILLING ORIGINAL		Actual Start Date 1/24/2014 00:00		End Date 2/23/2014 23:59		Final Job Status DRILLED		Final Report? Yes	
Daily Cost Total (Cost) 134,832.30		Cumulative Cost (Cost) 763,871.45		Total AFE (Cost) 7,122,600.00		AFE+Supp Amt (Cost) 7,122,600.00		AFE / RFE / Maint.# 10351812		Estimated Days	
Planned Depth (TMD) (mKB)		Override TVD (mKB)		Head Count 51.0		Personnel Total Hours (hr) 592.00		Cum Personnel Total Hours (hr) 3,354.00			
Avg Connection Gas		Avg Background Gas			Avg Trip Gas			Max H2S (ppm)			
Road Condition Ice/Snow		Weather Cloudy			Temperature (°C) -27			Wind NW 10 kms			
Ops and Depth @ Morning Report Vis up mud with gel additions and add LCM									Wellbore Original Hole		

Last 24hr Summary

No incidents or accidents. 4 - HID, 2 - OBS and 0 - ASA (all closed out)

Spud and drill 311mm surface hole from 0m to 263m with 311mm Mi616 Smith PDC bit with accumulated wireline surveys, rig services, connections and circulation times. Last survey at 300m was 0.2°. Sent pre-spud Beyond Compliance, pre-spud inspection and rig inspection checklists prior to spudding. Spud and drill 311mm surface hole at 00:01hrs on January 29, 2014. Stop pumping at 245m, build volume, vis up mud with gel additions and add LCM, circulate at a reduced rate, displace hole with viscosified mud and LCM, stop pump, viscosify light mud from wellbore with gel additions and add LCM, check muddrop of mud in annulus, pump at reduced rate and check mud volumes, continue with drilling operations.

24hr Forecast

Vis up mud with gel additions and add LCM. Run in the hole, drill 311mm surface hole with accumulated wireline surveys, rig services, connections and circulation times. Wiper trip at 590m+/- (strap out). Drill to surface TD.

Daily Contacts

Drilling Superintendent, Sheldon Vamplew, 403-999-1302; Drilling Engineer, Mike Greener, 403-771-5039; WS Supervisor, Richard Turgeon, 780-387-1706; WS Supervisor, Dave Oppen, 403-863-8205; Rig Manager, Rick Yavis, 780-718-2962; Command Centre, 403-910-0357

Last Casing String

Conductor, 20.00mKB

Log

Start Time	End Time	Dur (hr)	Phase	Op Code	Activity Code	Time P-T-X	Trbl Code	Start Depth (mKB)	End Depth (mKB)	Operation
00:00	01:30	1.50	SURFAC	DRILL	DRLG	P		20.00	29.00	Drill 311mm hole with Mi616 Smith PDC bit drill from 20m to 29m
01:30	01:45	0.25	SURFAC	RIGMNT	SVRG	P		29.00	29.00	Rig service function test rig smart anti collision system function test crown saver, function test flair stack ignitor, grease all moving parts check fluid levels in floor motor and HPU
01:45	07:45	6.00	SURFAC	DRILL	DRLG	P		29.00	76.00	Drill 311mm hole with Mi616 Smith PDC bit drill from 29m to 76m
07:45	08:00	0.25	SURFAC	DRILL	SFTY	P		76.00	76.00	Crew handover meeting with both crews, tool push and conoco rep present.
08:00	09:00	1.00	SURFAC	DRILL	DRLG	P		76.00	94.00	Drill 311mm hole with Mi616 Smith PDC bit drill from 76m to 94m
09:00	10:00	1.00	SURFAC	DRILL	CIRC	P		94.00	94.00	Float stuck on mud tank, lost suction and build volume
10:00	11:00	1.00	SURFAC	DRILL	DRLG	P		94.00	104.00	Drill 311mm hole with Mi616 Smith PDC bit drill from 94m to 104m
11:00	11:15	0.25	SURFAC	RIGMNT	SVRG	P		104.00	104.00	Rig service function test rig smart anti collision system function test crown saver, function test flair stack ignitor, grease all moving parts check fluid levels in floor motor and HPU
11:15	11:30	0.25	SURFAC	DRILL	SFTY	P		104.00	104.00	Rotating head diverter drill with crew
11:30	17:15	5.75	SURFAC	DRILL	DRLG	P		104.00	207.00	Drill 311mm hole with Mi616 Smith PDC bit drill from 104m to 207m
17:15	17:30	0.25	SURFAC	RIGMNT	SVRG	P		207.00	207.00	Rig service function test rig smart anti collision system function test crown saver, function test flair stack ignitor, grease all moving parts check fluid levels in floor motor and HPU
17:30	18:45	1.25	SURFAC	DRILL	DRLG	P		207.00	245.00	Drill 311mm hole with Mi616 Smith PDC bit drill from 207m to 245m
18:45	19:00	0.25	SURFAC	DRILL	SFTY	P		245.00	245.00	Crew change safety meeting Conoco Reps. present
19:00	23:00	4.00	SURFAC	DRILL	CIRC	T	Lost Circulation	245.00	245.00	Circulate and condition mud additions of gel to 80 viscosity and L.C.M. Build volume with pumps off add L.C.M mud viscosity to 80

Daily Drilling

COPRC MIRROR LAKE P-20 65-00 126-45

Rig: Beaver Drilling Ltd. 2

Report Date: 1/29/2014
Report #: 6
Depth Progress: 243.00m
Depth End: 263.00mKB
Rig Release Date: 2/23/2014

Time Log

Start Time	End Time	Dur (hr)	Phase	Op Code	Activity Code	Time P-T-X	Trbl Code	Start Depth (mKB)	End Depth (mKB)	Operation
23:00	00:00	1.00	SURFAC	DRILL	DRLG	P		245.00	263.00	Drill 311mm hole with Mi616 Smith PDC bit drill from 245m to 263m

Fluid/Mud Chks: Mud Engineer: Ed Thompson

Time	15:00	Depth (mKB)	184.00	Density (kg/m³)	1,060.0	Funnel Viscosity (s/L)	46	pH	9.0	PV Override (Pa·s)	13.0	YP Override (Pa)	4.5
Low Gravity Solids (%)	3.7	MBT (kg/m³)		Oil Water Ratio		Chlorides (mg/L)	1,500	Calcium (mg/L)	120	Lime (kg/m³)		Potassium (mg/L)	
Electric Stab (V)		ECD - Manual Entry (k...)	1,074.0	Sand (%)	0.1	Solids, Corr. (%)	3.8	T Flowline (°C)	25	HTHP Pressure (kPa)		HTHP Filtrate (mL/30...)	
API Filtrate (mL/30min)	13.0	Mud Lost to Surface (m³)		Mud Lost to Hole (m³)		Daily Mud Field Est (Cost)							5,741.27
Cum Mud Lost to Surface (m³)		Cum Mud Lost to Hole (m³)		Cumulative Mud Cost (Cost)									5,741.27

Last BOP Drill

Type	BOP Drill	Days Last Chk (...)	Last Date	Days Until Next...	Next Check Date
Days Since Lost Time Incident (days)		839.00	Days Since Recordable Incident (days)		839.00

Safety Incidents

Date	Com	Category

Drill String: BHA # 1

Bit Run	1	Drill Bit	311.0mm, mi616, JD3509	Length (m)	0.35	IADC Bit Dull	1-1-NO-G-X-WT-HP	TFA (incl Noz) (mm²)	1,283	BHA ROP (m/hr)	14.9
Nozzles (mm)	14.3/14.3/14.3/14.3/14.3/14.3/14.3	String Length (m)	450.51	OD (mm)	311.0	Max Rotating Hook Load (daN)				44,000	
Depth In (mKB)	18.00	Depth Out (mKB)	450.00	Avg ROP (m/hr)	14.9	Depth This Job (m)	432.00	Total Depth Drilled b...	432.00	Job Drill Hrs (hr)	29.00

Comment
Rotary drill 311mm slick

Drill String Components

Item Des	ID (mm)	OD (mm)	Jts	Len (m)	Cum Len (m)
4" H.W	65.0	101.0	34	317.07	450.51
X/O 4" H-90	62.0	162.0	1	0.80	133.44
6" D.C	60.0	160.0	12	111.84	132.64
Bell sub	69.0	232.0	1	0.66	20.80
9" D.C	71.0	233.0	2	18.50	20.14
Bit sub	70.0	235.0	1	0.94	1.64
PDC 311mm bit	67.0	311.0	1	0.35	0.70

Drilling Parameter: 188.00 - 263.00 mKB

Cum Depth (m)	245.00	Cum Drill...	16.25	Int ROP (...)	21.4	Flow Rate...	2.200	WOB (daN)	4,000	RPM (r...)	85	SPP (kPa)	5,900	Drill Str Wt (d...)	43,000	SO Str Wt (daN)	42,000	PU Str Wt (daN)	44,000	Off-Btm Str W...	43,000	Drill Tq	
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Hydraulic Calculations

Bit Hydraulic Powe...	17.8	HP/Area (kW/mm²)	0.00023	% P @ bit (%)	8	Bit Jet Velocity (m/s)	28.6	Bit dP (kPa)	485.7	P Drop Annular (kPa)	23.9	Mud Density (kg/m³)	1,060.0	ECD End (kg/m³)	1,069.3
Drill String Volume (m³)	0.83	Bit to Shoe Volume (m³)		Vol Shoe to Top (m³)		Min Casing AV (m/min)	0.0	Max Casing AV (m/min)	0.0	Min Open Hole AV (m/...	32.4	Max Open Hole AV (m/...	67.5		

Error

Mud Pump: 1, NATIONAL, 8-P-80

Pump Number	1	Make	NATIONAL	Model	8-P-80	Rod Diameter (mm)	140.0	Stroke Length (mm)	216.0
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Pump Checks

Date	Depth (mKB)	Q Flow (m³/min)	P (kPa)	Strokes (spm)
2/16/2014 16:00		2,209.00	0.608	5,153
2/16/2014 16:00		2,209.00	1.045	15,600

Pump Operations

Start Date	End Date	Liner Size (mm)	P Max (kPa)	Vol/Stk OR (m³/stk)
2/15/2014	2/15/2014	127.0		
2/16/2014	2/16/2014	127.0		

Mud Pump: 2, NATIONAL, 8-P-80

Pump Number	2	Make	NATIONAL	Model	8-P-80	Rod Diameter (mm)	140.0	Stroke Length (mm)	216.0
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Daily Drilling

COPRC MIRROR LAKE P-20 65-00 126-45

Rig: Beaver Drilling Ltd. 2

Report Date: 1/29/2014
Report #: 6
Depth Progress: 243.00m
Depth End: 263.00mKB
Rig Release Date: 2/23/2014

np Checks

Date	Depth (mKB)	Q Flow (m³/min)	P (kPa)	Strokes (spm)
2/19/2014 23:45	3,152.00	0.975	12,600	125
2/20/2014 00:00	3,143.00	0.647	6,414	83

Pump Operations

Start Date	End Date	Liner Size (mm)	P Max (kPa)	Vol/Stk OR (m³/stk)
2/20/2014	2/20/2014	127.0		
2/21/2014	2/21/2014	127.0		

Shaker Screens

Des	Start Date	End Date	Scr Sz 'X'	Scr Sz Y	Note

Centrifuge/Cyclone: HGS Centrifuge, BOS Solutions, 5500

Number	Make	Model	Diameter (mm)
2	BOS Solutions	5500	

Centrifuge/Cyclone Checks

Date	Hrs (hr)	RPM (rpm)	Dens OF (kg/m³)	Q OF (L/min)	Dens UF (kg/m³)	Q UF (L/min)
2/21/2014 00:00	3.00	2100	1,040.0	0.400	1,710.0	0.200

Centrifuge/Cyclone: HGS Centrifuge, BOS Solutions, 5500

Number	Make	Model	Diameter (mm)
1	BOS Solutions	5500	

Centrifuge/Cyclone Checks

Date	Hrs (hr)	RPM (rpm)	Dens OF (kg/m³)	Q OF (L/min)	Dens UF (kg/m³)	Q UF (L/min)
2/21/2014 00:00	3.00	2100	1,100.0	0.400	1,790.0	0.200

Fluid / Mud Additive Amounts

Des	Consumed	Cost	Size	Units
CELLOFLAKE	2.0	66.200	11.34	SX
FED SEAL	7.0	19.890	18.14	SX
Gel	149.0	7.200	40.0	SX
Kelzan	11.0	360.450	25.0	SX
dust	130.0	2.980	7.3	SX
AP STICKS	1.0	15.390	0.5	STICK
Soda Ash	2.0	14.550	22.68	SX

Survey Data

Date	MD (mKB)	Incl (°)	Azm (°)	TVD (mKB)	Depart (m)	NS (m)	EW (m)	VS (m)	DLS (°/30m)
1/29/2014	28.00	0.50	0.00	28.00	0.12	0.12	0.00	0.03	0.54
1/29/2014	56.00	0.60	0.00	56.00	0.39	0.39	0.00	0.10	0.11
1/29/2014	56.00	0.60	0.00	56.00	0.39	0.39	0.00	0.10	0.11
1/29/2014	84.98	0.40	0.00	84.98	0.64	0.64	0.00	0.17	0.21
1/29/2014	131.00	0.30	0.00	131.00	0.92	0.92	0.00	0.24	0.07
1/29/2014	151.00	0.30	0.00	151.00	1.03	1.03	0.00	0.27	0.00
1/29/2014	188.00	0.20	0.00	188.00	1.19	1.19	0.00	0.31	0.08

Formations

Formation Name	Drill Top MD (mKB)	Drill Top (TVD) (mKB)	Prog Top TVD (mKB)
Little Bear	43.00	43.00	20.85
Slater River	207.00	207.00	197.35
Arctic Red	954.00	953.52	932.35
Martin House	1,110.00	1,109.49	1,084.35
Imperial	1,140.00	1,139.48	1,118.35
KOP (5deg/30m)	1,731.00	1,730.40	1,730.73
KOP (7deg/30m)	1,817.00	1,815.65	1,816.00
Upper Canol	1,902.70	1,896.20	1,897.35
Lower Canol	1,935.80	1,924.43	1,929.35

Daily Drilling

COPRC MIRROR LAKE P-20 65-00 126-45

Report Date: 1/30/2014
Report #: 7
Depth Progress: 56.00m
Depth End: 319.00mKB
Rig Release Date: 2/23/2014

Rig: Beaver Drilling Ltd. 2

/UWI 200/D-020/L094P1699		Surface Legal Location P-20 65-00 126-45		MaxWell Job Number JOB01@2006		License No. EL 470					
Ground Elevation (m) 284.15		Original KB/RT Elevation (m) 289.35		Casing Flange Elevation (m) 283.95		Original Spud Date 1/29/2014		Days From Spud (days) 7.00			
Job Category DRILLING		Primary Job Type DRILLING ORIGINAL		Actual Start Date 1/24/2014 00:00		End Date 2/23/2014 23:59		Final Job Status DRILLED		Final Report? Yes	
Daily Cost Total (Cost) 152,056.22		Cumulative Cost (Cost) 915,927.67		Total AFE (Cost) 7,122,600.00		AFE+Supp Amt (Cost) 7,122,600.00		AFE / RFE / Maint.# 10351812		Estimated Days	
Planned Depth (TMD) (mKB)		Override TVD (mKB)		Head Count 48.0		Personnel Total Hours (hr) 508.00		Cum Personnel Total Hours (hr) 3,862.00			
Avg Connection Gas			Avg Background Gas			Avg Trip Gas			Max H2S (ppm)		
Road Condition Ice/Snow			Weather Cloudy			Temperature (°C)			Wind -8 NW 5 kms		
Ops and Depth @ Morning Report Drill 311mm surface hole to 412m. Last survey at 357m was 1.3°.									Wellbore Original Hole		

Last 24hr Summary

No incidents or accidents. 9 - HID, 0 - OBS and 0 - ASA (all closed out)

Drill 311mm surface hole from 263m to 301m with accumulated wireline surveys, rig services, connections and circulation times. Last survey at 300m was 0.2°. Pull out of the hole, attempt to back ream through tight spot at 110m, lost circulation, build volume, vis up mud with gel additions and add LCM, circulate at a reduced rate, displace hole with viscosified mud and LCM, stop pump, viscosify light mud from wellbore with gel additions and add LCM, backream through tight spots from 98m to 76m. Run in hole to 282m, build volume and vis up to 80+, displace hole to high vis mud, build volume and vis to 80+. Drill 311mm hole from 301m to 319m. Last survey at 357m was 1.3°.

24hr Forecast

Drill 311mm surface hole to 590m+/- with accumulated wireline surveys, rig services, connections and circulation times. Wiper trip, strap out, drill 311mm surface hole to 600m+/-, circulate hole clean, pull out of the hole, laydown 9" drill collars, rig up power tongs, run 244.5mm surface casing.

Daily Contacts

Drilling Superintendent, Sheldon Vamplew, 403-999-1302; Drilling Engineer, Mike Greener, 403-771-5039; WS Supervisor, Richard Turgeon, 780-387-1706; WS Supervisor, Dave Oppen, 403-863-8205; Rig Manager, Rick Yavis, 780-718-2962; Command Centre, 403-910-0357

Last Casing String

Conductor, 20.00mKB

Log

Start Time	End Time	Dur (hr)	Phase	Op Code	Activity Code	Time P-T-X	Trbl Code	Start Depth (mKB)	End Depth (mKB)	Operation
00:00	00:15	0.25	SURFAC	RIGMNT	SVRG	P		263.00	263.00	Rig service function test rig smart anti collision system function test crown saver, function test flair stack ignitor, grease all moving parts check fluid levels in floor motor and HPU
00:15	01:45	1.50	SURFAC	DRILL	DRLG	P		263.00	301.00	Drill 311mm hole with Mi616 Smith PDC bit drill from 263m to 301m
01:45	02:15	0.50	SURFAC	DRILL	CIRC	P		301.00	301.00	Circulate bottoms up, take bottom hole survey prepair to trip out of hole
02:15	04:30	2.25	SURFAC	DRILL	TRIP	P		301.00	301.00	Trip out of hole to 105m, pulled tight
04:30	07:45	3.25	SURFAC	DRILL	CIRC	T	Lost Circulation	301.00	301.00	Build volume and get a viscosity of 80+ and L.C.M additives
07:45	08:00	0.25	SURFAC	DRILL	SFTY	P		301.00	301.00	Crew handover meeting with both crews, tool push and conoco.rep present.
08:00	13:00	5.00	SURFAC	DRILL	CIRC	T	Lost Circulation	301.00	301.00	Build volume, mixed gel and LCM to a viscosity of 100+
13:00	14:30	1.50	SURFAC	DRILL	TRIP	P		301.00	301.00	Trip out, back reamed tight at 97m to 76m
14:30	14:45	0.25	SURFAC	RIGMNT	SVRG	P		301.00	301.00	Rig service function test rig smart anti collision system function test crown saver, function test flair stack ignitor, grease all moving parts check fluid levels in floor motor and HPU
14:45	16:30	1.75	SURFAC	DRILL	TRIP	P		301.00	301.00	Trip into the hole slowly
16:30	16:45	0.25	SURFAC	RIGMNT	SVRG	P		301.00	301.00	Rig service function test rig smart anti collision system function test crown saver, function test flair stack ignitor, grease all moving parts check fluid levels in floor motor and HPU
	18:45	2.00	SURFAC	DRILL	CIRC	T	Lost Circulation	301.00	301.00	Build volume, mixed gel and LCM to a viscosity of 100+
18:45	19:00	0.25	SURFAC	DRILL	SFTY	P		301.00	301.00	Crew handover meeting with both crews, tool push and conoco rep present.

Daily Drilling

COPRC MIRROR LAKE P-20 65-00 126-45

Rig: Beaver Drilling Ltd. 2

Report Date: 1/30/2014
Report #: 7
Depth Progress: 56.00m
Depth End: 319.00mKB
Rig Release Date: 2/23/2014

Time Log

Start Time	End Time	Dur (hr)	Phase	Op Code	Activity Code	Time P-T-X	Trbl Code	Start Depth (mKB)	End Depth (mKB)	Operation
19:00	20:45	1.75	SURFAC	DRILL	CIRC	T	Lost Circulation	301.00	301.00	Build volume, mixed gel and LCM to a viscosity of 100+
20:45	21:00	0.25	SURFAC	DRILL	CIRC	T	Lost Circulation	301.00	301.00	Circulate 100+ viscosity mud, saw returns after pumping 13m3
21:00	22:30	1.50	SURFAC	DRILL	CIRC	T	Lost Circulation	301.00	301.00	Build volume back to 50m3, mix gel to bring mud up to 100+ viscosity
22:30	00:00	1.50	SURFAC	DRILL	DRLG	P		301.00	319.00	Drill 311mm hole with Mi616 Smith PDC bit drill from 301m to 319m

Fluid/Mud Chks: Mud Engineer: Ed Thompson

Time	16:00	Depth (mKB)	301.00	Density (kg/m³)	1,050.0	Funnel Viscosity (s/L)	65	pH	8.5	PV Override (Pa·s)	23.0	YP Override (Pa)	7.0
Low Gravity Solids (%)	2.9	MBT (kg/m³)		Oil Water Ratio		Chlorides (mg/L)	800	Calcium (mg/L)	120	Lime (kg/m³)		Potassium (mg/L)	
Electric Stab (V)		ECD - Manual Entry (k...)	1,066.0	Sand (%)	0.1	Solids, Corr. (%)	3.1	T Flowline (°C)	15	HTHP Pressure (kPa)		HTHP Filtrate (mL/30...)	
API Filtrate (mL/30min)	14.0	Mud Lost to Surface (m³)		Mud Lost to Hole (m³)		Daily Mud Field Est (Cost)							6,511.19
Cum Mud Lost to Surface (m³)		Cum Mud Lost to Hole (m³)		Cumulative Mud Cost (Cost)									12,252.46

Last BOP Drill

Type	BOP Drill	Days Last Chk (...)	Last Date	Days Until Next...	Next Check Date
Days Since Lost Time Incident (days)	840.00	Days Since Recordable Incident (days)	840.00		

Safety Incidents

Date	Com	Category

Drill String: BHA # 1

Bit Run	1	Drill Bit	311.0mm, mi616, JD3509	Length (m)	0.35	IADC Bit Dull	1-1-NO-G-X-WT-HP	TFA (incl Noz) (mm²)	1,283	BHA ROP (m/hr)	14.9
Nozzles (mm)	14.3/14.3/14.3/14.3/14.3/14.3/14.3	String Length (m)	450.51	OD (mm)	311.0	Max Rotating Hook Load (daN)	44,000				
Depth In (mKB)	18.00	Depth Out (mKB)	450.00	Avg ROP (m/hr)	14.9	Depth This Job (m)	432.00	Total Depth Drilled b...	432.00	Job Drill Hrs (hr)	29.00
										Total Drill Hrs (hr)	29.00

Comment
Rotary drill 311mm slick

Drill String Components

Item Des	ID (mm)	OD (mm)	Jts	Len (m)	Cum Len (m)
4" H.W	65.0	101.0	34	317.07	450.51
X/O 4" H-90	62.0	162.0	1	0.80	133.44
6" D.C	60.0	160.0	12	111.84	132.64
Bell sub	69.0	232.0	1	0.66	20.80
9" D.C	71.0	233.0	2	18.50	20.14
Bit sub	70.0	235.0	1	0.94	1.64
PDC 311mm bit	67.0	311.0	1	0.35	0.70

Drilling Parameter: 301.00 - 319.00 mKB

Cum Depth (m)	301.00	Cum Drill...	19.25	Int ROP (...)	12.0	Flow Rate...	2.200	WOB (daN)	7,000	RPM (r...)	69	SPP (kPa)	9,000	Drill Str Wt (d...)	43,000	SO Str Wt (daN)	43,000	PU Str Wt (daN)	43,000	Off-Btm Str W...	43,000	Drill Tq	
Hydraulic Calculations																							
Bit Hydraulic Powe...	17.6	HP/Area (kW/mm²)	0.00023	% P @ bit (%)	5	Bit Jet Velocity (m/s)	28.6	Bit dP (kPa)	481.1	P Drop Annular (kPa)	43.8	Mud Density (kg/m³)	1,050.0	ECD End (kg/m³)	1,064.0								
Drill String Volume (m³)	1.01	Bit to Shoe Volume (m³)		Vol Shoe to Top (m³)		Min Casing AV (m/min)	0.0	Max Casing AV (m/min)	0.0	Min Open Hole AV (m/...	32.4	Max Open Hole AV (m/...	67.5										

Error

Mud Pump: 1, NATIONAL, 8-P-80

Pump Number	1	Make	NATIONAL	Model	8-P-80	Rod Diameter (mm)	140.0	Stroke Length (mm)	216.0
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Pump Checks

Date	2/16/2014 16:00	Depth (mKB)	2,209.00	Q Flow (m³/min)	0.608	P (kPa)	5,153	Strokes (spm)	78
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Daily Drilling

COPRC MIRROR LAKE P-20 65-00 126-45

Rig: Beaver Drilling Ltd. 2

Report Date: 1/30/2014
Report #: 7
Depth Progress: 56.00m
Depth End: 319.00mKB
Rig Release Date: 2/23/2014

Pump Checks

Date	Depth (mKB)	Q Flow (m³/min)	P (kPa)	Strokes (spm)
2/16/2014 16:00	2,209.00	1.045	15,600	134

Pump Operations

Start Date	End Date	Liner Size (mm)	P Max (kPa)	Vol/Stk OR (m³/stk)
2/15/2014	2/15/2014	127.0		
2/16/2014	2/16/2014	127.0		

Mud Pump: 2, NATIONAL, 8-P-80

Pump Number	Make	Model	Rod Diameter (mm)	Stroke Length (mm)
2	NATIONAL	8-P-80	140.0	216.0

Pump Checks

Date	Depth (mKB)	Q Flow (m³/min)	P (kPa)	Strokes (spm)
2/19/2014 23:45	3,152.00	0.975	12,600	125
2/20/2014 00:00	3,143.00	0.647	6,414	83

Pump Operations

Start Date	End Date	Liner Size (mm)	P Max (kPa)	Vol/Stk OR (m³/stk)
2/20/2014	2/20/2014	127.0		
2/21/2014	2/21/2014	127.0		

Shaker Screens

Des	Start Date	End Date	Scr Sz X	Scr Sz Y	Note

Centrifuge/Cyclone: HGS Centrifuge, BOS Solutions, 5500

Number	Make	Model	Diameter (mm)
2	BOS Solutions	5500	

Centrifuge/Cyclone Checks

Date	Hrs (hr)	RPM (rpm)	Dens OF (kg/m³)	Q OF (L/min)	Dens UF (kg/m³)	Q UF (L/min)
2/21/2014 00:00	3.00	2100	1,040.0	0.400	1,710.0	0.200

Centrifuge/Cyclone: HGS Centrifuge, BOS Solutions, 5500

Number	Make	Model	Diameter (mm)
1	BOS Solutions	5500	

Centrifuge/Cyclone Checks

Date	Hrs (hr)	RPM (rpm)	Dens OF (kg/m³)	Q OF (L/min)	Dens UF (kg/m³)	Q UF (L/min)
2/21/2014 00:00	3.00	2100	1,100.0	0.400	1,790.0	0.200

Fluid / Mud Additive Amounts

Des	Consumed	Cost	Size	Units
Caustic	1.0	24.650	50.0	SX
CELLOFLAKE	22.0	66.200	11.34	SX
FED SEAL	21.0	19.890	18.14	SX
Gel	445.0	7.200	40.0	SX
Kelzan	3.0	360.450	25.0	SX
Sawdust	100.0	2.980	7.3	SX
Soda Ash	2.0	14.550	22.68	SX

Survey Data

Date	MD (mKB)	Incl (°)	Azm (°)	TVD (mKB)	Depart (m)	NS (m)	EW (m)	VS (m)	DLS (°/30m)
1/30/2014	281.00	0.20	0.00	281.00	1.52	1.52	0.00	0.39	0.00
1/30/2014	300.00	0.20	0.00	300.00	1.58	1.58	0.00	0.41	0.00

Formations

Formation Name	Drill Top MD (mKB)	Drill Top (TVD) (mKB)	Prog Top TVD (mKB)
Little Bear	43.00	43.00	20.85
Slater River	207.00	207.00	197.35
Arctic Red	954.00	953.52	932.35
Martin House	1,110.00	1,109.49	1,084.35
Imperial	1,140.00	1,139.48	1,118.35
KOP (5deg/30m)	1,731.00	1,730.40	1,730.73
KOP (7deg/30m)	1,817.00	1,815.65	1,816.00
Upper Canol	1,902.70	1,896.20	1,897.35
Lower Canol	1,935.80	1,924.43	1,929.35

Daily Drilling

COPRC MIRROR LAKE P-20 65-00 126-45

Report Date: 1/31/2014
Report #: 8
Depth Progress: 131.00m
Depth End: 450.00mKB
Rig Release Date: 2/23/2014

Rig: Beaver Drilling Ltd. 2

/UWI 200/D-020/L094P1699		Surface Legal Location P-20 65-00 126-45		MaxWell Job Number JOB01@2006		License No. EL 470					
Ground Elevation (m) 284.15		Original KB/RT Elevation (m) 289.35		Casing Flange Elevation (m) 283.95		Original Spud Date 1/29/2014		Days From Spud (days) 8.00			
Job Category DRILLING		Primary Job Type DRILLING ORIGINAL		Actual Start Date 1/24/2014 00:00		End Date 2/23/2014 23:59		Final Job Status DRILLED		Final Report? Yes	
Daily Cost Total (Cost) 111,501.54		Cumulative Cost (Cost) 1,027,429.21		Total AFE (Cost) 7,122,600.00		AFE+Supp Amt (Cost) 7,122,600.00		AFE / RFE / Maint.# 10351812		Estimated Days	
Planned Depth (TMD) (mKB)		Override TVD (mKB)		Head Count 48.0		Personnel Total Hours (hr) 508.00		Cum Personnel Total Hours (hr) 4,370.00			
Avg Connection Gas		Avg Background Gas			Avg Trip Gas			Max H2S (ppm)			
Road Condition Ice/Snow		Weather Cloudy			Temperature (°C) -14			Wind NW 5 kms			
Ops and Depth @ Morning Report Slip and cut drill line								Wellbore Original Hole			

Last 24hr Summary

No incidents or accidents. 8 - HID, 0 - OBS and 0 - ASA (all closed out)

Drill 311mm surface hole from 319m to 450m with accumulated wireline surveys, rig services, connections and circulation times. Last survey at 450m was 2.3°. Lost circulation, build volume, vis up mud with gel additions and add LCM. Pull out of the hole, pick up and run in 31 joints of 4" drill pipe, pump and spot heavy high vis pill at 297m, pull and rack back 2 stands and rig up Schlumberger cementers at 256m.

From midnight to 6:00am: Pump 5m3 of water followed by 10m3 of 1740 RFC cement then 0.45m3 of water. Pull and rack back 8 stands, flush any excess cement out of drill pipe and displace to water to drill out cement plug, pull out of the hole, clean out 1 mud tank and fill with water, make up Reed tooth bit, slip and cut drill line.

24hr Forecast

Finish slip and cut, run in the hole, drill cement plug, displace to surface mud, drill 311mm surface hole to 590m+/- with accumulated wireline surveys, rig services, connections and circulation times. Wiper trip, strap out, drill 311mm surface hole to 602m (TD).

Daily Contacts

Drilling Superintendent, Sheldon Vamplew, 403-999-1302; Drilling Engineer, Mike Greener, 403-771-5039; WS Supervisor, Richard Turgeon, 780-387-1706; WS Supervisor, Dave Oppen, 403-863-8205; Rig Manager, Rick Yavis, 780-718-2962; Command Centre, 403-910-0357

Casing String

Conductor, 20.00mKB

Time Log

Start Time	End Time	Dur (hr)	Phase	Op Code	Activity Code	Time P-T-X	Trbl Code	Start Depth (mKB)	End Depth (mKB)	Operation
00:00	01:30	1.50	SURFAC	DRILL	DRLG	P		319.00	356.00	Drill 311mm hole with Mi616 Smith PDC bit drill from 319m to 356m
01:30	01:45	0.25	SURFAC	RIGMNT	SVRG	P		356.00	356.00	Rig service function test rig smart anti collision system function test crown saver, function test flair stack ignitor, grease all moving parts check fluid levels in floor motor and HPU
01:45	03:45	2.00	SURFAC	DRILL	DRLG	P		356.00	394.00	Drill 311mm hole with Mi616 Smith PDC bit drill from 356m to 394m
03:45	04:45	1.00	SURFAC	DRILL	CIRC	T	Lost Circulation	394.00	394.00	Build volume back up to 50m3 with a viscosity of 120 and L.C.M
04:45	07:45	3.00	SURFAC	DRILL	DRLG	P		394.00	422.00	Drill 311mm hole with Mi616 Smith PDC bit drill from 394m to 422m
07:45	08:00	0.25	SURFAC	DRILL	SFTY	P		422.00	422.00	Crew handover meeting with both crews, tool push and conoco rep present.
08:00	10:45	2.75	SURFAC	DRILL	CIRC	T	Lost Circulation	422.00	422.00	Build volume back up to 50m3 with a viscosity of 100+ and L.C.M
10:45	11:00	0.25	SURFAC	RIGMNT	SVRG	P		422.00	422.00	Rig service function test rig smart anti collision system function test crown saver, function test flair stack ignitor, grease all moving parts check fluid levels in floor motor and HPU
11:00	14:15	3.25	SURFAC	DRILL	DRLG	P		422.00	450.00	Drill 311mm hole with Mi616 Smith PDC bit drill from 422m to 450m
14:15	16:00	1.75	SURFAC	DRILL	CIRC	T	Lost Circulation	450.00	450.00	Build volume back up to 50m3 with a viscosity of 100+ and L.C.M
16:00	16:15	0.25	SURFAC	RIGMNT	SVRG	P		450.00	450.00	Rig service function test rig smart anti collision system function test crown saver, function test flair stack ignitor, grease all moving parts check fluid levels in floor motor and HPU

Daily Drilling

COPRC MIRROR LAKE P-20 65-00 126-45

Report Date: 1/31/2014
Report #: 8
Depth Progress: 131.00m
Depth End: 450.00mKB
Rig Release Date: 2/23/2014

Rig: Beaver Drilling Ltd. 2

Time Log

Start Time	End Time	Dur (hr)	Phase	Op Code	Activity Code	Time P-T-X	Trbl Code	Start Depth (mKB)	End Depth (mKB)	Operation
16:15	18:45	2.50	SURFAC	DRILL	TRIP	T	Lost Circulation	450.00	450.00	Trip out of the hole to run plugs
18:45	19:00	0.25	SURFAC	DRILL	SFTY	P		450.00	450.00	Crew handover meeting with both crews, tool push and conoco rep present.
19:00	21:00	2.00	SURFAC	DRILL	TRIP	T	Lost Circulation	450.00	450.00	Rack back stand of drill collars break bit and rack back 9inch
21:00	23:00	2.00	SURFAC	DRILL	PULD	T	Lost Circulation	450.00	450.00	Pick up 27 drill pipe and 4 H.W
23:00	23:30	0.50	SURFAC	DRILL	CIRC	T	Lost Circulation	450.00	450.00	Circulate 4m3 high viscosity high weight slug Chase with 3m3 of mud
23:30	00:00	0.50	SURFAC	DRILL	SFTY	T	Lost Circulation	450.00	450.00	Safety meeting with schlumberger on cementing plugs

Fluid/Mud Chks: Mud Engineer: Ed Thompson

Time 16:00	Depth (mKB) 450.00	Density (kg/m³) 1,080.0	Funnel Viscosity (s/L) 107	pH 9.0	PV Override (Pa·s)	YP Override (Pa)
Low Gravity Solids (%)	MBT (kg/m³)	Oil Water Ratio	Chlorides (mg/L)	Calcium (mg/L)	Lime (kg/m³)	Potassium (mg/L)
Electric Stab (V)	ECD - Manual Entry (k...	Sand (%)	Solids, Corr. (%)	T Flowline (°C)	HTHP Pressure (kPa)	HTHP Filtrate (mL/30...
API Filtrate (mL/30min)		Mud Lost to Surface (m³)		Mud Lost to Hole (m³)		Daily Mud Field Est (Cost)
Cum Mud Lost to Surface (m³)		Cum Mud Lost to Hole (m³)		Cumulative Mud Cost (Cost)		5,213.64
						17.4

Last BOP Drill

Type	BOP Drill	Days Last Chk (...)	Last Date	Days Until Next...	Next Check Date
Days Since Lost Time Incident (days)		841.00		Days Since Recordable Incident (days)	
				841.00	

Safety Incidents

Date	Com	Category

Drill String: BHA # 1

Bit Run	1	Drill Bit	311.0mm, m1616, JD3509	Length (m)	0.35	IADC Bit Dull	1-1-NO-G-X--WT-HP	TFA (incl Noz) (mm²)	1,283	BHA ROP (m/hr)	14.9
Nozzles (mm)		String Length (m)		OD (mm)		Max Rotating Hook Load (daN)					
14.3/14.3/14.3/14.3/14.3/14.3/14.3		450.51		311.0		44,000					
Depth In (mKB)		Depth Out (mKB)		Avg ROP (m/hr)		Depth This Job (m)		Total Depth Drilled b...		Job Drill Hrs (hr)	
18.00		450.00		14.9		432.00		432.00		29.00	
										29.00	

Comment

Rotary drill 311mm slick

Drill String Components

Item Des	ID (mm)	OD (mm)	Jts	Len (m)	Cum Len (m)
4" H.W	65.0	101.0	34	317.07	450.51
X/O 4" H-90	62.0	162.0	1	0.80	133.44
6" D.C	60.0	160.0	12	111.84	132.64
Bell sub	69.0	232.0	1	0.66	20.80
9" D.C	71.0	233.0	2	18.50	20.14
Bit sub	70.0	235.0	1	0.94	1.64
PDC 311mm bit	67.0	311.0	1	0.35	0.70

Drilling Parameter: 422.00 - 450.00 mKB

Cum Depth (m)	432.00	Cum Drill...	29.00	Int ROP (...)	8.6	Flow Rate...	2.200	WOB (daN)	5,500	RPM (r...	85	SPP (kPa)	12,000	Drill Str Wt (d...	44,000	SO Str Wt (daN)	44,000	PU Str Wt (daN)	44,000	Off-Btm Str W...		Drill Tq	
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Hydraulic Calculations

Bit Hydraulic Powe...	17.6	HP/Area (kW/mm²)	0.00023	% P @ bit (%)	4	Bit Jet Velocity (m/s)	28.6	Bit dP (kPa)	481.1	P Drop Annular (kPa)	54.8	Mud Density (kg/m³)	1,050.0	ECD End (kg/m³)	1,062.4
Drill String Volume (m³)	1.45	Bit to Shoe Volume (m³)		Vol Shoe to Top (m³)		Min Casing AV (m/min)	0.0	Max Casing AV (m/min)	0.0	Min Open Hole AV (m/...	32.4	Max Open Hole AV (m/...	67.5		
Error															

Daily Drilling

COPRC MIRROR LAKE P-20 65-00 126-45

Rig: Beaver Drilling Ltd. 2

Report Date: 1/31/2014
Report #: 8
Depth Progress: 131.00m
Depth End: 450.00mKB
Rig Release Date: 2/23/2014

Mud Pump: 1, NATIONAL, 8-P-80

Pump Number	Make	Model	Rod Diameter (mm)	Stroke Length (mm)
1	NATIONAL	8-P-80	140.0	216.0

Pump Checks

Date	Depth (mKB)	Q Flow (m³/min)	P (kPa)	Strokes (spm)
2/16/2014 16:00	2,209.00	0.608	5,153	78
2/16/2014 16:00	2,209.00	1.045	15,600	134

Pump Operations

Start Date	End Date	Liner Size (mm)	P Max (kPa)	Vol/Stk OR (m³/stk)
2/15/2014	2/15/2014	127.0		
2/16/2014	2/16/2014	127.0		

