BC Geological Survey
Coal Assessment Report
989

COAL ASSESSMENT REPORT TITLE PAGE AND SUMMARY

TITLE OF REPORT: **Coal assessment report for the Hudette coal property, British Columbia**

TOTAL COST: **$1,769,032**

AUTHOR(S): **M. Sultan**

SIGNATURE(S):

NOTICE OF WORK PERMIT NUMBER(S)/DATE(S): **CX9-051**

YEAR OF WORK: **2011, 2012, and 2013**

PROPERTY NAME: **Hudette**

COAL LICENSE(S) AND/OR LEASES ON WHICH PHYSICAL WORK WAS DONE:
Coal Licences 392474, 392476, 392550, and 392553

MINERAL INVENTORY MINFILE NUMBER(S), IF KNOWN:

MINING DIVISION: **Liard**

NTS / BCGS: NTS 093O/8; BCGS 093O.050

LATITUDE: **55° 28' 22" North**; LONGITUDE: **122° 05' 17" West** (at centre of work)

UTM Zone: 10N EASTING: **557649** NORTHING: **6147791**

OWNER(S): **Walter Canadian Coal Partnership**

MAILING ADDRESS: **235 Front Street, Unit 200, Tumbler Ridge, BC, V0C 2W0**

OPERATOR(S) [who paid for the work]: **Walter Canadian Coal Partnership**

MAILING ADDRESS: **235 Front Street, Unit 200, Tumbler Ridge, BC, V0C 2W0**

REPORT KEYWORDS (lithology, age, stratigraphy, structure, alteration, mineralisation, size and attitude). **coal, Gething Formation, Dresser Formation, Crassier Group, Beaudette Group, Fort St. John Group, anticlines, synclines, thrust faults**

REFERENCES TO PREVIOUS ASSESSMENT WORK AND ASSESSMENT REPORT NUMBERS: **Coal Assessment Reports 522, 523, 524, 525, 526, 582, 583, 584, 585, 586, 587, 588, 888, 936, 966, 972, 979, 984**

SUMMARY OF TYPES OF WORK IN THIS REPORT		EXTENT OF WORK (in metric units)	ON WHICH TENURES
GEOLOGICAL (scale, area)			
	Ground, mapping	**1:10,000 over 1764 hectares**	
	Photo interpretation	**1:20,000 over 1764 hectares**	
GEOPHYSICAL (line-kilometres)			
	Ground (Specify types)	**nil**	
	Airborne	**nil**	
	(Specify types)		
	Borehole		
	Gamma, Resistivity, **in 55 boreholes**	**10890.52 m**	**392474,392476, 392550, and 392553**
	Resistivity **in 55 boreholes**	**10890.52 m**	**392474,392476, 392550, and 392553**
	Caliper **in 55 boreholes**	**10890.52 m**	**392474,392476, 392550, and 392553**
	Deviation **in 56 boreholes**	**11003.38 m**	**392474,392476, 392550, and 392553**
	Dip **in 22 boreholes**	**4681.05 m**	**392476, 392550, and 392553**
	Others **Density in 55 boreholes** **Neutron in 56 boreholes**	**10890.52 m** **11161.34 m**	**392476, 392550, and 392553** **392476, 392550, and 392553**
	Core **partial or complete in 9 boreholes**	**704.19 m**	**392476 and 392553**
	Non-core **(rotary) in 53 boreholes**	**10169.43 m**	**392474,392476, 392550, and 392553**

SAMPLING AND ANALYSES			
Total # of Samples **56**			**392476 and 392553**
	Proximate	**56**	**392476 and 392553**
	Ultimate	**28**	**392476**
	Petrographic	**28**	**392476**
	Vitrinite reflectance	**28**	**392476**
	Coking	**nil**	
	Wash tests	**56**	**392476 and 392553**
PROSPECTING (scale/area)		**nil**	
PREPARATORY/PHYSICAL			
Line/grid (km)		**nil**	
Trench (number, metres)		**nil**	
Bulk sample(s)		**nil**	

Appendix B and Appendix C 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

1 Table of contents

1.1 List of tables

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2 Introduction

2.1 Scope of report

This report is submitted by Walter Canadian Coal Partnership (WCCP) in keeping with the provisions of the *Coal Act* and the *Coal Act Regulation*, with respect of exploratory activities on Crown coal tenure within British Columbia.

This report documents the work completed on WCCP's Hudette property, situated within the Brazion coalfield, in northeastern British Columbia. WCCP acquired the coal licenses of Hudette area in 2001 and 2002. The field investigations by WCCP (previously Western Canadian Coal) began in 2010 and continued during 2011, 2012 and 2013. These efforts have primarily focused in tenure numbers 392474, 392476, 392550 and 392553 (**Map-2-1**). This report presents the results of geological investigations comprising geological mapping, drilling, borehole geophysical logging, and coal analysis, conducted between May 2010 and December 2013. The exploration programme was conducted by personnel working in WCCP's Vancouver, Canada office, and written by personnel based from WCCP's field office in Tumbler Ridge, Canada.

2.2 Objectives

The Hudette coal property is located in the coal bearing Peace River Region. WCCP had operating coal mines in the north (Willow Creek Mine) and south (Brule Mine) of this property. The geological data from publicly available coal exploration reports (**Table 3-1**) suggest that coal bearing Gething Formation is widely exposed in the area. The historic drilling data in the area confirm subsurface coal seams of mineable thickness. The coal mined within the Brule and Willow Creek mines also is hosted by the Gething Formation. However, the geology of the area is very complex, and needed to be examined in great detail before the Hudette property could be accurately evaluated. For this reason, WCCP designed a phased and detailed exploration programme in the area on the basis of existing information. The purpose of the exploration programme was to confirm and expand the existing knowledge of coal geology and estimation of coal resources for potential future mining in the area.

The main objectives of the first phase of the programme were:

a. to conduct geological mapping to better understand the stratigraphy and structure of coal measures;
b. to understand the distribution of coal bearing rocks in license area;
c. to confirm the presence and thickness of coal seams within the property; and
d. to recommend a drilling program to validate the presence of possible viable coal seams

The first phase of the project was followed by drilling a number of diamond core and rotary drill holes. The drill hole data was analysed for lithology, seam identification and correlation, geological structure and coal quality. From this information, a preliminary geological model for the entire property was built, which defines the best coal prospects on the license.

2.3 Property description

The Hudette licenses are located in northeastern British Columbia and lie within the Liard mining district. The property is approximately centred on latitude 55° 26' 59" west and longitude

122° 03' 48" north, at UTM (NAD83 Zone 10) coordinates of 6145253 northing and 559246 easting. The property consists of twenty contiguous coal licenses (391078 through 391083 inclusive, 391530 through 391532 inclusive, 392474 through 391478 inclusive, and 392549 through 392553 inclusive) located in NTS map-area 93O/8 (as depicted within **Map 2-1**). These licenses cover an area of 5880 hectares.

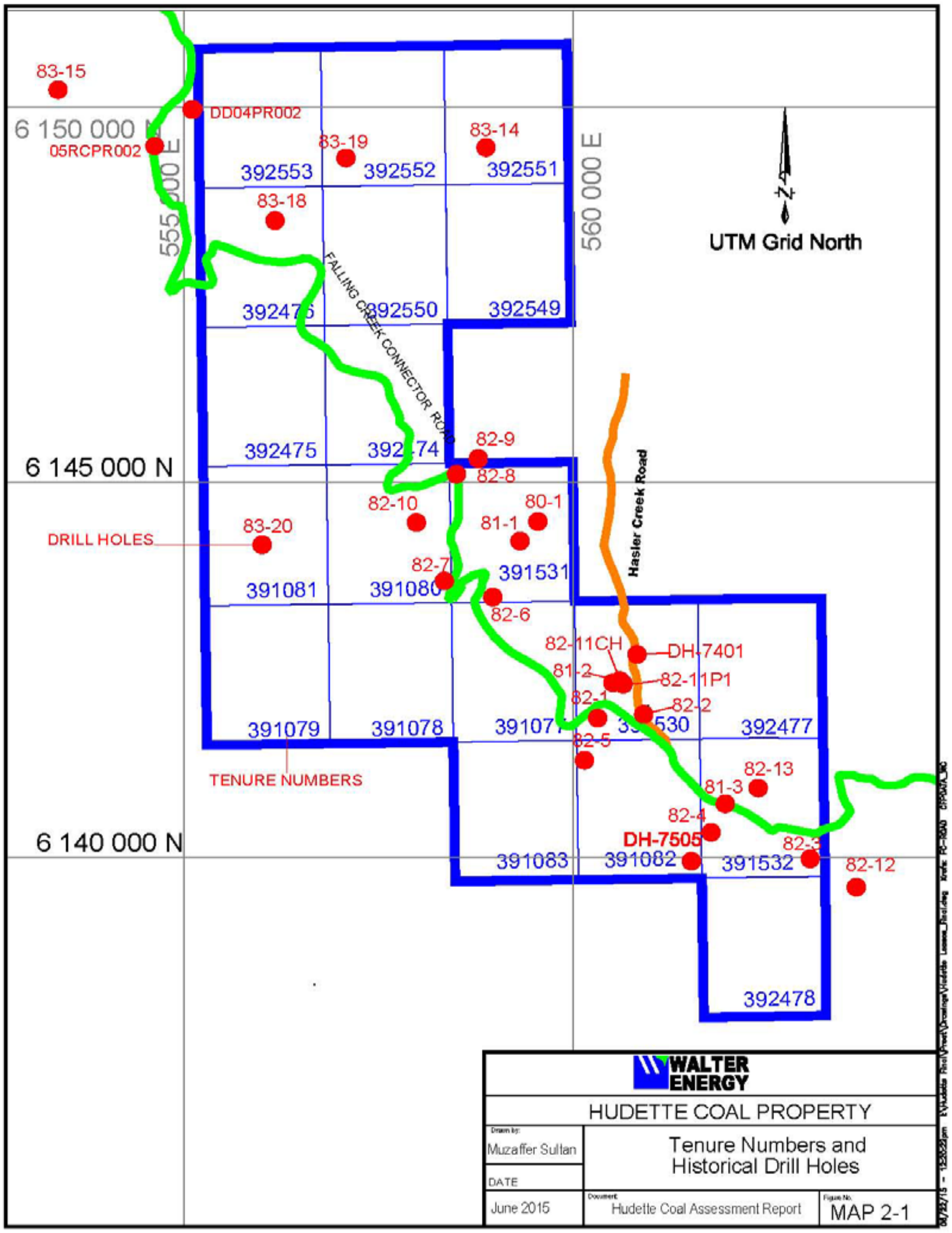
A separate assessment report concerning the Hudette Trend portion of the property (tenures 391530, 391531, 391532, 392477 and 392478) has been recently submitted by Gwyneth Cathyl-Huhn (2015), presenting the results of two current boreholes drilled along the property's eastern boundary. A statement of inactivity has been also been recently filed concerning the Hudette Southwest portion of the property (tenures 391077 through 391083 inclusive), where no current work has been done.

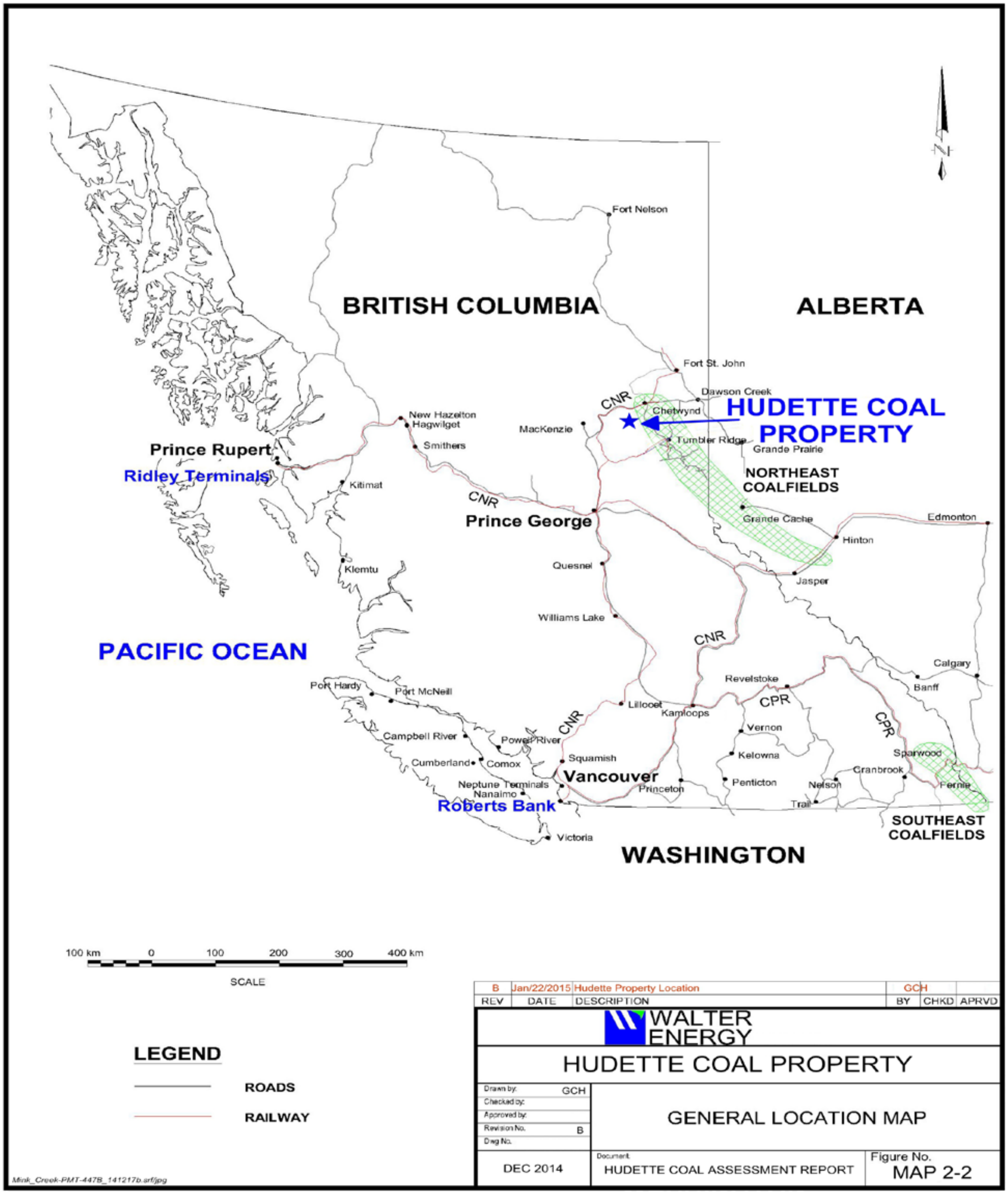
Table 2-1 shows relevant information for each individual license, and **Map 2-1** shows the location of each license as well as historical drill holes in each license.

Table 2-1: Tenures comprising the Hudette property

Tenure Number	Owner No. (% ownership)	Type of Tenure	Map Number	Date Acquired	Area (hectares)	Property
391077	140768 (100%)	Coal License	093O050	December 4, 2001	294	Hudette (Brazion)
391078	140768 (100%)	Coal License	093O050	December 4, 2001	294	Hudette (Brazion)
391079	140768 (100%)	Coal License	093O050	December 4, 2001	294	Hudette (Brazion)
391080	140768 (100%)	Coal License	093O050	December 4, 2001	294	Hudette (Brazion)
391081	140768 (100%)	Coal License	093O050	December 4, 2001	294	Hudette (Brazion)
391082	140768 (100%)	Coal License	093O040	December 4, 2001	294	Hudette (Brazion)
391083	140768 (100%)	Coal License	093O040	December 4, 2001	294	Hudette (Brazion)
391530	140768 (100%)	Coal License	093O050	January 8, 2002	294	Hudette (Brazion)
391531	140768 (100%)	Coal License	093O050	January 8, 2002	294	Hudette (Brazion)
391532	140768 (100%)	Coal License	093O040	January 8, 2002	294	Hudette (Brazion)
392474	140768 (100%)	Coal License	093O050	April 3, 2002	294	Hudette (Brazion)
392475	140768 (100%)	Coal License	093O050	April 3, 2002	294	Hudette (Brazion)
392476	140768 (100%)	Coal License	093O050	April 3, 2002	294	Hudette (Brazion)
392477	140768 (100%)	Coal License	093O050	April 3, 2002	294	Hudette (Brazion)
392478	140768 (100%)	Coal License	093O050	April 3, 2002	294	Hudette (Brazion)
392549	140768 (100%)	Coal License	093O050	April 8, 2002	294	Hudette (Brazion)
392550	140768 (100%)	Coal License	093O050	April 8, 2002	294	Hudette (Brazion)
392551	140768 (100%)	Coal License	093O050	April 8, 2002	294	Hudette (Brazion)
392552	140768 (100%)	Coal License	093O050	April 8, 2002	294	Hudette (Brazion)
392553	140768 (100%)	Coal License	093O050	April 8, 2002	294	Hudette (Brazion)

Note: These tenures are currently held by 0541237 B.C. Ltd. as trustee for and on behalf of WCCP, pursuant to the declaration of trust entered into by 0541237 B.C. Ltd. in favour of WCCP dated November 22, 2012. Map numbers in the table above refer to the British Columbia Geographic System (BCGS).


83-15
DD04PR002
6 150 000 N
05RCPR002
555 000 E
560 000 E
83-19
83-14
392553
392552
392551
83-18
UTM Grid North
FALLING CREEK CONNECTOR ROAD
392550
392549
392475
82-9
82-8
6 145 000 N
82-10
80-1
81-1
Hasler Creek Road
83-20
DRILL HOLES
82-7
391531
391081
391080
82-6
82-11CH
DH-7401
81-2
82-11P1
82-2
391079
391078
392477
82-5
82-13
TENURE NUMBERS
81-3
82-4
DH-7505
6 140 000 N
391083
391082
391532
82-12
392478
WALTER ENERGY
HUDETTE COAL PROPERTY
Drawn by:
Muzaffer Sultan
Tenure Numbers and
Historical Drill Holes
DATE
June 2015
Document
Hudette Coal Assessment Report
Figure No.
MAP 2-1


BRITISH COLUMBIA
ALBERTA
PACIFIC OCEAN
WASHINGTON
HUDETTE COAL PROPERTY
NORTHEAST COALFIELDS
SOUTHEAST COALFIELDS
Fort Nelson
Fort St. John
Dawson Creek
Chetwynd
Tumbler Ridge
Grande Prairie
MacKenzie
New Hazelton
Hagwilget
Smithers
Prince Rupert
Ridley Terminals
Kitimat
Prince George
Grande Cache
Edmonton
Hinton
Jasper
Quesnel
Klemtu
Williams Lake
CNR
CPR
Calgary
Revelstoke
Banff
Port Hardy
Port McNeill
Lillooet
Kamloops
Vernon
Campbell River
Powell River
Squamish
Kelowna
Sparwood
Cumberland
Comox
Vancouver
Penticton
Cranbrook
Nelson
Fernie
Neptune Terminals
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SCALE
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B
Jan/22/2015
Hudette Property Location
GCH
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DESCRIPTION
BY
CHKD
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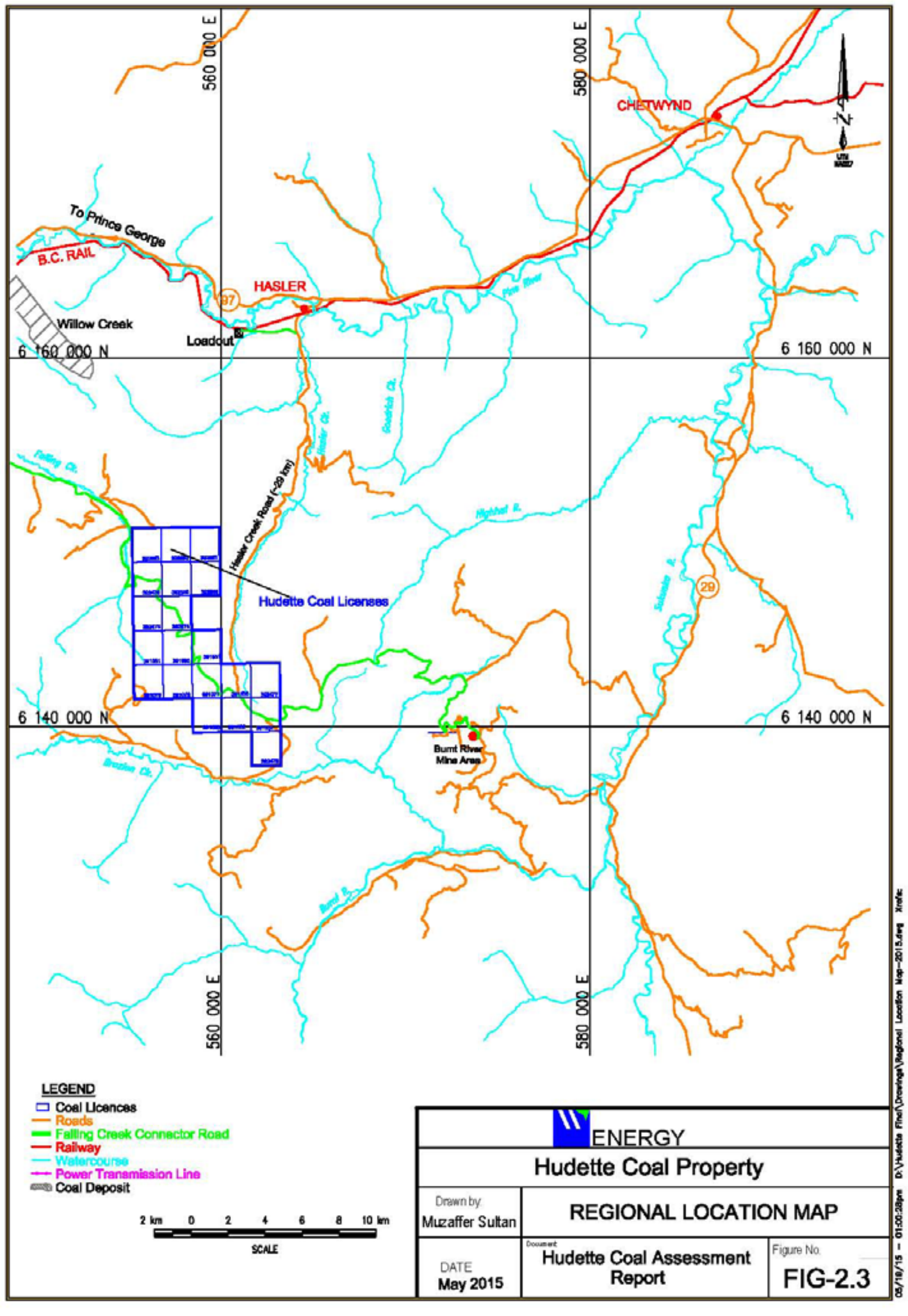
WALTER ENERGY
HUDETTE COAL PROPERTY
Drawn by: GCH
Checked by:
Approved by:
Revision No. B
Dwg No.
GENERAL LOCATION MAP
DEC 2014
Document
HUDETTE COAL ASSESSMENT REPORT
Figure No.
MAP 2-2
Mink_Creek-PMT-447B_141217b.srf/jpg


560 000 E
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Burnt River Mine Area
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LEGEND
Coal Licences
Roads
Falling Creek Connector Road
Railway
Watercourse
Power Transmission Line
Coal Deposit
2 km 0 2 4 6 8 10 km
SCALE
ENERGY
Hudette Coal Property
Drawn by:
Muzaffer Sultan
REGIONAL LOCATION MAP
DATE
May 2015
Hudette Coal Assessment Report
Figure No.
FIG-2.3

2.4 Location and Access

The Hudette coal property lies in the Peace River District of northeast British Columbia, Canada. Chetwynd town, located on Highway 97, with a population of 2500 to 3000 (2633 in 2006 census), is the closest population centre in the area. The Hudette property is approximately 55 kilometres southwest of Chetwynd.

The Hudette property is located 135 kilometres south of Fort St John, 100 kilometres west of Dawson Creek, and 310 kilometres east of Prince George. Vancouver is 725 kilometres to the south of the property (**Map 2-2**). Regular flights connect Vancouver to Fort St. John.

Primary access to the property from Chetwynd is via paved Highway 97, which intersects the Hasler Creek Forestry Road, 24 kilometres west of Chetwynd. The Hasler Creek Forestry Road southward at kilometre 26.5 joins the northward extending Falling Creek Connector Road at kilometre 38.5 (**Map 2-3).** The junction of Falling Creek Connector Road and Hasler Creek Forestry Road is in the south east corner of the Hudette property (**Map 2-1**). The Falling Creek Connector Road traverses the property from south to north (**Map 2-1 and Map 2-3**). The current exploration area approximately extends from kilometre 23 to kilometre 27 on the Falling Creek Connector Road. Alternate access to the property is provided from the Willow Creek Mine. From Chetwynd, the Willow Creek Forestry Road is west, approximately 45 kilometres via paved Highway 97. The Willow Creek Forestry Road joins the Falling Creek Road at kilometre 4 which runs through the property from north to south.

2.5 Climate

The climate of the area is described as cool continental with frigid winters and warm summers. Average annual rainfall and snowfall are 306 millimetres and 169 centimetres respectively. The average frost free period ranges 84 to 91 days and about 30 days with some fog are expected per year. The mean daily temperature in the region is 15.4 C in July and -10.7 C in January, (all data at Chetwynd).

2.6 Geographic setting

The Hudette property lies within the foothills of the Rocky Mountains. The region is characterised by steep mountains commonly trending northwest-southeast. The elevation ranges from 1000 to 1631 metres above sea level. The property is heavily forested. Well-incised creeks are common. Vegetation in the region is predominantly pine, spruce and low level scrub.

2.7 Acknowledgements and professional responsibility

Thanks are due to many past and present workers:

- This report was reviewed by Gwyneth Cathy-Huhn P.Geo. (Senior colliery geologist at Walter Energy). She made many valuable suggestions and many of her suggestions are included in this report. The author is very thankful for her technical support.
- Ian MacLeod P.Geo. (formerly a Walter energy employee) was involved in field activities during year-2011 and year-2012. The data collected by him is included in this report.
- David Lortie P.Geo. (former Chief Geologist at Walter Energy) provided technical and administrative support in the years 2011 and 2012.

- Blake Snodsmith, at Jim Walter Resources provided administrative support in the year-2013.

Muzaffer Sultan P.Geo. accepts professional responsibility for data and conclusion presented within this report.

3 Exploration

3.1 History of exploration

The Peace River coalfields extend for 400 kilometres along the Rocky Mountain Foothills of northeastern British Columbia. Coal was first discovered in the Peace River District in 1793, by Alexander MacKenzie's exploring expedition (MacKenzie, 1801). The first coal licenses were granted in 1908, but lack of infrastructure restricted mining to small scale operations serving local needs. The Hasler Creek Coal Company first developed a mine at Hasler Creek in 1943, and mined 4500 tons of coal during 1944 and 1945 for use by the Northern Alberta Railways on their lines within the Peace River region (Spivak, 1944; Stott, 1973). Prior to 1980, less than 100,000 tons were mined (Ryan, 2002).

The expansion of steel production in mid-1960's stimulated exploration for metallurgical coking coal. In western Canada, exploration focused largely within the Rocky Mountain Foothills of British Columbia and Alberta. By the mid 1970's, most of the land with coal potential had been acquired by mining and oil and gas consortiums. An agreement between companies within the Japanese steel industry, the Governments of Canada and British Columbia, along with Denison Mines Limited and Teck Corporation was signed in February 1981 to develop the Quintette and Bullmoose Mines in northeastern British Columbia. The Japanese steel-making companies agreed to buy 115 million tonnes of metallurgical and thermal coal from these mines over a period of 15 years. The township of Tumbler Ridge was constructed in the following years, along with rail, highway, electrical power, and port facilities. Coal shipments began from the Quintette and Bullmoose mines in 1983 and 1984, and continued until exhaustion of then-economic reserves in 2000 and 2003, respectively.

Historic (pre-2011) exploratory work in Hudette property includes regional geological mapping, 25 widely spaced boreholes and limited coal-quality data. Locations of historical boreholes are shown in **Map 2-1** and **Table 3-2,** and coal intersections in these holes are presented in **Table 3-3**. The Hudette property in previous Assessment Reports is generally discussed with the Pine Pass and Falling Creek properties. **Table 3-1** lists historic exploration reports consulted for the present report.

Table 3-1: Cross-reference to historic coal assessment reports

Company	Author	Coal Assessment Report number	Year	Property	Map-areas (within the National Topographic System)	Lati-tude	Longi-tude	UTM (NAD83, Zone 10)	
								Easting	Northing
Koporok Mines	Pringle, 1968	582	1968	Pine Pass	93P/9, 93P/8, 93P/5	55.497	122.33	542327	6150303
Pan Ocean Oil	Dyson, 1973	583	1973	Pine Pass	93P/5, 93O/8,93 O/9	55.3	122.1	557141	6128545
McIntyre Mines	Dyson, 1975-1	526	1975	Fall Mountain	93P/5, 93O/8,93 O/9	55.579	122.22	549489	6159505
Pan Ocean Oil	Dyson, 1975-2	584	1975	Pine Pass	93P/5, 93O/8,93O/9	55.3	122.1	557141	6128545
Pan Ocean Oil	Dyson, 1977	585	1977	Pine Pass	93P/5, 93O/8, 93O/9	55.3	122.1	557141	6128545
Shell Canada	Panchy, 1979	586	1979	Pine Pass	93O/9	55.6	122.24	547782	6161823
Norcen Energy	Newson, 1980	587	1980	Pine Pass	93P/7, 93O/9	55.535	122.06	559390	6154730
Norcen Energy	Newson, 1980	588	1980	Pine Pass	93P/7, 93O/9	55.535	122.06	559390	6154730
Esso Resources	Water, 1981	522	1980	Falling Creek	93O/8, 93O/9 ,93P/4	55.416	122	563303	6141614
Esso Resources	Klatzel-Mudry *et al.*, 1982	523	1981	Falling Creek	93O/8, 93O/09, 93P/5	55.423	122.04	560571	6142281
Esso Resources	Klatzel-Mudry *et al.*, 1982	524	1982	Falling Creek	93O/8, 93O/9, 93P/04	55.422	122.05	563294	6142208
Esso Resources	Klatzel:Mudry *et al.*, 1984	525	1983	Falling Creek	93O/8, 93O/9, 93P/5	55.472	122.04	560623	6147735
Kennecott	Hovis *et a*l, 2006	888	2006	Falling Creek	93O/8, 93O/9	55.506	122.139	554300	6151550

3.1.1 Regional exploratory context

The earliest coal exploration in the Hudette area was conducted from 1946 to 1951 by the Coal Division of the then-extant British Columbia, Department of Lands and Forests to estimate mineable coal reserves near the proposed railway route through the Peace River District. The exploration programme consisted of geological mapping, trenching and 14,830 metres (48,653 feet) of diamond drilling. The work was mainly conducted in the Noman Creek, Willow Creek, and Hasler Mine areas. A summary report, presenting results of this work, was published as a provincial government bulletin (McKechnie, 1955).

No exploration or mine-development activities in the area are known to have been conducted between the years 1951 and 1963, other than geological mapping by workers within the petroleum industry.

During the 1960s, with sponsorship by the British Columbia Department of Mines, J.E. Hughes conducted reconnaissance geological mapping of the Pine Pass area, followed by regional geological mapping on 1:63,360 scale. Results were initially published as a dissertation for McGill University (Hughes, 1963), and subsequently as Department of Mines bulletins (Hughes, 1964, 1967).

