Canadian Dehua International Mines Group Inc.

2012 - 2013

Wapiti River Coal Exploration Summary Report

Peace River Land District and Liard Mining Division

Northeast BC, Canada

Canadian Dehua International Mines Group Inc.

2014.07.22

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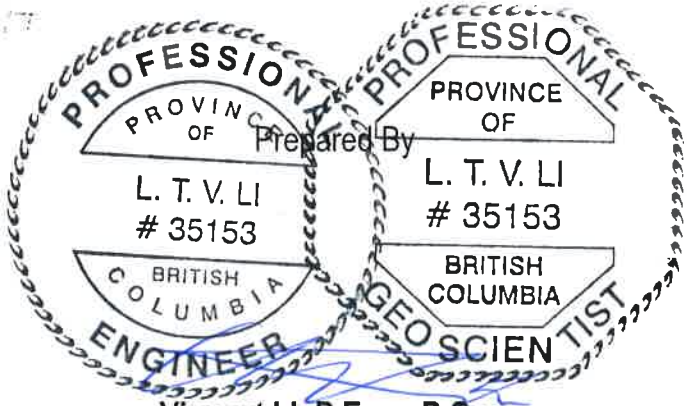
Coal License Numbers

418157	418162	418166	418170
418158	418163	418167	418171
418159	418164	418168	418172
418160	418165	418169	418173
418161			

BCGS Map No.:	093I068, 093I077, 093I078, 093I087, 093I088
UTM NAD83 Zone 10:	Easting: 647828 – 656054;
	Northing: 6065749 – 6075796
Latitude:	54°41′01″N - 54°51′31″N
Longitude:	120°42′06″W - 121°27′06″W



Prepared By

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Canadian Dehua International Mines Group Inc.

2014.07.22

Tables 7, 8, 9, 10, and Appendix 1 remain confidential under the terms of the Coal Act Regulation, and have been removed from the public version.

http://www.bclaws.ca/civix/document/id/complete/statreg/251_2004

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1. INTRODUCTION

1.1 OWNERSHIP OF COAL TENURES

Canadian Dehua International Mines Group Inc. (CDI) wholly owns the Wapiti River coal tenures with the tenure numbers from 418157 to 418173 in Table 1. The Wapiti River Coal Licenses were issued to CDI by Mineral Titles and Policy Branch of Ministry of Energy and Mines, British Columbia on May 7, 2012.

Wapiti River coal property consists of 17 crown coal licences covering 14936 hectares (ha), which is presented in Figure 1.

Table 1 Summary of the Wapiti River Coal Tenures

No.	Tenure Number	Owner Number		Map Number	Area		Status
1	418157	147315	100%	093I068	599	ha	active
2	418158	147315	100%	093I078	449	ha	active
3	418159	147315	100%	093I068	599	ha	active
4	418160	147315	100%	093I078	1495	ha	active
5	418161	147315	100%	093I078	1494	ha	active
6	418162	147315	100%	093I077	299	ha	active
7	418163	147315	100%	093I078	1195	ha	active
8	418164	147315	100%	093I078	1269	ha	active
9	418165	147315	100%	093I088	597	ha	active
10	418166	147315	100%	093I077	896	ha	active
11	418167	147315	100%	093I087	597	ha	active
12	418168	147315	100%	093I077	747	ha	active
13	418169	147315	100%	093I077	1493	ha	active
14	418170	147315	100%	093I077	597	ha	active
15	418171	147315	100%	093I087	1194	ha	active
16	418172	147315	100%	093I087	894	ha	active
17	418173	147315	100%	093I087	522	ha	active
total					**14936**	**ha**	all active

1.2 PROPERTY LOCATION

Wapiti River coal property is located at approximately 45 kilometers southeast of Tumbler Ridge in northeast of British Columbia, Canada along highway #52 (see Figure 2). The property can be connected through Tumbler Ridge to cities below by road：

Chetwynd，	98km;	Dawson Creek，	120km
Fort St John，	270km;	Prince George，	406km
Prince Rupert,	1128km;	Vancouver，	1184km

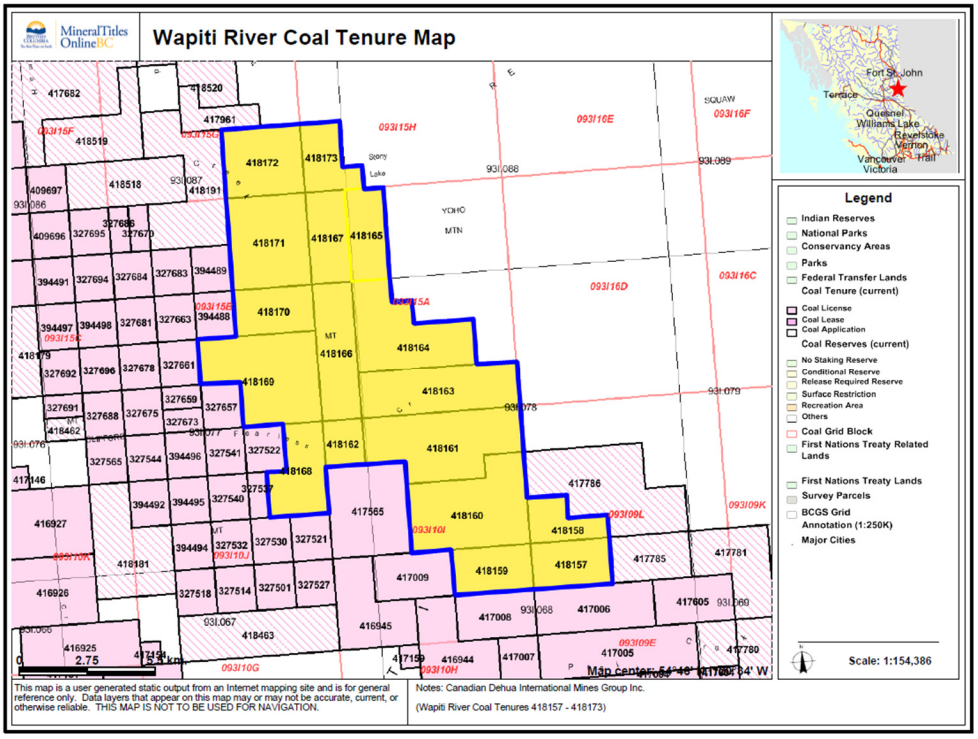


Figure 1 Wapiti River Coal Tenure Map

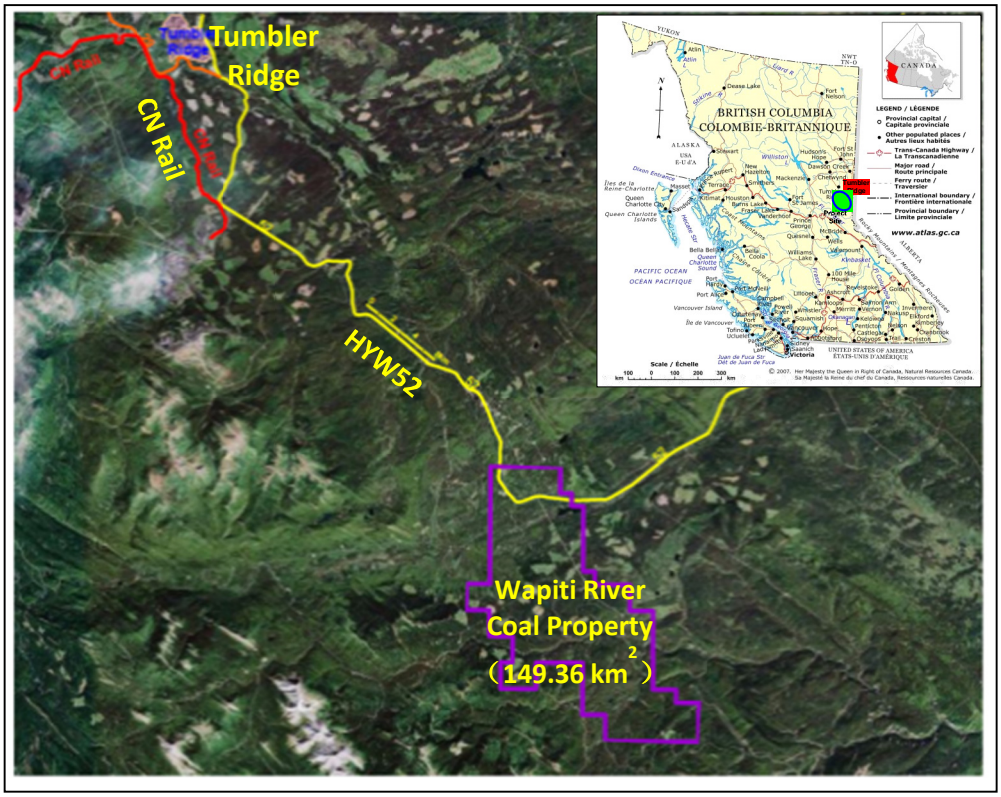


Figure 2 Location of Wapiti River Coal Property

2. PREVIOUS EXPLORATION AND PRODUCTION

There was no coal exploration and production within the Wapiti River coal property historically, with the exception of the oil and gas (O&G) exploration and production approximately 2000 meters below the coal bearing horizons since 1950's. Coal exploration was performed nearby the Wapiti River coal property from 1970's to 1980's, but there was no coal mine development and production. In the north area near Tumbler Ridge, the majority of coal produced in the PRC is mined from the Gates Formation, predominantly by surface extraction methods.

The most recent coal exploration in the Wapiti River coal property was conducted by CDI from July 2012 to April 2013. Figure 3 illustrates the historical drilling location of natural gas and coal within or nearby the Wapiti River coal property. It is noted that the 52 red dots were CDI drilling locations from July 2012 to April 2013.

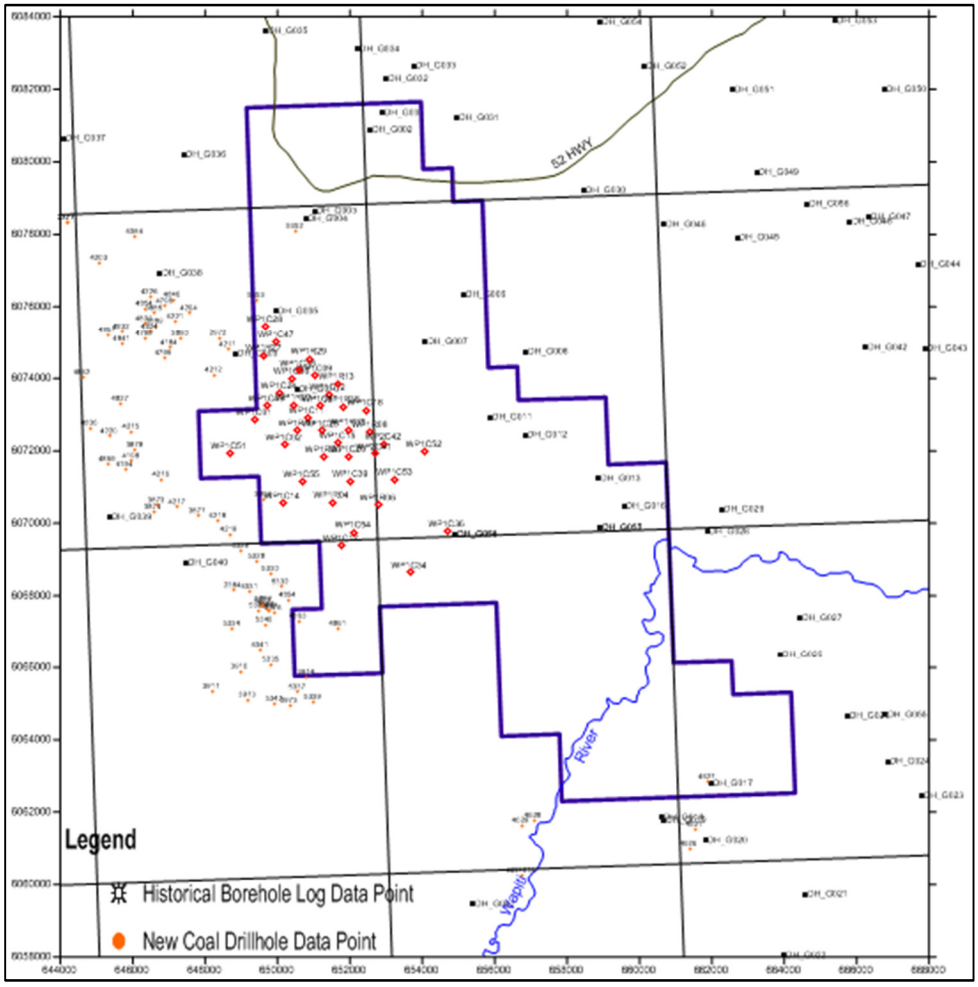


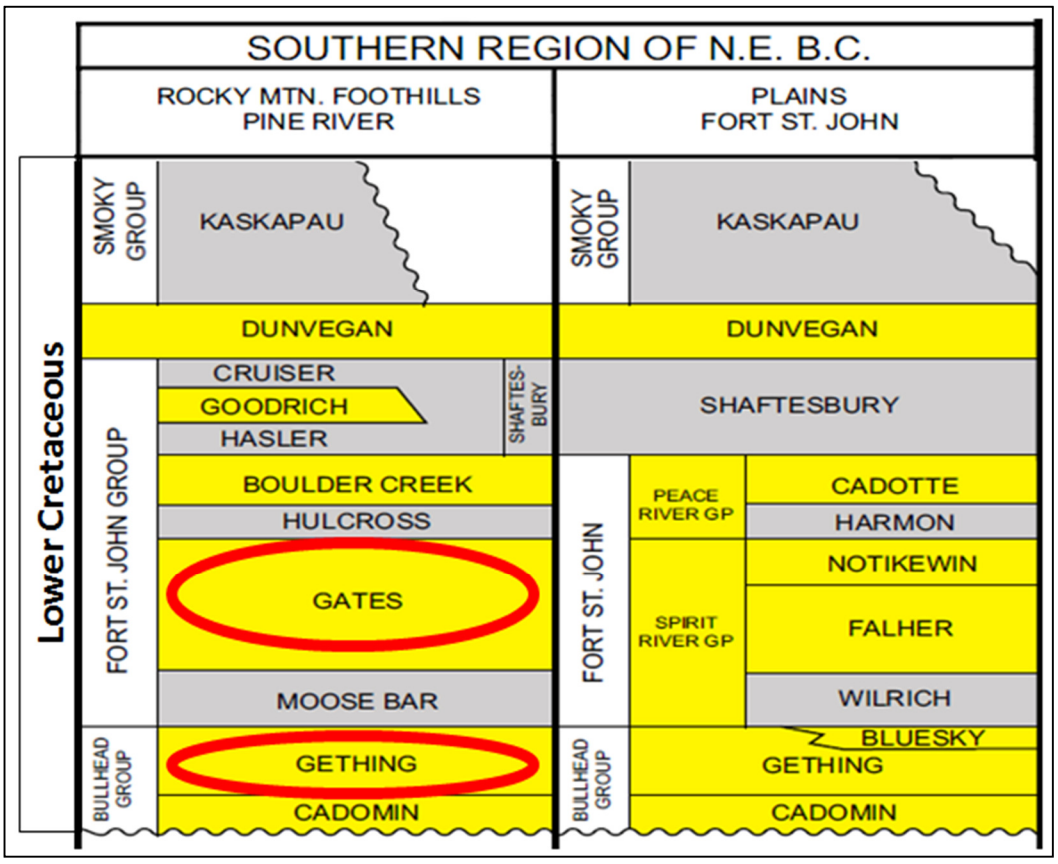
Figure 3 Historical Drilling Locations within or nearby the Project Area

3. GEOLOGIC AND COAL SETTING

Wapiti River coal deposit lies within the northern portion of eastern Inner Foothills Belt of the Rocky Mountains, Western Canada Sedimentary Basin. Wapiti River coal area contains the clastic sedimentary rocks and coal seams of the Lower Cretaceous Bullhead and Fort St. John Group (see Table 2 and Figure 4). The Jurassic-Cretaceous Minnes Group forms the base of geologic section within the Wapiti River coal area. Coal seams of interest at the Wapiti River coal property are contained within the Boulder Creek, Gates and Gething Formations.

17 main coal seams which were defined in the boreholes occur in the Gates Formation and Gething Formation (see Table 3). Gates Formation contains 12 main coal seams (B1 to B12) and Gething contains 5 main coal seams (A1 to A5), of which most of coal seams in Gates and Gething Formation are considered as significant and commercially important coal beds based on mineable thickness, buried depth, geologic structure and quality. Most coal seams are buried within a depth of 100 to 1200 metres in the Wapiti River coal area.

Table 2 Regional Stratigraphy of the Wapiti River Coal Property



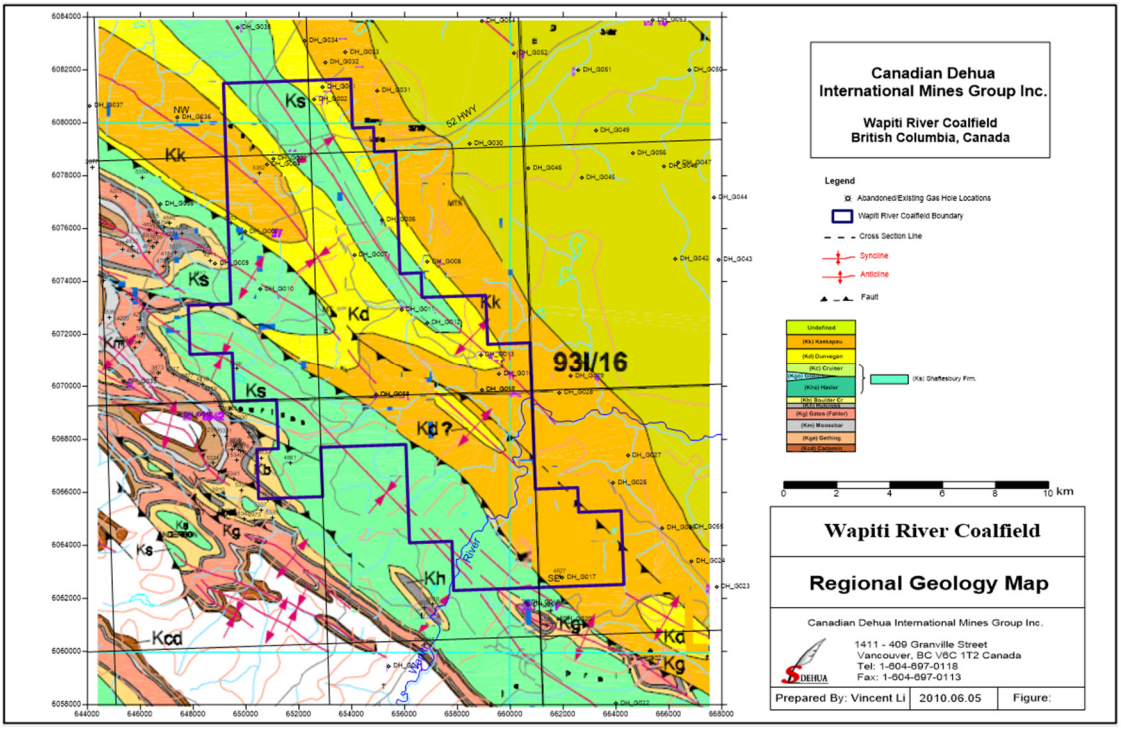


Figure 4 Regional Geology Map of Wapiti River Coal Area

Table 3 Coal – Bearing Formation and Coal Setting in Wapiti River Coal Area

Lower Cretaceous Stratigraphy	Coal-Bearing Formation	Coal Seams
Kk KASKAPAU FORMATION ~ 850M, Dark grey claystone, some sideritic concretions and coars-grained sediments.		
Kd DUNVEGAN FORMATION ~ 366M, Grey marine and non-marine fine to coarse sandstone with conglomerate.		
Ks SHAFTESBURY FORMATION ~ 600M, Dark grey marine claystone , silty claystone and siltstone, containing sideritic concretions and some sandstone.		
Kb BOULDER CREEK FORMATION 85 ~ 200M, Grey non-marine sandstone , some carbonaceous claystone and thin coal seam.		
Kh HULCROSS FORMATION 50 ~ 80M, Dark grey thinly laminated marine siltstone, claystone and fine-grained sandstone.		
Kg GATES FORMATION 190 ~ 317M, Dark and grey principal coal-bearing unit, consists of cyclic succession of sandstone, claystone, siltstone, conglomerate and numbered B1 to B12 of coal seams.	Gates Frm	B12 B11 B10 B9 B8 B7 B6 B5 B4 B3 B2 B1
Km MOOSEBAR FORMATION 70 ~ 100M, Dark marine claysone,silty-sandy phases increasing in upper portion and sideritic concretions increasing in lower part. Glauconitic sandstone and conglomerate immediately overlying the Gething Formation.		
Kge GETHING FORMATION 70 ~ 150M, Dark and grey principal coal-bearing unit, fine to coarse grain size calcareous sandstone, siltstone, claystone and coal, with some conglomerate.	Gething Frm	A5 A4 A3 A2 A1
Kcd CADOMIN FORMATION 40 ~ 50M, Grey conglomerate interbedded with coarse-grained quartzose sandstone, some chert and quartz pebbles and cobbles.		

A geologic model was compiled by Snowden Mining Consultants Inc. (Snowden) using seam correlations based on drill core and geophysical log signatures and structural interpretation data received from CDI. The Coal Resources Summary Report of Wapiti River Coal Project was finalized by Snowden on June 30, 2014, and the Coal resources for all coal seams have been estimated from Snowden's report. The Snowden's report is provided separately (Appendix 1).

4. 2012 – 2013 COAL EXPLORATION

4.1 COMPLETED DRILL HOLES AND DRILL HOLE SURVEY

The selection of coal exploration methods used by CDI followed the typical industry standard for northeastern British Columbian coalfields. A literature research, interpretation of 2D seismic and oil and gas (O&G) exploration data were used to compile a conceptual understanding of the subsurface geology. This information was then used to identify coal exploration target areas. The quality of the exploration work completed by CDI followed the industry guidelines. The correct selection of drilling methods and appropriate use of geophysical logging tools has enabled CDI to compile the necessary information for further development of the Wapiti River coal project.

Drilling program was conducted in initial 37.5 square kilometers of Wapiti River coal area from July 2012 to April 2013 (see Figure 5 and 6). A total of 39 drill holes were completed in the coal geologic exploration with a total of coring footage approximately 34322.24 meters and geophysical wireline logging approximately 32749.67 meters.

Figure 5 Site Views of Wapiti River Coal Exploration

Completed drill holes in 2012 – 2013 Wapiti Rive coal exploration project were surveyed by Integrated Pro*Action* Corporation (IPaC). Survey locations were identified and field verified by CDI's geologist. Final drill hole collar survey were completed on October 14, 2012, November 27, 2012, January 30, 2013 and March 12, 2013 respectively by using a Trimble GNSS R8 RTK survey instrument. Points surveyed with this equipment configuration can be

expected to be accurate within 5 cm vertically and horizontally according to the manufacturer's specifications. Survey control was established by the surveyor since no pre-existing control sites were identified. Drill holes in areas of active drilling required measuring offsets that were used in office calculations to determine the final drill hole positions: accuracy of the coordinates at these locations will be reflective of the offset tools used. The ground positions were recorded in NAD83, UTM Zone 10 N map projection. Table 4 summarizes the drill hole collar survey data. The original survey reports are provided in PDF format of electronic version (Appendix 2).

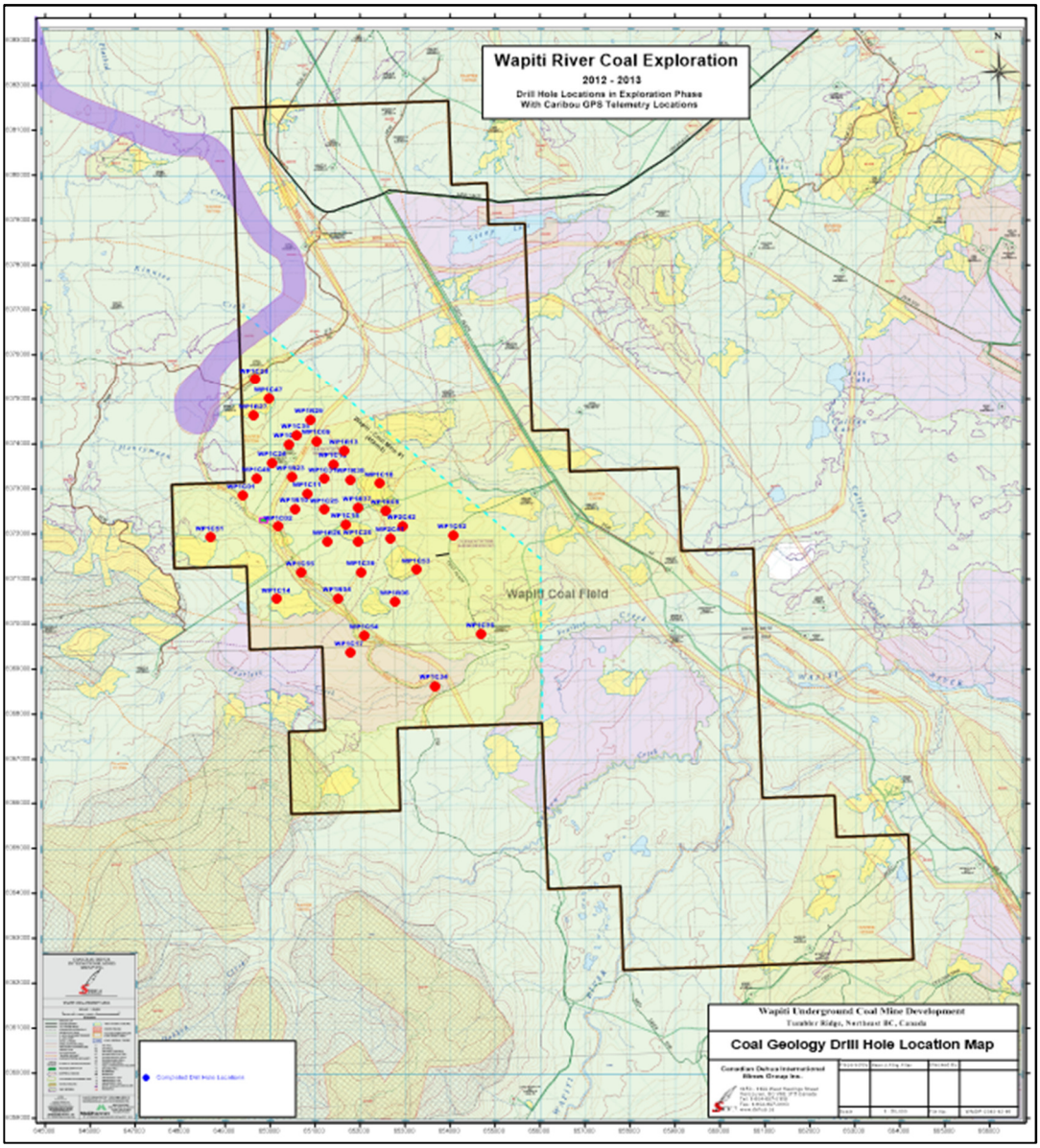


Figure 6 Completed Drill Hole Location Map of Wapiti River Coal Exploration

A high-resolution version of this figure follows page 19.

Table 4 Summary of Drillhole Collar Survey Data

BH No.	BH ID	Collar Location		Collar Elevation	Survey date
		Easting, m	Northing, m	m	
1	WP1C15	651683.1	6072216.6	1249.4	2013-03-12
2	WP1C47	649983.1	6075012.1	1095.3	2013-03-12
3	WP1C49	649712.1	6073235.9	1141.1	2013-03-12
4	WP1R08	652570.8	6072521.2	1313.4	2013-03-12
5	WP2C42	652939.8	6072184.2	1351.4	2013-03-12
6	WP1C09	651042.1	6074070.6	1134.5	2013-01-30
7	WP1C11	650836.3	6072902.8	1189.1	2013-01-30
8	WP1C12	651408.3	6073559.4	1197.4	2013-01-30
9	WP1C20	651959.9	6071841	1284.4	2013-01-30
10	WP1C24	650058.5	6073590.2	1126	2013-01-30
11	WP1C28	649661.9	6075445	1080.9	2013-01-30
12	WP1C30	650408.1	6073998.4	1117.2	2013-01-30
13	WP1C31	651187.4	6073231.3	1175.1	2013-01-30
14	WP1C35	650579	6074202.6	1123.9	2013-01-30
15	WP1R13	651652.8	6073851.9	1199.5	2013-01-30
16	WP1R23	650472.4	6073270.4	1149.8	2013-01-30
17	WP1R38	651801.6	6073218.1	1263.2	2013-01-30
18	WP1R06	652789.2	6070503.2	1251.1	2012-11-27
19	WP1R29	650880.6	6074542	1120.4	2012-11-27
20	WP1C02	650193.2	6072161	1190.4	2012-11-27
21	WP1R26	651280.7	6071834.5	1244.3	2012-11-27
22	WP1R04	651504.5	6070577.5	1206.7	2012-11-27
23	WP1C34	653656.3	6068637	1166.7	2012-11-27
24	WP1C17	651773.1	6069372.9	1250.6	2012-11-27
25	WP1C54	652106.2	6069753.2	1210.4	2012-11-27
26	WP1C52	654061.9	6071983.4	1337.4	2012-11-27
27	WP2C41	652687.5	6071907.9	1356.4	2012-11-27
28	WP1R10	650547.6	6072559.1	1200.9	2012-10-14
29	WP1C25	651218.7	6072545.1	1208.4	2012-10-14
30	WP1R37	651952.6	6072586.7	1283.3	2012-10-14
31	WP1C18	652442.8	6073123.9	1339.4	2012-10-14
32	WP1C55	650682.7	6071149.1	1201.7	2012-10-14
33	WP1C14	650149	6070553.9	1266.8	2012-10-14
34	WP1C39	652030.4	6071162.2	1291.1	2012-10-14
35	WP1C53	653260.4	6071212.9	1278.1	2012-10-14
36	WP1C36	654688.5	6069780.8	1239.7	2012-10-14
37	WP1C51	648673.7	6071931.2	1200.7	2012-10-14
38	WP1C01	649376.6	6072857.5	1140.2	2012-10-14
39	WP1R27	649639.8	6074640.2	1102.4	2012-10-14

Note: UTM NAD83 Zone10

4.2 DRILLING AND CORING

The exploration drilling method selected by CDI employed the following basic approach:

- Vertically oriented drillholes
- Rotary drilling through soft overburden (HWT or PQ casing)
- Rotary and slim core drilling through competent units (HQ or NQ or BQ bit size)
- Slim core drilling through coal horizons (HQ or NQ or BQ bit size)
- Geophysical wireline logging of completed holes
- Final collar survey of drillholes.

A total of 39 vertically oriented slim core exploration holes were completed by CDI. A total length of exploration drilling completed, including open-hole rotary drilling through soft overburden (glacial till) and core drilling through competent rock units, was 34322.24 meters. Table 5 presents the completed drill hole depth and size.

CDI's geologists logged all drill cores while drilling and collected all related such as coal and rock samples. The acquisition and sorting of all logging records were done on a timely matter. 39 drill hole core logs are provided in PDF and Excel format of electronic version separately (Appendix 3).

Table 5 Summary of Drill Hole Depth and Size

BH ID	Start Date	Complete Date	Hole Depth	Hole Bit Type
			m	Depth Range, m
WP1C01	2012.07.06	2012.07.30	1051.56	HQ/0-750; NQ/750-1051.56
WP1C02	2012.07.10	2012.08.01	996	HQ/0-996
WP1R04	2012.09.22	2012.11.19	948	HQ/0-750; NQ/750-948
WP1R06	2012.11.03	2012.12.08	1233.5	HQ/0-1188.50; NQ/1188.50-End
WP1R08	2013.02.05	2013.02.25	872	HQ/0-720; NQ/720-872
WP1C09	2013.01.24	2013.02.05	713.5	HQ/0-713.50
WP1R10	2012.10.11	2012.11.06	968.5	HQ/0-848.50; NQ/848.50-End
WP1C11	2013.01.25	2013.02.12	743	HQ/0-691; NQ/691-743
WP1C12	2013.01.12	2013.01.23	692	HQ/0-692
WP1C13	2013.01.25	2013.02.15	914	HQ/0-716; NQ/716-914
WP1C14	2012.09.27	2012.10.30	1028	HQ/0-1028
WP1C15	2013.03.03	3013.03.31	935	HQ/0-767; NQ/767-935
WP1C17	2012.11.01	2012.11.26	728	HQ/0-695; BQ/695-728
WP1C18	2012.10.05	2012.11.10	1017	HQ/0-1017
WP1C20	2013.01.28	2013.03.03	951	HQ/0-951
WP1R23	2013.01.14	2013.02.03	717	HQ/717
WP1C24	2013.01.10	2013.01.24	630	HQ/0-630
WP1C25	2012.07.15	2012.09.25	804	HQ/0-702; BQ/672-804
WP1C26	2012.11.11	2013.03.19	984	PQ/0-150; HQ/150-891; NQ/890-984
WP1C27	2012.10.05	2012.10.21	504	HQ/0-504
WP1C28	2013.01.25	2013.02.17	727	HQ/0-696; NQ/696-727
WP1C29	2012.11.12	2012.12.12	980.5	HQ/0-980.50
WP1C30	2013.01.14	2013.01.29	778.5	PQ/0-152.5; HQ/152.5-778.5
WP1C31	2013.01.10	2013.01.23	740	HQ/0-740
WP1C34	22/10/2012	26/11/2012	894	HQ/0-894
WP1C35	2013.01.08	2013.01.20	632.5	HQ/632.5
WP1R36	2012.08.25	2012.10.17	990	HQ/990
WP1R37	2012.08.08	2012.09.30	1092	HQ/0-885; NQ/885-1092
WP1R38	2013.01.08	2013.01.27	801	HQ/0-729; NQ/729-801
WP1C39	2012.09.19	2012.11.07	1181	HQ/1181
WP2C41	2012.11.10	2012.12.02	851	HQ/851
WP2C42	2013.02.26	2013.03.30	941	HQ/0-815; NQ/815-941
WP1C47	2013.02.08	2013.03.01	592.5	HQ/0-589.5; NQ/589.5-592.5
WP1C49	2013.02.18	2013.03.31	990	HQ/990
WP1C51	2012.10.03	2012.10.21	758.5	HQ/758.5
WP1C52	2012.07.13	2012.08.21	1167	HQ/1167
WP1C53	2012.09.30	2012.10.24	762.5	HQ/762.5
WP1C54	2012.10.23	2012.12.04	1172.5	HQ/1172
WP1C55	2012.08.05	2012.08.20	581	HQ/581
WP1C55	2012.08.21	2012.09.29	843	HQ/0-705; NQ/705-837; BQ/837-843

4.3 GEOPHYSICAL WIRELINE LOGGING

Weatherford was contracted by CDI to complete the post drilling geophysical wireline logging of the drillholes. Measured parameters included: gamma ray, neutron, density, resistivity, dip angle, well temperature, caliper, well deviation, etc. Table 6 provides a summary of the geophysical log parameters tested per hole. Although not all of the available parameters were completed in every hole, the most critical parameters for coal interpretation, such as gamma and density, were included in all holes.

39 drill hole wireline logs are provided in softcopy of PDF, Tif and LAS file formats separately (Appendix 4).

Table 6 Summary of Drill Hole Wireline Logging Parameters

BH ID	Coring Depth	Wireline Logging Depth	Density	Neutron Porosity	Gamma	Electric Resistivity	SP	Sonic	Dip Angle	Verticality Analysis	Temperature	Bit Size	Caliper
	(m)	(m)	g/c	%	API	ohm	mv	us/m			ºC	mm	mm
WP1C01	1051.56	936	√	√	√					√	√	√	√
WP1C02	996	993	√	√	√	√			√	√		√	√
WP1R04	948	939.5	√	√	√	√	√	√	√	√	√	√	√
WP1R06	1233.5	1219.5	√	√	√	√		√	√	√		√	√
WP1R08	872	860	√	√	√	√	√		√	√		√	√
WP1C09	713.5	711	√	√	√	√	√	√	√	√		√	√
WP1R10	968.5	966	√	√	√			√	√	√		√	√
WP1C11	740	737.55	√	√	√								√
WP1C12	692	692	√	√	√	√	√	√	√	√		√	√
WP1R13	914	912	√	√	√			√					√
WP1C14	1028	971	√	√	√	√	√	√	√	√	√	√	√
WP1C15	935	930	√	√	√								√
WP1C17	731	695	√	√	√	√	√	√	√				√
WP1C18	1017	1010.8	√	√	√			√		√		√	√
WP1C20	951	860	√	√	√								√
WP1R23	717	712	√	√	√	√	√	√	√	√		√	√
WP1C24	630	624.5	√	√	√	√	√	√	√	√		√	√
WP1C25	804	585		√	√								√
WP1R26	983	975	√	√	√								√
WP1R27	504	500	√	√	√	√			√	√	√	√	√
WP1C28	727.06	572	√	√	√								√
WP1R29	980.5	975.5	√	√	√	√	√	√	√	√	√	√	√
WP1C30	778.7	773	√	√	√	√	√	√	√	√		√	√
WP1C31	740	735	√	√	√	√	√	√	√	√		√	√
WP1C34	894.97	570	√	√	√	√	√			√		√	√
WP1C35	632.5	631	√	√	√	√	√	√	√	√		√	√
WP1C36	990	696	√	√	√	√		√	√	√	√	√	√
WP1R37	1092	1085	√	√	√	√	√	√	√	√	√	√	√
WP1R38	801	801	√	√	√	√	√	√	√	√		√	√
WP1C39	1181	1175	√	√	√	√	√	√	√	√	√	√	√
WP2C41	851	850	√	√	√	√	√	√	√	√	√	√	√
WP2C42	941	935	√	√	√	√		√	√	√		√	√
WP1C47	589.5	575	√	√	√	√	√	√	√	√		√	√
WP1C49	990	980	√	√	√	√		√	√	√		√	√
WP1C51	758.5	754.5	√	√	√					√		√	√
WP1C52	1167	1162	√	√	√								√
WP1C53	762.95	651	√	√	√								√
WP1C54	1172.5	1170	√	√	√	√	√	√	√	√	√	√	√
WP1C55	843	830	√	√	√					√		√	√
Total	34322.2	32749.67	38	39	39	25	19	24	25	29	10	29	39

5. SUMMARY OF COAL RESOURCES

Snowden was engaged by CDI to generate a preliminary stratigraphic model for the Wapiti River coal project incorporating the data gathered in the recent exploration project (39 boreholes), plus historical data from gas boreholes and 4 seismic lines interpretation. As well, Snowden conducted the preliminary estimation of the Coal Resources based on the GSC Paper 88-21 guidelines for Wapiti River coal property. Figure 7 illustrates the boreholes used in coal geo-modelling and resource estimation for Wapiti River coal property.

Detailed Wapiti River coal resources can be referred to Snowden's report, which is provided separately (Appendix 1).

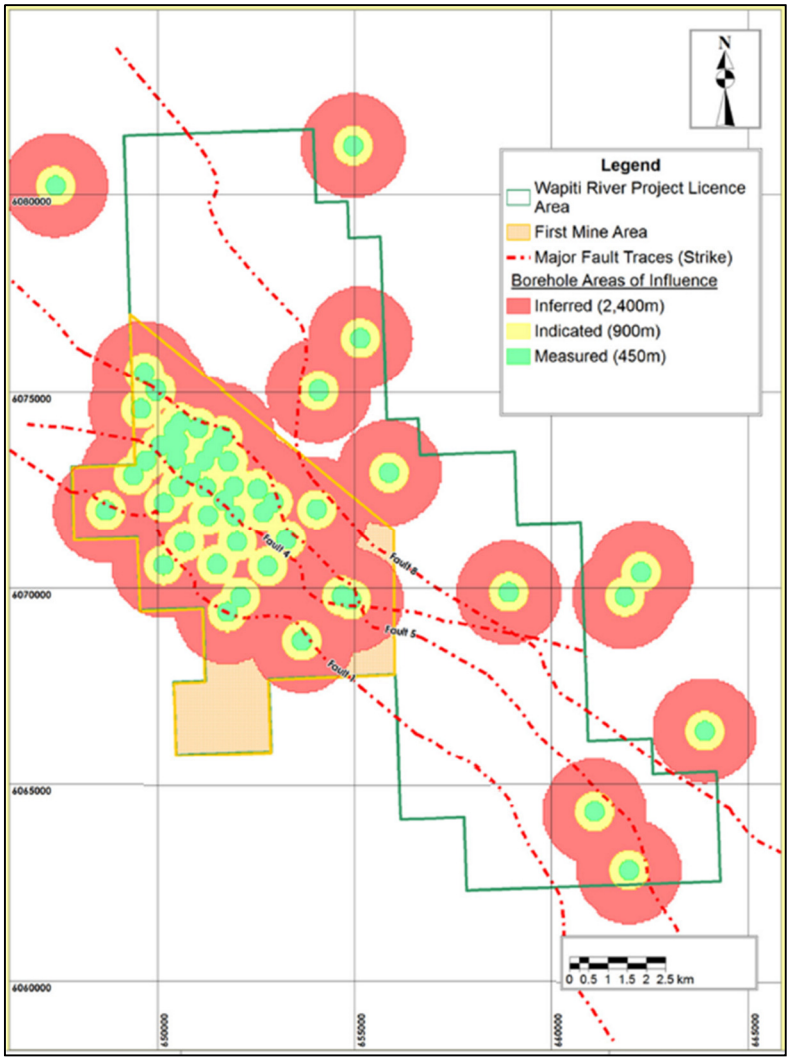


Figure 7 Boreholes Used in Wapiti River Coal Geo-Modelling and Resource Estimation

Table 7, 8, 9 and 10 summarizes the coal resource estimate with which coal seam thickness cut-off at 0.6, 1.0, 1.2 and 1.5 meter respectively according to Snowden's report.

6. CONCLUSION AND RECOMMENDATION

According to 2012 – 2013 Wapiti River coal exploration and Snowden's summary report, Wapiti River coal property is very rich in coal resources, which were estimated only based on geological structural continuity and therefore noncompliant with international codes, but it may be sued as an indication of the potential of the coal field.

The Coal Resource estimations presented in Snowden's report were generated for all seams in the project area that met the specified criteria (depth and thickness) from Gething seams (A series) to Gates seams (B series).

The geo-model generated by Snowden reflects the current exploration for Wapiti River coal property and allows CDI to start with the option analysis to define possible mining scenarios from the structural point of view. The current measured resources are located in the immediate interest resources area, which enables CDI to carry on with its consistent exploration program towards mining.

Further to the Wapiti River coal mining consideration, it would be beneficial to upgrade to resource and reserve categories if further supplementary exploration such as in-fill drilling and 3D seismic exploration can be conducted and coal quality model can be generated.

Wapiti River Coal Exploration

2012 - 2013

Drill Hole Locations in Exploration Phase
With Caribou GPS Telemetry Locations

WP1C28
WP1C47
WP1R27
WP1R29
WP1C35
WP1C09
WP1R13
WP1C24
WP1C49
WP1R23
WP1C31
WP1R38
WP1C18
WP1C01
WP1C11
WP1R10
WP1C25
WP1R37
WP1R08
WP1C02
WP1C15
WP2C42
WP1C51
WP1R26
WP1C20
WP2C41
WP1C52
WP1C55
WP1C39
WP1C53
WP1C14
WP1R04
WP1R06
WP1C54
WP1C36
WP1C17
WP1C34

Wapiti Coal Mine #1 (45km2)

Wapiti Coal Field

Completed Drill Hole Locations

CANADIAN DEHUA INTERNATIONAL MINES GROUP INC.

WAPITI COAL PROJECT AREA

McELHANNEY GEOMATICS
PROFESSIONAL LAND SURVEYING LTD.

Wapiti Underground Coal Mine Development

Tumbler Ridge, Northeast BC, Canada

Coal Geology Drill Hole Location Map

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Scale	1 : 50,000	File No.	WMDP-2013-12-16

Appendix 1: Coal Resources Summary Report of Wapiti Coal Project, by Snowden, June 2014

Canadian Dehua International Mines Group Inc.

Wapiti River Coal Project

Project No. V1365

Coal Resources Summary Report

30 June 2014

Final

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Canadian Dehua International Mines Group Inc.: 2

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Appendix 2: Canadian Dehua Wapiti River 39 Borehole Collar Locations – UTM NAD 83, Zone 10

Table Canadian Dehua 2012 - 2013 Drill Hole Location in Wapiti River Coal Property

BH No.	BH ID	Collar Location		Collar Elevation	Survey date
		Easting, m	Northing, m	m	
1	WP1C15	651683.1	6072216.6	1249.4	2013-03-12
2	WP1C47	649983.1	6075012.1	1095.3	2013-03-12
3	WP1C49	649712.1	6073235.9	1141.1	2013-03-12
4	WP1R08	652570.8	6072521.2	1313.4	2013-03-12
5	WP2C42	652939.8	6072184.2	1351.4	2013-03-12
6	WP1C09	651042.1	6074070.6	1134.5	2013-01-30
7	WP1C11	650836.3	6072902.8	1189.1	2013-01-30
8	WP1C12	651408.3	6073559.4	1197.4	2013-01-30
9	WP1C20	651959.9	6071841	1284.4	2013-01-30
10	WP1C24	650058.5	6073590.2	1126	2013-01-30
11	WP1C28	649661.9	6075445	1080.9	2013-01-30
12	WP1C30	650408.1	6073998.4	1117.2	2013-01-30
13	WP1C31	651187.4	6073231.3	1175.1	2013-01-30
14	WP1C35	650579	6074202.6	1123.9	2013-01-30
15	WP1R13	651652.8	6073851.9	1199.5	2013-01-30
16	WP1R23	650472.4	6073270.4	1149.8	2013-01-30
17	WP1R38	651801.6	6073218.1	1263.2	2013-01-30
18	WP1R06	652789.2	6070503.2	1251.1	2012-11-27
19	WP1R29	650880.6	6074542	1120.4	2012-11-27
20	WP1C02	650193.2	6072161	1190.4	2012-11-27
21	WP1R26	651280.7	6071834.5	1244.3	2012-11-27
22	WP1R04	651504.5	6070577.5	1206.7	2012-11-27
23	WP1C34	653656.3	6068637	1166.7	2012-11-27
24	WP1C17	651773.1	6069372.9	1250.6	2012-11-27
25	WP1C54	652106.2	6069753.2	1210.4	2012-11-27
26	WP1C52	654061.9	6071983.4	1337.4	2012-11-27
27	WP2C41	652687.5	6071907.9	1356.4	2012-11-27
28	WP1R10	650547.6	6072559.1	1200.9	2012-10-14
29	WP1C25	651218.7	6072545.1	1208.4	2012-10-14
30	WP1R37	651952.6	6072586.7	1283.3	2012-10-14
31	WP1C18	652442.8	6073123.9	1339.4	2012-10-14
32	WP1C55	650682.7	6071149.1	1201.7	2012-10-14
33	WP1C14	650149	6070553.9	1266.8	2012-10-14
34	WP1C39	652030.4	6071162.2	1291.1	2012-10-14
35	WP1C53	653260.4	6071212.9	1278.1	2012-10-14
36	WP1C36	654688.5	6069780.8	1239.7	2012-10-14
37	WP1C51	648673.7	6071931.2	1200.7	2012-10-14
38	WP1C01	649376.6	6072857.5	1140.2	2012-10-14
39	WP1R27	649639.8	6074640.2	1102.4	2012-10-14

Note: UTM NAD83 Zone10

Bore Hole Type
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Appendix 3: Canadian Dehua Wapiti River 39 Borehole Lithologic Logs

Wapiti River — Drill Hole Core Log

Drilling Company:	Canada Drilling Company	**Hole No.:**	WP1C01		
Rig Type:	VD-8000	**Collar Elevation:**	1140.2m		
Total Depth:	1051.56m	**Coordinate:**	**Northing:**	6072857.5	
Spud Date:	8-Jul-12		**Easting:**	649376.6	
Finished Date:	1-Aug-12		**Logging Geologist:**	Victor, Lee, Chris	
Core Size:	HWT/HQ/NQ		**Note:**		

Formation	Coal Seam	Core Depth Interval		Thickness, m		Strata	Coal Floor Elevatio	Sample ID		CBM	Rock Hardness	Rock Name	Lithology Description
		From	To	Thick	TRUE			Coal	Rock				
Q		0.00	1.00	1.00								till	Overburden
Boulder Creek		1.00	12.00	11.00								sandstone	Light-grey, fine-medium grained, with minor vitrain laminate
		12.00	13.20	1.20								siltstone	Grey, massive
		13.20	14.05	0.85								siltstone	Grey, massive, minor vitrain chip (2-3mm)
		14.05	16.30	2.25		20						siltstone	Dark grey with light grey fine-grained sandstone. At 15.10m bedding dip: 20°
		16.30	**16.50**	**0.20**								**coal**	**Bright, black, light**
		16.50	17.50	1.00								mudstone	Light black, massive at top, minor vitain laminate
		17.50	27.00	9.50		24						sandstone	Light grey, medium-grained, horizontal bedding, well-sorted, bedding plane:24° . Quartz and debris mainly, minor coarse-grained SS, minor vitrain thin laminate. From 24m-27m conglo-coarse sandstone light grey, poorly-sorted
		27.00	36.00	9.00								sandstone	Fine-grained light grey, well-sorted, minor conglomerate, predominately quartz and debris. From33.5m-36m, rock broken, fracture number 15m
Fault Zone		36.00	45.00	9.00								mudstone	Silty, light black, very much broken, fracture. Number 50/m fault fracture belt, fault gouge(39-42), mylonization, deformation taconite
		45.00	76.40	31.40								mudstone	Light Black, massive, rock broken, fracture developed. Fracture number: 30/m. Broken surface are slicken sided and shiny. With minor FGSS laminate. At 58m Bedding plane:67° (Fracture). From 72-76.40 very much broken, fracture number:50/m
		76.40	96.00	19.60								siltstone	Muddy, dark grey, massive, interbeded with light grey, fine-grained sandstone laminate(5%). At 81.5m-84.5m, very much broken, fracture number:20/m. At87.2m, bedding plane:60° (fracture)
		96.00	102.00	6.00								siltstone	Dark grey, massive, fracture developed, infill calcite vein, various angles vein to core axis.
		102.00	109.00	7.00								siltstone	Dark grey, massive, minor fracture developed, infill calcite vein
		109.00	124.00	15.00								sandstone	Grey to light grey, broken surface are slicken sided and shiny. Strong structure activate, result in two kinds of rock blended
		124.00	137.00	13.00								siltstone	Dark grey, fracture developed, various angle to core axis, infilled calcite veins. Fracture plane:52° . At upper part, disturbed structure
Hasler		137.00	155.00	18.00		10						siltstone	Dark grey, interbedded with light grey, fine-grained. Sandstone laminate(20%). At 150m bedding plane 10° . At 151.5 pyrite nodule (4X7mm)
		155.00	169.50	14.50								siltstone	With sandstone blended, dark grey to light grey. FGSS:20%
		169.50	191.00	21.50								siltstone	Dark grey, interbedded with light grey, fine-grained. Sandstone laminate(10%). Minor siderite laminate, muddy. At 174m, bedding plane: 6° . At 186m, plant roots fossils bedding plane 8°
		191.00	196.00	5.00								siltstone	Muddy, dark grey, rock broken, broken surface are slickensided and shiny. Fracture number: 15/m
		196.00	250.00	54.00								siltstone	Dark grey, massive with minor light grey, fine-grained, sandstone laminate (5%). At 200m, bedding plane: 8° .
		250.00	276.40	26.40								siltstone	Same as previous internal, plus interbeded with numerous light grey, fine-grained sandstone laminates(25%), minor siderite thin laminates. Micro-horizontal bedding. Distributed bedding in FGSS surface. Bedding plane: 10° (at 257m). At268m, bedding plane:10° . sideritic thin laminates, at 273.5m and pyrite nodules(2X6mm)
		276.40	285.40	9.00								siltstone	Dark grey, interbedded with minor fine-grained, light grey sandstone laminate(5%) argillaceous cement.
		285.40	296.00	10.60								siltstone	Same feature as above, plus sandy bands toward at base. At 295m, bedding plane:12°
		296.00	304.00	8.00								siltstone	Dark grey, massive, minor carbonaceous fragment and siderite laminates. At 300.6m, bedding plane: 8° . Grading downward at base, muddy.
		304.00	321.60	17.60								siltstone	Dark grey, interbeded with light grey, fine-grained sandstone laminate(30%). Alternating with FGSS bands. Micro-horizontal bedding, distorted bedding in FGSS surface. Bedding plane:6° (319m), At320.10m, pyrite grain at joint surface.
		321.60	332.00	10.40								siltstone	Dark grey with minor light grey, fined-grained sandstone laminate(10%) minor siderite laminate and minor carbonaceous
		332.00	338.00	6.00								siltstone	Same as previous internal, plus, sandstone bands increased(25%)
		338.00	351.50	13.50								siltstone	Dark grey with minor FGSS laminates(10%) At346m, bedding plane:6°
		351.50	373.80	22.30								siltstone	Dark grey, interbeded with light grey, fine-grained sandstone laminate (30%), minor carbonaceous fragment and sideritic bands. At 368m, bedding plane:8°
		373.80	393.35	19.55								siltstone	Dark grey, interbeded with light grey, fine-grained sandstone laminate (30%), alternating with bands of siderite.
Boulder Creek		393.35	397.45	4.10								sandstone	Light grey, medium-grained, locally conglomerate, Φ:2-5mm horizontal-bedding, nomral-sorted, predominately quartz and debris. Bedding plane:6° (at 391.5m)
		397.45	402.00	4.55								mudstone	Bauxitic, white-grey massive
		402.00	402.70	0.70								sandstone	0.7m FGSS
		402.70	412.00	9.30								mudstone	Bauxitic, white-grey with minor light black mudstone and light grey FGSS. At 402.8m, vitrain chip on the mudstone joint surface
		412.00	414.60	2.60								mudstone	Light black, massive, rich in plant roots fossil and minor vitrain laminate.
		414.60	424.50	9.90								mudstone	Bauxitic, massive, white-grey, with dark grey siltstone, rich in carbonaceous fragment, sandy toward at base
		424.50	429.70	5.20								mudstone	Light grey, fine-grained with light black mudstone laminate at 428.20-429.10, bauxitic mudstone. Bedding plane:10° (425)
		429.70	431.70	2.00								mudstone	Light black, massive rich in plant root, fossil and carbonaceous fragment, vitrain laminate at lower part.
		431.70	433.00	1.30								sandstone	Light grey, FGSS
		433.00	434.00	1.00								mudstone	Bauxitic, white-grey, numerous carbonaceous/plant fragment
		434.00	440.00	6.00								sandstone	Light grey, FG, numerous vitrain chip, sandy toward at base bedding plane:5° (438)
		440.00	443.00	3.00								siltstone	Grey, massive with minor vitrain laminate
		443.00	445.50	2.50								siltstone	Dark grey, massive minor carbonaceous, vitrain fragment.
		445.50	448.00	2.50								mudstone	Bauxitic mudstone, white-grey.
		448.00	483.00	35.00								siltstone	Grey, interbeded with dark grey mudstone and fine-grained, light grey sandstone laminas, sandstone react with 5% HCl(at 452,455,467, 474.5, 481.5). With minor vitrain laminas. At 479-480.5, black mudstone, minor vitrain chip
		483.00	492.70	9.70		5						siltstone	Muddy, massive, competent, muddy toward at base, rich in carbonaceous, vitrain fragment at lower part
		492.70	492.96	0.26		7						mudstone	Carbonaceous, light black
	BC	**492.96**	**493.58**	**0.62**								**coal**	**0.62m, coal lost: 0.06m. RC: 0.56m. Black, bright, light, no parting**
		493.58	500.80	7.22								sandstone	Medium-grained, light grey, well sorted, predominately quartz and debris from 497-500.8 conglomerate mainly, Φ:2-7mm with minor dark grey mudstone laminas(5%)
		500.80	513.00	12.20		7						sandstone	light grey, fine-grained, well sorted, quartz and debris mainly, muddy toward at base.
Hulcross		513.00	523.60	10.60								sandstone	Siltstone inter laminated alternating with bands of FGSS minor siderite laminate. At 522m, bedding plane:10°
		523.60	535.25	11.65		8						siltstone	Grey, interbedded with light grey, fine-grained. Sandstone laminate (40%) minor carbonaceous debris. At 535m, limestone, 0.05m, strong react with 5% HCL
		535.25	567.00	31.75								siltstone	Muddy, dark grey interbedded with light grey, fine-grained sandstone laminate(20%) and light black mudstone laminate(20%) at 542m. Pyrites nodules(1X3mm) and shell fossils/leaf fossils. Minor carbonaceous fragment and siderite laminate. At552.20m, 0.05m kaolinite, grey-greenish, crushed by finger. At 555m, carbonaceous leaf fossil. At 558.10m, 0.1m strong react with 5% HCL. At 558.55m, pyrite nodule(2X7mm). At560m, minor siderite laminates. At 564.20, 0.05m limestone, react with 5% HCL. At566.0m bedding plane:6°
		567.00	593.85	26.85								siltstone	Same feature as above, plus sandstone laminate toward at base alternating with sandstone bands(40%) numerous carbonaceous fragment. At575m, bedding plane 6°
		593.85	593.97	0.12								conglomerate	0.12m
Gates	**1#**	**593.97**	**594.10**	**0.13**						**CBM1**		**coal**	**0.13m coal seam 1, CBM-01**
		594.10	596.33	2.23								mudstone	Dark grey, rich in vitrain/Carbonaceous
	2#	**596.33**	**596.85**	**0.52**								**coal**	**0.52m coal seam 2**
		596.85	597.50	0.65								mudstone	CM- carbonaceous mudstone, numerous vitrain chip.
		597.50	597.60	0.10								coal	0.1m, coal badly broken
		597.60	599.45	1.85								mudstone	Light black grading throughout mud to silt at base
	3#	**599.45**	**601.25**	**1.80**				**Q1 Q2**		**CBM2**		**coal**	**1.80m coal seam 3. RC:1.60m. Coal is shiny and brittle coal fractured to 2-3cm fragments. CBM-02. (Parting: (1) 599.53m-599.68m 0.15m CM (2)599.93m-600.10m 0.17m CM. (3)600.5-600.6, 0.1 CM) Q2. Coal structure: 0.08<0.15>0.25<0.17>0.4<0.1>0.65**
		601.25	603.05	1.80								mudstone	black, numerous vitrain laminates
		603.05	604.05	1.00								mudstone	Carbonaceous, rich in vitrain laminates
		604.05	608.00	3.95		5						siltstone	Dark grey, massive
		608.00	611.80	3.80								sandstone	light grey, well-sorted
		611.80	613.10	1.30								mudstone	light black minor vitrain laminate
		613.10	618.00	4.90		10						sandstone	light grey, medium grained, well-sorted
		618.00	623.40	5.40								mudstone	light black, carbonaceous and vitrain fragment at lower part, grading throughout mud to silt at base. At 619.25-619.35m 0.1m coal seam very much broken, grinding
	4#	**623.40**	**624.00**	**0.60**								**coal**	**0.60m 4# coal seam. RC:0.50m**
		624.00	630.16	6.16		6						mudstone	Silty dark grey, numerous carbonaceous and virtain laminates
		630.16	630.30	0.14								coal	0.14m black bright
		630.30	633.00	2.70								siltstone	Dark grey massive plant leaf fossil on fractures at 632.72m
		633.00	643.00	10.00								sandstone	medium-grained, light grey, well sorted, grain toward to base, weak react with 5% HCl. Predominately quartz and debris horizontal bedding. Bedding plane:6° (639m). At base, coarse-grain sandstone
		643.00	644.90	1.90								siltstone	Muddy, massive, with minor FGSS laminate
		644.90	646.91	2.01								siltstone	Dark grey, massive at top, 0.4m FGSS at 646.5m
	5#	**646.91**	**648.67**	**1.76**				**Q3**		**CBM3**		**coal**	**1.76m Coal seam-5#, RC:1.76m, intact, bright, black**
		648.67	649.69	1.02								mudstone	Carbonaceous, rich in vitrain fragment. At 649.55-649.65, 0.1m coal grinding coal
	5-1#	**649.69**	**651.72**	**2.03**				**Q4 Q5**		**CBM4**		**coal**	**Coal seam 2.03m-5#. RC:1.95m. Intact, bright, black boney coal:650.94-651.32, 0.38m**
		651.72	654.70	2.98								siltstone	Sandy, grey, minor itrain and carbonaceous fragment
		654.70	657.30	2.60								mudstone	black
		657.30	662.00	4.70		15						siltstone	Muddy, dark grey, rich in vitrain and carbonaceous fragment. Dip: 15°
		662.00	663.00	1.00								sandstone	FGSS, with bright black MS
		663.00	663.35	0.35								mudstone	0.35 CM with coal laminates (0.05m)
		663.35	**663.77**	**0.42**								**coal**	**0.42m quality coal**
		663.77	664.37	0.60								mudstone	Coaly MS 0.6m
		664.37	**664.57**	**0.20**								**coal**	**0.20m coal seam. Bright, black**
		664.57	664.77	0.20								mudstone	0.2m CM
		664.77	**664.92**	**0.15**								**coal**	**0.15m Boney coal, dull**
		664.92	666.90	1.98								mudstone	CM, rich in plant fossil. vitrain
		666.90	**667.35**	**0.45**								**coal**	**0.45m coal seam. Brittle and black.**
		667.35	668.00	0.65								mudstone	MS
	6#	**668.00**	**668.88**	**0.88**				**Q6 Q7 Q8**				**coal**	**0.88m 6# coal seam, 0.20m boney coal. Parting: 668.10-668.22 0.07m/0.05m Q 6,7,8.**
		668.88	670.50	1.62								sandstone	FGSS
		670.50	673.00	2.50								mudstone	Light black, coaly rich in carbonaceous fragment bedding plane:10° (at 672.5m)
		673.00	678.00	5.00								siltstone	Dark grey with light grey, fine-grained sandstone laminate(20%)
		678.00	681.68	3.68								mudstone	Bright black, massive rich in carbonaceous/plant fossil/vitrain fragment. At 680.60-680.80m, 0.20m coal seam.
		681.68	**682.33**	**0.65**								**coal**	**0.65m coal seam. Bright, light**
		682.33	684.30	1.97								mudstone	Coaly, light black, rich in carbonaceous/vitrain
		684.30	687.00	2.70								siltstone	Dark grey, interbedded with light grey, fine-grained sandstone(20%) at 687m, bedding plane 10°
		687.00	690.40	3.40		10						mudstone	Carbonaceous, light black, minor carbonaceous/plant fossil
	7#	**690.40**	**690.93**	**0.53**				**Q9 Q10**				**coal**	**0.53m 7# coal seam. RC:0.50m Q9 Q10 coal structure: 0.15<0.09>0.29m**
		690.93	694.50	3.57								mudstone	Light black massive rich in vitrain/carbonaceous/plant fossil
		694.50	704.28	9.78		10						siltstone	Dark grey with light grey, fine-grained sandstone (25%) micron-horizontal bedding, bedding plane:10° (at 696m)
	8#	**704.28**	**706.45**	**2.17**				**Q11 Q12**				**coal**	**2.17m Coal seam-8# intact. Coal structure 0.76<0.18>0.05<0.07>0.76<0.05>0.30m.**
		706.45	707.33	0.88								mudstone	light black, rich in vitrain and carbonaceous laminates
	8-1#	**707.33**	**708.06**	**0.73**				**Q13 Q14**		**CBM5**		**coal**	**0.73m coal seam-8-1# RC:0.73m. Parting: 707.59-707.14, 0.15m MS Q13, Q14**
		708.06	711.50	3.44								mudstone	light black, rich in coal chip and carbonaceous fragment at 710.85-710.90, 0.05m
		711.50	719.00	7.50								siltstone	Dark grey, massive, competent, with minor mudstone laminate, horizontal bedding, bedding plane: 5° at 717m. Minor carbonaceous fragment
		719.00	741.00	22.00								sandstone	light grey, fine-grained, normal -sorted, interbedded with dark grey mudstone laminate(10%). Micro-horizontal bedding, bedding plane:10° , partly increased 20° . Calcite cement, strong react with 5% HCl, grading toward at base. At 729-734.6m, with numerous argillaceous pebbles and laminate scattered throughout size range of pebbles:2mm at top to 3cm at bottom. At 732m, bedding plane:6° . At base, vitrain observed on joint plane.
		741.00	745.86	4.86								siltstone	Dark grey, massive, rich in carbonaceous fragment, grey becoming increasingly dark and carbonaceous towards lower.
		745.86	**746.11**	**0.25**								**coal**	**0.25m, bright, brittle, shiny**
		746.11	748.37	2.26								mudstone	Carbonaceous, rich in plant leaf fossil and vitrain fragment
	9# from 750.0m , NQ	**748.37**	**753.05**	**4.68**				**Q15**		**CBM6**		**coal**	**4.68m 9# coal seam. RC:1.60m no parting. Q15(from750-753.05, wash away, only minor coal fragments bright, black shiny).**
		753.05	771.65	18.60								siltstone	Grey massive, interbeded with FGSS laminates sandy toward at base. At 755m bedding plane: 8° . Numerous plant leaf fossil observed on joint plane.
		771.65	772.94	1.29								mudstone	Black, massive with leaf fossil at bottom, 2 coal streaks
	10#	**772.94**	**776.41**	**3.47**				**Q16**		**CBM7**		**coal**	**#10 coal seam 3.47m, RC: 2.70m light, bright crispy, no parting, half-broken**
		776.41	777.40	0.99								mudstone	Black little silty, at 776.71, coal streak, 0.06m. 777.24m coal layer, 0.10m
		777.40	780.10	2.70								siltstone	light black muddy
		780.10	799.60	19.50		10						sandstone	light grey, medium-grained, with dark, mudstone laminate(2%)
	11#	**799.60**	**800.71**	**1.11**				**Q17 Q18**		**CBM8**		**coal**	**#11 coal seam RC:1.11m. Coal structure: 0.28<0.08>0.13<0.12>0.50m. The parting is mudstone.**
		800.71	807.50	6.79								siltstone	Dark grey, rich in coal seam(thin), and plant root fossils
		807.50	808.72	1.22								sandstone	FGSS, light grey, minor calcite vein
		808.72	811.85	3.13								mudstone	Silty, dark grey, numerous, vitrain/plant root fossils.
	12#	**811.85**	**813.34**	**1.49**				**Q19 Q20**				**coal**	**1.49m #12 coal seam RC: 1.49m. Coal structure: 0.12<0.07>0.75<0.24>0.31m. parting is mudstone**
		813.34	813.98	0.64								mudstone	Black, rich in carbonaceous fragment
	12-1#	**813.98**	**815.66**	**1.68**				**Q21 Q22**		**CBM9**		**coal**	**1.68m #12-1 Coal seam RC:1.68m coal structure: 1.42<0.2>0.06m.**
		815.66	816.27	0.61								mudstone	Light black, rich in vitrain/plant root fossils
		816.27	817.50	1.23								sandstone	FGSS with minor MS
		817.50	819.30	1.80								mudstone	
		819.30	**819.55**	**0.25**								**coal**	**0.25m, coal seam**
		819.55	832.00	12.45								sandstone	MG, light grey, pure. vertical fracture developed, infilled Calcite vein, react with 5% HCl at 820.00-823.30m.
		832.00	880.87	48.87		7						sandstone	FGSS. React with 5%HCl. with MS laminates. From 841.00-844.30m with light black MS laminates(20%)
Moosebar		880.87	938.78	57.91								siltstone	Grey -- dark grey, massive, interbedded with minor light grey FGSS laminates(5%) ,plant roots fossils, muddy, locally minor pyrite nodules. At 906.80-907.00m 0.20m FGSS, strong react with 5%HCl. At 916.30-916.40m, 0.10m Bauxitic mudstone. At base, silt to mud.
		938.78	958.30	19.52		7						mudstone	Silty, dark grey, massive, hard sense. Minor FGSS laminates. at 952.00m siderite 0.05m.
		958.30	960.02	1.72		5						Conglomerate	light grey, predominately quartz and debris, Φ:2-15mm, fine-grained, poorly-sorted, subround-subangular
Gething	**A1**	**960.02**	**960.87**	**0.85**				**Q23**				**coal**	**0.85m—A1 coal seam. RC:0.27m, Half-intact, black bright**
		960.87	962.20	1.33								mudstone	
		962.20	**962.38**	**0.18**								**coal**	**0.18m coal seam. RC :0.18m, half-intact black bright**
		962.38	963.66	1.28								mudstone	Black light, CM
	A2	**963.66**	**966.18**	**2.52**				**Q24 Q25**		**CBM10**		**coal**	**2.52m Coal seam-A2#. RC:2.40m Q23 Black bright half-intact. Parting: 966.00-966.12m, 0.12m CM, Q24.**
		966.18	968.00	1.82								mudstone	Dark grey massive numerous plant root fossil
		968.00	975.40	7.40		7						siltstone	Grey interbedded with light grey fine-grained sandstone(30%) rich in vitrain laminates and plant root fossils, horizontal bedding, bedding plane:7° (at 968.36) . minor pyrite nodules.
	A3	**975.40**	**976.90**	**1.50**				**Q26**		**CBM11**		**coal**	**1.50m Coal seam -- A3 RC:1.40m, intact, black bright, no parting**
		976.90	978.90	2.00								mudstone	Dark grey rich in plant rot fossil
	A3-1	**978.90**	**979.74**	**0.84**				**Q27 Q28**				**coal**	**0.84m A3-1 coal seam. 0.22m parting. half-bright, black, broken**
		979.74	981.00	1.26								mudstone	CM, plant roots fossils black
		981.00	993.65	12.65								sandstone	Medium-grained, well sorted, quartz and debris, sharp contact with top. at 987.05-987.15m, 0.10m MS Black. react with 5% HCl.
		993.65	999.85	6.20		5						sandstone	Fine-grained, light grey, well sorted, pure, horizontal bedding, bedding plane:5° at 999.00m.
	A4	**999.85**	**1000.90**	**1.05**		**5**		**Q29**				**coal**	**coal seam-A4 1.05m, RC:0.80m.**
		1000.90	1003.80	2.90								mudstone	light black, carbonaceous and vitrain laminate
		1003.80	1005.00	1.20								siltstone	Dark grey massive, minor plant root fossil sandy toward ar base
		1005.00	1007.50	2.50								sandstone	FGSS. sandy toward at base
		1007.50	1013.90	6.40		5						sandstone	Medium-grained, light grey, well-sorted, micro-horizontal bedding. Bedded plane:5°
		1013.90	1014.36	0.46								Conglomerate	0.46m, light grey, Φ:2-7mm, poorly-sorted, subrounded-subangular
		1014.36	1014.66	0.30								mudstone	MS, black, top:0.05m coal seam.
		1014.66	1018.00	3.34								sandstone	FGSS
		1018.00	1025.00	7.00								mudstone	Dark grey, rich in plant root fossil and shell. at 1021.10-1021.60m FGSS. mud to silt at base
		1025.00	1031.27	6.27		7						siltstone	Dark grey massive interbedded with minor FGSS, micro-horizontal bedding, bedded plane:7° at 1033.22m.
		1031.27	1039.75	8.48								siltstone	Dark grey, interbedded with light grey FGSS(35%), react with 5% HCl of FGSS. rich in plant root fossil and carbonaceous fragment. At 1030.32-1030.37m, 0.05m coal; At 1031.50-1031.60m 0.10m coal; at 1031.98-1032.03m, 0.05m coal. At 1035.00m, 0.05m coal. At base, silt to mud.
	A5	**1039.75**	**1041.16**	**1.41**				**Q30**		**CBM12**		**coal**	**1.41m A5 coal seam. RC: 1.30m. no parting. CBM12. BRIGHT, BLACK.**
		1041.16	1042.42	1.26								mudstone	CM rich in vitrain
		1042.42	1048.00	5.58	10							sandstone	fine-grained, light grey, with minor dark grey MS laminates, massive
		1048.00	1051.56	3.56								Sandstone	Medium-grained, light grey, predominately quartz and debris. Vertical fracture developed infilled calcite vein, normal-sorted. **TD=1051.56m.**

Wapiti River — **Drill Hole Core Log**

Drilling Company:	Canada Dedua Drilling Company		**Hole No.:**		WP1C02
Rig Type:	VD-5000		**Collar Elevation:**		1190.2m
Total Depth:	966.00 m		**Coordinate:**	**Northing:**	6072161
Spud Date:	10-Jul-12			**Easting:**	650193.2
Finished Date:	Aug. 04, 2012			**Logging Geologist:**	Lee,Victor, Chris, Liang
Core Size:	HWT/HQ			**Note:**	

Formation	Coal Seam	Core Depth Interval From	To	Thickness, m Thick	TRUE	Strata Dip	Coal Floor Elevatio	Sample ID Coal	Rock	CBM	Rock Hardness	Rock Name	Lithology Description
Q		0.00	4.00	4.00								till	Till, overburden.
Hasler		4.00	15.20	11.20		10						siltstone	Grey, interbedded with fine sandstone laminate(40%), Micro-horizontal bedding, bedded plane:10
		15.20	15.28	0.08		20°						conglomerate	Φ:2-5mm, poorly- sorted bedded plane:20°
		15.28	19.05	3.77		20						sandstone	White and grey, fine-grained, bedded plane:20
		19.05	27.30	8.25								sandstone	Brown and grey, bauxitic, massive, crispy
		27.30	30.00	2.70								mudstone	Black, silty, massive. with leaf fossil
		30.00	39.50	9.50								mudstone	Brown and grey, bauxitic, massive, crispy, no bedding
		39.50	45.40	5.90		15°						sandstone	White and grey, fine-grained, numbers dark mudstone laminate. At 43m, calcite laminate, at 45m bed plane:15°
		45.40	51.50	6.10								mudstone	Brown and grey, bauxitic massive crispy
		51.50	56.00	4.50		20						sandstone	white and grey, fine-grained interbedded with siltstone at upper, with dark mudstone. At 53m, bedd plane: 20°
		56.00	59.80	3.80								mudstone	Silty, light grey with a pyrite nodule, numerous coal nodule
		59.80	66.25	6.45		15						sandstone	White and grey, fine-grained, interbedded with siltstone layers, at 65.5 bedded plane: 15°
		66.25	87.00	20.75		30						mudstone	Light black, crispy, interbedded with fine sandstone, at 79. bedded plane:30° . At 73.9 a layer of 0.01m.84.5-84.6 numerous vitrain lenses
		87.00	94.00	7.00		28						sandstone	White and grey, medium-grained, interbedded with bauxitic mudstone. At 91.5, bedded plane:20°
		94.00	99.25	5.25								mudstone	Brown and grey, bauxitic crispy
		99.25	102.60	3.35		20°						sandstone	white and grey, fined-grained with numerous dark mudstone laminate. At 99.5m bedded plane :25° . A 20°
		102.60	117.70	15.10								mudstone	light black and brown, little bauxitic, crispy and massive, can be scratched by iron knife
		117.70	119.40	1.70								sandstone	White and grey, medium-grained, with dark mudstone laminate. Bedded plane: 15°
		119.40	120.50	1.10								mudstone	Black massive, carbonaceous, numerous vitrain lenses laminate
		120.50	122.06	1.56		15						sandstone	white and grey, medium-grained interbedded with mudstone. Bedded [lane 15
	BC'	**122.06**	**122.70**	**0.64**								**coal**	**RC:0.45 half intact, light, bright, 0.19m wash away no parting**
		122.70	131.70	9.00		20°						sandstone	white and grained coarse-medium grained, coarse predominately with several fine conglomerate, poor sorted quartz and dark debris mainly bedded. At 131.0m, plane:20
		131.70	141.95	10.25								sandstone	white and grey, fine-grained, massive, no bedding
		141.95	147.70	5.75		15						sandstone	White and grey, fine-grained, interbedded with dark muddy siltstone laminate, bedded plane:15°
Hulcross		147.70	162.00	14.30		20						siltstone	Dark and grey, muddy, interbedded with fine sandstone laminate (50%). At 149, bedded plane:18° At 18°
		162.00	195.00	33.00								siltstone	Dark and grey, muddy, interbedded with fine sandstone laminate (40%). At 187-187.15, kaolinite sof 191 bedded plane:20°
		195.00	230.60	35.60		20°						siltstone	Dark and grey, muddy, interbedded with fine sandstone laminate (50%). At 207-209, little broke, fo 206, bedded plane: 20° , At 208, 70° . At 211, 25° . At 203-203.1, argillaceous limestone. At 221, At 229, 20°
		230.60	231.10	0.50								sandstone	Coarse-medium grained, white and grey, poorly sorted.
		231.10	231.30	0.20								conglomerate	Φ:2-5mm, poorly- sorted
Gates		231.30	232.20	0.90								mudstone	black and massive
	1#	**232.20**	**232.40**	**0.20**								**coal**	**light bright, no parting**
		232.40	234.00	1.60								mudstone	black massive with vitrain lenses at middle
		234.00	239.30	5.30		30						sandstone	Whtie and grey, fine-grained with dark mudstone laminate. Bedded plane:30°
		239.30	241.70	2.40								mudstone	Very silty, light black with leaf fossil
	2#	**241.70**	**242.15**	**0.45**		**25°**						**coal**	**RC:0.45m intact light bright, no parting, bedded plane:25°**
		242.15	244.46	2.31								mudstone	black, massive at middle, coal seam 0.08m
	3#	**244.46**	**245.30**	**0.84**				**Q1**				**coal**	**B1 0.84m, RC:0.5m 0.34m wash away, no parting, light bright, partly broken.**
		245.30	246.07	0.77				Q2				mudstone	Black, 2layers of coal, 0.05m of each, rich in vitrain lenses.
	3-1#	**246.07**	**247.28**	**1.21**				**Q3 Q4**				**coal**	**B2 1.21m RC:0.9m Bright, core lost 0.31m. Parting: (1)246.85-247, 0.15m mudstone several vitr lenses. (2)247.11-247.18: 0.07, carbonaceous ms. 0.78<0.15>0.11<0.07>0.1 Coal (1)246.07-246.85, (2)247-247.11, 0.11m.(3)247.18-247.28, 0.1m**
		247.28	251.00	3.72		20°						sandstone	White and grey, fine-grained interbedded with black mudstone layers (40%) bedded plane:20°
		251.00	255.00	4.00								mudstone	black at upper, numerous vitrain laminate, 1 layer of coal streak(252.8-252.85)
		255.00	255.80	0.80								siltstone	light, black, muddy
		255.80	272.70	16.90		40°						sandstone	white and grey, fine-grained, with numerous dark siltstone laminate. At lower part, fine sandstone interbedded with mudstone, horizontal bedding. At 260, bedded plane: 25° . At 268.30, bedded plane
		272.70	281.90	9.20								sandstone	white and grey, fine-grained, with numerous dark mudstone breccia. Φ:10mm-20mm no bedding
		281.90	297.00	15.10		35°						sandstone	white and grey, medium-grained, interbedded with mudstone layer(40%). From 285-297, fracture zone, fracture number 20/m. At 285m, bedded plane:20° . At294, 35° .
		297.00	298.30	1.30								limestone	argillaceous, numerous calcite veins. At 297 70° , at 297.8 75°
		298.30	299.50	1.20								mudstone	black numerous vitrain laminate broken zone. Bedded plane:60°
		299.50	302.80	3.30		60						limestone	argillaceous, with numerous calcite veins at different direction, strongly react HCl 5%
Hulcross		302.80	361.00	58.20		40-20-40-65-10-5						siltstone	Dark and grey, interbedded with fine sandstone laminate (40%) at top, broken much. At 303.5, bedde plane:40° at 309.8-315, fold zone. At 309.8 bedded plane 80° . At 312 80° at 321 20° At 323-34 bedded plane:70° fold zone with numerous calcite veins different direction. At 327m, 40° . At 333 locally. At 336m, bedded plane:65° . At 337-339, numerous calcite veins at different direction. At 346.5, partly mylonitic. at 342.0m, bedded plane:80° At 347, bedded plane:10° . At354:5° . At 360 bedded plane:5°
Hasler		361.00	387.20	26.20		5						siltstone	dark grey interbedded with fine sandstone laminate (15%). Micro-horizontal bedding. At 363m bedded 5° . 375m 5° . 381m 5°
		387.20	398.00	10.80		5						siltstone	Dark and grey with fine sandstone laminate (10%) micro-horizontal bedding. Bedded plane:5°
		398.00	432.50	34.50								siltstone	dark and grey, with white and grey, fine sandstone laminate (30%) micro-horizontal bedding. At 405 plane: 5° . At 414, 7° . At417.5-418.5, siltstone, grey pure.
		432.50	456.17	23.67		7						siltstone	grey with fine sandstone laminate (20%), at lower part, siltstone blended fine sandstone, At 438m, plane:7° At 444m, 7° . At 450m, 7°
Boulder Creek		456.17	456.37	0.20								conglomerate	Φ: 1-3mm. Poorly-sorted
		456.37	462.15	5.78								sandstone	white and grey, medium-fine grained. At457.5, bedded plane:7°
		462.15	473.50	11.35								mudstone	brown and grey, bauxitic, massive, can be scratched by iron knife
		473.50	474.50	1.00		10						sandstone	white and grey, fine grained, at upper part, siltstone. Bedded plane:10°
		474.50	487.40	12.90								mudstone	brown and grey, bauxitic, massive. At 479.1-480.3m more bauxitic.
		487.40	492.45	5.05		10 or 20						sandstone	white and grey, fine-grained, interbedded with dark siltstone laminate. Bedded plane: changes 10°
		492.45	495.50	3.05								mudstone	brown and grey, bauxitic, massive with minor FGSS
		495.50	497.00	1.50								siltstone	dark and grey, competent numerous plant fossil, vitrain chip on joint surface at base.
		497.00	500.50	3.50								sandstone	fine-grain, light-grained with minor siltstone laminate (10%) bedding plane:10°
		500.50	503.70	3.20								sandstone	medium grained, light grey, well-sorted, predominately quartz and debris, grading downward at base
		503.70	530.50	26.80								mudstone	brown and grey massive, bauxitic. Minor plant leaf fossil and carbonaceous fragment. At509-511, mo bauxitic. At 517.3-518, more bauxitic. At 522-524, more bauxitic.
		530.50	532.50	2.00								sandstone	white and grey, fine-grained, interbedded with dark grey, siltstone layers, bedded plane:25°
		532.50	535.38	2.88								mudstone	dark grey, silty
		535.38	535.68	0.30								mudstone	black, carbonaceous, with coal films, with leaf fossils
		535.68	545.00	9.32								mudstone	brown and grey, bauxitic, massive
		545.00	545.80	0.80		20						mudstone	black massive at 545.80 -545.87, 2 coal laminate.
		545.80	547.27	1.47								sandstone	white and grey, fine-sandstone at upper, interbedded with dark siltstone layers.
	BC	**547.27**	**547.50**	**0.23**								**coal**	**0.23m RC:0.23m. Hard, light, intact, no parting.**
		547.50	558.00	10.50		10						sandstone	white and grey, fine-medium grained, interbedded with conglomerate layer(30%) quartz and debris predominately, poorly-sorted. At 552 bedded plane:10°
		558.00	571.56	13.56								sandstone	white and grey, fine-grained, well-sorted.
Hulcross		571.56	597.00	25.44		7						siltstone	dark grey interbedded with fine sandstone laminate (50%), bedded plane:7° . not react HCl 5%. At siltstone, dark grey. At 585, bedded plane: 7° . At 594m, 7°
		597.00	605.60	8.60								siltstone	dark grey interbedded with fine sandstone laminate (60%) micro-horizontal bedding at 603m, bedded ° . At 589.6-589.7, limestone react with 5% strongly
		605.60	644.07	38.47		10						siltstone	dark grey, interbedded with fine sandstone laminate (50%). At 608m, 620m, 637m, argillaceous limes 0.1m each layer, strong react HCL5%. At 606, 612m, 624m, bedded plane : 10° . Micro-horizontal bed 642, bedded plane:20°
Gates		644.07	644.72	0.65								conglomerate	white and grey, Φ:2-10mm, poorly-sorted quartz and debris predominately.
		644.72	646.60	1.88		20						sandstone	white grey, fine-grained, with dark mudstone and siltstone laminate. bedded plane:20
		646.60	647.05	0.45								mudstone	black, little silty massive with tiny pyrite nodules
	1#	**647.05**	**647.25**	**0.20**								**coal**	**0.2m coal seam. Half broken**
		647.25	649.90	2.65								mudstone	Black, massive. with vitrain laminate at middle, at lower part, fine-grained sandstone.
	2#	**649.90**	**650.08**	**0.18**								**coal**	**0.18m coal seam, intact, light black**
		650.08	650.65	0.57								mudstone	balck massive
	2-1#	**650.65**	**650.82**	**0.17**								**coal**	**0.17m coal seam.**
		650.82	651.60	0.78								mudstone	black massive. At 651.3-651.4, coal 0.1m
	3#	**651.60**	**652.99**	**1.39**				**Q5 Q6**		**CBM1**		**coal**	**1.39m coal seam. RC: 1.39m. Half broken, bright, light. Coal structure: 0.1<0.1>1.19**
		652.99	655.00	2.01								mudstone	Black, rich in leaf fossil, with fine sandstone laminate.
		655.00	662.90	7.90								siltstone	light black muddy, with leaf fossil throughout.
		662.90	665.30	2.40								mudstone	black, at top, carbonaceous, with leaf fossil fragment throughout
		665.30	666.80	1.50		15						sandstone	white and grey fine grained with mudstone laminate.
		666.80	670.30	3.50								siltstone	grey
		670.30	672.70	2.40		15						sandstone	white and grey, fine-grained, with mudstone laminate. react with HCl 5% weak
		672.70	677.00	4.30								mudstone	black massive, several coal streak and coal laminate
		677.00	679.60	2.60		15						sandstone	white and grey, fine grained, with dark mudstone laminate, with coal film
		679.60	680.25	0.65								mudstone	black massive, rich in leaf fossil fragment
	4#	**680.25**	**680.65**	**0.40**								**coal**	**0.40m coal seam. RC:0.40m light bright, parting 0.02m, mudstone.**
		680.65	681.90	1.25		15						sandstone	white and grey, fine-grained with mudstone laminate.
		681.90	685.00	3.10								mudstone	light black, little silty with leaf fossil
		685.00	696.00	11.00		15						sandstone	white and grey, fine-grained, interbedded with dark siltstone to mudstone laminate (10%). Horizont bedding predominately, reacting HCl 5%. At 687, bedded plane: 10. At 689m, 15. At 695m, 15.
		696.00	699.50	3.50								sandstone	white and grey, fine grained blended siltstone, no bedding predominately
		699.50	699.70	0.20								mudstone	light grey, silty
	5#	**699.70**	**701.55**	**1.85**				**Q7**		**CBM2**		**coal**	**1.85m coal seam. RC: 1.85. Half broken, light, bright, crispy. No parting**
		701.55	704.90	3.35								mudstone	black to light black, massive
	5-1#	**704.90**	**707.80**	**2.90**				**Q8 Q9 Q10 Q11**		**CBM3**		**coal**	**2.90m coal seam. RC: 2.20m. Half broken, light, bright, crispy. Coal structure: 0.05<0.05>0.50<0.08>0.75+0.16<0.18>1.13m. coal:704.90-704.95, 0.05m. parting: 704.95-705.00m, (Coal 705.00-705.50m, 0.50m, RC: 0.10m. 0.40m lost. Parting Mudstone:705.50-705.58, 0.08m. Coal: 706.33, 0.75m. Boney coal, 706.33-706.49, 0.16m. Parting sandstone, 706.49-706.67, 0.18m. coal:7 707.80, 1.13m, 0.30m lost.**
		707.80	709.43	1.63								mudstone	black
	5-2#	**709.43**	**710.76**	**1.33**								**coal**	**1.33m coal seam. broken, only fragment. RC: 0.30m**
		710.76	711.20	0.44								conglomerate	rich in vitrain laminates
	5-3#	**711.20**	**711.62**	**0.42**								**coal**	**0.42m coal seam, intact**
		711.62	712.57	0.95								conglomerate	rich in vitrain laminates to boney coal
	5-4#	**712.57**	**712.89**	**0.32**								**coal**	**0.32m. RC: 0.32m. Half intact**
		712.89	715.30	2.41								siltstone	dark grey, massive, numerous plant fossil
		715.30	721.00	5.70		22						sandstone	fine graded, light grey, well-sorted, horizontal bedding. Bedding plane: 22. React with 5% HCL
		721.00	730.30	9.30								sandstone	Medium graded, light grey, quartz and debris mainly. Normal sorted. At top: broken. With minor vit laminates and black Mudstone laminates. React with 5% HCL
		730.30	732.50	2.20								siltstone	dark grey, with minor GFSS laminates (5%). Rich in plant leaf fossil and vitrain
	6#	**732.50**	**733.10**	**0.60**		18						**coal**	**0.60m coal seam. RC: 100%.**
		733.10	736.44	3.34								siltstone	dark grey, massive, muddy, minor carbonaceous debris. At base, bauxitic mudstone
		736.44	738.00	1.56								mudstone	black, massive, rich in leaf fossil
		738.00	738.30	0.30								mudstone	black, massive, carbonaceous, coal streak at 738.15m, 0.05m
		738.30	739.16	0.86								mudstone	black, massive
		739.16	740.30	1.14								mudstone	black, carbonaceous with several coal streaks and vitrain lenses
	6-1#	**740.30**	**740.55**	**0.25**								**coal**	**0.25m coal seam, Rc: 0.25m, intact, no parting**
		740.55	741.40	0.85		18						sandstone	white and grey, fine grained
		741.40	742.30	0.90								mudstone	black, massive
		742.30	744.30	2.00								mudstone	black, carbonaceous, several coal laminate and vitrain lenses
		744.30	750.00	5.70								mudstone	light black, massive
	7#	**750.00**	**750.20**	**0.20**								**coal**	**0.20m coal seam.**
		750.20	753.80	3.60								sandstone	white and grey, fine-medium grained
		753.80	756.80	3.00								mudstone	black, massive
	7-1#	**756.80**	**756.96**	**0.16**								**coal**	**0.20 coal seam.**
		756.96	759.50	2.54								mudstone	black, massive, several coal laminate
		759.50	763.00	3.50								sandstone	white and grey, fine grained, interbedded with dark siltstone laminate (40%)
		763.00	770.00	7.00								siltstone	dark grey, interbedded with fine sandstone laminate (40%)
		770.00	774.70	4.70		25						mudstone	black, massive. At 773.80, bedded plane: 25
	8#	**774.70**	**777.00**	**2.30**				**Q12 Q13**		**CBM4**		**coal**	**2.30m coal seam. Rc:1.75m. Broken, light, crispy. 0.50<0.13>1.37<0.08>0.22m. Coal: 774.70-775. 0.50m, parting:775.20-775.33, 0.13m, black mudstone. Coal: 775.33-776.70, 1.37m. Parting:776.70-776.78, 0.08m, mudstone. Coal: 776.78-777.00, 0.22m.**
		777.00	777.50	0.50								mudstone	black, massive, broken by machine carbonaceous. 0.30m lost
		777.50	784.24	6.74								mudstone	black, massive, leaf fossil throughout. At 779.90-779.96, coal streak, 0.06m, broken. At 781.90m, streak. 0.03m
		784.20	790.20	6.00								siltstone	dark grey to light black, muddy massive
		790.20	803.50	13.30		30						sandstone	white grey, medium-grained, well-sorted, crispy, react with HCl(5%) throughout. At 791-792, broken tiny calcite veins, at 794.0-796, numerous tiny fractures. Fracture filling coal debris at differe direction. At 792m, bedded plane:20° . At 796.5m, 30° . At 798-803.5m, numerous vitrain lenses. At bedded plane:30° react with HCl 5% throughout.
		803.50	807.00	3.50								sandstone	grey, medium-grained, quartz and debris predominately, poorly-sorted.
		807.00	822.30	15.30		30						sandstone	white and grey, medium-grained, quartz and debris mainly, well-sorted, react HCl5%. Numerous vitra lenses and laminate. 807.3-810.3, more vitrain lenses and laminate. At 811m, bedded plane: 30°
		822.30	836.00	13.70		20						siltstone	grey, interbedded with fine sandstone laminate (30%) at 828m, bedded plane:20° . At 821.85-823.42m fracture zone, broken.
		836.00	837.00	1.00								mudstone	black, massive.
		837.00	837.10	0.10								mudstone	black, carbonaceous, broken
	9#	**837.10**	**842.82**	**5.72**				**Q14**		**CBM5**		**coal**	**5.72m coal seam. RC: 4.72m, 1.00m lost, broken, light, shinning, crispy. CO: 837.1-837.56 0.4 Parting: 837.56-837.06, 0.04m, mudstone, black. CO: 837.60-842.82, 4.82m. coal structure: 0.46<0.04>5.22m.**
		842.82	843.50	0.68								mudstone	black, with leaf fossil.
	9-1#	**843.50**	**843.65**	**0.15**								**coal**	**0.15m coal seam.**
		843.65	845.85	2.20		15						siltstone	dark grey, with FGSS layer
		845.85	846.25	0.40								mudstone	black, with coal laminate, massive.
		846.25	869.10	22.85		20						sandstone	FGSS, with siltstone and mudstone-40%. React with 5% HCL throughout.
		869.10	871.06	1.96		27						mudstone	black, numerous vitrain laminates
	10#	**871.06**	**875.65**	**4.59**				**Q15 Q16**		**CBM6**		**coal**	**4.59m coal seam. RC: 3.35m. coal structure: 1.85<0.09>2.09<0.26>0.30m**
		875.65	875.80	0.15								mudstone	carbonaceous, with leaf fossil.
	10-1#	**875.80**	**875.95**	**0.15**								**coal**	**0.15m coal seam. Broken.**
		875.95	878.00	2.05								mudstone	black, with coal laminate, massive.
		878.00	894.45	16.45		20						sandstone	FGSS, with siltstone and mudstone-40%. No React with 5% HCL throughout.
		894.45	896.65	2.20								mudstone	black, with coal laminate, massive.
		896.65	910.45	13.80		10						sandstone	FGSS, with siltstone and mudstone-40%. React with 5% HCL throughout. At lower part, numerous vitr lenses.
		910.45	911.75	1.30		15						mudstone	carbonaceous, with leaf fossil.
		911.75	914.40	2.65								mudstone	black, with siltstone laminates. Rich in leaf fossil fragment.
		914.40	915.50	1.10								sandstone	FGSS, with siltstone and mudstone-40%. No React with 5% HCL throughout.
		915.50	917.21	1.71								mudstone	black, with FGSS laminates-20%.
	12#	**917.21**	**917.56**	**0.35**								**coal**	**0.35m coal seam. RC: 0.08m.**
		917.56	918.10	0.54								mudstone	black, massive.
		918.10	921.00	2.90		25						sandstone	FGSS, with siltstone and mudstone-40%. No React with 5% HCL throughout.
		921.00	923.03	2.03								mudstone	black, with siltstone laminates. Rich in leaf fossil fragment.
	13#	**923.03**	**923.23**	**0.20**								**coal**	**0.20m coal seam. RC: 0.17m, broken, crisp.**
		923.23	946.00	22.77		15						sandstone	medium-grained, moderate-sorted, quart and debris mainly.
		946.00	989.65	43.65		10						sandstone	FGSS, with siltstone and mudstone-25%. React with 5% HCL throughout.
Moosebar		989.65	996.00	6.35		10						siltstone	dark grey, with FGSS layer, little muddy, massive. TD=996.00m

Wapiti River — **Drill Hole Core Log**

Drilling Company:	Foraco	**Hole No.:**	WP1C09		
Rig Type:	VD-8000	**Collar Elevation:**	1134.5m		
Total Depth:	713.5m	Coordinate: **Northing:**	6074070.6		
Spud Date:	24-Jan-13	**Easting:**	651042.1		
Finished Date:	3-Feb-13	**Logging Geologist:**	Lee, James, David		
Core Size:	HWT/HQ	**Note:**			

Formation	Coal Seam	Core Depth Interval From	To	Thickness, m Thick	TRUE	Strata Dip	Coal Floor Elevation	Sample ID Coal	Rock	CBM	Rock Hardness	Rock Name	Lithology Description
Q		0.00	9.30	9.30								Mudstone	till, soil, brown, broken mudstone, sandstone pebble; overburden: 9.30m.
Hasler		9.30	47.50	38.20		15° 25°						Siltstone	siltstone, dark gray-light black, muddy; with white-gray fine sandstone laminate (content: 5%) from broken fracture no: 8/m; from 35.40m - 38.50m broken fracture no: 8/m; at 35.50m, 1.10m long core l plane: 15°; at 30m bedded plane: 25°; at 35m bedded plane: 25°.
		47.50	65.90	18.40		30°						Siltstone	siltstone, dark gray, interbedded thin layers of white-gray fine sandstone (20%); at 49m bedded pla bedded plane: 30°.
		65.90	143.90	78.00		35° 40°						Siltstone	siltstone, dark gray; interbedded thin layers and laminate of white-gray fine sandstone (30%); micr x-bedding in part in sandstone; from 71.50m - 72.50m little broken fracture no: 8; from 91m - 98m f content: 50%; at 62m bedded plane: 35°; at 70m bedded plane: 35°; at 80m bedded plane: 35°; at 90m 100m bedded plane: 35°; at 108m bedded plane: 40°; at 120m bedded plane: 40°; from 141.40m - 142.60 fracture no: 8.
		143.90	195.52	51.62		35° 30°						Siltstone	siltstone, dark gray with white-gray fine sandstone laminate (10%); from 150.40m - 151.20m very bro no: 20; at 145m bedded plane: 35°; at 153m bedded plane: 35°; at 160m bedded plane: 35°; at 170.50m at 186m bedded plane: 30°; at 192m bedded plane: 30°.
Boulder Creek		195.52	195.85	0.33									conglomeratee, white-gray, 0-2-5mm; quartz, green charts predominately; moderately-sorted.
		195.85	223.50	27.65		32°						Mudstone	mudstone; bauxitic, brown-gray with a few layers of fine sandstone and siltstone; at 204m - 205.05m sandstone; from 216.70m - 217.90m, numerous coal lenses on bedding plane; at 204.20m bedded plane: 223.50m, more bauxitic; brown
		223.50	228.35	4.85		35°						Sandstone	sandstone, white-gray, fine medium grained; course toward base; at lower part, medium grained, quar dark siltstone laminate; at 224.20m bedded plane: 35°; at 228m bedded plane: 35° with a few calcite
		228.35	253.00	24.65								Mudstone	mudstone, light gray, bauxitic; massive with a few layers of white-gray fine sandstone; at 240.90m broken; broken no: 4.
		253.00	255.10	2.10		30°						Sandstone	sandstone, white-gray, fine grained with dark siltstone laminate; distorted bedding; bedded plane:
		255.10	262.20	7.10								Siltstone	siltstone, light gray; massive abundant with carbonication of tree leaf and branch fossil; at 261.5
		262.20	264.95	2.75		35°						Sandstone	sandstone, white-gray, medium-grained with dark siltstone laminate; quartz and dark debris predomin at top, with light gray mudstone breccia; at 263m bedded plane: 35°.
		264.95	274.10	9.15								Mudstone	mudstone, brown-gray, bauxitic, massive.
		274.10	281.25	7.15		35°						Sandstone	sandstone, white-gray, medium-grained with few thin layers of bauxitic mudstone; at lower part, num sandstone; at 275.80m bedded plane: 35°; at 279m bedded plane: 35°.
		281.25	291.80	10.55								Mudstone	mudstone, brown-gray, bauxitic, massive; at 281.40m - 284.50m, broken, fracture no: 8/m
		291.80	297.10	5.30		35°						Sandstone	sandstone, white-gray, medium-coarse grained; coarser toward base with dark mudstone laminate; from coal lenses and a coal streak at 192.50m; at 293.70m bedded plane: 35°; at bottom, numerous coal le
		297.10	300.70	3.60		35°						Siltstone	siltstone, light black, muddy; at middle part 0.70m thick, fine sandstone; at bottom, 0.15m thick, 299.50 bedded plane: 35°.
	BC	**300.70**	**301.05**	**0.35**		**30°**						**Coal**	**coal seam, 0.35m, Rc: 0.35m, half broken; no parting, shiny light.**
		301.05	302.08	1.03								Mudstone	mudstone, black, massive; carbonaceous at upper part.
		302.08	305.40	3.32		30°							conglomerate, 0: 2-6mm; quartz, green chart and dark debris; poorly sorted; at 304m bedded plane: 3
		305.40	314.20	8.80								Sandstone	sandstone, white-gray, fine-grained; quartz predominately, well-sorted; at 305.70m bedded plane: 35 plane: 35°.
		314.20	322.82	8.62		35°						Sandstone	sandstone, white-gray, fine-grained; interbedded thin layers of dark muddy siltstone (40%); horizon sandstone (60%); at 318m bedded plane: 35°.
Hulcross		322.82	327.50	4.68		35°						Siltstone	siltstone, dark gray; interbedded thin layers of fine sandstone (50%), siltstone content: 50%; at 3 35°.
		327.50	405.80	78.30								Siltstone	siltstone, dark gray; interbedded laminate of white-gray fine sandstone (30%); horizontal bedding: 330.10m, 0.01m thin layer of pyrite; at 340m bedded plane: 35°; at 350m bedded plane: 35°; at 360m 365m bedded plane: 35°; at 368.10m, 0.10m thick, agrilliceous limestone, white-gray, strong reactin bedded plane: 35°; at 380m bedded plane: 35°; at 387m bedded plane: 35°; at 390m bedded plane: 35°; plane: 35°.
		405.80	405.88	0.08								conglomerate	conglomeratee, light gray, 0: 1-3mm; poorly-sorted.
		405.88	407.50	1.62		40°						Sandstone	sandstone, white-gray, fine-grained with dark siltstone laminate; at 407m bedded plane: 40°.
		407.50	410.65	3.15								Mudstone	mudstone, black, carbonaceous, massive.
		410.65	411.05	0.40								Mudstone	mudstone, black, carbonaceous, massive with a few coal streaks.
		411.05	415.60	4.55								Mudstone	mudstone, black; massive; rich in leaf fossil; at lower part, a few coal streaks; at 412.60m, 0.10m 412.90m, 0.05m, coal seam; at 413.40m, 0.05m coal seam.
	#3	**415.60**	**416.42**	**0.82**				**Q1 Q2**				**Coal**	**coal seam, 0.82m, Rc: 0.75m, 0.07m lost at top; broken, shiny, light, bright; coal: 415.60m - 0.10m, 0.07m lost; parting: 415.77m - 415.83m, 0.06m, black, mudstone; coal: 415.83m - 416.42m structure: 0.17m<0.06m>0.10<0.10m>0.39m.**
		416.42	419.35	2.93		30°						Mudstone	mudstone, black; at upper part with fine sandstone laminate; at lower part, carbonaceous in part an lenses and streaks; at 416.70m, 0.10m coal seam; at 417.20m, 0.10m coal seam; at 414.60m bedded pla 0.20m banded coal seam; at 418.80m, 0.10m coal seam; at 419m - 419.25m, coal seam, 0.05m/each.
		419.35	430.40	11.05								Mudstone	mudstone, black; at middle part, a layer of fine sandstone; at 424m bedded plane: 40°.
		430.40	434.00	3.60		35°						Sandstone	sandstone, white-gray, fine-grained; at 431.80m bedded plane: 35°.
		434.00	436.90	2.90								Mudstone	mudstone, black, massive; with a few coal lenses at the middle part; at 434.57m, 0.04m coal seam; a seam.
		436.90	442.00	5.10		45°						Sandstone	sandstone, white-gray, fine-grained; with mudstone laminates; at 439m bedded plane: 45°.
		442.00	442.40	0.40								Mudstone	mudstone, black, massive.
	#4	**442.40**	**442.90**	**0.50**								**Coal**	**coal seam, 0.50m, Rc: 0.90m, broken; no parting, shiny, light.**
		442.92	450.20	7.28		30°						Mudstone	mudstone, black; interbedded layers of white-gray, fine sandstone; from 448m - 448.70m, few coal se 446.30m bedded plane: 30°.
		450.20	456.60	6.40		30°						Sandstone	sandstone, white-gray, fine-grained, quartz and debris, predominately, well-sorted; at 451m bedded
		456.60	458.07	1.47		40°						Siltstone	siltstone, light black, muddy.
	#5	**458.07**	**460.25**	**2.18**				**Q3**				**Coal**	**coal seam, 2.18m, Rc: 2.05m, 0.13m lost at top; half broken, shiny, light, brittle, co: 458.07 Rc: 0.22m; broken; parting: 458.42m - 458.45m, 0.03m, black, mudstone; co: 458.45m - 460.25m, shiny, light, brittle; structure: 0.35<0.03>1.70m.**
		460.25	466.38	6.13								Mudstone	mudstone, light black, silty, massive.
		466.38	468.25	1.87								Mudstone	mudstone, black, massive; with a few coal streaks.
	#5-1	**468.25**	**468.75**	**0.50**								**Coal**	**coal seam, 0.50m, Rc: 0.50m, very broken; shiny, light; no parting.**
		468.75	471.02	2.27								Mudstone	mudstone, black, massive; at 468.95m - 469.10m, coal seam, 0.15m, broken, shiny; at bottom, a few c
	#5-2	**471.02**	**471.67**	**0.65**		**35°**						**Coal**	**coal seam, 0.65m, Rc: 0.65m, broken, shiny, light; no parting; at 471.15m - 471.35m, 0.20m ban bedded plane: 35°.**
		471.67	472.27	0.60								Mudstone	mudstone, black, massive; at bottom, a few coal streaks.
	#6	**472.27**	**472.62**	**0.35**								**Coal**	**coal seam, 0.35m, Rc: 0.35m, half broken, bright shiny, light; no parting.**
		472.62	472.70	0.08								Mudstone	mudstone, black, massive.
		472.70	474.00	1.30		25°						Sandstone	sandstone, white-gray, fine-grained; at 473.80m bedded plane: 25°.
		474.00	482.00	8.00		40°						Mudstone	mudstone, light black-black, little silty; interbedded thin layers of fine sandstone (40%); rich in base, more fine sandstone; at 481m bedded plane: 40°.
		482.00	483.05	1.05								Mudstone	mudstone, black, massive.
	#6	**483.05**	**483.45**	**0.40**								**Coal**	**coal seam, 0.40m, Rc: 0.40, half broken; no parting; at lower part, banded coal.**
		483.45	485.10	1.65								Mudstone	mudstone, black, massive.
	#6	**485.10**	**485.60**	**0.50**								**Coal**	**coal seam. 0.50, Rc: 0.40m, 0.10m lost at bottom; no parting, broken, shiny, bright.**
		485.60	492.10	6.50								Mudstone	mudstone, black, massive, with a few coal streaks; at 488.45m - 488.55m, 0.10m thick, coal seam, br 489.30m, 0.10m carbonaceous.
		492.10	493.80	1.70		38°						Siltstone	siltstone, light gray; at 493m bedded plane: 38°.
		493.80	494.00	0.20								Limestone	limestone, agrilliceous, white-gray; rich in shell fossil with 0: 2-5mm; strong reacting with HCl (
		494.00	496.20	2.20								Mudstone	mudstone, black, massive; with a few coal streaks.
		496.20	498.20	2.00		40°						Siltstone	siltstone, gray, with a few fine sandstone laminate.
		498.20	502.50	4.30								Mudstone	mudstone, black, massive; rich in carbonization of leaf fossil; at 501.40m, 0.10m coal seam, very b
		502.50	504.00	1.50		40°						Siltstone	siltstone, light black, muddy; with a fine sandstone laminate.
		504.00	517.20	13.20		20°						Mudstone	mudstone, black, massive; at 511.80m - 512.10m, a layer of fine sandstone; at 512m bedded plane: 2
	#7	**517.20**	**517.30**	**0.10**								**Coal**	**coal seam, banded coal, 0.10m, Rc: 0.10m.**
		517.30	517.43	0.13								Mudstone	mudstone, black, massive.
	#7	**517.43**	**517.88**	**0.45**								**Coal**	**coal seam, 0.45m, Rc: 0.45m, broken, shiny, bright, light; no parting.**
		517.88	520.30	2.42		40°						Mudstone	mudstone, black, massive; at top, carbonaceous and with a few coal streaks; at 519m bedded plane: 4
		520.30	521.80	1.50								Sandstone	sandstone, white-gray, fine-grained.
		521.80	524.30	2.50								Mudstone	mudstone, black, soft, massive; from 522.40m - 522.60m, with a few coal streaks; at 524m, 0.01m coa
		524.30	538.50	14.20		30° 35°						Sandstone	sandstone, white-gray, fine-medium grained; at upper and lower part, fine-grained; at middle part, dark siltstone laminate throughout; at 530.40m - 530.90m, a vertical fracture, fracture no: 2; at 5 thin layers of calcite; at 278m bedded plane: 30°; at 536m bedded plane: 35°.
Gates		538.50	554.50	16.00		45° 55° 60° 65° 80°						Mudstone	mudstone, black, light black, silty in part; brittle; at upper part, with a few coal streaks; from broken, fracture no: 10 fold zone, with a few calcite vein; at 543m - 543.20m, numerous minor calci bedded plane: 45°; at 545m bedded plane: 65°; at 551.30m bedded plane: 80°; at 552m bedded plane: 6 plane: 55°.
		554.50	555.80	1.30								Mudstone	mudstone, black, at lower part, numerous coal streak and lenses and carbonaceous in part; at 555m - seam, very broken; no parting, bright, light; broken throughout.
	#8	**555.80**	**557.50**	**1.70**				**Q4**				**Coal**	**coal seam, 1.70m, Rc: 1.05m, 0.65m lost at bottom; very broken; no parting, shiny, bright, lig**
		557.50	558.70	1.20								Mudstone	mudstone, black, massive; at bottom, carbonaceous, numerous coal streak and lenses throughout.
	#8-1	**558.70**	**562.20**	**3.50**				**Q5 Q6 Q7**				**Coal**	**coal seam; 3.50m; Rc: 2.55m; at 559.30m - 561.25m, 0.95m lost; at upper part(559.30-561.25m), lower part, broken; shiny, brittle, light; co: 558.70m - 561.25m, 2.55m, Rc: 1.60m, 0.95m lost 561.70m, 0.45m, black, broken, mudstone; co: 561.70m - 562.20m, 0.50m, Rc: 0.50m, very broken; 2.55<0.45>0.50m.**
		562.20	563.75	1.55								Mudstone	mudstone, black, massive; at upper part, numerous coal lenses and streaks; at 563m, 0.08m coal seam
		563.75	574.40	10.65		40°						Sandstone	sandstone, white-gray, fine-grained; finning toward base, with dark mudstone laminate; at 565m bedd
		574.40	578.40	4.00		40°						Siltstone	siltstone, light gray; laminated with light black mudstone; at 576m bedded plane: 40°
		578.40	579.80	1.40								Mudstone	mudstone, black, massive; with a few coal streaks throughout; from 579.10m - 579.50m, 4 coal seams coal seam, rich in leaf fossils.
	#9	**579.80**	**586.20**	**6.40**		**40°**		**Q8 Q9 Q10**				**Coal**	**coal seam, 6.40m, Rc: 5.40m; from 581.10m - 582.10m, 1.0m lost; at upper part, broken; at lowe shiny, bright, brittle, light; no parting; at 581.60m bedded plane: 40°; at 583.20m bedded plane: 4**
		586.20	586.60	0.40								Mudstone	mudstone, light black, very silty, massive.
		586.60	617.95	31.35		40° 45°						Sandstone	sandstone, white-gray, medium-grained; quartz and dark debris predominately; quartz and dark debris well-sorted, unangular rounded; at lower part, a few coal film and minor coal lenses on bedding pla 592m, little broken, fracture no: 4/m; at 589.20m - 599m bedded plane: 40°; from 605m - 609.20m, li no: 6/m; at 606m bedded plane: 45°; at 610m bedded plane: 45°; at 615m bedded plane: 45°.
		617.95	623.30	5.35		48°						Mudstone	mudstone, black, interlaminated with fine sandstone; at bottom, few coal streaks; at 420m bedded pl
	#10	**623.30**	**627.90**	**4.60**		**45°**		**Q11 Q12**				**Coal**	**coal seam, 4.60m, Rc: 2.0m; at 625.90m - 627.50m, 1.60m lost; at upper and middle part broken; broken; shiny, brittle, bright, light; at 623.60m - 626.10m, bedding visible, bedded plane: 45° 0.10m, Rc: 0.10m; parting: 623.40m - 623.44m, 0.04m, black mudstone, co: 623.44m - 627.90m, 4.46m, Rc: 2.86m; struc 0.10<0.04>4.46m; structure of Rc: 0.10<0.04>2.86m.**
		627.90	628.70	0.80		45°						Mudstone	mudstone, black, with a few coal film on bedding; rich in leaf fossil; at 628.50m bedded plane: 45°
		628.70	641.90	13.20		45°						Sandstone	sandstone, light gray, fine-medium grained, coarser toward base; at upper part, interlaminated blac 630m bedded plane: 45°; at 638m bedded plane: 45°.
		641.90	653.50	11.60		45° 50°						Siltstone	siltstone, gray interbedded thin layers of light gray, silty mudstone; horizontal bedding; at 642.5 at 652m bedded plane: 50°; at 650m - 650.50m, very broken, fracture no: 15
		653.50	657.55	4.05		55° 60°						Sandstone	sandstone, white-gray, coarse-medium grained; at lower part, medium grained; quartz and dark debris subangular, subrounded; moderately-sorted; at 655m bedded plane: 55°; at 657.55m bedded plane: 60°.
		657.55	657.85	0.30								Mudstone	mudstone, black, massive.
	#11	**657.85**	**658.00**	0.15								**Coal**	**coal seam, 0.15m, Rc: 0.15m, broken; no parting.**
		658.00	658.20	0.20								Mudstone	mudstone, carbonaceous, massive; very broken.
		658.20	666.70	8.50								Mudstone	mudstone, black, brittle; from 660.80m - 661.70m, little carbonaceous; at 659.95m, 0.05m, coal seam from 660m - 660.70m, agrilliceous mudstone, gray, strongly reacting with HCl (5%); from 663.90m - 6 fracture no: 15/m; at 663.10m bedded plane: 55°.
		666.70	669.60	2.90								Mudstone	mudstone, light black, silty, solid, brittle; broken throughout; fracture no: 10/m; with numerous c
		669.60	675.50	5.90		45° 50° 70°						Siltstone	siltstone, light gray, solid; at upper part; white-gray, fine sandstone; with dark mudstone laminat 671.90m bedded plane: 70°; at 674m bedded plane: 50°; at 675.50m bedded plane: 45°.
		675.50	677.55	2.05		50°						Mudstone	mudstone, black, little silty; at 675.60m bedded plane: 50°.
	#11	**677.55**	**678.55**	**1.00**								**coal**	**1.00m #11 coal seam.black, massive, very broken. Contain mud, maybe Boney coal?**
		678.55	678.74	0.19		45°						Mudstone	mudstone, black, very broken to smashed; lots of CM and coal films, numerous plant fossils; quartz with 5% HCl); at 678.54m bedding plane: 45°.
		678.74	686.24	7.50		65°						Siltstone	siltstone, dark gray, competent, quartz and debris dominately. at the upper part, with fine sandst fracture; more mud towards the base and become darker; at the lower part, a few fractures, interbed veins; massive; at 682.30m - 686.24m bedding plane: 65°; at lower part, slightly broken; no reactio
		686.24	692.50	6.26		65°						Mudstone	silty mudstone, black to dark gray, massive; interbedded with siltstone laminates; react with 5% HC films; at about 692m, carbonate layer of 3cm thick; likely shell fossils; strong react with 5% HCl at lower part, broken, infilled with calcite veins.
		692.50	697.00	4.50		70°						Siltstone	siltstone, with mudstone laminates; react with 5% HCl; bedding plane: 70°; at 695m - 695.30m, 30cm carb strong react with 5% HCl.
		697.00	706.00	9.00								Siltstone	muddy siltstone; dark gray, with mudstone laminates; slightly fractured no: 5/m; massive, competent veins; carbonacious, react with 5% HCl; towards the base, mud increases.
		706.00	711.04	5.04								Mudstone	mudstone, black, massive; at the upper part, lots of siltstone, towards the base, mud increases, b slightly broken; more broken at the bottom; at the top, a few calcite veins; at the upper part, rea the lower part, no react with 5% HCl.
	#12	**711.04**	**711.35**	**0.31**								**Coal**	**coal seam, very broken; massive.**
		711.35	711.79	0.44								Mudstone	mudstone, black broken; contact clearly with coal seam at a big angle.
		711.79	713.50	1.71									no core, rods stuck, done; and end drilling.
													TD: 713.50m.

