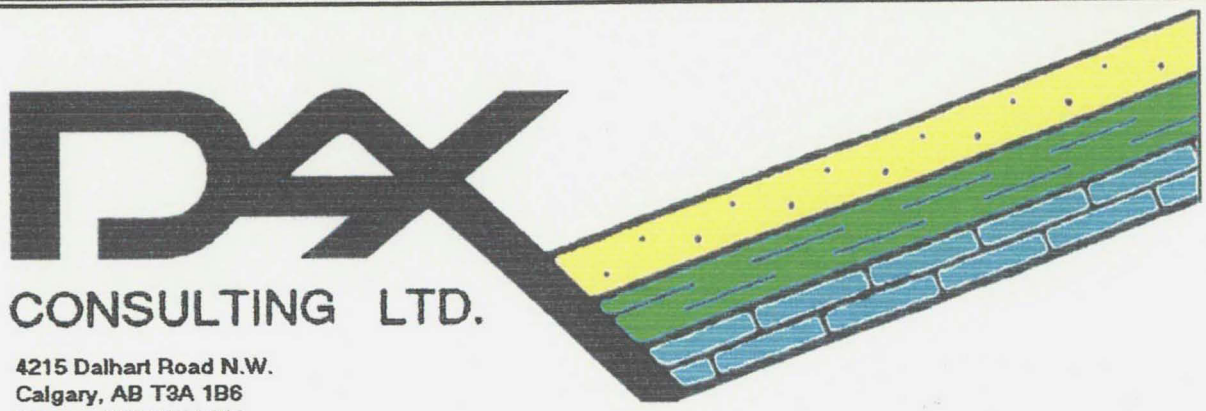

DAX CONSULTING LTD.
4215 Dalhart Road N.W.
Calgary, AB T3A 1B6
Phone: 403-288-9388

GEOLOGICAL WELL REPORT

PREPARED FOR

CANADIAN FOREST OIL LTD.

CDN FOREST et al NORTH LIARD C-31 / C-31A

SURFACE LOCATION: Unit C, Section 31

GRID AREA North 60 degrees 40 seconds // West 123 degrees 30 seconds

UTM Zone 10

DIRECTIONAL WELL

Report prepared by: Bryan Bellman, P.Geol.
Robert Kelly
David Murray
William Godwin, P. Geol.

Report approved by: William Godwin, P. Geol.

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DAX Consulting Ltd.

CDN FOREST et al NORTH LIARD C-31 / C-31A 60-40-123-30

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ADDENDUM

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CDN FOREST et al NORTH LIARD C-31 / C-31A 60-40-123-30

WELL DATA SUMMARY

OPERATOR: CANADIAN FOREST OIL LTD.

WELL NAME: CDN FOREST et al NORTH LIARD C-31 / C-31A 60-40-123-30

C-31 SURFACE LOCATION: Unit C Section 31
GRID AREA North 60 degrees 40 seconds
West 123 degrees 30 seconds
MAP ZONE: UTM Zone 10

C-31 SURFACE COORDINATES: 3.4 metres North; 36.3 metres West
as measured from the southeast corner
of Unit C Section 31

C-31 FINAL LOCATION: Unit B Section 31
GRID AREA North 60 degrees 40 seconds
West 123 degrees 30 seconds
MAP ZONE: UTM Zone 10

C-31 FINAL COORDINATES: 75.6 metres North; 85.2 metres East
as calculated from well head centre

79.0 metres North; 48.9 metres East
as calculated from the southeast corner of
Unit C Section 31

LICENCE No.: API 1900

ELEVATIONS: **Ground:** 481.3 metres **K.B.:** 488.0 metres

ZONE(S) OF INTEREST: Primary: Devonian - Nahanni

WELLSITE CONSULTANTS / GEOLOGISTS: Bryan Bellman / Robert Kelly /
David Murray / Bill Godwin

COMPANY GEOLOGIST: James R. Taylor / Gary Winter

DAX Consulting Ltd.

CDN FOREST et al NORTH LIARD C-31 / C-31A 60-40-123-30

WELL DATA SUMMARY

DRILLING CONTRACTOR: Akita Drilling Ltd. Rig No. 58

C-31 SPUD DATE: August 04, 2000 at 12:20 hour

C-31 TOTAL DEPTH DATE: December 27, 2000 at 05:00 hour

C-31 TOTAL DEPTH: 2730.75 metres K.B. / 2722.2 metres T.V.D.

C-31 TERMINATING FORMATION: Devonian – Horn River

VERTICAL SECTION AZIMUTH: 77.00 degrees

FINAL CLOSURE AND AZIMUTH: 114.0metres K.B. at 48.42 degrees

VERTICAL SECTION: 100.1 metres at 77.0 degrees

COMMENTS: Milled casing window, bottom of window at 2366.8 m K.B.
Top of whipstock ramp set at 2361.8 metres K.B. .
for commencement of Sidetrack No. 1 Drilling Operations
Well Name changed from C-31 to C-31A

WELL DATA SUMMARY

C-31A SIDETRACK NO. 1

C-31A SIDETRACK NO. 1 START DATE: January 05, 2001 at 10:00 hour

MILLED CASING WINDOW BOTTOM: 2366.8 metres K.B. //
2361.0 metres T.V.D.

TOP OF WHIPSTOCK RAMP DEPTH: 2361.8 metres K.B.
Set at 82.80 degrees

START FORMATION: Devonian – Ft. Simpson

C-31A SIDETRACK NO. 1 TOTAL DEPTH DATE: January 08, 2001 at 08:55 hour

C-31A SIDETRACK NO. 1 TOTAL DEPTH: 2450.0 metres K.B. // 2444.1 metres T.V.D.

TERMINATING FORMATION: Devonian – Horn River

C-31A INITIAL LOCATION: Unit B Section 31
GRID AREA North 60 degrees 40 seconds
West 123 degrees 30 seconds
MAP ZONE: UTM Zone 10

C-31A INITIAL COORDINATES: 39.4 metres North; 97.6 metres East
As calculated from well head centre
42.8 metres North; 61.3 metres East
as calculated from the southeast corner of
Unit C Section 31

C-31A FINAL LOCATION: Unit B Section 31
GRID AREA North 60 degrees 40 seconds
West 123 degrees 30 seconds
MAP ZONE: UTM Zone 10

C-31A FINAL COORDINATES: 42.0 metres North; 96.6 metres East
As calculated from well head centre
45.4 metres North; 60.3 metres East
as calculated from the southeast corner of
Unit C Section 31

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CDN FOREST et al NORTH LIARD C-31 / C-31A 60-40-123-30

WELL DATA SUMMARY

C-31A SIDETRACK NO. 1

VERTICAL SECTION AZIMUTH: 77.00 degrees

FINAL CLOSURE AND AZIMUTH: 105.3 metres K.B. at 66.50 degrees

VERTICAL SECTION: 103.6 metres at 77.00 degrees

C31A SIDETRACK NO. 1 STATUS: Abandoned

Note: Milled casing window, bottom of window at 2300.0 m K.B. Top of whipstock ramp set at 2395.0 metres K.B. . for commencement of Sidetrack No. 2 Drilling Operations

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CDN FOREST et al NORTH LIARD C-31 / C-31A 60-40-123-30

WELL DATA SUMMARY

C-31A SIDETRACK NO. 2

C-31A SIDETRACK NO. 2 START DATE: January 12, 2001 at 12:45 hour

MILLED CASING WINDOW BOTTOM: 2300.0 metres K.B. // 2294.3 metres K.B.

TOP OF WHIPSTOCK RAMP DEPTH: 2295.0 metres K.B. // 2289.3 metres T.V.D. set at 77.00 degrees

START FORMATION: Devonian – Fort Simpson

C-31 A SIDETRACK NO. 2 TOTAL DEPTH DATE: January 24, 2001 at 06:15 hour

C-31 A SIDETRACK NO. 2 TOTAL DEPTH: 2330.0 metres K.B. // 2324.3 metres T.V.D.

TERMINATING FORMATION: Devonian – Fort Simpson

C-31A INITIAL LOCATION: Unit B Section 31
GRID AREA North 60 degrees 40 seconds
West 123 degrees 30 seconds
MAP ZONE: UTM Zone 10

C-31A INITIAL COORDINATES: 42.4 metres North; 96.6 metres East
As calculated from well head centre
45.8 metres North; 60.3 metres East
As calculated from the southeast corner
Of Unit C Section 31

C-31A FINAL LOCATION: Unit B Section 31
GRID AREA North 60 degrees 40 seconds
West 123 degrees 30 seconds
MAP ZONE: UTM Zone 10

C-31A FINAL COORDINATES: 40.7 metres North; 97.0 metres East
As calculated from well head centre
44.1 metres North; 60.7 metres East
As calculated from the southeast corner
Of Unit C Section 31

WELL DATA SUMMARY

C31A SIDETRACK NO. 2

VERTICAL SECTION AZIMUTH: 77.00 degrees

FINAL CLOSURE AND AZIMUTH: 105.2 metres K.B. at 67.25 degrees

VERTICAL SECTION: 103.7 metres at 77.00 degrees

C31A SIDETRACK NO. 3 STATUS: Abandoned

Note: Plugged back to 2301.0 m K.B.for commencement of Sidetrack No. 3 Drilling Operations

WELL DATA SUMMARY

C-31A SIDETRACK NO. 3

C-31A SIDETRACK NO. 3 START DATE: January 27, 2001 at 00:40 hour

MILLED CASING WINDOW BOTTOM: 2300.0 metres K.B. //
2294.3 metres T.V.D.

TOP OF WHIPSTOCK RAMP DEPTH: 2295.0 metres K.B. //
2289.3 metres T.V.D.
Set at 234.00 degrees

CEMENT PLUG DEPTH: 2301.0 metres K.B. // 2295.2 metres T.V.D.

START FORMATION: Devonian – Fort Simpson

C-31A SIDETRACK NO. 3 TOTAL DEPTH DATE: March 30, 2001 at 09:30 hour

C-31A SIDETRACK NO. 3 TOTAL DEPTH: 2941.5 metres K.B. // 2865.3 metres .V.D.

TERMINATING FORMATION: Devonian – Horn River

C-31A INITIAL LOCATION: Unit B Section 31
GRID AREA North 60 degrees 40 seconds
West 123 degrees 30 seconds

C-31A INITIAL COORDINATES: 42.3 metres North; 96.6 metres East
As calculated from well head centre
45.7 metres North; 60.3 metres East
As calculated from the southeast corner of
Unit C Section 31

C-31A FINAL LOCATION: Unit B Section 31
GRID AREA North 60 degrees 40 seconds
West 123 degrees 30 seconds

C-31A FINAL COORDINATES: 43.7 metres North; 177.0 metres West
As calculated from well head centre
47.1 metres North; 213.3 metres West
As calculated from the southeast corner of
Unit C Section 31

WELL DATA SUMMARY

C-31A SIDETRACK NO. 3

VERTICAL SECTION AZIMUTH: 316.28 degrees

FINAL CLOSURE AND AZIMUTH: 182.3 metres K.B. at 283.86 degrees

VERTICAL SECTION: 153.9 metres at 316.28 degrees

C31A SIDETRACK NO. 3 STATUS: Abandoned

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CDN FOREST et al NORTH LIARD C-31 / C-31A 60-40-123-30

WELL DATA SUMMARY

CASING RECORD:

Upper Conductor Hole: Hole Size: 914.5 mm Casing Size: 762.0 mm
Landing Depth: 17.9 metres K.B.

Lower Conductor Hole: Hole Size: 660.4 mm Casing Size: 508.0 mm
Weight and Type: 139.9 kg/m; K-55; BT&C
Landing Depth: 190.0 metres K.B.

Surface Hole: Hole Size: 444.5 mm Casing Size: 339.7 mm
Weight and Type: 101.2 kg/m; K-55; BT&C, IPSCO
Surface Casing Landing Depth: 710.3 metres K.B.

First Intermediate Hole: Hole Size: 311.2 mm Casing Size: 244.5 mm
Weight and Type: 79.6 kg/m; HCL-80, BT&C, IPSCO
First Intermediate Casing Landing Depth: 2629.5 metres K.B.

Second Intermediate Hole: Hole Size: 215.9 mm

MUD COMPANY: Dynamic Drilling Fluids

MUD PARAMETERS:

Interval	Mud System
0 m to 190.0 m	K2SO4
190.0 m to 711.0 m	K2S04
711.0 m to 2629.5 m	K2SO4
2629.5 m to 2730.75 m	K2SO4
2366.8 m to 2450.0 m	K2SO4
2302.2 m to 2330.0 m	K2SO4
2301.2 m to 2895.4 m	K2SO4
2895.4 m to 2941.5 m	K2SO4

WELL DATA SUMMARY

SAMPLES:

Operator: CANADIAN FOREST OIL LTD.

Interval:
0 m to 2570.0 m at 5.0 m intervals
2570.0 m to 2730.75 m at 2.5 m intervals
2366.8 m to 2450.0 m at 2.5 m intervals
2302.2 m to 2330.0 m at 2.5 m intervals
2301.2 m to 2895.4 m at 2.5 m intervals
2895.4 m to 2941.5 m at 2.5 m intervals

Two (2) sets of washed sample vials and trays

Government: NATIONAL ENERGY BOARD // GEOLOGICAL SURVEY of CANADA

Interval:
0 m to 2570.0 m at 5.0 m intervals
2570.0 m to 730.75 m at 2.5 m intervals
2366.8 m to 2450.0 m at 2.5 m intervals
2302.2 m to 2330.0 m at 2.5 m intervals
2301.2 m to 2895.4 m at 2.5 m intervals
2895.4 m to 2941.5 m at 2.5 m intervals

Two (2) sets of washed sample vials and trays
One (1) set of dried unwashed sample bags

CORES: None

DRILL STEM TESTS: None on penetration

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CDN FOREST et al NORTH LIARD C-31 / C-31A 60-40-123-30

WELL DATA SUMMARY

LOGGING PROGRAM: Company: Schlumberger of Canada Ltd.

District: Grande Prairie Unit No.: 2016

Logging Engineer: S. Kirstine / T. Maksymchuk

Date: August 19, 2000

Run No. 1

Service No. 1	Logging Device	Logged Interval	Time
	AIT-BHCS-SP-GR-CAL	708.6 m to 190.0 m	5.75 hours

Company: Scientific Drilling Ltd.
Schlumberger of Canada Ltd.

District: Grande Prairie Unit No.: 3025

Logging Engineer: G. Stewart

Date: August 19, 2000

Service No. 2	GYRO SURVEY	705.2 m to 0.0 m	3.0 hours

Comments: Logs run in combination, two runs made - one centralized, one E centralized , due to large hole diameter.

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CDN FOREST et al NORTH LIARD C-31 / C-31A 60-40-123-30

WELL DATA SUMMARY

LOGGING PROGRAM: Company: Schlumberger of Canada Ltd.

District: Grande Prairie Unit No.: 3025

Logging Engineer: G. Stewart

Date: December 14, 2000

Run No. 2

Service No. 1	Logging Device	Logged Interval	Time
	FMI-DSI-GR-CAL	2613.5 m to 710.0 m	12.0 hours
	ARI-CNL-LDT-GR-XYCAL	2619.0 m to 710.0 m	8.5 hours

Company: Scientific Drilling Ltd.
Schlumberger of Canada Ltd.

District: Grande Prairie Unit No.: 3025

Logging Engineer: G. Stewart

Date: December 15, 2000

Service No. 2	GYRO SURVEY	2629.0 m to 710.0 m	3.0 hours

Comments: Caliper stuck open on first run, problems encountered with wireline fraying – lost time 2.0 hours. Hole severely washed out resulting in poor quality logs

DAX Consulting Ltd.

CDN FOREST et al NORTH LIARD C-31 / C-31A 60-40-123-30

WELL DATA SUMMARY

LOGGING PROGRAM: Company: Schlumberger of Canada Ltd.

District: Grande Prairie Unit No.: 2039

Logging Engineer: G. Robbins

Date: December 23, 2000

Run No. 3

Service No. 1	Logging Device	Logged Interval	Time
	USIT / CBT	2625.0 m to 1700.0 m	6.5 hours

Comments: Standardized and pressurized runs.

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CDN FOREST et al NORTH LIARD C-31 / C-31A 60-40-123-30

WELL DATA SUMMARY

LOGGING PROGRAM: Company: Schlumberger of Canada Ltd.

District: Grande Prairie Unit No.: 2028

Logging Engineer: G. Stewart

Date: December 29, 2000

Run No. 4

Service No. 1	Logging Device	Logged Interval	Time
	FMI-DSI-GR-CAL	2671.0 m to 2100.0 m	4.5 hours

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CDN FOREST et al NORTH LIARD C-31 / C-31A 60-40-123-30

WELL DATA SUMMARY

LOGGING PROGRAM: Company: Schlumberger of Canada Ltd.

District: Nisku / Grande Prairie Unit No.: 2028

Date: March 21- 25, 2001

Run No. 5

Service No. 1	Logging Device	Logged Interval	Time
	CSAT-SGTL	160 m, 234 m, 160 m	5.25 hours

Comments: Logging operations conducted via wireline inside to intermediate casing. One (1) shot taken at 160 metres, three (3) shots taken at 234 metres, two (2) shots taken at 1320 metres.

Service No. 2	Logging Device	Logged Interval	Time
	CSAT-SGTL TLC Pipe Conveyed	2882 m, 2696, 2359 m	31.25 hours

Comments: Driller Total Depth – 2895.4 metres K.B., Logger stopped descent into hole at 2885 metres K.B. Two (2) shots taken at 2882 metres, one (1) shot taken at 2696 metres, three (3) shots taken at 2359 metres. Twelve shot holes drilled at closure distance of 50 m at 200 degrees Azimuth from well head centre.

Service No. 3	Logging Device	Logged Interval	Time
	MESTB(FMS) TLC Pipe Conveyed	2863.6 m to 2310.0 m	25.00 hours

Comments: Driller Total Depth – 2895.4 metres K.B., Logger stopped descent into hole at 2874.2 metres K.B.

WELL DATA SUMMARY

DIRECTIONAL DRILLING SERVICES:

Company: Ryan Energy Technologies Inc.

Directional Drillers: William Baskin
Shane Matthews
Steven Walker
Brad Sandquist

Date: August 04, 2000 to March 30, 2001

Interval: 0.0 metres K.B. to 2629.5 metres K.B.
2629.5 metres K.B. to 2730.75 metres K.B.
2366.8 metres K.B. to 2450.0 metres K.B.
2300.0 metres K.B. to 2330.0 metres K.B.
2300.0 metres K.B. to 2895.4 metres K.B.
2895.4 metres K.B. to 2941.5 metres K.B.

MWD GAMMA RAY RECORD SERVICES:

Company: Ryan Energy Technologies Inc.

MWD Technicians: Wray Burch
James Harrison
Frank Seelagar
James Harrison
Scott Florence
Phil Cann

Date: September 28, 2000 to March 30, 2001

Interval: 1760.0 metres K.B. to 2616.75 metres K.B.
2616.75 metres K.B. to 2718.0 metres K.B.
2366.8 metres K.B. to 2437.25 metres K.B.
2300.0 metres K.B. to 2317.25 metres K.B.
2300.0 metres K.B. to 2885.0 metres K.B.
2885.0 metres K.B. to 2931.1 metres K.B.

WELL DATA SUMMARY

TOTAL GAS and CHROMATOGRAPHY SERVICES:

Company: Datalog Technology (Calgary) Inc.

Technicians:
Adrian Pristol
Pavel Alksne
Timour Chayipov
Ben Miller
Dan Stefanescu
Aliarcid Rodriguiz
Doug Haugen
Kurtis Coonfer
Todd King
Phill Penney
Gordon Bennett

Date: August 04, 2000 to March 30, 2001

Interval:
275.0 metres K.B. to 2629.5 metres K.B.
2629.5 metres K.B. to 2730.75 metres K.B.
2366.8 metres K.B. to 2450.0 metres K.B.
2302.2 metres K.B. to 2330.0 metres K.B.
2302.2 metres K.B. to 2895.4 metres K.B.
2895.4 metres K.B. to 2941.5 metres K.B.

DAX Consulting Ltd.

CDN FOREST et al NORTH LIARD C-31 / C-31A 60-40-123-30

GEOLOGICAL MARKERS

K.B. ELEVATION: 488.0 metres

FORMATION		PROGNOSIS SUBSEA (metres)	MEASURED LOG / MWD DEPTH (metres)	T.V.D. LOG / MWD (metres)	T.V.D SUBSEA (metres)
LOWER MISSISSIPPIAN					
Flett		-	0.0	0.0	+ 488.0
Yohin (?)		-	94.0	94.0	+ 394.0
Clausen (?)		-	234.0	234.0	+ 254.0
Yohin (?)		-	273.0	273.0	+ 215.0
Besa River Fault		-	301.0	301.0	+ 187.0
Besa River		+ 461.0	352.2	352.1	+ 135.9
Banff		- 840.0	1318.8	1314.5	- 826.5
UPPER DEVONIAN					
Exshaw		- 1030.0	1542.0	1537.4	- 1049.4
MIDDLE DEVONIAN					
Ft.Simpson		- 1080.0	1598.0	1593.9	- 1105.9
Horn River		- 1780.0	2355.4	2349.6	- 1861.6
First Intermediate Casing			2629.5	2622.6	- 2134.6
Muskwa		- 1930.0	Not penetrated		
Nahanni		- 2190.0	Not penetrated		
Total Depth C31	Driller	- 2600.0	2730.7	2722.2	- 2234.2
	Logger	- 2600.0	2672.0	2664.9	- 2176.9

GEOLOGICAL MARKERS

K.B. ELEVATION: 488.0 metres

FORMATION	PROGNOSIS SUBSEA (metres)	MEASURED LOG / MWD DEPTH (metres)	T.V.D. LOG / MWD (metres)	T.V.D SUBSEA (metres)
MIDDLE DEVONIAN				
Ft.Simpson	- 1080.0	1598.0	1593.9	- 1105.9
Horn River (?)	- 1780.0	2355.4	2349.6	- 1861.6
C-31A Sidetrack No. 1		2366.8	2361.0	- 1873.0
Base of Intermediate casing Window				
Muskwa	- 1930.0	Not penetrated		
Nahanni	- 2190.0	Not penetrated		
Total Depth Driller	- 2600.0	2450.0	2444.1	- 1956.1
C-31A Sidetrack No. 1				
MIDDLE DEVONIAN				
Ft.Simpson	- 1080.0	1598.0	1593.9	- 1105.9
C-31A Sidetrack No. 2		2300.0	2294.3	- 1806.3
Base of Intermediate Casing Windows				
Horn River (?)	- 1780.0	Not penetrated		
Muskwa	- 1930.0	Not penetrated		
Nahanni	- 2190.0	Not penetrated		
Total Depth Driller	- 2600.0	2330.0	2324.3	- 1836.3
C-31A Sidetrack No. 2				
MIDDLE DEVONIAN				
Ft.Simpson	- 1080.0	1598.0	1593.9	- 1105.9
C-31A Sidetrack No. 3		2300.0	2294.3	- 1806.3
Base of Intermediate Casing Window				
Top of Cement Plug		2301.0	2295.2	- 1807.2
Horn River (?)	- 1780.0	2336.8	2330.4	- 1842.4
Muskwa	- 1930.0	Not penetrated		
Nahanni	- 2190.0	Not penetrated		
Total Depth Driller	- 2600.0	2941.5	2865.3	- 2377.3
C-31A Sidetrack No. 3				

DAX Consulting Ltd.

CDN FOREST et al NORTH LIARD C31 / C31A 60-40-123-30

BIT RECORD

BIT No.	TYPE	SIZE (mm)	DEPTH OUT (metres)	METRES DRILLED	TOTAL HOURS
1A	J7	215	190.0	190.0	25.00
2A	R3	660	117.0	117.0	30.75
3A	DGJ	215	190.0	73.0	6.25
1B	SS33SG	444.5	229.0	39.0	37.00
2B	MS51AM	444.5	336.0	107.0	26.25
3B	FM2864	444.5	395.0	59.0	11.50
4B	I5JSL	444.5	612.0	217.0	41.00
5BRR	I5JSL	444.5	711.0	99.0	21.00
1C	ATJ-15	311.2	722.0	11.0	2.75
2C	FM-2763	311.2	1474.0	752.0	121.0
3C	ATJ-15	311.2	1474.0	REAMING	70.25
4C	EHP44H	311.2	1626.0	152.0 REAMING	43.50 19.75
5CRR	ATJ-15	311.2	1221.0	REAMING	52.25
6C	HP13G	311.2	1226.0	REAMING	18.50
7CRR	HP13G	311.2	1272.0	REAMING	43.75
8C	GT-CS1	311.2	1274.0	REAMING	26.50
9CRR	GT-CS1	311.2	1385.0	REAMING	12.75
10CRR	GT-CS1	311.2	1392.0	REAMING	13.00
11C	J– 4	311.2	1626.0	REAMING	19.25

BIT RECORD

BIT No.	TYPE	SIZE (mm)	DEPTH OUT (metres)	METRES DRILLED	TOTAL HOURS
12C	F2P	311.2	1748.0	122.0	55.50
13C	HP51H	311.2	1766.0	18.0	13.25
14C	FM2743	311.2	1770.0	4.0	3.75
15C	HP43H	311.2	1773.0	3.0	7.75
16C	FM2627	311.2	1791.0	18.0	25.25
17C	GT – 1	311.2	1819.0	28.0	24.25
18C	ATM 00XP	311.2	1893.0	74.0	71.25
19C	ATM 503	311.2	1967.0	74.0	53.00
20CRR	EHP43H	311.2	2020.0	53.0	61.75
21C	F10TP	311.2	2111.0	91.0	70.00
22C	F10TP	311.2	2197.0	86.0	83.00
23C	FM 2743	311.2	2214.0	17.0	12.75
24C	C1	311.2	2273.0	59.0	36.00
25C	EHP42H	311.2	2273.0	REAMING	11.25
26CRR	EHP42H	311.2	2326.0	53.0	49.75
27C	F2	311.2	2349.0	23.0	24.25
28C	EHP53A	311.2	2387.0	38.0	60.25
29C	EHP53A	311.2	2406.0	19.0	28.25
30C	EHP53A	311.2	2443.0	37.0	46.75

DAX Consulting Ltd.

CDN FOREST et al NORTH LIARD C31 / C31A 60-40-123-30

BIT RECORD

BIT No.	TYPE	SIZE (mm)	DEPTH OUT (metres)	METRES DRILLED	TOTAL HOURS
31C	EHP53A	311.2	2475.0	32.0	48.00
32C	F3	311.2	2517.0	42.0	69.00
33CRR	C3 ALRGSP	311.2	2537.0	20.0	27.75
34C	HP61A	311.2	2566.0	29.0	49.50
35C	ATJ 44XP	311.2	2577.0	11.0	26.00
36C	HP62A	311.2	2607.0	70.0	76.00
37C	HP62A	311.2	2629.5	22.5	43.50
38CRR	HP62A	311.2	2629.5	REAMING	11.50
39D	JD8	215.9	2629.5	DRILL FLOAT	
40D	H530	215.9	2637.0	7.5	13.00
41DRR	H530	215.9	2730.75	93.0	32.00
42D	JD8	215.9	2730.75	REAMING	
43D	JD8	215.9	2730.75	CLEANING	
44D	CSG MILL	215.9	2367.70	4.0	32.00
45D	EHP53A	215.9	2450.00	82.3	11.75
46DRR	JD8	215.9	2450.00	CLEANING	
47D	CSG MILL	215.9	2302.0	4.0	10.00
48D	GT51	215.9	2302.0	CLEANING	
49DRR	CSG MILL	215.9	2303.00	1.0	15.00
50DRR	GT51	215.9	2311.00	8.0	2.75

DAX Consulting Ltd.

CDN FOREST et al NORTH LIARD C31 / C31A 60-40-123-30

BIT RECORD

BIT No.	TYPE	SIZE (mm)	DEPTH OUT (metres)	METRES DRILLED	TOTAL HOURS
51DRR	JD8	215.9	2311.00	CLEANING	
52DRR	GT51	215.9	2330.00	19.0	3.00
53DRR	JD8	215.9	2330.00	CLEANING	
54D	XV	215.9	2362.00	62.0	43.50
55D	MF1P	215.9	2362.0	0.0	0.00
56D	GT18	215.9	2362.0	REAMING	
57D	ETD14	215.9	2400.0	38.0	36.50
58D	GT18	215.9	2436.5	36.5	63.75
59D	GT503	215.9	2505.0	68.5	77.75
60D	GT503	215.9	2586.0	81.0	84.25
61D	GT503	215.9	2655.0	69.0	81.00
62D	GT503	215.9	2689.0	34.0	43.00
63D	GT09	215.9	2725.0	36.0	52.50
64D	ETD14MS	215.9	2791.0	66.0	78.00
65D	EP4876	215.9	2792.0	1.0	1.25
66DRR	EP4976	215.9	2811.0	19.0	33.50
67D	MFIP	215.9	2895.4	84.4	82.00
68D	EDP4876	215.9	2941.5	46.1	67.00

SAMPLE RECORD / C-31

INTERVAL (metres)	LITH (%)	DESCRIPTION
12 – 15	100	CEMENT - white with black specks, soft, limy, chalky.
15 – 17.9	100	CEMENT - white with black specks, soft, limy, chalky.
17.9		**TOTAL DEPTH – 914.5 mm / 762.0 mm O.D. UPPER CONDUCTOR HOLE / CASING**
17.9 - 25	40	CEMENT - white with black specks, soft, limy, chalky.
	40	LIMESTONE - light brown to tan color, microcrystalline to cryptocrystalline, medium hard, silty, sandy, dense
	10	SHALE - medium brownish grey, sub-fissile, medium soft to hard, calcareous.
	10	SANDSTONE - medium brownish grey color, clear quartz with trace light colored chert, fine to medium grains, subrounded, moderate sorted, friable to firm, calcareous cement, poor intergranular porosity, no hydrocarbon shows.
25 - 30	20	CEMENT
	30	SHALE - medium dark brownish grey, sub-fissile, medium soft to medium hard, lightly waxy, calcareous, part slightly carbonaceous , trace calcite veining, trace pyrite.
	50	LIMESTONE - light brown to tan, microcrystalline to cryptocrystalline, medium hard to hard, slightly argillaceous, cherty, dense, no visible hydrocarbon shows.
30 - 35	10	CEMENT
	30	SHALE - medium dark brownish grey, sub-fissile, medium soft to medium hard, calcareous, part slightly siliceous.
	60	LIMESTONE - cream to buff and light brown colored, crypto-crystalline, medium hard, slightly blocky trace argillaceous, cherty streaks, trace pellets and fossil fragments, dense, no visible hydrocarbons.

SAMPLE RECORD / C-31

INTERVAL (metres)	LITH (%)	DESCRIPTION
35 - 40	10	CEMENT
	50	SHALE - medium dark brownish grey colored, sub-fissile, waxy lustre, calcareous, slightly carbonaceous, trace calcite veining, trace marly stringers.
	40	LIMESTONE - light brown to buff, cryptocrystalline to microcrystalline, medium hard, chert stringers, trace argillaceous, dense, rare pyrobitumen, no oil shows.
40 - 45	50	SHALE - dark to occasionally very dark grey colored, medium soft medium hard, waxy lustre, part carbonaceous, calcareous, trace calcite veins, trace pyrite, rare Ostracod.
	50	LIMESTONE - cream to buff and light brown, cryptocrystalline with trace pellets and fossil fragments, medium hard, presence chert streaks, rare pyrobitumen, dense, no oil shows.
45 - 50	80	LIMESTONE - medium brown colored, microcrystalline to very fine crystalline, blocky, hard, argillaceous, presence fossil fragments - pellets, common calcite veins, trace to presence pyrite veins, rare clear quartz prism, trace dark pyrobitumen, trace poor intercrystalline and organic porosity, no fluorescence or cut.
	20	SHALE - dark to very dark grey, slightly carbonaceous to carbonaceous.
50 - 60	60	MARLSTONE - medium to medium dark brown colored, very fine crystalline to microcrystalline, blocky, hard, extremely argillaceous, silty, trace bitumen partings, no hydrocarbon shows noted.
	40	LIMESTONE - medium dark brownish grey to greyish brown color, microcrystalline, blocky, hard, very argillaceous, trace pellet ghosts, trace to presence very dark brown pyrobitumen partings, dense, no oil shows.

SAMPLE RECORD / C-31

INTERVAL (metres)	LITH (%)	DESCRIPTION
60 - 70	80	MARLSTONE - dark brown colored, very fine crystalline, blocky, hard, very argillaceous, very silty, siliceous, trace pellet ghosts, presence white calcite veins, dense to trace fracture porosity, no visible shows.
	10	SHALE - dark grey, sub-fissile to fissile, medium soft to medium hard, calcareous, trace calcite veins.
	10	LIMESTONE - buff to light brown colored, fine to medium sized pellets and fossil fragments, medium hard, rare chert, slightly argillaceous, dense, no shows.
70 - 85	50	LIMESTONE - buff to slightly mottled light and medium brown, pelletal packstone, medium hard to hard, slightly argillaceous, presence fossil fragments, trace calcite veins, rare glauconite, trace to poor organic porosity, no fluorescence, trace very faint ring on cut.
	40	MARLSTONE - dark brownish grey colored, very fine crystalline / grainstone, blocky, hard, very argillaceous, very silaceous, silty, presence calcite veins, rare glauconite, presence dark colored pyrobituminous partings, dense to trace fracture porosity, no oil shows.
	10	SHALE - dark grey, sub-fissile to fissile, medium soft to medium hard, calcareous, trace calcite veins.
85 - 90	60	MARLSTONE - dark grey to brownish grey, very fine crystalline / grained, blocky, hard, very argillaceous, silty, silaceous, trace Brachiopod remains, trace black bitumen partings / veins, trace calcite veins, trace white calcareous specks, dense, no hydrocarbon shows.
	40	LIMESTONE - as above, trace euhedral calcite crystals and over-growths, rare loose clear quartz, trace to poor organic porosity.

SAMPLE RECORD / C-31

INTERVAL (metres)	LITH (%)	DESCRIPTION
90 - 100	30	SANDSTONE - light brown, quartz with chert and light colored lithic grains, fine to coarse grains, rounded, moderate to poorly sorted, loose in sample, presence potassium feldspar and chert, clay calcareous cement in part, poor intergranular porosity, trace pyrobitumen partings, no hydrocarbon shows.
	30	LIMESTONE - medium light brown colored, wackestone, fine to very fine fossil fragments / clasts, sand grains, cherty streaks, trace to poor intergranular and organic porosity, trace pyrobitumen partings, no visible shows.
	20	SHALE - dark to medium dark grey, sub-fissile to fissile, medium hard to medium soft, calcareous, presence medium brown colored soft bentonitic partings.
	20	MARLSTONE - as above.
100 - 105	60	LIMESTONE - medium light brown, packstone to wackestone, medium hard to hard, abundant medium to fine sized Crinoid ossicles and fossil fragments, trace pyrite veins, trace to poor organic porosity, no oil shows.
	20	MARLSTONE - dark brown grey, very fine crystalline to microcrystalline, common fossil / pellet ghosts, hard, very silty and argillaceous, dense.
	10	MARLSTONE - as above; trace fossil fragments.
	10	SANDSTONE - as above; loosely consolidated, frosted quartz with common arkose type grains, calcareous cement, poor to fair porosity.

SAMPLE RECORD / C-31

INTERVAL (metres)	LITH (%)	DESCRIPTION
105 - 110	80	SANDSTONE - light brownish grey to reddish grey colored, frosted quartz with 25% - 30% potassium / microcline feldspars and 10% - 15% dark mafic / lithic grains, fine to very coarse grained, well rounded, poorly sorted, loose to unconsolidated in sample, rare clay / calcareous cement, rare to trace mica and chlorite, trace pyrite, rare chert, rare quartz overgrowths, trace faceted quartz, trace pyrobitumen, poor to fair intergranular porosity, no hydrocarbon shows.
	20	LIMESTONE - as above.
110 - 115	100	SANDSTONE - as above; predominantly medium to coarse with fine and very coarse grains in part, granitic composition - 30% arkosic grains, trace limestone stringers.
115 - 125	80	SANDSTONE - medium light speckled reddish grey, 50% frosted quartz with 25% arkose and 25% lithic grains, fine to very coarse grain size, well rounded, medium to high sphericity, poorly sorted, loosely consolidated, trace mica chlorite and pyrite, trace calcareous cement, fair to good? intergranular porosity, no oil shows.
	10	SHALE - medium grey to slightly greenish grey colored, sub-fissile to fissile, medium soft, calcareous.
	10	MARLSTONE - dark grey, very fine crystalline / grained, hard, very argillaceous, silty, dense.
125 - 130	100	SANDSTONE - medium light speckled pinkish grey, 50% clear frosted quartz, 30% feldspar, 20% dark lithic / mafic grains, medium to very coarse grains with granules and small pebbles, rounded to well rounded, poorly sorted, unconsolidated in sample, trace calcareous, trace mica pyrite and chlorite, rare pyrobitumen flakes, good porosity?, no oil shows.

SAMPLE RECORD / C-31

INTERVAL (metres)	LITH (%)	DESCRIPTION
130 - 135	100	SANDSTONE - as above; trace coarse grain to granule and rare medium pebble Granite, rare Siltstone to very fine Sandstone grains.
135 - 145	90	SANDSTONE - medium light pinkish grey, most medium to coarse with some very coarse grains, presence tan colored rounded chert and Dolostone grains, granitic to sub-granitic composition, good? porosity.
	10	SANDSTONE - light grey salt and pepper, quartzitic, very fine grained, sub-angular to sub-rounded, moderately well sorted, medium hard to firm, calcareous cement, silty, poor intergranular porosity.
145 - 165	100	SANDSTONE - medium light speckled reddish grey, 40 - 50% quartz with 25% - 30% feldspar and 25% - 30% lithic / mafic grains, most medium to coarse grain size with presence up to small size pebble, well rounded, high sphericity, poorly sorted, unconsolidated, trace mica pyrite and chlorite, good? porosity, no visible shows.
165 - 175	100	SANDSTONE - as above; becoming predominantly coarse to very coarse grained, over half arkose / lithic composite Sandstone and carbonaceous composition.
175 - 185	70	SANDSTONE - as above; less quartz - more common lithic chert and Dolostone grains.
	20	LIMESTONE - medium greyish brown, microcrystalline, hard, argillaceous, trace fossil - Crinoid fragments, dense to poor porosity.
	10	SILTSTONE - light grey slightly salt and pepper, quartzitic, sub-angular, sandy, calcareous, glauconitic in part, micaceous in part, poor porosity, no hydrocarbon shows.

SAMPLE RECORD / C-31

INTERVAL (metres)	LITH (%)	DESCRIPTION
185 - 190	100	SANDSTONE - medium light speckled reddish grey, medium to very coarse granitic grains with granules and small pebbles, common very coarse composite and Dolostone grains, well rounded, poorly sorted, unconsolidated, good? porosity, no visible oil shows.
190		**TOTAL DEPTH – 660.4 mm / 508.0 mm O.D. LOWER CONDUCTOR HOLE / CASING**
190 - 195	100	SANDSTONE - medium light speckled pinkish grey, frosted quartz (60%) feldspar (20%) rock fragments (20%), fine to very coarse grain with occasional granules, well rounded, poorly sorted, good porosity, no shows.
195 - 200	100	SANDSTONE - as above, fine to medium grains, well rounded to rounded, medium to high sphericity, loosely consolidated, rare Ostracod and rounded carbonate grains.
200 - 210	100	SANDSTONE - medium light speckled pinkish grey, predominantly medium to coarse grains with common very coarse grain and granules, well rounded, high sphericity, poorly sorted, unconsolidated in sample, frosted quartz (50%) arkose grains (20%) lithic grains / carbonate grains (20%) granitic grains (10%), trace chlorite pyrite and heavy minerals, trace biotite mica, good porosity, no hydrocarbons.
210 - 220	100	SANDSTONE - as above; sub-arkosic, fine to coarse grains with numerous lithic / argillite / arenite / granitic / carbonate granules and small pebbles, no visible cement, trace pyrite and chlorite, trace to presence biotite mica flakes.
220 - 230	100	SANDSTONE - as above; fine to coarse quartz and feldspar with very coarse to granule and small pebble rounded lithic materials, abundant (40%) buff to tan colored microcrystalline rounded cherty fossiliferous limy Dolostone grains, trace pyrite chlorite heavy minerals and mica, good porosity, no fluorescence or cut.

SAMPLE RECORD / C-31

INTERVAL (metres)	LITH (%)	DESCRIPTION
230 - 235	100	SANDSTONE - speckled medium grey, sub-arkose - greywacke detritial gravel sand, medium to coarse sand rains with common lithic and tan colored rounded microcrystalline, hard limy cherty fossiliferous Dolostone granules, well rounded, poorly sorted, unconsolidated, trace mica and pyrite, good porosity, no oil shows.
235 - 245	90	SANDSTONE - rudaceous type 'pea gravel', medium grained sub-arkose sand with abundant granule to small pebble sized, well rounded, high sphericity, unconsolidated, multicolored, multitype, igneous materials, presence heavy minerals mica and pyrite, good intergranular porosity, no fluorescence or cut.
	10	SILTSTONE - dark grey, argillaceous, calcareous, hard, tight.
245 - 255	100	SHALE - dark to very dark grey, blocky to sub-fissile, medium hard, very slightly calcareous, trace micro-micaceous, trace dark brown hard marly partings, some black waxy bituminous partings.
255 - 260	20	LIMESTONE - light to medium brown, wackestone, fine sized fossil fragments, hard, dolomitic, argillaceous, dense to trace porosity.
	70	SHALE - dark to very dark grey as above.
	10	SANDSTONE - medium grey, loose fine to coarse sized quartz feldspar and lithic grains.

SAMPLE RECORD / C-31

INTERVAL (metres)	LITH (%)	DESCRIPTION
260 - 265	40	LIMESTONE - light brown, fine to medium sized bioclastic wackestone, hard, dolomitic, silty, argillaceous, micritic, silty, trace organic porosity, no shows.
	20	SHALE - dark to very dark grey colored, blocky to sub-fissile, medium hard, very slightly calcareous, trace medium brown hard marly streaks with calcite veining, trace to presence black carbonaceous streaks.
	20	SILTSTONE - dark grey color, hard, very argillaceous, calcareous, micro-micaceous, tight.
	20	SANDSTONE - medium light grey, clear frosted quartz with Feldspar and lithic grains, fine to medium size, rounded, moderately sorted, unconsolidated, good porosity.
265 - 275	80	LIMESTONE - buff to light brown colored, predominantly medium sized bioclastic wackestone / packstone, hard, cherty, trace calcite veining, rare pyrite and glauconite, rare pyrobitumen partings, trace organic porosity, no shows.
	20	SILTSTONE - dark grey, hard, very argillaceous, calcareous, tight.
275 - 280	90	SANDSTONE - medium light speckled pinkish grey, frosted quartz (60%) feldspar (20%) lithic (20%), well rounded, moderate sorting, unconsolidated, rare pyrite mica and chlorite, good porosity, no fluorescence or cut. predominantly fine to medium grained, rare pyrite and mica, good porosity, no oil shows.
	10	LIMESTONE - as above.

SAMPLE RECORD / C-31

INTERVAL (metres)	LITH (%)	DESCRIPTION
280 - 290	80	SANDSTONE - medium multicolored grey, medium quartz with abundant granule and small pebble of igneous argillite and carbonate makeup, well rounded, poorly sorted, unconsolidated, presence heavy minerals micas and pyrite, good porosity, no hydrocarbon shows.
	20	LIMESTONE - as above; light brown, fine to medium sized bioclasts.
290 - 295	60	SANDSTONE - as above, coarser sized, pea gravel, granules to small and medium lithic pebbles.
	30	MARLSTONE - dark brownish grey, hard, blocky, very argillaceous, silty, cherty, dense.
	10	LIMESTONE - as above.
295 - 300	60	SANDSTONE - medium grey with multicolored rounded loose igneous pebbles and granules, good porosity.
	30	MARLSTONE – dark brown to grey brown, hard, blocky, cherty, argillaceous, silty, siliceous.
	10	LIMESTONE - as above.
300 - 305	90	MARLSTONE - dark grey brown to brown grey, mudstone, hard to very hard, very argillaceous, silty, siliceous, trace calcite veins, trace fracture porosity, no hydrocarbon shows.
	10	LIMESTONE - buff to light brown, fine sized bioclasts, medium hard, slightly argillaceous, dense to trace porosity

SAMPLE RECORD / C-31

INTERVAL (metres)	LITH (%)	DESCRIPTION
305 - 310	50	MARLSTONE - as above; dark brownish grey, very argillaceous, silty, hard.
	30	LIMESTONE - light brown to buff, fine to medium bioclastic wackestone, medium hard, silty, becoming argillaceous, trace porosity, no oil shows.
	20	SANDSTONE - loose medium grained well-rounded frosted quartz with rare to trace feldspars and lithics, moderate sorting, unconsolidated, good porosity, no shows.
310 - 315	90	MARLSTONE - dark greyish brown color, mudstone, hard, very argillaceous, silty, siliceous, common increasing to abundant (50%) white colored massive crystalline calcite veins, trace black pyrobitumen partings, rare light to medium brown oil stain, rare faint fluorescence, weak slow greenish yellow milky cut.
	10	LIMESTONE - as above.
315 - 325	100	LIMESTONE - white, massive crystalline calcite, medium sized rhombohedral form crystals, soft, 50% dark grey marlstone laminations, trace fracture porosity, rare pin point intercrystalline porosity.
325 - 335	100	LIMESTONE - as above; 60% white crystalline calcite with dark grey marlstone laminations / interbreeds, trace light brown live oil stain on fracture planes.
335 - 340	90	MARLSTONE - dark to medium dark brown grey, blocky, hard, cherty / siliceous, presence (15%) white crystalline calcite spars, extremely argillaceous, very silty, grading to limy Siltstone.
	10	LIMESTONE - as above.

SAMPLE RECORD / C-31

INTERVAL (metres)	LITH (%)	DESCRIPTION
340 - 350	80	MARLSTONE - as above; becoming lighter colored, more calcareous in part, common (30%) white sparry calcite.
	10	SANDSTONE - loose fine to medium igneous / granite granules and very coarse grains.
	10	LIMESTONE - buff to light brown, medium to fine bioclasts and crystals, medium hard, part argillaceous, no shows.
350 - 355	70	MARLSTONE - as above; becoming lighter colored, up to 30% white sparry calcite.
	30	LIMESTONE - medium to light brown color, very fine to fine wackestone to mudstone, medium hard to hard, very argillaceous, silty, trace pelletal detritus, micritic cement, part slightly chalky texture, trace calcite, dense to trace porosity, no indications of hydrocarbons.
355 - 360	90	SHALE - very dark grey colored, fissile to sub-fissile, medium hard to medium soft, calcareous to slightly calcareous, trace silty in part, trace micro-micaceous, trace marly streaks.
	10	SILTSTONE - medium dark grey, very argillaceous, calcareous, micro-micaceous, tight.
360 - 370	70	SHALE - as above; part silty to very silty.
	10	SILTSTONE - as above.
	10	LIMESTONE - medium grey brown, very fine crystalline with fossil fragments and pellets, hard to medium hard, silty, argillaceous, dense to trace porosity.
	10	MARLSTONE - as above.

SAMPLE RECORD / C-31

INTERVAL (metres)	LITH (%)	DESCRIPTION
370 - 385	100	SHALE - very dark grey colored, fissile to sub-fissile, medium hard to medium soft, slightly calcareous to calcareous, part silty, part slightly carbonaceous, trace micro-micaceous, trace pelletal calcareous streaks.
385 - 390	100	SHALE - very dark grey, fissile to sub-fissile, medium hard to medium soft, slightly calcareous, trace black soft bituminous partings, trace glauconitic marly streaks, trace medium grey soft waxy bentonitic streaks.
390 - 395	60	SHALE - dark grey, fissile to sub-fissile, platy, medium hard.
	40	MARLSTONE - medium dark brownish grey colored, sub-fissile habit, very fine grain texture in part, medium hard, very argillaceous, silty, slightly micro-micaceous, trace very fine pyrite crystals, dense.
395 - 405	80	MARLSTONE - medium dark brownish grey, blocky, hard, very argillaceous, silty, trace fossiliferous, dense.
	20	SHALE - dark grey, fissile to sub-fissile, medium hard, slightly calcareous, very slightly micro-micaceous, rare pyrite, trace soft black slightly carbonaceous partings
405 - 415	70	SHALE - medium dark grey, fissile to sub-fissile, medium hard, slightly calcareous, very slightly micro-micaceous, trace black partings, trace calcite veins, minor Marlstone.
	30	MARLSTONE - as above.
415 - 430	100	SHALE - dark grey, fissile to sub-fissile, platy, slightly waxy lustre, slightly calcareous, trace very dark grey bituminous partings, trace calcite veins, rare pyrite.
430 - 440	100	SHALE - as above; common black trace carbonaceous partings.
440 - 445	100	MARLSTONE - medium dark brown, blocky, hard, very silty, very argillaceous, trace fossil fragments, trace very fine disseminated pyrite crystals, dense.

SAMPLE RECORD / C-31

INTERVAL (metres)	LITH (%)	DESCRIPTION
445- 450	80	SHALE - medium dark grey, sub-fissile to slightly blocky habit, medium hard, part silty, slightly calcareous, trace calcite veins, trace marly partings, rare black streaks.
	20	MARLSTONE - medium dark brown, silty, hard.
450 - 460	90	SHALE - medium dark grey sub-fissile, medium hard, slightly micro-micaceous, presence very dark grey to black soft waxy bituminous partings.
	10	MARLSTONE - medium dark brown colored, blocky to sub-fissile, hard, very silty, argillaceous, trace fossil fragments, trace very fine pyrite, dense.
460 - 470	100	SHALE - medium dark grey, sub-fissile to fissile, medium hard, very slightly calcareous, trace pyrite, common (20%) tan colored brittle bentonitic partings.
470 - 475	100	SHALE - medium dark grey to slightly greenish grey colored, fissile to sub-fissile, medium hard to medium soft, platy, very slightly calcareous, slightly micro-micaceous, presence very dark grey to black bituminous streaks.
475 - 480	100	SHALE - as above; more sub-fissile to blocky type habit, presence fine pyrite crystal veins, some marly partings.
480 - 485	80	SHALE - as above, becoming more blocky, harder, silty to very silty.
	20	MARLSTONE - dark grey, blocky, hard, very argillaceous, silty, parts pyritic, trace fossil fragments, dense.

SAMPLE RECORD / C-31

INTERVAL (metres)	LITH (%)	DESCRIPTION
485 - 495	50	SHALE - becoming sub-fissile to blocky, medium hard to hard, silty, trace pyrite crystals, trace bitumen streaks.
	30	LIMESTONE - light grey colored, very fine crystalline, blocky, medium hard to hard, silty, argillaceous, trace fossil fragments, presence white micritic chalky partings, dense, no fluorescence or cut noted.
	20	MARLSTONE - dark grey, blocky, hard, very argillaceous, silty, parts pyritic, trace fossil fragments, dense.
495 - 500	90	SHALE - dark to medium dark grey, sub-fissile to blocky, medium hard to hard, silty, calcareous, trace pyrite veins.
	10	LIMESTONE - light grey, very fine crystalline wackestone to grainstone, hard, silty, argillaceous, some fossil fragments, presence light colored chalky streaks, dense, no hydrocarbon shows.
500 - 510	100	SHALE - dark grey, sub-fissile, medium hard, calcareous, slightly micro-micaceous, trace calcareous partings, trace medium to light brown marly partings.
510 - 520	100	SHALE - dark grey to slightly brownish grey, sub-fissile to fissile, medium hard, calcareous, trace dark colored waxy bituminous partings.
520 - 530	90	SHALE - dark grey, sub-fissile, medium hard, calcareous, silty in part, trace calcite veins.
	10	MARLSTONE - dark grey colored, grainstone texture in part, blocky, hard, very silty, argillaceous, trace calcite veins, dense.

SAMPLE RECORD / C-31

INTERVAL (metres)	LITH (%)	DESCRIPTION
530 - 555	70	SHALE - dark grey to slightly brownish grey, sub-fissile to part blocky, medium hard, slightly micro-micaceous, trace light brown bentonitic partings, presence soft dark waxy streaks.
	20	SILTSTONE - dark grey, very argillaceous, calcareous to very calcareous, hard, micro-micaceous, tight.
	10	MARLSTONE - dark grey, blocky, hard, part grainy texture, very silty, argillaceous, trace micro-micaceous, dense
555 - 560	65	SHALE - dark grey colored, sub-fissile, medium hard, calcareous, trace calcite veins, rare Ostracod, rare to trace dark soft waxy streaks.
	20	MARLSTONE - dark grey, grainstone texture, blocky, hard, very argillaceous, trace micro-micaceous, very silty grading to limy Siltstone.
	15	SILTSTONE - as above.
560 - 580	80	SHALE - dark grey, sub-fissile, medium hard, presence dark colored soft bituminous waxy partings.
	20	MARLSTONE - medium dark to dark brownish grey, part grainy, hard, argillaceous, very silty.
580 - 590	70	SHALE - as above; presence very fine pyrite cube clusters
	10	LIMESTONE - medium brownish grey, very fine grainstone, medium hard, argillaceous, trace fossil fragments, dense to trace porosity, no shows.
	10	SILTSTONE - medium to medium dark brownish grey colored, sub-rounded, medium hard, silica cement, very argillaceous, very slightly calcareous, trace very finely disseminated pyrite crystals, tight.
	10	MARLSTONE – as above.

