ASSESSMENT REPORT TITLE PAGE AND SUMMARY

TITLE OF REPORT: Rotary-Air Core Drilling Bowron River Coal Basin

TOTAL COST: $177427.76

AUTHOR(S): Hardolph Wasteneys
SIGNATURE(S):

NOTICE OF WORK PERMIT NUMBER(S)/DATE(S): Mx-11-270
STATEMENT OF WORK EVENT NUMBER(S)/DATE(S): 5646201/ April 18, 2017

YEAR OF WORK: 2016

PROPERTY NAME: Bowron River Amber Property

CLAIM NAME(S) (on which work was done): 1035730, 1035741

COMMODITIES SOUGHT: Amber

MINERAL INVENTORY MINFILE NUMBER(S),IF KNOWN:

MINING DIVISION: North Central Mining Division
NTS / BCGS: 93H-13 / 93H.081
LATITUDE: 53° 50’ 00"
LONGITUDE: 121° 55’ 00" (at centre of work)
UTM Zone: 10 EASTING: 571400 E NORTHING: 5965000 N

OWNER(S): First Amber Mines Inc.

MAILING ADDRESS: 203- 11020 No. 5 Road, Richmond, BC, V7A 4E7

OPERATOR(S) First Amber Mine Ltd:

MAILING ADDRESS: 203- 11020 No. 5 Road, Richmond, BC, V7A 4E7

REPORT KEYWORDS: Amber, coal, mudstone, shale, sandstone, conglomerate, Bowron Basin, Paleogene, graben

REFERENCES TO PREVIOUS ASSESSMENT WORK AND ASSESSMENT REPORT NUMBERS:
Ryan and Lucas, 2016; Coal Assessment reports 003, 006, 008, 009, 012, 013, 018, 760, 784, 785, 786, Minfile 93H005

TYPE OF WORK IN THIS REPORT	EXTENT OF WORK (in metric units)	ON WHICH CLAIMS	PROJECT COSTS APPORTIONED (incl. support)
GEOLOGICAL (scale, area)			
Ground, mapping	1:500 2 ha	1035730 1035741	1000.00
Photo interpretation	1:10,000 200 ha	1035741, 1035741	571.00
GEOPHYSICAL (line-kilometres)			
Ground			
Magnetic			
Electromagnetic			
Induced Polarization			
Radiometric			
Seismic			
Other			
Airborne			
GEOCHEMICAL (number of samples analysed for …)			
Soil			
Silt			
Rock			
Other			
DRILLING (total metres, number of holes, size, storage location)			
Core	250 2 PQ Richmond, BC	1035730, 1035741	145598.76
Non-core	260 2 PQ nil	1035730, 1035741	20000
RELATED TECHNICAL			
Sampling / Assaying			
Petrographic			
Mineralographic			
Metallurgic			
PROSPECTING (scale/area)			
PREPATORY / PHYSICAL			
Line/grid (km)			
Topo/Photogrammetric (scale, area)			
Legal Surveys (scale, area)			
Road, local access (km)/trail	1.15 Km	1035730 1035741	10258
Trench (number/metres)			
Underground development (metres)			
Other			
		TOTAL COST	**177427.76**

Technical Report on

Rotary-Air Core Drilling
Bowron River Coalfield

Tenures
1035730, 1035737, 1035738, 1035739, 1035740, 1035741,
1035 946, 1035947, 1035949, 1035952, 1035954

Mines Act Permit Mx-11-270
Mine #1541372
issued June 8, 2016
Period June 26 to December 31, 2016

Statement of Work Event Numbers:
5646201 (Drilling, Geological, PAC Withdrawal)
work on tenures 1035730, 1035741

Location:
Bowron River, North Central Mining Region
Cariboo Mining Division

NTS 93H-13; 93H.081
Latitude: 53° 50' N, Longitude: 121° 55' W
UTM Zone 10, 571400 E, 5965000 N
NAD 83

Project Period:
October 4 to October 28, 2016

Owner and Operator:
First Amber Mines Inc.
203- 11020 No 5 Road, Richmond, BC V7A 4E7

Authors:
Hardolph Wasteneys, Ph.D., P.Geo.
Campbell River, BC

Submitted:
May 31, 2017

Bowron River Summary

In October 2016 two rotary air blast drill holes and a pilot percussion hole were drilled in the Bowron River Coal Basin located about 60 km east of Prince George, BC and south of highway 16, by First Amber Mines to measure the amber content of coal seams. Previous exploration drilling during the 1970s and 80s had defined a coal reserve of 50 Mt of bituminous B thermal coal and reported a remarkably high content of amber blebs. The coal bearing strata define a 1200-meter-deep basin roughly 2.5 km by 16 km in areal extent forming a NW trending trough or fault bounded synclinal structure deposited in a syndepositional graben. The unusual amber content, variously reported from 1 % and up to 8%, was attributed to the Paleocene age of the coal deposits of the Bowron, which were formed predominantly from coniferous trees, in contrast to older coal basins of the Rocky Mountains. The historical estimation methods were not well documented and none of the original core exists so confirmation was required by sampling coal seams near the western edge of the graben where coal seams might be intersected at depths near 100 meters. Two drill holes were sited based on drill sections in old reports.

