



Daily Drilling

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

Rig: Beaver Drilling Ltd. 2

Report Date: 3/12/2013

Report #: 20

Depth Progress: 27.00 m

Depth End: 2,000.00 mKB

Rig Release Date:

API / UWI 200/C-011-L/094-P-16/99		Surface Legal Location C-011-L/94-P-16		MaxWell Job Number JOB01@2006		License No. EL470	
Ground Elevation (m) 281.30		Original KB/RT Elevation (m) 286.50		Casing Flange Elevation (m)		Original Spud Date 2/25/2013	
Days From Spud (days) 15.29							
Daily Cost Total 78,365.50		Cumulative Cost 2,693,513.02		Total Job AFE Amount 10,274,600.00		Total AFE+Sup 10,274,600.00	
				AFE / RFE / Maint.# 10343209		Estimated Days 36.29	
Planned Depth (TMD) (mKB) 2,156.00		Override TVD (mKB)		Head Count 39.0		Personnel Total Hours (hrs) 450.00	
Cum Personnel Total Hours (hrs) 9,008.00							
Avg Connection Gas 558		Avg Background Gas 320		Avg Trip Gas 378		Max H2S (ppm) 0	
Road Condition Good		Weather Overcast		Temperature (°C) -26		Wind 7 KM NW	
Ops and Depth @ Morning Report Circulate bottoms up before dropping core barrels						Wellbore Original Hole	

Last 24hr Summary

No accidents or incidents 5 Hazard ID's: 0 Job observations: Pull core #3. with Schlumberger Wire Line unit, retrieve 27m core ,Make up inner barrel land and cut Core #4 from 1973m to 2000m. Rig up and pull core # 4 with Schlumberger Wire Line.

24hr Forecast

Continue Core program Cut core #5

Daily Contacts

WS Supervisor, Dave Forsberg, 780-361-6417; Drilling Superintendent, Sheldon Vamplew, 403-999-1302; Command, Center, 587-794-4599; Rig Manager, Rick Yavis; WS Supervisor, Brian Neigum, 403-548-5013; Drilling Engineer, Mike Greener, 403-771-5039

Last Casing String

Surface, 599.00mKB

Time Log

Start Time	End Time	Dur (hrs)	Phase	Op Code	Activity Code	Time P-T-X	Operation
00:00	00:15	0.25	PROD1	RIGMNT	SVRG	P	Rig service
00:15	05:00	4.75	PROD1	CORING	ELNE	P	Pull core #3 with NOV core hands and Schlumberger wire line
05:00	05:15	0.25	PROD1	CORING	SFTY	P	Safety meeting with NOV core hands
05:15	07:00	1.75	PROD1	CORING	RECR	P	Lay down core#3 with NOV core hands
07:00	07:15	0.25	PROD1	CORING	TRIP	P	Trip 4 stds back in the hole
07:15	07:45	0.50	PROD1	CORING	CIRC	P	Circulate bottoms up
07:45	08:00	0.25	PROD1	CORING	SFTY	P	Crew change safety meeting
08:00	08:15	0.25	PROD1	RIGMNT	SVRG	P	Rig service, function test annular 13sec. to close and function test crown saver
08:15	08:30	0.25	PROD1	CORING	SFTY	P	BOP drill Well secure in 90 sec crew in positions and function test motor kills ok Crew
08:30	09:30	1.00	PROD1	CORING	RECR	P	Rig up core barrels for run #4 and pump down
09:30	13:15	3.75	PROD1	CORING	CORE	P	Drill 222mm Core from 1973m-2000m to pump rate 1.2m3/min rotary at 62 wob 5dan rop 7.2m/hr
13:15	14:30	1.25	PROD1	CORING	CIRC	P	Circulate bttoms up
14:30	15:00	0.50	PROD1	CORING	TRIP	P	Pull out 3 stands and the pup joints out of the hole
15:00	15:15	0.25	PROD1	CORING	SFTY	P	Safety meeting with NOV core hands and schlumbger wireline on retrieving core #4
15:15	16:00	0.75	PROD1	CORING	ELNE	P	Wireline retrieve Core #4
16:00	16:15	0.25	PROD1	CORING	SFTY	P	Held b.o.p drill well secure in 85 sec
16:15	16:30	0.25	PROD1	RIGMNT	SVRG	P	Rig serevice f.t pipe rams 4 sec & crown saver
16:30	00:00	7.50	PROD1	CORING	ELNE	P	Wireline to retrieve core # 4 with schlumberger

Fluid / Mud Checks: Mud Engineer: Tri Pham

Time 13:15	Depth (mKB) 1,967.00	Density (kg/m³) 980.0	Funnel Viscosity (s/L) 82	pH	PV Override (cp) 17.0	YP Override (Pa) 4.5
Low Gravity Solids (%) 8.8	MBT (kg/m³) 83/17	Oil Water Ratio 83/17	Chlorides (mg/L) 212,656	Calcium (mg/L) 36,000	Lime (kg/m³) 14	Potassium (mg/L)
Electric Stab (V) 680.0	ECD - Manual Entry (...) 1025.0	Sand (%)	Solids, Corr. (%) 9.1	T (fl) (°C) 18	HTHP Pressure (kPa) 3,500	HTHP Filt (mL/30min) 5.7
Mud Lost to Surface (m³) 0.50		Mud Lost to Hole (m³)		Daily Mud Cost		
Cum Mud Lost to Surface (m³) 49.40		Cum Mud Lost to Hole (m³)		Cumulative Mud Cost 114,279.01		

Hazard IDs, Near Misses & PJHAs

Days Since Lost Time Incident (days) 397.00	Days Since Recordable Incident (days) 397.00
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Comment

"DESCRIPTION: Saw hand standing in swing path of the core lay down shuttle

No. Rpts
11,230

ACTION TAKEN: told hand to make sure he doesnt stand in swing path but off to the side

REPORTED BY: Driller

CORRECTED: YES LIKELYHOOD: 2 SEVERITY: 3

DATE NOTED: 03/12/13 DATE CORRECTED: 03/12/13"



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Rig: Beaver Drilling Ltd. 2

Report Date: 3/12/2013
Report #: 20
Depth Progress: 27.00 m
Depth End: 2,000.00 mKB
Rig Release Date:

Last BOP Drill

Type	Days Since Last Check (days)	Last Date	Days Until Next Check (days)	Next Date
BOP Drill (Pit)	0	3/12/2013	1	3/13/2013

Safety Incidents

Time	Comment	Type

Drill Strings: BHA # 3

Bit Run	Drill Bit	Length (m)	IADC Bit Dull	TFA (incl Noz) (mm ²)	BHA ROP (m/hr)
1C	222.0mm, NOV, PR513, E140308	0.34	-----	770	8.7
Nozzles (mm)	String Length (m)	OD (mm)	Rotating Hook Load (maximum) (daN)		
14.0/14.0/14.0/14.0/14.0	2,000.21	165.0	61,000		
Depth In (mKB)	Depth Out (mKB)	Avg ROP (m/hr)	Depth This Job (m)	Total Depth Drilled ...	Job Drill Hrs (hrs)
1,891.00	2,000.00	8.7	109.00	2,000.50	12.50
Total Drill Hrs (hrs)					
12.50					