SAMPLE RECORD / C-31

INTERVAL (metres)	LITH (%)	DESCRIPTION
590 - 610	60	SHALE - dark grey, sub-fissile, medium hard, very slightly calcareous, trace darker colored soft bituminous partings, trace medium brown marly partings.
	40	SILTSTONE - medium dark brownish grey, quartzitic, sub-rounded, medium hard, silica cement, very argillaceous, very slightly calcareous, trace very fine pyrite crystals, tight.
610 - 620	90	SHALE - dark grey colored, sub-fissile to fissile, medium hard, non-calcareous, rarely silty, parts slightly bituminous, trace medium brown colored bentonitic partings.
	10	SILTSTONE - as above.
620 - 645	100	SHALE - dark grey to slightly greenish grey, fissile to sub-fissile, medium hard to medium soft, trace calcite veins, presence medium brown bentonitic partings, presence very dark colored soft waxy bituminous partings.
645 - 655	100	SHALE - dark grey, fissile, platy, splintery, medium hard to medium soft, presence medium brown colored silty streaks with white calcareous specks, presence very dark grey colored soft waxy bituminous partings, rare pyrite crystals.
655 - 660	100	SHALE - as above; presence medium brown marly streaks.
660 - 665	100	SHALE - dark grey to slightly greenish grey, fissile, platy, splintery, medium hard to medium soft, non-calcareous, presence very dark grey colored soft waxy bituminous partings.
665 - 680	90	SHALE - as above, trace pyrite crystals.
	10	SILTSTONE - dark brownish grey, quartzitic, hard, calcareous silica cement, hard, very argillaceous, trace pyritic, tight.

SAMPLE RECORD / C-31

INTERVAL (metres)	LITH (%)	DESCRIPTION
680 - 685	100	SANDSTONE - light brown colored, quartzose, very fine grained, sub-round to sub-angular, moderately well sorted, hard, silica cement, slightly calcareous, very silty, rare glauconite, trace pyrite, tight to trace intergranular porosity, no hydrocarbon shows noted.
685 - 695	90	SHALE - dark grey, fissile, platy, splintery, medium hard to medium soft, non-calcareous, trace calcite veins.
	10	SANDSTONE - as above; very fine grained, hard, silty, trace porosity, no shows.
695 - 700	100	SHALE - dark grey to slightly greenish grey colored, fissile, platy, medium hard to medium soft, non-calcareous, slightly waxy type lustre, trace medium brown bentonitic streaks, trace very dark colored slightly bituminous streaks, trace very fine to fine pyrite crystals.
700 – 710.3	100	SHALE - as above; less greenish colored, more common darker colored slightly bituminous partings.
710.3		**TOTAL DEPTH – 444.5 mm / 339.7 mm O.D. SURFACE HOLE / CASING**
710.3 - 720	80	SHALE - dark grey, fissile, platy, medium hard to medium soft, common very dark grey soft slightly bituminous partings.
	20	CEMENT
720 - 730	100	SHALE - dark grey, fissile, platy, medium hard to medium soft.
730 - 740	100	SHALE - medium dark grey to slightly greenish grey colored, fissile, platy, medium hard to medium soft, non-calcareous, rarely silty, trace darker colored slightly waxy pyritic very slightly bituminous partings.
740 - 750	100	SHALE - medium dark greenish grey, fissile, platy, slightly flaky, slightly waxy, non-calcareous, rare pyrite, trace calcite veins.

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INTERVAL (metres)	LITH (%)	DESCRIPTION
750 - 770	100	SHALE - as above; presence dark brownish greenish grey colored soft waxy partings.
770 - 780	100	SHALE - medium to medium dark brownish and greenish grey colored, fissile, platy, medium hard, slightly silty, slightly calcareous to calcareous, micro-micaceous, rare pyrite, rare calcite veins.
780 - 785	80	SHALE - medium to medium dark brownish greenish grey, fissile, platy, medium hard, slightly silty, slightly calcareous to calcareous, micro-micaceous, rare pyrite, rare calcite.
	20	MARLSTONE - medium to medium dark brownish grey, hard, very argillaceous, calcareous to slightly calcareous, trace pellets.
785 - 790	30	SILTSTONE - medium brownish grey colored, quartzitic, hard, slightly calcareous clay cement, argillaceous, tight.
	70	SHALE - as above.
790 - 815	10	MARLSTONE - medium to medium dark brownish grey, medium hard, very argillaceous, calcareous to slightly calcareous, trace fossil / pellets.
	90	SHALE - medium to medium dark greenish grey colored, fissile, platy, medium hard, silty, calcareous, micro-micaceous, rare dark colored very slightly bituminous streaks.
815 - 820	90	SHALE - as above.
	10	SILTSTONE - medium brownish grey colored, quartzitic, hard, slightly calcareous clay cement, argillaceous, tight.

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INTERVAL (metres)	LITH (%)	DESCRIPTION
820 - 830	90	SHALE - medium to medium dark greenish grey, fissile, platy, medium hard to medium soft, slightly waxy lustre, very slightly calcareous, trace calcite veins, rare to trace pyrite veins.
	10	SILTSTONE - medium brownish grey colored, quartzitic, hard, slightly calcareous clay cement, argillaceous, tight.
830 - 835	100	SHALE - medium to medium dark greenish grey, fissile, platy, medium hard to medium soft, slightly waxy lustre, very slightly calcareous, trace calcite veins, rare to trace pyrite veins.
835 - 840	100	SHALE - as above; trace darker colored soft waxy partings.
840 - 850	100	SHALE - medium greenish grey, fissile, platy, slightly waxy lustre, medium hard to medium soft, very slightly to slightly calcareous, very slightly micro-micaceous, rare calcite veins, trace dark colored waxy partings, rare medium brown bentonitic clay.
850 - 860	100	SHALE - medium dark brownish greenish grey, platy, slightly waxy, slightly to very slightly calcareous, trace waxy streaks and calcite veins, trace calcite filled microfractures.
860 - 875	100	SHALE - as above; common medium dark to dark olive grey colored slightly waxy to waxy flaky partings, trace to presence bentonitic clay partings.
875 - 895	70	SHALE - medium to medium dark brownish grey colored, fissile, platy, slightly silty, slightly calcareous, very slightly micromicaceous, trace calcite veins.
	30	MARLSTONE - medium brownish grey, very fine crystalline, hard, very argillaceous, silty, presence very fine pyrite.

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INTERVAL (metres)	LITH (%)	DESCRIPTION
895 - 905	50	SHALE - as above; slightly calcareous to calcareous, silty to slightly silty, slightly micro-micaceous.
	40	MARLSTONE - medium brownish grey, pelletal mudstone, hard, very argillaceous, silty, presence very fine pyrite.
	10	SILTSTONE - medium brownish grey, hard, sandy, clay / calcareous cement, very argillaceous, tight.
905 - 915	80	SHALE - medium to medium dark brownish greenish grey, fissile, slightly calcareous, slightly silty, rare calcareous streaks of medium brown wackestone.
	20	MARLSTONE - medium to medium dark brownish grey, blocky habit, hard, argillaceous, silty, trace pellet ghost structures.
915 - 935	100	SHALE - medium to medium dark greenish grey colored, fissile, platy, slightly flaky, slightly waxy, medium hard to medium soft, very slightly calcareous, trace Ostracod remains, rare to trace white calcite veins.
935 - 945	100	SHALE - as above; greenish to brownish grey colored.
945 - 950	10	SILTSTONE: medium brownish grey, slightly salt and pepper, quartzitic, hard, very argillaceous, calcareous clay cement, tight.
	90	SHALE - as above, presence medium to dark colored soft waxy flaky partings
950 - 960	100	SHALE - medium dark greenish grey colored, fissile, platy, medium hard to medium soft, very slightly calcareous, trace calcite veins.

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INTERVAL (metres)	LITH (%)	DESCRIPTION
960 - 975	90	SHALE - medium grey to slightly greenish brownish grey, fissile, platy, very slightly calcareous, rare calcite veins, rare marly laminations.
	10	MARLSTONE - medium brownish grey, sub-fissile to blocky, medium hard to hard, calcareous, silty, very argillaceous, common pellet and fossil fragments, dense.
975 - 985	100	SHALE - medium grey to slightly greenish brownish grey, platy, very slightly calcareous, rare marly laminations
985 - 995	100	SHALE- as above; becoming slightly calcareous, trace clear white calcite veins, trace fossil remains.
995 - 1005	10	MARLSTONE - medium brownish grey, medium hard, very argillaceous, silty, trace very fine pyrite, trace pellets.
	90	SHALE - medium dark greenish brownish grey, fissile, platy, very slightly calcareous, very slightly micro-micaceous, trace darker colored waxy partings, rare light colored bentonitic clay partings.
1005 - 1015	70	SHALE - as above; part becoming slightly silty to silty.
	30	MARLSTONE - medium brownish grey colored, sub-fissile to blocky habit, medium hard to hard, calcareous to slightly calcareous, very argillaceous, silty, trace very fine disseminated pyrite, presence fine sized pellet ghosts, trace calcite veins.
1015 - 1020	80	SHALE - as above, medium dark greenish brownish grey, part marly, trace fossil remains.
	20	MARLSTONE - as above; very argillaceous, silty.

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INTERVAL (metres)	LITH (%)	DESCRIPTION
1020 - 1030	100	SHALE - medium to medium dark greenish brownish grey colored, fissile to sub-fissile, medium hard to medium soft, very slightly calcareous, slightly silty in part, very slightly micro-micaceous, rare pyrite, trace fossil fragments / pellets, trace marly partings, rare calcite veining.
1030 - 1040	90	SHALE - as above.
	10	MARLSTONE - medium to medium dark brownish grey, sub-fissile to blocky habit, medium hard to hard, very argillaceous, silty, trace very fine pyrite, trace pyrite veining.
1040 - 1050	100	SHALE - medium dark grey to slightly brownish grey colored, fissile to sub-fissile, medium hard, very slightly calcareous, slightly micro-micaceous, common pellet ghosts, trace marly partings.
1050 - 1055	90	SHALE - as above.
	10	LIMESTONE - medium brown, wackestone, hard, fossiliferous / pelletal, very argillaceous, dense
1055 - 1065	100	SHALE - medium dark grey to brownish grey colored, fissile to sub-fissile, medium hard, slightly calcareous, very slightly micromicaceous, trace very fine pyrite, trace pellet / fossils, some darker colored soft waxy streaks, trace marly laminations.
1065 - 1070	10	MARLSTONE - medium brownish grey, very fine crystalline to mudstone, medium hard to hard, very argillaceous, silty, fossiliferous / pelletal, rare intrafossil porosity.
	90	SHALE - medium dark brownish grey, fissile, trace (5%) clear white crystalline calcite, trace drusy calcite crystals, trace slickensides, trace fracture porosity, rare dead oil stain, no fluorescence or cut.

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INTERVAL (metres)	LITH (%)	DESCRIPTION
1070 - 1085	100	SHALE - medium dark grey to slightly brownish grey, fissile, slightly waxy, medium hard, slightly calcareous, trace calcite filled microfractures, some marly streaks, trace darker colored flaky waxy partings, rare pyrite.
1085 - 1090	90	SHALE - medium dark slightly brownish grey, sub-fissile to slightly blocky habit, medium hard to hard, slightly calcareous / marly, trace calcite veins.
	10	MARLSTONE - medium brownish grey, blocky, hard, very argillaceous, silty, trace calcite veins, trace fossils.
1090 - 1095	100	SHALE - becoming medium dark grey, fissile, platy, medium hard, slightly calcareous, rare pyrite and calcite veins.
1095 - 1100	90	SHALE - medium dark grey, fissile, medium hard, slightly calcareous, very slightly micro-micaceous, rare to trace calcite veins, trace marly interlaminae.
	10	MARLSTONE - medium dark brownish grey, sub-fissile to blocky habit, hard, very argillaceous, slightly silty, trace micro-micaceous, trace calcite veins, pellet remains.
1100 - 1105	100	SHALE - as above; slightly more sub-fissile habit, slightly harder, trace clay ironstone nodules, some darker colored soft waxy partings.
1105 - 1120	100	SHALE - as above, becoming more fissile, slightly softer, trace (10%) white crystalline and chalky calcite vein material with pyrobitumen staining.
1120 - 1125	90	SHALE - medium dark grey, fissile, medium hard, slightly calcareous, trace micro-micaceous, rare to trace calcite veins, trace marly streaks.
	10	MARLSTONE - medium dark brownish grey, very fine crystalline, sub-fissile to blocky, hard, silty to very silty, very argillaceous, slightly micro-micaceous, rare pyrite, trace calcite veins, grading to marly Siltstone.

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INTERVAL (metres)	LITH (%)	DESCRIPTION
1125 - 1140	40	SILTSTONE - medium dark brownish grey colored, quartzitic, hard, very argillaceous, calcareous clay cement, trace very fine pyrite crystals, tight.
	40	SHALE - medium dark grey to brownish grey, fissile to sub-fissile, medium hard, non-calcareous, common darker colored, flaky soft slightly waxy interbeds, rare medium brown bentonitic clay partings, trace medium grey splintery brittle interbeds.
	20	MARLSTONE - medium dark brownish grey to greyish brown, sub-fissile to blocky, hard, silty to very silty, very argillaceous, trace calcite, rare pyrite, trace intercrystalline porosity.
1140 - 1150	40	MARLSTONE - medium dark brownish grey, blocky to sub-fissile, hard, very argillaceous, silty to very silty, trace very fine pyrite, trace calcite veining, presence fossil and pellet remains.
	40	SHALE - as above.
	20	SILTSTONE - medium brownish grey, quartzitic, hard, calcareous, very argillaceous, trace micro-micaceous, tight.
1150 - 1160	40	MARLSTONE - medium dark brown grey color, blocky to sub-fissile, hard, very argillaceous, silty to very silty, trace very fine pyrite, trace calcite veins, presence pellets / fossils.
	30	SHALE - medium brownish grey colored, fissile, splintery, brittle, medium hard, non-calcareous, very slightly micro-micaceous, part silty.
	30	SILTSTONE - medium grey, quartzitic, hard, calcareous, very argillaceous, tight.

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INTERVAL (metres)	LITH (%)	DESCRIPTION
1160 - 1170	50	SHALE - medium dark brown grey and green grey colored, fissile, platy, splintery, medium hard, part calcareous, slightly calcareous, trace very fine pyrite, trace calcite veins, rare pyrite blebs.
	40	MARLSTONE - medium dark grey, sub-fissile to blocky, hard, calcareous to slightly calcareous, silty to slightly silty, very argillaceous, trace very fine pyrite crystals, trace calcite veins, trace darker slightly bituminous partings, trace fossil structures / pellets.
	10	SILTSTONE - medium brownish grey, quartzitic, hard, calcareous clay cement, argillaceous, trace pyritic, tight.
1170 - 1185	70	SHALE - medium dark grey, sub-fissile to fissile, slightly calcareous, part silty, trace micro-micaceous, grading to Marlstone, trace greenish grey splintery interbeds.
	30	MARLSTONE - as above.
1185 - 1190	70	SHALE - medium dark grey to brownish grey, fissile to sub-fissile, medium hard, slightly silty, slightly calcareous, slightly micro-micaceous, trace to presence very fine pyrite crystals, trace calcite veins.
	30	MARLSTONE - as above; presence calcite veining.
1190 - 1195	70	SHALE- medium dark grey to slightly brownish grey, fissile, platy, slightly waxy luster, slightly calcareous, slightly silty, trace calcite veining.
	20	MARLSTONE - as above, trace calcite veining with drusy crystallization and trace fracture porosity.
	10	SILTSTONE - medium brownish grey, quartzitic, hard, calcareous clay cement, argillaceous, trace pyritic, tight.

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INTERVAL (metres)	LITH (%)	DESCRIPTION
1195 - 1205	50	MARLSTONE - medium dark grey, sub-fissile to blocky, hard, calcareous to slightly calcareous, silty to slightly silty, very argillaceous, trace very fine pyrite crystals, trace calcite veins, trace darker slightly bituminous partings, trace fossil structures / pellets.
	50	SHALE - as above; part silty and marly, part with waxy streaks.
1205 - 1225	50	SHALE - as above - part silty and very marly.
	30	SILTSTONE - medium brownish grey, quartzitic, hard, calcareous clay cement, argillaceous, trace very fine pyrite crystals, tight.
	20	MARLSTONE - medium dark brown grey color, blocky to sub-fissile, hard, very argillaceous, silty to very silty, trace very fine pyrite, trace calcite veins, presence pellets / fossils.
1225 - 1240	60	SHALE - medium to medium dark brownish grey, fissile, platy, medium hard, slightly waxy lustre, part silty, calcareous, trace very fine pyrite crystals, trace calcite veins, trace medium green grey splintery laminations.
	40	MARLSTONE - as above.
1240 - 1250	60	SHALE - as above.
	40	MARLSTONE - medium dark grey to brownish grey, sub-fissile to blocky, hard, calcareous, silty to slightly silty, very argillaceous, trace very fine pyrite crystals, trace calcite veins, trace darker slightly bituminous partings, trace fossil structures / pellets.

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INTERVAL (metres)	LITH (%)	DESCRIPTION
1250 - 1260	50	SHALE - as above; trace silty to very silty.
	40	MARLSTONE - as above; grading to very calcareous silty Shale.
	10	SILTSTONE - medium brownish grey, quartzitic, hard, calcareous cement, argillaceous, trace very fine pyrite crystals, tight.
1260 - 1275	70	SHALE - medium dark to dark grey to brownish grey, fissile to sub-fissile, medium hard, calcareous to slightly calcareous, slightly silty to silty, trace pyrite veins, trace medium green grey splintery partings.
	30	MARLSTONE - as above; silty to slightly silty.
1275 - 1285	80	SHALE - as above; trace silty to very silty, calcareous.
	20	MARLSTONE - medium dark brownish grey to greyish brown, sub-fissile to blocky, hard, calcareous, silty to slightly silty, very argillaceous, trace very fine pyrite crystals, trace calcite veins, trace darker slightly bituminous partings, trace fossil structures / pellets.
1285 - 1290	90	SHALE - dark grey to brownish grey colored, fissile to sub-fissile, medium hard, calcareous, part silty, part with waxy streaks, rare slickensides, rare medium green grey splintery streaks.
	10	MARLSTONE - as above; very silty, very argillaceous, common pellets / fossil fragments.
1290 - 1300	80	SHALE - dark brownish grey, fissile to sub-fissile, medium hard, slightly waxy lustre, slightly silty, calcareous, trace very fine pyrite, trace calcite / dolomite filled micro- fractures.
	20	MARLSTONE - medium dark brown grey to grey brown, blocky mudstone, hard, part silty, very argillaceous, presence very fine pyrite, presence fossil / pellet remains

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INTERVAL (metres)	LITH (%)	DESCRIPTION
1300 - 1305	90	SHALE - as above medium to dark brownish grey, calcareous, silty.
	10	MARLSTONE - as above; silty to very silty, very argillaceous.
1305 - 1310	80	SHALE - as above.
	20	MARLSTONE - medium dark brown grey to grey brown, mudstone to very fine grainstone, hard, silty, argillaceous, trace calcite veins, pelletal
	Trace	SANDSTONE - medium brown, quartzitic, very fine grained, sub-rounded, medium hard, silica cement, silty, argillaceous, trace porosity.
1310 - 1315	90	SHALE - medium dark brown grey to grey brown, fissile to sub-fissile, very slightly waxy, medium hard, calcareous to slightly calcareous, very slightly micro-micaceous, rare pyrite veins.
	10	MARLSTONE - as above.
1315 - 1320	90	SHALE - black to very dark brownish grey colored, fissile, platy, very bituminous / organic, medium soft to medium hard, very slightly calcareous, rare small scale slickensides, rare light grey soft clay partings, rare calcite veins / crystals.
	10	MARLSTONE - as above.
1320 - 1335	100	SHALE - as above, black, very bituminous, becoming slightly silty to silty, trace pyrite nodules, rare light grey colored marlstone
1335 - 1350	100	SHALE - dark to very dark grey, fissile, platy, bituminous, medium hard to hard, silty, micro-micaceous, trace calcite veins, trace pyrite, presence black very bituminous streaks.

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INTERVAL (metres)	LITH (%)	DESCRIPTION
1350 - 1355	90	SHALE - as above; silty to very silty, trace marly, rare marcasite crystals.
	10	SILTSTONE - dark grey, slightly salt and pepper, quartzitic, hard, argillaceous, bituminous clay cement, very slightly calcareous, tight.
1355 - 1365	50	SHALE - as above; trace medium to light grey bentonitic shale.
	30	MARLSTONE - medium brownish grey colored, mudstone, blocky, hard, very argillaceous, trace pyritic, trace calcite veins.
	20	SILTSTONE - as above.
1365 - 1375	80	SHALE - very dark grey colored, platy, radioactive organic carbonaceous / bituminous components, black very bituminous streaks, trace light grey bentonite clay partings.
	10	MARLSTONE - as above.
	10	SILTSTONE - as above.
1375 - 1385	90	SHALE - as above; some very dark grey to black streaks.
	10	SILTSTONE - dark grey, quartzitic, bituminous, hard, tight
1385 - 1390	100	SHALE - brownish grey colored, fissile, platy, medium hard, radioactive organic constituents, black very bituminous streaks, trace calcite veins, trace pyrite, trace light grey bentonitic clay .
1390 - 1400	80	SHALE - grey to brownish grey, fissile, platy, bituminous, slightly silty to silty, micro-micaceous, trace pyrite, trace calcite veins, trace bentonite.
	20	SILTSTONE - dark to very dark grey, slightly salt and pepper, quartzitic, hard, bituminous clay cement, trace sandy, medium hard to hard, micro-micaceous, pyritic, tight.

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INTERVAL (metres)	LITH (%)	DESCRIPTION
1400 - 1410	80	SHALE - as above; very dark brown grey to grey, silty to slightly silty, part very bituminous.
	20	SILTSTONE - dark to very dark grey, quartzitic, hard, trace sandy, argillaceous, micro-micaceous.
1410 - 1415	100	SHALE - as above; very dark grey to brownish grey, fissile, organic material, silty, trace bentonitic partings, trace Siltstone laminations.
1415 - 1425	100	SHALE - very dark brownish grey to grey, fissile, platy, medium hard, slightly silty to silty, trace pyrite blebs, trace silty interbeds, trace marcasite crystals.
1425 - 1435	100	SHALE - as above; very dark brown grey, platy, radioactive organic bituminous constituents, slightly silty, micro-micaceous, trace pyritic, trace calcite veins, trace light grey bentonitic clay partings.
1435 - 1440	100	SHALE - as above; part slightly silty.
1440 - 1450	90	SHALE - very dark brownish grey to grey, fissile, platy, medium hard, slightly silty to silty, trace pyrite blebs, trace silty interbeds, trace pyrite veins.
	10	SILTSTONE - dark to very dark grey, quartzitic, hard, sandy, very argillaceous, micro-micaceous.
1450 - 1460	100	SHALE - very dark brownish grey to black, fissile to sub-fissile, very organic and bituminous, medium hard to medium soft, slightly silty, slightly micro-micaceous, rare pyrite, trace marly partings, trace light colored bentonitic partings, minor Siltstone interlaminae.
1460 - 1465	100	SHALE - very dark brownish grey, fissile to sub-fissile, silty, micro-micaceous, trace pyrite, presence light to medium brown and grey colored marly and bentonitic laminations.

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INTERVAL (metres)	LITH (%)	DESCRIPTION
1465 - 1470	100	SHALE - very dark brownish grey to black, fissile, platy, organic / carbonaceous - bituminous, medium hard to medium soft, slightly silty, very slightly calcareous, micro-micaceous, trace pyrite veins, trace pale grey colored bentonitic clay partings.
1470 – 1480	100	SHALE – predominantly black to dark grey, minor medium brownish grey, sub-fissile, micromicaceous, common carbonaceous to petroliferous, minor silty to thin Siltstone laminae, slightly bentonitic in small part, minor fossil debris, rare disseminated to nodular pyrite, trace sparry calcite fossil fragments to microfacture fill, moderately indurated.
1480 – 1510	100	SHALE – black to dark grey as above, sub-fissile to fissile, slightly earthy to minor waxy, very carbonaceous to common organic material, minor silty, micromicaceous to occasional mica, slight increase in pyrite crystals, occasional slickensides, increase quartz and calcite healed microfractures to rare microbreccia.
1510 – 1530	100	SHALE – generally black, fissile to platy, frequently carbonaceous to bituminous, possibly phosphatic, slightly micromicaceous, minor silty, rare fossil remains, decrease to trace slickensides and microfractures, moderately indurated to slightly brittle.
1530 – 1540	100	SHALE – mainly black as above, occasionally dark grey to minor medium brown, fissile to blocky, abundant organic content, locally silty, occasional dolomitic to sideritic with minor Ironstone concretions, slightly bentonitic in part, rare pyrite nodules, moderately to well indurated.
1540 – 1545		NO SAMPLE (working drill string – encountered tight hole conditions)

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INTERVAL (metres)	LITH (%)	DESCRIPTION
1545 – 1560	100	SHALE – black to occasionally dark grey as above, sub-fissile to tabular, very fine texture to minor earthy, common carbonaceous to slightly petroliferous, possible phosphatic, slightly micromicaceous, minor silty, sparsely fossiliferous, trace disseminated pyrite, moderately indurated.
1560 – 1575	100	SHALE – black to dark grey as above, blocky to sub-fissile, minor flaky, high organic content, micromicaceous, slightly bentonitic, minor siderite and hematite concretions, scattered fossil detritus, trace slickensides, moderately indurated to locally soft.
1575 – 1590	100	SHALE – predominantly black, occasional dark grey, slightly earthy, blocky to platy, micromicaceous, frequently carbonaceous to bituminous, locally silty, occasional bentonitic, indistinct cleavage, minor pyrite nodules, trace calcite filled microfractures, moderately indurated to soft.
1590 – 1605	100	SHALE – black to occasionally dark grey as above, sub-fissile to tabular, very fine texture to minor earthy, common carbonaceous to slightly petroliferous, possible phosphatic, slightly micromicaceous, minor silty, sparsely fossiliferous, trace disseminated pyrite, moderately indurated.
1605 – 1620	90	SHALE – black to dark grey to occasional medium grey, blocky to sub-fissile, generally very carbonaceous, bentonitic in small part, locally silty, numerous slickensides, occasional sparry calcite and quartz lined microfractures, minor fossil debris, moderately indurated.
	10	SILTSTONE – stringers, medium to dark grey to brownish, firm, quartzose to dolomitic to sideritic, common argillaceous, minor arenaceous to loose floating very fine to fine grain subrounded quartz grains, trace disseminated pyrite.

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INTERVAL (metres)	LITH (%)	DESCRIPTION
1620 – 1625	100	SHALE – black to dark and medium grey as above, common subvitreous to waxy, black, very carbonaceous, micaceous slickensides, frequent calcite and quartz healed micro to small fractures, occasional pyritic, moderately to well indurated.
1625 – 1650	90	SHALE – medium to dark grey to black, blocky to sub-fissile, slightly to very carbonaceous, minor bentonitic, locally silty, calcareous in part, scattered fossil debris, moderately indurated.
	10	SILTSTONE – light to dark grey to occasionally brownish, quartzose to dolomitic to minor calcareous, occasional very fine grain arenaceous, common argillaceous, minor pyrite nodules.
1650 – 1665	80	SHALE – black to medium grey as above, blocky, poor cleavage development, common organic rich, increasingly silty, part bentonitic, occasionally calcareous to numerous white calcite fossil remains (radiolarian), micromicaceous, rare calcite healed microfractures, moderately indurated to soft.
	20	SILTSTONE – medium to dark grey, generally very argillaceous, occasionally carbonaceous, dolomite to silica cement, occasionally calcareous to rare sideritic, locally grading to very fine grain Sandstone stringers, trace pyrite.
1665 – 1685	100	SHALE – dark grey to black, slightly earthy, blocky, carbonaceous, slightly to very calcareous to marl in part, common calcareous fossil fragments, occasional drusy calcite and quartz filled small scale fractures, soft to moderately indurated.
1685 – 1700	100	SHALE – black to dark grey, blocky, indistinct cleavage, high organic content, micro-micaceous, calcareous in part, minor bentonitic, locally silty to very fine grain arenaceous, decrease to sparse fossil debris, rare microfacture and slickensides, moderately indurated.

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INTERVAL (metres)	LITH (%)	DESCRIPTION
1700 – 1715	100	SHALE – black to dark grey as above, blocky to sub-fissile, frequently carbonaceous, micro-micaceous, locally calcareous, slightly bentonitic, occasionally silty, rare fossil remains, minor very fine disseminated pyrite to rare nodule, moderately indurated.
1715 – 1730	100	SHALE – black to dark to occasionally medium grey, blocky, poor cleavage development, common organic rich, increasingly silty, slightly to very calcareous to numerous white calcite fossil remains, micromicaceous, rare calcite healed microfractures, moderately indurated to soft.
1730 – 1745	100	SHALE – black to dark and medium grey, blocky to minor flaky, micro-micaceous, generally carbonaceous, part calcareous grading to marl, locally silty, slightly bentonitic, scattered fossil debris, trace pyrite, moderately indurated to soft.
1745 – 1760	100	SHALE – black to dark to slight increase medium grey, blocky to occasionally sub-fissile, micro-micaceous, carbonaceous in part, increasingly bentonitic, variably calcareous to dolomitic, minor silty, occasionally fossiliferous, minor pyrite nodules, moderately indurated to increasingly soft.
1760 – 1770	100	SHALE – medium to dark to occasionally light grey, part black, blocky to sub-fissile, occasional distinct cleavage, common bentonitic to Claystone, calcareous to dolomitic, locally carbonaceous, silty in part, scattered pyrite nodules, moderately indurated to soft.

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INTERVAL (metres)	LITH (%)	DESCRIPTION
1770 – 1775	80	SHALE – dark to occasionally light slightly greenish grey, rare black carbonaceous streaks, blocky to sub-fissile, parts with waxy texture, medium soft to medium hard, slightly silty in part, part bentonitic, slightly calcareous, locally carbonaceous, presence very fine pyrite crystals, abundant lost circulation material containing mica / sawdust / walnut shells in sample.
	20	SANDSTONE – frosted white colored quartz with presence (20-25%) pink to red colored potassium feldspar, predominantly fine with common medium and rare coarse sized grains, moderately well sorted, unconsolidated in sample, good (?) intergranular porosity
1775 – 1780	85	SHALE – dark grey with occasional medium light slightly greenish grey laminations, sub-fissile to blocky, bentonitic with slightly waxy lustre, medium hard to medium soft, part slightly carbonaceous, some slightly calcareous silty streaks, trace to presence very fine disseminated pyrite crystals, trace carbonaceous partings, rare woody plant remains.
	15	SANDSTONE – unconsolidated frosted white quartz with pink potassium feldspar, predominantly fine with presence medium and rare coarse sized grains, moderately well sorted, good (?) intergranular porosity.
1780 – 1785	80	SHALE – medium dark slightly brownish greenish grey colored with frequent light to medium greenish grey colored interbeds, sub-fissile, medium soft to medium hard, slightly waxy luster, parts slightly silty, very slightly calcareous, trace very fine pyrite, trace to presence dark colored earthy carbonaceous partings trace scattered fossil fragments / calcispheres.
	20	SANDSTONE - as above loose fine to medium quartz with k-spar grains.

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INTERVAL (metres)	LITH (%)	DESCRIPTION
1785 – 1790	50	SHALE – medium to medium dark grey to greenish grey with common light greenish grey interbeds, sub-fissile, medium hard to medium soft, slightly waxy luster, presence dark carbonaceous streaks, common LCM.
	50	SANDSTONE – clear white frosted quartz with presence (20%) pink colored potassium feldspar, sub rounded, fine with scattered medium and rare coarse sized grains, moderately well sorted, unconsolidated in sample, good intergranular porosity (?), no hydrocarbon shows noted.
1790 – 1795	75	SHALE – medium to medium dark grey to slightly greenish grey in part, sub-fissile, medium hard, parts slightly bentonitic and waxy, trace dark colored carbonaceous partings, very slightly micro-micaceous, trace fine sized pyrite crystals.
	25	SANDSTONE – loose fine to medium sized frosted white quartz with presence (20%) pink k-spar, sub rounded to sub angular, moderately well sorted.
1795 – 1800	65	SHALE – medium to medium dark grey to slightly brownish and greenish grey, sub-fissile, medium hard, slightly bentonite, very slightly to slightly calcareous, presence darker colored partings, trace pyrite crystals, presence LCM.
	35	SANDSTONE – loose mostly fine with some medium and rare coarse quartz grains, as above.
1800 – 1805	90	SHALE – medium slightly brownish to greenish grey colored, sub-fissile, slightly waxy luster, medium hard, very slightly to slightly calcareous, trace very fine pyrite flecks, trace pyrite veins, trace dark grey carbonaceous partings.
	10	SANDSTONE – frosted white quartz with k-spar float.

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INTERVAL (metres)	LITH (%)	DESCRIPTION
1805 – 1810	80	SHALE – medium greenish grey colored, sub-fissile, medium hard, slightly calcareous, slightly micro-micaceous, presence very dark grey colored carbonaceous partings, and light brownish grey soft earthy bentonitic claystone interbeds, rare calcareous silty streaks, trace pyrite veins.
	20	SANDSTONE – frosted white quartz with feldspar, fine to medium with trace coarse grains, sub rounded to sub angular, moderately well sorted, unconsolidated in sample, rare clay ironstone grains.
1810 – 1820	80	SHALE – as above; more common light brownish grey colored soft bentonite component.
	20	SANDSTONE – fine to medium loose quartz grains.
1820 – 1825	90	SHALE – medium grey to slightly greenish grey, sub-fissile, medium hard, slightly calcareous, presence dark carbonaceous partings, trace pyrite crystals.
	10	SANDSTONE – frosted quartz, fine to medium grained, sub rounded to sub angular, moderately well sorted, unconsolidated in sample.
1825 – 1835	100	SHALE – medium grey to greenish grey colored, sub-fissile, medium hard, slightly calcareous, slightly silty in part, trace carbonaceous partings, trace pyrite veins, presence fine to medium pyrite crystal aggregations.
1835 – 1840	100	SHALE – medium grey to partly greenish grey colored, sub-fissile, medium hard, slightly silty, slightly calcareous, trace micro-micaceous, trace pyrite crystals and veins, trace to rare very dark grey carbonaceous partings, rare calcite vein with euhedral crystal growth, rare clay ironstone grains.
1840 – 1845	100	SHALE – as above; slightly more carbonaceous laminae, trace white calcite vein material.

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INTERVAL (metres)	LITH (%)	DESCRIPTION
1845 – 1850	100	SHALE – medium to medium dark olive grey colored, sub-fissile to fissile, slightly waxy luster, medium hard, slightly to very slightly calcareous, trace micro-micaceous, trace to presence pyrite crystals and veins, trace calcite veins, trace very dark grey to black carbonaceous partings, trace pyritized fossil fragments (Crinoid).
1850 – 1860	100	SHALE – medium to medium dark grey to olive grey colored, sub-fissile to fissile, medium hard, slightly calcareous, part slightly silty, trace calcite veining trace pyrite crystals, trace black carbonaceous partings, trace light brownish grey soft bentonitic claystone.
1860 – 1865	90	SHALE – medium to medium dark grey to brownish grey, sub-fissile to fissile, slightly waxy, medium hard, slightly calcareous, presence medium green grey platy laminations, trace to rare carbonaceous partings, trace calcite veins, trace marly laminations.
	10	LIMESTONE – buff colored, blocky micritic / chalky texture, medium soft, dense.
1865 – 1870	100	SHALE – medium dark grey to brownish / greenish grey, sub-fissile, slightly waxy, medium hard, trace to presence dark grey carbonaceous partings, slightly silty to silty in part, trace pyrite crystals, trace calcite veining, trace indistinct fossil remains.
1870 – 1880	100	SHALE – medium dark grey, sub-fissile to blocky habit, medium hard to hard, presence dark colored carbonaceous partings, silty, slightly calcareous, trace calcite veins, trace pyritized fossil remains.

SAMPLE RECORD / C-31

INTERVAL (metres)	LITH (%)	DESCRIPTION
1880 – 1890	90	SHALE – medium dark grey, silty, slightly carbonaceous, as above.
	10	SANDSTONE – frosted white quartz with presence pink to red potassium feldspar, fine to medium with rare coarse grains, sub rounded, moderately well sorted, unconsolidated in sample.
1890 – 1895	100	SHALE – medium dark to dark grey colored, sub-fissile, medium hard to hard, silty, carbonaceous / bituminous stained, slightly calcareous, trace calcite veining, trace pyrite crystals, rare green grey platy and light brown grey earthy Claystone laminations.
1895 – 1900	90	SHALE – dark grey colored, sub-fissile to blocky, silty, medium hard to hard, carbonaceous / bitumen stained, slightly calcareous; interbedded Shale, medium greenish grey colored, sub fissile to fissile, slightly platy, medium hard to medium soft, trace micro-micaceous.
	10	LIMESTONE – cream to buff colored, blocky, soft, micritic, chalky texture, argillaceous, trace fossil fragments / pellets, dense.
1900 – 1905	70	SHALE – medium dark to dark grey, sub-fissile, medium hard to hard, carbonaceous / bitumen staining, silty, slightly calcareous, trace pyrite, common light grey soft earthy laminations.
	30	MARLSTONE – light grey, microcrystalline, medium soft, argillaceous, micritic, soft white chalky veins.
1905 – 1910	80	SHALE – dark grey colored, carbonaceous / bituminous stained, silty, trace pyrite crystals, trace calcite veins, trace clay ironstone grains, trace medium greenish grey platy laminations.
	20	MARLSTONE – light grey colored, microcrystalline, medium soft, very argillaceous, trace calcite veins.

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INTERVAL (metres)	LITH (%)	DESCRIPTION
1910 – 1915	65	SHALE – dark grey, sub-fissile, medium hard to hard, silty to slightly silty, slightly calcareous, common light grey soft earthy Claystone laminations.
	25	SANDSTONE – frosted white colored, quartz with presence k-spar, fine to coarse grains, sub rounded to sub angular, moderately well sorted, unconsolidated in sample.
	10	MARLSTONE – light grey colored, argillaceous, chalky texture, soft.
1915 – 1920	90	SHALE – medium dark brownish grey colored, sub-fissile, medium hard, slightly waxy luster, slightly calcareous to calcareous, part marly, slightly silty, common very fine disseminated pyrite, trace medium grey green platy and light grey soft earthy bentonitic claystone laminations, trace loose quartz float.
	10	MARLSTONE – medium brownish grey, microcrystalline, medium hard, very argillaceous, trace pyrite crystals.
1920 – 1925	100	SHALE – medium dark grey to slightly brownish greenish grey, sub-fissile, medium hard, calcareous, trace dark carbonaceous / bituminous partings, presence clear white part chalky calcite veins, trace euhedral calcite rhombs, trace clear colorless quartz prisms, trace fracture porosity.
1925 – 1930	100	SHALE – medium dark brownish greenish grey colored, sub-fissile, slightly waxy, presence calcite veining, trace bituminous partings, trace fracture porosity.
1930 – 1935	90	SHALE – medium dark brownish greenish grey, as above.
	10	MARLSTONE – light brownish grey colored, micritic, medium hard to medium soft, very argillaceous, chalky texture.

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INTERVAL (metres)	LITH (%)	DESCRIPTION
1935 – 1940	90	SHALE – medium dark grey to slightly brownish greenish grey, common dark bituminous partings, common white chalky calcite veins, trace fracture porosity.
	10	MARLSTONE – light brownish grey, chalky.
1940 – 1945	90	SHALE – dark grey to brownish grey colored, sub-fissile, medium hard to hard, carbonaceous / bituminous stained, calcareous, slightly silty, slightly micro-micaceous, trace to presence chalky white calcite veins, rare fracture porosity.
	10	MARLSTONE – light grey, soft, earthy / chalky texture.
1945 – 1950	80	SHALE – dark grey, sub-fissile, medium hard to hard, slightly waxy texture, calcareous, slightly bituminous / carbonaceous stained, trace calcite veins, trace fossil fragments.
	20	MARLSTONE – light to medium grey to brownish grey, soft, earthy / chalky texture, argillaceous.
1950 – 1965	80	SHALE – dark grey, sub-fissile, calcareous, bitumen staining, trace chalky white calcite veins.
	10	MARLSTONE – light grey, soft, chalky, as above.
	10	SANDSTONE – frosted white quartz with pink and red potassium feldspar, fine to coarse grained, sub rounded, moderately well sorted, unconsolidated in sample.
1965 – 1970	100	SHALE – dark grey with very dark grey streaks, sub-fissile, medium hard to hard, slightly calcareous, slightly silty to silty, micro-micaceous, trace pyrite, trace calcite veins, trace marly laminations, common light grey soft earthy argillaceous bentonitic claystone laminations.
1970 – 1980	100	SHALE – becoming medium to medium dark grey, sub-fissile, medium hard to hard, slightly calcareous, slightly silty, presence light grey earthy marly laminations, rare loose quartz grains, rare traces fracture porosity.

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INTERVAL (metres)	LITH (%)	DESCRIPTION
1980 – 1990	85	SHALE – medium dark to dark grey, sub-fissile, medium hard to hard, trace bitumen / carbonaceous stain, slightly calcareous, slightly silty, trace calcite veins with trace clear euhedral calcite rhombs and quartz prisms, trace fracture type porosity.
	15	SANDSTONE – cloudy white quartz with pink to red feldspar, fine to medium grained, sub rounded, moderately well sorted, uncemented.
1990 – 1995	100	SHALE – medium dark grey, sub-fissile to fissile, slightly waxy luster, silty and marly streaks, trace to rare calcite veins, trace pyrite.
1995 – 2000	100	SHALE – medium dark to dark grey, sub fissile to fissile, medium hard, slightly waxy luster, trace black bitumen partings, trace calcite veins – part chalky / part trace drusy crystals, rare medium brown Marlstone laminations.
2000 – 2005	100	SHALE – medium dark grey with dark grey slightly bituminous laminations, sub-fissile to fissile, medium hard, slightly waxy luster and rippled surface, non calcareous to very slightly calcareous, trace very fine disseminated pyrite crystals, trace fossil remains, rare calcite veins, rare clay ironstone grains.
2005 – 2010	100	SHALE – as above; rare medium to coarse quartz grain float, rare pyritohedrons.
2010 – 2015	100	SHALE – medium dark grey with dark grey bituminous streaks, trace calcite veins, rare drusy crystals.
2015 – 2025	100	SHALE – medium dark grey as above; presence light grey colored soft marly bentonitic claystone, trace limy veins.
2025 – 2030	100	SHALE – medium dark grey with darker slightly bituminous laminations, sub-fissile to fissile medium hard, rare silty streaks, very slightly calcareous, trace calcite veins, rare pyrite, rare clay ironstone grains, trace pellet / fossil remains.

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INTERVAL (metres)	LITH (%)	DESCRIPTION
2030 –2035	95	SHALE – medium dark grey, as above; interbedded light grey soft Shale grading to claystone, presence (10%) chalky white soft lime material.
	5	SANDSTONE – clear white quartz, fine to medium grains, sub rounded to sub angular, moderately well sorted, unconsolidated in sample.
2035 – 2045	85	SHALE – medium dark grey, as above; trace white chalky soft calcite with rare clear drusy calcite rhombs and rare quartz prisms, trace fracture – channel porosity abundant light grey colored amorphous to sub fissile soft Shale grading to bentonitic claystone.
	15	SANDSTONE – fine to medium and occasionally coarse quartz as above.
2045 – 2050	95	SHALE – medium dark grey, sub-fissile to fissile, medium hard, trace dark to very dark grey bituminous varved laminations, trace calcite veins, trace scattered sand grains, trace medium grey green colored platy Shale laminations, common light grey colored Shale grading claystone.
	5	SANDSTONE – as above.
2050 – 2060	75	SHALE – medium dark grey, abundant light grey amorphous soft bentonitic claystone with frequent dark bituminous / carbonaceous laminations, trace clear drusy calcite / quartz prisms, trace fracture porosity.
	25	SANDSTONE – clear frosted white quartz with trace k – spar and dark lithic grains, sub rounded, moderately well sorted, unconsolidated to loosely consolidated, trace calcareous clay cement, trace sideritic staining, fair to poor intergranular and tripolitic porosity, no hydrocarbon stain noted.

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INTERVAL (metres)	LITH (%)	DESCRIPTION
2060 – 2065	90	CLAYSTONE - light to medium light grey colored, amorphous to finely flaky, soft, slightly calcareous, bentonite, common very dark grey to black carbonaceous / bituminous laminations, trace fossil fragments, rare limy partings, trace pyrite crystals and veins.
	10	SANDSTONE – as above; predominantly medium sized quartz with k-spar, and lithic grains, unconsolidated.
2065 – 2070	70	CLAYSTONE – light to medium light grey with black carbonaceous laminae.
	30	SHALE – medium greenish grey to greyish green, sub-fissile to fissile, medium hard to hard, slightly calcareous.
2070 – 2075	70	CLAYSTONE – light grey colored, soft, bentonite, carbonaceous laminations.
	20	SHALE – medium greenish grey colored.
	10	SANDSTONE – white to clear frosted quartz, very fine to fine grained, sub rounded, moderately well sorted, unconsolidated, silty.
2075 – 2080	80	SHALE – medium to medium dark grey, sub-fissile to fissile, medium hard, non calcareous, micro-micaceous, presence black carbonaceous partings, rare pyrite, rare calcareous streaks, rare calcite, rare pyrite.
	20	CLAYSTONE – light grey as above.
2080 – 2085	80	SHALE – medium dark grey, fissile to sub-fissile, medium hard to hard, non calcareous, presence black carbonaceous / bituminous laminations, presence medium green grey platy interbeds, trace medium brown colored blocky marly laminations.
	20	CLAYSTONE – light grey, as above.

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INTERVAL (metres)	LITH (%)	DESCRIPTION
2085 – 2090	100	SHALE – dark grey with very dark grey streaks, fissile, slightly waxy luster, medium hard, non calcareous, presence medium green grey slightly calcareous streaks,
2090 – 2095	100	SHALE – very dark to dark grey, fissile, splintery, medium hard, carbonaceous, non calcareous, slightly micro-micaceous, trace calcite veins, trace pyritohedrons, trace medium grey and greenish grey colored, tabular, slightly calcareous laminae.
2095 – 2100	100	SHALE – black to very dark grey, fissile, platy, medium hard to medium soft, carbonaceous to very carbonaceous, trace pyrite veins and crystals, trace chalky calcite, presence very dark brownish grey soft organic earthy Shale.
2100 – 2105	60	SHALE – black to very dark grey, fissile, platy, carbonaceous to very carbonaceous, trace pyrite crystals, rare plant remains.
	40	SANDSTONE – cloudy white quartz with light colored feldspars and composite Granite and Igneous grains, fine to coarse and occasionally very coarse grained, sub rounded to rounded, moderately sorted, unconsolidated to trace friable calcareous cement, trace siderite stain, trace pyrite, poor to fair intergranular and tripolitic type porosity, trace black pyrobitumen partings, no visible oil shows.
2105 – 2110	30	SANDSTONE – as above.
	70	SHALE – black, platy, carbonaceous.
2110 – 2115	100	SHALE – dark grey colored, sub-fissile to blocky, medium hard to hard, slightly carbonaceous non calcareous to very slightly calcareous, trace pyrite veins, trace calcite veins, common very dark grey carbonaceous interbeds, trace medium grey to greenish grey medium hard, tabular slightly calcareous Shale interbeds.

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INTERVAL (metres)	LITH (%)	DESCRIPTION
2115 – 2120	80	SHALE – dark to very dark grey, sub-fissile, slightly carbonaceous to carbonaceous, medium hard to hard, as above; trace medium greenish grey tabular, trace calcite veins, part chalky.
	20	SANDSTONE – clear white salt and pepper quartz with dark colored lithic and black chert grains, medium to coarse and very coarse grains, rounded to sub rounded, moderate sorting, silica cement, trace pyrite, trace euhedral quartz crystals, fair intergranular, drusy and tripolitic porosity, trace pyrobitumen, no oil shows.
2120 – 2125	100	SHALE – dark grey with half sample very dark grey, part carbonaceous, sub-fissile to fissile, medium hard, trace light and medium grey part marly streaks, rare quartz float.
2125 – 2130	95	SHALE – dark grey, sub-fissile to fissile, medium hard, slightly carbonaceous, trace silty, trace pyrite veins, common very fine pyrite crystals, trace light grey earthy laminations, and medium greenish grey tabular slightly calcareous, interbeds.
	05	SANDSTONE – clear quartz with dark colored lithic and chert grains, fine to medium size, sub rounded, moderately well sorted, uncemented in sample, trace drusy crystal development.
2130 – 2135	90	SHALE – as above; very dark grey to black colored, splintery, carbonaceous, trace black fossiliferous Chert grains, rare Marlstone – dark brown, blocky, hard, very argillaceous.
	10	SANDSTONE – as above; trace black fossiliferous chert grains, becoming coarser sized, silica cement in part, trace siderite stain in part, trace euhedral crystals, fair porosity.
2135 – 2140	100	SHALE – very dark grey, sub-fissile to fissile, slightly splintery, medium hard, slightly carbonaceous, slightly silty, trace bitumen partings, rare to trace pyrite veins, rare slickensides.

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INTERVAL (metres)	LITH (%)	DESCRIPTION
2140 – 2145	100	SHALE – as above; slightly lighter colored, less carbon-aceous / bituminous, presence light grey colored soft earthy Claystone laminations, presence white colored calcite veins with euhedral crystals in part, trace scattered sand grains.
2145 – 2150	100	SHALE – dark grey, sub-fissile to fissile, slightly splintery, slightly waxy, medium hard, presence to common very dark grey carbonaceous / bituminous laminations, presence medium grey to greenish grey slightly calcareous tabular interbeds, trace light grey and brownish grey earthy interbeds, trace calcite veins, rare quartz crystals.
2150 – 2160	70	SHALE – as above, common light grey colored , amorphous slightly flaky soft slightly calcareous claystone.
	30	LIMESTONE – medium brownish grey colored, very fine to fine Grainstone, medium hard, silty, sandy, argillaceous, trace sideritc staining, trace pyrite crystals, trace fossil remains, trace to poor intergranular porosity, no visible oil shows.
2160 –2165	80	SHALE – medium dark grey color, sub-fissile to fissile, platy, slightly waxy, medium hard, trace pyrite, trace sand grains, trace siderite staining.
	10	SANDSTONE – predominantly fine sized quartz with rare feldspar, rounded to sub rounded, trace siderite stain, calcareous clay cement, trace to poor porosity.
	10	LIMESTONE – medium brown, fine sized grainstone, trace fossil fragments, trace pyrite.
2165 – 2170	100	SHALE - dark to medium dark grey, fissile, slightly platy to slightly splintery, medium hard, trace calcite veins, trace pyrite, rare light grey Claystone, rare light brown Marlstone.
2170 – 2175	100	SHALE – dark grey, fissile, slightly splintery, slightly waxy luster, medium hard, very slightly calcareous, carbonaceous varves, slightly silty in part, slightly micro – micaceous, trace calcite veins, trace small scale fractures.

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INTERVAL (metres)	LITH (%)	DESCRIPTION
2175 – 2180	90	SHALE – as above; slightly lighter colored to slightly greenish hue, trace medium brownish grey tabular interbeds.
	10	SANDSTONE – clear quartz with trace light colored orthoclase feldspars / dark lithic grains, predominantly fine sized, moderately well sorted, rounded to sub rounded, loosely consolidate – rare calcareous cement, poor porosity.
2180 – 2185	70	SHALE – medium dark grey, as above.
	30	SANDSTONE – clear and frosted quartz with presence light and red colored othoclase feldspars and dark lithic and carbonate grains, fine to medium with occasional coarse grains, sub rounded to rounded, moderately well sorted, loose to rare calcareous cement, poor intergranular porosity.
2185 – 2190	75	SHALE – medium dark grey, fissile, slightly platy to slightly splintery, slightly waxy luster, very slightly calcareous, trace pyrite / arsenopyrite.
	25	SANDSTONE – loose fine to medium with occasional coarse and rare very coarse quartz and light colored and siderite stained grains.
2190 – 2195	70	SHALE – medium dark steely grey colored, fissile, slightly splintery, slightly waxy, medium hard, trace micro-micaceous, very slightly calcareous, trace calcite veins.
	30	SANDSTONE – frosted white and yellow stained quartz with light and red colored feldspars, fine to coarse with rare very coarse grains, sub rounded to rounded, moderately well sorted, poor to fair porosity, no oil shows.
2195 – 2200	100	SHALE – medium to medium dark steely grey colored, fissile to sub-fissile, slightly waxy luster, medium hard, non calcareous to very slightly calcareous streaks, slightly micro-micaceous, rare calcite veins.

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INTERVAL (metres)	LITH (%)	DESCRIPTION
2200 – 2210	100	SHALE – medium to medium dark steely grey with trace darker slightly bituminous laminations.
2210 – 2215	90	SHALE – as above; part becoming medium grey, sub-fissile, medium hard, silty, slightly calcareous to calcareous, trace calcite veining / part chalky texture.
	10	SILTSTONE – medium grey, medium hard, very argillaceous, trace sandy, calcareous cement, slightly micro-micaceous, tight.
	Trace	LIMESTONE – medium grey, microcrystalline, blocky, medium hard to hard, very argillaceous, silty, dense, no visible oil shows.
2215 – 2230	100	SHALE - medium dark steely grey to slightly brownish grey colored, fissile to sub-fissile, medium hard, slightly waxy, non to very slightly calcareous, parts slightly silty, trace very fine disseminated pyrite, trace white crystalline calcite, trace loose sand.
2230 – 2240	100	SHALE - medium to dark grey, trace slightly brownish grey colored, rare dark grey to black, sub-fissile to blocky, medium hard, rare carbonaceous laminations, rare limestone streaks, becoming less waxy than above, predominantly silicious, trace non to very slightly calcareous, trace pyrite grains, rare white crystalline calcite, rare loose sand float.
2240 – 2245	95	SHALE - medium dark grey, blocky to fissile, hard, as above
	05	SILTSTONE - medium brownish grey to greyish brown, quartzitic, medium hard, argillaceous, sandy, slightly calcareous silica cement, tight.