Wapiti River — **Drill Hole Core Log**

Drilling Company:	CYR International Drilling			**Hole No.:**	WP1C11
Rig Type:	Super Bear-1			**Collar Elevation:**	1189.1m
Total Depth:	740m	**Coordinate:**	**Northing:**		6072902.8
Spud Date:	26-Jan-13		**Easting:**		650836.3
Finished Date:	10-Feb-13		**Logging Geologist:**		Victor, Ricky, Lee, Raymond
Core Size:	HWT/HQ/NQ		**Note:**		

Formation	Coal Seam	Core Depth Interval From	To	Thickness, m Thick	TRUE	Strata Dip	Coal Floor Elevation	Sample ID Coal	Rock	CBM	Rock Hardness	Rock Name	Lithology Description
Q		0.00	23.00	23.00								till	Tri-cone drill, no core.
Hasler		23.00	41.00	18.00		10°						Siltstone	siltstone, medium dark grey; interbedded with light grey, fine-grained sandstone (FGSS) laminated content: 10%; micro-horizontal bedding, at 32m, bedding plane: 10°.
		41.00	51.00	10.00		10°						Siltstone	siltstone, dark grey(medium), little muddy, interbedded with light grey FGSS laminated, 10%, horizontal bedding at 51m; bedded plane: 10°; a few siderite thin laminated throughout.
		51.00	68.00	17.00		10°						Siltstone	same features as above, plus light grey FGSS laminated increased to 30%, from 54.50m - 63m, interlaminated siltstone and FGSS, locally FGSS and siltstone mix into each other; not apparently bedding.
		68.00	103.00	35.00		5° 15°						Siltstone	same as previous interval, plus light grey FGSS laminated decreased to 10%→5%, muddy at 71m, bedded plane: 15°; at 95m, bedded plane: 5°.
		103.00	120.00	17.00		10°						Siltstone	siltstone, dark grey, muddy, interbedded with a few light grey FGSS laminated 5%; from 103m - 105m, more FGSS laminated, content:30%. From 105.60m - 107.70m, broken into many pieces, fracture number: 15/m; at 118.55m, pyrite nodule (1x2cm); from 113.40m - 114.40m; FGSS and siltstone mix into each other; at 108.50m, bedded plane: 10°; at 118.80m and 119.60m, 0.05m siderite laminated; at 119m, bedded plane: 10°.
		120.00	153.00	33.00		10° 15°						Siltstone	same features as above, plus FGSS laminated increased to 20%; at 125m, bedded plane: 15°; from 131m - 134m, less than FGSS laminated, (5%), more siderite then laminated; from 134m - 139m, more FGSS laminated, 40%, uneven wide or thin interrupted and lenses; at 140m, bedded plane: 10°; at 144.80m - 145.20m, more FGSS.
		153.00	163.70	10.70		15°						Siltstone	same as previous interval, plus FGSS laminated increased to 40% progressively; at 156.50m, bedded plane: 15°.
		163.70	171.50	7.80		15°						Siltstone	siltstone, muddy, dark grey; with few light grey FGSS laminated; content: 3-5%; at 169.50m, bedded plane: 15°; a few siderite thin laminated throughout.
		171.50	178.50	7.00		15°						Siltstone	same as previous interval, plus light grey FGSS increased to 40%; micro-horizontal bedding; at 177m, bedded plane: 15°; FGSS laminated uneven wide or thin; at 171.50m, 0.05m CGSS.
		178.50	209.00	30.50		10° 15°						Siltstone	siltstone, dark grey, interbedded with light grey FGSS laminated (30%), micro-horizontal bedding; at 191m, bedded plane: 15°; at 187.50m - 188m, more FGSS; at 200m, bedded plane: 10°; at 207m, bedded plane: 15°; at 224m, bedded plane: 15°.
		226.30	228.00	1.70		15°						Siltstone	broken into many pieces, fracture number: 15/m; at 238m, bedded plane: 15°.
		242.00	257.89	15.89		15°						Siltstone	siltstone, dark grey, interbedded with light grey FGSS laminated (20%), micro-horizontal bedding; at 247m bedded plane: 15°; at lower part, FGSS laminated increased to 30%.
		257.89	261.55	3.66		15°						conglomerate	conglomerate, light grey, poorly-sorted, predominately quartz and debris; Ø: 2-7mm, max: 10mm; from 258.24m - 259.69m, FGSS mainly, at 259m, bedded plane: 15°.
Boulder Creek		261.55	267.00	5.45								Siltstone	siltstone, medium grey, massive, not apparently bedding; with a few bauxitic mudstone, white-grey, at base, muddy toward.
		267.00	270.45	3.45								Mudstone	mudstone, light grey, massive; few coal film observed on bedding surface.
		270.45	277.50	7.05								Mudstone	bauxitic mudstone, white-grey, soft, core size reduced, massive; from 272m - 272.60m, few Fe^{2+} inclusion observed on bedding surface, red colour.
		277.50	281.15	3.65								Siltstone	siltstone, medium grey, massive, a few bauxitic mudstone, little muddy; not clearly bedding.
		281.15	295.44	14.29		25°						Sandstone	FGSS-MGSS, light grey, well-sorted, interbedded with light grey FGSS laminated, 30%, micro-horizontal bedding; at 284m, bedded plane: 25°, predominately quartz and debris, from 291 to end, FGSS becoming CGSS; at 295m, bedded plane: 25°.
		295.44	299.00	3.56								Mudstone	bauxitic mudstone, white-grey, soft, core size reduced, massive.
		299.00	303.30	4.30								Siltstone	siltstone, dark grey to medium grey at top, little muddy at lower part, with a few light grey FGSS laminated, 20%.
		303.30	307.10	3.80								Sandstone	conglomerate-bearing FGSS, light grey, well-sorted, at top; small cross-bed; from 304.50m - 306.50m; light grey conglomerate, mainly; Ø: 2-5mm; at base , a few coal film.
		307.10	310.85	3.75								Siltstone	siltstone, medium grey, with a few light grey FGSS laminated, 10% and minor bauxitic mudstone, soft core size reduced.
		310.85	325.40	14.55		20° 22°						Sandstone	FGSS, light grey, well-sorted, micro-horizontal bedding; at 312m, bedded plane: 22°; interbedded with light black mudstone laminated and minor coal streak throughout; from 316m -319m, MGSS mainly; at 317.50m, bedded plane: 20°; at base, minor calcite vein filled on fracture.
		325.40	327.00	1.60								Mudstone	mudstone, light black, massive, rich in coal threads; at base, 0.30m FGSS.
		327.00	335.60	8.60								Mudstone	bauxitic mudstone, little silt, soft, massive; white-grey to grey; partly black mudstone, slightly fracture, not apparently bedding.
		335.60	338.60	3.00		20°						Siltstone	siltstone, medium grey, interbedded with light grey FGSS laminated 20%; at 337m, bedded plane: 20°.
		338.60	342.12	3.52								Mudstone	mudstone, dark grey, massive.
		342.30	356.00	13.70		20°						Siltstone	siltstone, medium-grey, massive; with little bauxitic mudstone, at base, muddy toward, with minor carbonaceous fragment; at 356.70m, bedded plane: 20°.
		356.00	358.10	2.10								Mudstone	mudstone, black, massive; rich in coal streaks; at base, little FGSS laminated.
		358.10	358.65	0.55		20°							0.55m FGSS.
		358.65	359.00	0.35								Mudstone	0.35m black mudstone.
	BC	**359.00**	**359.25**	**0.25**								**Coal**	**0.25m; Rc: 0.75m; black, bright, little broken.**
		359.25	359.55	0.30								Mudstone	black mudstone.
		359.55	365.15	5.60		28°						Sandstone	FGSS, grey, well-sorted, pure, predominately quartz and debris; fracture developed, infilled irregular calcite vein. Locally with conglomerate; no react with 5% HCl; at 364m, bedded plane: 28°.
		365.15	371.85	6.70		30°						conglomerate	conglomerate, grey, poorly-sorted, quartz and debris mainly, Ø: 2-5mm; max: 10mm; subrounded-subangular; from 367.80m - 369.10m, FGSS mainly, horizontal bedding; at 369m, bedded plane: 30°, slightly fracture.
		371.85	380.87	9.02		30°						Sandstone	FGSS, light grey, well-sorted, pure mainly, quartz and debris mainly; no react with 5% HCl; at 377m, bedded plane: 30°.
		380.87	383.55	2.68		35°						Sandstone	FGSS, light grey, interbedded with dark grey siltstone laminated, content: 10; micro-horizontal bedding; at 383m, bedded plane: 35°; slightly fracture, filled few calcite vein.
		383.55	389.60	6.05		40°						Sandstone	interlaminated FGSS and siltstone, micro-horizontal bedding, slightly fracture; at 388m, bedded plane: 40°; at 387.80m, 0.05m argillaceous pebble thin laminated.
		389.60	396.00	6.40		45°						Siltstone	siltstone, medium-grey, interbedded with grey FGSS laminated, 30%; micro-horizontal bedding; at 392m, bedded plane: 45°; at 389.70m, 0.10m, broken into many pieces; grinding.
Hulcross		396.00	410.85	14.85		45°						Siltstone	siltstone, dark grey, muddy; massive mainly, soft, core size reduced, little bauxitic mudstone; at 399m bedded plane: 45°.
		410.85	424.35	13.50		35°						Siltstone	siltstone, dark grey, interbedded with grey FGSS laminated, 10%; at 415m, bedded plane: 35°; from 418m - 420.50m, black MS mainly, core sized reduced, soft; from 423m - 424.35m, very broken, broken into many pieces.
		424.35	435.00	10.65		40°						Siltstone	same as previous interval, plus light grey FGSS laminated increased to 30%; micro-horizontal bedding; at 434m, bedded plane: 40°.
		435.00	469.20	34.20								Siltstone	dark grey siltstone bedded with light grey fine grain sandstone, which content range in 30%-60%.
		469.20	469.40	0.20								Sandstone	light grey FGSS.
		469.40	477.35	7.95		40° 55° 60°						Sandstone	sandstone predominately , dark grey color, siltstone <30%; bedded plane: 40°; locally 55°-60°.
Gates		477.35	477.40	0.05								Sandstone	5cm medium size grain sandstone.
		477.40	478.40	1.00								Siltstone	grey siltstone-FGSS.
		478.40	478.80	0.40									broken zone, with coal vein; <20cm.
		478.80	480.55	1.75								Siltstone	grey siltstone.
		480.55	491.00	10.45								Sandstone	fine-grain sandstone dominated at upper to 488m; go with depth, siltstone getting more.
		491.00	494.70	3.70								Mudstone	dark grey mudstone; at 493.10m - 493.25m, exist thin coal seam (most lost).
	#3	**494.70**	**496.50**	**1.80**				**Q1**				**Coal**	**coal seam (#3), 1.8m; no parting, be recovery 80% (1.5m) . Sample Q1. bright, shiny.**
		496.50	499.70	3.20								Siltstone	siltstone, broken, at bottom, 35cm coal seam (5% recovery).
		499.70	511.10	11.40		40° 45°						Siltstone	siltstone, interbedded with FGSS in sections, one section 1-2m; bedding plane: 40°-45°.
		511.10	513.62	2.52		40°						Sandstone	FGSS. bedded with dark grey siltstone laminations; bedding plane: 40°.
		513.62	520.20	6.58								Mudstone	Mudstone, fracture developed at 513.82m - 513.80m; no bedding found, very broken.
	#4	**520.20**	**520.70**	**0.50**								**Coal**	**0.50m coal seam; 70% recovery.**
		520.70	530.00	9.30		35°						Mudstone	mudstone→Siltstone→mudstone. at bottom, 1.3m, very fractured. a thin coal seam 25cm appear at 529.45m - 529.70m; bedded plane: 35°.
		530.00	539.16	9.16								Sandstone	FGSS; at low part more siltstone appears.
	#5	**539.16**	**541.36**	**2.20**				**Q2**				**Coal**	**coal 2.2m, wash out. coal 15% recoved; Q2: 539.16m - 541.36m.**
		541.36	545.20	3.84								Mudstone	grey-black mudstone; fractured by pressure.
		545.20	555.12	9.92								Siltstone	grey siltstone; FGSS layers bedded at lower portion.
		555.12	562.60	7.48								Sandstone	grey FGSS; from 558 afterward; bedded with dark grey siltstone, thin layers.
		562.60	566.50	3.90								Siltstone	grey siltstone.
		566.50	568.46	1.96								Sandstone	FGSS.
		568.46	574.00	5.54								Siltstone	dark grey siltstone, interbedded with FGSS (<10%); at 573.70m - 573.75m, 0.05m coal.
	#6	574.00	579.20	5.20								Sandstone	FGSS, **two thin coal seams at 575.55m - 575.60m and 576.55m - 576.95m**; at the top and bottom of coal seam, there is black mudstone of 20-40cm.
		579.20	590.35	11.15		40° 45°						Sandstone	grey FGSS dominated, bedded with dark grey siltstone (20%); two coal seam exist in siltstone. At 580.60m - 580.75m (0.15m); 586.20m - 586.56m (0.36m); bedding plane: 40°-45°; broken developed at 589m - 590m.
		590.35	599.75	9.40		40°						Siltstone	dark grey siltstone (mudstone); bedding plane: 40°.
		599.75	601.80	2.05								Sandstone	FGSS, bedding siltstone (15-20).
		601.80	605.00	3.20								Mudstone	black mudstone dominated, fractured with coal seams at 602.95m - 603.20m, 0.25m; at 604.80m - 605m; 0.20m.
		605.00	619.40	14.40								Siltstone	massive grey-dark grey siltstone mainly, interbedded with grey FGSS (<10% total <1m); at 614m - 617m, polish plane developed, core loss 1m.
		619.40	624.45	5.05		45° 50°						Mudstone	black mudstone; bedding plane: 45°-50°.
	#7	**624.45**	**625.60**	**1.15**				**Q3 Q4**				**Coal**	**1.15m coal, 95% recoverd; parting at 624.65m - 624.80m, 15cm, Q4; coal sample, Q3: 624.15m - 625.60m.**
		625.60	629.20	3.60		40°						Mudstone	black mudstone, change to siltstone. Bedding plane: 40°.
		629.20	636.20	7.00		42°						Sandstone	medium-fine grain sandstone; gradually, minor thin streak of grey siltstone. Bedding plane: 42°.
		636.20	644.80	8.60								Siltstone	grey siltstone.
		644.80	648.36	3.56								Sandstone	grey FGSS.
		648.36	655.06	6.70								Siltstone	grey siltstone.
		655.50	656.10	0.60								Sandstone	pale grey FGSS, bedded with dark streak of siltstone.
		657.80	670.30	12.50								Siltstone	grey-dark grey siltstone.
		670.30	671.70	1.40								Mudstone	black mudstone.
	#8	**671.70**	**675.50**	**3.80**				**Q5 Q6**				**Coal**	**3.80m; black, bright, metallic luster. 80% recovered. Q5:671.70-675.5m; Q6: Parting 3 sections, a. 673.15-673.40m, 0.25m; b. 674.20-674.52m, 0.32m; c. 674.82-674.92m, 0.10m, black mudstone, total 0.67m.**
		675.50	676.20	0.70								Mudstone	70cm, mudstone.
	#8-2	**676.20**	**677.18**	**0.98**				**Q7**				**Coal**	**Q7 coal. Q7: 676.20-677.18m, 0.98m. 70% recovered.**
		677.18	680.45	3.27								Mudstone	black mudstone, bedded with thin coal seams.
		680.45	681.70	1.25								Coal	coal: two layers; 681.45m - 680.80m, 0.35m; 681.20m - 681.70m, 0.50m.
		681.70	684.30	2.60								Siltstone	siltstone/FGSS interlaminated.
		684.30	686.00	1.70								Mudstone	carbonaceous mudstone; filled with coal seams that <3cm.
		686.00	688.75	2.75								Mudstone	black mudstone; broken.
	#9	**688.75**	**700.45**	**11.70**				**Q8**				**Coal**	**11.70m coal seam; black, metallic, luster. 688.70-689.20m, RC:85%; 689.2-695m, core loss; 695m - 698m RC: 7%; 698m - 700.45m RC: 30%; parting 0.14m appear at 695m - 698m(broken). Q8: 688.75m - 700.45m.**
	at 692m, change to NQ	700.45	702.93	2.48		25° 30°						Siltstone	siltstone.
		702.93	705.00	2.07								Siltstone	grey silt FGSS.
		705.00	708.50	3.50								Siltstone	grey siltstone, changing in color, grey-dark grey.
		708.50	712.00	3.50		25° 30°						Sandstone	FGSS predominated/siltstone (<20%); at lower part, into siltstone gradually. bedded plane: 25° - 30°
		712.00	725.80	13.80								Siltstone	siltstone, bedded with FGSS layers (<40%); between 721.60m - 722.75m, light grey FGSS dominated.
		725.80	727.00	1.20								Mudstone	dark grey mudstone.
	#10	**727.00**	**731.30**	**4.30**				**Q9**				**Coal**	**4.30m coal seam. RC totally: 45%; parting, 0.15m seen at about 730.70m - 730.85m. Q9: 727.00m - 731.30m. At 727.00-728.00m, 50% recovered; at 728.00-731.30m, 40% recovered.**
		731.30	732.80	1.50								Mudstone	black mudstone.
		732.80	734.75	1.95								Siltstone	siltstone gradually go into pale grey, medium-grain sandstone.
		734.75	736.10	1.35								Mudstone	very broken, black mudstone, pressing polish plane obvious.
		736.10	**740.00**	**3.90**								**coal**	**core losing, only broken coal seen in the box. At 736.10-737.00m, 50% recovered; at 737.00-740.00m, 20% recovered. TD=740m, Feb.11, 2013**

Wapiti River — Drill Hole Core Log

Drilling Company:	CYR International Drilling	**Hole No.:**	WP1C12		
Rig Type:	Super bear-1	**Collar Elevation:**	1197.4m		
Total Depth:	692m	**Coordinate:**	**Northing:**	6073559.4m	
Spud Date:	Jan. 12,2013		**Easting:**	651408.3m	
Finished Date:	Jan. 23,2013		**Logging Geologist:**	Victor, Ricky	
Core Size:	HWT/HQ		**Note:**		

Formation	Coal Seam	Core Depth Interval From	To	Thickness, m Thick	TRUE	Strata Dip	Coal Floor Elevation	Sample ID Coal	Rock	CBM	Rock Hardness	Rock Name	Lithology Description
Q		0.00	5.00	5.00									overburden, weathered deposits, predominately broken mudstone brown and yellow.
Hasler		5.00	8.00	3.00								Mudstone	Mudstone, weathered mainly broken, at base, mud cast 0.10m.
		8.00	41.60	33.60		15° 16°						Siltstone	Siltstone, muddy, dark-gray to light, gray interbedded with a few light gray fine-grained (FGSS) laminated (5%) micro-horizontal bedding. at 8m, bedding plane: 15 °, from 10.30m-11m, very broken; from 21.78m - 22.60m, broken; at 28.60m - 29m, broken; at 34m - 35.10m, broken; a few siderite thin laminated throughout. at 39m, bedded plane 16 °.
		41.60	77.00	35.40		15°						Siltstone	Siltstone, little muddy, dark-gray to light black, interbedded with few light-gray fine-grained sandstone (FGSS), content 3-5%. at 41.60m - 42.45m, broken, vertical fractured developed; at 44m-44.50m, broken; at 48.50m - 50m, broken 20/m; at 54.50m - 56m, broken 10/m; at 57.50m - 58.70m, broken 5/m; at 58m, bedded plane: 15 °; at 63m - 65m, broken 15/m; a few siderite thin laminated throughout; at base, FGSS laminated increased.
		77.00	86.00	9.00		15°						Siltstone	same as previous interval, plus FGSS laminated increased to 10%. at 80m, bedded plane: 15 °, FGSS laminated thick or thin unevenly and with debris.
		86.00	134.50	48.50		15° 16°						Siltstone	Siltstone, dark-gray, interbedded with light-gray FGSS laminated, content 40%. micro-horizontal bedding, locally distorted bedding observed on bedding surface, and thick and thin unevenly. at 98m, bedded plane: 15 °, interrupted or nodular; a few siderite thin laminated throughout. from 112m - 119m, FGSS laminated decreased to 10%. at 118m, bedded plane: 16 °. at lower part, FGSS laminated increased to 50%; at 126m, bedded plane: 15 °; at 134.20m, 0.01m pyrite vein.
		134.50	139.60	5.10								Siltstone	Siltstone, dark-gray to light black, muddy, with a few FGSS laminated (<5%), at 137.40m - 138m, broken.
		139.60	156.30	16.70		20°						Siltstone	Siltstone, dark-gray, interbedded with light-gray FGSS laminated, content(30% - 40%); micro-horizontal bedding, and ripple bedding and distorted bedding, and FGSS laminated unevenly thick or thin; at 147.70m, pyrite nodule (1x2cm); a few siderite laminated throughout; at 155.80m, pyrite nodule (2x5cm); 156.30m - 165.50m, less than FGSS (<5%). same as previous intervals; at 160m, bedding plane: 20 °.
		165.50	169.00	3.50								Siltstone	Siltstone, with more FGSS laminated, content 50%.
		169.00	200.00	31.00		15° 20°						Siltstone	dark-gray, interbedded with a few light-gray FGSS laminated and black mudstone laminated 10%; micro-horizontal bedding and ripple bedding and distorted bedding, locally thick FGSS thin laminated; at 176m, bedding plane 20 °; few siderite vein throughout; from 190m - 193.50m, more FGSS laminated; at 194m, bedded plane: 15 °.
		200.00	225.16	25.16		15°						Siltstone	dark-gray to gray, interbedded with light-gray FGSS laminated, content 30%, at base 40%, partly interrupted laminated, micro-horizontal bedding; at 206m, bedding plane: 15 °; at upper part, a few siderite laminated; at 218.37m, 0.01m calcite vein; at 224.88m, 0.01m conglomerate laminated; at 225.13m - 225.16m, 0.03 conglomerate; from 223.80m 225.10m, more pyrite nodule (1x2 - 5cm).
Boulder Creek		225.16	227.30	2.14								sandstone	FGSS, light gray, partly with few bauxite.
		227.30	234.80	7.50								Mudstone	bauxitic mudstone, white-gray, soft cut by knife, rock core reduced size at 228.52m. at base, little silt massive; from 231.50m - 232.50m, more FGSS.
		234.80	239.20	4.40		25°						Siltstone	FGSS. gray to light gray with black mudstone, thin laminated and few coal threads; at upper part, with more siltstone laminated (30%); at 236m, bedding plane 25 °; react with 5% HCl.
		239.20	247.90	8.70		35°						sandstone	MGSS, light gray, well-sorted, quartz and debris mainly, horizontal bedding, pure mainly; react with 5% HCl. From 243m - 244m, with a few dark gray siltstone and coal streak and calcite vein; at 244.50m, bedding plane 35 °; from 244.50m to end, MGSS toward CGSS; at 247.15m, coal film.
		247.90	251.00	3.10								Mudstone	bauxitic mudstone, white-gray, soft cut by knife, rock core reduced size; massive.
		251.00	255.50	4.50								Mudstone	Black, with a few bauxitic massive, little silt; at base, 0.40m broken, slickensided.
		255.50	256.70	1.20								Siltstone	bauxitic siltstone, massive, brown-gray; at 256.05m - 256.10m, 0.05m FGSS.
		256.70	261.40	4.70		17°						Siltstone	siltstone dark gray, interbedded with light gray FGSS and black mudstone laminated; micro-horizontal bedding; at 258.85m - 260.15m, with 2 layers 0.30m black mudstone; react with 5% HCl; at 260m, bedded plane: 17 °.
		261.40	266.25	4.85		18°						sandstone	CGSS. light gray; predominately quartz and debris, poorly-sorted, rounded; at 262.60m - 262.75m, 0.15m black mudstone; at 262.60m, bedded plane: 18 °; at base, 0.30m FGSS.
		266.25	268.70	2.45								Mudstone	mudstone black, massive; at lower part, with a few dark gray siltstone laminated and FGSS pebbles. 268.70m - 274.80m, mudstone dark gray, massive; at upper part and lower part, predominately bauxitic mudstone, soft reduced size; at 269.90m - 271m, more FGSS; at 273.10m - 273.55m, with a few coal debris.
		274.80	275.30	0.50								sandstone	FGSS. light gray
		275.30	278.30	3.00								Mudstone	mudstone, light black, massive; at 277m - 277.80m, bauxitic mudstone locally with few carbonaceous/coal debris.
		278.30	282.75	4.45		20°						sandstone	FGSS. gray to light gray, interbedded with more irregular coal streak and argillaceous pebble; at 280m, bedded plane 20 °; at 281.60m - 282m, black mudstone; react with 5% HCl; at base, few calcite vein.
		282.75	287.15	4.40								Mudstone	Mudstone. light black mainly, massive; at upper part and lower part, brown-gray bauxitic mudstone; mudstone with a few coal film on joint surface.
		287.15	291.00	3.85		20°						Siltstone	siltstone dark gray, little muddy; interbedded with light gray FGSS and black mudstone laminated and few coal streak; at 289.30m, bedded plane: 20 °.
		291.00	297.00	6.00								Mudstone	mudstone white gray (pala), massive; at base silt toward; rock core reduced, soft. predominately bauxitic mudstone; at lower part, bauxitic siltstone.
		297.00	299.10	2.10								Mudstone	mudstone light black, massive; with a few carbonaceous debris on bedding plane.
		299.10	304.80	5.70		25°						sandstone	FGSS gray to light gray, with interbedded with dark gray siltstone and black mudstone laminated. Silt toward MGSS at base; react with 5% HCl; from 301.40m - 302m, with a few coal threads and calcite vein; at 303.75m, bedded plane: 25 °.
		304.80	308.60	3.80								Mudstone	mudstone white gray bauxitic mainly, massive; at top, 0.30m black mudstone, rich in coal film, little silt at base.
		308.60	313.00	4.40								Siltstone	siltstone dark gray, interbedded with minor light gray FGSS laminated, content 30%; micro-horizontal bedding; from 311.60m - 312.20m, broken fracture number: 10/m.
		313.00	324.90	11.90		20°						sandstone	MG - CGSS. light gray, predominately quartz and debris; normal sorted, horizontal bedding, interbedded with dark gray siltstone laminated, and rich in irregular coal threads; at 315m, bedding plane: 28 °; at 316.09m - 316.10m, 0.01m coal seam; at 319.59m - 319.60m and 320.50m - 320.51m, 0.01m coal streak 2 layers; at 323.20m, bedded plane: 20 °; at base, abundant unevenly/irregular argillaceous pebble.
		324.90	327.58	2.68		10°						sandstone	FGSS. light gray, pure mainly; from 326.50m, MGSS, with minor coal thread and inclusion; ;
		327.58	328.44	0.86								conglomerate	light gray; 0: 2mm - 10mm; poorly-sorted, quartz and debris; mainly with numerous coal streak and inclusion (max : 4cm - 12cm).
	BC	**328.44**	**328.63**	**0.19**								**coal**	**0.19m BC coal seam, RC: 0.11m, broken.**
		328.63	329.04	0.41								conglomerate	conglomerate-bearing FGSS; at base, 0.07m conglomerate; 329m - 329.04m, 0.04m coal seam;
		329.04	329.80	0.76								sandstone	FGSS-bearing conglomerate; at 329.50m dip: 20 ° and with 0.02m coaly FGSS.
		329.80	340.60	10.80		20°						sandstone	FGSS. pure, light gray, quartz mainly; at 332.25m - 332.37m, 0.12m conglomerate. horizontal-bedding, well-sorted; at 332.37m, dip: 10: no react with 5% HCl; at 333.92m, 0.02m stylolite; at 340.60m, bedded plane 20°.
		340.60	347.00	6.40		20° 25°						sandstone	FGSS interlaminated with dark gray mudstone, micro-horizontal bedding; at 346m, bedded plane: 25 °; occasional calcite vein.
Hulcross		347.00	355.50	8.50								Siltstone	Siltstone. dark gray, interbedded with light gray FGSS laminated, (40%); micro-horizontal bedding; at 355.60m, bedded plane: 20 °
		355.50	380.00	24.50		20°						Siltstone	same features as above, plus light gray FGSS laminated decreased to 30%, locally little muddy and with a few siderite thin laminated; from 374.60m - 377.30m, FGSS laminated is white-gray; at 380m, bedded plane: 20 °.
		380.00	383.10	3.10								Siltstone	Siltstone. dark gray, interbedded with light gray FGSS laminated (20%), very much broken, core size reduced.
		383.10	419.00	35.90		15°						Siltstone	Siltstone. dark gray, interbedded with light gray FGSS laminated (30%); micro-horizontal bedding. at 386.00m, bedding plane: 20 °; at 383.77m - 383.85m, 0.08m argillaceous limestone, strong react with 5% HCl; at 395.97m - 396.03m, 0.06m argillaceous limestone, strong react with 5% HCl; at 413m, bedded plane: 15 °.
		419.00	424.52	5.52		15°						Siltstone	same features as above, plus light gray FGSS increased to 50%; at 424m, bedded plane: 15 °; 424.48m - 424.52m, 0.05m conglomerate.
		424.52	427.05	2.53		15°						sandstone	FGSS. light gray, well-sorted, interbedded with dark gray siltstone laminated, 20%, micro-horizontal bedding. at 425m, bedded plane: 15 °.
		427.05	430.05	3.00								Mudstone	light black, massive, rich in carbonaceous/coal debris; at 427.55m - 427.63m, 0.07m mud cast. minor pyrites nodules observed on surface.
		430.05	**430.30**	**0.25**								**Coal**	**0.25m coal seam.**
		430.30	430.65	0.35								Mudstone	0.35m black mudstone.
		430.65	**430.82**	**0.17**								**Coal**	**0.17m coal seam.**
		430.82	433.38	2.56								Siltstone	siltstone dark gray, interbedded with light gray FGSS laminated, 10%. rock core reduced; numerous coal streak.
	#3	**433.38**	**434.90**	**1.52**		**25°**		**Q1**				**Coal**	**coal seam, 1.52m; RC: 1.29m, dip: 25 °, broken, fracture developed; coal structure: 0.25<0.03>0.14<0.03>0.37<0.04>0.66m.**
		434.90	436.41	1.51								Siltstone	siltstone light black, muddy, rich in coal streak and plant fossil.
		436.41	**436.50**	**0.09**								**Coal**	**0.09m, coal seam.**
		436.50	438.00	1.50								Mudstone	mudstone light black, massive; from 436.90m - 437.10m, 0.20m coaly MS.
		438.00	439.90	1.90		15°						sandstone	FGSS gray, interbedded with dark gray siltstone laminate, 20%, rich in coal streak and carbonaceous debris; at 439m, bedded plane: 15 °.
		439.90	444.60	4.70								sandstone	FGSS. light gray, interbedded with dark gray siltstone, 20%; micro-horizontal bedding, with few coal film; at base, siltstone increased.
		444.60	465.55	20.95		25°						Siltstone	Siltstone. dark gray, interbedded with light gray FGSS laminated (20%), micro-horizontal bedding ; at 447.50m - 448m, black mudstone mainly; at 449.20m - 449.30m, black mudstone, rich in coal streak and calcite vein; at 552.45m - 553.95m, black mudstone, massive, numerous coal threads; at 553.80m, 0.02m coal/calcite vein; at 457.60m - 458.55m, FGSS mainly; at 458m, bedded plane: 25 °; at 461.10m - 461.50m, FGSS mainly with numerous irregular calcite vein, disturbed bedding; at 462.10m - 462.30m, FGSS, light gray; at 462.60m - 463.20m, black mudstone, abundant coal streak and carbonaceous fragment.
		465.55	467.30	1.75								Mudstone	black massive, rich in coal streak; at 466.70m - 466.78m; 0.08 coal seam.
		467.30	471.70	4.40		15°						sandstone	FGSS. light gray, with dark gray siltstone laminated and a few black mudstone laminated; at 471m, bedding plane: 15 °.
		471.70	472.15	0.45								Mudstone	black mudstone, rich in carbonaceous and coal film.
		472.15	**472.40**	**0.25**								**Coal**	**0.25m, coal seam, RC: 0.25m, intact, black, bright and light.**
		472.40	474.55	2.15								Mudstone	black mudstone, massive, numerous carbonaceous and coal film; at 473.50m, calcite vein.
		474.55	479.10	4.55		20°°						Mudstone	FGSS. light gray, well-sorted, predominately quartz and debris; horizontal bedding, interbedded with dark gray siltstone laminated (20%), at lower part 30%; at 476.25m - 476.45m, black mudstone; at 476.35m - 476.40m, 0.05m coal seam; at 478m, bedded plane: 20 °; a few plant root fossils.
		479.10	479.90	0.80								Siltstone	muddy, light black, rich in coal and carbonaceous fragment and plant root/leaf fossil.
	#4	**479.90**	**480.30**	**0.40**								**Coal**	**0.40m coal seam, blank, intact, bright.**
		480.30	483.60	3.30								Siltstone	dark gray, interbedded with light gray FGSS laminated (30%); sandy toward at base, a few plant root fossil.
		483.60	489.55	5.95		15°						sandstone	FGSS. light gray, well-sorted, horizontal bedding, with a few dark gray siltstone laminated at top; at 485.33m -485.35m, 0.02 coal seam; at 485.35m, bedded plane: 15 °; locally MGSS and few coal film; at base, vertical calcite vein (0.40m).
		489.55	491.15	1.60								Mudstone	black, interbedded with light gray FGSS laminated (10%).
		491.15	492.20	1.05									FGSS. light gray, with a few coal film.
		492.20	493.34	1.14		10°						Siltstone	siltstone light gray, with a few light gray FGSS laminated (30%); at 493m, bedded plane: 10 °.
	#5	**493.34**	**496.90**	**3.56**				**Q2 Q3 Q4**				**Coal**	**coal seam, 3.56m, RC: 3.40m; black, bright, intact, light, fracture developed; parting: 495.32m - 495.78m, 0.46m, black MS. dip 10 °; boney coal: 494.90m - 494.97, 0.07m. coal structure: 1.98<0.46>1.12m.**
		496.90	497.63	0.73								Mudstone	0.73m black mudstone.
	#5-1	**497.63**	**499.21**	**1.58**				**Q5 Q6**				**Coal**	**coal seam, 1.58m; RC: 1.58m; parting: 498.65m - 498.82m, 0.17m black MS. coal structure: 1.00<0.17>0.39m.**
		499.21	500.35	1.14		10°						Siltstone	dark gray, with light gray FGSS laminated (40%); at 500m, bedded plane: 10 °.
		500.35	501.45	1.10								Mudstone	coaly mudstone, black, massive; at 500.50m - 500.66m, 0.16m coal seam.
		501.45	502.78	1.33		13°							FGSS. Gray, with dark gray siltstone; at 502.50m, dip: 13 °.
		502.78	506.26	3.48								Mudstone	black, massive, rich in coal and carbonaceous debris; at 503.08m -503.21m, 0.13m coal seam.
		506.26	**506.66**	**0.40**								**Coal**	**0.40m, coal seam. RC: 0.40m; black, bright, light, intact.**
		506.66	508.55	1.89								Siltstone	siltstone muddy, light gray, rich in coal film.
		508.55	**509.02**	**0.47**								**Coal**	**0.47m coal seam, RC: 0.47m, grinding, black, bright, light.**
		509.02	511.69	2.67								Siltstone	siltstone muddy, light black, numerous coal film.
		511.69	**512.16**	**0.47**								**Coal**	**0.47m coal seam, RC: 0.39m, black, few boney coal.**
		512.16	515.25	3.09		10°						Mudstone	mudstone black, massive; at 513.30m - 513.70m, 0.40m black CM(coaly), rich in coal seam; at 514.06m, dip: 10 °.
		515.25	515.35	0.10								Coal	0.10m coal seam.
		515.35	517.43	2.08								sandstone	FGSS. light gray, interbedded with dark gray siltstone, 30%; at top and bottom, more siltstone; at base, 0.20m FGSS, disturbed bedding and a layer calcite vein.
	#6	**517.43**	**517.58**	**0.15**								**Coal**	**0.15m coal seam.**
		517.58	517.80	0.22								Mudstone	0.22m black MS.
		517.80	**518.45**	**0.65**								**Coal**	**0.65m coal seam (boney mainly).**
		517.45	521.00	3.55								Siltstone	siltstone dark gray, interbedded with light gray FGSS and black mudstone laminated (30%), rich in coal streak.
		521.00	524.30	3.30								Mudstone	mudstone light black, massive, numerous coal thread and plant root fossil; at 523.90m - 524.02m, 0.12m coal seam (boney).
		524.30	528.18	3.88		15°						Siltstone	siltstone dark gray, interbedded with light gray FGSS laminated (at top) and a few black mudstone laminated at base; at 527.50m, bedded plane: 15 °.
		528.18	**528.35**	**0.17**								**Coal**	**0.17m coal seam.**
		528.35	528.75	0.40								Mudstone	0.40 black MS.
		528.75	532.28	3.53								Siltstone	siltstone dark gray, interbedded with light gray FGSS laminated (20%); micro-horizontal bedding, locally calcite vein, numerous plant fossil.
		532.28	539.50	7.22								Mudstone	mudstone light black, massive; at 534.25m - 534.50m, filled numerous, irregular calcite vein, a few plant root fossils; at 538.65m - 539m, 2 layers siderite.
	#6-2	**539.50**	**541.15**	**1.65**				**Q9 Q10**				**Coal**	**coal seam, 1.65m; RC: 1.55m, black, bright and light, boney. Boney coal: 539.50m - 539.90m, 0.40m. parting: 540.10m - 540.14m, 0.04m. black, bright; half broken.**
Gates		541.15	543.95	2.80								Mudstone	black mudstone, massive abundant coal film and carbonaceous fragment. from 541.87m to end; very broken, fracture number 30/m, vertical fracture; at 542.10m - 542.20m and 543.360m - 543.72m, included 0.10m and 0.12m coal seam.
		543.95	551.10	7.15		15°						sandstone	MGSS. light gray, well-sorted, quartz and debris; interbedded with dark gray siltstone laminated (20%), micro-horizontal bedding. at 548.80m, dip: 15 °, and meanwhile, with a few coal streak, react with 5% HCl.
		551.10	559.10	8.00		15°						Siltstone	siltstone dark gray, with light gray FGSS laminated (20%); rich in plant root fossil and carbonaceous fragment; at 554m, bedded plane: 15 °.
		559.10	560.87	1.77								sandstone	FGSS. light gray, well-sorted, with dark gray siltstone laminated (20%); react with 5% HCl.
		560.87	565.35	4.48								Mudstone	mudstone black, massive; rich in carbonaceous fragment.
		565.35	**565.60**	**0.25**								**Coal**	**0.25m coal seam.**
		565.60	566.30	0.70								Mudstone	mudstone black, massive, rich in coal streak and carbonaceous debris; at 565.97m - 566.04m; 0.07m boney coal.
	#7	**566.30**	**568.20**	**1.90**				**Q11 Q12**				**Coal**	**1.90m, coal seam; RC: 1.40m, lost: 0.50m, black, bright and light; half-intact. parting: 567m - 567.36m, 0.36m black MS; coal structure:0.70<0.36>0.84m.**
		568.20	568.93	0.73								Mudstone	black, CM mainly.
	#7-1	**568.93**	**571.00**	**2.07**				**Q13 Q14**				**Coal**	**coal seam, 2.07m; RC: 0.80m, lost: 1.27m, parting: 569.52m - 569.70m, 0.18m black MS; black, bright at top; at medium - lower, broken into many pieces, lost more coal seam, lower recovery.**
		571.00	573.10	2.10								Mudstone	Black, at top, CM mainly, numerous coal streak.
		573.10	575.20	2.10		15°						Siltstone	siltstone dark gray, interbedded with light gray FGSS laminated (20%), at top, more black mudstone. at 575m, dip: 15 °.
		575.20	583.40	8.20		10°						sandstone	FGSS. light gray - gray, interbedded with dark gray siltstone and black mudstone. at lower, laminated, micro-horizontal bedding; at 581.50m, bedded plane: 10 °.
		583.40	586.90	3.50		15°						Mudstone	light black to black, massive mainly, numerous plant root fossil and a few coal film. at 586.50m, bedded plane: 15 °.
	#8	**586.90**	**591.53**	**4.63**		**15°**		**Q15 Q16**		**CBM1 CBM2**		**Coal**	**4.63m, coal seam, RC: 4.25m, dip: 15 °. no parting, black, bright and light. half-intact. Q15: 586.90-590.0m, Q16: 590m - 591.53m, 1.53m, lost: 0.18m, RC: 1.35m.**
		591.53	592.50	0.97								Mudstone	light black, massive, rich in coal film and carbonaceous fragment.
		592.50	596.70	4.20		15°						Siltstone	dark gray, interbedded with light gray FGSS laminated (20% - 30%); at upper part, a few plant root fossil. at 594m, bedded plane: 15 °.
		596.70	600.60	3.90		15°						sandstone	FGSS. light gray, well-sorted, pure, horizontal bedding; at top, extend fracture from 596.70m - 597m; react with 5% HCl; at 600m, bedded plane: 15 °.
		600.60	605.00	4.40		20°						sandstone	MGSS. light gray to gray, well-sorted, horizontal bedding . at 603.50m, dip: 20 °, slightly fracture, filled numerous coal streak; at 602.46m - 602.49m, 0.03m coal seam; at 604.45m - 604.50m, 0.05m coal seam; from 601.10m - 603m, FGSS mainly; react with 5% HCl.
		605.00	614.60	9.60		10°						sandstone	FGSS - MGSS - FGSS. light gray, well-sorted, horizontal bedding. at 609.20m - 609.50m, rich in coal seam and with conglomerate; at 611m, bedded plane: 10 °; react with 5% HCl; at 612m - 612.20m, extend a layer calcite vein; at base, more vitrain film.
		614.60	616.95	2.35								Mudstone	black, massive. at lower part, rich in vitrain streak and carbonaceous fragment; from 616.58m - 616.65m, 0.07m coal seam.
	#9	**616.95**	**620.25**	**3.30**				**Q17 Q18**				**Coal**	**coal seam, 3.30m; RC: 2.00m, lost: 1.30m. black, bright, light; very broken, coal is shiny and brittle. parting: 619.67m - 619.85m, 0.18m, black MS; lost coal: 618m - 619.25m, 1.25m. coal structure: 2.72<0.18>0.40m;**
		620.25	621.30	1.05								Mudstone	black, massive, rich in vitrain streak and carbonaceous fragment.
		621.30	622.85	1.55		11°						Siltstone	dark gray; at base, with gray FGSS laminated. at 621.50m, dip: 11 °.
		622.85	630.65	7.80		12°						sandstone	light gray, well-sorted, predominately quartz and debris. at upper part, pure FGSS, fracture (vertical) developed, extend from 622.85m - 624.20m, and from 626.35m - 628.80m, broken, few coal, vertical fracture developed, filled calcite vein; meanwhile, at 626.85m - 628.45m, more black mudstone. calcite cement, react with 5% HCl; at 629m, bedded plane: 12 °; at base, siltstone laminated increased, micro-horizontal bedding.
		630.65	632.96	2.31								Siltstone	dark gray, little muddy, interbedded with light gray FGSS laminated at upper part and core reduced.
		632.96	636.55	3.59		15°						sandstone	FGSS. gray to light gray, with a few dark gray siltstone laminated (10%); CGSS toward at base, slight fracture, well-sorted, horizontal bedding. at 635.40m, dip: 15 °.
	#10	**636.55**	**637.20**	**0.65**								**Coal**	**coal seam, 0.65m; RC: 0.55m, black, bright, light, intact, vitrain. coal structure: 0.10<0.16>0.39m;.**
		637.20	640.20	3.00		15°						Siltstone	dark gray, with light gray FGSS and at top black mudstone laminated; micro-horizontal bedding. at 640 m, dip: 15 °; sand toward at base.
		640.20	645.97	5.77		13°						sandstone	FGSS. light gray, interbedded with dark gray siltstone laminated (10%); micro-horizontal bedding. at 643.50m, dip: 13 °; at medium - lower part, pure FGSS; occasionally vitrain chip. calcite cement; react with 5% HCl.
		645.97	684.73	38.76		15°						sandstone	CGSS. light gray, poorly-sorted; predominately quartz and debris and a few vitrain laminated. Horizontal bedding. at 647m, dip: 15 °; at 646.45m - 646.85m, extends calcite vein.
		648.73	652.10	3.37								sandstone	FGSS. light gray, interbedded with a few dark gray siltstone laminated (10%), micro-horizontal bedding, well-sorted. at upper part, fracture developed, filled numerous vitrain laminated; calcite cement; react with 5% HCl.
		652.10	662.00	9.90		15°						sandstone	CGSS. light gray, poorly-sorted, predominately quartz and debris. From 658.20m - 659.85m, more conglomerate, grading downward at base; at 660.06m, bedded plane: 15 °.
		662.00	666.10	4.10		20°						sandstone	MGSS. light gray, normal-sorted; predominately quartz and debris; at 663m - 663.20m, a few coal film; FGSS toward at base; at 667m, bedded plane: 20 °.
		666.10	668.00	1.90								Siltstone	dark gray, interbedded with dark gray siltstone laminated (30%) and a few black mudstone laminated (10%), minor plant root fossil and carbonaceous fragment.
	#11	**668.00**	**669.30**	**1.30**				**Q19 Q20**				**Coal**	**coal seam, 1.30m, RC: 0.85m, broken into many pieces, minor 2cm - 3cm fragment, other is grinding, black, bright; parting: 668.20m - 668.30m, 0.10m black MS; coal structure: 0.20<0.10>1.00m.**
		669.30	670.64	1.34								sandstone	FGSS. light gray, well-sorted, with a few dark gray siltstone laminated. At top: .10m black mudstone.
		670.64	671.73	1.09								Mudstone	black, massive, minor carbonaceous debris.
	#12	**671.73**	**671.95**	**0.22**								**Coal**	**coal seam; 0.22m; RC:0.18m, broken; coal is shiny and brittle.**
		671.95	677.00	5.05		20°						sandstone	MGSS. light gray, well-sorted, horizontal bedding. at 674m, dip: 20 °; fracture extend from 674.35m - 675.80m (vertical).
		677.00	692.00	15.00		15°						sandstone	FGSS. light gray, well-sorted; predominately quartz and debris; horizontal bedding. at 679m, dip: 15 °. From 678m - 682.30m, fracture developed; very broken, broken surface are infilled vertical calcite vein and irregular calcite vein; from 684.40m - 684.60m, a layer calcite vein; from 687.50m - 687.90m, a layer calcite vein; from 689.30m - 690.20m, fracture developed, filled calcite vein (vertical); at 689m, bedded plane: 15°.
													TD:692m Jan. 23,2013

Wapiti River — Drill Hole Core Log

Drilling Company:	Cyr Drilling Company	**Hole No.:**	WP1C14		
Rig Type:	Super Bear-2	**Collar Elevation:**	1266.8m		
Total Depth:	947.00 m	**Coordinate:**	**Northing:**	6070553.9	
Spud Date:	25/sept./2012		**Easting:**	650149	
Finished Date:	30/Oct./ 2012		**Logging Geologist:**	Victor, Lee, Ricky	
Core Size:	HWT/HQ		**Note:**		

Formation	Coal Seam	Core Depth Interval From	To	Thickness, m Thick	TRUE	Strata Dip	Coal Floor Elevation	Sample ID Coal	Rock	CBM	Rock Hardness	Rock Name	Lithology Description
Q		0.00	22.30	22.30								till	sand and gravel, minor mud, brown and grey, at base, weathered deposits.
Hasler		22.30	39.10	16.80		28						siltstone	muddy, dark grey, interbedded with minor light grey fine-grained sandstone(5%).
		39.00	77.00	38.00		32						siltstone	micro-horizontal bedding. At 24.50m, bedding plane:31°, at 23.10m and 26.00m, 0.10m mud, and at 38.00, two layers mud. At 28.20 m ,bedded plane: 28°.
		77.00	110.00	33.00		35						siltstone	Same features as above, plus light grey fine-grained sandstone, laminate 10%, dip:30° at 46.60m muddy. At 52.00m, bedding plane:30°.At 74.00m, bedding plane:32°.
		110.00	146.00	36.00		34						siltstone	dark grey, interbeded with light grey fine-grained sandstone laminate(30%),micro-horizontal bedding. At 88.00m, bedding plane:35°. At 94.00m minor pyrite nodule(1*2mm) on fracture plane. At base, minor siderite thin laminates. At 100.00m, bedding plane:30°. At 107.50m, pyrite nodule 2*5mm. At 110.30~111.50m, vertical fracture, polish, pyrite nodule. dark grey, interbedded with light grey fine-grained sandstone laminates(40%).At 119.00m, bedding plane:32 °,micro-horizontal bedding, small cross-bedding in FGSS. At 130.60m, bedding plane:32 °. At 133.00~133.50m, vertical fracture. At 144.60m, bedding plane:34 °.
		146.00	167.00	21.00		30						siltstone	Same as previous intervals, plus, FGSS laminates decreased 25%, and siderite thin laminates throughout, muddy, slightly fracture, polished. At 156.50m, bedding plane:34 °. At 166.00m, bedding plane:30 °.
		167.00	179.00	12.00		35						siltstone	Dark grey, interbedded with light grey fine-grained sandstone laminates (50%).At 174.50m, bedding plane:35 °.
		179.00	200.00	21.00		40						siltstone	Same features as above, plus FGSS laminates decreased 20%, micro-horizontal bedding. At 184.40m,pyrite nodule(1*4cm). At 184.70m, bedding plane:35 °,minor sideritic thin laminates. At 191.60~191.70m, 0.10, siderite. At 198.50m, bedding plane:40 °.
		200.00	236.00	36.00		33						siltstone	Dark grey, interbedded with minor light grey FGSS laminates(10%), horizontal bedding at 203.00m, bedded plane: 35 °. At 218.06m, bedded plane:35 °. At 233.50m, 0.05m calcite vein. At 226.00, bedded plane:33 °.
		236.00	262.30	26.30		35						siltstone	Same features as above, plus FGSS increased to 40%, minor siderite thin laminates throughout, horizontal bedding at 239.00m, bedded plane:35 °, distorted bedding on FGSS bedding throughout, minor cross-bedded. At 242.50m, bedded plane: 35 °. At 242.75m, pyrite nodule (2*6mm). At 245.80m, pyrite nodule (3*4mm). At base, 0.25m conglomerate, Φ:2~7mm. At 254.00m, bedded plane:35 °.
Boulder Creek		262.30	264.05	1.75								mudstone	white-grey, soft, can be scratched by fingers
		264.05	266.25	2.20								sandstone	MGSS, at base, few conglomerate.
		266.25	276.00	9.75								mudstone	massive, white-grey, soft, can be scratched by fingers, infilled calcite vein on fracture surface.
		276.00	281.60	5.60		50						siltstone	dark grey interbedded with few light grey FGSS laminates, from 276.50~277.50m fracture developed, infilled lots of calcite vein, dip:50°. At 278~278.80m, more FGSS.
		281.00	283.10	2.10								sandstone	MGSS, light grey, fracture developed, infilled vertical calcite vein. At base, 0.10m conglomerate, Φ: 2-5mm.
		283.10	304.00	20.90		35						mudstone	bauxltic, white-grey, massive. At 288.70~289.00m, broken, infilled. At 289.70~292.70m and 300.50~301.60m, pure Bauxitic mudstone, pale-white, small argillaceous nodule on joint surface? competent . At 288.60m, bedded plane:35°.
		304.00	307.75	3.75								siltstone	dark grey, little muddy, massive, at base, few FGSS laminates.
		307.75	314.10	6.35		35						sandstone	FGSS, light grey, interbedded with dark grey siltstone laminates (15%). Micro-horizontal bedding at 310.00m, dip 35°.
		314.10	318.00	3.90								mudstone	Bauxitic mudstone, white-grey, massive.
		318.00	324.20	6.20		38						sandstone	MGSS, light grey, few dark grey, siltstone laminates (5%) from 320.70~321.30m, more siltstone, few coal film. At 320.00m, bedding plane:45°. At 321.50m, dip:38°.
		324.20	326.60	2.40								mudstone	dark grey, massive, few coal film on joint surface.
		326.60	331.50	4.90		40						sandstone	FGSS, light grey, interbedded with black mudstone(15%) and vitrain chip. At 329.00m, bedded plane: 40°.
		331.50	356.00	24.50								mudstone	white-grey, massive. At 343.50~345.00m, FGSS mainly. At base, 355.00~355.20m, very much broken, brittle black mudstone. At medium part, a few layers black mudstone, infilled coal film on bedding. At 340.00~345.00m, white-grey. At 345.00~350.00, black mudstone predominately. At 352.00~356.00m, more black mudstone.
		356.00	365.40	9.40								mudstone	pure bauxitic mudstone, white grey, massive. At top abundant Fe^{2+} nodule, red colour. At base, silt toward.
		365.50	370.00	4.50		35						sandstone	FGSS, light grey, interbedded with few dark grey siltstone laminate(5%), slightly fracture, fracture infilled calcite vein. At 369.50m, bedded plane:35°.
		370.00	374.50	4.50		37						sandstone	MGSS, light grey, predominately quartz and debris, normal-sorted. At 372.50m, dip:37°, small-cross bed in MGSS surface.
		374.50	383.00	8.50		35						mudstone	light black, massive. At 377.10~378.00m, FGSS, minor calcite vein, minor bauxitic mudstone throughout, a few of coal film on bedding. At 381.50, bedded plane: 35°. At 381.70m, 0.10m vitrain seam broken. 0.10<0.10>0.05m. 382.60~382.75m, 0.15m fault gauge.
		383.00	384.00	1.00								siltstone	dark grey, massive, at bottom, black mudstone, rich in coal film.
	BC	**384.00**	**384.57**	**0.57**								**coal**	**0.57m BC-coal seam, RC:0.40m. At top, 0.20m boney coal.**
		384.75	385.00	0.25								mudstone	CM-carbonaceous mudstone. Black, massive, rich in coal threads.
		385.00	391.90	6.90								conglomerate	conglomerate, light grey, Φ:2-10mm, poorly-sorted, subrounded quartz and debris mainly included two layers, FGSS
		391.90	405.00	13.10		30						sandstone	FGSS, light grey, from 392.00~395.00m very much broken, two layers conglomerate horizontal bedding, well-sorted, quartz and debris mainly. At 397.00m, bedded plane:25°. At 403.00m, bedding plane: 30°.
		405.00	407.85	2.85								siltstone	dark grey, interbedded with light grey fine-grained sandstone laminates(50%), micro-horizontal bedding.
Hulcross		407.85	412.40	4.55								siltstone	dark grey with FGSS laminates(40%).
		412.40	434.00	21.60		25						siltstone	dark grey with light grey FGSS laminates(30%). At 414.00m, bedded plane:22°, micro-horizontal bedding, little muddy. At 419.00m, bedded plane:20°. At 425.00m, bedded plane:25°. From 428.00~433.00m, few plant root fossils.
		434.00	450.93	16.93		25						siltstone	dark grey, interbedded with few light grey fine-grained sandstone laminates(20%), muddy. At 440.00m, bedding plane: 25°. At 443.50m. Bedded plane: 25°.
		450.93	**451.03**	0.10								**limestone**	0.10m argillaceous limestone, white-grey, strong react with 5% HCL.
		451.03	473.00	21.97		20						siltstone	dark grey, interbeded with few light grey FGSS laminates at 451.90m, bedded plane:20°. At 457.00m, bedded plane:17°. At 463.00m, bedding plane: 23° and plant leaf fossil observed on siltstone bedding. At 467~470.00m, few carbonaceous fragment. At base, FGSS laminates increased. At 470.50m, bedding plane: 20°.
		473.00	476.30	3.30		20						sandstone	light grey, fine-grained, interbedded with dark grey siltstone laminates(40%), micro-horizontal bedding , bedding plane: 20° (476m).
		476.30	492.50	16.20		17						siltstone	dark grey, little muddy, with light grey FGSS laminates(30%), micro-horizontal bedding at 480.00m, dip:23°. Minor siderite throughout . From 486~489m, more FGSS laminates(50%). At 491.00m, bedding plane: 17°.
		492.50	494.00	1.50								sandstone	fine-grained, light-grey with few black mudstone laminates, facture developed, infilled irregular calcite vein. At base, 0.33m conglomerate, Φ2mm.
		494.00	495.14	1.14			**772.80**					mudstone	light black, massive, at top: 0.40m siltstone. Coal film observed on joint plane.
	1#	**495.14**	**495.30**	**0.16**								**coal**	**0.16m coal seam.**
		495.30	497.00	1.70								mudstone	black, mudstone, massive, 7 layers coal film.
		497.00	503.67	6.67		20						siltstone	dark grey, massive, interbedded with light black mudstone and light grey FGSS laminates. At 500.80~501.50m, more FGSS laminates. At 502.50m, bedding plane: 20°.
		503.67	505.50	1.83								sandstone	FGSS, light grey, interbedded with dark grey siltstone laminates.
		505.50	510.60	5.10								mudstone	light black, massive, abundant coal film and plant root fossil.
	3#	**510.60**	**511.12**	**0.52**								**coal**	**0.52m 3# coal seam, RC 0.52m, black, light, bright**
		511.12	514.80	3.68								mudstone	CM, rich in vitrain. At 512.50~512.58m, 0.08m. At 512.58~512.68m, 0.10 coal seam. At 514.70~514.80, 0.10 coal seam, massive, plant root fossil.
		514.80	518.00	3.20								siltstone	dark grey
		518.00	520.10	2.10								siltstone	at top: 0.50m black mudstone. Dark grey.
		520.10	**520.20**	**0.10**								**coal**	**0.10m coal seam.**
		520.20	526.00	5.80								siltstone	dark grey. At 522.80m, bedding plane:30°, interbedded with light grey FGSS laminates.
		526.00	535.00	9.00		23						sandstone	FGSS with dark grey siltstone, light grey. At 531.75m, dip: 23°.
		535.00	535.45	0.45								mudstone	CM, black
	4#	**535.45**	**536.50**	**1.05**				**Q1,Q2**				**coal**	**1.05m 4# coal seam, RC:1.05m. Coal structure: 0.25<0.10>0.70m**
		536.50	541.30	4.80								sandstone	FGSS, light grey.
		541.30	545.80	4.50		25						siltstone	dark grey, interbedded with minor black mudstone and light grey FGSS laminates. At 545.80m, bedding plane:25°. Few coal film observed on joint surface.
		545.80	**545.84**	**0.04**								**coal**	**0.04m coal seam.**
		545.84	546.30	0.46								mudstone	black, massive, minor coal film on joint plane.
		546.30	**546.44**	**0.14**								**coal**	**0.14m coal seam.**
		546.44	549.65	3.21								mudstone	light black, massive rich in plant root fossils and coal streak.
		549.65	549.85	0.20								mudstone	sideritic mudstone, heavy
		549.85	554.00	4.15		28						siltstone	dark grey, interbedded with light grey FGSS laminates (30%). At top, a few siderite. At 552.50m, bedded plane: 28°. At base, FGSS increased to 50%.
		554.00	560.30	6.30		25						sandstone	light grey, fine-grained, interbedded with dark grey siltstone laminates(30%). At 557.00m, bedding plane:25°. From 558.00~559.50m, 5 layers coal film. At base, siltstone increased to 50%.
		560.30	563.30	3.00		20						siltstone	dark grey, with light grey FGSS and light black mudstone laminates, few plant root fossils. At 562.00m, bedding plane: 20°.
		563.30	563.70	0.40								siltstone	dark grey, muddy, rich in plant root fossils and coal film.
	5#	**563.70**	**568.50**	**4.80**		**20**		**Q3-5**		**CBM01**		**coal**	**4.80m, 5# coal seam, RC:4.80m(100%). Black, light, bright, intact (at top, 0.50m broken),brittle, coal seam dip: 20° . Parting: Q4: 567.18~567.25m, 0.07m black mudstone, coal structure: 3.48<0.07>1.25m.**
		568.50	570.86	2.36		30						mudstone	black, massive, numerous vitrain thin chip and plant root fossils, 4 layers 0.02~0.05m thin coal seam. At 570.00, bedding plane: 30° .
	5-1#	**570.86**	**572.42**	**1.56**				**Q6,Q7**				**coal**	**1.56m 5-1# coal seam, RC:1.56m. Parting:571.06-571.68m, 0.62m, black mudstone. 0.20<0.62>0.74m**
		572.42	575.95	3.53								sandstone	grey, interbedded with dark grey siltstone laminates at top and bottom, more siltstone, rich in coal film and plant fossil at 574.95~575.05, 0.10m coal.
	5-2#	**575.95**	**576.80**	**0.85**				**Q8,Q9**				**coal**	**0.85m 5-2# coal seam, RC: 0.85m, black, light, bright, broken. Parting: 576.40-576.50m, 0.10m mudstone. 0.45<0.10>0.30m**
		576.80	579.00	2.20								siltstone	dark grey, massive, abundant plant root fossils and few coal film. At 578.56~578.60m, 0.04m coal seam.
		579.00	**579.27**	**0.27**		**25**						**coal**	**0.27m banded coal, RC: 0.27m, bedding plane: 25°.**
		579.27	581.50	2.23								mudstone	light black, massive, little silt, at top 0.30m-CM and 580.90~581.20m 0.30m-CM.
		581.50	583.70	2.20		25						siltstone	dark grey, interbedded with a few light grey, FGSS laminates, rich in carbonaceous fragment. 25°(583.50m)
		583.70	584.20	0.50								mudstone	CM, rich in plant fossils and carbonaceous.
		584.20	**584.50**	**0.30**								**coal**	**0.30m coal seam.**
		584.50	586.20	1.70								mudstone	black, numerous vitrain thin chip and carbonaceous fragment, 3 layers thin coal seam(0.03-0.10m).
		586.20	**586.50**	**0.30**								**coal**	**0.30m boney coal seam.**
		586.50	586.80	0.30								mudstone	0.30m CM
		586.80	**587.00**	**0.20**								**coal**	**0.20m coal seam.**
		587.00	593.80	6.80		25						mudstone	black, massive, at top 0.50m carbonaceous mudstone, dip: 25°(589.00m). At 588.45~588.60m, 0.15m coal seam, occasional coal film on bedding at medium part, silt toward. At base, more carbonaceous / Coal threads.
	6#	**593.80**	**594.88**	**1.08**				**Q9-10**		**CBM02**		**coal**	**1.08m 6# coal seam, RC: 1.08m, parting: 594.03-594.15m, 0.12m MS. 0.23<0.12>0.73m.**
		594.88	596.15	1.27								mudstone	black, massive, rich in carbonaceous and coal threads, at 595.86~~595.91m 0.05m coal seam.
		596.15	**596.40**	**0.25**								**coal**	**0.25m coal seam. grinding.**
		596.40	602.75	6.35		25						siltstone	dark grey, interbedded with FGSS laminates (10%) at lower part, more black mudstone, abundant carbonaceous fragment at 599.50m, bedding plane: 25°.
		602.75	604.72	1.97								mudstone	black, massive, numerous plant root fossil.
	7#	**604.72**	**606.00**	**1.28**				**Q12**		**CBM03**		**coal**	**1.28m 7# coal seam, RC: 1.28m, no parting, black , intact, a few boney coal.**
		606.00	607.10	1.10								mudstone	dark grey, massive, few coal threads.
		607.10	614.30	7.20		20						siltstone	dark grey, muddy with minor mudstone and thin coal threads. At 610.00m, bedding plane: 20°.
		614.30	615.53	1.23								mudstone	black, massive, rich in coal threads and carbonaceous fragment.
		615.53	617.00	1.47								mudstone	coaly mudstone, 3 layers coal thin laminates(0.15m/ 0.13m/ 0.15m).
		617.00	619.15	2.15								mudstone	light black, rich in plant root fossil and few coal film.
		619.15	620.75	1.60								sandstone	FGSS, grey with dark grey siltstone laminates.
		620.75	622.53	1.78								siltstone	dark grey, massive few carbonaceous fragment.
Gates		622.53	637.65	15.12		25						sandstone	FGSS, light grey, interbedded with dark grey siltstone laminates (40%) micro-horizontal bedding. At 622.50m, bedding plane: 25°. At upper part, few coal film. FGSS react with 5% HCL. At 629.00m, bedding plane: 20°. From 636.00~637.20m, vertical fracture developed on FGSS joint surface, in filled calcite vein. At 637.50m, bedding plane: 25°.
		637.65	642.50	4.85								siltstone	dark grey, competent, massive, a few plant leaf fossils on bedding. At base, carbonaceous trace on bedding.
		642.50	644.00	1.50		23						sandstone	FGSS, light grey, with few dark grey siltstone laminates (5%). At 643.00m, bedding plane: 23°.
		644.00	650.60	6.60								siltstone	dark grey, interbedded with minor light grey FGSS laminates(5%), rich in plant root / leaf fossils and minor coal film. At 649.50m, bedding plane: 22°.
		650.60	651.81	1.21								mudstone	light black, massive, abundant plant root / leaf fossils.
	8'#	**651.81**	**653.34**	**1.53**				**Q13**		**CBM04**		**coal**	**1.53m 8' coal seam, RC: 1.53m, no parting, black, intact, light, shine and at bottom, brittle.**
		653.34	654.04	0.70								siltstone	(0.70m) dark grey, with light grey FGSS and light black mudstone laminates and coal streak.
	8#	**654.04**	**658.15**	**4.11**				**Q14-16**		**CBM05**		**coal**	**4.11m, 8# coal seam, RC: 4.11m. black, light, half-intact, shiny at lower part, brittle (1.50m). parting: ①654.54-654.70, 0.16m carbonaceous; ②657.00-657.25, 0.15m, CM. Coal structure: 0.50<0.16>2.40<0.15>0.90m.**
		658.15	659.00	0.85								mudstone	black (0.85m).
	8-1#	**659.00**	**663.14**	**4.14**				**Q17-19**		**CBM06**		**coal**	**4.14m 8-1# coal seam; RC: 4.14m, black, light, shiny, intact, coal bedding: 25°, parting: 659.75~ 659.96m, 0.20m black mudstone. Q17: 659.00~~660.85m, 1.85m, RC: 1.85m. Q18: 660.85~663.14m, 2.29m RC: 2.29m. Coal structure: 0.75<0.20>3.19m.**
		663.14	665.00	1.86								mudstone	black, massive, rich in plant leaf / root fossils and coal film, and carbonaceous.
		665.00	667.80	2.80								siltstone	dark grey, massive, abundant plant fossil and coal threads.
		667.80	671.20	3.40		25						sandstone	FGSS, grey, interbedded with dark grey siltstone laminates. At top: 0.20m FGSS, fracture developed infilled calcite vein, almost vertical. At 669.00m, bedding plane: 25°, few coal film on joint surface. At base, siltstone increased.
		671.20	679.15	7.95		25						siltstone	dark grey, interbedded with few light grey FGSS laminates (5%). At lower part, 0.30m FGSS, infilled calcite vein. A few plant root fossil and coal threads observed on joint surface, micro-horizontal bedding. At 679.00m, bedding plane: 25°.
		679.15	681.78	2.63								mudstone	black, massive. At lower part, numerous carbonaceous fragment and vitrain thin laminates.
	9#	**681.78**	**685.78**	**4.00**				**Q20-22**		**CBM07**		**coal**	**4.00m 9# coal seam, RC: 4.00m, at medium-upper part; broken, brittle, at bottom part, intact. Black, light, shiny. Parting:① 683.10~683.18, 0.08m black mudstone; ② 684.37~684.97m, 0.60m, mudstone. Coal structure: 1.32<0.08>1.19<0.60>0.81m.**
		685.78	686.00	0.22								mudstone	0.22m black mudstone.
		686.00	686.80	0.80								sandstone	FGSS, light grey, minor black mudstone laminates.
		686.80	688.10	1.30		20						mudstone	coaly mudstone, black, rich in coal thin laminates. At 688.00m, bedding plane: 20°.
		688.10	703.15	15.05		30						sandstone	MGSS, light grey, locally conglomerate thin laminates. From 689.00~ 690.00m, 2 layers conglomerate thin laminates (0.115m and 0.20m). At 692.00m, 0.15m conglomerate, normal-sorted, predominately quartz and debris , minor mice, horizontal bedding. At 695.00m, bedding plane: 30°.
		703.15	707.62	4.47								sandstone	FGSS, light-grey, interbedded with few dark grey siltstone laminates (5%), micro-horizontal bedding.
	10#	**707.62**	**708.34**	**0.72**				**Q23**				**coal**	**0.72m 10# coal seam, RC: 0.72m, black, light, intact, no parting.**
		708.34	710.60	2.26								siltstone	dark grey, rich in coal film, and plant root fossils.
	10-1#	**710.45**	**710.65**	**0.20**								**coal**	**0.20m coal seam.**
		710.65	713.04	2.39								mudstone	coaly mudstone. Abundant coal thin laminates.
	10-2#	**713.04**	**713.30**	**0.26**								**coal**	**0.26m coal seam.**
		713.30	715.40	2.10								siltstone	dark grey, rich in plant root fossils and coal streaks, muddy minor black mudstone laminates.
		715.40	719.50	4.10		25						siltstone	dark grey, interbedded with light grey FGSS laminates (20%), micro-horizontal bedding. At 717.00m, bedding plane: 25°. At upper part, rich in plant fossil and few calcite vein.
		719.50	721.93	2.43								siltstone	dark grey, muddy numerous plant root fossils.
	11#	**721.93**	**722.77**	**0.84**				**Q24**				**coal**	**0.84m 11# coal seam, RC: 0.70m. No parting.**
		722.77	725.00	2.23								siltstone	dark grey, rich in coal film, and plant root fossils.
		725.00	725.70	0.70								sandstone	light-grey, fine-grained. fracture developed, infilled vertical angular calcite vein.at 725.16m-725..00m, 0.10m argillaceous limestone.
		725.70	732.70	7.00		25						siltstone	dark grey, interbedded with light grey FGSS laminates (20%), micro-horizontal bedding. At 717.00m, bedding plane: 25°. At upper part, rich in plant fossil and few calcite vein.
	12#	**732.70**	**733.15**	**0.45**		**29**						mudstone	**0.45m coaly mudstone. At 731.00m, bedding plane: 29 degree.**
		733.15	738.76	5.61		25						sandstone	MGSS, light grey, locally infilled large dip calcite vein. normal-sorted, predominately quartz and debris , minor mice, horizontal bedding. At 738.00m, bedded plane: 25 degree.
		738.76	766.80	28.04		20						sandstone	fine-grained, light-grey. From 751.30-755.10m, with more dark grey siltstone laminates, competent, massive, not clear bedding, and with few carbonaceous fragment. from 743.00-748.00m, facture developed, infilled irregular calcite vein. React with 5% HCL. Light grey becoming increasingly grey. from 757.50-766.28m, numerous black mudstone laminates progressively. at 758.00m, bedding plane: 28 degree. at 764.00m, bedding plane: 20 degree. at base, with calcite veins. at 766.18-766.28m, 0.10m fault gauge.
		766.80	771.85	5.05		25						siltstone	dark grey, interbedded with light grey fine-grained sandstone laminates (40%). Horizontal bedding, little muddy. At 770.00m, bedded plane: 25 degree.
		771.85	787.00	15.15		25						sandstone	fine-grained, grey, competent. Interbedded with dark grey siltstone laminates (10%), and with few calcite vein (vertical). At 780.00m, bedded plane: 25 degree. At 771.50, 775.00m, 776.00m and 779.50m, calcite vein observed on joint surface, react with 5% HCL.
		787.00	792.50	5.50								sandstone	FGSS, light grey. Broken, fracture developed, fracture number: 15/m. infilled calcite vein, slickenside at various angles to core axis.
		792.50	797.50	5.00		25						siltstone	dark grey, interbedded with light grey fine-grained sandstone laminates (30%). FGSS react with 5% HCL. Horizontal bedding, little muddy. At 794.00m, bedded plane: 35 degree. At 795.80m, bedded plane: 25 degree.
Moosebar		797.50	833.70	36.20		30						siltstone	dark grey, interbedded with few light grey fine-grained sandstone laminates (10%). Horizontal bedding, little muddy. At 800.00m, bedded plane: 30 degree. Alternating with bands of mudstone on and off (disseminated). At 806.50m, bedding plane: 30 degree. at lower part, few carbonaceous fragment observed on bedding, at 824.00m, bedding plane: 25 degree. at 823.80-824.00m, broken, deformation. vertical fracture extended from 833.70-835.30m. at 836.05-836.20m, 0.15m argillaceous limestone, react with 5% HCL. white, soft. and at 839.55-839.60m, 0.05m argillaceous limestone. from 841.00-842.50m, more calcite vein. at 844.00m, bedding plane: 30 degree.
		833.70	836.05	2.35								mudstone	dark grey, massive. Little silt. Not clear bedding.
		836.05	836.20	0.15								limestone	0.15m bauxitic mudstone and argillaceous limestone. React with 5% HCL.
		836.20	845.00	8.80		30						siltstone	dark grey, not clear bedding, massive. From 841.00-842.50m, more calcite vein. At 844.00m, bedding plane: 30 degree.
		845.00	848.25	3.25								siltstone	dark grey, nor clear bedding. Massive.
		848.25	848.35	0.10								limestone	0.10m bauxitic mudstone and argillaceous limestone. React with 5% HCL.
		848.35	904.26	55.91								mudstone	dark grey, massive. Little silt. Not clear bedding. At 856.50m, 863.00m, 865.00m, 869.50m, and 873.00m, irregular calcite vein observed on bedding. At 869.10m, pyrite small nodule suspended on joint surface. few pyrites nodules throughout. At 896.25-896.35m, sideritic nodules, light grey hard, massive.
		904.26	908.33	4.07								mudstone	more muddy, light black, massive.
		908.33	909.30	0.97								mudstone	coaly mudstone, black, rich in coal thin laminates.
		909.30	910.20	0.90								mudstone	black, massive, numerous carbonaceous fragment and vitrain thin laminates.
		910.20	910.54	0.34								conglomerate	0.34m. With a few pyrites nodules. Light grey, Φ: 2-7mm.
Gething	**A2**	**910.54**	**915.18**	**4.64**				**Q25-27**		**CBM08**		**coal**	**4.64m A2 coal seam. RC: 4.60m. Parting: 414.80-414.93m 0.13m black mudstone. Coal structure: 2.20<0.13>2.31m.**
		915.18	920.00	4.82		25						mudstone	dark grey, massive. Little silt. Rich in plant roots fossil and coal film. At 917.00m, bedding plane: 25 degree. At 916.60m, pyrite nodule.
		920.00	923.06	3.06								siltstone	dark grey, interbedded with minor light grey fine-grained sandstone laminates(10%). Micro-horizontal bedding, at 922.50m, bedding plane: 25 degree. A few quartz vein observed on joint. At upper-medium part, numerous plant root fossil.
		923.06	923.30	0.24								mudstone	0.24m carbonaceous mudstone.
	A3	**923.30**	**924.57**	**1.27**				**Q28**				**coal**	**1.27m A3 coal seam, RC: 1.27m, no parting. Intact, light, black.**
		924.57	929.46	4.89								mudstone	light black, massive. Rich in plant root fossil and carbonaceous fragment. At 926.21-926.31m, 0.10m coal seam. At medium-lower part, abundant coal thin seam.
		929.46	**929.63**	**0.17**								**coal**	**0.17m coal seam. BLACK.**
		929.63	937.70	8.07		30						sandstone	medium-grained, light grey, well-sorted, horizontal bedding. Predominately quartz and debris. From 933.50-935.00m, much broken, fracture number: 15/m. at 936.50-937.50m, with few black mudstone laminates. At 936.50m, bedded plane: 30 degree. At 937.55-937.70m, 0.15m conglomerate.
		937.70	948.12	10.42								sandstone	fine-grained, light grey, well-sorted, quartz and debris mainly. FGSS react with 5% HCL. Horizontal bedding.
		948.12	949.50	1.38		30						siltstone	grey, interbedded with light grey sandstone laminates. at 948.50m, bedding plane: 30 degree.
		949.50	949.92	0.42								sandstone	light grey, fine grained.
	A4	**949.92**	**951.70**	**1.78**				**Q29**				**coal**	**1.78m A4 coal seam, RC: 1.60m. Black, light and shiny and intact. No parting.**
		951.70	952.55	0.85								siltstone	grey, very broken, calcite vein infilled fracture surface, react with 5% HCL.
		952.55	953.70	1.15								mudstone	dark grey, massive. Rich in plant root fossil.
		953.70	958.55	4.85								siltstone	grey, at 954.90-956.10m, black mudstone.
		958.55	965.83	7.28		30						sandstone	light grey, fine grained. React with 5% HCL. At 963.00m, bedded plane: 30 degree.
		965.83	966.36	0.53								conglomerate	light grey, poor sorted, Φ: 2-7mm. Predominately quartz and debris. Subrounded-subangler.
		966.36	966.75	0.39								sandstone	light grey, fine-grained. 0.02m coal string at the top.
		966.75	967.40	0.65								conglomerate	light grey, poor sorted, Φ: 2-7mm. Predominately quartz and debris. Subrounded-subangler.
		967.40	967.60	0.20								mudstone	dark grey, massive. Rich in plant root fossil.
	A5	**967.60**	**969.15**	**1.55**				**Q30**				**coal**	**1.55m A5 coal seam, RC: 1.25m. Black, no parting.**
		969.15	969.45	0.30								mudstone	0.30m carbonaceous mudstone. Massive, black, numerous coal film.
		969.45	970.10	0.65								sandstone	light grey, fine grained.
		970.10	972.70	2.60								mudstone	dark grey, massive. Rich in plant root fossil.
	A5-1	**972.70**	**973.02**	**0.32**								**coal**	**0.32m A5-1 coal seam, RC: 0.06. broken, black, lost 0.26m.**
		973.02	977.00	3.98								siltstone	dark grey, muddy, rich in plant root fossils and coal film. Progressively silt to base.
		977.00	978.89	1.89								siltstone	
		978.89	984.43	5.54								siltstone	dark grey, interbedded with light grey fine-grained sandstone laminates(10%). At 980.00.-980.50m, more FGSS. At 979.80-979.60m, black mudstone, more coal film. At 982.70-983.0m, black mudstone, more coal film. At 983.40-983.70m, infilled minor calcite vein.
		984.43	986.00	1.57								mudstone	black, very much broken. Broken surface are slickensided and shiny. Fracture number: 30/m, infilled minor coal threads. Belong to fault zone.
		986.00	987.90	1.90								sandstone	fine-

Wapiti River — Drill Hole Core Log

Drilling Company:	Canada Dedua Drilling Company	**Hole No.:**		WP1C15
Rig Type:	VD-5000	**Collar Elevation:**	**Elevation**	H = 1249.4m
Total Depth:	935.0m	**Coordinate:**	**Northing:**	Y=6072216.6m
Spud Date:	Mar.03, 2013		**Easting:**	X=651683.1m
Finished Date:	Mar.31, 2013	**Logging Geologist:**		VICTOR, RICKY, LEE
Core Size:	HWT/HQ/NQ	**Note:**		

Formation	Coal Seam	Core Depth Interval From	To	Thickness, m Thick	TRUE	Strata Dip	Coal Floor Elevation	Sample ID Coal	Rock	CBM	Rock Hardness	Rock Name	Lithology Description
Q		0.00	36.80	36.80								till	overburden, air-rig drilling, no core.
Hasler		36.80	41.40	4.60		14°						siltstone	grey, interbedded with light grey fine-grained sandstone laminates
		41.40	83.00	41.60								siltstone	grey, interbedded with light grey fine-grained sandstone (FGSS)laminates (20%), micro- horizont
		83.00	139.65	56.65		10°-13°						siltstone	grey, interbedded with light grey fine-grained sandstone (FGSS)laminates (20%), micro- horizont 125m—10°.
		139.65	161.60	21.95								siltstone	grey, with light grey fine-grained sandstone,153.0-157.0m little broken.
		161.60	182.22	20.62								siltsone	grey,muddy.
		182.22	191.35	9.13		13°						siltstone	grey, interbedded with light grey fine-grained sandstone (FGSS)laminates (5%); bedded plane: 18
		191.35	206.00	14.65								siltstone	grey,muddy.
		206.00	214.00	8.00		20°						siltstone	grey, interbedded with light grey fine-grained sandstone (FGSS)laminates (20%), micro- horizont
		214.00	221.80	7.80								siltstone	grey, interbedded with light grey fine-grained sandstone (FGSS)laminates (10%).
		221.80	235.50	13.70								siltstone	grey, interbedded with light grey fine-grained sandstone (FGSS)laminates (30%).
		235.50	240.40	4.90								siltstone	grey, interbedded with light grey fine-grained sandstone (FGSS)laminates (10%).
		240.40	250.00	9.60		20°						siltstone	grey, interbedded with light grey fine-grained sandstone (FGSS)laminates (35%); micro- horizont
		250.00	260.50	10.50								siltstone	grey, interbedded with fine-grained sandstone (FGSS)laminates (15%).
		260.50	278.50	18.00		20°						siltstone	grey, interbedded with light grey fine-grained sandstone (FGSS)laminates (30%), micro- horizont little broken.
		278.50	287.70	9.20								siltstone	grey
		287.70	304.40	16.70		20°						siltstone	grey, interbedded with fine-grained sandstone (FGSS)laminates (20%); bedded plane: 290m—20°.
		304.40	306.10	1.70								siltstone	grey,very broken. Numbers: 11/m.
		306.10	326.25	20.15		20°						siltstone	grey, interbedded with fine-grained sandstone (FGSS)laminates (30%), micro- horizontal bedding;
		326.25	327.00	0.75								siltstone	grey, very broken.
		327.00	350.10	23.10		20°						siltstone	grey, interbedded with light grey fine-grained sandstone (FGSS)laminates (20%); micro- horizont 20°.
		350.10	350.80	0.70								conglomerate	grey, fine grained, Ø:3mm, with siltstone,broken.
Boulder Creek		350.80	353.60	2.80								sandstone	light grey, fine grained, coal streak infilled fracture.
		353.60	365.00	11.40								mudstone	grey, bauxitic, with siltstone, little broekn.
		365.00	370.10	5.10								siltstone	grey.
		370.10	380.30	10.20		20°						sandstone	light grey, medium grained, coal infilled fracture, strong react with 5% HCL.
		380.30	386.00	5.70								mudstone	dark grey, silty, broken, rich in coal debris.
		386.00	393.87	7.87								siltstone	grey, with bauxitic mudstone at the medium part.
		393.87	399.74	5.87								sandstone	light grey,fine-coarse grained, coarse grained at the base, calcite infilled fracture, strong r
		399.74	402.50	2.76								mudstone	dark grey, broken.
		402.50	409.36	6.86								siltstone	grey, with FGSS, little broken.
		409.36	411.30	1.94								sandstone	light grey, fine grained, calcite infilled fracture, strong react with 5% HCL.
		411.30	416.64	5.34								siltstone	grey.
		416.64	418.24	1.60								sandstone	light grey, fine grained, react with 5% HCL.
		418.24	424.00	5.76								siltstone	grey, bauxitic, broekn.
		424.00	427.10	3.10								mudstone	grey, bauxitic, broekn.
		427.10	434.50	7.40								siltstone	grey, very broken, silty mudstone at 430.0-431.0m.
		434.50	435.26	0.76								mudstone	grey, bauxitic.
		435.26	436.17	0.91								mudstone	black, rich in coal debris, very broken. 435.50-435.55m, 5cm coal streak.
		436.17	440.15	3.98								siltstone	grey, with bauxitic mudstone, very broken.
		440.15	452.00	11.85		20°						sandstone	light grey, fine-grained. Calcite infilled fracture. Strong react with 5% HCL. bedding plane: 3
		452.00	457.12	5.12								sandstone	light grey, medium grained, little broken, calcite infilled fracture.
		457.12	460.14	3.02		27°						siltstone	grey, bedding plane: 459.0m—27°.
		460.14	460.61	0.47								mudstone	black.
	BC	**460.61**	**461.55**	**0.94**								**coal**	**BC coal seam, 0.94m, Rc: 0.74m, black bright.**
		461.55	462.66	1.11								mudstone	black, rich in coal debris. 461.95-462.02m, 7cm coal streak.
		462.66	464.18	1.52								conglomerate	grey, fine grained, Ø:2-5mm.
		464.18	465.25	1.07								sandstone	light grey, fine grained.
		465.25	465.70	0.45								conglomerate	grey, fine grained, Ø:7mm.
		465.70	467.80	2.10								sandstone	light grey, medium grained, with conglomerate partly, react with 5% HCL.
		467.80	477.30	9.50		35°						sandstone	white grey, fine grained; bedding plane: 470.0m—35°
		477.30	485.45	8.15		38°						sandstone	white grey, fine grained, interbedded thin layers of dark muddy siltstone (40%). bedding plane
Hulcross		485.45	511.00	25.55		35°						siltstone	dark grey, laminated white-grey fine sandstone (content:40%); bedding plane: 490.0m—38°; 494
		511.00	520.30	9.30								siltstone	grey, interbedded with light grey FGSS laminates (30%), little broken.
		520.30	529.70	9.40		30°						siltstone	grey, interbedded with light grey FGSS laminates (30%); bedding plane: 528.0m—30°.
		529.70	534.15	4.45								siltstone	grey, interbedded with light grey FGSS laminates (25%), broken.
		534.15	554.00	19.85		30°						siltstone	grey, interbedded with light grey FGSS laminates (35%), micro- horizontal bedding; bedded plane
		544.00	566.40	22.40		30°						siltstone	grey, interbedded with light grey FGSS laminates (30%), micro- horizontal bedding; bedded plane
		566.40	572.56	6.16		30°						siltstone	grey, interbedded with light grey FGSS laminates (40%); bedded plane: 570m—30°.
		572.56	572.80	0.24								conglomerate	grey, fine grained, Ø:5-8mm.
		572.80	575.49	2.69								sandstone	light grey, fine grained, with siltstone.
		575.49	578.17	2.68								mudstone	dark grey, silty.
		578.17	580.63	2.46		30°						sandstone	light grey, fine-grained. bedding plane: 580.0m—30°.
		580.63	581.73	1.10								siltstone	grey.
		581.73	581.96	0.23								mudstone	dark grey, rich in coal streak.
	#2	**581.96**	**582.61**	**0.65**								**coal**	**2# coal seam (0.65m), black, bright, broken. RC: 0.50m.**
		582.61	586.84	4.23		30°						siltstone	grey, sandy. bedding plane: 584.0m—30°.
		586.84	587.00	0.16								mudstone	black.
	#3	**587.00**	**588.60**	**1.60**				**Q1**				**coal**	**#3 coal seam(1.60m), black, bright, Rc:0.90m.**
		588.60	593.69	5.09								siltstone	grey.
		593.69	593.84	0.15								mudstone	dark grey, rich in coal film, very broken.
		593.84	596.00	2.16								mudstone	dark grey, rich in coal debris.
		596.00	601.06	5.06								sandstone	light grey, fine grained.
		601.06	606.50	5.44								siltstone	grey. Dark gery mudstone at 602.50-602.85m.
		606.50	607.80	1.30								sandstone	light grey, fine grained.
		607.80	609.42	1.62		30°						siltstone	grey, dip:30°
		609.42	**609.86**	**0.44**								**coal**	**coal seam, most of lost.**
		609.86	610.50	0.64								mudstone	dark grey, silty, rich in coal films.
		610.50	614.30	3.80								mudstone	dark grey, silty.
		614.30	617.25	2.95								mudstone	dark grey, rich in plant fossil and coal debris.
	#4	**617.25**	**617.60**	**0.35**								**coal**	**4# coal seam (0.35m), black, RC: 0.35m.**
		617.60	618.64	1.04								mudstone	dark grey, rich in coal debris.
		618.64	621.90	3.26								siltstone	grey.
		621.90	623.00	1.10								sandstone	light grey, fine grained.
		623.00	626.00	3.00								siltstone	grey, with dark gery mudstone, rich in coal streak.
		626.00	629.80	3.80								mudstone	dark grey, rich in coal streak. At 628.95-629.20, carbonaceous mudstone (C-MS).
		629.80	632.12	2.32		30°						siltstone	grey. bedding plane: 633.0m—30°.
		632.12	636.50	4.38								sandstone	light grey.
		636.50	641.31	4.81		30°						siltstone	grey, with light grey FGSS; horizontal bedding, bedding plane: 641.0m—30°.
	#5	**641.31**	**644.00**	**2.69**				**Q2**				**coal**	**5# coal seam (2.69m), black,bright, broken, no parting. RC:1.00m.**
		644.00	645.70	1.70								mudstone	dark grey, very broken, rich in coal debris and plant fossil.
		645.70	**646.28**	**0.58**								**coal**	**0.58m coal seam, black, bright, intact. Rc: 0.50m.**
		646.28	647.32	1.04								mudstone	dark grey, rich in coal debris.
		647.32	654.50	7.18								siltstone	grey.
		654.50	657.23	2.73								mudstone	dark grey, with coal streak.
	#6	**657.23**	**658.10**	**0.87**								**coal**	**coal seam (#6), 0.87m, black, broken, Rc: 0.50.**
		658.10	659.00	0.90								mudstone	carbonaceous mudstone, black, very broken, rich in coal debris.
		659.00	661.40	2.40								siltstone	grey, with mudstone.
		661.40	**661.90**	**0.50**								**coal**	**coal seam , 0.50m, black, most of lost, Rc: 0.05m.**
		661.90	663.20	1.30								mudstone	black, broken, rich in coal streak.
		663.20	665.00	1.80								sandstone	light grey, fine grained.
		665.00	668.75	3.75		40°						siltstone	grey, sandy. bedding plane: 668.0m—40°.
		668.75	671.25	2.50								mudstone	dark grey.
		671.25	**671.85**	**0.60**								**coal**	**coal seam,0.60m, Rc: 0.20m.**
		671.85	674.10	2.25								siltstone	grey.
		674.10	674.90	0.80								mudstone	black, rich in coal debris, broken.
		674.90	**675.40**	**0.50**								**coal**	**coal seam, most of lost, wash away.**
		675.40	678.57	3.17		38°						siltstone	grey, with FGSS, nuerous irregular vein and vug of calcite infilled fracture. bedding plane: 6
		678.57	683.50	4.93								mudstone	light black, massive, rich in coal streak; at base, silt.
	#7+1	**683.50**	**684.48**	**0.98**				**Q3**				**coal**	**#7+1 coal seam, 0.98m, no parting, good quality, black, bright, light, intact. Rc: 0.55m.**
		684.48	686.49	2.01		40°						sandstone	grey, fine grained, well-sorted; at top, 0.15m mudstone; interbedded with minor light black mud 686.20m. bedding plane: 686m—40°.
		686.49	688.00	1.51								mudstone	dark grey, at top, more silt.
	#7	**688.00**	**689.30**	**1.30**				**Q4**				**coal**	**#7 coal seam, 1.30m, RC: 0.50, broken into many pieces, no parting, black, light, bright.**
		689.30	690.30	1.00								mudstone	black, rich in coal streak.
		690.30	691.15	0.85								sandstone	light grey, fine grained, with a few dark grey siltstone. Dip: 40°.
		691.15	697.00	5.85								mudstone	light black, massive, numerous coal threads and carbonaceous debris, at base, more silt; at 694
		697.00	700.50	3.50		35°						siltstone	dark grey, interbedded with light grey FGSS laminates (30%), and abundant plant leaf fossil. At mainly.
		700.50	706.80	6.30		40°						siltstone	dark grey, massive, not clear bedding, numerous plant leaf/root fossil and coal film.bedded pla
		706.80	**707.05**	**0.25**								**coal**	**coal seam, 0.25m, black, broken,Rc: 0.20m.**
		705.05	713.98	8.93								mudstone	black, massive, pure mudstone, at 708.10-708.50m, more FGSS.
	#7-1	**713.98**	**715.49**	**1.51**				**Q5**				**cosl**	**#7-1 coal seam, 1.51m, no parting, good quality, black, bright, light, intact. Rc: 1.51m.**
		715.49	717.50	2.01								mudstone	black, massive, a few coal streak.
		717.50	719.50	2.00								sandstone	light grey, with dark grey siltstone laminates (30%), at 718.00m, bedded plane: 30°.
		719.50	721.28	1.78								mudstone	light black, massive, 0.04m coal seam at the bottom.
		721.28	722.45	1.17								sandstone	light grey, fine grained, with minor dark grey siltstone laminates.
		722.45	731.00	8.55								siltstone	dark grey, muddy, micro- horizontal bedding. At 730.0m, bedding plane: 30°, a few coal streak throu
		731.00	731.05	0.05								coal	0.05m caol seam, black, broken into many pieces.
		731.05	733.30	2.25								mudstone	light black, massive, rich in coal threads on bedding surface.
	#8	**733.30**	**736.05**	**2.75**				**Q6 Q7**				**coal**	**2.75m, 8# coal seam, RC:2.50m, lost: 2.60m, black, light, bright, half-broken; parting: ① 735.25m,0.10m, mudstone.**
		736.05	739.80	3.75		35°						mudstone	light black, numerous coal streak and carbonaceous debris. At 738.0m, bedded plane: 35°.
	#8-1	**739.80**	**740.73**	**0.93**				**Q8**				**coal**	**0.93m 8-1# coal seam, RC: 0.90m, black, light, bright, intact, no parting.**
		740.73	748.00	7.27								mudstone	light black, massive, richin coal streak, 001m/each. At 746.20-746.30m, 0.10m coal seam.
		748.00	751.80	3.80								siltstone	dark grey, interbedded with a few light grey FGSS laminates (10%) and calicite vein. At 750m, b
		751.80	753.10	1.30								sandstone	light grey, fine grained, interbedded with minor dark grey siltstone laminates (20%). Micro- ho vein.
		753.10	758.00	4.90								mudstone	dark grey, at the upper, very broken, more coal debris infilled slickenside. With siltstone at
		758.00	759.53	1.53		24°						sandstone	light grey, fine grained, interbedded with grey siltstone laminates. Calcite vein infilled frac
		759.53	762.22	2.69								mudstone	dark grey, rich in coal debris and leaf fossil.
	#9	**762.22**	**767.00**	**4.78**				**Q9**				**coal**	**#9 coal seam, 4.78m, black, shiny, light. Rc: 2.45m, no parting. Drill rig stuck at 767m, be longer.**
		767.00	776.00	9.00									change NQ bit from 767.0m, no core, lost all core.
		776.00	777.10	1.10								mudstone	dark grey, rich in coal debris.
		777.10	787.00	9.90		34°						siltstone	grey, with dark gery mudstone. Mirco-horizontal bedding, bedding plane: 783m—34°
		787.00	789.83	2.83								sandstone	light grey, fine grained, interbedded with grey siltstone laminates.
		789.83	794.00	4.17								siltstone	grey, with a few coal streak. Two calcite vein infilled fracture.
		794.00	804.40	10.40								sandstone	light grey, fine grained, interbedded with grey siltstone laminates, silty at lower part; Calci bedding plane: 800m—30°.
		804.40	808.65	4.25								mudstone	dark grey, rich in coal debris and leaf fossil.
	#10	**808.65**	**813.77**	**5.12**				**Q10 Q11**				**coal**	**#10 coal seam. 5.12m,RC: 1.75m, most of coal wash away, black, broken. parting: ① 8 813.24m, 0.14m, mudstone.**
		813.77	816.92	3.15								mudstone	dark grey, broken, rich in coal debris.
		816.92	823.00	6.08		34°						sandstone	light grey, fine grained,bedding plane: 822m—34°.
		823.00	831.00	8.00		33°						siltstone	grey, interbedded with light grey FGSS laminates; horizontal bedding, bedding plane: 828.0m—3
		831.00	836.00	5.00								sandstone	light grey, medium grained, calcite vein infilled fracture.
	#11	**836.00**	**836.53**	**0.53**								**coal**	**#11 coal seam, 0.53m, Rc: 0.14m, black, light, most of coal wash away.**
		836.53	838.42	1.89								mudstone	dark grey, broken, rich in coal debris.
		838.42	839.65	1.23								sandstone	light grey, fine grained, with grey siltstone laminates.
		839.65	847.50	7.85		35°						mudstone	dark grey, with grey siltstone, rich in coal debris and coal streak, bedding plane: 844m—35°.
		847.50	**848.00**	**0.50**								**coal**	**coal seam, 0.50m, wash away all.**
		848.00	858.40	10.40								siltstone	grey, with FGSS.
		858.40	866.00	7.60		37°						sandstone	light grey, fine grained, with a few dark grey siltstone. bedding plane: 862.0m—37°. Calcite
		866.00	866.70	0.70								mudstone	dark grey, very broken.
		866.70	881.60	14.90								siltstone	grey, calcite infilled fracture.
		881.60	885.70	4.10		35°						sandstone	light grey, fine graine. bedding plane: 882.0m—35°. Calcite infilled fracture.
		885.70	887.27	1.57								mudstone	black, carbonaceous in lower part, massive.
	#12	**887.27**	**888.45**	**1.18**				**Q12**				**coal**	**#12 coal seam, 1.18m, Rc: 0.12m, a few coal pieces left; broken, shiny, bright, light, no**
		888.45	894.60	6.15		35°-45°						mudstone	black, carbonaceous locally, interbedded thin layers of fine grained sandstone (40%); at 891.50 bedded plane: 35°, at 893.0m, bedded plane: 45°.
		894.60	919.05	24.45		45°						sandstone	light grey, medium grained; quartz and dark debris mainly; well sorted; with a few mudstone lam
		919.05	935.00	15.95								sandstone	light grey, fine grained, interbedded thin layers of black mudstone (content: 40%), horizontal Pyrite nodule (10*15mm) at 930.30m, at 932.70-932.80m, numberous minor calcite veins.
Gates													TD: 935.0m March 30, 2013.

Wapiti River — Drill Hole Core Log

Drilling Company:	Canada Dehua Drilling Ltd.	**Hole No.:**	WP1C17		
Rig Type:	VD-5000	**Collar Elevation:**	1250.6m		
Total Depth:	731.00m	**Coordinate:**	**Northing:**	6069372.9	
Spud Date:	nov.01, 2012		**Easting:**	651773.1	
Finished Date:	Nov.25, 2012		**Logging Geologist:**	Lee, David	
Core Size:	HWT/HQ		**Note:**		

Formation	Coal Seam	Core Depth Interval From	To	Thickness, m Thick	TRUE	Strata Dip	Coal Floor Elevation	Sample ID Coal	Rock	CBM	Rock Hardness	Rock Name	Lithology Description
Q		0.00	39.20	39.20								till	tri-cone, no core.
Hasler		39.20	77.80	38.60		7°						siltstone	grey, interbedded white-grey fine sandstone laminate (content: 25%), micro-horizontal bedding; at 50.0m, bedded plane:7° ; at 60.0m, bedded plane:7° ; at 59.20~60.0m, vertical fracture, fracture No:6/m; at 77.50~78.30m, vertical fracture, fracture No:10/m.
		77.80	95.10	17.30		7°						siltstone	light grey, blended fine sandstone (30%). no bedding predominately, a few bedding; at 83.0m, bedded plane: 7° ; at 90.0m, bedded plane: 7° ; at 88.30~88.60m, broken, fracture No:5/m.
		95.10	131.50	36.40		7°						siltstone	dark grey-light black, with a few MS laminate (2%), very muddy; at 97.80~100.70m, broken, a few vertical fracture, fracture No: 4/m; at 116.0~117.0m, few vertical fracture, fracture No:8/m; at 128.0~128.70m, broken, vertical fracture, fracture No:12/m; at 107.0m, bedded plane: 10° ; at 116.0m, bedded plane: 10° ; at 125.0m, bedded plane: 10° .
		131.50	163.00	31.50		10°						siltstone	dark grey, little muddy, with white-grey fine sandstone laminate (5%), micros-horizontal bedding; at 136.50~137.30m, broken, vertical fractures most, fracture No:15/m; at 148.50m, a layer of siderite, 0.10m thick; at 135.0m, bedded plan: 10° ; at 140.0m, bedded plane:10° ; at 149.0m, bedded plane: 10° ; at 160.00m, bedded plane:10° ; at 158.15m, a pyrite nodule (10*20mm); at 158.0m, bedded plane: 10° .
		163.00	197.50	34.50		10°						siltstone	grey, with numerous white-grey fine sandstone laminate (20%), micro-horizontal bedding; at 166.30~167.0m, broken, fracture No:12/m; at 169.30~171.0m, broken much into shattered, fracture No:50/m; at 194.0~194.20m, a vertical fracture, fracture No:2/m; at 166.0m, bedded plane: 10° ; at 170.0m, bedded plane: 10° ; at 180.0m, bedded plane: 10° ; at 190.0m, bedded plane: 10° .
		197.50	209.98	12.48		15°						siltstone	interbedded thin layers of white-grey fine sandstone (content: 30%), micro-horizontal bedding, few cross-bedding; at 197.0m, bedded plane: 15° ; at 200.0m, bedded plane: 15° ; at 203.0m, bedded plane:20° ; at 206.0m, bedded plane: 20° .
		209.98	220.36	10.38		15°						siltstone	dark grey, with fine sandstone laminate (5%); at 213.30~213.60m, broken, a vertical fracture, fracture:4/m.
		220.36	278.00	57.64								siltstone	dark grey, interbedded white and grey fine sandstone laminate, fine sandstone content: 25%; at 225.80~227.10m, fine sandstone content: 50%, micro-horizontal bedding, bedding developed, at 230.0m, bedded plane: 20° ; at 242.0m, bedded plane: 25° ; at 250.0m, bedded plane: 25° ; at 257.0m, bedded plane: 25° ; at 258.65~259.20m, broken, fracture No:15/m; at 270.0m, bedded plane: 10° ; at 275.0m, bedded plane: 10° .
		278.00	314.00	36.00								siltstone	dark grey, with white-grey fine sandstone laminate (content: 10%); at 278.0~284.0m, siltstone blended fine sandstone; at 289.25m, a pyrite nodule (1*5mm); at 287.50~289.0m, broken, fracture No:20/m; at 281.0m, bedded pane:10° ; at 290.0m,bedded plane:10° ; at 295.0m, bedded plane: 10° ; at 301.0m, bedded plane:10° ; at 310.0m, bedded plane:10° .
		314.00	327.96	13.96		10°						siltstone	dark grey, interbedded thin layers of fine sandstone; at 320.0m, bedded plane: 10° .
		327.96	328.10	0.14									conglomerate, white-grey, Φ: 2~10mm, quartz and debris, poorly-sorted, subangular-subrounded.
Boulder Creek		328.10	329.80	1.70		10°						siltstone	light grey, very muddy, with 3 layer of fine conglomerate, with coal debris locally.
		329.80	330.70	0.90		10°						sandstone	white-grey, medium-coarse grained, poorly-sorted, quartz predominately, bedded plane:10° .
		330.70	336.00	5.30		25° ~30°						siltstone	light grey; at 334.0~334.40m, a few minor vertical calcite veins; at bottom, with many MS laminate; at 335.0m, bedded plane:30° ; at 335.70m, bedded plane:25° .
		336.00	337.78	1.78		30°						sandstone	white-grey, medium-coarse grained, with dark silt mudstone laminate.
		337.78	345.10	7.32								mudstone	light black-black, massive, little bauxitic; at top, 0.25m, numerous coal lenses and coal fragment; at 344.40~345.10m, black, rich in carbonization of leaf fossil.
		345.10	361.50	16.40								mudstone	grey to light grey, massive, soft, can scratched by iron knife; at 349.0~349.50, banxitic MS, light black; at 351.25~351.45, little carbonaceous; at 356.80~356.95m, carbonaceous, with few coal streak; at bottom, with silt.
		361.50	364.10	2.60		20°						siltstone	light grey, interbedded thin layers of fine sandstone (40%) with dark MS laminate; at 363.0m, bedded plane:20° ; at 364.0m, coal debris on fracture plane.
		364.10	368.82	4.72		20°						sandstone	white-grey, medium-coarse grained, interbedded with few layers of fine conglomerate, quartz and dark debris, poorly-sorted; at middle part, a few coal lenses.
		368.82	377.90	9.08								mudstone	black, light black, little bauxitic; at 374.0~375.0m, more bauxitic, brown; at 375.0~375.90m, fine sandstone.
		377.90	381.50	3.60		20°						siltstone	light grey, interbedded fine sandstone layers; at 381.0m, bedded plane:20° .
		381.50	385.02	3.52		20°						sandstone	white-grey, fine-grained; at upper and lower part, numerous coal and carbonaceous MS lenses, bedded plane: 20° .
		385.02	398.30	13.28								mudstone	black, light black, grey, massive; at 385.02~386.30m, bauxitic MS; at 387.10~387.30m, siliceous mudstone, black, cannot scratched by iron knife; at 388.0~389.0m, siltstone, light grey.
		398.30	402.2	3.90		15°						sandstone	white-grey, fine grained; at top, with mudstone laminate; at 398.90~399.40m, black mudstone; at 398.50m, bedded plane:15° .
		402.2	410.00	7.80								mudstone	black, brown, massive, black mudstone and brown bauxitic MS interbedded.
		410.00	424.70	14.70								mudstone	black, massive, little bauxitic; at 412.10m, coal , 0.05m, broken, shiny, light; at 415.0~415.70m, little carbonaceous, with few coal laminate; at 419.90m, a coal streak, 5mm thick; at 412.70~421.80m, carbonaceous MS, with 2 coal film on bedding plane.
		424.70	424.90	0.20								mudstone	black, massive.
		424.90	425.45	0.55								mudstone	black, little carbonaceous, numerous coal streaks, and carbonization of tree branches fossil.
		425.45	427.55	2.10								mudstone	black, massive; at 427.20~427.30m, carbonaceous.
	BC	**427.55**	**427.70**	**0.15**								**coal**	**coal seam, 0.15m, RC: 0.13m, no parting, broken, shiny, light.**
		427.70	427.92	0.22								mudstone	black, with few coal streaks.
	BC	**427.92**	**428.00**	**0.08**								**coal**	**coal seam, 0.08m, RC: 0.08m, light, shiny.**
		428.00	435.00	7.00		15°						sandstone	white-grey, fine and medium grained interbedded, quartz predominately, moderately sorted, rounded ,unangular; bedded plane:15° .
		435.00	438.30	3.30		15°						sandstone	white-grey, medium grained, interbedded with thin layer of fine conglomerate, conglomerate content: (40%); bedded plane: 15° .
		438.30	449.10	10.80								sandstone	white-grey, fine-grained, with few thin layer of MS (0.10m thick); at 442.70m, bedded plane:15° ; at 448.0m, (15°).
		449.10	451.77	2.67								sandstone	fine grained, interbedded with layer of dark grey siltstone (30%).
		451.77	459.90	8.13		15°						sandstone	white-grey, fine grained, interbedded with thin layers of dark siltstone (50%); at 452.0m, (15°); at 457.0m, (15°), siltstone content:30%.
Hulcross		459.90	476.00	16.10		10°						siltstone	dark grey, with fine sandstone laminate (content:10%); at 467.0m, (10°); at 470.0m, bedded plane: 10° .
		476.00	487.00	11.00		10°						siltstone	light black, very muddy, with fine sandstone laminate (5%), horizontal bedding; at 476.0~476.60m, broken, vertical fracture, fracture No:4/m ; at 476.0m (10°); at 480.0m (10°).
		487.00	529.04	42.04		10°						siltstone	dark grey, little muddy, interbedded with thin layers of fine sandstone (content: 30%); at 488.0m (10°); at 490.0m, (10°); at 510.0m (10°); at 520.0m (10°); at 504.0m, 0.10m, limestone, white, reacting WITH 5%HCL strongly; at 509.10~512.0m, fine sandstone content: 70%; at 527.0m (15%); at 529.0m (20°).
		529.04	529.40	0.36								sandstone	white-grey, coarse-grained, quartz and debris, moderately-sorted, cross-bedding.
		529.40	530.04	0.64								sandstone	white-grey, fine grained.
	#1	**530.04**	**530.13**	**0.09**								**coal seam**	**0.09m, RC:0.09m, no parting, light, shiny.**
		530.13	531.70	1.57								mudstone	black, massive, rich in leaf fossil; at 530.85m, 0.05m coal seam, shiny. 530.90~531.15m, numerous vitrain lenses and laminate.
		531.70	532.90	1.20		15°						sandstone	white-grey, fine grained, interbedded with thin layers of dark silt mudstone, bedded plane:15° .
		532.90	533.35	0.45								mudstone	black, little carbonaceous, rich in carbonization of leaf fossil.
	#2	**533.35**	**534.17**	**0.82**				**Q1**				**coal seam**	**0.82m, RC:0.82m, half-broken, shiny, light, brittle, black; parting:534.0~534.10, 0.10m, black, MS. Coal structure: 0.65<0.10>0.07m.**
		534.17	535.70	1.53								mudstone	light black-black, massive, with leaf fossil.
		535.70	542.25	6.55		15°						sandstone	white-grey, fine-grained, interbedded with layer of black mudstone (content:40%); at 541.0m, bedded plane: 15° .
		542.25	547.15	4.90		15°						mudstone	black, massive; at 546.20m (15°).
	#3	**547.15**	**547.85**	**0.70**				**Q2**				**coal seam**	**0.70m, RC:0.32m, 0.38m lost, broken, light, bright, brittle. CO:547.15~547.71m, 0.56m, RC:0.19m. Parting: 547.71~547.75m, 0.04m, black, mudstone. CO: 547.75~547.85, 0.01m, RC:0.05m, 0.56<0.04>0.10m.**
		547.85	548.75	0.90		20°						mudstone	black, massive.
		548.75	550.30	1.55		20°						sandstone	white-grey, medium grained, with dark mudstone laminate, bedded plane: 20° , react with 5% HCL.
		550.30	552.10	1.80								mudstone	black, carbonaceous in part; at 550.49m, a coal streak; at 551.90~5552.10m, a few coal steak, at middle, coal seam, 0.06m, bright, light.
		552.10	561.50	9.40		20°						sandstone	white-grey, fine grained, interbedded with layer of black mudstone (50%); at 555.0m (20°).
		561.50	564.10	2.60								mudstone	black to carbonaceous, massive; at 562.50~562.70m, carbonaceous, a few coal lenses.
		564.10	568.30	4.20								mudstone	black; at upper part, fine sandstone; at bottom, 0.10m thick carbonaceous.
	#3-1	**568.30**	**568.61**	**0.31**								**coal**	**coal seam, 0.31m, RC:0.31m, half-broken, light, bright, no parting.**
		568.61	576.00	7.39								mudstone	black, with leaf fossil and carbonization of leaf fossil; at bottom, a few thin layers of FGSS; at 571.50m, bedded plane: 25° ; at 576.0m (25°).
		576.00	577.60	1.60		30°						sandstone	white-grey, fine-grained, with dark mudstone laminate.
		577.60	578.65	1.05								mudstone	black, carbonaceous mostly; at 557.60m, 0.04m coal seam,; at 557.80m, 0.06m coal,; at middle, 2 coal streak.
		578.65	580.00	1.35								mudstone	white-light grey, kaolinite, massive, soft, can scratched by iron knife, no reacting with 5% HCL.
		580.00	581.60	1.60								mudstone	black, massive.
		581.60	587.00	5.40								sandstone	white-grey, fine grained, well-sorted, dark debris and quartz.
		587.00	589.05	2.05		15°						siltstone	grey, interbedded with thin layers of FGSS and mudstone, bedded plane: 15° .
	5#	**589.05**	**593.42**	**4.37**				**Q3 Q4 Q5**				**coal**	**coal seam, 4.37m, RC: 3.97m, 0.40m lost at top, bright, light, brittle, black, intact; at top, broken into pieces. CO: 589.05~592.45, 3.40m, RC: 3.0m, 0.40m lost; parting: 592.45~592.56m, 0.11m, black, mudstone. CO: 592.56~593.42, 0.86m, RC: 0.86m, structure: 3.40<0.11>0.86m.**
		593.42	594.80	1.38		15°						mudstone	black; at 594.10m, bedded plane: 15° .
		594.80	**594.90**	**0.10**								**coal**	**coal seam, 0.10m, RC:0.10m, no parting.**
		594.90	595.52	0.62								mudstone	black, few coal steaks.
		595.52	**595.77**	**0.25**								**coal**	**0.25m, RC:0.25m, parting: 595.57m, 0.05m, mudstone, black.**
		595.77	597.16	1.39								mudstone	black, massive.
		597.16	**597.60**	**0.44**								**coal**	**0.49m, RC:0.44m. No parting, bright, light.**
		597.60	615.80	18.20								mudstone	black, massive; at 604.70~606.70m, fine sandstone; at 605.70~606.50m, carbonaceous, numerous coal streaks; at 605.70m, coal seam, 0.05m thick; at 609.50m, 609.90m, coal seam, 0.06m thick each; at 615.50~615.57m, 0.07m coal seam; at 615.57~615.80m, numerous coal steaks.
	#5-1	**615.80**	**617.00**	**1.20**				**Q6 Q7**		**CBM1**		**coal seam**	**1.20m, RC:1.0m, 0.2m lost, half-broken, bright, light, structure: 0.90<0.08>0.22m. CO: 615.80~616.70, 0.90m, RC: 0.70m, paring: 616.70~616.78, 0.08m, mudstone, black. CO: 616.78~617.0m, 0.22m, RC: 0.30m.**
		617.00	617.80	0.80								mudstone	black, massive; at middle part, carbonaceous.
		617.80	626.20	8.40								sandstone	white-grey, medium-grained, quartz and dark debris predominately, well-sorted, subangular-subrounded, not react with 5%HCL; at 626.50m, bedded plane: 20° ; at 623.0m (20°).
	6#	**626.20**	**626.65**	**0.45**								**coal seam**	**0.45m, RC: 0.25m, 0.20m lost, broken, bright, light, no parting.**
		626.65	627.25	0.60								mudstone	black, massive, carbonaceous in part, few coal streaks, broken throughout, broken number: 10/m.
		627.25	639.05	11.80								mudstone	black, massive; at middle, interbedded with a few thin layers of fine sandstone, rich in leaf fossil in mudstone; at 634.50m, bedded plane: 15° ; at 635.80m (15°);
Gates	**7#**	**639.05**	**640.25**	**1.20**				**Q8**				**coal seam**	**RC: 1.10m, 0.10m lost, half-broken, light, bright, brittle, no parting.**
		640.25	640.81	0.56								mudstone	black, massive.
		640.81	**641.00**	**0.19**								**coal seam**	**0.19m, RC: 0.19m, no parting, light, bright.**
		641.00	643.10	2.10								mudstone	black, massive, rich in leaf fossil; at 641.70~641.80m, few coal streaks; at 641.80~641.88m, 0.08m, coal seam, light, bright.
		643.10	647.00	3.90		15°						siltstone	light grey, with thin layers of fines sandstone, bedded plane:15° .
		647.00	659.10	12.10								sandstone	light grey, fine-medium grained, coarse toward base, moderately-sorted, quartz predominately; at lower part, medium-grained; at 650.0m (15°); at 653.0m (15°); at 655.75~656.80m, broken, fracture No:15/m, with numerous calcite veins, reacting with 5% HCL.
		659.10	674.15	15.05								sandstone	white-grey, fine-grained, interbedded dark thin layers of mudstone; at 659.0m (15°); at 668.0m, bedded plane: 15° ; at 670.0m (15°); at 673.0m (15°).
		674.15	680.06	5.91								mudstone	black, massive, rich in leaf fossil, and carbonization leaf fossil; at 677.0~679.0m, a few coal streaks; at 680.06~680.40m, coal seam, 0.36m, RC: 0.36m, no lost, at lower part, banded coal (680.30~680.40m), no parting, broken, light, bright.
		680.06	683.00	2.94								mudstone	black, massive, rich in leaf fossil.
	#8+1	**683.00**	**684.20**	**1.20**				**Q9 Q10**				**coal seam**	**1.20m, RC:1.15, 0.05m lost, half-broken, light, half-bright, easily be broken by fingers. CO: 683.0~683.87, 0.87m, RC: 0.82m, 0.05m lost; parting: 683.87~683.95m, 0.08m, black, mudstone; CO: 683.95~684.20m, 0.25m, RC: 0.25m, structure: 0.87<0.08>0.25m.**
		684.20	685.75	1.55		10°						mudstone	black; at middle part, interbedded with layers of fine sandstone; at 685.0m, bedded plane: 10° .
	#8	**685.75**	**695.00**	**9.25**				**Q11-Q18**		**CBM2**		**coal seam**	**9.25m, RC:6.50m, 2.75m lost, lost place: at 690.35~693.10m; at upper part, half-broken; at lower part, very broken, shattered; at 685.75~688.0m, 2.25m, banded coal, dull, coal seam interbedded with mudstone; structure of coal seam: 0.30<0.33>0.17<0.30>0.25<0.09>0.48+0.28<0.05>→→ 1.10<0.10>5.10<0.20>0.25<0.12>0.13m; CO:685.75~686.05, 0.30m, RC: 0.30m, dull, light; part 1:685.75~686.05, 0.30m, RC: 0.30m, dull, light; parting:686.05~686.38, 0.33m, carbonaceous mudstone, black, numerous vitrain streak. CO:686.38~686.55m, 0.17m, banded coal, dull, RC:0.17m; parting2: 686.55~686.85m, 0.30m, mudstone, black, broken, with a few coal streak. CO:686.85~687.10, 0.25m, very broken; parting 3: 687.10~687.19, 0.09m, black, mudstone; CO:687.19~687.67m, 0.48m, bright, light, banded coal in part. CO: boney coal, 287.67~287.95m, 0.28m, heavy, hard; parting 4, 287.95~288.0m, 0.05m, black, mudstone. CO: 688.0~689.10m, 1.10m, RC: 1.10m, broken, bright, light; parting 5: 689.10~689.20, 0.10m, black, mudstone. CO: 689.20~694.30m, 5.10m, RC: 2.35m, 2.75m lost, broken much, shattered, bright, light; part 6: 694.30~694.50m, 0.20m, black, mudstone, broken. CO: 694.50~694.75, 0.25m, RC: 0.25m, broken; parting 7: 694.75~694.87m, 0.12m, mudstone, blk. CO: 694.87~695.0, 0.13m, RC: 0.13m.**
	from 695m, chang to BQ	695.00	695.15	0.15								mudstone	black, massive, rich in leaf fossil.
		695.15	704.00	8.85								mudstone	black, very silt, with few layers of fine sandstone; at 696.20~696.90m, broken, vertical fracture; at 696.10m, 0.05m, coal, broken much; at 700.50m, 15° .
		704.00	712.10	8.10		15°						sandstone	white-grey, fine-medium grained, coarser to base; at lower part, medium grained, with dark mudstone laminate; at 708.20m, bedded plane: 15; at 709.50m, (15°).
		712.10	718.40	6.30								mudstone	black, massive; at 717.10m, coal streaks.
		718.40	**719.00**	**0.60**								**coal**	**0.60m, RC: 0.10m, 0.50m lost; only few coal fragment left, no parting, light, bright.**
		719.00	719.82	0.82								mudstone	black, massive.
	#9	**719.82**	**721.50**	**1.68**								**coal**	**1.68m, RC:0.05m, 1.63m lost, only few coal debris left, no parting, bright, light.**
		721.50	723.54	2.04								mudstone	black, with leaf fossil; at middle, a few thin layer of fine sandstone; at 722.80m, bedded plane:20° .
	#9-1	**723.54**	**724.23**	**0.69**								**coal seam**	**0.69m, RC:0.10m, broken, 0.59m lost, light, bright, no parting.**
		724.23	725.00	0.77								mudstone	black; at 724.90m (15°).
		725.00	726.60	1.60		20°						sandstone	white-grey, medium grained, with mudstone laminate; at 725.30m (20°); at 726.0m (20°); at 726.0m, few coal lenses.
		726.60	728.00	1.40								mudstone	black, massive; at 727.60m, 0.30m, coarse wash away; at middle and lower part, a few coal streaks.
		728.00	730.00	2.00								sandstone	white-grey, medium grained, quartz and dark debris predominately, well-sorted, subrounded and subangular.
		730.00	731.00	1.00								mudstone	black, massive, with leaf fossil and carbonization of leaf fossil.
													End Depth:731.0m .

Wapiti River — **Drill Hole Core Log**

Drilling Company:	Canada Dedua Drilling Company	**Hole No.:**	WP1C18
Rig Type:	VD-8000	**Collar Elevation:**	1339.4m
Total Depth:	1017.00m	**Coordinate: Northing:**	6073123.9
Spud Date:	6-Oct-12	**Easting:**	652442.8
Finished Date:	10-Nov-12	**Logging Geologist:**	Victor, Lee, Ricky
Core Size:	HWT, HQ	**Note:**	

Formation	Coal Seam	Core Depth Interval From	To	Thickness, m Thick	TRUE	Strata	Coal Floo	Sample ID Coal	Rock	CBM	Rock Hardness	Rock Name	Lithology Description
Q		0.00	9.60	9.60								till	overburden, weathered deposits, yellow-brown mudstone mainly; broken.
Hasler		9.60	40.00	30.40		15						siltstone	dark grey, muddy, interbedded with light grey fine-grained sandstone laminates(10%);horizontal bedding. from 27.0m-30m, very broken, broken into many pieces, broken number: 50/m; at 31.0m, bedding plane:15°.
		40.00	127.00	87.00		20						siltstone	dark grey, interbedded with FGSS laminates(20%);micro-horizontal bedding; at 43.0m, bedding plane:20° , at 45.0m, siderite nodule; at 58.0m, siderite nodule; at 70.0m, bedded plane:20° ; at 73.0m, siderite nodule.
		80.00	159.00	79.00		15-20						siltstone	dark grey, interbedded with FGSS laminates(30%),micro-horizontal bedding, at 87.00m, bedding plane:20° ; at 99.00m, 2 layers siderite or limestone? at 106.00m, bedded plane:20° ;at 120.00m, bedding plane:15° ;at 121.00m, 0.10m siderite. at lower part, FGSS laminates increased to 40%;at 126.00m, bedding plane:15° ; siderite laminates(thin) throughout; at 135.00-136.00m, calcite vein; at 141.00m, bedding plane:16° ;at 159.00m, bedding plane:25°.
		159.00	208.00	49.00		20-24						siltstone	dark grey, interbedded with light grey FGSS laminates(40%); micro-horizontal bedding; at 169.00m, bedding plane:20°. from 164.00-167.00m, broken; fracture number 15/m, minor sideritic thin laminates throughout; at 174.00m, bedding plane:24° ; at lower part, FGSS laminates decreased to 20%, little muddy, at 191.00m, bedding plane:21° ; at 198.00m, bedding plane:23°.
		208.00	243.70	35.70		23						siltstone	dark grey, interbedded with light grey FGSS laminates(20%);micro-horizontal bedding, little muddy; at 216.00m, bedding plane 23°. from236.50-239.50m, more FGSS laminates(40%). at base, minor siderite thin laminates. At 240.00m,
		243.70	285.00	41.30		25						siltstone	dark grey, interbedded with light grey FGSS laminates(15%);distorted bedding on FGSS bedding. at 245.00m,bedding plane 21° ;at 248.00-248.00m,0.08m siderite. at 253.00m, bedding plane 25° ;at 257.00m, bedding plane:25° ;at 271.23-271.33m, 0.10m kaolinite; at 271.00m, bedding plane:22° ;at 280.00m, bedding plane:25° ;at 284.00m, bedding plane:25°.
		285.00	319.04	34.04		25						siltstone	dark grey, interbeded with light grey FGSS laminates(30%); micro-horizontal bedding; at 293.00m, bedding plane:30° ; from 287.70-288.50m, broken, developed vertical fracture. A few siderite nodule throughout. At 295.30m, observed a shell fossil. At 298.00m, bedding plane: 25°. at lower part, little muddy. At
		320.00	349.00	29.00		25						siltstone	dark grey, interbeded with light grey FGSS laminates(5%),micro-horizontal bedding; at 330.00m, bedding plane:25°.from335.00- 337.00m, more light grey fine-grained sandstone laminates(25%). From 337.00-349.00m, FGSS laminates, not clear, disturbed bedding.
		349.00	399.80	50.80		25						siltstone	dark grey, interbedded with few light grey FGSS laminates(5%), little muddy, a few sideritic thin laminates throughout. At 349.30-349.80m, 2 layers sideritic laminates, 0.05 and 0.10m. at 372.30-372.40m, sideritic laminates 0.10m. At 390.00m, bedding plane:25°, at 398.00-398.80m, 2 layers sideritic
		399.80	407.50	7.70		25						siltstone	dark grey, interbedded with numerous, light grey FGSS laminates(40%),very much broken. at 404.00m,bedded plane:25°.
		407.00	416.00	9.00		20						siltstone	same features as above, plus FGSS laminates decreased to 5%. at 415.00m,bedding plane:20°.
		416.00	429.50	13.50		23						siltstone	same as previous intervals, plus light grey FGSS increased to 35%. at 418.00m, bedding plane:23° ; distorted bedding on FGSS surface. at lower part, more
		429.50	439.00	9.50		25						siltstone	dark grey, muddy(little), few FGSS laminates 2%, at top more sideritic thin laminates. at 434.50m,bedding plane:25°.at 439.00m,bedding plane:25°.
		439.00	477.00	38.00		25						siltstone	dark grey, interbedded with light grey FGSS laminates(30%).micro-horizontal bedding, small cross-bed on FGSS joint surface.at 451.00m,bedding plane:25°.at 468.50m,bedding plane:25°.a few bands of siderite(very thin).
		477.00	486.00	9.00								siltstone	same features as above, plus FGSS laminates decreased to 10%.
		486.00	490.00	4.00		25						siltstone	at 486.00m, bedding plane:25°. same as previous intervals, plus FGSS
		490.00	510.00	20.00		25						siltstone	dark grey, interbedded with few light grey FGSS laminates content:5%, little muddy. at 497.50m, bedding plane:25° ; pyrite nodule observed on joint surface at 497.50m. From 505.50-507.00m, more carbonaceous fragment suspended on bedding.at 508.50m, bedding plane:25°.
		510.00	540.50	30.50		25						siltstone	grey, interbedded with FGSS laminates(25%), micro-horizontal bedding; at 517.0m, dip25° ; at 527.0m, dip25° ; at 533.0m, dip25° 。
		540.50	550.50	10.00		25						siltstone	grey, interbedded with more FGSS laminates(35%), horizontal bedding; at 548.0m, dip25° 。
		550.50	550.65	0.15								conglomerat	light grey.
Boulder Creek		550.65	551.53	0.88								sandstone	light grey, medium grained, with conglomerate at the bottom。Top of Gates is
		551.53	554.50	2.97								mudstone	bauxitic, light grey
		554.50	565.30	10.80								mudstone	bauxitic, light grey, with siltstone, partly fossil of shell at 559.0m
		565.30	576.30	11.00								siltstone	grey, with dark grey mudstone. coal stringer inside.
		576.30	578.80	2.50								siltstone	dark grey, minor FGSS and bauxitic mudstone and few calcite vein. Massive.
		578.80	598.40	19.60								bauxitic mudstone	white-grey, massive, with few black mudstone. At base(from596.40-597.40m), more black mudstone.
		598.40	605.00	6.60								sandstone	FGSS. light grey, interbedded with light black mudstone laminates(30%),well-sorted, micro-horizontal bedding, at 601.00m, bedding plane:50° , slightly fracture, infilled irregular calcite vein. slickensided at various angles to
		605.00	609.50	4.50								sandstone	MGSS. light grey, infilled calcite vein on sandstone joint, slightly fracture, react with 5% HCL.
		609.50	617.40	7.90		38						bauxitic mudstone	massive, soft, white-grey, with few black mudstone and light grey FGSS Laminates. At top, broken, fracture developed. Minor carbonaceous Fragment. at 614.56m, bedding plane, 38°.
		617.40	623.85	6.45		45						sandstone	FGSS. light grey, interbedded with few dark grey siltstone laminates(5%), react with 5% HCL. horizontal bedding, at 620.50m,bedding plane:45°. fracture developed, filled calcite vein(irregular), slickensided at various angles to
		623.85	627.00	3.15								mudstone	massive, light black, more bauxitic, included Fe2+(red) . at top, broken, more black mudstone and minor coal film and carbonaceous fragment.
		627.00	632.50	5.50		45						siltstone	dark grey, interbedded with minor light grey FGSS laminates(5%),massive. at base, rich in plant root fossil and carbonaceous fragment , muddy. at 629.00m,
		632.50	639.25	6.75								bauxitic mudstone	white-grey, massive, calcite vein observed on joint surface . At 635.20-635.30m, broken, coal film.
		639.25	645.30	6.05		55						sandstone	FGSS. light grey, interbedded with dark grey siltstone laminates(30%). At 642.5-644.5m, more siltstone. micro-horizontal bedding, at 642.5m, bedding plane 55° ; at lower part, fracture developed, slickensided and shiny,
		645.30	656.15	10.85		65						sandstone	FGSS. light grey, pure, well sorted, quartz and debris mainly, interbedded with few light black mudstone laminates. Horizontal bedding, fracture developed, filled calcite vein, slickenside at various angles to core axis. At 652.00m, bedded plane 65°. may be hit F5 Fault!
		656.15	663.15	7.00								bauxitic mudstone	massive, white-grey. At 656.15-658.00m,brken, included minor Fe2+ inclusions(red colour)
		663.15	669.00	5.85		70						sandstone	FGSS, grey, interbedded with minor dark grey siltstone laminate(5%), calcite vein observed on joint surface. at 667.50m, bedding plane:70°.
		669.00	684.50	15.50								mudstone	dark grey, little slit, massive, pure, few siltstone, not clear bedding, at 680.3-681.00m, fracture developed, infilled calcite vein, dip: 80° (vertical)
		684.50	689.00	4.50		80						siltstone	dark grey, massive, competent, bedding plane is vertical(80-85°), horizontal bedding, fracture developed, infilled calcite vein, at 689.00m bedding plane 80
		689.00	727.50	38.50		75-80						sandstone	FGSS, light grey, interbedded with dark grey slitstone laminates(20%). vertical bedding, dip:80°. from 691.30-692.50m, horizontal fracture developed, very broken, broken into many pieces, slickenside at various angle to core axis, from 694.00-699.00m, fracture developed, infilled irregular calcite vein, distorted bedding on FGSS surface. FGSS and calcite vein react with 5% HCl. At 702.00m, bedding plane:80°. alternating with bands of calcite vein throughout (irregular). and slickenside and shiny. FGSS and calcite vein react with 5%
		727.50	738.00	10.50		85						siltstone	dark grey, fracture developed, infilled calcite vein, at 728.00m,bedding plane:70°. fracture surface are slickenside and shiny, at 735.00m bedding
		738.00	745.50	7.50								siltstone	same as previous interval, plus very broken, broken surface infilled minor calcite vein.
		745.50	748.50	3.00								mudstone	light black, massive, soft, scratch by knife, bauxitic.
		748.50	753.80	5.30		75						sandstone	FGSS, light grey, pure. at base, 0.50m broken, Infilled few calcite vein, at 750.0m, bedding plane:75°.
		753.80	755.20	1.40								siltstone	dark grey, very broken, broken surface are slickenside and shiny. inflliied calcite vein, slickenside at various angles to core axis.
		755.20	764.77	9.57		80						siltstone	dark grey, with light grey FGSS laminates(10%) . at 756.00m, dip:80°. alternately with bands of calcite vein. at top, minor bauxitic.
		764.77	767.50	2.73								sandstone	FGSS, grey. few bauxitic.
		767.50	769.30	1.80								siltstone	dark grey, massive. minor bauxitic , no clear bedding.
		769.30	772.35	3.05								mudstone	bauxitic mudstone, white-grey, massive, soft, scratch by knife. at base, 0.40m very broken, broken into many pieces.
		772.35	779.65	7.30		85						sandstone	FGSS, light grey , at top, 0.90m very broken, fracture developed, infilled calcite vein. at 776.00m, bedding plane:85°.
		779.65	781.50	1.85								sandstone	FGSS, interbedded with dark grey siltstone laminates(10%). very broken ,broken surface are slickensided and shiny. vertical fracture developed, infilled black mudstone. Fault zone.
		781.50	791.60	10.10		70						siltstone	dark grey, with light grey FGSS laminates(20%). from 785.50-786.80m, fracture developed, infilled calcite vein(irregular), minor Bauxitic, at 791.50m, bedding plane:70°. at base, coal film infilled fracture.
		791.60	835.00	43.40		67-75						sandstone	MGSS, light grey, well-sorted, quartz and debris predominately. horizontal bedding, alternating with bands of calcite vein. MGSS and calcite vein react with 5% HCl. at top, argillaceous debris and inclusion observed on bedding surface, at 801.00m bedding plane :67°. at 809.00m, bedded plane: 75°. from 817.00-818.00m, very broken, broken are slickensided and shiny, and infilled calcite vein. from 819.5-822.6m, very broken. broken surface are slickensided and shiny, and infilled calcite veins; at 825-826.5m, argillaceous pebbles. at base, with black mudstone laminates. at 834.00m, plane: 68 °
		835.00	842.28	7.28		75						sandstone	FGSS, grey. interbedded with dark grey siltstone laminates(30%); micro-horizontal bedding . at 840.00m, bedding plane:75°. from 839.00-841.00m, very broken. Compression and deformation, filled minor coal film, at 842.00-842.28m, very broken, broken into many pieces.
	BC'	**842.28**	**842.72**	**0.44**								**coal**	**coal seam ,RC: 0.43m, black, very broken. Broken into 2-3cm fragment.**
		842.72	850.85	8.13		65-80						sandstone	FGSS, grey, interbedded with dark grey siltstone laminates(20%); at 843m, bedding plane:65°.at 844.8-845.3m, very broken, slickensided and shiny, infill coal film.at 849m, bedding plane:80°. At base, tectonic zone, fractured. FGSS disturbed bedding, infilled carbonaceous and coal film.
		850.85	861.00	10.15		76						sandstone	CGSS-MGSS, light grey, with dark grey siltstone laminates(10%). at 852.90-853.20m and 854.7-855.0m, broken, fracture developed, infilled carbonaceous debris. at 855.00m, bedding plane: 76°. At 858.45-858.65m, 0.20m very broken. at lower part, CGSS mainly.
		861.00	861.50	0.50								mudstone	Bauxitic, white-grey.
		861.50	864.90	3.40		70						sandstone	FGSS, light grey, infilled few calcite vein on bedding; bedding plane,dip:70°
		864.90	867.90	3.00								sandstone	FGSS, light grey, quartz and debris predominately, normal-sorted.
		867.90	869.50	1.60		50						mudstone	black, massive, at top, minor Bauxitic, very broken; at 869m, bedding plane: 50
		869.50	870.00	0.50								sandstone	FGSS, with few black mudstone laminates.
		870.00	875.10	5.10								siltstone	dark grey, massive, not clear bedding. at base, 0.40m,bauxitic silt mudstone.
		875.10	878.80	3.70								mudstone	black, very broken. broken surface are slickensided and shiny, infilled a few coal seamlet.
		878.80	881.50	2.70		70						sandstone	FGSS, grey, interbedded with dark grey mudstone laminates(30%). at 879.00m, bedding plane:70°. at base, fracture developed, broken.
		881.50	884.40	2.90								mudstone	black, massive, little silt
	BC	**884.40**	**887.35**	**2.95**				**Q1,Q2**				**coal**	**2.95m BC coal seam, RC:2.45m, black, light, bright and half-intact. dip:65°**
		887.35	891.50	4.15								conglomerate	conglomerate, light grey, fine-grain,Φ:2-5mm,quarte and debris mainly ,poorly-sorted, subrounded- subangle.
		891.50	893.60	2.10								sandstone	CGSS, light grey
		893.60	901.30	7.70		40						conglomerate	conglomerate, light grey, fine-graind, Φ:2-5mm, poorly sorted. from 894.00-896m, MGSS. from 898.30-899.50m,MGSS. subrounded-subanglar, infilled few calcite vein. at 894.00m,dip:40°.
		901.30	905.60	4.30								conglomerat	conglomerate-bearing FGSS, light grey, conglomerate content:30%.
		905.60	908.00	2.40								conglomerat	conglomerate, light grey, fine-grained,
		908.00	909.50	1.50								conglomerat	conglomerate-bearing FGSS, conglomerate content:40%.
		909.50	912.15	2.65								conglomerate	conglomerate, light grey,fine-grained,Φ:2-7mm, poorly sorted, subrounded-subanglar quartz and debris mainly. Few quartz vein.
		912.15	923.40	11.25		80						conglomerate	conglomerate-bearing FGSS, light grey, with various angles quartz and debris mainly.at 923.00m,bedding plane:80°,infilled few black mudstone.
		923.40	926.15	2.75								conglomerat	conglomerate, light grey, fine-grained,
		926.15	933.00	6.85								conglomerate	conglomerate-bearing FGSS, from928.90-933.00m,fracture developed, infill numerous irregular quartz vein.
		933.00	934.80	1.80								conglomerat	conglomerate, light grey, fine-grained.
		934.80	936.00	1.20								sandstone	FGSS, light grey
		934.80	941.00	6.20								conglomerate	conglomerate, light grey, fine-grained. predominately quartz and debris,poorly-sorted,subround-subanglar,Φ:2-7mm.
		941.00	942.40	1.40								sandstone	CGSS,
		942.40	951.00	8.60		78						sandstone	FGSS, grey, pure. from 944.00-945.36m,very broken; at 945.00m,dip:78° ; a few quartz vein observed on bedding surface(irregular). at 951.00m,bedded plane:80
		951.00	953.70	2.70								mudstone	light black, massive, slightly fracture, slickensided and shiny.
		953.70	972.20	18.50		75						sandstone	FGSS, grey, pure, well-sorted, horizontal bedding. at top, slightly fracture, slickensided and shiny. from 960.00 to 963.50m,more quartz vein infilled. at 966.00m,bedded plane:75°.
		972.20	973.50	1.30		73						sandstone	FGSS, grey, with dark grey siltstone laminates(30%); dip:73°.
		973.50	975.68	2.18								conglomerat	conglomerate-bearing FGSS. conglomerate content:20%.
		975.68	983.00	7.32		75						sandstone	FGSS, light grey, pure, well-sorted, horizontal bedding; at 978m,dip:75°.
		983.00	984.75	1.75								mudstone	black, massive. fracture developed, slickensided and shiny.
		984.75	991.30	6.55								sandstone	light grey, with dark grey siltstone laminated (5%). From 985.70-985.45m, black mudstone.
		991.30	996.00	4.70		85						siltstone	dark grey, with light grey FGSS laminated (40%). Very broken, broken surface are slickensided and shiny. Distorted bedding on FGSS surface. At 993.00m, dip:
		996.00	1006.10	10.10								sandstone	light grey, pure, well-sorted. Quartz and debris mainly. At lower part, a few quartz vein (irregular), no react with 5% HCL.
		1006.10	1007.50	1.40		80						mudstone	black, with minor light grey FGSS laminated (5%). At 1006.00m, bedded plane: 80
		1007.50	1011.90	4.40								sandstone	grey, pure, well-sorted. With few dark grey siltstone laminated (5%).
		1011.90	1013.75	1.85		75						siltstone	dark grey, with light grey FGSS laminated. Very broken, broken surface are slickensided and shiny.
		1013.75	1017.00	3.25								sandstone	grey, with few dark grey siltstone laminated. Very broken, infilled quartz vein on joint surface. TD: 1017m. Nov.09, 2012.