Comment

Drill String Components

Item Description	ID (mm)	OD (mm)	Jts	Len (m)	Cum Len (m)
Kelly	108.0	165.0		8.00	2,000.21
Drill pipe - Singles	109.0	127.0	1	9.63	1,992.21
Drill pipe - Stands	109.0	127.0	97	1,876.45	1,982.58
X/O	109.0	165.0	1	0.77	106.13
Core Collars	108.0	165.0	8	75.82	105.36
Stabilizer	108.0	165.0	1	0.83	29.54
Seat sub	108.0	165.0	1	0.49	28.71
Core Barrel	108.0	165.0	1	9.57	28.22
Stabilizer	108.0	165.0	1	1.23	18.65
Core Barrel	108.0	165.0	1	7.93	17.42
Stabilizer	108.0	165.0	1	1.23	9.49
Core Barrel	108.0	165.0	1	7.92	8.26

Drilling Parameters: 1,973.00 - 2,000.00 mKB

Cum Depth (m)	Cum Drill...	Int ROP (...)	Flow Rat...	WOB (daN)	RPM (r...	SPP (kPa)	Drill Str Wt (d...	SO Str Wt (da...	PU Str Wt (da...	Off-Btm Str ...	Drill Tq
109.00	12.50	7.2	1.170	5,000.0	55	6,200	61,000	66,000	66,000	66,000	

Hydraulic Calculations

Bit Hydraulic Pow...	HP/Area (kW/mm ²)	% P @ bit (%)	Jet Vel (m/s)	Bit dP (kPa)	Ann. dP (kPa)	Mud Density (kg/m ³)	ECD End (kg/m ³)
6.8	0.00018	6	25.3	351.1	140.2	975.0	982.2
Drill String Volume (...)	Bit to Shoe Volume (...)	Shoe to Top of Casin...	Min Casing AV (m/min)	Max Casing AV (m/min)	Min Open Hole AV (m...	Max Open Hole AV (...)	
18.64	74.94	16.03	43.5	64.4	18.5	67.5	

Error

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

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

Pump Checks

Date	Depth (mKB)	Q (m ³ /min)	Pres (kPa)	Strokes (spm)
3/12/2013 08:00	1,982.00	0.645	1,639	66
3/12/2013 10:00	1,976.00	1.369	5,200	140

Pump Operations

Start Date	End Date	Liner Size (mm)	P (max) (kPa)	Vol/Stk OR (m ³ /stk)
1/29/2013		140.0		

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

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

Pump Checks

Date	Depth (mKB)	Q (m ³ /min)	Pres (kPa)	Strokes (spm)
3/11/2013 14:00	1,957.00	1.173	4,900	120
3/11/2013 16:00	1,962.00	0.616	1,651	63

Pump Operations

Start Date	End Date	Liner Size (mm)	P (max) (kPa)	Vol/Stk OR (m ³ /stk)
1/29/2013		140.0		
2/5/2013		140.0		

Shaker Screens

Description	Make	Model	Deck No.	Start Date	End Date	Screen No.	Scr Sz X	Scr Sz Y
1	NOV	KING COBRA	2	2/25/2013	3/3/2013	1	84	84

Centrifuges/Cyclones: HGS Centrifuge, Brandt, 4000

Number	Make	Model	Diameter (mm)
1	Brandt	4000	



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Rig: Beaver Drilling Ltd. 2

Report Date: 3/12/2013
Report #: 20
Depth Progress: 27.00 m
Depth End: 2,000.00 mKB
Rig Release Date:

Centrifuge/Cyclone Checks

Date	Hrs (hrs)	RPM (rpm)	Dens OF (kg/m³)	Q (ovrflw) (L/min)	Dens UF (kg/m³)	Q (undrflw) (L/min)

Fluid / Mud Additive Amounts

Description	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)
Little Bear	20.00
Slater River	241.00
Arctic Red	829.00
Sans Sault	988.00
Martin House	1,138.00
Imperial	1,172.00
Upper Canol	
Lower Canol	
Hare Indian	
Bluefish Member	
Hume	

697792
V17



Daily Drilling
COPRC MIRROR LAKE N-20 65-00 126-45
Rig: Beaver Drilling Ltd. 2

Report Date: 3/11/2013
Report #: 19
Depth Progress: 0.00 m
Depth End: 1,946.00 mKB
Rig Release Date:

API / UWI 200/C-011-L/094-P-16/99		Surface Legal Location C-011-L/94-P-16		MaxWell Job Number JOB01@2006		License No. EL470	
Ground Elevation (m) 281.30		Original KB/RT Elevation (m) 286.50		Casing Flange Elevation (m)		Original Spud Date 2/25/2013	
Days From Spud (days) 14.29							
Daily Cost Total 77,235.20		Cumulative Cost 2,613,547.52		Total Job AFE Amount 10,274,600.00		Total AFE+Sup 10,274,600.00	
AFE / RFE / Maint.# 10343209		Estimated Days 36.29					
Planned Depth (TMD) (mKB) 2,156.00		Override TVD (mKB)		Head Count 39.0		Personnel Total Hours (hrs) 450.00	
Cum Personnel Total Hours (hrs) 8,558.00							
Avg Connection Gas 250		Avg Background Gas 174		Avg Trip Gas		Max H2S (ppm) 0	
Road Condition Good		Weather Clear		Temperature (°C) -24		Wind 10W	
Ops and Depth @ Morning Report Recover core #3						Wellbore Original Hole	

Last 24hr Summary
No accidents or incidents 5 Hazard ID's: 0 Job observations: Pull core #2. with Schlumberger Wire Line unit, retrieve 27m core ,Make up inner barrle land and cut Core #3 from 1946m to 1973m. Rig up and pull core # 3 with Schlumberger Wire Line.

24hr Forecast
Continue Core program Cut core #4

Daily Contacts
Rig Manager, Rick Yavis; Drilling Engineer, Mike Greener, 403-771-5039; WS Supervisor, Brian Neigum, 403-548-5013; WS Supervisor, Mike Hobmaier, 403-844-3210; Drilling Superintend, Sheldon Vamplew, 403-999-1302; Command, Center, 587-794-4599

Last Casing String
Surface, 599.00mKB

Time Log

Start Time	End Time	Dur (hrs)	Phase	Op Code	Activity Code	Time P-T-X	Operation
00:00	00:15	0.25	INTRM1	RIGMNT	SVRG	P	Rig service
00:15	07:45	7.50	INTRM1	CORING	ELOG	P	Pull core #2 with NOV core and Schlumberger wire line
07:45	08:00	0.25	INTRM1	CORING	SFTY	P	Crew change safety meeting
08:00	09:15	1.25	INTRM1	CORING	ELOG	P	Pull core #2 with NOV core and Schlumberger wire line
09:15	09:30	0.25	INTRM1	CORING	SFTY	P	Safety meeting with NOV core
09:30	11:00	1.50	INTRM1	CORING	RECR	P	Lay out core #2 with NOV hands
11:00	11:15	0.25	INTRM1	RIGMNT	SVRG	P	Rig service, function test annular 13 sec. to close and fuction test crown saver
11:15	12:15	1.00	INTRM1	CORING	CIRC	P	Circulate bottoms up
12:15	13:00	0.75	INTRM1	CORING	RECR	P	Rig up core barrels for run #3 and pump down
13:00	15:45	2.75	INTRM1	CORING	CORE	P	Core 222mm hole from 1946m to 1973m pump rate 1.2m3 rotary at 55 wob 5dan R.O.P 12m/hr
15:45	16:00	0.25	INTRM1	CORING	CIRC	P	Circulate bottoms up
16:00	16:15	0.25	INTRM1	CORING	SVRG	P	Rig service function test pipe rams 3 seconds
16:15	16:45	0.50	INTRM1	CORING	CIRC	P	Circulate bottoms up
16:45	17:00	0.25	INTRM1	CORING	ELOG	P	Safety meeting with nov and schlumbger on retrieving core #3
17:00	17:15	0.25	INTRM1	CORING	TRIP	P	Trip 4 stands out of the hole rig up to wireline for core #3
17:15	00:00	6.75	INTRM1	CORING	ELOG	P	Wire line retriive core #3