Mud Pump: 2, NATIONAL, 8-P-80

Pump Number	Make	Model	Rod Diameter (mm)	Stroke Length (mm)
2	NATIONAL	8-P-80	140.0	216.0

Pump Checks

Date	Depth (mKB)	Q Flow (m³/min)	P (kPa)	Strokes (spm)
2/19/2014 23:45	3,152.00	0.975	12,600	125
2/20/2014 00:00	3,143.00	0.647	6,414	83

Pump Operations

Start Date	End Date	Liner Size (mm)	P Max (kPa)	Vol/Stk OR (m³/stk)
2/20/2014	2/20/2014	127.0		
2/21/2014	2/21/2014	127.0		

Shaker Screens

Des	Start Date	End Date	Scr Sz X	Scr Sz Y	Note

Centrifuge/Cyclone: HGS Centrifuge, BOS Solutions, 5500

Number	Make	Model	Diameter (mm)
2	BOS Solutions	5500	

Centrifuge/Cyclone Checks

Date	Hrs (hr)	RPM (rpm)	Dens OF (kg/m³)	Q OF (L/min)	Dens UF (kg/m³)	Q UF (L/min)
2/20/2014 00:00	3.00	2100	1,040.0	0.400	1,710.0	0.200

Centrifuge/Cyclone: HGS Centrifuge, BOS Solutions, 5500

Number	Make	Model	Diameter (mm)
1	BOS Solutions	5500	

Centrifuge/Cyclone Checks

Date	Hrs (hr)	RPM (rpm)	Dens OF (kg/m³)	Q OF (L/min)	Dens UF (kg/m³)	Q UF (L/min)
2/21/2014 00:00	3.00	2100	1,100.0	0.400	1,790.0	0.200

Fluid / Mud Additive Amounts

Des	Consumed	Cost	Size	Units
Caustic	1.0	24.650	50.0	SX
CELLOFLAKE	8.0	66.200	11.34	SX
FED SEAL	9.0	19.890	18.14	SX
Fedzan	6.0	360.450	25.0	sx
Gel	307.0	7.200	40.0	SX
Sawdust	36.0	2.980	7.3	SX

Survey Data

Date	MD (mKB)	Incl (°)	Azm (°)	TVD (mKB)	Depart (m)	NS (m)	EW (m)	VS (m)	DLS (°/30m)
1/31/2014	328.00	0.90	0.00	327.99	1.85	1.85	0.00	0.48	0.75
1/31/2014	355.00	1.30	0.00	354.99	2.37	2.37	0.00	0.61	0.44
1/31/2014	357.00	1.30	0.00	356.99	2.41	2.41	0.00	0.62	0.00
1/31/2014	388.00	1.60	0.00	387.98	3.20	3.20	0.00	0.82	0.29
1/31/2014	412.00	2.00	0.00	411.97	3.95	3.95	0.00	1.02	0.50
1/31/2014	450.00	2.30	0.00	449.94	5.38	5.38	0.00	1.38	0.24

Formations

Formation Name	Drill Top MD (mKB)	Drill Top (TVD) (mKB)	Prog Top TVD (mKB)
Little Bear	43.00	43.00	20.85
Slater River	207.00	207.00	197.35
Arctic Red	954.00	953.52	932.35
House	1,110.00	1,109.49	1,084.35
Imperial	1,140.00	1,139.48	1,118.35
KOP (5deg/30m)	1,731.00	1,730.40	1,730.73
KOP (7deg/30m)	1,817.00	1,815.65	1,816.00
Upper Canol	1,902.70	1,896.20	1,897.35



Daily Drilling
COPRC MIRROR LAKE P-20 65-00 126-45

Report Date: 1/31/2014
Report #: 8
Depth Progress: 131.00m
Depth End: 450.00mKB
Rig Release Date: 2/23/2014

Rig: Beaver Drilling Ltd. 2

Formations

Formation Name	Drill Top MD (mKB)	Drill Top (TVD) (mKB)	Prog Top TVD (mKB)
Lower Canol	1,935.80	1,924.43	1,929.35

Daily Drilling

COPRC MIRROR LAKE P-20 65-00 126-45

Report Date: 2/1/2014
Report #: 9
Depth Progress: 18.00m
Depth End: 468.00mKB
Rig Release Date: 2/23/2014

Rig: Beaver Drilling Ltd. 2

/UWI 200/D-020/L094P1699		Surface Legal Location P-20 65-00 126-45		MaxWell Job Number JOB01@2006		License No. EL 470					
Ground Elevation (m) 284.15		Original KB/RT Elevation (m) 289.35		Casing Flange Elevation (m) 283.95		Original Spud Date 1/29/2014		Days From Spud (days) 9.00			
Job Category DRILLING		Primary Job Type DRILLING ORIGINAL		Actual Start Date 1/24/2014 00:00		End Date 2/23/2014 23:59		Final Job Status DRILLED		Final Report? Yes	
Daily Cost Total (Cost) 98,485.03		Cumulative Cost (Cost) 1,125,914.24		Total AFE (Cost) 7,122,600.00		AFE+Supp Amt (Cost) 7,122,600.00		AFE / RFE / Maint.# 10351812		Estimated Days	
Planned Depth (TMD) (mKB)		Override TVD (mKB)		Head Count 48.0		Personnel Total Hours (hr) 508.00		Cum Personnel Total Hours (hr) 4,878.00			
Avg Connection Gas			Avg Background Gas			Avg Trip Gas			Max H2S (ppm)		
Road Condition Ice/Snow			Weather Cloudy			Temperature (°C) -17			Wind NW		
Ops and Depth @ Morning Report Drill 311mm surface hole to 520m. Last survey at 486m was 1.3°.									Wellbore Original Hole		

Last 24hr Summary

No incidents or accidents. 7 - HID, 1 - OBS and 0 - ASA (all closed out)

After spotting a heavy high vis pill at 297m and racking back 2 stands, we rigged up Schlumberger cementers at 256m, pump 5m3 of water followed by 10m3 of 1740 RFC cement then 0.45m3 of water. Pull and rack back 8 stands, flush any excess cement out of drill pipe and displace to water to drill out cement plug, pull out of the hole, clean out 1 mud tank and fill with water, make up Reed tooth bit, slip and cut drill line, run in the hole, drill cement plug, displace to surface mud, drill 311mm surface hole from 450m to 468m with accumulated wireline surveys, rig services, connections and circulation times.

24hr Forecast

Drill 311mm surface hole to 590m+/- with accumulated wireline surveys, rig services, connections and circulation times. Wiper trip, strap out, drill 311mm surface hole to 602m (TD), circulate hole clean, pull out of the hole, laydown 6-1/2" and 9" drill collars, rig up power tongs, run 244.5mm surface casing.

Daily Contacts

Drilling Superintend, Sheldon Vamplew, 403-999-1302; Drilling Engineer, Mike Greener, 403-771-5039; WS Supervisor, Richard Turgeon, 780-387-1706; Rig Manager, Rick Yavis, 780-718-2962; Command Centre, 403-910-0357

Last Casing String

Conductor, 20.00mKB

Log

Start Time	End Time	Dur (hr)	Phase	Op Code	Activity Code	Time P-T-X	Trbl Code	Start Depth (mKB)	End Depth (mKB)	Operation
00:00	02:00	2.00	SURFAC	CEMENT	PLUG	T	Lost Circulation	450.00	450.00	Rig up Schlumberger cementers at 256m, pump 5m3 of water followed by 10m3 of 1740 RFC cement then 0.45m3 of water.
02:00	02:30	0.50	SURFAC	DRILL	TRIP	T	Lost Circulation	450.00	450.00	Pull out 8 stands of drill pipe.
02:30	02:45	0.25	SURFAC	CEMENT	PLUG	T	Lost Circulation	450.00	450.00	Flush out pipe with 5m3 of fresh water. Pull out of the hole.
02:45	03:30	0.75	SURFAC	RIGMNT	SLPC	P		450.00	450.00	Slip and cut 25m of drilling line.
03:30	03:45	0.25	SURFAC	CEMENT	WOC	T	Lost Circulation	450.00	450.00	Wait on cement
03:45	04:00	0.25	SURFAC	RIGMNT	SVRG	P		450.00	450.00	Rig service function test rig smart anti collision system function test crown saver, function test flair stack ignitor, grease all moving parts check fluid levels in floor motor and HPU
04:00	07:45	3.75	SURFAC	CEMENT	WOC	T	Lost Circulation	450.00	450.00	Wait on cement make up B.H.A.
07:45	08:00	0.25	SURFAC	DRILL	SFTY	P		450.00	450.00	Crew handover meeting with both crews, tool push and conoco rep present.
08:00	08:30	0.50	SURFAC	DRILL	TRIP	T	Lost Circulation	450.00	450.00	Trip in to the hole to 95m
08:30	08:45	0.25	SURFAC	RIGMNT	SVRG	P		450.00	450.00	Rig service function test rig smart anti collision system function test crown saver, function test flair stack ignitor, grease all moving parts check fluid levels in floor motor and HPU
08:45	15:00	6.25	SURFAC	CEMENT	DRLG	T	Lost Circulation	450.00	450.00	Wash to cement and drill out cement plug, tag cement 161m, drilled out cement @258m

Daily Drilling

COPRC MIRROR LAKE P-20 65-00 126-45

Report Date: 2/1/2014
Report #: 9
Depth Progress: 18.00m
Depth End: 468.00mKB
Rig Release Date: 2/23/2014

Rig: Beaver Drilling Ltd. 2

Time Log

Start Time	End Time	Dur (hr)	Phase	Op Code	Activity Code	Time P-T-X	Trbl Code	Start Depth (mKB)	End Depth (mKB)	Operation
15:00	16:00	1.00	SURFAC	DRILL	CIRC	T	Lost Circulation	450.00	450.00	Displace to surface mud
16:00	18:45	2.75	SURFAC	DRILL	CIRC	T	Lost Circulation	450.00	450.00	Displace to surface mud and clean suction tank
18:45	19:00	0.25	SURFAC	DRILL	SFTY	P		450.00	450.00	Crew handover meeting with both crews, tool push and conoco rep present.
19:00	20:15	1.25	SURFAC	DRILL	CIRC	T	Lost Circulation	450.00	450.00	Treat out calcium in mud system
20:15	20:30	0.25	SURFAC	DRILL	TRIP	T	Lost Circulation	450.00	450.00	Trip in the hole till 350m
20:30	20:45	0.25	SURFAC	DRILL	CIRC	T	Lost Circulation	450.00	450.00	Circulate bottoms up
20:45	21:15	0.50	SURFAC	DRILL	TRIP	T	Lost Circulation	450.00	450.00	Trip in the hole till 450m
21:15	21:45	0.50	SURFAC	DRILL	CIRC	T	Lost Circulation	450.00	450.00	Circulate bottoms up
21:45	22:00	0.25	SURFAC	RIGMNT	SVRG	P		450.00	450.00	Rig service change out hose on top drive grease all moving parts function test rig smart anti collision system
22:00	00:00	2.00	SURFAC	DRILL	DRLG	P		450.00	468.00	Drill 311mm hole from 450m to 468m

Fluid/Mud Chks: Mud Engineer: <Mud Engineer?>

Time	Depth (mKB)	Density (kg/m³)	Funnel Viscosity (s/L)	pH	PV Override (Pa*s)	YP Override (Pa)
Low Gravity Solids (%)	MBT (kg/m³)	Oil Water Ratio	Chlorides (mg/L)	Calcium (mg/L)	Lime (kg/m³)	Potassium (mg/L)
Electric Stab (V)	ECD - Manual Entry (k...	Sand (%)	Solids, Corr. (%)	T Flowline (°C)	HTHP Pressure (kPa)	HTHP Filtrate (mL/30...
API Filtrate (mL/30min)		Mud Lost to Surface (m³)		Mud Lost to Hole (m³)		Daily Mud Field Est (Cost)
Cum Mud Lost to Surface (m³)		Cum Mud Lost to Hole (m³)			Cumulative Mud Cost (Cost)	

Last BOP Drill

Type BOP Drill	Days Last Chk (...)	Last Date	Days Until Next...	Next Check Date
Days Since Lost Time Incident (days)	842.00	Days Since Recordable Incident (days)	842.00	

Safety Incidents

Date	Com	Category

Drill String: BHA # 2

Bit Run 2	Drill Bit 311.0mm, m4685, b159531	Length (m) 0.35	IADC Bit Dull	TFA (incl Noz) (mm²) 982	BHA ROP (m/hr) 7.2
Nozzles (mm) 19.1/19.1/19.1/12.7	String Length (m) 607.22	OD (mm) 311.0	Max Rotating Hook Load (daN) 46,000		
Depth In (mKB) 450.00	Depth Out (mKB) 602.00	Avg ROP (m/hr) 7.2	Depth This Job (m) 152.00	Total Depth Drilled b... 152.00	Job Drill Hrs (hr) 21.00
Total Drill Hrs (hr) 21.00					

Drill String Components

Item Des	ID (mm)	OD (mm)	Jts	Len (m)	Cum Len (m)
Drill pipe - Stands			6	114.15	607.22
4" H.W	65.0	101.0	40	372.73	493.07
X/O 4" H-90	62.0	162.0	1	0.80	1.
6" D.C	60.0	160.0	7	65.22	119.54
6 1/4 X/O	58.0	159.0	1	0.46	54.32
6 1/4 jars	59.0	159.0	1	4.45	53.86
6 1/4 x/o	58.0	160.0	1	0.49	49.41

Daily Drilling

COPRC MIRROR LAKE P-20 65-00 126-45

Rig: Beaver Drilling Ltd. 2

Report Date: 2/1/2014
Report #: 9
Depth Progress: 18.00m
Depth End: 468.00mKB
Rig Release Date: 2/23/2014

Drill String Components

Item Des	ID (mm)	OD (mm)	Jts	Len (m)	Cum Len (m)
6" D.C	60.0	160.0	5	46.62	48.92
Bell sub	69.0	232.0	1	0.66	2.30
Bit sub	70.0	235.0	1	0.94	1.64
311mm BIT	72.0	311.0	1	0.35	0.70

Drilling Parameter: 450.00 - 468.00 mKB

Cum Depth (m)	Cum Drill... (m)	Int ROP (m/hr)	Flow Rate (l/min)	WOB (daN)	RPM (r/min)	SPP (kPa)	Drill Str Wt (daN)	SO Str Wt (daN)	PU Str Wt (daN)	Off-Btm Str Wt (daN)	Drill Tq (Nm)
18.00	2.00	9.0	2.300	9,000	120	12,000	44,000	44,000	44,000	44,000	13,000.0

Hydraulic Calculations

Bit Hydraulic Powe... (kW)	HP/Area (kW/mm²)	% P @ bit (%)	Bit Jet Velocity (m/s)	Bit dP (kPa)	P Drop Annular (kPa)	Mud Density (kg/m³)	ECD End (kg/m³)
Drill String Volume (m³)	Bit to Shoe Volume (m³)	Vol Shoe to Top (m³)	Min Casing AV (m/min)	Max Casing AV (m/min)	Min Open Hole AV (m/min)	Max Open Hole AV (m/min)	

Error

A drill string component contains a null value in OD

Mud Pump: 1, NATIONAL, 8-P-80

Pump Number	Make	Model	Rod Diameter (mm)	Stroke Length (mm)
1	NATIONAL	8-P-80	140.0	216.0

Pump Checks

Date	Depth (mKB)	Q Flow (m³/min)	P (kPa)	Strokes (spm)
2/16/2014 16:00	2,209.00	0.608	5,153	78
2/16/2014 16:00	2,209.00	1.045	15,600	134

Pump Operations

Start Date	End Date	Liner Size (mm)	P Max (kPa)	Vol/Stk OR (m³/stk)
2/15/2014	2/15/2014	127.0		
2/16/2014	2/16/2014	127.0		

Mud Pump: 2, NATIONAL, 8-P-80

Pump Number	Make	Model	Rod Diameter (mm)	Stroke Length (mm)
	NATIONAL	8-P-80	140.0	216.0

Pump Checks

Date	Depth (mKB)	Q Flow (m³/min)	P (kPa)	Strokes (spm)
2/19/2014 23:45	3,152.00	0.975	12,600	125
2/20/2014 00:00	3,143.00	0.647	6,414	83

Pump Operations

Start Date	End Date	Liner Size (mm)	P Max (kPa)	Vol/Stk OR (m³/stk)
2/20/2014	2/20/2014	127.0		
2/21/2014	2/21/2014	127.0		

Shaker Screens

Des	Start Date	End Date	Scr Sz X	Scr Sz Y	Note

Centrifuge/Cyclone: HGS Centrifuge, BOS Solutions, 5500

Number	Make	Model	Diameter (mm)
2	BOS Solutions	5500	

Centrifuge/Cyclone Checks

Date	Hrs (hr)	RPM (rpm)	Dens OF (kg/m³)	Q OF (L/min)	Dens UF (kg/m³)	Q UF (L/min)
2/21/2014 00:00	3.00	2100	1,040.0	0.400	1,710.0	0.200

Centrifuge/Cyclone: HGS Centrifuge, BOS Solutions, 5500

Number	Make	Model	Diameter (mm)
1	BOS Solutions	5500	

Centrifuge/Cyclone Checks

Date	Hrs (hr)	RPM (rpm)	Dens OF (kg/m³)	Q OF (L/min)	Dens UF (kg/m³)	Q UF (L/min)
2/21/2014 00:00	3.00	2100	1,100.0	0.400	1,790.0	0.200

Fluid / Mud Additive Amounts

Des	Consumed	Cost	Size	Units

Survey Data

Date	MD (mKB)	Incl (°)	Azm (°)	TVD (mKB)	Depart (m)	NS (m)	EW (m)	VS (m)	DLS (°/30m)

Formations

Formation Name	Drill Top MD (mKB)	Drill Top (TVD) (mKB)	Prog Top TVD (mKB)
Little Bear	43.00	43.00	20.85
Slater River	207.00	207.00	197.35
Arctic Red	954.00	953.52	932.35
Martin House	1,110.00	1,109.49	1,084.35



Daily Drilling

COPRC MIRROR LAKE P-20 65-00 126-45

Rig: Beaver Drilling Ltd. 2

Report Date: 2/1/2014
Report #: 9
Depth Progress: 18.00m
Depth End: 468.00mKB
Rig Release Date: 2/23/2014

Formations

Formation Name	Drill Top MD (mKB)	Drill Top (TVD) (mKB)	Prog Top TVD (mKB)
Imperial	1,140.00	1,139.48	1,118.35
KOP (5deg/30m)	1,731.00	1,730.40	1,730.73
KOP (7deg/30m)	1,817.00	1,815.65	1,816.00
Upper Canol	1,902.70	1,896.20	1,897.35
Lower Canol	1,935.80	1,924.43	1,929.35

Daily Drilling

COPRC MIRROR LAKE P-20 65-00 126-45

Report Date: 2/2/2014
Report #: 10
Depth Progress: 134.00m
Depth End: 602.00mKB
Rig Release Date: 2/23/2014

Rig: Beaver Drilling Ltd. 2

/UWI 200/D-020/L094P1699		Surface Legal Location P-20 65-00 126-45		MaxWell Job Number JOB01@2006		License No. EL 470					
Ground Elevation (m) 284.15		Original KB/RT Elevation (m) 289.35		Casing Flange Elevation (m) 283.95		Original Spud Date 1/29/2014		Days From Spud (days) 10.00			
Job Category DRILLING		Primary Job Type DRILLING ORIGINAL		Actual Start Date 1/24/2014 00:00		End Date 2/23/2014 23:59		Final Job Status DRILLED		Final Report? Yes	
Daily Cost Total (Cost) 112,757.28		Cumulative Cost (Cost) 1,238,671.52		Total AFE (Cost) 7,122,600.00		AFE+Supp Amt (Cost) 7,122,600.00		AFE / RFE / Maint.# 10351812		Estimated Days	
Planned Depth (TMD) (mKB)		Override TVD (mKB)		Head Count 48.0		Personnel Total Hours (hr) 508.00		Cum Personnel Total Hours (hr) 5,386.00			
Avg Connection Gas			Avg Background Gas			Avg Trip Gas			Max H2S (ppm)		
Road Condition Ice/Snow			Weather Cloudy			Temperature (°C) -24			Wind NW		
Ops and Depth @ Morning Report Work tight hole at 134m.									Wellbore Original Hole		

Last 24hr Summary

No incidents or accidents. 7 - HID, 2 - OBS and 0 - ASA (all closed out)

Drill 311mm surface hole from 468m to 602m (TD) with accumulated wireline surveys, rig services, connections and circulation times. Circulate hole clean, wiper trip and strap out, backream through tight spots, backream through cement, encountered losses while backreaming, build volume and treat clobbered mud while backreaming.

24hr Forecast

Pull out of the hole, run in the hole, circulate hole clean and condition mud for casing run, pull out of the hole, laydown 6-1/2" and 9" drill collars, rig up power tongs, run 244.5mm surface casing, tag bottom, circulate hole clean and condition mud, rig up cementers and cement 244.5mm surface casing.

Daily Contacts

Drilling Superintend, Sheldon Vamplew, 403-999-1302; Drilling Engineer, Mike Greener, 403-771-5039; WS Supervisor, Richard Turgeon, 780-387-1706; Rig Manager, Rick Yavis, 780-718-2962; Command Centre, 403-910-0357

Last Casing String

Conductor, 20.00mKB

Time Log

Start Time	End Time	Dur (hr)	Phase	Op Code	Activity Code	Time P-T-X	Trbl Code	Start Depth (mKB)	End Depth (mKB)	Operation
00:00	02:45	2.75	SURFAC	DRILL	DRLG	P		468.00	487.00	Drill 311mm surface hole with Read m4685 rotary 100 from 468m to 487m
02:45	03:00	0.25	SURFAC	RIGMNT	SVRG	P		487.00	487.00	Rig service function test rig smart anti collision system function test crown saver grease all moving parts check fluid levels in floor motor and HPU
03:00	07:45	4.75	SURFAC	DRILL	DRLG	P		487.00	543.00	Drill 311mm surface hole with Read m4685 rotary 100 from 487m to 543m
07:45	08:00	0.25	SURFAC	DRILL	SFTY	P		543.00	543.00	Crew handover meeting with both crews, tool push and conoco rep present.
08:00	13:00	5.00	SURFAC	DRILL	DRLG	P		543.00	562.00	Drill 311mm surface hole with Read m4685 rotary 100 from 543m to 562m
13:00	13:15	0.25	SURFAC	RIGMNT	SVRG	P		562.00	562.00	Rig service function test rig smart anti collision system function test crown saver grease all moving parts check fluid levels in floor motor and HPU
13:15	16:00	2.75	SURFAC	DRILL	DRLG	P		562.00	581.00	Drill 311mm surface hole with Read m4685 rotary 100 from 562m to 581m
16:00	18:45	2.75	SURFAC	DRILL	DRLG	P		581.00	600.00	Drill 311mm surface hole with Read m4685 rotary 100 from 581m to 600m
18:45	19:00	0.25	SURFAC	DRILL	SFTY	P		600.00	600.00	Crew handover meeting with both crews, tool push and conoco rep present.
19:00	20:00	1.00	SURFAC	DRILL	DRLG	P		600.00	602.00	Drill 311mm surface hole from 600m to 602m lay out 1 d.p
20:00	20:15	0.25	SURFAC	RIGMNT	SVRG	P		602.00	602.00	Rig service function test rig smart anti collision system function test crown saver grease all moving parts check fluid levels in floor motor and HPU
20:15	20:45	0.50	SURFAC	DRILL	CIRC	P		602.00	602.00	Circulate 2 bottoms up prepair to trip to out of hole to 133m
20:45	00:00	3.25	SURFAC	DRILL	TRIP	P		602.00	602.00	Trip out of hole till 224m Ream tight spots from 514m ,435m ,429m

Daily Drilling

COPRC MIRROR LAKE P-20 65-00 126-45

Rig: Beaver Drilling Ltd. 2

Report Date: 2/2/2014
Report #: 10
Depth Progress: 134.00m
Depth End: 602.00mKB
Rig Release Date: 2/23/2014

Fluid/Mud Chks: Mud Engineer: Ed Thompson

Time 11:00	Depth (mKB) 550.00	Density (kg/m³) 1,100.0	Funnel Viscosity (s/L) 53	pH 10.5	PV Override (Pa*s) 9.0	YP Override (Pa) 10.0
Low Gravity Solids (%)	MBT (kg/m³)	Oil Water Ratio	Chlorides (mg/L)	Calcium (mg/L)	Lime (kg/m³)	Potassium (mg/L)
Electric Stab (V)	ECD - Manual Entry (k...	Sand (%)	Solids, Corr. (%) 6.3	T Flowline (°C) 40	HTHP Pressure (kPa)	HTHP Filtrate (mL/30...
API Filtrate (mL/30min)		Mud Lost to Surface (m³)		Mud Lost to Hole (m³)		Daily Mud Field Est (Cost) 1,802.25
Cum Mud Lost to Surface (m³)		Cum Mud Lost to Hole (m³)			Cumulative Mud Cost (Cost) 19,268.35	

Last BOP Drill

Type BOP Drill	Days Last Chk (...)	Last Date	Days Until Next...	Next Check Date
Days Since Lost Time Incident (days)	843.00		Days Since Recordable Incident (days)	843.00

Safety Incidents

Date	Com	Category

Drill String: BHA # 2

Bit Run 2	Drill Bit 311.0mm, m4685, b159531	Length (m) 0.35	IADC Bit Dull -----	TFA (incl Noz) (mm²) 982	BHA ROP (m/hr) 7.2
Nozzles (mm) 19.1/19.1/19.1/12.7	String Length (m) 607.22	OD (mm) 311.0	Max Rotating Hook Load (daN) 46,000		
Depth In (mKB) 450.00	Depth Out (mKB) 602.00	Avg ROP (m/hr) 7.2	Depth This Job (m) 152.00	Total Depth Drilled b... 152.00	Job Drill Hrs (hr) 21.00
				Total Drill Hrs (hr) 21.00	

Comment

Drill String Components

Item Des	ID (mm)	OD (mm)	Jts	Len (m)	Cum Len (m)
Drill pipe - Stands			6	114.15	607.22
4" H.W	65.0	101.0	40	372.73	41
X/O 4" H-90	62.0	162.0	1	0.80	120.34
6" D.C	60.0	160.0	7	65.22	119.54
6 1/4 X/O	58.0	159.0	1	0.46	54.32
6 1/4 jars	59.0	159.0	1	4.45	53.86
6 1/4 x/o	58.0	160.0	1	0.49	49.41
6" D.C	60.0	160.0	5	46.62	48.92
Bell sub	69.0	232.0	1	0.66	2.30
Bit sub	70.0	235.0	1	0.94	1.64
311mm BIT	72.0	311.0	1	0.35	0.70

Drilling Parameter: 581.00 - 602.00 mKB

Cum Depth (m) 152.00	Cum Drill... 21.00	Int ROP (...) 5.6	Flow Rate... 2.300	WOB (daN) 11,000	RPM (r... 120	SPP (kPa) 13,000	Drill Str Wt (d... 46,000	SO Str Wt (daN) 45,000	PU Str Wt (daN) 47,000	Off-Btm Str W... 44,000	Drill Tq 13,000.0
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Hydraulic Calculations

Bit Hydraulic Powe... HP/Area (kW/mm²)	% P @ bit (%)	Bit Jet Velocity (m/s)	Bit dP (kPa)	P Drop Annular (kPa)	Mud Density (kg/m³)	ECD End (kg/m³)
Drill String Volume (m³)	Bit to Shoe Volume (m³)	Vol Shoe to Top (m³)	Min Casing AV (m/min)	Max Casing AV (m/min)	Min Open Hole AV (m/...)	Max Open Hole AV (m/...)

Error

A drill string component contains a null value in OD

Mud Pump: 1, NATIONAL, 8-P-80

Pump Number 1	Make NATIONAL	Model 8-P-80	Rod Diameter (mm) 140.0	Stroke Length (mm) 216.0
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Pump Checks

Date	Depth (mKB)	Q Flow (m³/min)	P (kPa)	Strokes (spm)
2/16/2014 16:00	2,209.00	0.608	5,153	78
2/16/2014 16:00	2,209.00	1.045	15,600	134

Pump Operations

Start Date	End Date	Liner Size (mm)	P Max (kPa)	Vol/Stk OR (m³/stk)
2/15/2014	2/15/2014	127.0		
2/16/2014	2/16/2014	127.0		

Mud Pump: 2, NATIONAL, 8-P-80

Pump Number 2	Make NATIONAL	Model 8-P-80	Rod Diameter (mm) 140.0	Stroke Length (mm) 216.0
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Daily Drilling

COPRC MIRROR LAKE P-20 65-00 126-45

Rig: Beaver Drilling Ltd. 2

Report Date: 2/2/2014
Report #: 10
Depth Progress: 134.00m
Depth End: 602.00mKB
Rig Release Date: 2/23/2014

np Checks

Date	Depth (mKB)	Q Flow (m³/min)	P (kPa)	Strokes (spm)
2/19/2014 23:45	3,152.00	0.975	12,600	125
2/20/2014 00:00	3,143.00	0.647	6,414	83

Pump Operations

Start Date	End Date	Liner Size (mm)	P Max (kPa)	Vol/Stk OR (m³/stk)
2/20/2014	2/20/2014	127.0		
2/21/2014	2/21/2014	127.0		

Shaker Screens

Des	Start Date	End Date	Scr Sz X	Scr Sz Y	Note

Centrifuge/Cyclone: HGS Centrifuge, BOS Solutions, 5500

Number	Make	Model	Diameter (mm)
2	BOS Solutions	5500	

Centrifuge/Cyclone Checks

Date	Hrs (hr)	RPM (rpm)	Dens OF (kg/m³)	Q OF (L/min)	Dens UF (kg/m³)	Q UF (L/min)
2/21/2014 00:00	3.00	2100	1,040.0	0.400	1,710.0	0.200

Centrifuge/Cyclone: HGS Centrifuge, BOS Solutions, 5500

Number	Make	Model	Diameter (mm)
1	BOS Solutions	5500	

Centrifuge/Cyclone Checks

Date	Hrs (hr)	RPM (rpm)	Dens OF (kg/m³)	Q OF (L/min)	Dens UF (kg/m³)	Q UF (L/min)
2/21/2014 00:00	3.00	2100	1,100.0	0.400	1,790.0	0.200

Fluid / Mud Additive Amounts

Des	Consumed	Cost	Size	Units
Fedzan	5.0	360.450	25.0	sx

Survey Data

Date	MD (mKB)	Incl (°)	Azm (°)	TVD (mKB)	Depart (m)	NS (m)	EW (m)	VS (m)	DLS (°/30m)
2/2/2014	467.00	0.40	0.00	466.93	5.78	5.78	0.00	1.49	3.35
2/2/2014	487.00	1.30	0.00	486.93	6.08	6.08	0.00	1.56	1.35
2/2/2014	514.00	1.50	0.00	513.92	6.74	6.74	0.00	1.73	0.22
2/2/2014	544.00	1.90	0.00	543.91	7.63	7.63	0.00	1.96	0.40
2/2/2014	600.00	1.40	0.00	599.89	9.24	9.24	0.00	2.38	0.27

Formations

Formation Name	Drill Top MD (mKB)	Drill Top (TVD) (mKB)	Prog Top TVD (mKB)
Little Bear	43.00	43.00	20.85
Slater River	207.00	207.00	197.35
Arctic Red	954.00	953.52	932.35
Martin House	1,110.00	1,109.49	1,084.35
Imperial	1,140.00	1,139.48	1,118.35
KOP (5deg/30m)	1,731.00	1,730.40	1,730.73
KOP (7deg/30m)	1,817.00	1,815.65	1,816.00
Upper Canol	1,902.70	1,896.20	1,897.35
Lower Canol	1,935.80	1,924.43	1,929.35

Daily Drilling

COPRC MIRROR LAKE P-20 65-00 126-45

Report Date: 2/3/2014
Report #: 11
Depth Progress: 0.00m
Depth End: 602.00mKB
Rig Release Date: 2/23/2014

Rig: Beaver Drilling Ltd. 2

/ UWI 200/D-020/L094P1699		Surface Legal Location P-20 65-00 126-45		MaxWell Job Number JOB01@2006		License No. EL 470					
Ground Elevation (m) 284.15		Original KB/RT Elevation (m) 289.35		Casing Flange Elevation (m) 283.95		Original Spud Date 1/29/2014		Days From Spud (days) 11.00			
Job Category DRILLING		Primary Job Type DRILLING ORIGINAL		Actual Start Date 1/24/2014 00:00		End Date 2/23/2014 23:59		Final Job Status DRILLED		Final Report? Yes	
Daily Cost Total (Cost) 126,605.03		Cumulative Cost (Cost) 1,365,276.55		Total AFE (Cost) 7,122,600.00		AFE+Supp Amt (Cost) 7,122,600.00		AFE / RFE / Maint.# 10351812		Estimated Days	
Planned Depth (TMD) (mKB)		Override TVD (mKB)		Head Count 48.0		Personnel Total Hours (hr) 508.00		Cum Personnel Total Hours (hr) 5,894.00			
Avg Connection Gas			Avg Background Gas			Avg Trip Gas			Max H2S (ppm)		
Road Condition Ice/Snow			Weather Snowing			Temperature (°C) -18			Wind Calm		
Ops and Depth @ Morning Report Run in the hole at 214m.									Wellbore Original Hole		

Last 24hr Summary

No incidents or accidents. 8 - HID, 0 - OBS and 0 - ASA (all closed out)

Wiper trip and strap out, backream through tight spots, backream through cement, encountered losses while backreaming, build volume and treat clobbered mud while backreaming, work tight hole at 134m, conduct mechanical backoff leaving 88m (7x 6-1/2" and 2x 9" drill collars and tooth bit) worth of fish in the hole and retrieving 46m of 6-1/2" drill collars. Make up screw in sub, bumper sub and jars. Run in hole, screw into fish and jar down, break free, run in the hole to 295m to get circulation back, circulate hole clean, circulate and backream through tight spots to 76m.

Midnight to 6:00am= Pull out of the hole and laydown 9" drill collars. Make up tooth bit, 6-1/2" drill collars and jars and run in the hole.

24hr Forecast

Finish running in the hole, circulate hole clean and condition mud for casing run, pull out of the hole, laydown 6-1/2" drill collars, rig up power tongs, run 244.5mm surface casing, tag bottom, circulate hole clean and condition mud, rig up cementers and cement 244.5mm surface casing.

Daily Contacts

Drilling Superintendent, Sheldon Vamplew, 403-999-1302; Drilling Engineer, Mike Greener, 403-771-5039; WS Supervisor, Richard Turgeon, 780-387-1706; Rig Manager, Rick Yavis, 780-718-2962; Command Centre, 403-910-0357

Last Casing String

Conductor, 20.00mKB

Log

Start Time	End Time	Dur (hr)	Phase	Op Code	Activity Code	Time P-T-X	Trbl Code	Start Depth (mKB)	End Depth (mKB)	Operation
00:00	01:45	1.75	SURFAC	DRILL	TRIP	P		602.00	602.00	Trip out of hole Back ream from 245m to 189m
01:45	03:00	1.25	SURFAC	DRILL	CIRC	P		602.00	602.00	Build volume due to losses mud clobbered up water back and treat
03:00	07:45	4.75	SURFAC	DRILL	REAM	P		602.00	602.00	Back ream from 189m to 161m work tight pipe @ 151m
07:45	08:00	0.25	SURFAC	DRILL	SFTY	P		602.00	602.00	Crew handover meeting with both crews, tool push and conoco rep present.
08:00	08:15	0.25	SURFAC	RIGMNT	SVRG	P		602.00	602.00	Rig service function test rig smart anti-collision system, function test crown saver, grease all moving parts and check oil levels in the floor motor, pumps and HPU
08:15	13:30	5.25	SURFAC	DRILL	REAM	P		602.00	602.00	Work tight hole 133m
13:30	14:45	1.25	SURFAC	FISH	FISH	T	Hole Conditions	602.00	602.00	Mechanically back off and rack 1 std of HWDP and 2.5 stds of DCS
14:45	15:00	0.25	SURFAC	FISH	SFTY	P		602.00	602.00	Crew handover meeting with both crews, tool push and conoco rep present.
15:00	16:00	1.00	SURFAC	FISH	FISH	T	Stuck Pipe	602.00	602.00	Handle fishing tools
16:00	16:15	0.25	SURFAC	RIGMNT	SVRG	P		602.00	602.00	Rig service function test crown saver
16:15	16:30	0.25	SURFAC	FISH	SFTY	P		602.00	602.00	Safety meeting
16:30	17:15	0.75	SURFAC	FISH	FISH	T	Stuck Pipe	602.00	602.00	Handle fishing tools with schlumberger
17:15	17:45	0.50	SURFAC	FISH	TRIP	T	Stuck Pipe	602.00	602.00	Run in hole with fishing tools
17:45	18:15	0.50	SURFAC	FISH	FISH	T	Stuck Pipe	602.00	602.00	Screw into fish with schlumberger fishing tools
18:15	19:00	0.75	SURFAC	FISH	FISH	T	Stuck Pipe	602.00	602.00	Bump fish down 1.3m to free point, with schlumberger bumper sub
19:00	19:30	0.50	SURFAC	FISH	TRIP	T	Stuck Pipe	602.00	602.00	Run in 8 stands of HWDP to 295m
19:30	22:00	2.50	SURFAC	FISH	CIRC	T	Stuck Pipe	602.00	602.00	Break circulation and work pipe to clean up hole with water, at 295 m

Daily Drilling

COPRC MIRROR LAKE P-20 65-00 126-45

Report Date: 2/3/2014
 Report #: 11
 Depth Progress: 0.00m
 Depth End: 602.00mKB
 Rig Release Date: 2/23/2014

Rig: Beaver Drilling Ltd. 2

Time Log

Start Time	End Time	Dur (hr)	Phase	Op Code	Activity Code	Time P-T-X	Trbl Code	Start Depth (mKB)	End Depth (mKB)	Operation
22:00	23:45	1.75	SURFAC	FISH	REAM	T	Stuck Pipe	602.00	602.00	Back ream out of hole from 295m to 135m
23:45	00:00	0.25	SURFAC	FISH	SFTY	P		602.00	602.00	Crew handover meeting with both crews, tool push and conoco rep present.

Fluid/Mud Chks: Mud Engineer: <Mud Engineer?>

Time	08:00	Depth (mKB)	602.00	Density (kg/m³)	1,010.0	Funnel Viscosity (s/L)	30	pH	11.0	PV Override (Pa*s)	YP Override (Pa)
Low Gravity Solids (%)	MBT (kg/m³)		Oil Water Ratio		Chlorides (mg/L)		Calcium (mg/L)		Lime (kg/m³)		Potassium (mg/L)
Electric Stab (V)	ECD - Manual Entry (k...		Sand (%)		Solids, Corr. (%)		T Flowline (°C)		HTHP Pressure (kPa)		HTHP Filtrate (mL/30...
API Filtrate (mL/30min)			Mud Lost to Surface (m³)			Mud Lost to Hole (m³)			Daily Mud Field Est (Cost)		
Cum Mud Lost to Surface (m³)				Cum Mud Lost to Hole (m³)				Cumulative Mud Cost (Cost)			
								19,268.35			

Last BOP Drill

Type	BOP Drill	Days Last Chk (...)	Last Date	Days Until Next...	Next Check Date
Days Since Lost Time Incident (days)		844.00		Days Since Recordable Incident (days)	
				844.00	

Safety Incidents

Date	Com	Category

Drill String: BHA # <BHA No.??>

Bit Run	Drill Bit	Length (m)	IADC Bit Dull	TFA (incl Noz) (mm²)	BHA ROP (m/hr)
Nozzles (mm)	String Length (m)		OD (mm)	Max Rotating Hook Load (daN)	
Depth In (mKB)	Depth Out (mKB)	Avg ROP (m/hr)	Depth This Job (m)	Total Depth Drilled b...	Job Drill Hrs (hr)
				Total Drill Hrs (hr)	

Comment

Drill String Components

Item Des	ID (mm)	OD (mm)	Jts	Len (m)	Cum Len (m)

Drilling Parameter: <depthstart> - <depthend> mKB

Cum Depth (m)	Cum Drill...	Int ROP (...)	Flow Rate...	WOB (daN)	RPM (r...	SPP (kPa)	Drill Str Wt (d...	SO Str Wt (daN)	PU Str Wt (daN)	Off-Btm Str W...	Drill Tq
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Hydraulic Calculations

Bit Hydraulic Powe...	HP/Area (kW/mm²)	% P @ bit (%)	Bit Jet Velocity (m/s)	Bit dP (kPa)	P Drop Annular (kPa)	Mud Density (kg/m³)	ECD End (kg/m³)
Drill String Volume (m³)	Bit to Shoe Volume (m³)	Vol Shoe to Top (m³)	Min Casing AV (m/min)	Max Casing AV (m/min)	Min Open Hole AV (m/...	Max Open Hole AV (m/...	