Wapiti River — **Drill Hol**

Drilling Company:	Canada Dehua Drilling Ltd.		**Hole No.:**	WP1C20	
Rig Type:	VD-5000		**Collar Elevation:**	1284.4	
Total Depth:	951.0m	**Coordinate:**	**Northing:**	6071841	
Spud Date:	28-Jan-13		**Easting:**	651959.9	
Finished Date:	16-Feb-13		**Logging Geologist:**	Victor, Ricky, Raymond	
Core Size:	HWT/HQ/NQ		**Note:**		

Formation	Coal Seam	Core Depth Interval From	To	Thickness, m Thick	TRUE	Strata Dip	Coal Floor Elevation	Sample ID Coal	Rock	CBM	Rock Hardness	Rock Name	
Q		0.00	25.00	25.00								till	overburden, maybe; no core.
Hasler		25.00	42.00	17.00		15° 20°						Siltstone	siltstone, medium-gray, interbedded with light gray fine-grained sandstone laminated (30%), lit number: 20/m; at 39m, bedded plane: 20° .
		41.40	45.00	3.60								Siltstone	very broken.
		45.00	46.00	1.00								Siltstone	muddy siltstone mainly, few siderite thin laminated.
		58.00	63.00	5.00		23°						Siltstone	very broken, broken into many pieces; at 63m, bedded plane: 23° .
		63.00	90.00	27.00		20°						Siltstone	at 90m, bedded plane: 20° .
		90.00	109.00	19.00		30°						Siltstone	at 109m, bedded plane: 30° .
		110.50	111.50	1.00								Siltstone	very broken; broken number: 15/m.
		112.00	116.00	4.00								Siltstone	FGSS increased 30%.
		116.00	120.00	4.00		27°						Siltstone	at 120m, bedded plane: 27° .
		116.00	143.00	27.00		25°						Siltstone	FGSS laminated; content: 20%; at 137.10m - 139.50m, medium gray siltstone and light gray FGSS m
		143.00	162.00	19.00		20° 30°						Siltstone	same features as above, plus FGSS laminated decreased to 10%; at 151m, bedded plane: 20° ; from
		162.00	210.00	48.00		30° 35°						Siltstone	same features as above, muddy FGSS laminated 10%; at 166.65m - 166.75m, 0.10m, white-gray sider - 192m, broken into many pieces, fracture number: 10/m; at 197.53m, 0.01m pyrite vein; from 196
		210.00	222.50	12.50		30°						Siltstone	siltstone, medium-gray, interbedded with light gray FGSS laminated; content: 30%; micro-horizon
		222.50	234.00	11.50								Siltstone	same as previous interval, plus FGSS decreased to 5%.
		234.00	237.00	3.00								Siltstone	interlaminated siltstone and FGSS, medium gray.
		237.00	250.60	13.60								Siltstone	dark gray siltstone and light gray FGSS mix into each other mainly; not apparently bedding.
		250.60	291.00	40.40		30°						Siltstone	siltstone, dark gray, muddy with a few FGSS laminated, 3%; at 263m, bedded plane: 30° ; at 270m
		291.00	309.00	18.00		35°						Siltstone	dark gray siltstone bedded with light gray thin layer of fine-grain sandstone; sandstone: < thi
		309.00	342.50	33.50		30° 40°						Siltstone	dark gray siltstone bedded with light gray fine-grain sandstone; fine-grain sandstone: 10-20%;
		342.50	349.00	6.50								Siltstone	dark siltstone dominated; massive, fine-grained sandstone <5%.
		349.00	369.00	20.00		30° 35°						Siltstone	same as 309m - 342.50m, basically, fine-grained sandstone, getting more (25%- 35%), bedding pla
		369.00	374.60	5.60								Siltstone	dark gray siltstone, sandstone <5%.
		374.60	399.00	24.40		30°						Siltstone	dark gray siltstone bedded with light gray fine-grain sandstone (FGSS), (20% - 40%), dip: 30° .
		399.00	417.60	18.60		40°						Siltstone	same as upper layer only less content of fine-grained sandstone; (±20%); bedding plane: 40° ;
		417.60	468.00	50.40								Siltstone	dark gray siltstone bedded wit light gray FGSS; FGSS: 20%-50%; massive, few sliding plane appea
		468.00	477.00	9.00								Sandstone	light gray FGSS dominated (50% - 80%).
Boulder Creek		477.00	477.60	0.60								conglomerate	well-sorted conglomerate; Φ: 2-3mm, top of BC formation.
		477.60	478.30	0.70								Sandstone	(70cm FGSS).
		478.30	523.76	45.46		45° 50°						Mudstone	gray, yellowish, bauxitic mudstone; dark gray siltstone or mudstone and FGSS interbedded in sec fracture locally and fill with calcite veins (<5mm); dip in FGSS: 45° - 50° .
		523.76	531.90	8.14								Sandstone	gray FGSS bedded with siltstone, (<10%) laminations.
		531.90	539.40	7.50								Sandstone	gray medium size, well-sorted sandstone; at 539.05m - 539.15, 10cm conglomerate mudstone lump;
		539.40	545.10	5.70								Siltstone	dark gray siltstone.
		545.10	547.35	2.25								Sandstone	FGSS.
		547.35	554.35	7.00								Mudstone	pale gray-yellowish bauxitic mudstone.
		554.35	557.45	3.10		40°						Sandstone	gray FGSS; dip: 40° .
		557.45	566.35	8.90								Siltstone	light gray - gray siltstone; at 560.20m - 561.20m, whitish-gray, siliceous siltstone.
		566.35	583.50	17.15								Siltstone	gray-dark gray siltstone/FGSS/bauxitic mudstone interbedded in sections; fractured developed at
		583.50	592.12	8.62								Sandstone	gray FGSS.
		592.12	602.50	10.38								Sandstone	medium-coarse gray sandstone; thin coal seam (<1cm); filled in fractures along bedding.
	BC	**602.50**	**602.85**	**0.35**								**Coal**	**0.35m coal seam.**
		602.85	619.33	16.48		45° 50°						conglomerate	conglomerate dominated interbedded with medium-coarse sandstone; Φ:<15mm, sandstone, 3 section
		619.33	633.40	14.07								Sandstone	pure, FGSS, massive; in one layer of conglomerate (<10cm) at top.
		633.40	641.00	7.60								Sandstone	FGSS predominated with siltstone, interbedded; polish sliding plane developed, broken along bed
Hulscro		641.00	698.38	57.38								Sandstone	gray FGSS (70%) and dark gray siltstone (30%), interchanged in bedding; polished fracture plane
		698.38	698.43	0.05								limestone	5cm pale gray $CaCO_3$ netted siltstone.
		698.43	711.40	12.97								Siltstone	dark gray siltstone interbedded with gray siltstone/ or FGSS polishing plane developed as befor
		711.40	734.28	22.88		50°						Siltstone	massive dark gray-gray siltstone/ FGSS; lithology same as before, fracture not developed as bef
		734.28	734.38	0.10								limestone	0.14m, whitish kaolinite.
		734.38	742.80	8.42		50°						Siltstone	dark gray siltstone and gray FGSS interbedded, FGSS 50-60%; dip: 50° .
Gates		742.80	744.10	1.30								conglomerate	conglomerate, well-rounded; Φ:2mm-20mm.
		744.10	747.20	3.10								Siltstone	siltstone-FGSS-siltstone.
	#1	**747.20**	**747.25**	**0.05**								**Coal**	**coal seam.**
		747.25	752.62	5.37		40° 45°						Siltstone	siltstone, yellowish gray; dip: 40-45° .
	#2	**752.62**	**753.00**	**0.38**								**Coal**	**0.38m coal seam. RC: 50%**
		753.00	759.14	6.14		50°						Siltstone	gray siltstone-FGSS-siltstone; dip: 50° .
	#3	**759.14**	**761.00**	**1.86**				**Q1**				**Coal**	**1.86m coal seam; parting: 760.37-760.75m, 0.38m; Q1: 759.14m - 760.37m, 1.23m, RC: 30%. At**
		761.00	763.50	2.50								Sandstone	FGSS, predominated (75%).
		763.50	766.60	3.10								Siltstone	siltstone, broken.
	#4	**766.60**	**767.80**	**1.20**								**Coal**	**1.20m coal seam; composed of broken coal (0.50m), RC: 20%; two parting total 40cm; boney c**
		767.80	772.00	4.20								Siltstone	gray siltstone.
		772.00	777.20	5.20								Sandstone	FGSS/siltstone, interbedded in sections.
		777.20	778.87	1.67								Sandstone	FGSS.
		778.87	791.70	12.83								Siltstone	dark gray siltstone/black mudstone; thin coal seams (0.10cm-2cm); appear; at 781.30m - 789m, bl
		791.70	798.60	6.90		45° 50°						Sandstone	FGSS-medium-coarse sandstone; at 796m - 796.50, siltstone bedded with FGSS; coal in veins and b
		798.60	805.00	6.40								Siltstone	dark gray siltstone.
		805.00	809.30	4.30		40°						Sandstone	sandstone/siltstone (40%) interbedding in sections; bedding plane: 40° .
		809.30	813.00	3.70								Siltstone	massive gray siltstone.
	#5	**813.00**	**815.46**	**2.46**				**Q2**				**Coal**	**2.46m coal seam; RC: 60%; no parting found; Q2: 813m - 815.46m, 2.46m. Black, bright, ligh**
		815.46	830.25	14.79								Siltstone	siltstone, pure gray, no FGSS seen and massive.
		830.25	833.75	3.50								Mudstone	**black mudstone, there are 4 sections of coal seam exist, each <0.50m, total 1.01m. a.833.7**
		833.75	**833.90**	**0.15**								**Coal**	
		833.90	834.05	0.15								Mudstone	
	#6	**834.05**	**834.50**	**0.45**								**coal**	
		834.50	835.70	1.20								Mudstone	
		835.70	**835.83**	**0.13**								**coal**	
		835.83	837.20	1.37								Mudstone	
		837.20	**837.48**	**0.28**								**coal**	
		837.48	837.90	0.42								Mudstone	
		837.90	838.90	1.00								Sandstone	FGSS.
		838.90	840.50	1.60								Siltstone	siltstone.
		840.50	842.50	2.00								Sandstone	FGSS.
		842.50	846.80	4.30								Siltstone	dark gray siltstone-black mudstone-dark gray siltstone. Two coal seams in between; 844.28m - 84
		846.80	847.50	0.70								Sandstone	FGSS, $CaCO_3$ vein filled.
		847.50	853.00	5.50		45° 50°						Siltstone	siltstone with FGSS laminate, thin coal seam (<10cm) at 851.76m - 851.86m, dip: 45° -50° .
		853.00	855.50	2.50								Siltstone	siltstone.
		855.50	855.60	0.10								**Coal**	**0.10m coal seam.**
		855.60	858.40	2.80								Siltstone	dark gray siltstone.
	#7	**858.40**	**858.97**	**0.57**								**Coal**	**0.57m #7 coal seam; RC: 70%; black, shining.**
		858.97	861.30	2.33		42°						Siltstone	siltstone/FGSS interlaminated.
		861.30	863.12	1.82								Mudstone	black mudstone, broken; two coal seam in (<5cm/each seam), core loss: 0.50m.
		863.12	865.75	2.63								Sandstone	pure, FG-MG sandstone; at bottom minor dark gray siltstone laminated.
		865.75	868.40	2.65		45°						Siltstone	dark gray siltstone, a thin coal seam at 867.75m - 867.93m, 0.18m.
		868.40	884.40	16.00		45° 50°						Siltstone	gray siltstone, predominated with several sections of FGSS; core loss 0.40m at run of 876m -879
		884.40	892.20	7.80								Mudstone	black-dark gray mudstone at 889.30m - 890.10m, highly carbonated, and filled with thin coal vei
		892.20	892.70	0.50		47°						Sandstone	FGSS.
		892.70	901.70	9.00								Siltstone	dark gray siltstone/mudstone, fractured at 893.10m - 893.55m.
		901.70	901.80	0.10		45°						**Coal**	**0.10m coal seam.**
		901.80	902.80	1.00								Siltstone	dark gray siltstone, there are six thin layers of coal exist: ①902.80m - 903m, 0.20m; RC: 40%
		902.80	**903.00**	**0.20**								**coal**	912.15m, 0.05m; RC: 50% ⑥913.70m - 913.75m, 0.05m; RC: 30%;
		903.00	903.50	0.50								Siltstone	At run: 903m - 906m, core loss 1.10m; bedding plane dip: average 47° ; fractured developed in s
		903.50	**903.90**	**0.40**								**coal**	
		903.90	906.40	2.50								Siltstone	
		906.40	**906.60**	**0.20**								**coal**	
		906.60	908.90	2.30								Siltstone	
		908.90	**909.50**	**0.60**								**coal**	
		909.50	912.10	2.60								Siltstone	
		912.10	**912.15**	**0.05**								**coal**	
		912.15	913.70	1.55								Siltstone	
		913.70	**913.75**	**0.05**								**coal**	
		913.75	916.70	2.95								Siltstone	
		916.70	917.85	1.15								Sandstone	FGSS.
		917.85	919.40	1.55								Siltstone	siltstone.
		919.40	923.00	3.60								Mudstone	dark gray mudstone.
		923.00	926.50	3.50		45°						Siltstone	gray siltstone.
		926.50	929.70	3.20								Sandstone	FGSS.
		929.70	933.00	3.30								Siltstone	gray siltstone.
		933.00	939.75	6.75		50° 65°						Sandstone	FGSS with dark gray siltstone laminations; dip: 50° -65° ; $CaCO_3$ vein develop irregularly in th
		939.75	942.55	2.80								Siltstone	siltstone.
		942.55	945.70	3.15								Mudstone	dark gray mudstone, thin layers of coal filled at 944.30m and 945m.
		945.70	**951.00**	**5.30**		**45°**						**Siltstone**	**siltstone; dip: decreased to 45° . With minor coal streak. Stuck at #8 coal seam?**
													TD: 951.0m

Wapiti River — Drill Hole Core Log

Drilling Company:	Canada Dehua Drilling Ltd.	**Hole No.:**	WP1C24
Rig Type:	VD-5000	**Collar Elevation:**	1126.0m
Total Depth:	630.0m	**Coordinate: Northing:**	6073590.2
Spud Date:	14-Jan-13	**Easting:**	650058.5
Finished Date:	24-Jan-13	**Logging Geologist:**	Lee, Bo
Core Size:	HWT/HQ	**Note:**	

Formation	Coal Seam	Core Depth Interval From	To	Thickness, m Thick	TRUE	Strata Dip	Coal Floor Elevation	Sample ID Coal	Rock	CBM	Rock Hardness	Rock Name	Lithology Description
Q		0.00	27.90	27.90								till	starting coring.
Hasler		27.90	54.30	26.40		10° 15°						Siltstone	siltstone, dark grey, interbedded with thin layers of white-grey, fine sandstone (30%), mi bedding, bedding developed; at 31.50m - 32.20m, broken, fracture no: 20/m; at 29.30m, bedd 39m, bedded plane: 15°; at 45m, bedded plane: 10°; at 51m, bedded plane: 10°.
		54.30	123.75	69.45		15°						Siltstone	siltstone, dark grey, with white-grey fine sandstone laminate (20%); horizontal bedding; broken, fracture no: 8/m; at 65m, bedded plane: 15°; at 75m, bedded plane: 15°; at 96.75m vertical fracture, fracture no: 8/m; at 93m, bedded plane: 15°; at 108m, bedded plane: 15° plane: 15°.
Boulder Creek		123.75	124.40	0.65								conglomerate	conglomerate, light grey; Ø: 3-5mm, quartz, charts and dark debris; well-sorted, rounded,
		124.40	133.00	8.60		15°						Mudstone	mudstone, grey-brown, massive at upper and lower part with bauxitic; at 132m - 132.40m, a sandstone; at 129.50m, a few vitrain lenses; at 131.70m - 132.20m, broken, fracture no: 8/ plane: 15°; at 132m, bedded plane: 15°.
		133.00	134.00	1.00								Siltstone	siltstone, grey, massive.
		134.00	134.70	0.70								Sandstone	Sandstone, light grey, medium-grained, with numerous minor coal lenses.
		134.70	140.50	5.80								Mudstone	mudstone, brown-grey, bauxitic, massive.
		140.50	141.40	0.90		15°						Sandstone	sandstone, white-grey, fine-grained; at 140.65m, bedded plane: 15°.
		141.43	144.50	3.07								Mudstone	mudstone, brown-light grey, bauxitic; massive.
		144.50	152.90	8.40		20°						Siltstone	siltstone, light grey, interbedded with layers of light grey fine sandstone (50%); at 150. 20°; from 149.80m - 152.50m, little broken, fracture no: 8/m.
		152.90	165.40	12.50		20°						Mudstone	mudstone, bauxitic, brown-grey, little silt; at 163.50m, bedded plane: 20°.
		165.40	168.70	3.30		20°						Sandstone	sandstone, white-grey, fine-grained; quartz predominately, well-sorted; at lower part; dis 167.50m, bedded plane: 20°.
		168.70	174.30	5.60								Sandstone	sandstone, white-grey, course-grained; at 172m - 172.20m, a few carbonaceous mudstone lens and dark debris, moderately-sorted, subangular-subrounded.
		174.30	178.80	4.50								Mudstone	mudstone, brown-grey, bauxitic, massive.
		178.80	184.05	5.25		25° 30°						Sandstone	sandstone, light grey, fine-grained, interbedded with dark siltstone laminate; at lower pa black mudstone; at 179.80m, bedded plane: 25°; at 182m, 0.01m thick calcite, white; at 182
		184.05	206.30	22.25		25°						Mudstone	mudstone, black, light black; interbedded with a few layers of fine sandstone; mostly dist 197.30m, bedded plane: 25°; at 204.50m, bedded plane: 25°.
		206.30	210.50	4.20								Mudstone	mudstone, black, brown-grey, at middle part, brown-grey bauxitic mudstone; at upper and lo mudstone, carbonaceous in part, with a few coal streaks.
		210.50	221.70	11.20		25°						Mudstone	mudstone, light black to black; at lower part, black; at upper part, light black with a fe sandstone; at 217.70m - 218.70m, broken much into pieces; fracture no: 45/m; at 221m, bed
	BC	**221.70**	**222.00**	**0.30**								**Coal**	**coal seam, 0.30m, RC: 0.30m, half-broken; no parting, shiny, bright, light.**
		222.00	229.80	7.80		25°						Sandstone	sandstone, white-grey, fine-grained; interbedded with a few thin layers of fine conglomer plane: 25°.
		229.80	231.12	1.32								conglomerate	conglomerate, light grey; Ø: 3-5mm, quartz, green charts and dark debris; subrounded, mode
		231.12	241.50	10.38		25°						Sandstone	sandstone, white-grey, fine-grained, quartz predominately; at 235.30m, bedded plane: 25°.
		241.50	248.80	7.30		30° 20°						Sandstone	sandstone, white-grey, fine-grained, interbedded with thin layers of dark silt mudstone (4 bedding; at 242.50m, bedded plane: 30°; at 246m, bedded plane: 20°.
Hulcross		248.80	252.50	3.70		25°						Siltstone	siltstone, light black, muddy, interbedded with thin layers of white-grey, fine sandstone, siltstone content: 50%; at 252m, bedded plane: 25°.
		252.50	267.90	15.40		20°						Siltstone	siltstone, dark grey; interbedded with thin layers of white-grey fine sandstone content: 4 plane: 20°.
		267.90	289.00	21.10		20°						Siltstone	siltstone, dark grey; interbedded with thing layers of fine sandstone (30%); horizontal be 273.60m, broken, fracture no: 30/m; at 270m, bedded plane: 20°; at 280m, bedded plane: 20°
		289.00	320.84	31.84		20° 25°						Siltstone	siltstone, dark grey; interbedded with thin layers of white-grey fine sandstone (40%); hor 299.30m - 299.80m, 0.10m thick, argillaceous limestone, white-grey; at 295m, bedded plane: plane: 20°; at 306m, bedded plane: 25°; at 312m, bedded plane: 25°; at 318m, bedded plane:
		320.84	321.45	0.61		20°						Sandstone	sandstone, white-grey, fine-grained; with dark mudstone laminate; at 231m, bedded plane: 2
	#1	**321.45**	**321.63**	**0.18**								**Coal**	**coal seam, 0.18m, RC: 0.18m, half-broken; no parting, shiny, light.**
		321.63	323.30	1.67								Mudstone	mudstone, brown-grey, bauxitic; with minor tree branch fossil.
		323.30	323.80	0.50		30°						Sandstone	sandstone, white-grey, fine-grained.
		323.80	329.00	5.20		30°						Mudstone	mudstone, light black, silt, interbedded with thin layers of fine sandstone (40%); with le plane; at 327m, bedded plane: 30°.
		329.00	332.20	3.20								Mudstone	mudstone, black, little silt; massive; at 330.70m - 330.90m, 0.20m coal, shiny; at bottom, coal.
	#3	**332.20**	**332.81**	**0.61**								**Coal**	**coal seam, 0.61m, RC: 0.55m, 0.06 lost, broken; shiny, light. CO: 332.20m - 332.60m, 0 parting: 332.60m - 332.70m, 0.10m black mudstone. CO: 332.70m - 332.81m, 0.11m; RC: 0. Structure: 0.40<0.10>0.11m.**
		332.81	335.90	3.09		35°						Mudstone	mudstone, black, with a few carbonaceous laminate; at 334.70m - 335.50m, a few vitrain str thick, coal seam; at 333.50m, bedded plane: 35°.
		335.90	352.10	16.20		40° 30°						Mudstone	mudstone, black, little silty; with leaf fossil; at 337.90m - 338.70m, a layer of fine san bedded plane: 40°; at lower part, with a few thin layers of fine sandstone; at 336m - 337. mudstone; at 344.50m, bedded plane: 40°; at 345.50m, bedded plane: 30°; at 348.30m - 349.3 brown.
		352.10	353.00	0.90		30°						Sandstone	sandstone, white-grey, fine-grained.
		353.00	359.90	6.90								Mudstone	mudstone, black, at upper part, interbedded with thin layers of fine sandstone; at middle numerous coal streaks; at 356.30m - 356.50m, coal seam; 0.20m, RC: 0.20m; half-broken, bri parting; at 359.30m - 359.40m, 0.10m coal seam, much broken, shiny, light; no parting.
		359.90	362.70	2.80		30°						Sandstone	sandstone, white-grey, fine-grained; interbedded with laminate of dark mudstone; at 362m b
		362.70	369.02	6.32								Sandstone	sandstone, white-grey, medium-grained, quartz and dark debris; well-sorted; at 314m, bedde 366.50m, bedded plane: 30°; at bottom, numerous coal thread.
		369.02	369.92	0.90		27°						Mudstone	mudstone, black; at 369.20 bedded plane: 27°.
	#5	**369.92**	**371.33**	**1.41**				**Q1 Q2**				**Coal**	**coal seam, 1.41m, RC: 0.95m, 0.46m lost at top; half-broken, shiny, bright, brittle, b 371.03m, 1.11m, RC: 0.55m, 0.46m lost; parting: 371.03m - 371.08m, 0.05m, medium muddy 371.33m, 0.25m, RC: 0.25m; structure: 1.11<0.05>0.25m.**
		371.33	371.43	0.10								Mudstone	mudstone, black, carbonaceous, massive.
		371.43	372.40	0.97								Mudstone	mudstone, brown-grey, bauxitic.
		372.40	375.00	2.60		20°						Siltstone	siltstone, grey; at 374m bedded plane: 20°.
		375.00	380.30	5.30		15° 20°						Sandstone	sandstone, white-grey, medium-grained with dark mudstone laminate; numerous coal lenses an throughout; at 376m, bedded plane: 15°; at 380m, bedded plane: 20°.
		380.30	382.70	2.40		20°						Mudstone	mudstone, black; at upper part, carbonaceous in part; numerous coal streaks at upper and m 381.70m, bedded plane: 20°; at 381.20m - 381.80m, broken, fracture no: 6/m; at 383.20m - 3 fracture.
		382.70	384.60	1.90		20°						Sandstone	sandstone, white-grey, fine-grained; at 384m, bedded plane: 20°.
		384.60	390.30	5.70								Mudstone	mudstone, brown-grey, bauxitic, massive.
		390.30	396.10	5.80		25°						Siltstone	siltstone, light grey; interbedded with thin layers of fine sandstone; at 395m, bedded pla
		396.10	398.30	2.20								Mudstone	mudstone, black, little silty; with a few coal streaks.
		398.30	406.00	7.70		30°						Sandstone	sandstone, white-grey, medium-grained, with dark siltstone laminate; at upper part, numero coal streaks; at 400m, bedded plane: 30°; at 402m, bedded plane: 30°.
		406.00	411.15	5.15		40°						Sandstone	sandstone, light grey, fine-grained; with dark siltstone laminate; at 408m, bedded plane: bedded plane: 40°; at 408.80m - 410.10, numerous coal lenses.
		411.15	414.99	3.84								Mudstone	mudstone, black, massive.
	#6	**414.99**	**415.65**	**0.66**								**Coal**	**coal seam, 0.66m, Rc: 0.66m, half-broken; no parting, shiny, bright, light.**
		415.65	416.48	0.83								Mudstone	mudstone, black, carbonaceous in part; at 416m, 0.05m coal seam; at 416.25m, 0.10m coal se
	#6-1	**416.48**	**417.00**	**0.52**								**Coal**	**coal seam, 0.52m, RC: 0.52m, half-broken; no parting, shiny, light.**
		417.00	419.30	2.30								Mudstone	mudstone, black, massive; at 417m - 417.55m, a few coal streaks.
	#7-1	**419.30**	**419.60**	**0.30**				**Q3 Q4**				**Coal**	**coal seam, 0.30m, RC: 0.30m, half-broken, brittle, light, shiny; no parting.**
		419.60	423.50	3.90								Mudstone	mudstone, black, massive; at 422m - 422.17m, 0.17m thick, coal seam, broken; no parting, s
	#8	**423.50**	**423.62**	**0.12**								**Coal**	**coal seam; 0.12m, RC: 0.12m; intact; no parting, shiny, light.**
		423.60	423.80	0.20		35°						Sandstone	sandstone, white-grey, fine-grained; with dark mudstone laminate.
		423.80	428.40	4.60								Mudstone	mudstone, black, carbonaceous in part; a few coal streaks.
		428.40	435.50	7.10		35°						Sandstone	sandstone, white-grey, fine-grained; interbedded with dark silt mudstone laminate; distort plane: 35°.
		435.50	441.58	6.08		40°						Mudstone	mudstone, black, massive; rich in leaf fossil; at 440.10m - 440.80m; a layer of fine sands bedded plane: 40°.
	#9	**441.58**	**442.13**	**0.55**								**Coal**	**coal seam, 0.55m, RC: 0.55m, broken; no parting, shiny, light.**
		442.13	451.40	9.27								Mudstone	mudstone, black, massive; with leaf fossil; at 449.80m - 450.40m; broken, fracture no: 10/ thick, coal seam; at 451.35m, 0.07m coal seam, shiny.
	#10	**451.40**	**452.40**	**1.00**				**Q5 Q6 Q7 Q8**		**CBM1**		**Coal**	**coal seam, 1.0m, RC: 0.90m; 0.10m lost; intact- half broken, shiny, light. CO: 451.40m RC: 0.15; shiny. Parting: 451.55m - 451.60m, 0.05m, black, mudstone. CO: 451.60m - 452 0.70m, shiny, light. Structure: 0.15<0.05>0.80m.**
		452.40	457.30	4.90								Mudstone	mudstone, black; at 453.80m, 0.10m carbonaceous; at 454.50m, 0.20m carbonaceous.
	#11	**457.30**	**457.50**	**0.20**								**Coal**	**coal seam, 0.20m, RC: 0.20m, broken; no parting, shiny, light.**
		457.50	461.30	3.80		35°						Sandstone	sandstone, white-grey, fine-grained; with dark mudstone laminate; at 453.50m - 458.50m, ve fracture no: 8/m; at 459m, bedded plane: 35°.
		461.30	482.40	21.10		40° 35° 30°						Sandstone	sandstone, white-grey, fine-grained; well-sorted; quartz predominately, interbedded with t laminate of black mudstone (30%); at 464m, bedded plane: 35°; at 470m, bedded plane: 30°; plane: 30°; at 480m, bedded plane: 40°; at 482m, bedded plane: 30°.
		482.40	484.35	1.95		30°						Mudstone	mudstone, black; at 482.60m, bedded plane: 30°.
	#12	**484.35**	**489.12**	**4.77**				**Q9 Q10 Q11 Q12**		**CBM2**		**Coal**	**coal seam, 4.77m, RC: 3.40m, 1.37m lost; lost place: 485.60m - 487.17m; half-broken, l 484.35m - 485.10m, 0.75m; RC: 0.75m. Parting: 485.10m - 485.39m, 0.29m, black mudstone 487.27m, 1.88mm RC: 0.51m, 1.37m lost. Parting: 487.27m - 487.40m, 0.13m black mudston 487.55m, 0.15m. parting: 487.55m - 488m, 0.45m, black mudstone with a few coal streaks 489.12m, 1.12m. Structure: 0.75<0.29>1.88<0.13>0.15<0.45>1.12m**
		489.12	489.60	0.48								Mudstone	mudstone, black, massive; few coal streaks.
		489.60	489.80	0.20								Coal	coal seam, 0.20m, RC: 0.20m; no parting, shiny, light.
		489.80	490.35	0.55								Mudstone	mudstone, black, massive; at lower part, carbonaceous.
		490.35	490.65	0.30								Coal	0.30m coal seam, RC: 0.30m; no parting, intact.
		490.65	491.10	0.45								Mudstone	mudstone, black, at lower part, carbonaceous.
		491.10	491.40	0.30								Coal	coal seam, 0.30m, RC: 0.30m; no parting, shiny, light, intact.
		491.40	492.30	0.90								Mudstone	mudstone, black; with a few coal streaks.
		492.30	492.37	0.07								Coal	0.07m coal seam.
		492.30	493.60	1.30								Mudstone	mudstone, black; massive.
		493.60	496.00	2.40		30°						Siltstone	siltstone, grey; at 495m, bedded plane: 30°.
		496.00	497.40	1.40								Mudstone	mudstone, black, massive.
		497.40	505.00	7.60								Coal	**coal seam, 7.60m, RC: 3.70m; 3.90m lost. Lost place: 498.15m - 500.85m, 2.70m; 497.60m 504.20m - 505m, 0.80m, broken, shiny, bright, light. CO: 497.40m - 500.85m, 3.45m, RC: Parting: 500.85m - 501m, 0.15m, broken, RC: 0.10m, mudstone. CO: 501m - 505m. 4.0m, RC half-broken; shiny, bright, light. structure: 3.45<0.15>4.0m.**
		505.00	517.85	12.85		45°						Sandstone	sandstone, white-grey, fine-grained, quartz predominately; well-sorted; with dark mudstone 505.10m, bedded plane: 45°; at 510m, bedded plane: 45°; at 511.20m - 513.20m, broken, frac few calcite veins.
		517.85	525.70	7.85		30°						Siltstone	siltstone, dark grey; interbedded with layers of white-grey, fine sandstone (40%); at midd minor calcite veins; at 519.30m, bedded plane: 30°.
		525.70	541.50	15.80		40°						Sandstone	sandstone, white-grey, fine-grained; with black mudstone laminate, horizontal bedding; fro numerous coal lenses; from 527.60m - 531m; broken, fracture no: 15/m; at 526m, bedded plan bedded plane: 40°; at 534m, bedded plane: 40°; from 534m - 539.70m, numerous calcite veins
		541.50	550.50	9.00		40°						Mudstone	mudstone, light black, silt; interbedded with layers of white-grey, fine sandstone; at 548 at 548.50m - 549m, a vertical fracture in filling calcite crystal.
		550.50	552.30	1.80		35°						Mudstone	mudstone, black; at upper part with fine sandstone laminate; at lower part, with a few coa bedded plane: 35°.
	#13	**552.30**	**555.65**	**3.35**				**Q13 Q14**				**Coal**	**coal seam, 3.35m, RC: 0.90m; 2.45m lost. Lost place: 552.30m - 554.20m. 1.90m lost; 55 lost. CO: 552.30m - 554.75, 2.45m, RC: 0.55m, 1.90m lost. Parting: 554.75m - 555m, 0.2 mudstone. CO: 555m - 555.65m, 0.65m, RC: 0.10m, 0.55m lost. structure: 2.45<0.25>0.65m**
		555.65	557.00	1.35								Mudstone	mudstone, black, massive; carbonaceous in part; with a few coal streaks.
		557.00	559.50	2.50		30°						Mudstone	mudstone, light black; very silt, with a leaf fossil on bedding plane; at 557.50m bedded p
		559.50	566.60	7.10		35°						Sandstone	sandstone, white-grey, fine-grained; quartz predominately, well-sorted; with a few dark mu 561.70m, bedded plane: 35°.
		566.60	573.00	6.40		30°						Siltstone	siltstone, light black muddy; interbedded with thin layer of fine sandstone; horizontal be bedded plane: 30°.
		573.00	575.85	2.85		25°						Sandstone	sandstone, white-grey, medium-grained; interbedded with thin layers of black mudstone; at 25°.
	#14	**575.85**	**576.00**	**0.15**								**Coal**	**coal seam, 0.15m; RC: 0.15m; no parting, broken, shiny, light.**
		576.00	576.38	0.38								Mudstone	mudstone, black; massive.
	#15	**576.38**	**576.78**	**0.40**								**Coal**	**coal seam, 0.40m, RC: 0.40m, broken; no parting, shiny, light.**
		576.78	580.00	3.22								Mudstone	mudstone, black, massive; at upper part, carbonaceous in part and a few coal streaks and l
		580.00	587.05	7.05		30°						Mudstone	mudstone, black, at upper and lower part, carbonaceous in part; at middle part, white-grey 585.60m, 0.05m coal seam; at 582.70m, bedded plane: 30°; at 585m, bedded plane: 30°.
	#11-1	**587.05**	**587.60**	**0.55**								**Coal**	**coal seam, 0.55m, RC: 0.15m; half-broken, shiny, bright, brittle. CO: 587.05m - 587.25 Parting: 587.25m - 587.35m, 0.1m, carbonaceous mudstone. CO: 587.35m - 587.60m, 0.35m, Structure: 0.20<0.10>0.35m.**
		587.60	589.70	2.10								Mudstone	mudstone, black, massive; with a few coal streaks.
	#12	**589.70**	**591.10**	**1.40**				**Q15**				**Coal**	**coal seam, 1.40m. RC: 0.75m, 0.70m lost at top, broken, shiny, bright, brittle; no par**
		591.10	591.80	0.70								Mudstone	mudstone, black, massive; rich in leaf fossil.
		591.80	594.85	3.05		30°						Sandstone	sandstone, white-grey, fine-grained; interbedded with black mudstone laminate; at bottom, 594m, 0.03m coal seam, shiny, light; at 593m, bedded plane: 30°.
		594.85	605.68	10.83		35° 40°						Sandstone	sandstone, white-grey, medium-grained; quartz and dark debris predominately; well-sorted, rounded; at upper part, few calcite veins; at 597.50m - 597.90m; broken, fracture no:6/m; plane: 40°; at 605m, bedded plane: 35°
		605.68	630.00	24.32		35° 40°						Sandstone	sandstone, light grey, fine-grained, interbedded with thin layers of light black muddy sil bedding; at 612m, bedded plane: 40°; at 618m, bedded plane: 40°; at 620m, bedded plane: 40 plane: 35°.
													TD: 630m

Wapiti River — Drill Hole Core Log

Drilling Company:	Canada Dehua Drilling Company			**Hole No.:**	WP1C25		
Rig Type:	CS-14			**Collar Elevation:**	1208.4m		
Total Depth:	804.00m			**Coordinate:**	**Northing:**	6072545.1	
Spud Date:	21-Jul-12				**Easting:**	651218.7	
Finished Date:	25-Sep-12				**Logging Geologist:**	Victor, Lee, Chris, Liang	
Core Size:	HWT/HQ/BQ				**Note:**		

Formation	Coal Seam	Core Depth Interval		Thickness, m		Strata Dip	Coal Floor Elevation	Sample ID			Rock Hardness	Rock Name	Lithology Description
		From	To	Thick	TRUE			Coal	Rock	CBM			
Q		0.00	10.00	10.00	10.00							Till	till, Sandstone fragment, weather deposit.
Hasler		10.00	89.00	79.00		30						Siltstone	grey to dark grey, interbedded white and grey FGSS laminae(15), micro-horizontal bedding, at 15.00m, bedded plane:28° ; at 25.00m, 30° ; at31.00m-36.30m, very much broken fracture No: 30/m; at48.00m, 30° ; at56.00m, 30° ; at77.00m, 30° ; at 89.00m:25
		89.00	100.00	11.00								Siltstone	same feature as above. At 99.00m, bedding plane:28°
		100.00	120.00	20.00								Siltstone	Dark grey, BLENDED WITH minor light grey FGSS, not bedding, only blend with siltstone. competent. At base, minor carbonaceous fragment,
		120.00	123.00	3.00		25						Siltstone	Dark grey, muddy
		123.00	126.00	3.00								Siltstone	BLENDED with sandstone
		126.00	147.00	21.00								Siltstone	Dark grey, muddy massive, with minor FGSS, laminate(5%). Micro-horizontal bedding. Bedding plane:28° (at 130.00m)
		147.00	171.00	24.00		30						Siltstone	dark grey, interbedded with light grey FGSS laminates(15%), micro-horiazontal bedding. Bedding plane:24° (at148m); at154.4m, sider laminates; at 158m, bedding plane:30°
		171.00	205.00	34.00		25						Siltstone	same features as above, plus FGSS increased to 30%. At 179, bedding plane:40° ; At189m, bedding plane:30° ; At198.5m, pyrites nodule; At 202, bedding plane:35° ; at base, sandy toward.
		205.00	212.70	7.70								Siltstone	Dark grey with minor FGSS(10%)
		212.70	246.00	33.30								Siltstone	dark grey, interbedded with light grey fine-grained sandstone laminates(30%), micro-horizontal bedding, bedding plane:35° (213.00m), distorted bedding on FGSS joint plane, alternating with bands of FGSS, competnet; At 239m, bedding plane: 35°
		246.00	342.35	96.35								Siltstone	same features as above, plus sand bands decreased to 15%, competent. At 266m, bedding plane:35° . At 267.70m , pyrite nodules (2X5mm). At 275.50m, bedding plane:30° . At 297m, bedded plane: 35° . At 321m, 34° . At 341m pyrite nodules. At 342 bedding plane:45° , sandy toward at base.
		342.35	342.80	0.45								Conglomerate	light grey, Φ:2-5mm, quartz and debris mainly.
Boulder Creek		342.80	363.00	20.20								Siltstone	white-grey, massive. at 351.00m bedded plane:30° . Partly FGSS(349.00-350.50m), (355.40-356.90m), bauxitic.
		363.00	365.00	2.00								Siltstone	dark grey, competent, partly carbonaceous fragment.
		365.00	376.50	11.50								Sandstone	light grey fine-medium grained, micro-horizontal bedding, bedding plane: 40° at 369.50m, distorted bedding, grain toward at base. At base, minor vitrain laminates and minor agrilliceous, pebble at upper part.
		376.50	377.00	0.50								Siltstone	Bauxitic, white grey
		377.00	383.50	6.50								Siltstone	dark grey, massive, minor carbonaceous and vitrain fragment, at378.70m, dip:55°
		383.50	388.00	4.50								Siltstone	Bauxitic, white grey, massive. at 383.60-383.70m, 0.10m fault mud.
		388.00	389.60	1.60								Sandstone	FGSS, partly calcite vein, react with 5%HCl
		389.60	400.00	10.40		40						Siltstone	Dark grey, with FGSS laminate, At 391.40m, dip:40° . with minor calcite vein, react with 5%HCl. Silt to sand at base
		400.00	407.90	7.90								Sandstone	MGSS, light grey, normal-sorted, miner vitrain fragment on joint plane, micro-horizontal bedding, bedding plane:33° . At 401.5m, quartz and debris mainly. CGSS to conglomerate at base.
		407.90	435.00	27.10								Mudstone	white-grey, bauxitic(30%). AT top:0.30m, black ms. At 411.70m, fracture developed infilled calcite vein. At 411.50m, bedded plane: 40° . Partly with dark grey siltstone. At 421.00m, very much broken, 0.30m mylonization.
		435.00	453.00	18.00		45						Mudstone	Bauxitic, white-grey massive, silty. At top, fracture developed, broken. Broken surface are slickensided and shiny. At 436m, bedded plane:45° . At 443.60-443.65m, 0.05m fracture zone, mylonization, bedded plane:45° . At 452.00-452.20m, 0.20m very mch broken, broken surface are slickensided and shiny, infilled coal film.
		453.00	457.00	4.00								Mudstone	dark grey, minor bauxitic(30%),very much broken, fracture number:20/m. Coal film/Carbonaceous fragment on joint plane.
		457.00	469.50	12.50		38						Sandstone	light grey, fine-grained. at base, with dark grey siltstone laminate(25%). horizontal bedding, bedded plane:38° . At 466.00m, 463.00m, 465.00m, coal film. React with 5%HCl.
		469.50	479.20	9.70								Siltstone	Dark grey, competent, interbedded with light grey fine-grained sandstone laminates(30%) at base broken, broken surface are slickenside and shiny, infilled minor agrilliceous pebbles, react with 5%HCl. Carbonaceous fragment observed on joint plane.
	BC	**479.20**	**479.60**	**0.40**								**coal**	**0.40m, BC coal seam. RC:0.35m very much broken, light bright, black**
		479.60	480.19	0.59								mudstone	CM, black
		480.19	481.00	0.81								sandstone	MGSS, grey, very mcuh broken, minor vitrain laminates.
		481.00	490.10	9.10								Conglomerate	Φ:2-7mm at base, 10mm light grey, poorly-sorted, quartz and debris prodominately, at 488-488.5, MGSS
		490.10	492.20	2.10		35						sandstone	FGSS, irregular vitrain laminates at base. At491.00m: dip:35°
		492.20	498.60	6.40								Conglomerate	Φ:2-10mm, poorly-sorted, subrounded-sub angular, prodomaintely, quzrtz and debris. Sharp contact with base FGSS
		498.60	503.50	4.90		45						sandstone	FGSS, light grey, horizontal-bedding, bedding plane:45° . at 490.00m pure
		503.50	518.20	14.70		45						sandstone	FGSS, light grey, with dark grey mudstone laminates(15%) very much broken, fracture number:15/m. broken surface are slickensided and shiny. Horizontal bedding, bedded plane:40° at 507.00m. At 518.00m, bedded plane:45°
Hulcros		518.20	564.00	45.80		40/45						Siltstone	dark grey, interbedded with light grey fine-grained sandstone laminates (15%), micro-horizontal bedding, bedding plane: 40° at 524.00m. At 538.00m, bedded plane:45° . At 554.00m, bedded surface:47° . At base, silt to mud.
		564.00	614.40	50.40		43/45						Mudstone	silty, interbedded with light grey fine-grained sandstone(25%) locally sidertic laminates. At 570.5m, bedded plane:45° . fracture developed ,slickensided and shiny, slightly fractured. At 580.00-580.10m, limestone(0.10m), react with 5%HCl (strong). At 585.53m, coal film on joint plane. At 589.75-589.80m, 0.05m limestone. Strong react with 5% HCl. At 595.50m, bedded plane:43° . At 600.00m, bedded plane: 45° . At base, FGSS laminates increased to 40%, bedded plane:40° at 613.00m.
		614.40	616.24	1.84								Mudstone	silty, minor FGSS laminates. at 615.70m, pyrite observed on joint planes at base, silt to mud, richin plant fossils
Gates	**1#**	**616.24**	**616.34**	**0.10**			**598.66**					**coal**	**0.10m, boney coal dull, hard**
		616.34	625.00	8.66		37						Siltstone	grey, massive, locally plant root fossil, interbedded with FGSS laminates(20%). At 619.00m, bedding plane:37°
		625.00	627.25	2.25								Mudstone	Dark grey, silty, massive richin plant leaf fossil and carbonaceous fragment, at base, 0.25m CM
		627.25	**627.35**	**0.10**			**587.65**					**coal**	**0.10m, RC:0.07m**
		627.35	629.15	1.80								Mudstone	silty, dark grey, massive numerous plant leaf fossils at base, 0.20m -CM
	3#	**629.15**	**631.78**	**2.63**			**583.22**					**coal**	**2.63m, 3# coal seam, RC 0.10m. Black light. wash away 2.53m. Coal is badly broken and poor recovery.**
		631.78	639.00	7.22								Siltstone	dark grey. At 633.00m, bedded plane:37° richin vitrain/plant root fossil
		639.00	**639.20**	**0.20**			**575.80**					**coal**	**0.20m coal seam, RC:0.05m.**
		639.20	642.00	2.80		41						Siltstone	dark grey muddy, irregular carbonaceous fragment on joint plane. At 639.30m, bedding plane:41°
		642.00	646.00	4.00		50						Sandstone	Grey, interbedded with black grey siltstone(20%). At 642.00m, bedded plane:45° . At 645.50m, bedded plane:50°
		646.00	663.70	17.70		55						Siltstone	Dark grey, massive minor FGSS laminates(20%), muddy. At 650.00-650.50m. 0.50m FGSS. bedded plane:55° . At 655.00-658.00m black ms manily, broken, minor vitrain fragment and carbonaceous fragment.
		663.70	669.00	5.30								Sandstone	grey, fine-grained with minor dark grey siltstone laminae(10%), calcite vein observed on joint plane(minor), react with 5%HCl.
		669.00	674.85	5.85		45						Siltstone	dark grey, with minor FGSS laminaetes(5%). From 671.00-673.50m. Very much broken, fracture number: 30/m. At 673.20-673.50 m, 0.30m. At 673.00m, bedded surface:45° .
		674.85	681.10	6.25		40						Sandstone	light grey, fine-grained minor dark grey mudstone laminates(15%). At 676.00m, bedded plane: 50° . Micro-horizontal bedding. At 680.50m, 40° .
		681.10	684.05	2.95		45						Siltstone	dark grey, interbedded with light grey FGSS laminates(20%). Micro-bedding horizontal bedding. Bedding plane: 45° at 683.30m.
	5#	**684.05**	**685.96**	**1.91**			529.04	**Q1**		**CBM01**		**coal**	**1.91m, 5# coal seam. RC:1.56m. No parting, intact black light**
		685.96	691.49	5.53								Siltstone	dark grey, massive, coaly, plant root fossils. Silt to mud at base. At 690.90-691.05m. 0.15m FGSS with Calcite nodule.
		691.49	695.00	3.51								Mudstone	light black, massive. Rich in vitrain chip and carbonaceous fragment.
		695.00	702.00	7.00		40						Siltstone	dark grey, massive, thin vitrain thread observed on joint plane. Rich in plant root fossils. At 700.00m, bedding plane: 40° .

from 702m, change BQ drilling.

		633.00	635.00	2.00		40						siltstone	dark grey, interbedded with fine-grained light grey sandstone laminates(15%). Bedding plane: 40 degree at 635.00m.
		635.00	640.50	5.50								mudstone	light black, massive. At top: 0.01m coal seam. Rich in carbonaceous and coal fragment.
		640.50	645.00	4.50								sandstone	fine-grained, light grey, with minor dark grey mudstone laminates(5%).
		645.00	648.00	3.00								mudstone	dark grey to black, massive.
		648.00	653.00	5.00		40						sandstone	light grey, fine-grained, with dark grey mudstone laminates (10%). Horizontal bedding, at 651.00m, bedding plane: 40 degree.
		653.00	662.30	9.30								mudstone	black, massive, coal threads occasional. At base, rich in plant root fossils.
		662.30	666.00	3.70								sandstone	light grey, fine-grained, infilled minor calcite veins at sandstone bedding. Well-sorted.
		666.00	673.00	7.00		56						mudstone	dark grey, silty, massive. At 666.50m, bedding plane: 56 degree. From 669.00-672.00m, very much broken, with minor coal debris.
		673.00	679.00	6.00		53						sandstone	light grey, fine-grained, with black mudstone laminates (10%). Horizontal bedding, at 673.50m, bedding plane: 53 degree. At base, dark grey mudstone laminates increased.
		679.00	681.72	2.72		47						siltstone	dark grey, interbedded with fine-grained light grey, sandstone laminates(15%). Minor coal threads observed on joint surface. Bedding plane: 47 degree at 681.00m.
	5#	**681.72**	**682.15**	**0.43**			**532.85**					**coal**	**0.43m 5# coal seam. RC: 0.25m. Black, light, intact. March HQ drilling 5# coal.**
		682.15	684.30	2.15								mudstone	black, massive. At 682.55-682.60m, 0.05m coal seam.
		684.30	688.50	4.20								mudstone	**light black, massive. Rich in carbonaceous and coal fragment. At the Run of 684.00-687.00m, lost core 1.27m, recovery only 1.73m, maybe is coal seam?**
		688.50	692.30	3.80		42						mudstone	carbonaceous, black, numerous vitrain chip. At 691.50m, bedding surface: 42 degree.
		692.30	695.00	2.70								siltstone	dark grey, interbedded with light grey fine-grained sandstone laminates. Minor coal threads observed on joint surface.
		695.00	698.40	3.40		45						mudstone	black, carbonaceous, numerous coal threads and inclusionas of coal. Bedding plane: 45 degree at 698.00m.
		698.40	699.80	1.40								siltstone	dark grey, infilled minor calcite veins on joint plane.
		699.80	702.00	2.20								mudstone	black, minor light grey fine-grained sandstone laminates. Minor coal threads observed on joint surface.
		702.00	704.00	2.00								sandstone	light grey, fine-grained, with minor dark grey siltstone laminates (10%).
		704.00	706.00	2.00								siltstone	grey, massive, muddy. Plant root fossils.
		706.00	710.00	4.00								siltstone	dark grey, massive. No plant fossils.
		710.00	714.70	4.70		38						sandstone	light grey, fine-grained, very thin calcite vein suspended on bedding to core axis. At 713.00m, degree: 40. at 714.50m, degree: 38.
		714.70	721.00	6.30		45						siltstone	grey, interbedded with light grey fine-grained sandstone laminates(30%). Disseminated fine plant root fossils fragment on bedding. At 720.00m, bedding plane: 45 degree.
		721.00	721.50	0.50								mudstone	black, broken. Slickensides at various angles to core axis. Rich in carbonaceous fragment and with 0.02m coal threads.
Gates	**6#**	**721.50**	**722.32**	**0.82**			**492.68**	**Q2**				**coal**	**0.82m 6# coal seam, RC: 0.12m. Black, badly broken and poor recovery. Only 2-3cm coal fragment left.**
		722.32	724.25	1.93		40						sandstone	light grey, fine-grained, very thin calcite vein suspended on bedding to core axis. At 723.00m, degree: 40. at the Run of 723.00-726.00m, recovery: 2.10m.
		724.25	725.00	0.75								mudstone	black, massive.
		725.00	726.55	1.55								sandstone	light grey, fine-grained.
		726.55	729.25	2.70								mudstone	black. Rich in carbonaceous fragment.
		729.25	732.00	2.75								siltstone	dark grey, muddy. Rich in plant root fossils and carbonaceous debris.
		732.00	735.13	3.13		45						sandstone	light grey, fine-grained. At 735.00m, bedding plane: 45 degree.
	7#	**735.13**	**737.00**	**1.87**			**478.00**	**Q3**				**coal**	**1.87m 7# coal seam, RC: 0.05m. Coal is badly broken and poor recovery. Only very few coal fragment.**
		737.00	744.90	7.90		36						siltstone	dark grey, muddy. Rich in plant root fossils and coal threads. Minor light grey fine-grained sandstone laminates. At 737.50m, bedded surface: 36 degree.
	7-1#	**744.90**	**745.73**	**0.83**			**469.27**	**Q4**				**coal**	**0.83m 7-1# coal seam, RC: 0.10m. Black. Coal is badly broken and poor recovery. Only very few coal fragment.**
		745.73	747.00	1.27								mudstone	carbonaceous, black, numerous vitrain chip.
		747.00	756.00	9.00		40-35						siltstone	dark grey, interbedded with light grey fine-grained sandstone laminates. numerous plant root fossils observed on joint surface. At 748.00m, bedded plane: 40 degree. At 753.00m, dip: 35 degree.
		756.00	767.50	11.50		35						mudstone	dark grey, massive, very much broken. Lost core: 3.00m. numerous carbonaceous debris and plant root fossils on bedding surface. At 762.00m, bedding plane: 35 degree.
		767.50	769.50	2.00		45						sandstone	light grey, fine-grained, with minor dark grey siltstone laminates (10%). Horizontal bedding, at 768.50m, bedding plane: 45 degree.
		769.50	771.00	1.50								mudstone	light black, massive. Plant root fossils.
		771.00	774.80	3.80								siltstone	dark grey, interbedded with light grey, fine-grained sandstone laminates (30%). Plant root fossils oberved on bedding plane.
		774.80	783.35	8.55		45						sandstone	light grey, fine-grained, with minor dark grey siltstone laminates (5%). From 778.00-780.00m, lots of calcite vein at various angles to core axis. Fracture developed, fracture surface are slickensided and shiny. Horizontal bedding, at 779.00m, bedding plane: 45 degree.
		783.35	786.86	3.51								siltstone	muddy, dark grey. Interbedded with light grey, fine-grained sandstone laminates (30%). Plant root fossils and carbonaceous debris oberved on bedding plane.
	8#	**786.86**	**788.70**	**1.84**			**426.30**	**Q5**				**coal**	**1.84m 8# coal seam, RC: 0.25m. Black, light, dull. Coal is badly broken and poor recovery. Coal fractured to 2-3cm fragment.**
		788.70	796.50	7.80		35						mudstone	light black, massive. At 794.00m, bedded plane: 45 degree. Carbonaceous towards lower contact.
		796.50	804.00	7.50		35						sandstone	light grey, fine-grained, with dark grey siltstone laminates (50%). From 787.80-799.60m, Fracture developed, fracture surface are slickensided and shiny and vertical fracture extends from 790-799m. broken. Horizontal bedding, at 799.00m, bedding plane: 35 degree. **TD=804.00m.**

Wapiti River — Drill Hole Core Log

Drilling Company:	Canada Dedua Drilling Company	**Hole No.:**	WP1R27
Rig Type:	VD-5000	**Collar Elevation:**	1102.4m
Total Depth:	504.00 m	**Coordinate: Northing:**	6074640.2
Spud Date:	Oct.06, 2012	**Easting:**	649639.8
Finished Date:	Oct.20, 2012	**Logging Geologist:**	Lee,Victor, Ricky
Core Size:	HWT/HQ	**Note:**	water packer test hole

Formation	Coal Seam	Core Depth Interval From	To	Thickness, m Thick	TRUE	Strata Dip	Coal Floor Elevation	Sample ID Coal	Rock	CBM	Rock Hardness	Rock Name	Lithology Description
Q		0.00	7.50	7.50								till	Till, clay, mudstone fragment, brown and yellow, sandstone fragment, overbedden: 7.50m.
Boulder Creek		7.50	10.30	2.80		7						sandstone	white-grey, fine grained, interbedded bauxitic mudstone laminae. At 9.0m, bedded plane: 7°. At 10.(11.80~12.0m, soft clay.
		10.30	34.00	23.70		7						mudstone	brown-grey, massive, bauxitie. At 13.30~15.50, broken, fracture No:6/m. At 21.90~24.50, broken, 27.60~29.70, broken, fracture No:7/m. At 25.50m, bedded plane: 7°. At 30.40~32.40, broken, fra
		34.00	37.50	3.50		15						sandstone	white-grey, fine grained. At 37.50m, bedded plane: 15°.
		37.50	42.20	4.70								sandstone	white-grey, medium-coarse grained, dark debris predominately. At upper, medium-grained. At lower numberous coal film on fracture plane.
		42.20	42.80	0.60								conglomerate	conglomerate, ϕ: 1~3mm, quartz and chert and debris, poorly-sorted.
		42.80	74.30	31.50		15						mudstone	brown-grey, massive, little bauxitic. At 54.6~55.0m, fine sandstone. At 63.0~63.30m, 73.50~74.0m 15°, bedding is not obvious.
		74.30	75.82	1.52		10						sandstone	white-grey, fine-grained. At 75.82m, →10°.
		75.82	78.30	2.48								mudstone	brown and grey, bauxitic, massive.
		78.30	78.50	0.20								mudstone	black, carbonaceous numerous coal lense and laminae. At top(78.30~78.37), 0.07m boney coal.
		78.50	80.15	1.65								mudstone	black, rich in leaf fragment fossil, massive.
		80.15	81.20	1.05								mudstone	brown-grey, bauxitic, massive.
		81.20	82.00	0.80								mudstone	black. At 81.80~81.90, boney coal, 0.10m, intact.
		82.00	90.50	8.50								mudstone	black to light black, massive. At 88.70~89.0m, carbonaceous mudstone. At 88.95~89.0m, 0.05m, coa fracture: 3/m.
		90.50	91.40	0.90								sandstone	white-grey, fine-grained.
		91.40	91.56	0.16								mudstone	black.
	BC	**91.56**	**92.56**	**1.00**								**coal**	**BC coal seam, 1.0m, RC: 0.40m, very broken, 0.60m lost, shiny, light, no parting.**
		92.56	96.80	4.24		15						sandstone	white-grey, medium-coarse grained, poorly-sorted. At 94.0m→15°.
		96.80	102.00	5.20								conglomerate	conglomerate, ϕ: 2~7mm, chert, quartz, debris, poorly-sorted. At 98.80~99.80, broken, fracture
		102.00	112.10	10.10		15						sandstone	white-grey, fine grained, pure, almost no bedding, quartz predominately, well-sorted. At bottome
Mulcros		112.10	117.60	5.50		10						siltstone	dark grey, interbedded fine sandstone layers (content: 50%), bedded plane: 10°. At 113.70~114.7
		117.60	153.00	35.40		10						siltstone	dark grey, interbedded fine sandstone laminae(40%) micro-horizontal bedding. At 120.0m →10°. At 1 argillaceous limestone, strongly react Hcl 5%. At 150.0m→10°.
		153.00	188.68	35.68		10						siltstone	dark grey, interbedded fine sandstone laminae(30%),fine sandstonre portion increase base. At 155 strong react Hcl 5%. At upper, horizontal bedding. At lower part, many minor cross-bedding. At 170.0m and 180.0m, b
		188.68	189.73	1.05					GT1			conglomerate	conglomerate, 0.05m, ϕ: 2~5mm, poorly-sorted.
		189.73	190.30	0.57			890.27					mudstone	black, massive.
	#1	**190.30**	**190.40**	**0.10**								**coal**	**#1 coal seam, 0.10m, RC:0.10m, intact, shiny, blocky.**
		190.40	197.50	7.10								siltstone	grey, muddy with dark MS laminae, few coal films.
		197.50	198.20	0.70								mudstone	black, massive.
	#2	**198.20**	**198.30**	**0.10**								**coal**	**#2 caol seam, 0.10m, RC: 0.10m, shiny.**
		198.30	198.80	0.50								mudstone	black, massive.
		198.80	199.90	1.10								siltstone	grey.
	#3	**199.90**	**200.49**	**0.59**								**coal**	**#3 coal seam, 0.59m, RC: 0.59m, broken, shiny, 0.40<0.13>0.06m, parting: 200.30~200.43, 0.1**
		200.49	202.10	1.61					**GT2**			mudstone	black, silty.
	#3-1	**202.10**	**202.35**	**0.25**								**coal**	**coal seam, 0.25m, RC: 0.25m, light, shinny, intact, no parting.**
		202.35	202.60	0.25								mudstone	black, massive.
		202.60	**202.75**	**0.15**								**coal**	**coal seam, 0.15m, banded coal, RC:0.15m.**
		202.75	204.00	1.25								mudstone	black, little carbonaceous.
		204.00	206.00	2.00								sandstone	wht-gry, fine-grained, with mudstone laminae.
		206.00	207.00	1.00								mudstone	black, carbonaceous, many vitrain laminae. At 206.0m, 0.10m coal seam.
		207.00	223.70	16.70		15			GT3 GT4			mudstone	black, very silty. At 215.20~216.70m, fine sandstone. At 221.0~221.80, carbonaceous mudstone. At broken,fracture No:15.
		223.70	226.70	3.00								sandstone	white-grey, fine-grained.
		226.70	227.45	0.75								mudstone	blk,massive,broken, fracture Number: 8/m.
	#4	**227.45**	**228.35**	**0.90**				**Q1**				**coal**	**0.90Mm, B4 Coal seam. RC:0.40m, broken, shiny, light, no parting.**
		228.35	235.40	7.05								mudstone	black, massive. At 234.85m, 0.15m, banded coal. At 235.20m, 0.10m boney coal. At 230.30~230.60,
		235.40	239.90	4.50					GT5			sandstone	wht-grey, fine-medium grained, coarser toward base. At upper, with mudstone laminae.
		239.90	243.53	3.63					GT6			mudstone	black, massive, with minor leaf fragment fossil.
	#5	**243.53**	**245.32**	**1.79**				**Q2**		**CBM01**		**coal**	**5# coal seam, 1.79m, RC:1.0m, half-broken, 0.79m lost, no parting, shiny, light, blocky.**
		245.32	247.50	2.18					GT7			mudstone	black to light black, massive. At lower part, silty, light-grey.
		247.50	257.50	10.00		15			GT8			sandstone	white-grey,medium-coarse grained, coarse toward base, interbedded dark silty mudstone layers (30 No:20. At 251.85~253.0, broken, vertical fracture, fracture No:7/m. At 252.0~252.20m, 2 layers o vitrain lenses and few coal laminae and film on fracture plane. At 250.0m, bedded palen: 15°.
		257.50	262.00	4.50								sandstone	white-grey, medium grained, interbedded dark siltstone laminae (content: 50%). At upper, many co
		262.00	267.10	5.10					GT9			mudstone	black, massive, silty.
		267.10	269.50	2.40								sandstone	white-grey, fine-grained, with dark siltstone laminae.
		269.50	270.00	0.50								mudstone	black carbonaceous, massive. At 269.70m, 0.05m coal seam, shiny, light, broke.
		270.00	271.40	1.40								sandstone	fine-grained, white-grey, quartz and debris mainly.
		271.40	277.00	5.60					GT10			mudstone	black, massive. At upper part, many coal streaks. At 271.80, 0.05m banded coal. At 275.10~275.20
		277.00	279.00	2.00								sandstone	white and grey, medium-grained, with few carbonaceous laminae.
		279.00	280.36	1.36								mudstone	black, massive. At 279.40~279.50m, few vitrain laminae. At 279.80m, 0.10, banded coal. At 280.16
		280.36	**280.76**	**0.40**								**coal**	**0.40m, RC:0.40m, half broken, shiny, light, black. At 280.66~280.76, banded coal, no partin**
		280.76	281.70	0.94								mudstone	black, massive, with few vitrain laminae.
	#6-1	**281.70**	**282.20**	**0.50**								**coal**	**6# coal seam, 0.50m, RC: 0.50m, broken, shiny, light, no parting.**
		282.20	285.90	3.70					GT11			mudstone	black, little silty, with carbonaceous debris, masive. At 282.20~283.0m, broken, fracture No.:20
	#6-2	**285.90**	**286.45**	**0.55**								**coal**	**6-1# coal seam, 0.55m, RC:0.20m, broken, shiny, no parting.**
		286.45	290.50	4.05									black, massive. At middle part, 2 coal laminae. At 287.90~288.20, broken, fracture No.: 5/m.
		290.50	**290.60**	**0.10**								**coal**	**0.10m, intact, shiny, light.**
		290.60	290.90	0.30								mudstone	black, massive.
		290.90	292.50	1.60					GT12			siltstone	light grey, with MS laminae.
		292.50	296.80	4.30		20						mudstone	black. At middle part, 15 vitrain streaks, 3~4mm thick each streak, bedded plane: 20°.
		296.80	301.20	4.40					GT13			sandstone	light grey, with MS laminae.
		301.20	302.10	0.90								mudstone	black to carbonaceous. At upper and lower part, carbonaceous, many vitrain laminae. At middle pa
		302.10	**302.33**	**0.23**								**coal**	**0.23m, RC: 0.23m, broken, shiny, no parting.**
		302.33	304.17	1.84					GT14			mudstone	black, massive, with branch fossil.
Gates	**#7**	**304.17**	**305.00**	**0.83**				**Q3,Q4**				**coal**	**7# coal seam, 0.83m, RC:0.60m, half broekn, shiny, light, 0.68<0.10>0.05m, CO: 304.17~304.8 MS, black. CO: 304.95~305.0, 0.05m.**
		305.00	307.75	2.75		**70**						mudstone	light black, very silty, numberous calcite veins, fold zone, bedded plane: 70°.
	#7-1	**307.75**	**308.47**	**0.72**				**Q5**				**coal**	**7-1# coal seam, 0.72m, RC:0.55m, very broken, shiny, light, 0.55<0.05>0.12m, parting: 308.3 307.75~308.30, 0.55m. Co:308.35~308.47m, 0.12m.**
		308.47	309.60	1.13					GT15			siltstone	with MS laminae.
		309.60	311.10	1.50								mudstone	blk, little silty, massive.
		311.10	**311.25**	**0.15**								**coal**	**coal seam, 0.15m, RC: 0.15m, broken, shiny, light, no parting.**
		311.25	311.45	0.20								mudstone	blk, carbonaceous.
		311.45	318.16	6.71					GT16			mudstone	blk, massive, with a few siderite nodule (40*50mm), brown. At 314.40~314.80m, a vertical fractur
	#7-2	**318.16**	**318.94**	**0.78**				**Q6, Q7**				**coal**	**7-2# coal seam, 0.78m, RC:0.78m, intact, shiny, light. 0.15<0.05>0.16<0.05>0.37m. CO:318. 318.31~318.36, 0.05m, blk,MS. CO:318.36~318.52, 0.16m, parting: 318.52~318.57, 0.05m. CO:31**
		318.94	322.96	4.02					GT17			mudstone	black to carbonaceous. A few vitrain laminae. At 320.35~320.45m, coal, 0.10m, shiny, light, brok
		322.96	340.90	17.94		**15**			**GT18**			sandstone	white-grey, fine-medium grained, dark debris and quartz predominately, with numerous dark mudsto sorted. At 324.80~326.10m, broken, fracture No:25/m. At 331.30~333.10m, broken, fracture No:10/m fractures. At 328.0m, bedded plane: 15°. At 335.0m→15°. At 339.0m,→15°.
		340.90	343.33	2.43					GT19			mudstone	blk, massive. At upper, few vitrain laminae.
	#8	**343.33**	**349.25**	**5.92**				**Q8~Q10**		**CBM2**		**coal**	**8# coal seam, 5.92m, R:4.40m, lost: 1.52m, black, light, half-intact, blocky, 0.19<0.50>1.0<0.15>0.40<0.08>0.06<0.27>1.52<0.10>1.65m. CO: 343.33~343.52, 0.19m. Parting: carbonaceous; at 343.85~343.89m, 0.04m, coal streak. CO: 344.02~345.02, 1.0m, RC:0.90m, 0.1 blk, MS. CO:345.17~345.57m, 0.40m; parting: 345.57~345.65, 0.08m, blk,MS. CO: 345.65~345.7 blk, MS to carbonaceous, at middle part carbonaceous. CO:345.98~347.50, 1.52m, RC:1.40m, 0. carbonaceous mudstone. CO:347.60~349.25m, 1.65m, RC:0.35m, 1.30m lost.**
		349.25	349.55	0.30								mudstone	blk,carbonaceous, few vitrain laminae, rich in leaf fossil.
		349.55	351.50	1.95					**GT20**			siltstone	light grey, rich in leaf fossil.
		351.50	356.60	5.10		15			GT21			sandstone	white-grey, fine-grained, with dark mudstone laminae, few coal films on bedded plane, bedded pla
		356.60	362.00	5.40		**15**						siltstone	grey, with fine sandstone laminae. At bottom, few coal lenses. Bedded plane: 15° at 362.50m.
		362.00	364.04	2.04								mudstone	blk, massive. At middle part, rich in leaf fossil and few vitrain lenses.
	#9	**364.04**	**370.25**	**6.21**				**Q11-Q13**		**CBM3 CBM4**		**coal**	**9# coal seam, 6.21m, RC:5.50m, 0.71m lost, shiny, light, brittle, half broken, no parting. (Q13:369.0~370.25 m.**
		370.25	372.05	1.80					GT22			mudstone	black, massive, rich in leaf fossil. At 371.30~371.80, a few vitrain lenses and laminae. At 370. fracture No:10/m.
		372.05	383.15	11.10		15			GT23			sandstone	white-grey, fine to medium grained, with numberous dark siltstone MS laminae, coarse toward base at 387.6~387.0m numberous coal lenses on fracture plane, at 377.30~381.60m, very broken, fracture No:20/m.
		383.15	392.40	9.25					GT24			siltstone	light grey, interbedded fine sandstone layers.
		392.40	394.40	2.00								mudstone	light black-black, massive, with few coal streak (thick: 5mm each.)
	#10	**394.40**	**398.40**	**4.00**				**Q14-15**		**CBM05**		**coal**	**10# coal seam, 4.00m, RC:3.50m, 0.50m lost, shiny, light, brittle, no parting, half-broken.**
		398.40	399.40	1.00								mudstone	black, little carbonaceous, numberous vitrain streaks.
		399.40	404.00	4.60		15			GT25			siltstone	light grey to grey, muddy. 400.70~401.0, 4 vitrain streaks. At 402.60m, bedded plane: 15. At 403
		404.00	410.00	6.00								sandstone	white-grey, medium-grained, quartz, and debris predominately.
		410.00	417.00	7.00		15			GT26			sandstone	white-grey, fine grained, interbedded thin layers of siltstone, bedded plane:15°.
		417.00	427.23	10.23					GT27			sandstone	white-grey, medium-grained, quartz, and debris predominately, moderately-sorted. At 420.95~421.6 427.70~424.30m, numberous carbonaceous debris and calcite nodule; at bottom, no cement, very sof
	#12	**427.23**	**429.90**	**2.67**				**Q16-Q19**				**coal**	**12# coal seam, 2.67m, RC:2.60, half broken, light, shiny, brittle, banded coal partly. CO:42 0.50m, banded coal, parting: 428.13~428.50, 0.37m, included: 428.13~428.31, 0.18m, MS, many 0.19m, fine sandstone. CO: 428.50~429.90, 1.40m, coal structure: 0.90<0.37>1.40m.**
		429.90	431.07	1.17		20			GT28			mudstone	black, many vitrain laminae, rich in leaf fossil. At 431.07m, bedded plane: 20.
	#13	**431.07**	**432.46**	**1.39**				**Q20-Q21**		**CBM06**		**coal**	**13# coal seam, 1.39m, RC: 0.92m, 0.47 lost, broken, shiny, light; 0.63<0.07>0.69m. CO: 431. 431.77m, 0.07m blk, MS; CO: 431.77~432.46m, 0.69m.**
		432.46	433.76	1.30					**GT29**			mudstone	blk, rich in leaf fossil.
		433.76	444.00	10.24		20			GT30			sandstone	white-grey, medium-grained, debris and quartz, well-sorted, bedded plane: 15°. At 437.60~438.70, bro
		444.00	492.00	48.00		**20**			**GT31**			sandstone	white-grey fine-grained, interbedded dark muddy siltstone (50%), horizontal bedding. At 451.80~4 fracture No: 8, at 459.0m→20°, at 470.0m→20°, at 468.70~469.60, broken, fracture No: 9, at 477.0m→20°.
		492.00	502.00	10.00		20						sandstone	white-grey, fine-grained, interbedded dark siltstone (40%), bedded plane: 20°.
		502.00	504.00	2.00								siltstone	dark grey- grey, blended find sandstone, no beddeing predominately , few bedding. End: 504.0m .

Wapiti River — **Drill Hole Core Log**

Drilling Company:	Canada Dehua Drilling		**Hole No.:**		WP1C28
Rig Type:	VD-5000		**Collar Elevation:**		1080.8m
Total Depth:	727.06m	**Coordinate:**	**Northing:**		6075445
Spud Date:	27-Jan-13		**Easting:**		649661.9
Finished Date:	18-Feb-13		**Logging Geologist:**		Lee, Charles
Core Size:	HWT/HQ/NQ		**Note:**		

Formation	Coal Seam	Core Depth Interval From	To	Thickness, m Thick	TRUE	Strata Dip	Coal Floor Elevation	Sample ID Coal	Rock	CBM	Rock Hardness	Rock Name	Lithology Description
Q		0.00	28.20	28.20									starting coring from 28.20m with HQ.
		28.20	28.50	0.30								till	Till, sandstone debris; overburden : 28.50m.
H a s l e r		28.50	115.20	86.70		30° 32° 35°			GT1 GT2 GT3 GT4 GT5 GT6 GT7 GT8 GT9			Siltstone	siltstone, dark gray; interbedded thin layers of white-gray, fine sandstone; fine sandstone: 30%; cross-bedding in sandstone; from 28.50m - 37m; little broken fracture no: 6/m; at 30.50m bedded p bedded plane: 30°; at 60m bedded plane: 35°; at 75m bedded plane: 35°; from 70m - 77m, fine sands 35°; at 90m bedded plane: 40°; at 109.50m - 111m, very broken, fracture no: 40; at 115.50m bedded
		115.20	130.10	14.90		35°			GT10			Siltstone	siltstone, dark gray; with white-gray fine sandstone laminate (5%); at 120m bedded plane: 35°; at plane: 35°.
		130.10	166.10	36.00					GT11 GT12 GT13 GT14			Siltstone	siltstone, dark gray, interbedded white-gray fine sandstone laminate (30%); sandstone increases t content: 40%.
B o u l d e r C r e e k		166.10	166.30	0.20		30°			GT15			conglomerate	conglomerate, white-gray, Ø: 2-7mm quartz, chart and dark debris, poorly-sorted, angular; medium 30°.
		166.30	171.30	5.00								Mudstone	mudstone, brown-gray, bauxitic, massive; soft.
		171.30	172.30	1.00								Siltstone	siltstone, light gray, hard.
		172.30	174.50	2.20		30°			**GT16**			Mudstone	mudstone, light black, massive.
		174.50	188.50	14.00		35°			GT17			Sandstone	sandstone, white-gray, medium-grained; quartz predominately, well-sorted; with a few coal film on
		188.50	199.40	10.90					GT18			Mudstone	mudstone, brown-gray, bauxitic, massive; soft; from 196.80m - 198.80, broken, fracture no: 20/m.
		199.40	225.70	26.30		40° 42° 45°			GT19 GT20 GT21			Sandstone	sandstone, white-gray, medium-loose grained; quartz and dark debris predominately, moderately-sor thin layers of fine conglomerate; at 204m bedded plane: 40°; at 208m bedded plane: 45°; from 214. bedded plane: 42°; at 223m bedded plane: 40°.
		225.70	248.80	23.10					GT22 GT23 GT24			Mudstone	mudstone, brown-gray, black, bauxitic mostly; massive, soft; at 236.60m a few vitrain lenses; fro - 236.70m; black mudstone, toward base, very silty; at 242.70m - 243m, a vertical fracture, fract very silty.
		248.80	259.90	11.10		42°			GT25			Sandstone	sandstone, white-gray, medium grained; with dark silty mudstone laminate; at 250m bedded plane: 4
		259.90	266.40	6.50		42°			GT26			Mudstone	mudstone, brown-gray, black, massive; soft; at 259m - 259.39m, carbonaceous and a few coal lenses light; at 255.10m bedded plane: 42°.
		266.40	**266.55**	**0.15**								**Coal**	**coal seam, 0.15m, broken much; shiny, light.**
		266.55	267.90	1.35								Mudstone	mudstone, black, carbonaceous in part; massive; at 267.20m, 0.05m coal seam.
		267.90	269.00	1.10		40°						Sandstone	sandstone, white-gray, medium grained; bedded plane: 40°.
		269.00	269.60	0.60								Mudstone	mudstone, black; massive.
	BC	**269.60**	**269.78**	**0.18**								**Coal**	**coal seam, 0.18m, Rc: 0.18m, shiny, light.**
		269.78	282.15	12.37		45°			GT27			Sandstone	sandstone, white-gray, medium-coarsed grained; interbedded a few thin layers of fine conglomerate layer of mudstone at lower part; at 275m bedded plane: 45°; at 280m bedded plane: 45°.
		282.15	286.40	4.25		40°			GT28			Sandstone	sandstone, white-gray, fine-grained, pure; quartz predominately, well-sorted; at 283m, bedded pla
		286.40	292.90	6.50		40°						Sandstone	sandstone, white-gray, fine-grained; interbedded thin layers of mudstone (30%); at 290m bedded pl
H u l c r o s s		292.90	297.00	4.10		43°			GT29			Siltstone	siltstone, light black, very muddy, interbedded thin layers of fine sandstone (40%); at 294m bedd
		297.00	376.90	79.90		10° 40°			GT30 GT31 GT32 GT33 GT34 GT35 GT36			Siltstone	siltstone, light black - dark gray, at upper part, laminated with fine sandstone (30%); at 302m b 40°; at 318m bedded plane: 40°; at 330m bedded plane: 40°; at 340m - 341m, fine sandstone content fine sandstone with 0.10m thick each layer; at 340m bedded plane: 40°; at 345m bedded plane: 40°; at 350m bedded plane: 40°; at 360m bedded plane: 40°; at 370m bedded plane: 40°; at 375m bedded p limestone.
		376.90	378.70	1.80		45°			GT37			Sandstone	sandstone, white-gray, fine-grained; laminated dark siltstone; (40%); fine sandstone (60%); at 37 fine conglomerate, chart and dark debris; poorly-sorted.
		378.70	379.00	0.30		45°						conglomerate	conglomerate, gray chart and debris, rounded, moderately-sorted, Ø: 3-5mm; at 375m bedded plane:
		379.00	383.95	4.95								Sandstone	sandstone, white-gray, fine-grained; broken throughout, fracture no: 10/m; at lower part, numbero
		383.95	392.00	8.05		45° 48° 50°			GT38			Siltstone	siltstone, dark gray, light black, muddy, laminated, light gray, fine sandstone (50%); at 385m be at 391m bedded plane: 48°.
		392.00	392.20	0.20								Sandstone	sandstone, white-gray, fine-grained; broken throughout.
		392.20	392.40	0.20								conglomerate	conglomerate, green chart and dark debris, poorly-sorted.
		392.40	414.00	21.60		40° 45° 50° 60°			GT39 GT40			Sandstone	sandstone, white-gray, fine-grained; at 394m bedded plane: 50°; at 396m bedded plane: 45°; from 3 402m bedded plane: 40°; from 405.90m - 407m, broken, fracture no: 10, and with numberous coal len 408m bedded plane: 45°; at 410m bedded plane: 50°; at 412m bedded plane: 60°; at 413m bedded plan
		414.00	415.80	1.80					**GT37A**			Mudstone	mudstone, black mudstone; very broken; at lower part, few coal streak; at 415.20m - 415.40m, coal shiny.
		411.00	414.00	3.00		20° 58°						Sandstone	sandstone fine-grained, gray, quartz and debris is dark and light gray laminate; it is interbedde interbedded plane: 58°.
		414.00	416.84	2.84								Mudstone	mudstone, black, very broken to smashed; slicken side, shiny.
	#3	**416.84**	**419.11**	**2.27**				**Q1**				**Coal**	**2.27m coal seam; black, bright, light, broken; no parting.**
		419.11	420.90	1.79								Mudstone	mudstone, black, very broken; slicken side, fractured infilled calcite.
		420.90	425.15	4.25					GT38A			Siltstone	muddy siltstone; dark gray and gray interbedded mud 5%; slightly fractured at the top; two coal s bottom.
		425.15	426.00	0.85								Mudstone	mudstone in the middle, coal streak observed.
		426.00	431.40	5.40								Siltstone	siltstone, contain lots of mud, gray, few black layers interbedded; quartz dominant.
		431.40	435.00	3.60					**GT39A**			Mudstone	dark gray to gray, contain lots of silt competent in the middle, one coal film (2mm) observed.
		435.00	439.70	4.70		60°						Siltstone	gray siltstone, no fracture; at 429m, bedding dip: 60°.
		440.00	446.00	6.00					GT40A			Mudstone	mudstone, dark gray to black, not broken; to the bottom, silt increases and become light with sil
		446.00	451.65	5.65					GT41			Siltstone	siltstone, gray, no broken.
		451.65	452.80	1.15								Siltstone	siltstone, very muddy at the base; darker towards the base; it becomes mudstone when contact with seam and mudstone, present; a very deep angle, 70°-80°.
	#5	**452.80**	**455.10**	**2.30**		**70°**		**Q2**				**Coal**	**2.30m coal seam; Rc: 1.60m; contact with mudstone at a steep angle at both, top and bottom; debris 1-5cm.**
		455.10	458.47	3.37								Mudstone	mudstone, dark gray to black, slightly broken, abundant of plant fossils, carbonized; no react wi
		458.47	459.79	1.32								Mudstone	black mudstone with lots of CM and coal films with mudstone at top and bottom with a big angle ab
		459.79	462.18	2.39								Mudstone	mudstone, lots of coal films, numerous plant fossils, slightly broken, dark gray to black; no rea
		462.18	478.55	16.37		45° 50°			GT42 GT43			Siltstone	siltstone, gray to dark gray; more muddy and darken at the top and bottom; in the middle part, mo broken, few fractures, no: 5/m, minor mudstone laminate 15%; react with 5% HCl; going down from 4
		478.55	480.88	2.33								Mudstone	mudstone, lots of coal films, black, more muddy towards the base, a few coal films; abundant plan 10/m; no react with 5% HCl.
	#5-1	**480.88**	**482.30**	**1.42**		**45°**		**Q3**				**Coal**	**1.42m coal seam; Rc: 1.42m; black, light, bright; massive; dip: 45°.**
		482.30	483.40	1.10								Mudstone	mudstone, black, broken, plant fossils; no react with 5% HCl.
		483.40	**484.00**	**0.60**								**Coal**	**0.60m coal seam, broken.**
		484.00	487.86	3.86					GT44			Mudstone	silty mudstone, gray-dark gray; at the top and bottom, more mud; in the bottom, more silts.
	#5-2	**487.86**	**489.00**	**1.14**		**45°**		**Q4**		**CBM1**		**Coal**	**1.14m coal seam; Rc: 0.60m, very broken; dip: 45°; parting: 0.20m.**
		489.00	507.00	18.00		70°			GT45 GT46			Siltstone	siltstone, muddy, slightly broken, fracture no: 5/m; dark gray to gray; lots of mudstone laminate shiny; at 502.50m, bedding dip: 70°
		507.00	512.70	5.70					GT47			Siltstone	siltstone with more fine-grained sandstone in the middle, gray-dark gray; fracture developed, inf reaction with 5% HCl.
		512.70	520.15	7.45								Mudstone	mudstone; black, silty, a few of coal films, slightly broken; slickenside, shiny; no react with 5
		520.15	522.15	2.00								Siltstone	siltstone; gray-dark gray; no reaction with 5% HCl.
		522.15	532.29	10.14		71° 80°			GT48			Siltstone	muddy siltstone; gray-dark gray, clear dark gray-black mudstone laminates (30%); at 523m, bedding with 5% HCl; from 528m, mudstone laminates increase (40%); no reaction with 5% HCl, no broken, few fractures.
		532.29	539.00	6.71		90°			GT49			Siltstone	siltstone, mudstone laminates (20%); more dark debris in siltstone; broken; fracture no: 10/m; f coal films, carbonized, plant fossils, waving laminates (536m - 536.40m).
		539.00	543.53	4.53					GT50			Siltstone	siltstone, gray, quartz and debris; a few of fractures infilled with thin quartz vein; no react w
		543.53	550.00	6.47		75°						Siltstone	siltstone with black waving laminates (10%); bedding dip: 75°.
		550.00	552.10	2.10								Mudstone	silty mudstone.
		552.10	553.50	1.40		80°						Siltstone	gray-light gray siltstone, with minor black mudstone laminates (5%), a few coal films; bedding di
		553.50	567.45	13.95					GT51 GT52			Sandstone	fine sandstone, light gray to gray, more quartz, few dark debris; no reaction with 5% HCl; at 558 laminate, numerous carbonized fossils; a few coal seams.
		567.45	574.19	6.74					GT53			Mudstone	dark gray to black mudstone, silty; slightly broken.
		574.19	575.10	0.91								Mudstone	mudstone, black-dark gray, massive, competent, solid; rich in CM and carbonized plant fossils.
		575.10	578.50	3.40								Mudstone	mudstone, black; very rich in coal films, broken; at the base (578.40m - 578.50m); 0.10m coal sea
		578.50	579.60	1.10								Mudstone	dark gray mudstone; more silty than the above and the beneath.
		579.60	581.15	1.55		70°						Mudstone	black mudstone; lots of coal films; rich in carbonized plant fossils; bedding dip: 70°.
		581.15	585.13	3.98		70°						Siltstone	siltstone, very muddy; especially at the lower part; dark gray, intact.
		585.13	587.96	2.83		70°			GT54			Siltstone	siltstone, gray-dark gray; interbedded with mudstone laminates (30%); bedding dip: 70°, intact; no rea
		587.96	593.45	5.49					GT55			Sandstone	fine grained sandstone; light gray-gray, a few dark mudstone laminates (15%); fractured no: 5/m;
		593.45	594.10	0.65								Mudstone	silty mudstone, black; a few coal films.
		594.10	596.13	2.03								Sandstone	fine grained sandstone; gray-light gray, intact, numerous dark high carbonized laminates.
		596.13	596.80	0.67								Siltstone	gray-yellowish siltstone, at top; a few black laminates.
		596.80	601.63	4.83								Mudstone	mudstone, black; massive, numerous coal films; rich in MS; at the upper part, broken.
	#7	**601.63**	**604.30**	**2.67**		**70°**		**Q5**				**Coal**	**2.67m coal seam; Rc: 2.67m, black, bright, light; broken to 1-4cm debris; dip: 70°.**
		604.30	605.80	1.50					GT56			Mudstone	mudstone, black; a few coal films.
		605.80	611.42	5.62								Siltstone	dark gray to black siltstone, towards the base, mud increases; a few coal films; few plant fossil
		611.42	612.69	1.27								Mudstone	black mudstone; very rich in plant fossils; lots of CM, numerous coal films; thickest coal films
		612.69	613.44	0.75								Siltstone	black siltstone; broken, to the base, only 1-3cm chunks.
		613.44	616.25	2.81									no core; bad gravel, washed away; there may be a cave.
		616.25	616.60	0.35									also very broken; 1-3cm chunks, siltstone with coal films.
		616.60	617.43	0.83					GT57			Siltstone	dark gray siltstone; a few coal films; few plant fossils.
		617.43	626.05	8.62		70°			**GT58**			Siltstone	gray-dark gray siltstone; interbedded with light gray fine sandstone; in the middle part, more fi fractures infilled with white veins; no react with 5% HCl.
		626.05	628.30	2.25								Siltstone	dark gray to black siltstone; lots of coal films and plant fossils.
		628.30	628.50	0.20								Mudstone	black mudstone; rich in CM, coal films and plant fossils.
	#7-1	**628.50**	**629.80**	**1.30**		**70°**		**Q6**				**Coal**	**1.30m coal seam; Rc: 1.0m, parting: 0.08m. black, light, bright, broken to 1-5cm fragment, s 0.35<0.08>0.57m.**
		629.80	630.75	0.95								Siltstone	black siltstone.
		630.75	637.95	7.20					GT59			Siltstone	dark gray siltstone, interbedded with light gray fine sandstone; in the middle part, fine sandsto
		637.95	640.86	2.91								Siltstone	dark gray siltstone; waving laminates of mudstone.
		640.86	643.66	2.80		70°			GT60			Sandstone	light gray to gray fine sandstone; a few black siltstone laminates, a fracture at 641.90m; slicke
		643.66	653.06	9.40		65°			GT61			Sandstone	light gray fine grained sandstone, interbedded with minor dark gray siltstone laminates (5%), co debris; bedding dip: 65°; a few of fractures infilled with calcite veins; fracture angle to the core axis: 60%.
		653.06	655.00	1.94								Siltstone	black siltstone with light gray fine sandstone laminates (10%); towards the base, siltstone becom sandstone and with more sandstone laminates (30%).
		655.00	656.00	1.00								Siltstone	dark gray siltstone, interbedded with light gray fine sandstone lenses; siltstone is coarser than
		656.00	657.87	1.87		70°						Sandstone	light gray fine grained sandstone; rich in coal films. at the base; a few 2-3mm gravels (5%); fra
		657.87	662.37	4.50		65°			GT62			Siltstone	gray to dark gray siltstone, interbedded with light gray fine grained sandstone; at the lower par thickness of laminates; some present lenses, waving laminates. towards the base, rich in coal fi
	#8	**662.37**	**669.24**	**6.87**				**Q7 Q8 Q9**		**CBM2 CBM3**		**Coal**	**6.87m coal seam; Rc: 6.87m, black, light, bright. Dip:70.**
		669.24	672.00	2.76								Mudstone	black mudstone, very rich in coal films and CM, numerous plant fossils; a fracture at 671.30m; to
		672.00	672.10	0.10									very broken to smashed; black mudstone; cave & reaming here.
		672.10	677.46	5.36					**GT63**			Siltstone	gray siltstone, numerous coal films.
		677.46	678.25	0.79								Siltstone	light gray siltstone, a few coal films.
	#8-1	**678.25**	**681.05**	**2.80**		**65°**		**Q10**				**Coal**	**2.80m coal seam; Rc: 0.98m, black, light, bright; dip: 65°.**
		681.05	683.20	2.15					**GT64**			Siltstone	light gray siltstone, interbedded; numerous dark gray carbon containing weaving laminates.
		683.20	687.46	4.26								Siltstone	white and black siltstone; towards the base more mud and becomes darker.
		687.46	689.10	1.64								Sandstone	light gray fine grained sandstone, with minor black waving laminates.
		689.10	694.45	5.35					GT65			Siltstone	light gray siltstone, with numerous black waving laminates minor coal films.
	#9	**694.45**	**698.47**	**4.02**		**65°**		**Q11 Q12**		**CBM4**		**Coal**	**4.02m coal seam; light, bright, black; no parting; dip: 65°.**
	AT 694.8 m, NQ drilling	694.80	698.47	3.67									stuck, not reach the bottom. Restart logging on Feb. 18, 2013; reduced to NQ from 694.80m; NQ off 698.47m.
		696.30	696.80	0.50								Mudstone	black mudstone, very rich in CM and coal films.
		696.80	701.60	4.80		40°			GT66			Siltstone	dark gray siltstone; in the upper part, lots of plant fossils and coal films; in the lower part, plane: 40°; at 689.75m - 699.43m, fracture with 80-90° to core axis and infilled with calcite veins; no: 5/m.
		701.60	709.60	8.00								Mudstone	black mudstone; very rich in CM and coal films, especially in the lower part; broken, fracture de no: 10/m.
		709.60	714.20	4.60		40°			**GT67**			Siltstone	gray to dark gray siltstone; in the lower part, muddy and rich in CM and coal films; bedded plane developed, with 60-70° to core axis and infilled with calcite veins; fracture no: 15/m.
		714.20	719.00	4.80								Mudstone	black mudstone; very rich in CM and plant fossils; lots of coal films; in the lower part, very br
		719.00	719.50	0.50								Siltstone	gray to dark gray siltstone, with fracture, infilled with calcite veins.
		719.50	721.90	2.40								Mudstone	black mudstone; very rich in CM and plant fossils; lots of coal films; very broken.
	#9-1	**721.90**	**722.88**	**0.98**		**40°**		**Q13**				**Coal**	**0.98m coal seam; Rc: 0.60m; black, light, bright; massive; no parting; bedding dip: 40°.**
		722.88	723.00	0.12								Siltstone	dark gray-black siltstone; rich in coal films.
		723.00	726.00	3.00		60°			**GT68**			Sandstone	gray-light gray fine grained sandstone, interbedded with dark laminates; fracture with 60° to core a bedded plane: 60°.
		726.00	727.06	1.06		45°						Siltstone	dark gray siltstone, interbedded with mudstone; very rich in CM and lots of coal films; bedded p
													TD: 727.06m

Wapiti River — Drill Hole Core Log

Drilling Company:	Foraco			**Hole No.:**	WP1C30		
Rig Type:	VD-8000			**Collar Elevation:**	1117.2m		
Total Depth:	778.70m			**Coordinate:**	**Northing:**	6073998.4	
Spud Date:	14-Jan-12				**Easting:**	650408.1	
Finished Date:	27-Jan-13			**Logging Geologist:**	Lee, Bo		
Core Size:	HWT/HQ			**Note:**	**The hole is pumping test hole. (for Golder Company)**		

Formation	Coal Seam	Core Depth Interval From	To	Thickness, m Thick	TRUE	Strata Dip	Coal Floor Elevation	Sample ID Coal	Rock	CBM	Rock Hardness	Rock Name	Lithology Description
Q		0.00	31.80	31.80									starting to coring from 31.80m.
Hasler		31.80	44.50	12.70		5°						Siltstone	siltstone, light black-dark gray, with white-gray, fine sandstone laminate (5%); lots of pyrite crystal; at 39m bedded plane: 5°.
		44.50	77.60	33.10		5°						Siltstone	siltstone, dark gray to light black, interbedded with laminate of white-gray fine sandstone (25%) micro-horizontal bedding; at 50m bedded plane: 5°; at 72m bedded plane: 5°; at 57.25m - 58.25m, b vertical fracture, fracture no: 6; from 75.30m - 75.80m, broken, vertical fracture, fracture no: 75m, bedded plane: 5°.
Boulder Creek		77.60	77.90	0.30								Sandstone	sandstone, white-gray, coarse-grained, poorly-sorted.
		77.90	78.30	0.40		15°							conglomerate, white-gray, Ø: 4-6mm; poorly-sorted, interbedded with thin layers of coarse sandsto bedded plane: 15°.
		78.30	79.10	0.80								Mudstone	mudstone, brown and gray, bauxitic, massive.
		79.10	80.00	0.90								Sandstone	sandstone, gray, fine-grained, well-sorted.
		80.00	86.00	6.00								Siltstone	siltstone, light gray, little bauxitic; at 84.90m - 86.10m, broken, fracture no: 15; vertical fra
		86.00	92.50	6.50								Mudstone	mudstone, light gray, bauxitic, massive.
		92.50	97.05	4.55								Siltstone	siltstone, light gray; with a few layers of fine sandstone; at bottom, a layer of white-gray fine sandstone.
		97.05	111.95	14.90								Mudstone	mudstone, bauxitic, light gray, at 107.50m - 107.70m, bauxity, white-gray, hard, at 105.90m - 107 leaf fossil on bedding plane; at 1007.50m, a thin layer of calcite, 0.01m thick.
		111.95	122.10	10.15		15°						Sandstone	sandstone, white-gray, medium-coarse grained; coarser toward base; at 117.60m - 118.50m, dark gra siltstone breccia; quartz and black debris, green chart; moderately-sorted; subrounded-subangular 113.30m bedded plane: 15°; from 112.40m - 113.40m, broken, a vertical fracture; rough fracture pl fracture no: 2; at 115m bedded plane: 15°.
		122.10	128.55	6.45								Mudstone	mudstone, light black, brown-light gray, massive; from 122.10m - 124.30m, light black; 124.30m - 127.80m, brown-light gray, bauxitic.
		128.55	156.05	27.50		15° 20°						Siltstone	siltstone, light gray, interbedded with layers of black mudstone and thin layers of white-gray, f sandstone; mudstone content: 40%; fine sandstone: 20%; siltstone: 40%, with leaf fossil in mudsto upper part, distorted bedding; at 130m bedded plane: 15°; at 141m bedded plane: 15°; at 149m bedd plane: 20°; at 151.30m bedded plane: 15°; at 155.50m - 156.05m, a layer of fine sandstone.
		156.05	158.50	2.45								Mudstone	mudstone, brown-gray, bauxitic, massive.
		158.50	167.50	9.00								Mudstone	mudstone, gray, little bauxitic, silty; massive.
		167.50	168.40	0.90		30°						Sandstone	sandstone, white-gray, medium-grained; with dark siltstone laminate; at upper part, few calcite v at 167.70m bedded plane: 30°.
		168.40	173.50	5.10								Mudstone	mudstone, brown-gray, bauxitic, massive.
		173.50	176.85	3.35								Siltstone	siltstone, light gray; interbedded with thin layers of fine sandstone; from 170.50m - 175.50m, ve broken, fracture no: 30/m.
		176.85	177.05	0.20								Coal	coal seam, 0.20m, Rc: 0.20m; dull black.
		177.05	179.75	2.70								Sandstone	sandstone, white-gray, medium-grained; quartz predominately, well-sorted.
		179.75	186.70	6.95		20° 30°						Sandstone	sandstone, white-gray, medium-grained, interbedded with thin layers of conglomerate; poorly-sorte 180m bedded plane: 30°; at 183.50m bedded plane: 20°
		186.70	199.50	12.80		15°						Sandstone	sandstone, white-gray, fine-grained; from 195.50m - 199.50m, interbedded with layers of dark mudd siltstone; (20%); at 197m bedded plane: 15°.
Hulcross		199.50	203.50	4.00		15°						Sandstone	sandstone, white-gray, fine-grained, interbedded with thin layers of dark siltstone content: 50%; 202m bedded plane: 15°.
		203.50	221.40	17.90		15°						Siltstone	siltstone, dark gray; interbedded with thin layers of white-gray fine sandstone content: 40%; at 202.50m - 202.80m, broken, fracture no: 6; at 204m bedded plane: 15°; at 210m bedded plane: 15°; 220m bedded plane: 15°; at 213.70m - 214.50m, broken, fracture no: 15.
		221.40	276.80	55.40		10°			GT1 GT2 GT3 GT4 GT5			Siltstone	siltstone, dark gray; with laminate of white-gray fine sandstone; at 238.50m, 0.10m thick, a few limestone laminate; at 253m, 0.15m thick, argillaceous limestone; at 269.80m, 0.15m thick, argill limestone; at 230m bedded plane: 10°; at 250m bedded plane: 10°; at 260m bedded plane: 10°; at 27 - 276.80m, fine sandstone; at 270m bedded plane: 10°; at 275m bedded plane: 10°.
Gates		276.80	279.35	2.55					GT6			Mudstone	mudstone, light black-black, little silty; at 276.80m - 277.90m, numerous pyrite nodule (2x5mm).
		279.35	279.50	0.15								Coal	coal seam, 0.15m, Rc: 0.15m, intact, shiny, brittle; no parting.
		279.50	282.10	2.60		15°						Sandstone	sandstone, white-gray, fine-grained; interbedded with thin layers of black silty mudstone; rich i fossil in mudstone; at 282.10 bedded plane: 15°.
	#2	282.10	282.47	0.37								Coal	coal seam, 0.37m, Rc: 0.37m, half-broken; shiny, light. Co: 282.10m - 282.32m, 0.22m; parting: 28 - 282.40m, 0.08m, black, mudstone. Co: 282.40m - 282.47m, 0.07m. Structure: 0.22<0.08>0.07m.
		282.47	285.50	3.03					GT7			Mudstone	mudstone, black; carbonaceous in part at upper part.
	#3	285.50	286.77	1.27				Q1 Q2				Coal	coal seam, 1.27m, Rc: 1.27m, no lost; half-broken, banded coal; shiny. Co: 285.50m - 285.82m, 0.3 0.32m, shiny, light. Parting: 285.82m - 286.10m, 0.28m. Black, mudstone, a little carbonaceous. C 286.10m - 286.77m, 0.67m, shiny, light. Structure: 0.32<0.28>0.67m.
		286.77	287.50	0.73								Mudstone	mudstone, black, massive.
		287.50	287.60	0.10								Coal	coal seam, 0.10m; no parting, shiny, light.
		287.60	289.25	1.65								Mudstone	mudstone, black to carbonaceous; massive; at 288.10m - 289m, a few lenses and coal streaks; at 28 0.10m thick, coal seam, shiny; no parting.
		289.25	293.00	3.75		10°			GT8			Sandstone	sandstone, white-gray, fine-grained; with dark siltstone laminate, banded plane: 10°
		293.00	307.20	14.20		15°			**GT9**			Mudstone	mudstone, light black, silty; interbedded with thin layers of white-gray fine sandstone content: at 303m bedded plane: 15°.
		307.20	321.45	14.25		20°			GT10 GT11			Sandstone	sandstone, white-gray, fine-grained; interbedded with thin layers of dark muddy siltstone (30%); 313m bedded plane: 20°; at 305.30m - 305.60m, coal seam, 0.30m, Rc: 0.30m, broken; no parting, sh light; at 310.50m - 310.65m, with a few coal streaks; at 318.50m bedded plane: 20°; at 319.50m be plane: 20°.
		321.45	322.05	0.60		10°						Mudstone	mudstone, black, silty; with fine sandstone laminate; at 321.80m bedded plane: 10°.
	#5	322.05	323.50	1.45				Q3		CBM1		Coal	coal seam, 1.45m, Rc: 1.30m, 0.15m lost; intact; no parting, shiny, light.
		323.50	337.60	14.10					**GT12 GT13**			Mudstone	mudstone, black, massive; with a few layers of dark gray siltstone; from 326m - 326.95m, a few co streaks.
		337.60	338.50	0.90								Mudstone	mudstone, brown and gray, bauxitic.
		338.50	360.40	21.90		20°			GT14 GT15			Mudstone	mudstone, black, light black, interbedded with thin layers of white-gray fine sandstone; fine san content: 30%, mudstone: 70%; at 348.15m, 0.05m thick limestone, white-gray, reacting HCl 5% stron at 345.60m - 356.50m, little broken, fracture no: 15; with few calcite veins; at 346m bedded plan 20°; at 359.50m bedded plane: 20°; at 358m, 0.10m thick, coal seam, shiny, light.
	#6	360.40	361.00	0.60								Coal	coal seam, 0.60m, Rc: 0.60m; half-broken; no parting, shiny, light.
		361.00	362.50	1.50					GT16			Mudstone	mudstone, black, massive; at 361.70m, 0.05m coal seam, shiny, light.
		362.50	362.85	0.35								Coal	coal seam, 0.35m, Rc: 0.35m; shiny, light. Parting: 362.75m -362.80m, 0.05m, black, mudstone.
		362.85	372.50	9.65		10°			GT17			Mudstone	mudstone, black, massive; at 372.40m, 0.05m thick coal seam; at 369.20m bedded plane: 10°.
		372.50	374.10	1.60		20°						Sandstone	sandstone, white-gray, with dark mudstone laminate; at 374m bedded plane: 20°
		374.10	376.50	2.40								Mudstone	mudstone, black, carbonaceous in part.
		376.50	381.20	4.70								Sandstone	sandstone, white-gray; fine-grained; at 377m bedded plane: 15°; at 380.50 bedded plane: 20°.
		381.20	386.77	5.57		30°			GT18			Mudstone	mudstone, black; at middle part, a layer of fine sandstone; at 384.30m, 0.15m coal seam; at 385.5 bedded plane: 30°.
		386.77	387.37	0.60								Coal	coal seam, 0.60m, Rc: 0.60m, broken; no parting, shiny, light.
		387.37	399.47	12.10					GT19			Mudstone	mudstone, black, massive; with leaf fossil; at 389.50m - 390m, broken, fracture no: 20, with nume coal streaks; at 395.30m - 397.60m, broken, fracture no: 15/m.
	#7	399.47	400.55	1.08				Q4				Coal	coal seam, 1.08m, Rc: 0.90m, 0.18m lost; half-broken; no parting, shiny, light
		400.55	405.20	4.65					GT20			Mudstone	mudstone, black, massive; at lower part, a few coal streaks; at bottom, 0.06m, coal seam.
		405.20	413.35	8.15		15°			GT21			Sandstone	sandstone, white-gray, fine-grained; with few branch fossils; at 408m bedded plane: 15°; at 411m plane: 15°.
		413.35	427.00	13.65		15° 20°			GT22			Sandstone	sandstone, white-gray, fine-grained; with dark mudstone laminate; at 422m bedded plane: 15°; at 4 bedded plane: 20°.
		427.00	431.80	4.80					GT23			Mudstone	mudstone, black, massive; at 430.75m - 431.05m, 0.30m, coal seam, Rc: 0.30m, intact; light, brigh
	#8	431.80	433.20	1.40				Q5 Q6				Coal	coal seam, 1.40m, Rc: 1.40m, half-broken, shiny, bright, brittle. Co: 431.80m - 432.60m, 0.80m, R 0.80m. Parting: 432.60m - 432.95m, 0.35m, black, mudstone, a few coal streaks. Co: 432.95m - 433. 025m, Rc: 0.25m. Structure: 0.80<0.35>0.25m.
		433.20	434.15	0.95								Mudstone	mudstone, black, massive; at lower part, carbonaceous; with a few coal streaks.
	#8-1	434.15	437.85	3.70				Q7 Q8 Q9				Coal	coal seam, 3.70m, Rc: 1.85m; 1.85m lost at top; broken, bright, light. Co: 434.15m - 436.90m, 2.7 Rc: 0.90m, 1.85m lost at top. Parting:436.90-437.50m, 0.60m, black, carbonaceous; co: 437.50m - 437.85m, 0.35m, Rc: 0.35m, broken, dull. Structure: 2.75<0.60>0.35m.
		437.85	440.20	2.35								Mudstone	mudstone, black to carbonaceous, carbonaceous at upper part; numerous coal streaks; at 438.50m, 0. coal seam; at 440m, 0.10m thick, coal seam, broken.
		440.20	445.55	5.35					GT24			Mudstone	mudstone, black; at middle part, with fine sandstone laminate; at lower part, carbonaceous in par few coal streaks.
	#9	445.55	451.14	5.59				Q10 Q11 Q12 Q13				Coal	coal seam, 5.59m, Rc: 5.19; at 446.50m - 446.90m, 0.40m lost; half-broken at upper part; intact a lower and middle part; shiny, light, brittle. Co: 445.55m - 447.90m, 2.35m, Rc: 1.95m, 0.40m lost. Parting: 447.90m - 447.96m, 0.06m, black mudstone. Co: 447.96m - 451.14m, 3.18m, Rc: 3.18m. struc 2.35<0.06>3.18m.
		451.55	452.20	0.65					GT25			Mudstone	mudstone, black, massive.
		452.20	467.00	14.80		10°			GT26			Sandstone	sandstone, white-gray, fine-grained; interbedded with thin layers of black mudstone (30%); at 454 454.50m, a vertical fracture, no: 2; at 452m bedded plane: 10°; at 456m bedded plane: 10°; at 463 464.90m, vertical fracture No: 4.
		467.00	474.03	7.03		10° 20° 25°						Sandstone	sandstone, white-gray, fine-grained, quartz predominately, well-sorted; with dark mudstone lamina 468.20m - 471.80m, 3 vertical fracture, fracture no: 6; few coal film on bedding plane; at 467m b plane: 10°; at 470m bedded plane: 20°; at 473m bedded plane: 25°.
		474.03	476.80	2.77		20°						Sandstone	sandstone, light gray, fine-grained; interbedded with thin layers of black mudstone (40%); bedded plane: 20°.
		476.20	479.80	3.60		20°			GT28			Mudstone	mudstone, black; at middle; with fine sandstone laminate; at 478.50m bedded plane: 20°.
	#10	479.80	483.70	3.90				Q14 Q15 Q16		CBM2		Coal	coal seam, 3.90m, Rc: 3.80m, 0.10 lost at bottom, vertical fracture; half-broken, shiny, light, brittle. Co: 479.80m - 481.25m, 1.45m, half-broken, Rc: 1.45m. Parting: 481.25m - 481.35m, 0.10m, black mudstone; co: 481.35m - 483.10m, 2.35m, Rc: 2.25m, 0.10m lost at bottom. Structure: 1.45<0.10>2.35m.
		483.70	485.50	1.80					GT29			Mudstone	mudstone, black; at upper part, numerous coal streaks; rich in leaf fossil.
		485.50	496.10	10.60		15° 19°			GT30			Sandstone	sandstone, white-gray, medium-grained, quartz, chert and dark debris; well-sorted; at 487m bedded plane: 15°; at 494m bedded plane: 19°.
		496.10	506.30	10.20		15°			**GT31**			Sandstone	sandstone, white-gray, fine-grained; interbedded with thin layers of dark siltstone; at 497m bedd plane: 15°; at 500m bedded plane: 15°; 506.30m bedded plane: 15°.
		506.30	506.50	0.20								Mudstone	mudstone, black, carbonaceous.
	#11	506.50	506.95	0.45								Coal	coal seam, 0.45m; Rc: 0.45m; broken; no parting, bright, light.
		506.95	510.40	3.45					GT32			Mudstone	mudstone, black, massive; at upper part, carbonaceous; with a few coal streaks; at 509.40m - 509. carbonaceous, with few thin coal seams.
		510.40	511.40	1.00								Sandstone	sandstone, white-gray, fine-grained; with a vertical fracture throughout, in filled calcite cryst
		511.40	513.30	1.90								Mudstone	mudstone, black, massive.
	#11-1	513.30	513.80	0.50								Coal	coal seam, 0.50m, Rc: 0.50m; broken; no parting; shiny, light.
		513.80	520.05	6.25		13°			GT33			Mudstone	mudstone, black, at lower part, with fine sandstone laminate; at top, carbonaceous, with few coal streaks; with 2 thin layers of limestone; at 518.70m bedded plane: 13°.
	#12	520.05	521.20	1.15				Q17 Q18				Coal	coal seam, 1.15m, Rc: 1.07m, 0.08m lost at top; broken, shiny, light. Co: 520.05m - 520.23m, 0.18 0.10m. Parting: 520.23m - 520.43m, 0.20m black mudstone, broken. Co: 520.43m - 521.20m, 0.77m, Rc 0.73m. Structure: 0.18<0.20>0.77m.
		521.20	521.60	0.40								Mudstone	mudstone, black, carbonaceous in part; with a few coal streaks; at 521.30m, 0.07m coal seam.
		521.60	523.00	1.40		20°			GT34			Sandstone	sandstone, white-gray, fine-grained; at 523m bedded plane: 20°.
		523.00	524.00	1.00								Mudstone	mudstone, black, massive.
		524.00	546.05	22.05		20°			GT35 GT36			Sandstone	sandstone, white-gray, medium-grained; quartz and debris predominately; interbedded with thin lay light black, silty mudstone (20%); at 527m bedded plane: 20°; at 535m bedded plane: 20°; at 540m plane: 20°.
		546.05	569.70	23.65		15°						Sandstone	sandstone, white-gray, fine-grained; interbedded with thin layers of dark muddy siltstone; fine sandstone content: 50%; muddy siltstone: 50%; at 550m bedded plane: 15°; at 560m bedded plane: 15 from 563m - 564m, 2 vertical fracture; fracture no: 4.
		569.70	587.50	17.80		15°						Siltstone	siltstone, light black-dark gray, with white-gray, fine sandstone; fine sandstone: 45%, siltstone content: 55%; at 570m and 580m bedded plane: 15°.
		587.50	613.00	25.50		10°						Siltstone	siltstone, dark gray, with thin layers of fine sandstone (20%); fine sandstone decrease to base; 590m bedded plane: 10°; at 600m bedded plane: 10°.
Moosebar		613.00	654.18	41.18								Siltstone	siltstone, dark gray, massive; hard, well compacted and indurated; at 618.15m, 0.07m, koalinte, b
Gething		654.18	656.50	2.32									conglomerate, light gray, Ø: 5-10mm; quartz, green chart and dark debris; unangular - rounded; we sorted; matrix of sandstone.
	A1	**656.50**	**656.85**	**0.35**								**Coal**	**coal seam, 0.35m, Rc: 0.35m, intact; no parting, light, bright.**
		656.85	666.49	9.64		10° 15°						Mudstone	mudstone, black; interbedded with thin layers of find sandstone (30%); at 658.70m - 658.90m, few streaks; at 658.90m - 659m, coal seam, 0.10m, shiny, light; at 661.40mm 0.16m; coal seam; no part shiny, light; at 657.20m bedded plane: 10°; at 661m bedded plane: 15°; at 665m bedded plane: 15°.
	A2	**666.49**	**668.60**	**2.11**				**Q19**				**Coal**	**coal seam, 2.11m, Rc: 2.11m; half-broken; no parting, shiny, bright, light.**
		668.60	669.70	1.10		15°						Sandstone	sandstone, light gray, medium-grained; at 669.50m bedded plane: 15°.
		669.70	677.30	7.60		20°						Mudstone	mudstone, black; with 2 layers of fine sandstone; at 673.30m, 0.40m fine sandstone; at 675.90m, 0 fine sandstone; at 674m - 674.40m, argillaceous limestone, gray, strongly reacting with HCl 5%; a 670.80m, 0.05m thick, coal seam; at 676.80m, 0.07m thick, coal seam; at 676m bedded plane: 20°.
	A3	**677.30**	**678.50**	**1.20**				**Q20**				**Coal**	**coal seam, 1.20, Rc: 0.95m, 0.25m lost at top; no parting, bright, light.**
		678.50	679.10	0.60		20°						Sandstone	sandstone, light gray, medium-grained; with few coal lenses; at 678.70m bedded plane: 20°.
		679.10	679.40	0.30								Mudstone	mudstone, black, carbonaceous, massive.
		679.40	687.50	8.10		20°						Sandstone	sandstone, white-gray, fine-grained; interbedded with thin layers of dark mudstone (40%); at 685m bedded plane: 20°; at 686m bedded plane: 20°.
		687.50	704.62	17.12		15° 20°						Sandstone	sandstone, white-gray, medium-grained; quartz predominately, well-sorted; at 692.50m - 692.80m, f conglomerate; at 691.70m, 2 coal streaks; at 689m bedded plane: 20°; at 692m bedded plane: 20°; a bedded plane: 15°; reacting HCl 5% throughout weakly; at 696.30m bedded plane: 15°.
		704.62	706.60	1.98		18°						Mudstone	mudstone, black; at upper part, interbedded with thin layers of fine sandstone; at 705m bedded pl 18°.
	A4	**706.60**	**707.70**	**1.10**				**Q21**				**Coal**	**coal seam, 1.10m; Rc: 1.0m, 0.10m lost at bottom; no parting, shiny, light; broken.**
		707.70	708.20	0.50								Siltstone	siltstone, light black, muddy.
		708.20	709.50	1.30		20°						Sandstone	sandstone, white-gray, medium-grained; at 709m bedded plane: 20°.
		709.50	714.25	4.75		15°						Mudstone	mudstone, brown-gray, black; at 710m - 711.10m brown-gray, bauxitic; at top and bottom, black mud at 713.40m bedded plane: 15°.
	A5	**714.25**	**714.90**	**0.65**								**Coal**	**coal seam, 0.65m, Rc: 0.65m; half-broken, shiny, light. Co: 714.25m - 714.75m, 0.50m, Rc: 0.6 Parting: 714.75m - 714.80, 0.05m, black mudstone. Co: 714.80 - 714.90m, 0.10m, Rc: 0.10m. Structure: 0.50<0.05>0.10m.**
		714.90	718.60	3.70		15°						Sandstone	sandstone, white-gray, fine-grained; with dark mudstone laminate; distorted bedding; at 717m bedd plane: 15°.
		718.60	**718.75**	**0.15**								**Coal**	**coal seam, 0.15m, intact; no parting, shiny, bright.**
		718.75	719.70	0.95								Mudstone	mudstone, black, massive; at upper part, a few coal streaks.
		719.70	727.00	7.30		30°						Sandstone	sandstone, white-gray, fine-grained; interbedded with thin layers of black mudstone (50%); at 725 725.75m, 0.15m coal seam; at 721.50m, 0.12m coal seam; at 726.40m bedded plane: 30°.
		727.00	735.70	8.70								Mudstone	mudstone black; with fine sandstone laminate; at 732.30m - 732.70m, 733.40m - 733.70m, fine sands at 727m, 0.10m coal seam; at 728.30m, 0.15m coal seam.
		735.70	736.80	1.10								Mudstone	mudstone, black, carbonaceous at middle part; at 735.20m, 0.13m thick coal seam; at 735.80m, 0.15 thick coal seam; at 736.70m, 0.06m coal seam.
		736.80	740.50	3.70		15° 20°						Sandstone	sandstone, white-gray, medium-grained; with dark siltstone laminate; at 739m bedded plane: 20°.
		740.50	742.13	1.63								Siltstone	siltstone, dark gray; rich in leaf fossil, at bottom, 0.10m, carbonaceous mudstone.
	A7	**742.13**	**744.32**	**2.19**				**Q22 Q23 Q24**				**Coal**	**coal seam, 2.19m, Rc: 2.0m, 0.19m lost (743.50m - 743.69m); broken; at lower part, few vertic fracture; boney coal: 742.13m - 742.69m, 0.49m, Rc: 0.49m; little heavy, dull; parting: 742.6 742.62m, 0.08m, black mudstone. Co: 742.70m - 743.10m, 0.40m, Rc: 0.40m; parting: 743.10m - 743.15m, 0.05m, black mudstone. Co: 743.15m - 743.40m, 0.25m, Rc: 0.25m; parting: 743.40m - 743.50m, 0.10m, black mudstone. Co: 743.50m - 744.32m, 0.82m, Rc: 0.63m, 0.19m lost. Structu 0.49<0.08>0.40<0.05>0.25<0.10>0.82m**
		744.32	746.50	2.18								Mudstone	mudstone, black, massive.
		746.50	771.70	25.20								Mudstone	mudstone, black, interbedded with layers of white-gray fine sandstone (40%); at 749.20m - 750m, f sandstone; at 761.90m - 763.10m, fine sandstone; at 749.80m bedded plane: 35°; at 759.50m bedded 30°; at 768m bedded plane: 15°; at 767.80m - 768.20m, fine sandstone.
		771.70	774.50	2.80								Sandstone	sandstone, white-gray, fine-medium grained; coarser toward base, at lower part, medium sandstone; quartz and debris; well-sorted.
condomin		774.50	774.80	0.30									conglomerate, white-gray, Ø: 2-8mm; poorly-sorted; matrix of sandstone.
		774.80	778.70	3.90									conglomerate, white-gray, Ø: 10-50mm quartz, green charts and dark debris; rounded and unangular, poorly-sorted, matrix of sandstone and siltstone; at 777.10m - 778.50m, little broken, fracture n 15/m.
													TD= 778.70m