Fluid / Mud Checks: Mud Engineer: Tri Pham

Time 14:00	Depth (mKB) 1,967.00	Density (kg/m³) 975.0	Funnel Viscosity (s/L) 87	pH	PV Override (cp) 17.0	YP Override (Pa) 4.5
Low Gravity Solids (%) 8.8	MBT (kg/m³)	Oil Water Ratio 83/17	Chlorides (mg/L) 212,656	Calcium (mg/L) 36,000	Lime (kg/m³) 14	Potassium (mg/L)
Electric Stab (V) 680.0	ECD - Manual Entry (...) 1025.0	Sand (%)	Solids, Corr. (%) 9.1	T (fl) (°C) 18	HTHP Pressure (kPa) 3,500	HTHP Filt (mL/30min) 5.7
Mud Lost to Surface (m³) 0.50		Mud Lost to Hole (m³)		Daily Mud Cost 469.70		
Cum Mud Lost to Surface (m³) 48.90		Cum Mud Lost to Hole (m³)		Cumulative Mud Cost 114,279.01		

Hazard IDs, Near Misses & PJHAs

Days Since Lost Time Incident (days) 396.00		Days Since Recordable Incident (days) 396.00	
Comment "OBSERVATION: good job on putting the tools away. OBSERVER: Motor hand DATE NOTED: 03/11/13"			No. Rpts 12,000

Last BOP Drill

Type	Days Since Last Check (days)	Last Date	Days Until Next Check (days)	Next Date
BOP Drill (Pit)	6	3/5/2013	-5	3/6/2013



Daily Drilling
COPRC MIRROR LAKE N-20 65-00 126-45
Rig: Beaver Drilling Ltd. 2

Report Date: 3/11/2013
Report #: 19
Depth Progress: 0.00 m
Depth End: 0.00 mKB
Rig Release Date:

Safety Incidents

Time	Comment	Type
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Drill Strings: 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)	Rotating Hook Load (maximum) (daN)		
Depth In (mKB)	Depth Out (mKB)	Avg ROP (m/hr)	Depth This Job (m)	Total Depth Drilled ...	Job Drill Hrs (hrs)	Total Drill Hrs (hrs)
Comment						

Drill String Components

Item Description	ID (mm)	OD (mm)	Jts	Len (m)	Cum Len (m)
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Drilling Parameters:

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

Bit Hydraulic Pow...	HP/Area (kW/mm²)	% P @ bit (%)	Jet Vel (m/s)	Bit dP (kPa)	Ann. dP (kPa)	Mud Density (kg/m³)	ECD End (kg/m³)
Drill String Volume (...)	Bit to Shoe Volume (...)	Shoe to Top of Casin...	Min Casing AV (m/min)	Max Casing AV (m/min)	Min Open Hole AV (m...	Max Open Hole AV (...)	

Error

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

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

Pump Checks

Date	Depth (mKB)	Q (m³/min)	Pres (kPa)	Strokes (spm)
3/8/2013 08:00	1,816.00	0.929	12,900	95
3/8/2013 16:00	1,882.00	0.635	2,249	65

Pump Operations

Start Date	End Date	Liner Size (mm)	P (max) (kPa)	Vol/Stk OR (m³/stk)
1/29/2013		140.0		

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

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

Pump Checks

Date	Depth (mKB)	Q (m³/min)	Pres (kPa)	Strokes (spm)
3/11/2013 14:00	1,957.00	1.173	4,900	120
3/11/2013 16:00	1,962.00	0.616	1,651	63

Pump Operations

Start Date	End Date	Liner Size (mm)	P (max) (kPa)	Vol/Stk OR (m³/stk)
1/29/2013		140.0		
2/5/2013		140.0		

Shaker Screens

Description	Make	Model	Deck No.	Start Date	End Date	Screen No.	Scr Sz X	Scr Sz Y
1	NOV	KING COBRA	2	2/25/2013	3/3/2013	1	84	84

Centrifuges/Cyclones: HGS Centrifuge, Brandt, 4000

Number	Make	Model	Diameter (mm)
1	Brandt	4000	

Centrifuge/Cyclone Checks

Date	Hrs (hrs)	RPM (rpm)	Dens OF (kg/m³)	Q (ovrflw) (L/min)	Dens UF (kg/m³)	Q (undrflw) (L/min)
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Fluid / Mud Additive Amounts

Description	Consumed	Cost	Size	Units
CAL-CHLR 94-97%-40KG	10.0	46.970		sks

Survey Data

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

Formation Name	Drill Top MD (mKB)
Little Bear	20.00
Slater River	241.00
Arctic Red	829.00
Sans Sault	988.00
Martin House	1,138.00
Imperial	1,172.00



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Rig: Beaver Drilling Ltd. 2

Report Date: 3/11/2013
Report #: 19
Depth Progress: 0.00 m
Depth End: 1,946.00 mKB
Rig Release Date:

Formations

Formation Name	Drill Top MD (mKB)
Upper Canol	
Lower Canol	
Hare Indian	
Bluefish Member	
Hume	



Daily Drilling

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

Rig: Beaver Drilling Ltd. 2

Report Date: 3/10/2013

Report #: 18

Depth Progress: 27.00 m

Depth End: 1,946.00 mKB

Rig Release Date:

API / UWI 200/C-011-L/094-P-16/99		Surface Legal Location C-011-L/94-P-16		MaxWell Job Number JOB01@2006		License No. EL470					
Ground Elevation (m) 281.30		Original KB/RT Elevation (m) 286.50		Casing Flange Elevation (m)		Original Spud Date 2/25/2013		Days From Spud (days) 13.29			
Daily Cost Total 87,467.15		Cumulative Cost 2,532,793.32		Total Job AFE Amount 10,274,600.00		Total AFE+Sup 10,274,600.00		AFE / RFE / Maint.# 10343209		Estimated Days 36.29	
Planned Depth (TMD) (mKB) 2,156.00		Override TVD (mKB)		Head Count 39.0		Personnel Total Hours (hrs) 450.00			Cum Personnel Total Hours (hrs) 8,108.00		
Avg Connection Gas		Avg Background Gas 314			Avg Trip Gas			Max H2S (ppm) 0			
Road Condition Good		Weather Clear			Temperature (°C) -17			Wind 10 NW			
Ops and Depth @ Morning Report Pulling Core with wireline @ 305 mkb									Wellbore Original Hole		

Last 24hr Summary

No accidents or incidents 5 Hazard ID's: 0 Job observations: Pull core #1. with Schlumberger Wire Line unit, retrieve 27.5m core ,Make up inner barrle land and cut Core #2 from 1919m to 1946m. Rig up and pull core # 2