In 1968 and 1969, Brameda Resources restarted exploration work in the Norman Creek Area (half-way between Pine Pass and the town of Chetwynd), drilling 23 cored drill holes totalling 4,786 metres. Trenching was also conducted, and field mapping was done at a scale of 1:4800 (as reported by Panchy, 1979).

Pan Ocean Oil Limited (Pan Ocean) began exploration activity in the autumn of 1972, and completed field mapping and drilling of five boreholes (designated as H1 through H5) in early 1973. The area on the divide between Willow Creek and Johnson Creek (situated to the northeast of the Hudette property) was chosen for drilling because of generally low dips, demonstrated presence of thicker coal seams, and relatively easy access for drilling.

Pan Ocean drilled ten more widely-spaced boreholes in 1974-1975 (Dyson, 1975) to test the coal-bearing sequence across their holdings. Two of these holes (DH-7401 and DH-7505**,** with results shown in **Table 3-3**) are located in the southern part of the Hudette property. Two other boreholes (75-03 and 75-07) were drilled in the adjacent Mink Creek property. Pan Ocean's drilling indicated that the best potential for economic deposits lay within the upper portion of the Gething coal-measures.

During 1976-1977, Pan Ocean drilled three more boreholes (situated to the northeast of, and well outside, the Hudette property) in an attempt to define the site for an exploratory adit. These holes intersected coal seams, but the adit programme was unsuccessful due to thick overburden and to unexpected faulting (Dyson, 1977).

In 1979, Norcen Energy, acting under a joint venture agreement with Pan Ocean, carried out field mapping at 1:10,000 scale and the drilling of seven additional boreholes (also outside the Hudette property), with a cumulative coring length of 1700 metres (Newson, 1979). The mapping was not very helpful due to lack of exposures.

In May of 1980, the Norcen / Pan Ocean licenses were relinquished and subsequently acquired by Esso Resources (Klatzel-Mudry *et al.*, 1981). Esso Resources drilled one hole in 1980 and three more holes in 1983. All of these holes are within the Hudette property (**Map 2-1**).

Esso continued mapping and drilling in 1982 (Klatzel-Mudry *et al*., 1982), drilling fourteen more holes within the Hudette property (**Map 2-1**). All of these holes were drilled by the air-rotary method, except for one borehole, 11P1. Chip samples were taken every three metres and described in detail for all of these holes(Klatzel-Mudry *et al*., 1982). A suite of geophysical logs consisting of natural gamma, bulk density, neutron, caliper, deviation and dipmeter was also run on every hole. Coal seams were intersected in the upper half of the Gething Formation. Major coals were named, from top down, Brenda Seam (6.5 metres thick, and well-correlated by this work), Twin Seam (3.3 metres), Dave Seam (2.6 metres), Rat Seam (2 metres), High Gamma Seam (<1 metre), and Contact Seam (1.5 to 2 metres).

In 1983, Esso drilled eight additional holes in and around the Hudette property. These holes were continuously-cored by means of a diamond-drill, and geophysically logged. They ranged in depth from 77 to 384 metres. The 1983 drilling was intended to intersect the Moosebar - Gething formational contact, with the expectation of using it as a datum for coal seam correlations. Four holes (83-14, 83-18, 83-19, and 83-20) lie within the Hudette property. Esso's work halted in 1984 as the coal market declined.

Exploration activity resumed in 2004, when Kennecott Exploration Company carried out geological mapping and drilling. Geological mapping was limited to outcrops in the road cuts of logging roads. Fourteen year-2004 and 2005 holes, including diamond-drill and rotary-drill holes, were drilled (Hovis *et al*, 2006). One borehole (DD04PR002) is located in the northeastern corner of the Hudette property, whereas borehole 05RCPR05 lies just west of the property.

The Coal Section of the British Columbia Geological Survey, part of the Ministry of Energy, Mines and Petroleum Resources performed mapping of the Hudette area and surroundings on 1:50,000 from 1991 to 1993. A geological compilation map of the Peace River coalfields, at a scale of 1:200,000, was published by Legun (2003).

The Mink North coal property, belonging to Walter Canadian Coal Partnership (Cathyl-Huhn, 2015b), and the Willow Creek coal lease, belonging to the Willow Creek Coal Partnership (Cathyl-Huhn, 2015c), are located to the north of Hudette property. Geological data from this area can be helpful for regional correlation of coal seams in the Hudette, Mink North and Willow areas.

3.1.2 Historical drill hole data

The data presented in **Tables 3-2** and **3-3** were compiled from historic coal-assessment reports and WCCP’s database. Historic geophysical logs of a few holes were re-examined, and interpretations were refined wherever possible. The Universal Transverse Mercator (UTM) grid-reference coordinates were also changed from NAD27 to NAD83.

Table 3-2: Location of historical drill holes in the Hudette area

Coal Report No.	Borehole	Company Name	NAD83 Easting	NAD83 Northing	Elevation	Total Depth	Starting Formation	Orientation	Drilling Method
	DH-7401	Pan Ocean Oil	560818	6142704	1127	227	No data	Vertical	Diamond
584	DH-7505	Pan Ocean Oil	561515	6139950	1280	349	Gething	55°	Diamond
584	DH-7508	Pan Ocean Oil	558326	6151698	1097	362	Gething	60°	Diamond
522	80-1	Esso Minerals	559543	6144476	1100	269	Gething	Vertical	Diamond
523	81-1	Esso Minerals	559314	6144215	1220	283	Gething	Vertical	Diamond
523	81-2	Esso Minerals	560509	6142327	1185	340	Gething	Vertical	Diamond
523	81-3	Esso Minerals	561949	6140718	1183	292	Gething?	Vertical	Diamond
524	82-1	Esso Minerals	560314	6141855	1272	1988	Gething	Vertical	Rotary
524	82-2	Esso Minerals	560878	6141940	1165	198	Gething	Vertical	Rotary
524	82-3	Esso Minerals	563044	6139985	1140	180	Gething	Vertical	Rotary
524	82-4	Esso Minerals	561769	6140335	1237	201	Gething	Vertical	Rotary
524	82-5	Esso Minerals	560144	6141295	1338	198	Gething	Vertical	Rotary
524	82-6	Esso Minerals	558967	6143467	1255	201	Gething	Vertical	Rotary
524	82-7	Esso Minerals	558341	6143685	1230	200	Gething	Vertical	Rotary
524	82-8	Esso Minerals	558499	6145105	1269	200	Gething	Vertical	Rotary
524	82-9	Esso Minerals	558779	6145310	1258	200	Gething	Vertical	Rotary
524	82-10	Esso Minerals	557984	6144460	1352	171	Gething	Vertical	Rotary
524	82-11P1	Esso Minerals	560639	6142310	1177	27	Gething	Vertical	Rotary
524	82-11P2	Esso Minerals	560562	6142351	1187	50	Gething	Vertical	Rotary
524	82-11CH	Esso Minerals	560599	6142355	1187	11	Gething	Vertical	Diamond
524	82-12	Esso Minerals	563632	6139606	1105	200	Gething	Vertical	Rotary
524	82-13	Esso Minerals	562372	6140926	1152	171	Gething	Vertical	Rotary
525	83-14	Esso Minerals	558879	6149455	1335	336.11	Gething	Vertical	Diamond
525	83-15	Esso Minerals	553382	6150225	1185	205.96	Moosebar	Vertical	Diamond
525	83-18	Esso Minerals	556169	6148480	1282	201.77	Moosebar	Vertical	Diamond
525	83-19	Esso Minerals	557079	6149315	1292	251.66	Gething	Vertical	Diamond
525	83-20	Esso Minerals	556004	6144165	1575	232.97	Gething	Vertical	Diamond
888	DD04PR002	Kennecott	555108	6149960	1067	290.93	Moosebar	Vertical	Diamond
888	05RCPR002	Kennecott	554624	6149476	1100	204.22	Moosebar	Vertical	Reverse Circulation

Table 3-3: Coal seam intervals of historic boreholes

Hole DH-7401
No significant coal thickness, faulted section, no data for collar.

Hole DH-7505		
From	To	Thickness
28.65	29.26	0.61
37.49	38.4	0.91
57.3	59.74	2.44
109.88	110.16	0.28
113.19	113.5	0.31
171.45	173.12	1.67
222.07	227.16	5.09
247.1	247.8	0.70
299.61	300.53	0.92

Hole DH-7508		
From	To	Thickness
45.42	46.63	1.22
71.32	72.85	1.52
73.76	74.25	0.49
80.56	84.00	3.44
103.63	105.46	1.83
131.06	133.20	2.13
160.93	163.37	2.44
181.66	182.88	1.22
201.17	202.39	1.22
203.00	205.44	2.44
275.23	275.69	0.46
283.46	283.83	0.37
287.43	287.64	0.21
302.97	303.58	0.61
312.72	313.64	0.91
320.59	321.26	0.67
328.57	330.40	1.83
342.66	343.81	1.16
355.70	360.27	4.57

Hole 80-1		
From	To	Thickness
97	97.6	0.60
98.6	99.1	0.50
118.4	118.8	0.40
219.6	220.8	1.20

Hole 81-1		
From	To	Thickness
27.8	28.6	0.8
31.2	31.8	0.6
40.8	41.8	1
172.4	174.3	1.9

Hole 81-2		
From	To	Thickness
6.02	7.85	1.83
8.95	10.3	1.35
38	39.9	1.9
49.25	50.14	0.89
92.1	92.85	0.75
96.8	97.41	0.61
98.21	98.63	0.42
109.8	110.69	0.89
112.82	114.74	1.92
115.5	117.52	2.02
127.9	128.7	0.8
139.84	140.76	0.92
144.72	145.37	0.65
214	214.6	0.6
219.14	223.32	4.18
247.9	248.3	0.4
253.49	254.06	0.57
256.44	256.88	0.44
257.16	257.63	0.47
258.87	259.24	0.37

Table 3-3: Coal seam intervals of historic boreholes (continued)

Hole 81-3		
From	To	Thickness
53.86	55.06	1.2
62.1	62.9	0.8
69.3	70	0.7
75.43	76.1	0.67
77.16	77.92	0.76
86.1	87.74	1.64
105.11	105.83	0.72
106.04	106.38	0.34
143.66	145.04	1.38
152.7	153.3	0.6
154.1	154.8	0.7
161.45	163.5	2.05
163.86	166.03	2.17
234.8	235.33	0.53
239.73	240.43	0.7
247.29	247.54	0.25
257.69	258.11	0.42
269.09	269.73	0.64
271.29	271.94	0.65
274.04	274.71	0.67
276.84	277.36	0.52
283.54	283.89	0.35
284.4	284.7	0.3
Hole 82-1		
From	To	Thickness
1	2.3	1.3
4.2	4.8	0.6
8.3	14.6	6.3
28.8	31.6	2.8
52.4	53.6	1.2
57	58.2	1.2
131	131.8	0.8
Hole 82-2		
From	To	Thickness
26	29.2	3.20
32	32.8	0.80
34.3	36.8	2.50
51	51.6	0.60
107.6	108.8	1.20
118.20	119.20	1.0
120	120.6	0.60

Hole 82-3		
From	To	Thickness
2.6	4	1.4
9.4	11.82	2.42
Hole 82-4		
From	To	Thickness
7.4	10.8	3.4
14.5	15.1	0.6
16.5	17.3	0.8
30.4	32.1	1.7
32.9	34.5	1.6
72.4	73	0.6
145.3	146.1	0.8
Hole 82-5		
From	To	Thickness
42.15	43.1	0.95
70.2	71.6	1.4
73.75	74.3	0.55
136.6	137.5	0.9
147.2	148.8	1.6
Hole 82-6		
From	To	Thickness
7	9.1	2.1
13.4	14.5	1.1
21.4	21.95	0.55
25.5	26.4	0.9
29	30	1
35	36.5	1.5
44.2	46.1	1.9
121.5	122.2	0.7
Hole 82-7		
From	To	Thickness
21.4	23.9	2.5
27.6	28.6	1
60.8	61.4	0.6
72	72.4	0.4
74.3	74.65	0.35
122.4	123.1	0.7
182.4	182.8	0.4
184	184.8	0.8

Table 3-3: Coal seam intervals of historic boreholes (continued)

Hole 82-8		
From	To	Thickness
14	15	1.00
20.01	22.5	2.49
26.6	29.3	2.70
32.9	34.9	2.00
39	40	1.00
56.1	58.4	2.30
102.7	103.6	0.90
111.8	112.4	0.60
Hole 82-9		
From	To	Thickness
65.7	67	1.30
75.4	77.4	2.00
97	98	1.00
127.2	128.6	1.40
144	144.6	0.60
164	166.2	2.20
166.6	170.4	3.80
187.3	187.9	0.60
Hole 82-10		
From	To	Thickness
5.4	6.5	1.10
20.2	21	0.80
25.2	25.6	0.40
29.6	30	0.40
34.9	36.2	1.30
45.3	46.2	0.90
48	48.5	0.50
50.2	50.6	0.40
62.6	63.8	1.20
90.6	97	6.40
140.9	143.4	2.50
Hole 82-11-P1		
From	To	Thickness
1.4	3.36	1.96
4	8.5	4.50
From	To	Thickness
4.5	12	7.50
34.4	37	2.60
39.8	40.6	0.80

Hole 82-11-CH		
From	To	Thickness
2.9	10.48	7.58
Hole 82-12		
From	To	Thickness
12.9	13.7	0.8
14.2	15	0.8
15.4	15.7	0.3
16.9	18	1.1
23.9	24.2	0.3
51.2	52.8	1.6
53.6	54	0.4
94.8	95.4	0.6
96	96.8	0.8
131.2	132	0.8
Hole 82-13		
From	To	Thickness
31.92	33.04	1.12
77.2	78.5	1.3
87.86	88.96	1.1
119.4	120.5	1.1
125	125.5	0.5
137.2	137.6	0.4
153.54	154.36	0.82
Hole 83-15		
From	To	Thickness
No Coal, Only Moosebar Formation.		
Hole 83-18		
From	To	Thickness
41.6	43.21	1.61
70	73.24	3.24
74.87	75.33	0.46
96.72	104.57	7.85
143.05	143.27	0.22
155.66	156.06	0.4
158.88	161.52	2.64

Table 3-3: Coal seam intervals of historic boreholes (concluded)

Hole 83-14		
Thickness	To	Thickness
9.33	9.66	0.33
11.8	12.05	0.25
24.4	25.2	0.8
33.3	33.9	0.6
35.2	36.1	0.9
41.6	42	0.4
44.04	44.25	0.21
63.16	63.85	0.69
65.39	67.86	2.47
68.16	69.41	1.25
75.4	75.65	0.25
88.95	89.45	0.5
119.6	119.9	0.3
139.39	140.33	0.94
140.61	143.36	2.75
165.8	166.2	0.4
171.08	171.5	0.42
179.1	179.6	0.5
185.3	185.8	0.5
263.4	264.06	0.66
276.92	277.3	0.38
302.11	302.8	0.69
312.5	312.9	0.4

Hole DD04PR002		
From	To	Thickness
166.29	167.99	1.7
182.07	190.35	8.28
204.79	205.74	0.95

Hole 83-19		
From	To	Thickness
30.08	32	1.92
38	39.56	1.56
44.56	48	3.44
64.54	65.8	1.26
70.04	72.34	2.3
74.06	76.44	2.38
102.24	104.65	2.41
107.52	110.5	2.98
112.66	115.85	3.19
117.11	117.59	0.48
117.89	118.5	0.61
117.11	117.3	0.19
143.3	143.9	0.6
154.55	158.65	4.1
170.65	171.3	0.65
209.64	212.52	2.88
221.8	228.88	7.08
230.06	232.14	2.08
239.96	240.5	0.54

Hole 83-20		
From	To	Thickness
35.91	36.78	0.87
79.18	80.25	1.07
81.4	81.7	0.3
82.4	82.6	0.2
111.97	112.83	0.86
115.6	116	0.4
116.2	116.4	0.2
119.2	120	0.8
196.2	196.6	0.4
199.9	200.2	0.3
200.7	200.9	0.2
213.35	214.61	1.26

3.2 Current exploration

WCCP began exploration of the Hudette property in May 2010 and continued until December 2013. The programme was completed in two phases. The first phase, completed in 2010, included review of all available information from the property, and reconnaissance geological mapping. Fieldwork was followed by drilling between 2011 and 2013. Apart from surveying, data analysis, and geological interpretation including core logging and geophysical log interpretation, all other tasks relevant to property exploration were conducted by professional contracting firms. A year-2012 preliminary resource-evaluation study was also conducted by a consulting firm, Cardno. The contracting parties whose services were used for the period from 2011 to 2013 are listed below in **Table 3-4**.

Table 3-4: Coal exploration contractors in years-2011 through 2013

Activities and contractors	Year		
	2011	2012	2013
Downhole geophysical logging:			
Century Wireline Services	x	x	x
Access (trail-building) and drilling support			
Don Ho	x		
Can-West Exploration Ltd.		x	x
Rotary drilling:			
Camco	x		
RC Drilling		x	
G. Lindsay Drilling			x
Diamond drilling:			
Boart Longyear			x
Analytical services:			
Loring Laboratories		x	
Walter Energy Western Coal (in-house) Laboratory			x
Pearson & Associates Ltd. (coal petrography)			x
ALS			x
Geological consulting:			
Cardno		x	

3.2.1 Year-2010 geological mapping

Geological mapping was mostly carried out during the summer of 2010. Small-scale mapping continued from 2011 to 2013, but was restricted to minor outcrops exposed along newly built trails to access drill sites. The purpose of mapping was to confirm and expand the existing knowledge of geology, particularly structure and distribution of the coal bearing rocks in the area. Data collected include location of coal seams at outcrop, their thickness, probable correlation of coals, and recording of structural data (measurement of bedding attitude) at isolated outcrops. The new data collected allowed a refinement of existing geologic map and reinterpretation of the historic data.

As a consequence of extensive forest cover, and the widespread presence of glacial overburden ranging from a few metres to tens of metres in thickness, natural rock outcrops are very scarce within the Hudette coal property. WCCP's year-2010 geological mapping primarily focused upon new road-cuts along the Falling Creek Connector Road, which was under construction at the time. Occasional outcrops were also observed along stream channels or newly-built trails. Although many more coal outcrops and coal occurrences were found, than had previously been reported, no complete section of the Gething Formation was exposed. The lack of outcrop continuity did not allow seam tracing or correlation for a considerable distance. New geological structures were recognised, but their extents were not generally traceable. All available data have been plotted onto a base map, originally at 1:20,000 scale, and here incorporated within **Map 2-4**.

3.2.2 Current drilling

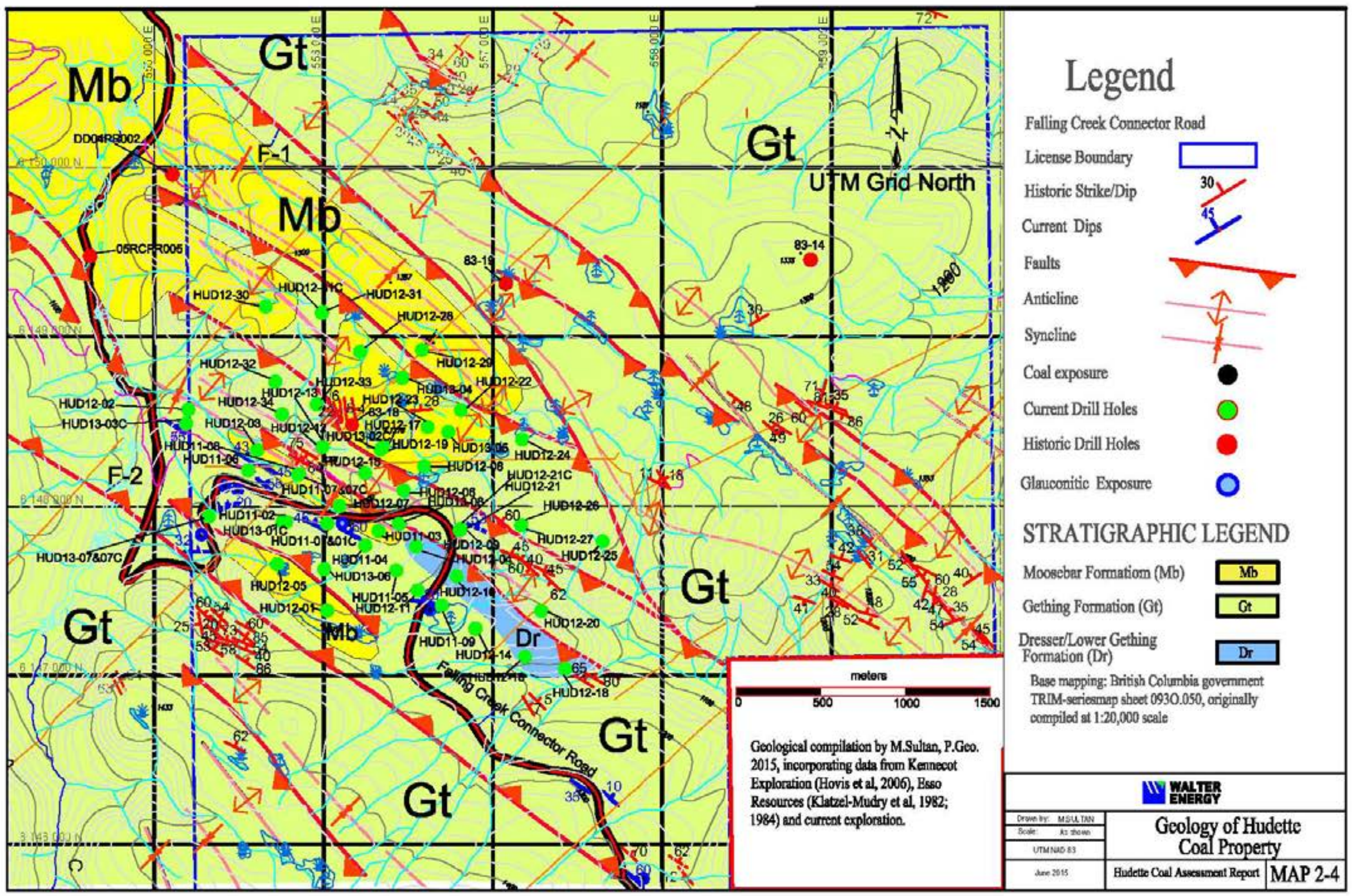
WCCP drilled within the Hudette coal property in years-2011, 2012 and 2013. The purpose of the drilling was to test the Gething Formation for viable coal seams, improve the understanding of structural features within the property, test seam continuity, and obtain unweathered samples for coal-quality analysis.

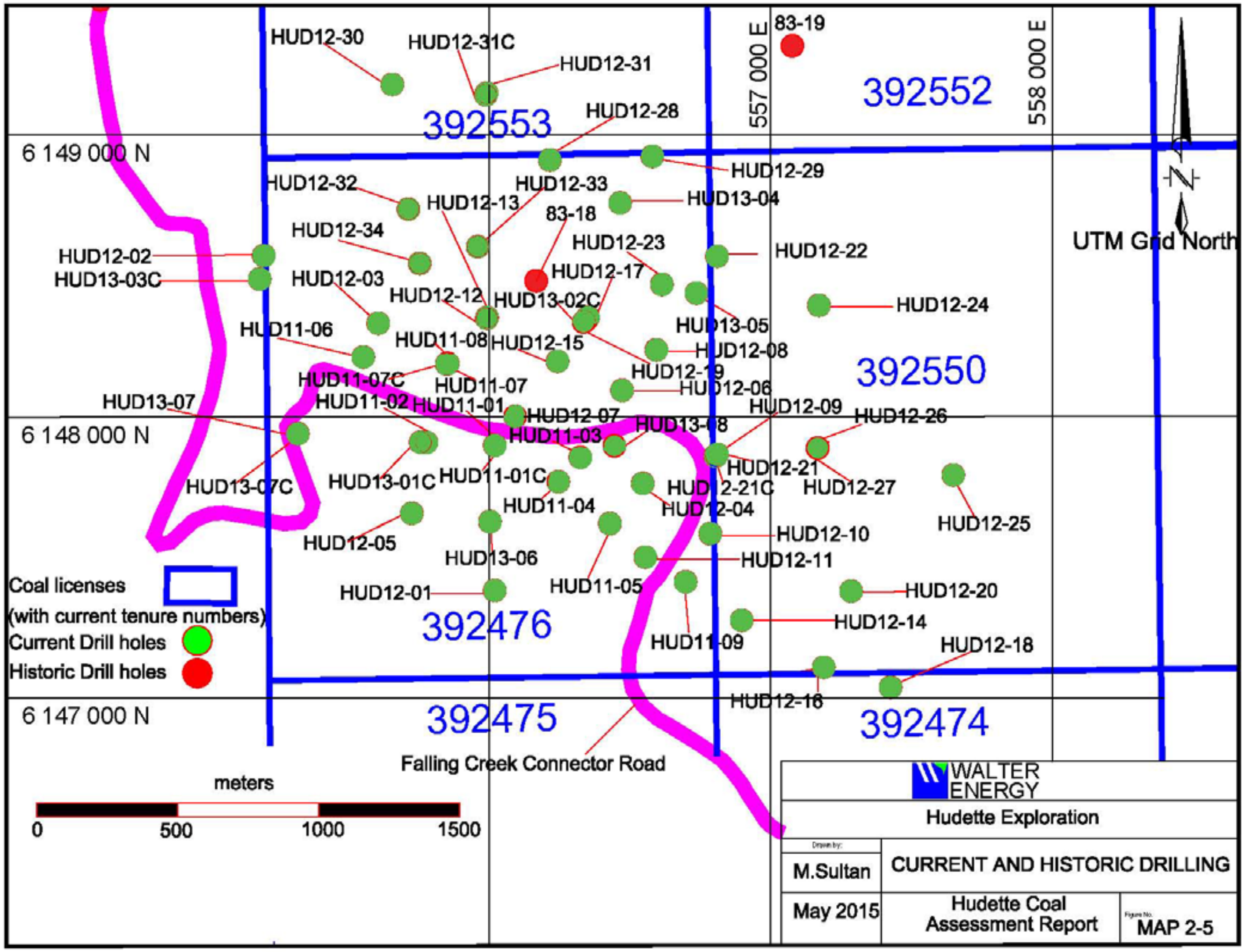
Fifty-six current (year-2011 or more recent) boreholes, with an overall depth of 11,514 metres, were drilled at Hudette (see **Map 2-5** for location, and **Table 3-5** for coordinates). Out of these holes, 47 were performed using air rotary drilling method, 7 were drilled with air rotary with spot coring of coal seams, and 3 were continuously cored using diamond rotary coring techniques. Multiple boreholes were drilled within a few metres' distance, at eight sites (twin holes at five sites, and triple holes at three sites) to interpret the structure, or to collect samples for quality study. Spot-coring holes were located within few metres of air- rotary holes and only coal bearing zones encountered in rotary holes were cored in these holes. Two of these holes (HUD13- 5 and HUD13-07C) did not recover any coal. The three continuously cored holes were drilled close to air rotary holes which had good coal intersections. The reason for diamond drilling was to obtain good coal recovery for quality studies.

Borehole HUD 13-03C is located outside the bounds of the Hudette coal property, situated within one of the coal licences comprising the New Creek coal property (Tenure # 418537), near Hudette's tenure 392476.

All of the current boreholes were accessed from the Falling Creek Connector Road via newly-built trails. **Table 3-5**, given below, presents locations, orientations, total depths and Drift thickness for all current boreholes. Positions of most of the boreholes were confirmed by means of surveying, with the exception of five boreholes, which were inaccessible during the times that a surveying crew was available:

- HUD11-01C Coordinates obtained by means of hand-held Global Positioning System (GPS); borehole was situated within a few metres of HUD11-1;
- HUD11-07C Only GPS coordinates; borehole was situated within a few metres of HUD11-7;
- HUD13-04 Only GPS coordinates;
- HUD11-05 Only GPS coordinates;
- HUD13-7C Only GPS coordinates; borehole was situated within a few metres of HUD13-7.