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INTERVAL (metres)	LITH (%)	DESCRIPTION
2245 – 2260	100	SHALE - medium dark steely grey, part light brownish grey colored, minor dark grey to black, fissile to sub-fissile, medium hard, slightly waxy, minor carbonaceous, non to very slightly calcareous, occasional sideritic laminae, parts slightly silty, trace very thin limestone to marlstone laminae, trace granular and disseminated pyrite, trace loose sand float.
2260 – 2270	100	SHALE - medium grey colored, sub-fissile to blocky, well indurated, slightly siliceous throughout, slightly calcareous to locally calcareous streaks, grading to marlstone in small part, slightly micro-micaceous, rare white crystalline calcite, rare thin calcite veins.
2270 – 2275	100	SHALE - medium grey colored, trace light greyish brown and dark grey, sub fissile to blocky, well indurated, slightly siliceous throughout, becoming dolomitic, grading to dolo-marlstone in small part, locally slightly silty, rare white crystalline calcite, rare disseminated native copper specks.
2275 – 2290	100	SHALE - medium grey colored, trace dark grey, sub-fissile to blocky, well indurated, slightly siliceous throughout, dolomitic, grading to dolo-marlstone in small part, locally slightly silty, trace limonite stained quartz veins, rare sparry calcite, rare granular pyrite.
2290 – 2295	100	SHALE - medium grey colored, trace dark grey, sub-fissile to fissile in part, well indurated throughout, slightly siliceous throughout, dolomitic throughout, grading to dolo-marlstone in small part, locally slightly silty, trace to occasional creamy white to beige quartz vein fillings, rare light grey claystone stringers, rare disseminated pyrite, rare obscure crinoid fragments.
2295 – 2300	100	SHALE - medium to dark grey colored, sub-fissile to blocky, well indurated throughout, slightly siliceous and dolomitic throughout, grading to dolo-marlstone in small part, rare creamy white quartz vein fillings, rare disseminated pyrite, rare obscure fossil fragments.

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INTERVAL (metres)	LITH (%)	DESCRIPTION
2300 - 2310	100	SHALE - light grey to medium grey colored, predominantly blocky, minor amounts sub-fissile, well to very well indurated throughout, slightly siliceous and dolomitic throughout, grading to dolo-marlstone in small part, trace light grey claystone laminae, rare creamy white to sub vitreous quartz vein fillings.
2310 - 2315	100	SHALE - medium grey, minor dark grey to black, blocky to sub-fissile, well to very well indurated, locally carbonaceous, slightly siliceous and dolomitic throughout, grading to dolo-marlstone in small part, trace disseminated pyrite, occasional light yellowish white to white quartz vein fillings, rare limonite staining associated with quartz.
2315 - 2320	100	SHALE - medium grey, minor dark grey to black, predominantly blocky, trace amounts sub-fissile, well to very well indurated, locally carbonaceous, siliceous and dolomitic throughout, grading to dolo-marlstone in small part, trace mottled with thin dolomitic streaks, rare bentonitic clay stringers, rare occasional light yellowish white to white quartz vein fillings.
2320 - 2325	100	SHALE - medium grey, minor dark grey to black, predominantly blocky, trace amounts sub-fissile, well to very well indurated, locally carbonaceous, siliceous and dolomitic throughout, grading to dolo-marlstone in small part, trace mottled with thin dolomitic streaks, trace light brown sideritic claystone patches, rare granular pyrite.
2325 - 2335	100	SHALE - medium grey, minor dark grey to black, predominantly blocky, trace amounts sub-fissile, well to very well indurated, siliceous and dolomitic throughout, grading to dolo-marlstone in small part, trace light brown sideritic claystone patches, rare thin bentonite laminae, rare granular pyrite and disseminated pyrite.

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INTERVAL (metres)	LITH (%)	DESCRIPTION
2335 - 2345	100	SHALE - medium grey to dark grey, minor amounts black, predominantly blocky, trace amounts sub-fissile, well to very well indurated, siliceous and dolomitic throughout, trace mottled with thin dolomitic streaks, occasional amounts bentonitic laminae, trace light brown sideritic claystone patches, trace sparry calcite vein linings, rare granular and disseminated pyrite.
2345 – 2350	100	SHALE - dark grey to black, blocky, sub-fissile in small part, well to very well indurated, siliceous and dolomitic throughout, locally very slightly carbonaceous, trace mottled with thin dolomitic streaks, rare disseminated pyrite.
2350 - 2355	100	SHALE - medium grey to dark grey, minor amounts black, predominantly blocky, trace amounts sub-fissile, well to very well indurated, siliceous and dolomitic throughout, trace mottled with thin dolomitic streaks, rare euhedral and nodular pyrite.
2355 - 2365	100	SHALE - medium grey to dark grey, minor amounts black, blocky to sub-fissile, well to very well indurated, siliceous and dolomitic throughout, mottled with thin dolomitic streaks, trace light brown sideritic Claystone patches, rare euhedral and disseminated pyrite.
2365 - 2370	100	SHALE - medium grey to dark grey, minor black, blocky to sub-fissile, well to very well indurated, siliceous and dolomitic throughout, mottled with thin dolomitic streaks, trace light brown sideritic claystone patches, rare granular and disseminated pyrite, rare sparry calcite vein fillings.
2370 - 2375	100	SHALE - predominantly dark grey, minor light grey and black, blocky to sub-fissile, well to very well indurated, siliceous and dolomitic throughout, trace light greyish green to greenish brown sideritic claystone patches, rare disseminated pyrite, occasional light yellowish white to white quartz vein fillings, rare sparry calcite fracture infillings.

SAMPLE RECORD / C-31

INTERVAL (metres)	LITH (%)	DESCRIPTION
2375 - 2385	100	SHALE - medium grey to dark grey, rare black, blocky to sub-fissile, trace slightly waxy, well to very well indurated, siliceous and dolomitic throughout, mottled with thin dolomitic streaks, trace light brown sideritic claystone stringers.
2385 - 2390	100	SHALE - medium grey to dark grey, rare black, blocky to sub fissile, trace slightly waxy, well to very well indurated, siliceous and dolomitic throughout, mottled with thin dolomitic streaks, trace light brown sideritic claystone stringers, rare coal partings.
2390 - 2400	100	SHALE - medium grey to dark grey, slightly darker than above, rare black, predominantly blocky, minor sub-fissile, well to very well indurated, siliceous, slightly more dolomitic than above, mottled with very fine wavy dolomitic laminations, occasional silty light grey claystone stringers, rare finely striated sparry calcite vein linings.
2400 - 2405	100	SHALE - medium grey to dark grey, part black, blocky, well to very well indurated, predominantly dolomitic, slightly siliceous throughout, slightly carbonaceous throughout, micro-micaceous, mottled with very fine dolomitic laminations, locally silty with occasional dark grey to black siltstone stringers.
2405 - 2410	100	SHALE - dark grey to black, blocky, minor sub-fissile, part well to very well indurated, becoming moderately indurated in part, dolomitic and siliceous throughout, slightly bituminous in part, rare finely striated sparry calcite fracture linings.
2410 – 2415	100	SHALE - dark grey, minor black, blocky, minor sub-fissile, part well to very well indurated, micro-micaceous, becoming moderately indurated in part, dolomitic and siliceous throughout, slightly bituminous in part, trace microfractures sealed with white calcareous linings.

SAMPLE RECORD / C-31

INTERVAL (metres)	LITH (%)	DESCRIPTION
2415 - 2420	60	SHALE - medium grey to dark grey, well to very well indurated, micro-micaceous, becoming moderately indurated in part, dolomitic and siliceous throughout, locally chertified, slightly bituminous in part, rare pyrite, trace micro fractures sealed with white calcareous linings.
	40	SILTSTONE - predominantly medium grey, rare amounts black, salt and pepper, calcareous cement, minor dolomite cement, moderately indurated, interbedded with thin silty black shale laminae.
2420 - 2425	75	SHALE - dark grey to black, blocky to sub-fissile, minor fissile, part well to very well indurated, micro-micaceous, becoming moderately indurated in part, dolomitic and siliceous throughout, slightly bituminous in small part, silty, trace micro fractures sealed with white calcareous linings.
	25	SILTSTONE - predominantly medium grey, rare amounts black, salt and pepper, as above, interbedded with thin silty black shale laminae.
2425 - 2430	100	SHALE - dark grey to black, blocky to sub-fissile, minor fissile, as above, part well to very well indurated, micro-micaceous, becoming moderately indurated in part, dolomitic and siliceous throughout, slightly bituminous in small part, silty, occasional micro fractures sealed with white calcareous linings.
2430 - 2435	100	SHALE - dark grey to black, rare greenish grey, blocky to sub-fissile, well to very well indurated, locally micromicaceous, dolomitic and siliceous throughout, slightly bituminous in small part, silty, trace nodular pyrite and disseminated pyrite, common microfractures partially sealed with white calcareous linings, trace sparry calcite and pyrite, rare quartz, brecciated, questionable poor fracture porosity, no shows.

SAMPLE RECORD / C-31

INTERVAL (metres)	LITH (%)	DESCRIPTION
2435 - 2445	100	SHALE - dark grey to black, blocky to sub-fissile, minor fissile, well to very well indurated, dolomitic and siliceous throughout, slightly silty, trace micro fractures sealed with white calcareous linings, trace sparry calcite micro fracture linings, rare disseminated pyrite, rare phospahtic nodules.
2445 - 2450	100	SHALE - dark grey, blocky to subfissile, well to very well indurated, siliceous throughout, trace dolomitic, occasional micro fractures sealed with vitreous quartz and white calcareous linings, rare slightly silty marlstone interbeds.
2450 - 2455	90	SHALE - dark grey, minor medium grey and black, blocky to sub-fissile, well to very well indurated, siliceous throughout, trace dolomitic, occasional micro fractures sealed with vitreous quartz and white calcareous linings, rare slightly silty marlstone interbeds, rare pyrite, locally micro-micaceous, probable cavings due to cleaning out trip tank.
	10	SANDSTONE – varicolored, lower medium to upper coarse, probable cavings, poorly sorted, subangular to subrounded, loose, quartz, minor microcline feldspar fragments, no shows.
2455 - 2465	100	SHALE - predominantly medium to dark grey, rare black carbonaceous stringers, blocky, well to very well indurated, micro-micaceous, dolomitic and siliceous throughout, locally grading to dolo-marlstone, part mottled with thin wavy dolomitic streaks, rare disseminated pyrite, rare micro fractures partially sealed with white calcareous linings and black carbonaceous material, questionable poor fracture porosity, no shows.

SAMPLE RECORD / C-31

INTERVAL (metres)	LITH (%)	DESCRIPTION
2465 - 2470	80	SHALE - predominantly medium to dark grey, blocky, well to very well indurated, micro-micaceous, dolomitic and siliceous throughout, locally grading to dolo-marlstone, part mottled with thin wavy dolomitic streaks, rare disseminated pyrite, rare micro fractures - clear, upper coarse to upper very coarse cuttings, angular, conchoidal fractures, vitreous quartz and sparry calcite, inferred good fracture porosity, no shows.
2470 - 2475	100	SHALE - medium grey, minor dark grey, blocky, minor sub-fissile, well to very well indurated, micro-micaceous, dolomitic and siliceous throughout, rare white calcareous linings and euhedral quartz crystals, possible cavings from fracture.
2475 - 2480	100	SHALE - medium to dark grey, rare black, blocky, minor sub-fissile, well to very well indurated, micro-micaceous, dolomitic and siliceous throughout, locally slightly bituminous, rare micro fractures annealded with white calcareous linings and quartz crystals, rare pyrite.
2480 - 2485	100	SHALE - medium to dark grey, rare black, blocky, minor sub-fissile, well to very well indurated, siliceous and slightly dolomitic throughout, locally grading to dolo-marlstone, part with thin bituminous laminae, rare thin silty laminae, rare micro fractures sealed with white calcareous linings, rare pyrite, rare pyritized Crinoid fragments.
2485 - 2490	100	SHALE - dark grey, rare black, predominantly blocky, rare sub-fissile, well to very well indurated, micro-micaceous, dolomitic and siliceous throughout, rare micro fractures sealed with white calcareous linings.
2490 - 2495	100	SHALE - dark grey to black, blocky, well to very well indurated locally micro-micaceous, siliceous, slightly dolomitic throughout, rare white euhedral calcareous fracture linings, fractures sealed, rare pyrite.

SAMPLE RECORD / C-31

INTERVAL (metres)	LITH (%)	DESCRIPTION
2495 - 2500	100	SHALE - dark grey to black, blocky, well to very well indurated locally micro-micaceous, siliceous, slightly dolomitic throughout, locally grading to dolo-marlstone, rare foraminifera fossils.
2500 – 2505	80	SHALE – dark grey to slightly brownish grey colored, sub-fissile to blocky, medium hard to hard, slightly bentonitic type waxy texture, trace micro-micaceous, trace very dark grey carbonaceous laminations, trace calcite filled micro fractures, trace to presence light brown to yellowish brown soft Claystone laminations.
	20	SANDSTONE – clear frosted quartz with trace orange to red colored feldspar and siderite stained quartz, fine to medium grained, sub rounded, moderately well sorted, friably cemented to uncemented, calcareous clay cement in part, rare pyrite, rare quartz prisms, no visible hydrocarbon shows.
2505 - 2510	85	SHALE – dark grey to brownish grey, sub-fissile to blocky, medium hard to hard, slightly brittle, slightly waxy / greasy lustre, trace disseminated pyrite in parts, trace black carbonaceous laminations, trace micaceous streaks, trace white crystalline calcite veining, trace light grey colored soft marly partings.
	10	SILTSTONE – medium grey colored, trace vitreous, blocky, hard, dolomitic silica cement, sandy, trace clay balls, micaceous, tight.
	05	SANDSTONE – as above; white and siderite stained quartz, most fine to occasional medium grains, unconsolidated in sample, no hydrocarbon shows.

SAMPLE RECORD / C-31

INTERVAL (metres)	LITH (%)	DESCRIPTION
2510 – 2515	80	SHALE – dark to medium dark grey to slightly brownish greenish grey, sub-fissile to fissile, medium hard to hard, trace calcite veins, trace marly partings, some siliceous micaceous streaks.
	20	SANDSTONE – white frosted quartz with trace k-spar and light lithic and carbonate grains, predominantly fine to medium grained, sub rounded, moderately well sorted, uncemented in sample, siderite staining, trace pyrite, poor porosity.
2515 – 2520	95	SHALE – medium dark to some dark grey to slightly brownish greenish grey, sub-fissile to fissile, medium hard to hard, slightly waxy lustre, micro-micaceous in part, trace very dark grey to black bitumen / carbonaceous laminations, trace crystalline calcite veining with rare euhedral crystals, rare clear quartz prisms, trace loose quartz grains.
	05	LIMESTONE – medium brownish grey, microcrystalline, hard, trace pellets, very argillaceous, trace dolomitic, trace pyritic, dense.
2520 – 2525	85	SHALE – medium dark grey to slightly brownish greenish grey colored as above; rare to trace black carbonaceous laminations, trace to presence white crystalline calcite veins, trace siliceous / pyritic streaks, rare light colored Claystone.
	10	SANDSTONE – white frosted to orange red stained quartz, fine to medium grained, trace k-spar and carbonate grains, unconsolidated in sample, trace calcareous coating in part, rare clear quartz prisms, poor porosity, no shows.
	05	LIMESTONE – medium slightly mottled brownish grey colored, microcrystalline to very fine crystalline, blocky, hard, dolomitic, argillaceous, trace pellet ghosts and fossil fragments, trace calcite veining, dense to trace fracture porosity.

SAMPLE RECORD / C-31

INTERVAL (metres)	LITH (%)	DESCRIPTION
2525 – 2530	90	SHALE – medium dark to slightly brownish greenish grey, sub-fissile to slightly tabular, slightly waxy / silky type lustre, medium hard to hard, very slightly calcareous, slightly micro-micaceous, trace very fine disseminated pyrite crystals, trace calcite veins, some siliceous micaceous streaks.
	10	LIMESTONE – medium brownish grey colored, very fine crystalline, blocky, hard, argillaceous, trace pellet and fossil fragments.
2530 – 2535	85	SHALE – as above; medium dark grey with dark grey to black bitumen / carbonaceous cleavages, trace calcite veins, rare euhedral calcite and quartz crystals.
	15	SANDSTONE – clear white frosted quartz, fine to medium grains, unconsolidated, trace orange / red siderite and ferric staining, poor porosity.
2535 – 2540	90	SHALE – dark to medium dark grey with very dark grey bituminous cleavages, sub-fissile to fissile, slightly waxy type lustre, trace euhedral calcite crystals and quartz prisms, trace black colored carbonaceous / bituminous laminations.
	10	LIMESTONE – medium brown grey colored, microcrystalline to very fine crystalline, trace pellets and fossil fragments, trace calcite veins with rare euhedral crystals, trace fracture porosity.
2540 – 2545	90	SHALE – medium dark grey with trace dark to very dark grey cleavages, as above; rare to trace black laminations, micro-micaceous, trace calcite veins.
	05	LIMESTONE – medium brown grey colored, micro-crystalline very fine crystalline, argillaceous, trace pellets, trace fossil fragments, trace calcite veins, trace fractures.
	05	SILTSTONE – medium brown, medium hard, dolomitic clay cement, very argillaceous, trace micaceous, tight.

SAMPLE RECORD / C-31

INTERVAL (metres)	LITH (%)	DESCRIPTION
2545 – 2555	100	SHALE – dark grey, sub-fissile to fissile, medium hard to hard, very slightly calcareous, trace micro-micaceous, presence (15%) clear white calcite veins including calcite rhombs and quartz prisms, trace to presence black carbonaceous / bituminous laminations, trace slickensides, trace inter- crystalline fracture porosity, minor Limestone and Siltstone laminations.
2555 – 2560	100	SHALE – dark grey to slightly olive grey colored, sub-fissile to slightly blocky habit, medium hard to hard, very slightly calcareous, micro-micaceous, trace euhedral calcite crystals and quartz prisms, rare black carbonaceous / bituminous partings, trace Limestone stringers.
2560 – 2565	100	SHALE – dark to medium dark steely grey colored as above; trace calcite crystals, rare black laminations, trace Limestone.
2565 – 2570	100	SHALE – medium dark to dark grey colored, sub-fissile to fissile slightly waxy lustre, medium hard to hard, very material, trace black hard blocky carbonaceous laminations, trace pyrite crystals, trace micaceous streaks, rare limy partings.
2570 – 2572.5	90	SHALE – as above; becoming, medium dark to dark brownish grey, more common very dark grey cleavages, trace calcite / silica vein and fracture fill material; part very dark brown colored, blocky, brittle, hard to very hard, siliceous.
	10	LIMESTONE – medium to dark brownish grey, micro-crystalline to very fine crystalline, blocky, hard, argillaceous, presence fossils / pellets, trace calcite / quartz veins and fracture infill, trace fracture porosity.

SAMPLE RECORD / C-31

INTERVAL (metres)	LITH (%)	DESCRIPTION
2572.5 – 2575	90	SHALE – dark grey to brown grey with common very dark grey to black colored cleavages, blocky to sub-fissile, hard, siliceous, very slightly calcareous micro-micaceous, presence milky calcite crystals (5%) and quartz (10%) crystals, presence (15%) very dark brown, blocky, very hard, pyrite veined, siliceous – cherty, trace fracture porosity.
	10	LIMESTONE – as above; presence calcite and quartz micro fracture fill material, trace fossil remains.
2575 – 2577.5	95	SHALE – dark grey, sub-fissile to fissile, medium hard to hard, trace to presence very dark grey carbonaceous / bituminous laminae, presence calcite (8%) and quartz (8%) crystals – part euhedral, rare dark brown cherty Shale laminations.
	05	LIMESTONE – as above; fossil and pellet fragments, trace white crystalline veining, dense to trace fracture porosity.
2577.5 – 2580	100	SHALE – dark grey to slightly brownish greenish grey colored, sub-fissile, medium hard to hard, very slightly micromicaceous to micro-micaceous, trace black bituminous / carbonaceous laminations – partly vitreous lustre, rare to trace pyrite, trace calcite / quartz crystals, rare limey streaks.
2580 – 2582.5	100	SHALE – as above; trace (5%) milky white colored euhedral calcite, presence (10%) clear and milky white quartz crystals and prisms, trace light greenish / yellowish fibrous mineralization, rare medium brown pyrobitumen like stain, trace fracture type porosity, no fluorescence or cut.
2582.5 – 2585	100	SHALE – as above; presence very dark colored cleavages, trace to presence (10%) clear and milky white calcite and quartz crystals.

SAMPLE RECORD / C-31

INTERVAL (metres)	LITH (%)	DESCRIPTION
2585 – 2587.5	100	SHALE – dark grey to brownish grey colored, sub-fissile to slightly blocky, hard, siliceous, very slightly calcareous, trace calcite veining / fracture fill, trace to presence milky quartz crystal veining / fracture fill, trace greenish gold fibrous mineral veining, trace slickensides, rare pyro-bituminous staining, rare loose fine sized quartz and k-spar sand grains, rare pyrite veins, trace Limestone stringers.
2587.5 – 2590	100	SHALE – as above; lesser amount (5%) calcite / quartz crystallization, sub-fissile, hard to medium hard, siliceous, poor to fair porosity.
2590 – 2592.5	100	SHALE – dark grey to slightly brownish greenish grey, sub-fissile to blocky, hard, siliceous, very slightly calcareous, slightly micro-micaceous, rare black bituminous / carbonaceous laminations, rare to trace pyrite, trace to rare clear white crystalline calcite / quartz crystals, trace limy streaks.
2592.5 – 2595	100	SHALE – as above; hard to some very hard siliceous laminations, trace calcite crystals, trace to presence clear and milky white quartz.
2595 – 2597.5	100	SHALE – as above; slightly blocky to tabular habit, slightly harder, trace calcite, common (25%) milky white crystalline quartz fracture fill material, trace clear drusy crystals, trace light green silky fibrous mineralization, some slickensides traces, trace limy brecciation and streaks.
2597.5 – 2600	85	SHALE – dark to medium dark grey to slightly brownish grey with some very dark grey laminae, sub-fissile to slightly blocky, hard to medium hard, very slightly calcareous, trace to presence calcite vein and micro fracture fill, trace quartz crystal fill, trace slickensides.
	15	SANDSTONE – clear frosted white and orange to red siderite/ ferric stained quartz, fine to medium grained, sub rounded, moderately well sorted, unconsolidated in sample.

SAMPLE RECORD / C-31

INTERVAL (metres)	LITH (%)	DESCRIPTION
2600 – 2605	100	SHALE – dark to very dark grey colored, sub-fissile, hard to medium hard, slightly waxy lustre, very slightly calcareous, trace to presence calcite material, trace quartz material, slightly micro-micaceous, trace black colored carbonaceous / bituminous laminations – part shiny lustre.
2605 – 2607.5	95	SHALE – as above; trace very dark brown grey colored, blocky, sharp, very hard, very siliceous streaks.
	05	LIMESTONE – medium brown, microcrystalline, hard, argillaceous, dolomitic, argillaceous, trace fossil fragments, trace calcite, trace pyrite, dense.
2607.5 – 2610	100	SHALE – dark grey with rare very dark grey partings, sub-fissile, becoming slightly calcareous, trace to presence calcite crystals, trace to presence quartz crystals, trace limy streaks.
2610 – 2612.5	95	SHALE – as above; trace very dark grey bitumen / carbonaceous laminae, trace calcite veining / sealed fractures, trace very hard very siliceous beds, presence (20%) quartz veining / fracture fill with part vitreous / adamantine crystals and prisms, trace slickensides, trace fracture porosity.
	05	LIMESTONE – medium grey brown, microcrystalline, hard, argillaceous, fossiliferous, dense.
2612.5 – 2617.5	95	SHALE – as above; becoming slightly lighter colored and slightly more calcareous in part, more calcite constituent in white vein / fracture fill material, rare black carbonaceous / bituminous streaks.
	05	LIMESTONE – as above.

SAMPLE RECORD / C-31

INTERVAL (metres)	LITH (%)	DESCRIPTION
2617.5 – 2620	90	SHALE – dark grey with presence very dark grey laminae, sub-fissile, hard, slightly calcareous with calcareous streaks, trace calcite and quartz veins / fracture infill.
	05	EVAPORITE – frosted white with pinkish stain, fine to medium grain size Calcispheres, rounded to well rounded, high sphericity, medium hard to soft, calcareous, unconsolidated in sample, presence insoluble residue (barite).
	05	LIMESTONE – light to medium mottled greyish brown, microcrystalline, blocky, hard, slightly argillaceous, slightly dolomitic, parts fossiliferous, trace calcite veins, dense to trace porosity.
2620 – 2622.5	50	SHALE – dark grey to slightly greenish grey colored with some very darker colored laminations, slightly silky / phyllitic texture, slightly calcareous, trace calcite and quartz veining, rare very hard cherty streaks, trace slickensides trace Limestone stringers.
	50	EVAPORITE – translucent to frosted white with reddish veining and patchy staining in part, fine to coarse micro-crystalline size grains and fine to medium sized partly euhedral crystals, medium hard to soft, some slightly limy.
2622.5 – 2627.5	95	SHALE – becoming very dark to dark grey, sub-fissile to fissile very slightly to slightly calcareous with trace limy streaks, micro-micaceous, slightly silty in part, presence (20%) clear and milky calcite veins and rhombs and quartz veins and prisms, rare pyrite crystal clusters, rare black bituminous laminae, trace slickensides.
	05	EVAPORITE – as above; clear frosted white, to pale grey and tan, fine to coarse grains and crystals.

SAMPLE RECORD / C-31

INTERVAL (metres)	LITH (%)	DESCRIPTION
2627.5 – 2629.5	90	SHALE – dark grey with common very dark grey laminae, sub-fissile to fissile, hard, slightly to very slightly calcareous, trace to rare pyrite, rare black carbonaceous / bituminous streaks, trace calcite veins and filled micro fractures, rare quartz prisms.
	10	LIMESTONE – medium to light grey brown, micro-crystalline to very fine crystalline, hard, argillaceous, trace calcite veins and fossil replacements, rare pyritized Crinoid remains.
2629.5		**TOTAL DEPTH – 311.2 mm / 244.5 mm O.D.** **FIRST INTERMEDIATE HOLE / CASING**
2629.5 – 2632.5	20	SHALE – dark grey with very dark grey greasy cleavages, hard, very slightly calcareous, slightly micro-micaceous, trace to rare black partings, rare white specks, trace calcite veins.
	80	CEMENT – buff colored, fine to medium sized micro-crystalline to cryptocrystalline grains, hard, trace calcite veins / fossil remains, rare pyrite, dense to trace organic type porosity
2632.5 – 2635	45	SHALE – dark grey with very dark grey partings, as above.
	55	CEMENT – buff colored, fine to medium sized micro-crystalline to cryptocrystalline grains, hard, trace calcite veins / fossil remains, rare pyrite, dense to trace organic type porosity
2635 – 2640	80	SHALE – very dark to dark grey, sub-fissile, hard, very slightly calcareous, trace micro-micaceous, rare pyrite, rare to trace calcite veins.
	20	CEMENT – buff colored, fine to medium sized micro-crystalline to cryptocrystalline grains, hard, trace calcite veins / fossil remains, rare pyrite, dense to trace organic type porosity

SAMPLE RECORD / C-31

INTERVAL (metres)	LITH (%)	DESCRIPTION
2640 – 2647.5	90	SHALE – very dark to dark grey with very dark grey to black greasy cleavages, sub-fissile to fissile, hard to medium hard, very slightly calcareous, slightly micro-micaceous, rare pyrite, rare calcite veins, rare slickensides.
	20	CEMENT – buff colored, fine to medium sized micro-crystalline to cryptocrystalline grains, hard, trace calcite veins / fossil remains, rare pyrite, dense to trace organic type porosity
2647.5 – 2652.5	95	SHALE – dark grey with some very dark grey streaks, sub-fissile to fissile, some medium grey colored soft flaky interbeds.
	05	CEMENT – buff colored, fine to medium sized micro-crystalline to cryptocrystalline grains, hard, trace calcite veins / fossil remains, rare pyrite, dense to trace organic type porosity
2652.5 – 2657.5	100	SHALE – dark to part very dark grey, sub-fissile to fissile, hard, very slightly calcareous, trace to rare calcite veins, minor Limestone.
2657.5 – 2660	100	SHALE – dark to medium dark grey to slightly olive grey colored, sub-fissile to fissile, hard, brittle, non calcareous to very slightly calcareous, trace micro-micaceous, some dark laminations.
2660 – 2662.5	100	SHALE – as above; trace to presence (10%) white colored crystalline calcite.
2662.5 – 2670	100	SHALE – as above; trace to rare calcite, trace to presence very dark brownish grey to black colored slightly pyritic bituminous laminations, trace to presence light grey colored, soft flaky laminae.
2670 – 2672.5	100	SHALE – dark grey to slightly olive grey colored, sub-fissile, hard, very slightly calcareous, trace very hard tabular siliceous laminations, presence (15%) white colored crystalline calcite and quartz material.

SAMPLE RECORD / C-31

INTERVAL (metres)	LITH (%)	DESCRIPTION
2672.5 – 2675	100	SHALE – as above; dark to medium dark color, presence white crystalline calcite with trace drusy / euhedral rhombs (10%), and milky crystalline quartz with trace clear prisms (10%), rare slickensides.
2675 – 2682.5	100	SHALE – as above trace (3 - 5%) white crystalline material, trace slickensides.
2682.5 – 2687.5	100	SHALE – as above; strong trace (10%) white colored crystalline calcite and quartz, greater quartz component.
2687.5 – 2690	100	SHALE – dark grey to slightly olive grey, sub-fissile, hard, brittle, very slightly calcareous, presence to common (35%) white colored crystalline calcite (¾), and milk colored crystalline quartz (1/4), traces clear drusy / euhedral crystals, trace to poor intercrystalline / fracture porosity.
2690 – 2695	100	SHALE – medium dark grey to slightly olive grey colored, some dark to very dark laminations, sub-fissile, hard, non calcareous, presence to common (30%) white crystalline vein / fracture infill material, rare to trace drusy crystals, trace slickensides, trace fracture porosity.
2695 – 2697.5	100	SHALE – as above; becoming slightly darker colored with common slightly bituminous laminae, sub fissile to slightly blocky habit, trace calcite healed micro fractures, calcite / quartz crystals (20%), trace black pyritic bitumen partings.
2697.5 – 2705	100	SHALE – dark to medium\m dark grey to slightly olive grey, trace very dark laminae, sub-fissile to fissile, slightly platy, slightly waxy lustre with greasy laminae, hard, very slight to non calcareous, trace very fine disseminated pyrite crystals, trace (10%) calcite / quartz crystallization, trace slickensides.
2705 – 2712.5	100	SHALE – as above; becoming mostly dark colored, slightly micro-micaceous, trace white crystals, rare fossil remains (Brachiopod).

SAMPLE RECORD / C-31

INTERVAL (metres)	LITH (%)	DESCRIPTION
2712.5 – 2715	100	SHALE – as above; slightly more blocky habit, some very hard siliceous streaks, trace milky white quartz.
2715 – 2720	100	SHALE – as above; dark grey to olive grey with very dark laminae, rare to trace pyrite crystal blebs.
2720 – 2722.5	100	SHALE – as above; sub-fissile to blocky, siliceous, trace calcite / quartz, trace soft black pyrobitumen parting / coating, trace slickensides.
2722.5 – 2730.75	100	SHALE – dark grey to slightly olive grey colored with trace very dark colored cleavages, sub-fissile to fissile, slightly waxy lustre, hard, brittle, non calcareous, trace very hard tabular siliceous laminae, trace to rare white colored calcite / quartz crystals.
2730.75		**TOTAL DEPTH C-31**
		MILLED CASING WINDOW at 2366.8 m K.B. FOR COMMENCEMENT of SIDETRACK NO. 1

SAMPLE RECORD / C-31A SIDETRACK NO. 1

INTERVAL (metres)	LITH (%)	DESCRIPTION
2366.8		**BASE OF INTERMEDIATE CASING WINDOW**
2366.8-2370		NO SAMPLE RECORD
2370 – 2375	30	CEMENT – speckled light grey to tan colored, soft, limy, with abundant buff colored loose fine to medium Calcium Carbonate grains.
	70	SHALE – dark to medium dark grey, sub-fissile to blocky, hard to medium hard, slightly calcareous, trace lighter colored Claystone partings, rare pyrite, trace calcite veins.
2375 – 2385	25	CEMENT – as above; mostly Calcium Carbonate grains.
	75	SHALE – very dark grey, sub-fissile, hard, brittle, slightly siliceous, trace pyrite, trace to rare calcite veins, trace blocky hard siliceous interbeds.
2385 – 2392.5	80	SHALE –dark grey with some very dark grey waxy laminae, sub-fissile to fissile, hard, slightly micro-micaceous, rare to trace calcite veins, rare light colored Claystone, rare black carbonaceous partings.
	20	CEMENT – as above; mostly Calcium Carbonate grains.
2392.5 – 2397.5	85	SHALE – medium dark to dark grey, trace to presence very dark grey carbonaceous / bituminous cleavages, blocky to sub-fissile, slightly calcareous, trace micro-micaceous, trace calcite veins, trace to rare pyrite.
	15	CEMENT – as above.

SAMPLE RECORD / C-31A SIDETRACK NO. 1

INTERVAL (metres)	LITH (%)	DESCRIPTION
2397.5 – 2405	90	SHALE – dark to medium dark grey to slightly brownish grey, blocky, hard, siliceous, slightly carbonaceous / bituminous, rare silty streaks.
	10	CEMENT – as above.
2405 – 2410	80	SHALE – very dark grey to slightly brownish grey, blocky to subfissile, hard, slightly silty to silty, part very siliceous, trace pyrite crystals, rare to trace crystalline calcite and rarely quartz, rare black carbonaceous partings.
	10	SILTSTONE – dark to medium dark grey, blocky, hard, slightly calcareous / dolomitic, very argillaceous, micro-micaceous, tight.
	10	CEMENT – speckled white to light grey and tan colored, soft, limy, chalky texture.
2410 – 2415	90	SHALE – medium dark grey to slightly brownish grey, sub-fissile to blocky, slightly siliceous, slightly bituminous, trace calcite filled micro-fractures, some Siltstone interbeds.
	10	CEMENT – speckled white to light grey and tan colored, soft, limy, chalky texture.
2415 – 2420	50	SHALE – very dark grey to dark grey, sub-fissile to blocky, hard, trace siliceous, trace cherty in part, trace to presence very dark grey to black bituminous / carbonaceous cleavages, rare pyrite, trace micro-fractures, trace white calcite material.
	30	SILTSTONE – medium dark slightly brownish grey, blocky, hard to very hard, siliceous, trace calcareous / dolomitic, micro-micaceous, tight.
	20	CEMENT – speckled white to light grey and tan colored, soft, limy, chalky texture.

SAMPLE RECORD / C-31A SIDETRACK NO. 1

INTERVAL (metres)	LITH (%)	DESCRIPTION
2420 – 2425	65	SHALE – dark to medium dark grey, blocky to sub-fissile, hard, micro-micaceous, as above; some very hard brittle interbeds, silty streaks.
	25	SILTSTONE – predominantly medium grey, blocky, hard, very argillaceous.
	10	CEMENT – speckled white to light grey and tan colored, soft, limy, chalky texture.
2425 – 2430	75	SHALE – very dark to dark grey with presence very dark greasy carbonaceous / bituminous laminae, sub-fissile, hard, micro-micaceous, very slightly calcareous, siliceous, trace to rare frosted white crystalline calcite vein and fracture fill material, rare crystalline quartz.
	25	CEMENT – speckled white to light grey and tan colored, soft, limy, chalky texture, minor buff fine to medium Calcium Carbonate grains, trace mica flakes.
2430 – 2435	80	SHALE – dark grey to very dark grey, rare greenish streaks, blocky to sub-fissile, hard, trace micro-micaceous, siliceous, silty, trace sandy streaks, trace finely disseminated pyrite, common micro-fractures with calcite fill material, rare milky crystalline quartz, trace fracture porosity.
	20	CEMENT – speckled white to light grey and tan colored, soft, limy, chalky texture.
2435 – 2445	80	SHALE – dark to very dark grey to very slightly brownish grey, sub-fissile, hard, brittle, siliceous, slightly silty, trace white crystalline calcite and quartz, rare disseminated pyrite, rare phosphate nodules.
	20	CEMENT – speckled white to light grey and tan colored, soft, limy, chalky texture.

SAMPLE RECORD / C-31A SIDETRACK NO. 1

INTERVAL (metres)	LITH (%)	DESCRIPTION
2445 – 2450	85	SHALE – dark to medium dark grey, sub-fissile to fissile, hard, siliceous, slightly silty, very slightly calcareous, trace frosted white calcite and quartz crystals, rare clear quartz prisms, trace marly silty micaceous interbeds.
	15	CEMENT – speckled white to light grey and tan colored, soft, chalky texture.
2450		**TOTAL DEPTH – C-31A SIDETRACK NO. 1**

SAMPLE RECORD / C-31A SIDETRACK NO. 2

INTERVAL (metres)	LITH (%)	DESCRIPTION
2300.0		**BASE OF INTERMEDIATE CASING WINDOW**
2300 – 2302.5	40	METAL – silvery to brassy to bluish colored casing filings.
	25	CEMENT – speckled light grey to tan colored, soft, limy, with abundant buff colored loose fine to medium Calcium Carbonate grains.
	25	SHALE – medium to medium dark grey, sub-fissile to blocky, hard to medium hard, slightly calcareous, trace lighter colored Claystone partings, rare pyrite, trace calcite vein
	10	.SANDSTONE – frosted quartz with reddish stain, fine to coarse grains, loose in sample.
2302.5 – 2307.5	5	METAL – as above.
	20	CEMENT – speckled white to tan with common fine to medium sized Calcium Carbonate grains.
	55	SHALE – medium to medium dark grey, blocky to sub-fissile, hard to medium hard, slightly siliceous, trace light colored Claystone laminations, rare pyritized Crinoid.
	20	SANDSTONE – frosted white quartz with reddish stain and feldspar grains, fine to coarse grains, sub-rounded, moderately well sorted, loose in sample, poor porosity.

SAMPLE RECORD / C-31A SIDETRACK NO. 2

INTERVAL (metres)	LITH (%)	DESCRIPTION
2307.5 – 2310	65	SHALE – medium light grey, sub-fissile, medium hard to hard, trace white soft chalky streaks, rare pyrite, slightly micro-micaceous, common (35%) shiny black colored, sub-fissile, soft, brittle, very carbonaceous grading to COAL.
	15	CEMENT – as above; common Calcium Carbonate.
	20	SANDSTONE – as above.
2310 – 2311	100	SHALE – medium grey, grading to medium greenish grey in small part, subfissile and blocky, micromicaceous, micro fractured in small part – rare amounts of clear upper medium size fragments of cryptocrystalline calcite and silica spar – micro fracture infill, well indurated.
	Trace	METAL
	Trace	MUD ADDITIVE – barite.
2311 – 2312.5	97	SHALE - medium grey, grading to medium greenish grey in small part, subfissile, grading to blocky in part, micromicaceous in part, rare amounts of scattered clear mica flakes, exhibits smaller degree of micro fracturing than above interval – less spar evident in this interval, very well indurated.
	02	METAL
	01	CEMENT

SAMPLE RECORD / C-31A SIDETRACK NO. 2

INTERVAL (metres)	LITH (%)	DESCRIPTION
2312.5 – 2315	94	SHALE - medium grey, grading to light greenish grey in small part, subfissile, fissile and splintery in small part, micromicaceous in part, micro fractured in small part – rare amounts of clear upper medium size fragments of cryptocrystalline calcite and silica spar – micro fracture infill, very well indurated.
	05	METAL
	01	CEMENT
2315 – 2317.5	96	SHALE - medium and light grey, subfissile, minor amounts of blocky, micromicaceous in part, rare amounts of white calcite veining, micro fractured in small part – rare amounts of clear upper medium and lower coarse size fragments of cryptocrystalline calcite and silica spar – micro fracture infill, well indurated.
	03	CEMENT
	01	METAL
2317.5 – 2320	96	SHALE - medium and light grey, subfissile and fissile, generally as above, well indurated.
	03	CEMENT
	01	METAL
2320 – 2322.5	94	SHALE - medium grey, minor amounts of light grey, subfissile and fissile, becoming splintery in small part, less microfracturing evident in this interval, rare amounts of medium grey calcareous marlstone laminae, well indurated.
	05	CEMENT
	01	METAL

SAMPLE RECORD / C-31A SIDETRACK NO. 2

INTERVAL (metres)	LITH (%)	DESCRIPTION
2322.5 – 2325	96	SHALE - medium grey, occasional amounts of light grey, subfissile, minor amounts of blocky, micromicaceous in part, no microfracturing evident in this interval, rare amounts of medium grey calcareous marlstone laminae, well to very well indurated.
	03	CEMENT
	01	METAL – casing.
2325 – 2327.5	92	SHALE - medium grey, rare amounts of light grey, subfissile to fissile, micromicaceous in part, no microfracturing evident in this interval, well indurated.
	07	CEMENT
	01	METAL – casing.
2327.5 – 2330	94	SHALE - medium and light grey, subfissile to fissile, micromicaceous in part, no microfracturing evident in this interval, well indurated.
	05	CEMENT
	01	METAL – casing.
2330		**TOTAL DEPTH – C-31A SIDETRACK NO. 2**
		CEMENT PLUG SET FROM 2301.0 m K.B to 2330.0 m K.B FOR SIDETRACK No. 3

SAMPLE RECORD / C-31A SIDETRACK NO. 3

INTERVAL (metres)	LITH (%)	DESCRIPTION
2300		**BASE OF INTERMEDIATE CASING WINDOW**
2301.0		**TOP OF CEMENT PLUG**
		TIME DRILL ON CEMENT PLUG
2301 – 2302	95	CEMENT
	05	SHALE – medium grey, subfissile, minor fissile, micromicaceous in small part, very well indurated.
2302.2 – 2302.5	80	CEMENT
	19	SHALE – medium grey, grading to light grey, subfissile, minor blocky, micromicaceous in small part, rare amounts of black micro to silt size specks scattered throughout, well indurated.
	01	METAL
2302.5 – 2305	85	SHALE – light and medium grey, subfissile to fissile, micromicaceous in small part, rare amounts of black micro to silt size specks scattered throughout, moderately indurated.
	15	CEMENT
	Trace	METAL

SAMPLE RECORD / C-31A SIDETRACK NO. 3

INTERVAL (metres)	LITH (%)	DESCRIPTION
2305 – 2306	95	SHALE – light and medium grey, subfissile to fissile, minor blocky, micromicaceous in small part, rare amounts of black micro to silt size specks scattered throughout, becoming micro fractured in this interval – occasional amounts (<1% disaggregated spar) clear to white cryptocrystalline to lower fine crystalline calcite spar / veining, well indurated.
	05	CEMENT
	Trace	METAL
2306 – 2307.5	87	SHALE – medium grey, grading to light grey in part, subfissile to blocky, micromicaceous in small part, rare amounts of black micro to silt size specks scattered throughout, becoming increasingly micro fractured in this interval – occasional amounts (<2% disaggregated spar) clear to white cryptocrystalline calcite and rare silica spar / veining, well indurated.
	08	CEMENT
	04	MARLSTONE – medium brown and medium grayish brown, lithographic, calcareous, well indurated.
	01	METAL

SAMPLE RECORD / C-31A SIDETRACK NO. 3

INTERVAL (metres)	LITH (%)	DESCRIPTION
2307.5		**END OF TIME DRILL OPERATIONS, COMMENCE DIRECTIONAL DRILLING OPERATIONS**
2307.5-2310	95	SHALE – medium grey, subfissile to fissile, minor blocky, micromicaceous in small part, rare amounts of black micro to silt size specks and very thin streaks scattered throughout, becoming less micro fractured in this interval – rare to trace amounts (<1% disaggregated spar) clear to white cryptocrystalline to lower fine crystalline calcite spar / veining, well indurated.
	03	CEMENT
	02	MARLSTONE – medium brown and medium grayish brown, lithographic, calcareous, well indurated.
	Trace	METAL
2310-2312.5	80	SHALE – light and medium grey, subfissile to blocky, micromicaceous in small part, well indurated.
	20	CEMENT
	Trace	MARLSTONE – medium brown and medium grayish brown, lithographic, calcareous, well indurated.
	Trace	METAL

SAMPLE RECORD / C-31A SIDETRACK NO. 3

INTERVAL (metres)	LITH (%)	DESCRIPTION
2312.5-2315	85	SHALE – medium grey, minor amounts of light grey, subfissile to fissile, very finely laminated to a moderate degree, becoming increasingly fractured in this interval, occasional amounts (<3% disaggregated spar) white to clear lower coarse to lower very coarse crystalline calcite spar, crystal habit truncated, well indurated.
	10	MARLSTONE – medium brown and medium grayish brown, silty, calcareous, well indurated.
	05	CEMENT
	Trace	METAL
2315-2317.5	96	SHALE – medium grey, occasional amounts of light grey, subfissile, minor blocky, well indurated.
	03	MARLSTONE – medium brown and medium tan, silty, calcareous, well indurated.
	01	CEMENT
	Trace	METAL
2317.5-2320	97	SHALE – medium grey, subfissile, minor fissile, rare amounts of small scale microfracturing, trace (<1% disaggregated spar) amounts of white cryptocrystalline calcite spar, well indurated.
	02	MARLSTONE – medium brown and medium tan, calcareous, well indurated.
	01	CEMENT
	Trace	METAL

SAMPLE RECORD / C-31A SIDETRACK NO. 3

INTERVAL (metres)	LITH (%)	DESCRIPTION
2320-2322.5	99	SHALE – medium grey, subfissile, minor blocky, well indurated.
	01	CEMENT
	Trace	MARLSTONE – medium brown and medium tan, calcareous, well indurated.
	Trace	METAL
2322.5-2325	99	SHALE – medium grey, subfissile, minor blocky, occasional amounts of small scale microfracturing – (<1% disaggregated spar) clear to white cryptocrystalline to upper fine crystalline calcite spar and veining, well indurated.
	01	CEMENT
	Trace	MARLSTONE – medium brown and medium tan, calcareous, well indurated.
	Trace	METAL
2325-2330	100	SHALE – medium grey, subfissile, well indurated.
	Trace	MARLSTONE – medium brown and medium tan, calcareous, well indurated.
2330 – 2332.5	100	SHALE – medium grey, subfissile, minor fissile, trace amounts of small scale microfracturing, (<1% disaggregated spar) white cryptocrystalline calcite spar and veining, well indurated.
	Trace	METAL

SAMPLE RECORD / C-31A SIDETRACK NO. 3

INTERVAL (metres)	LITH (%)	DESCRIPTION
2332.5 – 2335	100	SHALE – medium grey, subfissile, minor fissile, well indurated.
	Trace	METAL
2335 – 2337.5	100	SHALE – medium grey, subfissile, minor fissile, trace light grey bentonitic claystone laminae, well indurated.
	Trace	SILTSTONE – light grey, quartzose, rare medium grey lithic fragments, silica cement, very argillaceous, well indurated.
	Trace	METAL
2337.5 – 2340	100	SHALE – medium grey, subfissile, minor fissile, trace light grey bentonitic claystone laminae, well indurated.
	Trace	METAL
2340 – 2345	99	SHALE – medium grey, subfissile, minor blocky, trace light grey bentonitic claystone laminae, well indurated.
	01	METAL
2345 – 2350	98	SHALE – medium grey, subfissile, minor fissile, rare amounts of small scale microfracturing (<1% disaggregated spar) white cryptocrystalline to lower coarse crystalline silica spar, rare amounts of scattered micro to lower very fine crystalline pyrite, well indurated.
	02	MARLSTONE – medium to dark brown, silty in part, calcareous, well indurated.
	Trace	METAL

SAMPLE RECORD / C-31A SIDETRACK NO. 3

INTERVAL (metres)	LITH (%)	DESCRIPTION
2350 – 2352.5	100	SHALE – medium grey, subfissile, silty in small part, well indurated.
	Trace	METAL
2352.5 – 2355	100	SHALE – medium grey, subfissile, minor blocky, rare amounts of small scale microfracturing (<1% disaggregated spar) white upper medium to lower coarse crystalline calcite spar, well indurated.
	Trace	METAL
2355 – 2357.5	100	SHALE – medium grey, subfissile, minor blocky, rare amounts of upper coarse size pyrite inclusions – clusters of pyrite exhibiting a lower to upper fine crystalline equant habit, well indurated.
	Trace	METAL
2357.5 – 2362	98	SHALE – medium grey, subfissile, minor blocky, occasional amounts of light grey bentonitic claystone laminae, rare amounts of small scale microfracturing (<1% disaggregated spar) white upper medium to lower coarse crystalline calcite spar, rare amounts of upper coarse size pyrite inclusions – clusters of pyrite exhibiting a lower to upper fine crystalline equant habit, well indurated.
	02	SILTSTONE – medium grey, quartzose, rare silica cement, very argillaceous, moderately to poorly indurated.
2362		**TRIP FOR DRILL BIT – BECOME STUCK IN HOLE AT 2349.0 m K.B.**

SAMPLE RECORD / C-31A SIDETRACK NO. 3

INTERVAL (metres)	LITH (%)	DESCRIPTION
2362 – 2363	99	SHALE – medium grey, subfissile, minor blocky, very slightly micromicaceous, rare amounts of slickensides, moderately developed amounts of small scale microfracturing (<3% disaggregated spar) – micro to 1 mm width micro fracture planes evident, non intersecting, brecciated to small degree – rare amounts of floating micro to upper fine to lower very coarse size angular medium grey shale lithic fragments floating in spar, micro fractures predominantly lined with white upper very coarse crystalline silica spar, occasional amounts of microcrystalline dolomite spar, dolomite spar represented as a surficial stain on the silica crystals, alteration sequence along fracture planes is silica, then dolomite, rare amounts of disseminated / micro pyrite dispersed throughout, well indurated.
	01	SILTSTONE – light grey, quartzose, rare amounts of micro / disseminated pyrite dispersed throughout, rare amounts of dark mica flakes, silica cement, argillaceous, well indurated.

SAMPLE RECORD / C-31A SIDETRACK NO. 3

INTERVAL (metres)	LITH (%)	DESCRIPTION
2363 – 2365	98	SHALE – medium grey, subfissile, minor fissile, very slightly micromicaceous and rare amounts of mica flakes, slickensides becoming increasingly evident in this interval, moderately to well developed amounts of small scale microfracturing (<4% disaggregated spar) – becoming increasingly microfractured in this interval, micro to 1 mm width micro fracture planes evident, non intersecting, brecciated to small degree – rare amounts of floating micro to upper fine size medium grey shale lithic fragments floating in spar, micro fractures predominantly lined with white upper very coarse crystalline silica spar, occasional amounts of microcrystalline to upper coarse crystalline calcite spar, and light greyish green fibrous chlorite, alteration sequence along fracture planes is chlorite, calcite, then silica, occasional amounts of disseminated / micro pyrite dispersed throughout, well indurated.
	02	SILTSTONE – medium grey, grading to light grey, quartzose, occasional amounts of micro / disseminated pyrite dispersed throughout, rare amounts of dark mica flakes, silica cement, argillaceous, well indurated.
	Trace	METAL

SAMPLE RECORD / C-31A SIDETRACK NO. 3

INTERVAL (metres)	LITH (%)	DESCRIPTION
2365 – 2367.5	100	SHALE – medium grey, subfissile, minor blocky, generally as above, becoming silty in part, trace amounts of light grey bentonitic claystone laminae developed, slickensides becoming less evident in this interval, moderately to well developed amounts of small scale microfracturing (<4% disaggregated spar) – as above, micro to 3 mm width micro fracture planes evident, non and intersecting, brecciated to small degree – rare amounts of floating micro to upper fine size medium grey shale lithic fragments floating in spar, micro fractures predominantly lined with white upper very coarse crystalline silica spar, occasional amounts of microcrystalline to upper coarse crystalline calcite spar, and light greyish green fibrous chlorite, alteration sequence along fracture planes is as above, proportion of calcite spar within the fracture planes is increasing, occasional amounts of disseminated / micro pyrite dispersed throughout, well indurated.
	Trace	METAL

SAMPLE RECORD / C-31A SIDETRACK NO. 3

INTERVAL (metres)	LITH (%)	DESCRIPTION
2367.5 – 2370	97	SHALE – medium grey, subfissile and fissile, becoming silty in part, micromicaceous in part, trace amounts of light grey bentonitic claystone laminae developed, slickensides becoming increasingly evident in this interval, moderately to well developed amounts of small scale microfracturing (<3% disaggregated spar) minor amounts of lined micro fracture planes evident, non intersecting, brecciated to small degree – rare amounts of floating micro to upper medium size medium grey shale lithic fragments floating in spar, micro fractures predominantly lined with white upper coarse crystalline silica spar, occasional amounts of microcrystalline to upper coarse crystalline calcite spar, and rare amounts of light greyish green fibrous chlorite, alteration sequence along fracture planes is as above, proportion of chlorite is decreasing in this interval, minor amounts of disseminated / micro pyrite dispersed throughout, generally increasing in this interval, well indurated.
	03	SILTSTONE – medium grey, quartzose, rare amounts of micro to upper very fine size black organic specks, rare amounts of disseminated pyrite, silica cement, argillaceous, well indurated.

SAMPLE RECORD / C-31A SIDETRACK NO. 3

INTERVAL (metres)	LITH (%)	DESCRIPTION
2370 – 2372.5	100	SHALE – medium grey, occasional amounts of light grey, subfissile and fissile, blocky in large part, mcromicaceous in part, trace amounts of light grey bentonitic claystone laminae developed, slickensides becoming increasingly evident in this interval, moderately developed amounts of small scale microfracturing (<2% disaggregated spar) minor amounts of lined micro fracture planes evident, non intersecting, brecciated to small degree – rare amounts of floating micro to upper medium size medium grey shale lithic fragments floating in spar, micro fractures predominantly lined with white upper fine to upper coarse crystalline silica spar, occasional amounts of microcrystalline to upper coarse crystalline calcite spar, and rare amounts of light greyish green fibrous chlorite, alteration sequence along fracture planes is as above, proportion of chlorite is decreasing in this interval, minor amounts of disseminated / micro pyrite and pyrite veining dispersed throughout, proportion of pyrite generally increasing in this interval, well indurated.
	Trace	SILTSTONE – medium grey, quartzose, rare amounts of micro to upper very fine size black organic specks, rare amounts of disseminated pyrite, silica cement, argillaceous, well indurated.