Error

Mud Pump: 1, NATIONAL, 8-P-80

Pump Number	1	Make	NATIONAL	Model	8-P-80	Rod Diameter (mm)	140.0	Stroke Length (mm)	216.0
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Pump Checks

Date	Depth (mKB)	Q Flow (m³/min)	P (kPa)	Strokes (spm)
2/16/2014 16:00	2,209.00	0.608	5,153	78
2/16/2014 16:00	2,209.00	1.045	15,600	134

Pump Operations

Start Date	End Date	Liner Size (mm)	P Max (kPa)	Vol/Stk OR (m³/stk)
2/15/2014	2/15/2014	127.0		
2/16/2014	2/16/2014	127.0		

Mud Pump: 2, NATIONAL, 8-P-80

Pump Number	2	Make	NATIONAL	Model	8-P-80	Rod Diameter (mm)	140.0	Stroke Length (mm)	
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Pump Checks

Date	Depth (mKB)	Q Flow (m³/min)	P (kPa)	Strokes (spm)
2/19/2014 23:45	3,152.00	0.975	12,600	125
2/20/2014 00:00	3,143.00	0.647	6,414	83

Daily Drilling

COPRC MIRROR LAKE P-20 65-00 126-45

Rig: Beaver Drilling Ltd. 2

Report Date: 2/3/2014
Report #: 11
Depth Progress: 0.00m
Depth End: 602.00mKB
Rig Release Date: 2/23/2014

np Operations

Start Date	End Date	Liner Size (mm)	P Max (kPa)	Vol/Stk OR (m³/stk)
2/20/2014	2/20/2014	127.0		
2/21/2014	2/21/2014	127.0		

Shaker Screens

Des	Start Date	End Date	Scr Sz X	Scr Sz Y	Note

Centrifuge/Cyclone: HGS Centrifuge, BOS Solutions, 5500

Number	Make	Model	Diameter (mm)
2	BOS Solutions	5500	

Centrifuge/Cyclone Checks

Date	Hrs (hr)	RPM (rpm)	Dens OF (kg/m³)	Q OF (L/min)	Dens UF (kg/m³)	Q UF (L/min)
2/21/2014 00:00	3.00	2100	1,040.0	0.400	1,710.0	0.200

Centrifuge/Cyclone: HGS Centrifuge, BOS Solutions, 5500

Number	Make	Model	Diameter (mm)
1	BOS Solutions	5500	

Centrifuge/Cyclone Checks

Date	Hrs (hr)	RPM (rpm)	Dens OF (kg/m³)	Q OF (L/min)	Dens UF (kg/m³)	Q UF (L/min)
2/21/2014 00:00	3.00	2100	1,100.0	0.400	1,790.0	0.200

Fluid / Mud Additive Amounts

Des	Consumed	Cost	Size	Units

Survey Data

Date	MD (mKB)	Incl (°)	Azm (°)	TVD (mKB)	Depart (m)	NS (m)	EW (m)	VS (m)	DLS (°/30m)

Formations

Formation Name	Drill Top MD (mKB)	Drill Top (TVD) (mKB)	Prog Top TVD (mKB)
Little Bear	43.00	43.00	20.85
Slater River	207.00	207.00	197.35
Arctic Red	954.00	953.52	932.35
in House	1,110.00	1,109.49	1,084.35
Imperial	1,140.00	1,139.48	1,118.35
KOP (5deg/30m)	1,731.00	1,730.40	1,730.73
KOP (7deg/30m)	1,817.00	1,815.65	1,816.00
Upper Canol	1,902.70	1,896.20	1,897.35
Lower Canol	1,935.80	1,924.43	1,929.35

Daily Drilling

COPRC MIRROR LAKE P-20 65-00 126-45

Report Date: 2/4/2014
Report #: 12
Depth Progress: 0.00m
Depth End: 602.00mKB
Rig Release Date: 2/23/2014

Rig: Beaver Drilling Ltd. 2

UWI 2U0/D-020/L094P1699		Surface Legal Location P-20 65-00 126-45		MaxWell Job Number JOB01@2006		License No. EL 470					
Ground Elevation (m) 284.15		Original KB/RT Elevation (m) 289.35		Casing Flange Elevation (m) 283.95		Original Spud Date 1/29/2014		Days From Spud (days) 12.00			
Job Category DRILLING		Primary Job Type DRILLING ORIGINAL		Actual Start Date 1/24/2014 00:00		End Date 2/23/2014 23:59		Final Job Status DRILLED		Final Report? Yes	
Daily Cost Total (Cost) 253,295.03		Cumulative Cost (Cost) 1,618,571.58		Total AFE (Cost) 7,122,600.00		AFE+Supp Amt (Cost) 7,122,600.00		AFE / RFE / Maint.# 10351812		Estimated Days	
Planned Depth (TMD) (mKB)		Override TVD (mKB)		Head Count 48.0		Personnel Total Hours (hr) 508.00		Cum Personnel Total Hours (hr) 6,402.00			
Avg Connection Gas			Avg Background Gas			Avg Trip Gas			Max H2S (ppm)		
Road Condition Ice/Snow			Weather Clear			Temperature (°C) -25			Wind S 10 kms		
Ops and Depth @ Morning Report Run in 244.5mm surface casing.									Wellbore Original Hole		

Last 24hr Summary

No incidents or accidents. 7 - HID, 0 - OBS and 0 - ASA (all closed out)

Circulate and backream through tight spots to 76m, pull out of the hole and laydown 9" drill collars. Make up tooth bit, 6-1/2" drill collars and jars and run in the hole, ream in from 271m to 345m, circulate and attempt to viscosify water, pull out to 251m due to major losses and tight hole. Rotate slowly, build volume, viscosify mud and add LCM, circulate until mud comes around, viscosify mud in the mud tanks and add LCM. Run in the hole and ream through tight spots. Circulate and condition mud at 602m (TD). Pull out of the hole to lay down 12x 6-1/2" drill collars and run 244.5mm surface casing.

NEB and WSCC inspectors conducted an inspection at Beaver #2, inspection was satisfactory.

24hr Forecast

Run 244.5mm surface casing, tag bottom, circulate hole clean and condition mud, rig up cementers and cement 244.5mm surface casing, nipple down diverter, dig out cellar, cut casing, weld on casing bowl, nipple BOP.

Daily Contacts

Drilling Superintendent, Sheldon Vamplew, 403-999-1302; Drilling Engineer, Mike Greener, 403-771-5039; WS Supervisor, Richard Turgeon, 780-387-1706; WS Supervisor, Dave Oppen, 403-863-8205; Rig Manager, Rick Yavis, 780-718-2962; Command Centre, 403-910-0357

Last Casing String

Conductor, 20.00mKB

Log

Start Time	End Time	Dur (hr)	Phase	Op Code	Activity Code	Time P-T-X	Trbl Code	Start Depth (mKB)	End Depth (mKB)	Operation
00:00	03:30	3.50	SURFAC	DRILL	REAM	P		602.00	602.00	Back ream out of the hole and build volume
03:30	04:15	0.75	SURFAC	DRILL	PULD	P		602.00	602.00	Lay down 9" DCS
04:15	04:30	0.25	SURFAC	RIGMNT	SVRG	P		602.00	602.00	Rig service function test rig smart anti-collision system, function test crown saver, grease all moving parts, and check oil levels in floor motor, pump and HPU
04:30	04:45	0.25	SURFAC	WHDBOP	BOPE	P		602.00	602.00	Rotating diverter drill, function test motor kills
04:45	07:45	3.00	SURFAC	DRILL	TRIP	P		602.00	602.00	Make up bit to 6-1/2" drill collar, trip into the hole
07:45	08:00	0.25	SURFAC	DRILL	SFTY	P		602.00	602.00	Crew handover meeting, Conoco reps. and tool push present
08:00	08:15	0.25	SURFAC	RIGMNT	SVRG	P		602.00	602.00	Rig service function test rig smart anti-collision system, function test crown saver, grease all moving parts, and check oil levels in floor motor, pump and HPU
08:15	08:30	0.25	SURFAC	DRILL	SFTY	P		602.00	602.00	Held diverter drill with day crew
08:30	00:00	-8.50	SURFAC	DRILL	TRIP	P		602.00	602.00	Pull out of hole from 345 m to 251 m
00:00	11:15	11.25	SURFAC	DRILL	CIRC	P		602.00	602.00	Build volume and viscosity up to 70+
11:15	11:45	0.50	SURFAC	DRILL	CIRC	P		602.00	602.00	Displace hole to mud and l.c.m due to loss circulation at 251 m
11:45	15:15	3.50	SURFAC	DRILL	CIRC	P		602.00	602.00	Build volume and viscosity up to 70+
15:15	16:00	0.75	SURFAC	DRILL	TRIP	P		602.00	602.00	Trip in the hole from 251m 520 m
16:00	16:45	0.75	SURFAC	DRILL	TRIP	P		602.00	602.00	Run in hole from 520 m to 585 m
16:45	17:00	0.25	SURFAC	RIGMNT	SVRG	P		602.00	602.00	Rig service function test rig smart anti-collision system, function test crown saver, grease all moving parts, and check oil levels in floor motor, pump and HPU
17:00	17:45	0.75	SURFAC	DRILL	REAM	P		602.00	602.00	Ream and clean to bottom from 585 m to 602 m
17:45	22:30	4.75	SURFAC	DRILL	CIRC	P		602.00	602.00	Circulate and condition hole at 602 m build volume and get viscosity to 80+
22:30	00:00	1.50	SURFAC	DRILL	TRIP	P		602.00	602.00	Pull out of hole to 254m, to lay down 6-1/2" drill collars and run 244.5mm surface casing

Daily Drilling

COPRC MIRROR LAKE P-20 65-00 126-45

Report Date: 2/4/2014
Report #: 12
Depth Progress: 0.00m
Depth End: 602.00mKB
Rig Release Date: 2/23/2014

Rig: Beaver Drilling Ltd. 2

Fluid/Mud Chks: Mud Engineer: Corey Clark

Time 21:45	Depth (mKB) 602.00	Density (kg/m³) 1,085.0	Funnel Viscosity (s/L) 78	pH 9.0	PV Override (Pa·s) 27.0	YP Override (Pa) 11.0
Low Gravity Solids (%)	MBT (kg/m³)	Oil Water Ratio	Chlorides (mg/L)	Calcium (mg/L)	Lime (kg/m³)	Potassium (mg/L)
Electric Stab (V)	ECD - Manual Entry (k...	Sand (%)	Solids, Corr. (%) 2.7	T Flowline (°C) 23	HTHP Pressure (kPa)	HTHP Filtrate (mL/30...
API Filtrate (mL/30min)		Mud Lost to Surface (m³)		Mud Lost to Hole (m³)		Daily Mud Field Est (Cost)
Cum Mud Lost to Surface (m³)		Cum Mud Lost to Hole (m³)			Cumulative Mud Cost (Cost) 19,268.35	

Last BOP Drill

Type BOP Drill	Days Last Chk (...)	Last Date	Days Until Next...	Next Check Date
Days Since Lost Time Incident (days) 845.00	Days Since Recordable Incident (days) 845.00			

Safety Incidents

Date	Com	Category

Drill String: BHA # <BHA No.??>

Bit Run	Drill Bit	Length (m)	IADC Bit Dull	TFA (Incl Noz) (mm²)	BHA ROP (m/hr)
Nozzles (mm)	String Length (m)	OD (mm)	Max Rotating Hook Load (daN)		
Depth In (mKB)	Depth Out (mKB)	Avg ROP (m/hr)	Depth This Job (m)	Total Depth Drilled b...	Job Drill Hrs (hr)
Total Drill Hrs (hr)					
Comment					

Drill String Components

Item Des	ID (mm)	OD (mm)	Jts	Len (m)	Cum Len (m)

Drilling Parameter: <depthstart> - <depthend> mKB

Cum Depth (m)	Cum Drill...	Int ROP (...)	Flow Rate...	WOB (daN)	RPM (r...)	SPP (kPa)	Drill Str Wt (d...	SO Str Wt (daN)	PU Str Wt (daN)	Off-Btm Str W...	Drill Tq
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Hydraulic Calculations

Bit Hydraulic Powe...	HP/Area (kW/mm²)	% P @ bit (%)	Bit Jet Velocity (m/s)	Bit dP (kPa)	P Drop Annular (kPa)	Mud Density (kg/m³)	ECD End (kg/m³)
Drill String Volume (m³)	Bit to Shoe Volume (m³)	Vol Shoe to Top (m³)	Min Casing AV (m/min)	Max Casing AV (m/min)	Min Open Hole AV (m/...	Max Open Hole AV (m/...	
Error							

Mud Pump: 1, NATIONAL, 8-P-80

Pump Number 1	Make NATIONAL	Model 8-P-80	Rod Diameter (mm) 140.0	Stroke Length (mm) 216.0
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Pump Checks

Date	Depth (mKB)	Q Flow (m³/min)	P (kPa)	Strokes (spm)
2/16/2014 16:00	2,209.00	0.608	5,153	78
2/16/2014 16:00	2,209.00	1.045	15,600	134

Pump Operations

Start Date	End Date	Liner Size (mm)	P Max (kPa)	Vol/Stk OR (m³/stk)
2/15/2014	2/15/2014	127.0		
2/16/2014	2/16/2014	127.0		

Mud Pump: 2, NATIONAL, 8-P-80

Pump Number 2	Make NATIONAL	Model 8-P-80	Rod Diameter (mm) 140.0	Stroke Length (mm) 216.0
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Pump Checks

Date	Depth (mKB)	Q Flow (m³/min)	P (kPa)	Strokes (spm)
2/19/2014 23:45	3,152.00	0.975	12,600	125
2/20/2014 00:00	3,143.00	0.647	6,414	83

Pump Operations

Start Date	End Date	Liner Size (mm)	P Max (kPa)	Vol/Stk OR (m³/stk)
2/20/2014	2/20/2014	127.0		
2/21/2014	2/21/2014	127.0		

Shaker Screens

Des	Start Date	End Date	Scr Sz X	Scr Sz Y	Note

Daily Drilling

COPRC MIRROR LAKE P-20 65-00 126-45

Rig: Beaver Drilling Ltd. 2

Report Date: 2/4/2014
Report #: 12
Depth Progress: 0.00m
Depth End: 602.00mKB
Rig Release Date: 2/23/2014

Centrifuge/Cyclone: HGS Centrifuge, BOS Solutions, 5500

Number	Make	Model	Diameter (mm)
2	BOS Solutions	5500	

Centrifuge/Cyclone Checks

Date	Hrs (hr)	RPM (rpm)	Dens OF (kg/m³)	Q OF (L/min)	Dens UF (kg/m³)	Q UF (L/min)
2/21/2014 00:00	3.00	2100	1,040.0	0.400	1,710.0	0.200

Centrifuge/Cyclone: HGS Centrifuge, BOS Solutions, 5500

Number	Make	Model	Diameter (mm)
1	BOS Solutions	5500	

Centrifuge/Cyclone Checks

Date	Hrs (hr)	RPM (rpm)	Dens OF (kg/m³)	Q OF (L/min)	Dens UF (kg/m³)	Q UF (L/min)
2/21/2014 00:00	3.00	2100	1,100.0	0.400	1,790.0	0.200

Fluid / Mud Additive Amounts

Des	Consumed	Cost	Size	Units

Survey Data

Date	MD (mKB)	Incl (°)	Azm (°)	TVD (mKB)	Depart (m)	NS (m)	EW (m)	VS (m)	DLS (°/30m)

Formations

Formation Name	Drill Top MD (mKB)	Drill Top (TVD) (mKB)	Prog Top TVD (mKB)
Little Bear	43.00	43.00	20.85
Slater River	207.00	207.00	197.35
Arctic Red	954.00	953.52	932.35
Martin House	1,110.00	1,109.49	1,084.35
Imperial	1,140.00	1,139.48	1,118.35
KOP (5deg/30m)	1,731.00	1,730.40	1,730.73
KOP (7deg/30m)	1,817.00	1,815.65	1,816.00
Upper Canol	1,902.70	1,896.20	1,897.35
Lower Canol	1,935.80	1,924.43	1,929.35

Daily Drilling

COPRC MIRROR LAKE P-20 65-00 126-45

Report Date: 2/5/2014
Report #: 13
Depth Progress: 0.00m
Depth End: 602.00mKB
Rig Release Date: 2/23/2014

Rig: Beaver Drilling Ltd. 2

UWI 200/D-020/L094P1699		Surface Legal Location P-20 65-00 126-45		MaxWell Job Number JOB01@2006		License No. EL 470					
Ground Elevation (m) 284.15		Original KB/RT Elevation (m) 289.35		Casing Flange Elevation (m) 283.95		Original Spud Date 1/29/2014		Days From Spud (days) 13.00			
Job Category DRILLING		Primary Job Type DRILLING ORIGINAL		Actual Start Date 1/24/2014 00:00		End Date 2/23/2014 23:59		Final Job Status DRILLED		Final Report? Yes	
Daily Cost Total (Cost) 357,746.50		Cumulative Cost (Cost) 1,976,318.08		Total AFE (Cost) 7,122,600.00		AFE+Supp Amt (Cost) 7,122,600.00		AFE / RFE / Maint.# 10351812		Estimated Days	
Planned Depth (TMD) (mKB)		Override TVD (mKB)		Head Count 48.0		Personnel Total Hours (hr) 508.00		Cum Personnel Total Hours (hr) 6,910.00			
Avg Connection Gas		Avg Background Gas			Avg Trip Gas			Max H2S (ppm)			
Road Condition Ice/Snow		Weather Cloudy			Temperature (°C)			Wind -8 N 10 kms			
Ops and Depth @ Morning Report Weld on casing bowl								Wellbore Original Hole			

Last 24hr Summary

No incidents or accidents. 8 - HID, 2 - OBS and 0 - ASA (all closed out)

Pull out of the hole, lay down 12x 6-1/2" drill collars, rig up power tongs, run 244.5mm surface casing, tag bottom, circulate hole clean and condition mud, rig up cementers and cement 244.5mm surface casing, plug down at 13:57hrs on February 5, 2014 with 10m3 of good cement returns, nipple down diverter, dig out cellar, cut casing,

24hr Forecast

Nipple up BOP, pressure test BOP components and manifold shack, conduct an accumulator function test, install wear bushing, pick and make up directional tools, run in the hole, hold BOP and high angle rescue drills with rig crews, drill out cement, float and shoe, drill 5m of open hole, conduct a formation integrity test, drill 222mm intermediate hole.

Daily Contacts

Drilling Superintend, Sheldon Vamplew, 403-999-1302; Drilling Engineer, Mike Greener, 403-771-5039; WS Supervisor, Richard Turgeon, 780-387-1706; WS Supervisor, Dave Oppen, 403-863-8205; Rig Manager, Rick Yavis, 780-718-2962; Command Centre, 403-910-0357

Last Casing String

Surface, 602.00mKB

Time Log

Start Time	End Time	Dur (hr)	Phase	Op Code	Activity Code	Time P-T-X	Tribl Code	Start Depth (mKB)	End Depth (mKB)	Operation
00:00	00:45	0.75	SURFAC	DRILL	TRIP	P		602.00	602.00	Trip out of hole from 254m till 119m
00:45	02:30	1.75	SURFAC	DRILL	PULD	P		602.00	602.00	Lay down 12 x 6-1/2" drill collars
02:30	03:00	0.50	SURFAC	RIGMNT	SVRG	P		602.00	602.00	Rig service function test rig smart anti-collision system, function test crown saver, grease all moving parts, check oil in floor motor, pumps and HPU. Clean floor and prepare to rig up power tongs
03:00	04:15	1.25	SURFAC	CASING	RNCS	P		602.00	602.00	Rig up Hallmark power tongs
04:15	04:30	0.25	SURFAC	CASING	SFTY	P		602.00	602.00	Safety meeting with Hallmark power tong hands
04:30	07:45	3.25	SURFAC	CASING	RNCS	P		602.00	602.00	Make up 1-244.5mm float shoe, 1-joint of 244.5mm, 53.57kg/m, J-55, LTC surface casing and 1-244.5mm float collar and then run 46-joints of 244.5mm, 53.57kg/m, J-55, LTC surface from 602m to 5.20m.
07:45	08:00	0.25	SURFAC	CASING	SFTY	P		602.00	602.00	Crew handover meeting Conoco reps. and toolpush present
08:00	08:15	0.25	SURFAC	RIGMNT	SVRG	P		602.00	602.00	Rig service f.t crown saver
08:15	09:45	1.50	SURFAC	CASING	RNCS	P		602.00	602.00	Run 12 x centralizers and 1 x cement basket from 602m to surface, fill every 10 joints. Total length of 244.5mm surface casing: 602.94m. Landed at 602m, tagged bottom at 602m, float at 587.97m. Circulate hole clean (2 bottoms up+).
09:45	10:15	0.50	SURFAC	CASING	CIRC	P		602.00	602.00	Wash 12m to bottom
10:15	11:00	0.75	SURFAC	CASING	CIRC	P		602.00	602.00	Circ casing
11:00	11:15	0.25	SURFAC	CEMENT	SFTY	P		602.00	602.00	Safety meeting
11:15	14:00	2.75	SURFAC	CEMENT	CMNT	P		602.00	602.00	Rig up Schlumberger cementers, pump 5.0m3 of 1000kg/m3 of fresh water, stop pressure test line to 21,000kPA (held OK), bleed off pressure, then 5.0m3 of 1300kg/m3 MUDPUSH II pre-flush spacer.
14:00	15:15	1.25	SURFAC	CEMENT	CMNT	P		602.00	602.00	Then pump 40 tonnes/37m3 (100% excess) of RFC 1740 cement with 0.2% Anti Foam + 1.0% CaCl2 + 1.1% Low Temp Fluid Loss + 0.6% Dispersant from 602m to 5.2m. Drop plug and displace 23.8m3 of fresh water.

Daily Drilling

COPRC MIRROR LAKE P-20 65-00 126-45

Rig: Beaver Drilling Ltd. 2

Report Date: 2/5/2014
Report #: 13
Depth Progress: 0.00m
Depth End: 602.00mKB
Rig Release Date: 2/23/2014

Time Log

Start Time	End Time	Dur (hr)	Phase	Op Code	Activity Code	Time P-T-X	Trbl Code	Start Depth (mKB)	End Depth (mKB)	Operation
15:15	15:45	0.50	SURFAC	CEMENT	CMNT	P		602.00	602.00	Bump plug 3,500kPa over final circulating pressure of 6,500kPa at 13:57hrs on February 5th, 2014. Bleed pressure and check floats (holding OK). Pressure test casing to 11,500kPa for 10 minutes (holding OK). Bleed pressure, flush diverter and rig out cementers. Good cement returns: 10.0m3
15:45	16:00	0.25	SURFAC	CEMENT	WOC	P		602.00	602.00	Wait on cement & clean mud tanks
16:00	18:00	2.00	SURFAC	CEMENT	WOC	P		602.00	602.00	Wait on cement & clean tanks
18:00	18:15	0.25	SURFAC	RIGMNT	SVRG	P		602.00	602.00	Rig service function test crown saver
18:15	00:00	5.75	SURFAC	WHDBOP	NUND	P		602.00	602.00	Nipple down diverter, cut casing and clean tanks

Fluid/Mud Chks: Mud Engineer: Corey Clark

Time	11:15	Depth (mKB)	602.00	Density (kg/m³)	1,080.0	Funnel Viscosity (s/L)	58	pH	9.0	PV Override (Pa*s)	27.0	YP Override (Pa)	7.0
Low Gravity Solids (%)	MBT (kg/m³)			Oil Water Ratio		Chlorides (mg/L)		Calcium (mg/L)		Lime (kg/m³)		Potassium (mg/L)	
Electric Stab (V)	ECD - Manual Entry (k...			Sand (%)		Solids, Corr. (%)		T Flowline (°C)		HTHP Pressure (kPa)		HTHP Filtrate (mL/30...	
API Filtrate (mL/30min)			Mud Lost to Surface (m³)			Mud Lost to Hole (m³)			Daily Mud Field Est (Cost)				
Cum Mud Lost to Surface (m³)				Cum Mud Lost to Hole (m³)				Cumulative Mud Cost (Cost)					
								1,532.90					
								20,801.25					

Last BOP Drill

Type	BOP Drill	Days Last Chk (...)	Last Date	Days Until Next...	Next Check Date
Days Since Lost Time Incident (days)	846.00		Days Since Recordable Incident (days)	846.00	

Safety Incidents

Date	Com	Category
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Drill String: BHA # <BHA No.??>

Bit Run	Drill Bit	Length (m)	IADC Bit Dull	TFA (incl Noz) (mm²)	BHA ROP (m/hr)
Nozzles (mm)	String Length (m)	OD (mm)	Max Rotating Hook Load (daN)		
Depth In (mKB)	Depth Out (mKB)	Avg ROP (m/hr)	Depth This Job (m)	Total Depth Drilled b...	Job Drill Hrs (hr)
Comment		Total Drill Hrs (hr)			

Drill String Components

Item Des	ID (mm)	OD (mm)	Jts	Len (m)	Cum Len (m)
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Drilling Parameter: <depthstart> - <depthend> mKB

Cum Depth (m)	Cum Drill...	Int ROP (...)	Flow Rate...	WOB (daN)	RPM (r...	SPP (kPa)	Drill Str Wt (d...	SO Str Wt (daN)	PU Str Wt (daN)	Off-Btm Str W...	Drill Tq
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Hydraulic Calculations

Bit Hydraulic Powe...	HP/Area (kW/mm²)	% P @ bit (%)	Bit Jet Velocity (m/s)	Bit dP (kPa)	P Drop Annular (kPa)	Mud Density (kg/m³)	ECD End (kg/m³)
Drill String Volume (m³)	Bit to Shoe Volume (m³)	Vol Shoe to Top (m³)	Min Casing AV (m/min)	Max Casing AV (m/min)	Min Open Hole AV (m/...	Max Open Hole AV (m/...	

Error

Mud Pump: 1, NATIONAL, 8-P-80

Pump Number	1	Make	NATIONAL	Model	8-P-80	Rod Diameter (mm)	140.0	Stroke Length (mm)	216.0
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Pump Checks

Date	Depth (mKB)	Q Flow (m³/min)	P (kPa)	Strokes (spm)
2/16/2014 16:00	2,209.00	0.608	5,153	78
2/16/2014 16:00	2,209.00	1.045	15,600	134

Pump Operations

Start Date	End Date	Liner Size (mm)	P Max (kPa)	Vol/Stk OR (m³/stk)
2/15/2014	2/15/2014	127.0		
2/16/2014	2/16/2014	127.0		

Mud Pump: 2, NATIONAL, 8-P-80

Pump Number	2	Make	NATIONAL	Model	8-P-80	Rod Diameter (mm)	140.0	Stroke Length (mm)	216.0
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Daily Drilling

COPRC MIRROR LAKE P-20 65-00 126-45

Rig: Beaver Drilling Ltd. 2

Report Date: 2/5/2014
Report #: 13
Depth Progress: 0.00m
Depth End: 602.00mKB
Rig Release Date: 2/23/2014

np Checks

Date	Depth (mKB)	Q Flow (m³/min)	P (kPa)	Strokes (spm)
2/19/2014 23:45	3,152.00	0.975	12,600	125
2/20/2014 00:00	3,143.00	0.647	6,414	83

Pump Operations

Start Date	End Date	Liner Size (mm)	P Max (kPa)	Vol/Stk OR (m³/stk)
2/20/2014	2/20/2014	127.0		
2/21/2014	2/21/2014	127.0		

Shaker Screens

Des	Start Date	End Date	Scr Sz X	Scr Sz Y	Note

Centrifuge/Cyclone: HGS Centrifuge, BOS Solutions, 5500

Number	Make	Model	Diameter (mm)
2	BOS Solutions	5500	

Centrifuge/Cyclone Checks

Date	Hrs (hr)	RPM (rpm)	Dens OF (kg/m³)	Q OF (L/min)	Dens UF (kg/m³)	Q UF (L/min)
2/21/2014 00:00	3.00	2100	1,040.0	0.400	1,710.0	0.200

Centrifuge/Cyclone: HGS Centrifuge, BOS Solutions, 5500

Number	Make	Model	Diameter (mm)
1	BOS Solutions	5500	

Centrifuge/Cyclone Checks

Date	Hrs (hr)	RPM (rpm)	Dens OF (kg/m³)	Q OF (L/min)	Dens UF (kg/m³)	Q UF (L/min)
2/21/2014 00:00	3.00	2100	1,100.0	0.400	1,790.0	0.200

Fluid / Mud Additive Amounts

Des	Consumed	Cost	Size	Units
Gel	186.0	7.200	40.0	SX
Sawdust	65.0	2.980	7.3	SX

Survey Data

Date	MD (mKB)	Incl (°)	Azm (°)	TVD (mKB)	Depart (m)	NS (m)	EW (m)	VS (m)	DLS (°/30m)

Formations

Formation Name	Drill Top MD (mKB)	Drill Top (TVD) (mKB)	Prog Top TVD (mKB)
Little Bear	43.00	43.00	20.85
Slater River	207.00	207.00	197.35
Arctic Red	954.00	953.52	932.35
Martin House	1,110.00	1,109.49	1,084.35
Imperial	1,140.00	1,139.48	1,118.35
KOP (5deg/30m)	1,731.00	1,730.40	1,730.73
KOP (7deg/30m)	1,817.00	1,815.65	1,816.00
Upper Canol	1,902.70	1,896.20	1,897.35
Lower Canol	1,935.80	1,924.43	1,929.35

Daily Drilling

COPRC MIRROR LAKE P-20 65-00 126-45

Rig: Beaver Drilling Ltd. 2

Report Date: 2/6/2014
Report #: 14
Depth Progress: 0.00m
Depth End: 602.00mKB
Rig Release Date: 2/23/2014

/ UWI 200/D-020/L094P1699		Surface Legal Location P-20 65-00 126-45		MaxWell Job Number JOB01@2006		License No. EL 470
Ground Elevation (m) 284.15		Original KB/RT Elevation (m) 289.35		Casing Flange Elevation (m) 283.95		Original Spud Date 1/29/2014
Job Category DRILLING		Primary Job Type DRILLING ORIGINAL		Actual Start Date 1/24/2014 00:00		End Date 2/23/2014 23:59
Daily Cost Total (Cost) 106,166.13		Cumulative Cost (Cost) 2,082,484.21		Total AFE (Cost) 7,122,600.00		AFE+Supp Amt (Cost) 7,122,600.00
Planned Depth (TMD) (mKB)		Override TVD (mKB)		Head Count 49.0		Personnel Total Hours (hr) 520.00
Avg Connection Gas		Avg Background Gas		Avg Trip Gas		Max H2S (ppm)
Road Condition Ice/Snow		Weather Snowing		Temperature (°C) -15		Wind SE 10 kms

Ops and Depth @ Morning Report
Drill out float, Cement and Shoe.

Last 24hr Summary
No incidents or accidents. 7 - HID, 1 - OBS and 0 - ASA (all closed out)
Cut casing, weld on casing bowl, clean mud tanks, nipple up BOP, rig up booeey and flare lines, nipple up flow nipple and rig up catch can, rig up HCR and kill lines, pressure test BOP components and manifold shack, conduct an accumulator function test, install wear bushing.

24hr Forecast
Drill out float, cement and shoe. Drill 222mm intermediate directional hole with accumulated MWD surveys, rig services, connections and circulation times.

Daily Contacts
Drilling Superintend, Sheldon Vamplew, 403-999-1302; Drilling Engineer, Mike Greener, 403-771-5039; WS Supervisor, Richard Turgeon, 780-387-1706; WS Supervisor, Dave Oppen, 403-863-8205; Rig Manager, Rick Yavis, 780-718-2962; Command Centre, 403-910-0357

Last Casing String
Surface, 602.00mKB

Time Log										
Start Time	End Time	Dur (hr)	Phase	Op Code	Activity Code	Time P-T-X	Trbl Code	Start Depth (mKB)	End Depth (mKB)	Operation
00:00	01:00	1.00	SURFAC	WHDBOP	NUND	P		602.00	602.00	Nipple down diverter system, clean tanks change pumps over to 5 inch liners
01:00	04:45	3.75	SURFAC	WHDBOP	NUND	P		602.00	602.00	Dig cellar down 1.5m
04:45	07:45	3.00	SURFAC	WHDBOP	NUND	P		602.00	602.00	Cut conductor and prep casing, weld on casing bowl
07:45	08:00	0.25	SURFAC	WHDBOP	SFTY	P		602.00	602.00	Crew handover meeting, Conoco reps. and toolpush present
08:00	08:15	0.25	SURFAC	RIGMNT	SVRG	P		602.00	602.00	Rig service, check BOP slings and shackles
08:15	11:00	2.75	SURFAC	WHDBOP	NUND	P		602.00	602.00	Weld on casing bowl and change #1 pump to 5 inch liners, fill mud tanks with invert
11:00	15:00	4.00	SURFAC	WHDBOP	NUND	P		602.00	602.00	Nipple up upper bowl mandril hanger and BOP's
15:00	16:00	1.00	SURFAC	WHDBOP	BOPE	P		602.00	602.00	Pressure test all manifold valves and chokes, low of 1400kpa and a high of 21,000kpa, with peregrine pressure testing ltd.
16:00	16:15	0.25	SURFAC	RIGMNT	SVRG	P		602.00	602.00	Rig service, check crown saver and brake linkage
16:15	23:30	7.25	SURFAC	WHDBOP	BOPE	P		602.00	602.00	Pressure test with Peregrine, BOP stack, HCR valves, kill line, inside BOP, stabbing valve, pipe rams blind rams at a low 1,400kpa, high 21,000kpa., Annular low 1,400kpa., high 17,000kpa. All ok. HCR, pipe rams and annular, starting pressure 20,000kpa, final pressure 9,700kpa., recharge pump time 3min. 36sec.
23:30	00:00	0.50	SURFAC	WHDBOP	NUND	P		602.00	602.00	Pick up and install wear bushing, clean prepare floor to pick up directional tools.

Fluid/Mud Chks: Mud Engineer: <Mud Engineer?>						
Time	Depth (mKB)	Density (kg/m³)	Funnel Viscosity (s/L)	pH	PV Override (Pa*s)	YP Override (Pa)
Low Gravity Solids (%)	MBT (kg/m³)	Oil Water Ratio	Chlorides (mg/L)	Calcium (mg/L)	Lime (kg/m³)	Potassium (mg/L)
Electric Stab (V)	ECD - Manual Entry (k...)	Sand (%)	Solids, Corr. (%)	T Flowline (°C)	HTHP Pressure (kPa)	HTHP Filtrate (mL/30...

API Filtrate (mL/30min)		Mud Lost to Surface (m³)		Mud Lost to Hole (m³)		Daily Mud Field Est (Cost)
Mud Lost to Surface (m³)		Cum Mud Lost to Hole (m³)		Cumulative Mud Cost (Cost)		

Last BOP Drill				
Type BOP Drill	Days Last Chk (...)	Last Date	Days Until Next...	Next Check Date
Days Since Lost Time Incident (days)	847.00		Days Since Recordable Incident (days)	847.00

Daily Drilling

COPRC MIRROR LAKE P-20 65-00 126-45

Rig: Beaver Drilling Ltd. 2

Report Date: 2/6/2014
Report #: 14
Depth Progress: 0.00m
Depth End: 602.00mKB
Rig Release Date: 2/23/2014

Safety Incidents

Date	Com	Category

Drill String: BHA # <BHA No.??>

Bit Run	Drill Bit		Length (m)	IADC Bit Dull		TFA (incl Noz) (mm²)	BHA ROP (m/hr)
Nozzles (mm)		String Length (m)		OD (mm)		Max Rotating Hook Load (daN)	
Depth In (mKB)		Depth Out (mKB)	Avg ROP (m/hr)	Depth This Job (m)	Total Depth Drilled b...	Job Drill Hrs (hr)	Total Drill Hrs (hr)

Comment

Drill String Components

Item Des	ID (mm)	OD (mm)	Jts	Len (m)	Cum Len (m)

Drilling Parameter: <depthstart> - <depthend> mKB

Cum Depth (m)	Cum Drill...	Int ROP (...)	Flow Rate...	WOB (daN)	RPM (r...	SPP (kPa)	Drill Str Wt (d...	SO Str Wt (daN)	PU Str Wt (daN)	Off-Btm Str W...	Drill Tq

Hydraulic Calculations

Bit Hydraulic Powe...	HP/Area (kW/mm²)	% P @ bit (%)	Bit Jet Velocity (m/s)	Bit dP (kPa)	P Drop Annular (kPa)	Mud Density (kg/m³)	ECD End (kg/m³)
Drill String Volume (m³)	Bit to Shoe Volume (m³)	Vol Shoe to Top (m³)	Min Casing AV (m/min)	Max Casing AV (m/min)	Min Open Hole AV (m/...	Max Open Hole AV (m/...	