Legend
Falling Creek Connector Road
License Boundary
Historic Strike/Dip
Current Dips
Faults
Anticline
Syncline
Coal exposure
Current Drill Holes
Historic Drill Holes
Glauconitic Exposure
STRATIGRAPHIC LEGEND
Moosebar Formation (Mb)
Gething Formation (Gt)
Dresser/Lower Gething Formation (Dr)
Base mapping: British Columbia government TRIM-seriesmap sheet 093O.050, originally compiled at 1:20,000 scale
Geological compilation by M.Sultan, P.Geo. 2015, incorporating data from Kennecot Exploration (Hovis et al, 2006), Esso Resources (Klatzel-Mudry et al, 1982; 1984) and current exploration.
meters
0 500 1000 1500
UTM Grid North
Falling Creek Connector Road
WALTER ENERGY
Geology of Hudette Coal Property
Hudette Coal Assessment Report
MAP 2-4



HUD12-30
HUD12-31C
HUD12-31
HUD12-28
392553
557 000 E
83-19
392552
558 000 E
6 149 000 N
HUD12-29
HUD12-32
HUD12-33
HUD12-13
83-18
HUD13-04
HUD12-34
HUD12-23
HUD12-22
UTM Grid North
HUD12-02
HUD13-03C
HUD12-03
HUD12-17
HUD12-12
HUD13-02C
HUD12-24
HUD11-06
HUD13-05
HUD11-08
HUD12-15
HUD12-08
HUD12-19
HUD12-06
392550
HUD11-07C
HUD11-07
HUD11-02
HUD11-01
HUD13-07
HUD12-07
HUD11-03
HUD13-08
HUD12-09
HUD12-26
6 148 000 N
HUD12-21
HUD13-07C
HUD13-01C
HUD11-01C
HUD12-21C
HUD12-27
HUD11-04
HUD12-04
HUD12-25
HUD12-10
HUD12-05
HUD13-06
HUD12-11
Coal licenses
(with current tenure numbers)
Current Drill holes
Historic Drill holes
HUD12-01
HUD11-05
HUD12-20
392476
HUD12-14
HUD11-09
HUD12-18
HUD12-16
6 147 000 N
392475
392474
Falling Creek Connector Road
meters
0
500
1000
1500
WALTER ENERGY
Hudette Exploration
M.Sultan
CURRENT AND HISTORIC DRILLING
May 2015
Hudette Coal Assessment Report
MAP 2-5

Table 3-5: Current (2011-2013) drilling at Hudette

Borehole	Drilling method	Year	Easting NAD83	Northing NAD83	Elevation (m)	Total Depth (m)	Orientation	Casing Depth (m)	Start Date	Completion Date
HUD11-01	Air-rotary	2011	*556021.559*	*6147896.614*	1305.62	178	-60º → 210	4.87	14-Sep-11	21-Sep-11
HUD11-02	Air-rotary	2011	555778.768	6147907.192	1327.854	220	-60º → 210	4.9	21-Sep-11	26-Sep-11
HUD11-03	Air-rotary	2011	556325.245	6147854.238	1306.719	177	-60º → 210	13.57	27-Sep-11	4-Oct-11
HUD11-04	Air-rotary	2011	556246.549	6147767.817	1314.866	171	-60º → 210	4.9	4-Oct-11	9-Oct-11
HUD11-05	Air-rotary	2011	*556429.398*	*6147619.504*	1319.342	171	-75º → 210	16.46	10-Oct-11	20-Oct-11
HUD11-06	Air-rotary	2011	555554.409	6148210.296	1187.064	66	-60º → 210	4.57	21-Oct-11	26-Oct-11
HUD11-07	Air-rotary	2011	*555851.179*	*6148185.765*	1190.397	244	-60º → 210	26.82	27-Oct-11	5-Nov-11
HUD11-08	Air-rotary	2011	555854.232	6148187.484	1191.954	217	Vertical	19.82	6-Nov-11	30-Nov-11
HUD11-09	Air-rotary	2011	556698.394	6147412.505	1277.825	145	-75º → 210	13.71	30-Nov-11	12-Dec-11
			Year 2011	**Total Holes = 9**			**Total Depth=1587m**			
HUD11-01C	Spot-Coring	2012	556021.559	6147896.61	1305.62	123	-60o → 210	6.09	8-Sep-12	17-Sep-12
HUD11-07C	Spot-Coring	2012	555851.179	6148185.77	1190.397	160	-60o → 210	21.33	17-Sep-12	22-Sep-12
HUD12-01	Air-rotary	2012	556020.759	6147382.276	1292.957	235	-60o → 215	18.29	25-Jun-12	28-Jun-12
HUD12-02	Air-rotary	2012	555201.853	6148570.556	1126.995	187	-60o → 215	41.14	24-Jun-12	30-Jun-12
HUD12-03	Air-rotary	2012	555607.376	6148330.321	1149.073	226	-60o → 215	24.38	30-Jun-12	2-Jul-12
HUD12-04	Air-rotary	2012	556546.288	6147761.419	1321.636	248	-75o → 215	33.52	28-Jun-12	3-Jul-12
HUD12-05	Air-rotary	2012	555726.238	6147655.415	1303.013	125	-60o → 215	4.57	3-Jul-12	5-Jul-12
HUD12-06	Air-rotary	2012	556472.887	6148092.22	1291.298	241	-60o → 035	9.14	3-Jul-12	7-Jul-12

Table 3-5: Current (2011-2013) drilling at Hudette (continued)

Borehole	Drilling method	Year	Easting NAD83	Northing NAD83	Elevation (m)	Total Depth (m)	Orientation	Casing Depth (m)	Start Date	Completion Date
HUD12-07	Air-rotary	2012	556093.89	6148000.292	1257.598	192	-60o → 215	12.19	6-Jul-12	8-Jul-12
HUD12-08	Air-rotary	2012	556595.161	6148235.573	1279.571	213	-60o → 035	12.19	7-Jul-12	13-Jul-12
HUD12-09	Air-rotary	2012	556810.651	6147865.617	1298.987	210	-60o → 035	39.62	8-Jul-12	11-Jul-12
HUD12-10	Air-rotary	2012	556786.637	6147584.111	1279.683	250	Vertical	6.09	11-Jul-12	14-Jul-12
HUD12-11	Air-rotary	2012	556556.222	6147500.797	1275.184	241	-75o → 215	12.19	14-Jul-12	17-Jul-12
HUD12-12	Air-rotary	2012	555993.804	6148351.068	1240.787	184	-60o → 035	9.14	17-Jul-12	19-Jul-12
HUD12-13	Air-rotary	2012	555992.605	6148348.659	1235.37	259	-60o → 215	9.14	13-Jul-12	17-Jul-12
HUD12-14	Air-rotary	2012	556897.626	6147275.746	1263.059	244	Vertical	36	20-Jul-12	22-Jul-12
HUD12-15	Air-rotary	2012	556244.411	6148195.49	1299.045	195	-60o → 215	6.06	20-Jul-12	23-Jul-12
HUD12-16	Air-rotary	2012	557189.425	6147110.065	1210.341	253	Vertical	18.29	22-Jul-12	25-Jul-12
HUD12-17	Air-rotary	2012	556352.742	6148351.254	1277.598	98	-60° → 035	6.06	24-Jul-12	25-Jul-12
HUD12-18	Air-rotary	2012	557426.679	6147037.928	1179.417	210	Vertical	12.19	25-Jul-12	29-Jul-12
HUD12-19	Air-rotary	2012	556347.494	6148344.64	1277.424	251	Vertical	6.06	25-Jul-12	30-Jul-12
HUD12-20	Air-rotary	2012	557286.161	6147379.65	1257.962	250	-75° → 035	15.24	29-Jul-12	31-Jul-12
HUD12-21	Air-rotary	2012	556804.515	6147858.59	1299.372	251	-60° → 215	42.67	31-Jul-12	5-Aug-12
HUD12-21C	Spot-coring	2012	556806.465	6147858.813	1299.616	116	-60° → 215	39.5	4-Sep-12	8-Sep-12
HUD12-22	Air-rotary	2012	556810.565	6148567.987	1289.631	244	Vertical	6.06	5-Aug-12	8-Aug-12
HUD12-23	Air-rotary	2012	556614.906	6148467.995	1279.368	238	Vertical	9.14	30-Jul-12	12-Aug-12

Table 3-5: Current (2011-2013) drilling at Hudette (continued)

Borehole	Drilling method	Year	Easting NAD83	Northing NAD83	Elevation (m)	Total Depth (m)	Orientation	Casing Depth (m)	Start Date	Completion Date
HUD12-24	Air-rotary	2012	557172.414	6148394.414	1283.039	299	Vertical	9.14	9-Aug-12	12-Aug-12
HUD12-25	Air-rotary	2012	557649.184	6147791.683	1236.418	259	Vertical	9.14	14-Aug-12	16-Aug-12
HUD12-26	Air-rotary	2012	557167.471	6147887.058	1259.732	210	Vertical	9.14	13-Aug-12	16-Aug-12
HUD12-27	Air-rotary	2012	557167.938	6147887.62	1259.933	85	-60º → 035	9.14	12-Aug-12	13-Aug-12
HUD12-28	Air-rotary	2012	556217.074	6148910.583	1312.711	253	Vertical	4.57	17-Aug-12	20-Aug-12
HUD12-29	Air-rotary	2012	556580.853	6148922.981	1327.379	233	Vertical	7.01	17-Aug-12	21-Aug-12
HUD12-30	Air-rotary	2012	555657.305	6149178.54	1311.241	250	Vertical	9.14	21-Aug-12	23-Aug-12
HUD12-31	Air-rotary	2012	555992.219	6149146.734	1329.012	250	Vertical	6.09	21-Aug-12	24-Aug-12
HUD12-31C	Spot-coring	2012	555989.392	6149141.162	1328.285	241	Vertical	5.18	24-Aug-12	3-Sep-12
HUD12-32	Air-rotary	2012	555714.734	6148735.358	1305.794	250	Vertical	4.57	23-Aug-12	25-Aug-12
HUD12-33	Air-rotary	2012	555960.62	6148601.757	1246.386	250	Vertical	6.09	26-Aug-12	30-Aug-12
HUD12-34	Air-rotary	2012	555754.252	6148542.778	1236.929	250	Vertical	4.57	31-Aug-12	2-Sep-12
			Year-2012	**Total Holes = 38**		**Total Depth=8274m**				
HUD13-01C	Cont-inuous coring	2013	555758.30	6147908.00	1325.07	110	-60o → 210	3.7	22-Jul-13	23-Jul-13
HUD13-02C	Cont-inuous coring	2013	556337.40	6148335.00	1281.201	252	-60o → 035	5	24-Jul-13	27-Jul-13
HUD13-03C	Cont-inuous coring	2013	555187.90	6148487.00	1139.78	183	-60º → 215	7.2	28-Jul-13	30-Jul-13
HUD13-04	Spot-coring	2013	*556466*	*6148758*	*1308*	199	Vertical	6.09	21-Oct-13	13-Nov-13

Table 3-5: Current (2011-2013) drilling at Hudette (concluded)

Borehole	Drilling method	Year	Easting NAD83	Northing NAD83	Elevation (m)	Total Depth (m)	Orientation	Casing Depth (m)	Start Date	Completion Date
HUD13-05	Spot-coring	2013	*556737*	*6148438*	*1288*	189	Vertical	10.66	14-Nov-13	28-Nov-13
HUD13-06	Air-rotary	2013	556004.29	6147626.197	1317.121	208	Vertical	6.09	28-Nov-13	3-Dec-13
HUD13-07	Air-rotary	2013	555321.784	6147938.353	1191.231	241	Vertical	2.74	4-Dec-13	9-Dec-13
HUD13-07C	Spot-coring	2013	*555321.784*	*6147938.35*	*1191.231*	59	Vertical	2.74	10-Dec-13	13-Dec-13
HUD13-08	Air-rotary	2013	556446.229	6147895.156	1311.11	213	Vertical	19.81	14-Dec-13	18-Dec-13
Year-2013: 9 boreholes, totalling1654 metres										
Years-2011 through 2013: 56 boreholes, totalling 11,515 metres										
HUD = Hudette; Italic text indicates GPS coordinates										

3.2.2.1 Year-2011 drilling

Nine holes for a total depth of 1,578 metres were drilled in the Hudette area in 2011 (**Table 3-5**). All 2011 drill holes were completed by Camco Drilling Company. Drilling was done using a track mounted air rotary drill rig. The hole and casing diametres were 63.5 mm and 12.7 cm respectively. Sumps were constructed at each site to accommodate drill cutting discharge. Drilling was carried out only in day shift. The holes were cased to bedrock and steel casing after completion of hole was generally left in the ground. Access to drill sites was via newly built trails connected to Falling Creek Road. Don Ho was responsible for constructing the trails and providing support services.

3.2.2.2 Year-2012 drilling

The year-2012 drilling was a continuation of the drilling programme started in year-2011. Thirty eight holes were drilled by RC Drilling using two rigs. Access to drill sites was via newly built trails connected to Falling Creek Road. Can West was responsible for constructing the trails and providing support services. The same equipment and procedures used in 2011were used in the 2012 exploration effort.

Total length of drilling in 2012 was 8,274 metres. Spot coring was conducted in four holes (HUD11-01C, HUD11-07C, HUD12-21C and HUD12-31C). The spot coring intervals were based on coal intersections in boreholes HUD11-01, HUD11-07, HUD12-21and HUD12-31.

3.2.2.3 Year-2013 drilling

Nine year-2013 holes (three of them continuously-cored and six of them by the air-rotary method) were drilled, with a cumulative depth of 1,654 metres. The three cored boreholes (HUD13-01C, HUD13-2C, and HUD13-03C) were completed by Boart Longyear, using an LF90-D diamond-drill. The drilling rig was supported by a water truck, skidder and drill rod hauling truck. Each drill crew consisted of a driller and a driller's helper. Drilling was carried out 24 hours with two drill shifts. The six air-rotary holes were drilled by G. Lindsay Drilling Company. Attempts were made at spot coring three of these holes, but recovery was very poor to none. Can West provided access and support services for both drilling companies.

3.3 Core Logging

All recovered cores, of coal and rock, were studied in detail. The study included rock and coal description, recording of structural data and sedimentary structures. Coal samples, along with roof rock and floor rock, were collected for analytical studies. Driller’s depths were adjusted to match geophysical log depths. Two continuous core holes (HUD13-1 and HUD13-02C) and four spot coring holes from year-2012 were also photographed.

Coring intervals in drill holes are presented below as **Table 3-6** (also repeated as **Table A-1** within **Appendix A)**. Copies of all core logs are presented in **Appendix A**.

Table 3-6: Coring intervals in current boreholes

Hole ID	From	To	Length	Core Type	Comments
HUD11-01C	38.1	52.16	14.06	Spot	Photographed
HUD11-01C	104.55	121.92	17.37	Spot	Photographed
HUD11-07C	72.85	85.04	12.19	Spot	Photographed
HUD11-07C	127.71	149.4	21.69	Spot	Photographed
HUD11-07C	154.23	160.02	5.79	Spot	Photographed
HUD12-21C	39.32	43.28	3.96	Spot	Photographed
HUD12-21C	101.19	116.07	14.88	Spot	Photographed
HUD12-31C	6.1	17.37	11.27	Spot	Photographed
HUD12-31C	174.04	201.78	27.74	Spot	Photographed
HUD13-01C	0	110	110	Continuous	Photographed
HUD13-02C	0	251	251	Continuous	Photographed
HUD13-03C	0	182	182	Continuous	
HUD13-04	75.59	82.46	6.87	Spot	
HUD13-04	192.02	197.45	5.43	Spot	
HUD13-05	30	35.66	5.66	Spot	
HUD13-05	50.29	56.38	6.09	Spot	
HUD13-05	77.72	80.72	3	Spot	
HUD13-05	115.82	117.65	1.83	Spot	
HUD13-05	145	148.13	3.13	Spot	

3.4 Borehole geophysics

Downhole geophysical surveys were conducted within each borehole completed during years- 2011 to 2013. Century Geophysics Inc. carried out geophysical logging for all exploration programmes on the property. In all boreholes, when stable drill hole conditions prevailed, the following suites of geophysical logs were obtained:

- Compensated density/gamma/caliper/resistivity (9239C tool);
- Gamma/neutron (9057A tool);
- Verticality and deviation survey (9057A tool); and
- Dipmeter (9411 tool, provided that borehole conditions were acceptable for running this high-value tool)

Whenever possible, the geophysical tools were run into open holes, with the drilling rods having been removed beforehand. In cases where the holes were known to be blocked, or where poor ground conditions were otherwise suspected, a gamma-neutron tool, was run through the drill rods to obtain a basic log.

Copies of all downhole geophysical logs are presented in **Appendix A**, with an inventory of logs set forth below as **Table 3-7** (also repeated as **Table A-2** within **Appendix A)**.

Table 3-7: Geophysical logs run in current boreholes

Borehole	UTM Easting (NAD83)	UTM Northing (NAD83)	Elevation (metres)	Total Depth (metres)	Gamma/ Caliper/ Resistivity/ Density	Gamma/ Neutron	Deviation	Dipmeter	Notes
HUD11-01	556021.559	6147896.61	1305.62	176.78	173.21	173.42	173.21		
HUD11-02	555778.768	6147907.19	1327.854	220.06	216.79	217.05	216.86		
HUD11-03	556325.245	6147854.24	1306.719	177	176.63	176.67	176.48		
HUD11-04	556246.549	6147767.82	1314.866	170.68	170.44	170.54	170.34		
HUD11-05	556429.398	6147619.5	1319.342	171.29	169.45	168.93	168.74		
HUD11-06	555554.409	6148210.3	1187.064	65.53	59.36	59.12	58.92		
HUD11-07	555851.179	6148185.77	1190.397	243.84	242.58	242.44	242.24	241.5	
HUD11-08	555854.232	6148187.48	1191.954	216.46	212.35	212.37	212	211.5	
HUD11-09	556698.394	6147412.51	1277.825	144.78	142.23	142.25	142.06		
HUD11-01C	556021.559	6147896.61	1305.62	122.92	122.5	122.42	122.22		
HUD11-07C	555851.179	6148185.77	1190.397	160.02	159.44	159.5	159.3		
HUD12-01	556020.759	6147382.28	1292.957	234.69	229.85	230.4	230.2		
HUD12-02	555201.853	6148570.56	1126.995	187.45	186.4	186.44	186.24		also ran neutron through rods
HUD12-03	555607.376	6148330.32	1149.073	225.52	224.33	211.88	211.68	223.5	
HUD12-04	556546.288	6147761.42	1321.636	247.88		247.46	90.08	89.5	only ran neutron through rods
HUD12-05	555726.238	6147655.42	1303.013	124.96	88.24	92	91.8		also ran neutron through rods to 122.46m.
HUD12-06	556472.887	6148092.22	1291.298	240.79	239.24	239.18	238.98	238.5	
HUD12-07	556093.89	6148000.29	1257.598	192.02	190.48	190.6	190.4	190	
HUD12-08	556595.161	6148235.57	1279.571	213.36	211.52	212.03	211.84	211.5	
HUD12-09	556810.651	6147865.62	1298.987	210.31	206.04	205.37	205.18	200	
HUD12-10	556786.637	6147584.11	1279.683	249.93	242.88	242.96	242.76	241.5	
HUD12-11	556556.222	6147500.8	1275.184	240.79	235.08	235.58	235.38		
HUD12-12	555993.804	6148351.07	1240.787	184.4	183.54	183.46	183.26	183	
HUD12-13	555992.605	6148348.66	1235.37	259.08	208.03	214.64	214.44	206	
HUD12-14	556897.626	6147275.75	1263.059	243.84	242.82	243.06	242.86		
HUD12-15	556244.411	6148195.49	1299.045	195.07	193.05	192.97	192.78	192.05	
HUD12-16	557189.425	6147110.07	1210.341	252.98	250.74	250.76	250.56		
HUD12-17	556352.742	6148351.25	1277.598	97.53	92.34	92.46	92.26		
HUD12-18	557426.679	6147037.93	1179.417	210.31	209.49	209.51	209.32		

Table 3-7: Geophysical logs run in current boreholes (concluded)

Borehole	UTM Easting (NAD83)	UTM Northing (NAD83)	Elevation (metres)	Total Depth (metres)	Gamma/ Caliper/ Resistivity/ Density	Gamma/ Neutron	Deviation	Dipmeter	Notes
HUD12-19	556347.494	6148344.64	1277.424	251.46	249.96	249.9	249.7	249.5	
HUD12-20	557286.161	6147379.65	1257.962	249.93	248.67	248.71	248.52		
HUD12-21	556804.515	6147858.59	1299.372	251.46	146.54	160.06	159.86		
HUD12-21C	556806.465	6147858.81	1299.616	116.43	115.9	115.92	115.72		
HUD12-22	556810.565	6148567.99	1289.631	243.84	240.19	240.37	240.18	239.5	
HUD12-23	556614.906	6148468	1279.368	237.74	232.85	232.99	232.8		
HUD12-24	557172.414	6148394.41	1283.039	298.7	296.31	296.35	296.16	295.5	
HUD12-25	557649.184	6147791.68	1236.418	259.08	257.84	257.88	257.68		
HUD12-26	557167.471	6147887.06	1259.732	210.31	173.43	173.37	173.18		
HUD12-27	557167.938	6147887.62	1259.933	85.29	84.2	84.12	83.92		
HUD12-28	556217.074	6148910.58	1312.711	252.98	252.13	252.05	251.86		also ran neutron through rods
HUD12-29	556580.853	6148922.98	1327.379	232.52	230.72	230.76	230.56		
HUD12-30	555657.305	6149178.54	1311.241	249.93	210.46	227.76	227.56		
HUD12-31	555992.219	6149146.73	1329.012	249.93	248.69	248.53	248.34		
HUD12-31C	555989.392	6149141.16	1328.285	240.79	236.69	237.07	236.88	236	
HUD12-32	555714.734	6148735.36	1305.794	249.93	249.21	249.27	249.08		
HUD12-33	555960.62	6148601.76	1246.386	249.93	247.91	248.43	248.24	247	situated west of property
HUD12-34	555754.252	6148542.78	1236.929	249.94	243.97	246.18	245.98		
HUD13-01C	555758.30	6147908.00	1325.07	110	109.63	109.49	109.56		
HUD13-02C	556337.40	6148335.00	1281.201	252	251.12	251.04	251.04		
HUD13-03C	555187.90	6148487.00	1139.78	182.5	181.83	181.77	181.78		
HUD13-04	556466	6148758	1308	199	197.45	188.06	197.59	196.5	
HUD13-05	556737	6148438	1288	188.97	188.07	188.06	187.86	187.5	
HUD13-06	556004.29	6147626.2	1317.121	208.26	207.7	207.32	207.12	151.5	
HUD13-07	555321.784	6147938.35	1191.231	240.79	240.75	240.71	240.52	239.5	
HUD13-07C	555321.784	6147938.35	1191.231	59.43	58.53	58.88	58.68		
HUD13-08	556446.229	6147895.16	1311.11	213.36	210.72	210.82	210.62	210	

3.5 Sampling and analytical work

Fifty-six samples (**Table 3-8**, repeated as **Table B-1** within **Appendix B**) from Hudette property were sent to laboratories for quality analyses. Twenty of these samples were collected in 2012 and 36 were collected in 2013. Year-2012 samples were sent to Loring Laboratories whereas year-2013 samples were partially analysed in Walter Energy's in-house laboratory at the Wolverine mine site, and partially analysed externally, by ALS. Proximate analyses, sulphur, calorific value, and Free Swelling Index (FSI) were completed on year-2012 samples, whereas proximate and ultimate analyses, fluidity, Arnu Dilatation, ash fusibility and ash chemistry determinations were conducted on year-2013 samples. Results of all these analyses are presented within **Appendix B** of this report.

Petrographic analyses were conducted only on samples collected in 2013. Results of the petrographic analyses are presented within **Appendix C** of this report.

Table 3-8: Sample inventory

Borehole	Sample tag number	Seam	Metres				Recovery %
			From	To	Thickness	Recovered	
HUD12-21C	3443	F	104.67	107.29	2.62	0.55	21.32
HUD12-21C	3444	F	107.29	110.34	3.05	0.64	20.98
HUD12-21C	3445	F	110.34	112.43	2.09	0.49	24
HUD12-21C	3446	Coal	115.9	116.07	0.17	0.17	100
HUD12-31C	3447	B	10.90	16.00	5.10	0.43	8.30
HUD12-31C	3448	B	185.0	186.84	1.84	0.4	21.78
HUD12-31C	3449	B	186.84	191.60	4.76	1.36	28.57
HUD11-01C	3450	B	40	41.83	1.83	0.53	29
HUD11-01C	3451	C	48.6	50.68	2.08	1.37	65.86
HUD11-07C	3452	B	73.51	75.55	2.04	0.74	36.27
HUD11-07C	3453	C	76.72	78.00	1.28	0.45	35
HUD11-07C	3454	C	78.45	79.78	1.33	0.29	21.80
HUD11-07C	3455	D	81.78	83.52	1.74	1.19	68.39
HUD11-07C	3456	F	130.20	131.00	0.80	0.4	50
HUD11-07C	3457	F	131.00	133.51	2.51	1.89	75.29
HUD11-07C	3458	B	134.07	137.11	3.04	2.74	90.13
HUD11-07C	3459	B	137.11	139.50	2.39	1.73	56.72
HUD11-07C	3460	C	139.50	142.19	2.69	2.63	97.77
HUD11-07C	3461	C	142.19	144	1.81	0.36	16
HUD11-07C	3462	F	144	147.24	3.24	1.9	58.64
HUD13-01C	10392	B	5.67	7.25	1.58	1.58	100
HUD13-01C	10393	B	7.25	7.9	0.65	0.65	100
HUD13-01C	10394	C	9.2	10.25	1.05	0.85	81
HUD13-01C	10395	C	10.55	11.9	1.35	1.35	100
HUD13-01C	10396	D	14	15.9	1.9	1.27	67
HUD13-01C	10397	E	46.75	47.58	0.83	0.83	100
HUD13-01C	10398	F	64.25	64.7	0.45	0.45	100
HUD13-01C	10399	F	66	67.55	1.55	1.55	100
HUD13-01C	10400	F	67.55	68.25	0.7	0.7	100

Table 3-8: Sample inventory (concluded)

Borehole	Sample tag number	Seam	Metres				Recovery %
			From	To	Thickness	Recovered	
HUD13-01C	1976	G	82.4	82.75	0.35	0.35	100
		G	83.22	84	0.78	0.78	100
HUD13-02C	12651	A	37.8	39.32	1.52	1.52	100
HUD13-02C	12652	B	59.1	60.6	1.5	1.5	100
HUD13-02C	12655	C	84.70	85.10	0.40	0.40	100
HUD13-02C	12656	C	85.5	86.45	0.95	0.95	100
HUD13-02C	12657	D	89.9	91.4	1.5	1.5	100
HUD13-02C	12658	E	130.05	131.63	1.58	1.24	78.48
HUD13-02C	12659	F	148.35	149.02	0.67	0.67	100
HUD13-02C	12660	F	149.02	150.7	1.68	1.68	100
HUD13-02C	12661	F	150.7	151	0.3	0.3	100
HUD13-02C	12662	G	161.6	162.15	0.55	0.23	41.82
HUD13-02C	12663	G	162.67	163.6	0.93	0.68	73.12
HUD13-02C	12664	H	178.3	179.6	1.3	8	61.54
HUD13-02C	12665	Coal	197	197.37	0.37	0.37	100
HUD13-02C	12666	J	201.45	203.05	1.6	0.87	54.37
HUD13-02C	12667	K	235.7	236.35	0.65	0.65	100
HUD13-02C	12668	K	236.8	239.4	2.6	0.9	34.62
HUD13-02C	12669	K	239.4	240.8	1.4	1.4	100
HUD13-03C	12670	Coal	12	12.3	0.3	0.3	100
HUD13-03C	12671	F	61.85	63.2	1.35	1.1	81.48
HUD13-03C	12672	F	63.2	64.55	1.35	1.11	82.22
HUD13-03C	12673	G	68.42	69.45	1.03	1.03	100
HUD13-03C	12674	H	84.9	85.7	0.8	0.56	70
HUD13-03C	12675	I	103.8	104.2	0.4	0.34	85
HUD13-03C	1826	J	117.2	118.6	1.4	1.25	89.29
HUD13-04	1853	B	78.8	80.3	1.5	1.2	80
HUD13-04	1854	B	80.3	81.78	1.48	1.14	77.03

4 Geological setting

4.1 Regional setting

The strata which host the coalfields of northeastern British Columbia include marine and non-marine clastic sediments of late Jurassic, Cretaceous, and early Tertiary age, which is part of a thick molasse sequence with lesser proportion of flysch, deposited in the Rocky Mountain Foreland Basin.

The Foreland Basin is surrounded by the Cordilleran Orogen to the west, and the cratonic rocks and Palaeozoic cover sequence of the Canadian Shield to the east.

Most of the basin-filling sediments were derived from orogenically-uplifted land masses to the west and deposited into a foredeep to the east, although patterns of sedimentation were to some extent influenced by occasional vertical movements of underlying structures within the cratonic basement rocks, chief amongst which was the Peace River Arch (Stott, 1968).

The geology of the northeastern British Columbia coalfields is complex, both in terms of sedimentation and of tectonics. The region is characterised by complex tectonic and sedimentary regime which developed during late Jurassic to early Tertiary times. During the Late Mesozoic and Early Cenozoic, northeastern British Columbia underwent two main phases of deformation; the Columbian Orogeny, from Late Jurassic to earliest Late Cretaceous time, and the Laramide Orogeny, from Late Cretaceous to Oligocene time (Douglas *et al*, 1970). Deformation generally comprised northeast-verging thrusting and folding, producing a mountainous region, broadly termed the Rocky Mountain Thrust Belt. The Rocky Mountains represent the remnants of the foreland thrust and fold structural province of the Columbian orogeny. The northern Rocky Mountains are divided into two sub-provinces on the basis of deformation intensity: the Mountains and the Foothills (Thompson, 1979). Cretaceous coal-measures and associated marine rocks largely lie within the Foothills sub-province, which in northeast British Columbia consists mainly of folded strata.

Continental and marine sedimentary rocks interfinger and alternate, in keeping with transgressive and regressive cycles along the western edge of the Western Canadian Sedimentary Basin. These cycles gave rise to depositional environments that ranged from marine to near-shore, deltaic, and alluvial, thus containing sequences which grade laterally and vertically into alluvial-deltaic sandstone, siltstone, conglomerate, mudstone and coal facies.

4.2 Regional stratigraphy

The regional stratigraphy of the Peace River coalfields has been described by Duff and Gilchrist (1981), Hughes (1963, 1964, 1967), and Stott (1967, 1968, 1974). Interpretation of the sedimentary facies and division of strata into groups, formations and member status varies between the authors. The stratigraphic names assigned to groups, formation and members are also different for some stratigraphic intervals. The major difference in property stratigraphy between these authors lies with the interpretation of Jura-Cretaceous rocks underlying the Gething Formation. The sub-Gething rocks have been variously referred to the Dresser (*sensu* Hughes) or Cadomin (*sensu* Stott) formations.

4.2.1 Definition of the Cadomin Formation

The Cadomin Formation is a stratigraphic unit of Early Cretaceous (Barremian to Aptian) age, extending from western Alberta to northeast British Columbia. The type locality of the formation is near the town of Cadomin, in north-central Alberta. The Cadomin ranges from nil to at least 200 metres (660 feet) in thickness (McLean, 1977).

4.2.2 Definition of the Dresser Formation

The Dresser Formation is 370 metres thick at its type locality (Hughes, 1964), and measured at 350 metres in outcrops within the Falling Creek area (Klatzel-Mudry *et al.*, 1984). For this report, the stratigraphic nomenclature as described by Hughes (1964) is being adopted because his description of formation lithology appears to be similar to the rocks on the ground in Hudette property.

4.2.3 Stratigraphic sequence

The stratigraphic sequence in the Falling Creek region (Hudette and surrounding areas) consists of Lower Cretaceous sediments of the Beaudette, Crassier, and Fort St. Groups (as shown in **Figure 4-1**). The Beaudette Group (Hughes, 1964) is composed of continental sands to shales truncated by a low angle regional unconformity. The top of the Beaudette Group is marked by an unconformity. The group is not economically important for coal within the Hudette coal property.

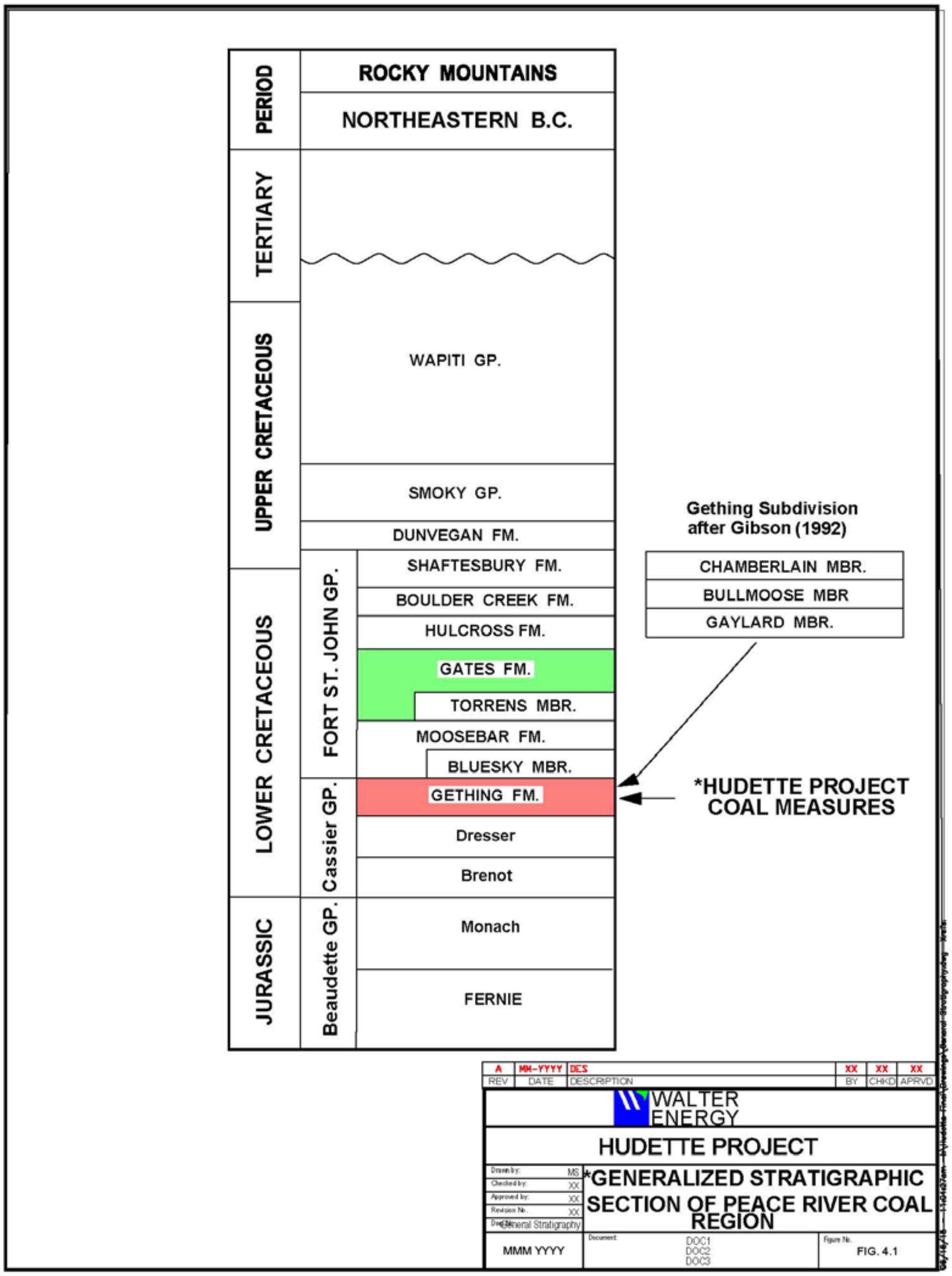
The Crassier Group overlies the Beaudette Group and includes the Dresser and Gething formations. Crassier rocks comprise continental alluvial-deltaic sediments deposited along the western margin of the Rocky Mountain Foreland Basin. Generally, these sediments begin to thin eastward and northeastward across the Foothills of northeastern British Columbia, and into the plains of northwestern Alberta. The base of Crassier Group is a regional and angular unconformity that truncates older Cretaceous and Jurassic strata below; it marks a major event in the development of basin. Generally, the region is characterised by inter-tonguing of marine and continental sediments above this unconformity.