Wapiti River **Drill Hole Core Log**

Drilling Company:	CYR INTERNATIONAL DRILLING		**Hole No.:**	WP1C31	
Rig Type:	SUPER BEAR-1		**Collar Elevation:**	1175.1m	
Total Depth:	740.00m	**Coordinate:**	**Northing:**	6073231.3	
Spud Date:	11-Jan-13		**Easting:**	651187.4	
Finished Date:	23-Jan-13		**Logging Geologist:**	Lee, Victor, Ricky	
Core Size:	HWT/HQ		**Note:**		

Formation	Coal Seam	Core Depth Interval From	To	Thickness, m Thick	TRUE	Strata Dip	Coal Floor Elevation	Sample ID Coal	Rock	CBM	Rock Hardness	Rock Name	Lithology Description
Q		0.00	14.00	14.00								till	overburden, RC:1.30m. Soft, soil, brown.
Hasler		14.00	47.00	33.00		45°						Siltstone	light black, muddy. With white-grey fine-grained sandstone(FGSS) laminated (5%). Horizontal bedding. At 21m, 31.5m,39.0m, bedding plane: 45 degree. From 14 to 29m, very broken, fracture No.: 30/m; from 37.7 to 47m, little broken, fracture No.:8/m.
		47.00	59.00	12.00		25°						Siltstone	dark grey to light black, little muddy, interbedded with light grey FGSS,3-5%. From 55.6 to 56.3m, broken, fracture No:10/m. at 58m, bedded plane: 25 degree.
		59.00	80.00	21.00		25°						Siltstone	same as previous intervals, plus FGSS laminated increased to 30%, micro-horizontal bedding. At 65m, bedded plane: 25 degree. FGSS laminated thick or thin unevenly, locally interrupted or nodular. At 80m, bedded plane: 25 degree.
		80.00	119.00	39.00		30°						Siltstone	dark grey, interbedded with light grey FGSS laminated, content: 30-40%. Micro-horizontal bedding. At 95m, bedded plane: 23 degree. Alternating with band of thin siderite. From 94.5-104m, more FGSS; mix into each other. At 115m, 0.15m CGSS. From 114.5-119.00m, broken into many pieces, one of 116.00-117.00m, brittle, only 2-3cm fragment, fracture No.: 30/m. at 115.5m, bedded plane: 30 degree.
		119.00	161.00	42.00								Siltstone	dark grey, interbedded with light grey FGSS laminated, content: 40%. Micro-horizontal bedding. little muddy, and with a few siderite laminated. At 122.00m, bedded plane: 15 degree. Alternating with band of thin siderite. From 123.6-125m, broken into many pieces, at 131-131.8m, more FGSS; From 132-141.5m, less than FGSS, content:10%. at 140m, bedded plane: 10 degree. at 143-144.6m, ripple-bedding on FGSS bedding; at 150m, interrupted or nodular; at 158m, bedded plane: 10 degree.
		161.00	199.85	38.85								Siltstone	dark grey, interbedded with a few light grey FGSS laminated, content: 15%.micro-horizontal bedding. Locally small cross-bedding and distorted bedding, and with a few siderite vein. At 164.4-166.6m, broken, vertical fracture developed. At 172m, bedded plane: 8 degree; at 194m,bedded plane: 5 degree. at base(from 194m), FGSS laminated increased to 50%, with FGSS nodule, distorted bedding.
		199.85	200.60	0.75								conglomerate	light grey, Φ:2-3mm; poorly-sorted. Rounded.
Boulder Creek		200.60	201.70	1.10								Mudstone	light black, massive.
		201.70	206.40	4.70								Sandstone	grey, well-sorted, with few dark grey siltstone laminated, and few bauxitic mudstone (white- grey).
		206.40	210.08	3.68								Mudstone	bauxitic mudstone. Massive, white-grey, little silt. At base, more black mudstone. At 210.07-210.08m, 0.01m coal streak.
		210.08	213.90	3.82		12°						Siltstone	grey, with light grey FGSS laminated and little bauxitic and carbonaceous debris. At 210.00m, bedded plane: 12 degree.
		213.90	216.00	2.10								Sandstone	Light grey, medium grained, with a few coal film on bedding plane. Partly with black mudstone. At 215m, bedded plane: 5 degree. At base, MGSS toward FGSS.
		216.00	225.00	9.00								Mudstone	bauxitic mudstone.massive, white-grey to grey. At upper part, more silt. From 219.3-221.5m, more FGSS.
		225.00	229.30	4.30								Siltstone	dark grey, muddy, massive,little bauxitic.
		229.30	237.50	8.20								Mudstone	bauxitic, massive, white-grey mainly. At 231.5-232.2m, more FGSS. At 235-236.5m, more black mudstone and with few coal film.
		237.50	241.00	3.50								Siltstone	grey, with light grey FGSS laminated, micro-horizontal bedding, a few carbonaceous debris observed on bedding surface.
		241.00	242.00	1.00								Sandstone	light grey,distorted bedding developed, with few coal film.
		242.00	253.40	11.40								Mudstone	bauxitic. Massive, white-grey to brown-grey. Locally perdominately black mudstone and FGSS. At 245.65m, coal film. At 246.4m, 0.05m calcite vein, react with 5% HCL. At 250.00-250.15m, broken(bauxitic).
		253.40	258.80	5.40								Sandstone	light grey, well-sorted, with a few dark grey siltstone laminated, and a few coal film and nodular observed on bedding surface. At 255.7-256.1m, 0.40m CGSS. At 253.5-253.75m, broken(FGSS). At base, with more argrillceous pebble and few calcite vein.
		258.80	259.80	1.00		5°						Mudstone	black mudstone at upper and white-grey bauxitic mudstone at lower, massive. At 256.5m, bedded plane: 5 degree.
		259.80	263.00	3.20								Sandstone	light grey, well-sorted, with a few black mudstone laminated and coal film, calcite vein at 262m. At base, 0.30m bauxitic.
		263.00	268.10	5.10								Mudstone	bauxitic. Dark grey to white-grey, massive, soft. Rock core reduced size, and with a few black mudstone.
		268.10	269.90	1.80		5°						Sandstone	light grey, well-sorted, with a few dark grey siltstone laminated. At 269m, bedded plane: 5 degree.
		269.90	274.50	4.60								Mudstone	bauxitic. Massive, dark grey to brown. At base, red-grey. Soft, rock core reduced size. At 271.6m, 0.05m mud cast. At base, silt and Fe2+ nudolar.
		274.50	277.40	2.90								Sandstone	lifgt grey, interbedded with dark grey siltstonelaminated. At 275-275.1m, more coal nodular.
		277.40	281.00	3.60								Mudstone	black, massive, broken. With munerous coal thread. A 277.9-278m, 0.10m coal seam. At 280.52-280.60m, 0.08m coal seam. From 278.55-280m, bauxitic.
		281.00	293.00	12.00		8°						Sandstone	FGSS-CGSS-MGSS. Grey-light grey, pure mainly. Interbedded with few black mudstone laminated at middle-lower part, and a few coal streak. Micro-horizontal bedding. Predominately quartz and debris, normal-sorted, partly small cross-bed. At base, 0.50m CGSS poorly-sorted, react with 5% HCL. at 292.5m, bedded plane: 8 degree.
		293.00	295.19	2.19								Mudstone	black, massive. Interbedded with 2 layers 0.30m light grey FGSS. At top, 0.20m broken.
	BC	**295.19**	**295.76**	**0.57**								**coal**	**0.57m BC coal seam. RC: 0.57m. Parting: 295.6-295.66m, 0.06m black MS. Coal structure: 0.41<0.06>0.10m.**
		295.76	302.08	6.32		5°						Sandstone	conglomerate-FGSS. Light grey. Horizontal bedding, with small cross-bed. At 300m, bedded plane: 5 degree. At base, few coal film observed. No react with 5% HCL.
		302.08	314.40	12.32								Sandstone	light grey, pure. Well-sorted. React with 5% HCL. At 303.28m, 302.50m, 302.80m, stylolite(conglomerate). Horizontal-bedding, quartz mianly. At 313.9m, 314.6m, black mudstone. At 314.5m, bedding plane: 5 degree.
		314.40	321.05	6.65		5°						Sandstone	interlaminated with FGSS and mudstone. From 317.9-318.4m, broken into many pieces, filled dew calcite vein. Fracture number:20/m. at 320m, bedded plane: 5 degree.
Hulcross		321.05	340.00	18.95		15°						Siltstone	dark grey, interbedded with ligght grey FGSS laminated, content: 40-50%. At 329.42m, 330.07m, pyrite nodule observed. Throughou with a few siderite vein. Micro-horizontal bedding. Rhythm well. At 340m, bedded plane: 15 degree.
		340.00	392.85	52.85								Siltstone	light black, little muddy, interbedded with light grey FGSS laminated, content: 20%. micro-horizontal bedding. a few siderite thin laminated throughout. at 355.65-355.75m, 0.10m white-grey argilliceous limestone, soft, strong react with 5% HCL. at 367.29-367.35m, 0.06m white-grey argliceous limestone, soft, strong react with 5% HCL. at 377m, bedded plane: 8 degree.at 386.1-386.3m, 0.20m white-grey bauxitic mudstone, soft.
		392.85	392.95	0.10								conglomerate	0.10m conglomerate, grey. Φ: 2-5mm; quartz, green charts predominately; poorly-sorted. Rounded.
Gates		392.95	402.00	9.05		17°						Sandstone	FGSS-MGSS. Grey, interbedded with light black mudstone laminated and minor black coal streak at lower part. Micro-horizontal bedding. At 395.5m, bedded plane: 15 degree. Weak react with 5% HCL. Quartz and dark grey debris mainly. At 402m, bedded plane: 17 degree. at base, 0.30m FGSS.
	#3+1	**402.00**	**402.47**	**0.47**								**coal**	**coal seam, 0.47m, RC: 0.13m, lost: 0.34m. broken; no parting, shiny, light.**
		402.47	405.86	3.39								Siltstone	light black, muddy, massive. Rich in plant root fossil/carbonaceous ebris. At base, with siderite thin laminated.
	#3	**405.86**	**407.57**	**1.71**				**Q1**				**coal**	**#3 coal seam, 1.71m, Rc: 1.09m, 0.62m lost. core lost: ① 407-407.57m, lost 0.47m; ② 406-406.15m, 0.15m; half intact, black , bright, light, no parting. Q1**
		407.57	410.00	2.43								Mudstone	black, massive. Rich in coal streak at base. At 409.28-409.53m, 0.25m coal seam.
	#3-1	**410.00**	**410.56**	**0.56**								**Coal**	**#3-1 coal seam, 0.56m, Rc: 0.56m, black, light. coal structure: 0.05<0.06>0.45m.**
		410.56	411.35	0.79								Mudstone	light black, massive. Rich in carbonaceous fragment.
		411.35	413.00	1.65								Siltstone	grey, little muddy, minor bauxitic. Massive.
		413.00	416.50	3.50								Mudstone	light black, with light grey FGSS. Little silt. At base, more coal streak and carbonaceous debris.
		416.50	421.10	4.60		5°						Siltstone	ark grey, interbedded with light grey FGSS and light black MS laminated. Micro-horizontal bedding. At 417m, bedded plane: 5 degree. At 471.5m, munerous plant root/leaf fossile.
		421.10	432.01	10.91		5°						Mudstone	light black, massive mainly. At 423.8-424.5m, more FGSS. At 424m, bedded plane: 5 degree. At 4255-427.7m, black mudstone. Rich in coal streak and filled irregular calcite vein. At 427.1-427.18m, 0.08m coal seam. Abundant carbonaceous fragment on jiont surface. at base, silt toward. at 430-431m, more FGSS, minor coal film. at base, black mudstone with few coal film.
	#4	**432.01**	**432.50**	**0.49**								**coal**	**0.49m coal seam. RC: 0.25m, lost:0.24m. Half-broken, black, bright and light.**
		432.50	432.65	0.15								Mudstone	0.15m carbonaceous mudstone.
		432.65	438.45	5.80								Mudstone	light black. At 435.1-435.5m, 0.4m bauxitic mudstone; at 435.5-436.9m, more FGSS laminated. From 436.8-end, more coal streak.
		438.45	438.95	0.50								coaly mudstone	0.50m coaly mudstone.
		438.95	440.35	1.40								Mudstone	light black, massive mainly, with minor coal threads. At 439m, bedded plane: 5 degree.
		440.35	447.93	7.58		8°						Sandstone	light grey to grey, well-sorted, quartz and dark grey debris mainly. Interbedded with light black mudstone. At 443m, bedded plane: 8 degree. At 445.3-445.9m, black mudstone mainly. From 446-446.92m, vertical fracture developed, filled calcite vein. At 446.92-end, interbedded with numerous black mudstone laminated and few carbonaceous debris.
	#5	**447.93**	**449.69**	**1.76**				**Q2**		**CBM01**		**coal**	**1.76m #5 coal seam, RC:1.54m, lost:0.22m at 449-449.22m. Black bright and light, intact, no parting. Vertical fracture developed. Q2/CBM01.**
		449.69	453.32	3.63								Mudstone	black, massive. Rich in carbonaceous fragment. At upper part, and lower part, abundant coal streak.
		453.32	**453.70**	**0.38**								**coal**	**0.38m coal seam. Boney coal. Black, dull, intact.**
		453.70	460.43	6.73		10°						Mudstone	black, massive, with numerous coal film and carbonaceous dark debris. At 459.55-459.70m, 2 layers 0.02m coal streaks. At 459m, bedded plane: 10 degree.
		460.43	**460.68**	**0.25**								**coal**	**0.25m coal seam. RC:0.25m, black.**
		460.68	462.25	1.57								Mudstone	black, massive, rich in coal streak.
		462.25	**462.40**	**0.15**								**coal**	**0.15m coal seam. Black.**
		462.40	464.64	2.24								Siltstone	dark grey, interbedded with black mudstone and light grey FGSS laminated. At top, 0.20m black mudstone.
		464.64	466.20	1.56								coaly mudstone	coaly mudstone. At 464.8-464.85m, 0.05m; 465.1-465.17m, 0.07m; 465.6-465.77m, 0.17m three layers coa seam.
		466.20	468.19	1.99								Siltstone	dark grey, with light grey FGSS laminated. At base, light black mudstone mainly, with a few coal streak.
		468.19	**468.34**	**0.15**								**coal**	**0.15m coal seam. Black.**
		468.34	470.77	2.43								Sandstone	grey, with numerous black mudstone laminated and minor coal streak. React with 5% HCL.
		470.77	471.55	0.78								Mudstone	black
		471.55	**471.67**	**0.12**								**coal**	**0.12m coal seam. Grinding.**
		471.67	476.34	4.67								Siltstone	dark grey, muddy massive. Numerous coal film and carbonaceous. At 473.58-473.61m, 0.03m coal and at 473.97-474m, 0.03m coal. At base, muddy toward.
		476.34	**476.54**	**0.20**								**coal**	**0.20m coal seam. Grinding.**
		476.54	483.50	6.96								Siltstone	dark grey to light black. Massive, abundant coal film and carbonaceous fragment. At 478.6-479.0m, broken into many pieces, black MS, grinding, rich in 2-3cm coal fragment. At 482.0-483.5m, coaly mudstone. Broken into many pieces. With a few coal thin seam.
		483.50	490.35	6.85		5°						Siltstone	dark grey, partly light black. Rich in plant rootfossil. At 493.5m, see shell fossil. At 485m, bedded plane: 5 degree. At 487.9-488.0m, 0.10m coal seam.
		490.35	**490.65**	**0.30**								**coal**	**0.30m coal seam , broken. RC:0.15m, black, bright and light.**
		490.65	499.80	9.15								Siltstone	At 494.0-494.3m, more coal streak. at 499.5m, bedded plane: 5 degree.
	#7	**499.80**	**501.17**	**1.37**		5°		**Q3 Q4**				**coal**	**1.37m coal seam. RC:1.10m, lost:0.27m. Boney coal: 499.8-500.2m, 0.40m. Black, no parting, intact. Dip: 5°. Q3,Q4.**
		501.17	503.80	2.63								Mudstone	light black, massive. Rich in coal streak. At 502.48-502.50m, and 502.96-502.98m, 2 layers 0.02m coal seamlet. Silt toward at base.
		503.80	505.70	1.90		7°						Siltstone	dark grey. At 504.8m, bedded plane: 7 degree. Numerous carbonaceous and coal debris.
		505.70	522.68	16.98		15°						Sandstone	light grey, well-sorted, interbedded with dark grey siltstone laminated. Micro-horizontal bedding, at 507m, bedding plane: 5 degree. Predomiantely quartz and dark debris. Strong react with 5% HCL. At 513m, bedding plane: 10 degree. From 518.0-521.0m, with a few coal film. at 520m, bedded plane: 10 degree. from 521.0-522.68m, MGSS mainly. rich in coal threads and filled calcite vein on joint surface. at 522.0m, dip: 15 degree.
		522.68	529.00	6.32								Siltstone	dark grey, competent. Interbedded with light grey FGSS abd a few light black mudstone laminated. A few plant root fossil and carbonaceous debris. At 526.2-529.1m, more black MS; at 527.7m, a layer calcite vein; at 527.1-529.8m, more FGSS, react with 5% HCL.
		529.00	534.48	5.48		5°						Mudstone	light black, massive, abundant coal film and carbonaceous fragment. At 533m, bedding plane: 5 degree.
		534.48	**534.81**	**0.33**								**coal**	**0.33m coal seam. RC:0.33m, black, intact.**
		534.81	535.80	0.99								Mudstone	carbonaceous mudstone. At 535.55-535.65m, 0.10m coal seam, grinding.
	#8	**535.80**	**541.15**	**5.35**				**Q5 Q5A Q6 Q7**				**coal**	**5.35m #8 coal seam, RC:4.30m. Black, bright mainly, partly dull, half-broken, more parting. Coal structure: 0.65<0.49>1.00<0.40>0.51<0.15>1.63+0.52m. Q5:535.80-537.94m, 2.14m, RC:1.77m, lost:0.37; Q5A:538.34-540.63m, 2.29m, RC:1.61m, lost:0.68m; Q6:boney coal:540.63-541.15m, 0.52m; parting:a.536.45-536.94m, 0.49m;b.537.94-538.34m, 0.40m;c.538.85-539.00m, 0.15m, black mudstone.**
		541.15	543.15	2.00								coaly mudstone	black, massive. Rich in coal streak and included 3 layers coal seam, 0.10m each, grinding. (541.55-541.65m;542.25-542.35m;542.70-542.80m)
		543.15	544.00	0.85								Mudstone	black
		544.00	550.50	6.50		5°						Siltstone	dark grey, interbedded with light grey FGSS laminated(30%). And with plant root fossil and coal streak. At 545.0m, bedded plane: 5 degree.
		550.50	553.55	3.05								Sandstone	FGSS. Light grey, well-sorted. Interbedded with dark grey siltstone laminated(10%). At upper part, 30%. With a few plant root fossil and coal streak. At 552.8m, a layer calcite vein.
		553.55	555.03	1.48								Mudstone	black, massive. Predominately carbonaceous mudstone.
	#9	**555.03**	**560.00**	**4.97**				**Q8 Q9**				**coal**	**4.97m #9 coal seam. RC:4.24m. No parting, intact, black, bright. Q8:55.03-558.03m, 3.00m, RC:2.56m, lost:0.94m; Q9:558.03-560.00m, 1.97m, RC:1.68m, lost:0.29m.**
		560.00	563.60	3.60		5°						Siltstone	light black to dark grey, massive. At top, 0.40m black MS mainly. Silt toward at base. At upper part, numerous coal streak, and carbonaceous fragment. At 562.0m, bedded plane: 5 degree.
		563.60	568.75	5.15								Sandstone	FGSS. Light grey, pure. Well-sorted, filled a few calcite vein and coal film. At 567m, bedded plane:10 degree.
		568.75	571.40	2.65								Siltstone	drak grey, interbedded with light grey FGSS laminated(20%). Micro-horizontal bedding. Few coal film observed.
		571.40	575.10	3.70								Sandstone	FGSS. Light grey, with a few siltstone laminated. At top and base, more siltstone(20%). At 572.0-572.3m, more coal streak. And calcite vein. No react with 5% HCL.
		575.10	576.60	1.50								Mudstone	light black, massive. Rich in coal streak.
		576.60	578.20	1.60		15°						Sandstone	FGSS. Light grey, well-sorted, with dark grey siltstone laminated(30%). At 577m, bedded plane: 15 degree.
		578.20	583.71	5.51		5°						Siltstone	dark grey, interbedded with light grey FGSS laminated(10%). Competent. Micro-horizontal bedding. At 580m, bedded plane: 5 degree. Rich in plant root fossil. At base, black mudstone mainly, rich in coal streak.
	#10	**583.71**	**587.55**	**3.84**				**Q10 Q11**				**coal**	**3.84m #10 coal seam. RC:3.12m, lost:0.72m, at 583.71-585.71m, 2.00m, lost:0.40m; 586.65-587.55m, 0.90m, lost:0.32m. Parting:586.74-586.97m, 0.23m black MS. Coal structure: 3.03<0.23>0.58m.**
		587.55	590.00	2.45		10°						Mudstone	black, interbedded with a few FGSS laminated (10%). Silt toward at base. At 588m, bedded plane:10 degree.
		590.00	592.95	2.95								Sandstone	FGSS. Light grey. Well-sorted, quartz and dark debris mainly, with few coal film.
		592.95	599.90	6.95		5°						Siltstone	dark grey, interbedded with light grey FGSS laminated (30%), and a few light black mudstone laminated (10%). Micro-horizontal bedding. At 596m, bedded plane: 10 degree. A few coal streak throughout. At base, mudstone increased. At 599m, bedded plane: 5 degree.
		599.90	603.45	3.55								Sandstone	FGSS-MGSS. Light grey, with few black mudstone laminated. Well-sorted. Horizontal bedding. No react with 5% HCL. At 601m, bedded plane: 6 degree. Occasionally coal film.
		603.45	**603.53**	**0.08**								**coal**	**0.08m coal seam.**
		603.53	604.71	1.18								Mudstone	black, massive. Rich in coal streak and coal seamlet.
	11#	**604.71**	**605.05**	**0.34**								**coal**	**0.34m coal seam. Coal structure: 0.10<0.08>0.16m**
		605.05	606.25	1.20								Mudstone	black, massive. Rich in coal streak and coal seamlet.
		606.25	616.30	10.05		5°						Sandstone	FGSS. Light grey to grey. Well-sorted. Predominately quartz and dark debris. From 609.6-610.25m, extend a few calcite vein to core aixs. From 611-612.85m, CGSS mainly, with numerous coal streak on bedding. React with 5% HCL. At 612m, bedded plane: 5 degree. micro-horizontal bedding. sany toward at base.
		616.30	619.85	3.55								Sandstone	CGSS. Partly conglomerate at base. Grey, poorly-sorted. Quartz and dark debris mainly, occasionally coal streak. React with 5% HCL. At 618.4m, bedded plane: 15 degree.
		619.85	623.00	3.15								Sandstone	CGSS. Conglomerate-bearing. Grey, poorly-sorted. Quartz and dark debris mainly, very broken, broken surface are filled numerous irregular coal thread React with 5% HCL.
		623.00	626.00	3.00								Sandstone	MGSS. Light grey, normal-sorted. Predomiantely quartz and dark debris. From 623.55-624.10m, more conglomerate. Horizontal bedding. Occasionally coal film, react with 5% HCL.
		626.00	629.86	3.86		5°						Mudstone	dark grey to light black. From 627.45-628.25m, more FGSS; from 628.10m to end, coaly mudstone mainly. Rich in coal streak. At 628m, bedded plane: 5 degree.
	#12	**629.86**	**630.67**	**0.81**				**Q12**				**coal**	**0.81m #12 coal seam. RC: 0.81m. No parting. Black, broken into many pieces, grinding, only 2-3cm fragment.**
		630.67	634.30	3.63								Siltstone	dark grey, massive. At top to 631.2m, broken, rich in plant root fossil and coal film. At medium-lower part, with light grey FGSS and light black mudstone laminated. And numerous plant leaf/root fossil observed on bedding.
		634.30	640.10	5.80								Sandstone	MGSS. Light grey, well-sorted. Micro-horizontal bedding. Predominately quartz and dark debirs. Occasionally calcite vein from 636-636.1m. At 638.7m, bedded plane: 5 degree. React with 5% HCL.
		640.10	655.90	15.80								Sandstone	FGSS. Light grey, well-sorted. Horizontal bedding, interbedded with dark grey siltstone laminated (10%). Weak react with 5% HCL. At 648.25-648.45m, broken, few calcite vein. At 651m, bedded plane: 15 degree. At 650-651m, more dark grey siltstone laminated (40%).
		655.90	664.65	8.75								Sandstone	FGSS. Light grey, interbedded with dark grey siltstone laminated (30%). Siltstone is muddy. Micro-horizontal bedding. At 659m, bedde plane: 10 degree. At base, a layer coal film.
		664.65	667.00	2.35								Sandstone	FGSS. Light grey, well-sorted, fracture developed, filled numerous calcite vein at various angles to core axis.
		667.00	677.00	10.00		10°						Sandstone	FGSS. Light grey, well-sorted. interbedded with dark grey siltstone laminated(20%). At lower part, siltstone laminated increased to 30%. At 675m, bedded plane: 10 degree.
		677.00	689.10	12.10								Sandstone	same as previous intervals, plus siltstone laminated increased to 30%. At top, 1.00m more calcite vein.
		689.10	695.00	5.90		10°						Sandstone	interlaminated with FGSS and siltstone. Strong react with 5% HCL. Micro-horizontal bedding. at 692m, m, bedded plane: 10 degree.
Moosebar		695.00	708.00	13.00		5°						Siltstone	dark grey to light black. Interbedded with FGSS laminated, content: 20%. Strong react with 5% HCL. Very small argilliceous debris on bedding surface (disseminated). Micro-horizontal bedding. At 701m, bedded plane: 5 degree.
		708.00	719.00	11.00								Siltstone	dark grey, muddy, with light grey FGSS laminated, content:5%. Micro-horizontal bedding. At 713m, bedded plane; 5 degree. Few carbonaceous debris.
		719.00	725.06	6.06								Siltstone	same features as above.
		725.06	725.10	0.04								limestone	white-grey, argilliceous limestone, react with 5% HCL.
		725.10	731.72	6.62								Mudstone	little silt, light black, massive, disseminated carbonaceous fragment. Little bauxitic.
		731.72	731.76	0.04								limestone	white-grey, argilliceous limestone, react with 5% HCL.
		731.76	740.00	8.24		5°						Mudstone	dark grey, massive. Little silt. Micro-horizontal bedding. At 738m, bedded plane: 5 degree.
													TD=740.00m Jan. 23, 2013.

Note: FGSS fine grained sandstone
MGSS medium grained sandstone
CGSS coarse grained sandstone

Wapiti River — Drill Hole Core Log

Drilling Company:	Canada Dedua Drilling Company		**Hole No.:**	WP1C34	
Rig Type:	VD-5000		**Collar Elevation:**	1166.7m	
Total Depth:	894.97m	Coordinate :	**Northing:**	653656.3	
Spud Date:	Oct. 23, 2012		**Easting:**	6068637	
Finished Date:	Nov. 17, 2012		**Logging Geologist:**	Lee, Victor, Ricky	
Core Size:	HWT/HQ		**Note:**		

Formation	Coal Seam	Core Depth Interval(m) From	To	Thickness, m Thick	TRUE	Strata Dip	Coal Floor Elevati	Sample ID Coal	Rock	CBM	Rock Hardness	Rock Name	Lithology Description
Q		0.00	19.81	19.81								Till	Overburden: 19.81m
Hasler		19.81	66.00	46.19		5°						siltstone	dark grey, interbedded with with light grey, fine grained sandstone (FGSS) laminates (20%) Horizontal bedding, disturbed bedding on (FGSS) bedding. At 35.5m pyrites nodule (3x4cm), A 37.4m, bedding plane:5°; a few siderite thin laminates throughout. at 38.7m and 39.5m, 0.15 thick, sideritic laminates. At 46,06-46.13m, 0.07m Conglomerate. At 51m, bedding plane 5°. 54.20,0.20m sideritic laminate. At lower part, little muddy. At 62.9m,0.10m sideritic lamin
		66.00	81.00	15.00		10°						siltstone	dark grey, interbedded with with light grey (FGSS) laminates (20%) . At 75m, bedding plane with a few siderite thin laminates.
		81.00	102.50	21.50		10°						Siltstone	Same textures as above, more FGSS laminates (30%). At 100m, Bedding plane:10° (102m-120m) previous interval. At 120m, Bedded plane:10°.
		102.50	120.00	17.50		10°						Siltstone	Same as previous interval. At 120m bedded plane 10°
		120.00	147.00	27.00		10°						Siltstone	dark grey, interbedded with with light grey FGSS laminates (20%). Micro - Horizontal beddi alternately with minor very thin siderite laminates. At 144m, bedding plane:10°.
		147.00	150.00	3.00		10°						Siltstone	Same as previous interval. Plus rock broken, core lost 1.22m
		150.00	164.05	14.05								Siltstone	Same features as above, plus FGSS laminates increased to 40% at base. At 159m, Bedding plan
		164.05	165.00	0.95		10						siltstone	with fine sandstone laminates.
		165.00	167.55	2.55								Sandstone	light grey, fine-grained, conglomerate-bearing.
Boulder Creek		167.55	167.80	0.25								Mudstone	bauxitic.
		167.80	168.00	2.20								Sandstone	light grey, fine grained, coaly.
		168.00	180.00	12.00		10°						Sandstone	Light grey, fine grained, interbedded with with a few light black mudstone laminates (10% minor coal threads, at upper part, more dark grey mudstone laminates. At 171.86m, Bedding p °. from 174-175.5m, more light black, mudstone bands and inclusion of argillaceous ; few c veins at lower part.
		180.00	183.00	3.00								Sandstone	light grey, at base, 0.25m very much broken, lost core 0.75m
		183.00	184.65	1.65		10°						Sandstone	white-grey, medium-grained, chert, quart and debris, poor-sorted; a few coal lenses throug At 184-184.3m breccia. At 180.40m, bedded plane:10°.
		184.65	193.00	8.35								mudstone	brown and grey, massive, bauxitic.
		193.00	197.90	4.90		15°						Sandstone	white-grey, fine-medium grained, interbedded with thin layer of dark mudstone. At 195m(15)° 196m(15°), At 197m(15°)
		197.90	201.95	4.05		20°						Conglomerate	white-grey, fine grained, ø: 2-4mm; moderately-sorted at 201.95m(20°); quartz and debris predominately.
		201.95	205.25	3.30		20°						Sandstone	white-grey, fine-grained, well-sorted, with dark siltstone laminate, bedded plane: 20°
		205.25	216.00	10.75								mudstone	brown -grey, massive, little bauxitic. At 207.10-207.4m, more bauxitic, white.
		216.00	216.70	0.70								Sandstone	white-grey, fine-grained.
		216.70	221.75	5.05								mudstone	Black, Little bauxitic locally, massive at lower part with coal fragments rich in leaf fos
		221.75	223.40	1.65		20°						Sandstone	white-grey, medium-grained, with 3 layers of dark muddy siltstone, distorted bedding, bedde plane: 20°.
		223.40	245.40	22.00		10°						mudstone	Light black to black, little bauxitic locally. At 238-238.3m, broken, fracture no: 10. At 2 242m,broken fracture No: 10/m.
		245.40	257.30	11.90		15°						Sandstone	white-grey, medium -coarse grained; at upper part, medium-grained; coarser toward base, w dark band of dark debris. At 249.1-249.15m, 4 Coal laminate on bedding plane. At 247.3-247. Vitrain streak and broken. At 248m249m bedding plane:15°
		257.30	257.79	0.49								Conglomerate	ø: 2-4mm; quart, chert and debris, moderately-sorted. At 257.1-257.2m 2 coal streak (0.02m each). At 257.1-257.2m, numerous coal lenses.
		257.79	259.55	1.76		10°						mudstone	Black, at lower part carbonaceous. At 257.8-234.9m, 0.10m thick, banded coal. At 258.1-258 0.07m thick, coal, shiny, light at middle part, with thin layers of siltstone. At 258.9m be plane: 10°
		259.55	269.00	9.45		15°						Sandstone	white-grey, fine- medium grained. Coarser toward base. Quartz and dark debris predominately moderately- sorted. At 261-261.8m, few vertical and horizontal fracture and fissure in fill coal debris, fracture no: 5/m. At 267m, bedded plane:15°.
		269.00	272.10	3.10		15°						Sandstone	white-grey, medium grained, interbedded with thin layer of fine conglomerate (40%), quart predominately, poorly-sorted, bedded plane:15°.
		272.10	282.40	10.30		15°						Sandstone	white-grey, fine grained, quartz predominately; interbedded with 3 layers of black mudsto 275m:15°. At 281m: 15°.
		282.40	288.40	6.00		15°						Sandstone	white-grey, fine grained, interbedded with thin layers of black silt MS(50%) At top, distor bedding, at 284m, bedded plane:15°. At 288m, bedded plane:15°.
Hulcross		288.40	364.25	75.85		15°						siltstone	dark grey to light black, interbedded with white-grey fine-grained sandstone laminate(40% Horizontal bedding; at 295m, bedded plane:15°. At 300m, 15°. At 295.5m, a pyrite nodule (30x30mm). At 307.5m, 2 laminate of limestone. At 309m, bedded plane: 7°. At 320m,→7°. A →7°. at 340m, →7°. At 338m,0.10m argillaceous limestone, reacting with HCl 5% Strongl 350m, →7°. At 363m, →10°. At 353.5-354m, broken, fracture No: 5/m.
		364.25	365.30	1.05		10°						Sandstone	white-grey, fine grained, interbedded with black MS thin layer.
		365.30	365.43	0.13								Conglomerate	white-grey, ø: 1-3mm, poorly-sorted.
		365.43	367.50	2.07								mudstone	black, massive, at middle part, little carbonaceous. at 366.65m, Coal streak ,0.02m; rich fossil.
		367.50	373.90	6.40		10°						siltstone	light-grey
		373.90	374.90	1.00								mudstone	black, massive.
		374.90	375.06	0.16								coal	0.16m, RC: 16m, shiny, light.
		375.06	375.90	0.84								mudstone	black, massive.
	#2	375.90	376.45	0.55								Coal Seam	Coal Seam, 0.55m, RC: 0.55m, Shiny, light; panting 376.0-376.15m, black, MS. Coal structure: 0.10<0.15>0.20m
		376.45	381.20	4.75		10°						mudstone	black, interbedded with light grey siltstone; at 380.5m, bedded plane:10°.
		381.20	382.41	1.21								mudstone	black, massive. at 382.1m,0.07m, coal streak.
	#3	382.41	383.38	0.97								Coal Seam	Coal Seam, 0.97m, RC: 0.75m, half broken, 0.22m lost. COAL:382.44-383.11,0.70m, RC:0.48m; P :383.11-383.18m, 0.07m, black, MS; CO: 383.18-383.38m, 0.20m; coal structure: 0.70<0.07>0
		383.38	393.00	9.62		25°						Sandstone	white-grey, fine-grained, with mudstone laminate; bedded plane:25° (at 385m). At 390m :20
		393.00	408.95	15.95								mudstone	black, massive; at 396.4-396.6m, Carbonaceous, with few coal streaks. At 398m → 30°; at 404.7m, 5 coal streaks, 0.01m thick each. At 403.5m, 0.05m, Coal Seam, light, shiny. At 4 0.08m coal, shiny, light. At 408m, 0.07m coal , shiny. At 408.7m, 0.05m, coal, light.
		408.95	425.78	16.83		25°						siltstone	white-grey, interbedded with fine-grained sandstone and black mudstone layers, fine-grained sandstone content: 30 %, MS: 30%; distorted bedding, At 411.50m →25°. At 417m →25°. At 420.88m, 0.03m thick shell fossil(10 X 10 mm) ,filling limestone. At 425m → 15°
		425.78	426.00	0.22								Coal Seam	Coal Seam, 0.22m, RC: 0.20m, intact, light, shiny.
		426.00	428.25	2.25								mudstone	black, massive, at upper, a few vitrain lenses; at bottom, carbonaceous, rich in leaf fossi
	#4	428.25	428.67	0.42		4°						Coal Seam	Coal Seam, 0.42m RC: 0.42m, Half broken, panting 428.3-428.35, 0.05m thick, black, massive; Coal structure: 0.05<0.05>0.32m.
		428.67	428.84	0.17		4°						mudstone	black, massive, in leaf fossil.
		428.84	434.10	5.26		15°						Sandstone	white-grey, fine grained, interbedded with dark siltstone laminate; at 433m bedded plane:1
		434.10	446.00	11.90								mudstone	black, massive; At 436.2-436.4m, broken, vertical fracture, fracture No: 2/m, and a few ca veins; at 436.3-436.6m, a few vitrain lenses: at 436.3-436.5m, siderite, brown, with calc veins; at bottom few coal streaks.
	#5	446.00	448.42	2.42		5°						Coal Seam	Coal Seam , 2.42m, RC 2.22m, 0.20m lost, bright, light, half- broken; CO: 446-447.6m,1.60m, 1.40m, parting: 447.6-447.67m,0.07m, black, mudstone. CO: 447.67-448.42m, 0.75m, RC: 0 .75m col structure: 1.60<0.07>0.75m.
		448.42	450.50	2.08		5°						mudstone	black to carbonaceous, at lower part, carbonaceous, rich in carbonization of leaf fossil. 449.85m and 450.30m, 0.05m Coal Seam/each.
	#5-1	450.50	451.30	0.80								Coal Seam	Coal Seam, 0.80m, RC: 0.65m, 0.15m lost, broken into shattered, shiny, light, no parting
		451.30	451.55	0.25								mudstone	black, carbonaceous at middle ,0.04m Coal Seam.
		451.55	453.20	1.65		15°						mudstone	black, rich in leaf fossil
		453.20	456.70	3.50		15°						Sandstone	white-grey, fine grained, with mudstone laminate.
		456.70	457.70	1.00								mudstone	black, massive.
		457.70	457.98	0.28								Coal Seam	0.28m coal seam, broken to shattered, light, shiny.
		457.98	460.30	2.32								mudstone	black, massive, at 459.07-459.17m, 0.10m, with many shell fossil (2x5mm) in filling calcite
		460.30	464.30	4.00								Siltstone	light-grey, blended fine-grained sandstone (30%), no bedding.
		464.30	469.30	5.00		20°						Sandstone	white-grey, medium-grained, moderately-sorted. At 467.86-468m, banded coal seam. At 468.70 469.3m, numerous Coal lenses. At 467.5m, bedded plane:20°.
	#5-2	469.30	470.17	0.87								Coal Seam	0.87m, RC: 0.65m, 0.22m lost, light, parting: 469.8-469.82m, 0.02m, black, mudstone. Coal structure 0.50<0.02>0.35m.
		470.17	470.47	0.30								mudstone	Mudstone, carbonaceous, many coal Streaks
		470.47	474.00	3.53								mudstone	Black, at 471.05m, 0.05m thick, Coal Seam, shiny
		474.00	474.17	0.17								Coal Seam	Coal, 0.17m, broken into pieces, shiny, no parting.
		474.17	475.30	1.13								mudstone	black.
		475.30	475.75	0.45								Coal Seam	banded coal, 0.45m, RC: 0.45m, Coal structure: 0.06<0.08>0.31m. parting: 475.36-475.44m, Mudstone.
		475.75	479.40	3.65								mudstone	black, massive.
	#6	479.40	480.80	1.40		6°						Coal Seam	Coal Seam, 1.40m, RC: 0.35m, broken, 1.05m lost at lower part. no parting.
		480.80	481.80	1.00								mudstone	black , massive.
		481.80	484.90	3.10		20°						Sandstone	Sandstone, white-grey, fine-grained, at 484m, bedded plane:20°.
		484.90	488.10	3.20								mudstone	black, massive, at 487m, 0.08m, Coal , broken, shiny, light.
		488.10	489.00	0.90								mudstone	carbonaceous mostly, numerous vitrain Streaks, at 489.6-489.10m, much broken.
		489.00	490.20	1.20								mudstone	black, massive, with leaf fossil.
	#7	490.20	490.95	0.75								Coal Seam	0.75m, RC: 0.65m, 0.10m lost, half broken, shiny, light, no parting.
		490.95	499.25	8.30								mudstone	Mudstone, black , massive, carbonaceous locally, at 493.4-493.6m, many minor calcite veins 495m, 496.2m and 498.6m Coal Streaks.
		499.25	501.80	2.55		20°						Sandstone	light grey, fine grained, interbedded with black MS (50%). At 500m, 2 coal streaks, bedded plane:20°.
		501.80	503.60	1.80								mudstone	black, massive, rich in leaf fossil.
		503.60	506.35	2.75		15°						Sandstone	light grey, fine grained. At 506.0m, bedded plane:15°.
		506.35	507.05	0.70								Limestone	argillaceous, grey, light grey, reacting with HCL 5% strongly, brittle.
		507.05	513.20	6.15		20°						siltstone	grey- light grey; at bottom, siltstone blended fine-grained sandstone, with dark MS laminat 510.50m, bedded plane: 20°; at 507.60~508.50m, broken, fracture no:25/m; at 511.60~512.60m, vertical fracture, fracture No:6/m.
		513.20	513.70	0.50								mudstone	black, massive.
		513.70	531.70	18.00		20-38						sandstone	white-grey, fine-grained, interbedded with thin layers of siltstone and mudstone; at 518.80~522.20m, broken into pieces, fracture No: 20/m, numerous fracture infilling calcite; 517.50~518.0, a calcite vein (3 mm wide); at 518.0m, →20°; at 519.0m, bedded plane: 20°; a 522.0~531.50m, numerous minor calcite veins; at 527.60~528.40, broken much, fracture No: 40 523.50m→50°; at 328.50m→38°
		531.70	533.00	1.30								mudstone	black, massive; at 533.0~533.10m, 2 coal streaks, 0.03m thick.
		533.00	559.10	26.10		30						sandstone	white-grey, fine-grained, interbedded with thin layers of black mudstone, mudstone content: react with HCL 5% throughout; at 537.0m, →30°; at 539.0m →30°; at 540.0m →30°; at 546.0m at 549.0m→30°; at 556.0m→30°; at 557.30~557.45, many calcite veins; at 557.90m, a layer o calcite, 5mm thick; at 559.0m→30°.
		559.10	563.00	3.90								mudstone	black, massive, brittle.
		563.00	565.60	2.60		20°						sandstone	white-grey, fine grained, with dark MS laminate.
		565.60	568.50	2.90								mudstone	black, massive; at upper and lower part, rich in leaf fossil; at 567.55, 0.05m, coal seam, light.
	#8+1	568.50	569.18	0.68								Coal Seam	0.68m, RC:0.68m, half-broken. Coal structure: 0.28+0.17<0.15>0.08m. CO:568.50-568.78m, shiny, light; Boney coal: 568.78~568.95m, little heavy, 0.17m; parting: 568.95~569.10m, 0.1 black, MS; CO:569.10~569.18m, 0.08m.
		569.18	570.70	1.52								mudstone	black, massive, with leaf fossil.
	#8	570.70	579.30	8.60			Q9 Q10 Q11 Q12 Q13 Q14			CBM1		coal seam	#8 coal seam, 8.60m, RC: 7.0m, 1.6m lost, shiny, light, broken; CO:570.70~570.95m, 0.25m, RC:0.25m, half broken; parting: 570.95~571.38m, 0.43m black, MS; CO: 571.38~571.68m, 0.30m, 0.30m, shiny ,light, half broken, parting: 571.68~571.82m, 0.14m, black, MS; CO:571.82~572. 0.35m, RC: 0.35m, light, shiny, parting: 572.17~572.24m, 0.07m, black MS; CO:572.24~576.20m 3.96m, RC: 3.06, 0.90m lost, broken much, parting: 576.20~576.35m, 0.15m, black, MS; CO: 576.35~579.30, 2.95m, RC: 2.25m, 0.70m lost. Coal structure: 0.25<0.43>0.30<0.14>0.35<0.07>3.96<0.15>2.95m.
		579.30	579.45	0.15								mudstone	black, massive.
		579.45	584.00	4.55		20°						sandstone	white-grey, fine grained, with MS laminate; at 580.0m, bedded plane:20°.
		584.00	591.90	7.90		20°						sandstone	white-grey, fine grained, interbedded with thin layers of black mudstone, content: 40%); at →20°; at 590.50m→20°; at 589.50m, 591.10m, 3 layers of calcite on bedding plane.
		591.90	604.70	12.80		20						mudstone	black, at middle and lower parts, lots of tree leaf and branch fossil; at 596.40~596.65m, 3 streaks, 0.04m thick each; at 600.12m, 0.05m coal seams, shiny; at 595.0m→20°; at 597.0m→ 599.60m→20°; at 596.70~596.909m, vertical fracture, fracture No:2/m.
		604.70	605.00	0.30								mudstone	black, carbonaceous, at middle part, 2 coal seam , 0.06m thick each.
	#9	605.00	605.65	0.65								coal seam	0.65m, RC:0.65m, dull, black, No parting; at 605.0~605.45m, banded coal, little heavy, dull 605.45~605.65m, coal, light;
		605.65	606.43	0.78		25						mudstone	black, bedded plane: 25°.
	#9-1	606.43	607.13	0.70			Q15 Q16					coal seam	0.70m, RC: 0.70m, half-broken, shiny, light, Coal Structure: 0.40<0.15>0.15m; CO:606.43~606.83m, 0.40m, parting: 606.83~606.98m, 0.15m, black, MS; CO:606.98~607.13m, 0.1 RC:0.15m.
		607.13	608.27	1.14								mudstone	black, at middle part, a coal streak; at 608.0m, bedded plane: 25°.
		608.27	608.56	0.29								coal	0.29m, Rc:0.29m, no parting, intact, bright, light.
		608.56	614.22	5.66		20						mudstone	black, with numerous fine-grained sandstone laminate, react with 5% HCL; at 613.0m, bedded 20°.
	#9-2	614.22	614.82	0.60								coal seam	0.60m, RC: 0.60m, broken in shattered, no parting.
		614.82	617.30	2.48								sandstone	white-grey, medium-grained, well-sorted, quarts and debris mainly, react with 5%HCL; at 617 bedded plane: 20°.
		617.30	618.30	1.00								mudstone	black, mostly carbonaceous; at 617.35~617.50m, carbonaceous; at 618.0~618.30m, carbonaceous 618.10m, 0.05m, coal seam.
		618.30	619.50	1.20								mudstone	black, with carbonization of leaf fossil.
		619.50	620.60	1.10		25°						sandstone	white-grey, fine grained, with MS laminate, bedded plane: 25°.
		620.60	621.20	0.60								mudstone	black, massive, no leaf fossil.
		621.20	623.05	1.85		25°						sandstone	white, medium-coarse grained, quartz predominately, moderately-sorted; at 623.05m →25°.
		623.05	626.80	3.75		25°						Conglomerate	white-grey, ø:1-4mm, interbedded with thin layers of coarse sandstone. quartz and dark debr predominately, poorly-sorted.
		626.80	636.45	9.65		20°						sandstone	white-grey, medium-grained, interbedded with thin layer of dark debris; at 629.0m, bedded p 25°; at 635.80~636.10m, fine-grained conglomerate, poorly-sorted; at 631.0m, 0.07m thick, limestone, white; at bottom, bedded plane: 20°.
	#10	**636.45**	**637.95**	**1.50**			**Q17**					**coal**	**coal:1.50m, RC: 1.35m, 0.15m lost, intact, light, bright, parting:637.60~637.63m, 0.03m black, MS, coal structure: 1.15<0.03>0.32m .**
		637.95	644.00	6.05								mudstone	black, massive, carbonaceous partly; at 637.95~638.15m, 638.40~638.65m, carbonaceous; at 64 0.10m, carbonaceous; at 641.80~641.95m, few coal streak; at 642.40~642.50m, 3 coal streak; 642.90m, 0.05m coal seam, shiny.
		644.00	644.30	0.30								Coal Seam	0.30m, RC:0.30m, shiny, light, no parting.
		644.30	648.00	3.70		20°						sandstone	white-grey, fine grained, with dark MS laminate; at 645.20m, bedded plane: 20°; at 647.0m,-
		648.00	649.57	1.57								mudstone	black.
	#12	649.57	650.72	1.15			**Q18**					Coal Seam	1.15m, RC:0.85m, 0.30m lost, light, shiny, brittle, half-broken, no parting.
		650.72	656.80	6.08		25						sandstone	white-grey, fine grained, with dark MS laminate; at 654.50~656.30m, broken, fracture No:15/ 653.0m, bedded plane:25°.
		656.80	659.50	2.70		25°						mudstone	black, with leaf fossil, with fine sandstone layer at middle parts; at 659.0m→25°.
		659.50	659.58	0.08								Coal Seam	0.08m, shiny.
		659.58	659.90	0.32								mudstone	black, massive.
	#13	659.90	659.98	0.08								coal seam	0.08m, shiny, no parting.
		659.98	678.00	18.02		25°						sandstone	black, medium grained, with dark debris laminate; at 662.0m,→25°; at 670.0m,→20°, react w 5% throughout.
		678.00	678.10	0.10								Coal Seam	0.10m, very broken, shattered, dull.
		678.10	681.08	2.98		20						sandstone	white-grey, fine-grained, interbedded with light black, muddy siltstone layers, siltstone c 50%; at 679.0m, bedded plane: 20°, with leaf fossil on bedding plane.
		681.08	707.50	26.42		25						sandstone	white-grey, medium-grained, interbedded with thin layers of black muddy siltstone, muddy si content: 25%; sandstone: quartz predominately, well-sorted; at 685.m, bedded plane:20°; at →20°; at 695.0m, bedded plane:20°; at 702.0m→25°; at 706.0m→25°.
		707.50	717.75	10.25		30°						sandstone	white-grey, fine grained, well-sorted, with dark siltstone laminate (content:10%), horizont bedding, 710.0m(25°); at 714.0m (30°).
		717.75	749.50	31.75		30°~35°						siltstone	dark grey, interbedded with thin layers of white-grey ,fine-grained sandstone (content:30% horizontal bedding, weak reacting with HCL 5%; at 725.0m(25°); at 735.0m (30°); at 746.0m (
		749.50	760.00	10.50		35°						siltstone	dark grey, with few thin layers of fine-grained sandstone (5%), bedded plane:35°.
Moosebar		760.00	797.00	37.00								siltstone	grey, massive; at 765.90~766.05m, Kaolinite, brown and yellow, soft, can be brittle by fin easily, not react with HCL 5%; at 766.50~771.30m, few calcite veins; at 775.50~776.50m, bro vertical fracture, fracture No:10/m; at 787.20~788.70m, vertical fracture, fracture No:8/m.
Gates		797.00	842.52	45.52		40-60-70-45-40						sandstone	white-grey, medium-grained, interbedded with thin layers of light black silt mudstone, muds content:20%, horizontal bedding; at 802.0m, bedded plane:35°, broken throughout, fracture N with numerous minor calcite veins and nodules throughout, calcite vein reacts with HCL 5% strongly, sandstone reacts with 5% HCL weakly, mudstone easily brittle by hammer; at 803.0m bedded plane:30°; at 805.0m (40°); at 807.0m (45°); at 810.0m (45°); at 812.0 (60°); at 813.0(70°); at 816.0m (65°); at 819.0m (45°);821.50m (45°),822.50m (60°),823.50m (60°), at (60°),at 829.0m (45°), at 830.0m (45°), at 831.50m (45°); at 830.0m (40°); at 832.0m (40°); 836.0m (45°); at 839.0m, (45°); at 841.0m (40°), from 797.0~842.52m, rich in calcite veins direction, including large scale and minor , calcite veins in about 100/m.
		842.52	842.87	0.35								coal	Banded coal, 0.35m, RC:0.35m, very broken, shattered, dull, black, parting:842.60~842.75m, MS, Coal structure: 0.08<0.15>0.12m.
		842.87	845.70	2.83		45°						sandstone	white-grey, fine-grained, with black MS laminate; at 844.0m (45°).
		845.70	849.75	4.05								sandstone	white-grey, fine-grained, with numerous light black mudstone breccia (5*10mm), no bedding.
		849.75	850.50	0.75								mudstone	black, massive, rich in leaf fossil and carbonization of leaf fossil; at top, a coal streak
	#7-1 (repeat)	850.50	851.20	0.70			**Q19 Q20**					(repeat) Coal Seam	0.70m, RC:0.60m, 0.10m lost, intact, little broken, bright, light; CO:850.50~850.85m, 0.35m RC:0.35m, parting: 850.85~850.91m, 0.06m, black, MS; CO: 850.91~851.20m, 0.29m, RC:0.19m, Coal structure: 0.35<0.06>0.29m.
		851.20	851.80	0.60								mudstone	black to carbonaceous, little carbonaceous, at middle, few leaf streaks, rich in leaf fossi
		851.80	857.00	5.20								mudstone	grey, silt, black in part, with leaf fossil and imprint; at 855.80~856.0m, siliceous mudsto black, heavy, hardness: >5, cannot scratch by iron knife.
		857.00	861.30	4.30								sandstone	white-grey, fine grained, at upper part, with siltstone layers.
		861.30	865.10	3.80								mudstone	black, massive, at 862.50~863.60m, little carbonaceous , numerous coal streak.
		865.10	866.90	1.80		15°						sandstone	white-grey, fine-grained; at 866.0m, bedded plane:15°.
		866.90	873.80	6.90		15°						mudstone	black, with few thin layer of fine-grained sandstone; at 869.50~869.80m, a few vitrain lens laminate; at 871.20m (15°).
		873.80	882.35	8.55		25°						sandstone	white-grey, fine-grained, interbedded with thin layers of dark mudstone; at 871.50m, bedded plane:20°; at 872.0m (20°); at 875.50m (25°); at 879.0m (25°); at 881.0m (25°); at 879.60~8 broken, few vertical fracture, fracture No:5/m.
		882.35	885.70	3.35								mudstone	black, carbonaceous in part, rich in leaf fossil and carbonization of leaf fossil, numerous streaks; at 883.30, 0.08m, coal streak, bright, light; at 884.0~884.25m, coal 0.25m, RC:0.2 bright, light.
	#8 (repeat)	885.70	886.34	0.64			Q21					(repeat) coal seam	0.64m, RC:0.50m, 0.14m lost, intact, no parting, bright, light.
		886.34	894.97	8.63								mudstone	black, massive; at 888.10~888.20m, numerous coal laminate; at 893.48m, a coal streak, with carbonization of tree leaf and branch fossil.

End Depth: 894.97 m

Wapiti River — Drill Hole Core Log

Drilling Company:	Foraco	**Hole No.:**	WP1C35		
Rig Type:	VD-8000	**Collar Elevation:**	1123.9m		
Total Depth:	632.50m	**Coordinate:**	**Northing:**	6074202.6	
Spud Date:	10-Jan-13		**Easting:**	650579	
Finished Date:	18-Jan-13		**Logging Geologist:**	Lee, Ricky, Bo	
Core Size:	HWT/HQ		**Note:**		

Formation	Coal Seam	Core Depth Interval From	To	Thickness, m Thick	TRUE	Strata Dip	Coal Floor	Sample ID Coal	Rock	CBM	Rock Hardness	Rock Name	Lithology Description
Q		0.00	11.00	11.00								till	RC: 3.0m, till, brown and grey, soft mudstone, not cement, little greys mudstone debris, surface soil with much tree ro
Hasler		11.00	37.00	26.00		5° 10°						Siltstone	siltstone, light black, muddy, interbedded with white-grey fine sandstone laminate (20%); micro-horizontal bedding; at 12m, bedded plane: 5°; at 18m, bedded plane: 10°; at 29m, bedded plane: 1 at 35m, bedded plane: 10°; at 11m - 16.70m, little broken; fracture no: 10/m.
		37.00	47.50	10.50		10°						Siltstone	siltstone, dark grey to light black, muddy, interbedded with white-grey fine sandstone laminate (25%); at 37.50m - 38.60m, broken, fracture no: 15/m; at 44.50m and 46.50m, bedded plane: 10°.
		47.50	100.80	53.30								Siltstone	siltstone, light black-dark grey, blended fine sandstone mostly, with a few white-grey fine sandstone laminate, fine sandstone content: 30%; mostly no bedding; at 56m, bedded plane: 10°; a 74.50m, bedded plane: 15°; at 79m, bedded plane: 15°; at 83m, bedded plane: 15°; at 89m, bedded plane: 10°; at 98m, bedded plane: 10°.
Boulder Creek		100.80	101.05	0.25								conglomerate	conglomerate, white-grey, Ø: 2-5mm; medium sandstone matrix; quartz and green chart, poorly-sort
		101.05	103.80	2.75								Sandstone	sandstone, white-grey, medium-grained; well-sorted, quartz predominately; at 100.90m - 102m, brc much into pieces; fracture no: 40/m.
		103.80	131.90	28.10								Mudstone	mudstone, brown and grey, bauxitic; massive, soft; with few light grey siltstone layers; at bott more bauxitic; at 111.05m - 113.05m, broken, fracture no: 10/m.
		131.90	134.95	3.05		15°						Sandstone	sandstone, white-grey, fine-grained, with black mudstone laminate; at lower part, with a few mir vitrain lenses and laminate; at 134.50m, bedded plane: 15°
		134.95	139.82	4.87								Sandstone	sandstone, white-grey, coarse-medium grained; coarse grain and medium grain interbedded; quartz dark debris predominately; moderately sorted; siliceous cement; not react with 5% HCl; from 137. - 139.60m, 1.70m long fracture infilling calcite crystal, fracture width: 1mm; at 136.60m, bedde plane: 15°
		139.82	149.20	9.38		10° 15°						Siltstone	siltstone, dark grey, interbedded with fine sandstone laminate (40%); at 145m, bedded plane: 15° at 149m, bedded plane: 10°.
		149.20	152.15	2.95		10°						Mudstone	mudstone, light black, silt, with a layer of fine sandstone; at 151.50m, bedded plane: 10°.
		152.15	170.50	18.35		15°						Mudstone	mudstone, grey, bauxitc in part; massive, with few fine sandstone laminate; at 157m - 157.60m; 157.90m - 158.30m, fine sandstone layers; at 158m, bedded plane: 15°; from 166.40m - 167.80m, 1.40m, broken, fracture no: 10/m; at 170m - 170.50m, a few coal lenses.
		170.50	171.35	0.85		15°						Sandstone	sandstone, white-grey, medium-grained; well-sorted, with numerous coal lenses; bedded plane: 15°
		171.35	176.40	5.05								Mudstone	mudstone, light black at upper part; brown at lower part; at lower part, bauxitic, massive; at 174.40m - 175.80m, little broken, fracture no: 15/m.
		176.40	179.50	3.10		20°						Sandstone	sandstone, white-grey, fine-grained; with dark mudstone laminate; at 176.70m, bedded plane: 20°.
		179.50	191.30	11.80								Mudstone	mudstone, brown and grey, bauxitic; massive; from 180.20m - 187.30m; broken, fracture no: 8/m.
		191.30	192.80	1.50		15°						Sandstone	sandstone, white-grey, fine-grained; interbedded with thin layers of siltstone; bedded plane: 15
		192.80	195.50	2.70								Mudstone	mudstone, black- light black, massive; at upper part, black, many minor coal lenses.
		195.50	197.10	1.60		15°						Sandstone	sandstone, white-grey, fine-grained, interbedded with light black mudstone laminate; bedded plar 15°.
	BC	**197.10**	**197.31**	**0.21**								**Coal**	**BC coal seam, 0.21m, RC: 0.11m, 0.10m lost; broken, shiny, bright, light; no parting.**
		197.31	208.00	10.69		20°						conglomerate	conglomerate, white-grey, Ø: 2-5mm; interbedded with medium-coarse sandstone layers; quartz and charts and dark debris, poorly-sorted; at 201m, bedded plane: 20°; at 203.50m, bedded plane: 20° at 206.70m, bedded plane: 20°.
		208.00	216.95	8.95		15°						Sandstone	sandstone, white-grey, fine-grained, pure, quartz predominately, well-sorted; at 210m, bedded plane: 15°.
		216.95	223.20	6.25		10° 15°						Sandstone	sandstone, white-grey, fine-grained; interbedded with thin layers of dark grey siltstone (40%); horizontal bedding; at 217m, bedded plane: 10°; at 219m, bedded plane: 10°; at 221m, bedded plar 10°; at 224m, bedded plane: 15°.
Hulcross		223.20	227.50	4.30		15°						Siltstone	siltstone, light black-dark grey; interbedded with, thin layers of white-grey fine sandstone; at 225m, bedded plane: 15°.
		227.50	257.00	29.50		15°						Siltstone	siltstone, dark grey; interbedded with white-grey, fine sandstone laminate; fine sandstone conte 30%; at 241m, 0.05m thick argillaceous limestone, white, strong reacting 5%HCl; at 248.50m, 0.(thick kaolinite, soft, not cement; at 251.10m, bedded plane: 15°; at 255m, bedded plane: 10°.
		257.00	275.50	18.50								Siltstone	siltstone, dark grey, with numerous white-grey fine sandstone laminate; at 265.60m, 0.07m thick limestone, white-grey; at 272.90m, 0.09m thick numerous limestone laminate, strongly reacting 5%HCl; at 271.50m - 273.50m, broken, few vertical fracture, fracture no: 6/m; at 266.40m - 268.1 broken, fracture no: 10/m; at 266m, bedded plane: 13°.
		275.50	299.45	23.95		10°						Siltstone	siltstone, dark grey, interbedded with white-grey, fine sandstone laminate, content: 40%, horizontal bedding; bedding developed; at 278.50m, 281m, 0.07m thick each, argillaceous limestor reacting 5% HCl strongly; at 292.60m, 0.10m argillaceous limestone; at 281m, bedded plane: 10°; 288m, bedded plane: 10°; at 290m, bedded plane: 10°; at 297m, bedded plane: 10°.
Gates		299.45	299.65	0.20								conglomerate	conglomerate, Ø: 2-10mm, matrix of sandstone, poorly-sorted, quartz and charts.
		299.65	310.50	10.85		20°						Sandstone	sandstone, white-grey, medium-grained, quartz and dark debris predominately, well-sorted; at upp part, pure sandstone; at 306.50m - 308.50m, with numerous black mudstone laminate; at 304m, bedc plane: 20°; at 309m, bedded plane: 20°.
		310.50	313.45	2.95		20°						Mudstone	mudstone, black with leaf fossil; at 313.30m - 313.45m, with few vitrain lenses; at 313.30m, bec plane: 20°.
	#3	**313.45**	**314.45**	**1.00**				**Q1 Q2**				**Coal**	**coal seam, 1.0m; RC: 0.75m, 0.25m lost at top; half-broken, shiny, bright, brittle, blocky. CO: 313.45m - 313.85m, 0.40m; RC: 0.15m, 0.25m lost. Parting 1: 313.85m - 313.97m, 0.12m, black, mudstone. CO: 313.97m - 314.10m, 0.13m, RC: 0.13m, broken into pieces; Parting 2: 314.10m - 314.23m, 0.13m, black, mudstone. CO: 314.23m - 314.45m. 0.22m, intact, RC: 0.22m. coal structure: 0.40<0.12>0.13<0.13>0.22m.**
		314.45	315.00	0.55								Mudstone	mudstone, black, massive; at top, 0.07m carbonaceous; at 314.80m, 0.05m thick, coal seam, bright few coal laminate.
		315.00	317.30	2.30		15°						Mudstone	mudstone, black, massive; at lower part, many coal streaks and lenses; at 315.20m, bedded plane 15°.
		317.30	318.20	0.90								Mudstone	mudstone, grey, little bauxitic, broken, vertical fracture.
		318.20	323.80	5.60		20°						Siltstone	siltstone, light grey to grey, with 2 layers of white-grey fine sandstone; at 323.30m, bedded plane: 20°.
		323.80	329.50	5.70		20°						Mudstone	mudstone, light black-dark grey, silt, with fossil leaf; with few layers of white-grey fine sandstone; at 325.30m, bedded plane: 17°; at 326.60m, bedded plane: 20°.
		329.50	332.00	2.50		20°						Mudstone	mudstone, black, massive; at middle, few coal streaks; at bottom, few thin layers of fine sandstone; at 332m, bedded plane: 20°.
		332.00	333.46	1.46		15°						Sandstone	sandstone, light grey, fine-grained; interbedded with thin layers of siltstone; at 332.70m - 332.75m, bioclastic limestone with many shells.
		333.46	333.90	0.44								Mudstone	mudstone, black, massive; at lower part, few coal streaks and lenses.
	#4	**333.90**	**334.50**	**0.60**								**Coal**	**coal seam, 0.60m, RC: 0.55m, half-intact; shiny, brittle, blocky; no parting**
		334.50	336.70	2.20								Mudstone	mudstone, grey-brown, little bauxitic; at upper part, a few coal lenses.
		336.70	341.00	4.30		20°						Siltstone	siltstone, light black, little muddy, at upper part, with few layers of fine sandstone; at lower part, few leaf fossils; at 338m bedded plane: 20°.
		341.00	345.18	4.18		20°						Mudstone	mudstone, black, rich in leaf fossil; at 344.10m - 344.50m, fine sandstone; at 345.10m, bedded plane: 20°; at 345m - 345.10m, carbonaceous mudstone.
	#4-1	**345.18**	**345.60**	**0.42**								**Coal**	**coal seam, 0.42m, RC: 0.42m; intact; shiny, brittle, blocky; no parting.**
		345.60	349.30	3.70		15°						Mudstone	mudstone, black; at middle part, few layers of fine sandstone; at 348m, bedded plane: 15°.
		349.30	**349.60**	**0.30**								**Coal**	**coal seam, 0.30m, RC: 0.25m; broken, shiny, bright; no parting.**
		349.60	350.20	0.60								Mudstone	mudstone, black, silt.
		350.20	356.40	6.20		20°						Sandstone	sandstone, white-grey, fine-grained; at upper part, with dark mudstone laminate; at 351.10m, bec plane: 20°.
		356.40	357.55	1.15								Mudstone	mudstone, light black, silt.
	#5	**357.55**	**359.07**	**1.52**				**Q3 Q4**				**Coal**	**coal seam, 1.52m, RC: 1.52m, no lost; half-intact; shiny, bright, light; with few vertical fracture. CO: 357.55m - 358.60m, 1.05m, RC: 1.05m, shiny. Parting: 358.60m - 358.67m, 0.07m coarse sandstone. CO: 358.67m - 359.07m, 0.40m; RC: 0.40m, shiny. Coal seam structure: 1.05<0.07>0.40m.**
		359.07	360.50	1.43								Mudstone	mudstone, brown-grey, bauxitic, massive.
		360.50	364.60	4.10		20°						Sandstone	sandstone, white-grey, fine-medium grained; coarser toward base; at lower part, medium-grained; interbedded with dark siltstone laminate; at 362m, bedded plane: 20°; at 363.50m, bedded plane: 20°; at 364m - 364.40m, a vertical fracture, fracture no: 2/m.
		364.60	370.02	5.42		25°						Sandstone	sandstone, white-grey, medium-coarse grained; coarser to bottom, at lower part, coarse grained; moderately-sorted; numerous vitrain lenses throughout; at 364.80m, a thin layer of vitrain, 0.02 thick; at 368.50m, bedded plane: 25°.
		370.02	372.50	2.48								Siltstone	siltstone, grey.
		372.50	375.50	3.00		20°						Sandstone	sandstone, light grey, fine-grained; with dark siltstone laminate; at 375m, bedded plane: 20°.
		375.50	380.50	5.00								Mudstone	mudstone, light black-black, massive; at lower part, black; a few coal streaks at lower part.
		380.50	381.30	0.80								Sandstone	sandstone, white-grey, fine-grained.
		381.30	393.20	11.90		20°						Sandstone	sandstone, white-grey, fine-grained; interbedded with layers of light grey siltstone; siltstone: 50%; fine sandstone: 50%; with few coal streaks; at 386m, bedded plane: 20°; at 389m, bedded pla 20°.
		393.20	398.30	5.10		15°						Mudstone	mudstone, light black; with white-grey fine sandstone laminate; rich in leaf fossil; at 396m, bedded plane: 15°.
		398.30	**398.60**	**0.30**								**Coal**	**coal seam; 0.30m, RC: 0.30m, broken; no parting, shiny, light.**
		398.60	399.90	1.30								Mudstone	mudstone, black, massive; at top, few coal streaks.
		399.90	**400.30**	**0.40**								**Coal**	**coal seam, 0.40m, RC: 0.35, half-broken, no parting, shiny, bright, light.**
		400.30	400.42	0.12								Mudstone	mudstone, black, massive, at middle, a coal streaks
		400.42	**400.52**	**0.10**								**Coal**	**coal seam, 0.10m RC: 0.10; shiny, light.**
		400.52	404.35	3.83								Mudstone	mudstone, black, massive.
		404.35	**404.50**	**0.15**								**Coal**	**coal seam, 0.15m, RC: 0.15m; no parting, shiny light.**
		404.50	410.30	5.80		15°						Mudstone	mudstone, light black-black, at upper part, light black; at 406.50m - 406.80m, a few coal streak at 406.80m - 406.90m, 0.10m coal seam, light, shiny; at 408.70m - 409.80m, fine sandstone with mudstone laminate; at 409m, bedded plane: 15°; at 408.60m, 0.10m coal seam, shiny, light.
		410.30	413.00	2.70								Mudstone	mudstone, black to carbonaceous; massive; at upper part, a few coal streaks; at 410.40m and 410.70m, 0.06m thick/each coal seam; at middle part, a few coal streaks.
		413.00	416.10	3.10		15°						Sandstone	sandstone, white-grey, fine-grained; with dark siltstone laminate; at 416m, bedded plane: 15°.
		416.10	421.40	5.30								Mudstone	mudstone, light black, little silt, with a few leaf fossil; at 417.80m - 418.10m, numerous minor calcite veins; at 419.25m - 419.25m, carbonaceous in part, few coal streaks.
		421.40	**421.72**	**0.32**								**Coal**	**coal seam, 0.32m, RC: 0.32m, intact; shiny, brittle, no parting.**
		421.72	431.81	10.09		20°						Mudstone	mudstone, black, massive, rich in leaf fossil; at upper part, few thin layers of siderite; at 42 - 424.30m, few coal streaks; at 426.35m 427.20m, medium sandstone with coal debris; at 427m, bec plane: 20°.
	#7	**431.81**	**432.81**	**1.00**				**Q5 Q6**				**Coal**	**coal seam, 1.0m; RC: 0.95m; 0.05m lost at bottom; intact, shiny, bright, light. Coal Structure: 0.12<0.05>0.18<0.08>0.57m. CO: 431.81m - 431.93m, 0.12m; RC: 0.12m. Parting: 431.93m - 431.98m, 0.05m black, mudstone. CO: 431.98m - 432.16m, 0.18m. RC: 0.18m; broken. Parting: 432.16m - 432.24m, 0.08m, black, mudstone. CO: 432.24m - 432.81m, 0.57m. RC: 0.52m**
		432.81	435.15	2.34								Mudstone	mudstone, black, massive; with a few coal streaks.
		435.15	438.10	2.95								Mudstone	mudstone, light black-black, little silt; at middle, fine sandstone; rich in leaf fossil.
		438.10	466.50	28.40		15° 20° 30°						Sandstone	sandstone, light grey, fine-grained; quartz predominately; well-sorted, with numerous dark siltstone and mudstone laminate; from 457.60m - 459.90m, numerous calcite veins at any direction at 459.50m - 459.90m, at 455.90m - 456.20m, a vertical fracture, fracture no: 2/m; at 457.10m - 457.40m, very broken, fracture no: 10/m; at 443m, bedded plane: 30°; at 447m, bedded plane: 15°; 453m, bedded plane: 20°; at 457m, bedded plane: 20°; at 463.50m, bedded plane: 20°; at 465.90m - 466.50m, many minor calcite veins.
		466.50	471.03	4.53								Mudstone	mudstone, black, massive; rich in leaf fossil.
	#8+1	**471.03**	**471.38**	**0.35**								**Coal**	**coal seam, 0.35m; RC: 0.35m, intact; shiny; no parting.**
		471.38	472.20	0.82								Mudstone	mudstone, black, massive; few coal streaks.
	#8	**472.20**	**478.10**	**5.90**				**Q7 Q8 Q9 Q10 Q11 Q12**				**Coal**	**coal seam, 5.90m; RC: 5.30m, 0.06m lost at bottom; at upper and middle part, intact - half broken; at bottom, much broken; shiny, bright, light. CO: 472.20m - 473.20m, 1.0m, RC: 1.0m intact. Parting 1: 473.20m - 473.48m, 0.28m, black mudstone. CO: 473.48m - 473.85m, 0.37m; 0.37m, intact. Parting 2: 473.85m - 474.65m, 0.80m, black mudstone with few coal streaks. C 477.15m - 478.10m, 0.95m, RC: 0.35m, 0.60m lost; broken much, powder, dull, black. Coal sea structure: 1.0<0.28>0.37<0.80>1.95<0.55>0.95m. [**
		478.10	478.80	0.70								Mudstone	mudstone, black, with few coal streaks.
		478.80	488.40	9.60		20°→ 25°→ 30°→ 40°						Sandstone	sandstone, white-grey, medium-grained; with dark mudstone laminate; at 480m, bedded plane: 20°; 482m, bedded plane: 25°; at 484m, bedded plane: 30°; at 487m, bedded plane: 40°.
		488.40	489.00	0.60								Mudstone	mudstone, black, massive; with a few coal streaks.
	#8-1	**489.00**	**489.63**	**0.63**								**Coal**	**coal seam, 0.63m, RC: 0.63m; half-broken; no parting; shiny, brittle, light.**
		489.63	491.53	1.90								Mudstone	mudstone, black, massive; at 490.90m, 491.10m, coal seam, 0.08m thick/each.
	#9	**491.53**	**497.70**	**6.17**				**Q13 Q14 Q15**				**Coal**	**coal seam, 6.17m, RC: 6.17m; at upper part, half-broken; at middle, intact; at bottom, ver broken; no parting, shiny, brittle, bright, light.**
		497.70	498.20	0.50								Mudstone	mudstone, black - light black; at top, black; rich in leaf fossil.
		498.20	505.20	7.00		23°→35°						Sandstone	sandstone, white-grey, fine-grained; with dark siltstone laminate; at 499m, bedded plane: 23°; a 504.50m, bedded plane: 35°; at bottom, few coal streaks.
		505.20	521.18	15.98		20°						Sandstone	sandstone, medium-coarse grained; white-grey; quartz and dark debris predominately; well-sorted; coarser toward base; at lower part, medium grained; at 506.50m - 510m, little broken, fracture r 6/m; at 511m, bedded plane: 20°; at 520m, bedded plane: 20°.
		521.18	525.50	4.32		20°						Sandstone	sandstone, white-grey, fine-grained; interbedded with thin layers of dark silt mudstone (40%); a 525m, bedded plane: 20°.
		525.50	530.33	4.83								Mudstone	mudstone, black; at upper part, interbedded with fine sandstone laminate; at 528m, bedded plane: 25°.
	#10	**530.33**	**534.30**	**3.97**				**Q16 Q17 Q18**				**Coal**	**coal seam, 3.97m, RC: 3.72m, 0.25m lost, lost place: 530.54m - 530.79m; at top, broken into pieces. CO: 530.33m - 530.44m, 0.11m, much broken; shiny, light. Parting: 530.44m - 530.54m 0.10m, mudstone, black. CO: 530.54m - 534.30m, 3.76m RC: 3.51m; at top, broken; at lower pa broken, shiny, light, brittle. Coal seam structure: 0.11<0.10>3.76m.**
		534.30	535.00	0.70								Mudstone	mudstone, black, with a few coal streaks; at 534.60m, 0.06m coal seam, shiny.
		535.00	545.50	10.50		20°→ 39°						Sandstone	sandstone, white-grey, medium-grained; quartz and dark debris; well-sorted; at upper part, with dark mudstone laminate; at 536.40m, bedded plane: 20°; at 539m, bedded plane: 39°; at 540.50m - 541m, broken, vertical fracture, fracture no: 4/m.
		545.50	554.80	9.30		30°						Sandstone	sandstone, white-grey, fine-grained; interbedded with thin layers of dark muddy siltstone; at 54 bedded plane: 30°; at 550m, bedded plane: 30°
		554.80	556.32	1.52		30°						Sandstone	sandstone, white-grey, medium-coarse grained interbedded; at 555m, bedded plane: 30°.
		556.32	556.42	0.10								Mudstone	mudstone, black, carbonaceous, massive.
	#11	**556.42**	**557.25**	**0.83**				**Q19 Q20**				**Coal**	**coal seam, 0.83m, RC: 0.65m, 0.18m lost; half-broken; no parting; boney coal: 556.42m - 556.65m, 0.13m. CO: 556.65m - 557.25m, 0.70m, RC: 0.52m.**
		557.25	558.80	1.55								Mudstone	mudstone, black; at middle part, a few coal streaks.
		558.80	**559.10**	**0.30**								**Coal**	**coal seam, 0.30m, RC: 0.25m; broken much, shattered; shiny, light; no parting.**
		559.10	562.40	3.30								Mudstone	mudstone, black, with coal streaks.
	#11-1	**562.40**	**563.05**	**0.65**								**Coal**	**coal seam, 0.65m, RC: 0.60m, half broken; no parting, shiny, light.**
		563.05	570.70	7.65		20°						Siltstone	siltstone, grey to dark grey; little muddy; with thin layers of white-grey, fine sandstone; at 565m, bedded plane: 20°.
		570.70	570.96	0.26								Mudstone	mudstone, black, massive; at bottom, carbonaceous.
	#12	**570.96**	**572.40**	**1.44**				**Q21 Q22**				**Coal**	**coal seam, 1.44m, RC: 1.24m, 0.20m lost at top, broken, shiny. CO: 570.96m - 571.30m, 0.34m RC: 0.14m, broken. Parting: 571.30m - 571.40m; 0.10m, black, mudstone; Co: 571.40-572.40m, 1.0m, RC: 1.0m, broken, shiny, light. Coal seam Structure: 0.34<0.10>1.0m.**
		572.40	572.75	0.35		20°						Mudstone	mudstone, black, with coal lenses; at 572m, bedded plane: 20°.
		572.75	573.50	0.75		20°						Sandstone	sandstone, white-grey, fine-grained; with dark siltstone laminate; distorted bedding; bedded pla 20°.
		573.50	574.95	1.45								Mudstone	mudstone, black, carbonaceous in part; at lower part, a few coal streaks; at 574.80m, 0.08m coal seam.
	#13	**574.90**	**575.05**	**0.15**								**Coal**	**coal seam, 0.10m RC: 0.10m, very broken.**
		575.05	586.40	11.35		15° 20°						Sandstone	sandstone, white-grey, medium grained; quartz and dark debris predominately; with dark siltstone laminate; at 576.90m - 577.90m, few vertical fracture in filling calcite crystal; at 576m, bedde plane: 15°; at 580m, bedded plane: 20°.
		586.40	596.50	10.10		20°						Sandstone	sandstone, light grey, fine-grained; with dark muddy siltstone laminate; at 587m, bedded plane: 20°; at 591m, bedded plane: 20°, calcite cement, reacting with 5% HCl.
		596.50	623.15	26.65		22° 25° 30°						Sandstone	sandstone, white-grey, fine-grained, quartz predominately; well-sorted; interbedded with thin layers of dark muddy siltstone; at 599m, bedded plane: 22°; at 608m, bedded plane: 25°; at 615m, bedded plane: 25°; at 617m, bedded plane: 30°; at 620m, bedded plane: 30°; at 622.50m, bedded plane: 25°.
		623.15	629.56	6.41		25°						Siltstone	siltstone, dark grey, interbedded with thin layers of white-grey, fine sandstone content 40%; at 624m, bedded plane: 25°.
		629.56	632.50	2.94		25°						Sandstone	sandstone, white-grey, fine-grained; interbedded with dark grey siltstone laminate (30%); at 631 bedded plane: 25°
													Ending Depth: 632.50m

Wapiti River — Canada Dehua Drilling Company

Drill Hole Core Log

Drilling Company:	Canada Dehua Drilling Company
Rig Type:	VD-5000
Total Depth:	990.00m
Spud Date:	23-Aug-12
Finished Date:	27-Sep-12
Core Size:	HWT/HQ

Hole No.:	WPIC36
Collar Elevation:	1239.7m
Coordinates:	**Northing:** 6069780.8
	Easting: 654688.5
Logging Geologist:	Victor, Lee, Chris, Liang
Note:	because of stuck, wireline log to 696.0m

Formation	Coal Seam	Core Depth Interval From	To	Thickness, m Thick	T/U/E	Strata Dip	Coal Floor Elevation	Sample ID Coal	Rock	C/BM	Rock Hardness	Rock Name	Lithology Description
Q		0.00	12.00	12.00	12.00							till	till, Sandstone fragment, weathered deposits.
Boulder Creek		12.00	57.50	45.50	45.50	7						siltstone	dark grey, with light grey fine-grained sandstone laminates (5%). Micro-horizontal bedding, At 15.00m, bedded plane: 7degree, at 39.00m, bedded plane: 70 degree. At 12.00-24.00m, broken, fracture number: 15/m, at 45.00-47.00m, and 52.00-57.00m, fracture zone, fracture number: 15/m, at 51.00m, bedded plane: 7 degree.
		57.50	60.00	2.50	2.50							siltstone	dark grey, interbedded with light grey fine-grained sandstone laminates (30%).
		60.00	69.00	9.00	9.00	7						siltstone	siltstone and sandstone blended, grey, sandstone content: 20%. Few white-grey light grey fine-grained sandstone laminates, No bedding predominately, few bedding. At 63.00m, bedded plane: 7 degree.
		69.00	99.00	30.00	30.00	7						siltstone	dark grey, few light grey fine-grained sandstone laminates (2%). At 84.00m, and 93.00m, bedded plane: 7 degree.
		99.00	107.00	8.00	8.00	7						siltstone	dark grey, little muddy. With light grey fine-grained sandstone laminates (10%). At 101.00m, bedded plane: 7 degree. With very thin mica throughout.
		107.00	130.00	23.00	23.00	7						siltstone	dark grey, interbedded with light grey fine-grained sandstone laminates (5%). slightly fracture, Micro-horizontal bedding, bedded surface, fracture surface are 30/m. Broken surface are slickensided and shiny.
		130.00	133.00	3.00	3.00							siltstone	same as previous interval, plus interbedded with light grey fine-grained sandstone laminates (10%).
		133.00	167.00	34.70	34.70	7						siltstone	dark grey. interbedded with light grey fine-grained sandstone laminates (10%). With minor cross-bedding. At 135.00m, and 147.00m, and 156.00m, bedded plane: 7 degree. At 159.00-160.00m, FGSS more 60%. At 153.25-154.45m, broken much.
		167.00	201.80	34.10	34.10	7						siltstone	same features as above, plus progressively light grey FGSS (40%). Micro-horizontal bedding. At 173.00m, bedding plane: 5 degree. At 180.40-181.20m, fracture developed, fracture veeical, fracture surface are slickensided and shiny. At 185.00m, bedding plane: 5 degree. At 198.00m, dip 7 degree.
		201.80	226.00	24.20	24.20	7						siltstone	same as previous interval, plus dark grey to light black, with FGSS 10%. At 210.00m and 219.00m, dip: 7 degree.
		226.00	262.80	36.80	36.80							siltstone	dark grey, little muddy. interbedded with light grey fine-grained sandstone laminates (40%). At 231.00m, bedding plane: 7 degree. At 240.00m, bedded plane: 7 degree. At predominately. at 252.00m and 258.00m, bedded plane: 10 degree. at bottom (262.70-262.80m) not cement. at 262.50-262.70m, broken, fracture number: 20/m.
		262.80	264.10	1.30	1.30							sandstone	white-grey, coarse-grained, poorly-sorted.
		264.10	265.03	0.93	0.93							conglomerate	conglomerate. ϕ: 2-10mm, Medium-grained sandstone matrix, poorly-sorted, quartz and debris mainly.
		265.03	269.32	4.22	4.22	12						sandstone	white-grey, medium-grained, well-sorted, With dark grey siltstone laminates. At 268.00m, bedded plane: 12 degree.
		269.32	270.75	1.50	1.50							sandstone	white-grey, coarse-grained, poorly-sorted, At 269.50m, a coal streak, 5mm thick.
		270.75	278.40	7.65	7.65							mudstone	brown-gray, baxitic, massive. With 2 layers of FGSS, 0.30m thick each layer.
		278.40	279.50	1.10	1.10	15						sandstone	white-grey, fine-grained. At bottom, bedded plane: 15 degree.
		279.50	288.40	8.90	8.90	22-15						sandstone	white-grey, medium-coarse grained, quartz predominately. At upper part, medium-grained: at 283.50m, dip:20 degree, at 285.00m, dip: 22 degree, at 282.00m, dip: 15 degree, coarse-grained. At 280.00m, bedded plane: 15 degree, at 282.00m, dip: 15
		288.90	290.83	2.43	2.43							mudstone	brown-gray, baxitic, massive. Soft, can be scratched by knife.
		290.83	292.85	2.02	2.02							sandstone	fine-grained, white-grey. Interbedded with dark grey siltstone laminates.
		292.85	299.85	7.00	7.00	15						sandstone	medium-grained, light grey. Moderate-sorted, quartz and debris mainly. At 294.00m, bedding plane: 15 degree. minor coal threads observed on joint surface.
		299.85	309.00	9.15	9.15							mudstone	baxitic mudstone. Massive. at 303.00-304.50m, black mudstone mianly, minor coal threads.
		309.00	312.30	3.30	3.30							mudstone	dark grey, minor baxitic.
		312.30	316.00	3.70	3.70	15						siltstone	dark grey, interbedded with minor FGSS laminates (5%). At 316.00m, bedded plane: 15 degree.
		316.00	318.00	2.00	2.00							mudstone	brown-gray, baxitic, massive. Soft, can be scratched by knife.
		318.00	322.80	4.80	4.80							mudstone	dark grey, silty. At top, black mudstone mainly. Minor coal trace. Silt toward at base.
11#		322.80	344.00	21.20	21.20	15						mudstone	black, abundant plant root fossils. At 332.70m, with FGSS laminates. At 331.00m, bedded plane: 15 degree. At 334.00-335.00m, with FGSS laminates, bedded plane: 15 degree. at 338.00-341.00m, more baxitic, soft, can be scratched by knife. at 341.30-343.00m, black mudstone mainly, broken.
		344.00	347.70	3.70	3.70							mudstone	black, massive, numerous coal streak and plant rrit fossils. At 345.90-345.93m, 0.03m coal trace.
		347.70	349.50	1.80	1.80	15						sandstone	light grey, fine-grained, interbedded with minor dark grey siltstone laminates (5%). locally coal threads observed on joint surface. At 349.50m, bedded plane:15 degree.
		349.50	352.00	2.50	2.50							mudstone	dark grey, massive. Baxitic minor.
		352.00	354.70	2.70	2.70	15						mudstone	black, massive. rich in coal streak and plant root fossils. At 352.50-352.54m, 0.04m coal seam.
		354.70	**354.85**	**0.15**	**0.15**							**coal1**	**At 354.70-354.85m, 0.15m coal seam, light shiny.**
		354.85	355.60	0.75	0.75							mudstone	black, massive. rich in coal streak and plant root fossils. At 355.50m, bedded plane: 15 degree.
		355.60	360.70	5.10	5.10							sandstone	white-grey, medium-coarse grained. At upper part, medium-grained: at lower part, interbedded with coarse-grained sandstone.
		360.70	368.00	7.30	7.30	15						sandstone	white-grey, fine-grained. At 366.00m, bedded plane: 15 degree.
Boulder Creek		368.00	374.30	6.30	6.30	20						sandstone	fine-grained, light grey, with dark grey siltstone and mudstone laminates (30%). At 372.00m, bedded plane: 20 degree. At 388.00-389.10m, broken very much, fracture number: 20/m, fractured developed, infilled calcite vein.
		374.30	379.00	4.70	4.70							siltstone	dark grey, with light grey fine-grained sandstone laminates (40%). Micro-horizontal bedding, At 377.30-377.80m, broken, vertical fracture, fracture number: 8/m, polished, infilled calcite vein.
		379.00	393.00	14.00	14.00	20						siltstone	dark grey, with light grey fine-grained sandstone laminates (50%). At 381.00m, 390.00m, bedded plane: 20 degree. Horizontal bedding. At 382.40-386.40m, broken, fracture vertically, fracture number: 7/m.
		393.00	437.00	44.62	44.62	20						siltstone	dark grey, with light grey fine-grained sandstone laminates (40%). At 399.00m, bedded plane: 20 degree. Horizontal bedding. At 407.20m, 419.90m, kaolinite, soft, 0.10m thick each. At 402.00m, bedded plane: 15 degree. At 411.00m, 15 degree. At 415.40-416.00m, 0.60m a vertical fracture.at 423.00m, 435.00m, dip: 15 degree.
		437.62	437.90	0.28	0.28							conglomerate	conglomerate. light grey. 0.2-5mm, poorly-sorted, rounded, quartz and debris mainly.
		437.90	440.00	2.10	2.10	10	770.00					siltstone	grey, very muddy, with baxitic locally. At 439.00m, bedded plane: 10 degree.
		440.00	443.55	3.55	3.55	10						sandstone	white and grey, fine-grained, with dark grey mudstone laminates. Bedded plane: 10 degree.
		443.55	444.15	0.60	0.60							mudstone	black, massive. half-broken. At top, carbonaceous mudstone, 0.07m: at lower part, 2 coal streaks.
Halcross		**379.00**	393.00	14.00	14.00	20						siltstone	dark grey, with light grey fine-grained sandstone laminates (50%). At 381.00m, 390.00m, bedded plane: 20 degree. At 384.40-386.40m, broken, fracture vertically, fracture number: 7/m.
		393.00	437.00	44.62	44.62	20						siltstone	dark grey, with light grey fine-grained sandstone laminates (40%). At 399.00m, bedded plane: 20 degree. Horizontal bedding. At 407.20m, 419.90m, kaolinite, soft, 0.10m thick each. At 402.00m, bedded plane: 15 degree. At 411.00m, 15 degree. At 415.40-416.00m, 0.60m a vertical fracture.at 423.00m, 435.00m, dip: 15 degree.
		437.62	437.90	0.28	0.28							conglomerate	conglomerate. light grey. 0.2-5mm, poorly-sorted, rounded, quartz and debris mainly.
		437.90	440.00	2.10	2.10	10	770.00					siltstone	grey, very muddy, with baxitic locally. At 439.00m, bedded plane: 10 degree.
		440.00	443.55	3.55	3.55	10						sandstone	white and grey, fine-grained, with dark grey mudstone laminates. Bedded plane: 10 degree.
		443.55	444.15	0.60	0.60							mudstone	black, massive. half-broken. At top, carbonaceous mudstone, 0.07m: at lower part, 2 coal streaks.
		444.15	**444.94**	**0.79**	**0.79**		**766.06**		**Q1**	**CBM01**		**coal1**	**0.79m 3# coal seam. RC: 0.50m, 0.29m lost. Half-broken, light shiny, no parting.**
		444.94	447.10	2.16	2.16	15						mudstone	black, massive. At 446.60m, 0.20m carbonaceous mudstone. Rich in leaf fragment fossil. At bottom, bedded palne: 15 degree.
		447.10	452.48	5.38	5.38	15						mudstone	black, interbedded with few FGSS layers. Rich in leaf fossil. At 449.00m, dip: 15 degree. At 451.00m, coal seam, 0.03m
		452.48	**453.00**	**0.52**	**0.52**		**767.00**					**coal1**	**0.52m 3-1# coal seam, RC: 0.48m, broken, 1light. Parting: 452.80-452.85m, 0.05m, black mudstone.**
		453.00	454.00	1.00	1.00							mudstone	black, massive, rich in leaf fossil. At upper part, a few vitrain laminates.
		454.00	457.50	3.50	3.50							siltstone	light black, very muddy.
		457.50	464.90	7.40	7.40	20						sandstone	white and grey, interbedded with light black silty mudstone (30%). At 461.50m, bedded plane: 20 degree.
		464.90	477.70	12.80	12.80	20						mudstone	black, massive. At 466.50-467.20m, a few coal streaks. At 466.70m, coal 0.03m, very broken. At 470.50m, coal seam 0.05m, very broken. At 472.00-473.40m, light grey fine-grained sandstone with black mudstone laminates. At 473.30m, bedded plane: 20 degree.
		477.70	483.78	6.08	6.08	20						sandstone	white and grey, medium-grained, well-sorted, weak react with 5% HCL. At 478.00m and 481.00m, bedded plane: 20 degree. At base, grain toward MGSS.
		483.78	484.70	0.92	0.92							mudstone	carbonaceous mudstone. Broken, numerous coal threads.
		484.70	486.20	1.50	1.50							siltstone	dark grey, muddy, massive.
		486.20	487.85	1.65	1.65	35						sandstone	light grey, fine-grained, interbedded with argillceous pebble on the FGSS joint surface. At 487.00m, bedded plane: 35 degree. react with 5% HCL.
		487.85	490.35	2.50	2.50							mudstone	light black, massive. At top, abundant coal threads. At base, mud to silty.
		490.35	**490.41**	**0.06**	**0.06**							**coal1**	**0.06m coal seam. Black, light.**
		490.41	493.35	2.94	2.94	31						sandstone	grey, interbedded with dark grey siltstone laminates (30%). Abundant plant roots fossil. At 492.00m, bedded plane: 31 degree.
		493.35	498.19	4.84	4.84	32						siltstone	dark grey, muddy, massive. Carbonaceous and coal fragments observed on joint surface. At 495.00m, bedding plane: 32 degree.
Gething		**498.19**	**501.00**	**2.81**	**2.81**		**709.00**		**Q2, Q3**	**CBM02**		**coal1**	**2.81m 5# coal seam, RC: 2.70m, Intact, black and shiny. Parting is three section: 498.85-499.10m, 0.25m black mudstone; 499.93-500.00m, 0.07m black mudstone; 500.60-500.75m, 0.15m black mudstone. Coal structure: 0.66<0.25>0.83<0.07>0.60<0.15>0.25m.**
		501.00	503.95	2.95	2.95	30						mudstone	carbonaceous mudstone. Massive, numerous coal streaks. At 503.00m, bedding plane: 30 degree.
		503.95	**504.00**	**0.05**	**0.05**							**coal1**	**0.05m coal seam.**
		504.00	504.98	0.98	0.98							siltstone	dark grey, massive. Rich in plant root fossil.
		504.98	**505.07**	0.09	0.09							**coal1**	**0.09m coal seam, Black, light, bright, half-intact.**
		505.07	506.88	5.61	5.61	25						siltstone	dark grey, interbedded with light grey FGSS laminates (10%) and black mudstone laminates, micro-horizontal bedding, At base sand toward. At 509.75m, bedding plane: 25 degree.
		510.68	**511.11**	**0.43**	**0.43**		**698.89**					**coal1**	**0.43m 5-1# coal seam, RC: 0.32m, Black, light, bright, brittle.**
		511.11	517.85	6.74	6.74	35						siltstone	dark grey, interbedded with light grey FGSS laminates (10%) and black mudstone fragments, At 511.11-511.85m, vertical fracture developed, dip: 70 degree. infilled coal film. At 515.00m, bedding plane: 35 degree. from 516.00-517.85m, very much broken.
		517.85	**518.00**	**0.15**	**0.15**							**coal1**	**0.15m coal seam, RC: 0.15m, Black, baxitic broken, and light, half-bright.**
		518.00	523.57	5.57	5.57	32						sandstone	fine-grained, light grey. react with 5% HCL. Fracture developed, infrilled Minor calcite veins. At 520.50m, bedded plane: 32 degree. At base, FGSS becoming mudstone, abundent carbonaceous fragment.
		523.57	**523.72**	**0.15**	**0.15**							**coal1**	**0.15m coal seam, RC: 0.15m, Black, baxitic broken, dull.**
		523.72	524.82	1.10	1.10							mudstone	carbonaceous mudstone.
		524.82	**525.07**	**0.25**	**0.25**							**coal1**	**0.25m coal seam, RC: 0.25m, Black.**
		525.07	525.27	0.20	0.20							mudstone	0.20m carbonaceous mudstone.
		525.27	**525.35**	**0.08**	**0.08**							**coal1**	**0.08m coal seam.**
		525.35	527.52	2.17	2.17	20						siltstone	dark grey, massive. At upper part, with FGSS laminates. At 526.50m, bedded plane: 20 degree.
		528.00	**528.48**	**0.48**	**0.48**		**682.00**					**coal1**	**0.48m 6# coal seam, RC: 0.45m, Black, light, bright and half-intact.**
		528.00	**529.90**	1.90	1.90							sandstone	MGSS
		529.90	533.50	3.60	3.60							siltstone	grey, rich in plant root fossil.
		533.50	534.10	0.60	0.60							sandstone	FGSS
		534.10	**534.22**	**0.12**	**0.12**							**coal1**	**0.12m coal seam, Black, brittle.**
		534.22	534.39	0.17	0.17							mudstone	0.17m carbonaceous mudstone.
		534.39	**534.44**	**0.05**	**0.05**							**coal1**	**0.05m coal seam.**
		534.44	537.50	3.06	3.06							siltstone	dark grey, muddy, massive. Numerous plant root fossil. With minor FGSS laminates.
Gething		537.50	550.35	12.85	12.85	28						siltstone	dark grey, interbedded with light grey fine-grained sandstone laminates (25%). Micro-horizontal bedding, At 543.00m, bedded plane: 28 degree. Abundent plant root/leaf fossil. At lower part, silt becoming mud, 0.50m carbonaceous mudstone at base.
		550.35	**552.00**	**1.65**	**1.65**		**668.00**		**Q3**	**CBM03**		**coal1**	**1.65m 7# coal seam, RC: 1.30m, Coal is black, light, bright and half-intact. No parting.**
		552.00	559.60	7.60	7.60	25						mudstone	black, massive. At 555.00m, bedded plane: 25 degree. At 555.48-555.55m, 0.07m coal seam, 557.92m, 0.07m coal seam, black, brittle.
		559.60	580.80	21.30	21.30	25-33						sandstone	medium-grained, light grey. Moderate-sorted, quartz and debris mainly. Interbedded with minor dark grey siltstone laminates. Micro-horizontal bedding. At 570.00m, bedding plane: 26 degree. At 570.80-571.48m, drak grey siltstone, at 572.00m, bedding plane: 33 degree. at lower part, minor calcite vein on joint surface, react with 5% HCl. At 574.85-575.50m, broken, a few layers coal threads observed on MGSS joint surface.
		580.80	593.65	12.85	12.85	23						sandstone	fine-grained, light grey, with dark grey siltstone and mudstone laminates (15%). Micro-horizontal bedding, well-sorted, predominately quartz and debris. At 586.00m, bedded plane: 23 degree. From 589.30-593.65m (at lower part), conglomerate-bearing FGSS, Ø:2-7mm, fracture developed. from 591.30-593.65m, very much broken, broken surface are slickensided and shiny. at base, 1.00m conglomerates.
		593.65	594.35	0.70	0.70							mudstone	black, carbonaceous. Rich in coal fragment.
		594.35	**596.96**	**1.61**	**1.61**		**614.04**		**Q4, Q5**			**coal1**	**1.61m 8# coal seam, RC: 0.80m, Black, dull, broken and brittle, bended. Coal structure: 594.35-594.85m, 0.50m coal seam; 594.85-595.05m, 0.20m honey coal; 595.05-595.96m, 0.91m coal seam.**
		596.96	598.30	2.34	2.34	35						siltstone	dark grey, with light grey fine-grained laminates at medium part. At top, 0.45m black carbonaceous mudstone, Abundant plant root fossil and carbonaceous fragment. At 597.50m, bedded plane: 35 degree.
		598.30	602.30	4.00	4.00							mudstone	black, massive. rich in carbonaceous fragment and plant root fossils. Minor coal streak.
		602.30	603.40	1.10	1.10	35						siltstone	fine-grained, light grey. With light black mudstone laminated (40%). Micro-horizontal bedding, dip: 35 degree. infilled minor calcite vein on joint surface.
		603.40	604.40	1.00	1.00							mudstone	black, carbonaceous. Rich in coal fragment.
		604.40	**604.53**	**0.13**	**0.13**							**coal1**	**0.13m coal seam. Brittle and black.**
		604.53	605.13	0.60	0.60							siltstone	dark grey, massive. Abundant carbonaceous fragment.
		605.13	609.40	4.67	4.67	31						sandstone	light grey, fine-grained. Interbedded with dark grey mudstone laminates (25%). Minor calcite vein observed on fine-grained sandstone joint surface. Micro-horizontal bedding, bedded plane: 31 degree at 607.50m, strong react with 5% HCL.
		609.80	620.70	10.90	10.90	25						sandstone	medium-grained, light grey. With light black mudstone laminated (30%). strong react with 5% HCL. Micro-horizontal bedding. At 615.00m, dip: 25 degree: From 612.40-612.90m, broken. fracture developed, polished, infilled minor coal film. From 615.00-618.00m, more irregular calcite veins and coal film infilled on plane.
		620.70	631.60	10.90	10.90	25						siltstone	dark grey, muddy, interbedded with minor light grey fine-grained sandstone laminates. Abundent plant root fossils.at upper part, fracture developed, dip: 30-70 degree, infilled calcite vein, react with 5% HCL. At base, silt toward mud. At 630.70m, bedded plane: 25 degree.
		631.60	634.66	3.06	3.06							mudstone	black, massive. From 633.80-634.66m carbonaceous mudstone, numerous coal threads.
		634.66	**637.70**	**3.04**	**3.04**		**672.30**		**Q7**	**CBM04**		**coal1**	**3.04m 9# coal seam, RC: 1.40m, Black, light and bright. Broken and poor recovery, lost 1.64m. No parting.**
		637.70	638.20	0.50	0.50							mudstone	black, carbonaceous. Rich in coal fragment.
		638.20	639.00	0.80	0.80	35						siltstone	dark grey, massive. Abundant carbonaceous fragment and calcite vein. At 638.80m, bedding plane: 35 degree.
		639.00	**639.05**	**0.05**	**0.05**							**coal1**	**0.05m coal seam. Broken, black, light and bright.**
		639.05	645.00	5.95	5.95	25						siltstone	dark grey, massive, muddy. Abundant carbonaceous fragment and plant root fossil. At 641.70m, bedding plane: 25 degree. At top, with FGSS laminates (20%).
		645.00	645.90	0.90	0.90							mudstone	black, carbonaceous. Rich in coal fragment.
		645.90	**653.32**	**7.42**	**7.42**		**556.68**		**Q8 Q9 Q10 Q11**	**CBM05**		**coal1**	**7.42m 9-1# coal seam, RC: 4.20m, lost: 3.22m, Black, light and bright, half-intact. Coal structure: 1.10<0.09>0.91<0.04>0.75<0.28m, Q8: 645.90-648.50m, 2.60m, RC: 1.30m; Q9: 648.50-653.32m, 2.18m, RC: 1.62m. Q11-parting: 647.00-647.09m, 0.09m black mudstone; 648.00-648.04m, 0.04m black mudstone.**
		653.32	654.00	0.68	0.68							mudstone	black, carbonaceous. Rich in coal fragment.
		654.00	660.40	6.40	6.40	25						siltstone	dark grey, muddy, interbedded with minor light grey fine-grained sandstone laminates (10%). Abundent plant root fossils and coal film. fracture developed, infilled irregular calcite vein, react with 5% HCL. At 655.00m, bedded plane: 25 degree. At 656.30-656.54m, 0.04m coal seam.
		660.40	675.30	14.60	14.60							siltstone	dark grey, muddy. interbedded with minor light grey fine-grained sandstone laminates (10%). no plant root fossils. at top, 0.30m FGSS. From 662.00-665.00m, and 669.00-671.50m, fracture developed, infilled few ireguular calcite vein, react with 5% HCL.
		675.30	675.47	0.30	0.30							mudstone	black, carbonaceous. Rich in coal fragment.
		675.47	**675.80**	**0.17**	**0.17**							**coal1**	**At 675.30-675.47m, 0.17m coal seam.**
		675.80	676.47	1.00	1.00							mudstone	black, carbonaceous. Rich in coal fragment.
		676.47	**676.82**	**0.35**	**0.35**							**coal1**	**0.35m coal seam, RC: 0.35m, Black, light, half-intact.**
		676.82	680.83	4.01	4.01	25						mudstone	black, massive. Numerous plant root fossil and carbonaceous fragment. At 677.50m, bedding plane: 25 degree.
		680.83	**684.00**	**3.17**	**3.17**	**60-70**	**526.00**		**Q12 Q13**			**coal1**	**3.17m 10# coal seam, RC: 1.65m, Parting: 681.33-682.13m, black mudstone. Black, dull and a little heavy. Belong to tectonic coal, fracture developed, dip: 60-70 degree. At 682.48-684.00m, lost coal 1.52m (5 feet).**
		684.00	686.75	2.75	2.75	22						siltstone	dark grey, massive. At top, 0.50m broken. At 685.00m, bedded plane: 22 degree.
		686.75	**688.30**	**1.55**	**1.55**		**521.70**		**Q14 Q15**			**coal1**	**1.55m 10-1# coal seam, RC: 1.40m, Parting: 687.45-687.77m, 0.32m, black carbonaceous mudstone. Coal structure: 0.70<0.32>0.55m.**
		688.30	693.10	4.80	4.80							siltstone	grey, massive. interbedded with minor light grey fine-grained sandstone laminates and dark grey mudstone laminates, at top, muddy, minor plant fossil and calcite vein.
		693.10	**693.45**	**0.35**	**0.35**							**coal1**	**At 693.10-693.45m, 0.35m coal seam.**
		693.45	696.00	2.55	2.55	35						siltstone	grey, massive. At lower part, light grey fine-grained sandstone laminates increased to 50%. at 695.00m, bedding plane: 35 degree.
		696.00	696.50	0.50	0.50							mudstone	black, carbonaceous. Rich in coal fragment.
		696.50	719.25	22.75	22.75	25						sandstone	light grey, fine-grained. Interbedded with few dark grey mudstone laminates (5%). At top, coal film observed on FGSS joint surface. Well-sorted, micro-horizontal bedding. react with 5% HCL. At 705.40-708.40m, medium-grained sandstone. At lower part, dark grey mudstone laminates increased to 15%, few coal film, and fracture developed, dip: 45-60 degree, irregular calcite vein observed on joint surface. at 716.35m, bedded plane: 25 degree.
		719.25	723.00	3.75	3.75							mudstone	light black, massive. Bedding developed, include minor sideritic thin laminates, irregular calcite vein on joint surface.
		723.00	724.00	1.00	1.00							mudstone	black, carbonaceous. Rich in honey coal.
		724.00	729.00	5.00	5.00							mudstone	black, abundent carbonaceous fragment and plant root fossil. At 724.80-725.05m, 0.25m fault gauge.
		729.00	730.45	1.45	1.45							mudstone	dark grey, massive. minor carbonaceous fragment and siderite.
		730.45	735.90	5.45	5.45	35						siltstone	dark grey, massive. Sandy, At base, silt toward sand. No plant fossil. At 734.90m, bedding plane: 35 degree.
		735.90	754.50	18.60	18.60	46-52						siltstone	dark grey, massive. interbedded with minor light grey fine-grained sandstone laminates and minor plant fossil. At 735.90-735.94m, 0.04m coal seam. at 736.50m, bedding plane: 47 degree. At 746.80m, bedding plane: 46 degree. At 747.08-747.18m, 0.10m calcite vein. at 751.00m, bedding plane: 52 degree. at base, silt toward mud.
		754.50	756.30	1.80	1.80	45						mudstone	light black, massive. Abundent carbonaceous fragment and vitrain streak. At 756.30m, dip: 45 degree.
		756.30	**756.45**	**0.15**	**0.15**							**coal1**	**0.15m coal seam. Black.**
		756.45	757.70	1.25	1.25							mudstone	black, carbonaceous. Rich in coal fragment.
		757.70	**757.85**	**0.15**	**0.15**							**coal1**	**0.15m coal seam. Black.**
		757.85	759.07	1.22	1.22							mudstone	black, carbonaceous. Rich in coal fragment.
		759.07	**760.43**	**1.36**	**1.36**		**449.67**		**Q16 Q17**			**coal1**	**1.36m 12# coal seam, RC: 1.30m, Black, light and bright, brittle mainly. Parting: 759.32-759.46m, 0.14m black mudstone. Coal structure: 0.25<0.14>0.97m.**
		760.43	768.00	7.57	7.57	25						siltstone	dark grey, massive. interbedded with minor light grey fine-grained sandstone laminates and at upper part, numerous plant fossil. At 762.00m and 766.40m, bedded plane: 25 degree. At lower part, FGSS increased and few calcite vein observed on joint surface.
		768.00	769.82	0.70	0.70							mudstone	black, carbonaceous. Rich in coal fragment.
		769.82	**769.96**	**0.07**	**0.07**							**coal1**	**0.07m 13# coal seam, RC: 0.05m, Broken, light, bright.**
		769.96	772.00	2.04	2.04							siltstone	dark grey, massive. At 770.00m, bedded plane: 25 degree. At 770.50-770.60m, 0.10m coal seam.
		772.00	772.30	0.30	0.30							mudstone	black, carbonaceous. Rich in coal fragment.
		772.30	**772.50**	**0.20**	**0.20**							**coal1**	**0.20m 14# coal seam, RC: 0.15m, Broken, light.**
		772.50	775.00	2.50	2.50							siltstone	dark grey, massive. At 773.00m, bedded plane: 25 degree. At 773.50-773.60m, 0.10m coal seam.
		775.00	775.30	0.30	0.30							mudstone	black, carbonaceous. Rich in coal fragment.
		775.30	**775.50**	**0.20**	**0.20**							**coal1**	**0.20m 15# coal seam, RC: 0.15m, Broken, light.**
		775.50	776.00	0.50	0.50							mudstone	black, carbonaceous. Rich in coal fragment.
		776.00	**776.20**	**0.20**	**0.20**							**coal1**	**0.20m 16# coal seam, RC: 0.15m, Broken, light.**
		776.20	776.50	0.30	0.30							mudstone	black, carbonaceous. Rich in coal fragment.
		776.50	**776.70**	**0.20**	**0.20**							**coal1**	**0.20m 17# coal seam, RC: 0.15m, Broken, light.**
		776.70	777.00	0.30	0.30							mudstone	black, carbonaceous. Rich in coal fragment.
		777.00	**777.20**	**0.20**	**0.20**							**coal1**	**0.20m 18# coal seam, RC: 0.15m, Broken, light.**
		777.20	778.00	0.80	0.80							mudstone	black, carbonaceous. Rich in coal fragment.
		778.00	**778.20**	**0.20**	**0.20**							**coal1**	**0.20m 19# coal seam, RC: 0.15m, Broken, light.**
		778.20	778.50	0.30	0.30							mudstone	black, carbonaceous. Rich in coal fragment.
		778.50	**778.70**	**0.20**	**0.20**							**coal1**	**0.20m 20# coal seam, RC: 0.15m, Broken, light.**
		778.70	779.00	0.30	0.30							mudstone	black, carbonaceous. Rich in coal fragment.
		779.00	**779.20**	**0.20**	**0.20**							**coal1**	**0.20m 21# coal seam, RC: 0.15m, Broken, light.**
		779.20	779.50	0.30	0.30							mudstone	black, carbonaceous. Rich in coal fragment.
		779.50	**779.70**	**0.20**	**0.20**							**coal1**	**0.20m 22# coal seam, RC: 0.15m, Broken, light.**
		779.70	780.00	0.30	0.30							mudstone	black, carbonaceous. Rich in coal fragment.
		780.00	**780.20**	**0.20**	**0.20**							**coal1**	**0.20m 23# coal seam, RC: 0.15m, Broken, light.**
		780.20	780.50	0.30	0.30						

Wapiti River — Drill Hole Core Log

Drilling Company:	CYR International Drilling	**Hole No.:**	WP1C39		
Rig Type:	Golder Bear-1	**Collar Elevation:**	1291.1m		
Total Depth:	1181.0m	**Coordinate:**	**Northing:**	6071162.2	
Spud Date:	22-Sep-12		**Easting:**	652030.4	
Finished Date:	24-Oct-12		**Logging Geologist:**	Lee,Victor, Ricky	
Core Size:	HWT/HQ		**Note:**		

Formation	Coal Seam	Core Depth Interval		Thickness, m		Strata Dip	Coal Floor Elevat	Sample ID			Rock Hardness	Rock Name	Lithology Description
		From	To	Thick	TRUE			Coal	Rock	CBM			
Q		0.00	5.30	5.30									Till, soft clay at 0~3.3m , at 3.3~5.30m broken siltstone, overbedden: 5.30m.
Hasler		5.30	10.10	4.80		5°						siltstone	dark grey, with fss laminae(20%), distorted bedding, bedded plane: 5°, broken zone throughout
		10.10	41.50	31.40								siltstone	muddy, dark grey -light black, siltstone blended find sandstone predominately, no bedding content: 25%. At 20.0m, bedded plane: 5° . At 38.0m, (5°). At 17.0~18.0m, broken, fractu
		41.50	61.00	19.50		5°						siltstone	dark grey to light black, little muddy, interbedded fine sandstone laminae (30%), horizont
		61.00	74.15	13.15		5°						siltstone	dark grey -grey, interbedded with fine sandstone laminae(45%), distorted bedding, at 62.0m vertical fracture.
		74.15	76.52	2.37		7°						sandstone	white and grey, medium-coarse grained, with a few gravels, moderately-sorted, rounded, at
Boulder Creek		76.52	79.30	2.78								mudstone	light black to black, massive; at upper, little bauritic; at 79.0~79.10m, a few vitrain le
		79.30	98.00	18.70		35°						mudstone	brown and grey, bauxitic, with a few dark siltstone, at 84.10~84.40m, more bauxitic, wht a No:8/m; at 93.0~97.20, very broken, fracture No:15/m; at 97.50m, bedded plane: 35°; little calc
		98.00	104.00	6.00								mudstone	light black, little bauxitic; at 102.0m, (40°), little broken.
		104.00	105.00	1.00		40°						sandstone	white and grey, fine grained, with dark mudstone laminae, bedded plane: 40° .
		105.00	135.80	30.80								mudstone	light black, little bauxitic; at 105.30~106.20m, fracture zone, very broken; at 111~113.10 broken; at 121.0~122.0, broken; at 125.0~126.70, few vertical calcite veins; at 123.0m, be at 123.50m, siderite, a layer, 0.01m; at 131.70m, a siderite layer, 0.01m; at 135.0~135.80
		135.80	142.30	6.50		70°						sandstone	white-grey, medium-coarse grained; at lower part, coarse-grained, moderate-sorted, broken at 137.0m, bedded plane: 70° ; at 140.0m (70%); at 142.0~143.0m, very broken, fracture No:
		142.30	154.00	11.70		70°						sandstone	white and grey, fine -medium grained, fine and medium grained interbedded, little broken t 144.0m, bedded plane:70° ; at 151.0m→70°; at 148.0m→70°.
		154.00	157.90	3.90		40°						sandstone	wht-gry, coarse-grained, quartz and debris mainly, poorly-sorted, rounded, little broken t
		157.90	161.00	3.10								mudstone	light black, silty, brittle, with a few calcite veins; at 157.90~159.0m, very broken; frac
		161.00	173.60	12.60		40°						mudstone	brown-grey, bauritic, brittle, massive, numberous calcite veins at different dirction, lit bauxitic, light grey; at 172.50m, bedded plane: 40° .
		173.60	179.00	5.40		45°						mudstone	light black, little bauxitic, many calcite veins; at 178.50m→45°.
		179.00	179.50	0.50								sandstone	white-grey, medium-grained, broken from top to bottom, fracture No: 10/m.
Hasler		179.50	205.50	26.00		40°						mudstone	light black, silty to very silty; at lower part, very silty; at upper, silty, with white a 179.50~187.0m, little broken; at 181.0m, bedded plane: 45° ; at 188.50m→40° ; at 190.0m→ broken; at 203.20m→55° ;at 203.50~204.50m, broken; at 204.0m→55° .
		205.50	208.75	3.25		55°						siltstone	dark grey to light black, muddy, fold zone, broken, very broken (207.50~208.75), fracture
		208.75	**226.50**	17.75								mudstone	light black, very silty, with fine sandstone laminae(5%); at 209.50m→40°; at 211.0m→25°; at 2 at 221.0m→22°; at 224.0m→25°.
		226.50	281.00	54.50		25°						siltstone	dark grey, very muddy; at 226.50~245.0m, blended find sandstone (15%); at 233.0m→25° ;at micro-horizontal bedding; at 248.0m→25° ; at 263.0m→25° ; at 275.0m→25° ; at 253.70m, 0
		281.00	287.00	6.00		25°						siltstone	dark grey, muddy, interbedded with fine sandstone laminae (30%), bedded plane: 25° .
		287.00	292.80	5.80								siltstone	dark grey, with fine sandstone laminae (5%); at 290.0m→25°.
		292.80	299.80	7.00		22°~25°						siltstone	dark grey-black, muddy, interbedded fine sandstone laminae (20%); at 295.50m→22°; at 299.0m
		299.80	320.00	20.20		25°						siltstone	dark grey-light black, muddy, with fine sandstone laminae (content: 5%); at 311.0→25°;at 31
		320.00	341.00	21.00								siltstone	dark grey-light black, blended fine sandstone (content: 10%), no bedding predominately; at
		341.00	377.00	36.00		40°						siltstone	light black, very muddy, with fine sandstone laminae (1%); at 352.0m, 356.0m, bedded plane at 368.10m, a pyrite nodule(10*50mm); at 372.30m, 0.15m, a fine sandstone layer; at 368.0m
		377.00	383.55	6.55		40°						siltstone	dark grey, interbedded fine sandstone laminae (15%), horizontal bedding; at 382.50m→40°.
		383.55	401.00	17.45		45°						siltstone	dark grey, blended fine sandstone (content: 30°), with few fine sandstone laminae, few be
		401.00	**425.00**	24.00		45°						siltstone	dark grey, with fine sandstone laminae (20%), horizontal bedding; at 406.0m→45° ; at 410.
		425.00	441.50	16.50		45°						siltstone	dark, interbedded fine sandstone, thin layer (30%); at 428.0m, bedded plane: 45° ; at 429. 440.20~441.50, fine sandstone laminae, increase to 50%; at 441.30m, a pyrite nodule (10*15mm).
		441.50	449.00	7.50								siltstone	dark grey, blended fine sandstone (20%), with few sandstone laminae; at 448.0→45°.
		449.00	480.00	31.00		45°						siltstone	dark grey-light dark, muddy, with find sandstone laminae (15%); at 453.0m→45°; at 461.0m→45 479.0m→45°;at 479.0m→45°.
		480.00	**523.00**	43.00		45°						siltstone	dark grey to light black, muddy, interbedded fine sandstone laminae (20%), horizontal beddi 503.0m→45° ; at 500.80, 503.10m, 2 pyrite nodule (10*40mm); at 527.70~528.90m, broken zon at 518.0m→40° ; at 510.0m→45° ; at 514.0m→45° .
		523.00	548.00	25.00								siltstone	dark grey, with wht and gry fine sandstone laminae (10%); at 525.0→45°;at 533.0m→45°;at 545.
		548.00	**582.00**	34.00								siltstone	dark grey, interbedded fine sandstone laminae (30%), horizontal bedding; at 554.0m, bedded
		582.00	602.55	20.55								siltstone	dark grey, with wht and gry fine sandstone laminae (10%); at 586.0m, bedded plane:45° ; at
		602.55	**602.78**	0.23								conglomerate	light grey, quartz, chert, debris predominately, ϕ:1~5mm, poorly-sorted.
Boulder Creek		**602.78**	605.64	2.86								siltstone	light grey, with dark mudstone laminae (2%); at 605.0m, →45°.
		605.64	620.40	14.76								sandstone	grey to light grey, fine-grained, dark debris predominately, poorly-sorted; at 606.0m, →40 fracture No: 10/m,with calcite veins.
		620.40	644.20	23.80								mudstone	light black, little bauritic, massive, little broken throughout; at 639.50~640.50, broken
		644.20	660.30	16.10								mudstone	brown and grey, massive, bauxitic; at upper and lower part, more bauxitic; at 657.30~656.3 bedded plane: 55° , soft, can be scratched by iron knife.
		660.30	673.00	12.70								sandstone	fine grained; at upper, grey, dark debris mainly; at lower part, light grey, quartz and de calcite veins.667.7~668.10,broken zone; at 670.80~671.80, broken, moderately-sorted; at 6
		673.00	677.00	4.00		45°						sandstone	dark grey, medium-grained; at 676.0m, bedded plane: 45° ; at 674.50~675.50, broken, fractu
		677.00	697.50	20.50								mudstone	brown and grey, little bauxitic, silty, massive, more bauxitic locally; at 692.0~694.0m, n broken, fracture No:40/m;at 681.10~683.0m, broken, facture No:15/m; at 683.50m→70°.
		697.50	698.60	1.10		50°						sandstone	light grey, fine-grained, little broken, bedded plane: 50° .
		698.60	702.35	3.75								mudstone	brown and grey, bauxitic,massive; at top, more bauxitic, numberous minor calcite veins thr
		702.35	713.90	11.55		50°						sandstone	light grey, fine-grained, well-sorted, debris and quartz mainly, with many minor calcite v plane: 50° .
		713.90	733.20	19.30		45°						mudstone	grey and brown, massive, bauxitic, with numberous minor calcite veins; at 713.90~714.70m, sandstone at 716.40~717.30m; at 719.90~722.0m, little broken, fracture: 10; at 717.0m, bed
		733.20	743.40	10.20		30°						sandstone	white and grey, fine-medium grained, with dark siltstone laminae; at 734.90~737.0m, very b fracture No: 25/m; at 735.30m, a thin layer carbonaceous mudstone, 0.05m; at 734.0m→45° ;
		743.40	744.00	0.60		30°						sandstone	light grey, medium-grained, poorly-sorted, with coal lenses.
		744.00	**744.05**	**0.05**								**coal**	**a coal streak, 0.05m, very broken.**
		744.05	745.60	1.55								sandstone	light grey, medium-grained,with local lenses.
		745.60	746.70	1.10								mudstone	dark grey-grey, little bauxitic, silty, little broken, fracture No:10/m.
		746.70	748.15	1.45		30°						sandstone	light grey, medium-grained, bedded plane: 30° .
		748.15	759.80	11.65								mudstone	light grey, little bauxitic; at 756.10~756.60m, fine sandstone; at 755.50m, bedded plane:
		759.80	764.70	4.90		20°						sandstone	white-grey, medium-grained, debris and quartz mainly; at 761.0, bedded plane: 20° , interb
		764.70	777.50	12.80		30°						mudstone	brown and grey, little bauxitic,interbedded fine sandstone layer (content: 40%); at 766.50 722.0~722.60m, broken, fracture No: 10; at 771.50m, bedded plane:30° .
		777.50	784.00	6.50		30° ~35°						sandstone	white-grey, fine-medium grained, with dark siltstone laminae, horizontal bedding; at 778.7 fine-grained; at lower part, medium-grained; at 783.0m→30°.
		784.00	786.50	2.50		30°						sandstone	white-grey, medium-coarse grained, medium grained interbedded coarse grained; at 784.0~784 coal streak, light , shiny.
		786.50	788.70	2.20		15°						sandstone	conglomerate, interbedded medium sandstone, light grey; conglomerate, ϕ:1~4mm, poorly-sorted laminae on fracture plane, at 786.75m, bedded plane: 15°.
		788.70	790.00	1.30		15°						siltstone	dark grey, interbedded fine sandstone; at 790.0m→15°.
		790.00	791.40	1.40								mudstone	black, massive; at lower part, carbonaceous, numberous vitrain lenses; at 790.50~790.65m,
		791.40	797.60	6.20								sandstone	white-grey, coarse and medium grained, interbedded with a layer of fine conglomerate; at b
		797.60	808.20	10.60								sandstone	white-grey, fine-grained, pure; at 803.0m→25°; at 805.0m→25°.
		808.20	813.70	5.50								sandstone	white-grey, fine-grained,interbedded light black mudstone; at 812.0m, bedded plane: 20° .
Hulcross		813.70	819.00	5.30								siltstone	dark grey-light black, interbedded fine sandstone thin layers, fine sandstone content:40%; at 815.0m→20°; at 818.0m→20°.
		819.00	826.20	7.20								siltstone	light black, very muddy,massive, no bedding.
		826.20	866.00	39.80		20°~15°			GT1 GT2			siltstone	light black, muddy, interbedded fine sandstone laminae (30%), horizontal bedding, bedding →15°;at 843.30~835.20, broken, fracture No: 8/m; at 850.0m→15°; at 854.0→15°.
		866.00	883.55	17.55		15°			**GT3 GT4**			siltstone	dark grey, interbedded fine sandstone laminae (40%), horizontal bedding; at 862.0m, 0.1m a argillaceous limestone, white and grey; at 870.0m, 878.0m, bedded plane: 15°.
		883.55	884.00	0.45								sandstone	light grey, medium-coarse grained, at lower part, coarse-grained.
		884.00	884.50	0.50		15°			GT5			conglomerate	conglomerate, white-grey, Ø:2~5mm; chert and debris predominately, poorly-sorted, angular and unroun
Gates		884.50	886.90	2.40								mudstone	black, little silty, few tiny pyrite nodule, little carbonaceous.
		886.90	895.50	8.60					GT6 GT7			sandstone	FGSS, light grey, interbedded with black mudstone laminates (20%) and coal film; at upper plane: 18°; at lower part, FGSS-MGSS.
	#3	**895.50**	**896.30**	**0.80**				**Q1 Q2**				**coal**	**0.80m coal seam-3 #, RC:0.70m, black, light, intact, parting: 895.63~895.75m, 0.12m bl**
		896.30	897.06	0.76					GT8			siltstone	dark grey; at top, two layers thin coal seam (0.01m); at medium part, 0.30m FGSS.
		897.06	**897.21**	**0.15**								**coal**	**0.15m coal seam.**
		897.21	897.51	0.30								mudstone	black mudstone.
		897.51	**897.71**	**0.20**								**coal**	**0.20m coal seam.**
		897.71	901.70	3.99		15°			GT9			siltstone	dark grey, interbedded with light grey FGSS laminates (30%), rich in plant root fossils an
		901.70	902.65	0.95								siltstone	dark grey, muddy, abundent coal film and carbonaceous fragment.
	#3-1	**902.65**	**903.56**	**0.91**				**Q3 Q4**				**coal**	**0.91m coal seam - 3-1#, RC: 0.70m; parting: 903.00~903.16m, black mudstone, 0.35<0.16>**
		903.56	906.90	3.34								mudstone	light black, massive; at 904.70~904.80m, 0.10m boney coal; at base, silty increased.
		906.90	915.00	8.10					GT10			sandstone	FGSS, light grey, interbedded with a few interval black mudstone, micro-horizontal bedding
		915.00	917.85	2.85		18°						siltstone	dark grey, massive, a few plant root fossils observed on bedding; at lower part, broken sl
		917.85	927.00	9.15					GT11			mudstone	black, massive; at 915.50~917.60, a few vitrain laminae; at 926.20~926.80, few coal streak
		927.00	**927.30**	**0.30**								**coal**	**coal seam, 0.30m, RC: 0.30m, broken, shiny, light, no parting.**
		927.30	935.65	8.35		15°			GT12 GT13			sandstone	white-grey, fine grained, interbedded light black silty mudstone layer (50%); at 928.0m, b 930.0m→15°; 934.0m→15°.
	#5	**935.65**	**937.52**	**1.87**				**Q5**		**CBM1**		**coal**	**coal seam, 1.87m, RC: 1.65m, 0.22m lost, intact, light, shiny, no parting.**
		937.52	940.20	2.68					GT14			mudstone	black, massive; at 938.90~939.90m, broken, fracture No:30.
		940.20	948.80	8.60		25°			GT15			siltstone	dark grey, muddy, with a few light grey siltstone thin layer (20%); at lower part, few vit
		948.80	950.10	1.30								mudstone	black, carbonaceous, massive, numberous, vitrain laminae.
		950.10	958.40	8.30					GT16			mudstone	black' at 951.50~951.95m, carbonaceous MS, a few vitrain streaks; at 952.40~953.0m, broken 0.04m each; at 958.10~958.30m, 0.20m, coal, RC: 0.20m, shiny, light, no parting.
		958.40	960.00	1.60		25°			GT17			sandstone	white-grey, fine-grained.
		960.00	965.35	5.35		25°			GT18 GT19			mudstone	black, massive; at 963.0~963.30, carbonaceous; at 963.60~963.70, fine sandstone, bedded pl plane: 25°; at 963.50~963.56, 0.06m coal seam, broken; at 963.30~963.48m, 0.18m, banded co
		965.35	969.25	3.90		30°			GT20			sandstone	white-grey, fine-grained; at upper part, pure sandstone; at lower part, interbedded silty
		969.25	971.40	2.15								mudstone	black to carbonaceous, interbedded white-grey fine sandstone; at 969.50~969.80m, 7 coal st
		971.40	**971.90**	**0.50**								**coal**	**coal seam, 0.50m, RC: 0.50m, shiny, light, very broken, no parting.**
		971.90	976.00	4.10					GT21			mudstone	light black, very silty, massive; at 975.30~975.70m, broken.
		976.00	**976.28**	**0.28**								**coal**	**coal seam, 0.28m, RC:0.28m, broken,shiny.**
		976.28	978.10	1.82		30°						mudstone	light black, very silty.
		978.10	**978.25**	**0.15**								**coal**	**coal seam, 0.15m, RC: 0.15m, shiny, broken.**
		978.25	978.45	0.20								mudstone	black, massive.
		978.45	**978.63**	**0.18**								**coal**	**0.18m, broken, RC:0.18m, shiny.**
		978.63	979.03	0.40								mudstone	carbonaceous, numberous, vitrain laminae.
		979.03	988.45	9.42					GT22			mudstone	black, silty localy, rich in leaf fragment fossil, bedded plane enlarges; at 985.70m→35°;
		988.45	**989.00**	**0.55**								**coal**	**coal seam, 0.55m, RC: 0.50m, very broken, shiny, light, no parting.**
		989.00	989.25	0.25								mudstone	carbonaceous, broken, numberous vitrain streaks.
		989.25	1003.40	14.15					GT23 GT24 GT25			mudstone	black, massive, rich in carbonization of leaf fossil; at 990.70 and 990.90m, 2 caol seam, shiny, parting:997.80~997.90m,MS, blk; at 998.0~999.10m, a few caol streak, rich in leaf f each; at 1001.70m, bedded plane: 15°; at 1003.10~1003.20m, 0.10m, coal, broken; 1003.20~10 fracture No: 7/m.
		1003.40	1005.70	2.30		15°						siltstone	light grey, with dark mudstone laminae; at 1005.50m, bedded plane: 15°.
		1005.70	1007.63	1.93								mudstone	blk, massive.
	#7-1	**1007.63**	**1008.00**	**0.37**								**coal**	**coal seam, 0.37m, RC:0.37m, soft, shiny, no parting.**
		1008.00	1008.80	0.80								mudstone	blk, massive.
	#7-2	**1008.80**	**1009.15**	**0.35**								**coal**	**coal seam, 0.35m, RC: 0.35m, intact, shiny, no parting; at 1008.05~1009.15m, banded co**
		1009.15	1012.00	2.85								mudstone	black, carbonaceous locally, with 20 coal steaks throughout , with leaf fossil; at 1009.20 shiny, light; rich in carbonization of leaf fossil.
		1012.00	1022.00	10.00					GT26			mudstone	black to light black, massive, with leaf fossil and carbonization of leaf fossil; at 1014. 1016.0~1016.20, carbonaceous; at 1021.70~1022.0m, carbonaceous, few coal streak.
		1022.00	1054.00	32.00					GT27 GT28 GT29 GT30			sandstone	white-grey, medium grained, quartz and dark debris predominately, well-sorted; at 1023.0~1 1024.80~1025.10m, a few coal streaks on fracture plane; at 1037.0m, bedded plane: 30°; at 1050.0m→15°.
		1054.00	1056.44	2.44								mudstone	blk, carbonaceous locally, massive, rich in leaf fossil; at 1055.90m, 0.06m coal, shiny, l
	#8	**1056.44**	**1062.35**	**5.91**				**Q6 Q7 Q8 Q9**		**CBM2 CBM3**		**coal**	**coal seam, 5.91m, RC: 5.0m, 0.91m lost,shiny, light, brittle, blocky, no parting; at u Boney coal: 1056.44~1056.54, 0.10m,little heavy; CO: 1056.54~1062.35m, 5.81m, RC: 4.90**
		1062.35	1072.25	9.90					GT32			mudstone	light black-black, very silty; at 1065.70~1067.0, fine sandstone; at 1070.0~1072.60, with at 1063.80m, bedded plane: 20°; at 1066.0m, →20°; 1069.0m, (20°).
		1072.25	1080.00	7.75					GT33			siltstone	light grey, very muddy, interbedded white-grey fine sandstone; at 1074.30m, a thin layer o 1078.0m, →30°; at 1080.0m→25°m, with leaf fossil at middle part.
		1080.00	1087.10	7.10		25°			GT34			sandstone	white-grey, fine grained, with dark silty mudstone laminae, horizontal bedding; at 1082.0m
		1087.10	1091.13	4.03					GT35			mudstone	black, massive; at 1090.40, 0.10m, carbonaceous; 1090.50~1090.85, 0.35m, banded coal, RC:0
	#9	**1091.13**	**1095.80**	**4.67**				**Q10 Q11 Q12 Q13**		**CBM4 CBM5**		**coal**	**coal seam, 4.67m, RC: 4.67m, intact, shiny, light, brittle, 1.02<0.25>0.90<0.10>0.80<0 1091.13~1092.15m, 1.02m, intact; parting: 1092.15~1092.40m,0.25m carbonaceous; CO: 109 0.10m, carbonaceous; CO:1093.40~1094.20, 0.80m, parting: 1064.20~1094.50, 0.30, blk, m parting:1094.85~1095.23, 0.38m, blk, ms; CO: 1095.23~1095.60m, 0.37m, parting: 1095.60 1095.70~1095.89m, 0.10m.**
		1095.80	1097.00	1.20					GT36			mudstone	black, massive, rich in leaf fossil.
		1097.00	1110.95	13.95					GT37			sandstone	white-grey, fine grained, quartz and debris predominately, well-sorted; at 1099.0~1099.25m plane:20°; at 1109.0m→15°.
		1110.95	1111.03	0.08								mudstone	blk, massive.
	#10	**1111.03**	**1112.80**	**1.77**				**Q14 Q15 Q16**				**coal**	**coal seam, 1.77m, RC: 1.50m, 0.27m lost; at upper , intact; at lower, half-broken; CO: parting: 1112.0~1112.10, 0.10m, black, massive; CO: 1112.10~1112.80, 0.70m, RC: 0.53m, 0.97<0.10>0.70m.**
		1112.80	1127.00	14.20					GT38 GT39			mudstone	black; at 1112.80~1113.50m, little carbonaceous, 2 coal streaks; at 1115.0~1116.40m, carbo each), rich in leaf fossil; at 1115.40, 0.07m coal seam; at 1115.70m, 0.08m coal seam; at plane: 15°; at 1124.0m, bedded plane: 20°; at 1121.0~1127.0m, silty mudstone.
		1127.00	1128.05	1.05		25°						sandstone	white-grey, fine grained, with dark ms laminae.
		1128.05	1130.25	2.20		20°			GT40			mudstone	black, with fine sandstone laminae; at upper , a few calcite laminae on bedding plane; at
	#12	**1130.25**	**1132.33**	**2.08**				**Q17 Q18**		**CBM6**		**coal**	**coal seam, 1.58m, RC: 1.58m, half-broken, light, shiny, coal structure: 1.33<0.15>0.10 1132.08~1132.23, 0.15m, blk, ms, rich in leaf fossil; CO:1132.23~1132.33, 0.10m, broke**
		1132.33	1132.43	0.10									ms, carbonaceous.
		1132.43	1135.65	3.22		20°			GT41			sandstone	white-grey, fine grained; at 1134.0m→20°, few minor calcite veins on fracture plane.
		1135.65	1138.00	2.35								mudstone	black, massive, with leaf fossil throughout; at 1135.65~1136, at 1137.50~1137.90, carbonac
		1138.00	1146.00	8.00					GT42			sandstone	white-grey, medium-grained, quartz and debris predominately, well-sorted, with dark siltst thick; at 1140.0m→15°, at 1145.0m→15°.
		1146.00	1154.90	8.90		15°			GT43			sandstone	white-grey, medium-grained, quartz predominately, well-sorted, at 1151.0m→15°.
		1154.90	1181.00	26.10		16°						sandstone	white-grey, medium-grained, interbedded dark ms thin layers (30%); at 1160.0m, bedded plan fracture No:2; at 1173.50~1173.90m, 2 vertcal fracture, fracture No:3; at 1176.50~1177.50, broken, fracture No:6.
													End depth: 1181.0m .