Error

Mud Pump: 1, NATIONAL, 8-P-80

Pump Number	Make	Model	Rod Diameter (mm)	Stroke Length (mm)
1	NATIONAL	8-P-80	140.0	216.0

Pump Checks

Date	Depth (mKB)	Q Flow (m³/min)	P (kPa)	Strokes (spm)
2/16/2014 16:00	2,209.00	0.608	5,153	
2/16/2014 16:00	2,209.00	1.045	15,600	

Pump Operations

Start Date	End Date	Liner Size (mm)	P Max (kPa)	Vol/Stk OR (m³/stk)
2/15/2014	2/15/2014	127.0		
2/16/2014	2/16/2014	127.0		

Mud Pump: 2, NATIONAL, 8-P-80

Pump Number	Make	Model	Rod Diameter (mm)	Stroke Length (mm)
2	NATIONAL	8-P-80	140.0	216.0

Pump Checks

Date	Depth (mKB)	Q Flow (m³/min)	P (kPa)	Strokes (spm)
2/19/2014 23:45	3,152.00	0.975	12,600	125
2/20/2014 00:00	3,143.00	0.647	6,414	83

Pump Operations

Start Date	End Date	Liner Size (mm)	P Max (kPa)	Vol/Stk OR (m³/stk)
2/20/2014	2/20/2014	127.0		
2/21/2014	2/21/2014	127.0		

Shaker Screens

Des	Start Date	End Date	Scr Sz X	Scr Sz Y	Note

Centrifuge/Cyclone: HGS Centrifuge, BOS Solutions, 5500

Number	Make	Model	Diameter (mm)
2	BOS Solutions	5500	

Centrifuge/Cyclone Checks

Date	Hrs (hr)	RPM (rpm)	Dens OF (kg/m³)	Q OF (L/min)	Dens UF (kg/m³)	Q UF (L/min)
2/21/2014 00:00	3.00	2100	1,040.0	0.400	1,710.0	0.200

Centrifuge/Cyclone: HGS Centrifuge, BOS Solutions, 5500

Number	Make	Model	Diameter (mm)
1	BOS Solutions	5500	

Centrifuge/Cyclone Checks

Date	Hrs (hr)	RPM (rpm)	Dens OF (kg/m³)	Q OF (L/min)	Dens UF (kg/m³)	Q UF (L/min)
2/21/2014 00:00	3.00	2100	1,100.0	0.400	1,790.0	

Fluid / Mud Additive Amounts

Des	Consumed	Cost	Size	Units
Gel	10.0	7.200	40.0	SX
Sawdust	45.0	2.980	7.3	SX



Daily Drilling

COPRC MIRROR LAKE P-20 65-00 126-45

Rig: Beaver Drilling Ltd. 2

Report Date: 2/6/2014
Report #: 14
Depth Progress: 0.00m
Depth End: 602.00mKB
Rig Release Date: 2/23/2014

Key Data

Date	MD (mKB)	Incl (")	Azm (")	TVD (mKB)	Depart (m)	NS (m)	EW (m)	VS (m)	DLS (*/30m)

Formations

Formation Name	Drill Top MD (mKB)	Drill Top (TVD) (mKB)	Prog Top TVD (mKB)
Little Bear	43.00	43.00	20.85
Slater River	207.00	207.00	197.35
Arctic Red	954.00	953.52	932.35
Martin House	1,110.00	1,109.49	1,084.35
Imperial	1,140.00	1,139.48	1,118.35
KOP (5deg/30m)	1,731.00	1,730.40	1,730.73
KOP (7deg/30m)	1,817.00	1,815.65	1,816.00
Upper Canol	1,902.70	1,896.20	1,897.35
Lower Canol	1,935.80	1,924.43	1,929.35

Daily Drilling

COPRC MIRROR LAKE P-20 65-00 126-45

Rig: Beaver Drilling Ltd. 2

Report Date: 2/7/2014
Report #: 15
Depth Progress: 445.00m
Depth End: 1,047.00mKB
Rig Release Date: 2/23/2014

/ UWI 200/D-020/L094P1699		Surface Legal Location P-20 65-00 126-45		MaxWell Job Number JOB01@2006		License No. EL 470	
Ground Elevation (m) 284.15		Original KB/RT Elevation (m) 289.35		Casing Flange Elevation (m) 283.95		Original Spud Date 1/29/2014	
Days From Spud (days) 15.00		Job Category DRILLING		Primary Job Type DRILLING ORIGINAL		Actual Start Date 1/24/2014 00:00	
End Date 2/23/2014 23:59		Final Job Status DRILLED		Final Report? Yes		Daily Cost Total (Cost) 217,238.53	
Cumulative Cost (Cost) 2,299,722.74		Total AFE (Cost) 7,122,600.00		AFE+Supp Amt (Cost) 7,122,600.00		AFE / RFE / Maint.# 10351812	
Estimated Days		Planned Depth (TMD) (mKB)		Override TVD (mKB)		Head Count 62.0	
Personnel Total Hours (hr) 608.00		Cum Personnel Total Hours (hr) 8,038.00		Avg Connection Gas 195		Avg Background Gas 85	
Avg Trip Gas 24		Max H2S (ppm) 0		Road Condition Ice/Snow		Weather Cloudy	
Temperature (°C) -21		Wind NW 10 kms		Ops and Depth @ Morning Report		Wellbore Original Hole	

Drill 222mm intermediate hole at 1180m. Last survey at 1121m, Inc: 1.59°, Azm: 29.26°.

Last 24hr Summary
No incidents or accidents. 11 - HID, 0 - OBS and 0 - ASA (all closed out)

Complete rig and pre-drill out inspection. Fill mud tanks with invert. Pick and make up directional BHA, run in the hole, tag cement, displace to invert mud, conduct BOP drill and high angle rescue safety meetings, drill out cement float and shoe. Drill 222mm intermediate directional hole from 602m to 609m, circulate bottoms up, perform FIT to a gradient of 18.1kPa/m (surface applied pressure: 4991kPa for 10 minutes). Drill 222mm intermediate directional hole from 609m to 1047m with accumulated MWD surveys, rig services, connections and circulation times. Last survey at 1121m, Inc: 1.59°, Azm: 29.26°.

24hr Forecast
Drill 222mm intermediate directional hole with accumulated MWD surveys, rig services, connections and circulation times.

Daily Contacts
Drilling Superintendent, Sheldon Vamplew, 403-999-1302; Drilling Engineer, Mike Greener, 403-771-5039; WS Supervisor, Richard Turgeon, 780-387-1706; WS Supervisor, Dave Oppen, 403-863-8205; Rig Manager, Rick Yavis, 780-718-2962; Command Centre, 403-910-0357

Last Casing String
Surface, 602.00mKB

Time Log										
Time	End Time	Dur (hr)	Phase	Op Code	Activity Code	Time P-T-X	Trbl Code	Start Depth (mKB)	End Depth (mKB)	Operation
00:00	00:15	0.25	SURFAC	RIGMNT	SVRG	P		602.00	602.00	Rig service function test rig smart anti-collision system, function test crown saver,grease all moving parts, check oil levels in floor motor, pumps and HPU
00:15	00:30	0.25	SURFAC	DRILL	SFTY	P		602.00	602.00	Safety meeting with pathfinder directional services
00:30	03:45	3.25	SURFAC	DRILL	PULD	P		602.00	602.00	Pick up, make up directional tools
03:45	06:00	2.25	SURFAC	DRILL	TRIP	P		602.00	602.00	Trip in the hole with 222mm, 513 Ulterra PDC bit, Wenzel mud motor, 7/8 lobe, 5 stage (0.077rev/L), set at 1.59 deg. with 0.81m from bit to bend
06:00	06:15	0.25	SURFAC	DRILL	SFTY	P		602.00	602.00	B.O.P drill held well secure in 90 sec crew in positions function test motor kills
06:15	06:30	0.25	SURFAC	DRILL	SFTY	P		602.00	602.00	Pre drill out safety meeting inspection done and corrections made
06:30	07:30	1.00	SURFAC	CEMENT	DRLG	P		602.00	602.00	Drill out float and shoe float tagged @ 587m, drill out cement shoe tagged @ 601m
07:30	07:45	0.25	SURFAC	DRILL	DRLG	P		602.00	609.00	Drill 222mm hole, with 513 Ulterra PDC bit, Wenzel mud motor, 7/8 lobe, 5 stage (0.077rev/L), set at 1.59 deg. with 0.81m from bit to bend from 602m to 609m
07:45	08:00	0.25	SURFAC	DRILL	SFTY	P		609.00	609.00	Crew handover meeting, Conoco reps. and toolpush present
08:00	08:30	0.50	SURFAC	DRILL	FIT	P		609.00	609.00	Formation integrity test with Peregrine pressure tester
08:30	08:45	0.25	INTRM1	DRILL	SFTY	P		609.00	609.00	BOP drill well secure in 70 secs
08:45	09:00	0.25	INTRM1	RIGMNT	SVRG	P		609.00	609.00	Rig service function test rig smart anti-collision system, function test crown saver,grease all moving parts, check oil levels in floor motor, pumps and HPU
09:00	15:30	6.50	INTRM1	DRILL	DRLG	P		609.00	818.00	Drill 222mm hole, with 513 Ulterra PDC bit, Wenzel mud motor, 7/8 lobe, 5 stage (0.077rev/L), set at 1.59 deg. with 0.81m from bit to bend, from 602m to 818m
15:30	16:00	0.50	INTRM1	DRILL	SRVY	P		818.00	818.00	Accumulated time for directional surveys
16:00	17:00	1.00	INTRM1	DRILL	DRLG	P		818.00	856.00	Drill 222mm hole, with 513 Ulterra PDC bit, Wenzel mud motor, 7/8 lobe, 5 stage (0.077rev/L), set at 1.59 deg. with 0.81m from bit to bend, from 818m to 856m
17:00	17:15	0.25	INTRM1	RIGMNT	SVRG	P		856.00	856.00	Rig service function test rig smart anti-collision system, function test crown saver,grease all moving parts, check oil levels in floor motor, pumps and HPU

Daily Drilling

COPRC MIRROR LAKE P-20 65-00 126-45

Rig: Beaver Drilling Ltd. 2

Report Date: 2/7/2014
Report #: 15
Depth Progress: 445.00m
Depth End: 1,047.00mKB
Rig Release Date: 2/23/2014

Time Log

Start Time	End Time	Dur (hr)	Phase	Op Code	Activity Code	Time P-T-X	Trbl Code	Start Depth (mKB)	End Depth (mKB)	Operation
17:15	23:30	6.25	INTRM1	DRILL	DRLG	P		856.00	1,047.00	Drill 222mm hole, with 513 Ultrerra PDC bit, Wenzel mud motor, 7/8 lobe, 5 stage (0.077rev/L), set at 1.59 deg. with 0.81m from bit to bend, from 856m to 1047m
23:30	00:00	0.50	INTRM1	DRILL	SRVY	P		1,047.00	1,047.00	Accumulated directional surveys

Fluid/Mud Chks: Mud Engineer: Corey Clark

Time	14:00	Depth (mKB)	780.00	Density (kg/m³)	995.0	Funnel Viscosity (s/L)	62	pH		PV Override (Pa·s)	15.0	YP Override (Pa)	3.5
Low Gravity Solids (%)	8.8	MBT (kg/m³)		Oil Water Ratio	80/20	Chlorides (mg/L)	161,771	Calcium (mg/L)	31	Lime (kg/m³)	12	Potassium (mg/L)	
Electric Stab (V)	490.0	ECD - Manual Entry (k...)	1,042.0	Sand (%)	2.6	Solids, Corr. (%)	8.8	T Flowline (°C)	28	HTHP Pressure (kPa)		HTHP Filtrate (mL/30...)	6.0
API Filtrate (mL/30min)		Mud Lost to Surface (m³)	9.00	Mud Lost to Hole (m³)	2.00	Daily Mud Field Est (Cost)							14,627.25
Cum Mud Lost to Surface (m³)	9.00	Cum Mud Lost to Hole (m³)	2.00	Cumulative Mud Cost (Cost)									35,634.60

Last BOP Drill

Type	BOP Drill	Days Last Chk (...)	0	Last Date	2/7/2014	Days Until Next...	5	Next Check Date	2/12/2014
Days Since Lost Time Incident (days)	848.00	Days Since Recordable Incident (days)	848.00						

Safety Incidents

Date	Com	Category

Drill String: BHA # 3

Bit Run	3	Drill Bit	222.0mm, u513, 17071	Length (m)	0.20	IADC Bit Dull	-----	TFA (incl Noz) (mm²)	677	BHA ROP (m/hr)	21.2
Nozzles (mm)	11.1/11.1/11.1/11.1/11.1/11.1/11.1	String Length (m)	1,921.00	OD (mm)	173.0	Max Rotating Hook Load (daN)	7				
Depth In (mKB)	602.00	Depth Out (mKB)	1,921.00	Avg ROP (m/hr)	21.2	Depth This Job (m)	1,319.00	Total Depth Drilled b...	1,319.00	Job Drill Hrs (hr)	62.25
										Total Drill Hrs (hr)	62.25

Comment

Drill 222mm hole, with 513 Ultrerra PDC bit, Wenzel mud motor, 7/8 lobe, 5 stage (0.077rev/L), set at 1.59 deg. with 0.81m from bit to bend. NM float sub, NM Pony monel, NM gap sub, 1 x MWD flex NM monel, 2 x NM flex monels, 3 joints HWDP, 1 x Jars, 37 joints HWDP

Drill String Components

Item Des	ID (mm)	OD (mm)	Jts	Len (m)	Cum Len (m)
Drill pipe - Stands	68.0	101.0	79	1,501.64	1,921.00
4" H.W	65.0	101.0	37	344.46	419.36
Jars	69.0	161.0	1	5.13	74.90
4" H.W	65.0	101.0	3	28.27	69.77
6.75" X/O	59.0	168.0	1	0.80	41.50
6.75" NM Flex Mon	70.0	171.0	1	8.28	40.70
6.75" Flex Monel	70.0	171.0	1	9.20	32.42
6.75" Gap Sub	88.0	162.0	1	0.54	23.22
4.5"H90 FLEX MONEL	70.0	171.0	1	9.35	22.68
NM pony monel	70.0	171.0	1	2.97	13.33
N.M SUB	72.0	173.0	1	0.54	10.36
MUD MOTOR	64.0	169.0	1	9.62	9.82

Drilling Parameter: 818.00 - 1,047.00 mKB

Cum Depth (m)	445.00	Cum Drill...	13.75	Int ROP (...)	31.6	Flow Rate...	1.800	WOB (daN)	6,000	RPM (r...	60	SPP (kPa)	15,000	Drill Str Wt (d...	47,000	SO Str Wt (daN)	46,000	PU Str Wt (daN)	48,000	Off-Btm Str W...	47,000	Drill Tq	9,100.0
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Hydraulic Calculations

Bit Hydraulic Powe...	32.8	HP/Area (kW/mm²)	0.00085	% P @ bit (%)	7	Bit Jet Velocity (m/s)	44.3	Bit dP (kPa)	1,094.9	P Drop Annular (kPa)	153.5	Mud Density (kg/m³)	995.0	ECD End (kg/m³)	1,010.0
Drill String Volume (m³)	3.69	Bit to Shoe Volume (m³)	12.98	Vol Shoe to Top (m³)	19.29	Min Casing AV (m/min)	55.7	Max Casing AV (m/min)	55.7	Min Open Hole AV (m/...	26.5	Max Open Hole AV (m/...	118.4		

Error

Mud Pump: 1, NATIONAL, 8-P-80

Pump Number	1	Make	NATIONAL	Model	8-P-80	Rod Diameter (mm)	140.0	Stroke Length (mm)	216.0
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Pump Checks

Date	Depth (mKB)	Q Flow (m³/min)	P (kPa)	Strokes (spm)
2/16/2014 16:00	2,209.00	0.608	5,153	78

Daily Drilling

COPRC MIRROR LAKE P-20 65-00 126-45

Rig: Beaver Drilling Ltd. 2

Report Date: 2/7/2014
Report #: 15
Depth Progress: 445.00m
Depth End: 1,047.00mKB
Rig Release Date: 2/23/2014

Date	Depth (mKB)	Q Flow (m³/min)	P (kPa)	Strokes (spm)
2/16/2014 16:00	2,209.00	1.045	15,600	134

Start Date	End Date	Liner Size (mm)	P Max (kPa)	Vol/Stk OR (m³/stk)
2/15/2014	2/15/2014	127.0		
2/16/2014	2/16/2014	127.0		

Mud Pump: 2, NATIONAL, 8-P-80

Pump Number	Make	Model	Rod Diameter (mm)	Stroke Length (mm)
2	NATIONAL	8-P-80	140.0	216.0

Date	Depth (mKB)	Q Flow (m³/min)	P (kPa)	Strokes (spm)
2/19/2014 23:45	3,152.00	0.975	12,600	125
2/20/2014 00:00	3,143.00	0.647	6,414	83

Start Date	End Date	Liner Size (mm)	P Max (kPa)	Vol/Stk OR (m³/stk)
2/20/2014	2/20/2014	127.0		
2/21/2014	2/21/2014	127.0		

Des	Start Date	End Date	Scr Sz X	Scr Sz Y	Note

Centrifuge/Cyclone: HGS Centrifuge, BOS Solutions, 5500

Number	Make	Model	Diameter (mm)
2	BOS Solutions	5500	

Date	Hrs (hr)	RPM (rpm)	Dens OF (kg/m³)	Q OF (L/min)	Dens UF (kg/m³)	Q UF (L/min)
2/21/2014 00:00	3.00	2100	1,040.0	0.400	1,710.0	0.200

Centrifuge/Cyclone: HGS Centrifuge, BOS Solutions, 5500

Number	Make	Model	Diameter (mm)
1	BOS Solutions	5500	

Date	Hrs (hr)	RPM (rpm)	Dens OF (kg/m³)	Q OF (L/min)	Dens UF (kg/m³)	Q UF (L/min)
2/21/2014 00:00	3.00	2100	1,100.0	0.400	1,790.0	0.200

Fluid / Mud Additive Amounts

Des	Consumed	Cost	Size	Units
CALCIUM CHLORIDE	1.0	43.920	40.0	SX
INVERT	11.0	1,063.330	1.0	M3
Lime	48.0	7.170	20.0	SX
OPTISEAL	5.0	96.200	25.0	SX
Versacoat HF	1.0	883.570	55.0	BBL
VERSAMUL	1.0	940.470	22.68	BBL
Versatrol	5.0	47.500	50.0	SX

Survey Data

Date	MD (mKB)	Incl (°)	Azm (°)	TVD (mKB)	Depart (m)	NS (m)	EW (m)	VS (m)	DLS (°/30m)
2/7/2014	608.40	1.60	7.20	608.28	9.46	9.46	0.01	2.42	0.98
2/7/2014	645.63	0.60	311.20	645.51	10.10	10.10	-0.07	2.66	1.09
2/7/2014	683.60	9.00	318.00	683.31	12.64	12.44	-2.21	5.34	6.64
2/7/2014	721.66	0.90	317.90	721.20	15.52	14.88	-4.40	8.09	6.38
2/7/2014	759.75	0.90	254.40	759.28	15.80	15.02	-4.89	8.59	0.75
2/7/2014	797.80	0.70	282.20	797.33	15.94	14.99	-5.41	9.08	0.34
2/7/2014	835.87	0.40	326.90	835.40	16.19	15.15	-5.71	9.42	0.40
2/7/2014	873.90	0.40	355.60	873.43	16.45	15.40	-5.79	9.56	0.16
2/7/2014	912.00	0.80	20.40	911.52	16.78	15.78	-5.71	9.58	0.37
2/7/2014	988.00	0.70	19.50	987.52	17.55	16.71	-5.37	9.49	0.04

Formations

Formation Name	Drill Top MD (mKB)	Drill Top (TVD) (mKB)	Prog Top TVD (mKB)
Little Bear	43.00	43.00	20.85
St. Mary River	207.00	207.00	197.35
Red	954.00	953.52	932.35
Martin House	1,110.00	1,109.49	1,084.35
Imperial	1,140.00	1,139.48	1,118.35
KOP (5deg/30m)	1,731.00	1,730.40	1,730.73
KOP (7deg/30m)	1,817.00	1,815.65	1,816.00

Daily Drilling
COPRC MIRROR LAKE P-20 65-00 126-45

Rig: Beaver Drilling Ltd. 2

Report Date: 2/7/2014
Report #: 15
Depth Progress: 445.00m
Depth End: 1,047.00mKB
Rig Release Date: 2/23/2014

Formations			
Formation Name	Drill Top MD (mKB)	Drill Top (TVD) (mKB)	Prog Top TVD (mKB)
Upper Canol	1,902.70	1,896.20	1,897.35
Lower Canol	1,935.80	1,924.43	1,929.35

Daily Drilling

COPRC MIRROR LAKE P-20 65-00 126-45

Report Date: 2/8/2014
Report #: 16
Depth Progress: 475.00m
Depth End: 1,522.00mKB
Rig Release Date: 2/23/2014

Rig: Beaver Drilling Ltd. 2

/UWI 200/D-020/L094P1699		Surface Legal Location P-20 65-00 126-45		MaxWell Job Number JOB01@2006		License No. EL 470					
Ground Elevation (m) 284.15		Original KB/RT Elevation (m) 289.35		Casing Flange Elevation (m) 283.95		Original Spud Date 1/29/2014		Days From Spud (days) 16.00			
Job Category DRILLING		Primary Job Type DRILLING ORIGINAL		Actual Start Date 1/24/2014 00:00		End Date 2/23/2014 23:59		Final Job Status DRILLED		Final Report? Yes	
Daily Cost Total (Cost) 257,034.63		Cumulative Cost (Cost) 2,556,757.37		Total AFE (Cost) 7,122,600.00		AFE+Supp Amt (Cost) 7,122,600.00		AFE / RFE / Maint.# 10351812		Estimated Days	
Planned Depth (TMD) (mKB)		Override TVD (mKB)		Head Count 67.0		Personnel Total Hours (hr) 644.00		Cum Personnel Total Hours (hr) 8,682.00			
Avg Connection Gas 100		Avg Background Gas 75			Avg Trip Gas			Max H2S (ppm) 0			
Road Condition Ice/Snow		Weather Clear			Temperature (°C) -30			Wind NW 20 kms			
Ops and Depth @ Morning Report Drill 222mm intermediate hole at 1577m. Inc: 0.7°. Azm: 120.3°.								Wellbore Original Hole			

Last 24hr Summary

No incidents or accidents. 9 - HID, 1 - OBS and 0 - ASA (all closed out)

Drill 222mm intermediate directional hole from 1047m to 1522m with accumulated MWD surveys, rig services, connections and circulation times. WOB: 6-8,000kDaN, RPM - 65-80 (Motor RPM - 131), Differential pressure: 100-3500kPa, Pump rate: 1.6-1.8 m3/min. Torque: 9,000 - 10,000ft/lbs, Rotate: 456m - 96% / Slide: 19m - 4%, ROP: 23.2m/hr. Last survey at 1577mMD, inclination= 0.7°, azimuth= 120.3°, TVD - 1577m.

24hr Forecast

Drill 222mm intermediate directional hole with accumulated MWD surveys, rig services, connections and circulation times.

Daily Contacts

Drilling Superintend, Sheldon Vamplew, 403-999-1302; Drilling Engineer, Mike Greener, 403-771-5039; WS Supervisor, Richard Turgeon, 780-387-1706; WS Supervisor, Dave Oppen, 403-863-8205; Rig Manager, Rick Yavis, 780-718-2962; Command Centre, 403-910-0357

Last Casing String

Surface, 602.00mKB

Time Log

Start Time	End Time	Dur (hr)	Phase	Op Code	Activity Code	Time P-T-X	Trbl Code	Start Depth (mKB)	End Depth (mKB)	Operation
00:00	01:15	1.25	INTRM1	DRILL	DRLG	P		1,047.00	1,085.00	Drill 222mm hole, with 513 Ulterra PDC bit, Wenzel mud motor, 7/8 lobe, 5 stage (0.077rev/L), set at 1.59 deg. with 0.81m from bit to bend, from 1047m to 1085 m
01:15	01:30	0.25	INTRM1	RIGMNT	SVRG	P		1,085.00	1,085.00	Rig service function test rig smart anti-collision system, function test, function test pipe rams 8 sec C/O crown saver,grease all moving parts, check oil levels in floor motor, pumps and HPU
01:30	07:15	5.75	INTRM1	DRILL	DRLG	P		1,085.00	1,208.00	Drill 222mm hole, with 513 Ulterra PDC bit, Wenzel mud motor, 7/8 lobe, 5 stage (0.077rev/L), set at 1.59 deg. with 0.81m from bit to bend, from 1085m to 1208m
07:15	07:45	0.50	INTRM1	DRILL	SRVY	P		1,208.00	1,208.00	Accumulated directional surveys
07:45	08:00	0.25	INTRM1	DRILL	SFTY	P		1,208.00	1,208.00	Crew handover meeting, Conoco reps. and toolpush present
08:00	08:15	0.25	INTRM1	RIGMNT	SVRG	P		1,208.00	1,208.00	Rig service function test rig smart anti-collision system, function test, function test hydrl 14 sec C/O crown saver,grease all moving parts, check oil levels in floor motor, pumps and HPU
08:15	15:30	7.25	INTRM1	DRILL	DRLG	P		1,208.00	1,389.00	Drill 222mm hole, with 513 Ulterra PDC bit, Wenzel mud motor, 7/8 lobe, 5 stage (0.077rev/L), set at 1.59 deg. with 0.81m from bit to bend, from 1208m to 1389 m
15:30	16:00	0.50	INTRM1	DRILL	SRVY	P		1,389.00	1,389.00	Accumulated time for directional surveys
16:00	16:45	0.75	INTRM1	DRILL	DRLG	P		1,389.00	1,408.00	Drill 222mm hole, with 513 Ulterra PDC bit, Wenzel mud motor, 7/8 lobe, 5 stage (0.077rev/L), set at 1.59 deg. with 0.81m from bit to bend, from 1389m to 1408 m
16:45	17:00	0.25	INTRM1	RIGMNT	SVRG	P		1,408.00	1,408.00	Rig service function test rig smart anti-collision system, function test, function test hydrl 14 sec C/O crown saver,grease all moving parts, check oil levels in floor motor, pumps and HPU
17:00	20:15	3.25	INTRM1	DRILL	DRLG	P		1,408.00	1,484.00	Drill 222mm hole, with 513 Ulterra PDC bit, Wenzel mud motor, 7/8 lobe, 5 stage (0.077rev/L), set at 1.59 deg. with 0.81m from bit to bend, from 1408m to 1484 m
20:15	21:15	1.00	INTRM1	RIGMNT	RGRP	T	Rig	1,484.00	1,484.00	Change out cap gasket on # 2 pump change out seal retainer on pump #1
21:15	23:30	2.25	INTRM1	DRILL	DRLG	P		1,484.00	1,522.00	Drill 222mm hole, with 513 Ulterra PDC bit, Wenzel mud motor, 7/8 lobe, 5 stage (0.077rev/L), set at 1.59 deg. with 0.81m from bit to bend, from 1484m to 1522m

Daily Drilling

COPRC MIRROR LAKE P-20 65-00 126-45

Rig: Beaver Drilling Ltd. 2

Report Date: 2/8/2014
Report #: 16
Depth Progress: 475.00m
Depth End: 1,522.00mKB
Rig Release Date: 2/23/2014

Time Log

Start Time	End Time	Dur (hr)	Phase	Op Code	Activity Code	Time P-T-X	Trbl Code	Start Depth (mKB)	End Depth (mKB)	Operation
23:30	00:00	0.50	INTRM1	DRILL	SRVY	P		1,522.00	1,522.00	Accumulated directional surveys

Fluid/Mud Chks: Mud Engineer: Corey Clark

Time	14:30	Depth (mKB)	1,377.00	Density (kg/m³)	965.0	Funnel Viscosity (s/L)	50	pH		PV Override (Pa-s)	8.0	YP Override (Pa)	2.5
Low Gravity Solids (%)	7.4	MBT (kg/m³)		Oil Water Ratio	84/16	Chlorides (mg/L)	179,998	Calcium (mg/L)	29	Lime (kg/m³)	12	Potassium (mg/L)	
Electric Stab (V)	510.0	ECD - Manual Entry (k...)	993.0	Sand (%)	2.6	Solids, Corr. (%)	7.4	T Flowline (°C)	37	HTHP Pressure (kPa)		HTHP Filtrate (mL/30...)	7.5
API Filtrate (mL/30min)		Mud Lost to Surface (m³)		Mud Lost to Hole (m³)	14.00	Daily Mud Field Est (Cost)							
Cum Mud Lost to Surface (m³)	23.00	Cum Mud Lost to Hole (m³)	5.00	Cumulative Mud Cost (Cost)									21,241.70
Last BOP Drill													56,876.30

Type	BOP Drill	Days Last Chk (...)	1	Last Date	2/7/2014	Days Until Next...	4	Next Check Date	2/12/2014
Days Since Lost Time Incident (days)				Days Since Recordable Incident (days)					
					849.00				849.00

Safety Incidents

Date	Com	Category

Drill String: BHA # 3

Bit Run	3	Drill Bit	222.0mm, u513, 17071	Length (m)	0.20	IADC Bit Dull		TFA (incl Noz) (mm²)	677	BHA ROP (m/hr)	21.2
Nozzles (mm)	11.1/11.1/11.1/11.1/11.1/11.1/11.1/11.1	String Length (m)	1,921.00	OD (mm)	173.0	Max Rotating Hook Load (daN)					70,000
Depth In (mKB)	602.00	Depth Out (mKB)	1,921.00	Avg ROP (m/hr)	21.2	Depth This Job (m)	1,319.00	Total Depth Drilled b...	1,319.00	Job Drill Hrs (hr)	62.25
										Total Drill Hrs (hr)	62.25

Comment
Drill 222mm hole, with 513 Ultrerra PDC bit, Wenzel mud motor, 7/8 lobe, 5 stage (0.077rev/L), set at 1.59 deg. with 0.81m from bit to bend. NM float sub, NM Pol monel, NM gap sub, 1 x MWD flex NM monel, 2 x NM flex monels, 3 joints HWDP, 1 x Jars, 37 joints HWDP

Drill String Components

Item Des	ID (mm)	OD (mm)	Jts	Len (m)	Cum Len (m)
Drill pipe - Stands	68.0	101.0	79	1,501.64	1,921.00
4" H.W	65.0	101.0	37	344.46	419.36
Jars	69.0	161.0	1	5.13	74.90
4" H.W	65.0	101.0	3	28.27	69.77
6.75" X/O	59.0	168.0	1	0.80	41.50
6.75" NM Flex Mon	70.0	171.0	1	8.28	40.70
6.75" Flex Monel	70.0	171.0	1	9.20	32.42
6.75" Gap Sub	88.0	162.0	1	0.54	23.22
4.5"H90 FLEX MONEL	70.0	171.0	1	9.35	22.68
NM pony monel	70.0	171.0	1	2.97	13.33
N.M SUB	72.0	173.0	1	0.54	10.36
MUD MOTOR	64.0	169.0	1	9.62	9.82

Drilling Parameter: 1,389.00 - 1,522.00 mKB

Cum Depth (m)	Cum Drill...	Int ROP (...)	Flow Rate...	WOB (daN)	RPM (r...	SPP (kPa)	Drill Str Wt (d...	SO Str Wt (daN)	PU Str Wt (daN)	Off-Btm Str W...	Drill Tq
920.00	34.25	21.3	1.700	7,000	65	16,200	60,000	59,000	61,000	60,000	9,600.0

Hydraulic Calculations

Bit Hydraulic Powe...	HP/Area (kW/mm²)	% P @ bit (%)	6	Bit Jet Velocity (m/s)	41.8	Bit dP (kPa)	947.2	P Drop Annular (kPa)	154.7	Mud Density (kg/m³)	965.0	ECD End (kg/m³)	975.4
Drill String Volume (m³)	5.41	Bit to Shoe Volume (m³)	27.56	Vol Shoe to Top (m³)	19.29	Min Casing AV (m/min)	52.6	Max Casing AV (m/min)	52.6	Min Open Hole AV (m/...	25.0	Max Open Hole AV (m/...	111.8
Error													

Mud Pump: 1, NATIONAL, 8-P-80

Pump Number	1	Make	NATIONAL	Model	8-P-80	Rod Diameter (mm)	140.0	Stroke Length (mm)	216.0
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Pump Checks

Date	Depth (mKB)	Q Flow (m³/min)	P (kPa)	Strokes (spm)
2/16/2014 16:00		2,209.00	0.608	78
2/16/2014 16:00		2,209.00	1.045	134

Daily Drilling

COPRC MIRROR LAKE P-20 65-00 126-45

Rig: Beaver Drilling Ltd. 2

Report Date: 2/8/2014
Report #: 16
Depth Progress: 475.00m
Depth End: 1,522.00mKB
Rig Release Date: 2/23/2014

Drilling Operations

Start Date	End Date	Liner Size (mm)	P Max (kPa)	Vol/Stk OR (m³/stk)
2/15/2014	2/15/2014	127.0		
2/16/2014	2/16/2014	127.0		

Mud Pump: 2, NATIONAL, 8-P-80

Pump Number	Make	Model	Rod Diameter (mm)	Stroke Length (mm)
2	NATIONAL	8-P-80	140.0	216.0

Pump Checks

Date	Depth (mKB)	Q Flow (m³/min)	P (kPa)	Strokes (spm)
2/19/2014 23:45	3,152.00	0.975	12,600	125
2/20/2014 00:00	3,143.00	0.647	6,414	83

Pump Operations

Start Date	End Date	Liner Size (mm)	P Max (kPa)	Vol/Stk OR (m³/stk)
2/20/2014	2/20/2014	127.0		
2/21/2014	2/21/2014	127.0		

Shaker Screens

Des	Start Date	End Date	Scr Sz X	Scr Sz Y	Note

Centrifuge/Cyclone: HGS Centrifuge, BOS Solutions, 5500

Number	Make	Model	Diameter (mm)
2	BOS Solutions	5500	

Centrifuge/Cyclone Checks

Date	Hrs (hr)	RPM (rpm)	Dens OF (kg/m³)	Q OF (L/min)	Dens UF (kg/m³)	Q UF (L/min)
2/21/2014 00:00	3.00	2100	1,040.0	0.400	1,710.0	0.200

Centrifuge/Cyclone: HGS Centrifuge, BOS Solutions, 5500

Number	Make	Model	Diameter (mm)
1	BOS Solutions	5500	

Centrifuge/Cyclone Checks

Date	Hrs (hr)	RPM (rpm)	Dens OF (kg/m³)	Q OF (L/min)	Dens UF (kg/m³)	Q UF (L/min)
2/21/2014 00:00	3.00	2100	1,100.0	0.400	1,790.0	0.200

Mud Additive Amounts

Des	Consumed	Cost	Size	Units
CALCIUM CHLORIDE	32.0	43.920	40.0	SX
INVERT	17.0	1,063.330	1.0	M3
Lime	45.0	7.170	20.0	SX
OPTISEAL	10.0	96.200	25.0	SX
Versatrol	10.0	47.500	50.0	SX

Survey Data

Date	MD (mKB)	Incl (°)	Azm (°)	TVD (mKB)	Depart (m)	NS (m)	EW (m)	VS (m)	DLS (°/30m)
2/8/2014	1,045.00	1.50	14.84	1,044.51	18.47	17.76	-5.06	9.46	0.42
2/8/2014	1,083.00	1.28	27.45	1,082.50	19.21	18.62	-4.74	9.37	0.30
2/8/2014	1,121.00	1.59	29.26	1,120.48	19.92	19.46	-4.28	9.15	0.25
2/8/2014	1,197.00	0.90	31.80	1,196.47	21.17	20.88	-3.45	8.71	0.27
2/8/2014	1,235.00	0.70	28.10	1,234.46	21.58	21.34	-3.19	8.57	0.16
2/8/2014	1,273.00	1.10	150.40	1,272.46	21.43	21.23	-2.90	8.26	1.25
2/8/2014	1,311.00	1.00	101.40	1,310.45	20.98	20.85	-2.39	7.68	0.69
2/8/2014	1,349.50	1.20	349.90	1,348.95	21.28	21.18	-2.13	7.51	1.42
2/8/2014	1,387.50	1.40	15.40	1,386.94	22.11	22.02	-2.08	7.68	0.48
2/8/2014	1,425.50	0.40	0.10	1,424.94	22.68	22.60	-1.96	7.71	0.80
2/8/2014	1,463.50	0.62	1.66	1,462.93	23.02	22.93	-1.95	7.79	0.17
2/8/2014	1,501.50	0.88	5.67	1,500.93	23.51	23.43	-1.92	7.88	0.21

Formations

Formation Name	Drill Top MD (mKB)	Drill Top (TVD) (mKB)	Prog Top TVD (mKB)
Little Bear	43.00	43.00	20.85
Slater River	207.00	207.00	197.35
Arctic Red	954.00	953.52	932.35
Martin House	1,110.00	1,109.49	1,084.35
trial	1,140.00	1,139.48	1,118.35
(5deg/30m)	1,731.00	1,730.40	1,730.73
KOP (7deg/30m)	1,817.00	1,815.65	1,816.00
Upper Canol	1,902.70	1,896.20	1,897.35
Lower Canol	1,935.80	1,924.43	1,929.35

Daily Drilling

COPRC MIRROR LAKE P-20 65-00 126-45

Rig: Beaver Drilling Ltd. 2

Report Date: 2/9/2014
Report #: 17
Depth Progress: 333.00m
Depth End: 1,855.00mKB
Rig Release Date: 2/23/2014

UWI 200/D-020/L094P1699		Surface Legal Location P-20 65-00 126-45		MaxWell Job Number JOB01@2006		License No. EL 470					
Ground Elevation (m) 284.15		Original KB/RT Elevation (m) 289.35		Casing Flange Elevation (m) 283.95		Original Spud Date 1/29/2014		Days From Spud (days) 17.00			
Job Category DRILLING		Primary Job Type DRILLING ORIGINAL		Actual Start Date 1/24/2014 00:00		End Date 2/23/2014 23:59		Final Job Status DRILLED		Final Report? Yes	
Daily Cost Total (Cost) 125,765.76		Cumulative Cost (Cost) 2,682,523.13		Total AFE (Cost) 7,122,600.00		AFE+Supp Amt (Cost) 7,122,600.00		AFE / RFE / Maint.# 10351812		Estimated Days	
Planned Depth (TMD) (mKB)		Override TVD (mKB)		Head Count 52.0		Personnel Total Hours (hr) 582.00		Cum Personnel Total Hours (hr) 9,264.00			
Avg Connection Gas 105		Avg Background Gas 70		Avg Trip Gas				Max H2S (ppm) 0			
Road Condition Ice/Snow		Weather Cloudy		Temperature (°C) -25				Wind NW 25 kms			
Ops and Depth @ Morning Report Drill 222mm intermediate directional hole at 1902m								Wellbore Original Hole			

Last 24hr Summary

No incidents or accidents. 9 - HID, 1 - OBS and 0 - ASA (all closed out)

Drill 222mm intermediate directional hole from 1522m to 1855m with accumulated MWD surveys, rig services, connections and circulation times. WOB: 6-8,000kDaN, RPM - 65-80 (Motor RPM - 131), Differential pressure: 100-3500kPa, Pump rate: 1.6-1.8 m3/min. Torque: 9,000 - 10,000ft/lbs, Rotate: 246m - 74% / Slide: 87m - 26%, ROP: 19.59m/hr. Last survey at 1862.5mMD, inclination= 20.0°, azimuth= 286.20°. TVD - 1853.76m. We are 0.56m above and 24.7m right of the line - 1.5° behind in angle - 0.86° behind in azimuth - 24.77m center to center - BURR: 7.4°/30m. KOP: 1731mMD.

24hr Forecast

Drill 222mm intermediate directional hole with accumulated MWD surveys, rig services, connections and circulation times.