The Dresser Formation consists of continental sand and conglomerate with probable source area to the west. The Dresser Formation is overlain by the Gething Formation which is composed of sandstone, siltstone, mudstone, minor conglomerate and coal.

The potentially-economic coal deposits of the Hudette study area occur within the Gething Formation. In the Burnt River / Sukunka River area, Gibson (1992) divided the Gething Formation into three subdivisions which, in ascending order, are the Gaylard, Bullmoose and Chamberlain members. The Chamberlain and Gaylard are considered coal-bearing members within those areas. These members were also recognised as parts of the Gething Formation within the adjacent Mink Creek property (Sultan and Cathyl-Huhn, 2014). However, at this stage, presence of the three members of the Gething are not confirmed in the Hudette property, probably due to lack of sufficient data. For this reason, Hughes' 1964 stratigraphic nomenclature is followed within the Hudette property.

The Fort St John Group is composed of, in ascending order, the Moosebar Formation, Gates Formation, Boulder Creek Formation and Shaftesbury Formation. These formations were deposited in marine, transitional and continental settings. The Moosebar Formation constitutes the youngest recognised strata in Hudette property.

Ages of the formations in the area are Upper Beaudette Group (Late Jurassic to Earliest Cretaceous), Dresser Formation (Barremian), Getting Formation (Barremian to Earliest Albian) and Moosebar Formation (Early Albian).



4.3 Local stratigraphy

Based upon examination of outcrops, core study and geophysical log interpretation, the following stratigraphic sequence from top to bottom have been identified in Hudette property.

1. Moosebar Formation
2. Gething Formation
3. Dresser Formation

Most of the Hudette property is underlain by the Gething Formation, which also is the main focus of this study. The Moosebar and Dresser formations are also locally exposed. Since the area is heavily forested and overlain by a thick blanket of glacial till (overburden), complete stratigraphic sections of any of the above formations are not exposed. Most of the outcrop data were recorded from isolated exposures, generally along the Falling Creek Connector Road or newly built trails, as the outcrops were exposed during construction.

Relationships between the various formations that occur within and adjacent to the Hudette property were plotted on a map which was originally compiled at 1:20,000 scale (**Map 2-4**). This map is combination of both recent work done in 2010-2013 by WCCP and Western Coal and compiled historic data. Geological contacts shown on the maps, as derived from recent study, are generally inferred because complete sections were not exposed due to vegetation and overburden.

4.3.1 Moosebar Formation

The Moosebar Formation occurs within the lower part of the Fort St John Group. It was originally defined by McLearn (1923), who gave the type locality at the southeastern end of the Peace River Canyon. The formation is about 289 metres (950 feet) thick at its type locality, but thins southeasterly along the Foothills. The age of the formation is late Early Albian (Stott, 1968).

Due to the recessive and heavily-weathered nature of Moosebar outcrops, the formation is best described from drill core. Where exposed, it is found as low relief, crumbly, thin bedded shale. It may also be found at the surface as a light to dark grey, fine grained sandstone; medium-bedded, often with crossbeds.

The sporadic outcrops of the Moosebar Formation occur in the southwestern part of the current exploration area. The formation has previously been mapped in northwestern portion of the Hudette property (Klatzel-Mudry *et al.*, 1984). During 2011-2013 exploration drilling, the formation was intersected in 24 drill holes (**Table 4-1**), although some of these holes are very closely spaced. The formation has also been reported from a historical drill hole (83-18) in the same area. Boreholes which intersected the Moosebar Formation are generally located in the central portion of the investigated area.

The Moosebar Formation is the most consistent stratigraphic marker within the broader Falling Creek area, including the Hudette property. The complete section of the formation was not intersected during the 2011-2013 drilling programme because all current boreholes were spudded below the Moosebar's upper contact. The thickest Moosebar section (250 metres) was intersected in HUD12-29 but its true thickness could not be confirmed owing to lack of dip information.

Although three holes were continuously cored during the year 2013, only one hole

(HUD13-02C) crossed a small section (**Table 4-1**) of the formation. A historical core hole (83-18) also intersected 35 metres of the formation. Data from core logging and geophysical logging of Hudette area and adjacent areas, particularly Mink Creek property were utilised for establishing the stratigraphy of the Moosebar Formation in Hudette area.

The Moosebar Formation in the Falling Creek area is composed of three distinct members, which from bottom to top are: the Bluesky Member, the Mudstone Member and the Bioturbated Siltstone Member (Klatzel-Mudry *et al.*, 1984). The intersected Moosebar sections in Hudette area include Mudstone Member and Bluesky Member with the exception of borehole HUD12-29 where the Siltstone Member also occurs.

The following table shows the thicknesses of Mudstone Member and Bluesky Member interpreted from geophysical logs and core logs.

Table 4-1: Thicknesses of Mudstone and Bluesky members of Moosebar Formation

	Apparent thickness		True thickness		
Borehole	Mudstone Member	Bluesky Member	Mudstone Member	Bluesky Member	Comments
HUD11-03	36.93	11.06	*unknown*	*unknown*	
HUD11-07		18.08		18.05	
HUD11-07C		23.17		23.17	
HUD11-08		22.06		16.90	
HUD12-01	71.71	26.2	*unknown*	*unknown*	
HUD12-03		12.47		11.30	
HUD12-05	121		*unknown*		
HUD12-06	120.79		77.65		Faulted contact
HUD12-07	23.31	23.3	22.96	22.95	
HUD12-08		15.31		14.68	
HUD12-17	34.44	27.5	22.14	17.68	Approximately same location
HUD12-19	15.44	17.3	14.51	16.26	
HUD12-25		13.46		*unknown*	
HUD12-26		13.54		*unknown*	
HUD12-27	60.86	12.0	*unknown*	*unknown*	Hole along dip?
HUD12-28	104.43	31.65	*unknown*	*unknown*	
HUD12-29	221		*unknown*	Did not reach base of Moosebar Formation	
HUD12-30	95.86	15.0	*unknown*	*unknown*	
HUD12-31	81.7	13	52.52	8.36	Below Gething faulted
HUD12-31C	72	15	46.28	9.64	Below Gething faulted
HUD13-02C	14	18.79	14	18.79	
HUD13-04		24.78		18.58	
HUD13-05		7.19		4.67	
HUD13-07	80.5	2.6	61.67	9.65	Below Gething, faulted
83-18	19.87	17.33	19.87	17.33	Historic borehole
True thickness is given where dip data are available.					

The geophysical log response of the Moosebar Formation is very distinct. The upper contact of the Bluesky Member is marked by a sharp downward deviation towards higher resistivity, lower gamma API and higher neutron API (**Figure 4-2**, below).

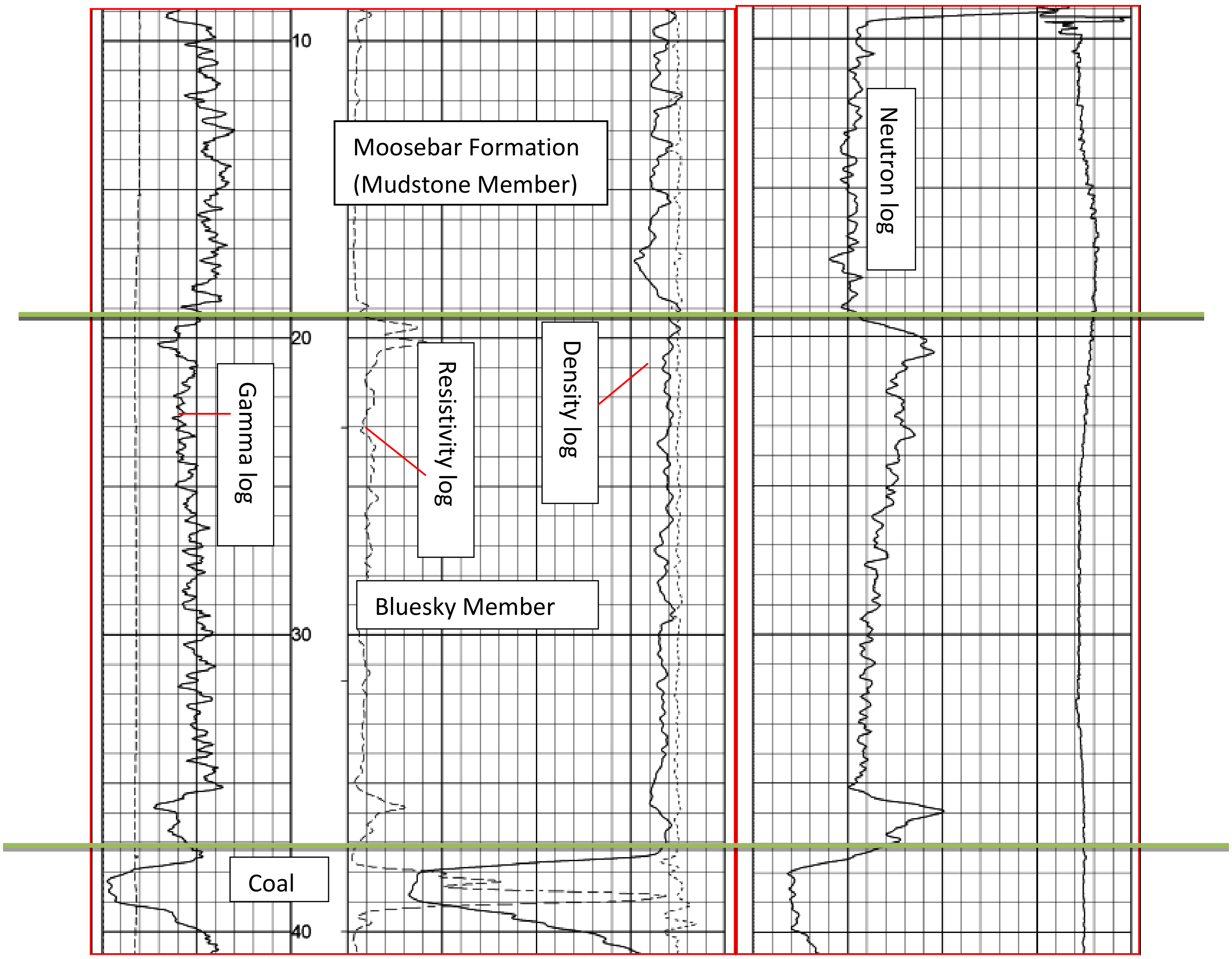


Figure 4-2: Geophysical log response of Mudstone member/Bluesky member contact (borehole HUD13-02C).

Following is a description, in downward stratigraphic order, of Moosebar Formation's members as recognised within the Hudette study area.

4.3.1.1 Bioturbated Siltstone Member

This member occurs above the Mudstone Member and is interpreted as a near shore marine facies. The member was recognised on geophysical log in only one hole (HUD 12-29). The apparent thickness of the Member is 62 metres in HUD12-29. Since no core or outcrops description is available from Hudette area, the characteristics from the adjacent property (Mink Creek property) are described here.

The Bioturbated Siltstone Member consists of siltstone, with minor sandstone and mudstone in lower part and very fine sandstone with minor mudstone and siltstone in upper part. The sandstone and siltstone are light to medium grey, but in outcrop, weather to medium to dark yellowish brown. Sandstone are very fine-grained, commonly well-sorted, and clean. Quartz and chert appear to be the principal detrital components. Pyritised worm tubes and burrows are common. Primary sedimentary structures include parallel bedding, cross bedding and ripples. Pyrite is associated with burrows and occasionally occurs as nodules and dissemination. Siltstones commonly include sandstone lenses and laminations. Mudstone interbeds are medium grey, silty to highly silty and commonly 4-5 centimetres in thickness. The sandstone interbeds are interpreted to be turbidite deposits (Duff and Gilchrist, 1981). This member correspond to the Moosebar Formation of the Mink property.

4.3.1.2 Mudstone Member

The Mudstone Member overlies the Bluesky Member and was encountered in 15 boreholes at Hudette. The maximum intersected true thickness is 77 metres (**Table 4-1**), although apparent thickness of 180 metres (with true thickness unknown) was encountered in one hole. The coring holes intersected only 20 metres of the lower section. The dominant lithology is medium dark grey to dark grey, commonly homogenous mudstone. The bedding is indistinct and laminations are rare. Horizontal and vertical burrows, pyritised worm tubes, and shell fragments are common. Pyrite is fairly common and occurs as nodules, dissemination, and in burrows.

The upper contact of this member is placed at the bottom of thick siltstone/sandstone sequence. The lower contact is marked at the top of the glauconitic sandy mudstone.

The mudstones are interpreted as offshore deposits. Carmichael (1983) suggested these mudstones to be mainly fairweather suspension deposits while coarser material was supplied to the offshore during storm events.

Although similarities occur in the lower part of the Bullmoose Member within the Mink property and the Mudstone Member within the Hudette property, further investigations are needed to correlate these two members.

4.3.1.3 Bluesky Member

The Bluesky Member was intersected in 21 boreholes (**Table 4-1**). The glauconitic zone is exposed in outcrops near HUD11-01(situated at UTM 556077 E, 6147921 N). The Bluesky generally ranges in thickness from 12 to 22 metres with one exception of 27 metres in hole HUD12-17. The Bluesky is a transitional unit and there is some debate whether it should be placed within the Moosebar or Gething Formation. In this report the Bluesky is considered to be the basal member of the Moosebar Formation.

The Bluesky Member generally consists of interbedded mudstone, siltstone, and sandstone. Thin to medium individual sandstone and mudstone beds give some sections a banded appearance. The top of the Bluesky is marked by a distinctive glauconitic horizon. The glauconitic zone is up to 1.30 metres thick and is characterised by abundant fine bright green glauconite grains commonly in siltstone and less commonly in silty mudstone and argillaceous sandstone. Few millimetre thick coal lenses also occur in the glauconitic zone.

Siltstone, grading into silty mudstone or sandy siltstone in places, is the most common Bluesky lithology in the Hudette area. Mudstone facies as encountered in a southern hole (HUD13-02C) and sandstone facies as encountered in a northern hole (83-18) occur occasionally. Siltstone is generally medium grey to medium dark grey with occasional cross laminations and wavy bedding. Pyrite-filled vertical and horizontal burrows are common. Polished surfaces and sandstone lenses occur in places.

Mudstones are medium dark grey to dark grey and occasionally silty and carbonaceous. It includes horizontal and vertical pyrite-filled burrows, disseminated pyrite, and occasional bioturbated surfaces.

Sandstones are medium grey to light grey, very fine- to fine-grained, occasionally medium-grained and pebbly, and commonly well-sorted. Pyritised burrows are less common than in mudstone and siltstone facies. Trace glauconite was noted near the contact with the underlying Gething Formation.

The basal contact of Bluesky Member is characterised by chert and quartz pebble conglomerate up to a metre thick, to an argillaceous sandstone with a few random chert and quartz pebbles. However, the basal contact in Hudette region varies from pebbly sandstone to mudstone. Kilby (1983) suggested that for convenience, the top of Gething has generally been positioned at the top of the uppermost coal seam, although some of the overlying strata may also be non-marine Gething. At Hudette, the Bluesky / Gething boundary has therefore been drawn at the top of carbonaceous mudstone/siltstone or coal bed.

4.3.1.4 Environments of deposition

The Gething Formation is overlain by the Bluesky Member of the Moosebar Formation which was deposited by the Moosebar Sea. The advancement of the sea is thought to be in response to increased subsidence of the foreland basin and the rapid decrease in sediment supply. The Bluesky Member of the Moosebar Formation is considered to be the erosional remnant of deposits laid down by the advancing sea. A minor erosional unconformity may occur between the Gething and Moosebar Formations (Klatzel-Mudry *et al.*, 1984).

The mudstone facies of the Moosebar Formation are interpreted as offshore deposits on the basis of trace fossils, similarity of mudstone facies deposit with other modern and ancient off shore deposits, and their stratigraphic position (Carmichael, 1983). The bioturbated member appears to be the equivalent of Carmichael’s 'transition facies'. The transition facies is interpreted as forming in the transition zone between offshore and lower shoreface, on the basis of stratigraphic position and by comparison with other modern and ancient shoreline deposits (Carmichael, 1983). The same depositional environment is suggested for the Bioturbated Siltstone Member.

4.3.2 Gething Formation

The Gething Formation (McLearn, 1923) forms the top of Hughes' (1964) Crassier Group. The formation is named for Gething Creek, a tributary of the Peace River, west of Hudson's Hope and nearby Gething Mountain. The age of the formation is Aptian to Early Albian (Gibson, 1992).

The Gething's thickness increases from about 75 metres (about 245 feet) near Smoky River to more than 550 metres (about 1,800 feet) at Peace River Canyon and is about 350 metres (about 1,150 feet) in the foothills to the north. Within the Falling Creek area, previous drilling and mapping has not encountered a complete section of the Gething Formation, although several natural-gas wells have intersected complete, albeit thrust-faulted, Gething sections. Klatzel-Mudry *et al.* (1984) compiled a composite Gething section approximately 450 metres thick, in the Falling Creek area.

During the current investigations of the Hudette property, almost every borehole (except HUD 12-30 and HUD12-05) intersected some section of the Gething Formation. However, a complete lithological section of the Gething Formation has not yet been established from this work, since none of the boreholes have drilled a complete sequence between Moosebar Formation and Dresser Formation. A number of Gething outcrops are exposed, particularly along Falling Creek Connector Road, but no continuous section from top to bottom was exposed.

The Gething Formation is largely a sequence of fining-upward cyclothems, typical of fluvial to deltaic depositional environments. The cyclic coal-bearing succession consists of a heterogeneous assemblage of rare conglomerate, coarse- to fine-grained sandstone, siltstone, mudstone, carbonaceous mudstone and coal. Coal seams developed in the culminating phase of many cycles.

Typical Gething Formation geophysical logs show intercalated lithologies of sandstone, mudstone, siltstone and coal. Fining-upward cyclothems are commonly easy to pick on these logs (**Figure 4-3**). The log response in underlying Dresser Formation is blockier than in the Gething Formation (Klatzel-Mudry *et al.*, 1984), a useful criterion for differentiating the two formations.

The Dresser-Gething contact was intersected in a few air-rotary drill holes in southeastern corner of the investigated area. However, it was neither crossed in any core hole nor observed in the outcrops during current investigations. Hughes (1967) described the contact between Gething Formation and Dresser at the top of a 15 to 20 metre thick sequence of sandstone, grit, and conglomerate. The geophysical logs from the current investigation support this criterion, and the contact was therefore placed at the top of the thick arenaceous facies.

The Gething Formation within the Hudette study area is divisible into the Upper Gething and Lower Gething units on the basis of coal occurrences. However, these two units have not been separately mapped due to lack of sufficient data.

More than thirteen Gething coal seams (**Table 5-1**), within a true stratigraphic thickness averaging 151 metres, have been intersected by drilling at Hudette, where these coals may be correlated through several boreholes. Seven of these coals, designated from top down as A-Seam through G-Seam, commonly occur in the upper 85 metres (again, average true stratigraphic thickness). These coals appear to be thick, laterally consistent and are considered potentially-economic at this stage. The strata consisting of these seams are considered to comprise the Upper Gething Unit.

The sequence below G seam is included in the Lower Gething Formation. The coal seams in the Lower Gething Unit are generally thin to very thin, occasionally swelling to greater thicknesses, but are not considered economic at the present time. These lower coals are not correlatable at this stage of exploration, and have therefore not been named.

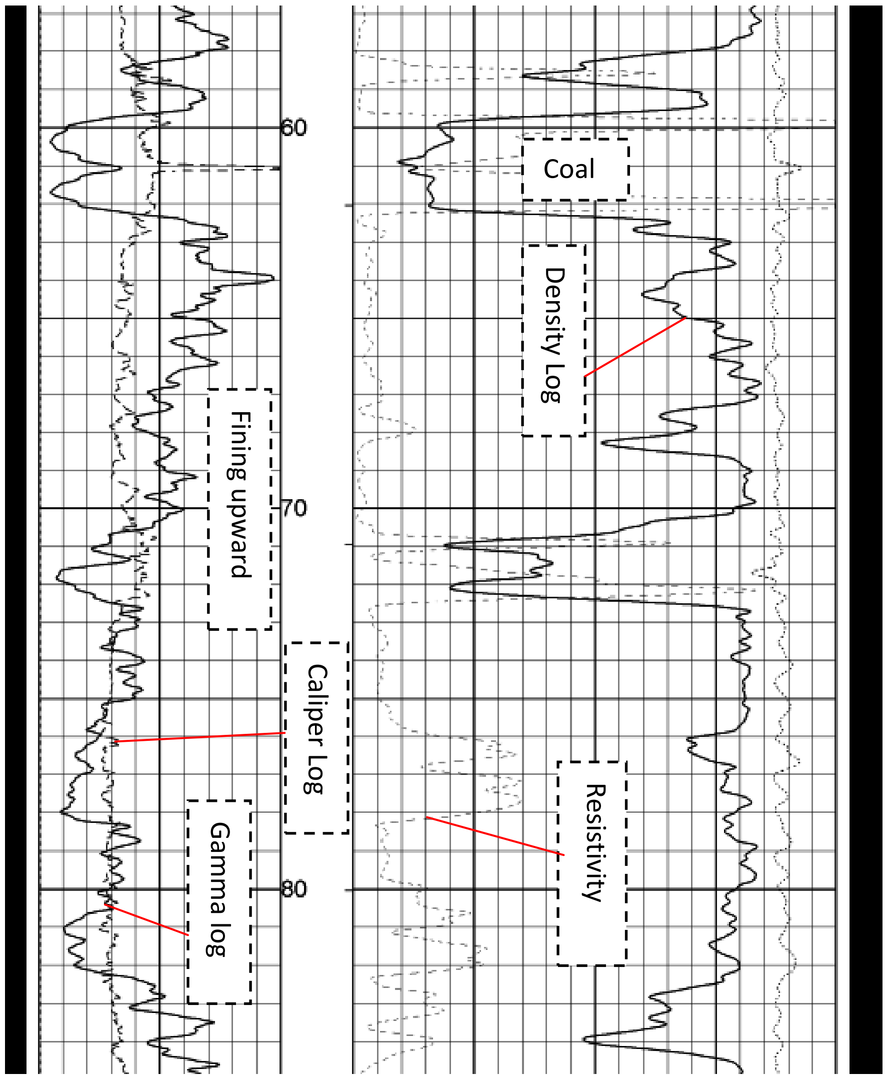


Figure 4-3: Fining-upward sequence capped by coal seam in upper unit of Gething (borehole HUD12-15)

4.3.2.1 Upper Gething Unit

The strata from Bluesky-Gething contact to the floor of G-Seam is included in the Upper Gething Unit. The lithological sequence in upper coal zone described here is based on three continuous core logs, five spot coring logs from current drilling, one historical drill hole (83-18), limited outcrop data and interpretation of geophysical logs.

Sandstone and mudstone constitute the dominant lithology of the Upper Gething Unit, based on core study, log interpretation and outcrops. The percentages of these lithologies vary in holes and any particular trend of these lithologies could not be concluded from the available data. Following is the description of major lithologies within the Upper Gething Unit.

4.3.2.1.1 Sandstone

Sandstone is light grey, medium grey, medium dark grey and brownish grey, and weathers orange brown to brownish grey in outcrops. It is moderately- to well-sorted and well indurated. The grains appear mostly quartz and chert, commonly subrounded to subangular, and exhibit salt-and-pepper texture in places. Mudstone and siltstone pebbles and laminae, and carbonaceous and coal lenses and laminae occur in places. Calcite (commonly) and pyrite (rarely) were recorded. Although the grain size ranges from very fine to very coarse (occasionally grading to pebbly sandstone), very fine- to fine-grained sandstones predominate. Coarser sizes are rare, usually occurring at the bottom of the fining-upward cyclothems. Parallel laminations, cross-laminations, coalified and carbonaceous plant debris, roots, bioturbation, burrows, soft-sediment deformation, flame structures, and rip-up clasts were noted in places. Polished surfaces and iron staining is common at several intervals. The upper and lower contacts of these sandstones vary from sharp to gradational.

4.3.2.1.2 Mudstone

The mudstone is medium grey to dark grey, silty to non silty, slightly carbonaceous to highly carbonaceous and locally grading to carbonaceous shale. A number of soft, light grey ash bands have been reported. Coal laminae, stringers, very thin beds, and coalified and carbonaceous plant debris are common to abundant. Rootlets, soft-sediment deformation, bioturbation, sandstone and siltstone lenses and very thin beds occur in places. Polished surfaces, calcite and rare pyrite were also noted.

4.3.2.1.3 Siltstone and pebbly sandstone

Quantitatively, siltstone and pebbly sandstone constitute the minor portion of the sequence in the core holes. Siltstones are medium grey and usually grade to sandstone or mudstone in the cycle. Carbonaceous and coalified plant fragments and burrows occur in places. Pebbly sandstone occurs at the base of the cycle and is generally coarse- to very coarse-grained with abundant chert pebbles, up to 5 millimetres in diameter.

4.3.2.1.4 Coal

Coals of A-Seam (near the top of the Upper Gething) down to G-Seam were deposited in the Upper Gething sequence. The extent, thickness and economic potential of these coal seams are described in detail in **Section 5** of this report.

4.3.2.2 Lower Gething Unit

The Lower Gething in this report represents all the strata drilled below G-seam during the 2011-2013 drilling programme. The coring holes were not deep enough to intersect the complete section of the Lower Gething Unit. The lithological characteristics are somehow similar to Upper Gething Unit in cores; however it appears on wireline logs that percentage of sandy facies increases downward.

Numerous coal occurrences in the Lower Gething have been picked on density and neutron logs (**Table 5-1**), but they are too thin to be of economic interest. Some of the seams locally thicken up to 3 metres but generally thin out or pinch out quickly. Although seam correlation in Lower Gething is generally reasonable, correlation of some of the coal zones has been difficult due to variable seam characteristics, absence of marker beds and lack of continuity. Additional data from future exploration programmes will improve the reliability of seam correlation.

The Lower Gething Unit comprises a sequence of sandstone, mudstone, siltstone and coal.

Sandstone are light to medium grey, argillaceous to clean, commonly fine- to very fine-grained, locally grading to medium- to very coarse-grained, moderately- to well-sorted and generally calcareous. Other locally developed features include laminations, cross lamination, burrows, bioturbation, rootlets, coal lenses, coal stringers, coalified plant debris, slumping and compaction structures and rip-up clasts.

Mudstones are medium grey to dark grey, locally carbonaceous and silty and calcareous to non-calcareous. Sandstone and siltstone laminations are common in some intervals. Laminations, coaly and carbonaceous stringers, coalified plant debris, and coal laminae occur in places. The contact with other lithologies is generally gradational. Nodular appearance, pyrite nodules and polished fragments and surfaces are occasional.

Siltstone is dark grey to black, commonly argillaceous and calcareous. Fine sand laminations, bioturbation, burrows, cross-lamination, parallel to ripple lamination, and coalified and carbonaceous plant debris occur locally.

Four coal seams along with a number of unidentified coal seams are identified in Lower Gething Unit. These seams generally appear uneconomic at this stage of exploration.

4.3.2.3 Environment of deposition

The Gething Formation is bounded by marine sediments of the Moosebar Formation at the top and delta plain facies of the Dresser Formation at the bottom. The tectonic and sedimentary processes of Gething Formation are thought to be analogous with a humid alluvial plain and delta plain facies model (Klatzel-Mudry *et al.*, 1984). Different facies (channel sandstone, carbonaceous mudstone, coal etc.) within the formation can be interpreted as various components of a deltaic complex (Klatzel-Mudry *et al.*, 1984).

The paleoenvironment and depositional history of the Gething Formation has also been described by Gibson (1992a). He concluded that the sedimentary facies, facies relationship, petrographic data, the presence of diagnostic sedimentary and biogenic structures, and the occurrence or absence of characteristic megafossils, microfossils and micro floral assemblage, suggest that most strata of the Gething Formation were deposited in a deltaic coastal plain, or paralic depositional environment.

4.3.3 Dresser Formation

The Dresser Formation underlies the Gething Formation. The type locality of the Dresser Formation has been described by Hughes (1964), from the west end of the Peace River Canyon. The formation boundaries in the Peace River Canyon are recognised in outcrops as well as in diamond drill cores. The thickness of the Dresser Formation in the Peace River area ranges 370 metres in the west to 200 metres in the east (Hughes, 1964). The average thickness in the Falling Creek area is reported to be 350 metres (Klatzel-Mudry *et al.*, 1984). The formation has been identified on geophysical logs run in few holes in the southeastern portion of the current exploration area, but none of the coring holes reached the depth of Dresser Formation. The maximum apparent thickness of 170 metres was drilled in HUD12-18. The following figure shows the gamma and neutron log response in Dresser Formation.

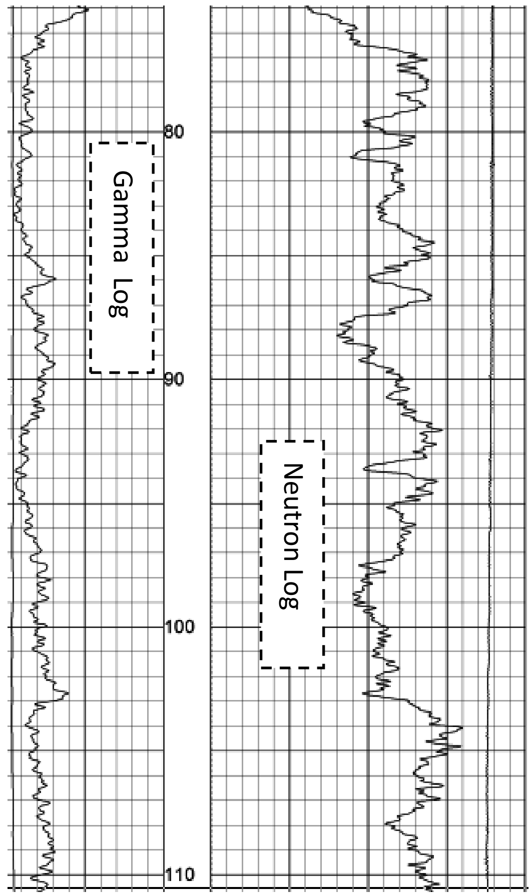


Figure 4-4: Neutron and Gamma log response of Dresser Formation (borehole HUD12-18)

The Dresser Formation as described from neighbouring areas (Sultan and Cathyl-Huhn, 2014, Klatzel-Mudry *et al.*, 1984) consists of interbedded mudstone, siltstone, sandstone, grits, conglomerates and coal. The mudstone and siltstone generally form the minor component of Dresser Formation. The sandstones are commonly very coarse- to medium-grained but range from very fine- to very coarse-grained. The grains are mostly quartz and chert and beds are medium to very thick. Both tabular and trough crossbedding was noted. The conglomerate units are thick and comprised of 3 millimetre to 10 centimetre, subrounded to rounded chert and quartz pebbles. The upper contact with Gething Formation is transitional and is placed at the top of the 15 to 20 metres thick sequence of sandstone, gritstone and conglomerates. The lower contact is placed on the last coarse-grained sandstone. Both contacts are conformable.