SAMPLE RECORD / C-31A SIDETRACK NO. 3

INTERVAL (metres)	LITH (%)	DESCRIPTION
2372.5 – 2380	96-99	SHALE – medium grey, rare amounts of light grey, subfissile and fissile, blocky in large part, micromicaceous in part, more micromicaceous than above interval, rare amounts of black organic microlaminations, slickensides less evident in this interval, but generally increasing in proportion down section, moderately developed amounts of small scale microfracturing (<2% disaggregated spar) minor amounts of lined micro fracture planes evident, non intersecting, brecciated to small degree – rare amounts of floating micro to upper medium size medium grey shale lithic fragments floating in spar, micro fractures predominantly lined with white upper fine to upper coarse crystalline silica spar, rare amounts of microcrystalline to upper coarse crystalline calcite spar, and very rare amounts of light greyish green fibrous chlorite, alteration sequence along fracture planes is as above, proportion of chlorite is decreasing in this interval, minor amounts of disseminated / micro pyrite and pyrite veining dispersed throughout, proportion of pyrite generally decreasing in this interval, well indurated.
	01-02	SILTSTONE – medium grey, quartzose, rare amounts of micro to upper very fine size black organic specks, rare amounts of disseminated pyrite, silica cement, argillaceous, well indurated.
	Trace-01	CLAYSTONE – light brown, light grayish brown, earthy, very bentonitic, poorly indurated.
	Trace	MARLSTONE – medium to dark tan, calcareous, well indurated.

SAMPLE RECORD / C-31A SIDETRACK NO. 3

INTERVAL (metres)	LITH (%)	DESCRIPTION
2380 – 2382.5	53	SHALE – medium grey, subfissile and fissile, blocky in large part, micromicaceous in part, becoming more micromicaceous than above interval, rare amounts of black organic microlaminations, slickensides more evident in this interval, moderately developed amounts of small scale microfracturing (<3% disaggregated spar) minor amounts of lined micro fracture planes evident, non intersecting, brecciated to small degree – rare amounts of floating micro to upper medium size medium grey shale lithic fragments floating in spar, micro fractures predominantly lined with white lower medium to upper coarse crystalline silica spar, rare amounts of microcrystalline to upper coarse crystalline calcite spar, and very rare amounts of light greyish green fibrous chlorite, alteration sequence along fracture planes is as above, proportion of chlorite is increasing slightly in this interval, minor amounts of disseminated / micro pyrite and pyrite veining dispersed throughout, proportion of pyrite generally increasing in this interval, well indurated.
	45	CLAYSTONE – light brown, light grayish brown, earthy, very bentonitic, poorly indurated.
	01	SILTSTONE – medium grey, quartzose, rare amounts of micro to upper very fine size black organic specks, rare amounts of disseminated pyrite, silica cement, argillaceous, well indurated.
	01	MARLSTONE – medium tan, calcareous, well indurated.

SAMPLE RECORD / C-31A SIDETRACK NO. 3

INTERVAL (metres)	LITH (%)	DESCRIPTION
2382.5 – 2385	99	SHALE – medium grey, subfissile and fissile, micromicaceous in part, rare amounts of black organic microlaminations and specks, minor slickensides, poorly developed amounts of small scale microfracturing (<1% disaggregated spar) occasional amounts of lined micro fracture planes evident, non intersecting, micro fractures predominantly lined with white cryptocrystalline calcite spar, rare amounts of disseminated / micro pyrite dispersed throughout, proportion of pyrite decreasing in this interval, well indurated.
	01	SILTSTONE – medium grey, quartzose, rare amounts of microcrystalline black organic specks, rare amounts of disseminated pyrite, silica cement, argillaceous, well indurated.
	Trace	CLAYSTONE – light brown, light grayish brown, earthy, very bentonitic, poorly indurated.
2385 – 2387.5	96	SHALE – medium grey, subfissile and blocky, micromicaceous in part, rare amounts of black organic microlaminations and specks, minor slickensides, poorly developed amounts of small scale microfracturing (<1% disaggregated spar) occasional amounts of lined micro fracture planes evident, non intersecting, micro fractures predominantly lined with white cryptocrystalline calcite spar, rare amounts of disseminated / micro pyrite dispersed throughout, proportion of pyrite increasing in this interval, well indurated.
	02	SILTSTONE – medium grey, quartzose, rare amounts of microcrystalline black organic specks, rare amounts of disseminated pyrite, silica cement, argillaceous, well indurated.
	02	CLAYSTONE – light brown, light grayish brown, earthy, very bentonitic, poorly indurated.

SAMPLE RECORD / C-31A SIDETRACK NO. 3

INTERVAL (metres)	LITH (%)	DESCRIPTION
2387.5 – 2392.5	100	SHALE – medium grey, subfissile and blocky, micromicaceous in part, rare amounts of black organic microlaminations and specks, minor slickensides, poorly developed amounts of small scale microfracturing (<1% disaggregated spar) occasional amounts of lined micro fracture planes evident, non intersecting, micro fractures predominantly lined with white cryptocrystalline calcite spar, rare amounts of disseminated / micro pyrite dispersed throughout, rare amounts of siderite nodules, well indurated.
	Trace	SILTSTONE – medium grey, medium brownish grey, quartzose, rare amounts of microcrystalline black organic specks, rare amounts of disseminated pyrite, silica cement, rare amounts of siderite cement, argillaceous, well indurated.
	Trace	CLAYSTONE – light brown, light grayish brown, earthy, very bentonitic, poorly indurated.
2392.5 – 2395	100	SHALE – medium grey, subfissile and blocky, micromicaceous in part, rare amounts of black organic microlaminations, minor slickensides, poorly developed amounts of small scale microfracturing (<1% disaggregated spar) occasional amounts of lined micro fracture planes evident, non intersecting, micro fractures predominantly lined with white cryptocrystalline calcite spar, rare amounts of disseminated / micro pyrite dispersed throughout, well indurated.

SAMPLE RECORD / C-31A SIDETRACK NO. 3

INTERVAL (metres)	LITH (%)	DESCRIPTION
2395 – 2397.5	96	SHALE – medium grey, subfissile and blocky, micromicaceous in part, rare amounts of black organic microlaminations, minor slickensides, poorly developed amounts of small scale microfracturing (<1% disaggregated spar) very rare amounts of lined micro fracture planes evident, non intersecting, micro fractures predominantly lined with white cryptocrystalline calcite spar, rare amounts of disseminated / micro pyrite dispersed throughout, well indurated.
	04	CLAYSTONE – light brown and light grayish brown, very bentonitic, micaceous in part, poorly indurated.
	Trace	MARLSTONE – medium tan, calcareous, silicified, very well indurated.
2397.5 – 2400	98	SHALE – medium grey, grading to dark grey in small part, subfissile and blocky, micromicaceous, rare amounts of black organic microlaminations, minor slickensides, no evidence of microfracturing, rare amounts of disseminated / micro pyrite dispersed throughout, well indurated.
	01	SILTSTONE – medium to dark grey, quartzose, rare black organic specks, silica cement, argillaceous, very well indurated.
	01	METAL
	Trace	CLAYSTONE – light brown and light grayish brown, very bentonitic, micaceous in part, poorly indurated.

SAMPLE RECORD / C-31A SIDETRACK NO. 3

INTERVAL (metres)	LITH (%)	DESCRIPTION
2400 – 2402.5	100	SHALE – medium grey, grading to dark grey in small part, subfissile, minor fissile, micromicaceous, becoming silty in small part, rare amounts of black organic microlaminations and specks, minor slickensides, no evidence of microfracturing, rare amounts of disseminated / micro pyrite dispersed throughout, well indurated.
	Trace	SILTSTONE – medium to dark grey, quartzose, rare black organic specks, silica cement, argillaceous, very well indurated.
	Trace	CLAYSTONE – light brown and light grayish brown, very bentonitic, micaceous in part, poorly indurated.
2402.5 – 2405	75	SHALE – medium grey, grading to dark grey in large part, becoming dark grey colored in this interval, subfissile, minor fissile, micromicaceous, becoming silty in small part, occasional amounts of black organic microlaminations and specks, black organic microlaminations increasing, minor slickensides, poorly developed amounts of small scale microfracturing (<1% disaggregated spar) rare amounts of lined micro fracture planes evident, non intersecting, micro fractures predominantly lined with white upper fine to lower medium crystalline calcite spar, occasional amounts of disseminated / micro pyrite dispersed throughout, generally proportion of pyrite increasing in this interval, well indurated.
	24	SILTSTONE – medium to dark grey, minor amounts of medium brownish grey, quartzose, minor black organic specks – up to upper very fine size, rare amounts of clear mica flakes, silica cement, occasional calcite cement, rare amounts of disseminated micro pyrite, argillaceous, very well indurated.
	01	CLAYSTONE – light brown and light grayish brown, very bentonitic, micaceous in part, poorly indurated.

SAMPLE RECORD / C-31A SIDETRACK NO. 3

INTERVAL (metres)	LITH (%)	DESCRIPTION
2405 – 2407.5	70	SHALE – medium grey, grading to medium brownish grey and dark grey in part, rare amounts of black, subfissile, minor fissile, micromicaceous, generally as above, becoming bituminous and phosphatic in small part, increase in proportion of disseminated micro pyrite, poorly developed amounts of small scale microfracturing (<1% disaggregated spar) rare amounts of lined micro fracture planes evident, non intersecting, micro fractures predominantly lined with white upper fine to lower coarse crystalline calcite spar, rare amounts of upper very coarse to granule size pyrite fragments, well indurated.
	20	SILTSTONE – medium to dark grey, minor amounts of medium brownish grey and black, as above, becoming bituminous and phosphatic in part, rare amounts of clear mica flakes, silica cement, occasional calcite cement, increase in proportion of disseminated micro pyrite, very well indurated.
	10	MARLSTONE – medium brownish grey, very silicified, pyritic in part – minor amounts of disseminated and micro pyrite dispersed throughout, very well indurated.

SAMPLE RECORD / C-31A SIDETRACK NO. 3

INTERVAL (metres)	LITH (%)	DESCRIPTION
2407.5 – 2412.5	85-90	SHALE – medium brownish grey, occasional dark grey, rare black, subfissile, minor fissile, micromicaceous, micaceous in part, silty in part, occasional amounts of black organic microlaminations and specks, slickensided, poorly developed amounts of small scale microfracturing (<1% disaggregated spar) rare amounts of lined micro fracture planes evident, non intersecting, micro fractures predominantly lined with white upper coarse to lower very coarse crystalline calcite spar, locally becoming pyritic, both disseminated and micro pyrite, occasional amounts of very fine crystalline pyrite clusters, well indurated.
	10-15	SILTSTONE – medium to dark grey, minor amounts of medium brownish grey and black, as above, very well indurated.
	Trace	MARLSTONE – medium brownish grey, very silicified, pyritic in part – minor amounts of disseminated and micro pyrite dispersed throughout, very well indurated.
2412.5 – 2415	95	SHALE – medium brownish grey, occasional dark grey, rare dark brownish grey, subfissile, minor fissile, becoming splintery in small part, micromicaceous, silty in part, rare amounts of black organic microlaminations and specks, slickensided in small part, no evidence of microfracturing, pyritic in small part, both disseminated and micro pyrite, well indurated.
	05	SILTSTONE – medium to dark grey, minor amounts of medium brownish grey and black, as above, very well indurated.

SAMPLE RECORD / C-31A SIDETRACK NO. 3

INTERVAL (metres)	LITH (%)	DESCRIPTION
2415 – 2417.5	100	SHALE – medium brownish grey, occasional dark grey, rare dark brownish grey, subfissile, minor fissile, becoming splintery in small part, micromicaceous, silty in part, rare amounts of black organic microlaminations and specks, slickensided in small part, no evidence of microfracturing, pyritic in small part, both disseminated and micro pyrite, less pyritic than above interval, well indurated.
	Trace	SILTSTONE – medium to dark grey, minor amounts of medium brownish grey and black, as above, very well indurated.
2417.5 – 2420	97	SHALE – medium grey, occasional dark grey, subfissile, minor blocky, rare amounts of black organic microlaminations and specks, occasionally slickensided in small part, poorly developed amounts of small scale microfracturing (<1% disaggregated spar) rare amounts of lined micro fracture planes evident, intersecting, micro fractures predominantly lined with white cryptocrystalline to lower coarse crystalline calcite and silica spar, localized medium grey shale lithic inclusions within the spar, rare disseminated and micro pyrite, well indurated.
	02	MARLSTONE – medium brownish grey, calcareous, silicified, very well indurated.
	01	MUD ADDITIVE
	Trace	SILTSTONE – medium to dark grey, minor amounts of medium brownish grey and black, as above, very well indurated.

SAMPLE RECORD / C-31A SIDETRACK NO. 3

INTERVAL (metres)	LITH (%)	DESCRIPTION
2420 – 2422.5	95	SHALE – medium grey, occasional dark grey, subfissile, minor blocky, rare amounts of black organic microlaminations and specks, occasionally slickensided in small part, exhibits higher degree of microfracturing in this interval, moderately developed amounts of small scale microfracturing (<3% disaggregated spar) rare amounts of lined micro fracture planes evident, intersecting, micro fractures predominantly lined with white cryptocrystalline to clear upper medium to upper very coarse crystalline silica and occasional calcite spar, brecciated - localized medium grey shale lithic inclusions within the spar, rare disseminated and micro pyrite, rare upper very fine crystalline pyrite clusters, well indurated.
	03	SILTSTONE – dark grey, grading to black, quartzose, occasional black organic micro specks – phosphate grains(?), silica cement, minor amounts of disseminated pyrite, bituminous in large part, very well indurated.
	01	MARLSTONE – medium brownish grey, calcareous, silicified, very well indurated.
	01	MUD ADDITIVE

SAMPLE RECORD / C-31A SIDETRACK NO. 3

INTERVAL (metres)	LITH (%)	DESCRIPTION
2422.5 – 2425	95	SHALE – medium grey, occasional dark grey, subfissile, minor blocky, rare amounts of black organic microlaminations and specks, becoming increasingly slickensided in this interval, poorly developed microfracturing in this interval, rare amounts of small scale microfracturing (<1% disaggregated spar) rare amounts of lined micro fracture planes evident, as above, microfractures predominantly lined with white cryptocrystalline to clear upper very coarse crystalline silica and occasional calcite spar, localized medium grey shale lithic inclusions within the spar, occasional disseminated and micro pyrite, becoming increasingly pyritic in this interval, well indurated.
	03	SILTSTONE – dark grey, grading to black, quartzose, occasional black organic micro specks – phosphate grains(?), silica cement, minor amounts of disseminated pyrite, bituminous in large part, very well indurated.
	01	MARLSTONE – medium brownish grey, calcareous, silicified, very well indurated.
	01	MUD ADDITIVE

SAMPLE RECORD / C-31A SIDETRACK NO. 3

INTERVAL (metres)	LITH (%)	DESCRIPTION
2425 – 2430	95	SHALE – medium grey, occasional dark grey, subfissile, minor blocky, rare amounts of black organic microlaminations and specks, slickensided in small part, poorly developed microfracturing in this interval, rare amounts of small scale microfracturing (<1% disaggregated spar) rare amounts of lined micro fracture planes evident, as above, microfractures predominantly lined with white cryptocrystalline to clear upper coarse crystalline calcite and minor silica spar, occasional disseminated and micro pyrite, rare very coarse size subrounded pyrite grains down section, well indurated.
	05	SILTSTONE – dark grey, grading to black in part, quartzose, rare black organic micro specks, silica cement, rare amounts of disseminated pyrite, bituminous in part, very well indurated.
	Trace	MARLSTONE – medium brownish grey, calcareous, silicified, very well indurated.
2430 – 2432.5	80	SHALE – medium grey, occasional dark grey, subfissile, minor blocky, rare amounts of black organic microlaminations and specks, slickensided in small part, poorly developed microfracturing in this interval, rare amounts of small scale microfracturing, rare amounts of very thin lined micro fracture planes evident, microfractures predominantly lined with white cryptocrystalline calcite spar, occasional disseminated and micro pyrite, well indurated.
	20	SILTSTONE – dark grey, grading to black in part, quartzose, rare black organic micro specks, silica cement, rare amounts of disseminated pyrite, bituminous in small part, very well indurated.
	Trace	MARLSTONE – medium brownish grey, calcareous, silicified, very well indurated.

SAMPLE RECORD / C-31A SIDETRACK NO. 3

INTERVAL (metres)	LITH (%)	DESCRIPTION
2432.5 – 2435	85	SHALE – medium grey, occasional dark grey, subfissile, minor blocky, rare amounts of black organic microlaminations and specks, slickensided in small part, no evidence of microfracturing, occasional disseminated and micro pyrite, well indurated.
	15	SILTSTONE – dark grey, quartzose, rare black organic micro specks, silica cement, rare amounts of disseminated pyrite, very well indurated.
2435 – 2437.5	80	SHALE – medium grey, grading to dark grey, occasional black, subfissile, minor blocky, rare amounts of black organic microlaminations and specks, slickensided in small part, no evidence of microfracturing, occasional disseminated and micro pyrite, well indurated.
	20	SILTSTONE – medium and dark grey, quartzose, rare black organic micro specks, silica cement, rare amounts of disseminated pyrite, very well indurated.
2437.5 – 2440	70	SHALE – medium grey, grading to medium brownish grey, occasional dark grey, subfissile, minor blocky, rare amounts of black organic microlaminations and specks, slickensided in small part, no evidence of microfracturing, occasional disseminated and micro pyrite, well indurated.
	20	MARLSTONE – medium to dark brownish grey, very calcareous, silty in part, well indurated.
	10	SILTSTONE – medium and dark grey, quartzose, rare black organic micro specks, silica and calcite cement, rare amounts of disseminated pyrite, very well indurated.

SAMPLE RECORD / C-31A SIDETRACK NO. 3

INTERVAL (metres)	LITH (%)	DESCRIPTION
2440 – 2442.5	80	SHALE – medium grey, grading to dark grey in part, dark grey, subfissile, minor blocky, rare amounts of black organic microlaminations and specks, localized black organic patches, slickensided in small part, poorly developed microfracturing in this interval (<1% disaggregated spar), rare amounts of micro fracture planes evident, microfractures predominantly lined with white very coarse crystalline calcite spar, exhibiting increased microfracturing in this interval, occasional disseminated and micro pyrite, well indurated.
	10	MARLSTONE – medium to dark brownish grey, very calcareous, silty in part, well indurated.
	10	SILTSTONE – medium and dark grey, quartzose, rare black organic micro specks, silica and calcite cement, rare amounts of disseminated pyrite, argillaceous, well indurated.
2442.5 – 2445	75	SHALE – medium to dark grey, occasional medium brownish grey, subfissile, rare amounts of black organic microlaminations and specks, slickensided in small part, poorly developed microfracturing in this interval (<1% disaggregated spar), rare amounts of micro fracture planes evident, microfractures predominantly lined with white upper coarse to upper very coarse crystalline calcite spar, occasional disseminated and micro pyrite, well indurated.
	15	MARLSTONE – medium to dark brownish grey, very calcareous, silty in part, well indurated.
	10	SILTSTONE – medium and dark grey, quartzose, rare black organic micro specks, silica and calcite cement, rare amounts of disseminated pyrite, argillaceous, well indurated.

SAMPLE RECORD / C-31A SIDETRACK NO. 3

INTERVAL (metres)	LITH (%)	DESCRIPTION
2445 – 2447.5	75	SHALE – medium to dark grey, occasional medium brownish grey and black, subfissile, becoming increasingly organic / bituminous in this interval, occasional amounts of black organic microlaminations and specks, increasingly slickensided – irregular striated surfaces present, moderately developed microfracturing in this interval (<2% disaggregated spar), occasional amounts of micro fracture planes evident, irregular, intersecting and non intersection microfractures predominantly lined with white upper fine to upper coarse crystalline calcite, then silica spar, occasional disseminated and micro pyrite, well indurated.
	15	MARLSTONE – medium to dark brownish grey, very calcareous, silty, well indurated.
	10	SILTSTONE – medium to light brownish grey, grading to medium and dark grey, mottled, quartzose, rare black organic micro specks, calcite and silica cement, rare amounts of disseminated pyrite, argillaceous, bituminous, well indurated.

SAMPLE RECORD / C-31A SIDETRACK NO. 3

INTERVAL (metres)	LITH (%)	DESCRIPTION
2447.5 – 2450	70	SHALE – medium to dark grey, minor medium brownish grey and black, subfissile, becoming increasingly organic / bituminous in this interval, occasional amounts of black organic microlaminations and specks, and localized patchy sections, localized occurrences of black mica flakes, increasingly slickensided – irregular striated surfaces present, well developed microfracturing in this interval (<5% disaggregated spar), common amounts of micro fracture planes evident, irregular, intersecting and non intersection microfractures predominantly lined with white cryptocrystalline upper fine to upper coarse crystalline calcite, occasional disseminated and micro pyrite and upper very fine crystalline pyrite clusters, well indurated.
	20	MARLSTONE – medium to dark brownish grey, very calcareous, silty, well indurated.
	10	SILTSTONE – medium to light brownish grey, grading to medium and dark grey, mottled, quartzose, rare black organic micro specks, localized occurrences of black mica flakes, calcite and silica cement, rare amounts of disseminated pyrite, argillaceous, bituminous, well indurated.

SAMPLE RECORD / C-31A SIDETRACK NO. 3

INTERVAL (metres)	LITH (%)	DESCRIPTION
2450 – 2455	75-80	SHALE – medium to dark grey, minor medium brownish grey and black, subfissile, generally as above, exhibiting a decrease in proportion of slickensides and microfracturing – generally moderately to poorly developed (2%-3% disaggregated spar – as above), microfractures decreasing down section over this interval, calcareous in small part, occasional disseminated and micro pyrite and upper very fine crystalline pyrite clusters, well indurated.
	10-15	MARLSTONE – medium to dark brownish grey, very calcareous, silty, pyritic in part, well indurated.
	10	SILTSTONE – medium to light brownish grey, grading to medium and dark grey, mottled, quartzose, rare black organic micro specks, localized occurrences of black mica flakes, calcite and silica cement, rare amounts of disseminated pyrite, argillaceous, bituminous, well indurated.

SAMPLE RECORD / C-31A SIDETRACK NO. 3

INTERVAL (metres)	LITH (%)	DESCRIPTION
2455 – 2457.5	75	SHALE – medium to dark grey, minor medium brownish grey and black, subfissile, occasional amounts of black organic microlaminations and specks, calcareous in small part, slickensided – irregular striated surfaces present, poorly developed microfracturing in this interval (<1% disaggregated spar), rare amounts of micro fracture planes evident, irregular, intersecting and non intersection microfractures predominantly lined with white cryptocrystalline upper fine to upper coarse crystalline calcite, occasional disseminated and micro pyrite and upper very fine crystalline pyrite clusters, occasional coarse to very coarse and granule size pyrite grains, well indurated.
	20	MARLSTONE – medium to dark brownish grey, very calcareous, silty, pyritic, well indurated.
	05	SILTSTONE – medium to light brownish grey, grading to medium and dark grey, mottled, quartzose, rare black organic micro specks, calcite and silica cement, rare amounts of disseminated pyrite, argillaceous, bituminous, well indurated.

SAMPLE RECORD / C-31A SIDETRACK NO. 3

INTERVAL (metres)	LITH (%)	DESCRIPTION
2457.5 – 2460	90	SHALE – medium to dark grey, grading to black, subfissile, becoming increasingly organic / bituminous in this interval, common amounts of black organic microlaminations and specks, calcareous in small part, very slickensided – irregular striated surfaces present, poorly developed microfracturing in this interval (<2% disaggregated spar), rare amounts of micro fracture planes evident, irregular, intersecting and non intersection microfractures predominantly lined with white cryptocrystalline upper fine to upper coarse crystalline calcite and rare silica spar, occasional disseminated and micro pyrite and upper very fine crystalline pyrite veining, well indurated.
	10	MARLSTONE – medium to dark brownish grey, very calcareous, silty, pyritic, well indurated.
	Trace	SILTSTONE – medium to light brownish grey, grading to medium and dark grey, mottled, quartzose, rare black organic micro specks, calcite and silica cement, rare amounts of disseminated pyrite, argillaceous, bituminous, well indurated.

SAMPLE RECORD / C-31A SIDETRACK NO. 3

INTERVAL (metres)	LITH (%)	DESCRIPTION
2460 – 2462.5	90	SHALE – medium grey, minor dark grey, occasional black, subfissile, minor fissile, locally becoming increasingly pyritic, calcareous – becoming increasingly calcareous in this interval, organic / bituminous in small part, rare amounts of black organic microlaminations and specks, slickensided – irregular striated surfaces present, poorly developed microfracturing in this interval (<1% disaggregated spar), rare amounts of micro fracture planes evident, irregular, intersecting and non intersection microfractures predominantly lined with white cryptocrystalline upper fine to upper coarse crystalline calcite spar, common amounts of disseminated and micro pyrite dispersed throughout, well indurated.
	10	MARLSTONE – medium to dark brownish grey, very calcareous, silty, pyritic, well indurated.
	Trace	SILTSTONE – medium to light brownish grey, grading to medium and dark grey, mottled, quartzose, rare black organic micro specks, calcite and silica cement, occasional amounts of disseminated pyrite, argillaceous, bituminous, well indurated.

SAMPLE RECORD / C-31A SIDETRACK NO. 3

INTERVAL (metres)	LITH (%)	DESCRIPTION
2462.5 – 2467.5	100	SHALE – medium grey, minor dark grey, occasional black, subfissile, minor blocky and splintery, pyritic, slightly calcareous, organic / bituminous in small part, rare amounts of black organic microlaminations and specks, slickensided – irregular striated surfaces present, well developed microfracturing and fracturing in this interval (<10% disaggregated spar), rare amounts of micro fracture planes evident, irregular, intersecting and non intersecting microfractures predominantly lined with white cryptocrystalline calcite spar and pyrite in small part, fracture plane lined with white to light greyish white and beige, cryptocrystalline to upper fine, and minor amounts of upper medium crystalline silica spar, then upper medium to upper coarse crystalline calcite spar, locally fracture is brecciated – floating upper medium to upper very coarse size angular medium grey shale lithic fragments enclosed by spar, common amounts of disseminated and micro pyrite dispersed throughout, poor fracture porosity, well indurated.
	Trace	MARLSTONE – medium to dark brownish grey, very calcareous, silty, pyritic, well indurated.
	Trace	SILTSTONE – medium to light brownish grey, grading to medium and dark grey, mottled, quartzose, rare black organic micro specks, calcite and silica cement, occasional amounts of disseminated pyrite, argillaceous, bituminous, well indurated.

SAMPLE RECORD / C-31A SIDETRACK NO. 3

INTERVAL (metres)	LITH (%)	DESCRIPTION
2467.5 – 2470	100	SHALE – medium grey, minor dark grey, occasional black, subfissile, minor blocky and splintery, pyritic, slightly calcareous and dolomitic in part, organic / bituminous in small part, rare amounts of black organic microlaminations and specks, slickensided – irregular striated surfaces present, moderately developed microfracturing and fracturing in this interval (<4% disaggregated spar), rare amounts of micro fracture planes evident, irregular, intersecting and non intersecting microfractures predominantly lined with white cryptocrystalline calcite spar, fracture plane lined with white to light greyish white cryptocrystalline to upper fine, and minor amounts of upper medium crystalline calcite spar, locally fracture is brecciated to a small degree – rare floating upper medium to upper very coarse size angular medium grey shale lithic fragments enclosed by spar, common amounts of disseminated and micro pyrite dispersed throughout, poor fracture porosity, well indurated.
	Trace	MARLSTONE – medium to dark brownish grey, very calcareous, silty, pyritic, well indurated.
	Trace	SILTSTONE – medium to light brownish grey, grading to medium and dark grey, mottled, quartzose, rare black organic micro specks, calcite and silica cement, occasional amounts of disseminated pyrite, argillaceous, bituminous, well indurated.

SAMPLE RECORD / C-31A SIDETRACK NO. 3

INTERVAL (metres)	LITH (%)	DESCRIPTION
2470 – 2472.5	100	SHALE – medium grey, minor dark grey and medium brownish grey, rare black, subfissile to fissile, minor blocky, dolomitic in part, organic / bituminous in small part, rare amounts of black organic microlaminations and specks, slickensided – irregular striated surfaces present, no evidence of microfracturing, common amounts of disseminated and micro pyrite dispersed throughout, well indurated.
	Trace	MARLSTONE – medium to dark brownish grey, very dolomitic, silty, pyritic, well indurated.
2472.5 – 2477.5	100	SHALE – medium grey, minor dark grey and medium brownish grey, rare black, subfissile to fissile, minor blocky, dolomitic in part, becoming less dolomitic down section, organic / bituminous in small part, rare amounts of black organic microlaminations and specks, slickensided – irregular striated surfaces present, no evidence of microfracturing, common amounts of disseminated and micro pyrite dispersed throughout, well indurated.
	Trace	MARLSTONE – medium to dark brownish grey, very dolomitic, silty, pyritic, well indurated.
2477.5 – 2480	98	SHALE – medium grey, minor dark grey and medium brownish grey, rare black, subfissile to fissile, minor blocky, dolomitic in part, organic / bituminous in small part, rare amounts of black organic microlaminations and specks, slickensided in small part, common amounts of disseminated and micro pyrite dispersed throughout, well indurated.
	02	MARLSTONE – medium to dark brownish grey, very dolomitic, silty, pyritic, well indurated.

SAMPLE RECORD / C-31A SIDETRACK NO. 3

INTERVAL (metres)	LITH (%)	DESCRIPTION
2480 – 2482.5	98	SHALE – medium grey, occasional dark grey, rare black, generally as above, becoming increasingly dolomitic, slight increase in organic content - bituminous in small part, rare to occasional amounts of black organic microlaminations and specks, slickensided in small part, common amounts of disseminated and micro pyrite dispersed throughout, well indurated.
	02	MARLSTONE – medium brownish grey, very dolomitic, silty, pyritic, rare amounts of micro fossil detritus, well indurated.
2482.5 – 2487.5	100	SHALE – medium grey, rare dark grey, subfissile, micromicaceous, very rare amounts of black organic microlaminations and specks, slickensided in small part, occasional amounts of disseminated and micro pyrite dispersed throughout, well indurated.
	Trace	MARLSTONE – medium grey, dolomitic, silty, pyritic, well indurated.
2487.5 – 2490	98	SHALE – medium grey, rare dark grey, subfissile, micromicaceous, slickensided in small part, dolomitic in part, occasional amounts of disseminated and micro pyrite dispersed throughout, well indurated.
	02	MARLSTONE – medium grey, dolomitic, pyritic, well indurated.

SAMPLE RECORD / C-31A SIDETRACK NO. 3

INTERVAL (metres)	LITH (%)	DESCRIPTION
2490 – 2492.5	97	SHALE – medium grey, rare dark grey, subfissile, micromicaceous, dolomitic, becoming increasingly dolomitic in this interval, slightly organic / bituminous in small part, rare amounts of black organic microlaminations and specks, slickensided in small part, poorly developed microfracturing in this interval (<1% disaggregated spar), rare amounts of micro fracture planes evident, irregular, non intersecting microfractures predominantly lined with white cryptocrystalline to upper medium crystalline calcite and rare dolomite spar, common amounts of disseminated and micro pyrite dispersed throughout, well indurated.
	03	MARLSTONE – medium grey, dolomitic, pyritic, well indurated.
2492.5 – 2495	100	SHALE – medium grey, rare dark grey, subfissile, micromicaceous, slightly dolomitic, becoming less dolomitic in this interval, slightly organic / bituminous in small part, rare amounts of black organic microlaminations and specks, slickensided in small part, poorly developed microfracturing in this interval – as above, rare amounts of disseminated and micro pyrite dispersed throughout, well indurated.
	Trace	MARLSTONE – medium grey, dolomitic, pyritic, well indurated.
2495 – 2497.5	95	SHALE – medium grey, rare dark grey and black, subfissile, micromicaceous, slightly dolomitic, very slightly organic / bituminous in small part, rare amounts of black organic microlaminations and specks, slickensided in small part, poorly developed microfracturing in this interval – as above, occasional amounts of disseminated and micro pyrite dispersed throughout, well indurated.
	05	MARLSTONE – medium grey, dolomitic, pyritic, well indurated.

SAMPLE RECORD / C-31A SIDETRACK NO. 3

INTERVAL (metres)	LITH (%)	DESCRIPTION
2497.5 – 2500	97	SHALE – medium grey, subfissile, micromicaceous, dolomitic, very slightly organic / bituminous in small part, very rare amounts of black organic microlaminations, slickensided in small part, poorly no evidence of microfracturing in this interval, occasional amounts of disseminated and micro pyrite dispersed throughout, rare amounts of very coarse size pyrite grains, well indurated.
	03	MARLSTONE – medium grey, occasional medium brown and medium tan, dolomitic, calcareous in part, locally very silty, pyritic, well indurated.
2500 – 2502.5	100	SHALE – medium grey, subfissile, micromicaceous, dolomitic, very slightly organic / bituminous in small part, very rare amounts of black organic microlaminations, slickensided in small part, poorly developed microfracturing (<1% disaggregated spar), microfractures lined with white to light greyish white cryptocrystalline to lower medium crystalline calcite spar, rare amounts of disseminated and micro pyrite dispersed throughout, well indurated.
	Trace	MARLSTONE – medium grey, occasional medium brown and medium tan, dolomitic, calcareous in part, pyritic, well indurated.

SAMPLE RECORD / C-31A SIDETRACK NO. 3

INTERVAL (metres)	LITH (%)	DESCRIPTION
2502.5 – 2505	100	SHALE – medium grey, grading to dark grey, rare amounts of black, subfissile, micromicaceous, dolomitic in small part, slightly organic / bituminous in small part, very rare amounts of black organic microlaminations, slickensided in small part, poorly developed microfracturing – no disaggregated spar, very thin micro fractures – irregular, sealed with light grey cryptocrystalline to upper very fine crystalline silica spar, occasional amounts of disseminated and micro pyrite dispersed throughout, generally more pyritic in this interval, well indurated.
	Trace	MARLSTONE – medium grey, occasional medium brown and medium tan, dolomitic, calcareous in part, pyritic, well indurated.
	Trace	SILTSTONE – medium to dark grey and black in part, quartzose, organic, silica and minor amounts of dolomite cement, pyritic, argillaceous, very well indurated.
2505 – 2507.5	97	SHALE – medium grey, grading to dark grey, subfissile, micromicaceous, dolomitic in part, slightly organic / bituminous in small part, very rare amounts of black organic microlaminations, slickensided in small part, poorly developed microfracturing – <1%) disaggregated spar, sealed with light grey cryptocrystalline to upper fine crystalline silica spar, occasional amounts of disseminated and micro pyrite dispersed throughout, well indurated.
	03	MARLSTONE – medium grey, dolomitic, pyritic in part, well indurated.
	Trace	SILTSTONE – medium to dark grey and black in part, quartzose, organic, silica and minor amounts of dolomite cement, pyritic, argillaceous, very well indurated.

SAMPLE RECORD / C-31A SIDETRACK NO. 3

INTERVAL (metres)	LITH (%)	DESCRIPTION
2507.5 – 2510	97	SHALE – medium grey, grading to dark grey, rare amounts of black, subfissile, micromicaceous, dolomitic in part, organic / bituminous in small part, becoming more organic in this interval, occasional amounts of black organic microlaminations, slickensided in small part, poorly developed microfracturing – <1%) disaggregated spar, sealed with light grey cryptocrystalline to upper fine to upper coarse crystalline calcite spar, occasional amounts of disseminated and micro pyrite dispersed throughout, well indurated.
	03	MARLSTONE – medium grey, grading to dark tan, dolomitic, pyritic in part, well indurated.
	Trace	SILTSTONE – medium to dark grey and black in part, quartzose, organic in part, silica and minor amounts of dolomite cement, pyritic, argillaceous, well indurated.
2510 – 2512.5	98	SHALE – medium grey, subfissile, micromicaceous, dolomitic in part, organic / bituminous in small part, rare amounts of black organic microlaminations, slickensided in small part, no evidence of microfracturing, occasional amounts of disseminated and micro pyrite dispersed throughout, rare amounts of coarse size pyrite grains, well indurated.
	02	MARLSTONE – medium grey, dolomitic, pyritic in part, well indurated.
2512.5– 2515	100	SHALE – medium grey, grading to dark grey in small part, fissile to subfissile, micromicaceous, organic / bituminous in part, becoming more organic in this interval, occasional amounts of black organic microlaminations, slickensided in small part, no evidence of microfracturing, occasional amounts of disseminated and micro pyrite dispersed throughout, well indurated.

SAMPLE RECORD / C-31A SIDETRACK NO. 3

INTERVAL (metres)	LITH (%)	DESCRIPTION
2502.5 – 2505	100	SHALE – medium grey, grading to dark grey, rare amounts of black, subfissile, micromicaceous, dolomitic in small part, slightly organic / bituminous in small part, very rare amounts of black organic microlaminations, slickensided in small part, poorly developed microfracturing – no disaggregated spar, very thin micro fractures – irregular, sealed with light grey cryptocrystalline to upper very fine crystalline silica spar, occasional amounts of disseminated and micro pyrite dispersed throughout, generally more pyritic in this interval, well indurated.
	Trace	MARLSTONE – medium grey, occasional medium brown and medium tan, dolomitic, calcareous in part, pyritic, well indurated.
	Trace	SILTSTONE – medium to dark grey and black in part, quartzose, organic, silica and minor amounts of dolomite cement, pyritic, argillaceous, very well indurated.
2505 – 2507.5	97	SHALE – medium grey, grading to dark grey, subfissile, micromicaceous, dolomitic in part, slightly organic / bituminous in small part, very rare amounts of black organic microlaminations, slickensided in small part, poorly developed microfracturing – <1%) disaggregated spar, sealed with light grey cryptocrystalline to upper fine crystalline silica spar, occasional amounts of disseminated and micro pyrite dispersed throughout, well indurated.
	03	MARLSTONE – medium grey, dolomitic, pyritic in part, well indurated.
	Trace	SILTSTONE – medium to dark grey and black in part, quartzose, organic, silica and minor amounts of dolomite cement, pyritic, argillaceous, very well indurated.

SAMPLE RECORD / C-31A SIDETRACK NO. 3

INTERVAL (metres)	LITH (%)	DESCRIPTION
2507.5 – 2510	97	SHALE – medium grey, grading to dark grey, rare amounts of black, subfissile, micromicaceous, dolomitic in part, organic / bituminous in small part, becoming more organic in this interval, occasional amounts of black organic microlaminations, slickensided in small part, poorly developed microfracturing – <1%) disaggregated spar, sealed with light grey cryptocrystalline to upper fine to upper coarse crystalline calcite spar, occasional amounts of disseminated and micro pyrite dispersed throughout, well indurated.
	03	MARLSTONE – medium grey, grading to dark tan, dolomitic, pyritic in part, well indurated.
	Trace	SILTSTONE – medium to dark grey and black in part, quartzose, organic in part, silica and minor amounts of dolomite cement, pyritic, argillaceous, well indurated.
2510 – 2512.5	98	SHALE – medium grey, subfissile, micromicaceous, dolomitic in part, organic / bituminous in small part, rare amounts of black organic microlaminations, slickensided in small part, no evidence of microfracturing, occasional amounts of disseminated and micro pyrite dispersed throughout, rare amounts of coarse size pyrite grains, well indurated.
	02	MARLSTONE – medium grey, dolomitic, pyritic in part, well indurated.
2512.5 – 2515	100	SHALE – medium grey, grading to dark grey in small part, fissile to subfissile, micromicaceous, organic / bituminous in part, becoming more organic in this interval, occasional amounts of black organic microlaminations, slickensided in small part, no evidence of microfracturing, occasional amounts of disseminated and micro pyrite dispersed throughout, well indurated.

SAMPLE RECORD / C-31A SIDETRACK NO. 3

INTERVAL (metres)	LITH (%)	DESCRIPTION
2515 – 2517.5	97	SHALE – medium grey, occasional amounts of dark grey, fissile to subfissile, micromicaceous, dolomitic, slightly organic / bituminous in part, rare amounts of black organic microlaminations, slickensided in small part, no evidence of microfracturing, occasional amounts of disseminated and micro pyrite dispersed throughout, well indurated.
	03	MARLSTONE – medium brownish grey, dolomitic, silty, pyritic in large part, well indurated.
2517.5 – 2520	98	SHALE – medium grey, rare amounts of dark grey, fissile, minor subfissile, micromicaceous, slickensided in small part, no evidence of microfracturing, rare amounts of disseminated and micro pyrite dispersed throughout, well indurated.
	02	MARLSTONE – medium brownish grey, dolomitic, silty, slightly pyritic, well indurated.
2520 – 2522.5	96	SHALE – medium grey, rare amounts of dark grey, subfissile to blocky, micromicaceous, slickensided in small part, no evidence of microfracturing, rare amounts of disseminated and micro pyrite dispersed throughout, well indurated.
	04	MARLSTONE – medium brownish grey, calcareous, siliceous, slightly pyritic, well indurated.

SAMPLE RECORD / C-31A SIDETRACK NO. 3

INTERVAL (metres)	LITH (%)	DESCRIPTION
2522.5 – 2525	100	SHALE – medium grey, rare amounts of dark grey, subfissile to blocky, micromicaceous, dolomitic in part, slickensided in small part, rare amounts of small scale microfracturing, irregular microfractures sealed with light greyish white upper very fine crystalline calcite and rare pyrite, rare amounts of disseminated and micro pyrite dispersed throughout, rare amounts of pyrite clusters – very fine crystalline, and rounded pyrite framboids, well indurated.
	Trace	MARLSTONE – medium brownish grey, calcareous, slightly pyritic, well indurated.
2525 – 2527.5	100	SHALE – medium grey, grading to dark grey in small part, rare amounts of black, subfissile to blocky, micromicaceous, micaceous in small part, slickensided to moderate degree, poorly developed microfractures, rare amounts of small scale microfracturing, irregular microfractures sealed with light greyish white upper very fine to upper medium crystalline calcite spar, occasional amounts of disseminated and micro pyrite dispersed throughout, rare amounts of pyrite clusters – very fine crystalline, well indurated.
	Trace	MARLSTONE – medium brownish grey, calcareous, slightly pyritic, well indurated.

SAMPLE RECORD / C-31A SIDETRACK NO. 3

INTERVAL (metres)	LITH (%)	DESCRIPTION
2527.5-2728		Circulate up bottom hole sample. EDR depth record concerns – drill bit depth reading 0.5 m greater than hole depth value at 2527.5 metres hole depth record, then advanced and/or corrected hole depth record to equal bit depth record. Missing meterage record interpreted to be possibly due to drill string pipe squat, while working hole and then conducting a flow check. EDR record indicates the 0.20 metre drill time records for 2527.6 , 2527.8 and 2528.0 m, occurred while drill bit was off bottom. A drilling fluid loss occurred - approximately 3 metres cube – interpreted to be squeezed or mechanically induced into the formation due to high mud density while drilling this interval, and not the resultant of a fracture zone – bottom hole sample indicated rare amounts of spar occurrence.
2528 – 2530	98	SHALE – medium grey, grading to dark grey in small part, subfissile to fissile, splintery in small part, micromicaceous, slickensided to moderate degree, poorly developed microfractures, rare amounts of small scale microfracturing, irregular microfractures sealed with light greyish white upper very fine to upper medium crystalline calcite spar, rare amounts of disseminated and micro pyrite dispersed throughout, well indurated.
	02	MARLSTONE – medium brownish grey, calcareous, slightly pyritic, well indurated.

SAMPLE RECORD / C-31A SIDETRACK NO. 3

INTERVAL (metres)	LITH (%)	DESCRIPTION
2530 – 2540	97-98	SHALE – medium grey, grading to dark grey in part, rare amounts of black down section, subfissile to fissile, micromicaceous, becoming organic / bituminous in small part, very thin black organic microlaminations throughout, slickensided in part, poorly developed microfractures, rare amounts of small scale microfracturing, irregular microfractures sealed with light greyish white upper very fine to upper fine crystalline calcite spar, rare amounts of disseminated and micro pyrite dispersed throughout, rare amounts of upper very fine crystalline pyrite clusters, well indurated.
	02-03	MARLSTONE – medium brownish grey, dolomitic, slightly pyritic, locally exhibits very small scale irregular microfractures – sealed with white and light greyish white microcrystalline to lower very fine crystalline calcite spar, well indurated.

SAMPLE RECORD / C-31A SIDETRACK NO. 3

INTERVAL (metres)	LITH (%)	DESCRIPTION
2540 – 2547.5	92-93	SHALE – medium grey, grading to dark grey, occasional black, subfissile to fissile, micromicaceous, becoming organic / bituminous, very thin black organic microlaminations, specks, and streaks throughout, slickensided in part, poorly developed microfractures (<1% disaggregated spar), lined with white and light greyish white cryptocrystalline and upper very coarse crystalline calcite and silica spar, silica spar content increases down section, rare amounts of disseminated and micro pyrite dispersed throughout, rare amounts of upper very fine crystalline pyrite clusters and coarse size pyrite grains, well indurated.
	03-05	SILTSTONE – medium to dark grey, grading to dark greyish black, quartzose, silica cement, minor amounts of calcite cement, bituminous, pyritic, well indurated.
	03-04	MARLSTONE – medium brownish grey, dolomitic, silty, slightly pyritic, locally exhibits very small scale irregular microfractures – sealed with white and light greyish white microcrystalline to lower very fine crystalline calcite spar, well indurated.
	Trace	CLAYSTONE – light grey and light brownish grey, very bentonitic, poorly indurated.

SAMPLE RECORD / C-31A SIDETRACK NO. 3

INTERVAL (metres)	LITH (%)	DESCRIPTION
2547.5 – 2550	85	SHALE – medium grey, grading to dark grey, subfissile to fissile, micromicaceous, becoming organic / bituminous, very thin black organic microlaminations, specks, and streaks throughout, slickensided, poorly developed microfractures, rare amounts of disaggregated spar, lined with white and light greyish white cryptocrystalline and upper very coarse crystalline calcite spar, rare amounts of disseminated and micro pyrite dispersed throughout, well indurated.
	10	CLAYSTONE – light to medium brownish grey, very bentonitic, poorly indurated.
	04	MARLSTONE – medium brownish grey, dolomitic, silty, slightly pyritic, locally exhibits very small scale irregular microfractures – sealed with white and light greyish white microcrystalline to lower very fine crystalline calcite spar, well indurated.
	01	METAL
	Trace	SILTSTONE – medium to dark grey, grading to dark greyish black, as above, pyritic, well indurated.

SAMPLE RECORD / C-31A SIDETRACK NO. 3

INTERVAL (metres)	LITH (%)	DESCRIPTION
2550 – 2552.5	95	SHALE – medium grey, grading to dark grey, subfissile to fissile, splintery in part, micromicaceous, organic / bituminous in part, very thin black organic microlaminations, specks, and streaks, slickensided, poorly developed microfractures, rare amounts of disaggregated spar, lined with white and light greyish white cryptocrystalline and upper very coarse crystalline calcite spar, rare amounts of disseminated and micro pyrite dispersed throughout, well indurated.
	03	MARLSTONE – medium brownish grey, dolomitic, silty, slightly pyritic, locally exhibits very small scale irregular microfractures – sealed with white and light greyish white microcrystalline to lower very fine crystalline calcite spar, brecciated – locally upper coarse size subangular marlstone lithic fragments floating in spar, well indurated.
	02	METAL
	Trace	CLAYSTONE – light to medium brownish grey, as above, poorly indurated.
	Trace	SILTSTONE – medium to dark grey, grading to dark greyish black, as above, pyritic, well indurated.

SAMPLE RECORD / C-31A SIDETRACK NO. 3

INTERVAL (metres)	LITH (%)	DESCRIPTION
2552.5 – 2557.5	97	SHALE – medium grey, grading to dark grey, trace amounts of black, subfissile, minor blocky, becoming splintery in part down section, micromicaceous, organic / bituminous, generally exhibits an increase in proportion of very thin black organic microlaminations, specks, and streaks, slickensided, becoming increasingly slickensided down section, poorly developed microfractures (<1%) disaggregated spar, microfractures lined with white and light greyish white cryptocrystalline, upper fine and upper medium crystalline calcite spar, rare amounts of upper medium to upper coarse crystalline silica spar, rare amounts of disseminated and micro pyrite dispersed throughout, slightly dolomitic, well indurated.
	03	MARLSTONE – medium brownish grey, dolomitic, silty, pyritic, locally exhibits very small scale irregular microfractures – exhibiting brecciated features as above, well indurated.
	Trace	METAL
	Trace	SILTSTONE – medium to dark grey, grading to dark greyish black, as above, pyritic, well indurated.

SAMPLE RECORD / C-31A SIDETRACK NO. 3

INTERVAL (metres)	LITH (%)	DESCRIPTION
2557.5 – 2562.5	98	SHALE – medium grey, grading to dark grey, trace amounts of black, subfissile, minor blocky, becoming splintery in part down section, micromicaceous, organic / bituminous, as above, slickensided, poorly developed microfractures (<1%) disaggregated spar, microfractures lined with white and light greyish white cryptocrystalline, upper fine and upper medium crystalline calcite spar, rare amounts of upper medium to upper coarse crystalline silica spar, rare amounts of black organic residue encrusting crystal faces of spar, rare amounts of disseminated and micro pyrite dispersed throughout, slightly dolomitic, well indurated.
	02	MARLSTONE – medium brownish grey, dolomitic, silty, pyritic, as above, well indurated.
	Trace	METAL
	Trace	SILTSTONE – medium to dark grey, grading to dark greyish black, as above, pyritic, well indurated.
2562.5 – 2565	96	SHALE – medium grey, grading to dark grey, subfissile, micromicaceous, slickensided in small part, poorly developed microfractures – trace amounts of disaggregated spar, microfractures lined with white and light greyish white cryptocrystalline, upper fine and upper coarse crystalline calcite spar, rare amounts of upper medium to upper coarse crystalline silica spar, rare amounts of disseminated and micro pyrite dispersed throughout, slightly dolomitic, well indurated.
	04	MARLSTONE – medium brownish grey, dolomitic, silty, siliceous in part, pyritic, as above, well indurated.

SAMPLE RECORD / C-31A SIDETRACK NO. 3

INTERVAL (metres)	LITH (%)	DESCRIPTION
2565 – 2567.5	100	SHALE – medium grey, grading to dark grey, subfissile, micromicaceous, slickensided in small part, poorly developed microfractures, microfractures lined with white and light greyish white cryptocrystalline calcite spar, rare amounts of disseminated and micro pyrite dispersed throughout, slightly dolomitic, well indurated.
	Trace	MARLSTONE – medium brownish grey, dolomitic, silty, siliceous in part, pyritic, as above, well indurated.
2567.5 – 2572.5	99-100	SHALE – medium grey, grading to dark grey, subfissile, organic / bituminous in small part, rare amounts of very thin black organic microlaminations, slickensided in small part, poorly developed microfractures, microfractures lined with white and light greyish white cryptocrystalline calcite spar, rare amounts of disseminated and micro pyrite dispersed throughout, slightly dolomitic, well indurated.
	Trace-01	METAL
2572.5 – 2575	99-100	SHALE – medium grey, grading to dark grey, subfissile, organic / bituminous in small part, rare amounts of very thin black organic microlaminations, slickensided in small part, poorly developed microfractures, microfractures lined with white and light greyish white cryptocrystalline calcite spar, occasional amounts of disseminated and micro pyrite dispersed throughout, rare lower coarse size pyrite grains, slightly dolomitic, well indurated.
	Trace-01	METAL

SAMPLE RECORD / C-31A SIDETRACK NO. 3

INTERVAL (metres)	LITH (%)	DESCRIPTION
2575 – 2577.5	99-100	SHALE – medium grey, grading to dark grey, subfissile, common fissile, organic / bituminous in small part, rare amounts of very thin black organic microlaminations, slickensided in small part, poorly developed microfractures, microfractures lined with white and light greyish white cryptocrystalline silica and rare calcite spar, occasional amounts of disseminated and micro pyrite dispersed throughout, slightly dolomitic, well indurated.
	Trace-01	METAL
2577.5 – 2580	100	SHALE – medium grey, grading to dark grey, subfissile, organic / bituminous in small part, rare amounts of very thin black organic microlaminations, slickensided in small part, poorly developed microfractures, microfractures lined with white and light greyish white cryptocrystalline silica and rare calcite spar, occasional amounts of disseminated and micro pyrite dispersed throughout, slightly dolomitic, well indurated.
	Trace	MARLSTONE – medium greyish brown, dolomitic, pyritic, well indurated.
	Trace	SILTSTONE – dark grey, grading to black, quartzose, minor black mica flakes, silica and rare calcite cement, bituminous, pyritic, well indurated.
	Trace	METAL

SAMPLE RECORD / C-31A SIDETRACK NO. 3

INTERVAL (metres)	LITH (%)	DESCRIPTION
2580 – 2585	96	SHALE – medium grey, grading to dark grey, occasional black, subfissile, minor fissile, organic / bituminous in part, becoming more organic in this interval, occasional to minor amounts of very thin black organic microlaminations – generally increasing in proportion down section, slickensided in part, poorly developed microfractures – (<1%) disaggregated spar, microfractures lined with white and light greyish white cryptocrystalline silica and calcite spar, occasional amounts of disseminated and micro pyrite dispersed throughout, slightly dolomitic, well indurated.
	02	CLAYSTONE – medium to dark brown, organic, very bentonitic, poorly indurated.
	01	MARLSTONE – medium greyish tan, grading to medium greyish brown, dolomitic, pyritic, becoming siliceous down section, well indurated.
	01	SILTSTONE – dark grey, grading to black, quartzose, minor black mica flakes, silica and rare calcite cement, bituminous, pyritic, well indurated.
	Trace	METAL

SAMPLE RECORD / C-31A SIDETRACK NO. 3

INTERVAL (metres)	LITH (%)	DESCRIPTION
2585 – 2587.5	100	SHALE – medium grey, grading to dark grey, occasional black, subfissile, minor fissile, organic / bituminous in part, generally as above, becoming increasingly micromicaceous, occasional to minor amounts of very thin black organic microlaminations, slickensided in part, poorly developed microfractures, microfractures lined with white and light greyish white cryptocrystalline to upper fine crystalline calcite and fibrous chlorite spar, occasional amounts of disseminated and micro pyrite dispersed throughout, silty in part, slightly dolomitic, well indurated.
2587.5 – 2592.5	100	SHALE – medium grey, grading to dark grey, rare black, subfissile, minor fissile, organic / bituminous in part, generally as above, occasional amounts of very thin black organic microlaminations, slickensided in part, poorly developed microfractures, microfractures lined with white and light greyish white coarse crystalline calcite spar and upper fine crystalline silica spar, rare very fine crystalline pyrite clusters, rare amounts of disseminated and micro pyrite dispersed throughout, becoming more pyritic down section, silty in part, well indurated.
2592.5 – 2595	100	SHALE – medium grey, grading to dark grey, rare black, subfissile, minor fissile, organic / bituminous in part, generally as above, occasional amounts of very thin black organic microlaminations with associated micro pyrite veining, slickensided in part, poorly developed microfractures (<1% disaggregated spar), microfractures lined with white and light greyish white cryptocrystalline silica spar and rare very fine crystalline calcite spar, rare very fine crystalline pyrite clusters, rare amounts of disseminated and micro pyrite dispersed throughout, well indurated.