Daily Contacts

Drilling Superintendent, Sheldon Vamplew, 403-999-1302; Drilling Engineer, Mike Greener, 403-771-5039; WS Supervisor, Richard Turgeon, 780-387-1706; WS Supervisor, Dave Oppen, 403-863-8205; Rig Manager, Rick Yavis, 780-718-2962; Command Centre, 403-910-0357

Last Casing String

Surface, 602.00mKB

Time Log

Time	End Time	Dur (hr)	Phase	Op Code	Activity Code	Time P-T-X	Trbl Code	Start Depth (mKB)	End Depth (mKB)	Operation
00:00	01:15	1.25	INTRM1	DRILL	DRLG	P		1,522.00	1,541.00	Drill 222mm hole, with 513 Ulterra PDC bit, Wenzel mud motor, 7/8 lobe, 5 stage (0.077rev/L), set at 1.59 deg. with 0.81m from bit to bend, from 1522m to 1541m
01:15	02:00	0.75	INTRM1	DRILL	CIRC	P		1,541.00	1,541.00	Work tight spot @1537m to 1541m
02:00	03:00	1.00	INTRM1	DRILL	DRLG	P		1,541.00	1,560.00	Drill 222mm hole, with 513 Ulterra PDC bit, Wenzel mud motor, 7/8 lobe, 5 stage (0.077rev/L), set at 1.59 deg. with 0.81m from bit to bend, from 1541m to 1560m
03:00	03:15	0.25	INTRM1	RIGMNT	SVRG	P		1,560.00	1,560.00	Rig service function test rig smart anti-collision system, function test, function test hydri 14 sec C/O crown saver,grease all moving parts, check oil levels in floor motor, pumps and HPU
03:15	07:15	4.00	INTRM1	DRILL	DRLG	P		1,560.00	1,646.00	Drill 222mm hole, with 513 Ulterra PDC bit, Wenzel mud motor, 7/8 lobe, 5 stage (0.077rev/L), set at 1.59 deg. with 0.81m from bit to bend, from 1560m to 1646m
07:15	07:45	0.50	INTRM1	DRILL	SRVY	P		1,646.00	1,646.00	Accumulated directional surveys
07:45	08:00	0.25	INTRM1	DRILL	SFTY	P		1,646.00	1,646.00	Crew handover meeting, Conoco reps. and toolpush present
08:00	08:15	0.25	INTRM1	RIGMNT	SVRG	P		1,646.00	1,646.00	Rig service function test rig smart anti-collision system, function test pipe ram's 4 sec crown saver,grease all moving parts, check oil levels in floor motor, pumps and HPU
08:15	15:15	7.00	INTRM1	DRILL	DRLG	P		1,646.00	1,777.00	Drill 222mm hole, with 513 Ulterra PDC bit, Wenzel mud motor, 7/8 lobe, 5 stage (0.077rev/L), set at 1.59 deg. with 0.81m from bit to bend, from 1646m to 1777 m
15:15	16:00	0.75	INTRM1	DRILL	SRVY	P		1,777.00	1,777.00	Accumulated time for surveys
16:00	16:45	0.75	INTRM1	DRILL	DRLG	P		1,777.00	1,788.00	Drill 222mm hole, with 513 Ulterra PDC bit, Wenzel mud motor, 7/8 lobe, 5 stage (0.077rev/L), set at 1.59 deg. with 0.81m from bit to bend, from 1777m to 1788 m
16:45	17:00	0.25	INTRM1	RIGMNT	SVRG	P		1,788.00	1,788.00	Rig service function test rig smart anti-collision system, function test hydri 14 sec to close crown saver,grease all moving parts, check oil levels in floor motor, pumps and HPU
17:00	19:00	2.00	INTRM1	DRILL	DRLG	P		1,788.00	1,808.00	Drill 222mm hole, with 513 Ulterra PDC bit, Wenzel mud motor, 7/8 lobe, 5 stage (0.077rev/L), set at 1.59 deg. with 0.81m from bit to bend, from 1788m to 1808m

Daily Drilling

COPRC MIRROR LAKE P-20 65-00 126-45

Rig: Beaver Drilling Ltd. 2

Report Date: 2/9/2014
Report #: 17
Depth Progress: 333.00m
Depth End: 1,855.00mKB
Rig Release Date: 2/23/2014

Time Log

Start Time	End Time	Dur (hr)	Phase	Op Code	Activity Code	Time P-T-X	Trbl Code	Start Depth (mKB)	End Depth (mKB)	Operation
19:00	19:15	0.25	INTRM1	DRILL	SFTY	P		1,808.00	1,808.00	Crew handover meeting, Conoco reps. and toolpush present
19:15	23:30	4.25	INTRM1	DRILL	DRLG	P		1,808.00	1,855.00	Drill 222mm hole, with 513 Ulterra PDC bit, Wenzel mud motor, 7/8 lobe, 5 stage (0.077rev/L), set at 1.59 deg. with 0.81m from bit to bend, from 1808m to 1855m
23:30	00:00	0.50	INTRM1	DRILL	SRVY	P		1,855.00	1,855.00	Accumulated Directional surveys

Fluid/Mud Chks: Mud Engineer: Corey Clark

Time 13:15	Depth (mKB) 1,756.00	Density (kg/m³) 1,020.0	Funnel Viscosity (s/L) 50	pH	PV Override (Pa·s) 16.0	YP Override (Pa) 4.0
Low Gravity Solids (%) 8.1	MBT (kg/m³)	Oil Water Ratio 83/17	Chlorides (mg/L) 219,005	Calcium (mg/L) 27	Lime (kg/m³) 15	Potassium (mg/L)
Electric Stab (V) 590.0	ECD - Manual Entry (k... 1,065.0	Sand (%) 2.8	Solids, Corr. (%) 9.0	T Flowline (°C) 46	HTHP Pressure (kPa)	HTHP Filtrate (mL/30... 6.0
API Filtrate (mL/30min)		Mud Lost to Surface (m³) 10.00	Mud Lost to Hole (m³) 2.00		Daily Mud Field Est (Cost) 19,398.91	
Cum Mud Lost to Surface (m³) 33.00		Cum Mud Lost to Hole (m³) 7.00		Cumulative Mud Cost (Cost) 76,275.21		

Last BOP Drill

Type BOP Drill	Days Last Chk (...) 2	Last Date 2/7/2014	Days Until Next... 3	Next Check Date 2/12/2014
Days Since Lost Time Incident (days) 850.00	Days Since Recordable Incident (days) 850.00			

Safety Incidents

Date	Com	Category

Drill String: BHA # 3

Bit Run 3	Drill Bit 222.0mm, u513, 17071	Length (m) 0.20	IADC Bit Dull	TFA (Incl Noz) (mm²) 677	BHA ROP (m/hr) 21.2
Nozzles (mm) 11.1/11.1/11.1/11.1/11.1/11.1	String Length (m) 1,921.00	OD (mm) 173.0	Max Rotating Hook Load (daN) 70,000		
Depth In (mKB) 602.00	Depth Out (mKB) 1,921.00	Avg ROP (m/hr) 21.2	Depth This Job (m) 1,319.00	Total Depth Drilled b... 1,319.00	Job Drill Hrs (hr) 62.25
				Total Drill Hrs (hr) 62.25	

Comment
Drill 222mm hole, with 513 Ulterra PDC bit, Wenzel mud motor, 7/8 lobe, 5 stage (0.077rev/L), set at 1.59 deg. with 0.81m from bit to bend. NM float sub, NM Pony monel, NM gap sub, 1 x MWD flex NM monel, 2 x NM flex monels, 3 joints HWDP, 1 x Jars, 37 joints HWDP

Drill String Components

Item Des	ID (mm)	OD (mm)	Jts	Len (m)	Cum Len (m)
Drill pipe - Stands	68.0	101.0	79	1,501.64	1,921.00
4" H.W	65.0	101.0	37	344.46	419.36
Jars	69.0	161.0	1	5.13	74.90
4" H.W	65.0	101.0	3	28.27	69.77
6.75" X/O	59.0	168.0	1	0.80	41.50
6.75" NM Flex Mon	70.0	171.0	1	8.28	40.70
6.75" Flex Monel	70.0	171.0	1	9.20	32.42
6.75" Gap Sub	88.0	162.0	1	0.54	23.22
4.5"H90 FLEX MONEL	70.0	171.0	1	9.35	22.68
NM pony monel	70.0	171.0	1	2.97	13.33
N.M SUB	72.0	173.0	1	0.54	10.36
MUD MOTOR	64.0	169.0	1	9.62	9.82

Drilling Parameter: 1,777.00 - 1,855.00 mKB

Cum Depth (m) 1,253.00	Cum Drill... 54.50	Int ROP (...) 11.1	Flow Rate... 1.700	WOB (daN) 8,000	RPM (r... 65	SPP (kPa) 16,500	Drill Str Wt (d... 69,000	SO Str Wt (daN) 67,000	PU Str Wt (daN) 71,000	Off-Btm Str W... 69,000	Drill Tq 10,100.0
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Hydraulic Calculations

Bit Hydraulic Powe... 28.4	HP/Area (kW/mm²) 0.00073	% P @ bit (%) 6	Bit Jet Velocity (m/s) 41.8	Bit dP (kPa) 1,001.2	P Drop Annular (kPa) 350.9	Mud Density (kg/m³) 1,020.0	ECD End (kg/m³) 1,039.3
Drill String Volume (m³) 6.62	Bit to Shoe Volume (m³) 37.78	Vol Shoe to Top (m³) 19.29	Min Casing AV (m/min) 52.6	Max Casing AV (m/min) 52.6	Min Open Hole AV (m/min) 25.0	Max Open Hole AV (m/min) 111.8	

Error

Mud Pump: 1, NATIONAL, 8-P-80

Pump Number 1	Make NATIONAL	Model 8-P-80	Rod Diameter (mm) 140.0	Stroke Length (mm) 216.0
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Daily Drilling

COPRC MIRROR LAKE P-20 65-00 126-45

Rig: Beaver Drilling Ltd. 2

Report Date: 2/9/2014
Report #: 17
Depth Progress: 333.00m
Depth End: 1,855.00mKB
Rig Release Date: 2/23/2014

np Checks

Date	Depth (mKB)	Q Flow (m³/min)	P (kPa)	Strokes (spm)
2/16/2014 16:00	2,209.00	0.608	5,153	78
2/16/2014 16:00	2,209.00	1.045	15,600	134

Pump Operations

Start Date	End Date	Liner Size (mm)	P Max (kPa)	Vol/Stk OR (m³/stk)
2/15/2014	2/15/2014	127.0		
2/16/2014	2/16/2014	127.0		

Mud Pump: 2, NATIONAL, 8-P-80

Pump Number	Make	Model	Rod Diameter (mm)	Stroke Length (mm)
2	NATIONAL	8-P-80	140.0	216.0

Pump Checks

Date	Depth (mKB)	Q Flow (m³/min)	P (kPa)	Strokes (spm)
2/19/2014 23:45	3,152.00	0.975	12,600	125
2/20/2014 00:00	3,143.00	0.647	6,414	83

Pump Operations

Start Date	End Date	Liner Size (mm)	P Max (kPa)	Vol/Stk OR (m³/stk)
2/20/2014	2/20/2014	127.0		
2/21/2014	2/21/2014	127.0		

Shaker Screens

Des	Start Date	End Date	Scr Sz X	Scr Sz Y	Note

Centrifuge/Cyclone: HGS Centrifuge, BOS Solutions, 5500

Number	Make	Model	Diameter (mm)
2	BOS Solutions	5500	

Centrifuge/Cyclone Checks

Date	Hrs (hr)	RPM (rpm)	Dens OF (kg/m³)	Q OF (L/min)	Dens UF (kg/m³)	Q UF (L/min)
2/21/2014 00:00	3.00	2100	1,040.0	0.400	1,710.0	0.200

Centrifuge/Cyclone: HGS Centrifuge, BOS Solutions, 5500

Number	Make	Model	Diameter (mm)
1	BOS Solutions	5500	

Centrifuge/Cyclone Checks

Date	Hrs (hr)	RPM (rpm)	Dens OF (kg/m³)	Q OF (L/min)	Dens UF (kg/m³)	Q UF (L/min)
2/21/2014 00:00	3.00	2100	1,100.0	0.400	1,790.0	0.200

Fluid / Mud Additive Amounts

Des	Consumed	Cost	Size	Units
Barite	71.0	17.040	40.0	SX
CALCIUM CHLORIDE	20.0	43.920	40.0	SX
Clean Up	1.0	75.330	18.93	PAIL
INVERT	12.0	1,063.330	1.0	M3
Lime	25.0	7.170	20.0	SX
OPTISEAL	5.0	96.200	25.0	SX
Truvis	18.0	149.670	25.0	SX
Versacoat HF	1.0	883.570	55.0	BBL
Versatrol	5.0	47.500	50.0	SX

Survey Data

Date	MD (mKB)	Incl (°)	Azm (°)	TVD (mKB)	Depart (m)	NS (m)	EW (m)	VS (m)	DLS (°/30m)
2/9/2014	1,539.50	0.90	135.50	1,538.93	23.57	23.51	-1.68	7.67	1.27
2/9/2014	1,577.50	0.70	120.30	1,576.92	23.21	23.18	-1.27	7.19	0.23
2/9/2014	1,654.00	1.00	54.80	1,653.42	23.33	23.33	-0.32	6.31	0.37
2/9/2014	1,692.00	1.20	31.40	1,691.41	23.86	23.86	0.16	5.99	0.38
2/9/2014	1,711.00	1.80	359.80	1,710.40	24.33	24.33	0.26	6.01	1.58
2/9/2014	1,720.00	1.90	10.60	1,719.40	24.62	24.61	0.29	6.06	1.21
2/9/2014	1,730.00	1.60	353.80	1,729.40	24.92	24.92	0.30	6.12	1.77
2/9/2014	1,739.00	2.30	320.90	1,738.39	25.18	25.18	0.18	6.31	4.31
2/9/2014	1,749.00	3.71	313.14	1,748.38	25.56	25.56	-0.19	6.76	4.39
2/9/2014	1,758.00	5.10	309.20	1,757.35	26.02	26.01	-0.71	7.38	4.74
2/9/2014	1,767.50	6.10	306.60	1,766.80	26.62	26.58	-1.44	8.23	3.26
2/9/2014	1,786.00	8.48	304.86	1,785.15	28.14	27.94	-3.35	10.43	3.88
2/9/2014	1,796.50	9.90	302.26	1,795.52	29.26	28.87	-4.75	12.02	4.23
2/9/2014	1,805.50	10.78	296.84	1,804.37	30.29	29.66	-6.15	13.58	4.37
2/9/2014	1,815.00	11.62	293.18	1,813.69	31.43	30.44	-7.83	15.40	3.47

Daily Drilling

COPRC MIRROR LAKE P-20 65-00 126-45

Rig: Beaver Drilling Ltd. 2

Report Date: 2/9/2014
Report #: 17
Depth Progress: 333.00m
Depth End: 1,855.00mKB
Rig Release Date: 2/23/2014

Survey Data

Date	MD (mKB)	Incl (")	Azm (")	TVD (mKB)	Depart (m)	NS (m)	EW (m)	VS (m)	DLS (°/30m)
2/9/2014	1,824.50	12.90	289.66	1,822.97	32.65	31.17	-9.70	17.40	4.68

Formations

Formation Name	Drill Top MD (mKB)	Drill Top (TVD) (mKB)	Prog Top TVD (mKB)
Little Bear	43.00	43.00	20.85
Slater River	207.00	207.00	197.35
Arctic Red	954.00	953.52	932.35
Martin House	1,110.00	1,109.49	1,084.35
Imperial	1,140.00	1,139.48	1,118.35
KOP (5deg/30m)	1,731.00	1,730.40	1,730.73
KOP (7deg/30m)	1,817.00	1,815.65	1,816.00
Upper Canol	1,902.70	1,896.20	1,897.35
Lower Canol	1,935.80	1,924.43	1,929.35

Daily Drilling

COPRC MIRROR LAKE P-20 65-00 126-45

Report Date: 2/10/2014
Report #: 18
Depth Progress: 66.00m
Depth End: 1,921.00mKB
Rig Release Date: 2/23/2014

Rig: Beaver Drilling Ltd. 2

UWI 200/D-020/L094P1699		Surface Legal Location P-20 65-00 126-45		MaxWell Job Number JOB01@2006		License No. EL 470	
Ground Elevation (m) 284.15		Original KB/RT Elevation (m) 289.35		Casing Flange Elevation (m) 283.95		Original Spud Date 1/29/2014	
Days From Spud (days) 18.00		Job Category DRILLING		Primary Job Type DRILLING ORIGINAL		Actual Start Date 1/24/2014 00:00	
End Date 2/23/2014 23:59		Final Job Status DRILLED		Final Report? Yes		Daily Cost Total (Cost) 433,279.02	
Cumulative Cost (Cost) 3,115,802.15		Total AFE (Cost) 7,122,600.00		AFE+Supp Amt (Cost) 7,122,600.00		AFE / RFE / Maint.# 10351812	
Estimated Days		Planned Depth (TMD) (mKB)		Override TVD (mKB)		Head Count 56.0	
Personnel Total Hours (hr) 610.00		Cum Personnel Total Hours (hr) 9,874.00		Avg Connection Gas 105		Avg Background Gas 70	
Avg Trip Gas 24		Max H2S (ppm) 0		Road Condition Ice/Snow		Weather Clear	
Temperature (°C) -26		Wind SW 10kms		Ops and Depth @ Morning Report Run in the hole to 589m, slip and cut drill line.		Wellbore Original Hole	

Last 24hr Summary
No incidents or accidents. 9 - HID, 0 - OBS and 0 - ASA (all closed out)

Drill 222mm intermediate directional hole from 1855m to 1921m with accumulated MWD surveys, rig services, connections and circulation times. WOB: 6-8,000kDaN, RPM - 65-80 (Motor RPM - 131), Differential pressure: 100-3500kPa, Pump rate: 1.6-1.8 m3/min. Torque: 9,000 - 10,000ft/lbs, Rotate: 5m - 8% / Slide: 61m - 92%, ROP: 12m/hr. Last survey at 1901mMD, inclination= 27°, azimuth= 282.34°, TVD - 1895m. We are 0.5m below and 24.4m right of the line - 6° behind in angle - 3° ahead in azimuth - 24.43m center to center - BURR: 7.75°/30m. Pull out to 1710m (vertical section) and replace module in mud pump #1, run in the hole, drill and attempt to build angle, pull out of the hole, dial up mud motor to a 1.93° bend and make up a 222mm Smith 4-3-7 insert bit, attempt to pull the wear bushing due to the fact we couldn't get BHA past wear bushing.

24hr Forecast
Run in the hole, drill 222mm intermediate directional hole with accumulated MWD surveys, rig services, connections and circulation times.

Daily Contacts
Drilling Superintend, Sheldon Vamplew, 403-999-1302; Drilling Engineer, Mike Greener, 403-771-5039; WS Supervisor, Richard Turgeon, 780-387-1706; WS Supervisor, Dave Oppen, 403-863-8205; Rig Manager, Rick Yavis, 780-718-2962; Command Centre, 403-910-0357

Last Casing String
Surface, 602.00mKB

Log										
Start Time	End Time	Dur (hr)	Phase	Op Code	Activity Code	Time P-T-X	Tribl Code	Start Depth (mKB)	End Depth (mKB)	Operation
00:00	01:00	1.00	INTRM1	DRILL	DRLG	P		1,855.00	1,864.00	Drill 222mm hole, with 513 Ulterra PDC bit, Wenzel mud motor, 7/8 lobe, 5 stage (0.077rev/L), set at 1.59 deg. with 0.81m from bit to bend, from 1855m to 1864 m
01:00	01:15	0.25	INTRM1	RIGMNT	SVRG	P		1,864.00	1,864.00	Rig service function test rig smart anti-collision system, function test H.C.R 3sec O/C crown saver,grease all moving parts, check oil levels in floor motor, pumps and HPU Change oil on floor motor
01:15	05:30	4.25	INTRM1	DRILL	DRLG	P		1,864.00	1,902.00	Drill 222mm hole, with 513 Ulterra PDC bit, Wenzel mud motor, 7/8 lobe, 5 stage (0.077rev/L), set at 1.59 deg. with 0.81m from bit to bend, from 1864m to 1902m
05:30	07:00	1.50	INTRM1	RIGMNT	RGRP	T	Rig	1,902.00	1,902.00	work on pump # 1 cap gasket
07:00	07:15	0.25	INTRM1	DRILL	SFTY	P		1,902.00	1,902.00	Weekly safety meeting with conoco rep present
07:15	07:30	0.25	INTRM1	DRILL	SRVY	P		1,902.00	1,902.00	Accumulated directional surveys
07:30	08:00	0.50	INTRM1	DRILL	SFTY	P		1,902.00	1,902.00	Crew handover meeting, Conoco reps. and toolpush present
08:00	08:15	0.25	INTRM1	RIGMNT	SVRG	P		1,902.00	1,902.00	Rig service function test rig smart anti-collision system, function test pipe ram's 4 sec to close crown saver,grease all moving parts, check oil levels in floor motor, pumps and HPU
08:15	08:45	0.50	INTRM1	DRILL	TRIP	P		1,902.00	1,902.00	Pull out 10 stds of drill pipe off bottom
08:45	12:15	3.50	INTRM1	RIGMNT	RGRP	T	Rig	1,902.00	1,902.00	Change out middle module in pump # 1
12:15	12:45	0.50	INTRM1	DRILL	TRIP	P		1,902.00	1,902.00	Trip in hole, 10 stands to bottom
12:45	14:30	1.75	INTRM1	DRILL	DRLG	P		1,902.00	1,921.00	Drill 222mm hole, with 513 Ulterra PDC bit, Wenzel mud motor, 7/8 lobe, 5 stage (0.077rev/L), set at 1.59 deg. with 0.81m from bit to bend, from 1902m to 1921m
14:30	15:00	0.50	INTRM1	DRILL	CIRC	P		1,921.00	1,921.00	Circulate bottoms up, prior to tripping out of hole
15:00	15:15	0.25	INTRM1	DRILL	SRVY	P		1,921.00	1,921.00	Accumulated time for dir surveys
15:15	15:30	0.25	INTRM1	DRILL	SFTY	P		1,921.00	1,921.00	Crew handover meeting, Conoco reps. and toolpush present
15:30	16:30	1.00	INTRM1	DRILL	TRIP	P		1,921.00	1,921.00	Trip out of hole to dial up mud motor, from 1.53deg. to 1.93deg. flow check at 1919m flow check at 1902 m

Daily Drilling

COPRC MIRROR LAKE P-20 65-00 126-45

Report Date: 2/10/2014
Report #: 18
Depth Progress: 66.00m
Depth End: 1,921.00mKB
Rig Release Date: 2/23/2014

Rig: Beaver Drilling Ltd. 2

Time Log

Start Time	End Time	Dur (hr)	Phase	Op Code	Activity Code	Time P-T-X	Trbl Code	Start Depth (mKB)	End Depth (mKB)	Operation
16:30	16:45	0.25	INTRM1	RIGMNT	SVRG	P		1,921.00	1,921.00	Rig service function test rig smart anti-collision system, function test hrdrill 13 sec to close crown saver,grease all moving parts, check oil levels in floor motor, pumps and HPU
16:45	21:15	4.50	INTRM1	DRILL	TRIP	P		1,921.00	1,921.00	Trip out of hole with flow checks at 1825m/1098m/390m out of hole, fution test blind rams 4sec open/close
21:15	21:30	0.25	INTRM1	DRILL	SFTY	P		1,921.00	1,921.00	Safety meeting with pathinder drectional services
21:30	23:30	2.00	INTRM1	DRILL	PULD	P		1,921.00	1,921.00	Install a 222mm Smith, 4-3-7 insert tri-cone bit, set angle of the mud motor to 1.93deg., clean and prepare to trip in the hole
23:30	23:45	0.25	INTRM1	DRILL	PULD	T	Wellhead/Tree	1,921.00	1,921.00	Attempt to pull the wear bushing due to the fact we couldn't get BHA past wear bushing.
23:45	00:00	0.25	INTRM1	DRILL	SFTY	P		1,921.00	1,921.00	Crew handover meeting, Conoco reps. and toolpush present

Fluid/Mud Chks: Mud Engineer: Corey Clark

Time 12:45	Depth (mKB) 1,902.00	Density (kg/m³) 1,020.0	Funnel Viscosity (s/L) 50	pH	PV Override (Pa*s) 16.0	YP Override (Pa) 4.0
Low Gravity Solids (%) 8.1	MBT (kg/m³)	Oil Water Ratio 83/17	Chlorides (mg/L) 219,005	Calcium (mg/L) 27	Lime (kg/m³) 15	Potassium (mg/L)
Electric Stab (V) 590.0	ECD - Manual Entry (k... 1,065.0	Sand (%) 2.8	Solids, Corr. (%) 9.0	T Flowline (°C) 46	HTHP Pressure (kPa)	HTHP Filtrate (mL/30... 6.0
API Filtrate (mL/30min)		Mud Lost to Surface (m³) 5.00	Mud Lost to Hole (m³) 0.00		Daily Mud Field Est (Cost) 8,992.17	
Cum Mud Lost to Surface (m³) 38.00		Cum Mud Lost to Hole (m³) 7.00		Cumulative Mud Cost (Cost) 85,267.38		

Last BOP Drill

Type BOP Drill	Days Last Chk (...) 3	Last Date 2/7/2014	Days Until Next... 2	Next Check Date 2/12/2014
Days Since Lost Time Incident (days) 851.00	Days Since Recordable Incident (days) 851.00			

Safety Incidents

Date	Com	Category

Drill String: BHA # 3

Bit Run 3	Drill Bit 222.0mm, u513, 17071	Length (m) 0.20	ADC Bit Dull	TFA (incl Noz) (mm²) 677	BHA ROP (m/hr) 21.2
Nozzles (mm) 11.1/11.1/11.1/11.1/11.1/11.1/11.1	String Length (m) 1,921.00	OD (mm) 173.0	Max Rotating Hook Load (daN) 70,000		
Depth In (mKB) 602.00	Depth Out (mKB) 1,921.00	Avg ROP (m/hr) 21.2	Depth This Job (m) 1,319.00	Total Depth Drilled b... 1,319.00	Job Drill Hrs (hr) 62.25
				Total Drill Hrs (hr) 62.25	

Comment

Drill 222mm hole, with 513 Ulterra PDC bit, Wenzel mud motor, 7/8 lobe, 5 stage (0.077rev/L), set at 1.59 deg. with 0.81m from bit to bend. NM float sub, NM Pony monel, NM gap sub, 1 x MWD flex NM monel, 2 x NM flex monels, 3 joints HWDP, 1 x Jars, 37 joints HWDP

Drill String Components

Item Des	ID (mm)	OD (mm)	Jts	Len (m)	Cum Len (m)
Drill pipe - Stands	68.0	101.0	79	1,501.64	1,921.00
4" H.W	65.0	101.0	37	344.46	419.36
Jars	69.0	161.0	1	5.13	74.90
4" H.W	65.0	101.0	3	28.27	69.77
6.75" X/O	59.0	168.0	1	0.80	41.50
6.75" NM Flex Mon	70.0	171.0	1	8.28	40.70
6.75" Flex Monel	70.0	171.0	1	9.20	32.42
6.75" Gap Sub	88.0	162.0	1	0.54	23.22
4.5"H90 FLEX MONEL	70.0	171.0	1	9.35	22.68
NM pony monel	70.0	171.0	1	2.97	13.33
N.M SUB	72.0	173.0	1	0.54	10.36
MUD MOTOR	64.0	169.0	1	9.62	9.82

Drilling Parameter: 1,902.00 - 1,921.00 mKB

Cum Depth (m)	Cum Drill...	Int ROP (...)	Flow Rate...	WOB (daN)	RPM (r...	SPP (kPa)	Drill Str Wt (d...	SO Str Wt (daN)	PU Str Wt (daN)	Off-Btm Str W...	Drill Tq
1,319.00	62.25	10.9	1.700	7,000	65	17,100	70,000	68,000	71,000	70,000	10,100.0

Daily Drilling

COPRC MIRROR LAKE P-20 65-00 126-45

Rig: Beaver Drilling Ltd. 2

Report Date: 2/10/2014
Report #: 18
Depth Progress: 66.00m
Depth End: 1,921.00mKB
Rig Release Date: 2/23/2014

Hydraulic Calculations

Friction Calculations							
Bit Hydraulic Power (kW)	HP/Area (kW/mm²)	% P @ bit (%)	Bit Jet Velocity (m/s)	Bit dP (kPa)	P Drop Annular (kPa)	Mud Density (kg/m³)	ECD End (kg/m³)
28.4	0.00073	6	41.8	1,001.2	363.1	1,020.0	1,039.4
Drill String Volume (m³)	Bit to Shoe Volume (m³)	Vol Shoe to Top (m³)	Min Casing AV (m/min)	Max Casing AV (m/min)	Min Open Hole AV (m/min)	Max Open Hole AV (m/min)	
6.86	39.81	19.29	52.6	52.6	25.0	111.8	

Error

Mud Pump: 1, NATIONAL, 8-P-80

Pump Number	Make	Model	Rod Diameter (mm)	Stroke Length (mm)
1	NATIONAL	8-P-80	140.0	216.0

Pump Checks

Date	Depth (mKB)	Q Flow (m³/min)	P (kPa)	Strokes (spm)
2/16/2014 16:00	2,209.00	0.608	5,153	78
2/16/2014 16:00	2,209.00	1.045	15,600	134

Pump Operations

Start Date	End Date	Liner Size (mm)	P Max (kPa)	Vol/Stk OR (m³/stk)
2/15/2014	2/15/2014	127.0		
2/16/2014	2/16/2014	127.0		

Mud Pump: 2, NATIONAL, 8-P-80

Pump Number	Make	Model	Rod Diameter (mm)	Stroke Length (mm)
2	NATIONAL	8-P-80	140.0	216.0

Pump Checks

Date	Depth (mKB)	Q Flow (m³/min)	P (kPa)	Strokes (spm)
2/19/2014 23:45	3,152.00	0.975	12,600	125
2/20/2014 00:00	3,143.00	0.647	6,414	83

Pump Operations

Start Date	End Date	Liner Size (mm)	P Max (kPa)	Vol/Stk OR (m³/stk)
2/20/2014	2/20/2014	127.0		
2/21/2014	2/21/2014	127.0		

Shaker Screens

Des	Start Date	End Date	Scr Sz X	Scr Sz Y	Note

Centrifuge/Cyclone: HGS Centrifuge, BOS Solutions, 5500

Number	Make	Model	Diameter (mm)
2	BOS Solutions	5500	

Centrifuge/Cyclone Checks

Date	Hrs (hr)	RPM (rpm)	Dens OF (kg/m³)	Q OF (L/min)	Dens UF (kg/m³)	Q UF (L/min)
2/21/2014 00:00	3.00	2100	1,040.0	0.400	1,710.0	0.200

Centrifuge/Cyclone: HGS Centrifuge, BOS Solutions, 5500

Number	Make	Model	Diameter (mm)
1	BOS Solutions	5500	

Centrifuge/Cyclone Checks

Date	Hrs (hr)	RPM (rpm)	Dens OF (kg/m³)	Q OF (L/min)	Dens UF (kg/m³)	Q UF (L/min)
2/21/2014 00:00	3.00	2100	1,100.0	0.400	1,790.0	0.200

Fluid / Mud Additive Amounts

Des	Consumed	Cost	Size	Units
Barite	37.0	17.040	40.0	SX
CALCIUM CHLORIDE	9.0	43.920	40.0	SX
INVERT	5.0	1,063.330	1.0	M3
OPTISEAL	5.0	96.200	25.0	SX
Truvis	7.0	149.670	25.0	SX
Versacoat HF	1.0	883.570	55.0	BBL
Versatrol	5.0	47.500	50.0	SX

Survey Data

Date	MD (mKB)	Incl (°)	Azm (°)	TVD (mKB)	Depart (m)	NS (m)	EW (m)	VS (m)	DLS (°/30m)
2/10/2014	1,834.00	14.58	285.16	1,832.20	33.98	31.84	-11.86	19.65	6.28
2/10/2014	1,843.50	16.22	285.66	1,841.36	35.51	32.51	-14.29	22.18	5.20
2/10/2014	1,853.00	18.12	286.88	1,850.44	37.38	33.30	-16.98	24.98	6.11
2/10/2014	1,862.50	20.00	286.20	1,859.42	39.58	34.18	-19.95	28.08	5.98
2/10/2014	1,873.00	21.61	284.46	1,869.23	42.32	35.17	-23.55	31.81	4.93
2/10/2014	1,881.50	23.70	283.00	1,877.08	44.79	35.94	-26.73	35.08	7.64
2/10/2014	1,891.50	25.50	284.70	1,886.17	48.08	36.94	-30.77	39.24	5.80
2/10/2014	1,901.00	27.00	282.34	1,894.69	51.51	37.92	-34.86	43.44	5.77

Daily Drilling

COPRC MIRROR LAKE P-20 65-00 126-45

Report Date: 2/10/2014
Report #: 18
Depth Progress: 66.00m
Depth End: 1,921.00mKB
Rig Release Date: 2/23/2014

Rig: Beaver Drilling Ltd. 2

Formations

Formation Name	Drill Top MD (mKB)	Drill Top (TVD) (mKB)	Prog Top TVD (mKB)
Little Bear	43.00	43.00	20.85
Slater River	207.00	207.00	197.35
Arctic Red	954.00	953.52	932.35
Martin House	1,110.00	1,109.49	1,084.35
Imperial	1,140.00	1,139.48	1,118.35
KOP (5deg/30m)	1,731.00	1,730.40	1,730.73
KOP (7deg/30m)	1,817.00	1,815.65	1,816.00
Upper Canol	1,902.70	1,896.20	1,897.35
Lower Canol	1,935.80	1,924.43	1,929.35

Daily Drilling

COPRC MIRROR LAKE P-20 65-00 126-45

Report Date: 2/11/2014
Report #: 19
Depth Progress: 72.00m
Depth End: 1,993.00mKB
Rig Release Date: 2/23/2014

Rig: Beaver Drilling Ltd. 2

UWI 200/D-020/L094P1699		Surface Legal Location P-20 65-00 126-45		MaxWell Job Number JOB01@2006		License No. EL 470					
Ground Elevation (m) 284.15		Original KB/RT Elevation (m) 289.35		Casing Flange Elevation (m) 283.95		Original Spud Date 1/29/2014		Days From Spud (days) 19.00			
Job Category DRILLING		Primary Job Type DRILLING ORIGINAL		Actual Start Date 1/24/2014 00:00		End Date 2/23/2014 23:59		Final Job Status DRILLED		Final Report? Yes	
Daily Cost Total (Cost) 152,618.32		Cumulative Cost (Cost) 3,268,420.47		Total AFE (Cost) 7,122,600.00		AFE+Supp Amt (Cost) 7,122,600.00		AFE / RFE / Maint.# 10351812		Estimated Days	
Planned Depth (TMD) (mKB)		Override TVD (mKB)		Head Count 54.0		Personnel Total Hours (hr) 598.00		Cum Personnel Total Hours (hr) 10,472.00			
Avg Connection Gas 840		Avg Background Gas 460		Avg Trip Gas 19		Max H2S (ppm) 0					
Road Condition Ice/Snow		Weather Clear		Temperature (°C) -36				Wind Calm			
Ops and Depth @ Morning Report Drill 222mm intermediate directional hole at 2016m.									Wellbore Original Hole		

Last 24hr Summary

No incidents or accidents. 8 - HID, 0 - OBS and 0 - ASA (all closed out)

Run in the hole, drill 222mm intermediate directional hole from 1921m to 1993m with accumulated MWD surveys, rig services, connections and circulation times.
WOB: 15-18,000kDaN, RPM - 40-50 (Motor RPM - 131), Differential pressure: 100-3500kPa, Pump rate: 1.6-1.8 m3/min. Torque: 9,000-10,000ft/lbs, Rotate: 10m - 13% / Slide: 62m - 87%, ROP: 7.0m/hr. Last survey at 1986.50mMD, inclination= 48.39°, azimuth= 279.96°, TVD - 1961.87m. We are 0.34m below and 21m right of the line - 0.11° behind in angle - 0.0° ahead in azimuth - 21m center to center - BURR: 8.77°/30m to new target of 2015.25mTVD.

24hr Forecast

Drill 222mm intermediate directional hole to intermediate TD (ICP) with accumulated MWD surveys, rig services, connections and circulation times.