The formation was deposited in distal alluvial fan and braided stream (predominantly channel) environments.

4.4 Regional structural setting

The present-day Rocky Mountains are the most visible manifestation of Columbian and Laramide overthrusting, which gradually proceeded northeastward, with successively-younger thrusts tending to break through the Foreland rocks at successively-deeper stratigraphic levels. As successively-younger thrusts developed, they generated passive folding within overlying, previously-deformed rocks. Overlying, older thrusts were therefore passively folded along with their adjoining strata.

From southwest to northeast, the Cordilleran fold-thrust belt gradually changes structural styles (Thompson, 1979) from a thrust-dominant regime(within the mostly-Palaeozoic carbonate-clastic rocks of the Rocky Mountain Main Ranges and Front Ranges) to a mixed fold-thrust regime (within the Inner Foothills, including the Hudette property) to a gently-folded frontal regime (within the Outer Foothills, ten or more kilometres to the northeast of Hudette).

4.5 Local structure

Structural geology of the Hudette area would be difficult to decipher on the sole basis of bedding attitudes within exposed bedrock, owing to the pervasive Drift cover over the area, and the concomitant paucity of outcrops. Much of our understanding of local structural geology comes from borehole intersections of coal-measures and associated younger non-coal-bearing rocks, supplemented by exposures of bedrock along exploration trails and within the locally-substantial rock-cuts bounding the Falling Creek Connector Road (the FCCR).

Regional geological mapping within the broader Falling Creek exploration area indicate (Klatzel-Mudry *et al.*, 1984) that the Hudette exploration area is bounded on the northeast and southwest by faults that continue many kilometres to the northwest and southeast, consistent with the general strike in the area. These faults are marked F-1 and F-2 on **Map 2-4**. The F-1 fault dips to the southwest whereas the F-2 fault dips to the northeast.

` The Hudette property and environs are characterised by intense faulting and associated folding (**Map 2-4**). Thrust faults are the most common structural feature in the property. Low angle thrust faults responsible for stratigraphic over-thickening have been interpreted in a number of drill holes.

A number of faults extending throughout the property are well-defined from borehole data. Two of these faults occur along the northern and southern boundaries of the exploration area. These faults dip northeast in the southern portion and southwest in the northern portion. The southernmost fault recognised during the current exploration programme in drill holes HUD13-07 and HUD12-01 appears to be in the vicinity of the fault F-2. In this fault, the Gething Formation is repeated above the Moosebar Formation in HUD13-07. The fault along the northern boundary of the exploration area was recognised in drill holes HUD12-31and HUD12-24. This fault is located in the south of fault F-1.

Although faulting is the dominant structural element, very tight folding is commonly associated with these thrust faults. A major syncline runs approximately in the centre of the investigated area.

The structural features are shown in **Map 2-4**.

5 Coal

The Gething Formation contains several coal zones of potentially-economic importance within the Hudette property. Since the exploration activities in Hudette property between years-2011 through 2013 were confined to the northern portion of the property, the following discussion is based on the results obtained from these investigations.

Thirteen coal seams were identified on downhole geophysical logs and in cores. These thirteen coal seams were designated from youngest (stratigraphically-highest) to oldest (stratigraphically-lowest) as A, B, C, D, E, E1, F, F1, G, H, I, J, and K. Most of these coals comprise more than one ply, separated by rock partings. A-Seam and I-seam are thin, but are used as datum for coal seam correlation. E1 and F1 are only locally developed. Several coals below K-Seam were intersected in a few boreholes, but they are thin and probably not of immediate economic interest. **Table 5-1**, given below, presents Drift thickness, coal seam thickness, interseam intervals, and presence of the Moosebar Formation and the Bluesky Member in the current boreholes drilled at Hudette.

Table 5-1: Coal Seam, Drift, Moosebar Formation and Bluesky Member intervals in Hudette boreholes

Borehole	From (m)	To (m)	Thickness (m)		Seam	Lithology/ Fm/Member	Remarks
			Drilled	True			
HUD11-01	0	4.87	4.87			Drift	No dip data, HUD11-01C at the same location, used HUD11-01C core dip data.
HUD11-01	38.40	39.57	1.17	1.08	B	Coal	
HUD11-01	39.57	40.36	0.79	0.73	B-PT		
HUD11-01	40.36	41.04	0.68	0.63	B	Coal	
HUD11-01	41.04	41.68	0.64	0.59	B-PT		
HUD11-01	41.68	43.13	1.45	1.34	B	Coal	
HUD11-01	46.12	49.59	3.47	3.42	C	Coal	
HUD11-01	49.59	50.83	1.24	1.22	C-PT		
HUD11-01	50.83	51.40	0.57	0.56	C	CR	
HUD11-01	60.95	61.92	0.97	0.96	D	Coal	
HUD11-01	61.92	62.27	0.35	0.34	D-PT		
HUD11-01	62.27	62.70	0.43	0.42	D	Coal	
HUD11-01	62.70	63.81	1.11	1.09	D-PT		
HUD11-01	63.81	64.03	0.22	0.22	D	CR	
HUD11-01	90.66	90.93	0.27	0.27	E	Coal	
HUD11-01	90.93	93.18	2.25	2.22	E-PT		
HUD11-01	93.18	94.65	1.47	1.45	E	Coal	
HUD11-01	107.39	107.88	0.49	0.48	F	Coal	
HUD11-01	107.88	109.22	1.34	1.32	F-PT		
HUD11-01	109.22	111.38	2.16	2.14	F	Coal	

Table 5-1: Coal Seam, Drift, Moosebar Formation and Bluesky Member intervals in Hudette boreholes (continued)

Borehole	From (m)	To (m)	Thickness (m)		Seam	Lithology/ Fm/Member	Remarks
			Drilled	True			
HUD11-01	131.47	133.14	1.67	1.65	G	Coal	
HUD11-01	141.91	142.33	0.42	0.42	H	Coal	
HUD11-02	0	4.9	4.9			Drift	No dip data, but same location as HUD13-01C, dip data from core in HUD13-01C
HUD11-02	11.32	13.88	2.56	2.41	B	Coal	
HUD11-02	15.85	16.53	0.68	0.64	C	Coal	
HUD11-02	16.53	17.03	0.50	0.47	C-PT		
HUD11-02	17.03	18.41	1.38	1.30	C	Coal	
HUD11-02	20.04	22.15	2.11	1.97	D	Coal	
HUD11-02	22.15	23.25	1.10	1.03	D-PT		
HUD11-02	23.25	23.78	0.53	0.49	D	CR	
HUD11-02	49.71	49.90	0.19	0.18	E	CR	
HUD11-02	49.90	52.00	2.1	1.96	E-PT		
HUD11-02	52.00	52.85	0.85	0.81	E	Coal	
HUD11-02	70.12	70.34	0.22	0.21	F	CR	
HUD11-02	70.34	71.90	1.56	1.46	F-PT		
HUD11-02	71.90	74.40	2.50	2.33	F	Coal	
HUD11-02	88.09	88.48	0.39	0.38	G	Coal	
HUD11-02	88.48	89.21	0.73	0.71	G	CR	
HUD11-02	89.21	89.72	0.51	0.49	G	Coal	
HUD11-02	95.93	96.39	0.46	0.45	H	Coal	
HUD11-02	108.64	108.90	0.26	0.25	I	Coal	
HUD11-02	127.95	128.87	0.92	0.90	J	Coal	
HUD11-02	180.20	180.68	0.48	0.47	Coal	Coal	
HUD11-02	191.25	191.35	0.10	0.10	Coal	CR	
HUD11-02	204.88	205.19	0.31	0.30	Coal	Coal	
HUD11-02	209.27	209.64	0.37	0.36	Coal	Coal	
HUD11-02	212.16	212.43	0.27	0.26	Coal	CR	
HUD11-03	0	13.57	13.57			Drift	
HUD11-03	13.57	50.5	36.93			Moosebar	

Table 5-1: Coal Seam, Drift, Moosebar Formation and Bluesky Member intervals in Hudette boreholes (continued)

Borehole	From (m)	To (m)	Thickness (m)		Seam	Lithology/ Fm/Member	Remarks
			Drilled	True			
HUD11-03	50.5	61.56	11.06			Bluesky	No dip data, HUD13-08 is closest hole with dipmeter log
HUD11-03	61.56	61.88	0.32		A	Coal	
HUD11-03	96.08	98.39	2.31		B	Coal	
HUD11-03	98.39	98.77	0.38		B	CR	
HUD11-03	107.71	108.66	0.95		C	Coal	
HUD11-03	108.66	109.22	0.56		C-PT		
HUD11-03	109.22	111.10	1.88		C	Coal	
HUD11-03	111.10	115.52	4.42		C-PT		
HUD11-03	115.52	117.59	2.07		C	Coal	
HUD11-03	117.59	118.10	0.51		C-PT		
HUD11-03	118.10	118.81	0.71		C	Coal	
HUD11-03	118.81	119.26	0.45		C-PT		
HUD11-03	119.26	119.88	0.62		C	Coal	
HUD11-03	122.45	124.07	1.62		D	Coal	
HUD11-03	124.07	124.20	0.13		D-PT		
HUD11-03	124.20	125.00	0.80		D	Coal	
HUD11-03	125.00	126.61	1.61		D-PT		
HUD11-03	126.61	127.02	0.41		D	Coal	
HUD11-03	136.68	136.86	0.18		Coal	CR	
HUD11-03	153.80	154.36	0.56		E	Coal	
HUD11-03	154.36	156.03	1.67		E-PT		
HUD11-03	156.03	157.91	1.88		E	Coal	
HUD11-03	163.49	163.84	0.35		F	CR	
HUD11-03	163.84	165.42	1.58		F-PT		
HUD11-03	165.42	165.63	0.21		F	CR	
HUD11-03	165.63	167.35	1.72		F-PT		
HUD11-03	167.35	169.27	1.92		F	Coal	
HUD11-04	0	4.9	4.9			Drift	No dip data.
HUD11-04	68.47	70.95	2.48		B	Coal	
HUD11-04	75.90	76.44	0.54		C	Coal	
HUD11-04	76.44	76.93	0.49		C-PT		
HUD11-04	76.93	77.98	1.05		C	Coal	
HUD11-04	81.10	81.96	0.86		D	Coal	
HUD11-04	81.96	82.17	0.21		D-PT		

Table 5-1: Coal Seam, Drift, Moosebar Formation and Bluesky Member intervals in Hudette boreholes (continued)

Borehole	From (m)	To (m)	Thickness (m)		Seam	Lithology/ Fm/Member	Remarks
			Drilled	True			
HUD11-04	82.17	82.70	0.53		D	Coal	
HUD11-04	82.70	83.78	1.08		D-PT		
HUD11-04	83.78	84.06	0.28		D	Coal	
HUD11-04	103.71	104.42	0.71		E	Coal	
HUD11-04	104.42	106.31	1.89		E-PT		
HUD11-04	106.31	107.80	1.49		E	Coal	
HUD11-04	110.91	111.10	0.19		Coal	CR	
HUD11-04	113.39	114.03	0.64		F	CR	
HUD11-04	114.03	116.04	2.01		F-PT		
HUD11-04	116.04	118.50	2.46		F	Coal	
HUD11-04	141.96	142.30	0.34		G	Coal	
HUD11-04	142.30	142.83	0.53		G-PT		
HUD11-04	142.83	143.71	0.88		G	Coal	
HUD11-04	157.09	157.76	0.67		H	Coal	
HUD11-05	0	16.46	16.46			Drift	No dip data.
HUD11-05	31.32	33.24	1.92		B	Coal	
HUD11-05	59.03	59.97	0.94		C	Coal	
HUD11-05	63.84	65.63	1.79		D	Coal	
HUD11-05	78.61	79.28	0.67		E	Coal	
HUD11-05	79.28	81.47	2.19		E-PT		
HUD11-05	81.47	83.23	1.76		E	Coal	
HUD11-05	87.12	87.33	0.21		Coal	Coal	
HUD11-05	90.11	92.08	1.97		F	Coal	
HUD11-05	107.66	107.88	0.22		F1	Coal	
HUD11-05	107.88	108.81	0.93		F1-PT		
HUD11-05	108.81	109.40	0.59		F1	Coal	
HUD11-05	109.40	113.86	4.46		F1-PT		
HUD11-05	113.86	114.15	0.29		F1	Coal	
HUD11-05	120.96	121.27	0.31		G	Coal	
HUD11-05	121.27	121.48	0.21		G-PT		
HUD11-05	121.48	122.03	0.55		G	Coal	
HUD11-05	138.37	139.23	0.86		H	Coal	
HUD11-06	0	4.57	4.57			Drift	No dip data.
HUD11-06	17.82	20.20	2.38		B	Coal	
HUD11-06	21.51	22.21	0.70		C	CR	

Table 5-1: Coal Seam, Drift, Moosebar Formation and Bluesky Member intervals in Hudette boreholes (continued)

Borehole	From (m)	To (m)	Thickness (m)		Seam	Lithology/ Fm/Member	Remarks
			Drilled	True			
HUD11-06	22.21	23.74	1.53		C-PT		
HUD11-06	23.74	24.25	0.51		C	CR	
HUD11-06	24.25	24.84	0.59		C	Coal	
HUD11-06	24.84	25.40	0.56		C-PT		
HUD11-06	25.40	26.64	1.24		C	Coal	
HUD11-06	26.64	27.08	0.44		C	CR Floor	
HUD11-06	28.46	30.08	1.62		D	Coal	
HUD11-06	30.08	30.16	0.08		D-PT		
HUD11-06	30.16	30.67	0.51		D	Coal	
HUD11-06	52.50	54.48	1.98		E	Coal	
HUD11-07	0.00	26.92	26.92			Drift	Dip data from dipmeter, repeated from B to G seams, C and D seams at 152.11m have no parting, thickness matched with overlying C and D.
HUD11-07	26.92	45	18.08	18.05		Bluesky	
HUD11-07	45.26	45.45	0.19	0.19	A	CR	
HUD11-07	74.60	76.67	2.07	2.07	B	Coal	
HUD11-07	78.44	78.69	0.25	0.23	C	CR	
HUD11-07	78.90	79.59	0.69	0.65	C	Coal	
HUD11-07	79.59	80.12	0.53	0.50	CP		
HUD11-07	80.12	81.29	1.17	1.10	C	Coal	
HUD11-07	83.05	85.50	2.45	2.22	D	Coal	
HUD11-07	112.69	112.87	0.18	0.16	E	CR	
HUD11-07	112.87	114.09	1.22	1.06	E-PT		
HUD11-07	114.09	115.28	1.19	1.03	E	Coal	
HUD11-07	133.33	133.64	0.31	0.27	F	Coal	
HUD11-07	133.64	134.18	0.54	0.47	FP		
HUD11-07	134.18	135.82	1.64	1.42	F	Coal	
HUD11-07	148.45	150.72	2.27	2.26	B	Coal	
HUD11-07	150.72	151.16	0.44	0.44	B-PT		
HUD11-07	151.16	151.46	0.30	0.30	B	Coal	
HUD11-07	152.11	155.67	3.56	2.70	C	Coal	
HUD11-07	155.67	158.57	2.9	2.20	D	Coal	
HUD11-07	167.19	170.83	3.64	3.42	F	Coal	
HUD11-07	179.42	181.13	1.71	1.61	G	Coal	
HUD11-07	187.48	187.89	0.41	0.39	H	Coal	
HUD11-07	201.98	202.13	0.15	0.14	I	CR	
HUD11-07	223.68	224.54	0.86	0.83	J	Coal	

Table 5-1: Coal Seam, Drift, Moosebar Formation and Bluesky Member intervals in Hudette boreholes (continued)

Borehole	From (m)	To (m)	Thickness (m)		Seam	Lithology/ Fm/Member	Remarks
			Drilled	True			
HUD11-08	0	19.82	19.82			Drift	Dip data from dipmeter
HUD11-08	19.82	41.88	22.06	16.90		Bluesky	
HUD11-08	41.88	42.13	0.25	0.23	A	CR	
HUD11-08	72.86	74.98	2.12	1.92	B	Coal	
HUD11-08	78.98	79.20	0.22	0.22	C	CR	
HUD11-08	79.20	79.69	0.49	0.47	C-PT		
HUD11-08	79.69	80.39	0.70	0.68	C	Coal	
HUD11-08	80.39	80.93	0.54	0.52	C-PT		
HUD11-08	80.93	82.42	1.49	1.44	C	Coal	
HUD11-08	84.90	87.51	2.61	2.48	D	Coal	
HUD11-08	121.49	122.34	0.85	0.80	E	CR	
HUD11-08	122.34	123.23	0.89	0.86	E-PT		
HUD11-08	123.23	124.64	1.41	1.36	E	Coal	
HUD11-08	141.69	144.14	2.45	2.41	F	Coal	
HUD11-08	154.07	154.63	0.56	0.54	G	Coal	
HUD11-08	154.63	155.08	0.45	0.43	G	CR	
HUD11-08	155.08	155.90	0.82	0.79	G	Coal	
HUD11-08	161.95	162.58	0.63	0.61	H	Coal	
HUD11-08	172.81	173.20	0.39	0.38	I	HCC	
HUD11-08	193.51	194.00	0.49	0.48	J	Coal	
HUD11-09	0	13.71	13.71			Drift	No dip data. .
HUD11-09	22.92	23.28	0.36		D	Coal	
HUD11-09	23.28	23.58	0.30		D-PT		
HUD11-09	23.58	23.83	0.25		D	Coal	
HUD11-09	23.83	24.15	0.32		D-PT		
HUD11-09	24.15	24.59	0.44		D	Coal	
HUD11-09	25.44	25.62	0.18		Coal	Coal	
HUD11-09	26.33	26.61	0.28		Coal	Coal	
HUD11-09	31.14	31.35	0.21		Coal	Coal	
HUD11-09	32.33	32.68	0.35		E1	Coal	
HUD11-09	32.68	33.03	0.35		E1-PT		
HUD11-09	33.03	33.25	0.22		E1	Coal	
HUD11-09	33.25	37.31	4.06		E1-PT		
HUD11-09	37.31	39.28	1.97		E1	Coal	
HUD11-09	40.10	40.49	0.39		E	Coal	

Table 5-1: Coal Seam, Drift, Moosebar Formation and Bluesky Member intervals in Hudette boreholes (continued)

Borehole	From (m)	To (m)	Thickness (m)		Seam	Lithology/ Fm/Member	Remarks
			Drilled	True			
HUD11-09	40.49	40.88	0.39		E-PT		
HUD11-09	40.88	42.23	1.35		E	Coal	
HUD11-09	43.40	43.77	0.37		Coal	Coal	
HUD11-09	47.69	49.52	1.83		F	Coal	
HUD11-09	67.78	68.51	0.73		G	Coal	
HUD11-09	93.22	95.04	1.82		H	Coal	
HUD11-09	97.08	98.6	1.52		H-REP	Coal	
HUD11-09	124.28	124.99	0.71		J	Coal	
HUD11-01C	0	6.09	6.09			OB	Dip data from core
HUD11-01C	39.54	40	0.46	0.43	B	CR	
HUD11-01C	40.00	41.83	1.83	1.70	B	Coal	
HUD11-01C	41.83	42.39	0.56	0.52	B-PT		
HUD11-01C	42.39	44.41	2.02	1.87	B	Coal	Dip data from core
HUD11-01C	48.60	50.68	2.08	2.05	C	Coal	
HUD11-01C	61.21	61.70	0.49	0.48	D	Coal	
HUD11-01C	87.80	88.06	0.26	0.26	E	Coal	
HUD11-01C	88.06	89.68	1.62	1.60	E-PT		
HUD11-01C	89.68	91.57	1.89	1.86	E	Coal	
HUD11-01C	100.97	101.29	0.32	0.32	F	CR	
HUD11-01C	101.29	104.55	3.26	3.19	F-PT		
HUD11-01C	104.55	106.52	1.97	1.94	F	Coal	
HUD11-07C	0.00	21.33	21.33			Drift	Dip data from dipmeter, repeated from B to G seams, C and D seams at 139.51m has no parting in between.
HUD11-07C	21.33	44.50	23.17	23.17		Bluesky	
HUD11-07C	44.50	44.70	0.2	0.20	A	Coal	
HUD11-07C	73.51	75.55	2.04	2.04	B	Coal	
HUD11-07C	76.72	77.10	0.38	0.36	C	CR	
HUD11-07C	76.72	78.00	1.28	1.20	C	Coal	
HUD11-07C	78.00	78.45	0.45	0.42	C-PT		
HUD11-07C	78.45	79.78	1.33	1.25	C	Coal	
HUD11-07C	81.78	83.52	1.74	1.58	D	Coal	
HUD11-07C	109.52	109.70	0.18	0.16	E	Coal	
HUD11-07C	109.70	111.05	1.35	1.17	E-PT		
HUD11-07C	111.05	112.27	1.22	1.06	E	Coal	
HUD11-07C	130.20	133.51	3.31	2.87	F	Coal	
HUD11-07C	134.07	139.50	5.43	5.41	B	Coal	

Table 5-1: Coal Seam, Drift, Moosebar Formation and Bluesky Member intervals in Hudette boreholes (continued)

Borehole	From (m)	To (m)	Thickness (m)		Seam	Lithology/ Fm/Member	Remarks
			Drilled	True			
HUD11-07C	139.50	144.00	4.5	3.45	C+D		
HUD11-07C	144.00	147.24	3.24	3.04	F	Coal	
HUD11-07C	154.00	155.05	1.05	0.99	G	Coal	
HUD12-01	0.00	18.29	18.29			Drift	No dip data.
HUD12-01	18.29	90.00	71.71			Moosebar	
HUD12-01	90.00	116.20	26.2			Bluesky	
HUD12-01	116.20	117.00	0.8		A	C.Sh	
HUD12-01	154.00	156.90	2.9		B	COAL	
HUD12-01	157.90	158.50	0.6		C	COAL	
HUD12-01	158.50	158.90	0.4		C-PT		
HUD12-01	158.90	160.30	1.4		C	COAL	
HUD12-01	162.40	164.50	2.1		D	COAL	
HUD12-01	164.50	165.30	0.8		D-PT		
HUD12-01	165.30	165.80	0.5		D	COAL	No dip data.
HUD12-01	206.00	206.20	0.2		COAL	COAL	
HUD12-01	209.70	211.80	2.1		B	COAL	
HUD12-01	211.80	213.50	1.7		B-C PT	COAL	
HUD12-01	213.00	213.50	0.5		C	COAL	
HUD12-01	213.50	214.20	0.7		C-PT		
HUD12-01	214.20	214.30	0.1		C	COAL	
HUD12-01	214.30	215.20	0.9		C-PT	COAL	
HUD12-01	215.20	216.00	0.8		C	COAL	
HUD12-01	219.20	221.60	2.4		D	COAL	
HUD12-01	221.60	222.20	0.6		D-PT		
HUD12-01	222.20	223.45	1.25		D	COAL	
HUD12-02	0.00	41.14	41.14			Drift	No dip data.
HUD12-02	53.50	54.10	0.6		E	COAL	
HUD12-02	54.10	55.60	1.5		E-PT		
HUD12-02	55.60	56.20	0.6		E	COAL	
HUD12-02	102.10	104.80	2.7		F	COAL	
HUD12-02	107.10	107.85	0.75		G	COAL	
HUD12-02	107.85	108.30	0.45		G-PT		
HUD12-02	108.30	109.20	0.9		G	COAL	
HUD12-02	123.10	123.70	0.6		H	COAL	

Table 5-1: Coal Seam, Drift, Moosebar Formation and Bluesky Member intervals in Hudette boreholes (continued)

Borehole	From (m)	To (m)	Thickness (m)		Seam	Lithology/ Fm/Member	Remarks
			Drilled	True			
HUD12-02	139.20	139.50	0.3		I	COAL	
HUD12-02	150.60	151.70	1.1		J	COAL	
HUD12-02	156.80	157.20	0.4		Coal	COAL	
HUD12-03	0.00	24.33	24.33			Drift	Dip data from dipmeter
HUD12-03	24.33	36.80	12.47	11.30		Bluesky	
HUD12-03	36.80	37.00	0.2	0.18	A	C.Sh	
HUD12-03	73.40	74.50	1.1	1.00	B	COAL	
HUD12-03	76.00	76.50	0.5	0.45	C	COAL	
HUD12-03	76.50	77.10	0.6	0.54	C-PT		
HUD12-03	77.10	78.50	1.4	1.27	C	COAL	
HUD12-03	79.80	82.10	2.3	2.08	D	COAL	
HUD12-03	97.75	99.00	1.25	1.13	E	COAL	
HUD12-03	133.40	134.00	0.6	0.54	Coal	COAL	
HUD12-03	151.60	155.30	3.7	3.35	F	COAL	
HUD12-03	161.00	161.90	0.9	0.82	G	COAL	
HUD12-03	161.90	162.10	0.2	0.18	G	CR	Dip data from dipmeter
HUD12-03	162.10	163.30	1.2	1.09	G	COAL	
HUD12-03	169.70	170.30	0.6	0.54	H	COAL	
HUD12-03	184.60	184.90	0.3	0.27	I	COAL	
HUD12-03	203.10	203.90	0.8	0.73	J	COAL	
HUD12-03	205.90	206.00	0.1	0.09	Coal	COAL	
HUD12-04	0.00	33.52	33.52			Drift	Only neutron log through rods, coal picks approximate, dipmeter for upper 85m, few dip readings.
HUD12-04	79.50	80.00	0.5	0.48	A	COAL	
HUD12-04	136.50	139.00	2.5		B	COAL	
HUD12-04	146.00	148.00	2		C		
HUD12-04	157.00	159.00	2		D		
HUD12-04	171.50	172.00	0.5		E	COAL	
HUD12-04	186.00	187.70	1.7		F	COAL	
HUD12-04	194.00	197.00	3		G	COAL	
HUD12-04	207.00	209.00	2		Coal	COAL	
HUD12-05	0.00	4.57	4.57			Drift	Intersected only Moosebar Formation
HUD12-05	4.57	33.00	28.43			Moosebar	
HUD12-05	33.00	54.00	21			Moosebar	
HUD12-05	54.00	124.96	70.96			Moosebar	

Table 5-1: Coal Seam, Drift, Moosebar Formation and Bluesky Member intervals in Hudette boreholes (continued)

Borehole	From (m)	To (m)	Thickness (m)		Seam	Lithology/ Fm/Member	Remarks
			Drilled	True			
HUD12-06	0.00	9.14	9.14			Drift	Dip data from dipmeter, Moosebar from 120m-240.79m.
HUD12-06	12.70	14.80	2.1	2.09	A	COAL	
HUD12-06	15.00	15.60	0.6	0.60	Coal	COAL	
HUD12-06	66.90	67.10	0.2	0.20	Coal	COAL	
HUD12-06	71.20	71.60	0.4	0.40	E	COAL	
HUD12-06	71.60	72.30	0.7	0.70	E-PT		
HUD12-06	72.30	77.00	4.7	4.63	E	COAL	
HUD12-06	98.80	104.40	5.6	3.60	F	COAL	
HUD12-07	0.00	12.19	12.19			Drift	Dip data from dipmeter.
HUD12-07	12.19	35.50	23.31	22.52		Moosebar	
HUD12-07	35.50	58.50	23	22.22		Bluesky	
HUD12-07	58.50	58.80	0.3	0.29	A	COAL	
HUD12-07	83.60	85.60	2	1.93	B	COAL	
HUD12-07	89.90	90.50	0.6	0.58	C	COAL	
HUD12-07	90.50	91.00	0.5	0.48	C-PT		
HUD12-07	91.00	92.25	1.25	1.21	C	COAL	
HUD12-07	93.20	94.45	1.25	1.21	D	COAL	
HUD12-07	133.90	135.30	1.4	1.38	E	COAL	
HUD12-07	135.30	136.50	1.2	1.18	E-PT		
HUD12-07	136.50	137.90	1.4	1.38	E	COAL	
HUD12-07	154.60	155.00	0.4	0.40	F	CR	
HUD12-07	155.00	156.80	1.8	1.80	F-PT		
HUD12-07	156.80	160.00	3.2	3.19	F	COAL	
HUD12-07	175.40	176.90	1.5	1.41	G	COAL	
HUD12-08	0.00	12.19	12.19			Drift	Dip data from dipmeter, Bluesky between A and Drift.
HUD12-08	27.50	28.00	0.5	0.48	A	CR	
HUD12-08	28.00	29.10	1.1	1.06	A	COAL	
HUD12-08	74.20	75.30	1.1	1.10	B	COAL	
HUD12-08	87.55	88.00	0.45	0.45	C	CR	
HUD12-08	88.00	88.80	0.8	0.80	C	COAL	
HUD12-08	93.30	94.30	1	1.00	D	COAL	
HUD12-08	101.20	102.30	1.1	1.10	E1	COAL	
HUD12-08	102.30	103.60	1.3	1.30	E1-PT		
HUD12-08	103.60	104.40	0.8	0.80	E1	COAL	
HUD12-08	134.90	135.30	0.4	0.39	E	COAL	

Table 5-1: Coal Seam, Drift, Moosebar Formation and Bluesky Member intervals in Hudette boreholes (continued)

Borehole	From (m)	To (m)	Thickness (m)		Seam	Lithology/ Fm/Member	Remarks
			Drilled	True			
HUD12-08	138.60	140.30	1.7	1.67	F	COAL	
HUD12-08	186.80	188.60	1.8	1.80	H	COAL	
HUD12-08	191.60	191.80	0.2	0.20	Coal	CR	
HUD12-08	192.50	193.10	0.6	0.60	Coal	CR	
HUD12-08	196.70	197.20	0.5	0.50	I	COAL	
HUD12-09	0.00	39.62	39.62			Drift	Hole downdip, Hole HUD-12-21 at the same location drilled in opposite direction, HUD12-21C Spot coring hole at the same location.
HUD12-09	62.40	63.00	0.6		E	COAL	
HUD12-09	78.00	82.00	4		E	COAL	
HUD12-09	85.60	86.30	0.7		E	COAL	
HUD12-09	105.20	106.80	1.6		F	COAL	
HUD12-09	112.90	117.50	4.6		F	COAL	
HUD12-09	117.80	118.60	0.8		F	COAL	
HUD12-09	119.70	150.20	30.5		F	COAL	
HUD12-09	162.30	162.60	0.3		F	COAL	
HUD12-09	165.80	166.40	0.6		F	COAL	
HUD12-09	170.10	173.30	3.2		F	COAL	
HUD12-09	190.60	193.20	2.6		G	COAL	
HUD12-09	194.60	196.30	1.7		G	COAL	
HUD12-09	201.60	202.20	0.6		Coal	COAL	
HUD12-10	0.00	6.09	6.09	6.09		Drift	Dip data from dipmeter., faulted below 21.64m.
HUD12-10	14.69	16.60	1.91	0.81	G?	COAL	
HUD12-10	21.64	21.87	0.23	0.10	Coal	COAL	
HUD12-10	80.89	81.90	1.01	0.43	C	COAL	
HUD12-10	81.90	82.20	0.3	0.13	C	CR	
HUD12-10	82.20	83.15	0.95	0.40	C	COAL	
HUD12-10	84.10	85.65	1.55	0.66	D	COAL	
HUD12-10	85.65	85.90	0.25	0.11	D-PT		
HUD12-10	85.90	86.86	0.96	0.41	D	COAL	
HUD12-10	86.86	88.38	1.52	0.64	D-PT		
HUD12-10	88.38	89.11	0.73	0.31	D	COAL	
HUD12-10	101.10	101.50	0.4	0.14	Coal	CR	
HUD12-10	105.91	106.15	0.24	0.08	Coal	COAL	
HUD12-10	110.60	111.60	1	0.34	E	COAL	
HUD12-10	111.60	113.34	1.74	0.60	E-PT		
HUD12-10	113.34	113.60	0.26	0.09	E	COAL	