SAMPLE RECORD / C-31A SIDETRACK NO. 3

INTERVAL (metres)	LITH (%)	DESCRIPTION
2595 – 2597.5	97	SHALE – medium grey, rare dark grey, subfissile, minor fissile, slightly organic / bituminous in part, rare amounts of very thin black organic microlaminations and streaks, slickensided in part, poorly developed microfractures (<1% disaggregated spar), microfractures lined with white cryptocrystalline calcite spar and rare amounts of fibrous light greyish green chlorite, rare amounts of disseminated and micro pyrite dispersed throughout, well indurated.
	03	CLAYSTONE – medium grey, very bentonitic, poorly indurated.
2597.5 – 2600	98	SHALE – medium grey, grading to dark grey in small part, subfissile, organic / bituminous in part, occasional amounts of very thin black organic microlaminations, becoming slightly more organic in this interval, slickensided in part, poorly developed microfractures (rare disaggregated spar), microfractures lined with white and light greyish white cryptocrystalline calcite spar and rare light greyish green chlorite, rare amounts of disseminated and micro pyrite dispersed throughout, slight increase in pyrite in this interval, well indurated.
	02	SILTSTONE – medium to dark grey, quartzose, rare black organic streaks, silica cement, pyritic, well indurated.

SAMPLE RECORD / C-31A SIDETRACK NO. 3

INTERVAL (metres)	LITH (%)	DESCRIPTION
2600 – 2602.5	98	SHALE – medium grey, grading to medium brownish grey in small part, occasional dark grey, subfissile, organic / bituminous, generally as above, becoming sideritic in small part, slickensided in part, poorly developed microfractures (rare disaggregated spar), microfractures lined with white and light greyish white cryptocrystalline calcite spar and rare light greyish green chlorite, occasional amounts of disseminated and micro pyrite dispersed throughout, locally occasional amounts of very fine crystalline pyrite clusters, rare fossil fragments – brachiopod, well indurated.
	02	SILTSTONE – medium grey, grading to medium brownish grey, quartzose, rare black organic streaks, silica cement, pyritic, well indurated.
2602.5 – 2607.5	100	SHALE – medium grey, occasional dark grey, subfissile, organic / bituminous in part, generally as above, slickensided in part, poorly developed microfractures (rare disaggregated spar), microfractures lined with white and light greyish white cryptocrystalline calcite spar and rare light greyish green chlorite, occasional amounts of disseminated and micro pyrite dispersed throughout, locally occasional amounts of very fine crystalline pyrite clusters, well indurated.

SAMPLE RECORD / C-31A SIDETRACK NO. 3

INTERVAL (metres)	LITH (%)	DESCRIPTION
2607.5 – 2610	98	SHALE – medium grey, occasional dark grey, rare black, subfissile, organic / bituminous in part, minor amounts of thin black organic microlaminations, slickensided, moderately developed microfractures – (<2% disaggregated spar), fracture planes lined with white cryptocrystalline silica spar, occasional amounts of medium crystalline calcite spar, fracture planes brecciated – floating upper coarse to upper very coarse size dark shale lithic fragments, becoming more pyritic in this interval, well indurated.
	02	CLAYSTONE – medium grey, very bentonitic, poorly indurated.
2610 – 2612.5	100	SHALE – medium grey, occasional dark grey, rare black, subfissile, organic / bituminous in part, minor amounts of thin black organic microlaminations, slickensided, poorly developed microfractures – (<1% disaggregated spar), fracture planes lined with white cryptocrystalline silica spar, occasional amounts of medium crystalline calcite spar, fracture planes brecciated – floating upper coarse to upper very coarse size dark shale lithic fragments, rare disseminated and micro pyrite, well indurated.
	Trace	CLAYSTONE – medium grey, very bentonitic, poorly indurated.

SAMPLE RECORD / C-31A SIDETRACK NO. 3

INTERVAL (metres)	LITH (%)	DESCRIPTION
2612.5 – 2615	98	SHALE – medium grey, occasional dark grey, rare black, subfissile, organic / bituminous in part, minor amounts of thin black organic microlaminations, slickensided, well developed microfractures – (<10% disaggregated spar), fracture planes lined with white cryptocrystalline silica spar, rare amounts of fine to medium crystalline calcite spar, fracture planes brecciated – floating upper coarse to upper very coarse size dark shale lithic fragments, rare amounts of pyrite veining, disseminated and micro pyrite, well indurated.
	02	CLAYSTONE – light and medium grey, very bentonitic, poorly indurated.
2615 – 2617.5	99	SHALE – medium and dark grey, occasional black, subfissile, proportion of organic / bituminous content increasing in this interval, minor amounts of thin black organic microlaminations, slickensided, moderately developed microfractures – (<3% disaggregated spar), fracture planes lined with white cryptocrystalline silica spar, rare amounts of fine to medium crystalline calcite spar, fracture planes brecciated – floating upper coarse to upper very coarse size dark shale lithic fragments, rare amounts of pyrite veining, disseminated and micro pyrite, well indurated.
	01	CLAYSTONE – light and medium grey, very bentonitic, poorly indurated.

SAMPLE RECORD / C-31A SIDETRACK NO. 3

INTERVAL (metres)	LITH (%)	DESCRIPTION
2617.5 – 2620	100	SHALE – medium grey, grading to medium brownish grey, subfissile, minor fissile, sideritic in part, organic / bituminous in part, rare amounts of thin black organic microlaminations, slickensided, moderately to well developed microfractures – (<5% disaggregated spar), locally fracture planes are intersecting, fracture planes lined with light greyish green fibrous chlorite, and white cryptocrystalline to occasional coarse crystalline anhedral silica spar, rare amounts of fine to medium crystalline calcite spar, fracture planes brecciated – floating upper coarse to upper very coarse size medium grey shale lithic fragments, rare amounts of pyrite veining, disseminated and micro pyrite, well indurated.
2620 – 2622.5	100	SHALE – medium grey, grading to dark grey, subfissile, minor fissile, splintery in part, organic / bituminous in part, occasional amounts of thin black organic microlaminations, slickensided, moderately to well developed microfractures – (<5% disaggregated spar), locally fracture planes are intersecting, fracture planes lined with light greyish green fibrous chlorite, and white cryptocrystalline to occasional upper medium crystalline anhedral silica spar, fracture planes brecciated – floating upper coarse to upper very coarse size medium grey shale lithic fragments, rare amounts of disseminated and micro pyrite, well indurated.
2622.5 – 2625	100	SHALE – medium grey, grading to medium brownish grey, subfissile, sideritic in part, organic / bituminous in part, rare amounts of thin black organic microlaminations, slickensided, moderately developed microfractures – (<3% disaggregated spar), locally fracture planes are intersecting, fracture planes lined with light greyish green fibrous chlorite, and white cryptocrystalline to occasional upper medium crystalline anhedral silica spar, fracture planes brecciated – floating upper coarse to upper very coarse size medium grey shale lithic fragments, rare amounts of pyrite veining, disseminated and micro pyrite, well indurated.

SAMPLE RECORD / C-31A SIDETRACK NO. 3

INTERVAL (metres)	LITH (%)	DESCRIPTION
2625 – 2627.5	100	SHALE – medium grey, subfissile, occasional blocky, micromicaceous, slightly organic / bituminous in part, rare amounts of thin black organic microlaminations, slickensided, poorly developed microfractures – (1% disaggregated spar), fracture planes lined with light greyish green fibrous chlorite, and white cryptocrystalline to occasional upper fine crystalline anhedral silica spar, slightly dolomitic, rare amounts of pyrite veining, disseminated and micro pyrite, well indurated.
2627.5 – 2630	100	SHALE – medium grey, subfissile, occasional blocky, micromicaceous, generally as above, slightly dolomitic, slight increase in proportion of pyrite in this interval, well indurated.
2630 – 2632.5	100	SHALE – medium grey, grading to dark grey, subfissile, micromicaceous, slightly organic / bituminous in part, rare amounts of thin black organic microlaminations, slickensided, moderately developed microfractures – (<3% disaggregated spar), fracture planes lined with light greyish green fibrous chlorite, and white cryptocrystalline to occasional upper coarse to upper very coarse crystalline anhedral silica spar, rare amounts of off white upper very fine crystalline calcite spar, slightly dolomitic, rare amounts of disseminated and micro pyrite, well indurated.
2632.5 – 2635	97	SHALE – medium grey, subfissile, micromicaceous, slightly organic / bituminous in part, rare amounts of thin black organic microlaminations, slickensided, poorly developed microfractures – (<1% disaggregated spar), fracture planes lined with light greyish green fibrous chlorite, and white cryptocrystalline silica spar, rare amounts of off white cryptocrystalline calcite spar, slightly dolomitic, rare amounts of disseminated and micro pyrite, well indurated.
	03	CLAYSTONE – light grey, very bentonitic, poorly indurated.

SAMPLE RECORD / C-31A SIDETRACK NO. 3

INTERVAL (metres)	LITH (%)	DESCRIPTION
2635 – 2637.5	75	SHALE – medium grey, grading to medium brownish grey, subfissile, minor blocky, slickensided, poorly developed microfractures – (rare disaggregated spar), fracture planes lined with light greyish white and white cryptocrystalline silica spar, dolomitic, rare amounts of disseminated and micro pyrite, well indurated.
	15	CLAYSTONE – light grey, grading to light and medium brownish grey, very bentonitic, poorly indurated.
	10	MARLSTONE – medium brownish grey, lithographic, dolomitic, siliceous, very well indurated.
2637.5 – 2640	90	SHALE – medium grey, grading to medium brownish grey, subfissile, minor fissile and splintery, occasional blocky, organic / bituminous, occasional amounts of black organic microlaminations throughout, poorly developed microfractures – (rare disaggregated spar), fracture planes lined with light greyish white and white cryptocrystalline silica spar, dolomitic, rare amounts of disseminated and micro pyrite, well indurated.
	05	CLAYSTONE – light grey, grading to light and medium brownish grey, very bentonitic, poorly indurated.
	05	MARLSTONE – medium brownish grey, lithographic, dolomitic, siliceous, very well indurated.

SAMPLE RECORD / C-31A SIDETRACK NO. 3

INTERVAL (metres)	LITH (%)	DESCRIPTION
2640 – 2642.5	95	SHALE – medium grey, subfissile, micromicaceous, slightly organic / bituminous, rare amounts of black organic microlaminations throughout, no evidence of microfractures, dolomitic, rare amounts of disseminated and micro pyrite, well indurated.
	05	CLAYSTONE – light grey, grading to light and medium brownish grey, very bentonitic, poorly indurated.
2642.5 – 2645	100	SHALE – medium grey, grading to dark grey in part, subfissile, minor blocky, organic / bituminous in part, rare amounts of black organic microlaminations throughout, poorly developed microfractures – (rare disaggregated spar), fracture planes lined with light greyish white and white cryptocrystalline silica spar, dolomitic, rare amounts of disseminated and micro pyrite, rare very fine crystalline pyrite clusters, rare upper coarse size pyrite grains, well indurated.
	Trace	CLAYSTONE – light grey, grading to light and medium brownish grey, very bentonitic, poorly indurated.
2645 – 2647.5	70	SHALE – medium grey, grading to dark grey in part, subfissile, organic / bituminous in part, rare amounts of black organic microlaminations throughout, poorly developed microfractures – (rare disaggregated spar), fracture planes lined with light greyish white and white cryptocrystalline silica spar, dolomitic, increase in proportion of pyrite in this interval, occasional amounts of disseminated and micro pyrite, rare very fine crystalline pyrite clusters, rare upper medium to upper coarse size pyrite grains, well indurated.
	30	CLAYSTONE – light grey, grading medium grey, very bentonitic, locally very pyritic, poorly indurated.

SAMPLE RECORD / C-31A SIDETRACK NO. 3

INTERVAL (metres)	LITH (%)	DESCRIPTION
2647.5 – 2650	63	CLAYSTONE – light grey, grading light brownish grey, very bentonitic, locally pyritic, poorly indurated.
	35	SHALE – medium grey, grading to dark grey in part, subfissile, organic / bituminous in part, rare amounts of black organic microlaminations throughout, poorly developed microfractures – (rare disaggregated spar), fracture planes lined with light greyish white and white cryptocrystalline silica spar, locally micro fracture planes are intersecting, dolomitic, rare amounts of disseminated and micro pyrite, rare very fine crystalline pyrite clusters, rare upper coarse size pyrite grains, well indurated.
	02	MARLSTONE – medium brownish grey, dolomitic, siliceous, very well indurated.
2650 – 2652.5	96	SHALE – medium grey and medium brownish grey, subfissile, minor blocky, micromicaceous, dolomitic, becoming increasingly dolomitic in this interval, no evidence of microfracturing, rare amounts of disseminated and micro pyrite, well indurated.
	02	CLAYSTONE – light grey, grading light brownish grey, very bentonitic, locally pyritic, poorly indurated.
	02	MARLSTONE – medium brownish grey, dolomitic, siliceous, very well indurated.

SAMPLE RECORD / C-31A SIDETRACK NO. 3

INTERVAL (metres)	LITH (%)	DESCRIPTION
2652.5– 2655	98	SHALE – medium grey, minor dark grey and medium brownish grey, subfissile, minor blocky, micromicaceous, dolomitic, no evidence of microfracturing, rare amounts of disseminated and micro pyrite, well indurated.
	02	CLAYSTONE – light grey, grading light brownish grey, very bentonitic, locally pyritic in small part, poorly indurated.
2655– 2657.5	99	SHALE – medium and dark grey, subfissile, micromicaceous, organic / bituminous, minor amounts of black organic microlaminations throughout, slickensided in part, poorly developed microfractures (<1% disaggregated spar), microfracture planes lined with light greenish grey resinous chlorite, white to light greyish white upper coarse to upper very coarse crystalline calcite spar, and cryptocrystalline to upper very fine crystalline silica spar, slightly dolomitic, rare to occasional amounts of disseminated and micropyrite, upper medium size pyrite grains, well indurated.
	01	CLAYSTONE – light brownish grey, very bentonitic, locally pyritic in small part, poorly indurated.

SAMPLE RECORD / C-31A SIDETRACK NO. 3

INTERVAL (metres)	LITH (%)	DESCRIPTION
2657.5 – 2660	99	SHALE – medium and dark grey, subfissile, micromicaceous, slightly organic / bituminous, rare amounts of black organic microlaminations, less organic in this interval, slickensided in part, poorly developed microfractures (<1% disaggregated spar), microfracture planes lined with light greenish grey resinous chlorite, white to light greyish white upper coarse to upper very coarse crystalline calcite spar, and cryptocrystalline to upper very fine crystalline silica spar, microfracture planes are brecciated to a high degree – common floating upper medium to upper coarse size medium to dark grey shale lithic fragments, rare amounts of disseminated and micropyrite, upper medium size pyrite grains, well indurated.
	01	MARLSTONE - light to medium brownish grey, calcareous, siliceous, well indurated.
2660 – 2662.5	99	SHALE – medium and dark grey, rare black, subfissile, micromicaceous, becoming more organic / bituminous, rare to occasional amounts of thin black organic microlaminations, slickensided in part, poorly to moderately developed microfractures (<2% disaggregated spar), microfracture planes lined with light greenish grey resinous chlorite, anhedral white to light greyish white upper medium to occasional upper very coarse crystalline silica and minor dolomite spar, and cryptocrystalline to upper very fine crystalline silica spar, microfracture planes are brecciated to a high degree – as above, rare amounts of disseminated and micropyrite, well indurated.
	01	MARLSTONE - light to medium brownish grey, calcareous, siliceous, well indurated.
	Trace	CLAYSTONE – light grey and light greenish grey, very bentonitic, poorly indurated.

SAMPLE RECORD / C-31A SIDETRACK NO. 3

INTERVAL (metres)	LITH (%)	DESCRIPTION
2662.5 – 2665	98	SHALE – medium and dark grey, rare black, subfissile, micromicaceous, generally as above, slight increase in slickensides, poorly to moderately developed microfractures (<2% disaggregated spar), microfracture planes lined with light greenish grey resinous chlorite, anhedral to subhedral white to light greyish white upper medium to upper very coarse crystalline silica spar, locally displaying radial truncated prisms, rare amounts of cryptocrystalline to upper very fine crystalline calcite spar, microfracture planes are brecciated to a high degree – as above, rare amounts of convolute organic rich microstyloids within the spar, rare amounts of disseminated and micropyrite, well indurated.
	02	CLAYSTONE – medium grey, very bentonitic, poorly indurated.
	Trace	MARLSTONE - light to medium brownish grey, calcareous, well indurated.

SAMPLE RECORD / C-31A SIDETRACK NO. 3

INTERVAL (metres)	LITH (%)	DESCRIPTION
2665 – 2668	98-99	SHALE – dark grey, grading to medium grey in part, rare black, subfissile, minor blocky and fissile, organic / bituminous, becoming more organic in this interval, slickensided, poorly to moderately developed microfractures (<1%-2% disaggregated spar), microfracture planes lined with light greenish grey resinous chlorite, anhedral to subhedral white to light greyish white upper fine to upper very coarse crystalline silica spar, rare amounts of cryptocrystalline to upper very fine crystalline calcite spar, microfracture planes are brecciated to a high degree – as above, rare amounts of disseminated and micropyrite, rare amounts of upper coarse size pyrite grains, well indurated.
	01-02	CLAYSTONE – medium brownish grey, very bentonitic, poorly indurated.
2668 – 2670	100	SHALE – medium and dark grey, rare black, subfissile, minor fissile, organic / bituminous as above, slickensided, moderately developed microfractures (<3% disaggregated spar), microfracture planes lined with light greenish grey resinous chlorite, anhedral to subhedral white to light greyish white upper fine to upper coarse crystalline silica spar, rare amounts of coarse crystalline dolomite spar, microfracture planes are brecciated to a high degree – as above, rare amounts of disseminated and micropyrite, well indurated.
2670 – 2672.5	100	SHALE – medium and dark grey, subfissile, becoming less organic / bituminous in this interval, slickensided, poorly to moderately developed microfractures (<2% disaggregated spar), microfracture planes lined with light greenish grey resinous chlorite, anhedral to subhedral white to light greyish white upper fine to upper coarse crystalline silica spar, minor amounts of coarse crystalline calcite spar, microfracture planes are brecciated to a high degree – as above, rare amounts of disseminated and micropyrite, well indurated.

SAMPLE RECORD / C-31A SIDETRACK NO. 3

INTERVAL (metres)	LITH (%)	DESCRIPTION
2672.5 – 2677.5	95	SHALE – medium brownish grey and dark grey, rare black, subfissile, minor blocky, organic / bituminous, minor amounts of very thin black organic microlaminations, poorly developed microfractures (<1% disaggregated spar), microfracture planes lined with light greenish grey resinous chlorite, anhedral to subhedral white to light greyish white upper fine to upper coarse crystalline silica spar, rare amounts of medium crystalline calcite spar, rare amounts of disseminated and micropyrite and pyrite clusters, bentonitic in part, well indurated.
	05	CLAYSTONE – medium brownish grey, rare amounts of very thin black organic microlaminations, very bentonitic in part, poorly indurated.
2677.5 – 2678.6	99	SHALE – medium and dark grey, rare black, subfissile, minor blocky and splintery, organic / bituminous, minor amounts of very thin black organic microlaminations, poorly developed microfractures (<1% disaggregated spar), microfracture planes lined generally as above, with rare amounts of upper fine crystalline dolomite spar, rare amounts of disseminated and micropyrite and pyrite clusters, bentonitic in part, well indurated.
	01	SILTSTONE – medium brownish grey and medium grey, quartzose, silica cement, rare amounts of dolomite cement, very well indurated.

SAMPLE RECORD / C-31A SIDETRACK NO. 3

INTERVAL (metres)	LITH (%)	DESCRIPTION
2678.6 – 2680	98	SHALE – medium brownish grey and dark grey, rare black, subfissile, minor blocky, sideritic, organic / bituminous, minor amounts of very thin black organic microlaminations, poorly developed microfractures (<1% disaggregated spar), microfracture planes lined generally as above, with rare amounts of upper fine crystalline dolomite spar, rare amounts of disseminated and micropyrite and pyrite clusters, bentonitic in part, well indurated.
	01	SILTSTONE – medium brownish grey and medium grey, quartzose, abundant silica cement, rare amounts of dolomite cement, very well indurated.
	01	MARLSTONE – medium brownish grey, very siliceous, dolomitic, very well indurated.
2680 – 2682	100	SHALE – medium brownish grey and dark grey, occasional black, subfissile, minor blocky, sideritic, becoming increasingly organic / bituminous in this interval, minor amounts of very thin black organic microlaminations, poorly developed microfractures (<1% disaggregated spar), microfracture planes lined with upper medium to upper very coarse crystalline anhedral silica spar, rare amounts of microcrystalline calcite spar and light greenish grey fibrous chlorite, rare amounts of disseminated and micropyrite , bentonitic in part, well indurated.
2682 – 2683	97	SHALE – medium to dark grey, grading to medium brownish grey, rare black, subfissile, minor blocky, organic / bituminous, generally as above, sideritic, microfractured as above, well indurated.
	03	MUD ADDITIVE (Barite and Lignite)

SAMPLE RECORD / C-31A SIDETRACK NO. 3

INTERVAL (metres)	LITH (%)	DESCRIPTION
2683 – 2685	100	SHALE – medium brownish grey, grading to medium grey, occasional amounts of dark grey, rare black, subfissile, minor blocky, organic / bituminous in part, locally common amounts of very thin black organic microlaminations, poorly developed microfracturing, rare amounts of very thin intersecting microfractures, rare amounts (<1% disaggregated spar) upper coarse to lower very coarse anhedral silica spar, microfractures lined / sealed with light greyish white to white cryptocrystalline silica spar, becoming increasingly sideritic in this interval, rare amounts of disseminated pyrite and micro pyrite, well indurated.
2685 – 2687.5	100	SHALE – medium grey, grading to medium brownish grey and dark grey, rare black, subfissile, minor blocky, organic / bituminous in part, locally common amounts of very thin black organic microlaminations, poorly developed microfracturing, rare amounts of very thin intersecting microfractures, rare amounts (<1% disaggregated spar) upper coarse to lower very coarse anhedral silica spar, microfractures lined / sealed with light greyish white to white cryptocrystalline silica spar, sideritic – as above, rare amounts of disseminated pyrite and micro pyrite, well indurated.
2687.5 – 2688	100	SHALE – medium grey and medium brownish grey, frequently grading to dark grey, rare black, subfissile, minor blocky, organic / bituminous in part, locally common amounts of very thin black organic microlaminations, organic microlaminations increasing slightly in this interval, no evidence of microfracturing, sideritic – as above, locally becoming dolomitic, rare amounts of disseminated pyrite and micro pyrite, well indurated.

SAMPLE RECORD / C-31A SIDETRACK NO. 3

INTERVAL (metres)	LITH (%)	DESCRIPTION
2688 – 2689	100	SHALE – medium to dark grey, minor medium brownish grey, rare black, subfissile, minor blocky, organic / bituminous in part, occasional amounts of very thin black organic microlaminations, organic microlaminations decreasing in this interval, poorly developed microfractures sealed with clear microcrystalline to lower fine crystalline silica spar, locally sideritic, occasional amounts of disseminated pyrite and micro pyrite, and rare amounts of upper very fine crystalline pyrite clusters, well indurated.
2689 – 2690	100	SHALE – medium grey, minor dark grey, subfissile, minor fissile, slightly organic / bituminous in part, rare amounts of very thin black organic microlaminations, organic laminations decreasing in this interval, poorly developed microfractures, locally sealed with off white to white cryptocrystalline calcite spar and lower to upper fine crystalline silica spar, microfractures are brecciated exhibiting floating medium to dark grey upper coarse size subangular and angular shale lithic fragments, sideritic, rare amounts of disseminated pyrite and micro pyrite, well indurated.

SAMPLE RECORD / C-31A SIDETRACK NO. 3

INTERVAL (metres)	LITH (%)	DESCRIPTION
2690 – 2695	100	SHALE – medium grey, minor dark grey, occasional amounts of medium brownish grey and rare black, subfissile, minor blocky, slightly organic / bituminous in part, rare amounts of very thin black organic microlaminations, generally decreasing in proportion down section, becoming very silicified throughout this interval – silicification increasing down section over this interval, exhibiting a lithographic and very finely laminated texture to a small degree, locally poorly to rare moderately developed microfractures (<1% disaggregated spar), where developed microfracture planes exhibit a brecciated texture – floating medium to dark grey angular to subangular upper medium to upper coarse size shale lithic fragments, microfractures are predominantly sealed with off white to occasional amounts of clear cryptocrystalline silica spar, occasional amounts of upper very fine silica spar, and rare amounts of white cryptocrystalline calcite spar , sideritic, rare amounts of disseminated pyrite and micro pyrite, rare amounts of pyrite clusters – upper very fine crystalline, and rare amounts of pyrite replacement of fossil skeletal detritus, very well indurated.

SAMPLE RECORD / C-31A SIDETRACK NO. 3

INTERVAL (metres)	LITH (%)	DESCRIPTION
2695 – 2697.5	97	SHALE – medium brownish grey, grading to dark grey in small part, occasional black, subfissile, minor blocky, generally as above, slight decrease in silicification in this interval, generally more silicification is evident within the darker colored portions, locally poorly to rare moderately developed microfractures (<1% disaggregated spar), where developed microfracture planes are intersecting and exhibit a brecciated texture – floating medium brownish grey subangular to subrounded upper medium to upper coarse size shale lithic fragments, microfractures are predominantly sealed with off white to occasional amounts of clear cryptocrystalline to upper medium crystalline silica spar, rare amounts of white cryptocrystalline calcite spar , sideritic in large part, rare amounts of disseminated pyrite and micro pyrite, very well indurated.
	03	MARLSTONE – medium brown, very silicified, locally extensively microfractured – micro fractures are brecciated – as above, sealed with clear to light grey cryptocrystalline to lower very fine crystalline silica spar, very well indurated.
2697.5 – 2700	95	SHALE – medium brownish grey, grading to dark grey in small part, subfissile, minor blocky, generally as above, increase in proportion of silicification in this interval, locally poorly to rare moderately developed microfractures (<2% disaggregated spar), where developed microfracture planes exhibit a brecciated texture – floating medium brownish grey to dark grey subangular to subrounded upper medium size shale lithic fragments, microfractures are sealed with off white to occasional amounts of clear cryptocrystalline to upper fine crystalline silica spar, occasional amounts of white cryptocrystalline calcite spar, proportion of calcite spar increasing in this interval, rare amounts of disseminated pyrite and micro pyrite, very well indurated.
	05	MARLSTONE – medium brown grading to medium grey, very silicified, dolomitic (?), locally extensively microfractured – as above, very well indurated.

SAMPLE RECORD / C-31A SIDETRACK NO. 3

INTERVAL (metres)	LITH (%)	DESCRIPTION
2705 – 2707.5	95	SHALE – dark grey, grading to medium grey and black in part, blocky, minor subfissile, organic / bituminous in part, occasional black organic microlaminations throughout, slightly dolomitic, varyingly silicified, more silicified in this interval, pyritic in part, excellent microfracture and fracture development throughout (<35% disaggregated spar), microfractures are irregular intersecting and convolute, exhibiting a high degree of brecciated texture, microfractures are sealed with light greyish white and white cryptocrystalline to minor upper very fine crystalline silica spar, and occasional amounts of light and medium greenish grey fibrous chlorite and rare amounts of pyrite, fracture planes are lined with predominantly upper medium to upper very coarse crystalline truncated anhedral to subhedral white and light greyish white silica spar, and rare amounts of off white to very light beige upper medium to upper coarse crystalline truncated anhedral dolomite and calcite spar, occasional amounts of disseminated pyrite and micro pyrite, and upper very fine crystalline pyrite clusters, good fracture porosity, very well indurated.
	04	METAL
	01	MARLSTONE – medium brown, becoming organic in small part, very silicified, dolomitic (?), locally extensively microfractured – as above, very well indurated.

SAMPLE RECORD / C-31A SIDETRACK NO. 3

INTERVAL (metres)	LITH (%)	DESCRIPTION
2700 – 2705	92-93	SHALE – dark grey, grading to medium grey, occasional black, subfissile, minor fissile, generally as above, organic / bituminous in part, occasional black organic microlaminations throughout, generally less organic down section in this interval, decrease in proportion of silicification in this interval, locally poorly to rare moderately developed microfractures (< 1%-3% disaggregated spar), proportion of spar decreasing down section, microfracture planes exhibit brecciated texture as above, microfractures are sealed with light greyish white and white cryptocrystalline to minor upper very fine crystalline silica spar, occasional amounts of upper medium to upper very coarse crystalline calcite spar, rare amounts of cryptocrystalline to upper very fine crystalline dolomite spar, becoming slightly dolomitic in part, rare amounts of disseminated pyrite and micro pyrite, and upper very fine crystalline pyrite clusters, very well indurated.
	04-05	MARLSTONE – medium brown, becoming organic in small part, very silicified, dolomitic (?), locally extensively microfractured – as above, very well indurated.
	03	METAL

SAMPLE RECORD / C-31A SIDETRACK NO. 3

INTERVAL (metres)	LITH (%)	DESCRIPTION
2707.5 – 2710	97	SHALE – dark grey, grading to very dark grey, minor black in part, subfissile, minor fissile and blocky, organic / bituminous in part, minor to occasional black organic microlaminations throughout, slightly dolomitic, varyingly silicified, less silicified in this interval, pyritic in part, good to excellent microfracture and fracture development throughout (<20% disaggregated spar), microfracture are generally as above, exhibiting a high degree of brecciated texture, microfracture planes are predominantly sealed with light greyish white to clear and white cryptocrystalline to minor upper very fine crystalline silica spar, occasional amounts of off white to very light brownish grey upper coarse to upper very coarse crystalline dolomite spar, rare amounts of light and medium greenish grey fibrous chlorite and rare amounts of pyrite, fracture planes are lined with predominantly upper medium to upper very coarse crystalline truncated anhedral to subhedral white and light greyish white silica spar, and occasional amounts of off white to very light beige upper medium to upper coarse crystalline truncated anhedral dolomite spar, proportion of dolomite spar is increasing in this interval, occasional amounts of disseminated pyrite and micro pyrite, and upper very fine crystalline pyrite clusters, good fracture porosity, very well indurated.
	02	METAL
	01	MARLSTONE – medium brown, becoming organic in small part, very silicified, dolomitic (?), locally extensively microfractured – as above, very well indurated.
	Trace	DOLOMITE – very light brown and very light tan, upper fine to upper medium crystalline, occasional amounts of lower coarse crystalline, silicified throughout, pyritic in part, rare amounts of dark brown organic specks encrusting intercrystalline voids (bitumen plugging), rare amounts of dark brownish black organic streaks on rhomb surfaces, no effective porosity.

SAMPLE RECORD / C-31A SIDETRACK NO. 3

INTERVAL (metres)	LITH (%)	DESCRIPTION
2710 – 2712.5	95	SHALE – dark grey, grading to medium grey in large part, rare black in part, subfissile, minor fissile and blocky, organic / bituminous in part, minor to occasional black organic microlaminations throughout, slightly dolomitic, silicified, more silicified in this interval, pyritic in part, moderate microfracture and fracture development throughout (<10% disaggregated spar), microfractures are generally as above, slight increase in calcite spar presence, occasional amounts of disseminated pyrite and micro pyrite, and upper very fine crystalline pyrite clusters, rare indistinct fossil skeletal detritus, poor fracture porosity, very well indurated.
	02	METAL
	02	MARLSTONE – medium brown, becoming organic in small part, very silicified, dolomitic (?), locally extensively microfractured – as above, very well indurated.
	01	SILTSTONE – medium to dark grey, quartzose, abundant silica cement, organic in large part, very well indurated.

SAMPLE RECORD / C-31A SIDETRACK NO. 3

INTERVAL (metres)	LITH (%)	DESCRIPTION
2712.5 – 2715	96	SHALE – medium to dark grey, subfissile, occasional fissile, micromicaceous, slickensided in part, organic / bituminous in part, minor to occasional black organic microlaminations throughout, pyritic in part, poor microfracture development throughout (<1% disaggregated spar), microfractures are generally as above, slight increase in calcite spar presence, occasional amounts of disseminated pyrite and micro pyrite, well indurated.
	02	MARLSTONE – medium brown, very silicified, pyritic in small part, very well indurated.
	02	METAL
2715 – 2717.5	92	SHALE – dark grey, minor medium grey, subfissile, occasional fissile, micromicaceous, slickensided, organic / bituminous, minor black organic microlaminations throughout, pyritic in part, poor microfracture development throughout (<1% disaggregated spar), microfractures are generally as above, dolomitic, rare amounts of disseminated pyrite and micro pyrite, well indurated.
	05	METAL
	03	MARLSTONE – medium brown, very silicified, very silty, very well indurated.

SAMPLE RECORD / C-31A SIDETRACK NO. 3

INTERVAL (metres)	LITH (%)	DESCRIPTION
2717.5 – 2720	97	SHALE – medium and dark grey, subfissile, micromicaceous, slickensided in small part, organic / bituminous in part, occasional black organic microlaminations throughout, pyritic in part, rare light grey and light brown bentonitic claystone laminae, poor microfracture development throughout (<1% disaggregated spar), microfractures are generally as above, dolomitic, rare amounts of disseminated pyrite and micro pyrite, well indurated.
	03	MARLSTONE – medium grey, very siliceous, silty, very well indurated.
	Trace	METAL
2720 – 2722.5	95	SHALE – medium grey, grading to medium brownish grey and dark grey, subfissile to fissile, splintery in part, micromicaceous, slickensided in small part, organic / bituminous in part, occasional black organic microlaminations throughout, silicified in part, poor microfracture development throughout (<1% disaggregated spar), microfractures lined with cryptocrystalline to upper very fine crystalline white silica spar, slightly dolomitic, rare amounts of disseminated pyrite and micro pyrite, well indurated.
	03	MARLSTONE – medium brown, lithographic, siliceous, very well indurated.
	02	SILTSTONE – medium grey, occasional medium brownish grey, quartzose, silica cement, very well indurated.
	Trace	METAL

SAMPLE RECORD / C-31A SIDETRACK NO. 3

INTERVAL (metres)	LITH (%)	DESCRIPTION
2722.5 – 2725	96	SHALE – dark grey, grading to medium grey, subfissile to fissile, minor blocky, micromicaceous, slickensided in small part, organic / bituminous in part, occasional black organic microlaminations throughout, silicified in part, poor microfracture development throughout (<1% disaggregated spar), microfractures lined with cryptocrystalline to upper fine crystalline white silica spar, slightly dolomitic, rare amounts of disseminated pyrite and micro pyrite, well indurated.
	03	METAL
	01	MARLSTONE – medium brown, lithographic, dolomitic, siliceous in part, very well indurated.
2725 – 2727.5	95	SHALE – medium grey, grading to dark grey, subfissile, minor blocky, micromicaceous, slickensided in part, organic / bituminous in part, occasional black organic microlaminations throughout, silicified in part, poor microfracture development throughout (<1% disaggregated spar), microfractures lined with cryptocrystalline to upper fine crystalline white silica spar, slightly dolomitic, rare amounts of disseminated pyrite and micro pyrite, well indurated.
	03	METAL
	01	MARLSTONE – medium brown, lithographic, dolomitic, siliceous in part, very well indurated.
	01	SILTSTONE – medium to dark grey, quartzose, abundant silica cement, very well indurated.

SAMPLE RECORD / C-31A SIDETRACK NO. 3

INTERVAL (metres)	LITH (%)	DESCRIPTION
2727.5 – 2730	95	SHALE – medium grey, grading to dark grey, subfissile, occasional blocky, micromicaceous, slickensided in part, organic / bituminous in part, occasional black organic microlaminations throughout, silicified in part, poor microfracture development throughout (<1% disaggregated spar), microfractures lined with cryptocrystalline white silica spar, and occasional amounts of upper very fine to lower fine crystalline light greyish white calcite spar, rare amounts of off white cryptocrystalline dolomite spar, slightly dolomitic, rare amounts of disseminated pyrite and micro pyrite, well indurated.
	05	SILTSTONE – medium grey, minor amounts of dark grey, quartzose, abundant silica cement, pyritic in small part, very well indurated.
	Trace	METAL
	Trace	MARLSTONE – medium brown, grading to medium grey, lithographic, very siliceous, dolomitic (?), very well indurated.

SAMPLE RECORD / C-31A SIDETRACK NO. 3

INTERVAL (metres)	LITH (%)	DESCRIPTION
2730 – 2732.5	97	SHALE – medium and dark grey, grading to black in small part, subfissile, minor fissile and minor blocky, micromicaceous, slickensided in part, becoming increasingly organic / bituminous in part, minor black organic microlaminations throughout, silicified in part, poor microfracture development throughout (<1% disaggregated spar), microfractures lined with cryptocrystalline to upper medium crystalline anhedral truncated off white to light greyish silica spar, and occasional amounts of upper very fine to lower fine crystalline light greyish white dolomite spar, slightly dolomitic, rare amounts of disseminated pyrite and micro pyrite, well indurated.
	02	MARLSTONE – medium brown, grading to dark brown, lithographic, very siliceous, dolomitic (?), very well indurated.
	01	SILTSTONE – medium grey, minor amounts of dark grey, quartzose, abundant silica cement, pyritic in small part, very well indurated.

SAMPLE RECORD / C-31A SIDETRACK NO. 3

INTERVAL (metres)	LITH (%)	DESCRIPTION
2732.5 – 2735	92	SHALE – medium and dark grey, subfissile, minor blocky, micromicaceous, organic / bituminous in part, minor black organic microlaminations throughout, locally very silicified in part, poor microfracture development throughout (<1% disaggregated spar), microfractures lined with cryptocrystalline to upper fine crystalline anhedral truncated off white to light greyish silica spar, rare amounts of disseminated pyrite and micro pyrite, well indurated.
	07	SILTSTONE – medium grey, minor amounts of dark grey, quartzose, abundant silica cement, pyritic in small part, very well indurated.
	01	MARLSTONE – medium brown, grading to dark brown, lithographic, very siliceous, dolomitic (?), very well indurated.
2735 – 2740	95-97	SHALE – medium and dark grey, rare amounts of black, subfissile and blocky, splintery in part, organic / bituminous in part, minor black organic microlaminations throughout, slickensided, locally very silicified in part, poor to moderately developed microfractures throughout (<2% disaggregated spar), locally microfractures exhibit a very finely laminated texture, locally very brecciated, microfractures lined with cryptocrystalline to upper fine crystalline off white to light greyish silica and calcite spar, occasional amounts of upper coarse to upper very coarse anhedral truncated silica spar, rare amounts of light greenish grey fibrous chlorite, rare amounts of disseminated pyrite and micro pyrite, well indurated.
	03-05	SILTSTONE – dark grey, quartzose, abundant silica cement, becoming more pyritic down section, very well indurated.
	Trace	MARLSTONE – medium brown, grading to dark brown, lithographic, very siliceous, very well indurated.

SAMPLE RECORD / C-31A SIDETRACK NO. 3

INTERVAL (metres)	LITH (%)	DESCRIPTION
2740 – 2745	92-95	SHALE – medium grey, minor dark grey, rare amounts of black, subfissile, organic / bituminous in part, minor black organic microlaminations throughout, slickensided, locally very silicified in part, poor to moderately developed microfractures throughout (<2% disaggregated spar), locally microfractures exhibit a very finely laminated texture, microfractures lined with cryptocrystalline to upper fine crystalline off white to light greyish silica and calcite spar, rare amounts of light greenish grey fibrous chlorite, rare amounts of disseminated pyrite and micro pyrite, well indurated.
	03-05	MARLSTONE – medium brown, grading to dark brown, lithographic, very siliceous, locally common microfracture swarms sealed with light greyish white cryptocrystalline calcite, very well indurated.
	Trace-01	SILTSTONE – dark grey, quartzose, abundant silica cement, becoming more pyritic down section, very well indurated.
	Trace-01	CLAYSTONE – medium brown, very bentonitic, poorly indurated.

SAMPLE RECORD / C-31A SIDETRACK NO. 3

INTERVAL (metres)	LITH (%)	DESCRIPTION
2745 – 2747.5	92	SHALE – medium grey, minor dark grey, subfissile, occasional fissile, slickensided in small part, locally silicified in part, becoming less silicified in this interval, dolomitic, poorly developed microfractures (<1% disaggregated spar), locally microfractures lined with cryptocrystalline to upper fine crystalline off white to light greyish silica and calcite spar, rare amounts of light greenish grey fibrous chlorite, rare amounts of disseminated pyrite and micro pyrite, well indurated.
	05	MARLSTONE – medium brown, lithographic, very siliceous, poorly developed microfractures sealed with light greyish white cryptocrystalline calcite, very well indurated.
	03	SILTSTONE – medium brown, medium brownish grey, dark grey, quartzose, abundant silica cement, very well indurated.
	Trace	CLAYSTONE – medium brown, very bentonitic, poorly indurated.

SAMPLE RECORD / C-31A SIDETRACK NO. 3

INTERVAL (metres)	LITH (%)	DESCRIPTION
2747.5 – 2750	85	SHALE – medium grey, minor dark grey, grading to medium brownish grey, rare black, subfissile, occasional fissile, slickensided in small part, locally silicified in part, dolomitic, poorly developed microfractures (<1% disaggregated spar), locally microfractures lined with cryptocrystalline to upper fine crystalline off white to light greyish silica and calcite spar, rare amounts of light greenish grey fibrous chlorite, rare amounts of disseminated pyrite and micro pyrite, well indurated.
	10	MARLSTONE – medium brown, grading to medium tan, lithographic, dolomitic, very siliceous, poorly developed microfractures sealed with light greyish white cryptocrystalline silica, very well indurated.
	05	SILTSTONE – medium brown, medium brownish grey and medium grey, quartzose, abundant silica cement, minor dolomite cement, locally pyritic, very well indurated.
	Trace	CLAYSTONE – medium brown, very bentonitic, poorly indurated.

SAMPLE RECORD / C-31A SIDETRACK NO. 3

INTERVAL (metres)	LITH (%)	DESCRIPTION
2750 – 2755	84-90	SHALE – medium grey, minor dark grey, grading to medium brownish grey, rare black, subfissile, occasional fissile, slickensided in small part, locally silicified in part, dolomitic, poorly developed microfractures (<1% disaggregated spar), locally microfractures lined with cryptocrystalline to upper fine crystalline off white to light greyish silica spar, rare amounts of light greenish grey fibrous chlorite, rare amounts of disseminated pyrite and micro pyrite, well indurated.
	07-08	MARLSTONE – medium brownish grey, grading to light and medium tan, very silty, lithographic, dolomitic, very siliceous, very well indurated.
	03-08	SILTSTONE – medium brownish grey and medium grey, quartzose, abundant silica cement, minor dolomite cement, locally pyritic, proportion of siltstone decreasing down section, very well indurated.
	Trace	CLAYSTONE – medium brown, very bentonitic, poorly indurated.
2755 – 2757.5	95	SHALE – medium and dark grey, occasional black, subfissile, occasional fissile, slickensided in small part, becoming increasingly organic / bituminous in this interval, locally silicified in part, dolomitic in small part, poorly developed microfractures (<2% disaggregated spar), locally microfractures lined with cryptocrystalline to upper fine crystalline off white to light greyish silica spar, rare amounts of disseminated pyrite and micro pyrite, well indurated.
	03	MARLSTONE – medium brownish grey, grading to light and medium tan, very silty, dolomitic, siliceous, well indurated.
	02	SILTSTONE – medium brownish grey and medium grey, as above, becoming more pyritic in this interval, very well indurated.

SAMPLE RECORD / C-31A SIDETRACK NO. 3

INTERVAL (metres)	LITH (%)	DESCRIPTION
2757.5 – 2762.5	98	SHALE – medium grey, occasional dark grey, subfissile, occasional fissile, slickensided in part, becoming more slickensided down section, locally silicified in part, dolomitic in small part, poorly developed microfractures (<1% disaggregated spar), locally microfractures lined with cryptocrystalline to upper fine crystalline off white to light greyish silica spar, rare amounts of disseminated pyrite and micro pyrite, well indurated.
	01	MARLSTONE – medium brownish grey, grading to light and medium tan, very silty, dolomitic, siliceous, well indurated.
	01	SILTSTONE – medium brownish grey and medium grey, as above, very well indurated.
	Trace	CLAYSTONE - medium brown, very bentonitic, poorly indurated.
2762.5 – 2765	97	SHALE – medium and dark grey, rare black, subfissile, occasional fissile, slickensided in part, becoming slightly organic / bituminous, occasional amounts of black organic microlaminations, silicified in part, dolomitic in small part, poorly developed microfractures (<1% disaggregated spar), locally microfractures exhibit a finely laminated texture, lined with cryptocrystalline to upper fine crystalline off white to light greyish silica and calcite spar, rare amounts of disseminated pyrite and micro pyrite, well indurated.
	02	SILTSTONE – medium brownish grey and medium grey, quartzose, abundant silica cement, pyritic, very well indurated.
	01	MARLSTONE – medium brownish grey, very silty, dolomitic, siliceous, well indurated.

SAMPLE RECORD / C-31A SIDETRACK NO. 3

INTERVAL (metres)	LITH (%)	DESCRIPTION
2765 – 2767.5	97	SHALE – medium grey, minor dark grey, rare black, subfissile, occasional fissile, slickensided in part, becoming less organic / bituminous, rare amounts of black organic microlaminations, silicified in small part, dolomitic in small part, poorly developed microfractures (<1% disaggregated spar), locally microfractures exhibit a finely laminated texture, lined with cryptocrystalline to upper fine crystalline off white to light greyish silica spar, rare amounts of disseminated pyrite and micro pyrite, well indurated.
	02	SILTSTONE – medium grey grading to medium brownish grey and light grey in part, quartzose, abundant silica cement, occasional dolomite cement, pyritic in small part, very well indurated.
	01	MARLSTONE – medium brownish grey, very silty, dolomitic, siliceous, well indurated.
2767.5 – 2770	97	SHALE – medium to dark grey, subfissile, occasional fissile, slickensided in part, becoming more organic / bituminous, occasional amounts of black organic microlaminations, silicified in part, dolomitic in small part, poorly developed microfractures (<1% disaggregated spar), locally microfractures exhibit a finely laminated texture, lined with cryptocrystalline to upper fine crystalline off white to light greyish silica spar, rare amounts of disseminated pyrite and micro pyrite, well indurated.
	03	SILTSTONE – medium grey grading to light grey, quartzose, abundant silica cement, occasional dolomite cement, becoming increasingly pyritic in this interval, very well indurated.
	Trace	MARLSTONE – medium brownish grey, very silty, dolomitic, siliceous, well indurated.

SAMPLE RECORD / C-31A SIDETRACK NO. 3

INTERVAL (metres)	LITH (%)	DESCRIPTION
2770 – 2775	94-96	SHALE – medium to dark grey, subfissile, occasional fissile, slickensided in part, organic / bituminous as above, occasional amounts of black organic microlaminations, silicified in part, dolomitic in small part, poorly developed microfractures (<1% disaggregated spar), locally microfractures exhibit a brecciated texture, lined with cryptocrystalline to lower medium crystalline off white to light greyish silica spar, rare amounts of disseminated pyrite and micro pyrite, well indurated.
	04-05	SILTSTONE – light grey, grading to light brownish grey, quartzose, rare clear mica flakes, abundant silica cement, rare dolomite cement, becoming pyritic down section, very well indurated.
	Trace-01	MARLSTONE – medium brownish grey, very silty, dolomitic, siliceous, well indurated.
2775 – 2777.5	93	SHALE – medium grey, minor dark grey, subfissile, occasional fissile, slickensided in part, slightly organic / bituminous as above, rare amounts of black organic microlaminations, silicified in part, locally very finely laminated with cryptocrystalline silica spar, poorly developed microfractures (<1% disaggregated spar), microfractures lined with cryptocrystalline to lower medium crystalline off white to light greyish silica spar, rare amounts of disseminated pyrite and micro pyrite, well indurated.
	05	SILTSTONE – light to medium brownish grey, quartzose, abundant silica cement, rare dolomite cement, pyritic in small part, very well indurated.
	02	MARLSTONE – medium brownish grey, very silty, siliceous, well indurated.

SAMPLE RECORD / C-31A SIDETRACK NO. 3

INTERVAL (metres)	LITH (%)	DESCRIPTION
2777.5 – 2780	88	SHALE – medium grey, minor dark grey, subfissile, occasional fissile, slickensided in part, becoming more organic in this interval, increase in proportion of black organic microlaminations, silicified in part, poorly developed microfractures (<1% disaggregated spar), microfractures lined with cryptocrystalline off white to light greyish silica spar, rare amounts of disseminated pyrite and micro pyrite, well indurated.
	08	SILTSTONE – medium brownish grey, quartzose, rare amounts of black organic microlaminations, abundant silica cement, pyritic in small part, very well indurated.
	04	MARLSTONE – medium brownish grey, minor light brownish grey, very silty, siliceous, well indurated.
2780 – 2782.5	92	SHALE – medium grey, minor dark grey, subfissile, occasional fissile, slickensided in part, slightly organic / bituminous as above, rare amounts of black organic microlaminations, silicified in small part, poorly developed microfractures (<1% disaggregated spar), microfractures lined with cryptocrystalline off white to light greyish silica spar, rare amounts of disseminated pyrite and micro pyrite, well indurated.
	04	SILTSTONE – medium brownish grey, quartzose, rare clear mica flakes, abundant silica cement, occasional dolomite cement, becoming more dolomitic in this interval, pyritic in small part, very well indurated.
	04	MARLSTONE – medium brownish grey, very silty, dolomitic, siliceous, well indurated.

SAMPLE RECORD / C-31A SIDETRACK NO. 3

INTERVAL (metres)	LITH (%)	DESCRIPTION
2782.5 – 2785	94	SHALE – medium grey, minor dark grey, subfissile, occasional fissile, slickensided in part, slightly organic / bituminous as above, rare amounts of black organic microlaminations, silicified in small part, moderately developed microfractures (<4% disaggregated spar), microfractures lined with cryptocrystalline off white to white and light greyish silica spar, occasional amounts of calcite spar, rare amounts of disseminated pyrite and micro pyrite, well indurated.
	03	SILTSTONE – medium brownish grey, grading to medium grey, quartzose, abundant silica cement, pyritic in part, becoming more pyritic in this interval, very well indurated.
	03	MARLSTONE – medium brownish grey, grading to light brownish grey, very silty, dolomitic, siliceous, well indurated.

SAMPLE RECORD / C-31A SIDETRACK NO. 3

INTERVAL (metres)	LITH (%)	DESCRIPTION
2785 – 2786	97	SHALE – medium and dark grey, rare black, subfissile, occasional fissile, slickensided in part, slightly organic / bituminous as above, rare amounts of black organic microlaminations, silicified in small part, moderately to well developed microfractures (<5% disaggregated spar), microfractures lined with cryptocrystalline to upper very fine crystalline, minor amounts of upper coarse to upper very coarse crystalline anhedral, rare euhedral off white to white and light greyish silica spar and rare prisms, rare amounts of calcite spar, rare amounts of pyrite veining, disseminated pyrite and micro pyrite, well indurated.
	02	MARLSTONE – medium brownish grey, grading to light brownish grey, very silty, dolomitic, siliceous, well indurated.
	01	SILTSTONE – medium brownish grey, grading to medium grey, quartzose, abundant silica cement, pyritic in part, becoming more pyritic in this interval, very well indurated.
	Trace	CLAYSTONE – medium brown, very bentonitic, poorly indurated.

SAMPLE RECORD / C-31A SIDETRACK NO. 3

INTERVAL (metres)	LITH (%)	DESCRIPTION
2786 – 2787.5	90	SHALE – medium and dark grey, rare black, subfissile, common blocky, slickensided in part, organic / bituminous as above, occasional amounts of black organic microlaminations, becoming increasingly silicified in this interval, moderately developed microfractures (<3% disaggregated spar), microfractures lined with cryptocrystalline white and light greyish silica spar, rare amounts of calcite spar, rare amounts of disseminated pyrite and micro pyrite, well indurated.
	10	SILTSTONE – medium grey, grading to medium brownish grey, quartzose, minor black organic specks, rare white mica flakes, abundant silica cement, rare dolomite cement, very well indurated.
	Trace	MARLSTONE – medium brownish grey, grading to light brownish grey, very silty, dolomitic, siliceous, well indurated.
2787.5 – 2790	95	SHALE – medium and dark grey, rare black, subfissile, slickensided in part, organic / bituminous as above, occasional amounts of black organic microlaminations, silicified in part, poorly developed microfractures (<1% disaggregated spar), microfractures lined with cryptocrystalline white and light greyish silica spar, rare amounts of disseminated pyrite and micro pyrite, well indurated.
	03	SILTSTONE – medium grey, grading to medium brownish grey, quartzose, abundant silica cement, rare dolomite cement, very well indurated.
	02	MARLSTONE – medium brownish grey, grading to light brownish grey, very silty, dolomitic, siliceous, well indurated.