Wapiti River — Drill Hole Core Log

Drilling Company:	Foraco Drilling Ltd		**Hole No.:**	WP1C47		
Rig Type:	VD-8000		**Collar Elevation:**	1095.3m		
Total Depth:	589.5m		**Coordinate:**	**Northing:**	6075012.1	
Spud Date:	11-Feb-13			**Easting:**	649983.1	
Finished Date:	21-Feb-13			**Logging Geologist:**	Charles, Raymond	
Core Size:	HWT/HQ			**Note:**		

Formation	Coal Seam	Core Depth Interval		Thickness, m		Strata Dip	Coal elevation	Sample ID			Rock Hardness	Rock Name	Lithology Description
		From	To	Thick	TRUE			Coal	Rock	CBM			
Q		0.00	16.00	16.00								till	cement and a few boulders and gravel.
Hasler		16.00	19.23	3.23								Sandstone	breccia, subangular chunks, variety of rocks, mostly sandstone.
		19.23	22.40	3.17								Sandstone	broken breccia, loose gravel and boulders, mostly sandstone.
		22.40	25.50	3.10		20° 25°						Siltstone	dark gray-black siltstone, interbedded with light gray fine-grained sandstone laminates (10%); bedding dip: 20°-25°.
		25.50	37.20	11.70					GT1			Siltstone	same as above, but sandstone laminates increase to about 30%.
		37.20	42.50	5.30		25°						Siltstone	same as above, sandstone laminates about 15%; bedding dip: 25°; minor fracture at about 70° to the core axis.
		42.50	47.62	5.12								Siltstone	black-dark gray siltstone, interbedded minor light gray fine sandstone15%; bedding dip: 25°.
		47.62	47.64	0.02								conglomerate	conglomerate, subrounded and subangular; 1-3cm.
		47.64	63.20	15.56								Sandstone	sandstone laminates 30%.
		63.20	69.15	5.95					GT2			Sandstone	sandstone laminates 15%, toward the base, increase to 20%.
		69.15	73.20	4.05								Sandstone	sandstone laminates 10%.
		73.20	76.40	3.20								Sandstone	sandstone laminates 30%.
		76.40	78.75	2.35								Sandstone	sandstone laminates 10%.
		78.75	80.10	1.35		20°						Sandstone	sandstone laminates 30%; bedding dip: 20°.
		80.10	91.69	11.59								Sandstone	sandstone laminates 10%.
		91.69	111.45	19.76					GT3			Sandstone	sandstone laminates 20%; slight fractured with angle of 60° - 70° to the core axis.
		111.45	134.40	22.95		25°			GT4			Sandstone	sandstone laminates 20%; bedding dip: 25°; at 131.90m, a thin layer of black mudstone (2-3mm).
		134.40	139.26	4.86		25°						Siltstone	siltstone, sandstone laminates 30%, cross bedding; bedded plane: 25°.
		139.26	140.00	0.74		25°						Sandstone	gray fine-grained sandstone. Dip: 25°.
		140.00	141.65	1.65								Siltstone	dark gray siltstone.
		141.65	146.63	4.98								Siltstone	gray siltstone with lots of fine sands, a few coal film rich in plant fossils.
		146.63	146.67	0.04								conglomerate	4cm conglomerate, subangular-subrounded, 1-4mm.
Boulder Creek		146.67	147.25	0.58								Mudstone	black mudstone, very rich in plant fossils and carbonaceous mudstone (C-MS), lots of coal films.
		147.25	147.80	0.55								Siltstone	dark gray siltstone.
		147.80	154.10	6.30								Sandstone	light gray or gray fine sandstone interbedded with dark gray siltstone; in the upper part, lots of coal films; the lower part containing bauxitic slightly fractured, no: 5/m; 60° to core axis.
		154.10	155.30	1.20								Siltstone	dark gray siltstone.
		155.30	156.50	1.20								Mudstone	black mudstone, very rich in plant fossils and cm lots of coal films.
		156.50	159.00	2.50					GT5			Siltstone	gray-dark gray siltstone; bauxitic.
		159.00	160.00	1.00								Sandstone	light gray - medium sandstone, react with 5% HCL.
		160.00	164.45	4.45		30°						Siltstone	gray-dark gray siltstone, bauxitic, a few coal films; bedded plane: 30°.
		164.45	165.00	0.55		30°						Sandstone	light gray fine-grained sandstone with dark laminates; react with 5% HCL; bedded plane: 30°.
		165.00	166.40	1.40								Siltstone	gray siltstone rich in bauxitic.
		166.40	167.00	0.60								Mudstone	black mudstone.
		167.00	171.30	4.30								Siltstone	gray-dark gray siltstone; bauxitic.
		171.30	172.00	0.70								Mudstone	black mudstone, a few coal films, rich in plant fossils and cm.
		172.00	175.45	3.45								Siltstone	gray-dark gray siltstone; bauxitic.
		175.45	180.00	4.55								Siltstone	gray-dark gray siltstone; bauxitic, minor coal films; towards the base, coarser.
		180.00	190.43	10.43		10°			GT6			Siltstone	dark gray siltstone, interbedded with light gray fine sandstone laminates of 15%, in places; bedded plane: 10°; few coal films.
		190.43	191.30	0.87								Sandstone	light gray fine sandstone, react with 5% HCL.
		191.30	192.00	0.70								Siltstone	dark gray siltstone.
		192.00	192.40	0.40								Sandstone	light gray fine sandstone, react with 5% HCL.
		192.40	197.50	5.10		20°						Siltstone	gray siltstone, few coal films; bedded plane: 20°.
		197.50	199.70	2.20								Sandstone	gray-light gray fine sandstone.
		199.70	206.90	7.20		25°						Sandstone	light gray medium sandstone, interbedded with dark laminates and calcite veins; a few coal films; bedded plane: 25°.
		206.90	215.00	8.10								Siltstone	dark gray siltstone.
		215.00	215.70	0.70								Sandstone	light gray fine sandstone.
		215.70	224.70	9.00								Siltstone	gray-dark gray siltstone, interbedded with light gray fine sandstone; in places, bauxitic, slightly broken, fractured, no: 10/m with angle of 60° to core axis.
		224.70	225.90	1.20		30°						Sandstone	gray fine-grained sandstone, interbedded with carbon-rich laminates, a few coal films; bedded plane: 30°.
		225.90	229.50	3.60		30°			GT7			Sandstone	light gray, medium sandstone, quartz and debris dominate; bedded plane: 30°.
		229.50	230.10	0.60								Sandstone	fine sandstone interbedded with dark siltstone.
		230.10	230.40	0.30								Mudstone	black mudstone with coal films.
		230.40	230.85	0.45								Siltstone	dark gray siltstone.
		230.85	231.05	0.20								Mudstone	black mudstone with coal films.
		231.05	232.30	1.25								Sandstone	gray fine sandstone, interbedded with dark siltstone, 14%; bedded plane: 20°.
		232.30	232.80	0.50								Siltstone	gray-dark gray siltstone.
		232.80	234.65	1.85								Mudstone	black mudstone with numerous coal films; blacken.
		234.65	238.50	3.85					GT8			Siltstone	dark gray siltstone, containing bauxite, fracture developed with 65° to core axis; no: 11/m.
		238.50	239.95	1.45								Mudstone	black mudstone, very rich in coal films.
		239.95	241.22	1.27								Siltstone	dark gray siltstone, a few coal films.
		241.22	242.15	0.93		10°						Sandstone	light gray fine grained sandstone with dark laminates; bedded plane: 10°.
		242.15	244.35	2.20								Mudstone	black mudstone, rich in plant fossils and c-ms; a few coal films in places, slightly fractured; no: 5/m.
		244.35	245.96	1.61								Siltstone	dark gray siltstone, alternates with light gray fine sandstone, slightly fractured, no: 5/m.
	BC	**245.96**	**246.40**	**0.44**								**Coal**	**0.44m BC coal seam.**
		246.40	255.05	8.65		20°			GT8-1			Sandstone	light gray medium sandstone, alternates with conglomerate sandstone, dominates by quartz and debris; conglomerate dominates by sandstone and siltstone; size: >10mm; bedded plane: 20°.
		255.05	256.28	1.23								Siltstone	dark gray siltstone; at the base, 4cm thick conglomerates.
		256.28	261.10	4.82					GT8-2			Sandstone	gray-light gray medium sandstone; dominate of quartz and debris; two fractures with 65° to core axis at 259.95m; at base, 3cm thick conglomerates.
Hulcross		261.10	262.00	0.90		40°						Siltstone	dark gray siltstone, interbedded with light gray fine sandstone, a few coal films in places; bedded plane: 40°.
		262.00	265.00	3.00								Sandstone	light gray fine sandstone, intact.
		265.00	273.30	8.30		35°						Sandstone	light gray fine sandstone, alternate with dark gray siltstone, 5%-10% no react with HCL; bedded plan: 35°.
		273.30	292.00	18.70		30°			GT-H1			Siltstone	dark gray siltstone, interbedded with gray fine sandstone; 14%; bedded plane: 30°.
		292.00	312.50	20.50		25°			GT-H2			Siltstone	dark gray siltstone, interbedded with gray fine sandstone; 13%; bedded plane: 25°; at about 309.50m - 309.60m, a cluster of calcite veins react with 5% HCL.
		312.50	315.80	3.30		25°						Siltstone	dark gray siltstone interbedded with gray fine sandstone (15%); bedded plane: 25°.
		315.80	315.86	0.06								limestone	carbonate react with 5% HCL.
		315.86	325.32	9.46		20°						Siltstone	dark gray siltstone interbedded with gray fine sandstone (20%); bedded plane: 20°
		325.32	325.42	0.10								limestone	carbonate react with 5% HCl.
		325.42	330.90	5.48								Siltstone	dark gray siltstone interbedded with gray fine sandstone (25%).
		330.90	334.50	3.60		20°						Siltstone	same as above; sandstone laminates (30%); bedded plane: 20°.
		334.50	339.45	4.95								Siltstone	same as above, sandstone laminates (20%).
		339.45	340.35	0.90		25°			GT-H3			Siltstone	same as above; sandstone laminates (50%); bedded plane: 25°
		340.35	346.75	6.40								Siltstone	same as above; sandstone laminate (20%); at 344.40m -344.55m, light color contain carbonate; react with HCL.
		346.75	347.50	0.75		20°						Siltstone	same as above; sandstone laminate (40%); bedded plane: 20°.
		347.50	352.10	4.60		15°						Siltstone	dark gray siltstone, interbedded with gray fine sandstone; from the top to the base, sandstone increases from 25% to 50%; bedded plane: 15°.
Gates		352.10	352.47	0.37								Sandstone	FGSS. Light grey.
		352.47	354.35	1.88					**GT9-1**			Siltstone	gray siltstone.
		354.35	355.16	0.81		10°						Sandstone	fine grained sandstone (FGSS); dip: 10°.
		355.16	361.45	6.29					**GT9**			Mudstone	black mudstone; broken, boney coal; 0.07m appear at 359.80m - 359.87m; one layer of FGSS at 355.47m-355.60m.
		361.45	**361.65**	**0.20**								**Coal**	**coal seam; parting: 0.07m. Coal structure: 0.05<0.07>0.08m.**
		361.65	363.00	1.35		15°						Mudstone	mudstone-FGSS-siltstone; dip: 15°.
	#3	363.00	370.60	7.60								Mudstone	black mudstone predominated. at 368.60m, 0.20m FGSS exists; plant print seen in mudstone. There are four thin coal seam in this section, detailed as: ①363.70m - 363.95m, 0.25m ②366.35m - 366.50, 0.15m ③368.20m - 368.30m, 0.10m ④368.80m - 368.90m, 0.10m; core loss at run: at 361.50m - 364.50m, 0.45m; at 364.50m - 367.50m, 0.30m; at 367.50m - 370.50m, 0.35m.
		370.60	374.50	3.90					GT10			Siltstone	gray siltstone, massive, no bedding seen.
		374.50	378.50	4.00		15° 20°			GT11			Sandstone	fine grained sandstone (80%), interbedded with dark gray siltstone; bedding dip: 15° - 20°.
		378.50	390.90	12.40					GT12			Sandstone	pure, massive, medium-grained sandstone, pale gray color.
		390.90	392.68	1.78								Mudstone	black mudstone.
		392.68	395.50	2.82		15°			GT13			Siltstone	siltstone, interbedded with fine grained sandstone.
	#4	**395.50**	**396.15**	**0.65**								**Coal**	**0.65m coal seam; black, shinning, no parting; RC: 75%.**
		396.15	398.50	2.35					GT14			Mudstone	mudstone.
		398.50	401.80	3.30					GT15			Siltstone	dark gray siltstone. 0.20m FGSS in the middle section.
		401.80	404.35	2.55								Sandstone	pale gray fine-medium grained sandstone; change to siltstone at bottom gradually.
		404.35	406.30	1.95		15°			GT16			Siltstone	dark grey siltstone; dip: 15°.
		404.35	409.70	5.35					GT17			Sandstone	massive, pure, light gray sandstone.
		409.70	411.34	1.64					GT18			Siltstone	dark gray siltstone with FGSS laminating.
	#5	**411.34**	**413.00**	**1.66**				**Q1 Q2**				**Coal**	**1.66m #5 coal seam, high quality; RC: 90%, parting 6cm; Q_1: 411.34m - 412.14; Q_2: 412.14m - 413m. Coal structure: 1.21<0.06>0.39m.**
		413.00	415.65	2.65								Mudstone	black mudstone, broken; core loss 25cm.
		415.65	419.50	3.85					**GT19**			Siltstone	gray siltstone, more sandy with depth; bedding unclear.
		419.50	431.40	11.90					GT20			Siltstone	gray, massive, siltstone with light FGSS laminations; unclear boundary; at bottom, boundary unseen; more sandy compare with section of 415.65m - 419.50m.
		431.40	432.40	1.00					**GT21**			Sandstone	pale gray medium-grained sandstone.
		432.40	433.40	1.00								Mudstone	dark gray mudstone.
		433.40	443.30	9.90		20°						Sandstone	gray color sandstone predominated, with siltstone laminations (<20%); bedding plane: 20°.
		443.30	445.80	2.50					GT22			Mudstone	black mudstone; carbonaceous locally.
		445.80	448.45	2.65					**GT23**			Siltstone	dark gray, massive siltstone; no bedding boundary seen.
		448.45	449.15	0.70								Sandstone	FGSS with siltstone laminations.
		449.15	450.15	1.00								Siltstone	siltstone.
		450.15	451.50	1.35		20°						Sandstone	(pale) light gray, fine-grained, medium-grained sandstone; bedding dip: 20°.
		451.50	453.55	2.05								Siltstone	siltstone.
	#6	**453.55**	**454.10**	**0.55**								**Coal**	**0.55m #6 coal seam, 0.18m coal seen; RC: 33%; core loss 0.37m.**
		454.10	459.95	5.85								Mudstone	mudstone; at 455.35m - 455.45m, coal seam.
	#6-1	**459.95**	**460.50**	**0.55**								**Coal**	**0.55m coal seam. crushed coal; RC: 50%.**
		460.50	465.92	5.42					GT24			Mudstone	black mudstone.
		465.95	**466.20**	**0.25**								**Coal**	**0.25m coal seam. Powder, grinded.**
		466.20	472.30	6.10					GT25			Siltstone	massive siltstone; at bottom there are two thin coal seams, at 471.55m and 472m; all less than 0.20m.
		472.30	480.23	7.93		<20°			GT26			Sandstone	FGSS; dip: <20°.
		480.23	483.00	2.77					GT27			Siltstone	siltstone.
	#7+1	**483.00**	**483.38**	**0.38**								**coal**	**0.38m, coal seam; RC: 30%; crushed.**
		483.38	484.38	1.00								Mudstone	mudstone.
	#7	**484.38**	**485.00**	**0.62**								**coal**	**0.62m, #7 coal seam; RC: 50%.**
		485.00	492.70	7.70		40°			GT28			Mudstone	black mudstone/siltstone; bedding dip measured at 488.80m: 40°; at 499.80m coal seam 0.04m.
		492.70	502.60	9.90		40° 75° 80°			GT29 GT30			Mudstone	dark gray and yellowish gray mudstone; very fractured and broken; dip abruptly change to steep; 40° at 496.50m; 75°-80° at 500.50m →a fault at this section, small polished pressure formed plane seen here, nearly vertical fracture; few $CaCO_3$ thin veins seen.
		502.60	513.00	10.40		70°			**GT31**			Mudstone	black mudstone; dip: 70°; broken at 504m - 505m; 508m - 509m and 508.60m-510m.
	#8	**513.00**	**519.40**	**6.40**				**Q3 Q4 Q5 Q6**				**Coal**	**6.40m #8 coal seam; RC: 55%; crushed, partings seen at five locations; due to broken and mixed with coal; the thickness and exact location can't be defined. The following are estimated: Q_3: 513m - 515.50m; Q_4: 515.50m - 517.50m; Q_5: 517.50m - 519.40m; Q_6: parting in coal seam of 513m - 519.40m. coal structure: 1.00<0.15>1.95<0.10>1.20<0.10>0.50<0.15>0.60<0.10>0.55m**
		519.40	525.30	5.90		65° 70°			GT32			Mudstone	black, carbonaceous mudstone, massive; dip: 65°-70°.
		525.30	525.40	0.10								Coal	0.10m coal seam.
		525.40	526.25	0.85								Sandstone	FGSS.
		526.25	527.15	0.90								Siltstone	siltstone.
		527.15	528.85	1.70								Mudstone	black, carbonaceous mudstone, thin coal seam (<2cm) filled.
		528.85	535.20	6.35		60° 65°			GT33			Siltstone	gray siltstone, more sandy; bedding change in color; dip: 60°-65°.
		535.20	537.10	1.90								Sandstone	light gray fine sandstone with gray sandy siltstone laminations.
		537.10	542.50	5.40		60° 70° 80°			GT34			Siltstone	gray siltstone laminations, siltstone itself with FGSS laminations; dip: 60°-70°; bedding dip in sandstone can reach 80°.
		542.50	552.50	10.00		65° 75°			GT35			Sandstone	FGSS more silty at lower and next section; dip: 65°-75°.
		552.50	558.05	5.55		65°						Sandstone	FGSS and siltstone interlamination.
		558.08	574.00	15.92		65°			GT36			Siltstone	gray, massive, siltstone with few light gray siltstone laminations.
		574.00	582.05	8.05					GT37 GT38			Siltstone	dark gray monochrome siltstone/mudstone; fracture at top of coal seam.
	#9	**582.05**	**584.50**	**2.45**				**Q7**				**Coal**	**2.45m #9 coal seam, crushed; RC: 20%; Q_7: 582.05m - 584.50m.**
		584.50	589.50	5.00								Mudstone	black mudstone, broken. TD=589.50m.

Wapiti River **Drill Hole Core Log**

Drilling Company:	Canada Dehua Drilling Company	**Hole No.:**	WP1C49
Rig Type:	VD800	**Collar Elevation:**	H = 1141.1m
Total Depth:	990	Coordinate: **Northing:**	Y=6073235.9m
Spud Date:	20-Feb-13	**Easting:**	X=649712.1m
Finished Date:	31-Mar-13	**Logging Geologist:**	VICTOR, LEE, Charles, Ricky
Core Size:	WHT/HQ	**Note:**	

Formation	Coal Seam	Core Depth Interval From(m)	To(m)	Thickness, m Thick(m)	Strata Dip	Coal Floor Elevation	Sample ID Coal	Rock	Core Fracture ID	Angle	Rock Hardness	Rock Name	Lithology
Q		0.00	31.54	31.54								till	overburden, air-rig drilling, no core.
Hasler		31.54	36.65	5.11	10°							siltstone	dark grey, interbedded with minor light grey fine-grained sandstone laminates (5%) (FGSS), Bedding
		36.65	53.00	16.35								siltstone	same as above. Fine sandstone laminates (10%), bedding plane: 15°. Fracture in the upper part, Number:
		53.00	56.00	3.00	20°-25°							siltstone	dark grey, interbedded with minor light grey fine-grained sandstone laminates (40%) (FGSS), Beddin
		56.00	60.90	4.90								siltstone	dark grey, interbedded with minor light grey fine-grained sandstone laminates (5-10%) .
		60.90	65.00	4.10								sandstone	uneven light grey fine sandstone, some lenses or lumps at the top, two layers of 1-2cm conglomerat
		65.00	73.20	8.20								siltstone	minor sandstone laminates (5%).
		73.20	90.78	17.58	20°							siltstone	dark grey, interbedded with minor light grey fine-grained sandstone laminates (10-15%), bedding pl
		90.78	90.90	0.12								sandstone	grey- green, with chlorite.
		90.90	131.00	40.10	20°							siltstone	dark grey, interbedded with light grey fine-grained sandstone laminates (15-20%), bedding plane: 2 axis, number:5/m; At 123.50-131.00m, fracture with 70°-85° to core axis, number:5/m.
		131.00	145.70	14.70	25°-20°							siltstone	dark grey, interbedded with light grey fine-grained sandstone laminates (30%) , sandstone lumps in
		145.70	154.60	8.90	15°							siltstone	dark grey, interbedded with minor light grey fine-grained sandstone laminates (5%). Bedding plane:
		154.60	157.20	2.60								siltstone	sansstone laminates increase to 20%.
		157.20	188.80	31.60	15°							siltstone	dark grey, interbedded with minor light grey fine-grained sandstone lumps in places. At 170.0-173. fracture with 60° to core axis. Number: 5/m. At 183.50m, bedding plane: 15°. A fracture at about 188.70m with 70° to cc
		188.80	210.20	21.40	10°							siltstone	dark grey to black, only few light grey fine sandstone laminates or lumps in places. A fracture at axis; bedding plane: 196.5m--10°, 209.0m--10°.
		210.20	215.70	5.50								siltstone	dark grey to black, interbedded with light grey fine-grained sandstone laminates or lumps (25%). A
		215.70	220.00	4.30	15°							siltstone	dark grey to black, interbedded with minor light grey fine-grained sandstone lumps in places. A fe
		220.00	227.20	7.20	15°							siltstone	dark grey to black, interbedded with light grey fine-grained sandstone laminates or lumps (5%). Be
		227.20	237.00	9.80	15°-20°							siltstone	dark grey to black, interbedded with light grey fine-grained sandstone laminates or lumps (20%). B
		237.00	240.00	3.00	10°							siltstone	only 5% light grey fine sandstone laminates. Bedding plane: 10°.
		240.00	246.60	6.60	15°							siltstone	light grey fine sandstone laminates increase to 10%, bedded plane: 15°.
		246.60	251.40	4.80	15°							siltstone	light grey fine sandstone laminates increase to 20%, bedded plane: 15°.
		251.40	256.50	5.10	10°							siltstone	only 5-10% light grey fine sandstone laminates, bedded plane: 10°.
		256.50	257.60	1.10	15°							siltstone	light grey fine sandstone laminates (20%), bedded plane: 15°.
		257.60	263.92	6.32	10°-15°							siltstone	dark grey to black, interbedded with light grey fine sandstone (5%-10%), bedded plane: 10°-15°.
		263.92	275.20	11.28								siltstone	interbedded fine sandstone increase to 25%, some lumps of sandstone. bedded plane: 15°.
		275.20	286.00	10.80	10°-15°							siltstone	interbedded fine sandstone laminates reduce to 10%, broken at 276.0m and 285.0m. bedded plane: 10°-
		286.00	299.80	13.80								siltstone	interbedded fine grained sandstone increase to 30%, alternates with siltstone in places. bedded pl
		299.80	303.20	3.40								siltstone	light grey fine sandstone laminates only 10%.
		303.20	304.30	1.10	15°							siltstone	lots of light grey fine sandstone laminates. Beddrd plane: 15°.
		304.30	309.60	5.30								siltstone	light grey fine sandstone 10%.
		309.60	315.00	5.40	15°							siltstone	light grey fine sandstone 15%, bedded plane: 15°.
		315.00	316.30	1.30	15°							siltstone	light grey fine sandstone 25%, bedded plane: 15°.
		316.30	334.20	17.90								siltstone	light grey fine sandstone 15%.
		334.20	360.00	25.80								siltstone	light grey fine grained sandstone (30%-20%), more evenly interbedded in dark grey siltstone. A fra
		360.00	379.40	19.40	15°							siltstone	dark grey, evenly interbedded with light grey fine grained sandstone laminates (25%), bedded plane
		379.40	381.50	2.10								siltstone	dark grey, interbedded with light grey fine grained sandstone (35%). Close the base, a few sandsto conglomerate layers.
		381.50	381.95	0.45	5°-10°							conglomerate	grey, at the top of 15cm, gravel are biger than the rest, 5-15mm size of gravels, sandstone, silts lower part, a couple of conglomerate layers (3-4cm) with gravel size about 1-4mm interbedded with
BOULDER CREEK		381.95	386.40	4.45								sandstone	white and black, medium grained, interbedded with dark laminates dominnated by quartz and debris.
		386.40	389.52	3.12								siltstone	grey, with bauxitic mudstone, at the top, 3cm chlorite sharp contact with medium-course sandstone.
		389.52	390.20	0.68	10°-15°							siltstone	dark grey, bedded plane: 10°-15°.
		390.20	391.50	1.30								mudstone	dark grey to black, silty, rich in plant fossils, numerous coal films.
		391.50	394.30	2.80								siltstone	grey, with bauxite, towards the base, course to fine grained sandstone.
		394.30	394.95	0.65								mudstone	black, very rich in carbonaceous mudstone (C-MS), numerous coal films.
		394.95	395.72	0.77								siltstone	dark grey.
		395.72	396.40	0.68								mudstone	black, silty, rich in plant fossils, numerous coal films.
		396.40	398.30	1.90								siltstone	dark grey, with bauxite.
		398.30	399.70	1.40								mudstone	dark grey to black, silty, rich in plant fossils, numerous coal films.
		399.70	403.35	3.65								siltstone	grey, with bauxite.
		403.35	404.25	0.90								mudstone	dark grey to black, silty, rich in plant fossils, numerous coal films.
		404.25	413.55	9.30								siltstone	dark grey, bauxitic in places, muddy and a few coal films in places.
		413.55	415.70	2.15	5°-15°							sandstone	grey, fine grained sandstone with dark laminates, a few coal films in placess. Bedded plane: 5°-15°
		415.70	417.00	1.30								mudstone	black, very rich in carbonaceous mudstone (C-MS) and plant fossil, lots of coal films.
		417.00	418.10	1.10								sandstone	grey, fine grained.
		418.10	419.07	0.97								mudstone	dark grey to black, silty, rich in C-MS and plant fossils, numerous coal films.
		419.07	422.80	3.73	15°							sandstone	grey, fine grained . Bedded plane: 15°.
		422.80	425.43	2.63								siltstone	grey, with bauxite.
		425.43	430.30	4.87	15°							sandstone	grey to light grey, fine grained. In the lower part, course to fine -medium sandstone and with dar
		430.30	432.00	1.70								sandstone	white and black, medium sandstone containing lots of dark grey siltstone lumps (irregular, size fr
		432.00	434.65	2.65								sandstone	white and black, medium grained. Towards the base, course in the lower part, numerous irregular da
		434.65	435.78	1.13	10°-15							sandstone	white and black, course grained, dominated by quartz. Bedded plane: 10°-15°.
		435.78	436.00	0.22								conglomerate	grey, 2-4mm subangular to subrounded sandstone and siltstone. A big irregular lumps of dark grey s
		436.00	436.18	0.18								mudstone	black.
		436.18	440.85	4.67								siltstone	grey, muddy or sandy in places.
		440.85	441.95	1.10								sandstone	light grey, fine grained. In the lower part, numerous carbonized filaments.
		441.95	443.10	1.15	15°							sandstone	light grey, fine grained. interbedded with dark grey siltstone laminates (20%-40%). Bedding plane:
		443.10	444.14	1.04								sandstone	light grey, fine grained. With carbonized filaments and a few coal films.
		444.14	447.30	3.16	15°							sandstone	light grey, fine grained. interbedded with dark grey laminates (5%-15%). Bedding plane:15°.
		447.30	452.60	5.30	25°-40°.							sandstone	white and black, fine to medium grained, with dark grey laminates from 450.60-451.70m, a few coal
		452.60	455.50	2.90	20°							sandstone	light grey, fine grained. with dark grey laminates . Bedding plane:20°.
		455.50	456.00	0.50								siltstone	dark grey.
		456.00	456.70	0.70								sandstone	light grey, fine grained.
		456.70	459.50	2.80								siltstone	dark grey, with bauxite in places, a few coal films; silt toward at base.
		459.50	462.55	3.05								siltstone	medium grey, interbedded with light grey FGSS laminates. Sandy toward at base. At 462.50m, bedded
		462.55	465.00	2.45	20°							mudstone	light grey, massive mainly, with minor bauxitic mudstone.
		465.00	471.90	6.90								siltstone	dark grey, interbedded with light grey FGSS laminates. Micro-horizontal bedding, at 466.50m, bedde
		471.90	475.85	3.95								mudstone	light black, massive, with minor coal streak and numerous plant root fossil. At 472.20-472.40m, 0.
		475.85	478.70	2.85	20°							sandstone	grey to light grey, well-sorted, with minor light black mudstone laminates (10%). at top, minor co
		478.70	482.50	3.80								mudstone	white grey, bauxitic mudstone, massive, little silt. Slightly fracture and reduced core size.
		482.50	489.67	7.17	20°							mudstone	light black, massive, with minor coal streak, increase to base. Partly bauxitic. At base, with lig 0.10m coal seam.
	BC	489.67	490.15	0.48								coal	BC coal seam, 0.48m, Rc:0.48m. Black, bright, light, shiny, little fracture.
		490.15	491.35	1.20								sandstone	light grey, fine grained, with numerous coal threads.
		491.35	491.88	0.53								mudstone	black, massive.
		491.88	500.00	8.12								conglomerate	light grey, fine-grained. Ø: 2-10mm (at lower part, 10mm), poor-sorted, predominately quartz and debris. Silighth
		500.00	512.20	12.20	20							sandstone	ight grey, fine-grained, pure, well-sortd, horizontal bedding; at top, with a few conglomerate; at 507.0m, bedded plane: 2
		512.20	521.50	9.30								sandstone	light grey, fine grained; interbedded with siltstone; at 520m, bedded plane: 20°; little broken.
HULCROSS		521.50	531.00	9.50								siltstone	light grey, with fine sandstone laminae.
		531.00	560.50	29.50	30							siltstone	grey, interbedded with FGSS laminates(40%); at 542.0m, bedded plane:30°.
		560.50	585.00	14.50	30							siltstone	grey, inteerbedded with FGSS laminates(35%); micro-horizontal bedding, little broken; at 566.0m, b 753.0m, bedded plane: 30°.
		585.00	589.55	4.55	30							siltstone	light grey, interbedded with FGSS(35%), broken, micro-horizental bedding; at 588.0m, bedded plane3
		589.55	600.80	11.25	30							siltstone	light grey, interbedded with FGSS laminates(40%); micro-horizental bedding; more slickenside; at 5
		600.80	607.11	6.31	27							siltstone	light grey, interbedded with FGSS laminates(45%); micro-horizental bedding; slickenside; at 606.0m
GATES		607.11	607.71	0.60								Mudstone	dark grey, 0.01m coal laminate at 607.70m, rich in coal debris inside.
		607.71	610.88	3.07	25							Sandstone	lighr grey, fine-grained; at 610.0m, dip:25°.
		610.88	611.10	0.22								Mudstone	Black
	#2	611.10	611.33	0.23								#2 Coal Seam	Black, bright
		611.33	611.75	0.42								Mudstone	dark grey.
		611.75	612.75	1.00								Sandstone	light grey, fine-grained.
		612.75	614.41	1.66								Mudstone	dark grey; rich in coal depris.
		614.41	615.00	0.59								Sandstone	light grey, fine-grained.
		615.00	615.60	0.60								Mudstone	dark grey; rich in leaf fossil.
	#3	615.60	617.50	1.90								#3 coal seam	RC: 0.05m
		617.50	619.68	2.18								Sandstone	light gery, brpken
		619.68	620.20	0.52								Mudstone	dark grey
		620.20	620.80	0.60								Coal seam	0.60m, RC:0.25m, no parting, black.
		620.80	621.55	0.75								Mudstone	dark grey, massive.
		621.55	628.00	6.45								Sandstone	light grey, fine-grained.
		628.00	633.00	5.00	27							Mudstone	grey, with fine sandstone at meddle part, bedded plane: 27°.
		633.00	634.80	1.80								Sandstone	light grey, fine-grained.
		634.80	641.60	6.80								Mudstone	black, broken, slikenside.
		641.60	643.35	1.75								Sandstone	light grey, fine-grained; calcite infillling fracture.
		643.35	649.50	6.15								Mudstone	black, broken; rich in coal debris.
		649.50	650.48	0.98	35							Sandstone	fine gained, interbedded with mudstone laminated(10%); micro-horizontal bedding; at 650.0m, beddin
		650.48	651.00	0.52								Mudstone	black.
		651.00	651.52	0.52								Sandstone	Fine-garined.
		651.52	657.80	6.28								Mudstone	dark grey, silty; at 657.0m and 657.7m, 5mm coal streaks; with plant fossil inside.
		657.80	662.40	4.60								siltstone	grey, with fine sandstone partly.
		662.40	667.16	4.76								Sandstone	light grey, fine grained.
		667.16	667.74	0.58								Mudstone	black, silty.
		667.74	669.47	1.73								Sandstone	light grey, fine-grained.
		669.47	670.56	1.09	33							siltstone	grey, interbedded with FGSS laminates(20%); micro-horizental bedding, bedding plane:33°.
	#5	670.56	672.17	1.61			Q1	Q2				#5 coal seam	1.61m, RC:0.95m, black,bright, broken; parting: 671.70-671.78m, 0.08m, mudstone.
		672.17	673.80	1.63								siltstone	grey.
		673.80	677.66	3.86								Sandstone	light grey, fine grained; interbedded with siltstone laminated; coal streak occasionally.
		677.66	679.64	1.98								siltstone	grey,with FGSS; calcite infills fracture.
		679.64	681.21	1.57								Sandstone	light grey, fine grained.
		681.21	681.70	0.49								Coal seam	0.49m, RC: 0.35m, black, no parting.
		681.70	683.90	2.20								siltstone	grey.
	#6	683.90	684.50	0.60								#6 Coal Seam	0.60m, RC:0.45m, black, broken.
		684.50	685.20	0.70								Mudstone	dark grey, at the base, into C-MS.
		685.20	685.60	0.40								Coal seam	boney coal.
		685.60	685.73	0.13								Mudstone	black
		685.73	686.86	1.13								Mudstone	black, silty.
		686.86	686.93	0.07								Coal seam	0.07m, black, bright.
		686.93	691.72	4.79								siltstone	grey
		691.72	692.60	0.88								Mudstone	black
		692.60	704.10	11.50	15							siltstone	grey, with dark grey mudstone partly, coal streak occasionally; little broken; bedded plane: 15°.
		704.10	708.00	3.90								Sandstone	lihgt grey, fine gained.
		708.00	713.60	5.60								Mudstone	black, little silty, massive; at 710.10-710.30m, coal seam, 0.20m, RC: 0.10m, very broken, shiny,
	#6-1	713.60	714.15	0.55								#6-1 coal seam	0.55m, RC: 0.30m 0.25m lost at bottom; no parting, shiny, bright, broken.
		714.15	721.10	6.95	20							Mudstone	black, little silty; with a few coal seams; at 717.0m, bedded plane: 20°; at 716.0-716.15m,coal seam,
		721.10	727.50	6.40	25							Sandstone	white-grey, fine-grained; with dark mudstone laminae; at 722.0m and 726.50m, bedded plane:25°.
		727.50	743.30	15.80								Mudstone	black, massive; rich in leaf fossil locally; at 731.0-732.0m, very broken, fructure No: 40; at 73 shiny, bright, parting: 734.35m, 0.04m, mudstone, structure: 0.10(0.04)0.16m; at 536.30-536.65m, 0. numberous coal lenses and laminae.
	#7	743.30	744.45	1.15			Q3	Q4				#7 coal seam	1.15m, RC:0.95m, 0.20m lost at bottom; broken, shiny, bright, brittle; parting1: 743.40-743.45m, 0 0.10(0.05)0.15(0.10)0.75m; RC: 1.0(0.05)0.15(0.10)0.55m.
		744.45	748.40	3.95	25							Mudstone	black; at upper part, carbonaceous in part, with fine sandstone laminae; at 743.30m, bedded plane:
		748.40	752.00	3.60	25							Sandstone	white-grey, fine-grained, interbedded thin layers of dark muddy siltstone; at 751.0m, bedded plane
		752.00	759.20	7.20	25							Sandstone	white-grey, fine-grained; quartz and dark debris predominately, well-sorted; at 755.0 and 759.0m,
		759.20	763.00	3.80	20							Sandstone	white-grey, fine-grained, laminated dark muddy siltstone; at 761.0m, bedded plane: 20°.
		763.00	772.35	9.35	20							Mudstone	black-light black, silty; laminated with fine sandstone (content: 30); rich in plant leaf and bran
		772.35	772.85	0.50								Mudstone	black, massive; with a few coal streaks.
	#8+1	772.85	773.30	0.45								#8+1 Coal seam	0.45m, RC:0.45m, half-broken; shiny, bright, light, brittle, no parting.
		773.30	774.30	1.00								Mudstone	black, massive.
	#8	774.30	778.00	3.70			Q5 Q6	Q7 Q8				#8 coal seam	3.70m, RC:3.10m, 0.60m lost(776.98-777.58m), broken, shiny,bright, light; co: 774.30-774.90m, 0.60 Parting2: 775.44-775.53m, 0.09m, black, mudstone; co:775.53-775.63m, 0.10m, RC:0.10m; parting3: 77 0.25m, black, carbonaceous mudstone; co:776.25-776.70m, 0.45m, RC:0.45m; parting5: 776.70-776.98m, 776.98-777.58m; structure of coal seam: 0.60(0.30)0.24(0.09)0.10(0.25)0.12(0.25)0.45(0.28)1.02m;
		778.00	778.25	0.25								Mudstone	black, carbonaneous;
		778.25	778.45	0.20								Coal seam	0.20m, RC:0.20m, very broken; shiny, bright; structure: 0.05(0.05)0.10m.
		778.45	778.95	0.50								Mudstone	black, carbonaceous in parting.
		778.95	779.25	0.30								Coal seam	0.30m, RC:0.30m, very broken; shiny, light; structure of coal seam: 0.15(0.10)0.05m.
		779.25	780.60	1.35	25							Mudstone	black; interbedded thin layers of fine sandstone; at 780.0m, bedded plane: 25°.
		780.60	783.50	2.90								Mudstone	black, massive; at middle part, numberous calcite veinss; at 781.0m, 0.10m coal seam, bright, shin at 783.0-784.0m, numberous coal streaks.
		783.50	788.44	4.94	30							Mudstone	black, upper part, laminated fine sandstone; at 786.0m, bedded plane:30°.
	#9	788.44	792.92	4.48			Q9	Q10				#9 coal seam	4.49m, RC: 2.40m, 2.09m lost(790.34-792.43m); no parting; very broken; shiny, bright, light,brittl
		792.92	800.00	7.08								Sandstone	white-grey, fine-grained; laminated with dark silty mudstone(40%); horizontal bedding; at 793.20-7
	#9-1	800.00	800.60	0.60								Coal seam	0.60m, RC:0.50m, 0.10m lost at top; very broken into small size pieces;
		800.60	806.02	5.42	40							Sandstone	white-grey, fine-grained; with dark mudstone laminates; at lower part, numberous calcite veins at
	#10	806.02	811.86	5.84			Q11					#10 coal seam	5.84m, RC:1.35m, 4.49m lost(806.02-809.31; 810.0-811.12m); very broken into pieces; shiny, bright,
		811.86	830.9	19.04								Sandstone	white-grey, fine-grained; laminated with black silty mudstone; with leaf fossil on bedding plane; 821.60m, numberous calcite veins; at 830.0m, a layer of calcite with 0.02m thickness; at 825.0 and 830.0m, bedded plane
		830.90	833.40	2.50								Mudstone	light grey, interbedded with thin layers of fine sandstone; bedded plane: 30°.
		833.40	836.00	2.60	30							Mudstone	black, massive, carbonaceous locally; at 833.80m, 0.08m coal, shiny; at 834.0-834.20m, 0.20m, bone
	#11	836.00	839.87	3.87			Q12 Q13					#11 coal seam	3.87m, RC:2.0m, 1.87m lost at 838.0-838.87m; half-broken at 836.0-836.60m; very broken at 836.60 837.30-837.34m, 0.04m, black, mudstone; co: 837.34-839.87m, 2.53m, RC: 0.66m, 1.87m lost at bottom
		839.87	843.80	3.93								Mudstone	black, massive.
		843.80	853.05	9.25	40							Sandstone	white-grey, medium-grained; quartz and dark debris predominately, well-sorted, hard; at upper part
		853.05	857.75	4.70	35							siltstone	lihgt grey, little muddy; laminated white-grey fine sandstone; at 855.0m, bedded plane:35°.
		857.75	860.80	3.05	35							Sandstone	light grey, medium-coarse grained; dark debris and quartz predominately; moderately-sorted; hard;
		860.80	861.25	0.45								Mudstone	black, masssive; with numberous coal lenses and laminates; broken throught, fracture no: 15.
	#11-1	861.25	861.75	0.50								Coal seam	0.50m, RC:0.50m, broken; black, dull, half boney coal; on parting.
		861.75	864.20	2.45								Mudstone	black, massive; rich in leaf fossil.
		864.20	882.50	18.30	35							Mudstone	black, interbedded with thin layers of fine sandstone(content: 50%); horizontal bedding; at 865.0m
		882.50	882.68	0.18								Mudstone	black, massive.
	#12	882.68	883.54	0.86			Q14	Q15				#12 coal seam	0.86m, RC: 0.80m, 0.06m lost at top; verr broken into small size pieces; shiny, half-bright; co: 883.54m, 0.01m, RC: 0.01m; structure of coal seam: 0.68(0.08)0.10m, RC: 0.62(0.08)0.10m.
		883.54	885.15	1.61								Mudstone	black, massive, carbonaceous in part; with a few coal lenses.
	#12-1	885.15	886.38	1.23								#12-1 coal seam	1.23m, RC:0.10m, only few coal debris left; 1.13m lost, shiny, no parting.
		886.38	886.88	0.50								Mudstone	black, massive.
		886.88	887.80	0.92	35							Sandstone	white-grey, medium-grained; bedded plane:35°.
		887.80	889.50	1.70								Mudstone	black, massive.
	#13	889.50	889.63	0.13								#13 coal seam	0.13m, RC: 0.13m, broken, bandded coal.
		889.63	898.45	8.82	35							Sandstone	light grey; coarse-grained; whitish quartz and dark debris laminated, well sorted; with few thin l
		898.45	900.00	1.55								siltstone	grey-light grey, firm.
		900.00	907.00	7.00	35							Sandstone	grey-dark grey, medium-grained; dark debris predominately, rich in tiny mica, well-sorted; at 904.
		907.00	925.90	18.90	30 ->85->40							Sandstone	white-grey,medium-grained; quartz and dark debris predominately; interbedded with a few thin layer 20; from 915.75-919.20m, fracture and fold zone, with numberous fractures infilled calcite and cem 85°(915.80m)->85°(917.0m)->45°(918.0m)->40°(919.0m).
		925.90	930.10	4.20								Sandstone	white-grey, fine-grained; quartz and dark debris mainly, well-sorted; at 928.0m, bedded plane:40°
		930.10	981.74	51.64	40							Sandstone	light grey, fine grained; dark debris and quartz predominately, well-sorted; laminated with black of calcite with 10mm thick; at 933.0m, bedded plane: 35°; at 938.0m, 945.0m, 950.0m, 954.0m, 956.0m,and 9 977.85-978.0m, numberous minor calcite veins.
		981.74	990.00	8.26	35							siltstone	grey, interbedded thin layers of white-grey fine sandstone(content: 35%); firm; distorted bedding;

Finished depth: 990.0m

Wapiti River — Drill Hole Core Log

Drilling Company:	Foraco Drilling Company	Hole No.:	WP1C51		
Rig Type:	VD-8000	Collar Elevation:	1200.7m		
Total Depth:	758.50 m	Coordinate:	Northing:	6071931.2	
Spud Date:	29-Sep-12		Easting:	648673.7	
Finished Date:	22/10/2012.		Logging Geologist:	Victor, Lee, Ricky	
Core Size:	HWT/HQ		Note:		

Formation	Coal Seam	Core Depth Interval		Thickness, m		Strata Dip	Coal Floor Elevatio	Sample ID			Rock Hardness	Rock Name	Lithology Description
		From	To	Thick	TRUE			Coal	CBM	Rock			
Q		0.00	6.60	6.60								till	weathered deposits, mudstone mainly, brown-yellow, very broken.
Hasler		6.60	65.50	58.90		22						siltstone	dark grey, muddy, interbedded with light grey fine-grained sandstone laminates(40%), micro-horizontal bedding; at 8.5m, bedding plane:15° . Few siderite thin laminates throughout. At 25.50~29.50m, broken, fracture, and number: 15/m. At 23.50m, bedded plane:12° . At 32.50m, bedded plane: 15° . At 39.50m, bedded plane: 20° . From 45.50~57.75m, FGSS laminates 10%, very muddy. At 48.10 ~48.77m, vertical fracture. At 51.50m, bedded plane: 15° . From 56.5-~ 57.00m, slightly fracture. At lower part, FGSS distorted bedding siltstone increased, mud decreased. At 64.00m, bedded plane: 22° .
		65.50	83.50	18.00		20						siltstone	dark grey, interbedded with light grey fine-grained sandstone laminates (30%), distorted bedding on FGSS bedding and small cross-bed. At 78.00m, bedded plane: 20° .
		83.50	114.00	30.50		20						siltstone	dark grey, muddy, interbedded with light grey fine-grained sandstone laminates(40%), micro-horizontal bedding; at 93.00m, bedding plane:20° . Few distorted bedding on FGSS surface, A few sideritic thin laminates throughout. At 104.00m, bedded plane: 21° . At base, FGSS laminates increased. At 114.00m, bedded plane: 20° .
		114.00	123.00	9.00								siltstone	dark grey, mix siltstone and FGSS to blended each other. FGSS 30% locally.
		123.00	126.00	3.00		22						siltstone	dark grey, interbedded with light grey FGSS (40%). From 123.70~125.50m, very broken, fracture number: 20/m. At 122.50m, bedded plane: 22° .
		126.00	128.78	2.78								sandstone	FGSS, light grey, with dark grey mudstone laminates. At base, 1.00m conglomerate, Φ: 2~7mm.
Boulder Creek		128.78	131.50	2.72								siltstone	grey, bauxitic, massive.
		131.50	136.60	5.10		25						sandstone	FGSS, light grey, minor dark grey siltstone. At 133.00m, dip: 25° .
		136.60	145.00	8.40								siltstone	grey, bauxitic, massive. At base, mud toward, few coal film.
		145.00	146.00	1.00								mudstone	light black, massive.
		146.00	160.60	14.60								mudstone	bauxitic mudstone, white-grey, massive, little silt. From 158.10~ 160.60m, predominately black mudstone, broken interval: (158.10~158.50m and 160.00~165.50m), minor plant root fossil.
		160.60	170.50	9.90								mudstone	bauxitic mudstone, white-grey, massive, can be scratched by fingers, minor Fe^{2+} nodule. At 163.00 ~167.10m, FGSS mainly.
		170.50	178.90	8.40								siltstone	dark grey, massive, interbedded with minor FGSS and black mudstone laminates.
		178.90	186.16	7.26		25						mudstone	bauxitic mudstone, white-grey, massive, few Fe^{2+} nodule. At lower part, black mudstone mainly, with few plant root fossil and coal film. At 185.20m, bedding plane: 25° (FGSS).
		186.16	187.60	1.44								sandstone	light grey, fine-grained, with minor dark grey siltstone laminates and coal film.
		187.60	200.50	12.90		30						siltstone	grey, massive, minor bauxitic, and interbedded with light grey FGSS and mudstone laminates. At 191.50m, bedded plane: 30° . (coal film on FGSS joint surface) . At 195.50~196.00m, FGSS mainly. At base, black mudstone predominately. From 199.00~199.50m, broken.
		200.50	211.50	11.00		30						mudstone	dark grey, silty, massive, at top, 2 layers calcite vein, dip: 30° . From 207.20~211.50m, very broken, fracture No: 15/m.
		211.50	218.30	6.80								mudstone	bauxitic mudstone, white-grey, massive. At base, black mudstone mainly, sharp contact with lower part of FGSS.
		218.30	231.30	13.00								sandstone	light grey, fine-grained, interbedded with few dark grey mudstone laminates (20%). From 227.50~229.40m, very broken, fracture number: 20/m; vertical fracture from 227.50 to 228.00m.
		231.30	239.20	7.90								mudstone	light black, massive, very broken, fracture developed, infilled coal film. Fracture number: 25/m. At base, vertical fracture, dip: 60° .
	BC	**239.20**	**240.35**	**1.15**								**coal**	**1.15m, BC coal seam, RC: 0.10m, Lost: 1.05m, black.**
		240.35	253.10	12.75								sandstone	medium-grained, light grey, interbedded with light black mudstone laminates (10%), developed fracture, infilled few calcite vein and coal film, fracture number: 20/m, fracture dip: 60~70° , compressed and deformation. At 242.00~242.20m, 0.20m conglomerate. At 245.00~245.50m, 0.50m conglomerate. At 249.00~249.50m, 0.50m conglomerate. At 249.50~249.60m, 0.10m coal seam, brittle. At 251.50~253.10m, 2 layers conglomerate.
		253.10	266.00	12.90		40						sandstone	FGSS, light grey, pure, little white(pale), well-sorted, fracture infilled calcite vein. From 254.50~ 257.50m, 8 layers thin laminates conglomerate (stylolite). From 257.00~261.00m, very broken, fracture developed, infilled calcite vein. At 263.00m, bedded plane: 40° , horizontal bedding.
		266.00	272.30	6.30		40						sandstone	FGSS, light grey, interbedded with dark grey mudstone laminates (35%), horizontal bedding. At 270.00m, dip: 40° . Slightly fracture, few distorted bedding on FGSS bedding, broken surface are slickensided and shiny.
Hulcross		272.30	297.55	25.25		35						siltstone	dark grey, interbedded with light grey fine-grained sandstone laminates (40%). At 277.00m, bedded plane: 38°. At 282.00m, bedding plane: 38°, micro-horizontal bedding, small cross-bed. At 286.00m, pyrite nodule (1*3cm). At 292.50m, bedded plane: 35°.
		297.55	297.68	0.13								limestone	0.13m, argillaceous limestone, strong react with 5% HCL.
		297.68	325.00	27.32		45						siltstone	dark grey, interbedded with light grey fine-grained sandstone laminates (30%), micro-horizontal bedding . At 304.50m, bedded plane: 40°. From 305.00~307.00m, broken, fracture number: 15/m. At 310.00m, bedded plane: 40°. At 314.50m, bedded plane: 45°, slightly fracture, fracture are slickensided and shiny, infilled minor calcite vein. At 324.00m, bedded plane: 45°.
		325.00	330.50	5.50								siltstone	same features as above, plus rock broken, broken into many pieces. broken surface are slickensided and shiny, fracture number: 23/m. At 327.60~327.70m, 0.10m very broken. At 325.53~325.60m, 0.07m argillaceous limestone, strong react with 5% HCL.
		330.50	373.53	43.03		35						siltstone	dark grey, interbedded with light grey sandstone (or mudstone) laminates (30%), micro-horizontal bedding. At 347.50m, bedded plane: 40°. At 346.50~347.50m, more FGSS, laminates (50%). At 351.37~351.44m, 0.07m argillaceous limestone, strong react with 5% HCL. At 360.00m, bedded plane: 35°. At 366.00m, bedded plane: 35°. At 365.80~365.95m, 0.15m argillaceous limestone. At 367.75~368.50m, broken, fracture developed, infilled few calcite vein. At base, FGSS laminates increased, and few siderite. At 373.50m, bedded plane: 35°.
		373.53	374.77	1.24								sandstone	MGSS, light grey, interbedded with light black mudstone laminates. At base, 0.15m conglomerate, Φ: 2mm.
Gates		374.77	375.72	0.95			825.23					mudstone	0.95m black mudstone, rich in vitrain/ plant root fossil/ coal film.
		375.72	381.50	5.78		35						mudstone	black, with dark grey siltstone, two layers (377.85~378.55 and 379.60~380.10), few coal film, massive. At 380.06m, bedded plane: 35°.
		381.50	385.00	3.50		35						siltstone	dark grey, interbedded with light grey FGSS laminates (15%), micro-horizontal bedding. At 383.50m, bedded plane: 35°, numerous plane root / leaf /shell fossil.
		385.00	385.62	0.62								mudstone	0.62 CM-carbonaceous mudstone.
	#3	**385.62**	**386.90**	**1.28**				**Q1,Q2**	**CBM01**			**coal**	**1.28m 3# coal seam, RC: 1.25m 0.33<0.22>0.73m (CBM01). Black, light and shiny, intact.**
		386.90	387.47	0.57								mudstone	carbonaceous, rich in coal. At base, 0.10m coal seam.
		387.47	392.70	5.23		30						siltstone	dark grey, with minor light grey FGSS laminates and black mudstone laminates. At 390.0m, bedded plane: 30°, abundant coal thin chip, and plant leaf/ root fossil at base.
		392.70	396.00	3.30								sandstone	grey, with dark grey siltstone laminates, numerous coal film on joint surface.
		396.00	397.45	1.45								mudstone	black mudstone, carbonaceous fragment, coal film.
		397.45	410.10	12.65		35						sandstone	fine-grained, light grey, interbedded with dark grey siltstone laminates (20%), micro-horizontal bedding. At 399.50m, bedded plane: 33°. At 401.30~401.60m, 0.30m black MS. At 404.10~404.40m, 0.30m black MS. Coal film observed on joint surface. At 407.50m, bedding plane: 35°.
		410.10	417.15	7.05		30						sandstone	pure, light grey, minor calcite vein, quartz and debris predominately, well-sorted, horizontal bedding. At base, from 416.00~416.50m, increased by dark grey siltstone laminates. At 416.00m, bedding plane: 30°.
		417.15	417.60	0.45								mudstone	CM, black.
	#4	**417.60**	**418.80**	**1.20**				**Q3**	**CBM02**			**coal**	**1.20m, 4# coal seam, RC: 0.80m.CBM02**
		418.80	421.10	2.30								mudstone	black, massive, rich in coal film/ CM/ plant fossils.
	#4-1	**421.10**	**421.50**	**0.40**								**coal**	**0.40m coal seam, RC: 0.30m.**
		421.50	422.20	0.70								mudstone	black, massive, numerous plant root fossil.
		422.20	431.78	9.58		32						sandstone	grey, fine-grained, interbedded with dark grey siltstone laminates (30%). At top and at bottom, more slitstone laminates (40%), micro-horizontal bedding. At 424.50m, dip (32°) and 430.00m (28°); few carbonaceous fragment.
		431.78	432.56	0.78		30						siltstone	dark grey, with few FGSS laminates (10%). At base, 0.15m CM. At 432.00, dip:30° .
	#5	**432.56**	**434.50**	**1.94**				**Q4,Q5**	**CBM03**			**coal**	**1.94m, 5# coal seam, RC: 1.8m. At base, 0.35m banded coal seam, black, intact, CBM03.**
		434.50	437.10	2.60		34						siltstone	dark grey, massive, at top numerous plant root fossils/ coal film. At 434.50m, bedding plane: 34° .
		437.10	440.50	3.40								siltstone	dark grey, interbedded with light grey FGSS laminates (20%), few carbonaceous fragment.
		440.50	453.38	12.88		31						sandstone	grey, FG, interbedded with dark grey siltstone laminates (15%) and black MS. At 445~446m, more coal film on fracture surface. At 447.90~452.00m, broken, fracture developed, infilled calcite vein, fracture number: 15/m. At 452.50m, bedding plane: 31° .
		453.38	453.52	0.14								mudstone	0.14 CM.
	#5-1	**453.52**	**456.60**	**3.08**				**Q6,Q7**				**coal**	**3.08m 5-1# coal seam, RC: 1.80m, lost coal at base(1.28m), parting: 454.52-454.60m, 1.28m coal structure: 1.00<0.08>2.00m.**
		456.60	458.35	1.75								mudstone	black, massive, broken. At 457.20~457.30m, 0.10 coal seam, abundant carbonaceous fragment.
		458.35	**458.50**	**0.15**								**coal**	**0.15m coal seam.**
		458.50	470.40	11.90		36						mudstone	black, massive. At 460.90~461.40m, dark grey siltstone. At 469.00m, bedded plane: 36° .
		470.40	471.26	0.86								siltstone	dark grey, interbedded with grey FGSS laminates (10%).
		471.26	473.80	2.54								mudstone	black, massive, rich in vitrain chip/ plant root fossil.
		473.80	485.00	11.20								sandstone	light grey, FG. At upper part with dark grey siltstone laminates (20%), few plant root fossils. At 482.00~482.50m, coal film on fracture surface. At bedding, argillaceous pebble. At 482.00~482.50m, more coal film on fracture surface. At lower part, progressively FGSS to MGSS.
		485.00	493.80	8.80		35						sandstone	MG, grey, with more black mudstone laminates and vitrain chip observed on joint surface, horizontal-bedding. At 488.50m, bedding plane: 35° , quartz and debris predominately normal-sorted. At base, progressively MGSS to CGSS.
		493.80	495.10	1.30								siltstone	dark grey, massive.
		495.10	496.35	1.25								mudstone	black, massive, abundant coal film / carbonaceous.
	#6	**496.35**	**497.35**	**1.00**				**Q8**				**coal**	**1.00m 6# coal seam, RC: 0.56, boney coal, banded coal, dull.**
		497.35	503.00	5.65								mudstone	At 499.35m, large plant leaf fossil. At 501.80m, black, mudstone, massive, rich in plant leaf fossils. At base, siltstone increased.
		503.00	505.73	2.73		25						siltstone	dark grey, interbedded with light grey FGSS laminates (20%), micro-horizontal bedding, at 504.00m, bedding plane:25° .
		505.73	508.20	2.47								mudstone	black, massive, abundant coal film and carbonaceous fragment, and plant root fossils.
		508.20	509.25	1.05								siltstone	dark grey, with light grey FGSS laminates (20%), rich in plant root fossils and coal film observed on bedding.
		509.25	510.58	1.33								mudstone	black, massive, at base numerous carbonaceous fragment.
	#7	**510.58**	**512.00**	**1.42**				**Q9-11**				**coal**	**1.42m 7# coal seam, RC: 1.40m; coal structure: 0.05(0.15)0.35<0.06>0.41<0.07>0.33m. At base, coal is badly broken, brittle.**
		512.00	513.85	1.85								mudstone	black mudstone, rich in vitrain and carbonaceous.
		513.85	514.70	0.85								siltstone	dark grey, rich in plant root fossil.
		514.70	516.23	1.53								mudstone	black, CM.
	#7-1	**516.23**	**516.87**	**0.64**								**coal**	**0.65m 7-1# coal seam, RC: 0.35m, black, intact.**
		516.87	517.30	0.43								mudstone	black, CM.
		517.30	519.70	2.40		30						siltstone	dark grey, interbedded with light grey FGSS laminates(40%), micro-horizontal bedding. At 518.50m, bedding plane: 30° , a few carbonaceous fragment observed on bedding.
		519.70	527.50	7.80		30						sandstone	light grey, fine-grained, interbedded with a few dark grey siltstone laminates (10%), and few calcite vein. FGSS strong react with 5% HCL. At 522.80m, bedded plane: 30° , few coal film on joint surface.
		527.50	533.50	6.00		30						siltstone	dark grey, interbedded with light grey FGSS laminates (30%), react with 5% HCL, a few carbonaceous fragment on bedding. At lower part, little muddy, rich in plant root/ leaf fossils and few coal film. At 530.70m, bedded plane: 30° .
	#8	**533.50**	**538.65**	**5.15**				**Q12-13**	**CBM04**			**coal**	**5.15m 8# coal seam, RC: 3.00m, coal is broken at top, black, parting:① 534.50~534.67m, 0.17m black mudstone.②536.25~536.50m, 0.25m, black MS,③ 537.75~538.10m, 0.35m, black MS; coal lost: 2.15m, at 534.35~536.50m; coal bedding plane: 30° , coal structure: 1.00<0.17>1.58<0.25>1.25<0.35>0.55m.**
		538.65	539.75	1.10								mudstone	CM, black, rich in coal film.
	#8-1	**539.75**	**540.30**	**0.55**					**CBM05**			**coal**	**0.65m, 8-1# coal seam, RC: 0.48m, coal is badly broken, dull, Boney coal mainly.**
		540.30	543.00	2.70								mudstone	black, massive, at upper part, rich in coal / carbonaceous fragment. At 541.16~541.21m, 0.05m coal seam.
		543.00	546.60	3.60		30						siltstone	dark grey, with light grey FGSS laminates (30%), micro-horizontal bedding. At 545.50m, bedding plane: 30° . React with 5% HCL; a few carbonaceous fragments.
		546.60	560.40	13.80		25						sandstone	light grey, fine-medium grained, interbedded with a few dark grey siltstone laminates (10%), well-sorted, quartz and debris mainly, horizontal bedding, with few calcite veins. FGSS react with 5% HCL. At 552.06m, bedding plane: 25° . From 552.1-554.06m, medium-grained sandstone(MGSS). At 557.90~558.10m, black mudstone, broken, fracture developed . At base, calcite vein infilled on fracture. Sandstone strong react with 5% HCL.
		560.40	576.00	15.60		32						sandstone	FGSS, light grey, with dark grey siltstone, fracture developed, infilled calcite vein. FGSS react with 5% HCL. From 560.5~569.50m, change bedding plane. At 563.00m, bedding plane: 60° . At 568m, bedding plane: 40° . At 570m, bedding plane: 32° . At 560.50~565.50m, fracture developed, infilled irregular calcite vein, react with 5% HCL. At 567.50~569.50m, vertical fracture, infilled calcite vein. At lower part, dark grey siltstone laminates increased to 30%, micro-horizontal bedding. At 575.00m, bedding plane: 32° .
		576.00	578.50	2.50		38						siltstone	dark grey, abundant plant root fossil and vitrain thin laminates. At 578.50m, bedding plane: 38 degree.
		578.50	580.87	2.37								mudstone	light black, massive, rich in plant root fossils.
	#9	**580.87**	**589.65**	**8.78**		**35**		**Q14-16**	**CBM06**			**coal**	**8.78m 9# coal seam, RC:4.90m, black, light, bright, half-intact, coal seam bedding: 35° . ①coal lost at 581.50~584.50m interval, lost: 2.70m; ②at 584.50~587.50m, lost: 1.18m. Q14: 580.87~584.50m, 3.63m, RC: 1.00m; Q15:584.50~587.50m, 3.00m, RC:1.80m; Q16:587.50~589.65m, 2.15m, RC:2.10m; but Q14: grinding coal from 581.50~584.50m, coal is shinny and brittle. no parting.**
		589.65	595.70	6.05		35						mudstone	black, massive, numerous plant root fossil, bedding plane: 35° . At 592.40~593.50m, fracture developed, vertical dip: 85~90° . At base, mud to silt. At base silt toward.
		595.70	602.00	6.30		25						siltstone	dark grey, interbedded with minor light grey mudstone laminates, micro-horizontal bedding. At 600.00m, bedding plane: 25, rich in plant fossils and coal film. At base, mudstone increased.
		602.00	603.33	1.33								mudstone	black, massive, rich in vitrain threads, and carbonaceous fragment.
	#10	**603.33**	**608.15**	**4.82**				**Q17-19**	**CBM07**			**coal**	**4.82m 10# coal seam, RC: 4.80. Q19: parting is three interval: ①605.32~605.50, 0.18m black MS; ②606.30~606.42m, 0.12m black MS; ③607.12~607.29m, 0.17m, black MS. Q17: 603.33~605.32, 1.99m, RC: 1.97m. Q18:605.32~608.12m 2.83m, RC: 2.83. Coal structure: 1.99<0.18>0.80<0.12>0.70<0.17>0.86m.**
		608.15	609.50	1.35								mudstone	black, massive, numerous plant root fossil and carbonaceous fragment.
		609.50	623.40	13.90		25						sandstone	fine-grained, light grey, interbedded with dark grey siltstone laminates (10%), micro-horizontal bedding. At 610.50m, bedding plane: 25°, well-sorted, predominately quartz and debris. From 621.90~623.40m, 3 layers calcite vein observed on joint surface, and from 623.10~623.40m, 3 layers conglomerate.
		623.40	624.10	0.70								siltstone	muddy, massive, abundant carbonaceous and coal fragment.
		624.10	625.00	0.90								sandstone	grey, interbedded with dark grey siltstone laminates (30%), rich in plant root fossils and coal film.
		625.00	**625.18**	**0.18**								**coal**	**0.18m coal seam.**
		625.18	625.50	0.32								mudstone	black CM.
	#11	**625.50**	**626.20**	**0.70**				**Q20**				**coal**	**0.70m 11# coal seam, RC:0.45m, shiny and brittle.**
		626.20	627.25	1.05								mudstone	black CM.
		627.25	633.20	5.95		30						sandstone	FGSS, light grey, vertical fracture, infilled calcite vein. At 627.50m, bedding plane: 30°. At 631.50m, bedding plane: 30°.
		633.20	637.10	3.90								sandstone	MGSS, grey, with light black mudstone laminate and coal threads, broken, fracture numerous: 10/m.
		637.10	639.15	2.05								mudstone	black, with FGSS laminates. Fault zone, deformation, mylonization.
	#12	**639.15**	**639.50**	**0.35**								**coal**	**0.35m coal, grinding, RC: 0.25m.**
		639.50	649.75	10.25								sandstone	light grey, rock broken, fracture developed, infilled calcite vein, fine-grained. At 645.00~649.20m, infilled abundant irregular calcite vein, react with 5% HCL. Broken surface are slickensided and shiny.
		649.75	655.28	5.53								siltstone	dark grey, muddy, broken, infilled few calcite vein, and minor coal film.
		655.28	670.50	15.22		35						sandstone	FGSS, grey, at top, with dark grey siltstone laminates. At 657.00m, bedding plane: 35°, horizontal-bedding. From 661.00~662.00m, infilled calcite vein. From 663.00~666.40m, very broken. Broken surface are slickensided and shiny, and infilled numerous calcite vein (irregular). At 666.40~670.50m, broken, fracture developed, infilled calcite vein(irregular).
		670.50	680.50	10.00								sandstone	MGSS, light grey, broken, fracture developed, infilled irregular calcite vein and few coal film, normal-sorted, predominately quartz and debris.
		680.50	697.00	16.50		40						sandstone	FGSS, light grey. normal-sorted, predominately quartz and debris. Horizontal bedding, at 783.00m, dip: 33 degree. fracture developed, infilled a lots irregular calcite vein and vug and react with 5% HCL. At 689.70m, 0.10m broken zone, deformation, mylonization. at 689.00m, bedded plane: 10 degree. from 694.80-697.00m, very broken, fracture number: 20/m. at 694.80m, bedded plane: 40 degree. at lower part, with a few black mudstone laminates and coal threads.
		697.00	702.90	5.90		40						sandstone	MGSS, light grey, predominately quartz and debris and few coal film. At base, broken, fracture developed, infilled irregular calcite vein. At 700.00m, bedding plane: 40 degree.
		702.90	720.00	17.10		35						sandstone	FGSS, light grey. well-sorted, Horizontal bedding, at 705.50m, dip: 35 degree. fracture developed, infilled a lots irregular calcite vein and react with 5% HCL. At 708.50-709.50m, calcite vug observed on joint surface.
		720.00	758.50	38.50		35						sandstone	FGSS, light grey. Interbedded with a few dark grey siltstone laminates (10%). Horizontal bedding, at 722.00m, dip: 35 degree. At top, fracture developed, infilled a lots calcite vein. A few calcite vein throughout. Slickensided at various angles to core axis. at 732.50m, bedding plane: 35 degree. FGSS react with 5% HCL.

Wapiti River — Drill Hole Core Log

Drilling Company:	Canada Drilling Company			**Hole No.:**	WP1C52	
Rig Type:	VD-5000			**Collar Elevation:**	1337.4m	
Total Depth:	1167 m		Coordinate:	**Northing:**	6071983.4	
Spud Date:	17-Jul-12			**Easting:**	654061.9	
Finished Date:	21-Aug-12			**Logging Geologist:**	Lee, Victor, Chris, Liang	
Core Size:	HWT/HQ			**Note:**		

Formation	Coal Seam	Core Depth Interval From	To	Thickness, m Thick	TRUE	Strata Dip	Coal Floor Elevation	Sample ID Coal	Rock	CBM	Rock Hardness	Rock Name	Lithology Description
Q		0.00	4.50	4.50								till	glacial till deposits. Fragment.
Hasler		4.50	7.50	3.00								siltstone	Dark grey, much broken
		7.50	11.80	4.30		10						siltstone	Interbedded fine sandstone laminate, at bottom, broken, bedded plane:10°
		11.80	18.50	6.70								sandstone	white and grey, fine-grained, interbedded dark grey siltstone. At 17-18.5, siltstone blend with fine sandstone
		18.50	23.70	5.20								sandstone	White and grey, fine grained, with dark grey siltstone laminate(5%)
		23.70	32.30	8.60		10						siltstone	Dark grey interbedded fine sandstone laminate(40%), horizontal bedding. Bedded plane:10°
		32.30	37.00	4.70		10						siltstone	Grey, with fine sandstone laminate(10%). At 36° , bedded plane: 10°
		37.00	44.50	7.50		10						sandstone	Light grey, fine-grained, interbedded siltstone(40%). At 42, bedded plane: 10°
		44.50	69.00	24.50		10						siltstone	Dark grey, interbedded fine sandstone laminate(15%). Bedded plane:10° , rich in very tiny mico-fragment. at 68m, 10°
		69.00	144.00	75.00		10-60-55-38-30-38-10						siltstone	Dark grey, with fine sandstone laminate (3%) At 74-78.5, broken. At 98m, 10° . At 100.7-105.5, fracture zone. At 100m, 10° . At 105m, 60° . At 107m, 55° . At 110m, 38° . At 118m, 30° . At 126m, 38° . At 121m-125m, broken. At 140m, 10°
		144.00	152.80	8.80		10						siltstone	grey, with fine grained sandstone(10%). Bedded plane:10°
		152.80	159.15	6.35		22						siltstone	very broken(152.7-154), grey. At 155m, bedded plane: 22°
		159.15	166.30	7.15		60						siltstone	grey, bedded plane:60° . Fold result in bedded plane changed.
		166.30	168.50	2.20		40-20						siltstone	grey, bedded plane: 40° . Decrease degree with depth at the bottom. 20°
		168.50	168.80	0.30								siltstone	grey, broken.
		168.80	177.00	8.20		10						siltstone	grey, 10°
		177.00	201.00	24.00		10						siltstone	grey with fine grained sandstone laminates(20%). At 187m, 10°
		201.00	222.50	21.50		10						siltstone	grey with fine grained sandstone laminates(15%). At 220m, 10°
		222.50	278.00	55.50								siltstone	dark grey, interbedded white fine sandstone laminate (50%), micro-horizontal bedding predominately, minor cross bedding. At 223m, 7° . At 240m, 10° . At 252m, 10° . At 275m, 12°
		278.00	299.50	21.50		7						siltstone	dark grey interbedded fine sandstone laminate(10%). At 282m, 7° . At 297m, 7°
		299.50	314.00	14.50		10						siltstone	dark grey, interbedded fine sandstone laminate(50%). Few cross-bedding, horizontal bedding predominately. At 301m, 10° . Minor cross bedding throughout. At 309, 7° . At 312, 12°
		314.00	366.50	52.50		10-40-30-70-20-15						siltstone	dark grey interbedded white and grey fine sandstone laminate(5%). At 318m, 10° . At 324m, 10° . From 327.3m, dips of bedding plane enlarge. At 326.9, 10° . At 327.3m, 40° . At 328.5m, 30° . At 341m, 30° . At 341.5-342, 70° . At 342.5m, 30° , at 347m, 20° . At 352m, 15° . At 362m, 15° .
		366.50	378.00	11.50		20-30						siltstone	dark grey, interbedded fine sandstone laminate(40%). At 366.5m, 20° . At 369, 30° . At374m, 30° . At 377m, 32°
		378.00	402.00	24.00		30-35						siltstone	same features as above, fine sandstone laminate(20%) decrease. At 389, 30° . At 395,35°
		402.00	413.50	11.50		40-45						siltstone	interbedded fine sandstone laminate(10%). At 404.5, 40° . At 411.0, 35° .
		413.50	444.00	30.50		32						siltstone	dark grey, interbedded fine sandstone laminate(20%). At 418m, 32° . At 422m, 32° . At 435m, 30° . 441m, 36° . Sandstone bands toward at base, distorted bedding in FGSS laminates.
		444.00	457.78	13.78								siltstone	dark grey interbedded with light grey FGSS(15%), competent, irregular laminated
		457.78	461.00	3.22								siltstone	dark grey, very much broken, fracture zone, deformation. Fracture number: more than 50/m
		461.00	540.00	79.00		28-35-45-30-35-40						siltstone	dark grey interbedded with light grey FGSS laminated (irregular laminated), massive, competent. At 473.5m, 28° . At 473.65-473.75, quartz sandstone. At 479m, 35° . At 492m, 35° . From 497-499.3, slightly fracture, bedding plane :45° . Broken surface are slickensided and shiny. At 507m, 30° . at 513m, pyrite nodule(1X5mm). At 520.10, 35° . At 530, 40° . At 53, sideritic nodules
		540.00	555.00	15.00		37						siltstone	dark grey, interbedded with light grey FGSS laminates(30%), irregular laminated, micro-horizontal bedding. At 553.5m, 37°
		555.00	558.00	3.00		30						siltstone	muddy, dark grey massive, minor plant leaf fossil on joint plane. At 557m, 30°
		558.00	597.00	39.00		40						siltstone	dark, interbedded FGSS laminate(15%). At 570m, 40° . At 588m, 40°
		597.00	612.00	15.00								siltstone	very muddy, dark grey to light black with tiny pyrite nodule. At 606.2m, a coal film on bedded plane
		612.00	661.00	49.00		40						siltstone	dark grey, interbedded fine sandstone laminate(5%). Horizontal bedding. At 621m, 40° . At 630m, 40° .At 654m, 40° .
		661.00	686.00	25.00		37-40						siltstone	dark grey, interbedded thin fine sandstone(20%). Micro-horizontal bedding, At 663m, 37° . At 666m, 37° . At 676m, 37° . At 686m, 40°
		686.00	699.00	13.00		40-37						siltstone	dark grey, interbedded white and grey fine sandstone laminate(40%) micro-horizontal bedding predominately, few distorted bedding. At 690m, 40° . At 697m, 37°
		699.00	711.00	12.00		40						siltstone	same features as above, plus fine sandstone laminate(20%) decrease to 20% . At 702, 40° .
		711.00	747.90	36.90		45-40-37-35						siltstone	dark grey, interbedded white and grey FGSS laminate(30%). Horizontal bedding, At 713m, 45° . At 718m, 45° . At 725m, 40° . At 732m, 40° . At 744m, 37° . At 747m, 35°
		747.90	815.00	67.10		32-30-35-37-40						siltstone	dark grey, interbedded FGSS laminate(15%). At 752.7m, 32° . At762m, 30° . At 768m, 35° . At 777m, 35° . At786m, 37° . At 798m, 40°
		815.00	815.50	0.50								conglomerate	white and grey. Φ:2-5mm, poorly-sorted, sub-angular to sub-rounded, mainly quartz and debris
Boulder Creek		815.50	821.80	6.30								mudstone	brown and grey, massive bauxitic, can be scratched by iron knife. No plant fossil
		821.80	823.30	1.50		40						siltstone	brown. At 823.10m, bedded plane: 40°
		823.30	833.50	10.20		40						mudstone	grey to dark grey, bauxitic locally, rich in leaf fossil locally, at 825.5m, bedded plane: 40° . Can be scratched by iron knife.
		833.50	847.00	13.50		40						mudstone	brown and grey, bauxitic, interbedded light grey siltstone layers(30%). At 834m, bedded plane:40°
		847.00	849.70	2.70								mudstone	black, massive with plant fragment fossil
		849.70	851.10	1.40		40						siltstone	light grey, bauxitic muddy, at 850.58-850.68m, numerous coal fragment on fracture plane. At 851m, 40° .
		851.10	854.30	3.20								mudstone	brown and grey, massive bauxitic. At 852.2-853m, fracture zone, much broken, with calcite veins
		854.30	855.80	1.50								siltstone	light grey, bauxitic
		855.80	867.30	11.50		46-50						sandstone	light grey, fine-medium-coarse grained, angle of bedding plane: enlarge. At 846m, 46° . At 859m, 50°
		867.30	870.30	3.00								conglomerate	light grey, Φ:2-5mm, dark debris and quartz predominately, poorly-sorted at bottom, broken.
		870.30	871.80	1.50		50						siltstone	light grey, bauxitic, at 871.5m, 50°
		871.80	872.41	0.61								mudstone	light black, very silty.
		872.41	876.30	3.89								mudstone	brown and grey, bauxitic, silty locally.
		876.30	877.60	1.30		40						siltstone	dark grey, interbedded fine sandstone layer, At 877m, 40°
		877.60	881.20	3.60								mudstone	brown and grey, bauxitic, silty, at top, brown, calcite vein infillling fracture.
		881.20	885.00	3.80								siltstone	brown, bauxitic
		885.00	890.50	5.50		45						mudstone	black and brown, fine sandstone laminate locally. At 888.00m, 45°
		890.50	894.40	3.90		40						siltstone	grey, interbedded light grey fine sandstone and dark grey mudstone laminate. At 894.2m, 40°
		894.40	900.00	5.60		37						sandstone	white and grey, fine-grained, with dark grey mudstone laminate. At 897m, 37° . At 899.3m, calcite veins.
		900.00	902.00	2.00								mudstone	light black, silty at lower part, a coal laminate
		902.00	903.85	1.85								sandstone	white and grey, fine-grained, numerous carbonaceous, mudstone laminate on bedding plane. react with 5%HCl strongly
		903.85	905.60	1.75								mudstone	grey, very silty, little bauxitic
		905.60	914.50	8.90		15						mudstone	grey and brown bauxitic, massive. At 909.3-909.7m, fine-grained sandstone. At 909.4m, bedded plane: 15°
		914.50	917.20	2.70								mudstone	light black to black, massive, rich in leaf fragment fossil.
		917.20	918.70	1.50								sandstone	white and grey, fine-grained
		918.70	921.75	3.05								mudstone	black, massive, at lower, carbonaceous mudstone, rich in leaf fossil
		921.75	922.50	0.75								siltstone	dark grey, at upper, with fine-grained sandstone laminate
		922.50	936.30	13.80		30						mudstone	grey to black with depth, bauxitic, massive. At 928.5, a coal laminate (3mm thickness). At 930.2m, 30° . At 935.5m, a coal laminate(5mm thickness), rich in leaf fossil
		936.30	937.20	0.90		40						sandstone	white and grey, fine-grained. Bedded plane: 40°
		937.20	941.18	3.98								mudstone	black, massive. At middle, carbonaceous mudstone, with few lenses, with leaf fossil
	BC	**941.18**	**941.58**	**0.40**								**coal**	**0.40m, RC:0.27m. Intact, light, shining**
		941.58	941.68	0.10								mudstone	black, carbonaceous
		941.68	946.10	4.42		40						sandstone	coarse-grained, with conglomerate, poorly-sorted. At 943.5m, 40°
		946.10	957.05	10.95								conglomerate	white and grey, Φ:2-7mm, interbedded medium and coarse sandstone layers, poorly-sorted. At 953.5m, Φ:4mm.
		957.05	969.10	12.05		45						sandstone	white and grey, fine-grained, at 963m, 45°
		969.10	969.90	0.80								sandstone	white and grey, fine-grained. at middle, a dark grey siltstone layer
Hulcross		969.90	976.00	6.10		43-38						sandstone	white and grey, fine-grained, interbedded dark grey siltstone layers(50%), At 973m, 43° . At 974.2m, 38° .
		976.00	1002.00	26.00		42-40						siltstone	dark grey, interbedded fine sandstone laminate(50%), horizontal bedding. At 978m, 42° . At 981m, 40° . At 987m, 40° . At 996m, 40° . At 997.5m-997.6m, 0.1m FGSS, React with 5%HCl.
		1002.00	1047.00	45.00		35-34-38-35						siltstone	dark grey, interbedded with light grey fine-grained sandstone laminate(10%), little muddy, At 1002.5m, 35° . At 1008m, 34° . At 1008.2m, vitrain fragment observed on joint plane. At 1017.36-1017.41m, 0.05m argillaceous limestone. React with 5%HCl strongly. At 1020.44-1020.50, 0.06m argillaceous limestone. At 1025m, 38° . at base, silt to mud. At 1030.80-1030.85, 0.05m argillaceous limestone, react with 5%HCl. At 1038m, 35° . At lower part, FGSS increased to 40%. At 1046.32m, shell fossil and vitrain fragment.
		1047.00	1061.30	14.30		40-35						siltstone	grey, interbedded with light grey fine-grained sandstone laminate(30%). At 1053.07-1053.12, 0.05m argillaceous limestone, react with 5% HCl. At 1050.5m, 40° . From 1059-1061.3m, FGSS laminates increased 50%, horizontal bedding, 35°
Gates		**1061.30**	**1061.31**	**0.01**			**278.70**					**conglomerate**	**thin layer. Border of Hulcross and Gates formation.**
		1061.31	1061.56	0.25								mudstone	blank, a layer of coal film
		1061.56	1063.00	1.44								sandstone	FGSS, pure, light grey, quartz and debris mainly
		1063.00	1064.20	1.20								siltstone	dark grey massive
		1064.20	1067.00	2.80		39						sandstone	fine-grained, with dark grey siltstone laminates(10%) horizontal bedding, 39°
		1067.00	1070.65	3.65								mudstone	light black massive, numerous vitrain chip and carbonaceous fragment and plant leaf fossil. Infill calcite vein locally. At 1070.5m, 36°
	3#	**1070.65**	**1072.01**	**1.36**		36		**Q1,Q2**				**coal**	**1.36m 3# coal seam. RC:1.27m. Bright, black, light, intact. Q1 Q2. Parting: 1071.36-1071.51, 0.15m, black mudstone. Coal structure: 0.71<0.15>0.50m.**
		1072.01	1072.13	0.12								mudstone	0.12m carbonaceous mudstone.
		1072.13	**1072.18**	**0.05**								**coal**	**0.05m coal seam. intact**
		1072.18	1072.68	0.50								mudstone	black
		1072.68	**1072.76**	**0.08**								**coal**	**0.08m coal seam. black broken**
		1072.76	1074.35	1.59								siltstone	muddy massive rich in carbonaceous fragment and plant root fossil
		1074.35	1076.38	2.03		42						sandstone	with dark grey siltstone, bedded plane: 42° at 1075.5m
	3#-1	**1076.38**	**1076.54**	**0.16**								**coal**	**0.16m coal seam. RC:0.16m bright light broken black. Coal is shiny and brittle**
		1076.54	1083.60	7.06		36-42						siltstone	dark grey with FGSS laminates(20%) rich in plant root fossil. Bedded plane: 36° (1077.5m). At 1079.3-1080, more layers coal film. At 1081.75m, 42° .
		1083.60	1086.00	2.40								mudstone	light black massive, numerous plant root fossil and coal film. At 1084.55-1084.65m, 0.10m coal, dull, black, banded. at 1085 m, shell fossil.
		1086.00	1090.10	4.10								siltstone	dark grey massive. at middle part, black mudstone, rich in leaf fossil
		1090.10	1092.93	2.83								sandstone	white and grey, fine-grained, with dark grey mudstone laminate. At 1092m, 40°
		1092.93	1097.70	4.77		40						mudstone	dark grey to light black very silty.
		1097.70	1101.70	4.00								mudstone	black, massive, numerous coal laminate at middle and upper part rich in leaf fossil
		1101.70	1107.70	6.00								sandstone	white and grey fine-grained, interbedded dark siltstone(40%), horizontal bedding, react with HCl 5% strongly.
		1107.70	1111.50	3.80								siltstone	grey, massive, no fossil
		1111.50	1112.50	1.00								sandstone	white and grey, medium-grained
		1112.50	1114.70	2.20								siltstone	grey, muddy interbedded fine-grained sandstone layers.
		1114.70	1115.92	1.22								mudstone	light black massive. At 1114.8m, 2 coal thin laminate.
	4#	**1115.92**	**1116.05**	**0.13**								**coal**	**0.13m coal seam. RC:0.07m. Coal fragment left.**
		1116.05	1117.30	1.25								mudstone	black, 3 thin coal laminate at middle parts.
		1117.30	1121.50	4.20								siltstone	dark grey to light black, muddy massive
		1121.50	1134.00	12.50		35						sandstone	white and grey, fine-grained with dark grey siltstone and mudstone laminate(10%). At 1130m, 35°
		1134.00	1137.45	3.45		31						mudstone	black with fine-grained sandstone laminate(20%). at 1137.4m, 31°
	5#	**1137.45**	**1143.80**	**6.35**				**Q3,Q4 Q5,Q6**				**coal**	**5#-coal seam, 6.35m RC:5.60m light shining, half-broken, brittle. 0.75m lost. 1137.45-1139.85, 2.40m, 0.30m lost. Parting: 1139.85-1140.00m, 0.15m, black mudstone. Coal:1140.00-1141.96m, 1.96m. Parting:1141.96-1142.06m, 0.10m, black MS. Coal: 1142.06-1143.80m, 1.74m, 0.45m lost. Coal Structure: 2.40<0.15>1.96<0.10>1.74**
		1143.80	1144.00	0.20								mudstone	black, massive
		1144.00	**1144.10**	**0.10**								**coal**	**0.10m coal seam. RC:0.08m. Broken**
		1144.10	1144.85	0.75								mudstone	black massive
	5-1#	**1144.85**	**1145.25**	**0.40**								**coal**	**#5-1 RC:0.40m. Intact, light shinning**
		1145.25	1145.50	0.25								mudstone	black
		1145.50	**1145.55**	**0.05**								**coal**	**0.05m coal seam. intact**
		1145.55	1146.00	0.45								sandstone	white and grey, fine-grained
		1146.00	1152.35	6.35		32						mudstone	black silty
		1152.35	**1152.45**	**0.10**								**coal**	**0.10m coal seam. intact. RC:0.10m**
		1152.45	1154.30	1.85								sandstone	white and grey, fine-grained
		1154.30	1160.60	6.30		40						sandstone	white and grey, fine-grained, interbedded dark grey siltstone and mudstone layers(40%). At middle part, a few vitrain lenses and laminate
		1160.60	1162.25	1.65								mudstone	black, interbedded siltstone layer(40%), with leaf fossil
		1162.25	**1162.40**	**0.15**								**coal**	**Boney coal, 0.15m coal seam. broken**
		1162.40	1162.90	0.50								mudstone	black carbonaceous, numerous vitrain lenses with leaf fossil
	6#	**1162.90**	**1163.30**	**0.40**								**coal**	**#6 0.40m coal seam. RC:0.15m. Half broken**
		1163.30	1163.35	0.05								mudstone	carbonaceous
		1163.35	1164.52	1.17								mudstone	black massive, at bottom, interbedded fine sandstone laminate
		1164.52	1167.00	2.48								siltstone	light grey, with dark mudstone laminate(5%) few carbonization of branch fossil. TD=1167.00m

Wapiti River — Drill Hole Core Log

Drilling Company:	Canada Dedua Drilling Company			**Hole No.:**	WP1C53		
Rig Type:	VD-5000			**Collar Elevation:**	1278.1m		
Total Depth:	762.95m	**Coordinate:**	**Northing:**	6071212.9			
Spud Date:	Oct. 1, 2012		**Easting:**	653260.4			
Finished Date:	Oct. 22, 2012		**Logging Geologist:**	Lee, Ricky, James, Bo			
Core Size:	HQ-60.3mm		**Note:**				

Formation	Coal Seam	Core Depth Interval		Thickness, m		Strata Dip	Coal Floor Elevati	Sample ID			Rock Hardness	Rock Name	Lithology Description
		From	To	Thick	TRUE			Coal	Rock	CBM			
Q		0.00	15.00	15.00								till	sandstone, fragment, brown and light grey, soft clay,overburden:15.0m .
Hasler		15.00	89.00	74.00		5°						siltstone	dark grey, with fine sandstone laminate (5%), micro-horizontal bedding; at 30.0m, 35.0m, bedded plane:5° ; 15~46.0m, very broken, mudstone fragment, fracture no:30/m; at 52.0m, mudstone,kaolinite,0.10m; at 66.0m, and 80.0m, bedded plane:5° .
		89.00	100.52	11.52		5°						siltstone	dark grey to light black, muddy, interbedded find sandstone laminate (content:20%), bedded plan ° .
		100.52	114.00	13.48		5°						siltstone	dark grey-light black, muddy, with find sandstone laminate (5%), bedded plane:5° .
		114.00	133.45	19.45		5°						siltstone	dark grey, blended fine sandstone; siltstone content:70%, fine sandstone content:30%, no beddin predominately; at 119.0m, bedded plane:5° ; at 129.0m, bedded plane:5° .
		133.45	147.00	13.55		5°						siltstone	dark grey to light black, very muddy, with fine sandstone laminate (content:2%); at 145.0m→5° at 146.20m, siderite, 0.10m, brown and hardness:5.
		147.00	173.50	26.50		5°						siltstone	dark grey, blended fine sandstone (content: 15%), few bedding; at 156.0m, bedded plane:5° ; at 170.50~171.0, little broken, fracture no:8; at 171.0m, gas blow out; at 173.0m, bedded plane:5°
		173.50	198.00	24.50		5°						siltstone	dark grey, little muddy, interbedded fine sandstone thin layer (content:30%); at 189.0m, bedded plane: 5° ; at 198.0 (5°).
		198.00	205.00	7.00		5°						siltstone	dark grey to light black, muddy, with find sandstone laminate (5%); at 203.50m, a shell fossil (3*4mm).
		205.00	237.80	32.80		5°						siltstone	dark grey to light black, muddy, interbedded fine sandstone laminate (30%), micro-horizontal bedding; at 216.0m, bedded plane:5° ; at 219.70~220.50m, broken zone, fracture no:20; at 228.0-° ; at 237.10~237.80, white and grey fine sandstone.
		237.80	246.00	8.20		5°						siltstone	blended fine sandstone, dark grey, fine sandstone, content:20%; at 249.0m, bedded plane:5° ; at 242.70~244.50m, broken zone, fracture No:20/m.
		246.00	277.00	31.00		5°						siltstone	dark grey, with sandstone laminate (10%); at 255.20~256.50m,broken, vertical fracture, fracture length: at 257.0m, bedded plane:5°; at250.0m→5° ; at 260.0m→5° ; at 270.0m→7° ; at 276.0→7° at 272.10~272.50,broken, fracture No:5.
		277.00	301.10	24.10		7°						siltstone	dark grey-light black, interbedded fine sandstone laminate (30%); at 290.0~291.0, broken, fract No:15; at 284.0~286.20, broken, vertical fracture, fracture No:10/m; at 286.40~286.80, broken, fracture No:10; at 290.0m, bedded plane:7° .
		301.10	301.15	0.05		7°						mudstone	black, massive, little carbonaceous.
		301.15	301.25	0.10		7°						conglomerate	0.10m, conglomerate, grey to light grey,Ø:1~5mm, chert and debris predominately, poorly-sorted, subangular-subrounded.
		301.25	304.00	2.75		7°						mudstone	brown-grey, bauxitic.
Boulder Creek		304.00	306.00	2.00								siltstone	light grey, little bauxitic mudstone.
		306.00	314.30	8.30		7°						sandstone	white-grey, fine grained, moderately-sorted; at 311.50~311.80, with dark mudstone breccia; at 306.0~317.50, broken, fracture No:30/m; at 309.0→7° .
		314.30	325.00	10.70								mudstone	brown and grey, bauxitic, can be scratched by iron knife, soft; at 319.0~319.30, carbonaceous, rich in leaf fossil; at bottom, with silt.
		325.00	329.20	4.20		10°						sandstone	light grey, fine grained, interbedded bauxitic mudstone layers; at 324.20m, bedded plane:10° .
		329.20	331.90	2.70								mudstone	brown-grey, bauxitic, massive; at bottom, 0.10m black mudstone, with leaf fossil.
		331.90	338.80	6.90		10°						sandstone	white-grey, medium-coarse grained; at upper part, medium-grained; at lower part, coarse-grained at 334.0m→10° ; at 338.0m→10° .
		338.80	339.40	0.60		10°						conglomerate	white-grey, fine-grained, Ø:1~8mm, moderately-sorted, numerous coal lenses, few coal laminate.
		339.40	342.00	2.60		10°						sandstone	white-grey, fine grained, with brown-grey bauxitic mudstone laminate (30%); at
		342.00	349.60	7.60		10°						mudstone	brown-grey, bauxitic, massive; at 346.0m,with leaf fossil on bedding plane
		349.60	351.00	1.40		10°						sandstone	white-grey, fine-grained; with dark siltstone laminate bedded plane:10°
		351.00	351.80	0.80		10°						mudstone	brown, bauxitic, broken, vertical fractures filling vitrain (5mmx 0.4m)
		351.80	353.00	1.20		10°						sandstone	white-grey, fine-grained; with siltstone laminate
		353.00	356.90	3.90		10°						mudstone	light black, with 2 layers of fine sandstone; at top few leaf fossil on bedding, at 356.0m,bed plane:10°
		356.90	369.75	12.85		10°						mudstone	brown and grey, bauxitic, massive; at 361.0m,few leaf fossil. soft, can be scratched by iron knife;at361.50-362.30m, muddy siltstone.
		369.75	373.00	3.25		15°						siltstone	grey, little muddy, bedded plane:15° .
		373.00	379.20	6.20		15°						sandstone	white-grey, fine-coarse grained, with dark mudstone laminate, coarse to base, at bottom coarse sandstone, at middle part, medium-grained, poorly-sorted subangular-subrounded; quartz and dark debris predominately at bottom, many coal lenses in sandstone ;at bottom, bedded plane:15°
		379.20	389.60	10.40		15°						mudstone	brown and grey, bauxitic, massive, no bedding
		389.60	391.70	2.10		15°						sandstone	white-grey, fine grained with black mudstone laminate
		391.70	395.65	3.95		15°						mudstone	black, massive, at middle, a lager of fine sandstone, 0.50m; at bottom, rich in leaf fossil, a 394.15m,banded coal, 0.08m. **at 394.50-394.65m, BC coal seam, 0.15m, RC:0.10m broken, shiny, light, no parting.**
		395.65	398.75	3.10		15°						conglomerate	light grey, Ø: 2-8min quartz, chert and debris predominately, poorly-sorted, fine sandstone mat
		398.75	404.30	5.55		15°						conglomerate	interbedded with medium-coarse sandstone, poorly sorted; at top, a vertical fracture, 0.40m lon
		404.30	411.95	7.65		15°						sandstone	white-grey, fine grained, pure, quartz and debris predominately
		411.95	418.65	6.70								sandstone	white-grey, fine grained, interbedded light black silt mudstone layers, at top bedded plane:15° at bottom, bedded plane: 15°.
Hulcross		418.65	488.20	69.55		10°						siltstone	grey to dark grey, with fine sandstone laminate (2%), horizontal bedding, at 419.0m bedded plane:10° ; at 483.0m → 15° , at 487.0m→20°
		488.20	488.57	0.37								conglomerate	Ø: 3-4mm, quartz, chert and debris, well-sorted, sunangular - rounded
Gates		488.57	492.10	3.53								mudstone	black rich in leaf fossil at bottom very silty at 491.80m, 0.05m, coal
		492.10	497.00	4.90		20°						sandstone	white-gray, fine grained , quartz and debris mainly
		497.00	498.25	1.25								mudstone	black, massive, at 497.80-498.25, carbonaceous, many coal laminate
	#3	**498.25**	**499.00**	**0.75**				**Q1**				**coal seam**	**0.75m RC:0.60m,half-broken, light, shiny, no parting**
		499.00	509.20	10.20								mudstone	black to light black, massive, at upper, black, at lower part, light black; rich in leaf fossi at 505.55-505.95m, carbonaceous, a few vitrain laminate ; at 505.70 and 505.80m, 2 coal strea 0.04m thick each.
		509.20	516.60	7.40		15						sandstone	white-grey, fine grained, interbedded light black silt mudstone layer(40%) at 514.25-514.40 mudstone many coal debris at 513.0m bedded plane:15°
		516.60	525.25	8.65								mudstone	black, massive, at 518.60, 0.04m thick, coal streak; at 524.20 -524.85m, black, carbonaceous mudstone, with carbonization of leaf fossil
		525.25	530.40	5.15		15°						sandstone	white-grey, medium grained, interbedded thin layers of dark muddy siltstone, at 527.0m, bedded plane:15° at 529.0m bedded plane:15° at 527.80-528.0m, broken fracture No:6
		530.40	532.90	2.50								mudstone	black massive with leaf fossil
		532.90	**533.15**	**0.25**								**coal**	**0.25m, RC:0.18m half-broken, light shiny, No parting**
		533.15	533.50	0.35								mudstone	black, carbonaceous a few coal laminate
		533.50	534.50	1.00								mudstone	light black, silt, massive
		534.50	541.50	7.00		15°						sandstone	white-grey, fine grained, dark debris and quartz predominately; interbedded light black silt mudstone layer, at 537.0m 540.0m, bedded plane:15°
		541.50	544.07	2.57								mudstone	black, at upper part, silt
	#5	**544.07**	**548.42**	**4.35**				**Q2 Q3 Q4**				**#5 coal seam**	**coal seam, 4.35m, RC:4.30m, 0.05m lost, intact, shiny, light, brittle. Co: 544.07-545.85m, 1.78m, RC:1.73m; parting: 545.85-546.15m, 0.30m, black, mudstone; co: 546.15-547.60m, 1.45m RC: 1.45m; parting: 547.60-547.67m, 0.07m, black, mudstone; co: 547.67-548.42m, 0.75m, RC: 0.75m; Coal structure: 1.78(0.30)1.45(0.07)0.75m.**
		548.42	548.80	0.38								mudstone	black, massive
		548.80	**549.10**	**0.30**								**coal seam**	**banded coal, 0.30m, RC:0.30m, half broken.**
		549.10	549.30	0.20								mudstone	black, massive.
		549.30	**549.45**	**0.15**								**coal seam**	**0.15m, shiny, light**
		549.45	563.00	13.55		15						mudstone	black, light black, interbedded fine sandstone, at 550.40-550.55m, coal ,0.15m shiny, light at 561.40-562.0m carbonaceous mudstone, many vitrain streaks, at 551.50-555.0 ,broken plane:15° , 558.50m→15°
		563.00	566.60	3.60		15						sandstone	white-grey medium grained, with dark siltstone, react with Hcl 5%.
		566.60	569.85	3.25								mudstone	black, massive, carbonaceous locally; at 567.90m ,0.05m coal, shiny; at 569.30, 0.08m coal, shiny; at 569.70m , 0.10m thick coal seam, shiny, light.
		569.85	572.00	2.15								siltstone	grey to light grey, massive, at lower part , light grey
		572.00	572.50	0.50								mudstone	black, carbonaceous, a few coal streak at 572.20-572.40 coal , 0.20m ,bright
		572.50	579.00	6.50								mudstone	light black, interbedded fine sandstone layer; at 577.0-577.70m, broken, fracture No:20; at 574.0m bedded plane:25° ; at 578.50m →25°
		579.00	581.75	2.75								mudstone	blk, massive.
	#6	**581.75**	**582.25**	**0.50**						**CBM3**		**#6 coal seam**	**0.50m, RC:0.40m ,0.10m lost, half broken , no parting, shiny, light.**
		582.25	591.15	8.90								mudstone	black, massive, with leaf fossil; at 587.10-588.0m, little carbonaceous, a few vitrain laminate
		591.15	591.62	0.47								mudstone	black, carbonaceous, a few vitrain laminate.
	#7	**591.62**	**592.42**	**0.80**				**Q5**				**#7 coalseam**	**0.80m, RC:0.80m,intact, shiny, light, brittle, no parting**
		592.42	593.00	0.58								mudstone	blk, little carbonaceous, a few vitrain laminate, with carbonization of leaf fossil.
		593.00	597.75	4.75								mudstone	black, carbonaceous locally, at 595.35-595.50m, carbonaceous, with 7 coal laminate; at 595.50 595.70m, coal seam, 0.25m, shiny, light;
	#7-1	**597.75**	**598.25**	**0.50**								**#7-1 coal seam**	**coal seam, 0.50m, RC: 0.30m, 0.20m lost, half-broken, shiny, light, no parting.**
		598.25	600.80	2.55								mudstone	black, massive; at 599.10-599.35m carbonaceous, few vitrain laminate.
		600.80	617.20	16.40		15						siltstone	light grey, at 612.50-613.20m, fine sandstone and siltstone blended, mostly reacting with Hcl 5 at 603.40-604.90m, numerous calcite veins, reacting Hcl 5%; at 600.80-601.10, broken ,fracture No:8; at 613.30-613.80m, a vertical fracture; at 601.10m bedded plane:15° ; at 603.0m→15°
		617.20	**617.60**	**0.40**								**coal seam**	**0.40m, RC:0.40m, intact, parting: 617.45-617.55m, 0.10m, mudstone.**
		617.60	624.30	6.70								mudstone	black to carbonaceous, massive, at 617.70-617.80, coal seam, broken ,0.10m, shiny, light; at 620.85-621.0, 619.40-619.50m carbonaceous, with a few coal laminate; at 621.25-40m, 0.15m carbonaceous; at 622.0-622.40m, carbonaceous, broken, with a few coal streak; at 619.60-619.95m broken into little debris, fracture No:20; at 623.70-624.30, carbonaceous, many coal streaks.
		624.30	633.00	8.70								siltstone	light grey, massive, react with HCl 5% throughout; at 625.10-626.40m, vertical fracture, fractu No:15.
		633.00	646.00	13.00		15°						sandstone	white-grey, fine- medium grained , with dark mudstone laminate , quartz and debris, predominate moderately-sorted , coarser toward base, subangular- subrounded; horizontal bedding, at 636.0m bedded plane: 15° ; at 643.0m→15° , at 645.0m→15° ,at 645.80m→40° locally; calcareous cem throughout
		646.00	651.50	5.50								siltstone	light grey, muddy; at middle part, black silt mudstone layer, at 650.0m, 651.0m, bedded plane:1 ° , reacting with hcl 5% throughout.
		651.50	653.00	1.50								mudstone	black, massive, few coal laminate, rich in carbonization of leaf fossil
	#8	**653.00**	**657.00**	**4.00**				**Q6**		**CBM4**		**#8 coal seam**	**4.0m ,RC: 1.70m, 2.30m lost at 653.0-653.35m, half- broken; at 653.35-657.0m, very broken into pieces and powder, shiny , light; parting, 653.08-653.12m, 0.04m thick, mudstone, bls Co:653.0-653.08m, 0.08m Rc:0.08m; Co:653.12-657.0m, 3.88m, Rc:1.58m,2.30 lost, broken into pieces and powder. coal structure: 0.08(0.04)3.88m. Note: place of depth mark is wron at 654.0m, so, thickness of coal seam maybe not right exactly.**
		657.00	687.30	30.30		15						sandstone	white-grey, medium grained, pure; at middle, coarser; quartz and dark debris, predominately. 662.40-667.60m, broken , fracture No:10/m with few calcite veins, vertical fracture most; wit coal lenses on fracture plane; at lower part a few coal laminate on bedding plane; at 658.0-660 few long calcite veins react with Hc15% throughout. calcareous cement; at 679.80-687.30m, numerous vitrain lenses and laminate on bedding plane; at 676.50-678.0m, broken, fracture No: at 675.0m, bedded plane :15° ; at 683.0m,→15°
		687.30	690.00	2.70								sandstone	white-grey, medium-coarse grained , interbedded thin layer of conglomerate, debris and quartz predominately, poorly-sorted, bedded plane:15°
		690.00	702.34	12.34								mudstone	black, massive, rich in leaf fossil,
	#9	**702.34**	**703.39**	**1.05**				**Q7 Q8**				**#9 coal seam**	**1.05m, Rc:1.05m, half-broken, light, shiny. Co:702.34-702.45, 0.11m; parting 702.45-702.51 ,0.06m, black, mudstone; Co:702.51-702.80m, 0.29m; parting:702.80-702.94m,0.14m,mudstone,bl Co:702.94-703.39,0.45m; coal structure: 0.11(0.06)0.29(0.14)0.45m,**
		703.39	704.23	0.84								mudstone	black, mudstone, rich in leaf fossil
	#9-1	**704.23**	**705.65**	**1.42**				**Q9**				**#9-1 coal seam**	**coal seam, 1.42m, RC:1.35m, 0.07m lost, broken into pieces ,shiny, no parting,**
		705.65	706.71	1.06								mudstone	black, massive, with lost of carbonization of leaf fossil,
	#9-2	**706.71**	**707.75**	**1.04**				**Q10**		**CBM5**		**#9-2 coalseam**	**#9-2 coal seam, 1.04m, RC:0.50m,0.54m lost, shiny, no parting,**
		707.75	710.08	2.33		15						sandstone	white-grey, medium-grained, with dark mudstone laminate. at bottom, a layer at mudstone; at bottom, bedded plane:15°
		710.08	**710.38**	**0.30**								**coal**	**0.30m, RC:0.30m half broken, parting :710.18-710.28m,0.10m,ms**
		710.38	710.58	0.20								mudstone	black, massive, with leaf fossil and coal laminate.
		710.58	726.43	15.85		10						sandstone	white-grey, fine-grained , at lower part, few thin layer of mudstone; at 723.0m bedded plane: 1 ° ; react with HCl 5% weakly.
	#10	**726.43**	**727.10**	**0.67**								**#10 coal seam**	**0.67m, RC:0.65m, half-broken ,shiny, light, no parting**
		727.10	729.00	1.90								mudstone	black, massive, at upper part, carbonaceous, a few coal streak at upper part; at 728.0-728.20m, coal, much broken into shattered; rich in leaf fossil at upper part,
		729.00	731.00	2.00		15						siltstone	light grey, with mudstone laminate, at 731.0m→15°
	#11	731.00	738.00	7.00								mudstone	black, massive, at 731.0-732.0m , many coal streaks; at 731.30m, 0.10m coal seam; at 735.45m, 0.06m coal seam, broken; at 735.60m, coal seam, 0.10m ,broken; at 738.0m, 0.15m coal, broken; near base, few coal streaks, little broken throughout, fracture No:8/m
		738.00	745.00	7.00		15						mudstone	Light black, interbedded with siltstone layer, at 741.0m, bedded plane:15° , at 746.0m 15° ,
		745.00	751.48	6.48		10						mudstone	**black, massive, with leaf fossil, at 749.50m, bedded plane:10°**
	#12	**751.48**	**752.40**	**0.92**				**Q11**				**#12 coal seam**	0.92m, RC:0.75m,0.17m lost, broken much , shattered, shiny, light, No parting.
		752.40	758.55	6.15		10						mudstone	black, interbedded thin layers of fine sandstone; with leaf fossil throughout; at 755.0m, bedd plane: 10° , at 757.0m→10° . at 756.90-757.05m, 0.15m, carbonaceous, few coal streaks,
		758.55	762.95	4.40		10						sandstone	white-grey, medium-grained, well-sorted, subangular-subrounded, quartz and debris predominately bedded plane:10° . TD=762.95m.