Table 5-1: Coal Seam, Drift, Moosebar Formation and Bluesky Member intervals in Hudette boreholes (continued)

Borehole	From (m)	To (m)	Thickness (m)		Seam	Lithology/ Fm/Member	Remarks
			Drilled	True			
HUD12-10	113.60	114.45	0.85	0.29	E-PT		
HUD12-10	114.45	115.00	0.55	0.19	E	COAL	
HUD12-10	115.00	115.78	0.78	0.27	E-PT		
HUD12-10	115.78	116.17	0.39	0.13	E	COAL	
HUD12-10	131.35	132.75	1.4	0.48	F	COAL	
HUD12-10	135.85	136.75	0.9	0.31	F	COAL	
HUD12-10	149.31	149.85	0.54	0.18	I	COAL	
HUD12-10	151.70	152.10	0.4	0.14	Coal	COAL	
HUD12-10	152.83	154.29	1.46	0.50	Coal	COAL	
HUD12-10	157.30	158.43	1.13	0.39	Coal	COAL	
HUD12-10	161.72	162.40	0.68	0.18	Coal	COAL	
HUD12-10	164.89	165.86	0.97	0.88	H	COAL	
HUD12-10	167.20	167.73	0.53	0.48	Coal	COAL	
HUD12-10	170.20	170.70	0.5	0.43	Coal	CR	
HUD12-10	179.12	179.39	0.27	0.24	Coal	COAL	
HUD12-10	211.62	212.33	0.71	0.58	Coal	COAL	
HUD12-11	0.00	12.16	12.16			Drift	No dip data, G and K seams repeated.
HUD12-11	26.40	27.70	1.3		C	Coal	
HUD12-11	33.10	35.10	2		D	Coal	
HUD12-11	46.10	47.00	0.9		E	Coal	
HUD12-11	47.00	48.80	1.8		E-PT		
HUD12-11	48.80	49.00	0.2		E	Coal	
HUD12-11	49.00	49.80	0.8		E-PT		
HUD12-11	49.80	51.90	2.1		E	Coal	
HUD12-11	52.80	53.10	0.3			C.Sh	
HUD12-11	54.20	54.50	0.3			C.Sh	
HUD12-11	55.10	55.50	0.4		Coal	Coal	
HUD12-11	58.00	60.30	2.3		F	Coal	
HUD12-11	76.40	77.20	0.8		G	Coal	
HUD12-11	99.90	100.50	0.6		G-REP	Coal	
HUD12-11	117.90	118.60	0.7		H	Coal	
HUD12-11	146.50	146.90	0.4		K	Coal	
HUD12-11	146.90	147.70	0.8		K-PT		
HUD12-11	147.70	148.00	0.3		K	Coal	

Table 5-1: Coal Seam, Drift, Moosebar Formation and Bluesky Member intervals in Hudette boreholes (continued)

Borehole	From (m)	To (m)	Thickness (m)		Seam	Lithology/ Fm/Member	Remarks
			Drilled	True			
HUD12-12	0.00	9.14	9.14			Drift	HUD12-12 and HUD12-13 at same location, but in opposite directions, dips from dipmeter.
HUD12-12	28.20	35.20	7	3.50	F	Coal	
HUD12-12	73.40	73.80	0.4	0.20	G	Coal	
HUD12-12	73.80	74.20	0.4	0.20	G-PT		
HUD12-12	74.20	75.90	1.7	0.85	G	Coal	
HUD12-12	75.90	76.30	0.4	0.20	G-PT		
HUD12-12	76.30	76.60	0.3	0.15	G	Coal	
HUD12-12	76.60	77.10	0.5	0.25	G-PT		
HUD12-12	77.10	79.10	2	1.00	G	Coal	
HUD12-13	0.00	9.14	9.14			Drift	Dip data from dipmeter.
HUD12-13	10.90	11.50	0.6	0.58	G	Coal	
HUD12-13	11.50	11.90	0.4	0.39	G-PT		
HUD12-13	11.90	12.60	0.7	0.68	G		
HUD12-13	20.90	21.80	0.9	0.87	H	Coal	
HUD12-13	33.80	34.00	0.2	0.19	I	Coal	
HUD12-13	76.20	76.50	0.3	0.30	Coal	Coal	
HUD12-13	91.80	92.50	0.7	0.70	H	Coal	
HUD12-13	110.50	111.20	0.7	0.69	Coal	Coal	
HUD12-13	140.00	141.40	1.4	1.39	D	Coal	
HUD12-13	153.10	154.65	1.55	1.54	E	Coal	
HUD12-13	154.65	154.95	0.3	0.30	E-PT		
HUD12-13	154.95	156.00	1.05	1.05	E		
HUD12-13	173.70	177.10	3.4	3.35	F	Coal	
HUD12-13	189.70	193.10	3.4	3.40	F-REP	Coal	
HUD12-13	194.40	195.10	0.7	0.70	Coal	CR	
HUD12-14	0.00	36.00	36			Drift	No dip data.
HUD12-14	69.10	70.50	1.4		G	Coal	
HUD12-14	108.00	108.60	0.6		H	Coal	
HUD12-14	173.60	174.50	0.9		H-REP	Coal	
HUD12-14	208.10	208.50	0.4		Coal	Coal	
HUD12-14	229.50	230.20	0.7		J	Coal	
HUD12-15	0.00	6.09	6.09	6.09		Drift	Dip data from dipmeter.
HUD12-15	5.20	7.80	2.6	2.59	D	Coal	
HUD12-15	14.90	15.20	0.3	0.30	Coal	Coal	
HUD12-15	15.70	16.00	0.3	0.30	Coal	Coal	

Table 5-1: Coal Seam, Drift, Moosebar Formation and Bluesky Member intervals in Hudette boreholes (continued)

Borehole	From (m)	To (m)	Thickness (m)		Seam	Lithology/ Fm/Member	Remarks
			Drilled	True			
HUD12-15	37.60	37.80	0.2	0.20	E	Coal	
HUD12-15	37.80	41.20	3.4	3.39	E-PT		
HUD12-15	41.20	43.10	1.9	1.89	E	Coal	
HUD12-15	47.30	47.50	0.2	0.20	Coal	Coal	
HUD12-15	58.60	58.70	0.1	0.10	F	Coal	
HUD12-15	58.70	59.70	1	1.00	F-PT		
HUD12-15	59.70	62.30	2.6	2.59	F	Coal	
HUD12-15	70.80	71.20	0.4	0.40	G	Coal	
HUD12-15	71.20	71.80	0.6	0.60	G	CR	
HUD12-15	71.80	72.30	0.5	0.50	G	Coal	
HUD12-15	85.90	86.60	0.7	0.68	H	Coal	
HUD12-15	96.10	96.50	0.4	0.40	I	Coal	
HUD12-15	103.10	103.30	0.2	0.20	Coal	Coal	
HUD12-15	163.70	164.00	0.3	0.30	Coal	Coal	
HUD12-15	190.20	190.90	0.7	0.70	K	Coal	
HUD12-16	0.00	18.29	18.29			Drift	No dip data, coal below Dresser in faulted sequence.
HUD12-16	80.10	80.60	0.5		Coal	Coal	
HUD12-16	185.20	190.10	4.9		C	Coal	
HUD12-16	194.50	194.90	0.4		D	Coal	
HUD12-16	194.90	195.60	0.7		D-PT		
HUD12-16	195.60	196.20	0.6		D	Coal	
HUD12-16	206.70	207.20	0.5		E	Coal	
HUD12-16	207.20	212.20	5		E-PT		
HUD12-16	212.20	212.50	0.3		E	Coal	
HUD12-16	218.20	218.70	0.5		Coal	Coal	
HUD12-16	229.10	229.60	0.5		F	Coal	
HUD12-16	229.60	230.90	1.3		F-PT		
HUD12-16	230.90	231.30	0.4		F	Coal	
HUD12-16	247.80	248.50	0.7		H	Coal	
HUD12-17	0.00	6.06	6.06			Drift	Dip data from HUD12-19.
HUD12-17	6.06	40.50	34.44	22.14		Moosebar	
HUD12-17	40.50	68.00	27.5	17.68		Bluesky	
HUD12-17	68.00	70.00	2	1.29	A	Coal	
HUD12-18	0.00	12.19	12.19	12.19		Drift	Dresser

Table 5-1: Coal Seam, Drift, Moosebar Formation and Bluesky Member intervals in Hudette boreholes (continued)

Borehole	From (m)	To (m)	Thickness (m)		Seam	Lithology/ Fm/Member	Remarks
			Drilled	True			
HUD12-19	0.00	6.06	6.06	6.06		Drift	Dip data from dipmeter, HUD12-17 and HUD12-19 approximately same location, HUD12-19 vertical and HUD12-17 angle hole, Dip data from HUD12-19 also utilized for true thicknesses in HUD12-17.
HUD12-19	6.06	21.50	15.44	14.51		Moosebar	
HUD12-19	21.50	38.80	17.3	16.26		Bluesky	
HUD12-19	38.80	40.10	1.3	1.22	A	Coal	
HUD12-19	59.90	61.30	1.4	1.32	B	Coal	
HUD12-19	84.80	85.70	0.9	0.85	C	Coal	
HUD12-19	88.80	90.40	1.6	1.50	D	Coal	
HUD12-19	123.60	123.90	0.3	0.29	E	CR	
HUD12-19	123.90	125.90	2	1.93	E-PT		
HUD12-19	125.90	127.40	1.5	1.45	E	Coal	
HUD12-19	136.00	136.20	0.2	0.19	Coal	CR	
HUD12-19	144.80	148.40	3.6	3.55	F	Coal	
HUD12-19	155.70	156.00	0.3	0.30	Coal	Coal	
HUD12-19	161.30	162.20	0.9	0.82	G	Coal	
HUD12-19	162.20	162.45	0.25	0.23	G-PT		
HUD12-19	162.45	163.50	1.05	0.91	G		
HUD12-19	180.90	181.20	0.3	0.26	Coal	CR	
HUD12-19	184.40	186.70	2.3	1.48	H	Coal	
HUD12-19	193.60	194.20	0.6	0.39	I	Coal	
HUD12-19	197.20	197.30	0.1	0.06	Coal	CR	
HUD12-19	198.00	198.20	0.2	0.13	Coal	CR	
HUD12-19	207.60	210.70	3.1	1.78	J	Coal	
HUD12-19	241.30	242.40	1.1	0.84	K	Coal	
HUD12-19	242.40	243.00	0.6	0.46	K-PT		
HUD12-19	243.00	246.40	3.4	2.60	K		
HUD12-20	9.50	15.24	5.74			Drift	No dip data, sequence below C repeated.
HUD12-20	9.50	11.27	1.77		D	Coal	
HUD12-20	30.66	31.04	0.38		E	Coal	
HUD12-20	48.43	50.22	1.79		F	Coal	
HUD12-20	50.22	51.00	0.78		F-PT		
HUD12-20	51.00	51.80	0.8		F	Coal	
HUD12-20	51.80	54.26	2.46		F-PT		
HUD12-20	54.26	55.20	0.94		F	Coal	
HUD12-20	58.04	58.85	0.81		G	Coal	
HUD12-20	112.16	113.87	1.71		B	Coal	

Table 5-1: Coal Seam, Drift, Moosebar Formation and Bluesky Member intervals in Hudette boreholes (continued)

Borehole	From (m)	To (m)	Thickness (m)		Seam	Lithology/ Fm/Member	Remarks
			Drilled	True			
HUD12-20	119.30	120.69	1.39		C	Coal	
HUD12-20	120.69	122.90	2.21		C-PT		
HUD12-20	122.90	123.50	0.6		C	C.Sh	
HUD12-20	125.67	126.79	1.12		D	Coal	
HUD12-20	143.82	144.70	0.88		E	Coal	
HUD12-20	172.41	172.77	0.36		Coal	Coal	
HUD12-20	199.04	200.00	0.96		G	Coal	
HUD12-21	0.00	42.67	42.67	42.67		Drift	HUD12-21C approximately at the same location, Dip data from spot cores from HUD12-21C.
HUD12-21	41.80	47.50	5.7	5.17	F	Coal	
HUD12-21	49.60	50.40	0.8	0.73	F1	Coal	
HUD12-21	90.50	91.90	1.4	1.27	E	C.Sh+ CR	
HUD12-21	91.90	96.00	4.1	3.72	E-PT		
HUD12-21	96.00	96.30	0.3	0.27	E	C.Sh	
HUD12-21	100.70	106.10	5.4	5.16	F-REP	Coal	
HUD12-21	117.20	119.10	1.9	1.82	F1	Coal	
HUD12-21	124.50	124.90	0.4	0.38		C.Sh	
HUD12-21	129.10	129.40	0.3	0.29	G	Coal	
HUD12-21	129.40	129.80	0.4	0.38	G-PT		
HUD12-21	129.80	130.50	0.7	0.67	G	Coal	
HUD12-21C	0.00	39.50	39.5			Drift	Dip data from core, Driller's depth 115.90 116.43 metres, log bottom metres, 17 cm coal recovered and sampled near bottom, actual thickness unknown.
HUD12-21C	42.93	49.18	6.25	5.66	F	Coal	
HUD12-21C	52.39	53.59	1.2	1.09	F1	Coal	
HUD12-21C	53.59	54.70	1.11	1.01	F1-PT		
HUD12-21C	54.70	55.00	0.3	0.27	F1	CR	
HUD12-21C	97.40	99.30	1.9	1.72	E	C.Sh+CR	
HUD12-21C	104.67	112.43	7.76	6.89	F-REP	Coal	
HUD12-21C	115.90	116.07	0.17	0.17	Coal	Coal	
HUD12-22	0.00	6.09	6.09			Drift	Dip data from dipmeter, fault above H seam.
HUD12-22	35.70	36.90	1.2	0.92	A	Coal	
HUD12-22	36.90	37.90	1	0.77	A-PT		
HUD12-22	37.90	38.20	0.3	0.23	A	Coal	
HUD12-22	132.80	133.10	0.3	0.19	H	Coal	
HUD12-22	133.10	133.50	0.4	0.26	H-PT		
HUD12-22	133.50	134.00	0.5	0.32	H	Coal	
HUD12-22	158.50	158.70	0.2	0.11	Coal	Coal	

Table 5-1: Coal Seam, Drift, Moosebar Formation and Bluesky Member intervals in Hudette boreholes (continued)

Borehole	From (m)	To (m)	Thickness (m)		Seam	Lithology/ Fm/Member	Remarks
			Drilled	True			
HUD12-22	185.80	186.10	0.3	0.17	J	Coal	
HUD12-22	186.10	186.40	0.3	0.17	J-PT		
HUD12-22	186.40	187.20	0.8	0.46	J	Coal	
HUD12-22	187.20	188.50	1.3	0.65	J-PT		
HUD12-22	188.50	188.70	0.2	0.10	J	Coal	
HUD12-23	0.00	9.14	9.14			Drift	No dip data.
HUD12-23	28.00	28.20	0.2		Coal	Coal	
HUD12-23	31.00	31.90	0.9		B	Coal	
HUD12-23	48.50	48.70	0.2		C	Coal	
HUD12-23	48.70	49.20	0.5		C-PT		
HUD12-23	49.20	49.60	0.4		C	Coal	
HUD12-23	49.60	51.80	2.2		C-PT		
HUD12-23	51.80	52.00	0.2		C	Coal	
HUD12-23	55.70	56.00	0.3		Coal	Coal	
HUD12-23	69.20	69.50	0.3		Coal	Coal	
HUD12-23	79.90	80.60	0.7		D	Coal	
HUD12-23	119.20	119.60	0.4		E	Coal	
HUD12-23	119.60	124.60	5		E-PT		
HUD12-23	124.60	125.80	1.2		E	Coal	
HUD12-23	154.80	157.00	2.2		F	Coal	
HUD12-23	157.00	157.60	0.6		F-PT		
HUD12-23	157.60	157.80	0.2		F	Coal	
HUD12-23	167.50	168.30	0.8		G	Coal	
HUD12-23	190.20	191.20	1		H	Coal	
HUD12-23	196.40	196.70	0.3		Coal	Coal	
HUD12-23	201.40	201.50	0.1		I	Coal	
HUD12-23	219.60	220.90	1.3		J		
HUD12-23	220.90	221.50	0.6		J-PT		
HUD12-23	221.50	221.80	0.3		J		
HUD12-24	0.00	9.14	9.14			Drift	Dip data from dipmeter, coal seams from F below Fault, Dresser between F and upper seams.
HUD12-24	37.50	37.80	0.3	0.25	Coal	Coal	
HUD12-24	73.00	73.60	0.6	0.34	Coal	Coal	
HUD12-24	246.10	247.70	1.6	1.39	F	Coal	
HUD12-24	254.40	255.70	1.3	1.13	G	Coal	
HUD12-24	255.70	256.60	0.9	0.78	G-PT		

Table 5-1: Coal Seam, Drift, Moosebar Formation and Bluesky Member intervals in Hudette boreholes (continued)

Borehole	From (m)	To (m)	Thickness (m)		Seam	Lithology/ Fm/Member	Remarks
			Drilled	True			
HUD12-24	256.60	256.70	0.1	0.09	G	Coal	
HUD12-24	258.80	259.00	0.2	0.18	Coal	Coal	
HUD12-24	261.00	261.80	0.8	0.73	H	Coal	
HUD12-24	267.40	267.80	0.4	0.36	F-REP	Coal	
HUD12-24	267.80	269.30	1.5	1.36	F-PT		
HUD12-24	269.30	271.30	2	1.93	F-REP	Coal	
HUD12-24	282.70	283.40	0.7	0.68	G	Coal	
HUD12-24	291.60	293.70	2.1	2.03	J	Coal	
HUD12-24	293.70	294.70	1	0.97	J-PT		
HUD12-24	294.70	295.00	0.3	0.29	J	Coal	
HUD12-25	0.00	9.14	9.14			Drift	No dip data.
HUD12-25	9.14	22.60	13.46			Bluesky	
HUD12-25	22.60	23.20	0.6		A?	Coal	
HUD12-25	23.20	23.60	0.4		A-PT		
HUD12-25	23.60	24.70	1.1		A?	Coal	
HUD12-25	24.70	25.10	0.4		A-PT		
HUD12-25	25.10	25.40	0.3		A?	Coal	
HUD12-25	25.40	26.40	1		A-PT		
HUD12-25	26.40	26.70	0.3		A?	Coal	
HUD12-25	37.80	38.50	0.7		Coal	Coal	
HUD12-25	47.90	49.40	1.5		B	Coal	
HUD12-25	78.60	79.00	0.4		C	Coal	
HUD12-25	87.50	87.70	0.2		Coal	Coal	
HUD12-25	92.00	92.40	0.4		D	Coal	
HUD12-25	92.40	93.00	0.6		D-PT		
HUD12-25	93.00	93.50	0.5		D	Coal	
HUD12-25	93.50	94.40	0.9		D-PT		
HUD12-25	94.40	94.60	0.2		D	Coal	
HUD12-25	129.70	130.40	0.7		E	Coal	
HUD12-25	130.40	131.10	0.7		E-PT		
HUD12-25	131.10	131.30	0.2		E	Coal	
HUD12-25	138.20	139.90	1.7		F	Coal	
HUD12-25	139.90	142.60	2.7		F-PT		
HUD12-25	142.60	142.80	0.2		F	Coal	

Table 5-1: Coal Seam, Drift, Moosebar Formation and Bluesky Member intervals in Hudette boreholes (continued)

Borehole	From (m)	To (m)	Thickness (m)		Seam	Lithology/ Fm/Member	Remarks
			Drilled	True			
HUD12-25	145.90	146.50	0.6		G	Coal	
HUD12-25	146.50	149.40	2.9		G-PT		
HUD12-25	149.40	149.50	0.1		G	Coal	
HUD12-25	167.50	167.80	0.3		H	Coal	
HUD12-25	179.70	179.90	0.2		I	Coal	
HUD12-25	199.40	199.60	0.2		J	Coal	
HUD12-25	245.10	245.70	0.6		K	Coal	
HUD12-25	245.70	247.50	1.8		K-PT		
HUD12-25	247.50	247.70	0.2		K	Coal	
HUD12-25	247.70	251.30	3.6		K-PT		
HUD12-25	251.30	254.40	3.1		K	Coal	
HUD12-26	0.00	9.14	9.14			Drift	HUD12-26 and HIUD12-27 approximately at same location, HUD12-26 vertical and HUD12-27 angle, HUD12-27 probably downdip, No dip data.
HUD12-26	9.14	22.70	13.56			Bluesky	
HUD12-26	22.70	24.70	2		A	Coal	
HUD12-26	81.20	83.10	1.9		C	Coal	
HUD12-26	86.90	87.00	0.1		D	CR	
HUD12-26	87.00	87.65	0.65		D-PT		
HUD12-26	87.65	91.30	3.65		D	Coal	
HUD12-26	115.40	118.50	3.1		F	Coal	
HUD12-26	118.50	120.50	2		F-PT		
HUD12-26	120.50	120.90	0.4		F	Coal	
HUD12-26	129.70	130.60	0.9		G	Coal	
HUD12-26	151.50	151.90	0.4		H	Coal	
HUD12-26	163.50	163.80	0.3		I	C.sh	
HUD12-26	169.40	169.60	0.2		Coal	Coal	
HUD12-27	0.00	9.14	9.14			Drift	No dip data.
HUD12-27	9.14	70	60.86			Moosebar	
HUD12-27	70	82	12			Bluesky	
HUD12-28	0.00	4.57	4.57			Drift	No dip data.
HUD12-28	4.57	109.00	104.43			Moosebar	
HUD12-28	109.00	140.65	31.65			Bluesky	
HUD12-28	140.65	144.95	4.3		A	Coal	
HUD12-28	225.74	227.80	2.06		G?	Coal	
HUD12-29	0.00	7.01	7.01			Drift	Only Moosebar
HUD12-29	7.01	228	221			Moosebar	

Table 5-1: Coal Seam, Drift, Moosebar Formation and Bluesky Member intervals in Hudette boreholes (continued)

Borehole	From (m)	To (m)	Thickness (m)		Seam	Lithology/ Fm/Member	Remarks
			Drilled	True			
HUD12-30	0.00	9.14	9.14			Drift	No dip data.
HUD12-30	9.14	105.00	95.86			Moosebar	
HUD12-30	105.00	120.00	15			Bluesky	
HUD12-30	120.90	121.30	0.4		A	Coal	
HUD12-30	139.60	141.80	2.2		B	Coal	
HUD12-30	167.40	168.10	0.7		C	Coal	
HUD12-30	168.10	169.20	1.1		C-PT		
HUD12-30	169.20	170.50	1.3		C	Coal	
HUD12-31	0.00	6.09	6.09	6.09		Drift	HUD12-31 and HUD12-31C at same location, Dip data from HUD12-31C.
HUD12-31	7.70	12.20	4.5	2.89	B	Coal	
HUD12-31	50.30	132.00	81.7	52.52		Moosebar	
HUD12-31	132.00	145.00	13	8.36		Bluesky	
HUD12-31	145.00	146.30	1.3	1.00	A	Coal	
HUD12-31	171.20	178.00	6.8	3.90	B	Coal	
HUD12-31	179.90	186.10	6.2	3.56	B-REP	Coal	
HUD12-31	207.00	207.90	0.9	0.64	C	Coal	
HUD12-31	213.90	214.90	1	0.71	D	Coal	
HUD12-31C	0.00	5.18	5.18	5.18		Drift	Dip data from dipmeter.
HUD12-31C	10.90	16.00	5.1	3.28	B	Coal	
HUD12-31C	45.00	46.00	1	0.64	B-REP	Coal	
HUD12-31C	46.00	46.40	0.4	0.26	B-PT		
HUD12-31C	46.40	55.10	8.7	5.59	B	Coal	
HUD12-31C	60.00	132.00	72	46.28		Moosebar	
HUD12-31C	132.00	147.00	15	9.64		Bluesky	
HUD12-31C	147.20	148.80	1.6	1.23	A	Coal	
HUD12-31C	178.00	178.30	0.3	0.19	Coal	Coal	
HUD12-31C	185.00	191.60	6.6	3.79	B	Coal	
HUD12-31C	219.80	220.40	0.6	0.42	C	Coal	
HUD12-31C	227.10	228.20	1.1	0.78	D	Coal	
HUD12-32	0.00	4.57	4.57			Drift	No dip data, HUD12-33 few hundred metres along strike with dipmeter data.
HUD12-32	33.35	35.74	2.39		E	Coal	
HUD12-32	35.74	36.63	0.89		E-PT		
HUD12-32	36.63	36.92	0.29		E	Coal	
HUD12-32	88.00	90.25	2.25		F	Coal	
HUD12-32	121.83	122.22	0.39		Coal	Coal	

Table 5-1: Coal Seam, Drift, Moosebar Formation and Bluesky Member intervals in Hudette boreholes (continued)

Borehole	From (m)	To (m)	Thickness (m)		Seam	Lithology/ Fm/Member	Remarks
			Drilled	True			
HUD12-32	132.90	133.60	0.70		H	Coal	
HUD12-32	140.40	140.89	0.49		Coal	Coal	
HUD12-32	161.00	161.70	0.7		J	Coal	
HUD12-32	230.21	230.93	0.72		K	Coal	
HUD12-32	230.93	232.10	1.17		K-PT		
HUD12-32	232.10	233.32	1.22		K	Coal	
HUD12-32	247.88	248.44	0.56		Coal	Coal	
HUD12-33	0.00	6.09	6.09			Drift	Dip data from dipmeter.
HUD12-33	20.50	20.90	0.40	.39	Coal	Coal	
HUD12-33	21.30	22.70	1.4	1.36	Coal	Coal	
HUD12-33	45.60	47.60	2	1.97	C	Coal	
HUD12-33	47.60	49.70	2.1	2.07	C-D-PT		
HUD12-33	49.70	51.20	1.5	1.47	D	Coal	
HUD12-33	62.25	62.35	0.1	0.10	Coal	Coal	
HUD12-33	73.80	75.80	2	1.97	E	Coal	
HUD12-33	113.00	113.20	0.2	0.19	F	Coal	
HUD12-33	113.20	113.50	0.3	0.29	F-PT		
HUD12-33	113.50	115.40	1.9	1.84	F	Coal	
HUD12-33	127.20	128.00	0.8	0.69	G	Coal	
HUD12-33	128.00	128.80	0.8	0.69	G-PT		
HUD12-33	128.80	130.00	1.2	1.04	G	Coal	
HUD12-33	159.60	161.00	1.4	0.90	H	Coal	
HUD12-33	178.70	179.20	0.5	0.38	I	Coal	
HUD12-33	204.60	205.80	1.2	0.92	J	Coal	
HUD12-33	210.70	210.90	0.2	0.15	Coal	Coal	
HUD12-33	242.50	243.60	1.1	0.95	K	Coal	
HUD12-34	0.00	4.57	4.57	4.57		Drift	No dip data.
HUD12-34	43.80	46.30	2.5		D		
HUD12-34	47	47.20	0.20		D		
HUD12-34	54.90	55.80	0.9		E	Coal	
HUD12-34	55.80	56.80	1		E-PT		
HUD12-34	56.80	57.20	0.4		E	Coal	
HUD12-34	72.20	73.70	1.5		F	Coal	
HUD12-34	100.20	101.50	1.3		G	Coal	
HUD12-34	114.00	114.30	0.3		H	Coal	

Table 5-1: Coal Seam, Drift, Moosebar Formation and Bluesky Member intervals in Hudette boreholes (continued)

Borehole	From (m)	To (m)	Thickness (m)		Seam	Lithology/ Fm/Member	Remarks
			Drilled	True			
HUD12-34	123.30	123.50	0.2		I	Coal	No dip data.
HUD12-34	160.70	163.20	2.5		J	Coal	
HUD12-34	187.20	187.70	0.5		Coal	Coal	
HUD12-34	209.10	209.60	0.5		Coal	Coal	
HUD13-01C	0.00	4.50	4.5	4.50		Drift	Dip data from Core, approximately same location as HUD11-02. F seam upper ply high ash coal.
HUD13-01C	5.67	7.9	2.23	2.10	B		
HUD13-01C	9.2	10.25	1.05	0.99	C	Coal	
HUD13-01C	10.25	10.55	0.3	0.28	C-PT		
HUD13-01C	10.55	11.9	1.35	1.27	C	Coal	
HUD13-01C	14	15.9	1.9	1.77	D	Coal	
HUD13-01C	15.9	17.05	1.15	1.07	D-PT		
HUD13-01C	17.05	17.17	0.12	0.11	D	Coal	
HUD13-01C	46.75	47.58	0.83	0.79	E	Coal	
HUD13-01C	64.1	64.4	0.3	0.29	F		
HUD13-01C	64.4	66	1.6	1.58	F-PT		
HUD13-01C	66	68.25	2.25	2.10	F	Coal	
HUD13-01C	82.4	82.75	0.35	0.34	G	Coal	
HUD13-01C	82.75	83.22	0.47	0.45	G-PT		
HUD13-01C	83.22	84	0.78	0.75	G	Coal	
HUD13-01C	90.2	90.4	0.2	0.19	H	Coal	
HUD13-02C	0	5				Drift	Dip data from Core, approximately same location as HUD12-17&12-19.
HUD13-02C	5	19	14	13.99		Moosebar	
HUD13-02C	19	37.8	18.8	18.79		Bluesky	
HUD13-02C	37.80	39.32	1.52	1.16	A	Coal	
HUD13-02C	59.10	60.60	1.50	1.23	B	Coal	
HUD13-02C	84.7	85.1	0.40	0.33	C	Coal	
HUD13-02C	85.1	85.50	0.40	0.33	C-PT	PT	
HUD13-02C	85.50	86.45	0.95	0.78	C	Coal	
HUD13-02C	89.90	91.40	1.50	1.23	D	Coal	
HUD13-02C	130.05	131.63	1.58	1.21	E	Coal	
HUD13-02C	148.35	151.00	2.65	2.03	F	Coal	
HUD13-02C	161.60	162.15	0.55	0.34	G	Coal	
HUD13-02C	162.15	162.67	0.52	0.32	G-PT		
HUD13-02C	162.67	163.60	0.93	0.57	G	Coal	
HUD13-02C	178.30	179.60	1.30	0.80	H	Coal	

Table 5-1: Coal Seam, Drift, Moosebar Formation and Bluesky Member intervals in Hudette boreholes (continued)