SAMPLE RECORD / C-31A SIDETRACK NO. 3

INTERVAL (metres)	LITH (%)	DESCRIPTION
2790 – 2791	96	SHALE – medium and dark grey, rare black, subfissile, common blocky, generally as above, becoming increasingly silicified in this interval, poorly developed microfractures (<1% disaggregated spar), microfractures lined with cryptocrystalline white and light greyish silica spar, rare amounts of disseminated pyrite and micro pyrite, well indurated.
	02	SILTSTONE – medium grey, grading to medium brownish grey, as above, very well indurated.
	02	MARLSTONE – medium brownish grey, as above, siliceous, well indurated.
2791 – 2792.1	98	SHALE – medium and dark grey, occasional black, subfissile, to fissile, common blocky, organic / bituminous, becoming increasingly organic, increase in proportion of black organic microlaminations, slickensided, silicified in part, poorly developed microfractures (<1% disaggregated spar), microfractures lined with cryptocrystalline white and light greyish silica spar, rare amounts of off white cryptocrystalline dolomite spar, rare amounts of disseminated pyrite and micro pyrite, well indurated.
	02	SILTSTONE – medium grey, grading to medium brownish grey, quartzose, common black organic specks, abundant silica cement, very well indurated.
	Trace	MARLSTONE – medium brownish grey, as above, siliceous, well indurated.
	Trace	CLAYSTONE – medium brownish grey, very bentonitic, poorly indurated.

SAMPLE RECORD / C-31A SIDETRACK NO. 3

INTERVAL (metres)	LITH (%)	DESCRIPTION
2792.1 – 2792.8	95	SHALE – medium and dark grey, grading to black in part, subfissile, to fissile, minor blocky, organic / bituminous – as above, slickensided, micaceous in part, silicified in part, poorly developed microfractures (<1% disaggregated spar), microfractures lined with cryptocrystalline white and light greyish silica spar, occasional amounts of off white upper fine to lower coarse crystalline calcite spar, rare amounts of off white cryptocrystalline dolomite spar, in rare local occurrences the spar is striated and encrusted with dark brown organic streaks, rare amounts of disseminated pyrite and micro pyrite, well indurated.
	03	MARLSTONE – medium brownish grey, very silty, dolomitic, very siliceous, pyritic in part, well indurated.
	02	SILTSTONE – light grey and light brownish grey, quartzose, common black organic specks, abundant silica cement, locally becoming very pyritic, very well indurated.
2792.8 – 2793.4	96	SHALE – medium and dark grey, occasionally grading to black in part, subfissile, to fissile, minor blocky, organic / bituminous – less organic in this interval, slickensided in part, micaceous in part, silicified in part, poorly developed microfractures (<1% disaggregated spar), microfractures lined with light greyish white to clear cryptocrystalline and upper coarse to upper very coarse anhedral truncated silica spar, rare amounts of off white upper fine to upper medium crystalline anhedral dolomite spar, rare amounts of disseminated pyrite and micro pyrite, well indurated.
	02	MARLSTONE – medium brownish grey, very silty, dolomitic, very siliceous, pyritic in part, well indurated.
	02	SILTSTONE – light grey and light brownish grey, quartzose, common black organic specks, abundant silica cement, locally becoming very pyritic, very well indurated.

SAMPLE RECORD / C-31A SIDETRACK NO. 3

INTERVAL (metres)	LITH (%)	DESCRIPTION
2793.4 – 2793.7	98	SHALE – medium grey, grading to dark grey, subfissile, occasional blocky, slightly organic / bituminous – less organic in this interval, slickensided in small part, silicified in small part, poorly developed microfractures (<1% disaggregated spar), microfractures lined with light greyish white to clear cryptocrystalline and upper fine to upper medium crystalline anhedral truncated silica spar, rare amounts of off white cryptocrystalline dolomite spar, rare amounts of disseminated pyrite and micro pyrite, well indurated.
	02	MARLSTONE – medium grey, grading to medium brownish grey, dolomitic, siliceous in part, well indurated.
	Trace	SILTSTONE – light grey and light brownish grey, quartzose, common black organic specks, abundant silica cement, locally becoming very pyritic, very well indurated.
2793.7 – 2795	95	SHALE – medium grey, grading to dark grey, subfissile, occasional blocky, organic / bituminous in part, slickensided in part, becoming more slickensided in this interval, silicified in small part, poorly developed microfractures (<1% disaggregated spar), microfractures lined with white to off white cryptocrystalline to upper fine to upper medium crystalline dolomite spar, rare amounts of off white cryptocrystalline to upper very fine crystalline silica spar, rare amounts of disseminated pyrite and micro pyrite, well indurated.
	03	SILTSTONE – light grey and light brownish grey, quartzose, common black organic specks, abundant silica cement, rare dolomite cement, locally pyritic, very well indurated.
	02	METAL
	Trace	MARLSTONE – medium grey, grading to medium brownish grey, dolomitic, siliceous in part, well indurated.

SAMPLE RECORD / C-31A SIDETRACK NO. 3

INTERVAL (metres)	LITH (%)	DESCRIPTION
2795 – 2797.5	93	SHALE – medium grey, grading to dark grey, occasional black, subfissile, occasional fissile, organic / bituminous in part, becoming more organic in this interval, slickensided in part, poorly developed microfractures (<1% disaggregated spar), microfractures lined with white to off white cryptocrystalline silica spar, rare amounts of off white cryptocrystalline to upper very fine crystalline calcite spar, rare amounts of disseminated pyrite and micro pyrite, well indurated.
	03	SILTSTONE – light grey and light brownish grey, grading to medium and dark grey, quartzose, common black organic specks, abundant silica cement, becoming increasingly organic in this interval, locally pyritic, very well indurated.
	02	MARLSTONE – medium grey, grading to medium brown, siliceous, well indurated.
	02	METAL
2797.5 – 2800	98	SHALE – medium grey, grading to dark grey, rare black, subfissile, occasional fissile, organic / bituminous in small part, becoming less organic in this interval, slickensided in part, poorly developed microfractures (<1% disaggregated spar), microfractures lined with white to off white cryptocrystalline silica spar, rare amounts of off white cryptocrystalline calcite spar, rare amounts of disseminated pyrite and micro pyrite, well indurated.
	01	SILTSTONE – light grey and light brownish grey, grading to medium and dark grey, quartzose, minor black organic specks, abundant silica cement, less organic in this interval, locally pyritic, very well indurated.
	01	MARLSTONE – medium brown and medium tan, siliceous, dolomitic in small part, well indurated.
	Trace	METAL

SAMPLE RECORD / C-31A SIDETRACK NO. 3

INTERVAL (metres)	LITH (%)	DESCRIPTION
2800 – 2802.5	94	SHALE – medium and dark grey, subfissile, occasional fissile, organic / bituminous in small part, occasional amounts of black organic microlaminations, slickensided in part, becoming increasingly silicified in this interval, poorly developed microfractures (<1% disaggregated spar), microfractures lined with white to off white cryptocrystalline to upper fine and rare amounts of upper coarse crystalline subhedral silica spar, minor amounts of off white lower coarse to upper very coarse crystalline calcite spar, proportion of calcite spar increasing in this interval, rare amounts of disseminated pyrite and micro pyrite, well indurated.
	03	MUD ADDITIVE – Calcium Carbonate
	02	SILTSTONE – medium grey, occasional amounts of light grey, quartzose, minor black organic specks, abundant silica cement, organic in part, pyritic in small part, very well indurated.
	01	MARLSTONE – medium brown and medium tan, siliceous, dolomitic in small part, well indurated.
	Trace	METAL

SAMPLE RECORD / C-31A SIDETRACK NO. 3

INTERVAL (metres)	LITH (%)	DESCRIPTION
2802.5 – 2805	96	SHALE – medium grey, grading to dark grey in part, subfissile, occasional fissile, organic / bituminous in small part, occasional amounts of black organic microlaminations, slickensided in part, silicified in part, poorly developed microfractures (<1% disaggregated spar), microfractures lined with white to off white cryptocrystalline to upper fine and rare amounts of upper coarse crystalline subhedral silica spar, minor amounts of off white lower coarse to upper very coarse crystalline calcite spar, rare amounts of disseminated pyrite and micro pyrite, well indurated.
	02	SILTSTONE – medium grey, occasional amounts of light grey, quartzose, minor black organic specks, abundant silica cement, organic in part, pyritic in small part, very well indurated.
	01	MUD ADDITIVE – Calcium Carbonate
	01	MARLSTONE – medium brown and medium tan, siliceous, dolomitic in small part, well indurated.
	Trace	METAL

SAMPLE RECORD / C-31A SIDETRACK NO. 3

INTERVAL (metres)	LITH (%)	DESCRIPTION
2805 – 2807.5	92	SHALE – medium and dark grey, subfissile, occasional fissile, organic / bituminous in part, becoming more organic in this interval, occasional amounts of black organic microlaminations, slickensided in part, silicified in part, moderately developed microfractures (<3% disaggregated spar), microfractures lined with white to off white and light greyish white, cryptocrystalline to upper fine and rare amounts of upper coarse crystalline subhedral and anhedral silica spar, minor amounts of off white upper coarse to upper very coarse crystalline calcite spar, rare amounts of disseminated pyrite and micro pyrite, well indurated.
	05	METAL
	03	SILTSTONE – medium grey, occasional amounts of light grey, quartzose, minor black organic specks, abundant silica cement, organic in part, pyritic in small part, very well indurated.
	Trace	MARLSTONE – medium brown and medium tan, siliceous, dolomitic in small part, well indurated.
	Trace	MUD ADDITIVE – Calcium Carbonate

SAMPLE RECORD / C-31A SIDETRACK NO. 3

INTERVAL (metres)	LITH (%)	DESCRIPTION
2807.5 – 2808	97	SHALE – medium grey, grading to dark grey, subfissile, minor blocky, generally as above, becoming more silicified in this interval, poorly to moderately developed microfractures (<2% disaggregated spar), as above, occasional amounts of off white upper medium to lower coarse crystalline dolomite spar, rare amounts of disseminated pyrite and micro pyrite, well indurated.
	02	METAL
	01	SILTSTONE – medium grey, occasional amounts of light grey, quartzose, minor black organic specks, abundant silica cement, organic in part, pyritic in small part, very well indurated.
	Trace	MARLSTONE – medium brown and medium tan, siliceous, dolomitic in small part, well indurated.
	Trace	MUD ADDITIVE – Calcium Carbonate

SAMPLE RECORD / C-31A SIDETRACK NO. 3

INTERVAL (metres)	LITH (%)	DESCRIPTION
2808 - 2810	94	SHALE – medium grey, grading to dark grey, subfissile, minor blocky, generally as above, locally very silicified in this interval, moderately developed microfractures (<3% disaggregated spar), microfractures lined with white to off white and light greyish white, cryptocrystalline to upper fine and rare amounts of upper coarse crystalline subhedral and anhedral silica spar, minor amounts of off white upper coarse to upper very coarse crystalline calcite spar, rare amounts of disseminated pyrite and micro pyrite, well indurated.
	03	METAL
	02	MARLSTONE – medium brown and medium tan, siliceous, dolomitic in small part, well indurated.
	01	SILTSTONE – medium grey, occasional amounts of light grey, quartzose, minor black organic specks, abundant silica cement, organic in part, pyritic in small part, very well indurated.
	Trace	MARLSTONE – medium brown and medium tan, siliceous, dolomitic in small part, well indurated.
	Trace	MUD ADDITIVE – Calcium Carbonate

SAMPLE RECORD / C-31A SIDETRACK NO. 3

INTERVAL (metres)	LITH (%)	DESCRIPTION
2810 - 2811	93	SHALE – medium grey, grading to dark grey, subfissile, minor blocky, generally as above, locally very silicified in this interval, poorly to moderately developed microfractures (<2% disaggregated spar), microfractures lined with white to off white and light greyish white, cryptocrystalline to upper fine and rare amounts of upper coarse crystalline subhedral and anhedral silica spar, minor amounts of off white upper coarse crystalline calcite spar, rare amounts of disseminated pyrite and micro pyrite, well indurated.
	03	METAL
	03	MARLSTONE – medium brown and medium tan, siliceous, dolomitic in small part, well indurated.
	01	SILTSTONE – medium grey, occasional amounts of light grey, quartzose, minor black organic specks, abundant silica cement, organic in part, pyritic in small part, very well indurated.
	Trace	MUD ADDITIVE – Calcium Carbonate

SAMPLE RECORD / C-31A SIDETRACK NO. 3

INTERVAL (metres)	LITH (%)	DESCRIPTION
2811 – 2812.5	96	SHALE – medium grey, grading to dark grey, subfissile, minor fissile, slickensided, silicified in small part, poorly developed microfractures (<2% disaggregated spar) microfractures lined with white to off white and light greyish white, cryptocrystalline to upper fine crystalline anhedral silica spar, rare amounts of off white cryptocrystalline dolomite spar, locally microfractures exhibit a finely laminate texture, rare amounts of disseminated pyrite and micro pyrite, well indurated.
	03	MARLSTONE – medium brownish grey, siliceous, dolomitic in small part, well indurated.
	01	METAL
	Trace	SILTSTONE – medium grey, occasional amounts of light grey, as above, abundant silica cement, organic in part, pyritic in small part, very well indurated.

SAMPLE RECORD / C-31A SIDETRACK NO. 3

INTERVAL (metres)	LITH (%)	DESCRIPTION
2812.5 – 2815	97	SHALE – medium and dark grey, subfissile, minor blocky, slickensided, micaceous in small part, silicified in small part, organic/bituminous in part, minor amounts of black organic microlaminations throughout, poorly developed microfractures (<2% disaggregated spar) microfractures lined with white to off white and light greyish white, cryptocrystalline to upper fine crystalline and occasional amounts of lower medium crystalline anhedral silica spar, rare amounts of off white cryptocrystalline dolomite spar, locally microfractures exhibit a finely laminate texture, locally microfractures exhibit a brecciated texture – floating upper medium size dark grey shale lithic fragments, rare amounts of disseminated pyrite and micro pyrite, well indurated.
	02	SILTSTONE – medium grey, grading to medium brownish grey, quartzose, abundant silica cement, vague indistinct microlaminations throughout, pyritic in small part, very well indurated.
	01	MARLSTONE – medium brownish grey, siliceous, well indurated.
	Trace	METAL
2815 – 2820	98-100	SHALE – medium grey, minor dark grey, subfissile, slickensided in small part, poorly developed microfractures (<1% disaggregated spar) microfractures lined with white to off white and light greyish white, cryptocrystalline to upper fine crystalline anhedral silica spar, rare amounts of disseminated pyrite and micro pyrite, well indurated.
	Trace-01	SILTSTONE – medium grey, grading to medium brownish grey, as above.
	Trace-01	MARLSTONE – medium brownish grey, siliceous, well indurated.

SAMPLE RECORD / C-31A SIDETRACK NO. 3

INTERVAL (metres)	LITH (%)	DESCRIPTION
2820 – 2822.5	98	SHALE – medium grey, grading to dark grey, subfissile, minor blocky, slickensided in small part, becoming very silicified in part, poorly developed microfractures (<1% disaggregated spar) microfractures lined with white to off white and light greyish white, cryptocrystalline to upper fine crystalline anhedral silica spar, rare amounts of disseminated pyrite and micro pyrite, well indurated.
	02	SILTSTONE – medium grey, grading to medium brownish grey, as above.
	Trace	MARLSTONE – medium brownish grey, siliceous, well indurated.
2822.5 – 2825	98	SHALE – medium grey, grading to dark grey, subfissile, minor blocky, slickensided in small part, silicified in part, poorly developed microfractures (<1% disaggregated spar) microfractures lined with white to off white and light greyish white, cryptocrystalline to upper fine crystalline anhedral silica spar, rare amounts of disseminated pyrite and micro pyrite, well indurated.
	01	SILTSTONE – medium grey, grading to medium brownish grey, as above.
	01	MARLSTONE – medium brownish grey, siliceous, well indurated.

SAMPLE RECORD / C-31A SIDETRACK NO. 3

INTERVAL (metres)	LITH (%)	DESCRIPTION
2825 – 2827.5	98	SHALE – medium grey, grading to dark grey, rare black, subfissile, minor blocky, slickensided in small part, silicified in part, locally becoming increasingly organic/bituminous, occasional amounts of black organic microlaminations throughout, poorly developed microfractures (<1% disaggregated spar) microfractures lined with white to off white and light greyish white, cryptocrystalline silica spar, rare amounts of disseminated pyrite and micro pyrite, rare pyrite clusters, well indurated.
	01	SILTSTONE – medium grey, grading to medium brownish grey, quartzose, abundant silica cement, very well indurated.
	01	MARLSTONE – medium brownish grey, grading to medium tan, siliceous, well indurated.
	Trace	METAL
2827.5 – 2830	97	SHALE – medium grey, occasional amounts of dark grey, subfissile, minor blocky, slickensided in small part, generally as above, silicified in part, slightly more silicified than above interval, poorly developed microfractures (<1% disaggregated spar) microfractures lined with white to off white and light greyish white, cryptocrystalline silica spar, rare amounts of disseminated pyrite and micro pyrite, well indurated.
	02	SILTSTONE – medium grey, grading to medium brownish grey, quartzose, abundant silica cement, very well indurated.
	01	MARLSTONE – medium brownish grey, grading to medium tan, siliceous, well indurated.
	Trace	CLAYSTONE – light grey and light brown, very bentonitic, poorly indurated.
	Trace	METAL

SAMPLE RECORD / C-31A SIDETRACK NO. 3

INTERVAL (metres)	LITH (%)	DESCRIPTION
2830 – 2832.5	96	SHALE – dark grey, grading to medium grey in part, subfissile, minor fissile, splintery in small part, slickensided, silicified in part, becoming organic/bituminous in large part, occasional amounts of black organic microlaminations throughout, well developed microfractures (<8% disaggregated spar) microfractures lined with white to off white and light greyish white and clear, cryptocrystalline silica spar, rare amounts of euhedral quartz prisms, rare amounts of disseminated pyrite and micro pyrite, poor fracture porosity, well indurated.
	02	SILTSTONE – medium and light grey, grading to medium brownish grey, quartzose, abundant silica cement, locally very finely laminated, very well indurated.
	02	MARLSTONE – medium brownish grey, grading to medium tan, siliceous, well indurated.
	Trace	CLAYSTONE – light grey and light brown, very bentonitic, poorly indurated.
	Trace	METAL

SAMPLE RECORD / C-31A SIDETRACK NO. 3

INTERVAL (metres)	LITH (%)	DESCRIPTION
2832.5-2835	98	SHALE – medium and dark grey, subfissile, minor fissile, slickensided in part, silicified in part, slightly organic/bituminous in part, occasional amounts of black organic microlaminations throughout, poorly developed microfractures (<1% disaggregated spar) microfractures lined with white to off white and light greyish white and clear, cryptocrystalline silica spar, rare amounts of off white cryptocrystalline calcite spar, rare amounts of disseminated pyrite and micro pyrite, well indurated.
	01	SILTSTONE – medium and light grey, grading to medium brownish grey, quartzose, abundant silica cement, locally very finely laminated, very well indurated.
	01	MARLSTONE – medium brownish grey, grading to medium tan, siliceous, well indurated.
	Trace	METAL
	Trace	CLAYSTONE – medium grey, very bentonitic, poorly indurated.

SAMPLE RECORD / C-31A SIDETRACK NO. 3

INTERVAL (metres)	LITH (%)	DESCRIPTION
2835-2837.5	97	SHALE – medium grey, minor dark grey, subfissile, minor fissile, slickensided in part, slightly organic/bituminous in part, occasional amounts of black organic microlaminations and streaks throughout, poorly developed microfractures (<2% disaggregated spar) microfractures lined with white to off white and light greyish white and clear, cryptocrystalline silica spar, rare amounts of off white cryptocrystalline calcite spar, locally microfractures exhibit a very finely laminated texture, rare amounts of disseminated pyrite and micro pyrite, well indurated.
	02	SILTSTONE – medium grey, grading to medium brownish grey, quartzose, abundant silica cement, very well indurated.
	01	MARLSTONE – medium brownish grey, as above.
	Trace	CLAYSTONE – medium grey and medium brown, very bentonitic, poorly indurated.
2837.5-2840	98	SHALE – medium grey, minor dark grey, subfissile, slickensided in part, slightly organic/bituminous in small part, rare amounts of black organic microlaminations and streaks throughout, poorly developed microfractures (<1% disaggregated spar) microfractures lined with white to off white and light greyish white and clear, cryptocrystalline silica spar, rare amounts of off white cryptocrystalline dolomite spar, rare amounts of pyrite veining, locally microfractures exhibit a very finely laminated texture, rare amounts of disseminated pyrite and micro pyrite, well indurated.
	01	SILTSTONE – light brownish grey, grading to medium brownish grey, quartzose, abundant silica cement, rare dolomite cement, very well indurated.
	01	MARLSTONE – medium brownish grey, as above.

SAMPLE RECORD / C-31A SIDETRACK NO. 3

INTERVAL (metres)	LITH (%)	DESCRIPTION
2840-2842.5	96	SHALE – medium grey, occasional dark grey, subfissile, minor fissile, slickensided in part, slightly organic/bituminous in part, occasional amounts of black organic microlaminations and streaks throughout, silicified in part, poorly developed microfractures (<1% disaggregated spar) microfractures lined with white to off white and light greyish white and clear, cryptocrystalline silica spar, rare amounts of off white cryptocrystalline dolomite spar, locally microfractures exhibit a very finely laminated texture, rare amounts of disseminated pyrite and micro pyrite, well indurated.
	02	SILTSTONE – light brownish grey, grading to medium brownish grey, quartzose, abundant silica cement, rare dolomite cement, very well indurated.
	02	MARLSTONE – medium brownish grey, as above.
2842.5-2845	96	SHALE – medium grey, grading to dark grey, subfissile, minor fissile, slickensided in part, slightly organic/bituminous in part, occasional amounts of black organic microlaminations and streaks throughout, silicified in small part, moderately developed microfractures (<3% disaggregated spar) microfractures lined with white to off white and light greyish white and clear, cryptocrystalline silica and calcite spar, occasional amounts of light greenish grey fibrous chlorite, locally microfractures exhibit a very finely laminated texture, occasional amounts of disseminated pyrite and micro pyrite, and pyrite clusters, well indurated.
	02	SILTSTONE – light brownish grey, grading to light grey, quartzose, abundant silica cement, very well indurated.
	01	MARLSTONE – medium brownish grey, as above.
	01	CLAYSTONE – light grey and light brown, very bentonitic, poorly indurated.

SAMPLE RECORD / C-31A SIDETRACK NO. 3

INTERVAL (metres)	LITH (%)	DESCRIPTION
2845-2847.5	93	SHALE – medium grey, grading to dark grey, subfissile, minor blocky, slickensided in part, slightly organic/bituminous in part, occasional amounts of black organic microlaminations and streaks throughout, silicified in part, becoming more silicified in this interval, poorly developed microfractures (<1% disaggregated spar) microfractures lined with white to off white and light greyish white and clear, cryptocrystalline silica and calcite spar, occasional amounts of light greenish grey fibrous chlorite, well indurated.
	03	SILTSTONE – light brownish grey, grading to light grey, quartzose, abundant silica cement, very well indurated.
	02	MARLSTONE – medium brownish grey, and medium grey, very silicified, very well indurated.
	02	CLAYSTONE – light and medium grey, grading to light brown, very bentonitic, poorly indurated.

SAMPLE RECORD / C-31A SIDETRACK NO. 3

INTERVAL (metres)	LITH (%)	DESCRIPTION
2847.5-2850	92	SHALE – medium and dark grey, rare black, subfissile, minor blocky, slickensided in part, becoming increasingly organic / bituminous in part, minor amounts of black organic microlaminations and streaks throughout, silicified in part, well developed microfractures (<10% disaggregated spar) microfractures lined with white to off white and light greyish white and clear, cryptocrystalline to upper medium crystalline anhedral silica and calcite spar, occasional amounts of light greenish grey fibrous chlorite, rare amounts of cryptocrystalline to upper medium crystalline truncated dolomite spar, well indurated.
	04	SILTSTONE – light brownish grey, grading to light and medium grey, quartzose, silica cement, minor dolomite cement, very well indurated.
	03	MARLSTONE – medium brownish grey, and medium grey, silicified, dolomitic, locally very silty, well indurated.
	01	CLAYSTONE – light and medium grey, grading to light brown, very bentonitic, poorly indurated.
2850-2855	95-96	SHALE – medium and dark grey, rare black, subfissile, minor blocky, generally as above, organic/bituminous in part, minor amounts of black organic microlaminations and streaks throughout, silicified in part, becoming increasingly silicified in this interval, poorly to moderately developed microfractures (<3% disaggregated spar) microfracture linings – as above, well indurated.
	02-03	SILTSTONE – light brownish grey, grading to light and medium grey, as above, very well indurated.
	03	MARLSTONE – medium brownish grey, and medium grey, silicified, dolomitic, locally very silty, well indurated.

SAMPLE RECORD / C-31A SIDETRACK NO. 3

INTERVAL (metres)	LITH (%)	DESCRIPTION
2855-2860	96-97	SHALE – medium grey, minor dark grey, subfissile, minor fissile and blocky, less blocky down section, organic/bituminous in part, occasional amounts of black organic microlaminations and streaks throughout, becoming slightly more organic down section, silicified in part, poorly developed microfractures (<1%-2% disaggregated spar) microfracture lined with white to off white and light greyish white and clear, cryptocrystalline to upper fine crystalline anhedral silica spar, rare amounts of cryptocrystalline calcite spar, well indurated.
	02	SILTSTONE – medium grey and light brownish grey, quartzose, abundant silica cement, very well indurated.
	01-02	MARLSTONE – medium brownish grey, and medium grey, silicified, well indurated.
2860-2862.5	98	SHALE – medium and dark grey, subfissile, minor blocky, organic/bituminous in part, occasional amounts of black organic microlaminations and streaks throughout, becoming more silicified in this interval, poorly developed microfractures (<1% disaggregated spar) microfracture lined with white to off white and light greyish white and clear, cryptocrystalline silica spar, rare amounts of cryptocrystalline calcite spar, well indurated.
	01	SILTSTONE – medium grey and medium brownish grey, quartzose, abundant silica cement, pyritic in part, very well indurated.
	01	MARLSTONE – medium brownish grey, and medium grey, silicified, well indurated.

SAMPLE RECORD / C-31A SIDETRACK NO. 3

INTERVAL (metres)	LITH (%)	DESCRIPTION
2862.5-2865	99	SHALE – medium and dark grey, rare black, subfissile, occasional blocky, organic/bituminous in part, occasional amounts of black organic microlaminations and streaks throughout, becoming less silicified in this interval, poorly developed microfractures (<1% disaggregated spar) microfracture lined with white to off white and light greyish white and clear, cryptocrystalline silica spar, rare amounts of cryptocrystalline calcite spar, well indurated.
	01	SILTSTONE – medium grey and medium brownish grey, quartzose, abundant silica cement, pyritic in part, very well indurated.
	Trace	MARLSTONE – medium brownish grey, and medium grey, silicified, well indurated.
2865-2870	97-98	SHALE – medium and dark grey, subfissile, occasional blocky, organic/bituminous in part, occasional amounts of black organic microlaminations and streaks throughout, silicified in small part, moderately developed microfractures (<3% disaggregated spar) microfracture lined with white to off white and light greyish white and clear, cryptocrystalline silica spar, rare amounts of cryptocrystalline calcite spar, well indurated.
	01-02	SILTSTONE – medium grey and medium brownish grey, quartzose, abundant silica cement, pyritic in part, very well indurated.
	01	MARLSTONE – medium brownish grey, and medium grey, silicified, well indurated.
	Trace	CLAYSTONE – medium grey, very bentonitic, poorly indurated

SAMPLE RECORD / C-31A SIDETRACK NO. 3

INTERVAL (metres)	LITH (%)	DESCRIPTION
2870-2872.5	97	SHALE – medium grey, minor dark grey, rare black, subfissile, organic/bituminous in part, occasional amounts of black organic microlaminations and streaks throughout, silicified in small part, moderately developed microfractures (<2% disaggregated spar) microfracture lined with white to off white and light greyish white and clear, cryptocrystalline silica spar, rare amounts of cryptocrystalline calcite spar, well indurated.
	02	SILTSTONE – medium grey and medium brownish grey, quartzose, abundant silica cement, pyritic in part, very well indurated.
	01	CLAYSTONE – medium grey, very bentonitic, poorly indurated
2872.5-2875	95	SHALE – medium and dark grey, rare black, subfissile, organic/bituminous in part, occasional amounts of black organic microlaminations and streaks throughout, locally very silicified in part, moderately developed microfractures (<2% disaggregated spar) microfracture lined with white to off white and light greyish white and clear, cryptocrystalline silica spar, rare amounts of cryptocrystalline calcite spar, well indurated.
	02	SILTSTONE – medium grey and medium brownish grey, quartzose, abundant silica cement, pyritic in part, very well indurated.
	02	CLAYSTONE – medium grey, very bentonitic, poorly indurated.
	01	MARLSTONE - medium brownish grey, silicified, well indurated.

SAMPLE RECORD / C-31A SIDETRACK NO. 3

INTERVAL (metres)	LITH (%)	DESCRIPTION
2875-2877.5	96	SHALE – medium grey, grading to dark grey, subfissile, slightly organic/bituminous in part, occasional amounts of black organic microlaminations and streaks throughout, locally very silicified in part, poorly developed microfractures (<1% disaggregated spar) microfracture lined with white to off white and light greyish white and clear, cryptocrystalline silica spar, rare amounts of cryptocrystalline calcite and dolomite spar, well indurated.
	02	SILTSTONE – medium grey, occasional medium brownish grey, quartzose, abundant silica cement, very well indurated.
	02	CLAYSTONE – medium grey, very bentonitic, poorly indurated
	Trace	MARLSTONE – medium brownish grey, very silicified, as above.
2877.5-2880	96	SHALE – medium grey, grading to dark grey, subfissile, slightly organic/bituminous in part, occasional amounts of black organic microlaminations and streaks throughout, locally very silicified in part, poorly developed microfractures (<1% disaggregated spar) microfracture lined with white to off white and light greyish white and clear, cryptocrystalline silica spar, rare amounts of cryptocrystalline calcite and dolomite spar, well indurated.
	02	SILTSTONE – medium grey, occasional medium brownish grey, quartzose, abundant silica cement, very well indurated.
	02	CLAYSTONE – medium grey, very bentonitic, poorly indurated
	Trace	MARLSTONE – medium brownish grey, very silicified, as above.

SAMPLE RECORD / C-31A SIDETRACK NO. 3

INTERVAL (metres)	LITH (%)	DESCRIPTION
2880-2882.5	96	SHALE – medium grey, occasional dark grey, subfissile, slightly organic/bituminous in part, occasional amounts of black organic specks and microlaminations throughout, locally silicified in part, poorly developed microfractures (<1% disaggregated spar) microfracture lined with white to off white and light greyish white and clear, cryptocrystalline silica spar, rare amounts of cryptocrystalline calcite and dolomite spar, rare amounts of disseminated pyrite and lower very fine crystalline pyrite clusters, well indurated.
	02	SILTSTONE – medium grey, occasional medium brownish grey, quartzose, abundant silica cement, pyritic in small part, very well indurated.
	02	MARLSTONE – medium greyish brown, dolomitic, silty, siliceous in large part, well indurated.
	Trace	CLAYSTONE – medium grey, very bentonitic, poorly indurated.
2882.5-2885	97	SHALE – medium grey, grading to dark grey, subfissile, becoming increasingly organic/bituminous in part, occasional amounts of black organic microlaminations and streaks throughout, locally silicified in part, poorly developed microfractures (<1% disaggregated spar) microfracture lined with white to off white and light greyish white and clear, cryptocrystalline silica spar, rare amounts of cryptocrystalline calcite and dolomite spar, rare amounts of disseminated pyrite, well indurated.
	01	SILTSTONE – medium grey, occasional medium brownish grey, quartzose, abundant silica cement, very well indurated.
	01	CLAYSTONE – medium grey, minor light brown, very bentonitic, poorly indurated
	01	MARLSTONE – medium brownish grey, very silicified, as above.

SAMPLE RECORD / C-31A SIDETRACK NO. 3

INTERVAL (metres)	LITH (%)	DESCRIPTION
2885-2887.5	97	SHALE – medium grey, occasional dark grey, subfissile to fissile, splintery in part, less organic/bituminous in this interval, rare amounts of black organic microlaminations and streaks throughout, becoming more fractured in this interval, moderately developed microfractures (<3% disaggregated spar) microfracture lined with white to off white and light greyish white and clear, cryptocrystalline to upper fine anhedral crystalline silica spar, occasional amounts of off white cryptocrystalline calcite spar, rare amounts of light greenish grey fibrous chlorite spar, rare amounts of disseminated pyrite, well indurated.
	02	SILTSTONE – light grey, light brownish grey, occasional medium brownish grey, quartzose, rare black organic specks, silica cement, minor dolomite cement, very well indurated.
	01	MARLSTONE – medium brownish grey, very silicified, as above.

SAMPLE RECORD / C-31A SIDETRACK NO. 3

INTERVAL (metres)	LITH (%)	DESCRIPTION
2887.5-2892.5	95-96	SHALE – medium grey, occasional dark grey, subfissile, becoming fissile and splintery down section, organic/bituminous in this interval, occasional amounts of black organic microlaminations and streaks throughout, generally decreasing in proportion down section, moderately developed microfractures (<3%-4% disaggregated spar) microfractures lined with white to off white and light greyish white and clear, cryptocrystalline to upper fine crystalline anhedral silica spar, occasional amounts of off white cryptocrystalline calcite spar – increasing in proportion down section, rare amounts of light greenish grey fibrous chlorite spar, rare amounts of disseminated pyrite, well indurated.
	03-04	SILTSTONE – light grey, grading to medium grey, locally very finely laminated in part, occasional amounts of light brownish grey, quartzose, occasional black organic specks and rare amounts of lower fine size subrounded grains – phosphate (?), silica cement, minor dolomite cement, locally very pyritic, very well indurated.
	Trace-02%	MARLSTONE – medium brownish grey, very silicified, as above.

SAMPLE RECORD / C-31A SIDETRACK NO. 3

INTERVAL (metres)	LITH (%)	DESCRIPTION
2892.5-2895.4	95-96	SHALE – medium grey, occasional dark grey, subfissile, occasional amounts of blocky, slightly organic/bituminous in this interval, occasional amounts of black organic microlaminations and streaks throughout, generally decreasing in proportion down section, poorly developed microfractures (<2% disaggregated spar) microfractures lined with white to off white and light greyish white and clear, cryptocrystalline to upper fine crystalline anhedral silica spar, occasional amounts of off white cryptocrystalline calcite spar, rare amounts of light greenish grey fibrous chlorite spar, rare amounts of disseminated pyrite, well indurated.
	03-04	SILTSTONE – light grey, grading to medium grey, occasional amounts of light brownish grey, quartzose, occasional black organic specks, silica cement, minor dolomite cement, locally pyritic, very well indurated.
	Trace-02%	MARLSTONE – medium brownish grey, very silicified, as above.

SAMPLE RECORD / C-31A SIDETRACK NO. 3

INTERVAL (metres)	LITH (%)	DESCRIPTION
2895.4-2897.5	97	SHALE – medium grey, occasional dark grey, subfissile, slightly organic/bituminous in this interval, occasional amounts of black organic microlaminations and streaks throughout, silicified in part, poorly developed microfractures (<1% disaggregated spar) microfractures lined with white to off white and light greyish white cryptocrystalline silica spar, rare amounts of off white cryptocrystalline dolomite spar, rare amounts of disseminated pyrite, well indurated.
	03	SILTSTONE – medium grey, occasional amounts of light brownish grey and medium greenish brown, quartzose, rare black organic specks, glauconitic clay matrix (?), silica cement, minor dolomite cement, locally pyritic, very well indurated.
	Trace	MARLSTONE – medium brownish grey, very silicified, as above.
2897.5-2900	94	SHALE – medium grey, occasional dark grey, subfissile and blocky, generally as above, becoming increasingly silicified in this interval, slightly dolomitic, well indurated.
	05	SILTSTONE – medium greenish brown, medium grey, occasional amounts of light brownish grey, quartzose, rare black organic specks, glauconitic clay matrix (?), silica cement, minor dolomite cement, locally pyritic, very well indurated.
	01	MARLSTONE – medium brownish grey, very silicified, as above.

SAMPLE RECORD / C-31A SIDETRACK NO. 3

INTERVAL (metres)	LITH (%)	DESCRIPTION
2900-2902.5	98	SHALE – medium grey, occasional dark grey, subfissile and blocky, generally as above, silicified in large part, becoming slightly more organic, slight increase in black organic microlaminations, slightly dolomitic, well indurated.
	02	SILTSTONE – medium grey, quartzose, abundant silica cement, locally pyritic in small part, very well indurated.
	Trace	MARLSTONE – medium brownish grey, very silicified, as above.
2902.5-2905	96	SHALE – medium grey, subfissile, becoming fissile in part, slightly organic, dolomitic, becoming increasingly dolomitic in this interval, silicified in small part, moderately developed microfractures (<3% disaggregated spar), microfractures lined with white to light grey cryptocrystalline to lower fine crystalline subhedral silica spar, occasional amounts of white cryptocrystalline dolomite spar, well indurated.
	03	SILTSTONE – medium grey, quartzose, abundant silica cement, occasional amounts of dolomite cement, very well indurated.
	01	MARLSTONE – medium brownish grey, very silicified, as above.

SAMPLE RECORD / C-31A SIDETRACK NO. 3

INTERVAL (metres)	LITH (%)	DESCRIPTION
2905-2907.5	95	SHALE – medium grey, minor amounts of dark grey, subfissile, becoming blocky in part, becoming slightly more organic – increase in black microlaminations, dolomitic, silicified in small part, moderately developed microfractures (<4% disaggregated spar), microfractures lined with white to light grey cryptocrystalline to lower fine crystalline subhedral silica spar, rare amounts of clear very coarse size silica prisms, occasional amounts of white cryptocrystalline dolomite spar, well indurated.
	03	SILTSTONE – medium grey, quartzose, abundant silica cement, occasional amounts of dolomite cement, very well indurated.
	02	MARLSTONE – medium grey and medium brownish grey, very silicified, very well indurated.
2907.5-2910	97	SHALE – medium grey, minor amounts of dark grey, subfissile, becoming fissile in part, slightly organic – decrease in black microlaminations, dolomitic, silicified in small part, locally becoming slickensided, moderately developed microfractures (<3% disaggregated spar), microfractures lined with white to light grey cryptocrystalline silica spar, minor amounts of white cryptocrystalline calcite and dolomite spar, well indurated.
	03	SILTSTONE – medium grey, quartzose, abundant silica cement, rare amounts of dolomite cement, very well indurated.
	Trace	MARLSTONE – medium grey and medium brownish grey, very silicified, very well indurated.

SAMPLE RECORD / C-31A SIDETRACK NO. 3

INTERVAL (metres)	LITH (%)	DESCRIPTION
2910-2912.5	98	SHALE – medium and dark grey, rare amounts of black, subfissile, becoming fissile and splintery in part, organic – increase in black microlaminations, becoming carbonaceous, silicified in small part, locally becoming slickensided, well developed microfractures (<6% disaggregated spar), microfractures exhibit a brecciated texture – floating irregular shaped upper medium to upper coarse size dark grey shale lithic clasts, microfractures are lined with white to light grey cryptocrystalline to occasional amounts of lower fine crystalline silica spar, occasional amounts of white cryptocrystalline calcite and dolomite spar, locally becoming increasingly pyritic, well indurated.
	02	SILTSTONE – medium grey, quartzose, occasional amounts of black organic microlaminations and specks, abundant silica cement, rare amounts of dolomite cement, very well indurated.
	Trace	MARLSTONE – medium grey and medium brownish grey, very silicified, very well indurated.

SAMPLE RECORD / C-31A SIDETRACK NO. 3

INTERVAL (metres)	LITH (%)	DESCRIPTION
2912.5-2914.8	99	SHALE – medium to dark grey, minor amounts of black, subfissile, becoming fissile and splintery in part, varyingly organic, becoming carbonaceous in large part, silicified in small part, locally slickensided, locally very pyritic, micro and disseminated pyrite, occasional amounts of upper medium size pyrite cubes scattered throughout, well developed microfractures and fractures (<12% disaggregated spar), microfractures exhibit a brecciated texture – floating irregular shaped lower and upper coarse size dark grey and black shale lithic clasts, microfractures are lined with white to light grey cryptocrystalline to rare amounts of lower fine crystalline silica spar, rare amounts of white and off white cryptocrystalline dolomite spar, locally very pyritic, well indurated.
	01	SILTSTONE – medium grey, grading to medium brownish grey, quartzose, occasional amounts of black organic microlaminations and specks, abundant silica cement, rare amounts of dolomite cement, very well indurated.

SAMPLE RECORD / C-31A SIDETRACK NO. 3

INTERVAL (metres)	LITH (%)	DESCRIPTION
2914.8-2916	99	SHALE – dark grey, grading to black, occasional medium grey, subfissile, becoming fissile and splintery in part, varyingly organic, very carbonaceous, silicified in part, locally becoming more silicified than above interval, locally slickensided, locally very pyritic, micro and disseminated pyrite, occasional amounts of upper medium size pyrite cubes scattered throughout, well developed microfractures and fractures (<8% disaggregated spar), microfractures exhibit a brecciated texture – floating irregular shaped lower and upper coarse size dark grey and black shale lithic clasts, microfractures are lined with white to light grey cryptocrystalline to rare amounts of lower fine crystalline silica spar, occasional amounts of white and off white cryptocrystalline dolomite spar, dolomite spar presence increasing, rare amounts of black organic specks and streaks on spar surface, well indurated.
	01	SILTSTONE – medium grey, grading to medium brownish grey, quartzose, occasional amounts of black organic microlaminations, streaks, and specks, abundant silica cement, rare amounts of dolomite cement, very well indurated.
	Trace	MARLSTONE – medium grey and medium brownish grey, very silicified, very well indurated.

SAMPLE RECORD / C-31A SIDETRACK NO. 3

INTERVAL (metres)	LITH (%)	DESCRIPTION
2916-2917.5	97	SHALE – medium and dark grey, grading to black, subfissile, becoming fissile in small part, varyingly organic, carbonaceous in part, less carbonaceous than above interval, silicified in part, locally slickensided, locally pyritic, micro and disseminated pyrite, moderately developed microfractures (<3% disaggregated spar), microfractures exhibit a brecciated texture – floating irregular shaped lower coarse size dark grey and black shale lithic clasts, microfractures are lined with white to light grey cryptocrystalline silica spar, rare amounts of white and off white cryptocrystalline dolomite spar, well indurated.
	02	SILTSTONE – medium grey, grading to medium brownish grey, quartzose, occasional amounts of black organic microlaminations, streaks, and specks, abundant silica cement, very well indurated.
	01	MARLSTONE – medium grey and medium brownish grey, very silicified, very well indurated.
2917.5-2922.5	98	SHALE – medium and dark grey, grading to black, subfissile, organic, carbonaceous in part, locally slickensided, locally pyritic, micro and disseminated pyrite, moderately to poorly developed microfractures (<2% disaggregated spar), microfractures exhibit a brecciated texture – floating irregular shaped upper fine to upper medium size dark grey and black shale lithic clasts, locally microfractures are intersecting, microfractures are lined with white to light grey cryptocrystalline silica spar, rare amounts of white and off white cryptocrystalline dolomite spar, well indurated.
	01	SILTSTONE – medium grey, grading to medium brownish grey, as above, abundant silica cement, very well indurated.
	01	MARLSTONE – medium grey and medium brownish grey, very silicified, very well indurated.

SAMPLE RECORD / C-31A SIDETRACK NO. 3

INTERVAL (metres)	LITH (%)	DESCRIPTION
2922.5-2925	98	SHALE – dark grey, grading to dark greyish black and black, subfissile, organic, carbonaceous in part, more carbonaceous than above interval, locally slickensided, locally pyritic, micro and disseminated pyrite, poorly developed microfractures (<1% disaggregated spar), microfractures are lined with white to light grey cryptocrystalline silica spar, rare amounts of white and off white cryptocrystalline dolomite spar, well indurated.
	01	SILTSTONE – medium grey, grading to medium brownish grey, as above, abundant silica cement, very well indurated.
	01	MARLSTONE – medium grey and medium brownish grey, very silicified, very well indurated.
2925-2927.5	98	SHALE – medium and dark grey, grading to dark greyish black and black, subfissile, organic, carbonaceous in part, locally slickensided, locally pyritic, micro and disseminated pyrite, poorly developed microfractures (<1% disaggregated spar), microfractures are lined with white to light grey cryptocrystalline silica spar, occasional amounts of white and off white cryptocrystalline dolomite spar, well indurated.
	01	SILTSTONE – medium grey, grading to medium brownish grey, as above, abundant silica cement, very well indurated.
	01	MARLSTONE – medium grey and medium brownish grey, very silicified, very well indurated.

SAMPLE RECORD / C-31A SIDETRACK NO. 3

INTERVAL (metres)	LITH (%)	DESCRIPTION
2927.5-2930	100	SHALE – dark grey and dark greyish black, minor black and medium grey, subfissile, minor blocky, carbonaceous, organic, becoming more organic in this interval, dolomitic in small part, locally slickensided, pyritic – becoming increasingly pyritic, micro and disseminated pyrite, occasional amounts of very fine crystalline pyrite clusters, poorly developed microfractures (<2% disaggregated spar), microfractures are lined with off white to white cryptocrystalline dolomite spar, occasional amounts of light grey and light greyish white cryptocrystalline silica spar, well indurated.
	Trace	SILTSTONE – light and medium grey, as above, abundant silica cement, very well indurated.
	Trace	MARLSTONE – medium grey and medium brownish grey, very silicified, very well indurated.
2930-2932.5	99	SHALE – dark grey and dark greyish black, common black, occasional medium grey, subfissile, minor blocky, carbonaceous, organic, becoming more organic in this interval, dolomitic in part, becoming more dolomitic in this interval, locally slickensided, locally very pyritic – micro and disseminated pyrite, occasional amounts of very fine to upper fine crystalline pyrite cubes and clusters, poorly developed microfractures (<1% disaggregated spar), microfractures are lined with off white to white cryptocrystalline dolomite spar, occasional amounts of light grey and light greyish white cryptocrystalline silica spar, well indurated.
	01	MARLSTONE – medium grey and medium brownish grey, very silicified, very well indurated.

SAMPLE RECORD / C-31A SIDETRACK NO. 3

INTERVAL (metres)	LITH (%)	DESCRIPTION
2932.5-2935	98	SHALE – dark grey and dark greyish black, common black, occasional medium grey, subfissile, minor blocky, carbonaceous, organic – as above, dolomitic in part, locally slickensided, locally very pyritic – micro and disseminated pyrite, occasional amounts of very fine to upper fine crystalline pyrite cubes and clusters, occasional amounts of coarse to very coarse size pyrite grains, poorly developed microfractures (<1% disaggregated spar), microfractures are lined with off white to white cryptocrystalline calcite spar, occasional amounts of light grey and light greyish white cryptocrystalline silica and dolomite spar, well indurated.
	02	MARLSTONE – medium grey and medium brownish grey, dolomitic, very silicified, very well indurated.
2935-29341.5	98-99	SHALE – dark grey and dark greyish black, common black, minor medium grey, subfissile, minor blocky, carbonaceous, organic – as above, locally slickensided, locally very pyritic – micro and disseminated pyrite, occasional amounts of very fine to upper fine crystalline pyrite cubes and clusters, pyrite proportion increasing down section, poorly developed microfractures (<1% disaggregated spar), microfractures lined with light grey and light greyish white cryptocrystalline silica and occasional dolomite spar, well indurated.
	01-02	SILTSTONE – light and medium grey, quartzose, abundant silica cement, locally very pyritic, very well indurated.
	Trace	MARLSTONE – medium grey and medium brownish grey, dolomitic, very silicified, very well indurated.
2941.5		**TOTAL DEPTH – C-31A SIDETRACK NO. 3**

REPORT DISTRIBUTION

The original and ten (10) copies of the Geological Well Report on CDN FOREST et al NORTH LIARD C-31 / C-31A 60-40-123-30 have now been completed. The original and nine (9) copies have been forwarded to CANADIAN FOREST OIL LTD., and the remaining copy will be retained in DAX Consulting Ltd. files.

ADDENDUM A – DIRECTIONAL SURVEY RECORD C–31

CDN FOREST et al NORTH LIARD C-31 60-40-123-30
DIRECTIONAL SURVEY RECORD

Calculations Based On Survey Data Provided By Ryan Energy Technologies Inc.