Wapiti River — Drill Hole Core Log

Drilling Company:	Foraco Drilling Ltd.	**Hole No.:**	WP1C54		
Rig Type:	VD-8000	**Collar Elevation:**	1210.4m		
Total Depth:	1172.50m	**Coordinate:**	**Northing:**	6069753.2	
Spud Date:	Oct.24, 2012		**Easting:**	652106.2	
Finished Date:	Dec. 01, 2012	**Logging Geologist:**	LEE, VICTOR, RICKY		
Core Size:	HWT/HQ	**Note:**			

Formation	Coal Seam	Core Depth Interval From	To	Thickness, m Thick	TRUE	Strata Dip	Coal Floor Elevation	Sample ID Coal	Rock	CBM	Rock Hardness	Rock Name	Lithology Description
Q		0.00	27.50	27.50								till	quartz pebble, sand, and sandstone fragment, and soil, brown and yellow, overburden: 27.50m.
Hasler		27.50	61.00	33.50		10°						siltstone	siltstone, dark grey, with white-grey fine-grained sandstone laminate (5%), horizontal beddi 27.50~29.50m, broken, fracture No: 8/m; at 32.0m, bedded plane: 10°; at 40.0m, bedded plane: bedded plane: 10°; at 53.0m, a calcite lamina (3mm thick), strong react with HCL (5%); at 55 10°; at 44.90~45.20m, broken, fracture :5/m; at 49.0~49.40m, broken, fracture No:4/m; at 60. plane:10°.
		61.00	75.00	14.00								mudstone	light black, very silt, with white-grey fine-grained sandstone laminate (5%), micro-horizont predominately, with little minor cross-bedding; at 62.0m, bedded plane: 10°; at 70.0m, bedded
		75.00	95.50	20.50								mudstone	black, little silt, with fine-grained sandstone laminate (5%), no plane fossil.
		95.50	114.00	18.50		10°						siltstone	dark grey, with white-grey fine-grained sandstone laminate (content:5%); at 99.m, bedded pla at 110m, bedded plane: 10°; at 110.0~111.20m, broken, fracture no:15/m; at 100.70~101.20m, br no:5/m; at 110.0m, bedded plane: 10°.
		114.00	131.00	17.00		10°						siltstone	light black, muddy, with white-grey fine-grained sandstone laminate (content: 5%); at 115.0m at 120.0m, bedded plane: 10°; at 128.0m, bedded plane:10°; at 130.0m, bedded plane: 10°.
		131.00	151.50	20.50		7°						mudstone	light black to black, silt, with white-grey fine-grained sandstone laminate (2%); at 143.0m, at 150.0m, bedded plane: 7°.
		151.50	185.50	34.00		7°						siltstone	dark grey, little muddy, blended fine-grained sandstone, fine-grained sandstone content: 30 bedded plane: 7°; at 170.0m, bedded plane:7°; at 182.0m, bedded plane:7°.
		185.50	244.00	58.50		7°						siltstone	light black, very muddy, with white-grey fine-grained sandstone laminate (10%); at 205.0~213 grained sandstone (30%), hardness:<5, can be scratched by knife; at 198.20~199.0m, very brok fracture No:40/m, micro-horizontal bedding; at 189.0m,bedded plane: 10°; at 196.0m, bedded pl 200.0m, bedded plane: 7°; at 209.0m, bedded plane: 7°; at 215.0m, bedded plane: 7°; at 222.0m at 230.0m, bedded plane: 7°; at 235.50m, 0.08m, siderite; at 235.0m, bedded plane: 7°.
		244.00	282.00	38.00		10°						siltstone	light black, interbedded with thin layers of fine-grained sandstone (20%), micro-horizontal 352.0~356.0m, siltstone and fine-grained sandstone blended; at 245.0m, bedded plane: 10°; at plane: 10°; at 260.0m, bedded plane: 10°; at 260.0m, bedded plane: 10°; at 270.0m, bedded pla 278.0~279.50m, siltstone and fine-grained sandstone blended.
		282.00	291.50	9.50		10°						siltstone	light black, muddy.
		291.50	301.00	9.50		10°						siltstone	dark grey, blended fine-grained sandstone (30%).
		301.00	305.13	4.13		10°						siltstone	dark grey, interbedded with thin layer of fine-grained sandstone (40%).
		305.13	305.52	0.39								conglomerate	conglomerate, Ø:1~3mm, quartz and dark debris; at upper, fine-grained sandstone.
Boulder Creek		305.52	306.20	0.68		10°						sandstone	white-grey, fine-grained sandstone, bedded plane: 10°.
		306.20	307.80	1.60		10°						conglomerate	conglomerate, Ø:2~10m, poorly-sorted, quartz, chert and debris.
		307.80	311.00	3.20		15°						mudstone	light grey-grey; at lower part, little bauxitic.
		311.00	312.20	1.20		15°						sandstone	sandstone blended siltstone, light grey.
		312.20	321.40	9.20								mudstone	brown and grey, little bauxitic, massive.
		321.40	331.00	9.60		10°						sandstone	white-grey, medium-coarse grained, quartz and dark debris predominately, pure, moderately-sor subrounded, coarse toward base; at 323.50m, bedded plane: 10°; at 326.50m, bedded plane: 15°, 5%HCL.
		331.00	340.40	9.40								mudstone	brown and grey, bautitic, massive; at 333.50~333.60m, 3 coal streaks.
		340.40	347.72	7.32		20°						sandstone	light grey, medium-coarse grained, coarse toward base; at bottom, 0.15m, fine-grained conglo predominately; at 343.0m, bedded plane: 20°; at bottom, bedded plane: 20°.
		347.72	352.90	5.18		20°						sandstone	light grey, fine-medium-coarse grained, coarse toward base, moderately-sorted , angular, quar predominately; at middle part, a few coal film; at 350.50m, bedded plane: 20°.
		352.90	358.00	5.10								mudstone	dark grey to light black, interbedded with light grey siltstone (40%).
		358.00	362.50	4.50								sandstone	light grey, fine-grained, with dark mudstone laminate; at 360.0m, bedded plane: 30°; at 361.0 30°.
		362.50	369.30	6.80								mudstone	light black, little bauxitic, massive; at 367.0m, bedded plane: 30°.
		369.30	373.00	3.70		20°						sandstone	light grey, fine-grained; at upper part, pure sandstone; at lower part, interbedded with thi mudstone; at bottom, bedded plane: 20°.
		373.00	384.40	11.40								mudstone	light black, massive, with leaf fossil; at 382.80m, a siderite nodule (40x40mm).
		384.40	391.15	6.75		25°						sandstone	white-grey, fine-grained, with MS laminate, bedded plane: 25°; at 385.20m, bedded plane:25°.
		391.15	401.65	10.50								mudstone	light black, massive; at 391.40~391.95m, little carbonaceous; at 394.70~396.50m, bauxitic mud 400.0~401.0m, black, little carbonaceous.
		401.65	402.80	1.15		20°						sandstone	white-grey, fine-grained, with black MS laminate; at 402.10m, bedded plane: 20°.
		402.80	405.60	2.80								mudstone	black, massive; at bottom, 5 coal streaks.
		405.60	407.75	2.15		15°						sandstone	white-grey, fine-grained grained, with MS laminate, bedded plane: 15°.
		407.75	408.20	0.45								mudstone	black, massive; at 408.0~408.15m, broken much.
		408.20	**408.60**	0.40		**BC**						**coal**	**coal seam 0.40m, RC: 0.40m, intact, no parting, shiny, light.**
		408.60	409.70	1.10								mudstone	black, little silt, little carbonaceous.
		409.70	414.20	4.50		15°						sandstone	conglomerate, white-grey, Ø:2~7mm, quartz, chert, dark debris, poorly-sorted, angular and unr part, interbedded with medium-grained sandstone.
		414.20	425.58	11.38		15°						sandstone	white-grey, fine-grained; at middle part, one layer of conglomerate, 2 layers of black mudst bedded plane: 15°; at 419.0m, bedded plane: 15°.
		425.58	433.77	8.19		15°						sandstone	white-grey, fine-grained, interbedded with light black muddy siltstone; at 430.0m, bedded pl
Hulcross		433.77	492.49	58.72		15°						siltstone	dark grey, little muddy, interbedded with white-grey fine-grained sandstone, laminate, fine content: 30%; at 466.0m, 0.08m, Kaolinite, light brown, not react with HCL 5%; at 435.70~436. fracture No:6/m; at 437.50m, bedded plane: 15°; at 450.0m, bedded plane: 15°; at 457.0m, 460. 15°; at 460.0m, bedded plane: 10°; at 480.0m, bedded plane: 10°; at 490.0m, bedded plane: 10°
		492.49	505.65	13.16		15°						siltstone	dark grey, interbedded with white-grey fine-grained sandstone thin layers (40%); at 103.0m 15°.
		505.65	506.05	0.40								conglomerate	conglomerate, white-grey, Ø:2~6mm, quartz and debris predominately, moderately-sorted, unangu
		506.05	508.40	2.35								mudstone	black, rich in leaf fossil; at 506.20~506.60m, few coal streak; at 507.50~507.70m, carbonaceo
		508.40	509.75	1.35								sandstone	white-grey, fine-grained.
		509.75	510.00	0.25								mudstone	black, carbonaceous.
	#2	**510.00**	**510.90**	**0.90**				**Q1**				**coal**	**coal seam, 0.90m, RC: 0.80m, broken, 0.10m lost, shiny, light, brittle, 0.30<0.04>0.56m; 0.30, parting: 510.30~510.34, 0.04m, MS; CO: 510.34~510.90,0.56m, RC: 0.46m, 0.10m lost. 0.30<0.04>0.56m.**
		510.90	513.25	2.35		15°						sandstone	white-grey, fine-grained.
		513.25	519.20	5.95		15°						mudstone	black, with few thin layers of fine-grained sandstone; at 516.0m, bedded plane: 15°; at 518. streak.
	#3	**519.20**	**519.80**	**0.60**								**coal**	**coal seam, 0.60m, RC: 0.60m, light , bright, parting: 519.52~519.72m, 0.20m, carbonaceou .**
		519.80	522.10	2.30		15°						sandstone	white-grey, fine-grained, bedded plane: 15°.
		522.10	523.08	0.98								mudstone	black, massive; at upper part, carbonaceous, a few coal streak.
		523.08	531.05	7.97		15°						sandstone	white-grey, fine-grained, interbedded with thin layers of black MS; at 527.0m, bedded plane
		531.05	540.00	8.95								mudstone	black, massive; at 533.0~533.60m, many coal streaks; at 539.27~539.37m, 0.10m, coal seam, lig part, lots of coal debris and leaf fossil.
		540.00	546.10	6.10		25°						sandstone	white-grey, fine-grained -grained, with dark MS laminate; at 541.0m, bedded plane:20°; at 543 plane:25°.
		546.10	550.90	4.80								mudstone	black, massive, rich in leaf fragment fossil; at 550.05~550.90m, carbonaceous MS, numerous co
		550.90	562.90	12.00		20°						sandstone	white-grey, fine-grained, with numerous mudstone laminate; at 556.0m, bedded plane: 20°; at 5 plane: 20°.
		562.90	563.62	0.72		15°						siltstone	light grey.
	#5	**563.62**	**568.05**	**4.43**				**Q2-4**		**CBM01**		**coal**	**coal seam, 4.43m, RC:4.43m, half broken, light, shiny. CO: 563.62~56.75, 0.13m, parting: 0.05m, black MS. CO: 563.80~567.30m, 3.50m, parting: 567.30~567.40m, 0.10m, black, MS. C 0.65m, coal structure: 0.13<0.05>3.50<0.10>0.65m .**
		568.05	568.30	0.25								mudstone	black, massive, with vitrain lenses.
		568.30	569.65	1.35		15°						sandstone	white-grey, fine-grained grained.
		569.65	571.30	1.65								mudstone	black, numerous coal streaks. 570.35m, 0.05m, coal seam, shiny, light.
		571.30	571.52	0.22								coal	coal seam, 0.22m, RC: 0.22m, intact, shiny, light.
		571.52	572.85	1.33		15°						mudstone	black; at middle part, fine-grained sandstones; at upper and lower part, MS with numerous vi laminate.
	#5-1	**572.85**	**573.60**	**0.75**				**Q5**				**coal**	**coal seam, 0.75m, RC: 0.70m, no parting, light,bright.**
		573.60	574.05	0.45								mudstone	black, massive, numerous coal streak.
		574.05	579.80	5.75								sandstone	white-grey, medium-grained, quartz predominately, well-sorted; at 577.40~579.90m, broken, fra
		579.80	593.75	13.95								mudstone	black, carbonaceous locally; at 585.10~585.25m, 0.15m, coal seam; at 585.25~585.75m, 0.50m, c
	#6	**593.75**	**594.70**	**0.95**				**Q6**				**coal**	**coal seam, 0.95m, RC: 0.65m, 0.20m lost, half-broken; light, shiny, no parting.**
		594.70	595.30	0.60								mudstone	black, many coal streak; at 594.80m, 0.05m, coal seam.
		595.30	603.55	8.25		15°						sandstone	white-grey, fine-grained, with dark MS laminate, bedded plane: 15°; at 602.0~603.55m, broken,
	#6-1	**603.55**	**604.20**	**0.65**								**coal**	**coal seam, 0.65m, RC: 0.60m, broken into pieces, shiny, light, no parting.**
		604.20	604.90	0.70								mudstone	black, carbonaceous, very broken, shattered.
		604.90	613.75	8.85		20°						mudstone	black, massive, rich in leaf fossil locally; at 610.20~610.60m, white-grey fine-grained sand plane: 20°.
	#7	**613.75**	**614.90**	**1.15**				**Q7**				**coal**	**coal seam, 1.15m, RC:1.05m, intact, 0.10m lost, shiny, light, no parting.**
		614.90	617.60	2.70								mudstone	black, massive, with leaf fossil; at 615.45~615.70m, coal, 0.25m, RC: 0.25m, intact, shiny, l at 616.90m, 0.08m, coal , shiny; at 617.40m, 0.10m, coal, broken.
		617.60	628.00	10.40								siltstone	light grey, interbedded with black MS laminate and thin layers of fine-grained sandstone, b at 617.60~620.50m, numerous, calcite veins.
		628.00	646.70	18.70		15°						sandstone	white-grey, fine-grained, with black mudstone and dark siltstone laminate; at 638.20m, bedded 636.20m, a coal streak; at 636.40m, a coal film; at 644.50m, bedded plane: 15°.
		646.70	652.77	6.07								mudstone	black, massive; at 649.77~650.07m, carbonaceous, rich in leaf fossil.
	#7-1	**652.77**	**654.30**	**1.53**				**Q8, Q9**				**coal**	**coal seam, 1.53m,RC:1.1m, very broken, 0.43m lost, dull, little heavy. CO: 652.77~653.40 0.43m, 0.20m lost, parting: 653.40~653.70m, 0.30m, carbonaceous MS. CO: 653.70~654.30m, 0.23m lost. Coal structure: 0.63<0.30>0.60m.**
		654.30	655.40	1.10								mudstone	black, massive; at 654.30~654.80m, numerous coal streak; at 654.50~654.60m, 0.10m, broken mu
		655.40	671.03	15.63								mudstone	black, massive; at 659.50m, 0.10m, coal seam, very broken; at 659.80m, 0.10m coal, broken muc 654.80~663.60m, broken, fracture No:8/m, rich in leaf fossil locally.
	#8	**671.03**	**673.42**	**2.39**				**Q10, Q11**				**coal**	**coal seam, 2.39m, RC: 1.67m, 0.72m lost, very broken, light, shiny. CO: 671.03~671.60m, 671.60~671.75m, 0.15m, black, MS. CO: 671.75~673.12m, 1.37m, RC: 0.65m, 0.72m lost, part 673.12~673.22m, 0.10m, black, MS. CO: 673.22~673.42m, 0.20m. Coal structure: 0.57<.15>1.**
		673.42	674.41	0.99								mudstone	black, massive, rich in leaf fossil, with numerous coal streak.
	#8-1	**674.41**	**676.90**	**2.49**				**Q12,13**				**coal**	**coal seam, 2.49m, RC: 1.76m, 0.73m lost, broken much. CO: 674.41~674.70m, 0.29m, parting 0.40m, at 674.70~675.0m, black, mudstone. at 675.0~675.10m, 0.10m, carbonaceous MS. CO:6 0.20m, parting: 675.30~675.70m, 0.40m, black MS. CO: 675.70~676.90m, 1.20m, RC:0.47m, 0. structure: 0.29<0.40)0.20<0.40>1.20m.**
		676.90	678.10	1.20								mudstone	black, massive, broken.
		678.10	**678.35**	**0.25**								**coal**	**0.25m, light, shiny, broken much.**
		678.35	681.20	2.85		40°						mudstone	black, with leaf fossil, bedded plane:40°.
		681.20	694.50	13.30								sandstone	white-grey, fine-grained, interbedded with dark MS laminate, horizontal bedding developed, w calcite veins at different direction: at 685.0m, bedded plane: 50°; at 687.0m (45°); at 688.0 (50°), 692.50 (40°); at 687.0~689.50m, broken, fracture No:8/m, with many calcite veins.
		694.50	706.00	11.50		55°						mudstone	black, brittle, with a few fine-grained sandstone laminate; at 691.20~699.50m, broken, fract polish of fracture surface; at 694.50~699.50m, numerous calcite veins at different directions at 702.0 (65°); at 705.50~706.0m, carbonaceous; at 705.70~705.85, coal seam, much broken, sha
		706.00	707.80	1.80								mudstone	black, rich in leaf fossil, broken throughout, fracture No:15/m.
	#9	**707.80**	**709.30**	**1.50**								**coal**	**coal seam, 1.50m, RC: 0.05m, 1.45m lost, only few coal fragment left, no parting, maybe**
		709.30	715.50	6.20								mudstone	black, massive; at lower part, few calcite veins (5mmx0.2m).
		715.50	729.50	14.00		70°~65°						mudstone	light black, interbedded with layers of siltstone (content:40%), fold zone; at 716.0m, bedde 717.50m (65°).
		729.50	736.00	6.50								sandstone	white-grey, fine-grained, interbedded with thin layer of black mudstone; at 729.90m (65°); a 732.50~734.0m, numerous calcite veins; at 735.0~735.60m, numerous minor calcite veins.
		736.00	738.20	2.20		50°						mudstone	black, massive; at 737.50m, bedded plane: 50°.
		738.20	738.70	0.50								mudstone	black, carbonaceous, massive, with leaf fossil, a few coal streaks.
		738.70	739.05	0.35								coal	coal seam, 0.35m, RC: 0.03m, 0.30m lost, no parting, shiny, light.
		739.05	764.76	25.71								sandstone	light grey, fine-grained, with dark MS laminate, dark debris and quartz predominately; at 745 vertical facture, fracture No:4/m; at 747.0~747.30m, vertical fracture, fracture No: 2/m; at plane:80°; at 747.0m (80°); at 752.0m (70°), 753.0m (70°); at 754.0m (70°); at 762.0~762.50m, fracture No:4/m, fracture plane infill calcite; at 763.0m, bedded plane:65°.
		764.76	768.30	3.54								mudstone	black, carbonaceous locally, numerous coal streak, very broken into pieces, from 764.50~767.5 lost.
		768.30	775.63	7.33		40°						mudstone	black; at upper part, muddy siltstone; at 771.20m, bedded plane:40°.
		775.63	778.04	2.41								mudstone	black, carbonaceous. 2.41m, RC: 1.20m, 1.21m lost, broken much, shattered, powder, with a few debris and mudstone mixed into version debris and powder. Coal seam: 776.83~778.04m, 1.21m lo coal?
		778.04	791.50	13.46		40°						mudstone	black, rich in leaf fossil; at 782.50~783.80m, interbedded with thin layers of fine-grained 786.10~786.60m, fine-grained sandstone; at 783.0m, bedded plane: 40°; at 786.0m (40°); at 78
		791.50	**791.60**	**0.10**								**coal**	**0.10m, RC:0.50m, broken, no parting, only few coal debris left.**
		791.60	791.80	0.20								mudstone	black, massive.
	#10	**791.80**	**793.87**	**2.07**				**Q14**				**coal**	**coal seam, 2.07m, RC:0.20m, 1.87m lost, only few coal fragment left, no parting, shiny,**
		793.87	794.50	0.63								mudstone	black, massive, with a few vitrain lenses.
	#10-1	**794.50**	**795.60**	**1.10**				**Q15**				**coal**	**coal seam, 1.10m, RC:0.05m, 1.05m lost, broken, only few coal debris left, no parting, sl**
		795.60	797.00	1.40								mudstone	black, massive, a few vitrain lenses, with leaf fossil.
		797.00	808.00	11.00		40~55°						mudstone	light black, brittle; at 709.0m (40°); at 802.50m, bedded plane:40°; at 804.0m (40°); at 807.
		808.00	821.30	13.30		50°						mudstone	black, brittle; at 816.90~817.10m, coal seam, 0.20m, RC:0.20m, very broken; at 816.60~816.90m from 810.50~817.80m, broken, fracture No:15/m, fracture plane is shiny smooth; at 813.0m (bed
		821.30	825.90	4.60		50°						sandstone	white-grey, fine-grained, with dark MS laminate, horizontal bedding; at 821.90m, bedded plane 841.0m,(55°); at 825.40m, (50°); at top, numerous calcite veins; at 822.0~827.0m, broken, fra inclined fracture.
		825.90	843.50	17.60		50°						mudstone	light black, silt, interbedded with white-grey fine-grained sandstone laminate, brittle, wi locally; at 832.60m (55°); at 834.0m (50°); at 838.0m, (45°).
		843.50	850.90	7.40		50-75-60°						sandstone	white-grey, fine-grained, interbedded with thin layers of dark muddy siltstone, horizontal b bedded plane: 50°; at 844.50m (50°); at 845.70m (75°); at 846.80m (75°); at 849.0m (60°); at
		850.90	855.20	4.30								mudstone	black, massive; at bottom, carbonaceous, few coal streak; at 854.30~855.20m, broken much into No:30/m.
	#10-2	**855.20**	**856.20**	**1.00**								**coal**	**coal seam, 1.0m, RC:0.05m, 0.95m lost, only a few coal debris left, no parting.**
		856.20	857.30	1.10								mudstone	black, a few coal streaks, broken much, fracture No:30/m.
Gates		857.30	869.82	12.52								mudstone	black, massive, brittle, can be easily broken by hammer, almost no leaf fossil, with minor ca at 869.50~869.70, broken, a vertical fracture, fracture No:2/m.
	#10-3	**869.82**	**870.60**	**0.78**				**Q16,17**				**coal**	**coal seam, 0.78m, RC:0.32m, 0.46 lost. CO: 869.82~870.02m, 0.20m, RC: 0.20m, parting: 87 0.06m, MS, blk. CO: 870.08~870.60, 0.52m, RC: 0.07m, 0.45m lost, 0.20<0.06>0.52m.**
		870.60	883.00	12.40		45-60°						sandstone	white-grey, fine-grained grained, with dark silt mudstone laminate; at 872.50~872.70m, broke at 875.0~878.60m, broken, fracture No:8/m, rich in minor calcite veins at different direction bedded plane:40°; at 871.0m (45°); at 871.50~874.50m, bedded plane:90°. 881.40m, bedded plane
		883.00	885.10	2.10								mudstone	black, massive; at 884.60~884.75m, few coal streaks.
		885.10	899.75	14.65		55-60-30						siltstone	grey, interbedded with thin layers white-grey fine-grained sandstone and dark mudstone, hor bedding developed; at 886.70~887.50m, little carbonaceous MS, very broken, fracture No:30/m, at 888.0m (55°); at 890.50m (60°), at 891.0m (60°); at 891.20~894.10m, bedded plane: 90°; at 894.80~895.30m,numberous minor calcite vein at different direction, vein No:300/m; at 894.50m (35°); at 899.0m (30°).
		899.75	901.95	2.20		20						mudstone	black, interbedded with thin layers of fine-grained sandstone; at 900.0m (20°); at 901.0m,
	#10-4	**901.95**	**903.95**	2.00				**Q14**				**coal**	**coal seam, 2.0m, RC:0.60m, 1.40m lost, broken in pieces, lost place at top, parting: 903. MS, broken, 0.04m. coal structure: 1.86<0.04>0.10m, light, bright.**
		903.95	904.80	0.85								mudstone	grey, massive; at top, carbonaceous, with leaf and branch fossil.
		904.80	906.30	1.50								sandstone	light grey, fine-grained.
	#10-5	**906.30**	**907.70**	**1.40**				**Q19**		**CBM02**		**coal**	**coal seam, 1.40m, RC:0.63m, 0.77m lost, half broken, bright light, no parting.**
		907.70	908.20	0.50								sandstone	white-grey, fine-grained.
		908.20	911.25	3.05								mudstone	grey, little bauxitic, massive.
		911.25	922.80	11.55		45-40						sandstone	light grey, fine-medium grained, coarse toward base; at 921.10~921.95m, medium grained, numer nodules, with a few calcite veins; at 913.0m (45°); at 915.0m (45°); at 916.6m (50°); at 919. 920.50m (40°).
		922.80	923.67	0.87								mudstone	black, massive.
	#10-6	**923.67**	**925.75**	**2.08**				**Q20**				**coal seam**	**2.08m, RC:0.38m, 1.70m lost, a few pieces of coal left, no parting, Boney coal mostly, 1**
		925.75	927.55	1.80								mudstone	1.80m, RC:1.30m, 0.50m lost, black, carbonaceous mostly, a few coal steak, rich in leaf fossi into pieces, fracture No:25/m.
		927.55	929.50	1.95								mudstone	brown and grey, bauxitic, massive.
		929.50	940.30	10.80		40						mudstone	light black, little silt, hard, brittle, with a few thin layers of white-grey fine-grained s 935.70m, bedded plane: 50° ; at 936.50~937.50m, broken, fracture No:20/m; at 939.10~940.30m, grey, fine-grained, interbedded with dark mudstone laminate; at 939.40m (40°); at 939.70m (
		940.30	943.10	2.80								mudstone	black, with a layer of sandstone, a few coal steaks at upper part; at 940.40~941.60m, broken,
		943.10	944.50	1.40								mudstone	0.70m lost, black, carbonaceous, massive, a few coal streaks, broken throughout.
		944.50	947.60	3.10								sandstone	white-grey, fine-grained.
		947.60	964.30	16.70		40						mudstone	black, with few layers of fine-grained sandstone, with carbonization of tree branch fossil; little broken, fracture No:4/m; at 948.0m, bedded plane: 40° ; at 949.0m (45°); at 954.0m (4 (40°); at 955.45m, 0.08m, coal, light, bright; at 955.30~955.45m, few coal streaks.
		964.30	964.70	0.40								mudstone	black, carbonaceous, massive, broken throughout.
		964.70	971.70	7.00		45° ~30°						sandstone	white-grey, fine-grained grained, interbedded with mudstone laminate; at 965.50m, bedded pla (45°); at 968.30m (35°); at 971.0m (30°).
		971.70	972.63	0.93								mudstone	siltstone, interbedded with fine-grained sandstone thin layer.
		972.63	974.50	1.87								mudstone	black, carbonaceous in part, with a few coal film and streaks, rich in leaf fossil.
		974.50	977.70	3.20								mudstone	black, massive; at middle part, carbonaceous; at 976.80~977.0m, few coal steaks.
		977.70	978.60	0.90								mudstone	grey, light grey, little bauxitic, massive.
		978.60	984.30	5.70								mudstone	black, silt; at 983.20~983.60m, broken, fracture No: 10/m.
		984.30	995.00	10.70		35° ~40°						sandstone	white-grey, fine-grained, interbedded with thin layers of black silt mudstone, horizontal be bedded plane: 40° ; at 990.0m (35°); at 993.0m (40°).
		995.00	996.70	1.70								mudstone	black, massive, with a few leaf fossil.
		996.70	998.80	2.10								sandstone	white-grey, fine-grained, pure, quartz and dark debris, well-sorted.
		998.80	**999.05**	**0.25**								**coal**	**0.25m, RC: 0.25, intact, no parting, light, bright.**
		999.05	1002.58	3.53		40						mudstone	black, massive; at upper part, a few coal steaks, rich in leaf fossil; at 1001.20m (40°).
		1002.58	1003.80	1.22		40						sandstone	white-grey, medium-grained, quartz predominately, well-sorted; at 1003.0m, bedded plane:40°.
	#12?	1003.80	1023.64	19.84		30						mudstone	black, massive, brittle, conchoidal; at 1010.70~1011.60m, a few thin layers of fine-grained 1010.70m, bedded plane:35° ; at 1011.50m (30°); at 1015.20~1015.60m, medium-grained sandston hard, cannot scratch by iron knife, not react with 5% HCL; at 1022.70~1023.50m, a few coal st 1013.0~1023.40m, little fracture, fracture No:6/m; at 1012.30~1012.80m, little carbonaceous.
		1023.64	1040.50	16.86		30-25						sandstone	white-grey, medium-grained, quartz and dark debris predominately, pure sandstone, well-sorted unangular; at 1031.40~1031.60m, few coal film; at 1024.10m, bedded plane: 30° ; at 1025.20m ((30°); at 1039.60~1040.50m, numerous coal lenses and calcite veins; at 1037.80m (25°).
		1040.50	1042.70	2.20								mudstone	black, massive, hard, brittle, with many minor calcite veins.
		1042.70	1045.00	2.30								mudstone	brown and grey, bauxitic, massive, soft, can be scratched by iron knife, brittle.
		1045.00	1056.50	11.50		45-55						mudstone	light black, little silt, interbedded with black mudstone laminate, brittle, easily be smash few leaf fossil; at 1045.50~1046.40m, broken, fracture No:15/m; at 1048.60m, bedded plane: 45 °); at 1052.80m (10°); at 1052.80m, minor fold; at 1054.20m (50°); at 1054.80m (45°); at 1055.50m (45°).
		1056.50	1059.00	2.50		55						mudstone	black to carbonaceous, carbonaceous mostly, numerous thin vitrain in streaks; at 1057.0m, bed 1057.80m, coal, 0.07m, broken much; at 1058.70m, coal, 0.05m, broken much; at 1058.30m, 0.08m
		1059.00	1059.30	0.30								mudstone	black, carbonaceous, numerous vitrain, streaks, broken.
		1059.30	**1059.60**	**0.30**								**coal**	**0.30m, RC:0.20m, much broken, shuttered pieces, bright, light, no parting.**
		1059.60	1060.05	0.45								mudstone	black, little carbonaceous, numerous coal thin streaks.
		1060.05	**1060.20**	**0.15**								**coal**	**0.15m, RC:0.10m, broken much, light, no parting.**
		1060.20	1062.10	1.90								**mudstone**	**black, broken, fracture No:30; at 1069.50m (80°).**
		1062.10	**1062.30**	**0.20**								**coal**	**coal seam, 0.20m, RC:0.15m, light, bright, broken, no parting.**
		1062.30	1062.60	0.30								mudstone	black, carbonaceous.
		1062.60	1064.50	1.90								mudstone	black to carbonaceous, broken into pieces, numerous coal thin streak; at 1063.0~1063.30, sili black, hard, heavy; at 1063.60~1063.75m, coal, 0.15m, RC: 0.10m, broken, light, bright, no pa
		1064.50	1065.50	1.00								mudstone	black, carbonaceous in part; at 1065.20m, 0.05m coal seam.
		1065.50	1070.50	5.00								mudstone	black, little silt, massive; at 1066.60~1067.60m, broken, fracture No:15/m.
		1070.50	1076.60	6.10		70° ~50°						siltstone	light black, muddy, interbedded with thin layers of white-grey fine-grained sandstone; at 1 plane:70° ; at 1073.80m (55°); at 1074.50m (50°).
		1076.60	1080.70	4.10		50° ~45°						sandstone	white-grey, fine-grained -grained, with dark mudstone laminate, bedding developed; at 1076.90 calcite veins; at 1077.20m (50°); at 1078.50m (50°); at 1070.50m (50°); at 1080.30 (45°).
		1080.70	1084.00	3.30		50° ~45°						mudstone	black, brittle, with white-grey fine-grained sandstone laminate; at 102.0m (50°); at 1084.0
		1084.00	1100.50	16.50		40° -45° -30°						sand

Wapiti River — **Drill Hole Core Log**

Drilling Company:	Canada Drilling Company	**Hole No.:**	WP1C55
Rig Type:	VD-5000	**Collar Elevation:**	1201.7m
Total Depth:	843.00m(second time); 581.0m(first time)	**Coordinate: Northing:**	6071149.1
Spud Date:	22-Aug-12	**Easting:**	650682.7
Finished Date:	27-Sep-12	**Logging Geologist:**	Victor, Lee, Chris, Liang
Core Size:	HWT/HQ/BQ	**Note:**	

Formation	Coal Seam	Core Depth Interval		Thickness, m		Strata Dip	Coal Floor Elevation	Sample ID			Rock Hardness	Rock Name	Lithology Description
		From	To	Thick	TRUE			Coal	Rock	CBM			
Q		0.00	34.00	34.00	34.00							till	till, Sandstone fragment, weathered deposits.
Hasler		34.00	57.00	23.00	23.00	40						siltstone	grey to dark grey, with fine-grained light grey sandstone(5%). At 47.00m, bedded plane: 40 degree. At 34.00-45.00m, fracture zone. At lower part, broken much, fracture number: 60/m. fracture surface are slickensided and shiny. At 48.50-57.00m, fracture zone, broken, fracture number: 20/m.
		57.00	84.00	27.00	26.90	43						siltstone	same features as above, dark grey, slightly fracture. At 63.00-63.10m, mud pebbles. At 64.10-66.00m, broken. At 73.00m, bedded plane: 33 degree. At 76.00-80.50m, broken, fracture number: 15/m. at 87.50m. Bedded plane: 43 degree.
		84.00	105.00	21.00	20.90							siltstone	dark grey, interbedded with light grey fine-grained sandstone laminates (15%). Slightly fracture. At 89.00-90.00m, fracture developed, fracture dip: 65-70 degree. At 99.00m, bedded surface: 39 degree. At 103.70-104.30m, very much broken.
		105.00	128.50	23.50	23.50	36						siltstone	same features as above, dark grey, plus, light grey fine-grained sandstone laminates (30%). At 106.00m, bedded plane: 38 degree. Micro-horizontal bedding. at 114.00m. Bedded plane: 35 degree. At 126.00m, bedding plane: 36 degree. At base, minor siltstone.
		128.50	129.50	1.00	1.00							siltstone	dark grey, very much broken, fracture zone. fracture number: more than 100/m.
		129.50	147.70	18.20	18.10							siltstone	dark grey, interbedded with light grey fine-grained sandstone laminates (20%). Slightly fracture. Micro-horizontal bedding. bedded surface: 34 degree. At 144.64-147.70m, fracture developed, very much broken. Broken surface are slickensided and shiny.
		147.70	163.70	16.00	16.00	40-57						siltstone	same as previous interval, plus bedded plane enlarge. At 148.50m, bedding plane: 57 degree. Distorted bedding on FGSS surface, slightly fracture, fracture surface are slickensided and shiny. Disturbed bedding and deformation. At 159.50m, pyrite nodule (2x5mm). at 160.50m, 45 degree; at 163.50m, 50 degree; at 165.00m, 40 degree.
		163.70	192.00	28.30	28.30							siltstone	dark grey, muddy. interbedded with light grey fine-grained sandstone laminates (20%). Lenticular bedding. At 183.00-192.00m, minor FGSS.
		192.00	209.20	17.20	17.20	43-55						siltstone	same features as above, plus progressively light grey FGSS (40%). Micro-horizontal bedding. At 200.00m, bedding plane: 43 degree. At 200.90-209.20m, fracture developed, fracture surface are slickensided and shiny. At 205.00m, bedding plane: 50 degree. At 209.00m, dip enlarge 55 degree.
		209.20	224.70	15.50	15.50	45						siltstone	same as previous interval, plus Disturbed bedding and deformation on FGSS bedded plane. At 210.00-213.00m, broken. At 216.00m, dip: 45 degree.
		224.70	246.00	21.30	21.30	36						siltstone	dark grey, little muddy. interbedded with light grey fine-grained sandstone laminates (15%). At 228.20m, bedding plane: 33 degree. At 240.00m, bedded plane: 35 degree. At 245.00m, bedded plane: 36 degree.
		246.00	279.00	33.00	33.00							siltstone	same features as above, plus progressively light grey FGSS (20%). disturbed bedding on FGSS bedding plane. from 249.50-255.20m, fracture developed, fracture surface are slickensided and shiny, dip enlarge. At 264.00-266.00m, vertical fracture. Diturbed bedding on FGSS bedding surface. at 275.30-276.00m, slickensided and shiny.
		279.00	300.00	21.00	21.00	43						siltstone	dark grey, interbedded with light grey fine-grained sandstone laminates (40%). Slightly fracture. At 294.00m, bedding plane: 43 degree. At 291.00-300.00m, very much broken, fracture number: 15/m.
		300.00	322.50	22.50	22.50	45-57						siltstone	dark grey, interbedded with light grey fine-grained sandstone laminates (25%). Normal bedding is 45 degree, At 306.50m, bedding plane enlarge to 57 degree. At base, FGSS laminates increased. Slickensided and shiny.
		322.50	330.33	7.83	7.83							siltstone	dark grey, interbedded with light grey fine-grained sandstone laminates (30%). Fracture developed, broken surface are Slickensided and shiny.
		330.33	330.53	0.20	0.20							conglomerate	0.20m, light grey, fine-grained, Ø: 3-7mm.
Boulder Creek		330.53	336.15	5.62	5.62							sandstone	medium-grained, light grey. From 332.00-333.50m, dark grey siltstone.
		336.15	342.30	6.15	6.15							mudstone	bauxitic mudstone. Brown and grey, massive, minor calcite vein. At 337.56m, coal streak.
		342.30	346.30	4.00	4.00							sandstone	fine-grained, light grey. At 343.28-344.00m, dark grey siltstone with coal threads. Rich in irregular calcite vein on joint plane.
		346.30	357.00	10.70	10.70							mudstone	bauxitic mudstone. Brown and grey, massive, minor black mudstone. No plant fossil, stain hand. Minor Fe_{2+} and calcite vein.
		357.00	368.50	11.50	11.50	58						sandstone	fine-grained, light grey. Interbedded with dark grey siltstone laminates (30%). Irregular Calcite vein developed. At 359.00m, bedding plane: 58 degree. Slickensided and shiny. At base, minor coal threads.
		368.50	386.00	17.50	17.50	43						mudstone	bauxitic mudstone. Massive. At top, black mudstoe mainly. From 372.50-373.00m, rich in red Fe2+ conclusion. White-grey, stain hand. From 374.00-379.00m, dark grey siltstone mainly. From 379.00-381.00m, more bauxitic, and red Fe2+ conclusion. Minor calcite vein, react with 5% HCL. at 378.00m, bedding plane: 42 degree.
		386.00	393.00	7.00	7.00							sandstone	fine-grained, light grey, with dark grey siltstone and calcite vein. At 391.90-392.10m, broken very much.
		393.00	405.00	12.00	12.00	50						mudstone	bauxitic mustone. White-grey. At 397.00-398.00m, FGSS. At 405.50m, bedded plane: 50 degree.
		405.00	418.00	13.00	13.00							siltstone	grey, minor bauxitic. Interbedded with light grey fine-grained sandstone and black mudstone laminates. Minor coal film and calcite vein.
		418.00	420.60	2.60	2.60							sandstone	fine-grained, light grey, infilled irregular calcite vein to core axis.
		420.60	429.20	8.60	8.60	53						siltstone	grey, locally bauxitic. Interbedded with light grey fine-grained sandstone and black mudstone laminates. At 422.50m, bedding plane: 53 degree.
		429.20	432.20	3.00	3.00							sandstone	fine-grained, light grey, react with 5% HCL.
		432.20	435.20	3.00	3.00							siltstone	dark grey, massive.
		435.20	440.00	4.80	4.80							mudstone	bauxitic mudstone. White-grey, massive.
		440.00	445.35	5.35	5.35							sandstone	fine-grained, light grey, react with 5% HCL. Interbedded with minor dark grey mudstone laminates and Minor coal film and infilled irregular calcite vein to core axis.
		445.35	453.20	7.85	7.85	45						mudstone	bauxitic mudatone. With light black mudstone. At 448.00m, bedded plane: 45 degree.
		453.20	456.00	2.80	2.80							siltstone	grey, massive, minor bauxitic.
		456.00	456.65	0.65	0.65							mudstone	black, massive.
		456.65	**456.80**	**0.15**	0.15							**coal**	**0.15m coal seam. Black.**
		456.80	458.00	1.20	1.20							mudstone	dark grey minor coal film.
		458.00	463.20	5.20	5.20							mudstone	bauxitic mudstone. White-grey, massive.
		463.20	479.00	15.80	15.80	55-45						siltstone	dark grey, with light grey fine-grained sandstone laminates. At 466.50m, bedded plane: 55 degree. And with black mudstone laminates, muddy. At 471.50-477.50m, black mudstone, rich in coal threads. At 470.00m, dip: 45 degree. At base, massive, no bedding.
		479.00	489.50	10.50	10.50	56						mudstone	bauxitic mudstone. Massive. At 483.00m, bedded plane: 56 degree. Numerous plant root fossil. At 482.32-484.00m, drak grey siltstone.
		489.50	492.50	3.00	3.00	55						mudstone	dark grey,massive. Rich in coal threads. At 491.50m, bedding plane: 55 degree. At 490.17-490.27m, 0.10m coal seam.
	BC	**492.50**	**493.15**	**0.65**	**0.05**							**coal**	**0.65m BC coal seam. RC: 0.05m. Badly broken and poor recovery. Only few coal fragments (2-3cm).**
		493.15	498.80	5.65	5.65							sandstone	medium-grained, light grey. Normal-sorted, quartz and debris predominately. At base, 0.20m conglomerate.
		498.80	520.50	21.70	21.70	55						sandstone	fine-grained, light grey. Interbedded with minor dark grey mudstone laminates (5%) and irregular quartz vein to core axis. At 500.00m, dip: 55 degree. Locally conglomerate from 501.20-501.30m. At 512.00-513.00m, very much broken. At 520.00m, bedded plane: 52 degree. at base, siderite nodules increased.
Hulcross		520.50	531.00	10.50	10.50	51						siltstone	grey, interbedded with light grey FGSS laminates (40%), micro-horizontal bedding. At 528.00m, bedding plane: 51 degree. Slightly fracture.
		531.00	600.00	69.00	69.00	45-40						siltstone	same features as above, plus light grey FGSS decreased to 25%. At 550.00m, bedded plane: 45 degree. At 552.80-552.85m, 0.05m argilliceous limestone, strong react with 5% HCL. At 560.00m, bedded plane: 43 degree. Minor siderite laminates. At 570.00m, bedded plane: 45 degree. from 576.70-879.00m, broken. at 576.70-576.90m, 0.20m argillceous kanlinate, no react with 5% HCL. at base, FGSS laminates increased progressively. at 600.00m, bedded surface: 40 degree.
		600.00	625.10	25.10	25.10	45						siltstone	dark grey, interbedded with light grey FGSS laminates (40%). Horizontal bedding, at 603.00-603.10m, irregular calcite vein infilled on FGSS surface. At 603.00m, dip: 45 degree. At 612.00m, bedding plane: 41 degree. At 618.50m, dip: 46 degree. From 622.00-625.0m, FGSS increased to 50%. at 625.00m, bedded plane: 45 degree.
Gates		625.10	627.00	1.90	1.90							conglomerate	conglomerate to coarse-grained sandstone. Light grey.
		627.00	627.70	0.70	0.70							mudstone	carbonaceous mudstone. Rich in plant leaf /root fossils.
		627.70	628.90	1.20	1.20							siltstone	muddy, dark grey, massive. Numerous plant roots fossil and minor coal threads.
		628.90	633.50	4.60	4.60	47						sandstone	grey, fine-grained, with minor dark grey siltstone laminates. At 630.30m, bedded plane: 47 degree.
		633.50	635.10	1.60	1.60							mudstone	silty, light black, massive. Rich in shell fragment and carbonaceous fragment and coal streak.
	3#	**635.10**	**635.92**	**0.82**	**0.57**		**574.08**	**Q1**				**coal**	**0.82m 3# coal seam. RC: 0.57m. Black, light, half-intact, no parting.**
		635.92	636.50	0.58	0.58							mudstone	black, massive.
		636.50	639.00	2.50	2.50	50						siltstone	grey, interbedded with light grey FGSS laminates (30%), micro-horizontal bedding. At 640.00m, bedding plane: 50 degree.
		639.00	652.30	13.30	13.30	45						sandstone	fine-grained, light grey. With dark grey siltstone laminates (40%). Weak react with 5% HCL. Minor coal threads on joint plane. At 645.00m, bedding plane: 45 degree. At base, richin light black mudstone laminates and coal threads on joint surface.
		652.30	654.90	2.60	2.60							mudstone	light black, massive. Numerous carbonaceous and coal chips.
		654.90	657.50	2.60	2.60	45						sandstone	fine-grained, light grey. With minor dark grey siltstone laminates (40%). Weak react with 5% HCL. At 645.00m, bedding plane: 45 degree.
		657.50	662.00	4.50	4.50							siltstone	dark grey, interbedded with light grey FGSS laminates (10%), minor carbonaceous fragment. micro-horizontal bedding.
		662.00	667.60	5.60	5.60	50						sandstone	fine-grained, light grey. With minor dark grey siltstone laminates (15%). Weak react with 5% HCL. At 667.60m, bedding plane: 50 degree.
		667.60	671.47	3.87	3.87	38						sandstone	pure, fine-grained, light grey. Locally medium-grained. Predominately quartz and debris.
		671.47	673.45	1.98	1.98							mudstone	black, massive. Rich in coal and carbonaceous debris. At 672.00m, bedded plane: 38 degree.
	4#	**673.45**	**674.30**	**0.85**	**0.48**		**535.70**	**Q2**				**coal**	**0.85m 4# coal seam. RC:0.48m. Black, light , bright, half-intact.**
		674.30	677.30	3.00	3.00							siltstone	dark grey, interbedded with light grey FGSS laminates (10%), minor carbonaceous fragment and plant root fossils. micro-horizontal bedding.
		677.30	687.00	9.70	9.70							sandstone	fine-grained, partly medium-grained, light grey. With dark grey siltstone laminates (15%). At base, infilled irregular calcite vein on joint surface. FGSS laminates react with 5% HCL, meanwhile, with minor calcite veins. At 688.00-689.00m, broken, fracture number: 15/m. at base, coal threads observed on joint surface.
		687.00	689.00	2.00	2.00							mudstone	carbonaceous mudstone. Rich in plant leaf /root fossils.
		689.00	690.30	1.30	1.30							siltstone	dark grey , massive.
		690.30	696.00	5.70	5.70	35						sandstone	fine-grained, light grey. Interbedded With dark grey siltstone laminates (30%). Weak react with 5% HCL. Minor calcite veins. At 694.00m, bedded plane: 35 degree. At silt increased.
		696.00	699.00	3.00	3.00							siltstone	muddy, dark grey, massive. At base, Numerous plant roots fossil and carbonaceous fragment, silt toward mud.
	5#	**699.00**	**701.64**	**2.64**	**1.53**		**508.36**	**Q3-4**		**CBM01**		**coal**	**2.64m 5# coal seam. RC: 1.53m. Black, light, broken. Coal lost: 1.11m. Parting: 700.50-700.58m, 0.08m black mudstone. Coal structure: 1.50<0.08>1.06m.**
		701.64	703.58	1.94	1.94							mudstone	black, carbonaceous. Numerous vitrain thin lamiantes and fragment.
	5-1#	**703.58**	**706.04**	**2.46**	**1.55**		**503.96**	**Q5**		**CBM02**		**coal**	**2.46m 5-1# coal seam. RC: 1.55m, coal lost: 0.91m. Black, light. Parting: 705.30-705.35m, 0.05m black mudstone. Coal lost: 703.58-703.95m, lost 0.37m; 705.50-706.04m, lost 0.54m.**
		706.04	710.80	4.76	4.76	30						siltstone	dark grey, interbedded with light grey FGSS laminates (10%), minor carbonaceous fragment and plant root fossils. micro-horizontal bedding. From 708.11-708.46m, numerous siderite nodules. At 710.80m, bedding plane: 30 degree. **From 706.04m BQ drilling.**
		710.80	723.60	12.80	12.80							sandstone	fine-grained, light grey. Interbedded With dark grey siltstone laminates (30%). Weak react with 5% HCL. Minor calcite veins. From 719.10-719.70m, carbonaceous mudstone. At base, slitstone laminates increased to 40%. At722.50m, bedded plane: 26 degree. At 721.80-721.95m, 0.15m fracture zone.
		723.60	726.17	2.57	2.57							siltstone	dark grey, muddy. Rich in plant root fossils and carbonaceous fragment, minor coal streak.
	6#	**726.17**	**726.81**	**0.64**	**0.15**		**483.19**					**coal**	**0.64m 6# coal seam. RC: 0.15m, lost: 0.49m, at 726.32-726.81m. Black, light. Badly broken and poor recovery.**
		726.81	729.85	3.04	3.04							siltstone	dark grey, muddy, numerous plant root ffossils and minor vitrain thin threads.
	6-1#	**729.85**	**730.35**	**0.50**	**0.15**		**479.65**					**coal**	**0.50m 6-1# coal seam. RC: 0.15, lost 0.35m, at 730.00-730.35m. Black, light.**
		730.35	731.60	1.25	1.25	35						mudstone	carbonaceous mudstone. Rich in plant leaf /root fossils. Dip: 35 degree.
		731.60	732.90	1.30	1.30							siltstone	dark grey, minor coal threads.
		732.90	738.00	5.10	5.10	35						sandstone	fine-grained, light grey. Irregular calcite veins observed on joint surface. Fracture developed, with dark grey siltstone laminates. Horizontal bedding, dip: 35 degree.
		738.00	749.90	11.90	11.90							sandstone	medium-grained, light grey. With dark grey siltstone laminates, normal-sorted. Quartz and debris mainly.
		749.90	750.70	0.80	0.80							mudstone	black, massive. Very much broken.
	7#	**750.70**	**752.40**	**1.70**	**0.05**		**457.60**					**coal**	**1.70m 7# coal seam. RC: 0.05m. Coal is badly broken and poor recovery. Only few coal fragments.**
		752.40	753.10	0.70	0.70							mudstone	black, massive. Very much broken.
	7-1#	**753.10**	**755.30**	**2.20**	**0.20**		**454.70**					**coal**	**2.20m 7-1# coal seam. RC: 0.20m. Coal is badly broken and poor recovery. Only few coal fragments. Attention: from 750-759m, recovery only 2.40m, core lost 6.60m. Maybe is coal?**
		755.30	763.70	8.40	5.35							siltstone	dark grey, muddy, much broken.
		763.70	768.00	4.30	4.30							mudstone	black, minor calcite veins, broken. With coal threads trace.
		768.00	777.80	9.80	9.80	55-45						siltstone	dark grey, interbedded with light grey fine-grained sandstone laminates (5%). Fracture developed, polished, infilled coal film (lots). At 767.80m, bedded plane: 55 degree. At 774.50m, bedded plane: 45 degree.
		777.80	783.30	5.50	5.50	50						mudstone	light black, massive. At lower part, Numerous plant root fossils and coal chips. At 782.50m, bedded plane: 50 degree.
	8#	**783.30**	**784.97**	**1.67**	**0.67**		**425.03**	**Q6**				**coal**	**1.67m 8# coal seam. RC: 0.67m. Black, light, bright, broken. Coal fractured to 2-3cm fragments.**
		784.97	788.34	3.37	3.37							mudstone	black, massive. Few calcite vein and coal film trace.
	8-1#	**788.34**	**788.65**	**0.31**	**0.05**		**421.35**					**coal**	**0.31m 8-1# coal seam. RC: 0.05m. Only few coal fragments.**
		788.65	791.28	2.63	2.63							sandstone	light grey, fine-grained, interbedded with minor dark grey siltstone laminates (5%). Calcite vein oberved on joint surface, react with 5% HCL.
		791.28	800.40	9.12	9.12	40						siltstone	dark grey, with light grey fine-grained sandstone laminates (10%) and black mudstone laminates. Abundent plant leaf and root fossils, coal film. At 798.00m, bedded plane: 40 degree.
		800.40	**801.00**	**0.60**	**0.20**							**coal**	**0.60m boney coal. Dull, banded, RC: 0.20m**
		801.00	807.00	6.00	6.00							siltstone	dark grey, interbedded with light grey fine-grained sandstone laminates and black mudstone laminates. Numerous plant root fossils.
		807.00	816.70	9.70	9.70	35-40						sandstone	fine-grained, light grey. With light black mudstone laminated (20%). Micro-horizontal bedding. At 810.10m, dip: 35 degree; at 813.00m, dip: 40 degree. From 807.50-810.00m, fracture developed, polished, infilled calcite vein on joint surface. From 816.20-816.70m, more calcite veins.
		816.70	843.00	26.30	26.30	45-35						siltstone	dark grey, interbedded with light grey fine-grained sandstone laminates. At 818.00m bedded plane: 45 degree. Abundent plant root fossils. At 822.00m, bedded plane: 35 degree. From 823.85-825.00m, black mudstone. At base, FGSS laminates increased to 40%. dip enlarge to 45 degree from 833.50-834.50m). at 832.00m, bedding surface: 35 degree. **TD=843.00m.**

Wapiti River — Drill Hole Core Log

Drilling Company:	Canada Dedua Drilling Company	**Hole No.:**	WP1R04		
Rig Type:	CS-14	**Collar Elevation:**	1206.7m		
Total Depth:	948.0m	**Coordinate:**	**Northing:**	6070577.5	
Spud Date:	23-Sep-12		**Easting:**	651504.5	
Finished Date:	19-Nov-12		**Logging Geologist:**	Victor, Lee, Ricky	
Core Size:	HWT/HQ/NQ		**Note:**		

Formation	Coal Seam	Core Depth Interval		Thickness, m		Strata Dip	Coal Floor Elevation	Sample ID			Rock Hardness	Rock Name	Lithology Description
		From	To	Thick	TRUE			Coal	Rock	CBM			
Q		0.00	9.00	9.00								till	overburden, weathered deposits, yellow-brown, broken mudstone mainly.
Hasler		9.00	16.60	7.60								siltstone	dark grey, muddy, interbedded with FGSS laminate (5%), rock broken, at bottom very much broke
		16.60	33.35	16.75		15°						siltstone	dark grey, interbedded with light grey FGSS laminates (20%), micor-horizontal bedding, bedding 24.00m, minor plant fossil fragment; at lower part, more sideritic nodules or thin laminates;
		33.35	52.50	19.15		15						siltstone	dark grey, with white-grey fine sandstone laminae (15%); at 30.0m, bedded plane: 15°; at 40.0m 51.0m →15°.
		52.50	81.00	28.50		15 40						siltstone	dark grey-light black, muddy, interbedded white and grey fine sandstone thin layers 920%); at 78.50~78.90, broken, fracture No:8; at 80.40~81.0, broken, fracture No:8, a vertical fracture; 20°; at 77.0m→20°; at 81.50m→40°; at 84.0m→40°.
		81.00	106.10	25.10		45°						siltstone	dark grey, muddy, interbedded fine sandstone layers (30%); at 90.0m→45°; at 93.0m→45°; at 96.0→4
		106.10	120.00	13.90		45°						siltstone	light dark, very muddy, with fine sandstone laminae (10%); at 110.0m→43°; at 115.0m,→45°; at 118.0
		120.00	164.00	44.00		45 55						siltstone	dark grey, interbedded with white-grey fine sanstone laminae 920%), horizontal bedding; at 126 45°; at 140.0→45°; at 146.0m→50°, a small fold; at 150.0m→50°; at 141.0~143.20m, broken,fracture No: 5/m; at 15
		164.00	223.80	59.80		90 45						siltstone	dark grey, interbedded white-grey fine sandstone laminae (30%); at 164.5m, bedded plane: 90°; 180.0m→60°; at 184.0m→50°; at 190.0m→50°; at 200.0m→50°; at 202.0m →50°;208.50m→50°; at 213.0m→45°; 2
		223.80	224.10	0.30								conglomerate	conglomerate, light grey, Ø:2~3mm, chert, quarts and debris predominately, matrix of fine sandstone, poorly
Boulder Creek		224.10	225.70	1.60								sandstone	white-grey, medium-grained.
		225.70	228.00	2.30								mudstone	light black, massive, silty, no leaf fossil.
		228.00	230.10	2.10								sandstone	white-grey, coarse-grained with gravel, poorly-sorted.
		230.10	243.95	13.85		45°						sandstone	white-grey, medium-grained, quartz and dark debris mainly, well-sorted, with carbonaceous ms l 231.50~236.90m, broken, fracture No:10/m; at 231.0m→45°; at 237.0m→45°; at 240.0m→45°.
		243.95	246.00	2.05								mudstone	light black to black, massive, little bauxitic, rich in coal debris, numberous coal lenses, an
		246.00	273.30	27.30		45°						mudstone	brown and grey, bauxitic; at 248.80~249.75, fine sandstone, bedded plane: 45°; at 254.80~256.0 in ooids, Φ: 1mm; at 256.30m, bedded plane: 45°; at 266.50~266.70m, carbonaceous ms, much brok 273.80~274.30m, very broken, fracture No:15.
		273.30	275.30	2.00								siltstone	light grey, muddy; at lower part, many minor calcite veins.
		275.30	285.56	10.26		45°						sandstone	light grey, medium-coarse grained quartz and dark debris predominately, well-sorted; at 276.0m layer of calcite (10mm thick), coarse toward base; at lower part, coarse grained; at 283.0m, b
		285.56	304.00	18.44		45°						mudstone	light grey, silty, little bauxitic , brittle, massive; at 295.0m, bedded plane: 45°; at 291.0~ fracture no: 6; at 287.80~288.60, 0.80m, fracute No:7/m.
		304.00	319.85	15.85		45° 40°						mudstone	light grey-black,massive; at lower part, very silty; at 313.0~314.40m, broken, fracture No: 20 312.30m, bedded plane: 45°; at 310.80~311.30m, broken, fracture no: 4; at 316.30, bedded plane calcite veins; at 317.50m, bedded plane: 40°.
		319.85	320.60	0.75								mudstone	more bauxitic, white-light grey, hardness: >5, can not scratched by iron knife, numberous mino
		320.60	323.60	3.00								siltstone	light grey, a few calcite veins.
		323.60	343.20	19.60		40°						mudstone	brown and grey, massivbe, little bauxitic; at 331.0~333.0m,black mudstone, at top , rich in le fracture No:5/m.
		343.20	348.00	4.80		40						siltstone	dark grey, with dark ms laminae; at 346.0m, bedded plane: 40°; at 348.0m, bedded plane: 40°.
		348.00	354.00	6.00								mudstone	light black, massive; at bottom, a carbonization of branchs fossil.
		354.00	358.70	4.70		50°						sandstone	white-grey, fine grained, with dark ms laminae, calcite veins throughout; at 365.50m,bedded pl
		358.70	363.00	4.30								mudstone	bauxitic mudstone, white-grey, massive, not clear bedding, little silt.
		363.00	364.25	1.25		48°						siltstone	dark grey, fracture developed, infilled a few calcite vein; at 364,00m, bedded plane: 48°.
		364.25	376.45	12.20		45°						mudstone	light black, interbedded with few light grey FGSS laminates (5%) and rich in carbonaceous frag plane: 45°; at lower part, minor bauxitic MS.
		376.45	376.80	0.35								coal	0.35m coal seam, RC: 0.15m, broken, black, only a few 2~3cm fragment.
		376.80	378.89	2.09								siltstone	dark grey, minor bauxitic, massive, not clear bedding.
		378.89	380.85	1.96		53°						sandstone	FGSS, interbedded with dark grey siltstone laminates (30%), and minor coal film; at 380.00m, b
		380.85	384.00	3.15								sandstone	FGSS, grey, fracture developed, infilled numberous calcite vein. But from 381.00~384.00m, 3.00 (nothing is left).
		384.00	387.40	3.40		41°						sandstone	MGSS, light grey, normal-sorted, predominately quartz and debris; from 384.00~387.40m, fractur top, more calcite vein; at 387.00m, bedded plane: 41°.
		387.40	392.00	4.60								sandstone	CGSS, light grey, quartz and debris mainly, normal-sorted, rounded, few calcite vein infilled
		392.00	411.60	19.60		50° 55°						sandstone	FGSS, light grey, well-sorted, predominately quartz and debris. At upper part, broken, fractur 394.80m, 0.15m, FGSS, not hard cemented, a few cove. From 396.35~398.60m, conglomerate-bearing bedded plane: 50°; at 405.0m, bedded plane: 50°; at 4111.60m, bedded plane: 50°.
Hulcross		411.60	424.80	13.20		50°						sandstone	white-grey, fine grained, interbedded thin layers of light black muddy siltstone, siltstone co 420.0m, bedded plane: 50; at 411.60~417.0m, little broken, fracture No:7/m.
		424.80	440.82	16.02		50°						siltstone	light black, muddy, interbedded fine sandstone laminae (content: 305), bedding developed; at 4 429.30~430.30, broken, fracture No:15; at 426.0m, bedded plane: 50°; at 470.0m, bedded plane: plane: 50°.
		440.82	480.43	39.61		50						siltstone	dark grey, interbedded with light grey FGSS laminates (20%), micor-horizontal bedding, little pyrites nodules (2*5cm), alternately with bands of FGSS; at 458.00m, bedded plane: 60°; from slickensided and shiney, fracture number: 20/m; from 475.15~476.00m, very much broken; at 474.
		480.43	519.00	38.57		55°						siltstone	dark grey, interbedded with light grey FGSS laminates (20%), slightly fracture, slickensided t from 488.00~488.1m, very much broken, micro-horizontal bedding; from 499.10~499.60m, very much 504.88m, limestone 0.05m, strong react with 5% Hcl; at 501.00m, bedded plane: 50°; at 513.00m
		519.00	542.90	23.90		55 45						siltstone	dark grey, interbedded with fine-grained sandstone laminaes (30%), little muddy, micro-horizon are slickensided and shiny; at 528.00m, bedded plane: 55°; at 540.00, bedded plane: 45°; from number: 15/m.
		542.90	545.00	2.10		40°						sandstone	FGSS, light grey, conglomerate-bearing, broken, broken surface are slickensided and shiny; at
		545.00	547.87	2.87								mudstone	black, massive, rich in coal threads, and carbonaceous fragment.
		547.87	**548.23**	**0.36**								**coal**	**0.38m, coal seam, RC:0.38m, black, dull, little broken.**
		548.23	552.00	3.77		35°						mudstone	black, massive, numberous plant leaf / root fossils; at 549.00m, bedded plane: 35° .
		552.00	553.61	1.61		45°						siltstone	dark grey, interbedded with light grey FGSS laminaes; at 552.00m, bedded plane: 45°, lost core
	#3	**553.61**	**555.00**	**1.39**				**Q1**				**coal**	**1.39m 3# coal seam, RC:1.39m, black, light, half-intact.**
		555.00	555.61	0.61								mudstone	black.
		555.61	**555.80**	**0.19**								**coal**	**0.19m coal seam.**
		555.80	556.78	0.98								mudstone	black.
		556.78	**557.27**	**0.49**								**coal**	**0.49m coal seam.**
		557.27	557.50	0.23								mudstone	black.
		557.50	559.50	2.00		50°						sandstone	FGSS, light grey, interbedded with dark grey siltstone laminates (40%), micro-horizontal beddi observed on FGSS surface.
		559.50	564.35	4.85		50°						siltstone	dark grey, interbedded with light grey FGSS laminates (10%)' from 561.85~562.10m, more FGSS; a film.
		564.35	566.30	1.95		50°						sandstone	FGSS, light grey, interbedded with dark grey siltstone laminates (20%), micro-horizontal beddi
		566.30	568.60	2.30		50°						mudstone	light black, massive, rich in coal film and plant root fossil; at 567.50m, pyrite nudule (1*6c
		568.60	**568.70**	**0.10**								**coal**	**0.10m coal seam.**
		568.70	573.00	4.30								sandstone	FGSS, grey, interbedded with dark grey mudstone laminates (305). At top, more carbonaceous fra
		573.00	574.90	1.90								mudstone	light black, massive, numberous plant root fossil.
		574.90	579.65	4.75		50						sandstone	FGSS, light grey, interbedded with dark grey siltstone laminates (10%), well-sorted; at 579.0m
		579.65	589.40	9.75		50°						mudstone	light black, massive, abundent plant fossil and carbonaceous fragment; from 585.00~585.40m, mo
		589.40	591.35	1.95		50°						sandstone	FGss, light grey, interbedded with dark grey siltstone laminates (20%), a few coal film.
		591.35	592.10	0.75								mudstone	black.
		592.10	**592.70**	**0.60**								**coal**	**0.60m, 4# coal seam, RC: 0.55m, black, light, half-intact.**
		592.70	594.20	1.50								siltstone	dark grey, with few light grey FGSS laminates (5%).
		594.20	597.80	3.60		45						sandstone	FGSS, light grey, with dark grey siltstone laminates (20%) and irregular calcite vein infilled reacti with 5% Hcl.
		597.80	601.80	4.00								mudstone	light black, massive, rich in coal threads and carbonaceou fragment and plant root fossil.
		601.80	**601.90**	**0.10**								**coal**	**0.10m coal seam.**
		601.90	604.35	2.45								siltstone	dark grey, muddy, massive; at base, mudstone increased.
		604.35	609.16	4.81		45°						sandstone	FGSS, light grey, interbedded with dark grey siltstone laminates (20%), micro-horizontal beddi fracture developed, infilled calcite vein.
		609.16	613.06	3.90		45						mudstone	black, interbedded with light grey FGSS laminates (55); at 612.50m, bedded plane: 45°.
	#5	**613.06**	**614.23**	**1.17**				**Q2**				**coal**	**1.17m coal seam, RC:0.72m, 5# , black, light, half-broken, shiny, no parting.**
		614.23	616.94	2.71		45°						mudstone	black, massive, rich in carbonaceous debris and minor coal film.
	#5-1	**616.94**	**620.76**	**3.82**				**Q3 Q4 Q5**		**CBM1**		**coal**	**3.82m 5-1# coal seam, RC: 2.95m, parting:①617.75~618.05m, 0.30m, black,mudstone;②619.20~619.3 structure: 0.81<0.30>1.15<0.12>1.44m, Q3: 616.94~617.75, 0.81m, RC: 0.81m; Q4: 618.05~6210.76, 2.71m, RC: 1.8**
Gates		620.76	635.00	14.24		45°						siltstone	dark grey, interbedded with light grey FGSS and black mudstone laminae, alternatly with bands bedded plane: 45°; from 630.30~631.50m, very much broken, fracture number: 10/m, slickensided fracture surface infilled coal film and minor calcite vein, slickensided and shiny.
		635.00	640.13	5.13		57°						sandstone	FGSS, grey, interbedded with dark grey siltstone laminates (30%), fracture developed, infilled from 637.50~638.10m,very much broken, broken surface are slickensided and shiny, and infilled at 640.00m, bedding plane: 57°.
		640.13	643.60	3.47		45°						mudstone	light black, with few coal threads, and carbonaceous debris and plant root fossils; at base, b
	#6	**643.60**	**644.55**	**0.95**								**coal**	**0.95m 6# coal seam, RC:0.20m, broken, light, black.**
		644.55	647.35	2.80		45						sandstone	FGSS, light grey, interbedded with dark grey siltstone laminates (205), fracture developed, in at 647.00m, bedding plane: 45°.
		647.35	651.30	3.95		45°						siltstone	dark grey, interbedded with black mudstone laminates; at 649m, bedded plane: 45°, abundant pla progressively sandy; at 651.00m, dip:50° .
		651.30	651.80	0.50								mudstone	0.50m black CM.
		651.80	**652.04**	**0.24**		**50°**						**coal**	**0.24m coal seam,RC:0.20m.**
		652.04	653.44	1.40								mudstone	black, massive, rich in coal streaks and carbonaceous fragment.
	#6-1	**653.44**	**654.60**	**1.16**				**Q6 Q7**				**coal**	**1.16m 6-1# coal seam, RC: 0.70m. Boney coal:654.00~654.60m, 0.60m, black, light/ dull (Bon**
		654.60	655.20	0.60								mudstone	0.60m black MS.
		655.20	662.80	7.60		40°						siltstone	dark grey, with minor black mudstone laminates (10%), and light grey FGSS laminates; from 657. slickensided and shiny, and infilled calcite vein, micro-horizontal bedding; at 657.00m, bedde
		662.80	669.72	6.92								mudstone	light black, interbedded with light grey FGSS laminates (10%), rich in plant root fossils and
	#7	**669.72**	**673.87**	**4.15**		**45**		**Q8 Q9**				**coal**	**3.50m 7# coal seam, RC: 2.00m, broken, black, light, bright. parting:①669.90~670.05 (0.15m), 67.02~672.37m (0.35m), mudstone. At roof, bedded plane: 60°; at 669.00m, bedded plane: 55°; at base, black,CM**
		673.87	675.80	1.93								sandstone	FGSS, light grey, with few dark grey siltstone laminates (10%), react with 5% Hcl.
		675.80	676.65	0.85								mudstone	black,black, rich in plant root fossil.
		676.65	679.15	2.50		45°						siltstone	dark grey, with light grey FGSS laminates (40%), fracture developed, infilled calcite vein irr bedded plane: 45°.
		679.15	680.20	1.05								mudstone	black, CM.
	#7-1	**680.20**	**681.00**	**0.80**		**55°**		**Q10**				**coal**	**0.80m coal seam, RC:0.35m, dip:55°, black, bright, light, half-intact, no parting.**
		681.00	683.72	2.72								mudstone	black, massive, numberous coal threads.
		683.72	685.40	1.68								siltstone	dark grey, massive, not clearing bedding.
		685.40	687.70	2.30		55						sandstone	FGSS, light grey, fracture developed, infilled various angles calcite vein to core axis; at 68
		687.70	693.33	5.63		55°						mudstone	black, massive, minor carbonaceous fragment; at base, broken, infilled minor carbonaceous debr
	#7-2	**693.33**	**695.04**	**1.71**				**Q11**				**coal**	**1.17m coal seam, RC:1.10m, black, light, bright, half-broken, no parting.**
		695.04	696.70	1.66		55°						mudstone	black(light), with rich in plant root/leaf fossil on bedding surface and minor coal film; at 6
		696.70	705.00	8.30		45						siltstone	dark grey, interbedded with light grey FGSS and light black mudstone laminates, abundant plant muddy; from 699-700m, more FGSS laminates, at 700.00m, bedded plane:45°; from 703.50~705.00, m coal film.
		705.60	**705.90**	**0.30**								**coal**	**0.30m coal seam.**
		705.90	708.00	2.10								siltstone	dark grey, carbonaceous debris, coal threads.
		708.00	714.00	6.00		45°						mudstone	black, massive, rich in coal threads and carbonaceou thin laminated; from 708~710, very much b plane: 45°.
		714.00	723.00	9.00		45°						siltstone	dark grey, interbedded with light grey FGSS laminated 20%, fracture developed, infilled irregu carbonaceous streaks on bedding surface; at 722.00m, bedded plane: 45°; at base, sandy toward,
		723.00	724.50	1.50								sandstone	FGSS, grey, with dark grey siltstone laminated, and minor calcite vein.
		724.50	726.00	1.50								siltstone	dark grey, with FGSS and mudstone laminates, broken, infilled irregular calcite vein, distorte
		726.00	727.00	1.00								sandstone	FGSS, grey.
		727.00	730.16	3.16								siltstone	light black, little muddy, massive, few carbonaceous debis, not clear (apparent) bedding.
Boulder Creek		730.16	732.00	1.84								mudstone	Bauxitic mudstone, white-grey, massive, soft, scractched by fingers.
		732.00	737.00	5.00								mudstone	dark grey, massive, with a few bauxitic mudstone, massive; from 735.00~735.45m, FGSS, with ca not apparently bedding.
		737.00	739.85	2.85								mudstone	Bauxitic mudstone,white-grey, massive, Fe^{2+} inclusion; at base, 0.50m black mudstone.
		739.85	744.70	4.85		25°						sandstone	MGSS, grey, predominately quartz and debris; at base, calcite filled on FGSS bedding; at 743.0 film on joint bedding.
		744.70	747.00	2.30								mudstone	dark grey, interbedded with a few light grey FGSS laminates (10%), occasionally few carbonace
		747.00	750.00	3.00								mudstone	Bauxitic mudstone, white-grey, massive, soft, by fingers.
		750.00	750.50	0.50								siltstone	dark grey.
		750.50	750.75	0.25								mudstone	0.25m black CM.
		750.75	753.00	2.25								siltstone	grey, massive, with bauxitic mudstone.
		753.00	753.80	0.80								sandstone	FGSS, light grey.
		753.80	756.00	2.20								siltstone	white-grey, massive, bauxitic mudstone (a few).
		756.00	756.60	0.60		25°						sandstone	FGSS, with minor dark greys siltstone, dip:25°.
		756.60	759.20	2.60								siltstone	dark grey, with few bauxitic mudstone, occasionally few carbonaceous fragment on bedding surfa
		759.20	761.00	1.80								sandstone	FGSS, light grey, with minor carbonaceous debris.
		761.00	764.35	3.35								sandstone	FGSS, grey, interbedded with dark grey mudstone laminated (30%), minor carbonaceous fragment o
		764.35	767.00	2.65		25°						mudstone	light black, with minor grey FGSS laminates (10%) and with a few carbonaceous thin laminated a
		767.00	769.00	2.00		30°						sandstone	FGss, grey, interbedded with dark grey mudstone laminated, rich in plant leaf fossil, micro-ho base, silt toward.
	from 770.m , NQ	769.00	770.40	1.40								siltstone	dark grey, with FGSS laminated.
	BC fault footwall	**770.40**	**771.47**	**1.07**				**Q12 Q13**				**coal**	**1.07m BC caol seam, RC: 0.60m, lost; 0.47m. Parting:①770.55~770.68, 0.13m, black;②770.75~770. 0.15<0.33>0.07<0.15>0.57m.**
		771.47	771.85	0.38								sandstone	0.38m coally FGSS.
		771.85	773.80	1.95								sandstone	CGSS, light grey, rich in coal streak.
		773.80	774.05	0.25								mudstone	black mudstone, coal film.
		774.05	774.50	0.45		30°						sandstone	FGSS , with black, dip:30°, mudstone laminated.
		774.50	777.75	3.25								conglomerate	conglomerate, light grey, fine-grained, Ø: 2~5mm, predominately quartz and debris, poorly-sorted, subro
		777.75	793.90	16.15		30						sandstone	fine-grained sandstone, light grey, generally pure; at 790.67~790.95m, and 793.00~793.30m, wit plane: 35°, horizontal bedding, various angles quartz vein observed on FGSS bedding surface (broken (0.40m); at 786.46~786.54m, 0.08m conglomorate; at 791.00m, bedded plane: 30°.
		793.90	804.00	10.10		30°						sandstone	FGSS, light grey, interbedded with light black mudstone laminated 40%; at 796.50m, bedded plan siltstone laminated increased 50%; at 803.00m, bedded plane: 30°.
Hulcross		804.00	831.00	27.00		35						siltstone	dark grey, interbedded with light grey FGSS laminated (20%) and a few light black mudstone lam bedding; at 807.50, dip:30°; at 816.00m, bedded plane: 35°; at 824.9~, pyrite nodules; from 82 toward at base.
		831.00	837.00	6.00		35°						mudstone	light black, interbedded with light grey FGSS laminates (30%) horizontal bedding, at 834.50m,
		837.00	840.00	3.00		35						siltstone	dark grey, interbedded with light grey FGSS laminates (30%), micro-horizontal bedding; at 840.
		840.00	847.00	7.00		40 50 60 80						siltstone	same feature as above, plus bedding plane enlarge; at 840.10, bedded plane: 40°; at 840.50, be from 842.50~847.20m, into fault zone, very much broken, broken surfance and slickensided and s dip: 80°.
		847.00	887.30	40.30		30						siltstone	dark grey, interbedded with light grey FGSS laminated (10%), and light black mudstone laminate bedded plane: 30°, alternately with bands of FGSS (width uneven); at 855.75~855.80m, 0.05m lim 860.00m, bedded plane:30°; at 870.00m, bedded plane:35°; at 873.00m, minor irregular calcite v bedded plane: 40°; at base, black mudstone laminated increased; at 885.00m, bedded plane: 30°.
		887.30	888.85	1.55								sandstone	FGSS, light grey, interbedded with dark grey siltstone laminated (20%); at 888.30m (0.08m), 88
Gates		888.85	889.64	0.79								mudstone	black, massive, rich in coal streak.
		889.64	890.40	0.76								mudstone	black mudstone, abundent coal film.
		890.40	890.80	0.40								mudstone	coaly mudstone.
		890.80	892.43	1.63								mudstone	light black, massive; at 891~892.30m, FGSS, grey.
		892.43	892.75	0.32								coal	0.32m, 2# coal seam, RC: 0.32m, half-broken.
		892.75	893.55	0.80								siltstone	dark grey, massive, rich in coal film.
		893.55	**894.62**	**1.07**				**Q14**				**coal**	**1.07m, 3# coal seam, RC: 1.00m, half-intact.**
		894.62	895.79	1.17		30°						mudstone	black mudstone; at 895.00m, bedded plan: 30°; 895.79~895.95m, 0.16m coal seam; 895.95~896.52m, 896.72~897.00, black mudstone.
		895.79	916.70	20.91		35 25						sandstone	FGSS, grey, interbedded with dark grey siltstone laminates (30%), horizontal bedding; at 900.0 on FGSS bedding surface throughout, minor calcite vein, FGSS and calcite vein, react with 5% H dark grey siltstone laminated increased and coal film decreased.
		916.70	923.00	6.30		30°						siltstone	dark grey, interbedded with light grey FGSS laminated (30%); at 917.00m, bedded plane: 30°, ri
		923.00	926.80	3.80		25						siltstone	dark grey, massive(generally), a few carbonaceous debris observed on joint surface; at 925.00m
		926.80	939.55	12.75		25						mudstone	black, massive, a few coal film and carbonaceous debris; at 927.30~927.35m, 0.05m coal seam; f 936.00m, bedding plane: 25°; from 937.00~939.55m, numerous coal streak and carbonaceous fragme
		939.55	945.15	5.60		28						sandstone	FGSS, grey, interbedded with black mudstone laminated (30%), horizontal-bedding; at 942.50m, b calcite vein; at 944.00m, bedded plane: 28°.
		945.15	**947.17**	**2.02**				**Q15 Q16**				**coal**	**2.02m 6# coal seam, RC: 2.02m, black, light, bright, half-intact. (at top, 0.50m broken).**
		947.17	948.00	0.83								siltstone	dark grey, abundent coal streak; at various angles to core axis, and a few carbonaceous debris
													TD:948.00m Nov. 19, 2012

Wapiti River — **DRILL HOLE CORE LOG**

Drilling Company:	CYR International Drilling Ltd.			**Hole No.:**	**WP1R06**
Rig Type:	Golder bear (NQ=1400m)			**Collar Elevation:**	1251.1m
Total Depth:	1233.50m	**Coordinate:**	**Northing:**	6070503.2m	
Spud Date:	Nov.1, 2012		**Easting:**	652789.2m	
Finished Date:	14-Dec-12		**Logging Geologist:**	Victor, Ricky, Lee	
Core Size:	HQ/NQ		**Note:**		

Formation	Coal Seam	Core Depth Interval From	To	Thickness Thick	TRUE	Strata Dip (°)	Coal Floor Elevation	Sample ID Coal	Rock	CBM	Rock Hardness	Rock Name	Lithology Description
Q		0.00	5.00	5								overburden	weathered deposits, brown-grey, mudstone mainly.
Hasler		5.00	29.00	24		10°						siltstone	dark grey, interbedded with light grey fine-grained, sandstone laminates (10%) (FGSS), micro-horizontal bedding; at 8.00m, bedded plane: 8° ; at bedded plane: 10° at 20.00m; from 23.00~29.00 more muddy, alternately with band of siderite; at 29.00~29.30m, mud, soft, unhard; from 29.10~80.0 siltstone, dark grey, interbedded with light grey FGSS laminates (30%), micro-horizontal bedding, distorted bedding on FGSS surface; at 40.00m, bedding plane: 10° .
		29.10	80.00	50.9								siltstone	dark grey, interbedded with light grey FGSS laminates (30%), micro-horizontal bedding; from 40.00~45.00m, with more siderite; at 45.50~45.70m, very broken; at 53.10~53.16m, 0.06m, mud, soft from 63.30~64.70m, very broken, fracture number: 15/m; at 70.0m, bedded plane: 17° ; from 72.10~75.30m, very broken, tectonic plane, deformation, mud gauge; at 76.00m, bedded plane: 10° ; 78.80~78.85m, mud gauge; from 80.40~80.80m, very broken, mud gauge, only 2~5mm fragment.
		80.80	117.00	36.2								siltstone	dark grey, interbedded with light grey FGSS laminates (20%), micro-horizontal bedding; at 92.00m, bedded plane: 10° , few siderite laminates; at 97.00~98.00m, broken, (0.20m); at 106.00m, bedded plane: 10° ; at lower part, FGSS laminates progressively, ripple-bedded.
		117.00	121.45	4.45								siltstone	dark grey, with light grey FGSS laminates (50%); at 120m, dip:15° .
		121.45	122.76	1.31									FGSS, light grey; at base, 0.55m FGSS surface, 5 layer conglomerate thin laminates.
Boulder Creek		122.76	127.00	4.24								mudstone	Bauxitic mudstone, white-grey, soft, scratched by fingers, massive; at 126.55~126.65m, 0.10m
		127.00	130.00	3									FGSS, light grey, interbedded with dark grey mudstone laminates (20%), horizontal bedding ; at 130.00m, dip:10° , infilled few irregular calcite vein.
		130.00	132.25	2.25		10°						mudstone	light black, massive, few carbonaceous fragment.
		132.25	140.10	7.85								mudstone	Bauxitic mudstone, white-grey, massive, soft, scratched by fingers, little silt, massive; at 136.60~137.00m, very broken; at 137.60m, a few calcite vein; at base, pale-red, (Fe^{2+} inclusion).
		140.10	143.50	3.4								siltstone	dark grey, massive, minor bauxitic.
		143.50	146.10	2.6		30°							FGSS, light grey, interbedded with dark grey siltstone laminates (5%); at 146.00m, bedded plane: 3
		146.10	151.60	5.5								mudstone	Bauxitic mudstone, white-grey and red, massive; at 148~149m, more black mudstone.
		151.60	154.20	2.6								Sandstone	FGSS, light grey, interbedded with minor dark grey siltstone laminates (5%) and few calcite vein; 154.00m, bedded plane:10° .
		154.20	162.50	8.3								Sandstone	MGSS-CGSS, light grey, predominately quartz and debris, normal-sorted, rounded, no react with 5% H
		162.50	163.85	1.35								conglomerate	conglomerate, light grey, fine-grained, Φ:2~3mm, quartz and debris mainly.
		163.85	166.40	2.55								Sandstone	CGSS, light grey, slight fracture.
		166.40	167.10	0.7								Sandstone	FGSS, grey, very much broken, only 2~10cm fragment, and mud.
		167.10	171.50	4.4								Sandstone	FGSS, grey, broken, fracture developed, infilled various angles calcite vein to core axis and disturbed bedding.
Hasler		171.50	175.50	4								siltstone	dark grey, with minor FGSS laminates (10%), very much broken, fracture number: more 100/m, fault zone, compress and deformation. Met F4 fault zone.
		175.50	194.00	18.5		20						siltstone	dark grey, interbedded with minor FGSS laminates (10%) occasionally, calcite vein (irregular); fro 177.00~178.00m, and 182.50~183.50m, broken; from 190.00~192.00m,very broken; at 192.50m, bedded plane: 20° ;
		194.00	266.50	72.5		75 40						siltstone	from 202.50~212.00m, very broken, broken Surface are slickensided and shiny; from 215.00m, FGSS laminates, increased 40%; from 227~232.00m, very broken; from 227.00~232.00m, very broken; from 239.50~241.00m, very broken; at 260.00m, bedded plane: 75° , distorted bedding on FGSS surface; a 266.00m, bedded plane:40° .
		266.50	296.00	29.5		30 15 5						siltstone	dark grey, interbedded with light grey FGSS laminates (10%), micro-horizontal bedding, little mudd bedding plane begin to decreased; at 269.00m, bedded plane: 30° ; at 275.00m, dip:25° , alternatel with bands of siderite; at 284.00m, bedded plane: 15° ; at 284.15m, pyrite nodule (1*6cm); from 290.00~291.50m, broken, fracture number:10/m; at 293.00m, bedded plane:5° .
		296.00	334.00	38		10 20 30						siltstone	same features as above, plus, FGSS laminates increased 30%, occasionally calcite vein observed on joint surface; at 305.00m, bedded plane:10° ; from 309.00m, FGSS laminates increased to 40%, rippl bedding; at 318.00m, bedded plane: 20° (locally); at 320.00m, dip:30° ; from 321.00~334.80m, siltstone, compression and deformation on FGSS bedding, very broken, fracture zone, distorted bedding, broken are slickensided and shiny.
		334.00	378.00	44		40 55						siltstone	dark grey, interbedded with light grey FGSS laminates (20%), micro-horizontal bedding; at 335.00m, bedding plane:55° , little muddy, a few siderite thin laminates, observed on bedding surface; at 349.00m, bedded plane:40° ; at 359.00m, bedded plane:45° ; at 374.00m, bedded plane:40° ; at 374.00~378.00m, more FGSS laminates (30%).
		378.00	422.00	44		50						siltstone	dark grey, interbedded with light grey laminates(5%). Siltstone and few FGSS blended. FGSS laminates(interrupted). At 384.0m, bedded plane: 45°; at 380.10m, pyrite nodule, muddy; at 393.0m, few carbonaceous fragment on bedding surface. At 398.0m, bedded plane: 55°. at lower part, a few siderite. at 420.0m, bedding plane: 50°.
		422.00	446.00	24		55						siltstone	dark grey, muddy, massive, with few light grey FGSS laminates(3%). At 429.0m, bedded plane:55°.
		446.00	459.00	13		70						Mudstone	light black, massive, soft; from 446.55-447.40m, fracture developed, silickenside and shiny; few siderite band on bedding; at 458.0m, bedded plan: 70°;
		459.00	464.00	5								mudstone	light grey, very broken, broken surface is slikensided and shiny, fracture number: 30/m.
		464.00	480.00	16		53						mudstone	light black, interbedded with minor light grey FGSS laminates(5%). Micro-horizontal bedding; at 470.0m, bedding plane: 53°; from 476.0-470.0m and 472.50-473.50m, slightly fracture. At 480.0m, bedded plane: 55°.
		480.00	485.00	5								mudstone	same features as above, plus light grey FGSS laminates increased to 20%, interrupted bedding obser on FGSS bedding.
		485.00	500.70	15.7		50-55						mudstone	FGSS decreased to 5%; from 489.65-491.0m, very broken; at 496.0m, bedded plane: 50°; at 500.0m, bedded plane: 55°.
		500.70	506.00	5.3		63						siltstone	dark grey, interbedded with few light grey FGSS laminates(5%).slight fracture, at 505.0m, a layer calcite vein, slickensided. At 503.0m, dip:63°.
		506.00	581.00	75		53 65 60						mudstone	light black, few FGSS thin laminated. At 506.30m, 0.05m mud block. At 511.0m, bedded plane: 53°; a 513.5m, pyrite nodule (2×2mm). From 513.30-514.35m, very broken, broken surface are slikensided shiny, some mud clasts. From 518-521.50m, more FGSS laminated; fracture extend from 519.70-522.0m, fracture number: 15/m; from 523.50-524.50m, very broken, few siderite thin laminated and carbonaceous fragment observed on bedding surface. at 530.0m, bedding plane: 65°; from 533.0-535.0 very broken; from 538-539.0m, broken; at 539.50m, bedding plane: 55°; from 541.80-542.10m, broken at 544.0m, bedded plane: 65°. from 561-563.0m, fracture developed, slickensided and shiny; at 563. bedded plane: 62°. at 573.0m, bedded plane: 63°. from 577.50-580.0m, more FGSS laminates, 50%; at 580.0m, bedding plane: 60°;
		581.00	610.00	29.00		60-65						mudstone	light black, generally massive, with few interrupted FGSS laminated; little silt; at 589.0m, bedde plane: 65°. At lower part, siderite nodule(few); at 593.0m, bedded plane: 60°; at 579.0m(60°). Fro 589.80-610.0m, more light grey fine-grained sandstone(FGSS) laminated(40%); at 602.0m(65°)
		610.00	624.00	14.00		60						siltstone	dark grey, interbedded with light grey FGSS laminated(30%). From 617.30-624.0m, broken, broken pla are slickensided and shiny, fracture No:10/m; at 620.20m, bedded plane: 60°.at base, mud toward.
		624.00	656.00	32.00		45						mudstone	dark grey, interbedded light grey FGSS(10%); micro-horizontal bedding; at 625.0m, bedded plane: 45 at 632.0m(45°); at 633.0-644.0m, siltstone, dark grey, interbedded with light grey FGSS laminates(30%); micro-horizontal bedding, little muddy; at 639.0m, bedded plane: 45°; a few sideri thin laminated throughout. at 650.0m, bedded plane: 45°.
		656.00	664.70	8.70		45						mudstone	dark grey, silt, interbedded with light grey fine-grained sandstone laminated(30%). Micro-horizont bedding; at 663.0m, bedded plane: 45°; occasionally carbonaceous debris.
		664.70	701.00	36.30		45						Siltstone	dark grey, interbedded with light grey FGSS laminated(20%); micro-horizontal bedding, interrupted bedding on siltstone surface; alternately with a few siderite thin laminated; at 680.00m, bedded plane: 40°; at 683.0m(45°); at base, sandy toward and FGSS laminated increased to 30%; at 689.50m, bedded plane:52°. at base, FGSS increased to 30%.
		701.00	746.60	45.60		45						siltstone	dark grey, interbedded with light grey fine-grained sandstone laminated(20%); micro-horizontal bedding; at 704.0m, bedded plane: 45°; little muddy; at 713.0m, bedded plane: 45°; at 719.0m(45°); 726.0m(45°); at 737.0m(45°);
		746.60	747.00	0.40		45						conglomerate	white-grey, ø:1-2mm; poorly-sorted; quartz and debris predominately; at 745.20-746.0m, broken, bro number: 8/m.
Boulder Creek		747.00	755.00	8.00		45						mudstone	brown and grey, bauxitic, massive; at 754.70m, bedded plane: 45°.
		755.00	763.90	8.90								siltstone	light grey, little muddy; at 760.0m, bedded plane: 45°; at 763.50m, bedded plane: 45°. At 763.30-763.45m, numerous coal lenses.
		763.90	767.65	3.75		45						Sandstone	white-grey, medium-grained; quartz and dark debris, well-sorted; with dark mudstone laminate; bedd plane: 45°
		767.65	769.80	2.15		45						Musstone	black, at upper part, with fine sandstone laminate; at 769.0m, bedded plane:45°.
		769.80	773.50	3.70		45						Sandstone	white-grey, coarse-grained, with dark mudstone laminate; at 771.50m, bedded plane: 45°
		773.50	774.25	0.75								conglomerate	white-grey, ø: 2~4mm; moderately-sorted, coarser toward base.
		774.25	786.50	12.25								Mudstone	brown and light grey, bauxitic; from 781.0-783.80m,siltstone, grey; at 782.80-783.40m, numerous co lenses and coal laminate, broken; at 784.80-785.15m, broken, broken number:6/m;
		786.50	789.45	2.95		45						siltstone	grey, muddy; at bottom, bedded plane: 45°.
		789.45	806.80	17.35		40-45						Sandstone	white-grey, medium-grained, quartz predominately, well-sorted, rounded and unangular; with a few calcite vein throughout; at 791.0m, 792.0m and 794.30m, bedded plane: 40°; at 797.35-797.80m, 0.45 conglomerate; at 797.80-798.10m, bauxitic mudstone, white-grey, soft. from 799.60-801.50m, broken, fracture developed, infilled calcite vein, some core are grinding; from 801.75-802.20m, conglomera at 805.20m, bedding plane: 45°; at base, sandy downward, with a few argillaceous pebble.
		806.80	814.10	7.30								mudstone	bauxitic, white-grey, soft, massive. At 811.50-812.0m, black mudstone mainly. At 813.0-813.30m, FG light grey.
		814.10	815.30	1.20								Sandstone	light grey, fine-grained; vertical fracture developed, filled calcite vein.
		815.30	816.70	1.40								Mudstone	black, massive, little bauxitic.
		816.70	820.80	4.10								Mudstone	bauxitic, white-grey, massive, soft.
		820.80	822.50	1.70								Sandstone	light grey, fine-grained; vertical fracture developed, filled calcite vein.
		822.50	824.15	1.65								Mudstone	dark grey, massive, minor carbonaceous.
		824.15	825.50	1.35								Sandstone	light grey, fine-grained; vertical fracture developed, filled calcite vein.
		825.50	830.80	5.30								mudstone	light black, massive; at 826.10-826.25m, broken; at top, little bauxitic; few calcite vein observe on bedding.
		830.80	831.50	0.70								Sandstone	light grey, fine-grained.
		831.50	833.60	2.10		35						mudstone	light black, with siderite and FGSS and calcite vein; at 832.0m, bedded plane: 35°.
		833.60	838.90	5.30								mudstone	bauxitic, massive, hardness >5; white-grey. At middle part, more silt; at base, 0.20m black mudsto a few coal film on bedding surface.
		838.90	847.90	9.00		25						Sandstone	grey, fine-grained, interbedded with light black mudstone laminated(20%); at 840.0m, bedded plane: 25°. From 841.50-842.0m, vertical calcite vein. From 845.0-847.90m, sandy toward at base, rich in coal film and mud ooids; at 846.0m, bedded plane: 25°.
		847.90	848.50	0.60								siltstone	dark grey, massive.
		848.50	851.10	2.60								Sandstone	light grey, medium-grained; at top, 0.60m FGSS; rich in irregular calcite vein.
		851.10	857.30	6.20		25						Sandstone	light grey, fine-grained; interbedded with dark grey siltstone laminated(10%); various angular calcite vein to core axis(abundant); well-sorted; at 854.0m, bedded plane:25°. At base, numerous c threads observed on bedding surface.
		857.30	860.50	3.20								Sandstone	light-grey, medium-grained, interbedded with a few FGSS and few coal streaks and a few calcite vein(irregular).
		860.50	861.30	0.80								sandstone	grey, fine-grained; very much broken, deformation, mylonization, grinding, calcite vug and vein.
		861.30	863.31	2.01		35						Mudstone	light black, with few FGSS laminated; at 862.0m, dip:35°.
	BC	**863.31**	**864.04**	**0.73**								**coal seam**	**0.73m, RC: 0.71m, black, light, shiny, intact; parting: ①863.54-863.64m, 0.10m, black, mudsto ②863.84-863.93m, 0.09m, black, mudstone. Coal structure: 0.23<0.10>0.20<0.09>0.11m.**
		864.04	864.30	0.26								Mudstone	black, carbonaceous.
		864.30	866.71	2.41		30						Sandstone	grey, medium-grained; with few dark grey siltstone; at 366.50m, dip:30°.
		866.71	872.00	5.29		40						sandstone	white-grey, medium-grained, quartz and dark debris, well-sorted, subangular-subrounded; cross-bedd developed; at 868.0m, bedded plane:40°
		872.00	879.20	7.20		40						Sandstone	white-grey, medium grained; interbedded thin layers of conglomerate(content: 20%); at upper part, ø:1-3mm, poorly sorted; at lower part, ø: 3-7mm, poorly-sorted; matrix of fine sandstone; at 873.0 and 876.0m, bedded plane: 35°; at 878.0m, bedded plane: 40°.
		879.20	888.95	9.75		35						Sandstone	white-grey, fine-grained, pure; at bottom, 3 layers of black silt mudstone; quartz predominately; well-sorted; siliceous cement; at 885.50m, bedded plane: 35°.
		888.95	893.68	4.73		35						Sandstone	white-grey, fine-grained, interbedded black muddy siltstone(content: 40%); horizontal bedding; at 890.30m, a coal film on bedding plane. At 890.0m, bedded plane: 35°; at 892.30m, a layer of pyrite(0.02m thick)
Hulcross		893.68	920.80	27.12		35-25						Siltstone	black, muddy; interbedded thin layers of fine sandstone(content:40%); bedded plane: 35° at 895.0m; 901.0m and 902.0m, bedded plane: 35°; at 908.0m and 918.0m, bedded plane: 25°; at 913.0m, 0.10m argillaceous limestone, white-grey, reacting with HCL 5%; at 919.0m, bedded plane: 25°.
		920.80	967.15	46.35		25-15						Siltstone	black-light black, muddy; interbedded white-grey fine sandstone laminate(20%). With lots of very minor plant branch fossil; bedding developed; horizontal bedding; at 925.0m and 935.0m, bedded pla 25°; at 930.0m, 0.10m kaolinite, white-grey, soft, easily be scratched by iron knife; at 937.0m, bedded plane: 20°; at 937.50 and 943.0m, bedded plane:15°; at 946.0m, 0.05m thick argillaceous limestone; at 952.0m, bedded plane: 10°; at 956.0m, bedded plane: 15°; at 961.30m, 0.08m thick, kaolinite, brown; at 962.0m and 965.0m, bedded plane: 15°.
		967.15	967.60	0.45								Conglomerate	white-grey, ø: 2~4mm; quartz and chert predominately, well-sorted; matrix of sandstone; broken at upper part, with numerous calcite veins.
Gates		967.60	968.05	0.45		15						mudstone	light black-black; at lower part, black; at middle, 0.10m thick conglomerate; at 967.60m, bedded plane: 15°.
		968.05	971.00	2.95								mudstone	black, massive, rich in leaf fossil; at 970.30m, 0.06m thick coal seam, shiny, light.
		971.00	974.00	3.00								Sandstone	white-grey, fine-grained; quartz predominately; at bottom, light black muddy siltstone; at 973.10-974.0m, little broken, fracture number: 6/m.
		974.00	974.35	0.35								Mudstone	black, carbonaceous; at 974.15-974.21m, 0.06m coal seam, light, shiny.
	#2	**974.35**	**975.25**	**0.90**				**Q1 Q2**				**coal seam**	**coal seam, 0.90m, RC:0.90m, half-broken, shiny, light. Structure of coal seam: 0.25<0.07>0.5 CO: 974.35-974.60m, 0.25m, RC:0.25m; parting: 974.60-974.67m, 0.07m, black, mudstone; CO: 974. 975.25m, 0.58m, RC: 0.58m.**
		975.25	975.80	0.55		15						mudstone	light grey, massive, at 975.70m, 0.05m coal seam, broken;
		975.80	977.60	1.80								Sandstone	white-grey, fine-grained, with grey mudstone laminate; at 977.30m, bedded plane: 15°.
		977.60	978.10	0.50								mudstone	black, massive.
	#3	**978.10**	**978.20**	**0.10**								**coal seam**	**at 978.10m, 0.10m thick, #3 coal seam, intact, light, shiny;**
		978.20	978.70	0.50								mudstone	black, massive;
		978.70	**978.90**	**0.20**								**coal**	**at 978.70-978.90m, 0.20m, coal seam, half-broken, bright, light.**
		978.90	979.10	0.20								mudstone	black, massive;
		979.10	983.50	4.40		15						Sandstone	white-grey, fine-grained; with dark mudstone laminate; at 982.0m, bedded plane: 15°.
		983.50	987.40	3.90								Siltstone	light grey, interbedded thin layers of white-grey fine sandstone; at 984.0m and 986.50m, bedded plane: 15°; at 984.20-986.70m, broken, fracture number: 15/m, with numerous calcite veins.
		987.40	989.15	1.75		15						mudstone	black, carbonaceous; in part with leaf fossil. At 988.75-989.0m, carbonaceous, with a few coal streaks;
		989.15	**989.35**	**0.20**								**coal**	**at 989.15-989.35m, 0.30m, coal seam, RC: 0.30m, broken, parting: at 989.35m, 0.03m thick, bla massive.**
		989.35	989.80	0.45								mudstone	black, carbonaceous;
		989.80	998.42	8.62		15						Sandstone	white-grey, fine-grained, well-sorted; interbedded layers of black mudstone(content:40%); at 994. and 998.42m, bedded plane: 15°
		998.42	1009.20	10.78		20						Mudstone	black, massive; with leaf fossil in part; at 1000.90m-1001.10m, a few coal lenses and coal streaks at 1009.95m, bedded plane: 15°; at 1002.50-1002.80m,a few coal streaks and lenses, rich in leaf
		1009.20	**1009.40**	**0.20**								**coal**	**at 1009.20-1009.40m, coal seam, 0.20m, RC: 0.15m, broken;**
		1009.40	1014.05	4.65								mudstone	black, massive; at 1012.0-1012.20m, few coal streaks; at 1025.0m, bedded plane: 20°; at 1013.70-1014.0m, a few coal streaks.
		1014.05	1017.90	3.85		20-15						Sandstone	white-grey, fine-grained; interbedded thin layers of dark grey siltstone(content: 40%); at 1014.30 bedded plane: 20°; at 1017.0m, bedded plane: 15°.
		1017.90	1019.30	1.40								Siltstone	light black, very muddy.
		1019.30	1020.05	0.75		15						Mudstone	black, silty; with few fine sandstone laminate; with leaf fossil; at 1019.60m, bedded plane: 15°.
	#5	**1020.05**	**1022.00**	**1.95**				**Q3**				**coal seam**	**coal seam, 1.95m, RC: 1.50m, 0.40m lost; very broken, shattered, pieces; shiny, light, no parting.**
		1022.00	1023.05	1.05								Sandstone	white-grey, fine-grained, well-sorted.
		1023.05	1025.15	2.10								Mudstone	light black to black; at upper part, light black; at lower part, black; at bottom, few coal streak
		1025.15	1025.25	0.10								Mudstone	carbonaceous, very broken, with a few coal streaks.
	#5-1	**1025.25**	**1026.95**	**1.70**				**Q4**				**coal seam**	**coal seam, 1.70m, RC: 1.70m; at middle part, intact; at upper and lower part, broken into pie no parting; bright, light, brittle.**
		1026.95	1028.00	1.05								mudstone	black, carbonaceous mostly, very broken, numerous coal streaks; at 1027.30m, 0.08m, coal seam, muc broken; at 1027.60m, 0.06m, coal seam, much broken; 1027.90m, 0.07m coal seam, much broken;
		1028.00	1028.15	0.15								mudstone	light black, massive;
		1028.15	1029.00	0.85								Sandstone	white-grey, fine-grained.
		1029.00	1030.50	1.50								Mudstone	light grey, little bauxitic.
		1030.50	1034.50	4.00								Sandstone	white-grey, fine-grained, interbedded thin layers of light grey siltstone; no bedding.
		1034.50	1037.40	2.90		20						Sandstone	white-grey, fine grained; interbedded thin layers of black mudstone(content:40%); at 1035.0m, bedd plane: 20°; at 1037.05-1037.40m, numerous coal lenses and coal debris.
		1037.40	1039.60	2.20								Mudstone	black, massive, numerous coal streaks, carbonaceous in part, broken throughout; at 1038.30-1038.50 0.20m of carbonaceous; at 1037.80-1038.20m, numerous coal streaks;
		1039.60	**1039.66**	**0.06**								**coal**	**at 1039.60m, 0.06m, coal seam, light, bright;**
		1039.66	1040.60	0.94								mudstone	at 1039.70-1042.20m, bauxitic mudstone;
		1040.60	**1040.80**	**0.20**								**coal**	**at 1040.60-1040.80m, coal seam, 0.20m, broken much;**
		1040.80	1043.30	2.50								mudstone	bauxitic mudstone;
	#6	**1043.30**	**1043.35**	**0.05**								**coal**	**at 1043.30m, 0.05m, coal seam, broken;**
		1043.35	1044.50	1.15								mudstone	black, massive,
		1044.50	**1044.65**	**0.15**								**coal**	**at 1044.50-1044.65m, coal seam, 0.15m, much broken, shiny;**
		1044.65	1044.90	0.25								mudstone	black, massive,
		1044.90	**1044.95**	**0.05**								**coal**	**at 1044.90m, coal seam, 0.05m thick.**
		1044.95	1045.00	0.05								mudstone	black, massive,
		1045.00	1045.75	0.75		40						Sandstone	white-grey, fine-grained; with dark muddy siltstone;
		1045.75	1046.60	0.85								mudstone	1.0m lost at 1048.0-1049.0m, black, massive, brittle;
		1046.60	**1046.80**	**0.20**								**coal**	**at 1046.60-1046.80m, 0.20m coal seam, broken much;**
		1046.80	1047.80	1.00								mudstone	at 1046.80-1047.70m, much broken;
		1047.80	**1047.90**	**0.10**								**coal**	**at 1047.80-1047.90m, 0.10m, coal seam, much broken, shiny.**
		1047.90	1049.00	1.10								mudstone	black, massive, brittle;
		1049.00	1049.20	0.20								mudstone	light grey, siliceous mudstone, hard, cannot scratched by iron knife, with white quartz veins;
		1049.20	1049.40	0.20								mudstone	black, broken, with a few coal streaks;
		1049.40	**1049.47**	**0.07**								**Coal seam**	**0.07m, broken much.**
		1049.47	1051.50	2.03		40						Sandstone	white-grey, fine-grained; at 1051.0m, bedded plane: 40°.
		1051.50	1052.70	1.20								Mudstone	black, at upper part, carbonaceous in part;
		1052.70	**1053.05**	**0.35**								**coal**	**at 1052.70-1053.05m, 0.35m, coal seam, broken, shiny, light, parting: 1052.90m, 0.03m, mudsto**
		1053.05	1057.70	4.65								mudstone	black, at 1054.80m, 0.05m coal seam, broken. At 1056.50-1058.05m, with a few coal streaks.
		1057.70	1060.20	2.50		40						Mudstone	black, interbedded layers of light grey fine sandstone(content:50%); at bottom, bedded plane:40°.
		1060.20	1064.00	3.80								Mudstone	black, rich in leaf and branch fossil and its carbonization; at 1060.20-1060.30m, a few coal strea at 1061.90-1062.03m, carbonaceous, with few coal streaks; at 1061.80m and 1063.40m, coal seam, 0.0 thick each, shiny, light.
		1064.00	1066.80	2.80								Mudstone	black, rich in leaf fossil; at 1065.85m, 0.10m, carbonaceous mudstone; at bottom, coal seam, 0.04m shiny.
		1066.80	1075.90	9.10		40						sandstone	white-grey, fine grained; interbedded thin layers and laminate of black mudstone; at 1067.0m, 1070 and 1073.50m, bedded plane: 40°; at 1075.0m, bedded plane: 45°; at 1073.80m, 2 coal streaks.
		1075.90	1079.00	3.10								Mudstone	black, massive, rich in leaf fossil; at 1076.30m, 0.05m, coal seam, broken much; at 1076.80-1076.9 few coal streaks; at 1077.50-1077.70m, a few coal lenses.
		1079.00	1080.00	1.00								Siltstone	dark grey, little muddy; at lower part, silty mudstone.
		1080.00	1081.80	1.80		45						Sandstone	white-grey, fine-grained; with black mudstone laminate; at 1081.0m, bedded plane: 45°; at 1080.5 a calcite layer, 0.01m thick.
		1081.80	1086.02	4.22								Mudstone	black, massive; at 1084.30-1085.0m, bauxitic mudstone; at 1082.70-1083.40m, broken, fracture numbe 10/m, and with a few coal lenses.
		1086.02	**1086.22**	**0.20**								**Coal seam**	**0.20m, RC: 0.20m, no parting, light, shiny, broken.**
		1086.22	1087.80	1.58		40						Sandstone	white-grey, fine-grained, at 1075.50m, bedded plane: 40°.
		1087.80	1087.95	0.15								Mudstone	light black, siliceous, hard, little heavy.
		1087.95	1097.90	9.95								Mudstone	black, at 1092.25-1092.70m, fine sandstone; at 1093.20m, 0.04m, coal seam; at 1096.80m, 0.10m, ban coal; at 1096.30-1097.50m, broken, fracture number: 15/m.
		1097.90	1100.70	2.80		40						Sandstone	white-grey, fine grained; with dark siltstone laminate; at 1100.0m, bedded plane: 40°; at 1099.10m vitrain lamina, 0.01m thick.
		1100.70	1105.00	4.30		40						Siltstone	dark grey, with laminate of fine sandstone; at 1102.0m, bedded plane: 40°; at 1100.60-1102.20m, fe vertical fracture, fracture NO: 8/m.
		1105.00	1114.00	9.00		40						Mudstone	black, massive; at 1111.10-1114.04m, little carbonaceous, brittle; at 1109.80-1111.30m, white-grey fine sandstone; at 1110.0m, bedded plane:40°. At 1109.30m, 0.10m siliceous mudstone; at 1105.80-1106.10m, broken, with a few coal lenses. At 1108.50-1109.20m, very broken, pieces, fracture NO:
	#7	**1114.00**	**1114.80**	**0.80**				**Q5**				**coal seam**	**0.76m, RC: 0.60m, 0.16m lost, broken into pieces, no parting, light, bright.**
		1114.80	1125.05	10.25		35						Mudstone	black, massive, at 1123.35-1123.55m, 0.20m, siliceous mudstone, hard, with brown quartz veins; at 1114.80-1120.50m, little broken, fracture NO: 7/m. at 1123.0m, bedded plane: 35°.
		1125.05	1126.30	1.25								Mudstone	black, carbonaceous; with numerous vitrain streaks and coal lenses; at 1125.40m, 0.10m thick, coal seam, light, shiny.
		1126.30	1129.00	2.70		35						Mudstone	black, massive; at 1127.0-1127.50m, white-grey fine sandstone; at 1127.90-1128.70m, a few coal lenses; at 1127.90m, 1128.0m, 1128.20m and 1128.35m, coal seam, 0.05m thick each; at 1127.50m, bed plane: 35°.
		1129.00	1139.40	10.40		40						Siltstone	dark grey and light black; interbedded layers of white-grey fine sandstone; with few carbonization branch fossil in siltstone; at 1132.05-1133.0m, vertical broken. At 1130.0m, bedded plane: 35°; a 1134.0m, 1136.0m and 1138.0m, bedded plane: 40°.
		1139.40	1153.60	14.20		40						Mudstone	black-light black, very silty; at upper and lower part, black; at middle, light black; at 1148.0-1149.90m, silty mudstone interbedded with white-grey fine sandstone. At 1151.0-1152.20m, little bauxitic; at 1149.0m, bedded plane:40°.
		1153.60	1170.80	17.20		35-25						Sandstone	white-grey, medium-coarse grained; quartz and debris predominately; at 1157.0-1159.60m, coarse and medium grained; at 1155.50-1159.60m,numerous coal lenses and laminate; at 1162.30-1163.20m, a few coal lenses; at 1161.60-1163.20m, coarse-grained; at 1170.60m, a vit

Wapiti River — Drill Hole Core Log

Drilling Company:	Dehua Drilling			**Hole No.:**	WP1R08		
Rig Type:	CS-14			**Collar Elevation:**	1313.4m		
Total Depth:	872m	**Coordinate:**	**Northing:**	6072521.2			
Spud Date:	5-Feb-13		**Easting:**	652570.8			
Finished Date:	24-Feb-13		**Logging Geologist:**	Charles			
Core Size:			**Note:**				

Formation	Coal Seam	Core Depth Interval From	To	Thickness, m Thick	TRUE	Strata Dip	Coal Floor Elevation	Sample ID Coal	Rock	CBM	Rock Hardness	Rock Name	Lithology Description
Q		0.00	21.67	21.67								till	overburden.
		21.67	29.75	8.08									coment.
Hasler		29.75	36.00	6.25		8°						Siltstone	dark gray siltstone interbedded with light gray fine sandstone laminates (15%); bedding
		36.00	51.06	15.06		5°						Siltstone	dark gray-black siltstone interbedded with light gray fine-grained sandstone (10%); at bas ° ; no react with 5% HCl, lots of plant fossils.
		51.06	63.00	11.94		5°						Siltstone	dark gray siltstone, interbedded with light gray fine sandstone (25%), horizontal bedding;
		63.00	71.50	8.50								Siltstone	dark gray siltstone interbedded with light gray fine sandstone laminates (10%), massive, s
		71.50	79.39	7.89									same as above; but more fine sandstone laminates (30%), few coal films, numerous plant lea
		79.39	81.80	2.41		5°						Siltstone	dark gray-black siltstone interbedded with light gray fine-grained sandstone (5%); react w
		81.80	93.84	12.04								Siltstone	same as above; but more light gray fine sandstone (30%), a few coal films.
		93.84	103.04	9.20		8°						Siltstone	more light gray fine sandstone, fine sandstone lenses in places, sands get coarser than ab
		103.04	111.00	7.96								Siltstone	dark gray siltstone. interbedded with light gray fine sandstone (10%).
		111.00	117.00	6.00		10°						Siltstone	dark gray siltstone. interbedded with light gray sandstone (15%) laminates, dip: 10° .
		117.00	120.00	3.00								Siltstone	same as above; from 119.70m - 120m, pale bauxite.
		120.00	156.30	36.30								Siltstone	dark gray siltstone. interbedded with light gray fine sandstone (10%).
		156.50	168.00	11.50								Siltstone	dark gray siltstone alternates with light gray fine sandstone; a few thin layer (1mm), whi HCl (calcite), slightly broken, fracture no: 5/m.
		168.00	176.72	8.72		5°						Siltstone	dark gray siltstone interbedded with light gray fine sandstone (10%) also thin white layer (calcite), bedding dip: 5° .
		176.72	179.90	3.18								Siltstone	dark gray to black siltstone, minor sandstone interbedded, a few of calcite veins parallel
		179.90	182.70	2.80		8°						Siltstone	dark gray to black siltstone interbedded with light gray fine-grained sandstone laminates
		182.70	187.70	5.00								Siltstone	dark gray-black siltstone interbedded with light gray sandstone lenses (15%), towards the
		187.70	193.95	6.25								Siltstone	same as above, but in the middle part siltstone becomes coarser sandstone account for 15%; angle to core axis 65°.
		193.95	208.80	14.85								Siltstone	dark gray siltstone interbedded with minor light gray sandstone laminates 5% toward the ba also decreases from 8° to almost horizontal.
		208.80	214.02	5.22		10°						Siltstone	dark gray to black siltstone, no sandstone interbedded, intact, massive; no react with HCl
		214.02	219.00	4.98								Siltstone	dark gray-black siltstone interbedded light gray fine-grained sandstone, 15% minor fractur 70° .
		219.00	222.65	3.65								Siltstone	dark gray-black siltstone interbedded with light gray fine sandstone laminates (10%); no f
		222.65	229.75	7.10								Siltstone	fine sandstone laminates increase (15%).
		229.75	234.60	4.85								Siltstone	fine sandstone laminates (15%); at 230.70m - 231.10, broken; at 232.20, a fracture with an
		234.60	236.87	2.27								Siltstone	fine sandstone laminates increase (10%); a few thick laminates (10mm).
		236.87	240.00	3.13								Siltstone	fine sandstone laminates (15%), minor fractured; no: 5/m.
		240.00	243.00	3.00								Siltstone	dark gray-black siltstone interbedded with minor light gray fine sandstone (15%); fracture broken.
		243.00	254.23	11.23								Siltstone	dark gray-black siltstone interbedded with light gray fine sandstone (5%); at 246m - 246.2
		254.23	261.00	6.77		10°						Siltstone	sandstone laminates 10%, bedding dip: 10°.
		261.00	264.00	3.00		10°						Siltstone	sandstone laminates 30%, bedding dip: 10° .
		264.00	267.92	3.92								Siltstone	sandstone laminates 15%.
		267.92	276.35	8.43		10°						Siltstone	fine sandstone laminates 15%; at 269.30m - 269.50, broken and fracture (70°); bedding dip: 10°.
		276.35	291.70	15.35		10°						Siltstone	fine sandstone laminates (30%), some thick sandstone laminates up to 9cm; two fractures at
		291.70	296.00	4.30								Siltstone	fine sandstone laminates (10%).
		296.00	313.10	17.10		10°						Siltstone	fine sandstone laminates 30%, bedding dip: 10° ; fractured at 299.40m - 300m, fracture ang interbedded with light gray fine-grained sandstone (25%); bedding dip: 10° .
		313.10	318.00	4.90								Siltstone	fine sandstone laminates 10%.
		318.00	322.00	4.00		10°						Siltstone	fine sandstone laminates 20%; bedding dip: 10°.
		322.00	330.00	8.00								Siltstone	fine sandstone laminates 30%; fractured in the lower part; fracture angle: 60-70°.
		330.00	333.00	3.00								Siltstone	fine sandstone 10%; fractures infilled with calcite veins.
		333.00	349.30	16.30		10°						Siltstone	fine sandstone laminates 10%; bedding dip: 10°.
		349.30	351.00	1.70								Siltstone	fractured no: 5/m; fracture angle: 70°.
		351.00	375.50	24.50								Siltstone	fine sandstone laminates 10%, fractures at 356.90m and 374.50m; fracture angle: 70°.
		374.30	379.84	5.54								Siltstone	dark gray-black siltstone interbedded with light gray, fine-grained sandstone laminates (2 part, fracture developed; no: 15/m; angle 70° ; towards the base, siltstone becomes coarse
		379.84	380.10	0.26								conglomerate	gray conglomeratee, gravels are dominately chert quartz, some other rocks; no react with competent, hard; conglomeratee contact with the above and beneath with clear flat boundary.
Boulder Creek		380.10	381.79	1.69								Siltstone	gray siltstone, no fine sandstone laminates; it's different from siltstone above conglomer is lighter than the above; ③ much competent that the above; ④ no sandstone laminates; ⑤
		381.79	384.62	2.83								Sandstone	gray-light gray fine-grained sandstone, contain bauxite, little fragile, scrapped by finge
		384.62	385.62	1.00								Siltstone	gray-dark gray siltstone, bauxitic.
		385.62	393.87	8.25								Sandstone	gray-light gray, bauxitic fine-grained sandstone.
		393.87	398.10	4.23								Siltstone	gray-dark gray siltstone, containing bauxitic; rich in plant fossils, numerous coal films.
		398.10	400.70	2.60								Sandstone	grey, bauxitic, fine-grained sandstone.
		400.70	402.00	1.30								Siltstone	dark gray siltstone, very rich in plant fossils, numerous coal films in the middle part, v
		402.00	407.30	5.30								Sandstone	gray, fine sandstone, bauxitic; micro-horizontal bedding.
		407.30	411.00	3.70		15° 20°						Siltstone	gray-dark gray siltstone, few bauxite, very rich in plant fossils, numerous coal films in
		411.00	415.70	4.70								Sandstone	medium-grained sandstone, gray, quartz and debris dominate.
		415.70	415.82	0.12								conglomerate	conglomerate, subangular, subrounded; 5mm-1cm, up to 4cm gravels.
		415.82	417.36	1.54								Sandstone	gray, fine sandstone, towards the base finer to siltstone.
		417.36	417.76	0.40								Mudstone	black, silty mudstone, very rich in plant fossils, numerous coal films.
		417.76	423.90	6.14								Sandstone	gray-dark gray, fine sandstone, in the middle part, more silty.
		423.90	426.30	2.40								Sandstone	gray-light gray medium sandstone, cross bedding.
		426.30	432.45	6.15		30° 35°						Sandstone	light gray medium sandstone, very rich in coal films; bedding dip: 30-35°.
		432.45	433.97	1.52								Siltstone	dark gray siltstone.
		433.97	436.03	2.06		25°						Sandstone	white-grey sandstone; medium grained, quartz and debris dominate cross bedding, intact, di
		436.03	439.13	3.10								Siltstone	dark gray-black siltstone, in the upper part, lots of coal films.
		439.13	440.43	1.30								Mudstone	black mudstone, rich in plant fossils, lots of coal films; slightly fractured, no: 5/m; in surface.
		440.43	441.05	0.62								Siltstone	dark gray siltstone.
		441.05	441.28	0.23								Sandstone	light gray, fine sandstone.
		441.28	443.15	1.87								Siltstone	dark gray siltstone, rich in plant fossils.
		443.15	444.20	1.05								Mudstone	black mudstone, very rich in plant fossils, numerous coal films.
		444.20	445.50	1.30								Siltstone	gray siltstone.
		445.50	447.00	1.50		25°						Sandstone	light grey, fine sandstone, coal film in places; dip: 25°.
		447.00	448.65	1.65		25°						Sandstone	white-grey, medium grained sandstone; lots of coal films interbedded, cross bedding; at 44 25° .
		448.65	448.83	0.18								conglomerate	conglomerate of mainly chert 1-2cm.
		448.83	451.60	2.77		20°						Sandstone	gray-dark gray, fine sandstone, interbedded with black mudstone laminates; in the lower pa
		451.60	453.00	1.40								Siltstone	gray-dark gray siltstone.
		453.00	453.95	0.95								Sandstone	gray, fine sandstone.
		453.95	457.60	3.65		25°						Sandstone	white-light gray, medium sandstone, interbedded with minor dark laminates (5%); bedding d
		457.60	459.12	1.52								Sandstone	gray, fine sandstone, interbedded with dark gray siltstone and a a few calcite veins.
		459.12	465.95	6.83		25°						Sandstone	white-grey medium sandstone, a few coal films; at 460.72m, 1.5cm coal seam; bedding dip: 2
		465.95	469.75	3.80								Siltstone	dark gray siltstone, towards the base, become coarser.
		469.75	474.04	4.29								Sandstone	white-grey medium sandstone, in the lower part, lots of coal films.
		474.04	475.22	1.18								Mudstone	black mudstone; at 475.22m - 475.36m, coal seam; at 476.60m - 476.85m, 0.25m coal seam, bl mudstone, very rich in coal films.
	BC	**475.22**	**475.36**	**0.14**								**coal**	**0.16m coal seam.**
		475.36	476.60	1.24								mudstone	black
	BC	**476.60**	**476.85**	**0.25**								**coal**	**0.25m coal seam.**
		476.85	477.40	0.55								Mudstone	black, very rich in coal film.
		477.40	478.45	1.05								Sandstone	light gray medium sandstone, broken, fractured no: 5/m.
		478.45	486.00	7.55		20°						Sandstone	light gray, medium sandstone and conglomerate alternately interbedding; conglomerate consi up to 1.5cm; 1.10(30)17(29)50(7)26(25)22(50)17(47)7(52)66(14)49(53)2.10; conglomerate in p interbedded with conglomerate layer every 2-15cm conglomerate size 2-5mm; bedding dip: 20°.
		486.00	486.17	0.17								Siltstone	dark gray to black siltstone, massive, competent.
		486.17	488.30	2.13		20°						Sandstone	light grey, medium sandstone, interbedded with thin layers of conglomerates; bedding dip:
		488.30	495.10	6.80		15°						Sandstone	light gray fine sandstone, intact, dip: 15°.
		495.10	495.33	0.23								Siltstone	dark gray-black siltstone, interbedded fine sandstone.
		495.33	496.00	0.67								Sandstone	light gray fine sandstone.
		496.00	496.03	0.03								Siltstone	3cm thick dark gray-black siltstone.
		496.03	496.98	0.95		15°						Sandstone	light gray, fine sandstone; bedding dip: 15°.
		496.98	467.20	-29.78								Siltstone	dark gray-black siltstone interbedded with light gray fine sandstone.
		497.20	497.50	0.30								Sandstone	light gray fine sandstone.
		497.50	503.40	5.90								Siltstone	dark gray-black silstone interbedded with light gray fine sandstone (40%), fine sandstone with 5% HCl.
Hulscro		503.40	514.97	11.57		20°						Siltstone	dark gray-black siltstone interbedded with light gray fine sandstone (30%), cross bedding;
		514.97	556.45	41.48		15° 20°						Siltstone	dark gray-black siltstone interbedded with light gray fine sandstone (20%), cross bedding; sandstone laminates increase to 30%; bedded plane: 15° at 544m; at 538.70m, 2mm bauxite or chlorit
		556.45	578.20	21.75		20°						Sandstone	light gray fine sandstone, alternates with dark gray siltstone 50% to 50%; bedded plane: 2 in places; thick sandstone layer reacts with 5% HCl, cross bedding.
		578.20	578.50	0.30								conglomerate	conglomerate; subrounded-subangular; size: 2-10mm, mostly quartz and sandstone.
		578.50	582.40	3.90								Siltstone	gray siltstone with fine sands, competent, a few coal films in places; a few fractures, in muddy in places.
		582.40	583.30	0.90		15°						Mudstone	black mudstone, very rich in plant fossils and CM, lots of coal seams; bedded plane: 15°.
		583.30	584.93	1.63								Sandstone	light gray, fine grained sandstone. close to the top and the base, more silts and mud, be
		584.93	**585.00**	**0.07**								**Coal**	**7cm coal seam, black, light.**
		585.00	585.35	0.35								Siltstone	dark gray-black siltstone.
		585.35	589.28	3.93		15°						Sandstone	gray-light gray fine-grained sandstone, interbedded with dark laminates (10%); coal films calcite veins; bedded plane: 15°.
		589.28	590.78	1.50								Siltstone	dark gray siltstone.
	#3	**590.78**	**592.43**	**1.65**								**Coal**	**1.65m #3 coal seam. RC:1.55m, light, black, bright. Two parting, 0.32m(fracture). Coal**
		592.43	592.80	0.37								Siltstone	dark gray siltstone, very rich in plant fossils, CM and coal films.
		592.80	594.80	2.00		15°						Siltstone	gray-light gray, fine-grained sandstone, interbedded with dark laminates, numerous coal fi
		594.70	600.30	5.60								Siltstone	dark gray siltstone, a few coal films and plant fossils; towards the base, mud increases.
		600.30	602.93	2.63								Mudstone	silty mudstone, dark gray-black, very rich in CM and plant fossils; a thin coal seam at 60 rich in mudstone layers, 6-8cm.
		602.93	605.45	2.52								Siltstone	dark gray siltstone, very rich in coal films and plant fossils.
		605.45	606.65	1.20		15°						Sandstone	gray fine-grained sandstone with dark laminates; bedded plane: 15°.
		606.65	608.10	1.45								Siltstone	dark gray siltstone.
		608.10	610.03	1.93		15°						Sandstone	light gray fine sandstone, with dark laminates (10%), cross bedding; bedded plane: 15°.
		610.03	613.25	3.22								Siltstone	dark gray siltstone, a few coal films in places.
		613.25	620.90	7.65								Mudstone	silty mudstone, dark gray-black, rich in coal films and plant fossils; at 620.17m - 620.37
		620.90	629.15	8.25		15° 20°						Siltstone	dark gray-black siltstone; massive, no fracture towards the base, more fine sandstone, ver 625.48m, 0.08m coal seam; bedded plane: 15-20°; no react with 5% HCl.
		629.15	630.82	1.67		15°						Sandstone	light gray, fine-grained sandstone, with dark laminates, towards the top and the base, mor bedded plane: 15°.
		630.82	636.65	5.83								Siltstone	dark gray-black siltstone, towards the base more fine sandstone; at 635.60m - 636.65m, bro core axis 50°-60°.
		636.65	645.50	8.85		15°						Sandstone	gray-light gray fine-grained sandstone, in the upper part and clost to the bottom part, mo HCl; bedded plane: 15°.
		645.50	647.20	1.70								Siltstone	dark gray siltstone, interbedded with light gray fine sandstone.
		647.20	648.10	0.90								Sandstone	gray to light gray fine sandstone, with dark laminated.
		648.10	649.33	1.23		10°						Siltstone	dark gray siltstone, alternates with light gray fine sandstone; bedded plane: 10°.
	#5	**649.33**	**656.07**	**6.74**								**Coal**	**6.74m #5 coal seam; black, light, same bright. morst of coal core in good condition; R 0.22m; b. 653.52-653.59m, 0.07m; c. 653.90-654.00m, 0.10m; d. 654.42-654.67m, 0.25m; e 0.32m. coal structure: 2.22<.022>1.75<0.07>0.31<0.10>0.42<0.25>0.27<0.16>0.35<0.32>0.3**
		656.07	657.00	0.93								Mudstone	black mudstone, very rich in plant fossils and CM; lots of coal film.
		657.00	659.20	2.20								Siltstone	dark gray siltstone; in the lower part, interbedded with light gray fine sandstone.
		659.20	**659.80**	**0.60**								**Coal**	**0.60m #5-1 coal seam. Black.**
		659.80	661.50	1.70								Sandstone	gray fine sandstone, with dark laminates, a few coal films; react with 5% HCl.
		661.50	663.00	1.50		15°						Siltstone	dark gray siltstone, interbedded with gray fine mudstone; very rich in coal film and plant
		663.00	664.53	1.53								Mudstone	black mudstone, alternates with dark gray siltstone; mudstone is very rich in coal film;
		664.53	667.45	2.92								Sandstone	gray, fine sandstone, fractured with infilled calcite veins, with 5-50° to core axis; react with
		667.45	668.20	0.75								Siltstone	dark gray siltstone; few coal films.
		668.20	669.36	1.16								Mudstone	black mudstone, very rich in coal films.
		669.36	669.79	0.43								Siltstone	dark gray siltstone.
		669.79	670.02	0.23								Mudstone	black mudstone, very rich in coal films.
		670.02	670.21	0.19								Siltstone	dark gray siltstone.
	#6+1	**670.21**	**670.59**	**0.38**								**Coal**	**0.38m coal seam; black, light, bright.**
		670.59	672.28	1.69								Sandstone	gray fine sandstone, a few dark laminates.
		672.28	673.10	0.82								Siltstone	dark gray siltstone.
	#6	**673.10**	**673.75**	**0.65**								**Coal**	**0.65m #6 coal seam; one parting, 0.11m; coal structure: 0.25<0.11>0.29m.**
		673.75	674.00	0.25								Siltstone	dark gray siltstone.
		674.00	675.93	1.93		10°						Sandstone	light gray medium sandstone; mostly quartz and debris; a few dark laminates and coal films
		675.93	688.06	12.13		15°						Siltstone	dark siltstone, interbedded with black mudstone laminates (30%), very muddy in places; ri places; bedded plane: 15°.
		688.06	698.25	10.19		10°						Mudstone	black mudstone, very rich in plant fossils and CM, lots of coal films; bedded plane: 10°. at
	#7	**698.25**	**699.00**	**0.75**								**Coal**	**0.75m #7 coal seam; RC: 0.35, black, light, bright.**
		699.00	700.10	1.10								Mudstone	black mudstone, very rich in CM and plant fossils, massive.
		700.10	**700.52**	**0.42**								**Coal**	**0.42m coal seam, very broken to smashed.**
Gates		700.52	707.60	7.08		10°						Mudstone	black mudstone, alternates with dark gray siltstone; rich in coal films; bedded plane: 10°;
		707.60	**708.24**	**0.64**								**Coal**	**0.64m coal seam. RC: 0.40m.**
		708.24	710.00	1.76								Mudstone	black mudstone, interbedded with dark gray siltstone, very rich in CM and coal films.
		710.00	**710.75**	**0.75**								**Coal**	**0.75m coal seam; Rc: 0.75m.**
		710.75	714.70	3.95								Mudstone	black mudstone, very rich in CM and coal films.
		714.70	**717.00**	**2.30**								**Coal**	**2.30m coal seam; RC: 2.17m; coal structure: 0.97<0.45>0.28<0.35>0.25m.**
		717.00	720.00	3.00								Mudstone	black mudstone; very rich in CM and plant fossils, lots of coal films; top part, very brok
	at 720m, change to NQ	720.00	722.85	2.85								Siltstone	dark gray siltstone; recovery of core is 1.40m; lost 1.60m.
		722.85	725.50	2.65		10° 15°						Sandstone	gray to dark gray fine-grained sandstone; in the upper part, more silts, toward the base,
		725.50	736.60	11.10		20°						Sandstone	white-grey medium grained sandstone, quartz and debris dominate, few coal films; fracture angle (1-90°) to core axis and infilled with calcite veins; fracture no: 20/m; bedded plane: 20.
		736.60	737.40	0.80								Siltstone	dark gray siltstone.
		737.40	739.25	1.85								Mudstone	black mudstone; rich in plant fossils, numerous coal films in places, very broken.
		739.25	741.85	2.60		10°						Siltstone	gray-dark gray siltstone, in the lower part, interbedded with light gray fine sandstone; b
		741.85	748.52	6.67								Sandstone	gray to light gray fine grained sandstone, interbedded with dark siltstone laminates, from
		748.52	753.40	4.88		10° 15° 25°						Sandstone	white-grey medium grained sandstone, interbedded dark laminates (10-15%); react with 5% HC 25°; at 753m, bedded plane: 15°; at 753.25m - 753.40m, a few coal films, bedded plane: 25°;
		753.40	757.80	4.40									753.40m - 757.80m, gray to dark gray fine grained sandstone, interbedded dark siltstone, m bedded plane: 25° ;
		757.80	759.28	1.48									757.80m - 759.28m, dark gray silty mudstone, rich in plant fossils, numerous coal films;
	#8	**759.28**	**764.97**	**5.69**									**5.69m #8 coal seam. RC: 4.40m, no parting. Black, light, bright. High quality coal. M broken to small pieces.**
		764.97	768.10	3.13		20°						Siltstone	gray-dark gray siltstone; rich in plant fossils, numerous coal films; bedded plane: 20°.
		768.10	781.40	13.30		20° 30°						Sandstone	gray-light gray fine sandstone, interbedded with dark siltstone laminates (10-30%); cross fractures about at 768.90m, 769.50m, 770.60m, 771.20m, 774m, 776.55m and 776.70m, with 65-75° to core ax
		781.40	783.00	1.60		30°						Siltstone	gray siltstone; bedded plane: 30°.
		783.00	789.00	6.00		35°						Sandstone	grey to light gray fine grained sandstone, interbedded with cherts laminates (20%); react infilled calcite veins, with 40-50° to core axis; bedded plane: 35°.
		789.00	796.46	7.46		15°						Siltstone	gray to dark gray siltstone, interbedded with mudstone laminates (20-40%); rich in plant 791.54m, 0.14m, coal seam; at 793m, bedded plane: 15°.
		796.46	797.20	0.74								Mudstone	black mudstone; broken, very rich in CM and plant fossils; lots of coal films; at 796.46m
	#9	**797.20**	**801.93**	**4.73**								**Coal**	**4.73m #9 coal seam; RC: 3.33m, black, light, broken; three partings, 0.56m; (0.05m + 0 0.34<0.05>0.60<0.35>2.80<0.16>0.43. Note: at 795-798m run, lost: 0.20m; at 798-801m r**
		801.93	804.00	2.07								Mudstone	dark gray to black mudstone; very rich in plant fossils, lots of coal films; at 802.15m-80
		804.00	815.40	11.40		30° 40°						Sandstone	gray to light gray fine-grained sandstone, at upper and the lower parts, interbedded with from 15 ° to 30°. in the middle part, coarser, a few fractures infilled with calcite veins; bedded plane: 30-40°.
		815.40	817.42	2.02								Siltstone	dark gray siltstone.
		817.42	821.30	3.88		40°						Sandstone	gray to light gray, fine-grained sandstone, interbedded with dark gray siltstone layers in
		821.30	822.63	1.33		30°						Sandstone	white-grey medium grained sandstone, dominated by quartz and debris; at the lower part of gravels (2-4mm) in the rock; bedded plane: 30°.
		822.63	**822.76**	**0.13**								**Coal**	**0.13m coal seam.**
		822.76	826.25	3.49		25°						Mudstone	dark gray to black mudstone, rich in CM and plant fossils, numerous coal films; at 823.30m
		826.25	831.20	4.95		25°						Sandstone	gray to light gray fine grained sandstone, interbedded with dark siltstone laminates (20%
		831.20	840.70	9.50		25° 30°						Mudstone	dark gray to black mudstone, very rich in plant fossils; rich in CM in places, lots of coa fractures infilled with calcite veins; massive; bedded plane: 25-30°.
		840.70	851.50	10.80		45° 50° 60°						Siltstone	gray to dark gray siltstone, interbedded with dark mudstone laminates; vary with mud and s bedded plane: 45°; from 842.55 to 843.95m, muddy; bedded plane: 50°; from 844.35 to 845.50m, light gray fi plane: 50-60°; at about 851m, bedded plane: 60°; fractures observed at : 842m - 842.50m, 844.20m - 844.30m,
		851.50	855.50	4.00		55°						Mudstone	dark gray to black mudstone; very rich in CM and plant fossils; lots of coal film; bedded
	#10	**855.50**	**857.70**	**2.20**		**50°**						**Coal**	**2.20m #10 coal seam; RC: 1.10m, very broken to small chunks and smashed, some might be estimate may not accurate; dip: 50°**
		857.70	858.05	0.35								Mudstone	black mudstone, very rich in CM and coal films.
		858.05	861.40	3.35		50°						Sandstone	gray-light gray, fine-grained sandstone, interbedded with dark laminates; bedded plane: 5 core axis and infilled with calcite veins; at 859.20m - 859.60m, black mudstone, very rich in CM and plant fossils
		861.40	864.80	3.40		65°						Siltstone	dark gray siltstone, alternates with black mudstone; very rich in CM and plant fossils i
	#11	**864.80**	**865.40**	**0.60**								**Coal**	**0.60m #11 coal seam; RC: 0.20m.**
		865.40	872.00	6.60		60° 65°						Sandstone	white-grey medium grained sandstone, interbedded with dark laminates, quartz and debris d infilled with calcite veins; bedded plane: 60°-65°, a few coal films in places.
				0.00									TD: 872m