Daily Contacts

Drilling Superintendent, Sheldon Vamplew, 403-999-1302; Drilling Engineer, Mike Greener, 403-771-5039; WS Supervisor, Richard Turgeon, 780-387-1706; WS Supervisor, Dave Oppen, 403-863-8205; Rig Manager, Rick Yavis, 780-718-2962; Command Centre, 403-910-0357

Last Casing String

Surface, 602.00mKB

Time Log

Time	End Time	Dur (hr)	Phase	Op Code	Activity Code	Time P-T-X	Tribl Code	Start Depth (mKB)	End Depth (mKB)	Operation
00:00	00:15	0.25	INTRM1	RIGMNT	SVRG	P		1,921.00	1,921.00	Rig service function test blind ram's 3 sec to close and crown saver
00:15	03:30	3.25	INTRM1	DRILL	TRIP	T	Wellhead/Tree	1,921.00	1,921.00	Attempt to pull wear bushing w/with bushing puller and a stand of HWDP, was able to get bit and mud motor with a 1.93deg bend, through wear bushing
03:30	03:45	0.25	INTRM1	DRILL	SFTY	P		1,921.00	1,921.00	Safety meeting with Pathfinder directional hands and Extrem MWD hand prior to handle directional tools
03:45	04:30	0.75	INTRM1	DRILL	PULD	P		1,921.00	1,921.00	Scribe and handle directional tools, check MWD
04:30	06:00	1.50	INTRM1	DRILL	TRIP	P		1,921.00	1,921.00	Trip in hole with Smith FHI18B tricone bit, Wenzel mud motor, 7/8 lobe, 5 stage (0.077rev/L), set at 1.93 deg. with 0.81m from bit to bend
06:00	06:45	0.75	INTRM1	RIGMNT	SLPC	P		1,921.00	1,921.00	Hang blocks and top drive, slip and cut 21 m drilling line
06:45	07:45	1.00	INTRM1	DRILL	TRIP	P		1,921.00	1,921.00	Trip in hole with Smith FHI18B tricone bit, Wenzel mud motor, 7/8 lobe, 5 stage (0.077rev/L), set at 1.93 deg. with 0.81m from bit to bend
07:45	08:00	0.25	INTRM1	DRILL	SFTY	P		1,921.00	1,921.00	Crew handover meeting, Conoco reps. and toolpush present
08:00	08:15	0.25	INTRM1	RIGMNT	SVRG	P		1,921.00	1,921.00	Rig service function test rig smart anti-collision system, function test pipe rams 5 sec to close crown saver,grease all moving parts, check oil levels in floor motor, pumps and HPU
08:15	10:45	2.50	INTRM1	DRILL	TRIP	P		1,921.00	1,921.00	Trip in the hole fill pipe, flow check at 647m,1495m
10:45	11:00	0.25	INTRM1	DRILL	CIRC	P		1,921.00	1,921.00	Wash to bottom from 1912m to 1921m
11:00	15:00	4.00	INTRM1	DRILL	DRLG	P		1,921.00	1,948.00	Drill 222mm hole, with Smith FHI18B tricone bit, Wenzel mud motor, 7/8 lobe, 5 stage (0.077rev/L), set at 1.93 deg. with 0.81m from bit to bend, from 1921m to 1948m
15:00	15:30	0.50	INTRM1	DRILL	CIRC	P		1,948.00	1,948.00	Work tight hole at 1941m
15:30	16:00	0.50	INTRM1	DRILL	SRVY	P		1,948.00	1,948.00	Accumulated directional surveys
16:00	17:30	1.50	INTRM1	DRILL	DRLG	P		1,948.00	1,959.00	Drill 222mm hole, with Smith FHI18B tricone bit, Wenzel mud motor, 7/8 lobe, 5 stage (0.077rev/L), set at 1.93 deg. with 0.81m from bit to bend, from 1948m to 1959m
17:30	17:45	0.25	INTRM1	RIGMNT	SVRG	P		1,959.00	1,959.00	Rig service function test rig smart anti-collision system, function test Hydrill 13sec to close crown saver,grease all moving parts, check oil levels in floor motor, pumps and HPU

Daily Drilling

COPRC MIRROR LAKE P-20 65-00 126-45

Report Date: 2/11/2014
Report #: 19
Depth Progress: 72.00m
Depth End: 1,993.00mKB
Rig Release Date: 2/23/2014

Rig: Beaver Drilling Ltd. 2

Time Log

Start Time	End Time	Dur (hr)	Phase	Op Code	Activity Code	Time P-T-X	Trbl Code	Start Depth (mKB)	End Depth (mKB)	Operation
17:45	19:00	1.25	INTRM1	DRILL	DRLG	P		1,959.00	1,967.00	Drill 222mm hole, with Smith FHI18B tricone bit, Wenzel mud motor, 7/8 lobe, 5 stage (0.077rev/L), set at 1.93 deg. with 0.81m from bit to bend, from 1959m to 1967 m
19:00	19:15	0.25	INTRM1	DRILL	SFTY	P		1,967.00	1,967.00	Crew handover meeting, Conoco reps. and toolpush present
19:15	19:30	0.25	INTRM1	DRILL	SFTY	P		1,967.00	1,967.00	Held BOP drill with rig crew, Conoco rep. crew in position for well shut in 50sec
19:30	20:00	0.50	INTRM1	RIGMNT	RGRP	T	Rig	1,967.00	1,967.00	Change dies in grabber box on top drive
20:00	23:30	3.50	INTRM1	DRILL	DRLG	P		1,967.00	1,993.00	Drill 222mm hole, with Smith FHI18B tricone bit, Wenzel mud motor, 7/8 lobe, 5 stage (0.077rev/L), set at 1.93 deg. with 0.81m from bit to bend, from 1967m to 1993m
23:30	00:00	0.50	INTRM1	DRILL	SRVY	P		1,993.00	1,993.00	Accumulated time for dir surveys

Fluid/Mud Chks: Mud Engineer: Corey Clark

Time	14:00	Depth (mKB)	1,915.00	Density (kg/m³)	1,015.0	Funnel Viscosity (s/L)	50	pH		PV Override (Pa·s)	17.0	YP Override (Pa)	4.5
Low Gravity Solids (%)	8.5	MBT (kg/m³)		Oil Water Ratio	84/16	Chlorides (mg/L)	242,335	Calcium (mg/L)	39	Lime (kg/m³)	15	Potassium (mg/L)	
Electric Stab (V)	600.0	ECD - Manual Entry (k...)	1,058.0	Sand (%)	2.7	Solids, Corr. (%)	9.0	T Flowline (°C)	42	HTHP Pressure (kPa)		HTHP Filtrate (mL/30...)	5.5
API Filtrate (mL/30min)		Mud Lost to Surface (m³)	8.00	Mud Lost to Hole (m³)	1.00	Daily Mud Field Est (Cost)							
Cum Mud Lost to Surface (m³)	46.00	Cum Mud Lost to Hole (m³)	8.00	Cumulative Mud Cost (Cost)									11,386.47
													96,653.85

Last BOP Drill

Type	BOP Drill	Days Last Chk (...)	0	Last Date	2/11/2014	Days Until Next...	5	Next Check Date	2/16/2014
Days Since Lost Time Incident (days)		852.00		Days Since Recordable Incident (days)					

Safety Incidents

Date	Com	Category

Drill String: BHA # 4

Bit Run	4	Drill Bit	222.0mm, FHI18B, RA3595	Length (m)	0.20	IADC Bit Dull	2-3-WT-G-1-1-NO-TD	TFA (incl Noz) (mm²)	942	BHA ROP (m/hr)	6.2
Nozzles (mm)	20.0/20.0/20.0	String Length (m)	2,152.00	OD (mm)	173.0	Max Rotating Hook Load (daN)					73,000
Depth In (mKB)	1,921.00	Depth Out (mKB)	2,152.00	Avg ROP (m/hr)	6.2	Depth This Job (m)	231.00	Total Depth Drilled b...	231.00	Job Drill Hrs (hr)	37.50
											37.50

Comment

Drill 222mm hole, with Smith FHI18B tricone bit, Wenzel mud motor, 7/8 lobe, 5 stage (0.077rev/L), set at 1.59 deg. with 0.81m from bit to bend. NM float sub, NM Pony monel, NM gap sub, 1 x MVWD flex NM monel, 2 x NM flex monels, 3 joints HWDP, 1 x Jars, 37 joints HWDP

Drill String Components

Item Des	ID (mm)	OD (mm)	Jts	Len (m)	Cum Len (m)
Drill pipe - Singles	68.0	101.0	1	1.80	2,152.00
Drill pipe - Stands	68.0	101.0	91	1,730.84	2,150.20
4" H.W	65.0	101.0	37	344.46	419.36
Jars	69.0	161.0	1	5.13	74.90
4" H.W	65.0	101.0	3	28.27	69.77
6.75" X/O	59.0	168.0	1	0.80	41.50
6.75" NM Flex Mon	70.0	171.0	1	8.28	40.70
6.75" Flex Monel	70.0	171.0	1	9.20	32.42
6.75" Gap Sub	88.0	162.0	1	0.54	23.22
4.5"H90 FLEX MONEL	70.0	171.0	1	9.35	22.68
NM pony monel	70.0	171.0	1	2.97	13.33
N.M SUB	72.0	173.0	1	0.54	10.36
MUD MOTOR	64.0	169.0	1	9.62	9.82

Drilling Parameter: 1,948.00 - 1,993.00 mKB

Cum Depth (m)	72.00	Cum Drill...	10.25	Int ROP (...)	7.2	Flow Rate...	1.700	WOB (daN)	16,000	RPM (r...)	10	SPP (kPa)	16,000	Drill Str Wt (d...)	71,000	SO Str Wt (daN)	67,000	PU Str Wt (daN)	75,000	Off-Btm Str W...	71,000	Drill Tq	7,900.0
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Daily Drilling

COPRC MIRROR LAKE P-20 65-00 126-45

Rig: Beaver Drilling Ltd. 2

Report Date: 2/11/2014
Report #: 19
Depth Progress: 72.00m
Depth End: 1,993.00mKB
Rig Release Date: 2/23/2014

Hydraulic Calculations

Bit Hydraulic Power (kW)	HP/Area (kW/mm ²)	% P @ bit (%)	Bit Jet Velocity (m/s)	Bit dP (kPa)	P Drop Annular (kPa)	Mud Density (kg/m ³)	ECD End (kg/m ³)
14.6	0.00038	3	30.1	514.6	404.0	1,015.0	1,036.0
Drill String Volume (m ³)	Bit to Shoe Volume (m ³)	Vol Shoe to Top (m ³)	Min Casing AV (m/min)	Max Casing AV (m/min)	Min Open Hole AV (m/min)	Max Open Hole AV (m/min)	
7.12	42.02	19.29	52.6	52.6	25.0	111.8	

Error

Mud Pump: 1, NATIONAL, 8-P-80

Pump Number	Make	Model	Rod Diameter (mm)	Stroke Length (mm)
1	NATIONAL	8-P-80	140.0	216.0

Pump Checks

Date	Depth (mKB)	Q Flow (m ³ /min)	P (kPa)	Strokes (spm)
2/16/2014 16:00	2,209.00	0.608	5,153	78
2/16/2014 16:00	2,209.00	1.045	15,600	134

Pump Operations

Start Date	End Date	Liner Size (mm)	P Max (kPa)	Vol/Stk OR (m ³ /stk)
2/15/2014	2/15/2014	127.0		
2/16/2014	2/16/2014	127.0		

Mud Pump: 2, NATIONAL, 8-P-80

Pump Number	Make	Model	Rod Diameter (mm)	Stroke Length (mm)
2	NATIONAL	8-P-80	140.0	216.0

Pump Checks

Date	Depth (mKB)	Q Flow (m ³ /min)	P (kPa)	Strokes (spm)
2/19/2014 23:45	3,152.00	0.975	12,600	125
2/20/2014 00:00	3,143.00	0.647	6,414	83

Pump Operations

Start Date	End Date	Liner Size (mm)	P Max (kPa)	Vol/Stk OR (m ³ /stk)
2/20/2014	2/20/2014	127.0		
2/21/2014	2/21/2014	127.0		

Shaker Screens

Des	Start Date	End Date	Scr Sz X	Scr Sz Y	Note

Centrifuge/Cyclone: HGS Centrifuge, BOS Solutions, 5500

Number	Make	Model	Diameter (mm)
2	BOS Solutions	5500	

Centrifuge/Cyclone Checks

Date	Hrs (hr)	RPM (rpm)	Dens OF (kg/m ³)	Q OF (L/min)	Dens UF (kg/m ³)	Q UF (L/min)
2/21/2014 00:00	3.00	2100	1,040.0	0.400	1,710.0	0.200

Centrifuge/Cyclone: HGS Centrifuge, BOS Solutions, 5500

Number	Make	Model	Diameter (mm)
1	BOS Solutions	5500	

Centrifuge/Cyclone Checks

Date	Hrs (hr)	RPM (rpm)	Dens OF (kg/m ³)	Q OF (L/min)	Dens UF (kg/m ³)	Q UF (L/min)
2/21/2014 00:00	3.00	2100	1,100.0	0.400	1,790.0	0.200

Fluid / Mud Additive Amounts

Des	Consumed	Cost	Size	Units
CALCIUM CHLORIDE	25.0	43.920	40.0	SX
INVERT	9.0	1,063.330	1.0	M3
OPTISEAL	5.0	96.200	25.0	SX
Versatrol	5.0	47.500	50.0	SX

Survey Data

Date	MD (mKB)	Incl (°)	Azm (°)	TVD (mKB)	Depart (m)	NS (m)	EW (m)	VS (m)	DLS (°/30m)
2/11/2014	1,910.50	28.80	283.40	1,903.08	55.23	38.91	-39.19	47.89	5.90
2/11/2014	1,920.00	30.90	281.10	1,911.32	59.26	39.91	-43.81	52.61	7.55
2/11/2014	1,929.50	34.60	284.40	1,919.31	63.78	41.05	-48.82	57.74	12.97
2/11/2014	1,939.00	37.70	282.90	1,926.98	68.85	42.37	-54.26	63.34	10.18
2/11/2014	1,948.50	40.30	282.34	1,934.36	74.29	43.68	-60.10	69.32	8.29
2/11/2014	1,958.00	42.51	282.34	1,941.49	80.09	45.02	-66.24	75.59	6.98
2/11/2014	1,967.50	44.32	279.87	1,948.39	86.13	46.27	-72.64	82.11	7.84

Formations

Formation Name	Drill Top MD (mKB)	Drill Top TVD (mKB)	Prog Top TVD (mKB)
Little Bear	43.00	43.00	20.85
Slater River	207.00	207.00	197.35
Arctic Red	954.00	953.52	932.35



Daily Drilling

COPRC MIRROR LAKE P-20 65-00 126-45

Rig: Beaver Drilling Ltd. 2

Report Date: 2/11/2014
Report #: 19
Depth Progress: 72.00m
Depth End: 1,993.00mKB
Rig Release Date: 2/23/2014

Formations

Formation Name	Drill Top MD (mKB)	Drill Top (TVD) (mKB)	Prog Top TVD (mKB)
Martin House	1,110.00	1,109.49	1,084.35
Imperial	1,140.00	1,139.48	1,118.35
KOP (5deg/30m)	1,731.00	1,730.40	1,730.73
KOP (7deg/30m)	1,817.00	1,815.65	1,816.00
Upper Canol	1,902.70	1,896.20	1,897.35
Lower Canol	1,935.80	1,924.43	1,929.35

Daily Drilling

COPRC MIRROR LAKE P-20 65-00 126-45

Report Date: 2/12/2014
Report #: 20
Depth Progress: 111.00m
Depth End: 2,104.00mKB
Rig Release Date: 2/23/2014

Rig: Beaver Drilling Ltd. 2

UWI J/D-020/L094P1699		Surface Legal Location P-20 65-00 126-45		MaxWell Job Number JOB01@2006		License No. EL 470	
Ground Elevation (m) 284.15		Original KB/RT Elevation (m) 289.35		Casing Flange Elevation (m) 283.95		Original Spud Date 1/29/2014	
Days From Spud (days) 20.00							
Job Category DRILLING		Primary Job Type DRILLING ORIGINAL		Actual Start Date 1/24/2014 00:00		End Date 2/23/2014 23:59	
Final Job Status DRILLED		Final Report? Yes					
Daily Cost Total (Cost) 155,243.11		Cumulative Cost (Cost) 3,423,663.58		Total AFE (Cost) 7,122,600.00		AFE+Supp Amt (Cost) 7,122,600.00	
AFE / RFE / Maint.# 10351812		Estimated Days					
Planned Depth (TMD) (mKB)		Override TVD (mKB)		Head Count 55.0		Personnel Total Hours (hr) 596.00	
Cum Personnel Total Hours (hr) 11,068.00							
Avg Connection Gas 1,120		Avg Background Gas 540		Avg Trip Gas		Max H2S (ppm) 0	
Road Condition Ice/Snow		Weather Clear		Temperature (°C) -30		Wind Calm	
Ops and Depth @ Morning Report Drill 222mm intermediate directional hole at 2140m.						Wellbore Original Hole	

Last 24hr Summary

No incidents or accidents. 9 - HID, 0 - OBS and 0 - ASA (all closed out)

Drill 222mm intermediate directional hole from 1993m to 2104m with accumulated MWD surveys, rig services, connections and circulation times. WOB: 15-18,000kDaN, RPM - 40-50 (Motor RPM - 131), Differential pressure: 100-3500kPa, Pump rate: 1.6-1.8 m3/min. Torque: 9,000-10,000ft/lbs, Rotate: 19.0m - 17% / Slide: 92.0m - 83%, ROP: 5.92m/hr. Last survey at 2110mMD, inclination= 81.80°, azimuth= 277.5°, TVD - 2010.91m. We are 2.0m above and 7.5m right of the line of 2017mTVD - 0.0° behind in angle - 8.0° left in azimuth - 7.5m center to center - BURR: 5.2°/30m to target TVD of 2014mTVD.

ConocoPhillips Reps toured the rig and NEB Environmental conducted environmental inspection, results were satisfactory.

24hr Forecast

Drill 222mm intermediate directional hole to intermediate TD (ICP) with accumulated MWD surveys, rig services, connections and circulation times. Circulate 2 bottoms up, wiper trip to 1700m+/-, slip and cut drill line, run in the hole, circulate hole clean, pull out of the hole, rig up loggers and run open hole logs.

Daily Contacts

Drilling Superintendent, Sheldon Vamplew, 403-999-1302; Drilling Engineer, Mike Greener, 403-771-5039; WS Supervisor, Richard Turgeon, 780-387-1706; WS Supervisor, Dave Oppen, 403-863-8205; Rig Manager, Rick Yavis, 780-718-2962; Command Centre, 403-910-0357

Last Casing String

Surface, 602.00mKB

Log

Start Time	End Time	Dur (hr)	Phase	Op Code	Activity Code	Time P-T-X	Trbl Code	Start Depth (mKB)	End Depth (mKB)	Operation
00:00	00:45	0.75	INTRM1	DRILL	DRLG	P		1,993.00	1,998.00	Drill 222mm hole, with Smith FHI18B tricone bit, Wenzel mud motor, 7/8 lobe, 5 stage (0.077rev/L), set at 1.93 deg. with 0.81m from bit to bend, from 1993m to 1998m
00:45	01:00	0.25	INTRM1	RIGMNT	SVRG	P		1,998.00	1,998.00	Rig service function test rig smart anti-collision system, function test pipe ram's 4 sec to close crown saver,grease all moving parts,
01:00	01:30	0.50	INTRM1	EVALFM	ELOG	P		1,998.00	1,998.00	Relog 11 m of gamma
01:30	05:45	4.25	INTRM1	DRILL	DRLG	P		1,998.00	2,016.00	Drill 222mm hole, with Smith FHI18B tricone bit, Wenzel mud motor, 7/8 lobe, 5 stage (0.077rev/L), set at 1.93 deg. with 0.81m from bit to bend, from 1998m to 2016 m
05:45	06:00	0.25	INTRM1	RIGMNT	RGRP	T	Rig	2,016.00	2,016.00	Changed out batteries on low angle sensor, on top drive bails
06:00	07:15	1.25	INTRM1	DRILL	DRLG	P		2,016.00	2,026.00	Drill 222mm hole, with Smith FHI18B tricone bit, Wenzel mud motor, 7/8 lobe, 5 stage (0.077rev/L), set at 1.93 deg. with 0.81m from bit to bend, from 2016 m to 2026m
07:15	07:45	0.50	INTRM1	DRILL	SRVY	P		2,026.00	2,026.00	Accumulated time for dir surveys
07:45	08:00	0.25	INTRM1	DRILL	SFTY	P		2,026.00	2,026.00	Crew handover meeting, Conoco reps. and toolpush present, daily rig walk around inspection R/T
08:00	09:15	1.25	INTRM1	DRILL	DRLG	P		2,026.00	2,036.00	Drill 222mm hole, with Smith FHI18B tricone bit, Wenzel mud motor, 7/8 lobe, 5 stage (0.077rev/L), set at 1.93 deg. with 0.81m from bit to bend, from 2026m to 2036m
09:15	09:30	0.25	INTRM1	RIGMNT	SVRG	P		2,036.00	2,036.00	Rig service function test rig smart anti-collision system, function test Hydrill 13sec to close crown saver,grease all moving parts, check oil levels in floor motor, pumps and HPU
09:30	10:15	0.75	INTRM1	RIGMNT	SVRG	P		2,036.00	2,036.00	Clean suction screen on mud pump, change shaker screen
10:15	15:30	5.25	INTRM1	DRILL	DRLG	P		2,036.00	2,069.00	Drill 222mm hole, with Smith FHI18B tricone bit, Wenzel mud motor, 7/8 lobe, 5 stage (0.077rev/L), set at 1.93 deg. with 0.81m from bit to bend, from 2036m to 2069m
15:30	16:00	0.50	INTRM1	DRILL	SRVY	P		2,069.00	2,069.00	Accumulated directional surveys

Daily Drilling

COPRC MIRROR LAKE P-20 65-00 126-45

Rig: Beaver Drilling Ltd. 2

Report Date: 2/12/2014
Report #: 20
Depth Progress: 111.00m
Depth End: 2,104.00mKB
Rig Release Date: 2/23/2014

Time Log

Start Time	End Time	Dur (hr)	Phase	Op Code	Activity Code	Time P-T-X	Trbl Code	Start Depth (mKB)	End Depth (mKB)	Operation
16:00	17:00	1.00	INTRM1	DRILL	DRLG	P		2,069.00	2,074.00	Drill 222mm hole, with Smith FHI18B tricone bit, Wenzel mud motor, 7/8 lobe, 5 stage (0.077rev/L), set at 1.93 deg. with 0.81m from bit to bend, from 2069m to 2074m
17:00	17:15	0.25	INTRM1	RIGMNT	SVRG	P		2,074.00	2,074.00	Rig service function test rig smart anti-collision system, function test HCR 2sec to close crown saver, grease all moving parts, check oil levels in floor motor, pumps and HPU
17:15	19:00	1.75	INTRM1	DRILL	DRLG	P		2,074.00	2,081.00	Drill 222mm hole, with Smith FHI18B tricone bit, Wenzel mud motor, 7/8 lobe, 5 stage (0.077rev/L), set at 1.93 deg. with 0.81m from bit to bend, from 2074m to 2081m
19:00	19:15	0.25	INTRM1	DRILL	SFTY	P		2,081.00	2,081.00	Crew handover meeting, Conoco reps. and toolpush present, daily rig walk around inspection D/O
19:15	23:30	4.25	INTRM1	DRILL	DRLG	P		2,081.00	2,104.00	Drill 222mm hole, with Smith FHI18B tricone bit, Wenzel mud motor, 7/8 lobe, 5 stage (0.077rev/L), set at 1.93 deg. with 0.81m from bit to bend, from 2081m to 2104 m
23:30	00:00	0.50	INTRM1	DRILL	SRVY	P		2,104.00	2,104.00	Accumulated time for dir surveys

Fluid/Mud Chks: Mud Engineer: Corey Clark

Time 10:00	Depth (mKB) 2,055.00	Density (kg/m³) 1,010.0	Funnel Viscosity (s/L) 79	pH	PV Override (Pa·s) 20.0	YP Override (Pa) 5.0
Low Gravity Solids (%) 9.2	MBT (kg/m³)	Oil Water Ratio 84/16	Chlorides (mg/L) 261,080	Calcium (mg/L) 41	Lime (kg/m³) 15	Potassium (mg/L)
Electric Stab (V) 700.0	ECD - Manual Entry (k... 1,060.0	Sand (%) 2.6	Solids, Corr. (%) 9.3	T Flowline (°C) 52	HTHP Pressure (kPa)	HTHP Filtrate (mL/30... 5.0
API Filtrate (mL/30min)		Mud Lost to Surface (m³) 4.00		Mud Lost to Hole (m³) 0.00		Daily Mud Field Est (Cost) 5,688.71
Cum Mud Lost to Surface (m³) 50.00		Cum Mud Lost to Hole (m³) 8.00		Cumulative Mud Cost (Cost) 102,342.56		

Last BOP Drill

Type BOP Drill	Days Last Chk (...) 1	Last Date 2/11/2014	Days Until Next... 4	Next Check Date 2/16/2014
Days Since Lost Time Incident (days) 853.00	Days Since Recordable Incident (days) 853.00			

Safety Incidents

Date	Com	Category

Drill String: BHA # 4

Bit Run 4	Drill Bit 222.0mm, FHI18B, RA3595	Length (m) 0.20	IADC Bit Dull 2-3-WT-G-1-1-NO-TD	TFA (incl Noz) (mm²) 942	BHA ROP (m/hr) 6.2
Nozzles (mm) 20.0/20.0/20.0	String Length (m) 2,152.00	OD (mm) 173.0	Max Rotating Hook Load (daN) 73,000		
Depth In (mKB) 1,921.00	Depth Out (mKB) 2,152.00	Avg ROP (m/hr) 6.2	Depth This Job (m) 231.00	Total Depth Drilled b... 231.00	Job Drill Hrs (hr) 37.50
			Total Drill Hrs (hr) 37.50		

Comment

Drill 222mm hole, with Smith FHI18B tricone bit, Wenzel mud motor, 7/8 lobe, 5 stage (0.077rev/L), set at 1.59 deg. with 0.81m from bit to bend. NM float sub, NM Pony monel, NM gap sub, 1 x MWD flex NM monel, 2 x NM flex monels, 3 joints HWDP, 1 x Jars, 37 joints HWDP

Drill String Components

Item Des	ID (mm)	OD (mm)	Jts	Len (m)	Cum Len (m)
Drill pipe - Singles	68.0	101.0	1	1.80	2,152.00
Drill pipe - Stands	68.0	101.0	91	1,730.84	2,150.20
4" H.W	65.0	101.0	37	344.46	419.36
Jars	69.0	161.0	1	5.13	74.90
4" H.W	65.0	101.0	3	28.27	69.77
6.75" X/O	59.0	168.0	1	0.80	41.50
6.75" NM Flex Mon	70.0	171.0	1	8.28	40.70
6.75" Flex Monel	70.0	171.0	1	9.20	32.42
6.75" Gap Sub	88.0	162.0	1	0.54	23.22
4.5"H90 FLEX MONEL	70.0	171.0	1	9.35	22.68
NM pony monel	70.0	171.0	1	2.97	1
N.M SUB	72.0	173.0	1	0.54	1
MUD MOTOR	64.0	169.0	1	9.62	9.82

Drilling Parameter: 2,069.00 - 2,104.00 mKB

Cum Depth (m) 183.00	Cum Drill... 30.00	Int ROP (...) 5.0	Flow Rate... 1.700	WOB (daN) 16,000	RPM (r... 40	SPP (kPa) 15,600	Drill Str Wt (d... 71,000	SO Str Wt (daN) 65,000	PU Str Wt (daN) 76,000	Off-Btm Str W... 71,000	Drill Tq 7,950.0
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Daily Drilling

COPRC MIRROR LAKE P-20 65-00 126-45

Rig: Beaver Drilling Ltd. 2

Report Date: 2/12/2014
Report #: 20
Depth Progress: 111.00m
Depth End: 2,104.00mKB
Rig Release Date: 2/23/2014

Hydraulic Calculations

Bit Hydraulic Power (kW)	HP/Area (kW/mm²)	% P @ bit (%)	Bit Jet Velocity (m/s)	Bit dP (kPa)	P Drop Annular (kPa)	Mud Density (kg/m³)	ECD End (kg/m³)
14.5	0.00037	3	30.1	512.1	527.7	1,010.0	1,036.8
Drill String Volume (m³)	Bit to Shoe Volume (m³)	Vol Shoe to Top (m³)	Min Casing AV (m/min)	Max Casing AV (m/min)	Min Open Hole AV (m/min)	Max Open Hole AV (m/min)	
7.53	45.42	19.29	52.6	52.6	25.0	111.8	

Error

Mud Pump: 1, NATIONAL, 8-P-80

Pump Number	Make	Model	Rod Diameter (mm)	Stroke Length (mm)
1	NATIONAL	8-P-80	140.0	216.0

Pump Checks

Date	Depth (mKB)	Q Flow (m³/min)	P (kPa)	Strokes (spm)
2/16/2014 16:00	2,209.00	0.608	5,153	78
2/16/2014 16:00	2,209.00	1.045	15,600	134

Pump Operations

Start Date	End Date	Liner Size (mm)	P Max (kPa)	Vol/Stk OR (m³/stk)
2/15/2014	2/15/2014	127.0		
2/16/2014	2/16/2014	127.0		

Mud Pump: 2, NATIONAL, 8-P-80

Pump Number	Make	Model	Rod Diameter (mm)	Stroke Length (mm)
2	NATIONAL	8-P-80	140.0	216.0

Pump Checks

Date	Depth (mKB)	Q Flow (m³/min)	P (kPa)	Strokes (spm)
2/19/2014 23:45	3,152.00	0.975	12,600	125
2/20/2014 00:00	3,143.00	0.647	6,414	83

Pump Operations

Start Date	End Date	Liner Size (mm)	P Max (kPa)	Vol/Stk OR (m³/stk)
2/20/2014	2/20/2014	127.0		
2/21/2014	2/21/2014	127.0		

Shaker Screens

Des	Start Date	End Date	Scr Sz X	Scr Sz Y	Note

Centrifuge/Cyclone: HGS Centrifuge, BOS Solutions, 5500

Number	Make	Model	Diameter (mm)
2	BOS Solutions	5500	

Centrifuge/Cyclone Checks

Date	Hrs (hr)	RPM (rpm)	Dens OF (kg/m³)	Q OF (L/min)	Dens UF (kg/m³)	Q UF (L/min)
2/21/2014 00:00	3.00	2100	1,040.0	0.400	1,710.0	0.200

Centrifuge/Cyclone: HGS Centrifuge, BOS Solutions, 5500

Number	Make	Model	Diameter (mm)
1	BOS Solutions	5500	

Centrifuge/Cyclone Checks

Date	Hrs (hr)	RPM (rpm)	Dens OF (kg/m³)	Q OF (L/min)	Dens UF (kg/m³)	Q UF (L/min)
2/21/2014 00:00	3.00	2100	1,100.0	0.400	1,790.0	0.200

Fluid / Mud Additive Amounts

Des	Consumed	Cost	Size	Units
Cal Carb SuperCal	10.0	5.280	25.0	SX
INVERT	4.0	1,063.330	1.0	M3
OPTISEAL	2.0	96.200	25.0	SX
Truvis	7.0	149.670	25.0	SX
Versatrol	3.0	47.500	50.0	SX

Survey Data

Date	MD (mKB)	Incl (°)	Azm (°)	TVD (mKB)	Depart (m)	NS (m)	EW (m)	VS (m)	DLS (°/30m)
2/12/2014	1,977.00	46.31	280.45	1,955.07	92.41	47.47	-79.29	88.84	6.42
2/12/2014	1,986.50	48.39	279.96	1,961.51	98.98	48.70	-86.17	95.80	6.67
2/12/2014	1,996.00	50.69	277.67	1,967.67	105.77	49.81	-93.31	102.99	9.11
2/12/2014	2,015.00	57.30	277.60	1,978.83	120.28	51.85	-108.53	118.22	10.44
2/12/2014	2,024.50	60.60	278.50	1,983.73	128.07	52.99	-116.59	126.30	10.70
2/12/2014	2,034.00	64.20	278.50	1,988.13	136.18	54.23	-124.92	134.67	11.37
2/12/2014	2,043.50	66.00	277.50	1,992.13	144.50	55.43	-133.45	143.22	6.37
2/12/2014	2,053.00	67.70	277.00	1,995.87	152.95	56.53	-142.11	151.88	5.56
2/12/2014	2,062.50	70.22	276.74	1,999.28	161.53	57.59	-150.92	160.66	7.99
2/12/2014	2,072.00	72.78	276.88	2,002.29	170.28	58.66	-159.86	169.57	8.10
2/12/2014	2,081.50	75.30	278.37	2,004.91	179.21	59.88	-168.91	178.63	9.15

Daily Drilling

COPRC MIRROR LAKE P-20 65-00 126-45

Rig: Beaver Drilling Ltd. 2

Report Date: 2/12/2014
Report #: 20
Depth Progress: 111.00m
Depth End: 2,104.00mKB
Rig Release Date: 2/23/2014

Formations

Formation Name	Drill Top MD (mKB)	Drill Top (TVD) (mKB)	Prog Top TVD (mKB)
Little Bear	43.00	43.00	20.85
Slater River	207.00	207.00	197.35
Arctic Red	954.00	953.52	932.35
Martin House	1,110.00	1,109.49	1,084.35
Imperial	1,140.00	1,139.48	1,118.35
KOP (5deg/30m)	1,731.00	1,730.40	1,730.73
KOP (7deg/30m)	1,817.00	1,815.65	1,816.00
Upper Canol	1,902.70	1,896.20	1,897.35
Lower Canol	1,935.80	1,924.43	1,929.35

Daily Drilling

COPRC MIRROR LAKE P-20 65-00 126-45

Report Date: 2/13/2014
Report #: 21
Depth Progress: 48.00m
Depth End: 2,152.00mKB
Rig Release Date: 2/23/2014

Rig: Beaver Drilling Ltd. 2

UWI ZuO/D-020/L094P1699		Surface Legal Location P-20 65-00 126-45		MaxWell Job Number JOB01@2006		License No. EL 470					
Ground Elevation (m) 284.15		Original KB/RT Elevation (m) 289.35		Casing Flange Elevation (m) 283.95		Original Spud Date 1/29/2014		Days From Spud (days) 21.00			
Job Category DRILLING		Primary Job Type DRILLING ORIGINAL		Actual Start Date 1/24/2014 00:00		End Date 2/23/2014 23:59		Final Job Status DRILLED		Final Report? Yes	
Daily Cost Total (Cost) 116,225.84		Cumulative Cost (Cost) 3,539,889.42		Total AFE (Cost) 7,122,600.00		AFE+Supp Amt (Cost) 7,122,600.00		AFE / RFE / Maint.# 10351812		Estimated Days	
Planned Depth (TMD) (mKB)		Override TVD (mKB)		Head Count 51.0		Personnel Total Hours (hr) 582.00		Cum Personnel Total Hours (hr) 11,650.00			
Avg Connection Gas 880		Avg Background Gas 475		Avg Trip Gas 20		Max H2S (ppm) 0					
Road Condition Ice/Snow		Weather Cloudy		Temperature (°C) -32				Wind SE 10 kms			
Ops and Depth @ Morning Report Run open hole logs. Point of refusal 2065.75m. Inc: 71° at 05:10hrs									Wellbore Original Hole		

Last 24hr Summary

No incidents or accidents. 6 - HID, 1 - OBS and 0 - ASA (all closed out)

Drill 222mm intermediate directional hole from 2104m to 2152m (TD) with accumulated MWD surveys, rig services, connections and circulation times. WOB: 15-18,000kDaN, RPM - 40-50 (Motor RPM - 131), Differential pressure: 100-3500kPa, Pump rate: 1.6-1.8 m3/min. Torque: 9,000-10,000ft/lbs, Rotate: 38m - 79% / Slide: 10m - 21%, ROP: 6.4m/hr. Last survey at 2131mMD, inclination= 85.9°, azimuth= 277.9°, TVD - 2013.06m. Projection at bit: Intermediate TD- 2152mMD, inclination: 89°, azimuth: 277.9°, TVD: 2014mTVD. Circulate 2 bottoms up and work drill string, wiper trip to 1699m, slip and cut drill line, run in the hole, circulate hole clean, pull out of the hole and lay down directional tools.

24hr Forecast

Finish running open hole logs, pull wear bushing, rig up power tongs and laydown truck, run 177.8mm intermediate casing, tag bottom, circulate bottoms up, lay down tag joint, make up and land mandrel hanger and landing joint, circulate, rig up cementers, cement 177.8mm intermediate casing.

Daily Contacts

Drilling Superintendent, Sheldon Vamplew, 403-999-1302; Drilling Engineer, Mike Greener, 403-771-5039; WS Supervisor, Richard Turgeon, 780-387-1706; WS Supervisor, Dave Oppen, 403-863-8205; Rig Manager, Rick Yavis, 780-718-2962; Command Centre, 403-910-0357

Last Casing String

Surface, 602.00mKB

Log

Start Time	End Time	Dur (hr)	Phase	Op Code	Activity Code	Time P-T-X	Trbl Code	Start Depth (mKB)	End Depth (mKB)	Operation
00:00	01:15	1.25	INTRM1	DRILL	DRLG	P		2,104.00	2,112.00	Drill 222mm hole, with Smith FHI18B tricone bit, Wenzel mud motor, 7/8 lobe, 5 stage (0.077rev/L), set at 1.93 deg. with 0.81m from bit to bend, from 2104m to 2112 m
01:15	01:30	0.25	INTRM1	RIGMNT	SVRG	P		2,112.00	2,112.00	Rig service function test rig smart anti-collision system, function test pipe ram's 4 sec to close crown saver,grease all moving parts, check oil levels in floor motor, pumps and HPU
01:30	06:45	5.25	INTRM1	DRILL	DRLG	P		2,112.00	2,146.00	Drill 222mm hole, with Smith FHI18B tricone bit, Wenzel mud motor, 7/8lobe, 5 stage (0.077rev/L), set at 1.93deg. with 0.81m from bit to bend, from 2112m to 2146m
06:45	07:15	0.50	INTRM1	RIGMNT	RGRP	T	Rig	2,146.00	2,146.00	Replace rubber on bottom of shaker
07:15	07:45	0.50	INTRM1	DRILL	SRVY	P		2,146.00	2,146.00	Accumulated time for dir surveys
07:45	08:00	0.25	INTRM1	DRILL	SFTY	P		2,146.00	2,146.00	Crew handover meeting, Conoco reps. and toolpush present, daily walk around rig inspection R/T.
08:00	08:30	0.50	INTRM1	DRILL	DRLG	P		2,146.00	2,150.00	Drill 222mm hole, with Smith FHI18B tricone bit, Wenzel mud motor, 7/8 lobe, 5 stage (0.077rev/L), set at 1.93 deg. with 0.81m from bit to bend, from 2146m to 2150m
08:30	08:45	0.25	INTRM1	RIGMNT	SVRG	P		2,150.00	2,150.00	Rig service function test rig smart anti-collision system, function test hydrill 13 sec to close, crown saver,grease all moving parts, check oil levels in floor motor, pumps and HPU
08:45	09:15	0.50	INTRM1	DRILL	DRLG	P		2,150.00	2,152.00	Drill 222mm hole, with Smith FHI18B tricone bit, Wenzel mud motor, 7/8 lobe, 5 stage (0.077rev/L), set at 1.93 deg. with 0.81m from bit to bend, from 2150m to 2152m
09:15	10:45	1.50	INTRM1	DRILL	CIRC	P		2,152.00	2,152.00	Circulate hole clean prior to wiper trip
10:45	12:30	1.75	INTRM1	DRILL	WPRT	P		2,152.00	2,152.00	Wiper trip up to 1699m flow check at 2140m, 2063m, 1699m
13:30	13:30	1.00	INTRM1	RIGMNT	SLPC	P		2,152.00	2,152.00	Slip and cut drill line. Cut 54.4m at 2139 MJ
14:45	14:45	1.25	INTRM1	DRILL	WPRT	P		2,152.00	2,152.00	Wiper trip in the hole to 2152mMD, bottom
14:45	16:15	1.50	INTRM1	DRILL	CIRC	P		2,152.00	2,152.00	Circulate hole clean and condition mud

Daily Drilling

COPRC MIRROR LAKE P-20 65-00 126-45

Report Date: 2/13/2014
Report #: 21
Depth Progress: 48.00m
Depth End: 2,152.00mKB
Rig Release Date: 2/23/2014

Rig: Beaver Drilling Ltd. 2

Time Log

Start Time	End Time	Dur (hr)	Phase	Op Code	Activity Code	Time P-T-X	Trbl Code	Start Depth (mKB)	End Depth (mKB)	Operation
16:15	16:30	0.25	INTRM1	RIGMNT	SVRG	P		2,152.00	2,152.00	Rig service function test rig smart anti-collision system, function test HCR 3 sec to open, function test crown saver, grease all moving parts, check oil levels in floor motor, pumps and HPU
16:30	18:45	2.25	INTRM1	DRILL	TRIP	P		2,152.00	2,152.00	Trip out of the hole, flow checks at 2139m, 2071m, 1615m
18:45	20:00	1.25	INTRM1	DRILL	SFTY	P		2,152.00	2,152.00	Crew handover meeting, safety meeting with night crew, tripping out of hole, Conoco reps. and toolpush present, daily walk around, rig inspection D/O.
20:00	23:15	3.25	INTRM1	DRILL	TRIP	P		2,152.00	2,152.00	Trip out of the hole to open hole log,
23:15	23:30	0.25	INTRM1	DRILL	SFTY	P		2,152.00	2,152.00	safety meeting on handle dir tools & lay down tools
23:30	00:00	0.50	INTRM1	DRILL	PULD	P		2,152.00	2,152.00	handle directional tools & lay down tools

Fluid/Mud Chks: Mud Engineer: Corey Clark

Time	06:00	Depth (mKB)	2,152.00	Density (kg/m³)	1,010.0	Funnel Viscosity (s/L)	78	pH		PV Override (Pa·s)	20.0	YP Override (Pa)	5.0
Low Gravity Solids (%)	9.2	MBT (kg/m³)		Oil Water Ratio	85/15	Chlorides (mg/L)	270,784	Calcium (mg/L)	42	Lime (kg/m³)	15	Potassium (mg/L)	
Electric Stab (V)	650.0	ECD - Manual Entry (k...)	1,060.0	Sand (%)	2.6	Solids, Corr. (%)	9.2	T Flowline (°C)	54	HTHP Pressure (kPa)		HTHP Filtrate (mL/30...)	4.0
API Filtrate (mL/30min)		Mud Lost to Surface (m³)	6.00	Mud Lost to Hole (m³)	1.00	Daily Mud Field Est (Cost)							
Cum Mud Lost to Surface (m³)	56.00	Cum Mud Lost to Hole (m³)	9.00	Cumulative Mud Cost (Cost)									8,636.11
Last BOP Drill													110,978.67

Type	BOP Drill	Days Last Chk (...)	2	Last Date	2/11/2014	Days Until Next...	3	Next Check Date	2/16/2014
Days Since Lost Time Incident (days)	854.00	Days Since Recordable Incident (days)	854.00						

Safety Incidents

Date	Com	Category

Drill String: BHA # 4

Bit Run	4	Drill Bit	222.0mm, FHI18B, RA3595	Length (m)	0.20	IADC Bit Dull	2-3-WT-G-1-1-NO-TD	TFA (incl Noz) (mm²)	942	BHA ROP (m/hr)	6.2
Nozzles (mm)	20.0/20.0/20.0	String Length (m)	2,152.00	OD (mm)	173.0	Max Rotating Hook Load (daN)	73,000				
Depth In (mKB)	1,921.00	Depth Out (mKB)	2,152.00	Avg ROP (m/hr)	6.2	Depth This Job (m)	231.00	Total Depth Drilled b...	231.00	Job Drill Hrs (hr)	37.50
										Total Drill Hrs (hr)	37.50

Comment
Drill 222mm hole, with Smith FHI18B tricone bit, Wenzel mud motor, 7/8 lobe, 5 stage (0.077rev/L), set at 1.59 deg. with 0.81m from bit to bend. NM float sub, NM Pony monel, NM gap sub, 1 x MWD flex NM monel, 2 x NM flex monels, 3 joints HWDP, 1 x Jars, 37 joints HWDP

Drill String Components

Item Des	ID (mm)	OD (mm)	Jts	Len (m)	Cum Len (m)
Drill pipe - Singles	68.0	101.0	1	1.80	2,152.00
Drill pipe - Stands	68.0	101.0	91	1,730.84	2,150.20
4" H.W	65.0	101.0	37	344.46	419.36
Jars	69.0	161.0	1	5.13	74.90
4" H.W	65.0	101.0	3	28.27	69.77
6.75" X/O	59.0	168.0	1	0.80	41.50
6.75" NM Flex Mon	70.0	171.0	1	8.28	40.70
6.75" Flex Monel	70.0	171.0	1	9.20	32.42
6.75" Gap Sub	88.0	162.0	1	0.54	23.22
4.5"H90 FLEX MONEL	70.0	171.0	1	9.35	22.68
NM pony monel	70.0	171.0	1	2.97	13.33
N.M SUB	72.0	173.0	1	0.54	10.36
MUD MOTOR	64.0	169.0	1	9.62	9.82