K.B. Elevation = 488.00
Vertical Section = 77.00

SURVEY DEPTH (m)	INCLINATION (deg)	AZIMUTH (deg)	TVD (m)	TVD SUBSEA (m)	LATITUDE N(+) / S(-) (m)	DEPARTURE E(+) / W(-) (m)	CLOSURE (m)	CLOSURE AZIMUTH (deg)	VERTICAL SECTION (m)	DOGLEG (deg)	DOGLEG SEVERITY (°/30m)
0.00	0.00	0.00	0.00	488.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
39.00	0.50	2.00	39.00	449.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
71.00	0.25	336.00	71.00	417.00	0.20	-0.02	0.20	353.40	0.02	0.30	0.28
88.00	0.50	58.00	88.00	400.00	0.28	0.02	0.28	5.02	0.09	0.53	0.93
116.00	0.50	217.00	116.00	372.00	0.24	0.05	0.25	12.58	0.11	0.98	1.05
145.00	0.50	11.00	145.00	343.00	0.27	0.00	0.27	0.51	0.06	0.97	1.01
181.16	0.50	86.00	181.16	306.84	0.43	0.19	0.47	23.69	0.28	0.61	0.51
201.00	0.50	301.00	201.00	287.00	0.48	0.20	0.52	22.68	0.31	0.95	1.44
210.72	0.60	339.00	210.72	277.28	0.55	0.15	0.57	14.94	0.27	0.37	1.14
213.44	0.40	39.00	213.44	274.56	0.57	0.15	0.59	14.50	0.27	0.53	5.84
223.00	0.30	36.00	223.00	265.00	0.62	0.18	0.65	16.54	0.32	0.10	0.32
232.73	0.30	16.00	232.73	255.27	0.66	0.21	0.70	17.22	0.35	0.10	0.32
242.60	0.60	358.10	242.60	245.40	0.74	0.21	0.77	15.92	0.37	0.33	1.00
252.00	0.60	12.60	252.00	236.00	0.84	0.22	0.87	14.74	0.40	0.15	0.48
261.50	2.00	356.10	261.49	226.51	1.05	0.22	1.08	11.81	0.45	1.43	4.53
270.90	0.40	287.00	270.89	217.11	1.23	0.18	1.24	8.24	0.45	1.89	6.05
280.62	0.90	298.00	280.61	207.39	1.27	0.08	1.27	3.50	0.36	0.51	1.58
290.35	1.30	315.90	290.34	197.66	1.39	-0.07	1.39	357.25	0.25	0.52	1.61
300.07	2.10	312.70	300.05	187.95	1.59	-0.27	1.61	350.19	0.09	0.81	2.49
309.50	3.00	317.11	309.47	178.53	1.88	-0.57	1.97	343.19	-0.13	0.92	2.93
318.93	3.00	315.90	318.89	169.11	2.24	-0.91	2.42	337.94	-0.38	0.06	0.20
326.48	3.00	313.70	326.43	161.57	2.52	-1.19	2.79	334.75	-0.59	0.12	0.46
335.91	3.20	312.70	335.85	152.15	2.87	-1.56	3.27	331.46	-0.88	0.21	0.66

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SURVEY DEPTH (m)	INCLINATION (deg)	AZIMUTH (deg)	TVD (m)	TVD SUBSEA (m)	LATITUDE N(+) / S(-) (m)	DEPARTURE E(+) / W(-) (m)	CLOSURE (m)	CLOSURE AZIMUTH (deg)	VERTICAL SECTION (m)	DOGLEG (deg)	DOGLEG SEVERITY (°/30m)
356.89	4.00	320.00	356.79	131.21	3.83	-2.46	4.55	327.25	-1.54	0.92	1.32
384.16	4.40	312.50	383.98	104.02	5.26	-3.84	6.52	323.85	-2.56	0.68	0.75
413.02	5.70	328.30	412.73	75.27	7.23	-5.41	9.03	323.18	-3.65	1.89	1.97
422.79	5.70	330.40	422.45	65.55	8.06	-5.91	10.00	323.77	-3.94	0.21	0.64
432.54	6.90	343.30	432.14	55.86	9.05	-6.32	11.03	325.08	-4.12	1.85	5.69
442.09	7.50	352.90	441.62	46.38	10.21	-6.56	12.14	327.30	-4.09	1.34	4.22
451.40	7.40	359.30	450.85	37.15	11.42	-6.64	13.21	329.82	-3.90	0.84	2.69
461.15	7.30	10.20	460.52	27.48	12.65	-6.54	14.24	332.68	-3.52	1.40	4.30
470.58	7.10	17.40	469.88	18.12	13.80	-6.26	15.15	335.61	-2.99	0.92	2.94
479.56	7.10	27.60	478.79	9.21	14.82	-5.83	15.93	338.51	-2.35	1.26	4.21
489.31	6.90	29.10	488.47	-0.47	15.87	-5.27	16.72	341.63	-1.57	0.27	0.83
499.01	6.70	33.50	498.10	-10.10	16.85	-4.67	17.49	344.49	-0.76	0.56	1.73
508.76	6.90	35.70	507.78	-19.78	17.80	-4.02	18.25	347.28	0.09	0.33	1.01
518.04	6.50	42.00	517.00	-29.00	18.64	-3.34	18.94	349.83	0.94	0.84	2.70
527.56	6.30	42.20	526.46	-38.46	19.43	-2.63	19.61	352.29	1.81	0.20	0.63
536.72	6.00	39.70	535.56	-47.56	20.17	-1.99	20.27	354.37	2.60	0.40	1.32
546.49	6.10	39.00	545.28	-57.28	20.97	-1.33	21.01	356.36	3.42	0.12	0.38
556.03	6.30	37.40	554.76	-66.76	21.78	-0.70	21.79	358.16	4.22	0.26	0.83
565.79	6.60	38.60	564.46	-76.46	22.64	-0.02	22.64	359.94	5.07	0.33	1.01
575.56	6.90	44.40	574.16	-86.16	23.50	0.74	23.51	1.80	6.01	0.74	2.29
585.31	7.30	46.20	583.84	-95.84	24.34	1.60	24.40	3.75	7.03	0.46	1.41
595.09	7.70	45.50	593.54	-105.54	25.23	2.51	25.36	5.68	8.12	0.41	1.26
603.53	8.10	51.00	601.90	-113.90	26.00	3.38	26.22	7.40	9.14	0.85	3.04

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613.22	8.20	51.10	611.49	-123.49	26.87	4.44	27.23	9.39	10.37	0.10	0.31
622.96	8.30	49.00	621.13	-133.13	27.77	5.52	28.31	11.24	11.62	0.32	0.98
632.21	7.90	51.00	630.29	-142.29	28.60	6.51	29.34	12.83	12.78	0.49	1.59
641.63	8.00	50.10	639.61	-151.61	29.43	7.52	30.38	14.33	13.95	0.16	0.51
651.38	8.10	48.70	649.27	-161.27	30.32	8.56	31.50	15.76	15.16	0.22	0.68
660.89	7.70	50.20	658.69	-170.69	31.17	9.55	32.60	17.03	16.32	0.45	1.42
670.31	7.60	48.50	668.02	-180.02	31.99	10.50	33.67	18.17	17.43	0.25	0.79
680.04	7.00	50.40	677.68	-189.68	32.79	11.44	34.73	19.23	18.52	0.65	1.99
689.30	7.30	53.90	686.86	-198.86	33.50	12.35	35.70	20.24	19.57	0.53	1.71
696.00	7.60	55.20	693.51	-205.51	34.00	13.06	36.42	21.01	20.37	0.34	1.54
711.00	7.60	52.67	708.38	-220.38	35.17	14.66	38.10	22.63	22.20	0.33	0.67
719.15	7.60	51.30	716.45	-228.45	35.83	15.51	39.05	23.40	23.17	0.18	0.67
728.91	7.50	53.40	726.13	-238.13	36.62	16.52	40.17	24.29	24.34	0.29	0.90
738.44	6.90	57.60	735.58	-247.58	37.29	17.51	41.20	25.15	25.45	0.80	2.51
748.12	6.20	62.70	745.20	-257.20	37.84	18.46	42.11	26.01	26.50	0.91	2.82
756.97	5.80	67.80	754.00	-266.00	38.23	19.30	42.83	26.79	27.41	0.67	2.26
766.29	5.10	77.80	763.28	-275.28	38.50	20.14	43.45	27.62	28.29	1.18	3.79
776.05	4.30	86.30	773.01	-285.01	38.61	20.93	43.92	28.46	29.08	1.06	3.25
785.79	3.90	89.40	782.72	-294.72	38.64	21.63	44.28	29.24	29.76	0.46	1.41
795.56	3.50	92.80	792.47	-304.47	38.63	22.26	44.58	29.95	30.38	0.46	1.40
805.29	3.00	94.20	802.19	-314.19	38.60	22.81	44.83	30.58	30.91	0.51	1.56
814.77	2.70	99.60	811.65	-323.65	38.54	23.28	45.02	31.13	31.35	0.40	1.27
824.48	2.40	87.20	821.36	-333.36	38.51	23.70	45.22	31.61	31.76	0.63	1.93

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834.05	2.30	94.90	830.92	-342.92	38.51	24.10	45.42	32.04	32.14	0.33	1.04
843.78	1.90	92.80	840.64	-352.64	38.48	24.45	45.59	32.43	32.48	0.41	1.26
853.31	1.90	80.70	850.17	-362.17	38.50	24.76	45.78	32.75	32.79	0.40	1.26
862.82	2.00	80.10	859.67	-371.67	38.55	25.08	46.00	33.05	33.11	0.10	0.32
872.58	2.10	82.10	869.42	-381.42	38.61	25.43	46.23	33.37	33.46	0.12	0.38
892.07	2.00	94.50	888.90	-400.90	38.63	26.12	46.63	34.07	34.14	0.45	0.70
901.55	2.40	95.60	898.37	-410.37	38.60	26.48	46.81	34.46	34.49	0.40	1.27
920.99	2.20	96.70	917.80	-429.80	38.51	27.26	47.18	35.29	35.22	0.20	0.32
930.52	2.30	93.10	927.32	-439.32	38.48	27.63	47.38	35.68	35.58	0.17	0.54
940.00	2.20	86.80	936.79	-448.79	38.48	28.00	47.59	36.04	35.94	0.27	0.84
949.70	2.20	76.10	946.49	-458.49	38.54	28.37	47.85	36.36	36.31	0.41	1.27
968.78	2.50	63.80	965.55	-477.55	38.81	29.10	48.51	36.86	37.08	0.59	0.92
987.76	2.30	70.30	984.51	-496.51	39.12	29.83	49.20	37.33	37.86	0.34	0.53
997.30	2.40	73.30	994.05	-506.05	39.24	30.20	49.52	37.58	38.25	0.16	0.50
1006.61	2.40	69.90	1003.35	-515.35	39.37	30.57	49.84	37.83	38.64	0.14	0.46
1025.31	2.50	81.20	1022.03	-534.03	39.56	31.34	50.47	38.39	39.44	0.49	0.79
1034.85	2.60	76.80	1031.56	-543.56	39.64	31.76	50.80	38.70	39.86	0.22	0.69
1044.59	2.40	79.60	1041.29	-553.29	39.73	32.17	51.12	39.00	40.29	0.23	0.72
1063.35	1.70	78.50	1060.04	-572.04	39.86	32.83	51.64	39.48	40.96	0.70	1.12
1082.60	1.70	68.20	1079.28	-591.28	40.02	33.38	52.11	39.83	41.52	0.31	0.48
1101.66	1.40	82.80	1098.34	-610.34	40.15	33.87	52.53	40.15	42.04	0.49	0.78
1130.81	1.60	98.10	1127.48	-639.48	40.14	34.63	53.01	40.78	42.77	0.45	0.46
1158.98	1.90	93.70	1155.63	-667.63	40.06	35.48	53.51	41.53	43.58	0.33	0.35

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1178.46	2.30	96.80	1175.10	-687.10	39.99	36.19	53.94	42.15	44.26	0.42	0.64
1197.23	2.20	90.50	1193.85	-705.85	39.94	36.93	54.40	42.75	44.97	0.27	0.43
1226.31	2.30	85.10	1222.91	-734.91	39.99	38.07	55.21	43.59	46.09	0.23	0.24
1245.79	2.00	75.90	1242.38	-754.38	40.10	38.79	55.79	44.04	46.81	0.46	0.70
1265.05	2.60	71.70	1261.62	-773.62	40.32	39.53	56.46	44.43	47.58	0.62	0.97
1284.13	3.00	72.60	1280.68	-792.68	40.61	40.41	57.29	44.86	48.51	0.40	0.63
1303.61	3.00	73.60	1300.13	-812.13	40.90	41.39	58.19	45.34	49.53	0.05	0.08
1322.67	3.40	78.40	1319.16	-831.16	41.16	42.42	59.11	45.87	50.59	0.48	0.76
1341.21	4.10	77.70	1337.66	-849.66	41.41	43.61	60.14	46.48	51.80	0.70	1.14
1360.51	4.30	68.30	1356.91	-868.91	41.82	44.95	61.40	47.07	53.21	0.72	1.11
1379.66	4.40	71.00	1376.01	-888.01	42.33	46.32	62.74	47.58	54.65	0.23	0.36
1398.97	4.80	73.60	1395.25	-907.25	42.80	47.79	64.15	48.15	56.19	0.45	0.70
1408.63	4.80	75.70	1404.88	-916.88	43.01	48.57	64.88	48.47	57.00	0.18	0.55
1418.28	4.50	78.90	1414.50	-926.50	43.18	49.33	65.56	48.80	57.78	0.40	1.23
1427.85	4.10	79.80	1424.04	-936.04	43.32	50.04	66.18	49.12	58.50	0.41	1.27
1437.25	3.70	82.80	1433.42	-945.42	43.41	50.67	66.72	49.41	59.14	0.45	1.43
1447.00	3.40	84.50	1443.15	-955.15	43.48	51.27	67.22	49.70	59.74	0.32	0.98
1456.75	3.20	87.00	1452.89	-964.89	43.52	51.83	67.68	49.98	60.29	0.25	0.76
1475.22	3.00	94.70	1471.33	-983.33	43.51	52.83	68.44	50.52	61.26	0.46	0.75
1494.71	2.90	93.10	1490.79	-1002.79	43.44	53.83	69.17	51.09	62.22	0.13	0.20
1513.08	2.60	82.20	1509.14	-1021.14	43.47	54.70	69.87	51.52	63.08	0.60	0.98
1532.16	3.20	78.70	1528.20	-1040.20	43.64	55.65	70.72	51.90	64.04	0.63	0.98
1560.33	3.80	74.50	1556.31	-1068.31	44.04	57.32	72.29	52.47	65.76	0.65	0.69

CDN FOREST et al NORTH LIARD C-31 60-40-123-30
DIRECTIONAL SURVEY RECORD

Calculations Based On Survey Data Provided By Ryan Energy Technologies Inc.

K.B. Elevation = 488.00
Vertical Section = 77.00

SURVEY DEPTH (m)	INCLINATION (deg)	AZIMUTH (deg)	TVD (m)	TVD SUBSEA (m)	LATITUDE N(+) / S(-) (m)	DEPARTURE E(+) / W(-) (m)	CLOSURE (m)	CLOSURE AZIMUTH (deg)	VERTICAL SECTION (m)	DOGLEG (deg)	DOGLEG SEVERITY (°/30m)
1589.11	3.60	79.10	1585.03	-1097.03	44.47	59.13	73.98	53.06	67.62	0.36	0.37
1607.90	3.60	78.00	1603.79	-1115.79	44.70	60.29	75.05	53.44	68.80	0.07	0.11
1627.96	4.10	69.90	1623.80	-1135.80	45.08	61.58	76.31	53.79	70.14	0.74	1.10
1647.16	4.70	68.20	1642.95	-1154.95	45.61	62.95	77.74	54.08	71.60	0.61	0.96
1666.45	5.20	69.40	1662.16	-1174.16	46.21	64.50	79.35	54.38	73.24	0.51	0.79
1685.57	5.40	73.40	1681.20	-1193.20	46.77	66.18	81.03	54.75	75.00	0.42	0.66
1704.55	5.70	70.10	1700.09	-1212.09	47.34	67.92	82.79	55.12	76.83	0.44	0.69
1723.76	5.40	65.50	1719.21	-1231.21	48.04	69.64	84.60	55.40	78.66	0.54	0.84
1743.01	4.80	68.00	1738.39	-1250.39	48.72	71.21	86.28	55.62	80.34	0.64	1.00
1760.00	4.60	68.20	1755.32	-1267.32	49.24	72.50	87.64	55.82	81.72	0.20	0.35
1771.23	4.30	73.30	1766.52	-1278.52	49.53	73.32	88.48	55.96	82.58	0.50	1.33
1780.75	4.30	74.70	1776.01	-1288.01	49.73	74.01	89.16	56.10	83.30	0.10	0.33
1790.47	4.30	75.00	1785.70	-1297.70	49.92	74.71	89.85	56.25	84.03	0.02	0.07
1800.13	4.20	69.20	1795.34	-1307.34	50.14	75.39	90.54	56.38	84.74	0.44	1.37
1809.70	4.20	68.90	1804.88	-1316.88	50.39	76.05	91.22	56.47	85.43	0.02	0.07
1819.22	4.00	76.60	1814.38	-1326.38	50.59	76.70	91.88	56.59	86.11	0.59	1.84
1828.69	4.00	72.40	1823.82	-1335.82	50.77	77.33	92.51	56.72	86.77	0.29	0.93
1838.25	3.80	68.30	1833.36	-1345.36	50.98	77.94	93.14	56.81	87.41	0.34	1.08
1848.39	3.80	73.50	1843.48	-1355.48	51.20	78.58	93.79	56.91	88.08	0.34	1.02
1867.10	3.60	73.60	1862.15	-1374.15	51.54	79.74	94.95	57.12	89.29	0.20	0.32
1876.70	3.40	68.20	1871.73	-1383.73	51.74	80.29	95.51	57.20	89.87	0.39	1.20
1884.00	3.40	68.00	1879.02	-1391.02	51.90	80.69	95.94	57.25	90.30	0.01	0.05
1892.16	3.60	63.40	1887.16	-1399.16	52.10	81.14	96.43	57.30	90.79	0.34	1.27

CDN FOREST et al NORTH LIARD C-31 60-40-123-30
DIRECTIONAL SURVEY RECORD

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Vertical Section = 77.00

SURVEY DEPTH (m)	INCLINATION (deg)	AZIMUTH (deg)	TVD (m)	TVD SUBSEA (m)	LATITUDE N(+) / S(-) (m)	DEPARTURE E(+) / W(-) (m)	CLOSURE (m)	CLOSURE AZIMUTH (deg)	VERTICAL SECTION (m)	DOGLEG (deg)	DOGLEG SEVERITY (°/30m)
1901.84	3.70	64.00	1896.82	-1408.82	52.38	81.70	97.04	57.34	91.38	0.11	0.33
1912.43	3.90	65.70	1907.39	-1419.39	52.67	82.33	97.74	57.39	92.07	0.23	0.65
1921.02	3.90	67.50	1915.96	-1427.96	52.91	82.87	98.32	57.44	92.65	0.12	0.43
1930.62	4.00	68.50	1925.54	-1437.54	53.15	83.48	98.97	57.51	93.30	0.12	0.38
1940.04	4.20	70.50	1934.93	-1446.93	53.39	84.11	99.63	57.60	93.97	0.25	0.78
1949.62	4.30	71.70	1944.49	-1456.49	53.62	84.78	100.32	57.69	94.67	0.13	0.42
1958.82	4.40	73.30	1953.66	-1465.66	53.83	85.45	100.99	57.79	95.37	0.16	0.51
1968.31	4.80	82.10	1963.12	-1475.12	53.99	86.19	101.70	57.94	96.13	0.81	2.56
1977.70	4.80	94.90	1972.48	-1484.48	54.01	86.97	102.38	58.16	96.89	1.07	3.41
1987.37	4.50	109.50	1982.12	-1494.12	53.85	87.73	102.94	58.46	97.60	1.22	3.78
1997.04	4.40	123.80	1991.76	-1503.76	53.51	88.40	103.33	58.81	98.17	1.11	3.45
2006.69	4.70	133.60	2001.38	-1513.38	53.04	88.99	103.60	59.21	98.64	0.83	2.59
2016.19	4.80	138.30	2010.84	-1522.84	52.47	89.54	103.78	59.63	99.05	0.40	1.27
2025.70	4.30	139.90	2020.32	-1532.32	51.90	90.03	103.92	60.04	99.40	0.52	1.63
2035.35	4.00	145.20	2029.95	-1541.95	51.35	90.46	104.02	60.42	99.69	0.49	1.51
2044.85	3.70	147.60	2039.43	-1551.43	50.82	90.81	104.06	60.77	99.92	0.34	1.08
2053.54	3.20	143.90	2048.10	-1560.10	50.38	91.10	104.11	61.06	100.10	0.55	1.89
2063.61	3.20	139.00	2058.16	-1570.16	49.94	91.45	104.20	61.36	100.35	0.27	0.81
2073.27	3.30	132.70	2067.80	-1579.80	49.55	91.84	104.35	61.65	100.63	0.37	1.15
2083.09	3.40	128.60	2077.60	-1589.60	49.18	92.27	104.56	61.94	100.97	0.26	0.79
2092.59	3.60	129.20	2087.09	-1599.09	48.81	92.72	104.79	62.24	101.33	0.20	0.64
2102.33	3.60	132.50	2096.81	-1608.81	48.41	93.18	105.01	62.55	101.69	0.21	0.64
2111.77	3.30	135.70	2106.23	-1618.23	48.02	93.59	105.19	62.84	102.00	0.36	1.13

CDN FOREST et al NORTH LIARD C-31 60-40-123-30
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2121.37	2.60	138.50	2115.82	-1627.82	47.66	93.93	105.33	63.10	102.24	0.71	2.23
2131.05	2.10	137.30	2125.49	-1637.49	47.36	94.20	105.43	63.31	102.44	0.50	1.56
2140.50	1.80	135.50	2134.93	-1646.93	47.13	94.42	105.53	63.47	102.60	0.31	0.97
2150.10	1.40	127.60	2144.53	-1656.53	46.95	94.62	105.63	63.61	102.75	0.46	1.42
2159.67	1.10	130.10	2154.10	-1666.10	46.82	94.78	105.71	63.71	102.88	0.30	0.96
2169.34	1.10	130.10	2163.77	-1675.77	46.70	94.92	105.79	63.80	102.99	0.00	0.00
2178.93	0.90	136.20	2173.35	-1685.35	46.59	95.04	105.85	63.89	103.09	0.23	0.71
2187.10	1.00	129.90	2181.52	-1693.52	46.50	95.14	105.90	63.96	103.16	0.14	0.53
2196.70	1.10	141.60	2191.12	-1703.12	46.37	95.26	105.95	64.05	103.25	0.24	0.74
2205.94	1.50	139.20	2200.36	-1712.36	46.21	95.40	106.00	64.16	103.35	0.40	1.31
2215.60	1.70	139.70	2210.01	-1722.01	46.00	95.57	106.07	64.30	103.47	0.20	0.62
2225.06	1.90	146.60	2219.47	-1731.47	45.77	95.75	106.13	64.45	103.59	0.29	0.93
2234.64	2.30	151.70	2229.04	-1741.04	45.46	95.93	106.16	64.64	103.70	0.44	1.38
2244.19	2.50	161.20	2238.59	-1750.59	45.10	96.09	106.14	64.86	103.77	0.44	1.40
2253.91	2.80	168.90	2248.29	-1760.29	44.67	96.20	106.06	65.10	103.78	0.46	1.43
2264.38	2.60	171.70	2258.75	-1770.75	44.18	96.28	105.94	65.35	103.76	0.24	0.69
2273.91	2.80	172.80	2268.27	-1780.27	43.73	96.35	105.81	65.59	103.71	0.21	0.65
2283.41	3.00	169.90	2277.76	-1789.76	43.26	96.42	105.68	65.84	103.68	0.25	0.78
2293.06	2.90	165.40	2287.40	-1799.40	42.77	96.52	105.58	66.10	103.67	0.25	0.78
2302.72	3.30	168.40	2297.04	-1809.04	42.27	96.64	105.48	66.38	103.67	0.43	1.34
2312.31	3.40	168.20	2306.62	-1818.62	41.72	96.75	105.37	66.68	103.66	0.10	0.31
2321.66	3.50	166.60	2315.95	-1827.95	41.17	96.88	105.26	66.98	103.66	0.14	0.45
2331.28	3.20	160.60	2325.55	-1837.55	40.63	97.04	105.20	67.28	103.69	0.46	1.44

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2340.96	3.00	155.70	2335.22	-1847.22	40.14	97.23	105.19	67.57	103.77	0.33	1.03
2350.60	2.60	152.20	2344.85	-1856.85	39.72	97.43	105.22	67.82	103.87	0.43	1.35
2360.28	1.70	145.20	2354.52	-1866.52	39.41	97.62	105.27	68.02	103.98	0.94	2.90
2369.75	0.90	82.80	2363.99	-1875.99	39.30	97.77	105.38	68.10	104.11	1.51	4.79
2379.35	1.40	22.60	2373.59	-1885.59	39.42	97.89	105.53	68.07	104.25	1.23	3.85
2388.81	2.20	10.90	2383.04	-1895.04	39.70	97.97	105.71	67.94	104.39	0.88	2.78
2399.18	2.60	7.30	2393.40	-1905.40	40.13	98.04	105.94	67.74	104.55	0.43	1.24
2408.87	3.10	9.20	2403.08	-1915.08	40.61	98.11	106.18	67.51	104.73	0.51	1.58
2418.52	3.30	356.90	2412.72	-1924.72	41.14	98.14	106.41	67.25	104.88	0.71	2.22
2428.03	4.00	359.10	2422.21	-1934.21	41.75	98.12	106.63	66.95	104.99	0.71	2.25
2439.43	3.30	5.90	2433.58	-1945.58	42.47	98.14	106.94	66.60	105.18	0.82	2.16
2449.01	4.40	348.70	2443.14	-1955.14	43.11	98.10	107.15	66.28	105.28	1.58	4.96
2458.23	4.80	346.30	2452.33	-1964.33	43.83	97.94	107.30	65.89	105.29	0.44	1.44
2467.15	4.90	343.50	2461.22	-1973.22	44.56	97.74	107.42	65.49	105.26	0.26	0.86
2471.38	5.40	341.00	2465.43	-1977.43	44.92	97.63	107.46	65.29	105.23	0.55	3.89
2480.76	5.40	337.60	2474.77	-1986.77	45.74	97.31	107.53	64.82	105.11	0.32	1.02
2490.35	5.30	336.40	2484.32	-1996.32	46.57	96.97	107.57	64.35	104.96	0.15	0.47
2499.87	5.30	334.80	2493.80	-2005.80	47.37	96.60	107.59	63.88	104.78	0.15	0.47
2511.00	5.60	334.50	2504.88	-2016.88	48.32	96.15	107.61	63.32	104.56	0.30	0.81
2519.25	5.90	332.72	2513.09	-2025.09	49.06	95.78	107.62	62.88	104.36	0.35	1.27
2528.92	5.60	328.86	2522.71	-2034.71	49.91	95.31	107.59	62.36	104.09	0.49	1.52
2538.41	6.20	329.40	2532.15	-2044.15	50.75	94.81	107.54	61.84	103.80	0.60	1.90
2548.08	6.40	332.90	2541.76	-2053.76	51.68	94.30	107.53	61.28	103.51	0.43	1.34

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2558.67	6.70	331.50	2552.28	-2064.28	52.74	93.73	107.56	60.63	103.20	0.34	0.96
2565.11	6.80	329.70	2558.68	-2070.68	53.40	93.36	107.56	60.23	102.98	0.23	1.09
2575.75	6.50	325.50	2569.25	-2081.25	54.44	92.70	107.51	59.57	102.58	0.57	1.61
2585.24	6.70	320.60	2578.67	-2090.67	55.31	92.05	107.39	59.00	102.13	0.60	1.89
2594.67	7.00	319.00	2588.04	-2100.04	56.17	91.32	107.22	58.40	101.62	0.36	1.13
2604.14	7.20	315.10	2597.43	-2109.43	57.03	90.52	106.99	57.79	101.03	0.52	1.65
2613.39	7.40	316.00	2606.61	-2118.61	57.87	89.70	106.75	57.17	100.42	0.23	0.75
2617.57	7.10	313.40	2610.75	-2122.75	58.24	89.33	106.64	56.90	100.14	0.44	3.19
2630.80	6.90	315.10	2623.89	-2135.89	59.36	88.17	106.29	56.05	99.27	0.29	0.65
2640.40	6.90	318.50	2633.42	-2145.42	60.20	87.38	106.11	55.43	98.69	0.41	1.28
2650.00	7.50	326.80	2642.94	-2154.94	61.16	86.66	106.07	54.79	98.19	1.20	3.75
2659.70	7.80	333.80	2652.55	-2164.55	62.28	86.02	106.20	54.09	97.83	0.98	3.03
2669.10	7.90	340.30	2661.87	-2173.87	63.46	85.52	106.50	53.42	97.60	0.89	2.85
2678.40	8.60	349.60	2671.07	-2183.07	64.75	85.18	106.99	52.76	97.56	1.50	4.85
2688.10	9.70	355.80	2680.65	-2192.65	66.28	84.99	107.78	52.05	97.72	1.48	4.56
2697.70	11.30	1.20	2690.09	-2202.09	68.02	84.95	108.83	51.31	98.07	1.88	5.86
2707.30	12.50	2.80	2699.48	-2211.48	70.00	85.02	110.13	50.53	98.59	1.24	3.89
2717.00	13.60	3.00	2708.93	-2220.93	72.19	85.13	111.62	49.70	99.19	1.10	3.40
2730.75	15.50	1.00	2722.24	-2234.24	75.64	85.25	113.97	48.42	100.08	1.97	4.29

ADDENDUM B – DIRECTIONAL SURVEY RECORD C–31A SIDETRACK NO. 1

CDN FOREST et al NORTH LIARD C-31A SIDETRACK NO. 1 60-40-123-30
DIRECTIONAL SURVEY RECORD

Calculations Based On Survey Data Provided By Ryan Energy Technologies Inc.

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Vertical Section = 77.00

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0.00	0.00	0.00	0.00	488.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
39.00	0.50	2.00	39.00	449.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
71.00	0.25	336.00	71.00	417.00	0.20	-0.02	0.20	353.40	0.02	0.30	0.28
88.00	0.50	58.00	88.00	400.00	0.28	0.02	0.28	5.02	0.09	0.53	0.93
116.00	0.50	217.00	116.00	372.00	0.24	0.05	0.25	12.58	0.11	0.98	1.05
145.00	0.50	11.00	145.00	343.00	0.27	0.00	0.27	0.51	0.06	0.97	1.01
181.16	0.50	86.00	181.16	306.84	0.43	0.19	0.47	23.69	0.28	0.61	0.51
201.00	0.50	301.00	201.00	287.00	0.48	0.20	0.52	22.68	0.31	0.95	1.44
210.72	0.60	339.00	210.72	277.28	0.55	0.15	0.57	14.94	0.27	0.37	1.14
213.44	0.40	39.00	213.44	274.56	0.57	0.15	0.59	14.50	0.27	0.53	5.84
223.00	0.30	36.00	223.00	265.00	0.62	0.18	0.65	16.54	0.32	0.10	0.32
232.73	0.30	16.00	232.73	255.27	0.66	0.21	0.70	17.22	0.35	0.10	0.32
242.60	0.60	358.10	242.60	245.40	0.74	0.21	0.77	15.92	0.37	0.33	1.00
252.00	0.60	12.60	252.00	236.00	0.84	0.22	0.87	14.74	0.40	0.15	0.48
261.50	2.00	356.10	261.49	226.51	1.05	0.22	1.08	11.81	0.45	1.43	4.53
270.90	0.40	287.00	270.89	217.11	1.23	0.18	1.24	8.24	0.45	1.89	6.05
280.62	0.90	298.00	280.61	207.39	1.27	0.08	1.27	3.50	0.36	0.51	1.58
290.35	1.30	315.90	290.34	197.66	1.39	-0.07	1.39	357.25	0.25	0.52	1.61
300.07	2.10	312.70	300.05	187.95	1.59	-0.27	1.61	350.19	0.09	0.81	2.49
309.50	3.00	317.11	309.47	178.53	1.88	-0.57	1.97	343.19	-0.13	0.92	2.93
318.93	3.00	315.90	318.89	169.11	2.24	-0.91	2.42	337.94	-0.38	0.06	0.20
326.48	3.00	313.70	326.43	161.57	2.52	-1.19	2.79	334.75	-0.59	0.12	0.46
335.91	3.20	312.70	335.85	152.15	2.87	-1.56	3.27	331.46	-0.88	0.21	0.66

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356.89	4.00	320.00	356.79	131.21	3.83	-2.46	4.55	327.25	-1.54	0.92	1.32
384.16	4.40	312.50	383.98	104.02	5.26	-3.84	6.52	323.85	-2.56	0.68	0.75
413.02	5.70	328.30	412.73	75.27	7.23	-5.41	9.03	323.18	-3.65	1.89	1.97
422.79	5.70	330.40	422.45	65.55	8.06	-5.91	10.00	323.77	-3.94	0.21	0.64
432.54	6.90	343.30	432.14	55.86	9.05	-6.32	11.03	325.08	-4.12	1.85	5.69
442.09	7.50	352.90	441.62	46.38	10.21	-6.56	12.14	327.30	-4.09	1.34	4.22
451.40	7.40	359.30	450.85	37.15	11.42	-6.64	13.21	329.82	-3.90	0.84	2.69
461.15	7.30	10.20	460.52	27.48	12.65	-6.54	14.24	332.68	-3.52	1.40	4.30
470.58	7.10	17.40	469.88	18.12	13.80	-6.26	15.15	335.61	-2.99	0.92	2.94
479.56	7.10	27.60	478.79	9.21	14.82	-5.83	15.93	338.51	-2.35	1.26	4.21
489.31	6.90	29.10	488.47	-0.47	15.87	-5.27	16.72	341.63	-1.57	0.27	0.83
499.01	6.70	33.50	498.10	-10.10	16.85	-4.67	17.49	344.49	-0.76	0.56	1.73
508.76	6.90	35.70	507.78	-19.78	17.80	-4.02	18.25	347.28	0.09	0.33	1.01
518.04	6.50	42.00	517.00	-29.00	18.64	-3.34	18.94	349.83	0.94	0.84	2.70
527.56	6.30	42.20	526.46	-38.46	19.43	-2.63	19.61	352.29	1.81	0.20	0.63
536.72	6.00	39.70	535.56	-47.56	20.17	-1.99	20.27	354.37	2.60	0.40	1.32
546.49	6.10	39.00	545.28	-57.28	20.97	-1.33	21.01	356.36	3.42	0.12	0.38
556.03	6.30	37.40	554.76	-66.76	21.78	-0.70	21.79	358.16	4.22	0.26	0.83
565.79	6.60	38.60	564.46	-76.46	22.64	-0.02	22.64	359.94	5.07	0.33	1.01
575.56	6.90	44.40	574.16	-86.16	23.50	0.74	23.51	1.80	6.01	0.74	2.29
585.31	7.30	46.20	583.84	-95.84	24.34	1.60	24.40	3.75	7.03	0.46	1.41
595.09	7.70	45.50	593.54	-105.54	25.23	2.51	25.36	5.68	8.12	0.41	1.26
603.53	8.10	51.00	601.90	-113.90	26.00	3.38	26.22	7.40	9.14	0.85	3.04

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613.22	8.20	51.10	611.49	-123.49	26.87	4.44	27.23	9.39	10.37	0.10	0.31
622.96	8.30	49.00	621.13	-133.13	27.77	5.52	28.31	11.24	11.62	0.32	0.98
632.21	7.90	51.00	630.29	-142.29	28.60	6.51	29.34	12.83	12.78	0.49	1.59
641.63	8.00	50.10	639.61	-151.61	29.43	7.52	30.38	14.33	13.95	0.16	0.51
651.38	8.10	48.70	649.27	-161.27	30.32	8.56	31.50	15.76	15.16	0.22	0.68
660.89	7.70	50.20	658.69	-170.69	31.17	9.55	32.60	17.03	16.32	0.45	1.42
670.31	7.60	48.50	668.02	-180.02	31.99	10.50	33.67	18.17	17.43	0.25	0.79
680.04	7.00	50.40	677.68	-189.68	32.79	11.44	34.73	19.23	18.52	0.65	1.99
689.30	7.30	53.90	686.86	-198.86	33.50	12.35	35.70	20.24	19.57	0.53	1.71
696.00	7.60	55.20	693.51	-205.51	34.00	13.06	36.42	21.01	20.37	0.34	1.54
711.00	7.60	52.67	708.38	-220.38	35.17	14.66	38.10	22.63	22.20	0.33	0.67
719.15	7.60	51.30	716.45	-228.45	35.83	15.51	39.05	23.40	23.17	0.18	0.67
728.91	7.50	53.40	726.13	-238.13	36.62	16.52	40.17	24.29	24.34	0.29	0.90
738.44	6.90	57.60	735.58	-247.58	37.29	17.51	41.20	25.15	25.45	0.80	2.51
748.12	6.20	62.70	745.20	-257.20	37.84	18.46	42.11	26.01	26.50	0.91	2.82
756.97	5.80	67.80	754.00	-266.00	38.23	19.30	42.83	26.79	27.41	0.67	2.26
766.29	5.10	77.80	763.28	-275.28	38.50	20.14	43.45	27.62	28.29	1.18	3.79
776.05	4.30	86.30	773.01	-285.01	38.61	20.93	43.92	28.46	29.08	1.06	3.25
785.79	3.90	89.40	782.72	-294.72	38.64	21.63	44.28	29.24	29.76	0.46	1.41
795.56	3.50	92.80	792.47	-304.47	38.63	22.26	44.58	29.95	30.38	0.46	1.40
805.29	3.00	94.20	802.19	-314.19	38.60	22.81	44.83	30.58	30.91	0.51	1.56
814.77	2.70	99.60	811.65	-323.65	38.54	23.28	45.02	31.13	31.35	0.40	1.27
824.48	2.40	87.20	821.36	-333.36	38.51	23.70	45.22	31.61	31.76	0.63	1.93

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834.05	2.30	94.90	830.92	-342.92	38.51	24.10	45.42	32.04	32.14	0.33	1.04
843.78	1.90	92.80	840.64	-352.64	38.48	24.45	45.59	32.43	32.48	0.41	1.26
853.31	1.90	80.70	850.17	-362.17	38.50	24.76	45.78	32.75	32.79	0.40	1.26
862.82	2.00	80.10	859.67	-371.67	38.55	25.08	46.00	33.05	33.11	0.10	0.32
872.58	2.10	82.10	869.42	-381.42	38.61	25.43	46.23	33.37	33.46	0.12	0.38
892.07	2.00	94.50	888.90	-400.90	38.63	26.12	46.63	34.07	34.14	0.45	0.70
901.55	2.40	95.60	898.37	-410.37	38.60	26.48	46.81	34.46	34.49	0.40	1.27
920.99	2.20	96.70	917.80	-429.80	38.51	27.26	47.18	35.29	35.22	0.20	0.32
930.52	2.30	93.10	927.32	-439.32	38.48	27.63	47.38	35.68	35.58	0.17	0.54
940.00	2.20	86.80	936.79	-448.79	38.48	28.00	47.59	36.04	35.94	0.27	0.84
949.70	2.20	76.10	946.49	-458.49	38.54	28.37	47.85	36.36	36.31	0.41	1.27
968.78	2.50	63.80	965.55	-477.55	38.81	29.10	48.51	36.86	37.08	0.59	0.92
987.76	2.30	70.30	984.51	-496.51	39.12	29.83	49.20	37.33	37.86	0.34	0.53
997.30	2.40	73.30	994.05	-506.05	39.24	30.20	49.52	37.58	38.25	0.16	0.50
1006.61	2.40	69.90	1003.35	-515.35	39.37	30.57	49.84	37.83	38.64	0.14	0.46
1025.31	2.50	81.20	1022.03	-534.03	39.56	31.34	50.47	38.39	39.44	0.49	0.79
1034.85	2.60	76.80	1031.56	-543.56	39.64	31.76	50.80	38.70	39.86	0.22	0.69
1044.59	2.40	79.60	1041.29	-553.29	39.73	32.17	51.12	39.00	40.29	0.23	0.72
1063.35	1.70	78.50	1060.04	-572.04	39.86	32.83	51.64	39.48	40.96	0.70	1.12
1082.60	1.70	68.20	1079.28	-591.28	40.02	33.38	52.11	39.83	41.52	0.31	0.48
1101.66	1.40	82.80	1098.34	-610.34	40.15	33.87	52.53	40.15	42.04	0.49	0.78
1130.81	1.60	98.10	1127.48	-639.48	40.14	34.63	53.01	40.78	42.77	0.45	0.46
1158.98	1.90	93.70	1155.63	-667.63	40.06	35.48	53.51	41.53	43.58	0.33	0.35

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1178.46	2.30	96.80	1175.10	-687.10	39.99	36.19	53.94	42.15	44.26	0.42	0.64
1197.23	2.20	90.50	1193.85	-705.85	39.94	36.93	54.40	42.75	44.97	0.27	0.43
1226.31	2.30	85.10	1222.91	-734.91	39.99	38.07	55.21	43.59	46.09	0.23	0.24
1245.79	2.00	75.90	1242.38	-754.38	40.10	38.79	55.79	44.04	46.81	0.46	0.70
1265.05	2.60	71.70	1261.62	-773.62	40.32	39.53	56.46	44.43	47.58	0.62	0.97
1284.13	3.00	72.60	1280.68	-792.68	40.61	40.41	57.29	44.86	48.51	0.40	0.63
1303.61	3.00	73.60	1300.13	-812.13	40.90	41.39	58.19	45.34	49.53	0.05	0.08
1322.67	3.40	78.40	1319.16	-831.16	41.16	42.42	59.11	45.87	50.59	0.48	0.76
1341.21	4.10	77.70	1337.66	-849.66	41.41	43.61	60.14	46.48	51.80	0.70	1.14
1360.51	4.30	68.30	1356.91	-868.91	41.82	44.95	61.40	47.07	53.21	0.72	1.11
1379.66	4.40	71.00	1376.01	-888.01	42.33	46.32	62.74	47.58	54.65	0.23	0.36
1398.97	4.80	73.60	1395.25	-907.25	42.80	47.79	64.15	48.15	56.19	0.45	0.70
1408.63	4.80	75.70	1404.88	-916.88	43.01	48.57	64.88	48.47	57.00	0.18	0.55
1418.28	4.50	78.90	1414.50	-926.50	43.18	49.33	65.56	48.80	57.78	0.40	1.23
1427.85	4.10	79.80	1424.04	-936.04	43.32	50.04	66.18	49.12	58.50	0.41	1.27
1437.25	3.70	82.80	1433.42	-945.42	43.41	50.67	66.72	49.41	59.14	0.45	1.43
1447.00	3.40	84.50	1443.15	-955.15	43.48	51.27	67.22	49.70	59.74	0.32	0.98
1456.75	3.20	87.00	1452.89	-964.89	43.52	51.83	67.68	49.98	60.29	0.25	0.76
1475.22	3.00	94.70	1471.33	-983.33	43.51	52.83	68.44	50.52	61.26	0.46	0.75
1494.71	2.90	93.10	1490.79	-1002.79	43.44	53.83	69.17	51.09	62.22	0.13	0.20
1513.08	2.60	82.20	1509.14	-1021.14	43.47	54.70	69.87	51.52	63.08	0.60	0.98
1532.16	3.20	78.70	1528.20	-1040.20	43.64	55.65	70.72	51.90	64.04	0.63	0.98
1560.33	3.80	74.50	1556.31	-1068.31	44.04	57.32	72.29	52.47	65.76	0.65	0.69

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1589.11	3.60	79.10	1585.03	-1097.03	44.47	59.13	73.98	53.06	67.62	0.36	0.37
1607.90	3.60	78.00	1603.79	-1115.79	44.70	60.29	75.05	53.44	68.80	0.07	0.11
1627.96	4.10	69.90	1623.80	-1135.80	45.08	61.58	76.31	53.79	70.14	0.74	1.10
1647.16	4.70	68.20	1642.95	-1154.95	45.61	62.95	77.74	54.08	71.60	0.61	0.96
1666.45	5.20	69.40	1662.16	-1174.16	46.21	64.50	79.35	54.38	73.24	0.51	0.79
1685.57	5.40	73.40	1681.20	-1193.20	46.77	66.18	81.03	54.75	75.00	0.42	0.66
1704.55	5.70	70.10	1700.09	-1212.09	47.34	67.92	82.79	55.12	76.83	0.44	0.69
1723.76	5.40	65.50	1719.21	-1231.21	48.04	69.64	84.60	55.40	78.66	0.54	0.84
1743.01	4.80	68.00	1738.39	-1250.39	48.72	71.21	86.28	55.62	80.34	0.64	1.00
1760.00	4.60	68.20	1755.32	-1267.32	49.24	72.50	87.64	55.82	81.72	0.20	0.35
1771.23	4.30	73.30	1766.52	-1278.52	49.53	73.32	88.48	55.96	82.58	0.50	1.33
1780.75	4.30	74.70	1776.01	-1288.01	49.73	74.01	89.16	56.10	83.30	0.10	0.33
1790.47	4.30	75.00	1785.70	-1297.70	49.92	74.71	89.85	56.25	84.03	0.02	0.07
1800.13	4.20	69.20	1795.34	-1307.34	50.14	75.39	90.54	56.38	84.74	0.44	1.37
1809.70	4.20	68.90	1804.88	-1316.88	50.39	76.05	91.22	56.47	85.43	0.02	0.07
1819.22	4.00	76.60	1814.38	-1326.38	50.59	76.70	91.88	56.59	86.11	0.59	1.84
1828.69	4.00	72.40	1823.82	-1335.82	50.77	77.33	92.51	56.72	86.77	0.29	0.93
1838.25	3.80	68.30	1833.36	-1345.36	50.98	77.94	93.14	56.81	87.41	0.34	1.08
1848.39	3.80	73.50	1843.48	-1355.48	51.20	78.58	93.79	56.91	88.08	0.34	1.02
1867.10	3.60	73.60	1862.15	-1374.15	51.54	79.74	94.95	57.12	89.29	0.20	0.32
1876.70	3.40	68.20	1871.73	-1383.73	51.74	80.29	95.51	57.20	89.87	0.39	1.20
1884.00	3.40	68.00	1879.02	-1391.02	51.90	80.69	95.94	57.25	90.30	0.01	0.05
1892.16	3.60	63.40	1887.16	-1399.16	52.10	81.14	96.43	57.30	90.79	0.34	1.27

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1901.84	3.70	64.00	1896.82	-1408.82	52.38	81.70	97.04	57.34	91.38	0.11	0.33
1912.43	3.90	65.70	1907.39	-1419.39	52.67	82.33	97.74	57.39	92.07	0.23	0.65
1921.02	3.90	67.50	1915.96	-1427.96	52.91	82.87	98.32	57.44	92.65	0.12	0.43
1930.62	4.00	68.50	1925.54	-1437.54	53.15	83.48	98.97	57.51	93.30	0.12	0.38
1940.04	4.20	70.50	1934.93	-1446.93	53.39	84.11	99.63	57.60	93.97	0.25	0.78
1949.62	4.30	71.70	1944.49	-1456.49	53.62	84.78	100.32	57.69	94.67	0.13	0.42
1958.82	4.40	73.30	1953.66	-1465.66	53.83	85.45	100.99	57.79	95.37	0.16	0.51
1968.31	4.80	82.10	1963.12	-1475.12	53.99	86.19	101.70	57.94	96.13	0.81	2.56
1977.70	4.80	94.90	1972.48	-1484.48	54.01	86.97	102.38	58.16	96.89	1.07	3.41
1987.37	4.50	109.50	1982.12	-1494.12	53.85	87.73	102.94	58.46	97.60	1.22	3.78
1997.04	4.40	123.80	1991.76	-1503.76	53.51	88.40	103.33	58.81	98.17	1.11	3.45
2006.69	4.70	133.60	2001.38	-1513.38	53.04	88.99	103.60	59.21	98.64	0.83	2.59
2016.19	4.80	138.30	2010.84	-1522.84	52.47	89.54	103.78	59.63	99.05	0.40	1.27
2025.70	4.30	139.90	2020.32	-1532.32	51.90	90.03	103.92	60.04	99.40	0.52	1.63
2035.35	4.00	145.20	2029.95	-1541.95	51.35	90.46	104.02	60.42	99.69	0.49	1.51
2044.85	3.70	147.60	2039.43	-1551.43	50.82	90.81	104.06	60.77	99.92	0.34	1.08
2053.54	3.20	143.90	2048.10	-1560.10	50.38	91.10	104.11	61.06	100.10	0.55	1.89
2063.61	3.20	139.00	2058.16	-1570.16	49.94	91.45	104.20	61.36	100.35	0.27	0.81
2073.27	3.30	132.70	2067.80	-1579.80	49.55	91.84	104.35	61.65	100.63	0.37	1.15
2083.09	3.40	128.60	2077.60	-1589.60	49.18	92.27	104.56	61.94	100.97	0.26	0.79
2092.59	3.60	129.20	2087.09	-1599.09	48.81	92.72	104.79	62.24	101.33	0.20	0.64
2102.33	3.60	132.50	2096.81	-1608.81	48.41	93.18	105.01	62.55	101.69	0.21	0.64
2111.77	3.30	135.70	2106.23	-1618.23	48.02	93.59	105.19	62.84	102.00	0.36	1.13

CDN FOREST et al NORTH LIARD C-31A SIDETRACK NO. 1 60-40-123-30
DIRECTIONAL SURVEY RECORD

Calculations Based On Survey Data Provided By Ryan Energy Technologies Inc.

K.B. Elevation = 488.00
Vertical Section = 77.00

SURVEY DEPTH (m)	INCLINATION (deg)	AZIMUTH (deg)	TVD (m)	TVD SUBSEA (m)	LATITUDE N(+) / S(-) (m)	DEPARTURE E(+) / W(-) (m)	CLOSURE (m)	CLOSURE AZIMUTH (deg)	VERTICAL SECTION (m)	DOGLEG (deg)	DOGLEG SEVERITY (°/30m)
2121.37	2.60	138.50	2115.82	-1627.82	47.66	93.93	105.33	63.10	102.24	0.71	2.23
2131.05	2.10	137.30	2125.49	-1637.49	47.36	94.20	105.43	63.31	102.44	0.50	1.56
2140.50	1.80	135.50	2134.93	-1646.93	47.13	94.42	105.53	63.47	102.60	0.31	0.97
2150.10	1.40	127.60	2144.53	-1656.53	46.95	94.62	105.63	63.61	102.75	0.46	1.42
2159.67	1.10	130.10	2154.10	-1666.10	46.82	94.78	105.71	63.71	102.88	0.30	0.96
2169.34	1.10	130.10	2163.77	-1675.77	46.70	94.92	105.79	63.80	102.99	0.00	0.00
2178.93	0.90	136.20	2173.35	-1685.35	46.59	95.04	105.85	63.89	103.09	0.23	0.71
2187.10	1.00	129.90	2181.52	-1693.52	46.50	95.14	105.90	63.96	103.16	0.14	0.53
2196.70	1.10	141.60	2191.12	-1703.12	46.37	95.26	105.95	64.05	103.25	0.24	0.74
2205.94	1.50	139.20	2200.36	-1712.36	46.21	95.40	106.00	64.16	103.35	0.40	1.31
2215.60	1.70	139.70	2210.01	-1722.01	46.00	95.57	106.07	64.30	103.47	0.20	0.62
2225.06	1.90	146.60	2219.47	-1731.47	45.77	95.75	106.13	64.45	103.59	0.29	0.93
2234.64	2.30	151.70	2229.04	-1741.04	45.46	95.93	106.16	64.64	103.70	0.44	1.38
2244.19	2.50	161.20	2238.59	-1750.59	45.10	96.09	106.14	64.86	103.77	0.44	1.40
2253.91	2.80	168.90	2248.29	-1760.29	44.67	96.20	106.06	65.10	103.78	0.46	1.43
2264.38	2.60	171.70	2258.75	-1770.75	44.18	96.28	105.94	65.35	103.76	0.24	0.69
2273.91	2.80	172.80	2268.27	-1780.27	43.73	96.35	105.81	65.59	103.71	0.21	0.65
2283.41	3.00	169.90	2277.76	-1789.76	43.26	96.42	105.68	65.84	103.68	0.25	0.78
2293.06	2.90	165.40	2287.40	-1799.40	42.77	96.52	105.58	66.10	103.67	0.25	0.78
2302.72	3.30	168.40	2297.04	-1809.04	42.27	96.64	105.48	66.38	103.67	0.43	1.34
2312.31	3.40	168.20	2306.62	-1818.62	41.72	96.75	105.37	66.68	103.66	0.10	0.31
2321.66	3.50	166.60	2315.95	-1827.95	41.17	96.88	105.26	66.98	103.66	0.14	0.45
2331.28	3.20	160.60	2325.55	-1837.55	40.63	97.04	105.20	67.28	103.69	0.46	1.44

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Calculations Based On Survey Data Provided By Ryan Energy Technologies Inc.

K.B. Elevation = 488.00
Vertical Section = 77.00

SURVEY DEPTH (m)	INCLINATION 3.60	AZIMUTH 63.40	TVD (m)	TVD SUBSEA (m)	LATITUDE N(+) / S(-) (m)	DEPARTURE E(+) / W(-) (m)	CLOSURE (m)	CLOSURE AZIMUTH (deg)	VERTICAL SECTION (m)	DOGLEG (deg)	DOGLEG SEVERITY (°/30m)
2340.96	3.00	155.70	2335.22	-1847.22	40.14	97.23	105.19	67.57	103.77	0.33	1.03
2350.60	2.60	152.20	2344.85	-1856.85	39.72	97.43	105.22	67.82	103.87	0.43	1.35
2360.28	1.70	145.20	2354.52	-1866.52	39.41	97.62	105.27	68.02	103.98	0.94	2.90
2369.75	0.90	82.80	2363.99	-1875.99	39.30	97.77	105.38	68.10	104.11	1.51	4.79
2406.00	3.00	299.10	2400.23	-1912.23	39.80	97.23	105.06	67.74	103.69	3.76	3.11
2424.00	3.70	48.70	2418.21	-1930.21	40.41	97.25	105.31	67.44	103.85	5.49	9.15
2438.00	4.80	321.60	2432.18	-1944.18	41.17	97.23	105.58	67.05	104.00	5.91	12.66
2450.00	4.80	321.60	2444.14	-1956.14	41.96	96.60	105.32	66.52	103.57	0.00	0.00

Survey record at 2450.0 m K.B is an extrapolation from survey record at 2438.0 m K.B.