Borehole	From (m)	To (m)	Thickness (m)		Seam	Lithology/ Fm/Member	Remarks
			Drilled	True			
HUD13-02C	179.60	180.35	0.75	0.46	H-PT		Dip data from Core, approximately same location as HUD12-17&12-19.
HUD13-02C	180.35	180.45	0.10	0.06	H	Coal	
HUD13-02C	183.20	183.30	0.10	0.10	Coal		
HUD13-02C	197.00	197.37	0.37	0.36	Coal	Coal	
HUD13-02C	201.45	203.1	1.65	1.62	J	Coal	
HUD13-02C	235.70	236.35	0.65	0.64	K	Coal	
HUD13-02C	236.35	236.80	0.45	0.44	K-PT		
HUD13-02C	236.80	240.80	4.00	2.57	K	Coal	
HUD13-02C	245.25	245.35	0.10	0.10	Coal	Coal	
HUD13-03C	0.00	7.20	7.20	7.20		Drift	Dip data from Core.
HUD13-03C	12.00	12.30	0.30	0.30	Coal	Coal	
HUD13-03C	61.85	64.55	2.7	2.70	F	Coal	
HUD13-03C	68.42	69.45	1.03	1.03	G	Coal	
HUD13-03C	69.45	69.85	0.4	0.40	G-PT		
HUD13-03C	69.85	71.02	1.17	1.17	G	Coal	
HUD13-03C	82.20	82.55	0.35	0.35	Coal	Coal	
HUD13-03C	84.90	85.70	0.8	0.80	H	Coal	
HUD13-03C	103.80	104.20	0.4	0.40	I	Coal	
HUD13-03C	117.20	118.60	1.4	1.40	J	Coal	
HUD13-03C	122.20	122.57	0.37	0.37	Coal	Coal	
HUD13-03C	130.30	130.35	0.05	0.05	Coal	Coal	
HUD13-03C	143.30	143.50	0.2	0.20	Coal	Coal	
HUD13-03C	165.05	165.20	0.15	0.15	Coal	Coal	
HUD13-04	0.00	6.09	6.09	6.09		Drift	Dip data from Core.
HUD13-04	6.09	30.87	24.78	18.58		Bluesky	
HUD13-04	30.87	32.55	1.68	1.29	A	Coal	
HUD13-04	78.8	81.78	2.98	2.28	B	Coal	
HUD13-04	98	98.6	0.6	0.46	C	Coal	
HUD13-04	98.6	99	0.4	0.31	C-PT		
HUD13-04	99	99.38	0.38	0.29	C	Coal	
HUD13-04	140.2	141.65	1.45	1.11	E	Coal	
HUD13-04	195	196.47	1.47	1.13	G	Coal	
HUD13-04	196.47	196.95	0.48	0.37	G-PT	Coal	
HUD13-04	196.95	197.27	0.32	0.25	G	Coal	

Table 5-1: Coal Seam, Drift, Moosebar Formation and Bluesky Member intervals in Hudette boreholes (continued)

Borehole	From (m)	To (m)	Thickness (m)		Seam	Lithology/ Fm/Member	Remarks
			Drilled	True			
HUD13-05	0	10.66	10.66	0.00		Drift	Dip data from dipmeter, Bluesky between Drift and A seam.
HUD13-05	10.66	17.85	7.19	4.67		Bluesky	
HUD13-05	17.85	18.05	0.2	0.13	A	Coal	
HUD13-05	30	30.95	0.95	0.61	B	Coal	
HUD13-05	72.45	73.3	0.85	0.55	D	Coal	
HUD13-05	78.95	80.5	1.55	1.00	E	Coal	
HUD13-05	112.8	114.9	2.1	1.48	F	Coal	
HUD13-05	114.9	116	1.1	0.78	F-PT		
HUD13-05	116	116.2	0.2	0.14	F	Coal	
HUD13-05	125.62	126.4	0.78	0.60	G	Coal	
HUD13-05	144.96	146	1.04	0.80	H	Coal	
HUD13-05	146	146.7	0.7	0.54	H-PT		
HUD13-05	146.7	147	0.3	0.23	H	Coal	
HUD13-05	151.03	151.22	0.19	0.15	Coal	Coal	
HUD13-05	157.8	158.05	0.25	0.19	I	Coal	
HUD13-05	174.75	175.2	0.45	0.34	J	Coal	
HUD13-05	175.2	175.6	0.4	0.31	J-PT		
HUD13-05	175.6	176.1	0.5	0.38	J	Coal	
HUD13-05	176.1	176.7	0.6	0.46	J-PT		
HUD13-05	176.7	177	0.3	0.23	J	Coal	
HUD13-05	184.9	185	0.1	0.08	Coal	Coal	
HUD13-06	0.00	6.06	6.06	0.00		Drift	Dip data from dipmeter.
HUD13-06	3.50	4.50	1	0.82	F	Coal	
HUD13-06	19.00	19.55	0.55	0.45	H	Coal	
HUD13-06	39.00	39.20	0.2	0.16	I	Coal	
HUD13-06	42.80	43.00	0.2	0.16	Coal	Coal	
HUD13-06	45.30	46.95	1.65	1.35	J	Coal	
HUD13-06	87.35	88.75	1.4	1.27	K	Coal	
HUD13-06	97.70	98.00	0.3	0.19	Coal	Coal	
HUD13-06	101.18	101.80	0.62	0.40	Coal	Coal	
HUD13-06	108.2	108.93	0.73	0.47	Coal	Coal	
HUD13-06	111.75	112.83	1.08	0.69	Coal	Coal	
HUD13-06	116.25	116.9	0.65	0.42	Coal	Coal	
HUD13-06	152.4	152.65	0.25	0.20	Coal	Coal	

Table 5-1: Coal Seam, Drift, Moosebar Formation and Bluesky Member intervals in Hudette boreholes (continued)

Borehole	From (m)	To (m)	Thickness (m)		Seam	Lithology/ Fm/Member	Remarks
			Drilled	True			
HUD13-07	0	2.74	2.74	0.00		Drift	HUD13-07 &13-07C approximately same location, Dip data from dipmeter, Moosebar faulted.
HUD13-07	15.4	15.58	0.18	0.15	B	Coal	
HUD13-07	15.58	17.3	1.72	1.41	B-PT		
HUD13-07	17.3	20	2.7	2.21	B	Coal	
HUD13-07	28.25	28.6	0.35	0.29	C	Coal	
HUD13-07	30.07	34	3.93	3.22	D	Coal	
HUD13-07	48.3	50.85	2.55	1.95	E	Coal	
HUD13-07	111.5	192	80.5	61.67		Moosebar	
HUD13-07	192	204.6	12.6	9.65		Bluesky	
HUD13-07	204.6	205.07	0.47	0.33	A	Coal	
HUD13-07	205.07	206.05	0.98	0.63	A-PT		
HUD13-07	206.05	208.15	2.1	1.35	A	Coal	
HUD13-07C	0	2.74	2.74			Drift	Dip data from HUD13-07.
HUD13-07C	15.8	16	0.2	0.16	B	Coal	
HUD13-07C	16	17.85	1.85	1.52	B-PT		
HUD13-07C	17.85	20.55	2.7	2.21	B	Coal	
HUD13-07C	28.4	29.6	1.2	0.98	C	Coal	
HUD13-07C	31.95	35.6	3.65	2.99	D	Coal	
HUD13-07C	35.6	36	0.4	0.33	D-PT		
HUD13-07C	36	37	1	0.82	D	Coal	
HUD13-07C	49.65	50.3	0.65	0.50	E	Coal	
HUD13-07C	50.3	52.1	1.8	1.38	E-PT		
HUD13-07C	52.1	52.55	0.45	0.34	E	Coal	
HUD13-07C	52.55	53.3	0.75	0.57	E-PT		
HUD13-07C	53.3	54.4	1.1	0.84	E	Coal	
HUD13-08	0	19.81	19.81	19.81		Drift	Dip data from dipmeter.
HUD13-08	29.8	30.2	0.4	0.20	C	Coal	
HUD13-08	30.2	32.5	2.3	1.15	C-PT		
HUD13-08	32.5	33.7	1.2	0.60	C	Coal	
HUD13-08	36.05	37	0.95	0.48	D	Coal	
HUD13-08	37	37.8	0.8	0.40	D-PT		
HUD13-08	37.8	37.9	0.1	0.05	D	Coal	
HUD13-08	37.9	38.55	0.65	0.32	D-PT		
HUD13-08	38.55	39.7	1.15	0.58	D	Coal	
HUD13-08	62.75	65.1	2.35	1.18	E	Coal	

Table 5-1: Coal Seam, Drift, Moosebar Formation and Bluesky Member intervals in Hudette boreholes (concluded)

Borehole	From (m)	To (m)	Thickness (m)		Seam	Lithology/ Fm/Member	Remarks
			Drilled	True			
HUD13-08	147	147.45	0.45	0.19	Coal	Coal	Dip data from dipmeter.
HUD13-08	178.6	178.85	0.25	0.04	Coal	Coal	
HUD13-08	179.8	180.05	0.25	0.04	Coal	Coal	
HUD13-08	181.3	181.8	0.5	0.09	Coal	Coal	
HUD13-08	182.8	189.3	6.5	1.13	C-REP	Coal	
HUD13-08	189.3	190	0.7	0.12	C-PT		
HUD13-08	190	193.1	3.1	0.54	C	Coal	
HUD13-08	194.25	194.6	0.35	0.15	Coal	Coal	
HUD13-08	195.3	195.4	0.1	0.04	Coal	Coal	
HUD13-08	196.3	198.8	2.5	1.61	D	Coal	
HUD13-08	198.8	200.3	1.5	1.41	D-PT		
HUD13-08	200.3	200.4	0.1	0.09	D	Coal	
HUD13-08	204.15	205.1	0.95	0.86	Coal	Coal	

Notes: Hole deviation not included in True thickness, C.Sh only picked where significant. Abbreviations: C.Sh = carbonaceous shale, CR= Coaly Rock, T.Thick = True Thickness, Seam coal = Unidentified seam, Fm = Formation, Drift = Overburden, Moosebar =Moosebar Formation, Bluesky = Bluesky Member, Dresser = Dresser formation, PT = Parting, G? = uncertain identification

5.1 Coal seam development

The coal seams of the Gething Formation within the Hudette coal property range in true thickness from thin traces of 0.04 metres up to 7.42 metres. Lateral extent of these coal seams varies from few hundred metres to over two thousand metres. A number of these coal seams are correlatable across the license area, while others appear to be more localised in extent. The thickest and most consistently-developed coal seams occur in the upper part of the Gething Formation at Hudette. At the present stage of exploration, seams B, C, D, E and F are considered to be potentially-mineable.

Coal seam nomenclature from previous work done by Esso Resources (Klatzel-Mudry, 1984) and Norcen (Newson, 1980a) is not followed in this report because many more coals were recognised during the relatively close-spaced exploratory drilling of this project. However, for reference, the Brenda Seam of previous workers is considered equivalent to the F Seam as recognised within the current study.

Following is a brief description, in stratigraphic order from top down, of the correlatable coal seams encountered in the Hudette area.

5.1.1 A-seam

Seam A is the uppermost coal seam of the Gething Formation and occur at the contact of Gething Formation and Bluesky Member. The seam is not thick enough to be considered as potentially -mineable, but is a valuable marker for correlation. The seam was intersected in 21 holes and true thickness was calculated in 16 holes (**Table 5-1**). The coal seam also appears as carbonaceous shale in two holes (HUD12-01 & HUD12-03), located along the western edge of the exploration area.

The true thickness ranges from 0.19 metre to 2.09 metre with average and median thicknesses of 0.70 metre and 0.56 metre. Thickness in excess of one metre was intersected in ten holes, generally located in the central part of the property. The apparent thickness in one holes (HUD12-28) exceeds 4 metres, although true thickness is not known. The seam consists of one ply except in holes HUD12-25 and HUD13-07, HUD12-22and HUD12-08.

Seam A was intersected only in HUD13-02C core hole. The coal is dull with minor bright bands, solid, hard and includes minor mudstone intercalations.

5.1.1.1 Interval between A-Seam and B-Seam

The true interval data between A seam and B-seam is available from 12 holes. It commonly varies from 19 metres to 32 metres, although it ranges from 8 metres to 42 metres (**Table 5-2**). The median and average thicknesses of the A seam to B seam interval are 28 metres and 25.73 metres respectively. The apparent thickness varies from 12 metre to 81 metres, but is commonly in the range of 18.3 metres to 37 metres. The average and median apparent thicknesses are 33.43 metres and 29.94 metres.

Lithologies recorded in HUD 13-02C include sandstone, siltstone and mudstone, although very fine to very fine grained sandstone and siltstone constitute the major lithology.

5.1.2 B-Seam

B-seam was intersected in 29 holes (**Table 5-1**), although few of these holes are very closely spaced for the reason of either understanding the structure or obtaining the samples for quality information. Eighteen of these holes have data to calculate the true thickness. The seam appeared twice in four holes (HUD11-07, HUD11-07C, HUD12-31, and HUD12-31C) as a result of structural repetition.

The seam is generally developed throughout the investigated area. The true thickness of the seam varies from 0.61 metre to 5.59 metres with median and average thicknesses of 2.36 metres and 2.57 metres. Thickness between 1.92 metre and 3.0 metre were recorded in twelve holes. Thickness exceeding 4 metres probably resulted from structural thickening. The apparent thicknesses (where no true thickness available) are generally within the range of true thicknesses.

The seam is made up of more than one ply in 5 holes. The parting is generally less than one metre except in HUD13-07C where it reaches 1.41 metres. The parting includes mudstone and carbonaceous mudstone.

B seam was cored in five holes (HUD11-01C, HUD11-07C, HUD12-31C, HUD13-01C and HUD13-02C). Ten samples were collected from these five holes (**Table 3-8**). The recovery varies from very poor to 100%. The coal is generally dull with minor bright bands, solid to very sheared and blocky. The samples collected from the cores were analysed and the results are presented in Appendix-2.

Table 5-2: Interseam intervals (as-drilled and true)

Borehole	Depths (in metres)		Thickness		Between Seams
	From	To	Drilled	True	
HUD11-03	61.88	96.08	34.2		**A-B**
HUD11-07	45.45	74.60	29.15	29.15	A-B
HUD11-08	42.13	72.86	30.73	28.27	A-B
HUD11-07C	44.70	73.51	28.81	28.81	A-B
HUD12-01	117.00	154.00	37		A-B
HUD12-03	37.00	73.40	36.4	32.75	A-B
HUD12-04	80.00	136.50	56.5		A-B
HUD12-07	58.80	83.60	24.8	24.00	A-B
HUD12-08	29.10	74.20	45.1	42.00	A-B
HUD12-19	40.10	59.90	19.8	17.85	A-B
HUD12-25	26.70	47.90	21.2		A-B
HUD12-28	144.95	225.74	80.79		A-B
HUD12-30	121.30	139.60	18.3		A-B
HUD12-31	146.30	171.20	24.9	19.23	A-B
HUD12-31C	148.80	185.00	36.2	28.00	A-B
HUD13-02C	39.32	59.10	19.78	15.26	A-B
HUD13-04	32.55	78.8	46.25	35.51	A-B
HUD13-05	18.05	30	11.95	8.00	A-B
HUD11-01	46.12	43.13	2.99	2.95	**B-C**
HUD11-02	15.85	13.88	1.97		B-C
HUD11-03	107.71	98.77	8.94		B-C
HUD11-04	75.90	70.95	4.95		B-C
HUD11-05	59.03	33.24	25.79		B-C
HUD11-06	21.51	20.20	1.31		B-C
HUD11-07	78.44	76.67	1.77	1.70	B-C
HUD11-08	78.98	74.98	4.00	4.00	B-C
HUD11-01C	48.60	44.41	4.19	4.12	B-C
HUD11-07C	76.72	75.55	1.17	1.09	B-C
HUD12-01	157.90	156.90	1.00		B-C
HUD12-03	76.00	74.50	1.50	1.35	B-C
HUD12-04	146.00	139.00	7.00		B-C
HUD12-07	89.90	85.60	4.30	4.15	B-C
HUD12-08	87.55	75.30	12.25	12.25	B-C
HUD12-19	84.80	61.30	23.50	22.19	B-C
HUD12-20	119.30	113.87	5.43		B-C
HUD12-23	48.50	31.90	16.60		B-C
HUD12-25	78.60	49.40	29.20		B-C

Table 5-2: Interseam intervals (as-drilled and true)-(Continued)

HUD12-30	167.40	141.80	25.60		B-C
HUD12-31	207.00	186.10	20.90	14.86	B-C
HUD12-31C	219.80	191.60	28.20	19.74	B-C
HUD13-01C	9.2	7.9	1.30	1.22	B-C
HUD13-02C	84.7	60.60	24.10	19.78	B-C
HUD13-04	98	81.78	16.22	12.16	B-C
HUD13-07	28.25	20	8.25	6.83	B-C
HUD13-07C	28.4	20.55	7.85	6.41	B-C
HUD11-01	51.40	60.95	9.55	9.38	**C-D**
HUD11-02	18.41	20.04	1.63	1.53	C-D
HUD11-03	119.88	122.45	2.57		C-D
HUD11-04	77.98	81.10	3.12		C-D
HUD11-05	59.97	63.84	3.87		C-D
HUD11-06	27.08	28.46	1.38		C-D
HUD11-07	81.29	83.05	1.76	1.65	C-D
HUD11-07	157.40	158.08	0.68	0.58	C-D
HUD11-08	82.42	84.90	2.48	2.39	C-D
HUD11-01C	50.68	61.21	10.53	10.37	C-D
HUD11-07C	79.78	81.78	2.00	1.87	C-D
HUD12-01	160.30	162.40	2.10		C-D
HUD12-03	78.50	79.80	1.30	1.18	C-D
HUD12-04	148.00	157.00	9.00		C-D
HUD12-07	92.25	93.20	0.95	0.92	C-D
HUD12-08	88.80	93.30	4.50	4.50	C-D
HUD12-10	83.15	84.10	0.95	0.40	C-D
HUD12-11	27.70	33.10	5.40		C-D
HUD12-16	190.10	194.50	4.40		C-D
HUD12-19	85.70	88.80	3.10	2.92	C-D
HUD12-20	123.50	125.67	2.17		C-D
HUD12-23	52.00	79.90	27.90		C-D
HUD12-25	79.00	92.00	13.00		C-D
HUD12-26	86.90	83.10	3.80		C-D
HUD12-31	207.90	213.90	6.00	4.26	C-D
HUD12-31C	220.40	227.10	6.70	4.69	C-D
HUD12-33	47.60	49.90	2.30	2.19	C-D
HUD13-01C	11.9	14	2.10	1.97	C-D
HUD13-02C	86.45	89.90	3.45	2.83	C-D
HUD13-07	28.6	30.07	1.47	1.21	C-D

Table 5-2: Interseam intervals (as-drilled and true)-(Continued)

HUD13-07C	29.6	31.95	2.35	1.86	C-D
HUD13-08	33.7	36.05	2.35	1.17	C-D
HUD11-01	90.66	64.03	26.63	26.63	**D-E**
HUD11-02	49.71	23.78	25.93	23.97	D-E
HUD11-03	153.8	127.02	26.78		D-E
HUD11-04	103.71	84.06	19.65		D-E
HUD11-05	78.61	65.63	12.98		D-E
HUD11-06	52.50	30.67	21.83		D-E
HUD11-07	112.69	85.50	27.19	24.63	D-E
HUD11-08	121.49	87.51	33.98	25.79	D-E
HUD11-09	40.1	24.59	15.51		D-E
HUD11-01C	87.80	61.70	26.1	25.56	D-E
HUD11-07C	109.52	83.52	26	23.60	D-E
HUD12-01	209.70	165.80	43.9		D-E
HUD12-03	97.75	82.10	15.65	14.15	D-E
HUD12-04	171.50	159.00	12.5		D-E
HUD12-07	133.90	94.45	39.45	38.18	D-E
HUD12-08	134.90	94.30	40.6	42.00	D-E
HUD12-10	101.10	89.11	11.99	5.09	D-E
HUD12-11	46.10	35.10	11		D-E
HUD12-13	153.10	141.40	11.7	11.60	D-E
HUD12-15	37.60	7.80	29.8	29.50	D-E
HUD12-16	206.70	196.20	10.5		D-E
HUD12-19	123.60	90.40	33.2	31.12	D-E
HUD12-20	30.66	11.27	19.39		D-E
HUD12-23	119.20	80.60	38.6		D-E
HUD12-25	129.70	94.60	35.1		D-E
HUD12-33	73.80	51.20	22.6	22.14	D-E
HUD12-34	54.90	47.20	7.7		D-E
HUD13-01C	46.75	17.17	29.58	27.11	D-E
HUD13-02C	130.05	91.40	38.65	31.69	D-E
HUD13-05	78.95	73.73	5.22	4.00	D-E
HUD13-07	48.3	34	14.3	11.71	D-E
HUD13-07C	49.65	37	12.65	10.37	D-E
HUD13-08	62.75	39.7	23.05	11.60	D-E
HUD11-01	107.39	94.65	12.74	12.55	**E-F**
HUD11-02	70.12	52.85	17.27	16.52	E-F
HUD11-03	163.49	157.91	5.58		E-F

Table 5-2: Interseam intervals (as-drilled and true)-(Continued)

HUD11-04	113.39	107.8	5.59		E-F
HUD11-05	90.11	83.23	6.88		E-F
HUD11-05	107.66	90.11	17.55		F-F1
HUD11-07	133.33	115.28	18.05	15.63	E-F
HUD11-08	141.69	124.64	17.05	16.47	E-F
HUD11-09	47.69	42.23	5.46		E-F
HUD11-01C	104.55	91.57	12.98	12.78	E-F
HUD11-07C	130.2	112.27	17.93	15.53	E-F
HUD12-01	219.2	216	3.2		E-F
HUD12-02	102.1	54.1	48		E-F
HUD12-03	151.6	99	52.6	47.67	E-F
HUD12-04	186	172	14		E-F
HUD12-06	98.8	77	21.8	21.00	E-F
HUD12-07	154.6	137.9	16.7	16.45	E-F
HUD12-08	138.6	135.3	3.3	3.22	E-F
HUD12-10	131.35	116.17	15.18	5.19	E-F
HUD12-13	173.7	156	17.7	17.63	E-F
HUD12-15	58.6	43.1	15.5	15.44	E-F
HUD12-16	229.1	212.5	16.6		E-F
HUD12-19	144.8	127.4	17.4	16.81	E-F
HUD12-20	172.41	144.7	27.71		E-F
HUD12-21	100.7	96.3	4.4	3.99	E-F
HUD12-21C	104.67	99.3	5.37	4.87	E-F
HUD12-23	154.8	125.8	29		E-F
HUD12-25	138.2	131.3	6.9		E-F
HUD12-32	88	36.92	51.08		E-F
HUD12-33	113	75.8	37.2	36.63	E-F
HUD12-34	72.2	57.2	15		E-F
HUD13-01C	66	47.58	18.42	17.62	E-F
HUD13-02C	148.35	131.63	16.72	12.81	E-F
HUD13-05	112.8	80.5	32.3	24.54	E-F
HUD11-01	131.47	111.38	20.09	19.89	**F-G**
HUD11-02	88.09	74.40	13.69	12.78	F-G
HUD11-04	141.96	118.50	23.46		F-G
HUD11-05	120.96	92.08	28.88		F-G
HUD11-07	179.42	170.83	8.59	8.07	F-G
HUD11-08	154.07	144.14	9.93	9.78	F-G
HUD11-09	67.78	49.52	18.26		F-G

Table 5-2: Interseam intervals (as-drilled and true)-(Continued)

HUD11-07C	154.00	147.24	6.76	6.34	F-G
HUD12-02	107.10	104.80	2.3		F-G
HUD12-03	161.00	155.30	5.7	5.17	F-G
HUD12-04	194.00	187.70	6.3		F-G
HUD12-07	175.40	160.00	15.4	15.34	F-G
HUD12-09	190.60	173.30	17.3		F-G
HUD12-11	76.40	60.30	16.1		F-G
HUD12-12	73.40	35.20	38.2	19.10	F-G
HUD12-15	70.80	62.30	8.5	8.47	F-G
HUD12-19	161.30	148.40	12.9	12.70	F-G
HUD12-20	58.04	55.20	2.84		F-G
HUD12-21	129.10	106.10	23	22.00	F-G
HUD12-23	167.50	157.80	9.7		F-G
HUD12-24	254.40	247.70	6.7	5.80	F-G
HUD12-25	145.90	142.80	3.1		F-G
HUD12-26	129.70	120.90	8.8		F-G
HUD12-33	127.20	115.40	11.8	11.40	F-G
HUD12-34	100.20	73.70	26.5		F-G
HUD13-01C	82.4	68.25	14.15	13.21	F-G
HUD13-02C	161.60	151.00	10.6	8.12	F-G
HUD13-03C	68.42	64.55	3.87	3.87	F-G
HUD13-05	125.62	116.2	9.42	7.15	F-G
HUD11-01	141.91	133.14	8.77	8.68	**G-H**
HUD11-02	95.93	89.72	6.21	6.00	G-H
HUD11-04	157.09	143.71	13.38		G-H
HUD11-05	138.37	122.03	16.34		G-H
HUD11-07	187.48	181.13	6.35	5.97	G-H
HUD11-08	161.95	155.90	6.05	5.84	G-H
HUD11-09	93.22	68.51	24.71		G-H
HUD12-02	123.10	109.20	13.9		G-H
HUD12-03	169.70	163.30	6.4	5.80	G-H
HUD12-11	117.90	100.50	17.4		G-H
HUD12-13	20.90	12.60	8.3	8.02	G-H
HUD12-14	108.00	70.50	37.5		G-H
HUD12-15	85.90	72.30	13.6	13.55	G-H
HUD12-19	184.40	163.50	20.9	18.10	G-H
HUD12-23	190.20	168.30	21.9		G-H
HUD12-24	261.00	256.70	4.3	3.90	G-H

Table 5-2: Interseam intervals (as-drilled and true)-(Continued)

HUD12-25	167.50	149.50	18		G-H
HUD12-26	151.50	130.60	20.9		G-H
HUD12-33	159.60	130.00	29.6	19.00	G-H
HUD12-34	114.00	101.50	12.5		G-H
HUD13-01C	90.2	84	6.2	5.99	G-H
HUD13-02C	178.30	163.60	14.7	9.05	G-H
HUD13-03C	84.90	71.02	13.88	13.87	G-H
HUD13-05	144.96	126.4	18.56	14.10	G-H
HUD11-02	108.64	96.39	12.25	11.94	**H-I**
HUD11-07	201.98	187.89	14.09	13.24	H-I
HUD11-08	172.81	162.58	10.23	9.88	H-I
HUD12-02	139.20	123.70	15.5		H-I
HUD12-03	184.60	170.30	14.3	12.96	H-I
HUD12-13	33.80	21.80	12	11.59	H-I
HUD12-15	96.10	86.60	9.5	9.29	H-I
HUD12-19	193.60	186.70	6.9	4.44	H-I
HUD12-23	196.40	201.40	5		H-I
HUD12-25	179.70	167.80	11.9		H-I
HUD12-26	163.50	151.90	11.6		H-I
HUD12-33	178.70	161.00	17.7	11.38	H-I
HUD12-34	123.30	114.30	9		H-I
HUD13-03C	103.80	85.70	18.1	18.08	H-I
HUD13-05	157.80	147.00	10.8	8.20	H-I
HUD13-06	39.00	19.55	19.45	15.93	H-I
HUD11-02	127.95	108.90	19.05	18.56	**I-J**
HUD11-07	223.68	202.13	21.55	20.82	I-J
HUD11-08	193.51	173.20	20.31	19.62	I-J
HUD12-02	150.60	139.50	11.10		I-J
HUD12-03	203.10	184.90	18.20	16.49	I-J
HUD12-19	207.60	194.20	13.40	8.61	I-J
HUD12-23	201.40	196.70	4.70		I-J
HUD12-25	199.40	179.90	19.50		I-J
HUD12-33	204.60	179.20	25.40	19.46	I-J
HUD12-34	160.70	123.50	37.20		I-J
HUD13-03C	117.20	104.20	13.00	12.99	I-J
HUD13-05	174.75	158.05	16.70	12.69	I-J
HUD13-06	45.30	39.20	6.10	5.00	I-J
HUD12-19	241.30	210.70	30.60	17.55	**J-K**
HUD12-25	245.10	199.60	45.50		J-K

Table 5-2: Interseam intervals (as-drilled and true)-(Concluded)

HUD12-32	230.21	161.70	68.51		J-K
HUD12-33	242.50	205.80	36.70	28.11	J-K
HUD13-02C	235.70	203.1	32.60	32.10	J-K
HUD13-06	87.35	46.95	40.40	33.09	J-K

5.1.2.1 Interval between B-Seam and C-Seam

The entire interval between B and C seam was intersected in 27 drill holes (**Table 5-2**). The true thickness of this interval was calculated in 16 holes. The true thickness of the interval varies from 1.09 metre to 33.19 metres with average and median thicknesses of 8.43 metres and 6.41 metres. The interval is generally thin in the western part and thick in the eastern part. The apparent thickness is generally in the same range and appears to follow the same trend.

The lithology in core holes between B seam and C seam comprises dominantly very fine grained to fine grained sandstone and siltstone in HUD13-02C and dark grey, carbonaceous mudstone in HUD12-31C. The intervals in other core holes are small but consist of mudstone.

5.1.3 C-Seam

C-seam was encountered in 33 holes (**Table 5-1**) and was also repeated in three holes (HUD 11-07, HUD11-07C & HUD 13-08). Out of these 33 holes, 9 holes were very closely drilled for obtaining the structural information and collecting samples for quality studies. The true thicknesses of the seams and partings were calculated in 20 holes. The seam consists of one ply in 15 holes and generally two, in the remaining holes. The single ply holes commonly occur in the northern (trending northwest-southeast) portion of the investigated area. The true thickness of the C-zone varies from 1.06 metres to 5.33 metres whereas the true thickness of the net coal varies from 0.29 metres to 4.05 metres with average and median thicknesses of 1.73 metres and 1.72 metres. True stratigraphic thicknesses exceeding 2 metres occur in 8 holes and apparent (as-drilled) thicknesess exceeding 2 metres was found in 16 holes. The thicker seams generally occurs in the southwestern portion of the investigated area. The true thickness of the parting varies from 0.12 metres to 1.22m with average and median thickness of the 0.55 metres and 0.42 metres.

Nine samples of C Seam were collected (**Table 3-8**) from the cores of the four holes (HUD11-01C, HUD11-07C, HUD13-01C and HUD13-02C) for analyses. The analytical results are presented in Appendix-B. The core recovery varies from poor to 100%. The coal is generally dull to bright and solid to broken.

5.1.3.1 Interval between C-Seam and D-Seam

The interval between C seam and D seam was intersected in 32 holes and the true thickness was computed in 20 holes (**Table 5-2**). The true thickness of the interval ranges from 0.40 metre to 10.37 metres, although thicknesses exceeding 4 metres were intersected only at three locations (HUD11-01 and 01C, HUD12-31and 31C and HUD12-08). The average and median true thicknesses are 2.89 metres and 1.92 metres respectively. The apparent thickness of 28 metres in hole HUD12-23 probably resulted from structural repetition.

The interval between C-Seam and D-Seam, where cored, consist of dark grey, carbonaceous mudstone.

5.1.4 D-Seam

D Seam was encountered in 36 holes (**Table 5-1**) and was also repeated in two holes (HUD11-07 and HUD12-20). Eleven of these holes were very closely drilled at five locations for structure interpretation and sample collection. The true seam thickness was computed in 22 holes (**Table 5-1**).

The coal zone has been correlated with certainty in most of the holes. However, parting between C and D seams is very small in few holes which make it difficult to place the boundary between these seams.