Wapiti River — Drill Hole Core Log

Drilling Company:	Focaro Drilling Company	**Hole No.:**	WP1R10		
Rig Type:	VD-8000	**Collar Elevation:**	1200.9		
Total Depth:	968.50m	**Coordinate:**	**Northing:**	6072559.1	
Spud Date:	10-Oct-12		**Easting:**	650547.6	
Finished Date:	10-Nov-12		**Logging Geologist:**	Victor, Lee, Ricky	
Core Size:	HWT, HQ, NQ		**Note:**		

Formation	Coal Seam	Core Depth Interval From	To	Thickness, m Thick	TRUE	Strata Dip	Coal Floor Elevation	Sample ID Coal	Rock	CBM	Rock Hardness	Rock Name	Lithology Description
Q		0.00	9.60	9.60								till	overburden, weathered, deposits, yellow-brown mudstone mainly broken so much
Hasler		9.60	29.50	19.90		80-85						siltstone	siltstone, dark grey, interbedded with light grey fine-grained sandstone laminates. micro-bedding, bedding plane:80-85°.at 14.00-15.00m fault gauge. from 14.00-23.00m,very much br fracture number: more than 50/m. slickensides at various angles to core axis.
		29.50	80.00	50.50		77						siltstone	at 32.5m, bedding plane:77°.from 36.00-39.50m very much broken, broken surface are slicke shiny, vertical fracture extends from 41.50-59.50m,very much broken,fracture developed, b surface are slickensided and shiny. Fault zone. Bedding plane:67° at 59.00m.reeppears lowe vertical fracture extends from 41.50-59.50m,fracture number:15/m. at 69.00m,bedding plane
		80.00	122.00	42.00		68-30						siltstone	siltstone, dark grey,interbedded with light grey FGSS laminates(10%).micro-horizontal bec 86.50m,bedding plane:68°,at 90.00m dip→60°,at 99.00m dip→50°,at 104.00m dip→40°,bec decreased toward(dip),at 111.00m dip→30°.from 110.00m-112.00m broken, broken surface are slickensided and shiny, distorted bedding on FGSS joint surface, minor siderite nodule obs bedding. from 118.50-120.50m very much broken.
		122.00	159.00	37.00		5						siltstone	siltstone, dark grey,interbedded with light grey FGSS laminates(10%).micro-horizontal bec 125.00m,bedding plane:5°.at 126.50m,coalfilm observed on bedding. minor sideritic nodule throughout.at 136.00m,bedding plane:5°.at 140.00-140.50m,few carbonaceous fragment.at 148 debris and sideritic nodule. from 150.00-151.30m very much broken, fracture number:30/m, a 153.00m,dip 5°.from 154.25-155.90m compressed and broken, deformation slickenside at vari to core asis.at 155.90-159.00m, slightly fracture.at 146.50m dip:25°,few coal film.
		159.00	200.50	41.50		5						siltstone	same as previous interval, plus bedding plane decreased to 5°.minor sideritic nodule thro 176.00m,bedding plane:5°.at 196.00m,bedding plane:5°.
		200.50	242.50	42.00		5						siltstone	same features as above, minor sideritic nodule throughout. at 207.25-207.33.00m 0.08m kaol color hands, soft. at 219.00m,bedding plane:5°.at 230.50m,bedding plane:5°.at 239.50m,be plane:5°
		242.50	281.50	39.00		5						siltstone	siltstone, dark grey, interbedded with light grey fine-grained sandstone laminates(20%),mi horizontal bedding. a few sideritic thin laminates throughout.at 251.50m,bedding plane:5° 260.50m,bedding plane:5°.at 268.50m,bedding plane:5°.at 268.05-268.35m,FGSS more distort bedding. blended with siltstone and FGSS.at 273.00-273.50m,very much broken, fracture numb 275.00-275.50m,very much broken.
		281.50	295.40	13.90		5						siltstone	same features as above, blended with siltstone and few FGSS.at 284.00m,bedding plane:5°.
		295.40	324.50	29.10		5						siltstone	siltstone, dark grey,interbedded with light grey FGSS laminates(5%). little muddy, micro-bedding.at 300.00m,bedding plane:5°.alternating with band of a few siderite thin laminate 320.50m,bedding plane:5°.at 322.00m, few carbonaceous fragment observed on bedding.
		324.50	328.50	4.00								siltstone	same as previous interval, plus more FGSS laminates(30%)
		328.50	332.50	4.00								siltstone	same features as above, plus FGSS laminates decreased to 5%,and more sideritic thin lamir
		332.50	365.50	33.00		5						siltstone	same features as above, plus more FGSS laminates(20%).at 336.25m 0.10m FGSS thin laminate horizontal bedding. sideritic thin laminates throughout.at 341.58m,pyrites 2 layers thin laminates.at 344.50-347.50m more FGSS distorted bedding.at 345.30m,0.01m pyrites band.at 353.50m,bedding plane:5°.from 359.65-361.65m,more FGSS thin laminates(50%).at 361.55m, py nodule.at 362.60m, pyrite nodule 3 layers.at 362.60m, more carbonaceous fragment observed bedding, at 362.00m,bedding plane:5°.
		365.50	444.00	78.50		5						siltstone	dark grey, interbedded with light grey fine-grained sandstone laminates(20%). micro-horizo bedding.at 374.50m,bedding plane:5°.a few sideritic, nodule throughout. from 377.50-386.5 FGSS thin laminates(40%).distorted bedding on FGSS bedding and few CGSS. from 389.00-390.0 FGSS. from 359.50-397.00m,more FGSS. at 400.00m,bedding plane:7°.from 405.00-308.00m,more nodule/laminates. alternating with bands of sideritic. at 419.50m,bedding plane:5°.at 434.50m,bedding plane:5°.
		444.00	480.90	36.90		5						siltstone	siltstone, dark grey, interbedded with light grey fine-grained sandstone laminates(20%). horizontal bedding. At 449.00m, bedding plane 5°. alternating with bands of brown sider 470.43m, and 470.70m, coal film observed on joint surface. At 471.10m, pyrites nodule. at bedding plane 5°。
		480.90	481.48	0.58								siltstone	Light grey, fine-grain conglomerate ∮2-5mm.
Boulder Creek		481.48	482.75	1.27								mudstone	mudstone, dark grey, massive. Rich in plant leaf fossils.
		482.75	488.75	6.00								siltstone	siltstone dark grey, interbedded with light grey FGSS laminates(30%) at 485.00-486.00 more laminates. At 484.50-484.53m,0.03m longlomerate,minor plant fragment and coal film.
		488.75	497.50	8.75								mudstone	bauxitic mudstone, white-grey, soft, minor Fe2+,(red), at 491.00m,massive with few FGSS, bedding.
		497.50	500.00	2.50		5						siltstone	siltstone, dark grey, with minor bauxitic, and few coal film. At 500.00m,bedding plane 5°
		500.00	503.60	3.60								sandstone	sandstone, light grey, fine-grained interbedded with light black mudstone laminates, and threads suspended on joint surface.
		503.60	509.00	5.40		5						siltstone	siltstone grey, a few bauxitic mudstone, and minor FGSS laminates. At 506.50m,bedding plar lower part, few coal film. At base 0.40m FGSS.
		509.00	509.50	0.50								mudstone	black mudstone
		509.50	512.20	2.70								mudstone	mudstone, dark grey, little silt, Rich in carbonaceous and coal fragment.
		512.20	515.50	3.30		5						sandstone	FGSS, light grey, at top, abundant plant roof fossil. At 515.00m,bedding plane 5°。
		515.50	517.00	1.50								mudstone	mudstone, light black, massive, with minor bauxitic, white-grey.
		517.00	523.40	6.40		10						sandstone	FGSS, light grey, with few black mudstone thin laminates and coal film, well-sorted, quart debris mainly. react with 5% HCL. At 522.00m,bedding plane 10°. At base,sandy toward.
		523.40	527.85	4.45								sandstone	MGSS, light grey, with minor coal threads on joint surface. predominately quarts and debri sorted. At base, sandy becoming conglomerate.(0.30m)
		527.85	528.35	0.50								mudstone	bauxitic mudstone, white-grey, massive.
		528.35	529.60	1.25								mudstone	mudstone, light black, massive, Rich in plant leaf root fossils.
		529.60	530.15	0.55								sandstone	FGSS
		530.15	532.20	2.05		10						siltstone	siltstone, grey, minor bauxitic, at 531.55-531.70m,coaly FGSS,at530.00m,bedding plane 10°
		532.20	532.75	0.55								sandstone	FGSS, react with 5%HCL.
		532.75	539.20	6.45								mudstone	mudstone, bauxitic with siltstone partly grey.
		539.20	540.90	1.70								sandstone	sandstone, light grey, fine-grained.
		540.90	554.80	13.90								mudstone	mudstone, dark grey with siltstone, plant fossil inside on mudstone.552.5-554.0,broken cor
		554.80	555.60	0.80								sandstone	sandstone light grey fine grained.
		555.60	562.70	7.10								mudstone	mudstone, dark grey, plant fossil inside.
		562.70	568.05	5.35								mudstone	mudstone, grey bauxitic and silt.
		568.05	572.00	3.95								mudstone	mudstone, dark grey, silt, massive, minor coal film on bedding.
		572.00	572.70	0.70								sandstone	FGSS
		572.70	576.25	3.55		7						mudstone	mudstone, light black, massive, Rich in plant root fossils and minor coal film. At base wi FGSS laminates. At 576.00m,bedding plane 7°.
		576.25	576.80	0.55								sandstone	FGSS
		576.80	577.15	0.35								mudstone	mudstone black
	BC	**577.15**	**577.57**	**0.42**								**coal**	**0.42m BC coal seam. RC:0.15m.**
		577.57	578.35	0.78								mudstone	black carbonaceous mudstone
		578.35	578.55	0.20		7						sandstone	FGSS, at 578.50m,bedding plane 7°.
		578.55	583.40	4.85								conglomerate	conglomerate, light grey, fine grained, ∮2-10mm,poorly-sorted,predominately quartz and det lower part, with a few FGSS.
		583.40	584.97	1.57								sandstone	FGSS, light grey, with minor conglomerate.
		584.97	595.75	10.78		7						sandstone	FGSS, light grey,pure,well-sorted,586.30m horizontal bedding, predominately quartz and det 587.55-587.60m, 0.05m conglomerate.at 595.50m,bedding plane 7°.at base, with minor dark g siltstone laminates.
		595.75	600.57	4.82		7						sandstone	FGSS, light grey interbedded with dark with siltstone laminates 40%.micro-horijontal beddi 597.00m,bedding plane 7°.
Hulcross		600.57	620.50	19.93		10						siltstone	siltstone dark grey, interbedded with light grey, fine-grained sandstone, laminates(20%).m horizontal bedding at 603.00m,bedding plane 7°. At 602.35m,pyrite nodule(2x5mm).alternati bands of sideritic laminates. small-cross bedding on FGSS. At 615.00m,bedding plane 10°.
		620.50	634.64	14.14		10		**GT1, GT2**				siltstone	Same features as above ,plus light grey FGSS laminates increased to 30%.At 623.00m,bedding °.a few carbonaceous fragment observed on bedding surface(625.00m).
		634.64	634.74	0.10								limestone	Kaolinite and minor limestone. strong react with 5% HCL.
		634.74	645.50	10.76		10		GT3				siltstone	siltstone, dark grey, interbedded with light grey FGSS laminates(20%). micro-horizontal b 638.50m, bedding plane 10°. a few carbonaceous fragment observed on bedding(640.25m). lit At 643.50m, bedding plane 10°. At 644.00m, coal film on bedding.
		645.50	671.02	25.52		10		GT4, GT5				siltstone	siltstone dark grey, interbedded with light grey, fine-grained sandstone, laminates(40%).m horizontal bedding . few carbonaceous fragment .At 650.50m,bedding plane 10°. Small cross FGSS surface.at lower parts, a few coal threads observed on bedding. At 659.50m,bedding pl at 665.50m,bedding plane 10°. progressively FGSS laminates to base.
		671.02	671.15	0.13								conglomerate	conglomerate, with FGSS laminates Ø:2-15mm, rounded-subrounded
		671.15	672.32	1.17			**529.75**					mudstone	light black, massive. a few carbonaceous fragment
	1#	**672.32**	**672.52**	**0.20**								**coal**	**coal seam,RC:0.20m black, dull**
		672.52	673.15	0.63								siltstone	Dark grey, muddy, with a few coal threads
		673.15	675.60	2.45				GT6				sandstone	FGSS, grey, with minor dark grey siltstone laminates at base
		675.60	678.12	2.52								siltstone	Dark grey ,massive, rich in plant root leaf fossil and coal firm
	2#	**678.12**	**678.37**	**0.25**								**coal**	**coal seam,RC:0.25m black**
		678.37	679.88	1.51				GT7				mudstone	Dark grey, massive. rich in plant fossil, at base, 0.20m carbonaceous mudstone.
	3#	**679.88**	**681.35**	**1.47**			**Q1,Q2**					**coal**	**1.47m 3#coal, RC:1.07m;parting:680.15-680.30,0.15m carbonaceous mudstone. coal structure:0.27<0.15>1.05m. black, light, shiny, intact**
		681.35	684.50	3.15				GT8				mudstone	Dark grey, massive; at top:0.20m coaly mudstone; from 648.00-684.50m broken, with minor co
		684.50	684.80	0.30								mudstone	bauxitic mudstone
		684.80	686.00	1.20								siltstone	Dark grey, with minor FGSS laminates, rich in plant leaf fossil
		686.00	690.20	4.20		10		GT9				sandstone	FGSS light grey, interbedded with minor dark grey siltstone laminates. at 687.50-688.50m,mudstone,numerous plant leaf fossil. at 689.50,bedding plane:10°
		690.20	692.30	2.10								mudstone	black mudstone
		692.30	694.50	2.20								sandstone	FGSS, light grey, with minor dark grey mudstone laminates and coal threads
		694.50	700.20	5.70				GT10				mudstone	mudstone, black, massive, rich in carbonaceous fragment. at 695.30-695.60m more coal thre ;at697.50-698.50 more slit.at 699.00m bedding plane:10°;at base,0.40m.black carbonaceous
		700.20	**700.46**	**0.26**								**coal**	**0.26m coal seam**
		700.46	704.95	4.49				GT11				mudstone	black, massive, abundant carbonaceous and plant fragment and minor coal film
		704.95	**705.05**	**0.10**								**coal**	**0.10m coal seam**
		705.05	706.16	1.11								siltstone	Dark grey, massive, at top,0.10m black carbonaceous mudstone
		706.16	708.68	2.52		10		GT12				sandstone	FGSS, light grey, at upper part, with minor dark grey siltstone laminates. at 706.50m,dip: at base, grading toward
		708.68	710.40	1.72								mudstone	black(light),massive
		710.40	712.36	1.96		10		GT13				mudstone	Dark grey, interbedded light grey FGSS laminates (20%), at top: 0.30m FGSS, distorted bedc 712.00m, dip: 10 degree.
	4#	**712.36**	**713.66**	**1.30**			**Q3**					**coal**	**4#coal seam,1.30m,RC:1.25m,no parting, black, light, intact**
		713.66	720.50	6.84		10		GT14 GT15				siltstone	Dark grey, interbedded with minor light grey FGSS laminated. no plant fossil, almost massi 715.00m,bedded plane:10°
		720.50	723.20	2.70		20						sandstone	FGSS, grey, interbedded with dark grey siltstone laminate(30%),rich in coal film, and cart flagment.at 722.00m bedding plane 20°.
		723.20	725.40	2.20								siltstone	siltstone, dark grey, interbedded with a few FGSS laminates(20%).
		725.40	730.70	5.30		20		GT16 GT17				sandstone	FGSS grey, well sorted, micro-horizontal bedding, at lower part, with more dark grey silts laminates(40%).at 729m,bedding plane:20°.small cross-bed on FGSS bedding, numerous coal f carbonaceous fragment on bedding. FGSS weak react with 5% HCL.
		730.70	731.60	0.90								mudstone	Mudstone, light black, massive, few carbonaceous fragment.
		731.60	735.30	3.70								sandstone	FGSS, light grey ,interbedded with dark grey siltstone laminates(30%)
		735.30	735.90	0.60								mudstone	0.60m black, mudstone, and 0.02m coal film.
		735.90	739.50	3.60				GT18				siltstone	siltstone, grey, with minor FGSS laminated. alternately with bands of coal threads.
		739.50	740.75	1.25								siltstone	siltstone, dark grey, massive rich in coal thread, at base25carbonaceous mudstone.
		740.75	**740.82**	**0.07**								**coal**	**0.07m coal seam**
		740.82	746.50	5.68				GT19				siltstone	siltstone, dark grey, muddy, interbedded with light grey FGSS laminates(30%),micro-horizor bedding. at743.00m,bedding plane:25°,abundant coal film.at 744.8-745.3m more FGSS.at 745. 0.03m coal.at 745.83-746.5 mudstone ,light black, rich in coal film.
		746.50	746.90	0.40								sandstone	0.40m FGSS, with dark grey siltstone laminates
		746.90	748.14	1.24		25						mudstone	mudstone, light black, numerous coal thread on bedding.at 747.5m,bedding plane25°.minor carbonaceous debris on bedding surface.
		748.14	751.30	3.16								sandstone	FGSS, with siltstone laminates
		751.30	752.18	0.88								mudstone	mudstone, light black, massive, rich in plant leaf fossil and carbonaceous debris
		752.18	**752.25**	**0.07**								**coal**	**0.07m coal seam**
		752.25	755.55	3.30				GT20				siltstone	siltstone, dark grey, interbedded with light grey FGSS laminates(20%),at base 0.30m black carbonaceous mudstone.
	5#	**755.55**	**756.18**	**0.63**								**coal**	**0.63m 5#coal seam, RC:0.39m black**
		756.18	757.81	1.63								siltstone	siltstone, dark grey, rich in coal seam.
	5-1#	**757.81**	**758.10**	**0.29**								**coal**	**0.29m coal seam, RC=0.20m**
		758.10	758.50	0.40								mudstone	black, carbonaceous mudstone.
		758.50	760.61	2.11		12		GT21				mudstone	mudstone, light black, abundant coal film and carbonaceous. with minor dark grey siltstone laminates.at 760m.bedded plane 12°.
		760.61	**760.81**	**0.20**								**coal**	**0.20m coal seam**
		760.81	763.09	2.28								mudstone	black mudstone. rich in plant root fossil
		763.09	763.54	0.45								mudstone	black, carbonaceous mudstone.
		763.54	**763.72**	**0.18**								**coal**	**0.18m coal seam**
		763.72	764.32	0.60				GT22				siltstone	Dark grey siltstone, numerous carbonaceous debris
		764.32	764.90	0.58								sandstone	FGSS
		764.90	765.55	0.65								mudstone	black mudstone.
		765.55	**765.70**	**0.15**								**coal**	**0.15m coal seam**
		765.70	766.90	1.20								mudstone	mudstone carbonaceous ,3 layers coal seamlet(0.1,0.03,0.05m)
		766.90	767.56	0.66								mudstone	mudstone, black, rich in coal film and carbonaceous fragment
		767.56	773.20	5.64				GT23				mudstone	mudstone, light black, massive. minor coal film, soft
		773.20	**773.50**	**0.30**								**coal**	**0.30m,coal seam,RC:0.15m**
		773.50	775.17	1.67								mudstone	mudstone, light black, massive, numerous plant root fossil and coal film.
	6#	**775.17**	**775.88**	**0.71**								**coal**	**0.71m 6#coal seam, grinding,black,parting:775.37-775.77m, 0.40m,mudstone,black.coal st 0.20<0.40>0.11m.**
		775.88	776.17	0.29				GT24				mudstone	black, mudstone.
		776.17	776.56	0.39								siltstone	siltstone, dark grey, interbedded with light grey FGSS laminates
		776.56	779.80	3.24								mudstone	mudstone, black ,massive. minor carbonaceous fragment, at base,0.20m,carbonaceous mudstone
Gates	**6-1#**	**779.80**	**780.63**	**0.83**			**Q4**					**coal**	**0.83m 6-1#coal seam, RC:0.68m,black ,intact, light.**
		780.63	783.30	2.67				GT25				mudstone	mudstone, black, massive, rich in carbonaceous and coal fragment
		783.30	785.40	2.10		15						sandstone	FGSS, grey, interbedded with black mudstone laminates(30%),and coal seamlet,at784.5m,beddi plane:15°
		785.40	794.60	9.20		20		GT26				sandstone	FGSS-MGSS, light grey, interbedded with a few dark grey siltstone laminates(15%), micro-hc bedding, alternating with bands of coal threads. partly small cross-bed, predominately qua debris.at 792.5m,bedding plane:20°
		794.60	**794.63**	**0.03**								**coal**	**0.03m coal seam**
		794.63	795.02	0.39								mudstone	black carbonaceous mudstone.
	7+1#	**795.02**	**795.40**	**0.38**								**coal**	**0.38m coal seam,7+1# black,light,intact,RC:0.38m**
		795.40	796.58	1.18				GT27				mudstone	mudstone, black, carbonaceous.
	7#	**796.58**	**799.14**	**2.56**			**Q5 Q6 Q7**					**coal**	**2.56m, 7#coal seam, RC: 2.50m,black. parting:a.797.50-797.73,0.23m,black,mudstone,b.79 798.27,0.15m,black,mudstone,c.798.87-779.02,0.15m,black,mudstone.boney coal:798.27-798.87,0.60m.coal structure:0.92<0.23>0.39<0.15>0.60<0.15>0.12m.**
		799.14	800.40	1.26								mudstone	black, mudstone. carbonaceous.
	7-1#	**800.40**	**801.21**	**0.81**			**Q8,Q9**					**coal**	**0.81m,7-1#coal seam, RC: 0.79m.parting:800.80-800.85,0.05m,black,mudstone.coal stucture:0.40<0.05>0.36m**
		801.21	806.20	4.99		15		GT28				mudstone	mudstone, dark grey, massive, numerous coal film and carbonaceous fragment.at base ,with a FGSS laminates, at 803.60m,bedding plane:15°
		806.20	817.00	10.80		15		GT29				sandstone	FGSS, light grey ,pure, predominately quartz and debris. horizontal bedding from 806.8-808 Broken, fracture number:15/m.at 810m bedding plane:15°. from 812.5-817.0m with a few dark mudstone laminates.at 817.00m bedding plane:15°,at 815.1-815.5m,more mudstone inclusions. 816.7m,more mudstone inclusions. at base,0.20m,a few coal film observed.
		817.00	821.50	4.50		15		GT30				mudstone	mudstone, light black, massive, rich in plant root fossil ,at lower part, progressively si base.at 820m,bedding plane:15°.
		820.74	824.60	3.86								siltstone	siltstone, dark grey, interbedded with light grey FGSS laminates(30%),numerous coal threac carbonaceous.
		824.60	826.88	2.28				GT31				mudstone	mudstone, dark grey, massive, a few coal film .
		826.88	831.34	4.46		16						siltstone	siltstone, dark grey, interbedded with light grey FGSS laminates(20%),micro-horizontal bec 830m,bedding plane:16°.
		831.34	840.50	9.16		12		GT32				mudstone	mudstone, dark grey, interbedded with light grey FGSS laminates(5%),micro-horizontal beddi 837m,bedding plane:15°.few carbonaceous fragment.at840m,bedding plane:12°
		840.50	842.60	2.10				GT33				mudstone	mudstone, light black ,massive, abundant coal threads and carbonaceous fragment, a few pla fossils
	8#	**842.60**	**848.58**	**5.98**			**Q10,Q 11**			**CBM01**		**coal**	**5.98m 8# coal seam, RC:4.32m,divided two intervals, take coal sample. Q10:842.60-845.5 no parting,black,light,,bright,half-intact.lost:1.40m RC:4.32m.Q11:845.5-848.5m,3.00m, parting,black,light,bright,intact,shiny.RC:2.82.**
	NQ DRILL	848.58	854.00	5.42		10						mudstone	mudstone, light black, interbedded with light grey FGSS laminates(20%),rich in plant root coal film. micro-horizontal bedding, at 851m,bedding plane:10°
		854.00	856.50	2.50								siltstone	siltstone, dark grey, with light grey FGSS laminates(20%),from 854.00-856.50m broken, brok are slickensided and shiny.
		856.50	858.00	1.50								mudstone	mudstone, light black, massive rich in carbonaceous fragments and coal threads
		858.00	862.90	4.90		10						sandstone	FGSS, light grey, interbedded with dark grey, siltstone laminates(30%),at lower part ,silt laminates increased to 50%,few carbonaceous fragment observed on bedding surface.Dip:10° a
		862.90	869.50	6.60								mudstone	light black, massive. rich in coal threads and plant leaf/root fossil. And with few calcit
		869.50	**874.03**	**4.53**			**Q12,Q1 3**					**coal**	**4.53m 9# coal seam.RC:2.35m. Parting: 872.55-872.73m,0.18m black mudstone. black, ligh intact, shiny. Coal structure:3.05<0.18>1.30m.**
		874.03	876.20	2.17								mudstone	mudstone, black ,massive, rich in plant root fossil and coal threads ,at base silt toward.
		876.20	883.20	7.00		10						sandstone	FGSS, light grey, pure, predominately, quartz and debris, horizontal bedding, well-sorted. 879.00m,bedding plane:10°,weak react with 5% HCL. at lower part, interbedded with a few c mudstone laminates and carbonaceous fragment.
		883.20	884.55	1.35								mudstone	mudstone, light black, with light grey FGSS laminates.at 884.25-884.3m, 0.05m coal seam.
		884.55	887.50	2.95		15						siltstone	siltstone, dark grey, with light grey FGSS laminates(30%),from 886-886.8m,very much broker calcite veins.at 886.00m,dip:15°
		887.50	888.50	1.00								mudstone	mudstone, black, massive, little silt.
		888.50	892.66	4.16								sandstone	FGSS, light grey, with few dark grey siltstone laminates(10%),well-sorted, horizontal bedc base, few coal threads, and 0.05m conglomerate. react with 5% HCL.
		892.66	893.66	1.00								mudstone	black carbonaceous mudstone. rich in coal film.
		893.66	897.50	3.84								siltstone	siltstone, dark grey, massive ,at lower part, change black colour, rich in carbonaceous fr progressively silt to sandy.
		897.50	901.50	4.00		15						sandstone	FGSS, grey, interbedded with few dark grey, siltstone laminate(10%),micro-horizontal bedding,at900m,bedding plane:15°,strong react with 5% Hcl.at base, few carbonaceous fragm
		901.50	908.80	7.30		15						sandstone	MGSS, light grey, interbedded with dark grey siltstone laminates(30%) and a few coal seaml horizontal bedding ,at 908m bedding plane:15°,strong react with 5% HCL, few calcite vein on bedding surface. partly FGSS.
		908.80	912.60	3.80								mudstone	mudstone, light black, massive, abundant plant root fossil and few coal film.
		912.60	915.53	2.93								siltstone	siltstone, dark grey, interbedded with light grey FGSS laminates(40%),rich in plant root/l and carbonaceous debris.
	10#	**915.53**	**917.70**	**2.17**			**Q14,Q1 5**					**coal**	**2.17m,10#coal seam.RC:1.65m.black,light,bright,half-broken.parting:a:915.8-915.93,0.13 mudstone.b:916.13-916.16,0.03m black mudstone,c:916.27-916.32m,0.05m black mudstone. c structure:0.27<0.13>0.2<0.03>0.11<0.05>1.38m**
		917.70	918.10	0.40								mudstone	0.40m black, carbonaceous mudstone.
		918.10	920.50	2.40		15						siltstone	siltstone, dark grey, with light grey FGSS laminates(20%),at920m,bedded plane:15°.
		920.50	921.40	0.90								sandstone	FGSS, light grey, with few dark grey siltstone laminates(5%),and plant root fossil.
		921.40	922.73	1.33								mudstone	mudstone, black, massive ,numerous coal thread and carbonaceous debris.
	12#	**922.73**	**922.81**	**0.08**								**coal**	**0.08m 12# coal seam.**
		922.81	929.75	6.94		10						sandstone	MGSS, light grey, normal sorted, with dark grey mudstone laminates. horizontal bedding ,a bedding dip:10°,at926-926.4,more black mudstone.
		929.75	936.90	7.15								sandstone	FGSS, light grey, with few calcite vein, with few dark grey silk.
		935.50	944.50	9.00		20						sandstone	FGSS, light grey, pure, coal film few observed on FGSS bedding.at 942.00m bedded plae:20°
		944.50	968.50	24.00		10						sandstone	FGSS, light grey, with interbedded with dark grey siltstone laminates (30%), micro-horizor bedding.at 952.00m bedded plae:10°.from 958-958.5m,vertical fracture. from 959.5-960.5,ve broken, vertical fracture. predominately quartz and debris.
													TD=968.5M NOV.05,2012.

Wapiti River — Drill Hole Core Log

		Drilling Company:	CYR International Drilling								**Hole No.:**	WP1R13	
		Rig Type:	Super Bear-2								**Collar Elevation:**	1199.5m	
		Total Depth:	914.00m								**Coordinate: Northing:**	6073851.9	
		Spud Date:	Jan.25, 2013								**Easting:**	651652.8	
		Finished Date:	Feb.14, 2013								**Logging Geologist:**	Victor, Ricky, Raymond	
		Core Size:	HWT/HQ/NQ								**Note:**		

Formation	Coal Seam	Core Depth Interval From	To	Thickness, m Thick	TRUE	Strata Dip	Coal Floor Elevati	Sample ID Coal	Rock	CBM	Rock Hardness	Rock Name	Lithology Description
Q		0.00	32.00	32.00									tri-cone drill; no core.
Haasler		32.00	57.00	25.00		10° 15°						Siltstone	siltstone, dark grey(medium), interbedded with light grey fine-grained sandstone (FGSS) laminated, content: 20%; at 36m, bedded plane: 15°; micro-horizontal bedding, little muddy; a few siderite throughout, at 43.80m-44.40m, broken; at 44m-54m, FGSS decreased to 10%; muddy. at 52m; bedded plane: 10°. at 54m - 56m, more FGSS, 50% and broken into many pieces, broken number: 10/m. at 57m, bedded plane: 10°; at 55m - 55.10m, disturbed bedding, infilled a few argillaceous pebble.
		57.00	65.00	8.00								Siltstone	same feature as above.
		65.00	77.00	12.00								Siltstone	same as previous interval, plus light grey FGSS increased to 30%; at 68m, bedded plane: 15°, ripple-bedding on bedding surface.
		77.00	98.00	21.00		15°						Siltstone	interlaminated dark grey siltstone and light grey FGSS, partly siltstone and FGSS mix into each other, little sandy; at 80m, bedded plane: 15°; at 95m, bedded plane: 15°.
		98.00	113.00	15.00		10°						Siltstone	siltstone, dark grey(medium), little muddy, interbedded with light grey FGSS laminated, 10%; at 103.51m - 103.59m, 0.08m calcite FGSS; react with 5% HCl, soft, white-grey; at 107m, bedded plane: 10°
		113.00	128.00	15.00		10°						Siltstone	same feature as above, plus light grey FGSS increased to 20%; at 114m, bedded plane: 15°; at lower part, siderite, thin laminated increased; at 126m, bedded plane: 10°.
		128.00	153.00	25.00		15°						Siltstone	siltstone, dark grey(medium), interbedded with light grey FGSS laminated, content: 30%; mirco-horizontal bedding; at 134m, bedded plane: 15°; at 141.85m, coal film on bedding; at 149m, bedded plane: 15°; at lower part, progressively light grey FGSS laminated to 40%.
		153.00	163.25	10.25								Siltstone	same as previous interval, plus light grey FGSS decreased to 10%, muddy, siderite thin laminated progressively; at 160m, bedded plane: 15°.
		163.25	187.00	23.75								Siltstone	interlaminated dark grey siltstone and light grey FGSS, locally FGSS and siltstone mix into each other, not apparently bedding.
		187.00	210.00	23.00		10° 15°						Siltstone	siltstone, dark grey, muddy, interbedded with few light grey FGSS laminated, 5%; at 191m, bedded plane: 15°; at 206m, bedded plane: 10°.
		210.00	239.00	29.00		15°						Siltstone	siltstone, dark grey (medium), interbedded with light grey FGSS laminated, content: 20%; FGSS laminated, unevenly thick or thin; a few siderite thin laminated; micro-horizontal bedding, at 219.50m, bedded plane: 15°; at 210.40m, 218.85m, 223.55m, 224.40m, 0.05m siderite laminated; at 233.20m - 233.40m, interrupted FGSS bedding; at 236.50m, bedded plane: 15°.
		239.00	253.00	14.00		15°						Siltstone	siltstone, dark grey (medium), interbedded with light grey FGSS laminated, content: 30%; micro-horizontal bedding at 245.58m, pyrite nodule; at 248m, bedded plane: 15°, FGSS laminated unevenly thick or thin, partly lenses or interrupted bedding.
		253.00	259.00	6.00								Siltstone	same features as above, plus FGSS laminated decreased to 10%.
		259.00	275.50	16.50		15°						Siltstone	same as previous interval, plus FGSS laminated increased to 30 - 40%, FGSS laminated unevenly thick or thin, locally interrupted bedding or lenses. at 263m, bedded plane: 15°; at 275m, bedded plane: 15°.
		275.50	281.13	5.63								Siltstone	same as previous interval, plus, FGSS laminated decreased to 10%.
		281.13	281.19	0.06								conglomerate	0.06m conglomerate, light grey, Ø:2-3mm.
		281.19	297.20	16.01		15°						Siltstone	siltstone, medium grey, interbedded with light grey FGSS laminated, 40%; micro-horizontal bedding; at 286m, at 289.20m, coal film; at 294m, bedded plane: 15°.
		297.20	331.00	33.80		15° 20°						Siltstone	same as previous interval, plus FGSS laminated decreased to 10%, little muddy, at 300m and 300.40m, 0.10m siderite laminated; from 307m - 308.50m, more FGSS laminated, content: 40%; at 307m, bedded plane: 20°; at 317m bedded plane: 15°; pyrite being observed; at 323m, bedded plane: 15°.
		331.00	350.00	19.00		15°						Siltstone	siltstone; medium grey interbedded with light grey FGSS laminated, content: 30 - 40%; micro-horizontal bedding; at 336.50m, bedded plane: 15°; at 344.20m - 344.40m irregular calcite vein observed on bedding surface; at 349m, bedded plane: 15°, FGSS laminated downward at base.
		350.00	362.00	12.00								Siltstone	same features as above, plus FGSS laminated decreased to 10%; at 359m, bedded plane: 15°.
		362.00	366.57	4.57		10°						Siltstone	siltstone, medium grey, interbedded with light grey FGSS laminated, 40% and FGSS laminated unevenly thick or thin, micro-horizontal bedding; at 365m, bedded plane: 10°.
		366.57	366.86	0.29								conglomerate	conglomerate, light grey, poorly-sorted, Ø: 2-5mm.
Boulder Creek		366.86	369.32	2.46		15°						Sandstone	FGSS, light grey, well-sorted, predominately quartz and debris; at top, 0.40m and at base, 0.05m; CGSS; at 368.50m, bedded plane: 15°.
		369.32	380.00	10.68								Mudstone	bauxitic mudstone, white-grey to grey, massive, soft, core size reduced; locally, dark grey mudstone; at 374m - 374.40m, FGSS mainly; at 375.40m - 376.05m, FGSS mainly; at 381.50m - 382.10m, more Fe^{2+} inclusion, red; at base, bauxitic decreased.
		386.05	404.00	17.95		20° 25°						Sandstone	FGSS, light grey, well-sorted, horizontal bedding, predominately quartz and debris; at upper part, minor coal film on bedding (to 395m); at 390m, bedded plane: 20°; react with 5% HCl; at 395m, a layer calcilte vein; at 400m, bedded plane: 25°; at 402m, more irregular calcite vein.
		404.00	410.80	6.80								Mudstone	bauxitic mudstone, white-grey to medium grey; at base, dark grey mudstone increased, bauxitic decreased, massive, soft, core size reduced.
		410.80	416.00	5.20		22°						Siltstone	siltstone, dark grey to medium grey, with light grey FGSS laminated at base, sandy toward, little bauxitic; at 413m, bedded plane: 22°; minor carbonaceous debris.
		416.00	420.30	4.30								Mudstone	mudstone, light black to grey, massive, at upper part, light black mudstone mainly, at lower part; bauxitic mudstone mainly, little silt, core size reduced.
		420.30	424.70	4.40								Sandstone	FGSS, light grey, well-sorted; from 421.30m - 423.30m with minor bauxitic mudstone and medium grey siltstone.
		424.70	429.25	4.55		25°						Mudstone	interlaminated black mudstone and white-grey bauxitic mudstone, little silt at base; bauxitic mudstone core size reduced; at 428m, bedded plane: 25°; minor coal film.
		429.25	431.05	1.80								Sandstone	FGSS, white-grey to light grey; well-sorted, with a few dark grey siltstone laminated (5%).
		431.05	443.00	11.95								Mudstone	mudstone, dark grey to white-grey; massive, mudstone and bauxitic mudstone mix into each other; at upper part, little silt, not apparently bedding; soft, core size reduced.
		443.00	444.10	1.10								Sandstone	FGSS, white-grey, well-sorted, pure
		444.10	447.35	3.25		20°						Siltstone	siltstone, dark grey, interbedded with light grey FGSS laminated, content: 30%; at 446.06m bedded plane: 20°.
		447.35	452.35	5.00								Mudstone	bauxitic mudstone, white-grey, soft, massive, core size reduced; partly black mudstone, with a few coal film; slightly fracture.
		452.35	461.20	8.85		20°						Sandstone	FGSS, medium grey to grey, well-sorted, predominately quartz and debris, interbedded with light black mudstone laminated, 20%; micro-horizontal bedding; at 458m, bedded plane: 20°; at 456.45m, 2 layers 0.10m coal streak observed on bedding; from 459.60m - 460.10m, numerous irregular coal film observed on bedding.
		461.20	464.35	3.15		30°						Sandstone	MGSS - CGSS, light grey, poorly-sorted, predominately quartz and debris; from 463.10m - 463.70m, broken, infilled numerous coal streaks; at 463.50m bedded plane: 30°.
	BC	**464.35**	**466.05**	**1.70**								**Coal**	**1.70m, BC coal seam, RC: 1.70m; coal structure: 0.40<0.20>0.40>0.33<0.37m; parting: 464.55m - 464.75m, 0.20m, black MS/FGSS; boney coal: ①464.75m - 465.15m, 0.40m; ②465.68m - 466.05m, 0.37m, black, intact, more boney coal; dip: 20°.**
		466.05	472.97	6.92		20°						conglomerate	FGSS-bearing conglomerate, grey, predominately quartz and debris; poorly-sorted, horizontal bedding on FGSS bedding surface; at 470.20m bedded plane: 20°; Ø: 2-10mm; at 470.10m - 470.55m, FGSS mainly.
		472.97	483.12	10.15		25°						Sandstone	FGSS, light grey, well-sorted, pure; at 478.32m - 478.37m, 0.05m conglomerate; horizontal bedding; at 479m, bedded plane: 25°.
		483.12	487.85	4.73		25°							interlaminated FGSS with muddy siltstone, light grey to dark grey (60% and 40%); micro-horizontal bedding; at 486m, bedding plane: 25°.
Hulcross		487.85	549.00	61.15		20°						Siltstone	siltstone, dark grey, interbedded with light grey FGSS laminated, 20%, micro-horizontal bedding, at 495m, bedded plane: 20°; muddy, a few siderite thin laminated throughout; at 495m, bedded plane: 20°; at 500m, bedded plane: 20°; at 508.20m - 509m, vertical fracture developed, broken; at 512m, bedded plane: 15°; at 518.80m - 518.90m, 0.10m, white-grey kaolinate, soft; at 526.50m - 526.55m, 0.05m, strong react with 5% HCl, white-grey argillaceous limestone; from 527m - 530m, white-grey siltstone; at 533m, bedded plane: 20°; from 533m - 539m, more FGSS laminated, 40%; at 542.07m - 542.14m, 0.07m, white-grey, argillaceous limestone; from 542m - 543m, slightly fracture.
		549.00	567.80	18.80		22° 25°						Siltstone	siltstone, medium grey, interbedded with light grey FGSS laminated, 40%; micro-horizontal bedding; at 560m, bedded plane: 22°; at 560.90m and 562.30m, 2 layers 0.05m and 0.02m, FGSS thin laminated; from 566m - 567.80m, FGSS, 50%; at 566m bedded plane: 25°.
Gates		567.80	567.85	0.05								conglomerate	0.05m fine-grained conglomerate.
		567.85	568.92	1.07								Sandstone	FGSS, minor siltstone laminated.
		568.92	571.10	2.18								Mudstone	black mudstone, massive, rich in coal streak; at 569.78m - 569.80m, 0.02m; coal seam.
	#2	**571.10**	**571.90**	**0.80**								**Coal**	**0.80, boney coal; RC: 0.60m.**
		571.90	573.00	1.10								Sandstone	FGSS, at top, 0.30m MS.
		573.00	575.17	2.17								Siltstone	dark grey to light black, at base, 0.30m CM.
	#3	**575.17**	**576.60**	**1.43**				**Q1**				**Coal**	**1.43m coal seam, shiny and brittle, RC: 1.43m, black, banded coal mainly, 2 interval 0.04m parting.**
		576.60	579.15	2.55								Mudstone	coaly MS, massive, at 576.75m - 578m, dark grey, siltstone mainly.
		579.15	582.30	3.15		30°						Siltstone	dark grey siltstone, massive, rich in coal streak and carbonaceous fragment; at 582m, dip: 30°.
		582.30	589.00	6.70		25°						Sandstone	FGSS, grey, with minor dark grey siltstone laminated, 10%; micro-horizontal bedding, at 587m, bedded plane: 25°; from 584.90m - 585.60m, muddy siltstone mainly.
		589.00	591.40	2.40								Siltstone	siltstone, medium grey with minor FGSS laminated.
		591.40	594.80	3.40								Sandstone	FGSS, light grey, well-sorted, pure, at 593.50m - 593.85m, vertical fracture developed, filled calcite vein.
		594.80	601.30	6.50		20° 25°						Mudstone	mudstone, dark grey to light black, massive, mainly with minor coal film; at 597m, bedded plane: 25°; at 600.15m - 600.85m, more FGSS laminated, at base, rich in coal streak; at 600m, bedded plane: 20°.
	#4	**601.30**	**602.00**	**0.70**				**Q2**				**Coal**	**0.70m coal seam, RC: 0.50m, black, bright, half-broken, light.**
		602.00	603.50	1.50								Siltstone	siltstone, dark grey, massive. at top and base, rich in coal film; locally irregular calcite vein observed on bedding.
		603.50	609.62	6.12								Sandstone	FGSS, light grey, well-sorted with minor dark grey mudstone laminated; at 606m, bedded plane: 30°; at 605.30m - 605.32m; 0.02m coal streak; at 605.50m - 605.80m, more coal film; from 607.90 to end, fracture developed, infilled calcite vein; strong react with 5% HCl; predominated quartz and debris.
		609.62	612.10	2.48								Mudstone	mudstone, black to dark grey; at 610.50m - 611m, coaly mudstone, numerous coal streak; at base silt toward.
		612.10	615.26	3.16		30°						Siltstone	siltstone, medium grey, interbedded with light grey FGSS laminated; from 612.65m - 613.50m, FGSS mainly, fractured developed, filled calcite vein; at 615m, dip: 30°.
		615.26	623.20	7.94		25° 30°						Sandstone	light grey, fine-medium grained, muddy laminate at bottom; bedding plane: 25-30 degree changeable.
		623.20	626.50	3.30								Siltstone	dark grey, muddy siltstone, massive.
		626.50	628.20	1.70								Sandstone	light grey, fine-grain sandstone (FGSS).
		628.20	629.50	1.30								Mudstone	black mudstone. Bedded plane: 22 degree.
	#5	**629.50**	**636.30**	**6.80**		42°		**Q3 Q4 Q5**				**Coal**	**6.80m #5 coal seam. high quality; at 635.40m - 635.55m, 0.15m bony coal. Q3: coal (629.50-631.65m, 2.15m, 80% recovered); Q4: parting: a.631.65m - 632.00m, 0.35m, b. 635.20-635.26m, 0.06m, black mudstone; Q5: coal (632.00m - 636.30m, 4.30m, 75% recovered). Dip: 42 degree.**
		636.30	638.57	2.27								Mudstone	Muddy siltstone; at 638.00m - 638.10m 0.10m coal seam.
	#5-1	**638.57**	**639.13**	**0.56**								**Coal**	**0.56cm coal.**
		639.13	642.00	2.87								Sandstone	light grey, pure SS; fine-medium grained; bedding plane: 60° (in local).
		642.00	642.88	0.88								Mudstone	black mudstone.
	#5-2	**642.88**	**643.54**	**0.66**								**Coal**	**0.66m #5-2 coal seam.**
		643.54	647.00	3.46								Mudstone	Muddy siltstone.
	#5-3	**646.88**	**647.90**	**1.02**				**Q6**				**Coal**	**coal; 1.02m, 80% recovered; 5cm boney coal between.**
		647.90	650.60	2.70								Siltstone	siltstone.
		650.60	**651.10**	**0.50**								**Coal**	**coal seam. 0.60m coal.**
		651.10	654.00	2.90								Siltstone	Siltstone, progressively fine SS.
		654.00	655.85	1.85								Mudstone	mudstone.
		655.85	**656.10**	**0.25**								**coal**	**0.29m coal seam. very broken, 40% recovered.**
		656.10	658.10	2.00								Mudstone	black carbonaceous mudstone, broken very much by pressure.
	#6	**658.10**	**659.50**	**1.40**				**Q7**				**Coal**	**1.40m coal seam, broken, 80% recovered.**
		659.50	662.50	3.00								Mudstone	mudstone, at upper part, 70cm fracture developed.
		662.50	663.60	1.10								Sandstone	light grey FGSS, filled with carbonaceous veins, bedding dip: 60°.
		663.60	664.60	1.00								Mudstone	Black, broken, core loss 40cm.
		664.60	666.85	2.25								Sandstone	light grey, $CaCO_3$ vein filled; bedding plane not clear.
		666.85	669.57	2.72								Mudstone	black mudstone & coal seam; broken, only 20cm mudstone recovered, other core lost. lost may be coal seam, (only get a few coal blocks).
		669.57	671.33	1.76		55°						Siltstone	siltstone/FGSS; dip: 55°.
	#7	**671.33**	**673.20**	**1.87**								**coal**	**#7 coal seam. 1.87m core lost, several pieces of coal left, should be coal seam left.**
		673.20	674.85	1.65								Sandstone	grey FGSS, at upper part, 20cm carbonaceous mudstone; filled with C_2CO_3 vein.
		674.85	676.35	1.50		50°						Siltstone	siltstone dominated; dip: 50°; locally nearly vertical.
		676.35	689.00	12.65		70° 80°						Mudstone	dark grey mudstone. bedded with a few FGSS stringers (< 5%); dip: 70° - 80°; broken at 680m - 681.50m and 685.20m - 686.10m.
		689.00	691.40	2.40								Sandstone	grey FGSS, change gradually.
		691.40	694.15	2.75		63°						Siltstone	dark grey siltstone, with FGSS thin layers (< 10%); dip: 63°.
	#8	**694.15**	**710.95**	**16.80**				**Q8-13**				**Coal**	**#8 coal seam, black, shiny; loss in the middle parts; dip: at top, middle and bottom: 60° - 65°; Q8: 694.15m - 700.85m, Recovery: from roof to foot, 90%(695.2m)-15%(698.0m)-10%(700.85m), (in two bags); Q9: 701.15m - 704m, 20% recovered; Q10: 704m - 707m, 4% recovered, only debris, grinded to powders; Q11: 707m - 709m, 85% recovered; Q12: 709m - 710.95m, 85% recovered; Q13: parting together 0.96m: a. 700.85-701.15m, 0.30m; b. 706.00-706.38m, 0.38m; c. 709.60-709.88m, 0.28m, black mudstone.**
		710.95	712.80	1.85								Mudstone	mudstone-FGSS-siltstone.
		712.80	714.32	1.52								Mudstone	carbonaceous mudstone, and bony coal; broken (get mixed wrong?). may be material from upper collapsing.
	at 716.29m, chang to NQ	714.32	718.70	4.38								Siltstone	siltstone.
		718.70	720.15	1.45								Sandstone	FGSS.
		720.15	721.07	0.92								Siltstone	siltstone.
		721.07	**721.71**	**0.64**								**Coal**	**0.64m coal seam. 25% recovered.**
		721.71	725.05	3.34								Siltstone	siltstone; dip: 60°; at 724.50m thin coal seam filled, 5cm.
	#9	**725.05**	**726.05**	**1.00**				**Q14**				**Coal**	**1.00m coal seam; black, metallic luster. Q14:725.05-726.05m. 85% recovered.**
		726.05	731.04	4.99								Mudstone	dark grey MS-siltstone-FGSS-siltstone-dark grey MS (mini circle).
		731.04	**731.55**	**0.51**								**Coal**	**0.51m coal; RC: 100%; at upper part, 25cm, quality coal, at lower part, 26cm, bony coal.**
		731.55	735.50	3.95								Mudstone	dark grey mudstone, bony coal (5cm) at 732.70m, 733.0m; 725.50m - 735.80m 0.30m coal seam.
		735.50	739.60	4.10								Siltstone	siltstone-FGSS-siltstone.
		739.60	742.20	2.60								Mudstone	black carbonaceous mudstone, with 3 thin coal seams (<5cm/each).
		742.20	750.10	7.90								Siltstone	grey siltstone.
		750.10	752.30	2.20								Mudstone	dark grey-black mudstone, bony coal; 0.10m at center.
		752.30	766.00	13.70		55° 62°						Siltstone	dark grey siltstone dominated, FGSS <20%; dip: 55° - 62°; bedding plane dip getting greater with depth; at 758.60m, a thin coal seam filled (7cm).
		766.00	787.75	21.75								Siltstone	massive, dark grey siltstone (60%), bedded with FGSS thin layers (<40%). bedding plane change greatly. From to 70-62-55-50-35 degree.
		787.75	794.00	6.25								Siltstone	black siltstone, broken, fractured, polished, movement plane developed; CaCO3 vein (1mm) seen. Fault zone. Broken, coal seen at 789.50; 790.10m, 791.0m. Thickness can't be detected.
		794.00	798.70	4.70		65° 70°						Siltstone	siltstone/FGSS interlaminated (siltstone predominated). bedding plane dip: 65° - 70°.
		798.70	835.25	36.55		55° 75° 80° 90°						Sandstone	FGSS in light grey-grey predominated, with laminated siltstone; dips in this section, vary in 55° - 90°, average 75° - 80°; from 813.50m; dip: >75°; $CaCO_3$ vein filled in vein or block forms in rock of this section; more broken than before.
		835.25	836.70	1.45								Sandstone	pure sandstone; coarser MGSS.
		836.70	885.50	48.80		55° 70°						Sandstone	FGSS predominated. at lower part, change to dark grey siltstone gradually; $CaCO_3$ vein seen in sandstone details: at 837m - 840.30m, fractured, $CaCO_3$ veins developed; dip: 55° - 70°, only in this section. At 859m - 863.20m; $CaCO_3$ vein developed; at 869m - 873.75m, $CaCO_3$ veins filled. Bedded plane: 75-70 degree.
		885.50	894.23	8.73								Siltstone	siltstone; at 933.28m, 1cm coal seam.
		894.23	898.20	3.97								Sandstone	FGSS to siltstone.
		898.20	914.00	15.80		80-85						Siltstone	siltstone. Siltstone itself also changes in colors with laminations, from grey-dark grey. Bedded plane: 80-85 degree. TD=914.00M.

Wapiti River — Drill Hole Core Log

Drilling Company:	Canada Dehua Drilling		**Hole No.:**	WP1R23
Rig Type:	CS-14		**Collar Elevation:**	1149.8m
Total Depth:	717m	**Coordinate:**	**Northing:**	6073270.4
Spud Date:	19-Jan-13		**Easting:**	650472.4
Finished Date:	6-Feb-13		**Logging Geologist:**	Lee, Cherlas
Core Size:	HWT/HQ		**Note:**	

Formation	Coal Seam	Core Depth Interval From	To	Thickness, m Thick	TRUE	Strata Dip	Coal Floor Elevation	Sample ID Coal	Rock	CBM	Rock Hardness	Rock Name	Lithology Description
Q		0.00	30.00	30.00								till	starting coring from 30.00m.
Hasler		30.00	45.00	15.00		10°						Siltstone	siltstone, dark grey; interbedded with thin layers of fine sandstone (5%); at 40m bedded plane: 10°.
		45.00	112.10	67.10		15°						Siltstone	siltstone, dark grey; interbedded with thin layers of white-grey fine sandstone (content: 30%); at 60m bedded plane: 15°; at 70m bedded plane: 15°; at 80m bedded plane: 15°; from 93.10m - 94.60m; broken, vertical fracture, fracture no: 8.
		112.10	175.10	63.00		10°						Siltstone	siltstone, dark grey-light black, muddy, with white-grey, fine sandstone laminate (5%); at 130m bedded plane: 10°; from 123.70m - 125.10m; broken fracture no: 6/m; at 135.10m - 136.40m, broken, fracture no: 8; at 147m - 148m, vertical fracture, fracture no: 4; at 130m bedded plane: 10°; at 140m bedded plane: 10°; at 150m bedded plane: 10°; at 160m bedded plane: 10°; at 170m bedded plane: 10°.
		175.10	180.10	5.00		20°						Siltstone	siltstone, dark grey; interbedded with thin layers of white-grey fine sandstone (45%); at 178m bedded plane: 20°; at 180m - 182m, broken, fracture no: 15.
Boulder Creek		180.10	182.40	2.30		15°							conglomerate, white-grey, Ø: 3-5mm; interbedded with thin layers of thin layers of coarse-medium sandstone; quartz, green charts and dark debris; poorly-sorted; at 181m bedded plane: 15°.
		182.40	199.80	17.40								Mudstone	mudstone, brown-grey, bauxitic, massive.
		199.80	211.05	11.25		15°						Sandstone	sandstone, white-grey, medium-grained; from 205.50m - 207.70m, numerous black mudstone breccia; at 202m bedded plane: 15°.
		211.05	221.20	10.15								Siltstone	siltstone, grey; interbedded with layers of light, black mudstone (30%).
		221.20	226.30	5.10		15°						Sandstone	sandstone, white-grey, medium-grained; at 225m bedded plane: 15°.
		226.30	258.20	31.90		17°						Mudstone	mudstone, brown-grey, light black, bauxitic in part; at upper part, light black, lighter bauxitic; at 245.60m - 246m, broken, fracture no: 8; at 255.50m bedded plane: 17°.
		258.20	258.95	0.75		20°						Sandstone	sandstone, fine grained, white-grey; bedded plane: 20°.
		258.95	259.35	0.40								Mudstone	mudstone, black, massive.
		259.35	**259.60**	**0.25**								**Coal**	**coal seam, 0.35m, Rc: 0.25m; no parting, broken, shiny, light.**
		259.60	272.30	12.70		20°						Mudstone	mudstone, black-light black, silt; interbedded with laminate at white-grey fine sunstone; at 261.50m bedded plane: 20°; at 271.10m bedded plane: 20°.
		272.60	276.21	3.61		20°						Mudstone	mudstone, black; at lower part, interbedded with 3 layers of fine sandstone; at 275m - 275.20m, a few coal lenses; at 275.30m bedded plane: 20°.
	BC	**276.21**	**276.46**	**0.25**								**Coal**	**coal seam, 0.25m, RC: 0.25m; light, bright; no parting.**
		276.46	281.82	5.36								Sandstone	sandstone, white-grey, medium-grained; quartz predominately; well-sorted; at top numerous minor coal lenses; at lower part with a few thin layers of fine conglomerate; at 276.70m - 279.80m; broken, fracture no: 7/m.
		281.82	285.60	3.78		20°							conglomerate, white-grey, Ø: 2-5mm quartz, green chart and dark debris; moderately-sorted; subangular-subrounded; at 281.82m bedded plane: 20°.
		285.60	294.00	8.40		20°						Sandstone	sandstone, white-grey, fine-grained; quartz predominately, well-sorted; at top with a few thin layers of fine conglomerate; at 290m bedded plane: 20°.
		294.00	297.00	3.00		20°						Sandstone	sandstone, white-grey, fine-grained; interbedded with layer of black silt mudstone (30%); at 296m bedded plane: 20°.
Hulcross		297.00	303.00	6.00		20°						Siltstone	siltstone, light black, muddy; with few layers of light grey fine sandstone (40%); at 302m bedded plane: 20°.
		303.00	311.30	8.30		20°						Siltstone	siltstone, bright black; muddy; interbedded with thin layers of white-grey fine sandstone(30%); at 307 bedded plane: 20°.
		311.30	374.40	63.10								Siltstone	siltstone, dark grey, muddy; with a few sandstone laminate (content 20%); at 319.05m and 320.05m argillaceous limestone, light grey, 0.06m/ each layer; at 328m bedded plane: 20°; at 337m bedded plane: 20°; at 335.90m - 337.10m, fine sand (content 70%); at 348.80m, 0.07m argillaceous limestone; at 349m bedded plane: 20°; at 360m bedded plane: 20°; at 370m bedded plane: 20°; at 374m, 0.05m fine conglomerate, Ø: 1-2mm.
Gates		374.40	374.70	0.30								Mudstone	mudstone, black; massive; at bottom, 0.10m thick, coal seam; no parting, broken, shiny.
		374.70	375.40	0.70								Mudstone	mudstone, brown and grey, bauxitic, massive.
		375.40	388.93	13.53		15° 20°						Sandstone	sandstone; white-grey, medium-grained, quartz and dark debris predominately; well-sorted, rounded, white quartz and dark debris interbedded with; with a few coal film on fracture plane and bedding plane; at 376.50m bedded plane: 15°; at 380m bedded plane: 25°; at 378m bedded plane: 20°.
	#3	**388.93**	**390.20**	**1.27**				**Q1 Q2**				**Coal**	**coal seam, 1.27m, RC: 0.80m; at 389.63m - 390.10m, 0.47m lost; broken shiny, light; CO: 388.93m - 389.03m, 0.10m RC: 0.13m; parting: 389.03m - 389.13m, 0.10m, black, mudstone, broken; CO: 389.13m - 390.20m, 1.0/m, RC: 0.60m, 0.47m lost; structure: 0.10<0.10>1.07m.**
		390.20	391.90	1.70		30°						Mudstone	mudstone, black; at middle, a layer of fine sandstone; at 390.50m bedded plane: 30°.
		391.90	393.10	1.20								Mudstone	mudstone, black to carbonaceous; carbonaceous mostly; at 392.08m - 392.20m, banded coal; at 392.35m - 392.50m, banded coal.
		393.10	402.75	9.65		30°						Sandstone	sandstone, light grey, fine-grained; quartz mainly; well-sorted; with a few thin layers of light black mudstone; at 398m - 398.30m, with mudstone breccia; at 394m, 396m bedded plane: 30°.
		402.75	405.15	2.40								Siltstone	siltstone, light black, muddy, massive.
		405.15	405.90	0.75		30°						Sandstone	sandstone, white-grey, fine grained; bedded plane: 30°.
		405.90	410.70	4.80								Mudstone	mudstone, black, massive; at lower part, a few coal streaks; at 410m, 0.10m coal seam, shiny, light.
		410.70	415.10	4.40		25°						Siltstone	siltstone, light black, muddy; at 410.80m bedded plane: 25°.
		415.10	415.80	0.70								Mudstone	mudstone, black, massive.
		415.80	**416.10**	**0.30**								**Coal**	**coal seam, 0.30m, RC: 0.30m; no parting, broken; shiny, light.**
		416.10	422.45	6.35		30°						Mudstone	mudstone, black; at upper part, little silt; at 416.20, 0.07m coal seam, shiny light; at lower part with minor coal lenses; at 421.60, 0.10m coal seam, no parting, shiny, light; at 420.40m bedded plane: 30°.
		422.45	429.15	6.70		30°						Sandstone	sandstone, white-grey, fine-grained; quartz predominately, well-sorted; at middle part, mudstone; at 423.50m bedded plane: 30°; at 426.50m bedded plane: 30°.
		429.15	430.15	1.00		30°						Mudstone	mudstone, black; interbedded with laminate of white-grey, fine sandstone; at 430m bedded plane: 30°.
	#5	**430.15**	**431.74**	**1.59**				**Q3**				**Coal**	**#5 coal seam, 1.59m, RC: 1.40m, 0.19m lost; broken, shiny, bright, brittle, light; CO: 430.15m - 430.70m, 0.55m, RC: 0.36m. 0.19m lost; parting: 430.70m - 430.74m, 0.04m black mudstone; CO: 430.74m - 431.74m, 1.0m, RC: 1.0m; structure: 0.55<0.04>1.0m.**
		431.74	434.00	2.26								Mudstone	mudstone, brown-grey, bauxitic, massive; silt towards base; at upper, with tree branch fossil.
		434.00	440.20	6.20		35°						Sandstone	sandstone, light grey, medium-grained; quartz and dark debris; well-sorted; at lower part, numerous coal lenses on bedding; at 435.80m - 439.40m, little broken, fracture no: 15/m; at 437m, bedded plane: 35°; at 438m bedded plane: 35°.
		440.20	445.10	4.90								Mudstone	mudstone, black carbonaceous in part; numerous coal lenses and streaks.
		445.10	465.00	19.90		30°						Mudstone	mudstone, light black, black; at upper part, brown and grey, little bauxitic; at 461.40m - 462.70m, a few thin layers of fine sandstone; at 459m - 459.15m; at 459.60m - 459.90m, numerous coal lenses; at 455.40m, bedded plane: 30°; at 462.50m, bedded plane: 30°.
		465.00	466.35	1.35								Mudstone	mudstone, black, massive; with a few coal streaks.
		466.35	467.40	1.05		30°						Sandstone	sandstone, white-grey, fine-grained; bedded plane: 30°.
		467.40	469.90	2.50								Mudstone	mudstone, black, massive; carbonaceous at middle; at 469.40m, 0.10m thick, banded coal.
		469.90	471.70	1.80		30°						Sandstone	sandstone, white-grey, fine-grained; with dark mudstone laminate; bedded plane: 30°.
		471.70	472.40	0.70								Mudstone	mudstone, black, massive; broken throughout.
		472.40	**472.70**	**0.30**								**Coal**	**coal seam, 0.30m, RC: 0.30m; broken; no parting, shiny, light.**
		472.70	485.40	12.70		30°						Mudstone	mudstone, black, carbonaceous in part; rich in leaf fossil; from 474.60m - 475.30m, a few coal streaks; at 477.35m - 477.57m , 0.22m, coal seam, RC: 0.22m, broken; shiny, light; at 481.10m, 0.10m, coal seam; at 482.40m, 0.10m coal seam, broken much; at 484.10m - 484.60m, carbonaceous mostly with a few streaks; at 485.40m, 0.10m, coal seam, shiny bright; at 483.30m, bedded plane: 20°.
		485.40	498.90	13.50		20° 15°						Mudstone	mudstone, black, massive; at 491.20m, 0.10m, coal seam, bright; at 493.50m, 0.10m coal, light shiny; at 497.80m, 0.13m coal seam, bright, light; at 486.50m - 487.50m, white-grey, fine sandstone; at 487m, bedded plane: 20°; at 494m, bedded plane: 15°.
		498.90	499.50	0.60								Sandstone	sandstone, white-grey, fine-grained.
		499.50	503.55	4.05								Mudstone	mudstone, black to carbonaceous; massive; at lower part, carbonaceous in part and few coal streaks; conchoidal fracture; at 503.50m bedded plane: 25°.
	#7	**503.55**	**504.50**	**0.95**				**Q4 Q5**				**Coal**	**coal seam, 0.95m, RC: 0.70m, broken, shiny, bright, light, 0.25m lost at bottom; CO: 503.55m - 503.75m, 0.20m, RC: 0.20m; parting: 503.75m - 503.85m, 0.10m, black, mudstone; CO: 503.85m - 504.50m, 0.65m, RC: 0.40m, 0.25m lost; structure: 0.20<0.10>0.65m.**
		504.50	507.00	2.50								Mudstone	mudstone, black, massive; at lower part, a few coal streaks.
		507.00	514.90	7.90		20°						Mudstone	mudstone, light black, silt, with fine sandstone laminates; rich in leaf fossil on bedding plane; at 509m bedded plane: 20°; at 512m bedded plane: 20°; at 509.90m, 0.06m coal seam; at 514.80m, 0.10m coal seam.
		514.90	530.50	15.60								Sandstone	sandstone, white-grey, medium-fine grained; quartz predominately; well-sorted, with dark mudstone laminate; at top from 514.90m - 516.50m, medium-grained; at 517m, bedded plane: 25°; at 522m, bedded plane: 20°; at 528m, bedded plane: 25°.
		530.50	539.95	9.45								Mudstone	mudstone, black, massive; with leaf fossil; at lower part, a few coal streaks; from 539.m - 539.95m, broken, fracture no: 20/m.
		539.95	540.05	0.10								Coal	coal seam, 0.10m, broken; no parting, shiny, light.
		540.05	541.10	1.05								Mudstone	mudstone, black, massive; with a few coal streaks.
	#8	**541.10**	**542.58**	**1.48**				**Q6**				**Coal**	**coal seam, 1.48m, RC: 0.88m, 0.70m lost at top; half broken, shiny, light, bright, brittle; no parting.**
		542.58	543.90	1.32								Mudstone	mudstone, black, carbonaceous in part; massive; with a few coal streaks; at 543.05m, 0.10m coal seam; at 543.50m, 0.06m coal seam.
	#8-1	**543.90**	**546.00**	**2.10**				**Q7 Q8**				**Coal**	**coal seam, 2.10m, RC: 1.15m, 0.95m lost at bottom, broken, shiny, brittle, light; CO: 543.90m - 544.10m, 0.20m, RC: 0.20m; parting: 544.10m - 544.30m, 0.20m, black, carbonaceous, mudstone, a few coal streaks; CO: 544.30m - 546m, 1.70m, RC: 0.70m, 0.95m lost; structure: 0.20<0.30>1.70m.**
		546.00	547.50	1.50								Mudstone	mudstone, black to carbonaceous; massive; numerous coal lenses and streaks; at lower part, carbonaceous.
		547.50	547.80	0.30								Coal	coal seam, 0.30m, RC: 0.30m; intact; no parting; shiny, brittle, light.
		547.80	548.50	0.70								Mudstone	mudstone, black, carbonaceous in part, numerous coal lenses and streaks; 10 coal seams, 0.05m thick each.
		548.50	**548.60**	**0.10**								**Coal**	**coal seam, 0.10m, shiny, light.**
		548.60	553.90	5.30								Mudstone	mudstone, black, massive; at upper part, a few coal streaks; at 553.50m - 553.0m, very broken by grind.
	#9	**553.90**	**560.00**	**6.10**				**Q9 Q10**				**Coal**	**coal seam, 6.10m; RC: 2.30m, 3.80m lost; lost depth: ① 553.90m - 556.90m, 3.0m lost; ② 559.20m - 560m, 0.80m lost; broken at upper part; half broken at lower part; shiny, brittle, bright; CO: 553.90m - 557.20m, 3.30m; R: 0.30m, 3.0m lost; parting: 557.20m - 557.24m, 0.04m, black, mudstone; CO: 557.24m - 560m, 2.76m, RC: 1.96m, 0.80m lost; structure: 3.30<0.04>2.76m.**
		560.00	560.60	0.60								Siltstone	siltstone, light grey, little muddy.
	#9-1	**560.60**	**561.50**	**0.90**				**Q11 Q12**				**Coal**	**coal seam, 0.90m, RC: 0.90m, broken; shiny, light, bright; CO: 560.60m - 561.35m, 0.75m, RC: 0.75m; parting: 561.35m - 561.40m, 0.05m black, mudstone; CO: 561.40m - 561.50m, 0.10m, RC: 0.10m; structure: 0.75<0.05m>0.10m.**
		561.50	568.06	6.56		35°						Sandstone	sandstone, light grey, fine-grained; with dark mudstone laminate; at 562m, bedded plane: 35°; at 566m, bedded plane: 35°.
		568.06	579.50	11.44		40°						Sandstone	sandstone, white-grey, fine-grained; interbedded with thin layers of dark silt mudstone (50%); at 560.50m, bedded plane: 40°; at 513m, bedded plane: 40°.
		579.50	598.00	18.50								Siltstone	siltstone, grey; firm, compacted, with a few black mudstone laminate; from 584.90m - 588.50m, very broken, fracture no: 20/m; numerous calcite vein throughout; at 588.50m - 592.30m, little broken, fracture no: 6/m; at 580m, bedded plane: 40°; at 595m, bedded plane: 45°.
		598.00	602.70	4.70								Sandstone	sandstone, white-grey, fine-grained, with dark muddy siltstone laminate; at 600m, bedded plane: 40°.
		602.72	606.40	3.68		45°						Mudstone	mudstone, light black-black, silt; with black mudstone laminate; at 602m, bedded plane: 45°; at 606.05- 606.15m, 0.10m coal seam.
	#10	**606.40**	**608.92**	**2.52**				**Q13**				**Coal**	**coal seam, 2.52m; RC: 0.30m; 2.22m lost at top; very broken pieces; no parting, shiny, bright, light.**
		608.92	609.20	0.28		40° 30°						Mudstone	mudstone, black with a few coal streak on bedding plane; at 609.40m, bedded plane: 40°; at 607m, bedded plane: 30°.
		609.20	617.60	8.40		40°						Sandstone	sandstone, white-grey, medium-grained; at 614.80m, bedded plane: 40°.
		617.60	624.00	6.40		40°						Siltstone	siltstone, light grey; interbedded with black mudstone laminate at upper part; at 620m, bedded plane: 40°; at 610.50m - 621m, little broken, fracture no: 5/m.
		624.00	627.00	3.00		40°						Sandstone	sandstone, white-grey, medium-grained; quartz predominately; at lower part, few coal films; at 626.70m, bedded plane: 40°.
	#11	**627.00**	**627.10**	**0.10**								**Coal**	**coal seam, 0.10m, shiny, light, broken.**
		627.10	630.00	2.90								Siltstone	siltstone, light black, muddy; with numerous coal debris at upper part.
		630.00	640.50	10.50		40°						Sandstone	sandstone, white-grey, fine-grained, quartz and debris predominately; with dark mudstone laminate; at 636.5m, bedded plane: 40°.
		640.50	644.30	3.80		40°						Siltstone	siltstone, grey, firm; solid, with dark mudstone laminate; at 641.30m, bedded plane: 40°.
		644.30	655.80	11.50		40°						Mudstone	mudstone, black, carbonaceous in part; from 646m - 648.90m, broken, fracture no: 10/m; at 648.10m - 648.90m, numerous coal lenses and streaks; at 649.10m and 651.30m, coal seam, 0.05m thick/each; at 461.30m, bedded plane: 40°; at 650m, bedded plane: 40°.
	#12	**655.80**	**657.10**	**1.30**								**Coal**	**coal seam, 1.30m, RC: 0.15m, 1.15m lost at top; no parting, very broken, only few coal debris left, shiny, light.**
		657.10	659.90	2.80		40°						Mudstone	mudstone, black; with fine sandstone laminate at lower part; at middle part, a layer of fine sandstone; at 659.60m, bedded plane: 40°.
		659.90	**660.00**	**0.10**								**Coal**	**coal seam, 0.10m, RC: 0.10m, very broken; no parting, shiny, light.**
		660.00	660.82	0.82								Mudstone	mudstone, black, massive.
		660.82	665.25	4.43		48°						Sandstone	sandstone, white-grey, medium-grained, towards the base, fine-grained in places and darker; at 662.50m - 663.20m, very broken, fracture developed; infilled with calcite veins; fracture no: 15/m; react with 5% HCl; at 662m, bedded plane: 48°.
	#13	**665.25**	**665.45**	**0.20**								**coal**	**0.20m coal seam. Black,**
		665.45	668.64	3.19		25°						Sandstone	fine grained sandstone; dark grey, fracture developed, infilled with calcite veins, fracture no: 15/m; at 667.70m, bedded plane: 25°.
		668.64	669.30	0.66								Siltstone	siltstone, dark grey-black.
		669.30	673.20	3.90								Sandstone	fine-grained sandstone, grey, quartz and debris.
		673.20	673.70	0.50								Siltstone	siltstone, dark grey-black.
		673.70	683.70	10.00		20°						Sandstone	fine grained sandstone; grey-light grey; broken at 679.65m, 679.80m and 680.30m; horizontal bedding plane: 20°.
Moosebar		683.70	698.80	15.10		30°						Siltstone	siltstone, grey-dark grey with mudstone laminates (10-30%); bedding plane: 30°; react with 5% HCl.
		698.80	706.82	8.02								Siltstone	muddy siltstone, dark grey-black, mudstone laminates in places and increase toward the base; few fractures.
		706.82	717.00	10.18		40°						Siltstone	dark grey siltstone, interbedded with black mudstone; siltstone bands react with 5% HCl, but mudstone bands don't react with 5% HCl. Bedding plane: 40°; few fractures; at 708.15m, 2mm coal films. TD=717.0m.

Wapiti River — Drill Hole Core Log

Drilling Company:	Dehua	**Hole No.:**	WP1C26
Rig Type:	VD-8000	**Collar Elevation:**	1244.3
Total Depth:	983m	**Coordinate: Northing:**	6071834.5
Spud Date:		**Easting:**	651280.7
Finished Date:	Feb. 11, 2013	**Logging Geologist:**	Lee, David
Core Size:	SWT/PWT/PQ/HQ	**Note:**	

Formation	Coal Seam	Core Depth Interval From	To	Thickness, m Thick	TRUE	Strata Dip	Coal Floor	Sample ID Coal	Rock	CBM	Rock Hardness	Rock Name	Lithology Description
Q		0.00	24.50	24.50								till	maybe overburden; no coring drill.
Hasler		24.50	30.65	6.15		15°						Siltstone	siltstone, dark gray, interbedded with light gray fine-grained sandstone; FGSS laminates (5%), micro-horizontal bedding; at 24.30m - 24.40m and 28.60m - 28.80m and 30.55m - 30.65m; broken; at 30m, bedded plane: 15°.
		30.65	33.45	2.80								conglomerate	FG-MG-CG-conglomerate; at base 33.20m - 33.45m, 0.25m conglomerate, predominately quartz and debris, minor mica; minor coal film observed on sandstone surface.
Boulder Creek		33.45	56.00	22.55		30°						Mudstone	bauxitic mudstone, massive; soft, white-gray, scratched by fingers; at 46.10m - 47.50m, FGSS, light gray, at 47m, bedding plane: 30°; at 50m - 50.70m, more black mudstone; at 52m - 53m, more siltstone; at 54.50m - 55m, more siltstone; at 55.50m - 56m, bauxitic mudstone, blue colour.
		56.00	66.00	10.00		30° 50°						Siltstone	siltstone, dark gray, massive, little bauxitic mudstone and with minor light gray FGSS laminated; at 60m, bedded plane: 30°; at 65m, bedded plane: 50°.
		66.00	77.80	11.80								Sandstone	FGSS light gray, with a few black mudstone and coal film, very much broken, disturbed bedding, deformation, at 68m, bedding dip: 60°; compression; at 72m, bedding dip: 65°; this is fault zone, bedding enlarge (place near).
Hasler		77.80	85.00	7.20		75°						Siltstone	siltstone, dark gray, interbedded with light gray FGSS laminated, core very broken, deformation, mylonization, tectonic zone(fault); at 85m, bedding plane: 75°, compression.
		85.00	94.00	9.00		20° 25°						Siltstone	siltstone, light black, muddy, interbedded with light gray FGSS laminated (20%), micro-horizontal bedding; at 87m, dip: 25°; at 93m, bedding plane: 20°.
		94.00	101.10	7.10		75°						Siltstone	siltstone, light black, muddy, very broken, broken surface are slickensided and shiny fracture number: 30/m; at 97m, dip: 75°.
		101.10	114.50	13.40		40°						Siltstone	siltstone, dark gray, interbedded with few light gray FGSS laminated (5%) at 102m, bedding plane: 40°; core intact, muddy; at 108m, bedding plane: 20°.
		114.50	121.80	7.30		70°						Siltstone	same features as above, plus core broken, broken surface are slickensided and shiny. Locally dip: 70° (113.30m); from 118m - 121.90m, very broken, grinding, mud cast.
		121.90	150.00	28.10		5° 10° 12° 15°						Siltstone	siltstone, dark gray, muddy interbedded with minor light gray FGSS laminated (5%), core intact; dip decreased at 128m: 5°; at 129.26m - 129.34m, 0.08m siderite laminated; at 136m, bedded plane: 5°; at 141.25m - 142m, broken, deformation, FGSS pebble observed on bedding surface; at 143m, bedding plane: 15°; at 146m, bedded plane: 12°; at 145.64m, pyrite nodule (1x5cm); a few siderite thin laminated at base; at 149m, bedded plane: 10°; at 150m, starting HQ, depth difference: 1.20m from starting using HQ.
	at 150m, PQ change HQ	150.00	250.00	100.00		10° 15° 20°						Siltstone	siltstone dark gray to light black, little muddy; at upper part, dark gray, at lower part, light black; interbedded with white-gray fine sandstone laminates (10%-20%); micro-horizontal bedding, at 162.70m - 164m, very broken, fracture no: 30/m; at 156m, bedded plane: 10° ; at 170m, bedded plane: 10° ; at 180m, bedded plane: 10° ; at 185.70m - 185.80m, kaolinite, white-gray; at 195m, bedded plane: 10° ; at 210m, bedded plane: 15° ; at 222.50m, bedded plane: 15° ; from 224m - 231.30m, more laminate of fine-grained sandstone; content: 30%; at 233.50m, bedded plane: 20° .
		250.00	315.00	65.00		15° 20° 25°						Siltstone	siltstone, light black, muddy, interbedded with few light gray, fine-grained sandstone (FGSS) laminated (5%), micro-horizontal bedding; at 255m, bedded plane: 15° ; at 255m, nodular FGSS; at 260.75m, 0.05m siderite laminated; locally with a few siderite thin laminated and nodule (at 274m, 285.50m, 299m); at 273.30m, 0.05m FGSS pebble (nodule); at 294.50m, bedded plane: 20° ; from 300m - 305m, more FGSS laminated, content: 30%; at 303m, bedded plane: 25° ; at 308.80m - 309m, little broken; at 315m - 315.30m, little broken; at 309.50m, 310.50m, 313m, 314m, 314.80m; with little thick FGSS laminate (0.02m - 0.05m).
		315.00	336.00	21.00		15° 20°						Siltstone	siltstone, light black to dark gray, interbedded with light gray FGSS laminated, increased to 20%; micro-horizontal bedding; at 322.50m, bedded plane: 20° ; alternating with band of siderite laminated (thin); at 330.85m, 0.02m FGSS thin laminated; at 333.50m, bedded plane: 15° ; at base, FGSS laminated decreased to 10%; at 337m, bedded plane: 20° .
		336.00	347.50	11.50		20°						Siltstone	siltstone, dark gray, interbedded with light gray FGSS laminated (30%); micro-horizontal bedding; at 337m and 342m, bedding plane: 20° ; at 341.90m, pyrite nodule (2x1cm); from 336m to 337.50m, more carbonaceous fragment; at 342.75m, 0.10m bauxite mudstone; a few siderite thin laminated throughout.
		347.50	356.00	8.50								Siltstone	same as previous interval, plus FGSS decreased to 10%.
		356.00	367.20	11.20		20°						Siltstone	siltstone, dark gray, interbedded with light gray FGSS laminated, content: 40%; at 360m, bedded plane: 20° ; small crossbed on bedding surface and FGSS laminated unevenly (thin or thick) partly, a few siderite thin laminated.
		367.20	376.00	8.80		20°						Siltstone	same feature as above, plus FGSS decreased to 10%; at 372.70m, solid on bedding plane; a few siderite laminated throughout; at 373.70m, bedded plane: 20° .
		376.00	394.00	18.00		20° 25°						Siltstone	siltstone, dark gray, interbedded with light gray FGSS laminated, content: 40%, micro-horizontal bedding, at 379.50m, bedded plane: 20° ; at 375.90m, with a few CGSS (0.05m); at 324m - 374.20m, broken, small cross-bed and distorted bed throughout; at 384m, bedded dip: 25° ; at 381.05m - 381.10m, 0.05m bauxite; at 392.90m, 0.10m FGSS laminated at base, FGSS pebble.
		394.00	412.50	18.50		25°						Siltstone	same as previous interval, plus FGSS laminated decreased to 20%; at 400.30m - 401m, more FGSS laminated; at 402.70m, with few coal film; from 404.60m - 407m, with more FGSS laminated (40%); at 405m, bedded plane: 25° ; a few siderite thin laminated throughout. at base, muddy toward; at lower part, FGSS laminated, content: 10%; at 412.50m, bedded plane: 25° .
		412.50	428.00	15.50		22°						Siltstone	same as previous intervals, plus light gray FGSS decreased to 10%, muddy; at 420m, bedded plane: 22° ; at 420.50m, few coal film, at lower part, with a few black mudstone laminated (20%).
		428.00	452.00	24.00		25°						Siltstone	siltstone, light black, interbedded with light gray FGSS (15%) and black, mudstone laminated (20%), little muddy, micro-horizontal bedding; at 441m, bedding plane: 25° ; at 439.84m, 0.01m pyrite vein observed; at 444.20m - 444.40m, 0.20m broken.
		452.00	467.45	15.45		23° 30°						Siltstone	siltstone, dark gray, interbedded with light gray FGSS laminated (20% - 40%); micro-horizontal bedding; at 454m, bedded plane: 23° ; from 459m - 467.45m (end); FGSS laminated increased to 40%, with ripple-bedding and distorted bedding; at 467m, bedding plane: 30° .
		467.45	467.63	0.18								conglomerate	light gray conglomerate.
Boulder Creek		467.63	471.16	3.53								Sandstone	FGSS, light gray, interbedded with a few dark gray siltstone laminated (10%), and infilled a lots argillaceous pebble; (size: 1x5cm to 1mm disseminated); at base, 0.16m conglomerate-FGSS.
		471.16	486.00	14.84								Mudstone	bauxitic mudstone, massive, white-gray to gray, not clear bedding at upper part, more silt and more muddy at base; at 476.70m - 477.05m, more FGSS, at base, soft, rock core reduced size.
		486.00	488.50	2.50								Siltstone	siltstone, dark gray, interbedded with black mudstone, one FGSS laminated at base, a few carbonaceous debris, sandy.
		488.50	495.20	6.70		20° 35°						Sandstone	FGSS, light gray, interbedded with a few black mudstone laminated (10%), micro-horizontal bedding, at 492m, bedding plane: 20° ; sandy toward at base, and coal streak; at 494m, bedding plane: 35° .
		495.20	497.80	2.60								Mudstone	mudstone, black, massive, soft, reduced size with a few coal film and carbonaceous debris.
		497.80	499.70	1.90								Mudstone	bauxitic mudstone, massive, at base, black mudstone.
		499.70	501.00	1.30								Mudstone	blank mudstone interlaminated and dark gray siltstone.
		501.00	507.50	6.50								Mudstone	bauxitic mudstone, massive mainly, at upper part, more silt; from 505.30m - 506.65m, very broken, fracture number: 10/m.
		507.50	521.30	13.80		25° 35° 50°						Sandstone	FGSS, gray to light gray, interbedded with dark gray siltstone laminated, content: 10%; at upper part: 30%; horizontal bedding, with a few calcite vein; from 510.40m - 511.80m; very broken, infilled few calcite vein and carbonaceous debris; at 512m, bedding plane: 35° ; from 512m - 521.30m; MG-CGSS-FGSS, fracture developed, filled a few black mudstone laminated and calcite vein; FGSS react with 5% HCL; at 513m, bedded plane: 25° ; at 519m, bedded plane enlarge: 50° ; from 519.0m - 520.30m, conglomerate mainly, filled irregular calcite vein.
		521.30	523.45	2.15		50°						Siltstone	siltstone, dark gray interlaminated with black mudstone, massive; at top filled a few irregular calcite vein.
		523.45	533.40	9.95		50°						Mudstone	bauxitic mudstone, white-gray to dark gray, massive, soft; core size reduced; at medium part, with black mudstone; from 526.50m - 528m, broken; at 526m, bedding plane: 50° ; at 528.70m - 530m, dark gray siltstone mainly; from 530.80m - 531m, broken; from 528m - 528.80, filled calcite vein; at base, black mudstone mainly.
		533.40	535.85	2.45		45°						Sandstone	FGSS, light gray, well-sorted, fracture developed, filled calcite vein; at 534.55m - 534.70m, more thick irregular calcite vein (result by fault); at lower part, with dark gray siltstone laminated, various angles calcite vein to core axis. React with 5% HCl; at 534.50m, dip: 45° .
		535.85	542.00	6.15								Mudstone	black mudstone, massive mainly, slight fracture, infilled a few coal film and calcite vein; little bauxitic; from 536.50m - 538.50m, more dark gray siltstone; at base, 0.20m, very broken, infilled calcite vein.
		542.00	547.15	5.15		50°						Sandstone	FGSS, light gray, well-sorted, micro-horizontal bedding, slightly fracture, infilled a few calcite vein; at upper part, more dark gray siltstone; at base, with numerous black mudstone laminated and irregular calcite; FGSS react with 5% HCl; at 545m, bedded plane: 50° .
		547.15	554.00	6.85		50°						Siltstone	siltstone, dark gray to light black, massive mainly; at top, little muddy; at 548.30m - 548.50m, 0.20m FGSS; at 551.10m - 551.80m, coaly black FGSS, fracture developed, filled a few calcite vein; at 551.50m, bedding plane: 50° .
		554.00	560.10	6.10								Mudstone	bauxitic mudstone, white-gray, massive, soft, core size reduced, little broken; at 567.80m, fracture, infilled calcite vein; at 558.20m, fracture, infilled calcite vein; at base, black mudstone mainly, slickensided.
		560.10	563.50	3.40		45°						Siltstone	siltstone, dark gray, interbedded with light gray FGSS laminated (20%); micro-horizontal bedding; at 560.80m, bedded plane: 45° ; from 560.50m - 561.50m, more FGSS, 50%, fracture developed, infilled irregular calcite vein; at base, little bauxitic mudstone.
		563.50	567.74	4.24								Mudstone	bauxitic mudstone, white-gray, massive, at top, 1.0m broken; at base, siltstone increased, filled calcite vein.
		567.74	570.00	2.26								Mudstone	mudstone, black, massive, very broken, broken surface are slickensided, infilled a few coal film and shiny, fracture number:15/m.
		570.00	577.15	7.15		60° 70°						Siltstone	siltstone, dark gray, interbedded with light gray FGSS laminated (20%); micro-horizontal bedding; at 571m, bedded plane: 60° ; at medium - lower part, more black MS; at 572.60m - 573m, broken, fracture developed throughout, infilled few coal film and calcite vein, slickensided and shiny; at 574.65m - 575.10m, very broken; at 576.50m, dip enlarge to 70° .
		577.15	580.00	2.85								Mudstone	bauxitic mudstone and black mudstone; at upper part, rock broken, in spite of lower part, deformation and mylonite, tectonic broken; at 578.95m - 579m, 0.05m, broken coal, very broken, parallel bedding.
		580.00	591.15	11.15		50° 60°						Siltstone	siltstone, dark gray, massive mainly, muddy, very broken; at 583.70m, bedding plane: 60° ; at 585m, bedded plane: 50° ; from 585m - 585.50m, very broken; at 587m, bedded plane: 50° ; from 589.35m - 591m; a few calcite vein observed at various angles to core axis.
		591.15	597.00	5.85								Sandstone	MGSS, light gray, normal-sorted, quartz and debris mainly, fracture developed, slickensided and shiny, infilled a few irregular coal film at upper part; at 594m - 597m, very broken, fracture number: 15/m.
		597.00	600.60	3.60		70°						Sandstone	FGSS, light gray, well-sorted, very broken, broken surface are slickenedsided and shiny; fractured number: 15/m; at 597.50m, bedded plane: 70° .
		600.60	606.85	6.25		65°						Sandstone	MGSS - conglomerate, light gray at upper - medium part, intent, but angle large, at 605.35m, dip: 65° ; at lower part, conglomerate mainly and very broken, vertical fracture developed, infilled few coal threads and slickensided and shiny, bedding deformation; fracture number: more than 30/m.
		606.85	608.00	1.15								Sandstone	FGSS, gray, with dark gray siltstone, very broken; fracture number: 20/m.
		608.00	610.50	2.50		40°						Mudstone	mudstone, black, massive, very broken, broken surface are slickensided and shiny, compression and deformation; at 608.75m, infilled, 0.05m, coal seamlet, angle almost vertical; at 610.50m, dip: 40° .
		610.50	612.05	1.55								Mudstone	mudstone, light black to dark gray, silt toward at base.
		612.05	615.00	2.95		65°						Sandstone	FGSS, light gray, with light black mudstone laminated (20%); at lower part, broken; at 613m, bedded plane: 65° ; broken surface are slickensided and shiny and filled calcite vein.
	BC	615.00	615.40	0.40								Coal	**0.40m coal seam, broken; RC: 0.15m**
		615.40	616.10	0.70								Mudstone	mudstone, massive, black.
		616.10	618.35	2.25								Sandstone	FGSS, light gray, well-sorted, pure, but very much broken; at base, 0.20m conglomerate; fracture number: 25/m.
		618.35	624.65	6.30		15°						Sandstone	conglomerate-bearing, FGSS, light gray, well-sorted, horizontal bedding; dip decreased to 15° .
		624.65	637.80	13.15		10°						Sandstone	FGSS, light gray, pure, well-sorted; at 627m, bedded plane: 10° ; at 634.80m - 635.50m, black mudstone mainly.
		637.80	645.00	7.20		10°						Siltstone	interlaminated FGSS with dark gray siltstone, micro-horizontal bedding; at 642m, dip: 10° .
Hulcross		645.00	660.00	15.00		20°						Siltstone	siltstone, light black, muddy with light gray FGSS laminated (20%); at 648m, bedded plane: 20° .
		660.00	702.50	42.50		20°		GT1 GT2 GT3 GT4				Siltstone	siltstone, light black, muddy, micro-horizontal bedding; at 664m, bedded plane: 20° ; interbedded with a few light grey; FGSS laminated (20%); at 690m, bedded plane: 20° ; at 690.07m - 690.17m, 0.10m, white-gray, argillaceous limestone; from 696m - 696.70m, more FGSS.
		702.50	707.50	5.00		18°		GT5				Siltstone	siltstone, dark gray, interbedded with light gray FGSS laminated, 40%; micro-horizontal bedding; at 707.50m, bedded plane: 18° ; at 702.20m - 702.28m, 0.08m, white-gray, argillaceous, limestone, strong react 5% HCl.
		707.50	712.30	4.80		18° 20°		GT6				Sandstone	interlaminated with dark gray siltstone and light gray FGSS; micro-horizontal bedding; at 711m, bedded plane: 18° ; from 710.90m - 711.50m, more FGSS; at base, with more black mudstone laminated; at 712m, dip: 20° .
Gates		712.30	712.75	0.45								conglomerate	conglomerate, fine-grained, light gray with 2 layers thin black mudstone laminated; Φ: 2-5mm, poorly-sorted, rounded.
		712.75	714.00	1.25								Siltstone	siltstone, dark gray, massive, a few carbonaceous fragment.
		714.00	714.56	0.56								Sandstone	FGSS, gray, little silt.
		714.56	715.38	0.82								Siltstone	siltstone, dark gray to light black, massive, at base, black mudstone.
		715.38	**715.50**	**0.12**								**Coal**	**0.12m coal seam, boney coal mainly.**
		715.50	717.85	2.35								Sandstone	FGSS, gray, interbedded with dark gray siltstone; at top, 0.10m coaly FGSS; at 716.83m - 716.85m, 0.02m coal seam.
		717.85	718.75	0.90								Mudstone	black mudstone, massive, rich in carbonaceous debris.
	#2	**718.75**	**719.02**	**0.27**								**Coal**	**0.27m coal seam. 0.12<0.03>0.12m.**
		719.02	721.22	2.20				GT7				Sandstone	FGSS, light gray to gray, well-sorted, at top, 0.35m dark gray siltstone; at base, more vitrain chip.
	#3	**721.22**	**722.72**	**1.50**		**5**		Q1 Q2				**Coal**	**1.50m coal seam, RC: 1.45m, dip: 5° ; parting: 722.05m - 722.18m, 0.13m, black MS, black, intact, bright and light; coal structure: 0.83<0.13>0.54m.**
		722.72	726.90	4.18					GT8			Siltstone	siltstone, gray to dark gray, little sandy, with few coal film, muddy toward at base, rich in coal film.
	#4	**726.90**	**727.47**	**0.57**								**Coal**	**0.57m coal seam, RC: 0.57m, boney coal mainly.**
		727.47	728.50	1.03								Siltstone	siltstone, dark gray, massive, numerous coal streak, at top, 0.15m, black CM, very muddy.
		728.50	732.45	3.95		5°			GT9			Siltstone	siltstone, gray to dark gray at top, 1.0m, FGSS mainly, at 729m, bedded plane: 5° ; at base, minor carbonaceous debris.
		732.45	737.13	4.68		20°			GT10			Sandstone	FGSS, light gray, well-sorted, pure, few coal film; at 736.30m, bedded plane: 20° .
		737.13	739.28	2.15		5°						Mudstone	mudstone, black, massive, rich in coal film; at 739m, bedded plane: 5° .
		739.28	742.33	3.05								Siltstone	siltstone, dark gray, massive, a few carbonaceous fragment.
		742.33	744.85	2.52								Mudstone	mudstone, black, massive, rich in coal streak, at 744.08m - 744.10m, 0.02m coal seam; at 744.64m - 744.74m, 0.10m coal seam.
		744.85	748.22	3.37		5°						Siltstone	siltstone, dark gray to gray, little sandy, interbedded with light gray FGSS laminated (30%); micro-horizontal bedding; at 746m, bedded plane: 5° ; but FGSS is inclined bedding; few carbonaceous fragment.
		748.22	750.50	2.28		20°			GT11			Mudstone	mudstone, light black, massive, rich in coal streak; at base, a few coal seam (thin); at 750.50m, bedded plane: 20° .
		750.50	761.46	10.96		15° 20°			GT12			Sandstone	FGSS; light gray, interbedded with dark gray siltstone laminated (40%); micro-horizontal bedding; at 753m, bedded plane: 15° ; rich in plant fossil and coal streak; at 752.12m - 752.20m, 0.08m coal seam; at 754m - 754.50m, more dark gray siltstone; at 754m, bedded plane: 20° ; at 758.40m - 759.80m, more dark gray siltstone, few carbonaceous debris.
	#5	**761.46**	**763.09**	**1.63**		**10°**		Q3				**Coal**	**1.63m coal seam, RC: 1.48m, intact, black, shiny and light, no parting, 10° .**
		763.09	765.00	1.91		13°			GT13			Mudstone	mudstone, black massive, rich in coal streak and coal seamlet; at 764m, bedded plane: 13° .
		765.00	770.00	5.00								Siltstone	siltstone, dark gray, interbedded with light gray FGSS laminated (20%) and numerous coal streaks and lenses and rich in carbonaceous fragment.
		770.00	778.20	8.20		10°			GT14			Sandstone	FGSS, light gray, pure mainly at upper; at lower part, with dark gray siltstone laminated, few coal film; horizontal bedding; at 775m, bedded plane: 10° ; at base, silt toward.
		778.20	779.90	1.70								Mudstone	mudstone, black, massive; coal streak at 778.70m - 778.72m, 0.02m coal seam.
		779.90	780.90	1.00								Sandstone	FGSS, silt sandstone, medium gray, massive.
		780.90	781.90	1.00								Mudstone	mudstone, black, massive; at 781.10m - 781.17m, 0.07m, boney coal.
		781.90	783.65	1.75					GT15			Sandstone	silt sandstone, FGSS, a few carbonaceous debris.
		783.65	785.50	1.85		8°						Mudstone	coaly mudstone, black, massive, 5 layers 0.05m coal seam, boney mainly; at 784m, bedded plane: 8° .
		785.50	786.70	1.20								Sandstone	silt FGSS, medium-gray.
		786.70	787.51	0.81								Mudstone	mudstone, black, massive, rich in carbonaceous fragment.
	#6+1	**787.51**	**787.85**	**0.34**								**Coal**	**0.34m coal seam, good clean and bright.**
		787.85	790.00	2.15					GT16			Siltstone	sandy siltstone, dark gray, muddy toward base.
		790.00	**790.06**	**0.06**								**Coal**	**0.06m coal seam.**
		790.06	790.55	0.49								Mudstone	mudstone, black, massive, rich in coal streaks.
	#6-1	**790.55**	**790.83**	**0.28**								**Coal**	**coal seam; 0.13<0.10>0.05m**
		790.83	793.80	2.97		15°						Sandstone	FGSS, light gray to 792m, from 792m - end; dark gray siltstone, numerous carbonaceous fragment and a few coal threads, dip: 15° .
	#6	**793.80**	**794.20**	**0.40**								**Coal**	**0.40m coal, boney mainly.**
		794.20	795.84	1.64								Mudstone	mudstone, black; at top, CM to 795m, numerous coal streak and carbonaceous.
		795.84	**796.05**	**0.21**								**Coal**	**0.21m coal seam.**
		796.05	801.46	5.41					GT17			Mudstone	mudstone, light black, little silt at top; at lower part, rich in plant root fossils; at base, black CM. from 801m - 801.46m; abundant coal streaks.
		801.72	803.10	1.38		15°						Sandstone	FGSS, light gray with dark gray siltstone; at 802.50m bedded plane: 15° .
		803.10	**803.22**	**0.12**								**Coal**	**0.12m coal seam.**
	#7	803.22	803.33	0.11								Mudstone	0.11m, black MS.
		803.33	**803.78**	**0.45**								**Coal**	**0.45m coal, 0.28<0.07>0.10m.**
		803.78	804.07	0.29								Mudstone	coaly mudstone.
		804.07	807.93	3.86		15°						Siltstone	siltstone, dark gray, interbedded with light gray FGSS and black mudstone laminated, and a few carbonaceous debris; at 806m, bedded plane: 15° .
		807.93	**808.07**	**0.14**								**Coal**	**0.14m coal seam.**
		808.07	811.12	3.05					GT18			Sandstone	FGSS, gray, well-sorted, with a few dark gray siltstone laminated (20%); rich in carbonaceous fragment on fracture.
	#7-1	**811.12**	**811.48**	**0.36**								**Coal**	**0.36m coal seam, RC: 0.36m, intact.**
		811.48	813.93	2.45								Siltstone	muddy siltstone, massive, rich in coal streak and carbonaceous debris at top and base, black mudstone.
		813.93	**814.21**	**0.28**								**Coal**	**0.28m coal seam, RC: 0.17m black dull.**
		814.21	815.10	0.89		10°						Mudstone	mudstone, light black, massive, silt toward base; at 815m, dip: 10° .
		815.10	815.90	0.80								Sandstone	FGSS, gray, well-sorted, with dark gray siltstone.
		815.90	818.74	2.84								Mudstone	mudstone, black, massive, few carbonaceous fragment on bedding.
	#7-2	**818.74**	**819.28**	**0.54**								**Coal**	**0.54m coal seam, RC: 0.54m, black, bright and light, brittle.**
		819.28	821.00	1.72					GT19			Mudstone	mudstone, black, massive, rich in coal streak, at 820.65m, 0.10m coal seam.
		821.00	822.20	1.20								Sandstone	FGSS, light gray with dark gray siltstone laminated, silt toward base; react with 5% HCl.
		822.20	825.75	3.55								Siltstone	siltstone, dark gray to light black; rich in plant root fossils and a few coal threads.
		825.75	**826.10**	**0.35**								**Coal**	**0.35m coal seam, boney coal mainly, banded, black, RC: 0.35m.**
		826.10	829.02	2.92		10°			GT20			Siltstone	siltstone, dark gray with numerous plant root fossils and a few coal streak and with a few black mudstone laminated; react with 5% HCl; at 828.50m, bedded plane: 10° .
	#8	**829.02**	**830.92**	**1.90**				Q4 Q5 Q6				**Coal**	**1.90m coal seam, RC: 1.90m; parting: 829.50m - 829.78m, 0.28m, black MS, black, shiny and light, intact; boney coal: 830.30m - 830.90m, 0.60m, dull, banded.**
		830.92	831.65	0.73								Mudstone	black, coal mudstone.
		831.65	833.96	2.31								Siltstone	siltstone, dark gray, massive, rich in carbonaceous debris and a few coal streaks; at 833.45m - 833.55m, 0.10m coal seam.
	#8-1	**833.96**	**834.90**	**0.94**				Q7 Q8				**Coal**	**0.94m coal seam, RC: 0.94m; two parting: ①834.52m - 834.66m, 0.14m black MS; ② 834.01m - 834.11m, 0.10m, black MS. coal structure; 0.05<0.10>0.41<0.15>0.23m;**
		834.90	840.28	5.38					**GT21**			Siltstone	siltstone, dark gray, interbedded with a few light gray FGSS laminated (10%), at base, increased 30% and numerous plant root fossils and a few coal streak; react with 5% HCl; at 840m, bedded plane: 15° .
		840.28	844.75	4.47					GT22			Sandstone	FGSS, light gray, well-sorted, pure, predominately quartz and minor debris, grading toward at base; at 843m, bedded plane: 15° , react with 5% HCl.
		844.75	858.08	13.33		15°			GT23			Sandstone	MGSS-CGSS, light gray, normal-sorted; from 851m - 853m, FGSS mainly; at 851m - 851.60m, numerous argillaceous, observed unevenly, horizontal bedding; at 849m, bedding plane: 15° ; small cross-bed throughout and a few coal streak observed on fracture; react with 5% HCl; at 857.30m - 857.55m, more coal film.
		858.08	861.44	3.36		12°			GT24			Siltstone	siltstone, dark gray, interbedded with light gray FGSS laminated 20%; at top: 0.60m FGSS, rich in plant root fossil; at 858.10m, bedded plane: 12° ; react with 5% HCl.
		861.44	873.40	11.96		5°			GT25			Siltstone	siltstone, dark gray, competent at upper part, interbedded with light gray FGSS laminated (30%), micro-horizontal bedding; at 864m, bedded plane: 5° ; at medium part, little muddy, rich in coal streak and carbonaceous fragment on bedding surface; from 870.50m - 873.40m, more light gray FGSS laminated (40%); at 871m, bedded plane: 5° ; a few carbonaceous debris and ooid.
		873.40	880.00	6.60					GT26			Siltstone	siltstone, dark gray to light black, little muddy, at base, very muddy, rich in plant leaf/root fossil and coal streaks and carbonaceous debris.
		880.00	881.60	1.60								Mudstone	mudstone, black, massive, numerous vitrain thin laminated and lenses; at 880.74m - 880.89m, 0.15m coal seam, RC:0.15m, blank.
	#9	**881.60**	**887.45**	**5.85**				Q9 Q10				**Coal**	**5.85m coal seam; RC: 4.90m, no parting; black, shiny and intact, brittle, light at base, little broken; Q9: 881.60m - 885m, 3.40m, RC: 2.70m, lost: 0.70m; Q10: 885m - 887.45m, 2.45m, RC: 2.25m, lost : 0.25m; lost coal: ①883m - 883.10m, 0.70m; ②886m - 886.25m, 0.25m.**
		887.45	888.00	0.55					GT27			Mudstone	mudstone.
		888.00	891.00	3.00								Sandstone	FGSS.
		891.00	901.70	10.70					GT28			Siltstone	gray siltstone, massive, filled with $CaCO_3$ veins at 894m.
		901.70	904.76	3.06								Sandstone	FGSS predominated, bedded with dark gray siltstone.
		904.76	905.70	0.94								Siltstone	siltstone.
		905.70	910.24	4.54					GT29			Siltstone	siltstone.
	#10	**910.24**	**914.36**	**4.12**				Q11				**Coal**	**4.12m coal seam; RC: 1.24m, 30% recovered. three partings: at 910.30m - 910.40m, 0.10m; 912.60m - 912.89m, 0.29m; 913.92m - 914m, 0.07m; total 0.46m; coal recovery 30%. Q11: 910.24m - 914.36m (coal), 4.12m, RC:30%; three parting: at 910.24m - 914.36m, total: 0.46m. a. 910.30-910.40m: 0.10m; b. 912.60-912.89; 0.29m; c. 913.93-914.00m; 0.07m, black mudstone, no sampling.**
		914.36	916.30	1.94					GT30			Mudstone	dark black mudstone-dark gray siltstone.
		916.30	921.90	5.60								Sandstone	Sandstone-little siltstone-pure MGSS-FGSS-minor siltstone; change gradually.
		921.90	926.70	4.80		10° 15°						Sandstone	pale gray FGSS (60%), gray siltstone bedded in sections; dip: 10% - 15%.
		926.70	931.55	4.85								Sandstone	pure gray FGSS-MGSS.
	#11	**931.55**	**931.65**	**0.10**								**coal**	**0.10m coal seam.**
		931.65	940.88	9.23					GT31			Mudstone	dark mudstone/gray siltstone, thin coal seam interbedded in sections.
		940.88	946.80	5.92								Sandstone	FGSS (80%) , interbedded with siltstone (20%).
		946.80	948.00	1.20								Siltstone	dark gray siltstone.
		948.00	953.57	5.57					GT32			Sandstone	FGSS. with laminations dark gray siltstone (15%).
		953.57	954.28	0.71								Mudstone	dark gray mudstone.
	#12	**954.28**	**955.00**	**0.72**								**Coal**	**0.72m coal seam; parting: 0.15m at bottom. RC: 90%.**
		955.00	955.25	0

Wapiti River — Drill Hole Core Log

Drilling Company:	Foraco Drilling Ltd.	**Hole No.:**	WP1R29
Rig Type:	VD-8000	**Collar Elevation:**	1120.4
Total Depth:	980.50 m	**Coordinate: Northing:**	607454.2
Spud Date:	12-Nov-12	**Easting:**	650880.6
Finished Date:	12-Dec-12	**Logging Geologist:**	Victor, Ricky, Lee
Core Size:	HWT/HQ	**Note:**	met Fault 5, dip enlarge to 70-80 degree, strata repeated, only drilled to Boulder Creek formation.