Drilling Parameter: 2,146.00 - 2,152.00 mKB

Cum Depth (m)	231.00	Cum Drill...	37.50	Int ROP (...)	6.0	Flow Rate...	1.700	WOB (daN)	20,000	RPM (r...	40	SPP (kPa)	17,200	Drill Str Wt (d...	73,000	SO Str Wt (daN)	65,000	PU Str Wt (daN)	81,000	Off-Btm Str W...	73,000	Drill Tq	8,
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Daily Drilling

COPRC MIRROR LAKE P-20 65-00 126-45

Rig: Beaver Drilling Ltd. 2

Report Date: 2/13/2014
Report #: 21
Depth Progress: 48.00m
Depth End: 2,152.00mKB
Rig Release Date: 2/23/2014

Hydraulic Calculations

Bit Hydraulic Power (kW)	HP/Area (kW/mm ²)	% P @ bit (%)	Bit Jet Velocity (m/s)	Bit dP (kPa)	P Drop Annular (kPa)	Mud Density (kg/m ³)	ECD End (kg/m ³)
14.5	0.00037	3	30.1	512.1	492.4	1,010.0	1,034.9
Drill String Volume (m ³)	Bit to Shoe Volume (m ³)	Vol Shoe to Top (m ³)	Min Casing AV (m/min)	Max Casing AV (m/min)	Min Open Hole AV (m/min)	Max Open Hole AV (m/min)	
7.70	46.90	19.29	52.6	52.6	25.0	111.8	

Error

Mud Pump: 1, NATIONAL, 8-P-80

Pump Number	Make	Model	Rod Diameter (mm)	Stroke Length (mm)
1	NATIONAL	8-P-80	140.0	216.0

Pump Checks

Date	Depth (mKB)	Q Flow (m ³ /min)	P (kPa)	Strokes (spm)
2/16/2014 16:00		2,209.00	0.608	5,153
2/16/2014 16:00		2,209.00	1.045	15,600

Pump Operations

Start Date	End Date	Liner Size (mm)	P Max (kPa)	Vol/Stk OR (m ³ /stk)
2/15/2014	2/15/2014	127.0		
2/16/2014	2/16/2014	127.0		

Mud Pump: 2, NATIONAL, 8-P-80

Pump Number	Make	Model	Rod Diameter (mm)	Stroke Length (mm)
2	NATIONAL	8-P-80	140.0	216.0

Pump Checks

Date	Depth (mKB)	Q Flow (m ³ /min)	P (kPa)	Strokes (spm)
2/19/2014 23:45		3,152.00	0.975	12,600
2/20/2014 00:00		3,143.00	0.647	6,414

Pump Operations

Start Date	End Date	Liner Size (mm)	P Max (kPa)	Vol/Stk OR (m ³ /stk)
2/20/2014	2/20/2014	127.0		
2/21/2014	2/21/2014	127.0		

Shaker Screens

Des	Start Date	End Date	Scr Sz X	Scr Sz Y	Note

Centrifuge/Cyclone: HGS Centrifuge, BOS Solutions, 5500

Number	Make	Model	Diameter (mm)
2	BOS Solutions	5500	

Centrifuge/Cyclone Checks

Date	Hrs (hr)	RPM (rpm)	Dens OF (kg/m ³)	Q OF (L/min)	Dens UF (kg/m ³)	Q UF (L/min)
2/21/2014 00:00	3.00	2100	1,040.0	0.400	1,710.0	0.200

Centrifuge/Cyclone: HGS Centrifuge, BOS Solutions, 5500

Number	Make	Model	Diameter (mm)
1	BOS Solutions	5500	

Centrifuge/Cyclone Checks

Date	Hrs (hr)	RPM (rpm)	Dens OF (kg/m ³)	Q OF (L/min)	Dens UF (kg/m ³)	Q UF (L/min)
2/21/2014 00:00	3.00	2100	1,100.0	0.400	1,790.0	0.200

Fluid / Mud Additive Amounts

Des	Consumed	Cost	Size	Units
Barite	70.0	17.040	40.0	SX
INVERT	7.0	1,063.330	1.0	M3

Survey Data

Date	MD (mKB)	Incl (°)	Azm (°)	TVD (mKB)	Depart (m)	NS (m)	EW (m)	VS (m)	DLS (°/30m)
2/13/2014	2,091.00	77.91	276.74	2,007.11	188.26	61.09	-178.07	187.80	9.64
2/13/2014	2,100.50	79.72	277.98	2,008.95	197.40	62.28	-187.32	197.04	6.89
2/13/2014	2,110.00	81.80	277.50	2,010.47	206.62	63.55	-196.61	206.34	6.74
2/13/2014	2,119.50	84.20	277.36	2,011.63	215.90	64.77	-205.96	215.69	7.59
2/13/2014	2,131.00	85.90	277.90	2,012.62	227.20	66.29	-217.31	227.05	4.65
2/13/2014	2,152.00	89.00	277.90	2,013.56	247.93	69.17	-238.09	247.87	4.43

Formations

Formation Name	Drill Top MD (mKB)	Drill Top (TVD) (mKB)	Prog Top TVD (mKB)
Little Bear	43.00	43.00	20.85
Red River	207.00	207.00	197.35
Red	954.00	953.52	932.35
Martin House	1,110.00	1,109.49	1,084.35
Imperial	1,140.00	1,139.48	1,118.35
KOP (5deg/30m)	1,731.00	1,730.40	1,730.73



Daily Drilling

COPRC MIRROR LAKE P-20 65-00 126-45

Rig: Beaver Drilling Ltd. 2

Report Date: 2/13/2014
Report #: 21
Depth Progress: 48.00m
Depth End: 2,152.00mKB
Rig Release Date: 2/23/2014

Formations

Formation Name	Drill Top MD (mKB)	Drill Top (TVD) (mKB)	Prog Top TVD (mKB)
KOP (7deg/30m)	1,817.00	1,815.65	1,816.00
Upper Canol	1,902.70	1,896.20	1,897.35
Lower Canol	1,935.80	1,924.43	1,929.35

Daily Drilling

COPRC MIRROR LAKE P-20 65-00 126-45

Report Date: 2/14/2014
Report #: 22
Depth Progress: 0.00m
Depth End: 2,152.00mKB
Rig Release Date: 2/23/2014

Rig: Beaver Drilling Ltd. 2

TUVI 200/D-020/L094P1699		Surface Legal Location P-20 65-00 126-45		MaxWell Job Number JOB01@2006		License No. EL 470	
Ground Elevation (m) 284.15		Original KB/RT Elevation (m) 289.35		Casing Flange Elevation (m) 283.95		Original Spud Date 1/29/2014	
Days From Spud (days) 22.00		Job Category DRILLING		Primary Job Type DRILLING ORIGINAL		Actual Start Date 1/24/2014 00:00	
End Date 2/23/2014 23:59		Final Job Status DRILLED		Final Report? Yes		Daily Cost Total (Cost) 494,764.92	
Cumulative Cost (Cost) 4,034,654.34		Total AFE (Cost) 7,122,600.00		AFE+Supp Amt (Cost) 7,122,600.00		AFE / RFE / Maint.# 10351812	
Estimated Days		Planned Depth (TMD) (mKB)		Override TVD (mKB)		Head Count 56.0	
Personnel Total Hours (hr) 638.00		Cum Personnel Total Hours (hr) 12,288.00		Avg Connection Gas		Avg Background Gas 20	
Avg Trip Gas 20		Max H2S (ppm) 0		Road Condition Ice/Snow		Weather Clear	
Temperature (°C) -32		Wind NW 10 kms		Ops and Depth @ Morning Report Run 177.8mm intermediate casing.		Wellbore Original Hole	

Last 24hr Summary

No incidents or accidents. 7 - HID, 1 - OBS and 0 - ASA (all closed out)

Lay down directional tools, attempt to pull wear bushing, rig up loggers, run open hole logs: AIT-TLD-HGNS-GR-BHC-TLD2-EMS-EMA-ECRD to point of refusal (2065.75mMD Inc: 71° at 05:10hrs), pull wear bushing, rig up power tongs and laydown truck, run 177.8mm intermediate casing.

24hr Forecast

Run 177.8mm intermediate casing, tag bottom, circulate bottoms up, lay down tag joint, make up and land mandrel hanger and landing joint, circulate, rig up cementers, cement 177.8mm intermediate casing, rig out cementers, lay down landing joint, set Stream-Flo packoff seal assembly and pressure test, make up BHA, run in the hole, drill out cement, float and shoe, conduct formation integrity test, drill 156mm lateral hole with accumulated MWD surveys, rig services, connections and circulation times.

Daily Contacts

Drilling Superintend, Sheldon Vamplew, 403-999-1302; Drilling Engineer, Mike Greener, 403-771-5039; WS Supervisor, Richard Turgeon, 780-387-1706; WS Supervisor, Dave Oppen, 403-863-8205; Rig Manager, Rick Yavis, 780-718-2962; Command Centre, 403-910-0357

Last Casing String

Intermediate, 2,152.00mKB

Time Log

Time	End Time	Dur (hr)	Phase	Op Code	Activity Code	Time P-T-X	Trbl Code	Start Depth (mKB)	End Depth (mKB)	Operation
00:00	00:30	0.50	INTRM1	DRILL	PULD	P		2,152.00	2,152.00	Handle directional tools & lay down tools
00:30	01:15	0.75	INTRM1	DRILL	RURD	T	Wellhead/Tree	2,152.00	2,152.00	Attempt to pull out damaged wear bushing.
01:15	01:30	0.25	INTRM1	RIGMNT	SVRG	P		2,152.00	2,152.00	Rig service function test rig smart anti-collision system, function test blind ram's 3 sec to close, function test crown saver,grease all moving parts, check oil levels in floor motor, pumps and HPU
01:30	01:45	0.25	INTRM1	EVALFM	SFTY	P		2,152.00	2,152.00	Safety meeting with Schlumberger prior to open hole log
01:45	07:45	6.00	INTRM1	EVALFM	ELOG	P		2,152.00	2,152.00	Wireline open hole logs, AIT-TLD-HGNS-GR-BHC-TLD2-EMS-EMA-ECRD tools, to point of refusal at 2065.75mMD, Inc: 71deg, with Schlumberger
07:45	08:00	0.25	INTRM1	EVALFM	SFTY	P		2,152.00	2,152.00	Crew handover meeting, Conoco reps. and toolpush present, daily walk around rig inspection R/T.
08:00	11:30	3.50	INTRM1	EVALFM	ELOG	P		2,152.00	2,152.00	Wireline logs with Schlumberger.
11:30	11:45	0.25	INTRM1	EVALFM	SFTY	P		2,152.00	2,152.00	Safety meeting prior to rigging out loggers.
11:45	13:00	1.25	INTRM1	EVALFM	PULD	P		2,152.00	2,152.00	Rig out Schlumberger loggers.
13:00	13:15	0.25	INTRM1	RIGMNT	SVRG	P		2,152.00	2,152.00	Rig service function test rig smart anti-collision system, function test pipe ram's 4 sec to close, function test crown saver,grease all moving parts, check oil levels in floor motor and HPU
13:15	16:00	2.75	INTRM1	DRILL	RURD	T	Wellhead/Tree	2,152.00	2,152.00	Mill and attempt to retrieve damaged wear bushing/modify wear bushing puller
16:00	16:15	0.25	INTRM1	RIGMNT	SVRG	P		2,152.00	2,152.00	Rig service function test rig smart anti-collision system, function test HCR 3 sec to open, function test crown saver,grease all moving parts, check oil levels in floor motor and HPU
16:15	18:45	2.50	INTRM1	DRILL	RURD	T	Wellhead/Tree	2,152.00	2,152.00	Mill and attempt to retrieve damaged wear bushing/modify wear bushing puller
18:45	19:00	0.25	INTRM1	DRILL	SFTY	P		2,152.00	2,152.00	Crew handover meeting, Conoco reps. and toolpush present, daily walk around rig inspection R/T.daily walk around rig inspection D/O.
19:00	19:30	0.50	INTRM1	DRILL	RURD	T	Wellhead/Tree	2,152.00	2,152.00	Retrieve wear bushing

Daily Drilling

COPRC MIRROR LAKE P-20 65-00 126-45

Report Date: 2/14/2014
Report #: 22
Depth Progress: 0.00m
Depth End: 2,152.00mKB
Rig Release Date: 2/23/2014

Rig: Beaver Drilling Ltd. 2

Time Log

Start Time	End Time	Dur (hr)	Phase	Op Code	Activity Code	Time P-T-X	Trbl Code	Start Depth (mKB)	End Depth (mKB)	Operation
19:30	20:45	1.25	INTRM1	CASING	SFTY	P		2,152.00	2,152.00	Safety meeting, with Hallmark power tongs and Miko lay down truck, prior to rigging up
20:45	22:00	1.25	INTRM1	CASING	RNCS	P		2,152.00	2,152.00	Rig up Hallmark power tongs and Miko lay down truck, rig in hole fill line
22:00	22:30	0.50	INTRM1	CASING	SFTY	P		2,152.00	2,152.00	Safety meeting prior to running 177.8mm intermediate casing.
22:30	00:00	1.50	INTRM1	CASING	RNCS	P		2,152.00	2,152.00	Make up float shoe, 1x joint of 177.8mm intermediate casing, float collar. Test floats, run in 177.8mm intermediate casing. with Hallmark power tongs

Fluid/Mud Chks: Mud Engineer: Corey Clark

Time	Depth (mKB)	Density (kg/m³)	Funnel Viscosity (s/L)	pH	PV Override (Pa·s)	YP Override (Pa)
10:00	2,152.00	1,010.0	78		20.0	5.0
Low Gravity Solids (%)	MBT (kg/m³)	Oil Water Ratio	Chlorides (mg/L)	Calcium (mg/L)	Lime (kg/m³)	Potassium (mg/L)
9.2		85/15	270,784	42	15	
Electric Stab (V)	ECD - Manual Entry (k...)	Sand (%)	Solids, Corr. (%)	T Flowline (°C)	HTHP Pressure (kPa)	HTHP Filtrate (mL/30...)
650.0	1,060.0	2.6	9.2	54		4.0
API Filtrate (mL/30min)	Mud Lost to Surface (m³)	Mud Lost to Hole (m³)	Daily Mud Field Est (Cost)			
	6.00	1.00				
Cum Mud Lost to Surface (m³)	Cum Mud Lost to Hole (m³)	Cumulative Mud Cost (Cost)				
62.00	10.00	110,978.67				

Last BOP Drill

Type	Days Last Chk (...)	Last Date	Days Until Next...	Next Check Date
BOP Drill	3	2/11/2014	2	2/16/2014
Days Since Lost Time Incident (days)	855.00	Days Since Recordable Incident (days)	855.00	

Safety Incidents

Date	Com	Category

Drill String: BHA # <BHA No.??>

Bit Run	Drill Bit	Length (m)	IADC Bit Dull	TFA (incl Noz) (mm²)	BHA ROP (m/hr)
Nozzles (mm)	String Length (m)	OD (mm)	Max Rotating Hook Load (daN)		
Depth In (mKB)	Depth Out (mKB)	Avg ROP (m/hr)	Depth This Job (m)	Total Depth Drilled b...	Job Drill Hrs (hr)
					Total Drill Hrs (hr)

Comment

Drill String Components

Item Des	ID (mm)	OD (mm)	Jts	Len (m)	Cum Len (m)

Drilling Parameter: <depthstart> - <depthend> mKB

Cum Depth (m)	Cum Drill...	Int ROP (...)	Flow Rate...	WOB (daN)	RPM (r...	SPP (kPa)	Drill Str Wt (d...	SO Str Wt (daN)	PU Str Wt (daN)	Off-Btm Str W...	Drill Tq
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Hydraulic Calculations

Bit Hydraulic Powe...	HP/Area (kW/mm²)	% P @ bit (%)	Bit Jet Velocity (m/s)	Bit dP (kPa)	P Drop Annular (kPa)	Mud Density (kg/m³)	ECD End (kg/m³)
Drill String Volume (m³)	Bit to Shoe Volume (m³)	Vol Shoe to Top (m³)	Min Casing AV (m/min)	Max Casing AV (m/min)	Min Open Hole AV (m/...	Max Open Hole AV (m/...	
Error							

Error

Mud Pump: 1, NATIONAL, 8-P-80

Pump Number	Make	Model	Rod Diameter (mm)	Stroke Length (mm)
1	NATIONAL	8-P-80	140.0	216.0

Pump Checks

Date	Depth (mKB)	Q Flow (m³/min)	P (kPa)	Strokes (spm)
2/16/2014 16:00	2,209.00	0.608	5,153	78
2/16/2014 16:00	2,209.00	1.045	15,600	134

Pump Operations

Start Date	End Date	Liner Size (mm)	P Max (kPa)	Vol/Stk OR (m³/stk)
2/15/2014	2/15/2014	127.0		
2/16/2014	2/16/2014	127.0		

Mud Pump: 2, NATIONAL, 8-P-80

Pump Number	Make	Model	Rod Diameter (mm)	Stroke Length (mm)
2	NATIONAL	8-P-80	140.0	216.0

Daily Drilling

COPRC MIRROR LAKE P-20 65-00 126-45

Rig: Beaver Drilling Ltd. 2

Report Date: 2/14/2014
Report #: 22
Depth Progress: 0.00m
Depth End: 2,152.00mKB
Rig Release Date: 2/23/2014

np Checks

Date	Depth (mKB)	Q Flow (m³/min)	P (kPa)	Strokes (spm)
2/19/2014 23:45	3,152.00	0.975	12,600	125
2/20/2014 00:00	3,143.00	0.647	6,414	83

Pump Operations

Start Date	End Date	Liner Size (mm)	P Max (kPa)	Vol/Stk OR (m³/stk)
2/20/2014	2/20/2014	127.0		
2/21/2014	2/21/2014	127.0		

Shaker Screens

Des	Start Date	End Date	Scr Sz X	Scr Sz Y	Note

Centrifuge/Cyclone: HGS Centrifuge, BOS Solutions, 5500

Number	Make	Model	Diameter (mm)
2	BOS Solutions	5500	

Centrifuge/Cyclone Checks

Date	Hrs (hr)	RPM (rpm)	Dens OF (kg/m³)	Q OF (L/min)	Dens UF (kg/m³)	Q UF (L/min)
2/21/2014 00:00	3.00	2100	1,040.0	0.400	1,710.0	0.200

Centrifuge/Cyclone: HGS Centrifuge, BOS Solutions, 5500

Number	Make	Model	Diameter (mm)
1	BOS Solutions	5500	

Centrifuge/Cyclone Checks

Date	Hrs (hr)	RPM (rpm)	Dens OF (kg/m³)	Q OF (L/min)	Dens UF (kg/m³)	Q UF (L/min)
2/21/2014 00:00	3.00	2100	1,100.0	0.400	1,790.0	0.200

Fluid / Mud Additive Amounts

Des	Consumed	Cost	Size	Units

Survey Data

Date	MD (mKB)	Incl (°)	Azm (°)	TVD (mKB)	Depart (m)	NS (m)	EW (m)	VS (m)	DLS (°/30m)

Formations

Formation Name	Drill Top MD (mKB)	Drill Top (TVD) (mKB)	Prog Top TVD (mKB)
3 Bear	43.00	43.00	20.85
Slater River	207.00	207.00	197.35
Arctic Red	954.00	953.52	932.35
Martin House	1,110.00	1,109.49	1,084.35
Imperial	1,140.00	1,139.48	1,118.35
KOP (5deg/30m)	1,731.00	1,730.40	1,730.73
KOP (7deg/30m)	1,817.00	1,815.65	1,816.00
Upper Canol	1,902.70	1,896.20	1,897.35
Lower Canol	1,935.80	1,924.43	1,929.35

Daily Drilling

COPRC MIRROR LAKE P-20 65-00 126-45

Report Date: 2/15/2014
Report #: 23
Depth Progress: 0.00m
Depth End: 2,152.00mKB
Rig Release Date: 2/23/2014

Rig: Beaver Drilling Ltd. 2

UWI 200/D-020/L094P1699		Surface Legal Location P-20 65-00 126-45		MaxWell Job Number JOB01@2006		License No. EL 470	
Ground Elevation (m) 284.15		Original KB/RT Elevation (m) 289.35		Casing Flange Elevation (m) 283.95		Original Spud Date 1/29/2014	
Days From Spud (days) 23.00		Job Category DRILLING		Primary Job Type DRILLING ORIGINAL		Actual Start Date 1/24/2014 00:00	
End Date 2/23/2014 23:59		Final Job Status DRILLED		Final Report? Yes		Daily Cost Total (Cost) 118,131.01	
Cumulative Cost (Cost) 4,152,785.35		Total AFE (Cost) 7,122,600.00		AFE+Supp Amt (Cost) 7,122,600.00		AFE / RFE / Maint.# 10351812	
Estimated Days		Planned Depth (TMD) (mKB)		Override TVD (mKB)		Head Count 61.0	
Personnel Total Hours (hr) 686.00		Cum Personnel Total Hours (hr) 12,974.00		Avg Connection Gas		Avg Background Gas 20	
Avg Trip Gas 20		Max H2S (ppm) 0		Road Condition Ice/Snow		Weather Cloudy	
Temperature (°C) -32		Wind SW 5 kms		Ops and Depth @ Morning Report Run in the hole at 729m.		Wellbore Original Hole	

Last 24hr Summary

No incidents or accidents. 8 - HID, 0 - OBS and 0 - ASA (all closed out)

Run 177.8mm intermediate casing, tag bottom, circulate bottoms up, lay down tag joint, make up and land mandrel hanger and landing joint, circulate, rig up cementers, cement 177.8mm intermediate casing (plug down at 19:08hrs on February 15/14 - Full pre-flush returns: 8m3 of CW8 and 8m3 of MudPushII Spacer, cement at surface by calculated volume results), floats not holding after pressure testing casing to 18,500kPa for 10 minutes, shut in until cement hardens, rig out cementers, lay down landing joint, set Stream-Flo packoff seal assembly.

Midnight to 6:00am: Pressure test Stream-Flo packoff seal assembly, set wear bushing, make up directional BHA, run in the hole.

24hr Forecast

Run in the hole, drill out cement, float and shoe, conduct formation integrity test, drill 156mm lateral hole with accumulated MWD surveys, rig services, connections and circulation times.

Daily Contacts

Drilling Superintendent, Sheldon Vamplew, 403-999-1302; Drilling Engineer, Mike Greener, 403-771-5039; WS Supervisor, Richard Turgeon, 780-387-1706; WS Supervisor, Dave Oppen, 403-863-8205; Rig Manager, Rick Yavis, 780-718-2962; Command Centre, 403-910-0357

Last Casing String

Intermediate, 2,152.00mKB

Log

Start Time	End Time	Dur (hr)	Phase	Op Code	Activity Code	Time P-T-X	Trbl Code	Start Depth (mKB)	End Depth (mKB)	Operation
00:00	00:15	0.25	INTRM1	RIGMNT	SVRG	P		2,152.00	2,152.00	Rig service function test rig smart anti-collision system, function test hydrl 14 sec to close, function test crown saver,grease all moving parts, check oil levels in floor motor, pumps and HPU
00:15	04:00	3.75	INTRM1	CASING	RNCS	P		2,152.00	2,152.00	Run 177.8mm intermediate Casing, 1- 177.8mm float shoe, 1-joint of 177.8mm, 38.69kg/m, P-110, LTC casing, 1-177.8mm float collar, 160-joints of 177.8mm, 38.69kg/m, P-110, LTC intermediate casing, from 2152mMD to 5.20m.
04:00	07:45	3.75	INTRM1	CASING	RNCS	P		2,152.00	2,152.00	Run 35 Volant Hydroform centralizers from 2152mMD to 1698m, run 10-Weatherford Micro Seal Packers, from 1818mMD to 1698mMD, RUN 41 Topco bow spring centralizers to surface
07:45	08:00	0.25	INTRM1	CASING	SFTY	P		2,152.00	2,152.00	Crew handover meeting, Conoco reps. and toolpush present, daily walk around rig inspection R/T.daily walk around rig inspection D/O.
08:00	08:15	0.25	INTRM1	RIGMNT	SVRG	P		2,152.00	2,152.00	Rig service function test rig smart anti-collision system, function test HCR 2 sec to close, function test crown saver,grease all moving parts, check oil levels in floor motor, pumps and HPU
08:15	09:15	1.00	INTRM1	CASING	RNCS	P		2,152.00	2,152.00	Fill every 20 joints and break circulation every 700m. Tag bottom at 2152mMD. Total length of 177.8mm intermediate casing: 2151.70m, float collar at 2136.75mMD
09:15	10:30	1.25	INTRM1	CASING	CIRC	P		2,152.00	2,152.00	Circulate 2 bottoms up, hole clean. Rig out laydown truck and power tongs
10:30	11:00	0.50	INTRM1	CASING	RNCS	P		2,152.00	2,152.00	Lay down joint of casing install mandrell hanger and land
11:00	16:00	5.00	INTRM1	CEMENT	CIRC	T	Waiting	2,152.00	2,152.00	Wait on Schlumberger cementers. Circulate casing on bottom
	16:15	0.25	INTRM1	CEMENT	SFTY	P		2,152.00	2,152.00	Safety meeting with Schlumberger cementers, prior to cement 177.8mm intermediate casing. Reviewed jsa.#105 rig to and cement casing

Daily Drilling

COPRC MIRROR LAKE P-20 65-00 126-45

Report Date: 2/15/2014
Report #: 23
Depth Progress: 0.00m
Depth End: 2,152.00mKB
Rig Release Date: 2/23/2014

Rig: Beaver Drilling Ltd. 2

Time Log

Start Time	End Time	Dur (hr)	Phase	Op Code	Activity Code	Time P-T-X	Trbl Code	Start Depth (mKB)	End Depth (mKB)	Operation
16:15	19:30	3.25	INTRM1	CEMENT	CMNT	P		2,152.00	2,152.00	Rig up Schlumberger cementers to cement 177.8mm intermediate casing, pump 8m3 of 1000kg/m3 CW8 pre-flush, stop and pressure test line to 21,000kPa (held OK), bleed off pressure, then pump 8m3 of 1200kg/m3 MUDPUSH II pre-flush spacer and then pump 19 tonnes/26.2m3 (35% excess) of HiLITE 1400 Lead cement with 0.2% Anti Foam + 0.6% Fluid Loss + 0.6% Low Temp Dispersant + 60L/tonne Gas Control Agent + 0.3% Antisettling from 1500m to 5.20m then pump 16 tonnes/12.3m3 (35% excess) of 1900kg/m3 Conventional Class G Tail Cement with 0.6% Fluid Loss + 0.5% Dispersant + 0.2% Anti Foam + 0.2% Retarder + 72L/tonne Gas Control Agent from 2152m to 1500m. Drop plug and displace 42.6m3 of invert. Bump plug 3,500kpa over final circulating pressure of 9,500kpa at 19:08hrs on February 15th 2014, bleed pressure and check floats (holding OK). Pressure test casing to 18,500kpa for 10 minutes (holding OK). Bleed pressure, check floats (floats not holding), shut in until cement set up, then rig out cementers. Full pre-flush returns: 8m3 of CW8 and 8m3 of MudPushII Spacer, cement at surface by calculated volume results.
19:30	19:45	0.25	INTRM1	RIGMNT	SVRG	P		2,152.00	2,152.00	Rig service function test rig smart anti-collision system, function test pipe ram's 4 sec to close, function test crown saver,grease all moving parts, check oil levels in floor motor, pumps and HPU
19:45	22:15	2.50	INTRM1	CEMENT	WOC	P		2,152.00	2,152.00	Wait on cement with valves on cementing head closed
22:15	23:30	1.25	INTRM1	CEMENT	WOC	P		2,152.00	2,152.00	Opened valves on cementing head, drained head, vac truck sucked out cementing head and landing joint, drain BOP stack, removed cementing head, turned landing joint out of mandrel hanger, lay down landing joint
23:30	00:00	0.50	INTRM1	CEMENT	WOC	P		2,152.00	2,152.00	Pick up 1 joint of 4" drill pipe, installed Pack-off Seal Assembly running tool, pick up Pack-off Seal Assembly, run in and set

Fluid/Mud Chks: Mud Engineer: Corey Clark

Time	10:00	Depth (mKB)	2,152.00	Density (kg/m³)	1,023.0	Funnel Viscosity (s/L)	78	pH		PV Override (Pa·s)	19.0	YP Override (Pa)	5.0
Low Gravity Solids (%)	9.3	MBT (kg/m³)		Oil Water Ratio	84/16	Chlorides (mg/L)	270,784	Calcium (mg/L)	42	Lime (kg/m³)	14	Potassium (mg/L)	
Electric Stab (V)	640.0	ECD - Manual Entry (k...)	1,060.0	Sand (%)	2.7	Solids, Corr. (%)	9.7	T Flowline (°C)	24	HTHP Pressure (kPa)		HTHP Filtrate (mL/30...)	4.0
API Filtrate (mL/30min)		Mud Lost to Surface (m³)		Mud Lost to Hole (m³)	2.00	Daily Mud Field Est (Cost)							
Cum Mud Lost to Surface (m³)	64.00	Cum Mud Lost to Hole (m³)	10.00	Cumulative Mud Cost (Cost)									2,126.66
													113,105.33

Last BOP Drill

Type	BOP Drill	Days Last Chk (...)	4	Last Date	2/11/2014	Days Until Next...	1	Next Check Date	2/16/2014
Days Since Lost Time Incident (days)		856.00		Days Since Recordable Incident (days)		856.00			

Safety Incidents

Date	Com	Category

Drill String: BHA # <BHA No.??>

Bit Run	Drill Bit	Length (m)	IADC Bit Dull	TFA (incl Noz) (mm²)	BHA ROP (m/hr)
Nozzles (mm)	String Length (m)	OD (mm)	Max Rotating Hook Load (daN)		
Depth In (mKB)	Depth Out (mKB)	Avg ROP (m/hr)	Depth This Job (m)	Total Depth Drilled b...	Job Drill Hrs (hr)
					Total Drill Hrs (hr)

Comment

Drill String Components

Item Des	ID (mm)	OD (mm)	Jts	Len (m)	Cum Len (m)

Daily Drilling

COPRC MIRROR LAKE P-20 65-00 126-45

Rig: Beaver Drilling Ltd. 2

Report Date: 2/15/2014
Report #: 23
Depth Progress: 0.00m
Depth End: 2,152.00mKB
Rig Release Date: 2/23/2014

Logging Parameter: <depthstart> - <depthend> mKB

Cum Depth (m)	Cum Drill...	Int ROP (...)	Flow Rate...	WOB (daN)	RPM (r...	SPP (kPa)	Drill Str Wt (d...	SO Str Wt (daN)	PU Str Wt (daN)	Off-Btm Str W...	Drill Tq
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Hydraulic Calculations

Bit Hydraulic Powe...	HP/Area (kW/mm²)	% P @ bit (%)	Bit Jet Velocity (m/s)	Bit dP (kPa)	P Drop Annular (kPa)	Mud Density (kg/m³)	ECD End (kg/m³)
Drill String Volume (m³)	Bit to Shoe Volume (m³)	Vol Shoe to Top (m³)	Min Casing AV (m/min)	Max Casing AV (m/min)	Min Open Hole AV (m/...	Max Open Hole AV (m/...	

Error

Mud Pump: 1, NATIONAL, 8-P-80

Pump Number	Make	Model	Rod Diameter (mm)	Stroke Length (mm)
1	NATIONAL	8-P-80	140.0	216.0

Pump Checks

Date	Depth (mKB)	Q Flow (m³/min)	P (kPa)	Strokes (spm)
2/16/2014 16:00	2,209.00	0.608	5,153	78
2/16/2014 16:00	2,209.00	1.045	15,600	134

Pump Operations

Start Date	End Date	Liner Size (mm)	P Max (kPa)	Vol/Stk OR (m³/stk)
2/15/2014	2/15/2014	127.0		
2/16/2014	2/16/2014	127.0		

Mud Pump: 2, NATIONAL, 8-P-80

Pump Number	Make	Model	Rod Diameter (mm)	Stroke Length (mm)
2	NATIONAL	8-P-80	140.0	216.0

Pump Checks

Date	Depth (mKB)	Q Flow (m³/min)	P (kPa)	Strokes (spm)
2/19/2014 23:45	3,152.00	0.975	12,600	125
2/20/2014 00:00	3,143.00	0.647	6,414	83

Pump Operations

Start Date	End Date	Liner Size (mm)	P Max (kPa)	Vol/Stk OR (m³/stk)
2/19/2014	2/20/2014	127.0		
2/20/2014	2/21/2014	127.0		

Shaker Screens

Des	Start Date	End Date	Scr Sz X	Scr Sz Y	Note

Centrifuge/Cyclone: HGS Centrifuge, BOS Solutions, 5500

Number	Make	Model	Diameter (mm)
2	BOS Solutions	5500	

Centrifuge/Cyclone Checks

Date	Hrs (hr)	RPM (rpm)	Dens OF (kg/m³)	Q OF (L/min)	Dens UF (kg/m³)	Q UF (L/min)
2/21/2014 00:00	3.00	2100	1,040.0	0.400	1,710.0	0.200

Centrifuge/Cyclone: HGS Centrifuge, BOS Solutions, 5500

Number	Make	Model	Diameter (mm)
1	BOS Solutions	5500	

Centrifuge/Cyclone Checks

Date	Hrs (hr)	RPM (rpm)	Dens OF (kg/m³)	Q OF (L/min)	Dens UF (kg/m³)	Q UF (L/min)
2/21/2014 00:00	3.00	2100	1,100.0	0.400	1,790.0	0.200

Fluid / Mud Additive Amounts

Des	Consumed	Cost	Size	Units
INVERT	2.0	1,063.330	1.0	M3

Survey Data

Date	MD (mKB)	Incl (°)	Azm (°)	TVD (mKB)	Depart (m)	NS (m)	EW (m)	VS (m)	DLS (°/30m)

Formations

Formation Name	Drill Top MD (mKB)	Drill Top (TVD) (mKB)	Prog Top TVD (mKB)
Little Bear	43.00	43.00	20.85
Slater River	207.00	207.00	197.35
Arctic Red	954.00	953.52	932.35
Martin House	1,110.00	1,109.49	1,084.35
Imperial	1,140.00	1,139.48	1,118.35
(5deg/30m)	1,731.00	1,730.40	1,730.73
ROP (7deg/30m)	1,817.00	1,815.65	1,816.00
Upper Canol	1,902.70	1,896.20	1,897.35
Lower Canol	1,935.80	1,924.43	1,929.35

Daily Drilling

COPRC MIRROR LAKE P-20 65-00 126-45

Report Date: 2/16/2014
Report #: 24
Depth Progress: 202.00m
Depth End: 2,354.00mKB
Rig Release Date: 2/23/2014

Rig: Beaver Drilling Ltd. 2

/ UWI 200/D-020/L094P1699		Surface Legal Location P-20 65-00 126-45		MaxWell Job Number JOB01@2006		License No. EL 470	
Ground Elevation (m) 284.15		Original KB/RT Elevation (m) 289.35		Casing Flange Elevation (m) 283.95		Original Spud Date 1/29/2014	
Days From Spud (days) 24.00		Job Category DRILLING		Primary Job Type DRILLING ORIGINAL		Actual Start Date 1/24/2014 00:00	
End Date 2/23/2014 23:59		Final Job Status DRILLED		Final Report? Yes		Daily Cost Total (Cost) 434,836.45	
Cumulative Cost (Cost) 4,587,621.80		Total AFE (Cost) 7,122,600.00		AFE+Supp Amt (Cost) 7,122,600.00		AFE / RFE / Maint.# 10351812	
Estimated Days		Planned Depth (TMD) (mKB)		Override TVD (mKB)		Head Count 59.0	
Personnel Total Hours (hr) 664.00		Cum Personnel Total Hours (hr) 13,638.00		Avg Connection Gas 2,450		Avg Background Gas 1,030	
Avg Trip Gas 18		Max H2S (ppm) 0		Road Condition Ice/Snow		Weather Cloudy	
Temperature (°C) -34		Wind NW 10 kms		Ops and Depth @ Morning Report Drill 156mm lateral directional hole at 2475m.		Wellbore Original Hole	

Last 24hr Summary

No incidents or accidents. 7 - HID, 1 - OBS and 0 - ASA (all closed out)

Set and pressure test Stream-Flo packoff seal assembly, make up directional BHA, run in the hole, drill out cement, float and shoe, drill 156mm hole from 2152m to 2157m, circulate bottoms up, perform formation integrity test to a gradient of 12.5kPa/m (surface applied pressure: 5025kPa for 10 minutes), drill 156mm lateral hole from 2157m to 2354m with accumulated MWD surveys, rig services, connections and circulation times. WOB: 6-10,000kDaN, RPM - 35-80 (Motor RPM - 152), Differential pressure: 2200-3000kPa, Pump rate: 1.1 m3/min. Torque: 7-10,000ft/lbs, Rotate: 177m - 88% / Slide: 25m - 12%, ROP: 25.25m/hr. Last survey at 2437.50mMD, inclination= 89.6°, azimuth= 285.9°, TVD - 2017.5m. We are 0.52m below and 9.14m left of the line.

24hr Forecast

Drill 156mm lateral directional hole with accumulated MWD surveys, rig services, connections and circulation times.