24hr Forecast

Cut core #3

Daily Contacts

Drilling Engineer, Mike Greener, 403-771-5039; Rig Manager, Rick Yavis; Drilling Superintend, Sheldon Vamplew, 403-999-1302; WS Supervisor, Mike Hobmaier, 403-844-3210; Command, Center, 587-794-4599; WS Supervisor, Brian Neigum, 403-548-5013

Last Casing String

Surface, 599.00mKB

Time Log

Start Time	End Time	Dur (hrs)	Phase	Op Code	Activity Code	Time P-T-X	Operation
00:00	00:15	0.25	PROD1	RIGMNT	SVRG	P	Rig service
00:15	07:45	7.50	PROD1	CORING	ELOG	P	Retrive core #1 with NOV core and schlumberger wire line
07:45	08:00	0.25	PROD1	CORING	SFTY	P	Crew change safety meeting
08:00	12:15	4.25	PROD1	CORING	CORE	P	Retrive core #1 with NOV core and schlumberger wire line
12:15	12:30	0.25	PROD1	CORING	SFTY	P	Safety meeting with NOV core hands
12:30	14:00	1.50	PROD1	CORING	RECR	P	Lay out core #1 with nov core hands, Recover 27.5m of core (Full recovery)
14:00	14:15	0.25	PROD1	RIGMNT	SVRG	P	Rig service function test pipe rams 3 seconds to close function test crown saver
14:15	15:30	1.25	PROD1	CORING	CIRC	P	Circulate
15:30	16:00	0.50	PROD1	CORING	RECR	P	Rig up core barrels for run#2 and pump down
16:00	16:15	0.25	PROD1	RIGMNT	SVRG	P	Rig service
16:15	17:00	0.75	PROD1	CORING	CORE	P	Drill 222mm core from 1919mto1937m rotary 60 WOB 5dan pumping at 1.2m3 R.O.P 9m/hr
17:00	17:15	0.25	PROD1	CORING	SFTY	P	Crew Handover meeting
17:15	19:30	2.25	PROD1	CORING	CORE	P	Drill 222mm core from 1937m to 1946m rotary 60 WOB 5dan pumping at 1.2m3 R.O.P 9m/hr
19:30	20:30	1.00	PROD1	CORING	CIRC	P	Circulate bottoms up
20:30	20:45	0.25	PROD1	CORING	TRIP	P	Pull 3 stds up to 1877m to pull core #2
20:45	21:00	0.25	PROD1	CORING	SFTY	P	Safety meeting with NOV core hands and schlumberger wire line
21:00	00:00	3.00	PROD1	CORING	ELOG	P	Rig to and pull core#2 with NOV core and Schlumberger wire line

Fluid / Mud Checks: Mud Engineer: Tri Pham

Time 16:00	Depth (mKB) 1,919.00	Density (kg/m³) 975.0	Funnel Viscosity (s/L) 90	pH	PV Override (cp) 16.0	YP Override (Pa) 5.0
Low Gravity Solids (%) 9.4	MBT (kg/m³)	Oil Water Ratio 82/18	Chlorides (mg/L) 219,515	Calcium (mg/L) 38,500	Lime (kg/m³) 15	Potassium (mg/L)
Electric Stab (V) 735.0	ECD - Manual Entry (...) 1023.5	Sand (%)	Solids, Corr. (%) 9.5	T (fl) (°C) 20	HTHP Pressure (kPa) 3,500	HTHP Filt (mL/30min) 5.7

Mud Lost to Surface (m³) 0.50		Mud Lost to Hole (m³)		Daily Mud Cost 1,003.25	
Cum Mud Lost to Surface (m³) 48.40		Cum Mud Lost to Hole (m³)		Cumulative Mud Cost 113,809.31	

Hazard IDs, Near Misses & PJHAS

Days Since Lost Time Incident (days) 395.00	Days Since Recordable Incident (days) 395.00
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Comment "DESCRIPTION: Laying down pipe, picking up subs using winch and slings ACTION TAKEN: stay out of line of fire down on the catwalk. Double drap slings if needed and good communications. REPORTED BY: motorman CORRECTED: YES LIKELYHOOD: 2 SEVERITY: 3 DATE NOTED: 03/10/13 DATE CORRECTED: 03/10/13"	No. Rpts 11,230
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Last BOP Drill

Type	Days Since Last Check (days)	Last Date	Days Until Next Check (days)	Next Date
BOP Drill (Pit)	5	3/5/2013	-4	3/6/2013

Safety Incidents

Time	Comment	Type

Drill Strings: BHA # 3

Bit Run	Drill Bit	Length (m)	IADC Bit Dull	TFA (incl Noz) (mm ²)	BHA ROP (m/hr)
1C	222.0mm, NOV, PR513, E140308	0.34	-----	770	9.2
Nozzles (mm)	String Length (m)	OD (mm)	Rotating Hook Load (maximum) (daN)		
14.0/14.0/14.0/14.0/14.0	1,946.00	165.0	59,000		
Depth In (mKB)	Depth Out (mKB)	Avg ROP (m/hr)	Depth This Job (m)	Total Depth Drilled ...	Job Drill Hrs (hrs)
1,891.00	1,946.00	9.2	55.00	1,946.50	6.00
Total Drill Hrs (hrs)					
6.00					

Comment

Drill String Components

Item Description	ID (mm)	OD (mm)	Jts	Len (m)	Cum Len (m)
Kelly	108.0	165.0		11.53	1,946.00
Drill pipe - Stands	109.0	127.0	95	1,828.34	1,934.47
X/O	75.0	165.0	1	0.77	106.13
Core Collars	108.0	165.0	8	75.82	105.36
Stabilizer	108.0	165.0	1	0.83	29.54
Seat sub	108.0	165.0	1	0.49	28.71
Core Barrel	108.0	165.0	1	9.57	28.22
Stabilizer	108.0	165.0	1	1.23	18.65
Core Barrel	108.0	165.0	1	7.93	17.42
Stabilizer	108.0	165.0	1	1.23	9.49
Core Barrel	108.0	165.0	1	7.92	8.26

Drilling Parameters: 1,919.00 - 1,946.00 mKB

Cum Depth (m)	Cum Drill...	Int ROP (...)	Flow Rat...	WOB (daN)	RPM (r...	SPP (kPa)	Drill Str Wt (d...	SO Str Wt (da...	PU Str Wt (da...	Off-Btm Str ...	Drill Tq
55.00	6.00	9.0	1.160	5,000.0	55	5,000	59,000	64,000	64,000	64,000	

Hydraulic Calculations

Bit Hydraulic Pow...	HP/Area (kW/mm²)	% P @ bit (%)	Jet Vel (m/s)	Bit dP (kPa)	Ann. dP (kPa)	Mud Density (kg/m³)	ECD End (kg/m³)
6.7	0.00017	7	25.1	345.1	135.4	975.0	982.1
Drill String Volume (...)	Bit to Shoe Volume (...)	Shoe to Top of Casin...	Min Casing AV (m/min)	Max Casing AV (m/min)	Min Open Hole AV (m...	Max Open Hole AV (...)	
18.13	74.94	16.00	43.2	63.9	18.3	67.0	