Formation	Coal Seam	Core Depth Interval From	To	Thickness, m Thick	TRUE	Strata Dip	Coal Floor Elevatio	Sample ID Coal	Rock	CBM	Rock Hardness	Rock Name	Lithology Description
Q		0.00	5.85	5.85								till	overburden. From 0-1.00m, soil, mud. Brown-yellow. From 1.00-5.85m, weathered deposits. Mainly brown-yellow mudstone, very much broken.
Hasler		5.85	35.50	29.65		25						siltstone	grey to dark grey, muddy. with fine-grained light grey sandstone-FGSS(20%). micro-horizontal bedding. a few siderite laminates throughout. From 14.50-14.80m, mud cast. At 26.50m, bedded plane: 25 degree. At 33.00m and 38.00m, bedded plane: 25 degree.
		35.50	65.50	30.00		25						mudstone	dark grey, little silt. Interbedded with light grey FGSS laminated (25%). Micro-horizontal bedding. At 45.00m, bedding plane: 25 degree. A few siderite thin laminated throughout. From 53.00-57.00m, more FGSS laminated, 40%. At 57.00m, dip: 25 degree. At 65.50m, pyrite thin laminated-1cm. at 66.00m, bedded plane: 25 degree.
		65.50	77.00	11.50								mudstone	dark grey, interbedded with few light grey fine-grained sandstone laminates (5%). At 71.40-71.50m, and 74.00-74.10m, 3 layers siderite laminated.
		77.00	86.50	9.50								mudstone	dark grey, plus, light grey fine-grained sandstone laminates (30%). Interrupted FGSS laminated on bedding surface. Blended with siltstone and FGSS.
		86.50	92.50	6.00								siltstone	dark grey. Massive. Not apparently bedding.
		92.50	120.50	28.00		28						siltstone	dark grey, muddy. interbedded with few light grey fine-grained sandstone laminates (5%). Micro-horizontal bedding. At 93.00m, bedded surface: 25 degree. Alternately with a few siderite thin laminated. At 114.80-114.90m, 0.10m siderite laminated. At 112.00m, bedded plane: 28 degree.
		120.50	143.50	23.00		25						siltstone	same as previous interval, at 126.50m and 134.00m, bedded plane: 25 degree. At 120.50m and 130.20m, pyrites nodule observed on bedding. At 135.50-135.55m, 0.05m FGSS.
		143.50	146.50	3.00								siltstone	same features as above, plus rock very much broken. Vertical fracture developed. Broken surface are slickensided and shiny.
		146.50	155.80	9.30		30						siltstone	dark grey, interbedded with light grey FGSS laminates (30%). Horizontal bedding, at 151.50-152.00m, broken. At 153.00m, bedded plane: 30 degree.
		155.80	165.50	9.70								siltstone	same as previous interval, plus light grey FGSS decreased to 10%. At 158.00-158.50m, broken.
		165.50	178.50	13.00		30						siltstone	dark grey, little muddy. interbedded with light grey fine-grained sandstone laminates (30%). At 168.00m, bedding plane: 30 degree. Minor distorted bedding on bedding. FGSS laminated has thin and wide, uneven. A few siderite thin laminated.
		178.50	199.00	20.50		25						siltstone	same features as above, plus siderite increased. At 195.00m, bedded plane: 25 degree. At base, interrupted bedding observed on bedding.
		199.00	209.60	10.60		30						siltstone	dark grey, muddy. interbedded with light grey fine-grained sandstone laminates (10%). Micro-horizontal bedding. A few siderites thin laminated throughout. At 204.50m, dip: 30 degree.
		209.60	245.50	35.90		25						siltstone	dark grey, interbedded with light grey fine-grained sandstone laminates (20%). Micro-horizontal bedding. At 222.00m, bedding surface: 25 degree. Alternately with a few thin siderites laminated. Distorted bedding observed on siltstone bedding. FGSS laminated has thin and wide (0.01m and 0.05m), uneven. at 228.00m, bedding plane: 25 degree. at 230.70-231.00m, broken. at 233.50-236.50m, more muddy.
		245.50	255.00	9.50		25						siltstone	dark grey, interbedded with few light grey fine-grained sandstone laminates (5%). Few siderites thin laminated. Micro-horizontal bedding. At 246.00m, bedding plane:25 degree.
		255.00	272.50	17.50		25						siltstone	same as previous interval, plus light grey FGSS increased to 20%. At 266.50m and 270.00m, bedding plane: 25 degree. From 267.00-267.60m, and 271.00-271.50m, vertical fracture developed.
		272.50	296.00	23.50		27						siltstone	dark grey, little muddy. interbedded with light grey fine-grained sandstone laminates (30%). At 280.00m, bedding plane: 30 degree. At 284.50-285.00m, 2 layers pyrites. At 284.50m, bedded surface: 27 degree. At 288.00m, pyrite thin laminated-0.03m observed. at 294.70m, pyrite nodule, 1x2mm.
		296.00	304.87	8.87		35						siltstone	same as previous interval, plus light grey FGSS increased to 40%. At base, FGSS content: 50%. At 296.00m, bedding plane: 33 degree. At 303.85m, pyrite nodule-1x15mm. At 304.00m, bedding surface: 35 degree.
		304.87	305.54	0.67								conglomerate	light grey, fine-grained. Ø=2-7mm. Poorly-sorted.
		305.54	306.72	1.18								sandstone	MGSS. Light grey. Moderate-sorted. At base, 0.04m conglomerate.
Boulder Creek		306.72	307.32	0.60								bauxitic mudstone	0.60m bauxitic mudstone. White-grey, soft.
		307.32	308.00	0.68								sandstone	FGSS. Light grey.
		308.00	312.75	4.75								sandstone	MGSS. Light grey. Moderate-sorted. Quartz predominately, no reacts with 5% HCL.
		312.75	326.55	13.80								bauxitic mudstone	bauxitic mudstone. White-grey. Generally massive. Soft, scratched by fingers. From 314.30-315.00m, more FGSS. At 317.85-318.00m, Fe2+ inclusion, red. From 323.50-324.50m, black mudstone mainly.
		326.55	329.50	2.95								siltstone	grey, massive, minor bauxitic.
		329.50	334.80	5.30								bauxitic mudstone	white-grey. Massive, with a few black mudstone.
		334.80	339.60	4.80		33						sandstone	FGSS. Grey, with a few dark grey siltstone laminated (15%). At 338.00m, bedded plane: 33 degree.
		339.60	340.20	0.60								bauxitic mudstone	
		340.20	343.85	3.65								sandstone	FGSS. Grey, interbedded with black mudstone and coal film (irregular).
		343.85	347.26	3.41								bauxitic mudstone	white-grey, minor Fe2+ inclusion. with minor black mudstone. At base, sandy toward.
		347.26	349.70	2.44								mudstone	light black, massive. Few carbonaceous debris. Sandy toward at base.
		349.70	351.50	1.80								bauxitic mudstone	bauxitic mudstone. Massive. White-grey, scratched by knife.
		351.50	361.30	9.80		30						sandstone	FGSS. light medium grey. Interbedded with black mudstone laminated (15%). Horizontal bedding. At 356.00m, bedded plane: 30 degree. At base, minor coal film.
		361.30	368.00	6.70								mudstone	white-grey, bauxitic mudstone mainly. At upper part (from 361.30-364.20m), soft, scratched by knife and at base, minor coal film. At lower part, hardness more than 5, little bauxitic. Not apparently bedding. A few carbonaceous debris and black mudstone increased at lower part.
		368.00	369.00	1.00		**35**						sandstone	FGSS. Grey, interbedded with dark grey siltstone laminated and calcite vein. Bedding plane: 35 degree. Rich carbonaceous fragment.
		369.00	371.60	2.60								bauxitic mudstone	white-grey. massive.
		371.60	373.90	2.30								siltstone	dark grey interbedded with light grey FGSS laminated and a few carbonaceous and plant leaf fossil.
		373.90	380.20	6.30		30						mudstone	dark grey. At top, little bauxitic. From 375.00-375.20m and 375.90-376.20m, more FGSS laminated. At 376.00m, bedded plane: 30 degree. Alternately with a few carbonaceous debris and few coal threads.
		380.20	389.40	9.20								mudstone	dark grey, little bauxite. Massive. Rich in carbonaceous debris and coal threads. At 382.75-383.10m, 0.35m broken, bauxitic mudstone. At 384.10-385.00m and 386.00-388.00m, predominately siltstone.
		389.40	391.30	1.90		30						sandstone	FGSS. Light grey, interbedded with dark grey siltstone laminated, content: 30%. At 391.00m, bedded plane: 30 degree.
		391.30	**394.90**	3.60								bauxitic mudstone	white-grey, massive. With a few carbonaceous fragment, ooid, soft. At base, silt toward.
		394.90	399.75	4.85		30						sandstone	FGSS. Light grey, with dark grey siltstone laminated (10%). From 396.70-398.00m, rich in irregular coal streak on FGSS surface. At 399.03-399.17m, 0.14m coal seam. RC: 0.05m. At 399.00m, bedding plane: 30 degree.
		399.75	409.50	9.75								bauxitic mudstone	white-grey, soft, massive. Scratched by fingers. At top, 1.00m, black mudstone mainly. From 401.00-402.00m, very much broken. At lower part, silt toward, few calcite vein.
Boulder Creek		409.50	424.35	14.85		30						sandstone	FGSS. Light grey, well-sorted. Interbedded with dark grey siltstone laminated (20%). From 411.60-411.95m, 0.35m bauxitic mudstone. From 412.50-413.20m, broken. At 410.00m and 417.00m, bedded plane: 30 degree. From 419.50-421.00m, few calcite vein. At base, few coal film.
		424.35	427.23	2.88								siltstone	dark grey, with a few light grey FGSS laminated, content: 15%. Massive, little bauxitic mudstone.
		427.23	428.10	0.87								mudstone	black. Very much broken, only 2-3cm fragment and grinding.
		428.10	428.75	0.65								mudstone	black, at top, with 0.10m light grey FGSS.
	BC	**428.75**	**430.20**	**1.45**	**0.88**			**Q1 Q2**				**coal**	**1.45m BC coal seam. RC: 0.88m. Black, intact, light and shiny. Coal structure: 0.85<0.40>0.20m. Parting: 429.60-430.00m, 0.40m black mudstone.**
		430.20	432.00	1.80		50						sandstone	FGSS. Light grey, conglomerate-bearing. At top, 0.70m conglomerate. Poorly-sorted, quartz mainly. At 430.50m, bedded plane: 40 degree, and at 431.50m, dip enlarge to 50 degree.
		432.00	437.20	5.20								conglomerate	light grey, fine-grained. Ø:2-10mm. Poorly-sorted. Subrounded-subangular, predominately quartz and debris.
		437.20	443.35	6.15		45						sandstone	conglomerate-bearing FGSS. Light grey, well sorted. Horizontal bedding. At 440.50m and 438.00m, bedded plane: 45 degree and 50 degree. At 437.60-437.70m, and 440.15-440.55m, conglomerate. At 442.10-442.50m, very much broken, slightly fracture.
		443.35	446.00	2.65		**65**						sandstone	FGSS. Light grey, interbedded with a interval black mudstone laminated (from 443.40-443.70m) and two interval conglomerate (from 444.50-445.00m and 445.90-446.00m). Developed fracture, filled irregular calcite vein. At 443.50m, bedded plane: 65 degree.
		446.00	449.30	3.30								sandstone	FGSS. Light grey, with light black mudstone, very much broken. Broken surface are slickensided and shiny. Bedding plane enlarge to 60 degree. Filled few coal film and at base, 0.10m conglomerate.
		449.30	469.70	20.40		70						sandstone	FGSS. Light grey, pure, weak react with 5% HCL. Well-sorted, calcite vein and quartz vein observed on bedding surface. From 455.00-455.50m, very much broken, filled black mudstone. From 457.50-458.00m, very much broken, infilled black mudstone. At 460.00m, bedded plane: 70 degree.
		469.70	471.12	1.42		70						mudstone	black, very much broken. Dip: 70 degree. Fracture zone.
		471.12	475.50	4.38								sandstone	FGSS. Light grey, pure, well-sorted. Infilled a few calcite vein on joint surface. And at base, calcite vein and quartz vein increased, various angles to core axis.
		475.50	493.20	17.70		65-70						sandstone	FGSS. Light grey. Interbedded with black mudstone laminated, content: 20%, wide and thin uneven. Bedding plane suddenly enlarge to 65 degree and core broken. Fracture developed, filled irregular calcite vein. Broken surface are slickensided and shiny. vertical fracture at 482.00m, dip: 70 degree. from 477.00m to 482.50m, very much broken. fracture number: 15/m. distorted bedding on FGSS surface. at 491.00m, bedded plane: 65 degree.
		493.20	498.40	5.20		65-30						sandstone	FGSS. Light grey. At top, pure. From 495.00m to end, with black mudstone laminated, content: 40%. And very much broken, fracture developed. Fracture surface are slickensided and shiny. At 497.00m, bedded plane: 30 degree. Dip decreased from 65 to 30 degree.
		498.40	510.83	12.43		25-65						sandstone	FGSS. Light grey. Well-sorted, generally pure. With few calcite vein. From 504.26-504.93m, black mudstone. At 504.00m, dip; 25 degree and at 506.00m, dip: 40 degree. At 509.00m, dip: 50 degree.
		510.83	518.00	7.17		65						sandstone	FGSS. Grey, with few black mudstone laminated (5%). And three intervals conglomerate. From 514.00-518.00m, broken. Vertical fracture developed. Parallel core axis. Slickensided and shiny, infilled calcite vein and vug. At 516.00m and 518.00m, dip: 65 degree. dip enlarged.
		518.00	521.50	3.50		65						conglomerate	light grey. Fine-grained, Ø: 2-5mm, poorly-sorted, subrounded-subangular. With few FGSS. Slightly fracture. At 521.50m, bedded plane: 65 degree.
		521.50	526.17	4.67		**60**						sandstone	FGSS. Light grey, with 0.10m conglomerate at 524.50m. At 524.00m, dip: 60 degree.
		526.17	526.87	0.70								conglomerate	grey, fine-grained, poorly-sorted, Ø: 2-8mm.
		526.87	527.90	1.03								sandstone	grey, fine-grained. Interbedded with black mudstone laminated.
		527.90	528.70	0.80								conglomerate	grey. With FGSS.
		528.70	530.35	1.65								sandstone	grey, fine-grained.
		530.35	545.50	15.15		65						sandstone	FGSS. Light grey, pure. At 532.00m, dip: 65 degree. Don't react with 5% HCL.
		545.50	548.50	3.00								sandstone	FGSS. Grey. Interbedded with black mudstone, very much broken. More slickensides.
		548.50	551.45	2.95		**70**						sandstone	FGSS. Light grey. Broken. At 551.30m, dip: 70 degree.
		551.45	552.15	0.70								mudstone	black, very much broken.
		552.15	562.70	10.55		**70**						sandstone	FGSS. Light grey. At top, broken. At 555.00m, dip: 70 degree.
		562.70	563.80	1.10		75						mudstone	black. Broken. Dip: 75 degree.
		563.80	571.00	7.20								sandstone	FGSS. Light grey. Interbedded with black mudstone laminated, content: 25%, wide and thin uneven. Two intervals black mudstone (565.00-566.50m and 567.90-568.30m). Very much broken.
Hulcross		571.00	577.50	6.50		70						siltstone	light black, muddy. With light grey FGSS laminated, content: 20%. At top: 1.00m very much broken. At 575.00m, bedded plane: 70 degree.
		577.50	600.40	22.90		**75**						siltstone	dark grey, interbedded with light grey FGSS laminates (10%). Micro-Horizontal bedding, ripple-bedding on siltstone surface. at 589.00m, distorted bedding. At 585.50m, bedded plane: 80 degree. At base, FGSS decreased to 5%. Black mudstone increased. At 600.00m, bedded plane: 75 degree.
		600.40	604.00	3.60								mudstone	at top, 0.50m black mudstone. And bauxitic mudstone to end, massive, soft. At base, silt toward.
		604.00	607.00	3.00								sandstone	FGSS. Light grey, few bauxitic pebbles. And few dark grey siltstone laminated.
		607.00	623.00	16.00		75						siltstone	dark grey. Competent. Interbedded with light grey FGSS laminated, content: 30%. Micro-horizontal bedding. At 608.50m, bedding plane: 75 degree.
		623.00	641.50	18.50		75-80						siltstone	same as previous interval, plus FGSS laminated decreased to 10%. At 623.50m, bedded plane: 75 degree. From 626.50-627.20m, very much broken. Broken surface are slickensided and shiny. At 640.00m, bedding plane: 80 degree.
		641.50	647.50	6.00								siltstone	same as previous interval, From 641.50-647.50m, horizontal (parallel) fracture developed. slickensided and shiny.
		647.50	671.00	23.50		75						siltstone	same as previous interval, at 648.00m, bedding plane: 75 degree. from 650.50-653.30m, broken. slickensided and shiny. fracture number: 10/m. at 658.00m, bedded plane: 75 degree. from 657.50-663.00m, very muddy. at 663.00m and 680.00m, bedded plane: 78 degree. at 668.50-668.70m, very much broken. from 669.00-671.00m, distorted bedding on bedding surface. more FGSS laminated.
		671.00	764.00	93.00		75-82						siltstone	same as previous interval, from 682.50-689.00m, broken. slickensided and shiny. fracture number: 5/m. at 692.00m, bedded plane: 75 degree. from 692.60-693.60m, very much broken, fracture number: 30/m, and filled black mudstone laminated. at 700.00m, bedded plane: 80 degree. from 710.00-716.00m, broken. broken surface are slickensided and shiny. parallel fracture developed. fracture number: 20/m. at 717.50m, bedded plane: 80 degree. from 718.50-722.50m, broken. slickensided and shiny. at 724.00m, bedded plane: 80 degree. at 727.80m, bedding plane: 82 degree (almost vertical). from 733.00-737.50m, very much broken. broken surface are slickensided and shiny. fracture number: 30/m. at 738.00m, bedded plane: 80 degree. from 740.50-742.72m, broken, slickensided and shiny. at 743.50-744.00m, broken. fracture developed, shiny and slickensided. at 752.00m, bedded plane 75 degree. from 755.00-756.00m, very much broken. slickensided and shiny. at 758.40-759.20m, siderite observed on bedding, pale grey, massive. at 760.00m, bedding plane: 82 degree. at 766.00m, bedded plane: 80 degree.
		764.00	800.50	36.50		**80**						siltstone	dark grey, interbedded with light grey fine-grained sandstone laminates (30%). Micro-horizontal bedding. A few Distorted bedding observed on siltstone bedding. At 767.50-768.00m, very much broken, and 772.80-773.20m, very much broken too. Slickensided and shiny. at 783.00-784.50m, more black mudstone. at 780.00m, bedded plane: 80 degree. at 793.00-793.20m, and 797.00-797.50m, very much broken. broken fragment only 2-3cm debris. at 800.00m, bedded plane: 80 degree.
		800.50	817.40	16.90		83						siltstone	same features as above. From800.50-806.50m, very much broken. Broken surface are slickensided and shiny, filled more black mudstone. At 810.00-817.40m, broken. Slickensided and shiny. At 815.50m, bedding plane: 83 degree.
		817.40	842.50	25.10		**75-70**						sandstone	light grey, fine-grained sandstone (FGSS). Micro-horizontal bedding, quartz mainly. From 817.90-818.30m, very much broken (FGSS). Broken surface are slickensided and shiny. Fracture number: 30/m. at 874.00m, bedding plane: 75 degree, filled irregular calcite vein and black mudstone. from 825.90-826.70m, only 2-3cm fragment (very much broken). at 831.00m, bedded plane: 70 degree. at 833.50-834.00m, very much broken, more calcite vein (irregular). at 830.00-834.50m, very much broken, slickensided and shiny.
		842.50	875.35	32.85		**75-55**						sandstone	same features as above. From 842.50-845.00m, very much broken. Fracture number: 25/m. at 847.00m, bedded plane: 75 degree. At 850.00m and 851.50m, bedding plane: 80 degree. At 851.00-853.50m, various angles calcite veins. From 854.00-856.00m, very much broken. filled black mudstone. broken surface are slickensided and shiny. from 856.00-875.30m, pure FGSS. light grey. at 860.00m, bedded plane: 70 degree. at 867.50-868.35m, grey FGSS, with minor black mudstone laminated. at 868.00m, bedded plane: 55 degree.
		875.35	875.80	0.45								conglomerate	0.45m. light grey, poorly-sorted, Ø: 2-5mm. Quartz and debris mainly.
		875.80	877.00	1.20								sandstone	conglomerate-bearing FGSS. Light grey, broken.
		877.00	878.25	1.25								sandstone	FGSS. Light grey, filled irregular calcite veins.
		878.25	878.65	0.40								conglomerate	0.40m. light grey, poorly-sorted, Ø: 2-5mm. Quartz and debris mainly.
		878.65	884.50	5.85		**45**						sandstone	conglomerate-bearing FGSS. Light grey. At 879.50m, bedding surface: 45 degree. From 881.50-884.50m, broken, fracture developed. Fracture number: 30/m. slickensided and shiny. At 882.00m, few coal streaks.
		884.50	885.10	0.60		45						sandstone	FGSS. Light grey, with a few dark grey siltstone laminated. At 884.50m, bedded plane: 45 degree.
Boulder Creek-2	**BC-2**	**885.10**	**885.20**	**0.10**								**coal**	**0.10m coal seam. RC: 0.10m. Broken, black, light. Met F5 fault zone.**
	repeat	885.20	887.00	1.80								sandstone	coaly FGSS. Grey rich in coal film.
		887.00	904.54	17.54		60-75						sandstone	MGSS. Light grey-white grey. Fracture developed, filled a few calcite veins to 895.00m. Normal-sorted. Predominately quartz and debris. At 890.00m, bedded plane: 60 degree. White-grey MGSS react with 5% HCL. Light grey MGSS no react with 5% HCL. At 893.50m, 895.00m, 898.50m, few coal threads observed on bedding plane. a few various angles calcite veins throughout. at 900.00m, bedding plane: 60 degree. at 901.00m, 902.00m, 902.75m and 904.00m, a few coal film observed on bedding surface. at 904.50m, bedded plane: 75 degree. at base, sandy downward to FGSS.
		904.54	923.00	18.46		**65-73**						sandstone	FGSS. Light grey, well-sorted. Micro-horizontal bedding, minor calcite veins. At 905.00m, dip: 65 degree. From 910.08-917.00m, MGSS mainly. From 917.70-918.70m, a few coal film. At 916.70-916.90m, very much broken, filled few coal film. At 921.00m, bedding plane: 73 degree. from 922.00-923.30m, MGSS mainly, calcite veins filled on fracture surface.
		923.00	930.00	7.00		60						sandstone	MGSS. Grey moderate-sorted, predominately quartz and debris. At 929.00m, bedded plane: 60 degree.
		930.00	945.00	15.00								sandstone	FGSS. Light grey, pure, well-sorted. At 937.70-938.70m, broken. From 940.00-945.00m, not clear bedding, fracture developed, filled calcite veins. FGSS and calcite veins react with 5% HCL.
		945.00	946.00	1.00								sandstone	FGSS. Grey, with bauxitic mudstone, white-grey.
		946.00	960.00	14.00		70						sandstone	MGSS-FGSS. Grey, filled a few calcite veins, various angles to core axis. At 953.00m, bedded plane: 70 degree. Weak react with 5% HCL.
		960.00	962.70	2.70								bauxitic mudstone	brown and grey, massive. Not apparently bedding, silt.
		962.70	980.50	17.80								bauxitic mudstone	pure. Brown and grey, scratched by knife (easy). At lower part, from 977.00-980.50m, filled a few irregular calcite veins. Massive, not clearing bedding. TD=980.50m. DEC. 11, 2012.

FGSS=fine-grained sandstone; MGSS=medium-grained sandstone. HCL=hydrochloric acid.

Wapiti River — Drill Hole Core Log

Drilling Company:	Canada Dehua Drilling Company	**Hole No.:**	**WP1R37**
Rig Type:	VD-8000	**Collar Elevation:**	1283.3m
Total Depth:	1092.00m	**Coordinate: Northing:**	6072586.7
Spud Date:	2012-8-10	**Easting:**	651952.6
Finished Date:	20-Sep-12	**Logging Geologist:**	Lee, Victor, Chris, liang
Core Size:	HWT/HQ/NQ	**Note:**	water packer test hole.

Formation	Coal Seam	Core Depth Interval From	To	Thickness, m Thick	TRUE	Strata Dip	Coal Floor Elevation	Sample ID Coal	Rock	CBM	Rock Hardness	Rock Name	Lithology Description
Q		0.00	8.00	8.00	8.00							till	brown and grey, broken siltstone; soft clay at 0-5.00m; overburden 8.00m.
HASLER		8.00	82.00	74.00	74.00	5			GT1			siltstone	dark grey, with fine sandstone laminate(5%); bedded pane: 5°; Micro-horizontal bedding; at 36.0m, 5°; at 48.0m, 54.0m, bedded plane:5°; at 53.60-63.80m and 58.0-58.30m, broken; at 67.0-69.50m, very
		82.00	85.50	3.50	3.50	5			2to12			siltstone	dark grey, muddy; interbedded fine sandstone laminate(40%); at upper, siltstone and fine sandstone l minor cross-bedding.
		85.50	146.00	60.50	60.50	5			13to20			siltstone	dark grey, with fine sandstone laminate(5%); at 83.0m(5°), at 100.0m(7°), at 117 m and 132m(5°).
		146.00	195.00	49.00	49.00	5			21to26			siltstone	dark grey, interbedded fine sandstone laminate(25%); predominately micro-horizontal bedding, minor secondly; at 150.0m and 159.0m and 170.0m, bedded plane: 5°; at 153.40m, a pyrite nodule(ø:15mm). A 170.0m, more fine sandstone (70%); at 178.0-186.0m, more fine sandstone (50%);
		195.00	195.10	0.10	0.10				5			sandstone	white-grey, coarse-grained.
		195.10	222.00	26.90	26.90	5			27to28			siltstone	dark grey; interbedded with fine sandstone laminate(35%); micro-horizental bedding; cross-bedding l bottom, fine sandstone increase.
		222.00	253.00	31.00	31.00	5			29to32			siltstone	Dark grey, interbedded sandstone laminate(20%); at 228.0m, 237m and 245.0m, bedded plane:5°; at 223 broken, fracture plane: 65°; at 229.50-231.0m, broken, fracture plane:65°;
		253.00	261.00	8.00	8.00				33			siltstone	dark grey, with fine sandstone laminate(10%).
		261.00	275.15	14.15	14.15	5			34			siltstone	dark grey, interbedded fine sandstone laminate(20%); at 264.10m, a laminate of pyrite, 4mm thickness a pyrite nodule; at 262.50-264.0m, broken, fracture number:10/m.
		275.15	275.35	0.20	0.20	7						conglomerate	ø:2-5mm, light grey; at upper, interbedded siltstone.
BOULDER CREEK		275.35	281.50	6.15	6.15				35			mudstone	brown-grey, bauxitic; at 278.0-279.10m, fracture zone, fracture No: 10/m; fracture plane: 60°; at b fracture planes infilling coal debris.
		281.50	287.50	6.00	6.00				36			mudstone	brown-grey, bauxitic, silty; interbedded siltstone reacting with HCL 5% locally; at 285-287.0m, br fracture no: 10%.
		287.50	292.00	4.50	4.50				37			mudstone	brown-grey, massive, silty, little bauxitic.
		292.00	296.90	4.90	4.90	35						sandstone	white-grey, fine grained; interbedded silty, bauxitic mudstone layers. At 293.0m, bedded plane: 35°.
		296.90	308.10	11.20	11.20				38			mudstone	brown-grey, massive; soft, can be scratched by iron knife; at 297.50-298.50m, broken, fracture No:
		308.10	310.00	1.90	1.90	15			39			mudstone	light black, light black, massive; interbedded fine sandstone layers; with leaf fossil; at 308.5m b 15°.
		310.00	318.90	8.90	8.90	10			40			mudstone	grey to light black, little bauxitic, massive; at 316.15-316.75m, fine sandstone layers;
		318.90	319.60	0.70	0.70	10						sandstone	white-grey, fine grained; with dark siltstone laminate; distorted bedding; reacting HCL 5%.
		319.60	329.40	9.80	9.80							mudstone	brown-grey, bauxitic, interbedded light grey siltstone layers; at 319.5-320.80m, little broken, fra at 326.30-327.20m, broken, fracture No: 7/m, fracture plane: 80°.
		329.40	331.00	1.60	1.60	10						sandstone	white-grey, fine-grained; with dark mudstone laminate; distorted bedding plane: 10°; strong react w
		331.00	334.50	3.50	3.50	10						siltstone	grey, interbedded fine sandstone layer(30%); at bottom, bedded plane: 10°.
		334.50	336.90	2.40	2.40	10			41			sandstone	white and grey, medium-grained; not reacting HCL 5%; at top, a bauxitic mudstone layer; at lower pa interbedded dark mudstone; at bottom, bedded plane:10°.
		336.90	339.00	2.10	2.10							siltstone	grey.
		339.00	341.75	2.75	2.75	15						sandstone	white-grey, fine-Grained, with dark siltstone laminate; cross-bedding predominately.
		341.75	351.30	9.55	9.55				42			mudstone	brown-gray, bauxitic, massive.; interbedded fine sandstone layers reacting with HCL 5% strongly; at 348.0m, more bauxitic.
		351.30	352.60	1.30	1.30				43			mudstone	light black to black, massive; at 351.70-352.0m, carbonaceous mudstone, with numerous vitrain lense laminate.
		352.60	359.80	7.20	7.20				44			mudstone	grey, little bauxitic; interbedded fine sandstone and siltstone layers(40%); at 352.70-353.50m, lit fracture plane:90°.
		359.80	369.60	9.80	9.80				45			sandstone	white-grey, fine to medium and coarse grained; at upper part, well-sorted; at lower part, poorly 365.5-368.50m, numerous coal lenses, few coal laminate on fracture plane; reacting HCL 5% throughou 366.30m, fracture zone, little broken; at 365.50m(15°).
		369.60	370.29	0.69	0.69							mudstone	black, massive; at bottom, carbonaceous mudstone.
	BC	**370.29**	**370.59**	**0.30**	**0.30**							**coal**	**0.30m, RC: 0.08m, 0.22m lost; half-broken, light, shiny.**
		370.59	379.70	9.11	9.11	15						sandstone	white-grey, medium to coarse grained; poorly-sorted throughout; with a few conglomerate layer; whit predominately; at 378.0m, bedded plane: 15°; at 373.0-373.50m, broken, fracture plane:90°.
		379.70	381.40	1.70	1.70	15						conglomerate	ø: 2-7mm, at bottom, 2 layers of coarse sandstone; poorly-sorted;
		381.40	389.85	8.45	8.45	15			46			sandstone	white-grey, fine grained; well-sorted; at top, 3 thin layers of conglomerate.
		389.85	392.55	2.70	2.70	10						sandstone	white-grey, fine sandstone; interbedded dark siltstone and mudstone laminate(50%).
		392.55	398.75	6.20	6.20	10			47			siltstone	dark grey; interbedded fine sandstone layer(50%).
		398.75	411.00	12.25	12.25	10			48			siltstone	dark grey, interbedded fine sandstone laminate(20%).
HULCROOS		411.00	416.00	5.00	5.00	7						siltstone	dark grey, interbedded fine sandstone laminate(40%); horizontal bedding.
		416.00	424.00	8.00	8.00	7			49			siltstone	dark grey, interbedded fine sandstone laminate(20%).
		424.00	432.50	8.50	8.50	7			50			siltstone	dark grey, interbedded fine sandstone laminate(40%).
		432.50	436.80	4.30	4.30							siltstone	dark grey, interbedded fine sandstone laminate(20%); at 436.70m, 0.05m argillaceous limestone.
		436.80	456.50	19.70	19.70	7			51			siltstone	dark grey, interbedded fine sandstone laminate(40%); at 442.5m, 0.09m thickness, a layer of argilla limestone; at 441.0m and 447.0m, bedded plane: 7°.
		456.50	468.50	12.00	12.00	7-10-20			52			siltstone	dark grey, interbedded fine sandstone laminate(50%); horizontal bedding; at 462.0m(7°), at 466.0m(1 467.50m(20°); at bottom, a layer of medium sandstone, 0.10m.
GATES		468.50	476.10	7.60	7.60	25	821.50		53 54			siltstone	grey-dark grey, interbedded fine sandstone layer(50%); reacting HCL 5% strongly throughout; horizon and distorting bedding; no plant fossil; at 473.0m, many calcite veins; at 469.50m, bedded plane:25
		476.10	478.00	1.90	1.90	25						sandstone	white-grey, medium grained; several coal films on bedding plane at top.
		478.00	480.00	2.00	2.00				55			mudstone	grey-brown, bauxitic, no fossil.
		480.00	480.90	0.90	0.90							mudstone	black, massive; at 483.30-483.55m, carbonaceous.
		480.90	485.88	4.98	4.98	25			56			sandstone	white-grey, fine grained; with dark mudstone laminate; at 483.0-483.15m, mudstone, rich in leaf fos
		485.88	486.52	0.64	0.64							mudstone	black, massive.
	#3	**486.52**	**488.52**	**2.00**	2.00	**20**	**801.48**	**Q1, Q2**		**CBM1**		**coal**	**#3 coal seam, 2.0m, RC: 2.0m, half-broken, light, shiny, brittle; co: 486.52-486.69m, 0.17m; parting:486.69-486.91m, 0.22m, black, mudstone; co:486.91-487.36m, 0.45m; parting: 487.92-488.(black, mudstone;co:488.02-488.52m, 0.52m; structure: 0.17<0.22>0.45<0.07>0.49<0.10>0.50m; at b pyrite nodule(0.01*0.03m); at 488.50m, bedded plane:20°.**
		488.52	492.15	3.63	3.63	20						sandstone	white-grey, fine grained; with dark mudstone laminate; at 489.0m, bedded plane 20°.
		492.15	497.13	4.98	4.98				57			mudstone	black, massive; at 492.60m, coal streak, 0.01m; at 495.50m, coal streak, 0.20m; at 495.75-495.85m, 0.10m; at 497.0-497.13m, coal, 0.13m, RC:0.13m, with a pyrite nodule.
		497.13	507.00	9.87	9.87	20						mudstone	black, interbedded fine sandstone thin layers(40%); at middle part, with carbonization of leaf foss part, several vitrain laminate.
		507.00	512.30	5.30	5.30				58			mudstone	black to carbonaceous; numerous vitrain lenses and laminate; at 509-509.10m, boney coal; at middle, mudstone; at 512.12-512.30m, carbonaceous to boney coal; broken zone at 507.0-512.30m, fracture No:
		512.30	518.75	6.45	6.45							mudstone	black, massive; at bottom, rich in leaf fragment fossil, a coal film.
	#4	**518.75**	**519.10**	**0.35**	0.35							**coal**	**0.35m, RC: 0.35m, intact, shiny, light; no parting.**
		519.10	523.24	4.14	4.14							mudstone	black, massive
		523.24	527.30	4.06	4.06	25						sandstone	white-grey, fine-grained; interbedded dark siltstone and mudstone laminate(5%); a few coal laminate thick); distorting bedding; at 526.0m, bedding plane:25°.
		527.30	531.75	4.45	4.45	20			59			sandstone	white-grey, medium grained; with dark mudstone laminate(5%); at bottom, several coa film.
		531.75	534.80	3.05	3.05							mudstone	black to light black, very silty.
		534.80	541.00	6.20	6.20	10			60			sandstone	white-grey, fine grained; at upper part, interbedded dark siltstone(40%); at lower part, with dark laminate(2%).
		541.00	544.70	3.70	3.70	10			61			siltstone	dark grey, blended fine sandstone(50%); distorted bedding predominately.
	#5	**544.70**	**548.00**	**3.30**	3.10		**742.00**	**Q3 Q4 Q5**		**CBM2**		**coal**	**3.30m, RC: 3.10m; Co:544.70-546.88m, 2.18m, RC: 2.08m, 0.10m lost; parting: 546.88-547.38m, 0.5 broken, black, mudstone; co: 547.38-548.0m, 0.62m, RC:0.52m, 0.10m lost, intact; coal seam structure 2.18<0.50>0.62m**
		548.00	548.65	0.65	0.65							mudstone	black, massive, with leaf fossil.
		548.65	548.80	0.15	0.15							coal	0.15m, intact.
		548.80	551.52	2.72	2.72				62			mudstone	black to carbonaceous, massive; at lower part, many coal lenses and laminate, rich in leaf fossil a
	#5-1	**551.52**	**553.77**	**2.25**	1.70		**736.23**	**Q6 Q7 Q8**		**CBM3**		**coal**	**#5-1 coal seam, 2.25m, RC: 1.70m, 0.55m lost, half broken; co: 551.52-552.52m, 1.0m, RC: 0.55m, parting: 552.52-552.67m, 0.15m, black, mudstone; coal: 552.67-553.77m, 1.10m, half broken, RC:1 lost; structure: 1.0<0.15>1.10m.**
		553.77	556.60	2.83	2.83	15						mudstone	blk, rich in leaf fossil; many coal laminate.
		556.60	**556.90**	**0.30**	0.30							**coal**	**0.30m, Rc: 0.30m, broken.**
		556.90	557.40	0.50	0.50							mudstone	black, carbonaceous.
		557.40	**557.50**	**0.10**	0.10							**coal**	**0.10m, very broken.**
		557.50	559.60	2.10	2.10				64			siltstone	light black, very muddy.
		559.60	**560.00**	**0.40**	0.40							**coal**	**0.40m, Rc: 0.40m, very broken.**
		560.00	562.50	2.50	2.50	10						sandstone	white-grey, fine grained; with dark mudstone and siltstone laminate(40%); reacting HCL 5%.
	#6	**562.50**	**562.90**	**0.40**	0.30							**coal**	**0.40m, RC:0.30m.**
		562.90	563.15	0.25	0.25							mudstone	carbonaceous, with coal streak.
		563.15	563.80	0.65	0.65							mudstone	black, rich in leaf fossil.
		563.80	566.85	3.05	3.05	10			63			sandstone	white-grey, fine-grained; at 566.10-566.25m, many coal laminate(2 mm thick each).
		566.85	**567.00**	**0.15**	0.15							**coal**	**0.15m, shiny, light.**
		567.00	569.00	2.00	2.00							mudstone	black, massive; at 568.30m, coal streak, 0.08m, broken; at 568.30-568.80m, carbonaceous.
		569.00	**569.27**	**0.27**	0.27							**coal**	**0.27m, RC: 0.27m, light, shiny, intact.**
		569.27	571.35	2.08	2.08	10						sandstone	white-grey, fine-grained; at bottom, bedded plane: 10°.
		571.35	571.52	0.17	0.17							mudstone	black, rich in shell fossil (1*5mm).
		571.52	**571.70**	**0.18**	0.18							**coal**	**0.18m, intact.**
		571.70	571.90	0.20	0.20							mudstone	black, massive.
		571.90	**572.20**	**0.30**	0.30							**coal**	**0.30m, RC: 0.30m, parting: 572.02-572.10m, 0.08m, blk.**
		572.20	573.00	0.80	0.80							mudstone	black to carbonaceous; numerous vitrain lenses.
		573.00	576.70	3.70	3.70				65			mudstone	black, at bottom, carbonaceous mudstone.
		576.70	**576.78**	**0.08**	0.08							**coal**	**0.08m.**
		576.78	579.00	2.22	2.22	10						sandstone	white-grey, fine-grained; at upper part, mudstone.
		579.00	581.40	2.40	2.40							sandstone	grey, fine-grained, blended dark siltstone; no bedding.
		581.40	581.75	0.35	0.35							mudstone	carbonaceous, several coal lenses and laminate.
	#6-1	**581.75**	**582.24**	**0.49**	0.27							**coal**	**0.49m, RC: 0.27m, broken, no parting, shiny and light.**
		582.24	583.85	1.61	1.61							mudstone	black, massive; at upper part, carbonaceous; at lower part, blended siltstone; with leaf fossil thr
		583.85	586.00	2.15	2.15	15			66			siltstone	muddy, dark grey to light black, with leaf fossil.
		586.00	593.60	7.60	7.60				72			mudstone	black, massive; at upper part, with silty; at lower part, carbonaceous mudstone.
	#7	**593.60**	**595.10**	**1.50**	1.20		**694.90**	**Q9 Q10**				**coal**	**1.50m, RC: 1.20m, half-broken, shiny, light, brittle, no parting; vertical fracture developed; boney coal: 595.0-595.10m.**
		595.10	596.70	1.60	1.60							mudstone	black, little carbonaceous; with several coal laminate; with leaf fossil.
		596.70	596.90	0.20	0.20	25						sandstone	white-grey, fine-grained, with dark mudstone laminate.
		596.90	597.4	0.50	0.50							mudstone	black, massive.
		597.4	**597.55**	**0.15**	0.10							**coal**	**0.15m, RC: 0.10m, very broken, no parting.**
		597.55	598.55	1.00	1.00							mudstone	black, massive, broken, fracture No: 10/m.
		598.55	606.90	8.35	8.35	20			67			sandstone	white-grey, medium to fine grained; with dark mudstone laminate; react with HCL 5% strongly through 602.0m, a limestone lamina(0.01m thickness).
		606.90	**607.20**	**0.30**	0.25							**coal**	**0.30m, RC: 0.25m, broken.**
		607.20	612.14	4.94	4.94				68			mudstone	black, massive.
	#7-1	**612.14**	**614.05**	**1.91**	1.40	**10**	**675.95**	**Q11 Q12 Q13**				**coal**	**1.91m, RC: 1.40m, 0.51m lost, black, banded coal, broken; co: 612.14-613.14m, 1.0m, RC: 0.49m, parting: 613.14-613.64m, 0.50m, black, mudstone, half-broken; co: 613.64-614.05m, 0.41m, RC:0.4 banded coal, black, little heavy. Structure: 1.0<0.50>0.41m. at 614.05m, bedded plane: 10°.**
		614.05	614.65	0.60	0.60							mudstone	black, carbonaceous, much broken; with a coal streak.
		614.65	617.30	2.65	2.65							mudstone	black, carbonaceous locally; 3 coal seams, 0.05m each coal seam; broken.
		617.30	**617.70**	**0.40**	0.40							**coal**	**0.40m, very broken, a parting: 617.40-61755m, 0.15m.**
		617.70	618.25	0.55	0.55							mudstone	black, carbonaceous, broken.
		618.25	**618.40**	**0.15**	0.15							**coal**	**0.15m, RC: 0.15m, broken.**
		618.40	621.80	3.40	3.40				69			mudstone	black, massive, at 619.20-619.40m, coal seam, broken.
	#7-2	**621.80**	**622.70**	**0.90**	0.40			**Q14**				**coal**	**0.90m, RC: 0.40m, 0.50m lost, shiny, light, broken much, no parting.**
		622.70	625.75	3.05	3.05							mudstone	black, carbonaceous locally; 5 coal seams: at 623.60m, 0.10m, coal seam, broken; at 624.50m, 0.08m at 624.90m, 0.18m, coal seam; at 625.50m, 0.06m coal seam.
	#8	**625.75**	**626.98**	**1.23**	1.20			**Q15**		**CBM4**		**coal**	**1.23m, RC: 1.20m, half-broken, shiny, light, no parting.**
		626.98	628.00	1.02	1.02	15						mudstone	black, carbonaceous partly; at lower part, numerous vitrain laminate.
	#8-1	**628.00**	**628.40**	**0.40**	0.40							**coal**	**0.40m, RC: 0.40m, half broken, light, shiny, no parting.**
		628.40	630.50	2.10	2.10				70			mudstone	black, massive; at middle part, many vitrain laminate; at 630.10-630.20m, coal, 0.10m, RC:0.10m.
		630.50	641.60	11.10	11.10	10			71			sandstone	white-grey, fine to medium grained, with dark siltstone and mudstone laminate(5%); calcareous ceme 5% throughout; at 633.0m, bedded plane: 10°.
		641.60	643.50	1.90	1.90	15						mudstone	silty, light black; with leaf fossil throughout.
		643.50	644.74	1.24	1.24				73			mudstone	black; at bottom, carbonaceous.
	#9	**644.74**	**650.08**	**5.34**	3.50		**639.92**	**Q16 Q17 Q18**				**coal**	**#9 coal seam, 5.34m, RC:3.50m, 1.84m lost, half-broken; light, shiny; coal: 644.74-644.90m, 0.1 RC:0.10m; parting: 644.90-644.96m, 0.06m, black, mudstone; coal:644.96-650.08m, 5.12m, RC: 3.34 lost, shiny, light; structure: 0.16<0.06>5.12m; vertical fracture in coal seam.**
		650.08	651.70	1.62	1.62							mudstone	black, massive, very silty, with several calcite veins throughout.
		651.70	662.50	10.80	10.80	15			74			sandstone	white-grey, fine grained; interbedded dark siltstone and mudstone(50%); at 655.00m, bedded plane: 1 658.00m(15°); at 658.50m, vertical calcite vein, 0.50m long; at 654.00-657.70m, fracture vertically, fracture no: 5/m.
		662.50	664.00	1.50	1.50							mudstone	black, massive; rich in leaf fossil.
		664.00	668.30	4.30	4.30	15			75			sandstone	white-grey, fine-grained; interbedded dark siltstone laminate(50%); at upper, sandstone and siltsto at bottom, bedded plane: 15°
		668.30	670.00	1.70	1.70	15						sandstone	white-grey, fine grained; with dark mudstone laminate; with calcite veins; reacting with HCL 5% str
		670.00	673.00	3.00	3.00	15						mudstone	dark grey to black, silty, with fine sandstone laminate
		673.00	677.35	4.35	4.35				76			mudstone	black, massive; at lower part, carbonaceous; at 676.50m, coal seam, 0.07m.
	#10	**677.35**	**680.60**	**3.25**	2.30		**609.40**	**Q19 Q20 Q21**		**CBM5**		**coal**	**coal seam, 3.25m, RC: 2.30m, 0.95m lost, broken, shiny; coal:677.35-677.60m, 0.25m; parting: 67 677.70m, 0.10m, mudstone, broken; coal:677.70-679.63m, 1.93m, RC:1.30m. 0.63m lost; parting: 67 679.88m, 0.25m, black, mudstone; coal: 679.88-680.60m, 0.72m, broken, RC:0.40m, 0.32m lost; coa 0.25<0.10>1.93<0.25>0.72m.**
		680.60	682.00	1.40	1.40							mudstone	black, blended dark siltstone; at middle part, carbonaceous; 2 coal streaks, 0.02m and 0.05m thick
		682.00	698.82	16.82	16.82	15			77 78			sandstone	white-grey, fine-grained, interbedded dark siltstone and mudstone laminate(30%); at 685m, bedded pl
		698.82	700.25	1.43	1.43				79			mudstone	black, massive, little broken; at lower part, carbonaceous locally.
		700.25	701.50	1.25	1.25	15						sandstone	white-grey, fine grained; at lower part, with dark siltstone laminate.
		701.50	709.00	7.50	7.50				80			mudstone	black, massive, 3 coal streaks, 0.01m thick each, many vitrain lenses; at 708.0-709.0m, rich in lea fracture zone, broken.
		709.00	718.56	9.56	9.56	15			81			sandstone	white-grey, fine-medium grained; with dark mudstone laminate; at 713.70-717.30m, numerous vitrain l laminate; at 715m, 0.1m, coal seam, broken much; at 716m, coal streak, 0.01m; at 711.5m and 713.5m, plane:15°; at 713-713.40m, bedded plane:30°.
		718.56	723.38	4.82	4.82				82			mudstone	black, massive, at bottom, carbonaceous.
	#12	**723.38**	**724.00**	**0.62**	0.15							**coal**	**coal seam, 0.62m, RC: 0.15m, 0.47m lost, broken to a few debris; no parting, light, shiny.**
		724.00	724.35	0.35	0.35	15						mudstone	black, with leaf fossil, a coal streak.
		724.35	726.95	2.60	2.60	15						mudstone	black, at 724.80-725.10m, fine sandstone; at 725.20-725.30m,727.0-727.15m, 6 coal laminate.
		726.95	746.00	19.05	19.05	10			83 84			sandstone	light grey, fine grained, dark debris predominately; react with HCL 5% strongly throughout; at 735m plane:10°; at 733-739.0m, few calcite veins almost vertically.
		746.00	782.70	36.70	36.70	15			85 86 86-1			sandstone	white-grey, fine grained, interbedded dark thin siltstone and mudstone laminate(40%); micro-horizon at 746m and 756m, bedded plane:15°; react HCL 5%. At 733-739.00m, broken, fracture no: 3/m; at 765. 768.00m(15°), at 780m(15), at 783m(15°).
		782.70	791.70	9.00	9.00	15			87			siltstone	dark grey, interbedded fine sandstone layer(40%); distorted bedding predominately; at 789.0m(15°)
		791.70	810.00	18.30	18.30	15			88			siltstone	grey, blended with fine sandstone, few white-grey fine-grained sandstone layers; distorted bedding predominately; react HCL 5%; at 803.00m(15°)
		810.00	817.70	7.70	7.70	15			89 90 91 92			siltstone	grey to dark grey, massive; with tiny pyrite nodule(ø:0.5mm) throughout; at top, a few fine sandsto at 811.00m, bedded plane: 15°; ; at 817.70m, 824.30m, 2 layers of bauxitic mudstone, yellow color; nodules(0.5x0.5mm) throughout; at 843.00m, 1.00m core lost; at 846.00m, 1.50m core lost; at 856.00- broken much, 10 fractures.
Moosebar		817.70	817.80	0.10	0.10							limestone	at 817.70m, a layer of limestone, 0.10m thick
		817.80	855.00	37.20	34.70							siltstone	824.30m, 1 layers of bauxitic mudstone, yellow color; with a pyrite nodules(0.5x0.5mm) throughout; 1.00m core lost; at 846.00m, 1.50m core lost; at 856.00-856.30m, broken much, 10 fractures.
		855.00	863.40	8.40	8.40				93			mudstone	silty, light black, massive; on plant fossil; with tiny mica fragment throughout and tiny nodule th
		863.40	867.60	4.20	4.20				94			Conglomerate	ø: 3-7mm, massive; quartz, chert and dark debris predominately; poorly-sorted, well-rounded; at bottom, quartz vein at 7(with HCL 5%; no bedding.
Gething		867.60	868.40	0.80	0.80							siltstone	grey, hard; at top, mudstone, 0.10m.
		868.40	870.85	2.45	2.45	15						mudstone	little silty, light black; at 870.10-870.70m, 0.60m, vertical fracture.
		870.85	**871.00**	**0.15**	0.12							**coal**	**0.15m, RC: 0.12m, half broken, no parting.**
		871.00	873.39	2.39	2.39	15			95			mudstone	black, massive; at middle, muddy siltstone, light black; with few leaf fossil.
	#A2	**873.39**	**876.50**	**3.11**	3.00			**Q22 Q23 Q24**		**CBM6**		**coal**	**#A2 coal seam, 3.11m, RC: 3.00m, 0.11m lost, intact, light, shiny, and brittle. Coal: 873.39-87 2.51m, RC: 2.45m, 0.06m lost, intact; parting: 875.90-876.03m, 0.13m, black, mudstone; coal: 87 876.50m, 0.47m, RC: 0.42m, 0.05m lost, much broken; structure: 2.51<0.13>0.47m.**
		876.50	880.53	4.03	4.03				96			mudstone	black; at middle, fine sandstone, 0.50m thick; with a few leaf fossil on bedding plane; at 879.10m, plane: 15°.
	#A2-1	**880.53**	**880.81**	**0.28**	0.28							**coal**	**0.28m, intact, light, no parting.**
		880.81	881.20	0.39	0.39							mudstone	carbonaceous.
		881.20	881.80	0.60	0.60							sandstone	white-grey, fine sandstone.
		881.80	882.20	0.40	0.40							mudstone	black, massive.
	#A2-2	**882.20**	**882.85**	**0.65**	0.65			**Q25**				**coal**	**#A2-2 coal seam, 0.65m, RC: 0.65m, intact, no parting, light, shiny.**
		882.85	884.20	1.35	1.35	15						mudstone	black, at middle, silty
		884.20	**884.30**	**0.10**	0.10							**coal**	**0.10m,broken much, RC: 0.10m.**
		884.30	884.60	0.30	0.30							mudstone	black, carbonaceous, with vitrain lenses.
	#A3	**884.60**	**885.5**	**0.90**	0.80			**Q26**		**CBM7**		**coal**	**#A3 coal seam, 0.90m, RC: 0.80m, half-broken, shiny, light; coal:884.60-884.76m, 0.16m; partin 884.80m, 0.04m, mudstone, broken much; coal: 884.80-885.50, 0.70, RC: 0.60m; structure: 0.16<0.04>0.70m.**
		885.50	901.90	16.40	16.40	10			97 98			sandstone	white-grey, medium-fine grained, dark debris predominately at upper part; at upper from 885.50 to 8 medium grained; at lower part, quartz and debris mainly; at 887.00m, 893.00m and 900.00m, bedded pl few calcite veins at lower part.
		901.90	904.62	2.72	2.72				99			mudstone	black, very silty; at middle part, a layer of fine sandstone, rich in leaf fragment fossil.
	#A4	**904.62**	**905.12**	**0.50**	0.45							**coal**	**coal seam, 0.50m, RC: 0.45m, broken much, no parting.**
		905.12	905.62	0.50	0.50							mudstone	carbonaceous, black.
		905.62	910.00	4.38	4.38				100			mudstone	black, massive.
		910.00	912.00	2.00	2.00							siltstone	light black, muddy, massive.
		912.00	913.80	1.80	1.80	15						sandstone	white-grey, fine grained.
		913.80	918.00	4.20	4.20				101			sandstone	white-grey, medium- coarse grained; at upper, medium-grained; at lower part, coarse-grained, numero laminate and lenses.
		918.00	923.50	5.50	5.50	15						sandstone	white-grey, coarse grained, interbedded conglomerate thin layers, with gravels in sandstone; quartz debris predominately, poorly-sorted; at upper part, numerous coal lenses in fractures.
		923.50	926.73	3.23	3.23				102			Conglomerate	white-grey, ø:6-10mm; quartz and debris mainly; poorly-sorted, rounded, subangular, matrix of mediu
		926.73	930.80	4.07	4.07	15						mudstone	black, massive, with a few carbonization of leaf fragments.
		930.80	950.00	19.20	19.20	20			103			mudstone	black, massive; at 933.15m, coal layer, 0.06m; at 934.20m, coal seam. 0.08m, very broken; at 934.40 0.10m, half broken; at 931.50-936.75m, carbonaceous predominately, several coal streaks, rich in lea fossil; at 941.70-941.90m, coal seam, 0.20m, broken, RC: 0.15m; at 933.50-936.80m, broken, fracture 943.50-944.50m, vertical calcite veins; at 944.50 -950.0m, few calcite vein at 45°; at 945.00m, bed 20°.
		950.00	955.64	5.64	5.64	35-45			104			sandstone	white-grey, fine grained, inter

Wapiti River — Drill Hole Core Log

Drilling Company:	Dehua	**Hole No.:**	WP1R38
Rig Type:	VD-5000	**Collar Elevation:**	1263.2
Total Depth:	801	**Coordinate: Northing:**	6073218.1
Spud Date:	12-Jan-13	**Easting:**	651801.6
Finished Date:	25-Jan-13	**Logging Geologist:**	Victor, Ricky
Core Size:		**Note:**	

Formation	Coal Seam	Core Depth Interval From	To	Thickness, m Thick	TRUE	Strata Dip	Coal Floor Elevation	Sample ID Coal	Rock	CBM	Rock Hardness	Rock Name	Lithology Description
Q		0.00	25.07	25.07								till	casing; no core.
Hasler		25.07	60.00	34.93		11° 12° 15°						Siltstone	siltstone, dark gray, partly light black, interbedded with a few light gray fine-grained sandstone (FGSS) laminated (5%-3%); micro-horizontal bedding; at 30m, bedding plane: 11°, from 26m - 26.50m and 29m - 29.50m, rock broken; from 35.50m - 41.50m, more FGSS laminated (20%); at 40m, bedded plane: 15°; no react with 5% HCl; at 43.20m, 0.08m bauxite/kaolinite, white-gray, soft; cut by knife; from 39m - 55.18m, alternating with band of brown-gray, siderite thin laminated; at 54m, bedded plane: 12°.
		60.00	80.50	20.50		10° 12°						Siltstone	siltstone, muddy, dark gray to light black, interbedded with light gray FGSS laminated content, 15%; micro-horizontal bedding, at 69m, bedded plane: 10°; alternating with band of thin siderite laminated; from 71.80m to 72.30m, broken, silt toward at base; at 80m, bedded plane: 12°.
		80.50	92.00	11.50		15°						Siltstone	siltstone, dark gray, interbedded with light gray FGSS laminated (25%); micro-horizontal bedding; at 88m, bedding plane: 15°; at 80.10m, 0.10m white-gray siderite; FGSS laminated thick or thin unevenly, from 80.45m - 91.40m with thick or thin unevenly FGSS laminated, occasionally, pebble.
		92.00	102.55	10.55								Siltstone	same features as above, plus FGSS laminated decreased 5%, muddy towards and siderite thin laminated increased.
		102.55	120.30	17.75		15°						Siltstone	same as previous intervals, plus FGSS laminated increased to 40% and upper and lower part, siltstone mix with FGSS each other and few carbonaceous-debris; at 104m, bedded plane: 15°; and a few FGSS nodule observed, not clear bedding.
		120.30	151.00	30.70		11° 12° 15°						Siltstone	siltstone, little muddy, dark gray to light black, interbedded with few light gray FGSS laminated, 3-5%; at 123m, bedded plane: 12°, siderite thin laminated throughout; at 139m - 139.20m, broken; at 142m, bedded plane: 11°; at 150m, bedded plane: 15°.
		151.00	168.00	17.00		12°						Siltstone	same features as above, plus FGSS increased to 10%; at 159.50m, bedded plane: 12°; from 166.80m - 168m, broken, vertical fracture developed, fracture number: 10/m.
		168.00	201.00	33.00		15°						Siltstone	siltstone, dark gray, interbedded with light gray FGSS laminated, content: 10%, upper: 20% (2.0m); micro-horizontal bedding, little muddy; at 180m, bedded plane: 15°; alternating with band of siderite FGSS laminated, unevenly thickor thin; at 193.30m, with 0.30m mix with siltstone and FGSS each other; at 198m, bedded plane: 15°.
		201.00	213.50	12.50								Siltstone	siltstone, dark gray to gray, interbedded with more light gray FGSS laminated (40%), micro-horizontal bedding, ripple bedding and distorted bedding occasionally; at 207m, bedding plane: 15°; at 205m, 5mm pyrite vein observed; at 208.30m - 209m, mix with siltstone and FGSS each other.
		213.50	220.00	6.50								Siltstone	same features as above, plus muddy and FGSS decreased to 3-5%, siderite vein throughout.
		220.00	220.10	0.10								sandstone	0.10m, CGSS, light gray.
		220.10	236.40	16.30		15°						Siltstone	siltstone, dark gray, interbedded with light gray FGSS (30%); at top to 222.0m, more FGSS (40%); at 222m, bedded plane: 15°; micro-horizontal bedding, with a few distorted bedding on siltstone surface and with a few carbonaceous fragment on bedding; FGSS laminated unevenly thick or thin; at 236m, bedding plane: 20.
		236.40	246.00	9.60								Siltstone	same feature as above, plus light gray FGSS decreased to 20%, muddy, a few siderite laminated throughout; at 241.60m, 0.05m FGSS; at 246m, bedding plane: 18°.
		246.00	269.00	23.00		15°						Siltstone	same as previous interval, plus FGSS increased to 30%; at 256.75m, coal film observed on joint bedding; at 262m, FGSS surface stretch; at 265m, bedding plane: 15°.
		269.00	304.30	35.30		20°						Siltstone	siltstone, dark gray, interbedded with light gray FGSS laminated (40%); at 280m, bedding plane: 20°; a few siderite laminated throughout; at 294m, bedding plane: 13°; at 300m, a layer calcite vein; at 303.85m - 304.30m, conglomerate, light gray; Φ:2-5mm.
Boulder Creek		304.30	309.00	4.70								Mudstone	bauxitic mudstone, massive, white-gray mainly; at top: 1.0m black mudstone; from 308.40m - 308.60m, light gray FGSS.
		309.00	314.50	5.50								sandstone	FGSS, gray, well-sorted, with a few dark gray siltstone, little bauxitic; from 313.85m - 314.35m, vertical fracture developed; at 312.80m - 313.05m, more coal film, silt toward at base.
		314.50	315.35	0.85								Mudstone	mudstone, at top bauxitic; at base, black MS.
		315.35	329.70	14.35		25°						sandstone	FGSS-CGSS-FGSS-MGSS-CGSS; light gray - gray; at 317.30m - 318.25m, CGSS with few coal streaks; at 319.53m - 319.55m, 0.02m coal; react with 5% HCl; from 319.75m - 321.20m, vertical fracture developed, filled calcite vein and coal streak; from 321m - 327.50m, MGSS, normal-sorted, with a few dark gray siltstone laminated; horizontal bedding, react with 5% HCl; at base, more coal nodule; at 325.50m bedding plane: 25°; at base, FGSS mainly, gray, rich in coal thread and debris; partly, CGSS at base.
		329.70	331.60	1.90								Mudstone	bauxitic mudstone, white-gray, massive, soft, core size reduced; at base, little silt.
		331.60	333.60	2.00								sandstone	FGSS, dark gray, interbedded with light black siltstone and a few coal streak and inclusion.
		333.60	340.40	6.80		25°						sandstone	FGSS, gray-light gray, interbedded with light black mudstone laminated, micro-horizontal bedding; at 337.90m - 338.45m, more argillaceous pebble; at 337.85m, 0.01m coal seam; from 339m - 339.20m, CGSS with coal thread and few conglomerate, react with 5% HCl; well-sorted, at base, poorly-sorted.
		340.40	360.00	19.60		10°						Mudstone	bauxitic mudstone, white-gray, massive, soft, core size reduced; at top, 0.40m broken; at 344.40m - 345m, dark gray siltstone; at 344.80m, bedded plane: 10°; at 347.50m - 349.60m, dark gray siltstone, with a few black mudstone and carbonaceous debris and few coal film; at 349m, bedded plane: 20°; at 351m - 351.20m, FGSS; from 351.70m - 357.60m, black mudstone mainly, with a few bauxitic mudstone and coal film partly; at 355m - 356.45m, dark gray siltstone; at 358.30m - 358.50m, FGSS.
		360.00	365.00	5.00								Mudstone	bauxitic mudstone, massive, white-gray, soft, rock core reduced; at 362m - 362.70m, more black mudstone with a few coal streak.
		365.00	369.00	4.00								Siltstone	siltstone, dark gray, interbedded with light gray FGSS and few black mudstone laminated and with a few carbonaceous debris; at 368m - 368.40m, FGSS, at base; broken.
		369.00	378.00	9.00								Mudstone	bauxitic mudstone, white-gray, soft, rock core reduced; at 374.20m - 374.80m, black MS, coal film.
		378.00	381.24	3.24		20°						sandstone	FGSS, gray, well-sorted, at medium part, more black mudstone laminated, and with a few coal threads; at 380m, bedded plane: 20°.
		381.24	384.55	3.31								Mudstone	mudstone, black, massive, few coal film; from 383.10m - 348.55m, bauxitic mudstone, little broken.
		384.55	388.70	4.15								sandstone	FGSS, light gray, well-sorted, pure, quartz mainly; react with 5% HCl.
		388.70	398.75	10.05		15°						sandstone	MGSS-CGSS, light gray, interbedded with dark gray siltstone laminated, content (30%), and minor coal streak; react with 5% HCl; micro-horizontal bedding; at 390.50m, bedded plane: 15°; from 393.70m - 394.50m, 4 layers coal streak; from 395m - 396m, 8 layers coal threads.
		398.75	399.05	0.30								conglomerate	conglomerate; Φ: 2-5mm layer coal.
		399.05	399.56	0.51								sandstone	conglomerate-CGSS, gray, poorly-sorted.
		399.56	399.76	0.20								Mudstone	0.20m black mudstone.
	BC	**399.76**	**400.26**	**0.50**								**Coal**	**0.50m coal seam, RC: 0.45m; black, bright and intact.**
		400.26	400.46	0.20								Mudstone	0.20 black MS.
		400.46	404.70	4.24								sandstone	MGSS, light gray, normal-sorted, quartz and debris mainly; at 402.28m - 402.38m, conglomerate.
		404.70	409.75	5.05		15°						sandstone	conglomerate-FGSS, light gray, horizontal bedding; react with 5% HCl (weak); included 11 interval conglomerate, thick and thin unevenly (40cm - 10cm).
		409.75	419.60	9.85								sandstone	FGSS, pure, light gray.
		419.60	426.30	6.70		20°						sandstone	FGSS light gray, interbedded with light black mudstone laminated (30%), rhythm isn't good (thick or thin); at 423m, bedding plane: 20°.
Hulcross		426.30	429.00	2.70		15°						Siltstone	siltstone, dark gray, interbedded with light gray FGSS laminated, 30%, micro-horizontal bedding; at 428m, bedded plane: 15°.
		429.00	447.00	18.00								Siltstone	siltstone, dark gray, interbedded with FGSS laminated (20%); micro-horizontal bedding.
		447.00	480.00	33.00		15° 20°						Siltstone	siltstone, dark gray, little muddy, interbedded with a few light gray FGSS laminated (10%); micro-horizontal bedding; at 447m, bedded plane: 15°; at 462.12m - 462.23m, white-gray, argillaceous limestone, soft; at 468.96m - 469.04m; 0.05m, white-gray, argillaceous limestone, strong react with 5% HCl; at 480m, bedded plane: 20°.
		480.00	485.50	5.50		15°						Siltstone	siltstone, dark gray, with light gray FGSS laminated (30%); micro-horizontal bedding; dip:15°.
		485.50	497.40	11.90		15°						Siltstone	same as previous interval, plus light gray FGSS laminated decreased 20%; at 495m, bedded plane: 15°.
		497.40	502.56	5.16								Siltstone	same as previous interval, plus light gray FGSS laminated increased to 40%.
		502.56	502.69	0.13								sandstone	0.13m FGSS, with a few conglomerate.
		502.69	504.18	1.49								Siltstone	siltstone, dark gray, with a few light gray FGSS laminated, (10%) and with a few coal streak.
		504.18	506.62	2.44								Mudstone	mudstone, black, massive; rich in coal film, slightly broken.
	#2	**506.62**	**507.02**	**0.40**								**Coal**	**0.40m coal seam.**
		507.02	510.45	3.43								Mudstone	Mudstone, black, massive; from 507.02m - 508.60m, very much broken, rich in coal streak and few carbonaceous debris.
		510.45	**510.70**	**0.25**								**Coal**	**0.25m coal seam.**
		510.70	514.58	3.88								Mudstone	mudstone, silt, dark gray, rich in plant root fossil and carbonaceous fragment.
	#3	**514.58**	**515.35**	**0.77**		**15°**		**Q1**				**Coal**	**0.77m coal seam, RC: 0.77m, no parting, black intact, bright and light; dip: 15°**
		515.35	519.60	4.25								Siltstone	siltstone, muddy, dark gray with light gray FGSS laminated (10%), numerous plant root fossil and coal threads.
	#3-1	**519.60**	**519.98**	**0.38**								**Coal**	**0.38m boney coal seam.**
		519.98	520.60	0.62								Mudstone	black mudstone, massive, slightly fracture; rich in coal film and carbonaceous debris.
		520.60	521.30	0.70								Siltstone	siltstone, dark gray, competent, with a few FGSS laminated, rich in plant root fossils.
		521.30	525.90	4.60		20°						sandstone	FGSS, pure, light gray, well-sorted; horizontal bedding; at 525.50m, dip: 20°.
		525.90	531.66	5.76		15°						Siltstone	siltstone, muddy, dark gray, rich in plant root fossils, and coal streak; at 527m, bedded plane: 15°; at base, sandy toward.
		531.66	534.52	2.86		10°						sandstone	FGSS, light gray, interbedded with dark gray siltstone laminated (20%); micro-horizontal bedding, weak react 5% HCl; at 534m, bedded plane: 10°.
		534.52	540.15	5.63								Siltstone	siltstone, dark gray to light black, massive, muddy, from 539m - 540m, more FGSS, rich in plant root fossils and coal streak.
		540.15	540.75	0.60								Mudstone	black mudstone, carbonaceous mudstone-CM mainly.
		540.75	**540.99**	**0.24**								**Coal**	**0.24m coal seam.**
		540.99	542.90	1.91								Siltstone	siltstone, light black, massive; muddy toward base.
		542.90	544.60	1.70								Mudstone	mudstone, black, massive, rich in coal seam; at 592.97m - 543m, 0.03m coal seam.
		544.60	546.35	1.75								sandstone	FGSS, light gray, with light black mudstone laminated.
		546.35	549.10	2.75		15°						Siltstone	siltstone, dark gray, interbedded with FGSS; at 546.30m, bedded plane: 15°; numerous plant root/ leaf fossils and a few coal film.
		549.10	551.70	2.60								Mudstone	mudstone, black, massive; at 551.35m - 551.40m, 0.05m coal seam, broken; abundant carbonaceous and plant fragment.
		551.70	554.45	2.75								Siltstone	siltstone, dark gray, with light gray FGSS, a few carbonaceous film.
		554.45	561.60	7.15		15°						sandstone	FGSS light gray, well-sorted, predominately quartz and debris, horizontal-bedding; weak react with 5% HCl; at 560m, bedded plane: 15°.
		561.60	564.92	3.32		15°						Siltstone	siltstone, dark gray, interbedded with light gray FGSS laminated (10%); micro-horizontal bedding, dip: 15°.
	#5	**564.92**	**568.20**	**3.28**		**15°**		**Q2 Q3**				**Coal**	**3.28m coal seam, RC: 3.20m; black, intact, bright and light; dip: 15° ; parting: 567m - 567.28m, 0.28m black CM; coal structure: 2.08<0.28>0.92m.**
		568.20	570.57	2.37								Mudstone	mudstone, black, massive, rich in carbonaceous and coal fragment.
	#5-1	**570.57**	**572.16**	**1.59**				**Q4 Q5**				**Coal**	**1.59m coal seam, RC: 1.20m; black, intact, bright and light; parting: 571.08m - 571.16m, 0.08m siltstone. coal structure: 0.51<0.08>1.00m.**
		572.16	573.44	1.28								sandstone	FGSS, gray, with dark gray siltstone, numerous plant root fossils.
	#5-2	**573.44**	**574.04**	**0.60**								**Coal**	**0.60m coal seam, boney coal mainly. Coal structure: 0.04<0.05>0.10<0.06>0.35m; no parting.**
		574.04	576.00	1.96		20°						sandstone	FGSS, light gray, with light black mudstone laminated, at top : 0.20m CM (black); at 574.50m, bedded plane: 20°; weak react with 5% HCl.
		576.00	576.97	0.97								Mudstone	mudstone, light black, top: 0.08m coal.
	#5-3	**576.97**	**578.60**	**1.63**				**Q6**				**Coal**	**1.63m coal seam, RC: 0.90m, broken into many pieces, lower recovery, black, dull; no parting.**
		578.60	582.20	3.60								sandstone	FGSS, gray, with light black mudstone laminated; from 579.70m - 581m, very broken, fracture number: 30/m; weak react with 5% HCl.
		582.20	**582.50**	**0.30**								**Coal**	**0.30m coal seam.**
		582.50	583.87	1.37								Siltstone	siltstone, dark gray, massive.
		583.87	**583.95**	**0.08**								**Coal**	**0.08m coal seam.**
		583.95	584.63	0.68								Mudstone	light black mudstone, plant root fossils.
		584.63	585.26	0.63								Siltstone	siltstone, dark gray, muddy, rich in vitrain laminated and plant root fossils.
	#6	**587.05**	**587.67**	**0.62**								**Coal**	**0.62m coal seam, RC: 0.25m, broken.**
		587.67	591.00	3.33		20°						Siltstone	siltstone, dark gray to light black; at upper part, more FGSS laminated; at 590m, bedded plane: 20°; at base, 0.60m, black mudstone mainly.
		591.00	592.50	1.50								Mudstone	mudstone, black, CM mainly; at 592.22m - 592.35m, 0.13m banded coal.
		592.50	594.00	1.50								Siltstone	siltstone, dark gray, massive, numerous coal film and plant root fossil.
		594.00	**594.05**	**0.05**								**Coal**	**0.05m coal seam.**
		594.05	596.46	2.41								Siltstone	siltstone, dark gray, massive at base, 0.40m black mudstone with few coal film; rich in plant root fossil.
	#6-1	**596.46**	**597.00**	**0.54**								**Coal**	**0.54m coal seam, banded coal; RC: 0.54m; coal structure: 0.12<0.18>0.34m.**
		597.00	597.80	0.80		15°						Mudstone	coaly mudstone, numerous coal streak and carbonaceous debris; at 597m; dip: 15°.
		597.80	605.70	7.90		20°						Siltstone	siltstone, dark gray to light black, interbedded with light gray FGSS laminated, content: 20%, but at upper and lower part, more FGSS (40%); abundant plant root fossils; at base, 0.50m, black mudstone; at 604.50m, bedded plane: 20°.
		605.70	**606.00**	**0.30**								**Coal**	**0.30m coal seam, RC: 0.20m.**
		606.00	610.18	4.18		10°						Siltstone	siltstone, dark gray, interbedded with light gray FGSS laminated (30%), micro-horizontal bedding; at 606m, bedded plane: 10°; numerous coal film, plant root fossils.
		610.18	611.64	1.46								Mudstone	black mudstone, massive, rich in coal streak; at 610.70m - 611.10m, numerous banded coal seam (0.01m).
		611.64	612.90	1.26								Mudstone	mudstone, dark gray, massive; no plant fossils.
		612.90	616.43	3.53								Mudstone	mudstone, black, massive, not clear bedding few vitrain lenses.
	#7	**616.43**	**617.58**	**1.15**				**Q7 Q8**				**Coal**	**1.15m coal seam, RC: 1.15m; boney coal: 616.43m - 616.78m, 0.35m, dull, black, intact, bright, light, fracture developed.**
		617.58	619.70	2.12		25°						Mudstone	mudstone, light black, massive, at base, 0.45m rich in coal streak, and 0.04m coal seam; at 619m, bedded plane: 25°.
		619.70	622.85	3.15		30° 50°						sandstone	FGSS light gray, interbedded with dark gray siltstone laminated (30%); micro-horizontal bedding; at 621.50m, bedded plane: 30°, (partly 50°); 4 layers calcite vein.
		622.85	625.00	2.15		15°						Mudstone	mudstone, light black with dark gray siltstone laminated, rich in coal film and carbonaceous fragment; at 623m, bedded plane: 15°.
		625.00	**625.05**	**0.05**								**Coal**	**0.05m coal seam, filled calcite vein.**
		625.05	635.75	10.70		20°						sandstone	FGSS, gray, well-sorted, interbedded with dark gray siltstone laminated (20%), micro-horizontal bedding, react with 5% HCl; rich in plant leaf/root fossils; at 627.20m - 627.60m, vertical fracture developed, infilled coal streak (irregular); silt toward at base; at 635m, bedded plane: 20°.
		635.75	639.00	3.25								Mudstone	mudstone, light black, massive, numerous plant leaf fossils; at base, 0.01m black CM.
		639.00	**639.40**	**0.40**								**Coal**	**0.40m coal seam, RC: 0.40, black.**
		639.40	640.26	0.86								Siltstone	siltstone, dark gray.
	#8+1	**640.26**	**641.10**	**0.84**				**Q9**				**Coal**	**0.84m coal seam, RC: 0.67m, intact, dip: 15°. fractured developed; no parting.**
		641.10	642.97	1.87								Mudstone	mudstone, massive, black, CM mainly or coaly mudstone, included 4 layers, 0.05-0.10m coal seamlet each.
	#8	**642.97**	**645.17**	**2.20**				**Q10 Q11**				**Coal**	**2.20m coal seam, RC: 1.40m; black, half-broken, shiny and little brittle; no parting. boney coal: 644.73m - 645m, 0.27m, dull; lost coal: 643.93m - 644.73m, 0.80m.**
		645.17	646.60	1.43								Mudstone	mudstone, black CM, at top and base, 2 layers, 0.15m boney coal.
		646.60	647.50	0.90								Siltstone	siltstone, more plant fossils.
		647.50	654.00	6.50		15°						sandstone	FGSS, light gray, interbedded with dark gray siltstone laminated (20%), micro-horizontal bedding; at 654m, bedded plane: 15°; rich in vitrain laminated.
		654.00	658.40	4.40		10°						Siltstone	siltstone, dark gray, interbedded with light gray FGSS laminated, (20%), rich in plant leaf/root fossils; micro-horizontal bedding, dip: 10°.
		658.40	660.11	1.71								Mudstone	mudstone, black, massive, numerous coal streak; at 659.50m - 659.65m, more vitrain layers (thin).
	#9	**660.11**	**664.64**	**4.53**		**15°**		**Q12 Q13**				**Coal**	**4.53m coal seam, RC: 4m; coal lost: 660.50m - 661.03m, 0.53m; Q : 660.11m - 663m, 2.89m, RC: 2.45m; Q : 663m - 664.04m, 1.64m, RC: 1.55m; black, intact, shiny and light; no parting; coal seam dip: 15°.**
		664.64	665.03	0.39								Mudstone	mudstone, black, massive, rich in vitrain laminated.
		665.03	668.90	3.87		20°						Siltstone	siltstone, dark gray, interbedded with light gray FGSS laminated (20%), micro-horizontal bedding, react with 5% HCl; at 667m, bedded plane: 20°; from 665.03m - 666m, little bauxitic, abundant coal streaks.
		668.90	690.60	21.70		15°						sandstone	FGSS, light gray, interbedded with dark gray siltstone laminated (20%); micro-horizontal bedding; at 671.25m - 671.60m, more bauxitic mudstone; at base, a layer siderite; minor coal streak throughout; at 674.08m - 674.58m, more light black mudstone and coal film; at 682.65m - 684.90m, extend vertical fracture, infilled calcite vein; at 677m, bedded plane: 15°; from 682.65m - 684.90m, extend vertical fracture, infilled calcite vein; at 685.50m, bedded plane: 15°; at 687.80m, a layer calcite vein.
		690.60	695.80	5.20		15°						Mudstone	mudstone, light black to black, massive; few carbonaceous fragment/plant leaf fossil; at upper part, little bauxitic, soft, rock core reduced (to 693m); at 695.50m - 695.53m, 0.03m, coal seamlet; at 695m, bedded plane: 15°.
	#10	**695.80**	**698.88**	**3.08**				**Q14 Q15**				**Coal**	**3.08m coal seam, RC: 1.55m; lost coal: 696.87m - 698.42m, lost 1.55m; parting: 698.42m - 698.58m, 0.16m, black MS; coal is shiny and broken, black, light. coal structure: 1.07(1.55)<0.16>0.30m,**
		698.88	700.40	1.52		15						Mudstone	mudstone, black, rich in vitrain chip; at 699m - 699.40m, 0.40m FGSS, filled a layer calcite vein; at 700m, bedded plane: 15°; at 699.20m - 699.25m and 699.50m - 699.55m, 2 layers, 0.05m coal seam.
		700.40	708.65	8.25		15°						sandstone	FGSS, light gray, well-sorted, interbedded with dark gray siltstone laminated (20%); at base, 30%; micro-horizontal bedding; from 701.20m - 702m and 703.60m - 704.80m, fractured developed (vertical), infilled calcite vein, (and 706.50m - 706.90m same); at base, silt toward; at 706m, bedded plane: 15°.
		708.65	711.00	2.35								Mudstone	mudstone, dark gray (white), bauxitic, massive, silt toward at base, soft, rock core reduced.
		711.00	713.45	2.45		20°						sandstone	FGSS, light gray, well-sorted, interbedded with black mudstone laminated; laminated thick or thin unevenly; horizontal bedding; at 713m, dip: 20°.
		713.45	715.15	1.70								sandstone	CGSS, light gray, normal-sorted, with a few MGSS.
		715.15	719.18	4.03								Mudstone	mudstone, black, massive, rich in coal streak and carbonaceous fragment; at 717.50m to end, bauxitic mudstone, silt toward at base.
		719.18	720.90	1.72								sandstone	FGSS, light gray, well-sorted, and pure mainly.
	from 729m, NQ drill	720.90	729.22	8.32		20°						Siltstone	siltstone, dark gray, interbedded with light gray FGSS laminated, sandy toward at base; react with 5% HCl; 722m - 727.55m, CGSS, light gray, normal-sorted, predominately quartz and debris, slight fractured; from 726.15m - 727.55m, more irregular coal streak, infilled on bedding surface; at 727m, bedded plane: 20°; from 727.50m - 729.22m, with more irregular coal streaks.
	#11	**729.22**	**730.27**	**1.05**				**Q16**				**Coal**	**1.05m coal seam, RC: 0.05m. because change rods size, reduced to NQ, result in coal lost, only 2-3cm coal fragment; no parting.**
		730.27	743.07	12.80		20°						sandstone	CGSS - MGSS - FGSS, gray, well-sorted, predominately quartz and debris; at upper part, more coal film and argillaceous pebbles unevenly; at 734.80m - 735.30m, more irregular argillaceous pebble; react with 5% HCl; from 738m to end, interbedded with dark gray siltstone laminated (30%), micro-horizontal bedding; at 742m, bedded plane: 20°; at 742m, bedded plane: 20°.
		743.07	748.72	5.65								Siltstone	siltstone, dark gray to light black, massive, few coal film, muddy toward at base, react with 5% HCl.
	#12	**748.72**	**749.22**	**0.50**								**Coal**	**0.50m coal seam, RC: 0.15m, black, dull, broken, only 2-3cm fragment.**
		749.22	750.00	0.78								sandstone	FGSS, dark gray, at top, 0.10m black mudstone, rich in coal streak.
		750.00	751.00	1.00								sandstone	FGSS, light gray, vertical fracture developed, filled calcite vein; react with 5% HCl.
		751.00	752.92	1.92								Mudstone	mudstone, light black, massive, rich in plant root fossil and a few coal streak; at 752.73m - 752.75m, 0.02m coal.
		752.92	762.14	9.22								sandstone	MGSS, gray, normal-sorted, predominately quartz and debris, react with 5% HCl (weak); at 759.40m - 760.10m, light gray FGSS mainly and few calcite vein, and at 760m - 760.10m, irregular argillaceous pebble.
		762.14	765.13	2.99		15°						sandstone	FGSS, dark gray, interbedded with dark gray siltstone laminated (20%); at 763.50m, bedded plane: 15°.
		765.13	775.50	10.37		15°						sandstone	FGSS, light gray, well-sorted, predominately quartz and debris; micro-horizontal bedding; from 765.20m - 765.30m, a layer calcite vein; from 767.80m - 770m, more dark gray siltstone laminated (30%); at 768m, bedded plane: 15°, slightly fracture, filled few calcite vein; from 771.34m - 772.10m, fracture developed, filled calcite vein; at 773.60m - 774m, a layer calcite vein. react with 5% HCl (strong).
		775.50	801.00	25.50		10°						sandstone	FGSS, light gray, well-sorted, interbedded with light black mudstone laminated (20%), thick or thin unevenly, micro-horizontal bedding; at 778m, bedded plane: 10°; react with 5% HCl; from 782m - 786m, few light black mudstone laminated (5%); at 786m, bedded plane: 15°; at 790m, bedded plane: 22°; at 793.35m - 793.55m, a layer calcite vein; at 795m, bedded plane: 35°; at 799m, bedded plane: 25°; at base, silt toward.
Gates													

TD: 801m January 25, 2013

note: FGSS-fine-grained; MGSS-medium-grained; CGSS-coarse-grained; HCL-hydrochloric acid

Wapiti River — Drill Hole Core Log

Drilling Company:	CYR International Drilling Ltd.		**Hole No.:**	WP2C41
Rig Type:	Golder Bear-2		**Collar Elevation:**	1356.4m
Total Depth:	851.0m	**Coordinate:**	**Northing:**	6071907.9
Spud Date:	10-Nov-12		**Easting:**	652687.5
Finished Date:	2-Dec-12		**Logging Geologist:**	Victor, Ricky, Lee, James
Core Size:	HWT/HQ		**Note:**	

Formation	Coal Seam	Core Depth Interval		Thickness, m		Strata Dip	Coal Floor Elevation	Sample ID			Rock Hardness	Rock Name	Lithology Description
		From	To	Thick	TRUE			Coal	Rock	CBM			
Q		0.00	4.00	4.00								till	overburden, weahered deposits, brown-yellow, mudstone mainly.
Hasler		4.00	41.00	37.00		5						siltstone	dark grey, interbedded with light grey fine-grained, sandstone laminated (40%) (FGSS), micı bedding; at 11.10m, 0.10m mud cast; from 19.0~20.0, small crossbed on FGSS bedding; at 20.(plane: 5°; from 20.0~31.0m,more FGSS thin laminated; at 25.0~26.0m, broken, 25/m; at 29.00m, bedded plar siderite of lower part.
		41.00	80.00	39.00		5						mudstone	dark grey, interbedded with light grey fine-grained, sandstone (FGSS)laminated (15%), hori: at 47.00m, bedded plane: 5°; at 41.10~41.20m, mud cast, a few siderite thin laminated throı 53.00m, small distorted bedding; at 59.15~59.25m, 0.10m siderite; from 59.30~60.50m, sligh infilled mud cast; from 67.00~67.50m, 0.50m, FGSS, filled, calcite vein; at 67.00m, bedded from 67.00~69.00m, more FGSS laminated.
		80.00	88.50	8.50		5°						mudstone	dark grey, interbedded with few light grey FGSS laminated (5%), micro-horizontal bedding, 88.0m, bedding plane:5°, a few siderite thin laminated throughout, small cross-bed on FGSS 89.50~91.00m, slightly fracture .
		88.50	125.00	36.50		5°						siltstone	dark grey, muddy, interbedded with light grey FGSS laminates (20%), micro-horizontal beddi bedding on siltstone bedding surface throughout; at 101.00m, bedded plane: 5°, alternately siderite thin laminated' at 113.35~113.43, 0.08m,FGSS; at 119.0m, bedded plane: 5°; at 124. plane:5°.
		125.00	170.70	45.70		5°						mudstone	dark grey, little silt, interbedded with light grey FGSS laminated (10%), horizontal beddd 128.00m, bedded plane: 5°; at 128.07~128.15m, 0.08m mud cast, alternately with more sideri laminated; at 139.00m, bedded plane:5°; at 140.0m, bedded plane: 5°; at 150.0m, bedded plar 160.0m, bedded plane: 5°; at 167.0~167.30, broken, fracture No:3; at 170.0m, bedded plane:
		170.70	184.00	13.30		5°						siltstone	grey, blended with fine sandstone, fss content: 305, bedded plane:5v.
		184.00	231.50	47.50								siltstone	light black, very muddy, with white-grey fine sandstone laminae (content:2%), horizontal be 185.0m (5°); at 190.0m (5°); at 200.0m (5°); at 212.0m, bedded plane: 5°; at 215.0m (5°); a 213.60~2124.90, broken; at 227.0m (5°).
		231.50	284.10	52.60		7°						siltstone	light black, muddy, interbedded thin laminae of white-grey fine sandstone (15%), micro-hor bedding; at 236.00m (7°); at 240.0m (7°); at 240.30m, 0.08m thick, a layer of siderite; at plane:7°; at 266.0m (7°); from 266.0~276.0m, fine sandstone, content: 30%; at 270.0m (7°); (7°); at 281.0m, bedded plane: 7°.
		284.10	299.90	15.80		7°						siltstone	dark grey, interbedded thin layers of fine sandstone (content: 30%), micro-horizontal bedd cross-bedding in fine sandstone; at 290.0m (7°); at 298.0m (7°).
		299.90	305.00	5.10		7°						siltstone	black, very muddy, with a few fine sandstone laminae (content:2%); at 302.0m (7°).
		305.00	314.50	9.50								siltstone	light black, little muddy, interbedded with light grey nodule (30%); at 309.20m, pyrite noc at 314.90m, pyrite nodule (1*5mm).
		314.50	341.00	26.50		7						siltstone	light black, interbedded with minor light grey FGSS (5%); at 320.00m, bedded plane: 7°, a t thin laminated througout; at 324.00m, bedded plane: 7°; at 334.35m, pyrite nodule (1*5mm), laminated rhythmite uneven; at 334.50m, bedded plane:8°.
		341.00	363.00	22.00		10						siltstone	light black, very muddy, interbedded with light grey FGSS laminated (5%), horizontal beddi bedded plane: 7°; from 356.00~358.50m, broken, vertical developed, fracture, fracture numb 362.00m, bedded plane:10°.
		363.00	365.10	2.10								siltstone	dark grey, interbedded with light grey FGSS (40%); from 364.50~364.70m, a layers conglomer 0.01cm) laminated.
Boulder Creek		365.10	388.10	23.00								mudstone	bauxitic, white-grey, or brown-grey, soft, by knife, massive; from 368.00~369.00m, silt mo 369.0~370.0m, more black mudstone , a few carbonaceous; from 373.50~375.50m, more Fe^{2+} inclus 385.50~388.10m, black mudstone mainly, a few carbonaceous debris and few coal streak.
		388.10	390.45	2.35		5°						sandstone	FGSS, light grey, with a few dark grey, mudstone laminated, little bauxitic; at 389.50m, b 5°.
		390.45	391.55	1.10								mudstone	black mudstone.
		391.55	393.25	1.70								sandstone	coaly FGSS, grey, numerous thin coal film.
		393.25	402.10	8.85		23						sandstone	MGSS, light grey, normal-sorted, predominately quartz and debris; from 396.75~397.40m, a f observed on bedding surface; from 397.40~399.00m, FGSS mainly; at 398.00m, bedding plane: with 5% HCL.
		402.10	403.50	1.40								mudstone	Bauxitic mudstone, white-grey, massive.
		403.50	404.20	0.70								siltstone	dark grey, with a few FGSS laminated, little bauxitic.
		404.20	405.90	1.70								mudstone	black, interbedded with light grey FGSS laminated and few coal film and carbonaceous debri
		405.90	406.25	0.35								siltstone and mudstone	at upper part, siltstone mainly; at lower part, mudstone mainly.
		406.25	417.30	11.05								sandstone	FGSS, light grey, interbedded with a few black mudstone laminated (5%); at upper and lower mudstone laminated (15%) and a few coal film, horizontal bedding; at 410.00m, dip: 10°;at and 412.60~413.00m, predominately black mudstone, small-cross bed on bedding surface; from 415.50~417.30m, broken, rich in irregular coal filem and inclusion, a few agrilliceous pebl sandy toward at base.
		417.30	424.70	7.40								mudstone	black mainly, locally white-grey, little bauxitic, a few carbonaceous fragment throughout.
		424.70	428.13	3.43		7°						sandstone	FGSS, light grey, well-sorted, weak react with 5% Hcl, with a few dark grey siltstone lamii a few calcite vein; at 428.00m, bedded plane: 7° .
		428.13	432.90	4.77								mudstone	light black, massive, interbedded with a few light grey FGSS laminates (5%), rhythm uneven, threads and calcite vein observed on bedding surface.
		432.90	434.70	1.80								siltstone	dark-medium grey, massive, little bauxitic.
		434.70	444.90	10.20		10°						siltstone	FGSS, light grey mainly; at upper and lower part, grey mainly and interbedded with dark gr laminated (20%); from 438.00~439.00m, more agrilliceous pebbles (1*3cm uneven), same at 44 well-sorted, micro-horizontal bedding; at 440.00m, bedding plane: 10°; at base, few thin c 443.00m, bedded plane: 10°.
		444.90	446.05	1.15								sandstone	MGSS, light grey.
		446.05	446.35	0.30								mudstone	bauxitic mudstone.
		446.35	455.10	8.75		20°						sandstone	FGSS, grey, interbedded with numerous dark grey siltstone, micro-horizontal bedding; at l becoming MGSS, and with few coal film; at 450.00m, bedded plane:20°, small-cross bed on be weak react with 5% HCL.
		455.10	456.00	0.90								mudstone	Bauxitic mudstone, massive, white-grey; at base, becoming silt.
		456.00	459.24	3.24								mudstone	black, massive, with few light grey FGSS laminated (5%), and dark grey siltstone laminated nodule observed on bedding surface, few carbonaceous and coal film.
	BC	459.24	459.59	0.35								coal	0.35m, BC coal seam, RC: 0.35m, black, dull, light.
		459.59	461.25	1.66		15°						sandstone	FGSS, grey, interbedded with black mudstone laminated, rhythm uneven and few calcite veins few coal streak; at 461m, dip: 15°.
		461.25	467.27	6.02								conglomerate	conglomeate, medium-grey, fine-grained, ϕ:2~10mm, predominately quartz and debris, minor mica; from mainly, minor black mudstone.
		467.27	478.70	11.43		7						sandstone	FGSS, light grey, pure, well-sorted, predominately quartz and minor debris; at 468.15~468. 470.10~470.15m, conglomerate; at 475.55~476.15m, black mudstone; at 475.50m, bedding plane
Hulcross		478.70	482.50	3.80								siltstone	dark grey, interbedded with light grey FGSS laminated, content:40%,ryhthm uneven. At 479.5(482.23~482.28 m , 0.05m siderite and pyrite pebble; and at 482.10m, 0.10m siderite.
		482.50	500.66	18.16		5 7						siltstone	darkg grey, interbedded with light grey FGSS laminated, content: 305, rhythmite, micro-hor bedding, alternately with bands of minor siderite; at 485.00m, bedded plane: 7°; occasiona bed on bedding surface; at 497.00m, bedded plane: 5°; at 498.85m, pyrite nodule (1*6cm).
		500.66	500.75	0.09								limestone	at 500.66~500.75m, 0.09m limestone, strong react with 5% HCL, siltstone, very muddy;
		500.75	507.24	6.49		5						siltstone	at 507.19~507.24m, 0.05m bauxitic mudstone, soft, scratched by fingers. at 506.00m, bedde
		507.24	531.14	23.90		7			GT1 GT2			siltstone	at 520.00m, bedded plane: 7°; at 521.00m, bedded plane: 7°;
		531.14	531.19	0.05								limestone	at 531.14~531.19m, 0.05m limestone, white-grey, soft, strong react with 5% Hcl;
		531.19	546.75	15.56		7			GT3			siltstone	at 539.00m, bedded plane: 7°; at 541.70~542.73m, 0.03m limestone , white-grey, soft, stron HCL; at 546.62~546.75m, 0.13m FGSS.
		546.75	557.00	10.25		7°			GT4 GT5			siltstone	siltstone, dark grey, interbedded with light grey FGSS laminated (20%), a few siderite thi throughout; at 555.87, 556.32m, pyrite; at 553.23m, pyrite nodule (1*2mm); at 554.30m, pyr (1*2mm); from 554.86~ 556.60m, more FGSS, 50%; at 555.50m, bedded plane: 7°; at 556.60~55 mudstone.
	#1	557.00	557.23	0.23								coal	0.23m, 1# coal seam, RC: 0.23m,, 3 pyrite nodules observed on coal surface.
		557.23	557.58	0.35								mudstone	0.35m black mudstone.
		557.58	557.68	0.10								coal	0.10m coal seam.
		557.68	563.87	6.19		5			GT6 GT7			sandstone	FGSS, light grey, interbedded with black mudstone laminated (10%) and few coal film, no rea HCL, a few plant leaf fossil observed on bedding surface; at 562.94m, pyrite and coal filı bedded plane: 5°.
		563.87	564.47	0.60								mudstone	dark grey, two coal film: ①564.07~564.11m (0.04m coal);② 564.25~564.28m (0.03m coal).
	#3	564.47	565.49	1.02				Q1				coal	3# coal seam (1.02m), black, RC: 0.62m, no parting.
		565.49	566.22	0.73		5°			GT8			mudstone	dark grey,0.04m coal file at 565.96~566.0m.
		566.22	566.38	0.16								coal	black, shiney, 0.16m coal seam.
		566.38	571.48	5.10		5						sandstone	FGSS, with mudstone; at 569.0m, bedded plane: 5°.
	#3-1	571.48	572.14	0.66								coal	#3-1 coal seam, black,0.66m, parting: ①571.73~571.79m (0.06m mudstone); ②572.02~572.06m (
		572.14	582.24	10.10					GT9			sandstone	FGSS, with siltstone, light grey, 2 coal film at 575m, 575.75m.
		582.24	589.40	7.16					GT10			mudstone	dark grey, carbonaceous mudstone : 582.50~582.58m and 583.32~583.52m.
		589.40	589.58	0.18								coal	black, intact , 0.18m coal seam, light , shiny.
		589.58	595.25	5.67		5						siltstone	grey muddy; at 593.0m, bedded plane: 5°.
	#4	595.25	596.39	1.14								coal	1.14m 4# coal seam, very broken, more parting, RC: 1.14m, coal structure: 0.12<0.20>0.10<0.30>0.10<0.20>0.12. parting: ①595.37~595.57m(0.20m mudstone);②595.67~59 mudstone);③596.07~596.27m (0.20m mudstone).
		596.39	598.36	1.97								sandstone	FGSS, light, grey.
		598.36	603.40	5.04								siltstone	grey, with black mudstone; 602.15~602.20m, 0.05m coal film.
		603.40	618.50	15.10		5°			GT11			sandstone	FGSS, light grey, interbedded with siltstone partly, calcite infilled inside; at 614.0m, d
		618.50	622.08	3.58					GT12			siltstone	grey, with FGSS.
	#5	622.08	627.03	4.95				Q2 Q3 Q4				coal	5# coal seam (4.95m), black, shiny, intact, RC:4.90m. Parting:①624.04~624.30m (0.26m mu 626.06~626.12m (0.06m mudstone). Coal structure:1.96<0.26>1.76<0.06>0.89m.
		627.03	628.65	1.62								mudstone	dark grey, more coal film infilled.
		628.65	628.88	0.23								coal	0.23m coal seam, black, shiny, intact.
		628.88	631.90	3.02		6°			GT13			mudstone	black, massive, a few carbonaceous and coal streak, dip:6°.
		631.90	632.05	0.15								coal	0.15m coal seam.
		632.05	632.90	0.85								mudstone	black mudstone.
		632.90	633.05	0.15								coal	0.15m coal seam.
		633.05	635.10	2.05					GT14			sandstone	FGSS, grey, with dark grey mudstone laminated and a few coal film.
		635.10	637.15	2.05								mudstone	black, massive; at 636.35~636.38m, 0.03m coal seam.
		637.15	637.60	0.45								coal	0.45m coal, RC: 0.35m, black, intact.
		637.60	639.15	1.55					GT15			mudstone	black, few coal threads; at 639m, plant leaf fossil.
		639.15	639.90	0.75								sandstone	FGSS, few calcite vein.
		639.90	640.65	0.75								mudstone	black.
		640.65	641.19	0.54								coal	0.54m coal seam, RC: 0.54m, black, light, bright, broken.
		641.19	642.25	1.06		5°						mudstone	black mudstone, massive.
		642.25	642.79	0.54								sandstone	MGSS, light grey, few black mudstone laminated.
	#6	642.79	643.52	0.73				Q5 Q6				coal	#6 coal seam: 0.73m, RC: 0.67m. black, light, shiny, intact, parting: 643.03~643.19m, mudstone. Coal structure: 0.24<0.16>0.33m.
		643.52	645.03	1.51								mudstone	black, massive.
	#6-1	645.03	645.70	0.67								coal	0.67m 6-1# coal seam, RC:0.53m. black, light, dull (almost), intact. Coal structure: 0.
		645.70	648.25	2.55		10°			GT16			sandstone	FGSS, light grey, with black mudstone laminated (15%); at 674.20m, bedded plane: 10°.
		648.25	650.43	2.18								mudstone	black, mudstone, massive.
		650.43	650.58	0.15								coal	0.15m coal seam, RC:0.15m, black, light,bright.
		650.58	656.20	5.62		8°			GT17			siltstone	dark grey, interbedded with grey FGSS laminated and black mudstone laminated; at upper part part, more black mudstone, massive; at 651.00m, bedded plane: 8°; at 655.91~655.96m 0.05m (
		656.20	657.30	1.10					GT18			sandstone	FGSS, grey, with dark grey siltstone laminated.
		657.30	659.50	2.20		12°						sandstone	MGSS, light grey, with black mudstone laminated (30%), and a few coal film; at 657.50m, be 12°; at base, becoming FGSS.
		659.50	668.00	8.50					GT19			mudstone	black, massive, a few carbonaceous and coal debris observed or bedding surface; from 662.3 broken, lots of mud cast, grinding; from 664.00~664.10m 0.10m mud cast; from 665.32~665.38 cast; from 667.13~667.28m, 0.15m mud cast; from 667.45~667.65m, 2 layers siderite.
	#7	668.00	669.44	1.44				Q7				coal	coal 7#, 1.44m, RC: 0.67m, no parting, black, light, shiny, lost: 0.77m coal at upper
		669.44	670.13	0.69								mudstone	black; at base, 0.05m coal seam.
		670.13	671.40	1.27		20°			GT20			sandstone	FGSS, light grey, with a few dark grey, siltstone laminated; at 671.00m, dip:20°.
		671.40	671.90	0.50								mudstone	black mudstone; at base, 0.35m coally mudstone.
		671.90	673.53	1.63								mudstone	black mudstone, massive, rich in coal streak; at base, 0.30m CM.
		673.53	673.73	0.20								coal	0.20m coal seam, RC: 0.20m, black, intact, light, shiny.
		673.73	676.40	2.67								mudstone	black, massive, rich in carbonaceous and coal film.
Gates	#7-1	676.40	677.39	0.99				Q8		CBM1		coal	0.99m 7-1# coal seam, RC: 0.72m, lost: 0.27m, black, light,shiny. CBM01,
		677.39	681.80	4.41					GT21			mudstone	black, massive, numerous coal threads and coal thin seamlet at top, abundant carbonaceous lower part, more dark grey siltstone, rich in plant root fossils.
		681.80	682.00	0.20								coal	0.20m coal seam.
		682.00	683.75	1.75								mudstone	black, massive, rich in coal streak and carbonaceous debris.
	#7-2	683.75	684.48	0.73		10°		Q9				coal	0.73m 7-2# coal seam, RC: 0.60m, black, light, shiny, no parting. bedded plane:10°.
		684.48	686.00	1.52								mudstone	black,massive; from 685.00~686.00m, black, CM, rich in coal film.
	#7-3	686.00	686.55	0.55		20°						coal	0.55m 7-3# coal seam, RC: 0.55m; at base: 0.02m parting, 0.10 Boney coal. Coal structu 0.37<0.02>(0.10)m.
		686.55	688.00	1.45					GT22			siltstone	dark grey, with a few light grey FGSS laminated, rich in plant fossil.
		688.00	690.00	2.00		10°						mudstone	black, massive, numerous coal thread and carbonaceous fragment; at 688.50m, bedded plane:1(
		690.00	704.50	14.50		15			GT23			sandstone	FGSS, grey, interbedded with numerous dark grey siltstone and black mudstone laminated (40 horizontal bedding; at 695.00m, bedded plane: 15°, a few plant leaf /root fossil on beddin few coal film, strong react with 5% HCL; from 698.00~703.80m, FGSS, generally pure, MGSS m
		704.50	707.35	2.85					GT24			siltstone	dark grey, massive, rich in plant root fossil and carbonaceous debris (a few), with light react with 5% HCL.
		707.35	708.57	1.22		5°						mudstone	black, massive, abundant coal threads; at 708.32~708.42m, 0.10m mud cast.
	#8	708.57	713.32	4.75				Q10 Q11				coal	4.75m, 8# coal seam, RC:2.15m, lost: 2.60m, black, light, bright, half-intact; Q10:708. 1.43m,RC: 0.60m; lost: at 708.57-709.40m, 0.83m. Q11: 710.00~713.32m, 3.32m, RC: 1.55m, 710.00-711.77m, 1.77m. Parting: 709.84~709.86m, 0.02m, black mudstone. coal structure: 1.27<0.02>3.46m.
		713.32	713.86	0.54								mudstone	black, massive, rich in coal streak.
		713.86	715.50	1.64		7			GT25			siltstone	dark grey, with a few light grey FGSS laminated and coal film; at 716.00m, bedded plane:7°.
		715.50	723.21	7.71		15			GT26			sandstone	FGSS, light grey, interbedded with dark grey siltstone laminated (30%), micro-horizontal be 717.00m, bedded plane:15°; at 719.00~719.11m, black mudstone and a layer coal seamlet (0.0 719.00~723.21m, a few irregular calcite vein infilled on fracture (joint) surface, react w
	#8-1	723.21	726.32	3.11		12°		Q12		CBM2		coal	3.11m 8-1# coal seam, RC: 2.85m, lost: at 725.00-725.26m, 0.26m, black, light, shiny, parting. coal seam dip:12°. CBM02.
		726.32	728.20	1.88								siltstone	dark grey, with a few light grey FGSS and black mudstone laminated, very broken, broken su calcite vein.; at 727.55~727.75m, 0.20m black mudstone.
		728.20	731.20	3.00					GT27			sandstone	FGSS, light grey, very broken, fracture developed (vertical), filled calcite vein, fractur
		731.20	740.00	8.80		10°			GT28			sandstone	FGSS, light grey, interbedded with dark grey siltstone laminated (20%), micro-horizontal be 732.00m, bedded plane:10°; at 731.90m, coal inclusion (1*10cm); at 733.00~733.65m, a few ca 737.25m, extend calcite vein to 737.90m; at 736.00m, bedded plane: 10°, react with 5% HCL.
		740.00	746.50	6.50		7°						siltstone	dark grey, interbedded with light grey FGSS laminated (40%), and few black mudstone lamina 743.50m, bedded plane: 7°, a few carbonaceous fragment observed on bedding.
		746.50	753.60	7.10		7			GT29			mudstone	dark grey, interbedded with light grey FGSS laminated (10%), horizontal bedding, rich in p fossil and carbonaceous, and minor coal steaks througout; at 748.65~748.75m, 0.10m coal sea bedded plane: 7°; at 750.75~750.80m, 0.05m coal seam; at base, coal film increase.
	#9	753.60	758.55	4.95				Q13 Q14 Q15 Q16		CBM3		coal	4.95m 9# coal seam, RC: 4.55m, black, light, shiny, and intact. 5 interval parting; (0.18+0.34+0.06+0.30+0.37m)=1.25m. Q13:753.60~754.94m, 1.34m, RC:1.14m; lost at 754.74 0.20m. Q14:754.94~758.55m,3.61m, RC:3.41m; lost at 756.80-757.00m, 0.20m. Q15: parting 753.80~753.98m, 0.18m, black mudstone;②754.94~755.28m, 0.34m, black mudstone;③756.10 0.06m, black mudstone; Q16: ④757.00~757.30m, 0.30m, black mudstone;⑤757.52~757.89m, (mudstone (SL). Coal structure: 0.20<0.18>0.96<0.34>0.82<0.06>0.84<0.30>0.22<0.37>0.66m.
		758.55	759.90	1.35		15°						mudstone	black, massive, very much broken, filled coal streak and carbonaceous debris; at 758.50m, l 15°, slickensided and shiny.
		759.90	771.00	11.10		10			GT30			sandstone	FGSS,light grey, interbedded with dark grey siltstone laminated (20%) and black mudstone la at top, 0.50m very much broken, filled mudstone and calcite vein; at 763.70~764.00m, more l at upper part, a few calcite vein; from 766.00~766.50m, 0.50m, broken, a few coal streaks 769.00m, bedded plane:7°; at 771.50m, bedded plane:10°.
		771.00	777.56	6.56		10°			GT31			sandstone	FGSS, light grey, pure, few coal film and argillaceous pebble, horizontal bedding; at 775.(plane: 10°; at 774.70~775.10m, more black mudstone, few siderite.
	#10	777.56	777.80	0.24								coal	0.24m #10 coal seam. RC: 0.15m.
		777.80	779.20	1.40								mudstone	black, rich in carbonaceous fragment, and a few coal streak. At 778.03-778.05m, 0.02m coal 778.4-778.5m, very broken, broken into many pieces. Mixed with black mudstone and coal sea
		779.20	782.28	3.08		5°						siltstone	siltstone, dark grey, interbedded with light grey FGSS laminated (30%); at 779.88~780.28, fracture; at 780.28~780.78m, black mudstone mainly.
		782.28	786.50	4.22					GT32			mudstone	black, massive, numberous, coal streaks and carbonaceous debris; at 782.55m, 783.00m, 783.5 784.17m, 0.01m~0.03mk coal thin seam; at 786.00m, 0.03m coal; 786.05m, 0.05m coal.
		786.50	800.80	14.30		10°			GT33 GT34			siltstone	dark grey, interbedded with light grey FGSS laminates, content:30%, FGSS react with 5% HCL, horizontal bedding, abundant plant root fossil and carbonaceous, and a few coal film throu 795.00m, bedded plane: 10°.
		800.80	802.44	1.64								mudstone	black, massive, a few coal film.
	#12	802.44	803.58	1.14				Q17 Q18				coal	1.14m 12# coal seam, RC: 0.33m, black, light, broken, only 2~5cm fragment; parting: 80 0.08m black mudstone. Coal structure: 0.48<0.08>0.58m.
		803.58	804.55	0.97					GT35			sandstone	MGSS, grey, few coal film.
		804.55	807.35	2.80		15°						siltstone	dark grey, interbedded with light grey FGSS and black mudstone laminated; at 805.40 ~806.2 broken, infilled irregular calcite vein, react with 5% HCL,
	#13	807.35	807.40	0.05								coal	at 807.35~807.40m, 0.05m coal seam;
		807.40	808.05	0.65								siltstone	dark grey, and a few coal film, rich in plant root fossil; at 808.03~808.05m, 0.02m coal s base, sandy toward.
		808.05	828.55	20.50		15°			GT36			sandstone	MGSS, light grey, normal-sorted, horizontal bedding; react with 5% HCL. at 809.50m,bedded predominately quartz and dark debris, few black mudstone laminated, no react with 5% HCL. 813.00m, 3 layers black mudstone. At 815.00m, bedded plane: 8 degree. at 815.6m, 816.3m, 8 and 826.3m, calcite vein observed on bedding surface. from 820.3 to 820.8m, more black mud laminated. from 823.8-824.8m, a few black mudstone laminated. at 824.5m, bedded plane: 8 d part, sandy downward to FGSS.
		828.55	851.00	22.45		8						sandstone	FGSS. light grey, interbeded with black mudstone laminated(20%). Rhythm unevenly, thick or horizontal bedding. From 838.3-841.0m, extend calcite vein. React with 5% HCL. AT 840.0m, 11 degree. From 845.0 to 848.0m, distorted bedding/ripple bedding and few calcite vein. at plane: 8 degree. TD=851.0m, Dec.02, 2012.

Wapiti River — **Drill Hole Co**

Drilling Company:	Canada Dehua Drilling Company			**Hole No.:**	**WP2C42**
Rig Type:	CS-14			**Collar Elevation:**	H = 1249.4m
Total Depth:	941.0M		**Coordinate:**	**Northing:**	Y=6072184.2m
Spud Date:	Feb. 25, 2013			**Easting:**	X=652939.8m
Finished Date:	Feb. 28, 2013			**Logging Geologist:**	VICTOR, LEE, RICKY
Core Size:	HWT/HQ/NQ			**Note:**	

Formation	Coal Seam	Core Depth Interval From(m)	To(m)	Thickness, m Thick(m)	True	Strata Dip	Coal Floor Eleva	Sample ID Coal	Rock	CBM	Rock Hardness	Rock Name	
Q		0.00	37.00	37.00								till	overburden, air-rig drilling, no core.
HASLER		37.00	41.00	4.00		10°						siltstone	medium grey, interbedded with light grey fine-grained sandstone (FGSS) laminates (30%) . mic
		41.00	59.00	18.00								siltstone	medium grey, little muddy, interbedded with light grey fine-grained sandstone laminates (35%- laminate wide or thin uneven.
		59.00	74.30	15.30		10°						siltstone	medium grey, interbedded with light grey fine-grained sandstone laminates (30%) . micro- hor
		74.30	92.30	18.00		13°						siltstone	medium grey, interbedded with light grey fine-grained sandstone laminates (45%) . micro- hor
		92.30	107.20	14.90		12°						siltsone	medium grey, interbedded with light grey fine-grained sandstone laminates (15%) . micro- hor
		107.20	125.85	18.65		12°						siltstone	medium grey, interbedded with light grey fine-grained sandstone laminates (25%) . micro- hor
		125.85	143.00	17.15								siltstone	medium grey, interbedded with light grey fine-grained sandstone laminates (30%) . micro- hor
		143.00	150.00	7.00		12°						siltstone	medium grey, interbedded with light grey fine-grained sandstone laminates (35%) . micro- hor
		150.00	184.00	34.00		12°						siltstone	siltstone, grey, with fine grained sandstone (20%). Bedded palne: 174m—12°.
		184.00	210.20	26.20		10°						siltstone	grey, muddy, interbedded with light grey fine-grained sandstone laminates (20%) . micro- hor
		210.20	222.30	12.10		10°						siltstone	grey, interbedded with light grey fine-grained sandstone laminates (35%) . micro- horizontal
		222.30	233.18	10.88		10°						siltstone	grey, with light grey fine-grained sandstone laminates (5%) . micro- horizontal bedding, bed
		233.18	256.50	23.32								siltstone	grey, with light grey fine-grained sandstone laminates (20%) . At 235.8m, 4cm pyrite vein.
		256.50	281.00	24.50		10°						siltstone	dark grey, muddy, 262.30-262.70m, broken; 271.80-272.50m, broken. At 266.0m, bedding plane: 1
		281.00	321.00	40.00		10°						siltstone	light black, little muddy, laminated light grey fine sandstone (20%); micro-horizontal beddin sandstone is up to 50%.
		321.00	329.00	8.00								siltstone	light black, muddy, with light grey fine sandstone laminates (2%), a few tree leaf fossil.
		329.00	334.00	5.00		10°						siltstone	grey, interbedded with light grey fine-grained sandstone laminates (30%). bedded plane: 10°.
		334.00	348.50	14.50								siltstone	siltstone, grey, with fine grained sandstone (20%).
		348.50	380.50	32.00		10°						siltstone	grey, interbedded with light grey fine-grained sandstone laminates (35%), decrease FGSS lamin 354.70m.
		380.50	422.70	42.20		10°						siltstone	grey, interbedded with light grey fine-grained sandstone laminates (10%). Micro-horizontal be
		422.70	428.20	5.50								siltstone	light grey, with dark grey siltstone (30%).
BOULDER CREEK		428.20	430.14	1.94								mudstone	grey, bauxitic mudstone, silty. Boulder Creek top: 428.20m.
		430.14	437.40	7.26								siltstone	grey, bauxitic. At 432.88-433.48m, bauxitic mudstone.
		437.40	440.00	2.60								siltstone	dark grey, muddy, little broken, richin coal debris.
		440.00	450.63	10.63								siltstone	grey, with bauxitic mudstone, little broken.
		450.63	451.38	0.75								mudstone	dark grey, richin coal debris.
		451.38	453.40	2.02								siltstone	grey.
		453.40	454.35	0.95								mudstone	dark grey.
		454.35	463.42	9.07								sandstone	light grey, pure, react with 5% HCL.
		463.42	465.30	1.88								mudstone	dark grey, silty, plant fossil occationally.
		465.30	466.94	1.64								mudstone	grey, bauxitic. toward to base, silty.
		466.94	475.65	8.71								siltstone	grey, with fine grained sandstone partly, richin plant fossil, coal streak occationally.
		475.65	479.30	3.65								mudstone	grey, bauxitic.
		479.30	480.25	0.95								siltstone	grey.
		480.25	481.70	1.45								mudstone	dark grey, bauxitic.
		481.70	484.00	2.30								sandstone	light grey, with siltstone at the base. Strong react with 5% HCL.
		484.00	494.95	10.95								siltstone	grey, muddy, with siltstone.
		494.95	497.00	2.05								mudstone	dark grey, bauxitic.
		497.00	504.10	7.10								siltstone	grey.
		504.10	509.53	5.43		20						sandstone	light grey, fine grained. Strong react with 5% HCL. Bedded plane: 506m—20°. Coarse-grained sands
		509.53	522.50	12.97								siltstone	grey, with bauxitic mudstone.
		522.50	523.85	1.35								mudstone	black, richin coal debris.
		523.85	524.50	0.65								sandstone	light grey, fine grained.
		524.50	525.27	0.77								mudstone	dark grey.
	BC	**525.27**	**525.57**	**0.30**								**coal**	**BC coal seam, 0.30m, Rc: 0.30m. Black, bright, intact.**
		525.57	525.85	0.28								mudstone	black, carbonaceous mudstone.
		525.85	527.54	1.69								sandstone	light grey, medium-coarse grained, weak react with HCL.
		527.54	532.20	4.66		19						conglomerate	grey, Ø: 2-8mm, with coarse grained sandstone. Bedded plane: 531m—19°.
		532.20	545.40	13.20								sandstone	light grey, fine grained, weak react with 5% HCL, with conglomerate partly at top.
HULCROSS		545.40	548.85	3.45		15						siltstone	dark grey, interbedded thin layers of white-grey fine sandstone(content:45%); at 548.0m, bedd
		548.85	567.70	18.85		15						siltstone	dark grey; laminated with fine sandstone(35%); horizontal bedding; at 557.0m and 560.0m, bedd
		567.70	622.00	54.30		15						siltstone	dark grey, laminated with fine sandstone(30%); at bottom, 2 thin layers of coarse sandstone; argillaceous limestone.
		622.00	622.10	0.10			627.40					Conglomerate	light grey, ø: 2mm; quartz and grey cherts, moderately-sorted.
		622.10	623.00	0.90		10						Sandstone	white-grey, fine grained; bedded plane:10°.
		623.00	624.40	1.40								mudstone	black, massive.
		624.40	625.10	0.70								mudstone	black, carbonaceous mostly; rich in leaf fossil; at upper part, a layer of coal seam, 0.05m t
		625.10	630.10	5.00		15						Sandstone	white-grey, fine grained, with dark siltstone laminae; at 628.0m, bedded plane: 15°.
		630.10	630.85	0.75								mudstone	black, massive; 2 coal streaks at top.
	#3	**630.85**	**631.85**	**1.00**				Q1 Q2				**#3 coal seam**	**1.0m, RC: 0.86m, 0.14m lost at top; shiny, bright; half-broken; co: 630.85-631.05m, 0.20 RC;0.10m, black, soft; parting: 631.19-631.29m, 0.10m, mudstone; co: 631.29-631.85m, 0.5**
		631.85	632.35	0.50								mudstone	black, massive.
		632.35	638.95	6.60		15						Sandstone	white-grey, fine-grained, distorted bedding; with dark mudstone laminae; bedded plane: 15°.
		638.95	640.10	1.15								mudstone	light grey, brown, little bauxitic, massive.
		640.10	640.45	0.35								mudstone	black,massive.
		640.45	**640.80**	**0.35**								**coal seam**	**0.35m, RC:0.35m, broken; shiny, bright, parting: 640.55-640.68m, 0.13m, black, mudstone;**
		640.80	643.00	2.20								mudstone	light black-black, massive; with a few leaf fossil at upper part.
		643.00	649.45	6.45		15						Sandstone	white-grey, fine-grained; interbedded a few layers of light black silty mudstone; at 646.0m,
		649.45	657.86	8.41								mudstone	black-light black, massive; little silty at lower part; at 652.30-653.0m, numberous lenses an
		657.86	**658.06**	**0.20**								**coal seam**	**0.20m, RC: 0.20m; half-broken; shiny, bright, on parting.**
		658.06	663.95	5.89								mudstone	light black-black, massive; at upper part, light black; at lower part, black.
		663.95	667.61	3.66		20						Sandstone	white-grrey, medium-coarse grained; coarser toward base; quartz and dark debris predominately
		667.61	671.00	3.39								siltstone	light-grey, firm.
		671.00	673.45	2.45								mudstone	black, massive; at 672.30m, 0.04m thick, coal seam, shiny; at 672.34m, 0.10m thick, carbonace
		673.45	683.00	9.55		20						Sandstone	white-grey, medium-grained; quartz and dark debris predominately, well-sorted; rounded and un
		683.00	686.70	3.70		20						Sandstone	white-grey, fine-grained; with dark mudstone laminae; at 685.0m, bedded plane: 20°.
	#5	**686.70**	**691.62**	**4.92**				Q3 Q4 Q5		CBM1		**#5 coal seam**	**4.92m, RC: 4.80m, 0.12m lost at 688.88-689.0m; at upper part, intact; at lower part, hal 688.88m, 0.24m, mudstone, black; co:688.88-690.60m, 1.72m, RC: 1.60m, half-broken; partin coal seam: 1.94(0.24)1.72(0.08)0.94m; RC: 1.94(0.24)1.60(0.08)0.94m.**
		691.62	697.90	6.28								mudstone	black, massive.
		697.90	699.40	1.50		20						Sandstone	white-grey, fine-grained; with dark mudstone laminates; bedded plane: 20°; at 698.15m, 0.10m thick
		699.40	701.76	2.36		20						mudstone	black, soft; at 701.20-701.60m, fine sandstone; at 700.0 and 701.40m, bedded plane: 20°.
		701.76	**702.20**	**0.44**								**coal seam**	**0.44m, black, no parting.**
		702.20	703.30	1.10								mudstone	black, rich in coal debris.
		703.30	705.36	2.06								Sandstone	light grey, fine-grained.
		705.36	706.57	1.21								mudstone	dark grey, rich in coal debris.
	#6	**706.57**	**708.20**	**1.63**				Q6 Q7				**#6 coal seam**	**black, bright, intact; parting1: 707.17-707.55m, 0.38m mudstone; parting2: 707.67-707.82**
		708.20	710.20	2.00		15						mudstone	black, with siltstone at the top; bedding plane: 15°.
		710.20	**710.77**	**0.57**								**coal seam**	**0.57m, RC: 0.24m, black, broken, no paarting.**
		710.77	711.07	0.30								mudstone	black, with coal streaks.
		711.07	712.58	1.51								siltstone	grey.
		712.58	713.85	1.27								Sandstone	light grey, fine-grained.
		713.85	717.14	3.29								mudstone	ddark grey; calcite infilled fracture; with coal streak at bottom.
		717.14	720.09	2.95								mudstone	grey, with FGSS.
		720.09	726.40	6.31								mudstone	black, with coal streaks; plant fossil rich in; calcite infilled fracture.
		726.40	728.95	2.55								mudstone	black,very broken; calcite infilled fracture.
		728.95	730.10	1.15								siltstone	grey,calcite infilled fracture.
		730.10	731.60	1.50								mudstone	black, broken.
GATES		731.60	735.18	3.58								siltstone	grey,calcite infilled fracture.
		735.18	740.00	4.82								mudstone	black, calcite infilled fracture, broken, more slickenside.
		740.00	743.15	3.15								siltstone	grey,with coal streak occasionally;
		743.15	759.30	16.15		20						mudstone	black, massive, at 753.0m, a coal streak; at bottom, a few coal streaks; at upper part, lamin
		759.30	759.70	0.40								mudstone	black, carboonaceous, massive; at 759.50-759.60m, 0.10m thick, boney coal seam.
	#7	**759.70**	**760.70**	**1.00**				Q7				**#7 coal seam**	**1.0m, RC:1.0m, very broken, shiny, bright, brittle, no parting.**
		760.70	761.50	0.80								mudstone	black, massive; with few thin coal seams; at 760.80 and 761.50m, coal seam, 0.05m thick each.
		761.50	**761.77**	**0.27**								**coal seam**	**0.27m, RC: 0.27m, broken; shiny, light; structure of coal seam: 0.08(0.06)0.13m.**
		761.77	769.35	7.58								mudstone	black, silty at upper part; at top, laminated fine sandstone; at lower part, a few coal strea
	#7-1	**769.35**	**770.00**	**0.65**								**#7-1 coal seam**	**0.65m, RC: 0.15m, 0.50m lost at top; half-broken, shiny,bright, light, no parting.**
		770.00	775.85	5.85		20						mudstone	black, massive, carbonaceous in part; numberous coal lenses and laminae throught; with a fe thick each.
	#8	**775.85**	**777.03**	**1.18**				Q9				**#8 coal seam**	**1.18m, RC: 0.60m, 0.58m lost at lower part; broken into pieces, bright, shiny, light, no**
		777.03	777.80	0.80								mudstone	black to carbonacous, carbonaceous in part; with coal lenses and streaks throughout.
		777.80	**778.20**	**0.40**								**coal seam**	**0.40m, RC:0.40m, intact, shiny, bright, light, blocky, no parting.**
		778.20	781.60	3.40								mudstone	black, massive; numberous lenses and few coal streaks; at 780.30m, 0.05m thick, coal seam, sh
		781.60	801.60	20.00		20→25						Sandstone	white-grey, medium-grained; laminated light black-black mudstone; at 794.0-794.20m, 2 layers plane:20°; at 800.0m, bedded plane:25°; at 801.10-801.60m, broken, vertical fracture NO: 10.
		801.60	803.20	1.60								mudstone	black, massive.
	#9	**803.20**	**808.46**	**5.26**				Q10 Q11		CBM2		**#9 coal seam**	**5.26m, RC: 5.10m, 0.16m lost at top; shiny, bright, light, brittle, no parting; broken, s**
		808.46	809.90	1.44								mudstone	black, massive.
		809.90	815.00	5.10		30						Sandstone	light grey, with dark grey mudstone laminae; mediuum-grained; quartz and dark debris predomin
		815.00	825.18	10.18		30						Sandstone	white-grey, medium-grained; coarser toward baase; quartz and debris predominately; with dark 823.0-824.50m, a few calcite veins at different direction; at 823.0m, bedded plane: 30°.
		825.18	831.70	6.52								mudstone	black, rich in leaf fossil and carbonizatioon of leaf fossil; at lower part, few coal lenses;
		831.70	833.00	1.30		30						Sandstone	white-grey, fine-grained; with dark mudstone laminates; bedded plane: 30°.
		833.00	838.40	5.40								mudstone	black, massive; at lower paart, rich in leaf fossil and numberous coal lenses and streaks.
		838.40	**839.05**	**0.65**								**coal seam**	**0.65m, RC:0.05m, few coal coal debris left, 0.60m lost; dull; no parting.**
		839.05	839.42	0.37								mudstone	black, massive.
	#10	**839.42**	**841.40**	**1.98**				Q12				**#10 coal seam**	**1.98m, RC:0.35m; 1.63m lost at top, broken, no parting, shiny, bright.**
		841.40	842.70	1.30								mudstone	black, massive; at 841.80m, coal seam, 0.08m, shiny, light; at 842.22-842.45m, 0.23m, RC:0.23
		842.70	843.70	1.00		35						Sandstone	white-grey, medium-grained; bedded plane:35°.
		843.70	844.70	1.00								mudstone	black, massive; at middle part, a few coal streak; at 844.0m, 0.10m thick,coal seam; very br
		844.70	854.00	9.30		25						Sandstone	white-grey, medium-fine grained; finer toward base; with light grey mudstone laminae; at 850.
		854.00	856.20	2.20		30						mudstone	light grey, little silty; at 855.0m, bedded plane: 30°.
		856.20	862.25	6.05		30						Sandstone	white-grey, medium-coarse grained; coarser toward base; dark debris and quartz predominately;
		862.25	**862.38**	**0.13**								**coal seam**	**0.13m, RC: 0.13m, shiny, bright, brittle, no parting.**
		862.38	864.25	1.87								mudstone	black,massive; carbonaceous at upper part; rich in leaf fossil throughout.
		864.25	865.00	0.75								mudstone	brown-grey,bauxitic, massive, soft.
		865.00	874.30	9.30		30						mudstone	light black-black; interbedded thin layers of white-grey fine sandstone; horizontal bedding p
		874.30	887.87	13.57		30→20						mudstone	black, masive, brittle; at 879.0-878.0m and 879.80-880.70m, numberous coal lenses and leminat and streaks; from 883.0-886.0m, mudstone laminated fine sandstone; at 882.50 and 884.0m, bedd
	#12	**887.87**	**889.05**	**1.18**				**Q13**				**#12 coal seam**	**1.18m, RC:0.30m, 0.88m lost at top; broken; shiny, bright, brittle, blocky, no parting.**
		889.05	889.17	0.12								mudstone	black, massive; a few coal lenses throughout.
		889.17	893.25	4.08		35						mudstone	black, at bottom, a coal streak; interbedded thin layers of medium sandstone; at 889.0m, bedd
		893.25	915.45	22.20		30						Sandstone	white-grey, medium-fine grained; quartz and debris predominately; rounded , well-sorted; fine
		915.45	941.00	25.55		35→50						Sandstone	white-grey, fine-grained; firm, hard; interbedded thin layers of black mudstone; at 919.40-92 plane: 35°; at 923.0m, bedded plane 40°; at 928.0m, bedded plane: 45°; at 935.0 and 940.0m, bedded plane:50°

Finished depth: 941.0m