D seam generally lies one to three metres below C seam and consist of one to three plies. The true thickness of the zone (parting and coal) ranges from 1.83 metres to 4.14 metres with average and median thicknesses of 2.99 metres and 3.03 metres. The true thickness of the net coal (including single ply) ranges from 0.48 metre to 3.81 metres with average and median thickness of 1.74 metres and 1.54 metres. The coals exceeding 2 metres in thickness commonly occur in the western portion of the investigated area.

Three samples with moderate to good recovery were collected from HUD11-01C, HUD13-01C and HUD13-02C for analyses (**Table 3-8**). The results of these samples are presented in Appendix-B. The coal varies from dull with minor bright bands to dull and bright banded, commonly hard and solid and occasionally broken to pulverised.

5.1.4.1 Interval between D-Seam and E-Seam

The sequence between D seam and E seam was penetrated by 33 holes (**Table 5-2**). The true interval from D seam floor to E seam roof changes from 10 metres to 42 metres. The average and median thicknesses are 24.73 metres and 25.93 metres respectively. The thinner intervals generally occur in the southwest corner of the exploration area.

The lithology between D seam and E seam interval comprises dominantly very fine grained to fine grained sandstone in cores of HUD 13-01C and HUD13-02C.

5.1.5 E-Seam

E seam was intersected in 40 holes (**Table 5-1**). 11 of these holes were drilled within few metres at five locations for interpreting the structure or collecting the samples for analyses. The seam was also repeated in one hole (HUD12-20). The true thickness of the seam was calculated in 23 holes. Although the seam occur throughout the investigated area, the thickness (true thickness in 4 holes and apparent thickness in 6 holes) in excess of 2 metre was found in only 10 holes which are generally located in the southwestern portion of the investigated area.

Six to eight metres below D seam, a seam with considerable thickness (net coal of 2.54 metres and 1.90 metres) was picked in holes HUD11-09 and HUD 12-08. This seam is named E1. It appears that this seam is very localised.

E seam consists of a single ply in 13 holes, two plies in 22 holes , three plies in 3 holes and 4 plies in two holes (**Table 5-1**). The zone thickness (true thickness) varies from 1 metre to 5.48 metres with average and median thicknesses of 3.36 metres and 3.42 metres. The total true thickness of parting changes from 30 centimetres to 3.72 metres. The average and median thicknesses of parting are 1.78 metres and 1.93 metres respectively. The true thickness of net coal ranges from 0.40 metre to 2.69 metres with average and median thicknesses of 1.42 metres and 1.38 metres.

The seam was intersected in core holes HUD13-01C and HUD13-02C. Two samples were collected for analyses (**Table 3-8**). The results are presented in Appendix-2. The coal is dull and bright banded, solid, hard and occasionally granular.

5.1.5.1 Interval between E-Seam and F-Seam

The complete sequence from the floor of E-Seam to the roof of F-Seam was crossed in 33 holes; however the true thickness of the sequence was computed in only 20 holes (**Table 5-2**). The true thickness ranges from 3.22 metres to 47.67 metres whereas apparent thickness in all drilled holes ranges from 3.22 metres to 52.60 metres. The average and median true thicknesses are 15.39 metres and 15.53 metres respectively. The thinner intervals occur in the middle of the southern portion of the investigated area. The thickest sequences are located in the northwest region.

The interval between E-Seam and F-Seam comprises mudstone in core holes HUD13-01C and HUD13-02C and sandstone with minor mudstone in HUD13-03C.

5.1.6 F-Seam

F-Seam forms the most laterally consistent coal horizon in Hudette property and is the most economically-attractive seam. It is also the thickest coal zone and typically consists of one to two plies. The seam has adequate thickness and continuity to be considered for mining. In previous work (Klatzel-Mudry *et al.*, 1984), F-Seam was designated as the Brenda Seam.

F-Seam occurs 3 metres to 47 metres below E-Seam. F-Seam was intersected in 40 holes and was also found twice due to structural repetition in six holes (**Table 5-1**). Thirteen of these holes are very closely spaced at six locations for structural interpretation or coring for coal seam sampling.

An associated coal bed, the F1 coal seam, is locally developed in three holes (HUD11-05, HUD12-21 and HUD21C). This seam occurs 2 metres to 15 metres below F-Seam. It is 0.73 metres and 1.36 metres thick in HUD12-21 and HUD12-21C respectively (true thickness) and 1.97 metres thick in HUD11-05 (apparent thickness).

The true thickness of F-Seam was computed in 26 holes (**Table 5-1**). The seam is made up of a single ply in 29 cases, double plies in 3 cases, and triple plies in 3 cases. The true thickness of the F-zone varies from 1.85 metres to 5.72 metres with average and median thicknesses of 3.67 metres and 3.82 metres. The parting thickness changes from 0.29 metres to 3.19 metres. The average and median thicknesses of the parting are 1.25 metres and 1.19 metres respectively. The net coal ranges from 0.73 metres to 6.89 metres with average and median thicknesses of 2.90 metres and 2.69 metres. The seam exceeding 2 metres (apparent and true) was found in 30 holes. The thicker coal occur in central portion of the investigated area, trending northwest-southeast.

Five core holes intersected F seam. The recovery was poor to excellent in these holes. 14 samples were collected and sent to laboratory for analyses (**Table 3-8**). The results are presented in **Appendix B**. The coal is generally dull with minor bright bands. The bright bands are more common in lower part. It is commonly solid and occasionally broken to pulverised.

5.1.6.1 Interval between F-Seam and G-Seam

The complete section between F-Seam and G-Seam was intersected in 29 holes (**Table 5-2**). The true thickness of the section was computed in 18 holes. The true thickness varies from 3.87 metres to 22 metres. The average and median true thicknesses are 11.72 metres and 10.59 metres. The apparent thickness ranges from 2.3 metres to 38.2 metres. The thinner intervals between the F and G coals commonly occur in the northwestern part of the investigated area.

Lithologies of this interval, where cored, vary from sandstone to mudstone. Mudstone is dominant in HUD13-02C and HUD13-03C, whereas siltstone and very fine sandstone constitute major lithology in HUD13-01C.

5.1.7 G-Seam

G seam was identified in 34 holes (**Table 5-1**) which extend throughout the investigated area. The seam was also repeated in 2 holes. Thirteen of these holes were drilled as pairs or a triplet, situated within tens of metres of each other, at six locations for structural interpretation and coring for sample collection. The true thickness was determined in 20 holes (**Table 5-1**). Although the true thickness ranges from 0.51 metre to 2.20 metres, the thickness exceeding 1.50 metres was encountered in 11 holes. The true average and median thicknesses are 1.44 metres and 1.50 metres respectively. The apparent thickness varies from 0.30 metres to 3.0 metres. The thicker seams were generally intersected in the western part. The G seam comprises one ply in 19 holes, two plies in 13 holes, three plies in one hole and four plies in one hole. The partings in more than one ply seams are commonly less than one metre thick.

Five samples were collected from year-2013 drill cores for analyses (**Table 3-8**). The results are presented in **Appendix B** of the present report. The recovery was moderate to excellent. The coal is bright with dull bands, closely cleated in places, and commonly solid to broken.

5.1.7.1 Interval between G-Seam and H-Seam

The interval between G-Seam and H-Seam was intersected in 24 holes (**Table 5-2**). Fourteen of these holes had data to compute true thickness. The true thickness ranges from 3.90 metres to 19.0 metres, however 5.80 metres to 9.30 metres is the common interval. The average and median true thicknesses are 9.23 metres and 8.02 metres. Apparent thickness changes from 4.3 metres to 46 metres. The thicker interval was noticed in the holes located in the western part.

Dark grey mudstone, siltstone and very fine sandstone were encountered in coring holes between G-Seam and H-Seam.

5.1.8 H-Seam

Although H seam appears to be developed throughout the investigated area, its thickness rarely exceeds one metre. The seam was identified in 30 holes (**Table 5-1**) and was also repeated in two holes. Eight holes (at four locations) are situated as pairs, a few metres apart. True thickness was computed in 18 holes. The true thickness varies from 0.19 metre to 1.80

metres with average and median thicknesses of 0.77 metre and 0.71 metre. The apparent thickness changes from 0.20 metre to 3.18 metres. The seam consists of a single ply except in 3 holes (HUD12-22, HUD13-02C HUD13-05) where less than 50 centimetres of intervening parting was noted.

Two samples were collected from HUD13-02C and HUD13-03C (**Table 3-8**) for analyses. The results are presented in **Appendix B**. The recovery was moderate. The coal is bright and dull banded and commonly solid.

5.1.8.1 Interval between H-Seam and I-Seam

The interval between H-Seam and I-Seam was intersected in 16 holes. The true thickness of the interval ranges from 4.44 metres to 18.08 metres with average and median thicknesses of 11.87 metres and 11.76 metres. Sandstone is the dominant lithology in this interval in core hole HUD13-03C.

5.1.9 I-Seam

I-Seam is economically-insignificant, insofar as its thickness does not exceed 50 centimetres at any point of measurement. However, the seam is a useful marker for correlation among several holes.

I-Seam was encountered in 18 holes and true thickness was calculated in 12 holes (**Table 5-1**). The thickness ranges from 14 centimetres to 50 centimetres with average and median thicknesses of 0.30 metre and 0.32 metre, respectively.

One sample with a good recovery was collected from HUD12-03C (**Table 3-8**). The analytical results of this sample are presented in **Appendix B**. The coal is dull with minor bright bands and solid to broken.

5.1.9.1 Interval between I-Seam and J-Seam

J-Seam lies 5 metres to 20.82 metres (true thickness) below I-Seam (**Table 5-2)**. The interval between I-Seam and J-Seam was crossed in 13 holes (**Table 5-1**).

5.1.10 J-Seam

Although J-Seam was intersected in 19 holes, it is not considered economic at this stage of exploration, because of its narrow thickness and apparent lack of lateral continuity. Data from 9 holes were available, to calculate the true thickness of the I-J interval.

The true thickness of J-Seam was computed in 12 holes. The true thickness ranges from 0.23 metres to 2.03 metres, although the thickness exceeding 1 metre was encountered in five holes. The average and median thicknesses are 0.99 metre and 0.90 metre respectively. The apparent thickness ranges from 10 centimetres to 3.10 metres.

J-Seam consists of a single ply except in holes HUD13-05, HUD12-24, HUD12-23 and HUD12-22 where two to three plies were recorded. Two samples with good to moderate recovery were collected for analysis (**Table 3-8**). The results are presented in **Appendix B**. The coal is bright and dull banded and commonly solid.

5.1.10.1 Interval between J-Seam and K-Seam

The interval between J-Seam and K-Seam was crossed in 6 holes (**Table 5-2**). The true thickness of the interval in five holes varies from 17 metres to 33 metres with average and median thicknesses of 26.42 metres and 28.11 metres.

5.1.11 K-Seam

K-Seam is the lowest correlatable seam in the investigated area. It was intersected in eight holes, although it appears that a number of other holes did not reach the depth of the K seam. The true thickness of seam calculated in five holes changes from 0.70 metres to 3.44 metres (**Table 5-1**). The thickness above 3 metres was found in two holes (HUD12-19 and HUD13-2C) which are few tens of metres apart. The average and median thicknesses are 1.75 metres and 1.11 metres respectively. The apparent thickness varies from 0.70 metres to 3.9 metres.

5.1.12 Lower Seams

Coal seams underlying K-Seam were intersected in HUD12-32, HUD13-01C, HUD13-03C, HUD13-05 and HUD13-06. These coals range in thickness from 0.08 metres to 0.69 metres and occur within an interval of 5 metres to 64 metres. Only HUD 13-03C and HUD13-05 intersected more than one seam.

6 Coal quality

Coal quality data for ‘current’ boreholes drilled in year-2012 and year-2013 are presented in **Appendices B** and **C** of this report. No coal-quality work was done in year-2011, owing to the non-coring nature of the drilling done in that year.

Appendix B deals with clean-coal quality, from core samples taken within year-2012 and year-2013. **Appendix C** presents petrographic data. Both of these appendices are presented on a confidential basis, owing to their dealing with clean-coal quality (no raw-coal quality work having been done at Hudette during the years covered by the present report).

6.1 Note concerning historic coal-quality data

The present report does not include a review of historic coal-quality information. Such data are available within historic coal-assessment reports covering the Hudette area and its vicinity, as referenced in **Section 10** of this report.

7 Coal-resource estimation

Within the Hudette coal property, only its northern portion has been sufficiently drilled to be able to confidently establish its level of geological complexity. Within the Canadian national standard coal-resource estimation scheme (Hughes *et al*, 1989), the tight folding and moderate intensity of faulting at Hudette places it within the ‘complex’ tectonostratigraphic category, requiring the use of cross-sectioning methods as a means of resource estimation.

At its present density of drilling, Hudette has not yet been sufficiently-explored to support coal-resource estimation by cross-sectioning. Further exploration would be needed before any consideration could be given to the recognition of measured or indicated coal resources.

8 Reclamation

Drilling at Hudette during the years 2011 through 2013 required the construction of drill pads (upon which the drilling rig and associated equipment could be safely placed, with sufficient room for parking and movements of support vehicles), as well as the construction of new drill trails to reach sites which were not adequately served by existing trails and roads.

Disturbance associated with the year-2011 drilling programme was reduced by the choice to employ an air-rotary drill rather than a diamond-drill (which would have required the use of mud-based drilling fluids). Where possible, pre-existing trails were re-used in the course of the year-2012 and year-2013 drilling programmes, further reducing disturbance.

Substantial reclamation effort was undertaken after the completion of the year-2013 drilling programme. Drill sites were cleared of equipment, supplies and trash prior to removal of the drilling rigs.

9 Statement of costs

‘Current work’ within the Hudette coal property, for purposes of the present report, comprises exploratory work done between the years 2011 and 2013.

For the year-2011 drilling programm, exploratory cost is available from exploration department files, but these data are not accessible for the years 2012 and 2013 programms. Years 2012 and 2013 costs are therefore estimated, based on provincial average unit costs, following the methodology used by Cathyl-Huhn and Avery (2014) for costing of work done at Brule Mine.

Table 9-1 presents the resultant combination of known (year-2011) and estimated (year-2012/2013) costs.

Table 9-1: Estimated exploratory cost breakdown by activity

	2011		2012			2013			Totals
Item/year	Quantities	Costs	Quantities	Average unit costs	Estimated costs	Quantities	Average unit costs	Estimated costs	Costs
Rotary-drilling	1586.42 metres	$269,470	7633.88 metres	$201.34/ metre	$153,705	661.42 metres	$201.34/ metre	$133,170	$556,345
Core-drilling	nil	nil	640.16 metres	$210.34/ metre	$134,651	991.9 metres	$210.34/ metre	$208,636	$343,287
Geophysical logging	1563.69 metres	$56,830	7976 metres	$17.56/ metre	$140,058	1646.25 metres	$17.56/ metre	$28,869	$225,757
Roadwork	unknown length	$220,888	(based on 8274.04 metres of drilling)	$23.30/ metre	$192,785.1	unknown length		$148,200	$561,873
Analytical work	nil	nil	20 samples		$2,777	(based on 992 metres of cored boreholes)	$79.63/ metre	$78,993 (estimated)	$81,770
Totals		$547,188			$623,976			$597,868	$1,769,032

Notes: unit costs are on per-metre drilled length basis, derived from provincial average unit-costs (see Bouchard (2011) report on behalf of Natural Resources Canada. Geophysical log metreage is slightly lower than drilled metreage, as not all boreholes could be logged, and logging often starts slightly above the bottoms of holes. Breakdown of coring vs. non-coring costs is not available for year-2013 drilling.

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11 Conclusions

The stratigraphic sequence in the Hudette property includes, from top to bottom, the lower part of the Moosebar Formation, the Gething Formation, and the Dresser Formation. Most of the property is underlain by the Early Cretaceous Gething Formation, which hosts all of the known coal occurrences. More than thirteen coal seams were intersected by drilling within the Gething Formation. Results of geological mapping and exploratory drilling, conducted between 2011 and 2013, suggest that potentially-mineable coal seams occur within the upper 85 metres (here designated as the ‘Upper Gething’) of the Gething Formation.

Fifty-six boreholes were drilled within the Hudette property during 2011-2013. Four coal seams, designated as seams B, C, D, and F, appear to be particularly attractive for mining, at the current stage of exploration. F-seam is the most prospective of the coals, on the basis of its thickness and consistent development.

The Mink Creek coal property is structurally-complex, characterised by thrust faulting and tight folding. For this reason, the tectonostratigraphic geology type of the property is considered to be complex, in keeping with the Canadian national standards proposed by Hughes and others (1989).

A closely-spaced drilling programme will be required to better establish the property’s geology, as well as allow a formal coal-resource estimate.

Estimated exploratory costs to date, covering year-2011 through year-2013 activities, are $1,769,032. The Hudette coal property is regarded as being a property of merit.

12 Statement of qualification

I, Muzaffer Sultan P.Geo.(BC), do hereby certify that:

a) I am currently employed on a full-time basis by Walter Canadian Coal Partnership, a subsidiary of Walter Energy, in their Canadian office in Tumbler Ridge, British Columbia.

b) This certificate applies to the current report, titled *Coal Assessment Report for the Hudette coal licences, British Columbia*, dated June 24, 2015.

c) I am a member (Professional Geoscientist, Licence No. 34690) of the Association of Professional Engineers and Geoscientists of British Columbia. I have worked as a geologist for over 41 years since my graduation from university.

d) I certify that by reason of my education, affiliation with a professional association, and past relevant work experience, having written numerous published and private geological reports and technical papers, that I am qualified as a Qualified Person as defined by Canadian *National Instrument 43-101*.

e) My most recent visit to the Hudette coal property was in July 2014.

f) I am the author of this report, titled *Coal Assessment Report for the Hudette coal licences, British Columbia*, dated June 24, 2015, concerning the Hudette coal property.

g) As of the date of the writing of this report, I am not independent of Walter Canadian Coal Partnership and Walter Energy, pursuant to the tests in Section 1.4 of *National Instrument 43-101*.

“original signed and sealed by” M. Sultan P.Geo.

Appendix A: Geophysical logs and other borehole data

Copies of core descriptions, for those boreholes from which cores were taken, are presented in digital format; in this case, *Excel* files have been provided. **Table A-1** summarises the core intervals in spot coring holes as well as drill holes with continuous core. The photographs of cores are also presented in digital format; core intervals photographed are summarised in **Table A-1** in comments column.

Table A-1: Coring Intervals in current boreholes

Borehole	From (m)	To (m)	Length (m)	Core Type	Comments
HUD11-01C	38.1	52.16	14.06	Spot	Photographed
HUD11-01C	104.55	121.92	17.37	Spot	Photographed
HUD11-07C	72.85	85.04	12.19	Spot	Photographed
HUD11-07C	127.71	149.4	21.69	Spot	Photographed
HUD11-07C	154.23	160.02	5.79	Spot	Photographed
HUD12-21C	39.32	43.28	3.96	Spot	Photographed
HUD12-21C	101.19	116.07	14.88	Spot	Photographed
HUD12-31C	6.1	17.37	11.27	Spot	Photographed
HUD12-31C	174.04	201.78	27.74	Spot	Photographed
HUD13-01C	0	110	110	Continuous	Photographed
HUD13-02C	0	251	251	Continuous	Photographed
HUD13-03C	0	182	182	Continuous	
HUD13-04	75.59	82.46	6.87	Spot	
HUD13-04	192.02	197.45	5.43	Spot	
HUD13-05	30	35.66	5.66	Spot	
HUD13-05	50.29	56.38	6.09	Spot	
HUD13-05	77.72	80.72	3	Spot	
HUD13-05	115.82	117.65	1.83	Spot	
HUD13-05	145	148.13	3.13	Spot	

Geophysical logs run in current (year-2011 through year-2013) boreholes are summarised in **Table A-2**. Copies of these logs are submitted as digital files accompanying this report, in both LAS and TIF format where available. Note that that in some boreholes only a minimal suite of logs were obtained, owing to poor ground conditions necessitating the running of geophysical tools inside drilling-rods.

Table A-2: Geophysical logs run in current boreholes

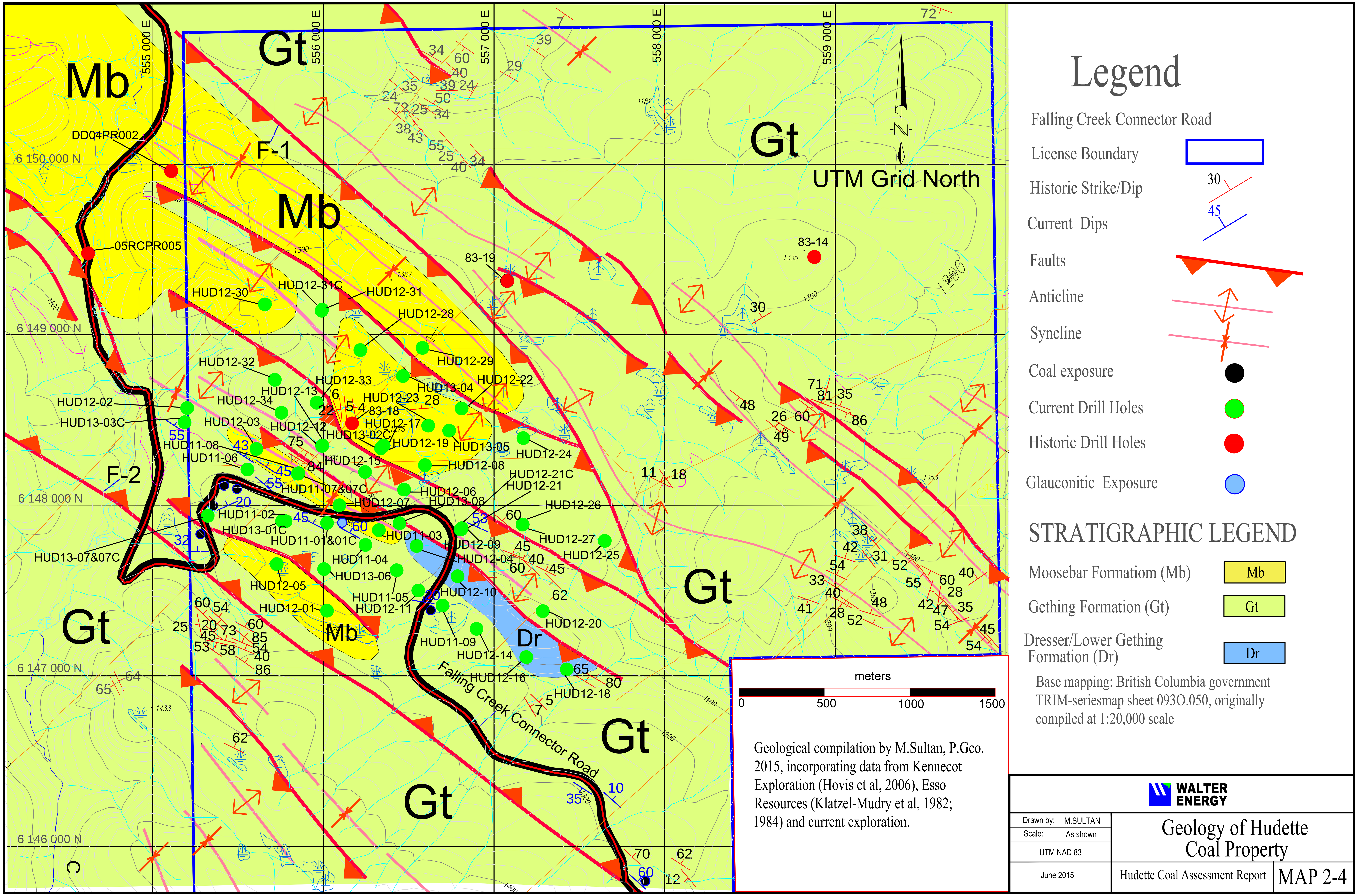
Borehole	Easting NAD83	Northing NAD83	Elevation (m)	Total Depth (m)	Gamma/ Caliper/ Resistivity/ Density	Gamma/ Neutron	Deviation	Dipmeter	Notes
HUD11-01	556021.559	6147896.61	1305.62	176.78	173.21	173.42	173.21		
HUD11-02	555778.768	6147907.19	1327.854	220.06	216.79	217.05	216.86		
HUD11-03	556325.245	6147854.24	1306.719	177	176.63	176.67	176.48		
HUD11-04	556246.549	6147767.82	1314.866	170.68	170.44	170.54	170.34		
HUD11-05	556429.398	6147619.5	1319.342	171.29	169.45	168.93	168.74		
HUD11-06	555554.409	6148210.3	1187.064	65.53	59.36	59.12	58.92		
HUD11-07	555851.179	6148185.77	1190.397	243.84	242.58	242.44	242.24	241.5	
HUD11-08	555854.232	6148187.48	1191.954	216.46	212.35	212.37	212	211.5	
HUD11-09	556698.394	6147412.51	1277.825	144.78	142.23	142.25	142.06		
HUD11-01C	*556021.559*	*6147896.61*	*1305.62*	122.92	122.5	122.42	122.22		
HUD11-07C	*555851.179*	*6148185.77*	*1190.397*	160.02	159.44	159.5	159.3		
HUD12-01	556020.759	6147382.28	1292.957	234.69	229.85	230.4	230.2		
HUD12-02	555201.853	6148570.56	1126.995	187.45	186.4	186.44	186.24		Also, neutron through rods
HUD12-03	555607.376	6148330.32	1149.073	225.52	224.33	211.88	211.68	223.5	
HUD12-04	556546.288	6147761.42	1321.636	247.88		247.46	90.08	89.5	Only neutron log through rods
HUD12-05	555726.238	6147655.42	1303.013	124.96	88.24	92	91.8		Also neutron through rods up to 122.46m.
HUD12-06	556472.887	6148092.22	1291.298	240.79	239.24	239.18	238.98	238.5	
HUD12-07	556093.89	6148000.29	1257.598	192.02	190.48	190.6	190.4	190	
HUD12-08	556595.161	6148235.57	1279.571	213.36	211.52	212.03	211.84	211.5	
HUD12-09	556810.651	6147865.62	1298.987	210.31	206.04	205.37	205.18	200	
HUD12-10	556786.637	6147584.11	1279.683	249.93	242.88	242.96	242.76	241.5	
HUD12-11	556556.222	6147500.8	1275.184	240.79	235.08	235.58	235.38		
HUD12-12	555993.804	6148351.07	1240.787	184.4	183.54	183.46	183.26	183	
HUD12-13	555992.605	6148348.66	1235.37	259.08	208.03	214.64	214.44	206	
HUD12-14	556897.626	6147275.75	1263.059	243.84	242.82	243.06	242.86		
HUD12-15	556244.411	6148195.49	1299.045	195.07	193.05	192.97	192.78	192.05	
HUD12-16	557189.425	6147110.07	1210.341	252.98	250.74	250.76	250.56		
HUD12-17	556352.742	6148351.25	1277.598	97.53	92.34	92.46	92.26		

Table A-2: Geophysical logs run in current boreholes (continued)

Borehole	Easting NAD83	Northing NAD83	Elevation (m)	Total Depth (m)	Gamma/ Caliper/ Resistivity/ Density	Gamma/ Neutron	Deviation	Dipmeter	Notes
HUD12-18	557426.679	6147037.93	1179.417	210.31	209.49	209.51	209.32		
HUD12-19	556347.494	6148344.64	1277.424	251.46	249.96	249.9	249.7	249.5	
HUD12-20	557286.161	6147379.65	1257.962	249.93	248.67	248.71	248.52		
HUD12-21	556804.515	6147858.59	1299.372	251.46	146.54	160.06	159.86		
HUD12-21C	556806.465	6147858.81	1299.616	116.43	115.9	115.92	115.72		
HUD12-22	556810.565	6148567.99	1289.631	243.84	240.19	240.37	240.18	239.5	
HUD12-23	556614.906	6148468	1279.368	237.74	232.85	232.99	232.8		
HUD12-24	557172.414	6148394.41	1283.039	298.7	296.31	296.35	296.16	295.5	
HUD12-25	557649.184	6147791.68	1236.418	259.08	257.84	257.88	257.68		
HUD12-26	557167.471	6147887.06	1259.732	210.31	173.43	173.37	173.18		
HUD12-27	557167.938	6147887.62	1259.933	85.29	84.2	84.12	83.92		
HUD12-28	556217.074	6148910.58	1312.711	252.98	252.13	252.05	251.86		Also Neutron through rods
HUD12-29	556580.853	6148922.98	1327.379	232.52	230.72	230.76	230.56		
HUD12-30	555657.305	6149178.54	1311.241	249.93	210.46	227.76	227.56		
HUD12-31	555992.219	6149146.73	1329.012	249.93	248.69	248.53	248.34		
HUD12-31C	555989.392	6149141.16	1328.285	240.79	236.69	237.07	236.88	236	
HUD12-32	555714.734	6148735.36	1305.794	249.93	249.21	249.27	249.08		
HUD12-33	555960.62	6148601.76	1246.386	249.93	247.91	248.43	248.24	247	West of property
HUD12-34	555754.252	6148542.78	1236.929	249.94	243.97	246.18	245.98		
HUD13-01C	555758.30	6147908.00	1325.07	110	109.63	109.49	109.56		
HUD13-02C	556337.40	6148335.00	1281.201	252	251.12	251.04	251.04		
HUD13-03C	555187.90	6148487.00	1139.78	182.5	181.83	181.77	181.78		
HUD13-04	*556466*	*6148758*	*1308*	199	197.45	188.06	197.59	196.5	
HUD13-05	*556737*	*6148438*	*1288*	188.97	188.07	188.06	187.86	187.5	

Table A-2: Geophysical logs run in current boreholes (concluded)

Borehole	Easting NAD83	Northing NAD83	Elevation (m)	Total Depth (m)	Gamma/ Caliper/ Resistivity/ Density	Gamma/ Neutron	Deviation	Dipmeter	Notes
HUD13-06	556004.29	6147626.2	1317.121	208.26	207.7	207.32	207.12	151.5	
HUD13-07	555321.784	6147938.35	1191.231	240.79	240.75	240.71	240.52	239.5	
HUD13-07C	*555321.784*	*6147938.35*	*1191.231*	59.43	58.53	58.88	58.68		
HUD13-08	556446.229	6147895.16	1311.11	213.36	210.72	210.82	210.62	210	


Legend
Falling Creek Connector Road
License Boundary
Historic Strike/Dip
Current Dips
Faults
Anticline
Syncline
Coal exposure
Current Drill Holes
Historic Drill Holes
Glauconitic Exposure
STRATIGRAPHIC LEGEND
Moosebar Formation (Mb)
Gething Formation (Gt)
Dresser/Lower Gething Formation (Dr)
Base mapping: British Columbia government TRIM-seriesmap sheet 093O.050, originally compiled at 1:20,000 scale
Geological compilation by M.Sultan, P.Geo. 2015, incorporating data from Kennecot Exploration (Hovis et al, 2006), Esso Resources (Klatzel-Mudry et al, 1982; 1984) and current exploration.
meters
0 500 1000 1500
UTM Grid North
Falling Creek Connector Road
F-1
F-2
555 000 E
556 000 E
557 000 E
558 000 E
559 000 E
6 150 000 N
6 149 000 N
6 148 000 N
6 147 000 N
6 146 000 N
DD04PR002
05RCPR005
83-19
83-14
83-18
WALTER ENERGY
Drawn by: M.SULTAN
Scale: As shown
UTM NAD 83
June 2015
Geology of Hudette Coal Property
Hudette Coal Assessment Report
MAP 2-4