Error

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

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

Pump Checks

Date	Depth (mKB)	Q (m ³ /min)	Pres (kPa)	Strokes (spm)
3/8/2013 08:00	1,816.00	0.929	12,900	95
3/8/2013 16:00	1,882.00	0.635	2,249	65

Pump Operations

Start Date	End Date	Liner Size (mm)	P (max) (kPa)	Vol/Stk OR (m ³ /stk)
1/29/2013		140.0		

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

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

Pump Checks

Date	Depth (mKB)	Q (m ³ /min)	Pres (kPa)	Strokes (spm)
3/10/2013 08:00	1,918.00	0.616	695	63
3/10/2013 16:00	1,920.00	1.202	5,100	123

Pump Operations

Start Date	End Date	Liner Size (mm)	P (max) (kPa)	Vol/Stk OR (m ³ /stk)
1/29/2013		140.0		
2/5/2013		140.0		

Shaker Screens

Description	Make	Model	Deck No.	Start Date	End Date	Screen No.	Scr Sz X	Scr Sz Y
1	NOV	KING COBRA	2	2/25/2013	3/3/2013	1	84	84

Centrifuges/Cyclones: HGS Centrifuge, Brandt, 4000

Number	Make	Model	Diameter (mm)
1	Brandt	4000	



Daily Drilling

COPRC MIRROR LAKE N-20 65-00 126-45
Rig: Beaver Drilling Ltd. 2

Report Date: 3/10/2013
Report #: 18
Depth Progress: 27.00 m
Depth End: 1,946.00 mKB
Rig Release Date:

Centrifuge/Cyclone Checks

Date	Hrs (hrs)	RPM (rpm)	Dens OF (kg/m³)	Q (ovrflw) (L/min)	Dens UF (kg/m³)	Q (undrflw) (L/min)

Fluid / Mud Additive Amounts

Description	Consumed	Cost	Size	Units
VERSAMUL - 208LT	1.0			brl
CAL-CHLR 94-97%-40KG	5.0	46.970		sks
LIME - 20KG	5.0	8.680		sks
VERSACLEAN INVERT	0.5	1,450.000		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)
Little Bear	20.00
Slater River	241.00
Arctic Red	829.00
Sans Sault	988.00
Martin House	1,138.00
Imperial	1,172.00
Upper Canol	
Lower Canol	
Hare Indian	
Bluefish Member	
Hume	

697792

VIS



Daily Drilling
COPRC MIRROR LAKE N-20 65-00 126-45
Rig: Beaver Drilling Ltd. 2

Report Date: 3/9/2013
 Report #: 17
 Depth Progress: 28.00 m
 Depth End: 1,919.00 mKB
 Rig Release Date:

API / UWI 200/C-011-L/094-P-16/99		Surface Legal Location C-011-L/94-P-16		MaxWell Job Number JOB01@2006		License No. EL470					
Ground Elevation (m) 281.30		Original KB/RT Elevation (m) 286.50		Casing Flange Elevation (m)		Original Spud Date 2/25/2013		Days From Spud (days) 12.29			
Daily Cost Total 206,781.56		Cumulative Cost 2,446,247.77		Total Job AFE Amount 10,274,600.00		Total AFE+Sup 10,274,600.00		AFE / RFE / Maint.# 10343209		Estimated Days 36.29	
Planned Depth (TMD) (mKB) 2,156.00		Override TVD (mKB)		Head Count 39.0		Personnel Total Hours (hrs) 450.00			Cum Personnel Total Hours (hrs) 7,658.00		
Avg Connection Gas 250		Avg Background Gas 65		Avg Trip Gas				Max H2S (ppm) 0			
Road Condition Good		Weather Overcast		Temperature (°C) -20				Wind 3 km			
Ops and Depth @ Morning Report Wireline core @ 840 mkb									Wellbore Original Hole		

Last 24hr Summary
 No accidents or incidents 5 Hazard ID's: 0 Job observations: Finish pulling out of hole lay down directional tools. Pick up and make up Core BBL. run in hole, circulate condition hole and clear Core barrels, retrieve Drill Rod, Cut Core #1 from 1891.5m to 1919m. Rig in Schlumberger and start pulling core #1.

24hr Forecast

Cut core #2

Daily Contacts

Rig Manager, Rick Yavis; Drilling Superintend, Sheldon Vamplew, 403-999-1302; Command, Center, 587-794-4599; WS Supervisor, Brian Neigum, 403-548-5013; Drilling Engineer, Mike Greener, 403-771-5039; WS Supervisor, Mike Hobmaier, 403-844-3210

Last Casing String

Surface, 599.00mKB

Time Log

Start Time	End Time	Dur (hrs)	Phase	Op Code	Activity Code	Time P-T-X	Operation
00:00	03:30	3.50	INTRM1	CORING	PULD	P	Lay down BHA Flow check OOH Strap 1891.5m Trip calc 9.22m3 meas 11.60m3 diff 2.38m3
03:30	04:00	0.50	INTRM1	RIGMNT	SVRG	P	Rig service function blind rams 3 sec crown saver operating properly/Blow kelly take MWD transducer out of stand pipe
04:00	04:15	0.25	INTRM1	RIGMNT	SVRG	P	Clean and prepare floor to pick up core BHA
04:15	04:30	0.25	INTRM1	CORING	SFTY	P	Safety meeting with NOV core hands reviewed NOV jsa#1 picking up core tools
04:30	07:45	3.25	INTRM1	CORING	PULD	P	Pick up core BHA and RIH
07:45	08:00	0.25	INTRM1	CORING	SFTY	P	Crew change safety meeting
08:00	08:45	0.75	INTRM1	RIGMNT	SLPC	P	Slip and cut 20m drilling line 6707mj
08:45	09:00	0.25	INTRM1	RIGMNT	SVRG	P	Rig service function test annular 13 seconds to close
09:00	12:00	3.00	INTRM1	CORING	TRIP	P	TRIP IN HOLE
12:00	13:00	1.00	INTRM1	CORING	CIRC	P	Circulate prep floor to pick up singles
13:00	13:30	0.50	INTRM1	CORING	PULD	P	Pick up drill pipe to tag bottom
13:30	14:30	1.00	INTRM1	CORING	CIRC	P	Circulate bottoms up prepair to wire line retrieve drill rod.
14:30	14:45	0.25	INTRM1	CORING	SFTY	P	Safety meeting with schlumberger wireline and nov core hands
14:45	16:00	1.25	INTRM1	CORING	ELOG	P	Run in wireline with schlumberger to retrieve nov drill rod.
16:00	16:15	0.25	INTRM1	RIGMNT	SVRG	P	Rig service function test H.C.R
16:15	17:45	1.50	INTRM1	CORING	ELOG	P	Run in with schlumberger wireline to retrieve nov drill rod
17:45	18:15	0.50	INTRM1	CORING	RECR	P	Rig up to run core #1 with nov core hands
18:15	18:30	0.25	INTRM1	CORING	RECR	P	Pump down core #1 with nov core hands
18:30	21:30	3.00	INTRM1	CORING	CORE	P	drill 222mm core #1 from 1891.5m to 1919m Pumping at 1.2m3 rotating at 65rpm weight on bit 5dan average R.O.P 10m/h
21:30	22:15	0.75	INTRM1	CORING	CIRC	P	Circulate bottoms up to pull core#1
22:15	22:30	0.25	INTRM1	CORING	SFTY	P	Safety meeting with Schlumberger wire line and NOV core hands
22:30	22:45	0.25	INTRM1	CORING	TRIP	P	Pull 2 stds up to to retive core #1
22:45	00:00	1.25	INTRM1	CORING	ELOG	P	Rig to and pull core #1 with Schlumberger wire line and NOV core