ADDENDUM C – DIRECTIONAL SURVEY RECORD C–31A SIDETRACK NO. 2

CDN FOREST et al NORTH LIARD C-31A SIDETRACK NO. 2 60-40-123-30
DIRECTIONAL SURVEY RECORD

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Vertical Section = 77.00

SURVEY DEPTH (m)	INCLINATION (deg)	AZIMUTH (deg)	TVD (m)	TVD SUBSEA (m)	LATITUDE N(+) / S(-) (m)	DEPARTURE E(+) / W(-) (m)	CLOSURE (m)	CLOSURE AZIMUTH (deg)	VERTICAL SECTION (m)	DOGLEG (deg)	DOGLEG SEVERITY (°/30m)
0.00	0.00	0.00	0.00	488.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
39.00	0.50	2.00	39.00	449.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
71.00	0.25	336.00	71.00	417.00	0.20	-0.02	0.20	353.40	0.02	0.30	0.28
88.00	0.50	58.00	88.00	400.00	0.28	0.02	0.28	5.02	0.09	0.53	0.93
116.00	0.50	217.00	116.00	372.00	0.24	0.05	0.25	12.58	0.11	0.98	1.05
145.00	0.50	11.00	145.00	343.00	0.27	0.00	0.27	0.51	0.06	0.97	1.01
181.16	0.50	86.00	181.16	306.84	0.43	0.19	0.47	23.69	0.28	0.61	0.51
201.00	0.50	301.00	201.00	287.00	0.48	0.20	0.52	22.68	0.31	0.95	1.44
210.72	0.60	339.00	210.72	277.28	0.55	0.15	0.57	14.94	0.27	0.37	1.14
213.44	0.40	39.00	213.44	274.56	0.57	0.15	0.59	14.50	0.27	0.53	5.84
223.00	0.30	36.00	223.00	265.00	0.62	0.18	0.65	16.54	0.32	0.10	0.32
232.73	0.30	16.00	232.73	255.27	0.66	0.21	0.70	17.22	0.35	0.10	0.32
242.60	0.60	358.10	242.60	245.40	0.74	0.21	0.77	15.92	0.37	0.33	1.00
252.00	0.60	12.60	252.00	236.00	0.84	0.22	0.87	14.74	0.40	0.15	0.48
261.50	2.00	356.10	261.49	226.51	1.05	0.22	1.08	11.81	0.45	1.43	4.53
270.90	0.40	287.00	270.89	217.11	1.23	0.18	1.24	8.24	0.45	1.89	6.05
280.62	0.90	298.00	280.61	207.39	1.27	0.08	1.27	3.50	0.36	0.51	1.58
290.35	1.30	315.90	290.34	197.66	1.39	-0.07	1.39	357.25	0.25	0.52	1.61
300.07	2.10	312.70	300.05	187.95	1.59	-0.27	1.61	350.19	0.09	0.81	2.49
309.50	3.00	317.11	309.47	178.53	1.88	-0.57	1.97	343.19	-0.13	0.92	2.93
318.93	3.00	315.90	318.89	169.11	2.24	-0.91	2.42	337.94	-0.38	0.06	0.20
326.48	3.00	313.70	326.43	161.57	2.52	-1.19	2.79	334.75	-0.59	0.12	0.46
335.91	3.20	312.70	335.85	152.15	2.87	-1.56	3.27	331.46	-0.88	0.21	0.66

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Vertical Section = 77.00

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356.89	4.00	320.00	356.79	131.21	3.83	-2.46	4.55	327.25	-1.54	0.92	1.32
384.16	4.40	312.50	383.98	104.02	5.26	-3.84	6.52	323.85	-2.56	0.68	0.75
413.02	5.70	328.30	412.73	75.27	7.23	-5.41	9.03	323.18	-3.65	1.89	1.97
422.79	5.70	330.40	422.45	65.55	8.06	-5.91	10.00	323.77	-3.94	0.21	0.64
432.54	6.90	343.30	432.14	55.86	9.05	-6.32	11.03	325.08	-4.12	1.85	5.69
442.09	7.50	352.90	441.62	46.38	10.21	-6.56	12.14	327.30	-4.09	1.34	4.22
451.40	7.40	359.30	450.85	37.15	11.42	-6.64	13.21	329.82	-3.90	0.84	2.69
461.15	7.30	10.20	460.52	27.48	12.65	-6.54	14.24	332.68	-3.52	1.40	4.30
470.58	7.10	17.40	469.88	18.12	13.80	-6.26	15.15	335.61	-2.99	0.92	2.94
479.56	7.10	27.60	478.79	9.21	14.82	-5.83	15.93	338.51	-2.35	1.26	4.21
489.31	6.90	29.10	488.47	-0.47	15.87	-5.27	16.72	341.63	-1.57	0.27	0.83
499.01	6.70	33.50	498.10	-10.10	16.85	-4.67	17.49	344.49	-0.76	0.56	1.73
508.76	6.90	35.70	507.78	-19.78	17.80	-4.02	18.25	347.28	0.09	0.33	1.01
518.04	6.50	42.00	517.00	-29.00	18.64	-3.34	18.94	349.83	0.94	0.84	2.70
527.56	6.30	42.20	526.46	-38.46	19.43	-2.63	19.61	352.29	1.81	0.20	0.63
536.72	6.00	39.70	535.56	-47.56	20.17	-1.99	20.27	354.37	2.60	0.40	1.32
546.49	6.10	39.00	545.28	-57.28	20.97	-1.33	21.01	356.36	3.42	0.12	0.38
556.03	6.30	37.40	554.76	-66.76	21.78	-0.70	21.79	358.16	4.22	0.26	0.83
565.79	6.60	38.60	564.46	-76.46	22.64	-0.02	22.64	359.94	5.07	0.33	1.01
575.56	6.90	44.40	574.16	-86.16	23.50	0.74	23.51	1.80	6.01	0.74	2.29
585.31	7.30	46.20	583.84	-95.84	24.34	1.60	24.40	3.75	7.03	0.46	1.41
595.09	7.70	45.50	593.54	-105.54	25.23	2.51	25.36	5.68	8.12	0.41	1.26
603.53	8.10	51.00	601.90	-113.90	26.00	3.38	26.22	7.40	9.14	0.85	3.04

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613.22	8.20	51.10	611.49	-123.49	26.87	4.44	27.23	9.39	10.37	0.10	0.31
622.96	8.30	49.00	621.13	-133.13	27.77	5.52	28.31	11.24	11.62	0.32	0.98
632.21	7.90	51.00	630.29	-142.29	28.60	6.51	29.34	12.83	12.78	0.49	1.59
641.63	8.00	50.10	639.61	-151.61	29.43	7.52	30.38	14.33	13.95	0.16	0.51
651.38	8.10	48.70	649.27	-161.27	30.32	8.56	31.50	15.76	15.16	0.22	0.68
660.89	7.70	50.20	658.69	-170.69	31.17	9.55	32.60	17.03	16.32	0.45	1.42
670.31	7.60	48.50	668.02	-180.02	31.99	10.50	33.67	18.17	17.43	0.25	0.79
680.04	7.00	50.40	677.68	-189.68	32.79	11.44	34.73	19.23	18.52	0.65	1.99
689.30	7.30	53.90	686.86	-198.86	33.50	12.35	35.70	20.24	19.57	0.53	1.71
696.00	7.60	55.20	693.51	-205.51	34.00	13.06	36.42	21.01	20.37	0.34	1.54
711.00	7.60	52.67	708.38	-220.38	35.17	14.66	38.10	22.63	22.20	0.33	0.67
719.15	7.60	51.30	716.45	-228.45	35.83	15.51	39.05	23.40	23.17	0.18	0.67
728.91	7.50	53.40	726.13	-238.13	36.62	16.52	40.17	24.29	24.34	0.29	0.90
738.44	6.90	57.60	735.58	-247.58	37.29	17.51	41.20	25.15	25.45	0.80	2.51
748.12	6.20	62.70	745.20	-257.20	37.84	18.46	42.11	26.01	26.50	0.91	2.82
756.97	5.80	67.80	754.00	-266.00	38.23	19.30	42.83	26.79	27.41	0.67	2.26
766.29	5.10	77.80	763.28	-275.28	38.50	20.14	43.45	27.62	28.29	1.18	3.79
776.05	4.30	86.30	773.01	-285.01	38.61	20.93	43.92	28.46	29.08	1.06	3.25
785.79	3.90	89.40	782.72	-294.72	38.64	21.63	44.28	29.24	29.76	0.46	1.41
795.56	3.50	92.80	792.47	-304.47	38.63	22.26	44.58	29.95	30.38	0.46	1.40
805.29	3.00	94.20	802.19	-314.19	38.60	22.81	44.83	30.58	30.91	0.51	1.56
814.77	2.70	99.60	811.65	-323.65	38.54	23.28	45.02	31.13	31.35	0.40	1.27
824.48	2.40	87.20	821.36	-333.36	38.51	23.70	45.22	31.61	31.76	0.63	1.93

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834.05	2.30	94.90	830.92	-342.92	38.51	24.10	45.42	32.04	32.14	0.33	1.04
843.78	1.90	92.80	840.64	-352.64	38.48	24.45	45.59	32.43	32.48	0.41	1.26
853.31	1.90	80.70	850.17	-362.17	38.50	24.76	45.78	32.75	32.79	0.40	1.26
862.82	2.00	80.10	859.67	-371.67	38.55	25.08	46.00	33.05	33.11	0.10	0.32
872.58	2.10	82.10	869.42	-381.42	38.61	25.43	46.23	33.37	33.46	0.12	0.38
892.07	2.00	94.50	888.90	-400.90	38.63	26.12	46.63	34.07	34.14	0.45	0.70
901.55	2.40	95.60	898.37	-410.37	38.60	26.48	46.81	34.46	34.49	0.40	1.27
920.99	2.20	96.70	917.80	-429.80	38.51	27.26	47.18	35.29	35.22	0.20	0.32
930.52	2.30	93.10	927.32	-439.32	38.48	27.63	47.38	35.68	35.58	0.17	0.54
940.00	2.20	86.80	936.79	-448.79	38.48	28.00	47.59	36.04	35.94	0.27	0.84
949.70	2.20	76.10	946.49	-458.49	38.54	28.37	47.85	36.36	36.31	0.41	1.27
968.78	2.50	63.80	965.55	-477.55	38.81	29.10	48.51	36.86	37.08	0.59	0.92
987.76	2.30	70.30	984.51	-496.51	39.12	29.83	49.20	37.33	37.86	0.34	0.53
997.30	2.40	73.30	994.05	-506.05	39.24	30.20	49.52	37.58	38.25	0.16	0.50
1006.61	2.40	69.90	1003.35	-515.35	39.37	30.57	49.84	37.83	38.64	0.14	0.46
1025.31	2.50	81.20	1022.03	-534.03	39.56	31.34	50.47	38.39	39.44	0.49	0.79
1034.85	2.60	76.80	1031.56	-543.56	39.64	31.76	50.80	38.70	39.86	0.22	0.69
1044.59	2.40	79.60	1041.29	-553.29	39.73	32.17	51.12	39.00	40.29	0.23	0.72
1063.35	1.70	78.50	1060.04	-572.04	39.86	32.83	51.64	39.48	40.96	0.70	1.12
1082.60	1.70	68.20	1079.28	-591.28	40.02	33.38	52.11	39.83	41.52	0.31	0.48
1101.66	1.40	82.80	1098.34	-610.34	40.15	33.87	52.53	40.15	42.04	0.49	0.78
1130.81	1.60	98.10	1127.48	-639.48	40.14	34.63	53.01	40.78	42.77	0.45	0.46
1158.98	1.90	93.70	1155.63	-667.63	40.06	35.48	53.51	41.53	43.58	0.33	0.35

CDN FOREST et al NORTH LIARD C-31A SIDETRACK NO. 2 60-40-123-30
DIRECTIONAL SURVEY RECORD

Calculations Based On Survey Data Provided By Ryan Energy Technologies Inc.

K.B. Elevation = 488.00
Vertical Section = 77.00

SURVEY DEPTH (m)	INCLINATION (deg)	AZIMUTH (deg)	TVD (m)	TVD SUBSEA (m)	LATITUDE N(+) / S(-) (m)	DEPARTURE E(+) / W(-) (m)	CLOSURE (m)	CLOSURE AZIMUTH (deg)	VERTICAL SECTION (m)	DOGLEG (deg)	DOGLEG SEVERITY (°/30m)
1178.46	2.30	96.80	1175.10	-687.10	39.99	36.19	53.94	42.15	44.26	0.42	0.64
1197.23	2.20	90.50	1193.85	-705.85	39.94	36.93	54.40	42.75	44.97	0.27	0.43
1226.31	2.30	85.10	1222.91	-734.91	39.99	38.07	55.21	43.59	46.09	0.23	0.24
1245.79	2.00	75.90	1242.38	-754.38	40.10	38.79	55.79	44.04	46.81	0.46	0.70
1265.05	2.60	71.70	1261.62	-773.62	40.32	39.53	56.46	44.43	47.58	0.62	0.97
1284.13	3.00	72.60	1280.68	-792.68	40.61	40.41	57.29	44.86	48.51	0.40	0.63
1303.61	3.00	73.60	1300.13	-812.13	40.90	41.39	58.19	45.34	49.53	0.05	0.08
1322.67	3.40	78.40	1319.16	-831.16	41.16	42.42	59.11	45.87	50.59	0.48	0.76
1341.21	4.10	77.70	1337.66	-849.66	41.41	43.61	60.14	46.48	51.80	0.70	1.14
1360.51	4.30	68.30	1356.91	-868.91	41.82	44.95	61.40	47.07	53.21	0.72	1.11
1379.66	4.40	71.00	1376.01	-888.01	42.33	46.32	62.74	47.58	54.65	0.23	0.36
1398.97	4.80	73.60	1395.25	-907.25	42.80	47.79	64.15	48.15	56.19	0.45	0.70
1408.63	4.80	75.70	1404.88	-916.88	43.01	48.57	64.88	48.47	57.00	0.18	0.55
1418.28	4.50	78.90	1414.50	-926.50	43.18	49.33	65.56	48.80	57.78	0.40	1.23
1427.85	4.10	79.80	1424.04	-936.04	43.32	50.04	66.18	49.12	58.50	0.41	1.27
1437.25	3.70	82.80	1433.42	-945.42	43.41	50.67	66.72	49.41	59.14	0.45	1.43
1447.00	3.40	84.50	1443.15	-955.15	43.48	51.27	67.22	49.70	59.74	0.32	0.98
1456.75	3.20	87.00	1452.89	-964.89	43.52	51.83	67.68	49.98	60.29	0.25	0.76
1475.22	3.00	94.70	1471.33	-983.33	43.51	52.83	68.44	50.52	61.26	0.46	0.75
1494.71	2.90	93.10	1490.79	-1002.79	43.44	53.83	69.17	51.09	62.22	0.13	0.20
1513.08	2.60	82.20	1509.14	-1021.14	43.47	54.70	69.87	51.52	63.08	0.60	0.98
1532.16	3.20	78.70	1528.20	-1040.20	43.64	55.65	70.72	51.90	64.04	0.63	0.98
1560.33	3.80	74.50	1556.31	-1068.31	44.04	57.32	72.29	52.47	65.76	0.65	0.69

CDN FOREST et al NORTH LIARD C-31A SIDETRACK NO. 2 60-40-123-30
DIRECTIONAL SURVEY RECORD

Calculations Based On Survey Data Provided By Ryan Energy Technologies Inc.

K.B. Elevation = 488.00
Vertical Section = 77.00

SURVEY DEPTH (m)	INCLINATION (deg)	AZIMUTH (deg)	TVD (m)	TVD SUBSEA (m)	LATITUDE N(+) / S(-) (m)	DEPARTURE E(+) / W(-) (m)	CLOSURE (m)	CLOSURE AZIMUTH (deg)	VERTICAL SECTION (m)	DOGLEG (deg)	DOGLEG SEVERITY (°/30m)
1589.11	3.60	79.10	1585.03	-1097.03	44.47	59.13	73.98	53.06	67.62	0.36	0.37
1607.90	3.60	78.00	1603.79	-1115.79	44.70	60.29	75.05	53.44	68.80	0.07	0.11
1627.96	4.10	69.90	1623.80	-1135.80	45.08	61.58	76.31	53.79	70.14	0.74	1.10
1647.16	4.70	68.20	1642.95	-1154.95	45.61	62.95	77.74	54.08	71.60	0.61	0.96
1666.45	5.20	69.40	1662.16	-1174.16	46.21	64.50	79.35	54.38	73.24	0.51	0.79
1685.57	5.40	73.40	1681.20	-1193.20	46.77	66.18	81.03	54.75	75.00	0.42	0.66
1704.55	5.70	70.10	1700.09	-1212.09	47.34	67.92	82.79	55.12	76.83	0.44	0.69
1723.76	5.40	65.50	1719.21	-1231.21	48.04	69.64	84.60	55.40	78.66	0.54	0.84
1743.01	4.80	68.00	1738.39	-1250.39	48.72	71.21	86.28	55.62	80.34	0.64	1.00
1760.00	4.60	68.20	1755.32	-1267.32	49.24	72.50	87.64	55.82	81.72	0.20	0.35
1771.23	4.30	73.30	1766.52	-1278.52	49.53	73.32	88.48	55.96	82.58	0.50	1.33
1780.75	4.30	74.70	1776.01	-1288.01	49.73	74.01	89.16	56.10	83.30	0.10	0.33
1790.47	4.30	75.00	1785.70	-1297.70	49.92	74.71	89.85	56.25	84.03	0.02	0.07
1800.13	4.20	69.20	1795.34	-1307.34	50.14	75.39	90.54	56.38	84.74	0.44	1.37
1809.70	4.20	68.90	1804.88	-1316.88	50.39	76.05	91.22	56.47	85.43	0.02	0.07
1819.22	4.00	76.60	1814.38	-1326.38	50.59	76.70	91.88	56.59	86.11	0.59	1.84
1828.69	4.00	72.40	1823.82	-1335.82	50.77	77.33	92.51	56.72	86.77	0.29	0.93
1838.25	3.80	68.30	1833.36	-1345.36	50.98	77.94	93.14	56.81	87.41	0.34	1.08
1848.39	3.80	73.50	1843.48	-1355.48	51.20	78.58	93.79	56.91	88.08	0.34	1.02
1867.10	3.60	73.60	1862.15	-1374.15	51.54	79.74	94.95	57.12	89.29	0.20	0.32
1876.70	3.40	68.20	1871.73	-1383.73	51.74	80.29	95.51	57.20	89.87	0.39	1.20
1884.00	3.40	68.00	1879.02	-1391.02	51.90	80.69	95.94	57.25	90.30	0.01	0.05
1892.16	3.60	63.40	1887.16	-1399.16	52.10	81.14	96.43	57.30	90.79	0.34	1.27

CDN FOREST et al NORTH LIARD C-31A SIDETRACK NO. 2 60-40-123-30
DIRECTIONAL SURVEY RECORD

Calculations Based On Survey Data Provided By Ryan Energy Technologies Inc.

K.B. Elevation = 488.00
Vertical Section = 77.00

SURVEY DEPTH (m)	INCLINATION (deg)	AZIMUTH (deg)	TVD (m)	TVD SUBSEA (m)	LATITUDE N(+) / S(-) (m)	DEPARTURE E(+) / W(-) (m)	CLOSURE (m)	CLOSURE AZIMUTH (deg)	VERTICAL SECTION (m)	DOGLEG (deg)	DOGLEG SEVERITY (°/30m)
1901.84	3.70	64.00	1896.82	-1408.82	52.38	81.70	97.04	57.34	91.38	0.11	0.33
1912.43	3.90	65.70	1907.39	-1419.39	52.67	82.33	97.74	57.39	92.07	0.23	0.65
1921.02	3.90	67.50	1915.96	-1427.96	52.91	82.87	98.32	57.44	92.65	0.12	0.43
1930.62	4.00	68.50	1925.54	-1437.54	53.15	83.48	98.97	57.51	93.30	0.12	0.38
1940.04	4.20	70.50	1934.93	-1446.93	53.39	84.11	99.63	57.60	93.97	0.25	0.78
1949.62	4.30	71.70	1944.49	-1456.49	53.62	84.78	100.32	57.69	94.67	0.13	0.42
1958.82	4.40	73.30	1953.66	-1465.66	53.83	85.45	100.99	57.79	95.37	0.16	0.51
1968.31	4.80	82.10	1963.12	-1475.12	53.99	86.19	101.70	57.94	96.13	0.81	2.56
1977.70	4.80	94.90	1972.48	-1484.48	54.01	86.97	102.38	58.16	96.89	1.07	3.41
1987.37	4.50	109.50	1982.12	-1494.12	53.85	87.73	102.94	58.46	97.60	1.22	3.78
1997.04	4.40	123.80	1991.76	-1503.76	53.51	88.40	103.33	58.81	98.17	1.11	3.45
2006.69	4.70	133.60	2001.38	-1513.38	53.04	88.99	103.60	59.21	98.64	0.83	2.59
2016.19	4.80	138.30	2010.84	-1522.84	52.47	89.54	103.78	59.63	99.05	0.40	1.27
2025.70	4.30	139.90	2020.32	-1532.32	51.90	90.03	103.92	60.04	99.40	0.52	1.63
2035.35	4.00	145.20	2029.95	-1541.95	51.35	90.46	104.02	60.42	99.69	0.49	1.51
2044.85	3.70	147.60	2039.43	-1551.43	50.82	90.81	104.06	60.77	99.92	0.34	1.08
2053.54	3.20	143.90	2048.10	-1560.10	50.38	91.10	104.11	61.06	100.10	0.55	1.89
2063.61	3.20	139.00	2058.16	-1570.16	49.94	91.45	104.20	61.36	100.35	0.27	0.81
2073.27	3.30	132.70	2067.80	-1579.80	49.55	91.84	104.35	61.65	100.63	0.37	1.15
2083.09	3.40	128.60	2077.60	-1589.60	49.18	92.27	104.56	61.94	100.97	0.26	0.79
2092.59	3.60	129.20	2087.09	-1599.09	48.81	92.72	104.79	62.24	101.33	0.20	0.64
2102.33	3.60	132.50	2096.81	-1608.81	48.41	93.18	105.01	62.55	101.69	0.21	0.64
2111.77	3.30	135.70	2106.23	-1618.23	48.02	93.59	105.19	62.84	102.00	0.36	1.13

CDN FOREST et al NORTH LIARD C-31A SIDETRACK NO. 2 60-40-123-30
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K.B. Elevation = 488.00
Vertical Section = 77.00

SURVEY DEPTH (m)	INCLINATION (deg)	AZIMUTH (deg)	TVD (m)	TVD SUBSEA (m)	LATITUDE N(+) / S(-) (m)	DEPARTURE E(+) / W(-) (m)	CLOSURE (m)	CLOSURE AZIMUTH (deg)	VERTICAL SECTION (m)	DOGLEG (deg)	DOGLEG SEVERITY (°/30m)
2121.37	2.60	138.50	2115.82	-1627.82	47.66	93.93	105.33	63.10	102.24	0.71	2.23
2131.05	2.10	137.30	2125.49	-1637.49	47.36	94.20	105.43	63.31	102.44	0.50	1.56
2140.50	1.80	135.50	2134.93	-1646.93	47.13	94.42	105.53	63.47	102.60	0.31	0.97
2150.10	1.40	127.60	2144.53	-1656.53	46.95	94.62	105.63	63.61	102.75	0.46	1.42
2159.67	1.10	130.10	2154.10	-1666.10	46.82	94.78	105.71	63.71	102.88	0.30	0.96
2169.34	1.10	130.10	2163.77	-1675.77	46.70	94.92	105.79	63.80	102.99	0.00	0.00
2178.93	0.90	136.20	2173.35	-1685.35	46.59	95.04	105.85	63.89	103.09	0.23	0.71
2187.10	1.00	129.90	2181.52	-1693.52	46.50	95.14	105.90	63.96	103.16	0.14	0.53
2196.70	1.10	141.60	2191.12	-1703.12	46.37	95.26	105.95	64.05	103.25	0.24	0.74
2205.94	1.50	139.20	2200.36	-1712.36	46.21	95.40	106.00	64.16	103.35	0.40	1.31
2215.60	1.70	139.70	2210.01	-1722.01	46.00	95.57	106.07	64.30	103.47	0.20	0.62
2225.06	1.90	146.60	2219.47	-1731.47	45.77	95.75	106.13	64.45	103.59	0.29	0.93
2234.64	2.30	151.70	2229.04	-1741.04	45.46	95.93	106.16	64.64	103.70	0.44	1.38
2244.19	2.50	161.20	2238.59	-1750.59	45.10	96.09	106.14	64.86	103.77	0.44	1.40
2253.91	2.80	168.90	2248.29	-1760.29	44.67	96.20	106.06	65.10	103.78	0.46	1.43
2264.38	2.60	171.70	2258.75	-1770.75	44.18	96.28	105.94	65.35	103.76	0.24	0.69
2273.91	2.80	172.80	2268.27	-1780.27	43.73	96.35	105.81	65.59	103.71	0.21	0.65
2283.41	3.00	169.90	2277.76	-1789.76	43.26	96.42	105.68	65.84	103.68	0.25	0.78
2293.06	2.90	165.40	2287.40	-1799.40	42.77	96.52	105.58	66.10	103.67	0.25	0.78
2302.72	3.30	168.40	2297.04	-1809.04	42.27	96.64	105.48	66.38	103.67	0.43	1.34
2312.31	3.40	168.20	2306.62	-1818.62	41.72	96.75	105.37	66.68	103.66	0.10	0.31
2321.66	3.50	166.60	2315.95	-1827.95	41.17	96.88	105.26	66.98	103.66	0.14	0.45
2330.00	3.50	166.60	2324.27	-1836.27	40.67	97.00	105.18	67.25	103.66	0.00	0.00

CDN FOREST et al NORTH LIARD C-31A SIDETRACK NO. 2 60-40-123-30
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Vertical Section = 77.00

SURVEY DEPTH (m)	INCLINATION (deg)	AZIMUTH (deg)	TVD (m)	TVD SUBSEA (m)	LATITUDE N(+) / S(-) (m)	DEPARTURE E(+) / W(-) (m)	CLOSURE (m)	CLOSURE AZIMUTH (deg)	VERTICAL SECTION (m)	DOGLEG (deg)	DOGLEG SEVERITY (°/30m)
	No directional survey records taken during drilling of the Sidetrack No. 2 // Survey at 2330.0 m K.B. is an extrapolation of the survey record from C31										

ADDENDUM D – DIRECTIONAL SURVEY RECORD C–31A SIDETRACK NO. 3

CDN FOREST et al NORTH LIARD C-31A SIDETRACK NO. 3 60-40-123-30
DIRECTIONAL SURVEY RECORD

Calculations Based On Survey Data Provided By Ryan Energy Technologies Inc.

K.B. Elevation = 488.00
Vertical Section = 316.28

SURVEY DEPTH (m)	INCLINATION (deg)	AZIMUTH (deg)	TVD (m)	TVD SUBSEA (m)	LATITUDE N(+) / S(-) (m)	DEPARTURE E(+) / W(-) (m)	CLOSURE (m)	CLOSURE AZIMUTH (deg)	VERTICAL SECTION (m)	DOGLEG (deg)	DOGLEG SEVERITY (°/30m)
0.00	0.00	0.00	0.00	488.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
39.00	0.50	2.00	39.00	449.00	0.17	0.01	0.00	0.00	0.00	0.00	0.00
71.00	0.25	336.00	71.00	417.00	0.37	-0.01	0.37	357.93	0.28	0.30	0.28
88.00	0.50	58.00	88.00	400.00	0.45	0.03	0.45	4.39	0.30	0.53	0.93
116.00	0.50	217.00	116.00	372.00	0.41	0.06	0.42	8.85	0.25	0.98	1.05
145.00	0.50	11.00	145.00	343.00	0.44	0.01	0.44	1.62	0.31	0.97	1.01
181.16	0.50	86.00	181.16	306.84	0.60	0.20	0.63	18.35	0.30	0.61	0.51
201.00	0.50	301.00	201.00	287.00	0.65	0.21	0.69	17.98	0.33	0.95	1.44
210.72	0.60	339.00	210.72	277.28	0.72	0.16	0.74	12.29	0.41	0.37	1.14
213.44	0.40	39.00	213.44	274.56	0.74	0.16	0.76	12.02	0.43	0.53	5.84
223.00	0.30	36.00	223.00	265.00	0.79	0.19	0.81	13.81	0.44	0.10	0.32
232.73	0.30	16.00	232.73	255.27	0.83	0.22	0.86	14.51	0.45	0.10	0.32
242.60	0.60	358.20	242.60	245.40	0.91	0.22	0.94	13.66	0.51	0.33	1.00
252.00	0.60	12.60	252.00	236.00	1.01	0.23	1.03	12.89	0.57	0.15	0.48
261.50	2.00	356.10	261.49	226.51	1.22	0.23	1.24	10.67	0.72	1.43	4.53
270.90	0.40	287.00	270.89	217.11	1.40	0.19	1.41	7.66	0.88	1.89	6.05
280.62	0.90	298.10	280.61	207.39	1.44	0.09	1.44	3.49	0.98	0.51	1.58
290.35	1.30	315.90	290.34	197.66	1.56	-0.06	1.56	357.93	1.16	0.52	1.61
300.07	2.10	312.70	300.05	187.95	1.76	-0.26	1.78	351.46	1.45	0.81	2.49
309.50	3.00	317.11	309.47	178.53	2.05	-0.56	2.13	344.78	1.87	0.92	2.93
318.93	3.30	315.90	318.89	169.11	2.43	-0.92	2.60	339.36	2.39	0.31	0.98
326.48	3.00	313.70	326.43	161.57	2.72	-1.21	2.98	336.05	2.80	0.32	1.28
335.91	3.20	312.70	335.84	152.16	3.07	-1.58	3.46	332.76	3.31	0.21	0.66

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Vertical Section = 316.28

SURVEY DEPTH (m)	INCLINATION (deg)	AZIMUTH (deg)	TVD (m)	TVD SUBSEA (m)	LATITUDE N(+) / S(-) (m)	DEPARTURE E(+) / W(-) (m)	CLOSURE (m)	CLOSURE AZIMUTH (deg)	VERTICAL SECTION (m)	DOGLEG (deg)	DOGLEG SEVERITY (°/30m)
356.89	4.00	320.00	356.78	131.22	4.03	-2.48	4.73	328.37	4.63	0.92	1.32
384.16	4.40	312.50	383.98	104.02	5.46	-3.86	6.69	324.73	6.62	0.68	0.75
413.02	5.70	328.30	412.73	75.27	7.43	-5.43	9.21	323.83	9.13	1.89	1.97
422.79	5.70	330.40	422.45	65.55	8.27	-5.93	10.17	324.35	10.07	0.21	0.64
432.54	6.90	343.30	432.14	55.86	9.25	-6.34	11.21	325.59	11.06	1.85	5.69
442.09	7.50	352.90	441.62	46.38	10.42	-6.58	12.32	327.73	12.08	1.34	4.22
451.40	7.40	359.30	450.85	37.15	11.62	-6.66	13.39	330.18	13.00	0.84	2.69
461.15	7.30	10.20	460.52	27.48	12.86	-6.56	14.43	332.97	13.83	1.40	4.30
470.04	7.10	17.40	469.34	18.66	13.94	-6.29	15.29	335.69	14.42	0.92	3.12
479.76	7.10	27.60	478.98	9.02	15.04	-5.84	16.14	338.79	14.91	1.26	3.89
489.31	6.90	29.10	488.46	-0.46	16.07	-5.28	16.91	341.80	15.26	0.27	0.85
499.01	6.70	33.50	498.10	-10.10	17.05	-4.69	17.68	344.62	15.56	0.56	1.73
508.76	6.90	35.70	507.78	-19.78	18.00	-4.03	18.44	347.37	15.79	0.33	1.01
518.04	6.50	42.00	516.99	-28.99	18.84	-3.36	19.14	349.90	15.94	0.84	2.70
527.56	6.30	42.20	526.45	-38.45	19.63	-2.64	19.81	352.33	16.01	0.20	0.63
536.72	6.00	39.70	535.56	-47.56	20.37	-2.00	20.47	354.39	16.10	0.40	1.32
546.49	6.10	39.00	545.28	-57.28	21.17	-1.35	21.21	356.36	16.23	0.12	0.38
556.03	6.30	37.40	554.76	-66.76	21.98	-0.71	21.99	358.15	16.37	0.26	0.83
565.79	6.60	38.60	564.46	-76.46	22.84	-0.04	22.84	359.91	16.53	0.33	1.01
575.56	6.90	44.40	574.16	-86.16	23.70	0.72	23.71	1.75	16.63	0.74	2.29
585.31	7.30	46.20	583.84	-95.84	24.54	1.58	24.60	3.69	16.65	0.46	1.41
595.09	7.70	45.50	593.53	-105.53	25.43	2.50	25.56	5.61	16.66	0.41	1.26
603.53	8.10	51.00	601.89	-113.89	26.20	3.36	26.42	7.31	16.61	0.85	3.04

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Vertical Section = 316.28

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613.22	8.20	51.10	611.49	-123.49	27.07	4.43	27.43	9.30	16.50	0.10	0.31
622.96	8.30	49.00	621.13	-133.13	27.96	5.50	28.50	11.13	16.41	0.32	0.98
632.21	7.90	51.00	630.28	-142.28	28.80	6.50	29.53	12.72	16.32	0.49	1.59
641.63	8.00	50.10	639.61	-151.61	29.63	7.51	30.57	14.22	16.23	0.16	0.51
651.38	8.10	48.70	649.27	-161.27	30.52	8.54	31.69	15.64	16.15	0.22	0.68
660.89	7.70	50.20	658.69	-170.69	31.37	9.54	32.79	16.91	16.08	0.45	1.42
670.31	7.60	48.50	668.02	-180.02	32.19	10.49	33.85	18.05	16.01	0.25	0.79
680.04	7.00	50.40	677.67	-189.67	32.99	11.43	34.91	19.10	15.95	0.65	1.99
689.30	7.30	53.90	686.86	-198.86	33.70	12.34	35.88	20.11	15.83	0.53	1.71
696.00	7.60	55.20	693.50	-205.50	34.20	13.04	36.60	20.88	15.70	0.34	1.54
711.00	7.60	52.67	708.37	-220.37	35.37	14.65	38.28	22.50	15.44	0.33	0.67
719.15	7.60	51.30	716.45	-228.45	36.03	15.50	39.22	23.27	15.33	0.18	0.67
728.91	7.50	53.40	726.13	-238.13	36.82	16.51	40.35	24.16	15.20	0.29	0.90
738.44	6.90	57.60	735.58	-247.58	37.49	17.49	41.37	25.01	15.01	0.80	2.51
748.12	6.20	62.70	745.20	-257.20	38.04	18.45	42.28	25.87	14.74	0.91	2.82
756.97	5.80	67.80	754.00	-266.00	38.43	19.29	43.00	26.65	14.45	0.67	2.26
766.29	5.10	77.80	763.28	-275.28	38.70	20.13	43.62	27.48	14.06	1.18	3.79
776.05	4.30	86.30	773.01	-285.01	38.81	20.92	44.09	28.32	13.59	1.06	3.25
785.79	3.90	89.40	782.72	-294.72	38.84	21.61	44.45	29.09	13.13	0.46	1.41
795.56	3.50	92.80	792.47	-304.47	38.83	22.24	44.75	29.81	12.69	0.46	1.40
805.29	3.00	94.20	802.18	-314.18	38.80	22.79	45.00	30.44	12.28	0.51	1.56
814.77	2.70	99.60	811.65	-323.65	38.74	23.26	45.19	30.98	11.92	0.40	1.27
824.48	2.40	87.20	821.35	-333.35	38.71	23.69	45.39	31.47	11.60	0.63	1.93

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834.05	2.30	94.90	830.91	-342.91	38.71	24.08	45.59	31.89	11.33	0.33	1.04
843.78	1.90	92.80	840.64	-352.64	38.68	24.44	45.75	32.28	11.07	0.41	1.26
853.31	1.90	80.70	850.16	-362.16	38.70	24.75	45.94	32.60	10.86	0.40	1.26
862.82	2.00	80.10	859.67	-371.67	38.75	25.07	46.16	32.90	10.68	0.10	0.32
872.58	2.10	82.10	869.42	-381.42	38.81	25.42	46.39	33.22	10.48	0.12	0.38
892.07	2.00	94.50	888.90	-400.90	38.83	26.11	46.79	33.92	10.02	0.45	0.70
901.55	2.40	95.60	898.37	-410.37	38.80	26.47	46.97	34.31	9.74	0.40	1.27
920.99	2.20	96.70	917.80	-429.80	38.71	27.25	47.34	35.14	9.15	0.20	0.32
930.52	2.30	93.10	927.32	-439.32	38.68	27.62	47.53	35.53	8.87	0.17	0.54
940.00	2.20	86.80	936.79	-448.79	38.68	27.99	47.75	35.89	8.61	0.27	0.84
949.70	2.20	76.10	946.48	-458.48	38.74	28.36	48.01	36.21	8.40	0.41	1.27
968.78	2.50	63.80	965.55	-477.55	39.01	29.09	48.66	36.71	8.09	0.59	0.92
987.76	2.30	70.30	984.51	-496.51	39.32	29.82	49.35	37.17	7.81	0.34	0.53
997.30	2.40	73.30	994.04	-506.04	39.44	30.19	49.67	37.43	7.64	0.16	0.50
1006.61	2.40	69.90	1003.35	-515.35	39.56	30.56	49.99	37.68	7.48	0.14	0.46
1025.31	2.50	81.20	1022.03	-534.03	39.76	31.33	50.62	38.23	7.08	0.49	0.79
1034.85	2.60	76.80	1031.56	-543.56	39.84	31.74	50.94	38.55	6.86	0.22	0.69
1044.59	2.40	79.60	1041.29	-553.29	39.93	32.16	51.27	38.85	6.63	0.23	0.72
1063.35	1.70	78.50	1060.04	-572.04	40.06	32.82	51.78	39.33	6.27	0.70	1.12
1082.60	1.70	68.20	1079.28	-591.28	40.22	33.36	52.26	39.68	6.01	0.31	0.48
1101.66	1.40	82.80	1098.33	-610.33	40.35	33.86	52.68	40.00	5.76	0.49	0.78
1130.81	1.60	98.10	1127.47	-639.47	40.34	34.61	53.16	40.63	5.23	0.45	0.46
1158.98	1.90	93.70	1155.63	-667.63	40.26	35.47	53.65	41.38	4.58	0.33	0.35

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1178.46	2.30	96.80	1175.10	-687.10	40.19	36.18	54.07	41.99	4.04	0.42	0.64
1197.23	2.20	90.50	1193.85	-705.85	40.14	36.91	54.53	42.60	3.50	0.27	0.43
1226.31	2.30	85.10	1222.91	-734.91	40.19	38.05	55.34	43.44	2.74	0.23	0.24
1245.79	2.00	75.90	1242.38	-754.38	40.30	38.77	55.92	43.89	2.33	0.46	0.70
1265.05	2.60	71.70	1261.62	-773.62	40.52	39.51	56.60	44.28	1.98	0.62	0.97
1284.13	3.00	72.60	1280.68	-792.68	40.81	40.40	57.42	44.71	1.57	0.40	0.63
1303.61	3.00	73.60	1300.13	-812.13	41.10	41.38	58.32	45.19	1.11	0.05	0.08
1322.67	3.40	78.40	1319.16	-831.16	41.36	42.41	59.23	45.72	0.58	0.48	0.76
1341.21	4.10	77.70	1337.66	-849.66	41.61	43.59	60.26	46.33	-0.06	0.70	1.14
1360.51	4.30	68.30	1356.91	-868.91	42.02	44.94	61.53	46.92	-0.69	0.72	1.11
1379.66	4.40	71.00	1376.00	-888.00	42.53	46.30	62.87	47.43	-1.27	0.23	0.36
1398.97	4.80	73.60	1395.25	-907.25	43.00	47.78	64.28	48.01	-1.95	0.45	0.70
1408.63	4.80	75.70	1404.88	-916.88	43.21	48.56	65.00	48.33	-2.33	0.18	0.55
1418.28	4.50	78.90	1414.50	-926.50	43.38	49.32	65.68	48.66	-2.73	0.40	1.23
1427.85	4.10	79.80	1424.04	-936.04	43.52	50.02	66.30	48.98	-3.12	0.41	1.27
1437.25	3.70	82.80	1433.42	-945.42	43.61	50.66	66.84	49.27	-3.49	0.45	1.43
1447.00	3.40	84.50	1443.15	-955.15	43.68	51.26	67.34	49.56	-3.86	0.32	0.98
1456.75	3.20	87.00	1452.88	-964.88	43.72	51.82	67.80	49.84	-4.21	0.25	0.76
1475.22	3.00	94.70	1471.33	-983.33	43.71	52.81	68.55	50.39	-4.91	0.46	0.75
1494.71	2.90	93.10	1490.79	-1002.79	43.64	53.81	69.28	50.96	-5.65	0.13	0.20
1513.08	2.60	82.20	1509.14	-1021.14	43.67	54.69	69.99	51.39	-6.23	0.60	0.98
1532.16	3.20	78.70	1528.19	-1040.19	43.84	55.64	70.83	51.77	-6.77	0.63	0.98
1560.33	3.80	74.50	1556.31	-1068.31	44.24	57.31	72.40	52.33	-7.64	0.65	0.69

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1589.11	3.60	79.10	1585.03	-1097.03	44.67	59.12	74.09	52.93	-8.58	0.36	0.37
1607.90	3.60	78.00	1603.79	-1115.79	44.90	60.27	75.16	53.32	-9.21	0.07	0.11
1627.96	4.10	69.90	1623.80	-1135.80	45.28	61.56	76.42	53.67	-9.83	0.74	1.10
1647.16	4.70	68.20	1642.94	-1154.94	45.81	62.94	77.84	53.95	-10.39	0.61	0.96
1666.45	5.20	69.40	1662.16	-1174.16	46.41	64.49	79.45	54.26	-11.03	0.51	0.79
1685.57	5.40	73.40	1681.20	-1193.20	46.97	66.16	81.14	54.63	-11.78	0.42	0.66
1704.55	5.70	70.10	1700.09	-1212.09	47.54	67.91	82.89	55.00	-12.57	0.44	0.69
1723.76	5.40	65.50	1719.21	-1231.21	48.24	69.62	84.71	55.28	-13.25	0.54	0.84
1743.01	4.80	68.00	1738.38	-1250.38	48.92	71.20	86.38	55.51	-13.85	0.64	1.00
1760.00	4.80	72.00	1755.31	-1267.31	49.41	72.53	87.76	55.74	-14.42	0.33	0.59
1771.23	4.30	73.30	1766.51	-1278.51	49.67	73.38	88.61	55.91	-14.82	0.51	1.36
1780.75	4.30	74.70	1776.00	-1288.00	49.87	74.07	89.29	56.05	-15.15	0.10	0.33
1790.47	4.30	75.00	1785.70	-1297.70	50.06	74.77	89.98	56.20	-15.50	0.02	0.07
1800.13	4.20	69.20	1795.33	-1307.33	50.28	75.45	90.67	56.32	-15.81	0.44	1.37
1809.70	4.20	68.90	1804.87	-1316.87	50.53	76.11	91.35	56.42	-16.08	0.02	0.07
1819.22	4.00	76.70	1814.37	-1326.37	50.73	76.75	92.01	56.54	-16.38	0.59	1.87
1828.69	4.00	72.40	1823.82	-1335.82	50.91	77.39	92.63	56.66	-16.69	0.30	0.95
1838.25	3.80	68.30	1833.35	-1345.35	51.13	78.00	93.26	56.76	-16.96	0.34	1.08
1848.39	3.80	73.50	1843.47	-1355.47	51.35	78.64	93.92	56.86	-17.24	0.34	1.02
1867.10	3.60	73.60	1862.14	-1374.14	51.69	79.79	95.07	57.07	-17.79	0.20	0.32
1876.70	3.40	68.20	1871.72	-1383.72	51.88	80.35	95.64	57.15	-18.04	0.39	1.20
1884.00	3.40	68.00	1879.01	-1391.01	52.04	80.75	96.07	57.20	-18.20	0.01	0.05
1892.16	3.60	63.40	1887.16	-1399.16	52.25	81.20	96.56	57.24	-18.36	0.34	1.27

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1901.84	3.70	64.00	1896.82	-1408.82	52.52	81.76	97.17	57.28	-18.55	0.11	0.33
1911.43	3.90	65.70	1906.39	-1418.39	52.79	82.33	97.80	57.33	-18.75	0.23	0.72
1921.02	3.90	67.50	1915.95	-1427.95	53.05	82.93	98.44	57.39	-18.98	0.12	0.38
1930.62	4.00	68.50	1925.53	-1437.53	53.29	83.54	99.09	57.46	-19.22	0.12	0.38
1940.04	4.20	70.50	1934.93	-1446.93	53.53	84.17	99.75	57.55	-19.49	0.25	0.78
1949.62	4.30	71.70	1944.48	-1456.48	53.76	84.85	100.44	57.64	-19.79	0.13	0.42
1958.82	4.40	73.30	1953.65	-1465.65	53.97	85.51	101.12	57.74	-20.09	0.16	0.51
1968.31	4.80	82.10	1963.11	-1475.11	54.13	86.25	101.83	57.89	-20.49	0.81	2.56
1977.70	4.80	94.90	1972.47	-1484.47	54.15	87.03	102.50	58.11	-21.02	1.07	3.41
1987.37	4.50	109.50	1982.11	-1494.11	53.99	87.79	103.07	58.41	-21.66	1.22	3.78
1997.04	4.40	123.80	1991.75	-1503.75	53.66	88.46	103.46	58.76	-22.36	1.11	3.45
2006.69	4.70	133.60	2001.37	-1513.37	53.18	89.05	103.72	59.16	-23.12	0.83	2.59
2016.19	4.80	138.30	2010.84	-1522.84	52.61	89.60	103.90	59.58	-23.90	0.40	1.27
2025.70	4.30	139.90	2020.32	-1532.32	52.04	90.09	104.05	59.99	-24.66	0.52	1.63
2035.35	4.00	145.20	2029.94	-1541.94	51.49	90.52	104.14	60.37	-25.35	0.49	1.51
2044.85	3.70	147.60	2039.42	-1551.42	50.96	90.87	104.19	60.72	-25.98	0.34	1.08
2054.54	3.20	143.90	2049.09	-1561.09	50.48	91.20	104.24	61.04	-26.55	0.55	1.69
2063.61	3.20	139.00	2058.15	-1570.15	50.08	91.52	104.32	61.31	-27.06	0.27	0.90
2073.27	3.30	132.70	2067.79	-1579.79	49.69	91.90	104.47	61.60	-27.60	0.37	1.15
2083.09	3.40	128.60	2077.60	-1589.60	49.31	92.33	104.68	61.89	-28.17	0.26	0.79
2092.59	3.60	129.20	2087.08	-1599.08	48.95	92.78	104.90	62.19	-28.75	0.20	0.64
2102.33	3.60	132.50	2096.80	-1608.80	48.55	93.25	105.13	62.50	-29.36	0.21	0.64
2111.77	3.30	135.70	2106.22	-1618.22	48.16	93.65	105.31	62.79	-29.92	0.36	1.13

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2121.37	2.60	138.50	2115.81	-1627.81	47.79	93.99	105.44	63.05	-30.42	0.71	2.23
2131.05	2.10	137.30	2125.48	-1637.48	47.50	94.26	105.55	63.25	-30.81	0.50	1.56
2140.50	1.80	135.50	2134.93	-1646.93	47.27	94.48	105.64	63.42	-31.14	0.31	0.97
2150.10	1.40	127.60	2144.52	-1656.52	47.09	94.68	105.74	63.56	-31.40	0.46	1.42
2159.67	1.10	130.10	2154.09	-1666.09	46.96	94.84	105.83	63.66	-31.61	0.30	0.96
2169.34	1.10	130.40	2163.76	-1675.76	46.84	94.98	105.90	63.75	-31.79	0.01	0.02
2178.93	0.90	136.20	2173.35	-1685.35	46.72	95.10	105.96	63.84	-31.96	0.22	0.70
2187.10	1.00	129.90	2181.52	-1693.52	46.63	95.20	106.01	63.90	-32.10	0.14	0.53
2196.70	1.10	141.60	2191.11	-1703.11	46.51	95.32	106.06	63.99	-32.27	0.24	0.74
2205.94	1.50	139.20	2200.35	-1712.35	46.34	95.46	106.11	64.10	-32.48	0.40	1.31
2213.52	1.70	139.70	2207.93	-1719.93	46.18	95.60	106.17	64.21	-32.69	0.20	0.79
2225.06	1.90	146.60	2219.46	-1731.46	45.89	95.81	106.24	64.41	-33.05	0.29	0.77
2234.64	2.30	151.70	2229.04	-1741.04	45.59	95.99	106.27	64.59	-33.39	0.44	1.38
2244.19	2.50	161.20	2238.58	-1750.58	45.23	96.15	106.25	64.81	-33.77	0.44	1.40
2253.91	2.80	168.90	2248.29	-1760.29	44.79	96.26	106.17	65.05	-34.16	0.46	1.43
2264.38	2.60	171.70	2258.75	-1770.75	44.31	96.35	106.04	65.30	-34.57	0.24	0.69
2273.91	2.80	172.80	2268.27	-1780.27	43.86	96.41	105.91	65.54	-34.93	0.21	0.65
2283.41	3.00	169.40	2277.75	-1789.75	43.39	96.48	105.79	65.79	-35.33	0.26	0.83
2293.06	2.90	165.40	2287.39	-1799.39	42.90	96.59	105.69	66.05	-35.75	0.23	0.71
2303.23	6.30	230.00	2297.53	-1809.53	42.29	96.23	105.11	66.27	-35.94	5.69	16.79
2312.88	7.90	245.00	2307.11	-1819.11	41.67	95.22	103.94	66.36	-35.69	2.44	7.57
2322.32	9.10	255.00	2316.45	-1828.45	41.21	93.91	102.55	66.31	-35.12	1.90	6.04
2331.92	9.70	255.40	2325.92	-1837.92	40.81	92.39	101.00	66.17	-34.37	0.60	1.89

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Vertical Section = 316.28

SURVEY DEPTH (m)	INCLINATION (deg)	AZIMUTH (deg)	TVD (m)	TVD SUBSEA (m)	LATITUDE N(+) / S(-) (m)	DEPARTURE E(+) / W(-) (m)	CLOSURE (m)	CLOSURE AZIMUTH (deg)	VERTICAL SECTION (m)	DOGLEG (deg)	DOGLEG SEVERITY (°/30m)
2341.56	9.90	252.70	2335.42	-1847.42	40.35	90.82	99.38	66.04	-33.60	0.50	1.56
2353.40	10.50	260.60	2347.07	-1859.07	39.88	88.78	97.32	65.81	-32.54	1.52	3.85
2362.90	10.60	266.80	2356.41	-1868.41	39.68	87.05	95.67	65.49	-31.49	1.14	3.60
2372.70	10.90	268.60	2366.04	-1878.04	39.61	85.23	93.98	65.07	-30.28	0.45	1.38
2382.30	11.50	270.30	2375.45	-1887.45	39.59	83.36	92.29	64.59	-29.00	0.68	2.14
2391.00	12.40	271.70	2383.97	-1895.97	39.63	81.56	90.68	64.09	-27.73	0.95	3.26
2400.40	12.40	273.30	2393.15	-1905.15	39.72	79.55	88.91	63.47	-26.27	0.34	1.10
2410.00	12.70	277.50	2402.52	-1914.52	39.91	77.47	87.15	62.74	-24.70	0.96	3.00
2419.40	13.30	283.30	2411.68	-1923.68	40.30	75.39	85.49	61.88	-22.98	1.44	4.58
2428.60	13.80	288.40	2420.62	-1932.62	40.89	73.32	83.95	60.86	-21.13	1.29	4.22
2438.20	14.80	287.50	2429.92	-1941.92	41.62	71.07	82.36	59.65	-19.04	1.02	3.20
2447.60	15.90	285.40	2438.99	-1950.99	42.32	68.68	80.67	58.36	-16.88	1.23	3.93
2457.28	17.30	283.10	2448.26	-1960.26	43.00	66.00	78.77	56.92	-14.54	1.55	4.79
2466.80	18.70	277.90	2457.32	-1969.32	43.53	63.11	76.67	55.41	-12.16	2.13	6.71
2476.40	20.40	275.20	2466.36	-1978.36	43.89	59.92	74.27	53.78	-9.69	1.92	6.01
2485.90	21.80	271.00	2475.23	-1987.23	44.07	56.51	71.66	52.05	-7.20	2.06	6.50
2495.30	23.50	270.10	2483.90	-1995.90	44.11	52.89	68.86	50.17	-4.68	1.73	5.54
2504.90	24.40	267.90	2492.68	-2004.68	44.04	48.99	65.87	48.05	-2.03	1.27	3.96
2514.40	25.50	268.00	2501.29	-2013.29	43.89	44.99	62.85	45.70	0.63	1.10	3.48
2524.10	26.70	267.20	2510.00	-2022.00	43.71	40.72	59.74	42.97	3.45	1.25	3.87
2533.70	27.70	265.60	2518.54	-2030.54	43.44	36.34	56.64	39.92	6.27	1.24	3.87
2542.80	28.10	264.30	2526.58	-2038.58	43.06	32.10	53.71	36.70	8.93	0.73	2.40
2552.20	28.60	263.60	2534.85	-2046.85	42.59	27.66	50.79	33.00	11.66	0.60	1.92

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2561.90	28.80	264.00	2543.36	-2055.36	42.09	23.03	47.98	28.69	14.50	0.28	0.86
2571.60	29.50	264.90	2551.83	-2063.83	41.63	18.33	45.49	23.76	17.42	0.83	2.55
2581.40	29.50	265.00	2560.36	-2072.36	41.21	13.52	43.37	18.17	20.44	0.05	0.15
2591.00	29.60	264.70	2568.71	-2080.71	40.78	8.81	41.72	12.19	23.39	0.18	0.56
2601.50	29.40	266.60	2577.85	-2089.85	40.39	3.65	40.55	5.17	26.67	0.96	2.73
2610.00	29.00	268.20	2585.27	-2097.27	40.20	-0.49	40.20	359.30	29.39	0.88	3.10
2619.70	28.80	268.60	2593.77	-2105.77	40.07	-5.18	40.40	352.64	32.54	0.28	0.86
2629.20	29.00	269.10	2602.08	-2114.08	39.98	-9.77	41.15	346.27	35.64	0.31	0.99
2638.70	29.10	269.10	2610.39	-2122.39	39.91	-14.38	42.42	340.19	38.78	0.10	0.32
2648.30	29.20	268.20	2618.77	-2130.77	39.80	-19.05	44.12	334.42	41.93	0.45	1.41
2657.51	29.60	267.20	2626.80	-2138.80	39.61	-23.57	46.10	329.25	44.92	0.63	2.06
2666.90	30.10	267.00	2634.94	-2146.94	39.38	-28.24	48.46	324.36	47.98	0.51	1.63
2676.70	30.30	267.90	2643.41	-2155.41	39.16	-33.16	51.31	319.74	51.22	0.49	1.52
2689.00	30.80	270.10	2654.00	-2166.00	39.05	-39.41	55.48	314.74	55.46	1.22	2.99
2696.30	30.00	270.10	2660.30	-2172.30	39.06	-43.11	58.17	312.18	58.02	0.80	3.29
2705.80	29.70	272.30	2668.54	-2180.54	39.15	-47.83	61.82	309.30	61.36	1.14	3.59
2717.10	28.70	271.40	2678.40	-2190.40	39.33	-53.34	66.28	306.40	65.29	1.09	2.90
2723.90	28.30	276.30	2684.38	-2196.38	39.55	-56.58	69.03	304.96	67.69	2.37	10.46
2729.10	28.70	277.50	2688.95	-2200.95	39.85	-59.04	71.23	304.02	69.60	0.70	4.03
2733.50	28.80	277.90	2692.81	-2204.81	40.13	-61.14	73.13	303.28	71.26	0.22	1.48
2743.10	29.70	277.50	2701.18	-2213.18	40.76	-65.79	77.39	301.78	74.93	0.92	2.88
2752.80	30.90	274.70	2709.56	-2221.56	41.28	-70.65	81.83	300.30	78.66	1.85	5.73
2762.40	32.40	272.60	2717.73	-2229.73	41.60	-75.68	86.36	298.80	82.37	1.86	5.82

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2767.40	33.00	273.30	2721.94	-2233.94	41.74	-78.38	88.80	298.04	84.33	0.71	4.26
2772.10	33.00	273.00	2725.88	-2237.88	41.88	-80.93	91.12	297.36	86.20	0.16	1.04
2781.20	33.80	271.90	2733.48	-2245.48	42.09	-85.94	95.69	296.09	89.81	1.00	3.31
2790.90	33.90	271.70	2741.53	-2253.53	42.26	-91.34	100.64	294.83	93.67	0.15	0.46
2800.60	33.10	272.30	2749.62	-2261.62	42.45	-96.69	105.59	293.70	97.50	0.87	2.68
2810.30	32.50	271.40	2757.77	-2269.77	42.62	-101.94	110.49	292.69	101.25	0.77	2.39
2820.00	32.50	270.90	2765.96	-2277.96	42.72	-107.15	115.35	291.74	104.93	0.27	0.83
2829.70	33.20	270.30	2774.10	-2286.10	42.78	-112.41	120.27	290.83	108.61	0.77	2.39
2835.50	33.20	270.30	2778.96	-2290.96	42.79	-115.59	123.25	290.32	110.81	0.00	0.00
2839.40	34.00	270.00	2782.21	-2294.21	42.80	-117.74	125.28	289.98	112.31	0.82	6.28
2849.10	34.70	267.90	2790.21	-2302.21	42.70	-123.22	130.40	289.11	116.02	1.38	4.26
2858.80	35.30	269.30	2798.16	-2310.16	42.56	-128.78	135.63	288.29	119.76	1.00	3.10
2868.50	36.00	269.30	2806.04	-2318.04	42.49	-134.43	140.99	287.54	123.62	0.70	2.16
2878.22	36.20	269.40	2813.90	-2325.90	42.43	-140.16	146.44	286.84	127.53	0.21	0.64
2881.20	36.10	269.30	2816.30	-2328.30	42.41	-141.92	148.12	286.64	128.73	0.12	1.17
2888.30	36.00	270.50	2822.04	-2334.04	42.40	-146.09	152.12	286.18	131.61	0.71	3.01
2898.10	36.00	272.40	2829.97	-2341.97	42.55	-151.85	157.70	285.65	135.70	1.12	3.42
2907.80	36.00	271.50	2837.82	-2349.82	42.74	-157.55	163.24	285.18	139.78	0.53	1.64
2917.40	35.20	273.10	2845.62	-2357.62	42.96	-163.13	168.70	284.75	143.80	1.23	3.84
2927.10	35.10	272.80	2853.56	-2365.56	43.25	-168.71	174.17	284.38	147.86	0.20	0.62
2941.50	35.10	272.80	2865.34	-2377.34	43.66	-176.98	182.28	283.86	153.87	0.00	0.00

ADDENDUM E – GEOLOGICAL STRIP LOGS