Daily Contacts

Drilling Superintend, Sheldon Vamplew, 403-999-1302; Drilling Engineer, Mike Greener, 403-771-5039; WS Supervisor, Richard Turgeon, 780-387-1706; WS Supervisor, Dave Oppen, 403-863-8205; Rig Manager, Rick Yavis, 780-718-2962; Command Centre, 403-910-0357

Last Casing String

Intermediate, 2,152.00mKB

Time Log

Start Time	End Time	Dur (hr)	Phase	Op Code	Activity Code	Time P-T-X	Tribl Code	Start Depth (mKB)	End Depth (mKB)	Operation
00:00	00:15	0.25	INTRM1	RIGMNT	SVRG	P		2,152.00	2,152.00	Rig service function test rig smart anti-collision system, function test blind ram's 3 sec to close, function test crown saver, grease all moving parts, check oil levels in floor motor, pumps and HPU
00:15	01:15	1.00	INTRM1	WHDBOP	PRTS	P		2,152.00	2,152.00	Tighten bolt on Packoff Seal Assembly, pressure test Packoff Seal Assembly, held OK. Unscrew from packoff, make up running tool for and install wear bushing
01:15	01:30	0.25	INTRM1	DRILL	SFTY	P		2,152.00	2,152.00	Safety meeting prior to pick up directional tools
01:30	03:30	2.00	INTRM1	DRILL	PULD	P		2,152.00	2,152.00	Pick up and make up, Smith 156mm MSI613 PDC bit, Weatherford 7/8 Lobe, 3.8 Stage (rpm at 0.135/L), 1.36deg bend, 1.66m bit to bend mud motor, MWD and LWD tools, 2-joints of HWDP, Jars, 1-joint of HWDP
03:30	07:45	4.25	INTRM1	DRILL	TRIP	P		2,152.00	2,152.00	Trip in hole with, Smith 156mm MSI613 PDC bit, Weatherford 7/8 Lobe, 3.8 Stage (rpm at 0.135/L), 1.36deg bend, 1.66m bit to bend mud motor, MWD and LWD tools, 2-joints of HWDP, Jars, 1-joint of HWDP
07:45	08:00	0.25	INTRM1	DRILL	SFTY	P		2,152.00	2,152.00	Crew handover meeting, Conoco reps. and toolpush present, daily walk around rig inspection R/T. daily walk around rig inspection D/O.
08:00	08:15	0.25	INTRM1	RIGMNT	SVRG	P		2,152.00	2,152.00	Rig service function test rig smart anti-collision system, function test pipe rams 4 sec to close, function test crown saver, grease all moving parts, check oil levels in floor motor, pumps and HPU
08:15	09:00	0.75	INTRM1	DRILL	TRIP	P		2,152.00	2,152.00	Trip in the hole to 1996m, fill pipe and test MWD tool
09:00	09:15	0.25	INTRM1	DRILL	SFTY	P		2,152.00	2,152.00	BOP drill crew in position well secure in 90 sec
09:15	10:15	1.00	INTRM1	DRILL	CIRC	P		2,152.00	2,152.00	Wash to bottom from 1996m Tag cement at 2133m
10:15	11:15	1.00	INTRM1	CEMENT	DRLG	P		2,152.00	2,152.00	Drill cement float and shoe, with Smith 156mm MSI613 PDC bit, Weatherford 7/8 Lobe, 3.8 Stage (rpm at 0.135/L), 1.36deg bend, 1.66m bit to bend mud motor, from 2132m to 2152m
11:15	11:45	0.50	INTRM1	DRILL	DRLG	P		2,152.00	2,157.00	Drill 156mm hole, with Smith 156mm MSI613 PDC bit, Weatherford 7/8 Lobe, 3.8 Stage (rpm at 0.135/L), 1.36deg bend, 1.66m bit to bend mud motor, from 2152m to 2157m
11:45	12:15	0.50	INTRM1	DRILL	CIRC	P		2,157.00	2,157.00	Circulate bottoms up, prior to formation integrity test

Daily Drilling

COPRC MIRROR LAKE P-20 65-00 126-45

Report Date: 2/16/2014
Report #: 24
Depth Progress: 202.00m
Depth End: 2,354.00mKB
Rig Release Date: 2/23/2014

Rig: Beaver Drilling Ltd. 2

Time Log

Start Time	End Time	Dur (hr)	Phase	Op Code	Activity Code	Time P-T-X	Trbl Code	Start Depth (mKB)	End Depth (mKB)	Operation
12:15	12:30	0.25	INTRM1	DRILL	FIT	P		2,157.00	2,157.00	Conduct formation integrity test, hold pressure for 10 min. AT 4860kpa. Held OK.
12:30	14:00	1.50	PROD1	DRILL	DRLG	P		2,157.00	2,174.00	Drill 156mm hole, with Smith 156mm MSi613 PDC bit, Weatherford 7/8 Lobe, 3.8 Stage (rpm at 0.135/L), 1.36deg bend, 1.66m bit to bend mud motor, from 2157m to 2174m
14:00	14:15	0.25	PROD1	RIGMNT	SVRG	P		2,174.00	2,174.00	Clean suction screen for mud pumps
14:15	15:45	1.50	PROD1	DRILL	DRLG	P		2,174.00	2,210.00	Drill 156mm hole, with Smith 156mm MSi613 PDC bit, Weatherford 7/8 Lobe, 3.8 Stage (rpm at 0.135/L), 1.36deg bend, 1.66m bit to bend mud motor, from 2174m to 2210m
15:45	16:00	0.25	PROD1	DRILL	SRVY	P		2,210.00	2,210.00	Accumulated directional surveys
16:00	16:15	0.25	PROD1	RIGMNT	SVRG	P		2,210.00	2,210.00	Rig service function test rig smart anti-collision system, function test hydrill 13 sec to close, function test crown saver,grease all moving parts, check oil levels in floor motor, pumps and HPU
16:15	19:00	2.75	PROD1	DRILL	DRLG	P		2,210.00	2,267.00	Drill 156mm hole, with Smith 156mm MSi613 PDC bit, Weatherford 7/8 Lobe, 3.8 Stage (rpm at 0.135/L), 1.36deg bend, 1.66m bit to bend mud motor, from 2210m to 2267 m
19:00	19:15	0.25	PROD1	DRILL	SFTY	P		2,267.00	2,267.00	Crew handover meeting, Conoco reps. and toolpush present, daily walk around rig inspection
19:15	23:15	4.00	PROD1	DRILL	DRLG	P		2,267.00	2,354.00	Drill 156mm hole, with Smith 156mm MSi613 PDC bit, Weatherford 7/8 Lobe, 3.8 Stage (rpm at 0.135/L), 1.36deg bend, 1.66m bit to bend mud motor, from 2267m to 2354 m
23:15	00:00	0.75	PROD1	DRILL	SRVY	P		2,354.00	2,354.00	Accumulated time for dir surveys

Fluid/Mud Chks: Mud Engineer: Corey Clark

Time	14:30	Depth (mKB)	2,192.00	Density (kg/m³)	985.0	Funnel Viscosity (s/L)	61	pH		PV Override (Pa-s)	13.0	YP Override (Pa)	4.0
Low Gravity Solids (%)	7.2	MBT (kg/m³)		Oil Water Ratio	84/16	Chlorides (mg/L)	196,931	Calcium (mg/L)	32	Lime (kg/m³)	14	Potassium (mg/L)	
Electric Stab (V)	490.0	ECD - Manual Entry (k...)	1,123.0	Sand (%)	2.7	Solids, Corr. (%)	7.7	T Flowline (°C)	33	HTHP Pressure (kPa)		HTHP Filtrate (mL/30...)	4.0
API Filtrate (mL/30min)		Mud Lost to Surface (m³)	4.00	Mud Lost to Hole (m³)	0.00	Daily Mud Field Est (Cost)							6,782.26
Cum Mud Lost to Surface (m³)	68.00	Cum Mud Lost to Hole (m³)	10.00	Cumulative Mud Cost (Cost)									119,887.59

Last BOP Drill

Type	BOP Drill	Days Last Chk (...)	0	Last Date	2/16/2014	Days Until Next...	5	Next Check Date	2/21/2014
Days Since Lost Time Incident (days)	857.00	Days Since Recordable Incident (days)							857.00

Safety Incidents

Date	Com	Category

Drill String: BHA # 5

Bit Run	5	Drill Bit	156.0mm, MS1613UBPXX, JH8401	Length (m)	0.19	IADC Bit Dull	-----	TFA (incl Noz) (mm²)	581	BHA ROP (m/hr)	23.7
Nozzles (mm)	11.1/11.1/11.1/11.1/11.1/11.1	String Length (m)	3,142.00	OD (mm)	131.0	Max Rotating Hook Load (daN)				68,000	
Depth In (mKB)	2,152.00	Depth Out (mKB)	3,152.00	Avg ROP (m/hr)	23.7	Depth This Job (m)	1,000.00	Total Depth Drilled b...	1,000.00	Job Drill Hrs (hr)	42.25
										Total Drill Hrs (hr)	42.25

Comment

Smith 156mm MSi613 PDC bit, Pathfinder 7/8 lobe, 3.8 stage, set at 1.36 deg. rotate at 0.135/L, 1.66m from bit to bend, (rpm at 0.135/L) mud motor, MWD and LWD tools 2 JOINTS HWDP, Jars, 1 joint of HWDP.

Drill String Components

Item Des	ID (mm)	OD (mm)	Jts	Len (m)	Cum Len (m)
Drill pipe - Stands	68.0	101.0	80	1,521.47	3,142.00
4" H.W	65.0	101.0	36	335.34	1,620.53
4 " D.P	70.0	101.0	126	1,198.30	1,285.19
4" H.W	65.0	101.0	1	9.12	8P
Jar	59.0	131.0	1	5.07	7
4" H.W	65.0	101.0	3	28.27	72.70
X/O	58.0	128.0	1	0.82	44.43
Slick monel	67.0	119.0	1	9.50	43.61
x/o	56.0	120.0	1	0.87	34.11

Daily Drilling

COPRC MIRROR LAKE P-20 65-00 126-45

Rig: Beaver Drilling Ltd. 2

Report Date: 2/16/2014
Report #: 24
Depth Progress: 202.00m
Depth End: 2,354.00mKB
Rig Release Date: 2/23/2014

String Components

Item Des	ID (mm)	OD (mm)	Jts	Len (m)	Cum Len (m)
4.75 LWD ABS	70.0	131.0	1	4.79	33.24
4.75 LWD SAWR	70.0	130.0	1	6.18	28.45
Landing Sub	63.0	119.0	1	0.58	22.27
Slick monel	67.0	119.0	1	9.47	21.69
NM Pony Monel	57.0	119.0	1	3.10	12.22
Mud motor	54.0	123.0	1	8.93	9.12

Drilling Parameter: 2,210.00 - 2,354.00 mKB

Cum Depth (m)	Cum Drill...	Int ROP (...)	Flow Rate...	WOB (daN)	RPM (r...	SPP (kPa)	Drill Str Wt (d...	SO Str Wt (daN)	PU Str Wt (daN)	Off-Btm Str W...	Drill Tq
202.00	10.25	21.3	1.000	10,000	80	15,600	67,000	62,000	72,000	67,000	10,600.0

Hydraulic Calculations

Bit Hydraulic Power (kW)	HP/Area (kW/mm²)	% P @ bit (%)	Bit Jet Velocity (m/s)	Bit dP (kPa)	P Drop Annular (kPa)	Mud Density (kg/m³)	ECD End (kg/m³)
7.6	0.00040	3	28.7	455.3	910.0	985.0	1,031.0
Drill String Volume (m³)	Bit to Shoe Volume (m³)	Vol Shoe to Top (m³)	Min Casing AV (m/min)	Max Casing AV (m/min)	Min Open Hole AV (m/min)	Max Open Hole AV (m/min)	
8.67	2.04	25.67	83.7	83.7	14.7	177.5	

Error

Mud Pump: 1, NATIONAL, 8-P-80

Pump Number	Make	Model	Rod Diameter (mm)	Stroke Length (mm)
1	NATIONAL	8-P-80	140.0	216.0

Pump Checks

Date	Depth (mKB)	Q Flow (m³/min)	P (kPa)	Strokes (spm)
2/16/2014 16:00	2,209.00	0.608	5,153	78
2/16/2014 16:00	2,209.00	1.045	15,600	134

Pump Operations

Start Date	End Date	Liner Size (mm)	P Max (kPa)	Vol/Stk OR (m³/stk)
2/15/2014	2/15/2014	127.0		
2/16/2014	2/16/2014	127.0		

Pump: 2, NATIONAL, 8-P-80

Pump Number	Make	Model	Rod Diameter (mm)	Stroke Length (mm)
2	NATIONAL	8-P-80	140.0	216.0

Pump Checks

Date	Depth (mKB)	Q Flow (m³/min)	P (kPa)	Strokes (spm)
2/19/2014 23:45	3,152.00	0.975	12,600	125
2/20/2014 00:00	3,143.00	0.647	6,414	83

Pump Operations

Start Date	End Date	Liner Size (mm)	P Max (kPa)	Vol/Stk OR (m³/stk)
2/20/2014	2/20/2014	127.0		
2/21/2014	2/21/2014	127.0		

Shaker Screens

Des	Start Date	End Date	Scr Sz X	Scr Sz Y	Note

Centrifuge/Cyclone: HGS Centrifuge, BOS Solutions, 5500

Number	Make	Model	Diameter (mm)
2	BOS Solutions	5500	

Centrifuge/Cyclone Checks

Date	Hrs (hr)	RPM (rpm)	Dens OF (kg/m³)	Q OF (L/min)	Dens UF (kg/m³)	Q UF (L/min)
2/21/2014 00:00	3.00	2100	1,040.0	0.400	1,710.0	0.200

Centrifuge/Cyclone: HGS Centrifuge, BOS Solutions, 5500

Number	Make	Model	Diameter (mm)
1	BOS Solutions	5500	

Centrifuge/Cyclone Checks

Date	Hrs (hr)	RPM (rpm)	Dens OF (kg/m³)	Q OF (L/min)	Dens UF (kg/m³)	Q UF (L/min)
2/21/2014 00:00	3.00	2100	1,100.0	0.400	1,790.0	0.200

Fluid / Mud Additive Amounts

Des	Consumed	Cost	Size	Units
Barite	56.0	17.040	40.0	SX
CALCIUM CHLORIDE	4.0	43.920	40.0	SX
RT	4.0	1,063.330	1.0	M3
	49.0	7.170	20.0	SX
Truvis	7.0	149.670	25.0	SX

Survey Data

Date	MD (mKB)	Incl (°)	Azm (°)	TVD (mKB)	Depart (m)	NS (m)	EW (m)	VS (m)	DLS (°/30m)
2/16/2014	2,171.00	88.00	279.90	2,014.06	266.78	72.11	-256.85	266.76	3.53

Daily Drilling

COPRC MIRROR LAKE P-20 65-00 126-45

Rig: Beaver Drilling Ltd. 2

Report Date: 2/16/2014
Report #: 24
Depth Progress: 202.00m
Depth End: 2,354.00mKB
Rig Release Date: 2/23/2014

Survey Data

Date	MD (mKB)	Incl (")	Azm (")	TVD (mKB)	Depart (m)	NS (m)	EW (m)	VS (m)	DLS ("/30m)
2/16/2014	2,190.00	88.00	280.50	2,014.72	285.69	75.47	-275.54	285.68	0.95
2/16/2014	2,209.00	88.50	281.10	2,015.30	304.62	79.03	-294.19	304.62	1.23
2/16/2014	2,228.00	89.20	281.20	2,015.68	323.58	82.70	-312.83	323.58	1.12
2/16/2014	2,247.00	89.30	281.50	2,015.93	342.54	86.44	-331.46	342.54	0.50
2/16/2014	2,266.00	88.20	276.50	2,016.34	361.45	89.41	-350.21	361.43	8.08
2/16/2014	2,285.00	89.30	281.00	2,016.76	380.35	92.30	-368.98	380.31	7.31
2/16/2014	2,304.00	89.80	281.90	2,016.91	399.33	96.07	-387.60	399.27	1.63
2/16/2014	2,323.00	90.00	281.90	2,016.94	418.32	99.99	-406.20	418.25	0.32

Formations

Formation Name	Drill Top MD (mKB)	Drill Top (TVD) (mKB)	Prog Top TVD (mKB)
Little Bear	43.00	43.00	20.85
Slater River	207.00	207.00	197.35
Arctic Red	954.00	953.52	932.35
Martin House	1,110.00	1,109.49	1,084.35
Imperial	1,140.00	1,139.48	1,118.35
KOP (5deg/30m)	1,731.00	1,730.40	1,730.73
KOP (7deg/30m)	1,817.00	1,815.65	1,816.00
Upper Canol	1,902.70	1,896.20	1,897.35
Lower Canol	1,935.80	1,924.43	1,929.35

Daily Drilling

COPRC MIRROR LAKE P-20 65-00 126-45

Report Date: 2/17/2014
Report #: 25
Depth Progress: 483.00m
Depth End: 2,837.00mKB
Rig Release Date: 2/23/2014

Rig: Beaver Drilling Ltd. 2

UWI 200/D-020/L094P1699		Surface Legal Location P-20 65-00 126-45		MaxWell Job Number JOB01@2006		License No. EL 470	
Ground Elevation (m) 284.15		Original KB/RT Elevation (m) 289.35		Casing Flange Elevation (m) 283.95		Original Spud Date 1/29/2014	
Days From Spud (days) 25.00		Job Category DRILLING		Primary Job Type DRILLING ORIGINAL		Actual Start Date 1/24/2014 00:00	
End Date 2/23/2014 23:59		Final Job Status DRILLED		Final Report? Yes		Daily Cost Total (Cost) 123,592.84	
Cumulative Cost (Cost) 4,711,214.64		Total AFE (Cost) 7,122,600.00		AFE+Supp Amt (Cost) 7,122,600.00		AFE / RFE / Maint.# 10351812	
Estimated Days		Planned Depth (TMD) (mKB)		Override TVD (mKB)		Head Count 55.0	
Personnel Total Hours (hr) 642.00		Cum Personnel Total Hours (hr) 14,280.00		Avg Connection Gas 5,000		Avg Background Gas 1,370	
Avg Trip Gas		Max H2S (ppm) 0		Road Condition Ice/Snow		Weather Snowing	
Temperature (°C) -28		Wind NW 10 kms		Ops and Depth @ Morning Report Drill 156mm lateral directional hole at 2980m.		Wellbore Original Hole	

Last 24hr Summary
No incidents or accidents. 7 - HID, 0 - OBS and 0 - ASA (all closed out)

Drill 156mm lateral hole from 2354m to 2837m with accumulated MWD surveys, rig services, connections and circulation times. WOB: 6-10,000kDaN, RPM - 60-85 (Motor RPM - 152), Differential pressure: 2200-3000kPa, Pump rate: 0.9-1.0 m3/min. Torque: 7-10,000ft/lbs, Rotate: 433m - 89.6% / Slide: 50m - 10.4%, ROP: 29.78m/hr. Last survey at 2951mMD, inclination= 89.40°, azimuth= 285.8°, TVD - 2024.24m. We are 2.78m below and 0.51m left of the line.

24hr Forecast
Drill 156mm lateral directional hole to TD with accumulated MWD surveys, rig services, connections and circulation times. Circulate hole clean (2 bottoms up), wiper trip to 2152mMD (casing shoe), wash in to bottom, circulate hole clean (3+ bottoms up), pull out of the hole to run 114.3mm liner, laydown 1000m+ of drill pipe.

Daily Contacts
Drilling Superintendent, Sheldon Vamplew, 403-999-1302; Drilling Engineer, Mike Greener, 403-771-5039; WS Supervisor, Richard Turgeon, 780-387-1706; WS Supervisor, Dave Oppen, 403-863-8205; Rig Manager, Rick Yavis, 780-718-2962; Command Centre, 403-910-0357

Last Casing String
Intermediate, 2,152.00mKB

Time Log

Time	End Time	Dur (hr)	Phase	Op Code	Activity Code	Time P-T-X	Trbl Code	Start Depth (mKB)	End Depth (mKB)	Operation
00:00	00:30	0.50	PROD1	DRILL	DRLG	P		2,354.00	2,362.00	Drill 156mm hole, with Smith 156mm MSi613 PDC bit, Weatherford 7/8 Lobe, 3.8 Stage (rpm at 0.135/L), 1.36deg bend, 1.66m bit to bend mud motor, from 2354m to 2362 m
00:30	00:45	0.25	PROD1	RIGMNT	SVRG	P		2,362.00	2,362.00	Rig service function test rig smart anti-collision system, function test pipe ram's 4 sec to close, function test crown saver,grease all moving parts, check oil levels in floor motor, pumps and HPU
00:45	01:00	0.25	PROD1	DRILL	SFTY	P		2,362.00	2,362.00	Held b.o.p drill with crew well secure in 85 sec
01:00	07:00	6.00	PROD1	DRILL	DRLG	P		2,362.00	2,514.00	Drill 156mm hole, with Smith 156mm MSi613 PDC bit, Weatherford 7/8 Lobe, 3.8 Stage (rpm at 0.135/L), 1.36deg bend, 1.66m bit to bend mud motor, from 2362 m to 2514 m
07:00	07:45	0.75	PROD1	DRILL	SRVY	P		2,514.00	2,514.00	Accumulated time for dir surveys
07:45	08:00	0.25	PROD1	DRILL	SFTY	P		2,514.00	2,514.00	Crew handover meeting, Conoco reps. and toolpush present, daily walk around rig inspection R/T.daily walk around rig inspection D/O.
08:00	08:15	0.25	PROD1	RIGMNT	SVRG	P		2,514.00	2,514.00	Rig service function test rig smart anti-collision system,function test crown saver, function test hydill 13 sec to close, function test crown saver,grease all moving parts, check oil levels in floor motor, pumps and HPU
08:15	15:15	7.00	PROD1	DRILL	DRLG	P		2,514.00	2,686.00	Drill 156mm hole, with Smith 156mm MSi613 PDC bit, Weatherford 7/8 Lobe, 3.8 Stage (rpm at 0.135/L), 1.36deg bend, 1.66m bit to bend mud motor, from 2514m to 2686m
15:15	16:00	0.75	PROD1	DRILL	SRVY	P		2,686.00	2,686.00	Accumulated time for directonal surveys
16:00	17:15	1.25	PROD1	DRILL	DRLG	P		2,686.00	2,704.00	Drill 156mm hole, Smith 156mm MSi613 PDC bit, Weatherford 7/8 Lobe, 3.8 Stage (rpm at 0.135/L), 1.36deg bend, 1.66m bit to bend mud motor, from 2686m to 2704m
17:15	17:30	0.25	PROD1	RIGMNT	SVRG	P		2,704.00	2,704.00	Rig service function test rig smart anti-collision system, function test crown saver, function test HCR 3 sec to open, function test crown saver,grease all moving parts, check oil levels in floor motor, pumps and HPU
17:30	17:45	0.25	PROD1	DRILL	SFTY	P		2,704.00	2,704.00	Held BOP drill with crew, well secure in 90 sec
17:45	19:00	1.25	PROD1	DRILL	DRLG	P		2,704.00	2,723.00	Drill 156mm hole, Smith 156mm MSi613 PDC bit, Weatherford 7/8 Lobe, 3.8 Stage (rpm at 0.135/L), 1.36deg bend, 1.66m bit to bend mud motor, from 2704m to 2723 m
19:00	19:15	0.25	PROD1	DRILL	SFTY	P		2,723.00	2,723.00	Crew handover meeting, Conoco reps. and toolpush

Daily Drilling

COPRC MIRROR LAKE P-20 65-00 126-45

Report Date: 2/17/2014
Report #: 25
Depth Progress: 483.00m
Depth End: 2,837.00mKB
Rig Release Date: 2/23/2014

Rig: Beaver Drilling Ltd. 2

Time Log

Start Time	End Time	Dur (hr)	Phase	Op Code	Activity Code	Time P-T-X	Trbl Code	Start Depth (mKB)	End Depth (mKB)	Operation
19:15	20:15	1.00	PROD1	DRILL	DRLG	P		2,723.00	2,761.00	Drill 156mm hole, Smith 156mm MSi613 PDC bit, Weatherford 7/8 Lobe, 3.8 Stage (rpm at 0.135/L), 1.36deg bend, 1.66m bit to bend mud motor, from 2723m to 2761 m
20:15	20:45	0.50	PROD1	RIGMNT	RGRP	T	Rig	2,761.00	2,761.00	Changed out seat & valve in pump # 2 flywheel side
20:45	23:15	2.50	PROD1	DRILL	DRLG	P		2,761.00	2,837.00	Drill 156mm hole, Smith 156mm MSi613 PDC bit, Weatherford 7/8 Lobe, 3.8 Stage (rpm at 0.135/L) 1.36deg bend 1.66m bit to bend mud motor from 2761m to 2837m
23:15	00:00	0.75	PROD1	DRILL	SRVY	P		2,837.00	2,837.00	Accumulated time for directional surveys

Fluid/Mud Chks: Mud Engineer: Corey Clark

Time	06:30	Depth (mKB)	2,500.00	Density (kg/m³)	1,050.0	Funnel Viscosity (s/L)	73	pH		PV Override (Pa·s)	19.0	YP Override (Pa)	5.0
Low Gravity Solids (%)	9.5	MBT (kg/m³)		Oil Water Ratio	83/17	Chlorides (mg/L)	213,540	Calcium (mg/L)	32	Lime (kg/m³)	18	Potassium (mg/L)	
Electric Stab (V)	580.0	ECD - Manual Entry (k...)	1,247.0	Sand (%)	2.8	Solids, Corr. (%)	10.6	T Flowline (°C)	44	HTHP Pressure (kPa)		HTHP Filtrate (mL/30...)	4.0
API Filtrate (mL/30min)		Mud Lost to Surface (m³)	8.00	Mud Lost to Hole (m³)	1.00	Daily Mud Field Est (Cost)							16,302.49
Cum Mud Lost to Surface (m³)	76.00	Cum Mud Lost to Hole (m³)	11.00	Cumulative Mud Cost (Cost)									136,190.08

Last BOP Drill

Type	BOP Drill	Days Last Chk (...)	0	Last Date	2/17/2014	Days Until Next...	5	Next Check Date	2/22/2014
Days Since Lost Time Incident (days)		858.00	Days Since Recordable Incident (days)		858.00				

Safety Incidents

Date	Com	Category

Drill String: BHA # 5

Bit Run	Drill Bit	Length (m)	IADC Bit Dull	TFA (incl Noz) (mm²)	BHA ROP (m/h, ...)
5	156.0mm, MS1613UBPXX, JH8401	0.19	-----	581	23.7
Nozzles (mm)	String Length (m)	OD (mm)	Max Rotating Hook Load (daN)		
11.1/11.1/11.1/11.1/11.1/11.1	3,142.00	131.0	68,000		
Depth In (mKB)	Depth Out (mKB)	Avg ROP (m/hr)	Depth This Job (m)	Total Depth Drilled b...	Job Drill Hrs (hr)
2,152.00	3,152.00	23.7	1,000.00	1,000.00	42.25

Comment

Smith 156mm MSi613 PDC bit, Pathfinder 7/8 lobe, 3.8 stage, set at 1.36 deg. rotate at 0.135/L, 1.66m from bit to bend, (rpm at 0.135/L) mud motor, MWD and LWD tools 2 JOINTS HWDP, Jars, 1 joint of HWDP.

Drill String Components

Item Des	ID (mm)	OD (mm)	Jts	Len (m)	Cum Len (m)
Drill pipe - Stands	68.0	101.0	80	1,521.47	3,142.00
4" H.W	65.0	101.0	36	335.34	1,620.53
4" D.P	70.0	101.0	126	1,198.30	1,285.19
4" H.W	65.0	101.0	1	9.12	86.89
Jar	59.0	131.0	1	5.07	77.77
4" H.W	65.0	101.0	3	28.27	72.70
X/O	58.0	128.0	1	0.82	44.43
Slick monel	67.0	119.0	1	9.50	43.61
x/o	56.0	120.0	1	0.87	34.11
4.75 LWD ABS	70.0	131.0	1	4.79	33.24
4.75 LWD SAWR	70.0	130.0	1	6.18	28.45
Landing Sub	63.0	119.0	1	0.58	22.27
Slick monel	67.0	119.0	1	9.47	21.69
NM Pony Monel	57.0	119.0	1	3.10	12.22
Mud motor	54.0	123.0	1	8.93	9.12

Drilling Parameter: 2,686.00 - 2,837.00 mKB

Cum Depth (m)	Cum Drill...	Int ROP (...)	Flow Rate...	WOB (daN)	RPM (r...	SPP (kPa)	Drill Str Wt (d...	SO Str Wt (daN)	PU Str Wt (daN)	Off-Btm Str W...	Drill Tq
685.00	29.75	25.2	1.000	9,000	80	16,800	68,000	73,000	63,000	68,000	11,

Daily Drilling

COPRC MIRROR LAKE P-20 65-00 126-45

Rig: Beaver Drilling Ltd. 2

Report Date: 2/17/2014
Report #: 25
Depth Progress: 483.00m
Depth End: 2,837.00mKB
Rig Release Date: 2/23/2014

Hydraulic Calculations

Bit Hydraulic Power (kW)	HP/Area (kW/mm²)	% P @ bit (%)	Bit Jet Velocity (m/s)	Bit dP (kPa)	P Drop Annular (kPa)	Mud Density (kg/m³)	ECD End (kg/m³)
8.1	0.00042	3	28.7	485.4	1,101.8	1,050.0	1,105.5
Drill String Volume (m³)	Bit to Shoe Volume (m³)	Vol Shoe to Top (m³)	Min Casing AV (m/min)	Max Casing AV (m/min)	Min Open Hole AV (m/min)	Max Open Hole AV (m/min)	
10.42	7.40	25.67	83.7	83.7	14.7	177.5	

Error

Mud Pump: 1, NATIONAL, 8-P-80

Pump Number	Make	Model	Rod Diameter (mm)	Stroke Length (mm)
1	NATIONAL	8-P-80	140.0	216.0

Pump Checks

Date	Depth (mKB)	Q Flow (m³/min)	P (kPa)	Strokes (spm)
2/16/2014 16:00		2,209.00	0.608	78
2/16/2014 16:00		2,209.00	1.045	134

Pump Operations

Start Date	End Date	Liner Size (mm)	P Max (kPa)	Vol/Stk OR (m³/stk)
2/15/2014	2/15/2014	127.0		
2/16/2014	2/16/2014	127.0		

Mud Pump: 2, NATIONAL, 8-P-80

Pump Number	Make	Model	Rod Diameter (mm)	Stroke Length (mm)
2	NATIONAL	8-P-80	140.0	216.0

Pump Checks

Date	Depth (mKB)	Q Flow (m³/min)	P (kPa)	Strokes (spm)
2/19/2014 23:45		3,152.00	0.975	125
2/20/2014 00:00		3,143.00	0.647	83

Pump Operations

Start Date	End Date	Liner Size (mm)	P Max (kPa)	Vol/Stk OR (m³/stk)
2/20/2014	2/20/2014	127.0		
2/21/2014	2/21/2014	127.0		

Shaker Screens

Des	Start Date	End Date	Scr Sz X	Scr Sz Y	Note

Centrifuge/Cyclone: HGS Centrifuge, BOS Solutions, 5500

Number	Make	Model	Diameter (mm)
2	BOS Solutions	5500	

Centrifuge/Cyclone Checks

Date	Hrs (hr)	RPM (rpm)	Dens OF (kg/m³)	Q OF (L/min)	Dens UF (kg/m³)	Q UF (L/min)
2/21/2014 00:00	3.00	2100	1,040.0	0.400	1,710.0	0.200

Centrifuge/Cyclone: HGS Centrifuge, BOS Solutions, 5500

Number	Make	Model	Diameter (mm)
1	BOS Solutions	5500	

Centrifuge/Cyclone Checks

Date	Hrs (hr)	RPM (rpm)	Dens OF (kg/m³)	Q OF (L/min)	Dens UF (kg/m³)	Q UF (L/min)
2/21/2014 00:00	3.00	2100	1,100.0	0.400	1,790.0	0.200

Fluid / Mud Additive Amounts

Des	Consumed	Cost	Size	Units
Barite	125.0	17.040	40.0	SX
CALCIUM CHLORIDE	36.0	43.920	40.0	SX
INVERT	9.0	1,063.330	1.0	M3
Truvis	8.0	149.670	25.0	SX
Versacoat HF	1.0	883.570	55.0	BBL
VERSAMUL	1.0	940.470	22.68	BBL

Survey Data

Date	MD (mKB)	Incl (°)	Azm (°)	TVD (mKB)	Depart (m)	NS (m)	EW (m)	VS (m)	DLS (°/30m)
2/17/2014	2,342.50	90.40	283.80	2,016.87	437.82	104.33	-425.21	437.73	2.99
2/17/2014	2,342.50	90.40	283.80	2,016.87	437.82	104.33	-425.21	437.73	2.99
2/17/2014	2,361.50	90.70	284.40	2,016.69	456.82	108.96	-443.63	456.73	1.06
2/17/2014	2,380.50	90.60	283.40	2,016.48	475.82	113.52	-462.08	475.73	1.59
2/17/2014	2,399.50	89.40	283.60	2,016.48	494.81	117.96	-480.55	494.72	1.92
2/17/2014	2,418.50	89.88	284.94	2,016.59	513.81	122.64	-498.96	513.72	2.25
2/17/2014	2,437.50	89.60	285.90	2,016.68	532.81	127.69	-517.28	532.72	1.58
2/17/2014	2,514.00	87.80	286.80	2,018.42	609.22	149.22	-590.66	609.17	0.79
2/17/2014	2,552.00	88.10	287.00	2,019.78	647.15	160.26	-627.00	647.12	0.28
2/17/2014	2,571.00	88.30	287.10	2,020.37	666.12	165.83	-645.15	666.10	0.35

Daily Drilling

COPRC MIRROR LAKE P-20 65-00 126-45

Report Date: 2/17/2014
 Report #: 25
 Depth Progress: 483.00m
 Depth End: 2,837.00mKB
 Rig Release Date: 2/23/2014

Rig: Beaver Drilling Ltd. 2

Survey Data

Date	MD (mKB)	Incl (°)	Azm (°)	TVD (mKB)	Depart (m)	NS (m)	EW (m)	VS (m)	DLS (°/30m)
2/17/2014	2,589.50	89.10	285.40	2,020.79	684.61	171.00	-662.91	684.59	3.05
2/17/2014	2,609.00	89.70	285.60	2,021.00	704.11	176.21	-681.70	704.09	0.97
2/17/2014	2,628.00	89.80	287.00	2,021.08	723.10	181.54	-699.93	723.08	2.22
2/17/2014	2,703.50	89.60	286.70	2,021.47	798.54	203.43	-772.19	798.54	0.14
2/17/2014	2,722.50	89.00	287.30	2,021.71	817.52	208.98	-790.36	817.52	1.34
2/17/2014	2,741.50	88.90	284.90	2,022.06	836.51	214.25	-808.61	836.51	3.79
2/17/2014	2,760.50	89.10	285.60	2,022.39	855.51	219.25	-826.94	855.51	1.15
2/17/2014	2,779.50	89.30	286.40	2,022.65	874.50	224.49	-845.20	874.50	1.30
2/17/2014	2,798.50	89.40	286.30	2,022.87	893.50	229.83	-863.43	893.50	0.22

Formations

Formation Name	Drill Top MD (mKB)	Drill Top (TVD) (mKB)	Prog Top TVD (mKB)
Little Bear	43.00	43.00	20.85
Slater River	207.00	207.00	197.35
Arctic Red	954.00	953.52	932.35
Martin House	1,110.00	1,109.49	1,084.35
Imperial	1,140.00	1,139.48	1,118.35
KOP (5deg/30m)	1,731.00	1,730.40	1,730.73
KOP (7deg/30m)	1,817.00	1,815.65	1,816.00
Upper Canol	1,902.70	1,896.20	1,897.35
Lower Canol	1,935.80	1,924.43	1,929.35

Daily Drilling

COPRC MIRROR LAKE P-20 65-00 126-45

Report Date: 2/18/2014
Report #: 26
Depth Progress: 305.00m
Depth End: 3,142.00mKB
Rig Release Date: 2/23/2014

Rig: Beaver Drilling Ltd. 2

/UWI 200/D-020/L094P1699		Surface Legal Location P-20 65-00 126-45		MaxWell Job Number JOB01@2006		License No. EL 470					
Ground Elevation (m) 284.15		Original KB/RT Elevation (m) 289.35		Casing Flange Elevation (m) 283.95		Original Spud Date 1/29/2014		Days From Spud (days) 26.00			
Job Category DRILLING		Primary Job Type DRILLING ORIGINAL		Actual Start Date 1/24/2014 00:00		End Date 2/23/2014 23:59		Final Job Status DRILLED		Final Report? Yes	
Daily Cost Total (Cost) 125,005.66		Cumulative Cost (Cost) 4,836,220.30		Total AFE (Cost) 7,122,600.00		AFE+Supp Amt (Cost) 7,122,600.00		AFE / RFE / Maint.# 10351812		Estimated Days	
Planned Depth (TMD) (mKB)		Override TVD (mKB)		Head Count 55.0		Personnel Total Hours (hr) 642.00		Cum Personnel Total Hours (hr) 14,922.00			
Avg Connection Gas 5,200		Avg Background Gas 4,500		Avg Trip Gas 27		Max H2S (ppm) 0					
Road Condition Ice/Snow		Weather Cloudy		Temperature (°C) -33		Wind N 15 kms					
Ops and Depth @ Morning Report Make up slick BHA and run in the hole.									Wellbore Original Hole		

Last 24hr Summary

No incidents or accidents. 9 - HID, 0 - OBS and 0 - ASA (all closed out)

Drill 156mm lateral hole from 2837m to 3142m with accumulated MWD surveys, rig services, connections and circulation times. WOB: 6-10,000kDaN, RPM - 60-85 (Motor RPM - 152), Differential pressure: 2200-3000kPa, Pump rate: 0.9-1.0 m3/min. Torque: 7-10,000ft/lbs, Rotate: 300m - 98.4% / Slide: 5.0m - 1.6%, ROP: 31.28m/hr. Last survey at 3103mMD, inclination= 89.9°, azimuth= 283.7°, TVD - 2024.92m. We are 2.13m below and 0.51m left of the line. Pull out of the hole due to mud motor failure.

24hr Forecast

Run in the hole, wash in from 2152m to 3142m, drill 156mm lateral hole to 3152mMD, circulate 3+ bottoms up, pull out to 2152m, rig up laydown truck, laydown 1000m of drill pipe, pull out of the hole, rig up power tongs.

Daily Contacts

Drilling Superintend, Sheldon Vamplew, 403-999-1302; Drilling Engineer, Mike Greener, 403-771-5039; WS Supervisor, Richard Turgeon, 780-387-1706; WS Supervisor, Dave Oppen, 403-863-8205; Rig Manager, Rick Yavis, 780-718-2962; Command Centre, 403-910-0357

Last Casing String

Intermediate, 2,152.00mKB

Time Log

Start Time	End Time	Dur (hr)	Phase	Op Code	Activity Code	Time P-T-X	Trbl Code	Start Depth (mKB)	End Depth (mKB)	Operation
00:00	00:15	0.25	PROD1	RIGMNT	SVRG	P		2,837.00	2,837.00	Rig service function test rig smart anti-collision system, function test pipe ram's 4 sec to close, function test crown saver, grease all moving parts, check oil levels in floor motor, pumps and HPU
00:15	07:00	6.75	PROD1	DRILL	DRLG	P		2,837.00	3,015.00	Drill 156mm hole, with Smith 156mm MSI613 PDC bit, Weatherford 7/8 Lobe, 3.8 Stage (rpm at 0.135/L), 1.36deg bend, 1.66m bit to bend mud motor, from 2837m to 3015m
07:00	07:45	0.75	PROD1	DRILL	SRVY	P		3,015.00	3,015.00	Accumulated time for surveys
07:45	08:00	0.25	PROD1	DRILL	SFTY	P		3,015.00	3,015.00	Crew handover meeting, Conoco reps. and toolpush present, daily walk around rig inspection R/T. daily walk around rig inspection D/O.
08:00	08:30	0.50	PROD1	DRILL	DRLG	P		3,015.00	3,028.00	Drill 156mm hole, with Smith 156mm MSI613 PDC bit, Weatherford 7/8 Lobe, 3.8 Stage (rpm at 0.135/L), 1.36deg bend, 1.66m bit to bend mud motor, from 3015m to 3028m
08:30	08:45	0.25	PROD1	RIGMNT	SVRG	P		3,028.00	3,028.00	Rig service function test rig smart anti-collision system, function test Hydrill 25 sec to close and open, function test crown saver, grease all moving parts, check oil levels in floor motor, pumps and HPU
08:45	13:30	4.75	PROD1	DRILL	DRLG	P		3,028.00	3,142.00	Drill 156mm hole, with Smith 156mm MSI613 PDC bit, Weatherford 7/8 Lobe, 3.8 Stage (rpm at 0.135/L), 1.36deg bend, 1.66m bit to bend mud motor, from 3028m to 3142m
13:30	16:00	2.50	PROD1	DRILL	TRIP	P		3,142.00	3,142.00	Trip out of the hole due to mud motor failure, flow checks at 3125m, 3008m
16:00	16:15	0.25	PROD1	DRILL	TRIP	P		3,142.00	3,142.00	Trip out of the hole, flow check at 2606m
16:15	16:45	0.50	PROD1	RIGMNT	RGRP	T	Rig	3,142.00	3,142.00	Change slip dies
16:45	17:45	1.00	PROD1	DRILL	TRIP	P		3,142.00	3,142.00	Trip out of the hole, flow checks at 2316m
17:45	18:00	0.25	PROD1	RIGMNT	SVRG	P		3,142.00	3,142.00	Rig service function test rig smart anti-collision system, function test HCR 3 sec to open and close, function test crown saver, grease all moving parts, check oil levels in floor motor and HPU
18:00	18:45	0.75	PROD1	DRILL	TRIP	P		3,142.00	3,142.00	Trip out of the hole, to lay down directional tools
18:45	19:00	0.25	PROD1	DRILL	SFTY	P		3,142.00	3,142.00	Crew handover meeting, Conoco reps. and toolpush present
19:00	00:00	5.00	PROD1	DRILL	TRIP	P		3,142.00	3,142.00	Trip out of the hole, flow checks at 1437m