Fluid / Mud Checks: Mud Engineer: Tri Pham

Time 17:00	Depth (mKB) 1,890.00	Density (kg/m³) 960.0	Funnel Viscosity (s/L)	pH	PV Override (cp) 16.0	YP Override (Pa) 5.0
Low Gravity Solids (%) 8.3	MBT (kg/m³)	Oil Water Ratio 83.3/16.7	Chlorides (mg/L) 241,833	Calcium (mg/L) 40,250	Lime (kg/m³) 17	Potassium (mg/L)
Electric Stab (V) 630.0	ECD - Manual Entry (...) 1038.0	Sand (%)	Solids, Corr. (%) 8.3	T (fl) (°C)	HTHP Pressure (kPa) 3,500	HTHP Filt (mL/30min) 5.7
Mud Lost to Surface (m³) 2.30		Mud Lost to Hole (m³)		Daily Mud Cost 3,335.00		
Cum Mud Lost to Surface (m³) 47.90		Cum Mud Lost to Hole (m³)		Cumulative Mud Cost 112,806.06		

Hazard IDs, Near Misses & PJHAs

Days Since Last Time Incident (days)	Days Since Recordable Incident (days)
394.00	394.00

Comment "OBSERVATION: Service hand walked up to doghouse not waering a hard hat. Hand was told to get hard hat on right away as it is a major part of PPE OBSERVER: Driller DATE NOTED: 03/09/13"	No. Rpts 12,000
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Last BOP Drill

Type	Days Since Last Check (days)	Last Date	Days Until Next Check (days)	Next Date
BOP Drill (Pit)	4	3/5/2013	-3	3/6/2013

Safety Incidents

Time	Comment	Type

Drill Strings: BHA # 3

Bit Run		Drill Bit	Length (m)	IADC Bit Dull	TFA (incl Noz) (mm²)	BHA ROP (m/hr)
1C		222.0mm, NOV, PR513, E140308		-----	770	7.5
Nozzles (mm)		String Length (m)		OD (mm)	Rotating Hook Load (maximum) (daN)	
14.0/14.0/14.0/14.0/14.0		1,918.66		165.0	59,000	
Depth In (mKB)	Depth Out (mKB)	Avg ROP (m/hr)	Depth This Job (m)	Total Depth Drilled ...	Job Drill Hrs (hrs)	Total Drill Hrs (hrs)
1,891.00	1,919.00	7.5	28.00	1,919.50	3.75	3.75

Comment

Drill String Components

Item Description	ID (mm)	OD (mm)	Jts	Len (m)	Cum Len (m)
Kelly	108.0	165.0		13.08	1,918.66
Drill pipe - Singles	109.0	127.0	1	9.65	1,905.58
Drill pipe - Stands	109.0	127.0	93	1,790.14	1,895.93
X/O	75.0	165.0	1	0.77	105.79
Core Collers	108.0	165.0	8	75.82	105.02
Stabilizer	108.0	165.0	1	0.83	29.20
Seat sub	108.0	165.0	1	0.49	28.37
Core Barrel	108.0	165.0	1	9.57	27.88
Stabilizer	108.0	165.0	1	1.23	18.31
Core Barrel	108.0	165.0	1	7.93	17.08
Stabilizer	108.0	165.0	1	1.23	9.15
Core Barrel	108.0	165.0	1	7.92	7.92

Drilling Parameters: 1,891.00 - 1,919.00 mKB

Cum Depth (m)	Cum Drill...	Int ROP (...)	Flow Rat...	WOB (daN)	RPM (r...	SPP (kPa)	Drill Str Wt (d...	SO Str Wt (da...	PU Str Wt (da...	Off-Btm Str ...	Drill Tq
28.00	3.75	7.5	1.174	5,000.0	65	5,100	59,000	64,000	64,000	64,000	

Hydraulic Calculations

Bit Hydraulic Pow...	HP/Area (kW/mm²)	% P @ bit (%)	Jet Vel (m/s)	Bit dP (kPa)	Ann. dP (kPa)	Mud Density (kg/m³)	ECD End (kg/m³)
6.8	0.00018	7	25.4	348.1	548.5	960.0	989.2
Drill String Volume (...)	Bit to Shoe Volume (...)	Shoe to Top of Casin...	Min Casing AV (m/min)	Max Casing AV (m/min)	Min Open Hole AV (m...	Max Open Hole AV (...)	
17.88	74.94	15.98	43.7	64.6	18.5	67.8	

Error

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

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

Pump Checks

Date	Depth (mKB)	Q (m³/min)	Pres (kPa)	Strokes (spm)
3/8/2013 08:00	1,816.00	0.929	12,900	95
3/8/2013 16:00	1,882.00	0.635	2,249	65

Pump Operations

Start Date	End Date	Liner Size (mm)	P (max) (kPa)	Vol/Stk OR (m³/stk)
1/29/2013		140.0		

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

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

Pump Checks

Date	Depth (mKB)	Q (m³/min)	Pres (kPa)	Strokes (spm)
3/9/2013 16:00	1,878.00	0.645	1,301	66
3/9/2013 19:00	1,900.00	1.320	4,800	135

Pump Operations

Start Date	End Date	Liner Size (mm)	P (max) (kPa)	Vol/Stk OR (m³/stk)
1/29/2013		140.0		
2/5/2013		140.0		



Daily Drilling

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

Rig: Beaver Drilling Ltd. 2

Report Date: 3/9/2013

Report #: 17

Depth Progress: 28.00 m

Depth End: 1,919.00 mKB

Rig Release Date:

Shaker Screens

Description	Make	Model	Deck No.	Start Date	End Date	Screen No.	Scr Sz X	Scr Sz Y
1	NOV	KING COBRA	2	2/25/2013	3/3/2013	1	84	84

Centrifuges/Cyclones: HGS Centrifuge, Brandt, 4000

Number	Make	Model	Diameter (mm)
1	Brandt	4000	

Centrifuge/Cyclone Checks

Date	Hrs (hrs)	RPM (rpm)	Dens OF (kg/m³)	Q (ovrflw) (L/min)	Dens UF (kg/m³)	Q (undrflw) (L/min)

Fluid / Mud Additive Amounts

Description	Consumed	Cost	Size	Units
VERSACLEAN INVERT	2.3	1,450.000		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)
Little Bear	20.00
Slater River	241.00
Arctic Red	829.00
Sans Sault	988.00
Martin House	1,138.00
Imperial	1,172.00
Upper Canol	
Lower Canol	
Hare Indian	
Bluefish Member	
Hume	



Daily Drilling

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

Rig: Beaver Drilling Ltd. 2

Report Date: 3/8/2013

Report #: 16

Depth Progress: 177.00 m

Depth End: 1,890.00 mKB

Rig Release Date:

API / UWI 200/C-011-L/094-P-16/99			Surface Legal Location C-011-L/94-P-16			MaxWell Job Number JOB01@2006			License No. EL470		
Ground Elevation (m) 281.30			Original KB/RT Elevation (m) 286.50			Casing Flange Elevation (m)			Original Spud Date 2/25/2013		
Days From Spud (days) 11.29											
Daily Cost Total 144,396.87			Cumulative Cost 2,239,466.21			Total Job AFE Amount 10,274,600.00			Total AFE+Sup 10,274,600.00		
AFE / RFE / Maint.# 10343209			Estimated Days 36.29								
Planned Depth (TMD) (mKB) 2,156.00			Override TVD (mKB)			Head Count 39.0			Personnel Total Hours (hrs) 450.00		
Cum Personnel Total Hours (hrs) 7,208.00											
Avg Connection Gas 45			Avg Background Gas 32			Avg Trip Gas			Max H2S (ppm) 0		
Road Condition Good			Weather Overcast			Temperature (°C) -23			Wind SE 15 KM		
Ops and Depth @ Morning Report Make up core barrel									Wellbore Original Hole		

Last 24hr Summary

No accidents or incidents 5 Hazard ID's: 0 Job observations: Drill ahead from 1713m to 1890m (Core Point) with Reed MSR616M bit,Dyna Drill 7/8 5stage motor set at 1.15* and Schlumberger directional BHA, Pumping at 1.7m3/min. motor RPM 130,table RPM 60,WOB 7-10 dan,Average ROP 13.35 m/hr.Circulate condition hole prior to pulling out and Core, Pull out of hole lay down directional tools.

24hr Forecast

Cut core #1

Daily Contacts

Rig Manager, Rick Yavis; WS Supervisor, Brian Neigum, 403-548-5013; WS Supervisor, Mike Hobmaier, 403-844-3210; Drilling Superintendent, Sheldon Vamplew, 403-999-1302; Command, Center, 587-794-4599; Drilling Engineer, Mike Greener, 403-771-5039

Last Casing String

Surface, 599.00mKB

Time Log

Start Time	End Time	Dur (hrs)	Phase	Op Code	Activity Code	Time P-T-X	Operation
00:00	01:00	1.00	INTRM1	DRILL	DRLG	P	Drill 222mm hole from 1713m to 1722m with Reed MSR616M bit,Dyna Drill 7/8 5stage motor set at 1.15* and Schlumberger directional BHA, Pumping at 1.7m3/min. motor RPM 130,table RPM 50,WOB 2 to 3dan,Average ROP 21m/hr.
01:00	01:15	0.25	INTRM1	RIGMNT	SVRG	P	Rig service function hydrill 13 sec crown saver operating properly
01:15	03:00	1.75	INTRM1	DRILL	DRLG	P	Drill 222mm hole from 1722m to 1741m with Reed MSR616M bit,Dyna Drill 7/8 5stage motor set at 1.15* and Schlumberger directional BHA, Pumping at 1.7m3/min. motor RPM 130,table RPM 50,WOB 2 to 3dan,Average ROP 21m/hr.
03:00	03:30	0.50	INTRM1	RIGMNT	RGRP	T	Change out pump control on driller control panel
03:30	07:30	4.00	INTRM1	DRILL	DRLG	P	Drill 222mm hole from 1741m to 1818m with Reed MSR616M bit,Dyna Drill 7/8 5stage motor set at 1.15* and Schlumberger directional BHA, Pumping at 1.7m3/min. motor RPM 130,table RPM 50,WOB 2 to 3dan,Average ROP 21m/hr.
07:30	07:45	0.25	INTRM1	DRILL	SRVY	P	Accumilated directional surveys
07:45	08:00	0.25	INTRM1	DRILL	SFTY	P	Crew change safety meeting
08:00	08:15	0.25	INTRM1	RIGMNT	SVRG	P	Rig service function test pipe rams 3 seconds to close function test crown saver working proper
08:15	10:00	1.75	INTRM1	DRILL	DRLG	P	Drill 222mm hole from 1818m to 1847m with Reed MSR616M bit,Dyna Drill 7/8 5stage motor set at 1.15* and Schlumberger directional BHA, Pumping at 1.7m3/min. motor RPM 130,table RPM 50,WOB 2 to 3dan,Average ROP 21m/hr.
10:00	14:45	4.75	INTRM1	DRILL	DRLG	P	Drill 222mm hole from 1847m to 1890m with Reed MSR616M bit,Dyna Drill 7/8 5stage motor set at 1.15* and Schlumberger directional BHA, Pumping at 1.7m3/min. motor RPM 130,control drill at 10m/hr to core point
14:45	15:00	0.25	INTRM1	DRILL	SRVY	P	Accumulated survey time
15:00	16:00	1.00	PROD1	CORING	CIRC	P	Condition mud and circulate
16:00	16:15	0.25	PROD1	RIGMNT	SVRG	P	Rig service function test annular 13sec to close function test crown saver working proper
16:15	16:30	0.25	PROD1	CORING	SFTY	P	Safety meeting on tripping out of the hole, reviewed jsa#129.
16:30	19:00	2.50	PROD1	CORING	TRIP	P	Pump pill, Trip out of hole with pipe spinner lay down BHA/flow check@1881m/1789m/
19:00	19:15	0.25	PROD1	CORING	SFTY	P	Crew change safety meeting
19:15	23:30	4.25	PROD1	CORING	TRIP	P	Trip out of hole Flow check@933M/214m/
23:30	23:45	0.25	PROD1	CORING	SFTY	P	Safety meeting reviewed jsa#159 laying down DC
23:45	00:00	0.25	PROD1	CORING	PULD	P	Lay down BHA



Daily Drilling

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

Rig: Beaver Drilling Ltd. 2

Report Date: 3/8/2013

Report #: 16

Depth Progress: 177.00 m

Depth End: 1.00 mKB

Rig Release Date:

Fluid / Mud Checks: Mud Engineer: Tri Pham

Time	Depth (mKB)	Density (kg/m³)	Funnel Viscosity (s/L)	pH	PV Override (cp)	YP Override (Pa)
15:20	1,890.00	960.0	67		16.0	5.5
Low Gravity Solids (%)	MBT (kg/m³)	Oil Water Ratio	Chlorides (mg/L)	Calcium (mg/L)	Lime (kg/m³)	Potassium (mg/L)
8.4		83.3/16.7	241,833	40,250	17	
Electric Stab (V)	ECD - Manual Entry (...)	Sand (%)	Solids, Corr. (%)	T (fl) (°C)	HTHP Pressure (kPa)	HTHP Filt (mL/30min)
630.0	1038.5		8.3	39	3,500	5.7
Mud Lost to Surface (m³)	Mud Lost to Hole (m³)		Daily Mud Cost			
10.20			42,994.02			
Cum Mud Lost to Surface (m³)	Cum Mud Lost to Hole (m³)		Cumulative Mud Cost			
45.60			109,471.06			

Hazard IDs, Near Misses & PJHAs

Days Since Last Time Incident (days)	Days Since Recordable Incident (days)
393.00	393.00

Comment

"DESCRIPTION: Hands coveralls were soaked in invert

No. Rpts

11,230

ACTION TAKEN: Ordered him to change and not keep on saturated coveralls, to be more cautious and try to avoid getting covered in it

REPORTED BY: Motorman

CORRECTED: YES LIKELYHOOD: 2 SEVERITY: 3

DATE NOTED: 03/08/13 DATE CORRECTED: 03/08/13"

Last BOP Drill

Type	Days Since Last Check (days)	Last Date	Days Until Next Check (days)	Next Date
BOP Drill (Pit)	3	3/5/2013	-2	3/6/2013

Safety Incidents

Time	Comment	Type

Drill Strings: BHA # 2

Bit Run	Drill Bit	Length (m)	IADC Bit Dull	TFA (incl Noz) (mm²)	BHA ROP (m/hr)
1	222.0mm, REED, MSR616M-A2C, A141415	0.28	1-1-CT-S-X-0-NO-CP	581	15.3
Nozzles (mm)	String Length (m)	OD (mm)	Rotating Hook Load (maximum) (daN)		
11.1/11.1/11.1/11.1/11.1/11.1	1,890.00	168.0	66,000		
Depth In (mKB)	Depth Out (mKB)	Avg ROP (m/hr)	Depth This Job (m)	Total Depth Drilled ...	Job Drill Hrs (hrs)
601.00	1,890.00	15.3	1,289.00	1,890.00	84.50
					Total Drill Hrs (hrs)
					84.50

Comment

Dyna-Drill 7/8 5 Stage set @ 1.15*

Drill String Components

Item Description	ID (mm)	OD (mm)	Jts	Len (m)	Cum Len (m)
Kelly	70.0	109.0	1	6.93	1,890.00
Drill pipe - Singles	109.0	127.0	1	9.60	1,883.07
Drill pipe - Stands	109.0	127.0	89	1,713.19	1,873.47
X/O SUB	59.0	123.0	1	0.61	160.28
X/O Sub	58.0	134.0	1	0.51	159.67
6 D.C	60.0	160.0	12	112.00	159.16
X/O 4 H-90	62.0	162.0	1	0.48	47.16
Jar	76.0	157.0	1	9.18	46.68
N.M. DC	72.0	168.0	2	18.96	37.50
Landing Sub	86.0	164.0	1	0.55	18.54
X-PULSE	70.0	164.0	1	9.48	17.99
MUD MOTOR	34.0	131.0	1	8.23	8.51

Drilling Parameters: 1,847.00 - 1,890.00 mKB

Cum Depth (m)	Cum Drill...	Int ROP (...)	Flow Rat...	WOB (daN)	RPM (r...	SPP (kPa)	Drill Str Wt (d...	SO Str Wt (da...	PU Str Wt (da...	Off-Btm Str ...	Drill Tq
1,289.00	84.50	11.1	1.800	3,000.0	60	12,900	66,000	73,000	79,000	76,000	3,700.0

Hydraulic Calculations

Bit Hydraulic Pow...	HP/Area (kW/mm²)	% P @ bit (%)	Jet Vel (m/s)	Bit dP (kPa)	Ann. dP (kPa)	Mud Density (kg/m³)	ECD End (kg/m³)
43.8	0.00113	11	51.7	1,460.4	286.4	975.0	990.5
Drill String Volume (...)	Bit to Shoe Volume (...)	Shoe to Top of Casin...	Min Casing AV (m/min)	Max Casing AV (m/min)	Min Open Hole AV (m...	Max Open Hole AV (...)	
16.59	41.85	16.12	59.6	67.0	27.0	108.8	

Error

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

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

Pump Checks

Date	Depth (mKB)	Q (m³/min)	Pres (kPa)	Strokes (spm)
3/8/2013 08:00		1,816.00	0.929	12,900
3/8/2013 16:00		1,882.00	0.635	2,249
				95
				65



Daily Drilling

COPRC MIRROR LAKE N-20 65-00 126-45
Rig: Beaver Drilling Ltd. 2Report Date: 3/8/2013
Report #: 16
Depth Progress: 177.00 m
Depth End: 1,890.00 mKB
Rig Release Date:

Pump Operations

Start Date	End Date	Liner Size (mm)	P (max) (kPa)	Vol/Stk OR (m³/stk)
1/29/2013		140.0		

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

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

Pump Checks

Date	Depth (mKB)	Q (m³/min)	Pres (kPa)	Strokes (spm)
3/8/2013 08:00	1,805.00	0.704	2,421	72
3/8/2013 16:00	1,882.00	0.929	10,500	95

Pump Operations

Start Date	End Date	Liner Size (mm)	P (max) (kPa)	Vol/Stk OR (m³/stk)
1/29/2013		140.0		
2/5/2013		140.0		

Shaker Screens

Description	Make	Model	Deck No.	Start Date	End Date	Screen No.	Scr Sz X	Scr Sz Y
1	NOV	KING COBRA	2	2/25/2013	3/3/2013	1	84	84

Centrifuges/Cyclones: HGS Centrifuge, Brandt, 4000

Number	Make	Model	Diameter (mm)
1	Brandt	4000	

Centrifuge/Cyclone Checks

Date	Hrs (hrs)	RPM (rpm)	Dens OF (kg/m³)	Q (ovrflw) (L/min)	Dens UF (kg/m³)	Q (undrflw) (L/min)

Fluid / Mud Additive Amounts

Description	Consumed	Cost	Size	Units
VERSAMUL - 208LT	2.0			brl
OPTISEAL IV 25KG	5.0	61.180		sks
VERSAMOD - 208LT	1.0	1,071.390		bbl
VERSAMUL - 208LT	1.0	940.470		bbl
TRUVIS - 25KG	6.0	152.410		sks
OPTISEAL IV 25KG	10.0	61.180		sks
Barite	80.0			sks
VERSACLEAN INVERT	27.0	1,450.000		m3

Survey Data

Date	MD (mKB)	Incl (°)	Azm (°)	TVD (mKB)	Depart (m)	NS (m)	EW (m)	VS (m)	DLS (°/30m)
3/8/2013	1,718.17	2.20	41.00	1,717.68	29.80	20.01	22.08	20.01	0.41
3/8/2013	1,737.50	1.58	73.61	1,737.00	30.41	20.36	22.58	20.36	1.89
3/8/2013	1,756.66	1.32	96.41	1,756.16	30.79	20.41	23.05	20.41	0.98
3/8/2013	1,775.91	0.62	95.71	1,775.41	31.01	20.38	23.38	20.38	1.09
3/8/2013	1,795.03	1.32	75.71	1,794.52	31.28	20.42	23.69	20.42	1.20
3/8/2013	1,814.27	1.01	1.89	1,813.76	31.59	20.65	23.91	20.65	2.22
3/8/2013	1,833.39	1.58	14.28	1,832.88	31.93	21.07	23.98	21.07	0.99
3/8/2013	1,852.66	2.90	31.68	1,852.13	32.61	21.74	24.31	21.74	2.29
3/8/2013	1,871.80	2.50	30.32	1,871.25	33.48	22.52	24.77	22.52	0.63
3/8/2013	1,875.84	2.59	38.89	1,875.28	33.65	22.66	24.87	22.66	2.90
3/8/2013	1,890.00	2.20	40.00	1,889.43	34.24	23.12	25.25	23.12	0.83

Formations

Formation Name	Drill Top MD (mKB)
Little Bear	20.00
Slater River	241.00
Arctic Red	829.00
Sans Sault	988.00
Martin House	1,138.00
Imperial	1,172.00
Upper Canol	
Lower Canol	
Hare Indian	
Bluefish Member	
Hume	