The first was continuously cored in a predominantly lacustrine facies shale sequence of very finely planar interlaminated mudstone – siltstone unit containing abundant bituminous debris, but only very minor coal seams to a depth of 150 meters indicating rapid facies change away from nearby historical drill holes and underground workings. The second drill hole was completed to a depth of 135 meters and encountered several coal zones throughout its length each with numerous seams. A pilot hole percussion drilled nearby penetrated through a basal unconformity or fault at a depth of about 150 meters into basement rocks consisting of Paleozoic greenstones, greywackes and cherts of the Slide Mountain Group. Three coal bearing intervals were cored in the drill hole separated by percussion drilled sections, of which only the bottom core interval showed significant amber contents associated mainly with the coal and sporadically with the flaser bedded siltstones-sandstones This bottom core interval contained 2 significant coal zones with a cumulative thickness of over 10 meters and the lowest zones consisting of one nearly solid 5 meter thick coal seam lying above a thick sandstone-conglomerate sequence. All amber grains were logged and an estimation of the volume percentage was calculated by measuring ellipsoidal axes of grains from which an estimate of 0.09% by volume was derived for amber in the coal beds.

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Introduction

Property Description and Location

The Bowron River Property is located 56 km east of Prince George, British Columbia, centred along the Bowron River south of Highway 99. Coordinates of the central part of the property are at Latitude: 53° 50' N, Longitude: 121° 55' W, UTM Zone 10, 571400 E, 5965000 N; NAD 83in the NTS map sheet NTS 93H-13 or BC 1:20k map sheet; 93H.081 in the Omineca Mining Division (Figure 1). First Amber Mines Inc. owns 11 mineral cell claims, tenure numbers 1035730, 1035737, 1035738, 1035739, 1035740, 1035741, 1035 946, 1035947, 1035949, 1035952, and 1035954, which have total area of 2957.25 ha. Prior to the current work the claims were variously good to April 28 or May 6, 2017 and now, subject to acceptance, good to August 28, 2022. Current tenure information is tabulated in the Summary of Work Value table recorded on the MTO Event page reproduced in Appendix 1.

Access, Climate and Physiography

The property straddles the NW-flowing Bowron River and extends about 20 km to the SE of Highway 16. Access from Prince George is via Highway 16 east for 54 km to the "Cut-off" Road and then south to a junction with old Coal Mine Road for 6.7 km and then 8.5 km east to the centre of the property (Fig. 2).

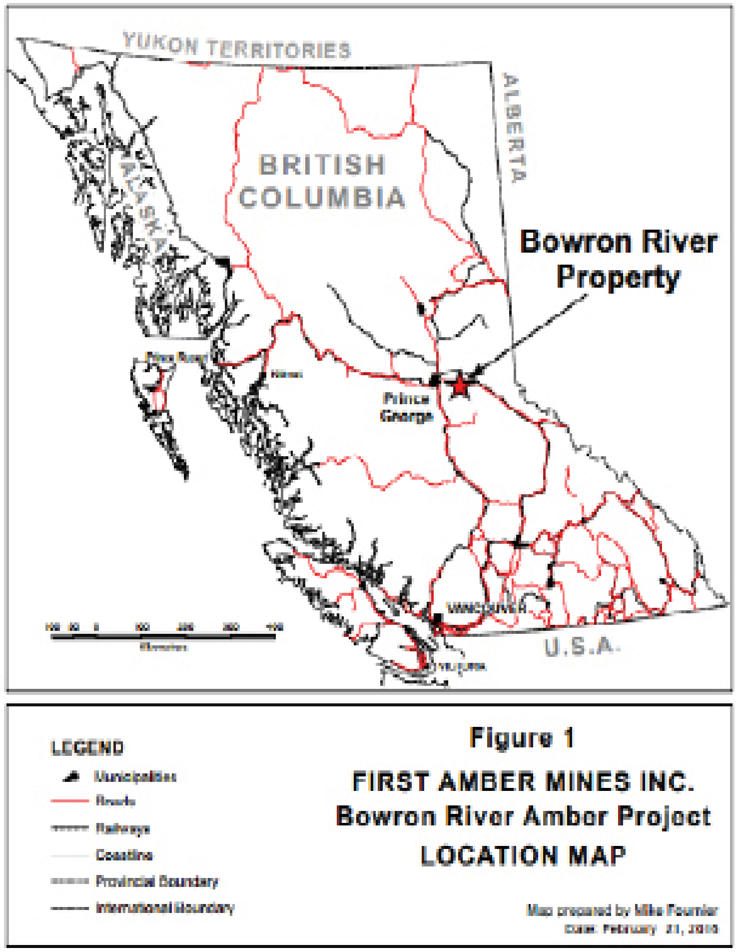

Figure 1: Location Map of the Bowron River Amber project property

The logging road network was developed in the early 1980s after a widespread outbreak of spruce beetles in the area. The outbreak was promoted by severe blowdown damage by wind-storms in the Upper Bowron River area in 1975 that flattened patches of forest throughout the region and left adjacent areas damaged. Mature to overmature interior spruce (Picea glauca engle-manni) and interior spruce-balsam (Abies laiso-carpa) in volumes to 300 cubic meters per hectare typify forests of the region. Discoloured spruce trees were observed by forestry staff in mid 1979 a revealing a significant spruce beetle (Dendrocto-nus rufipennis Kirby) infestation in the area of the discoloured trees. It was decided that containment of the beetle infestation and salvage of the timber could be accomplished by an accelerated logging program. The action plan involved developing an extensive network of logging roads, including the ones present today such as Coalmine Road, followed by rapid harvesting of green-attack spruce trees infested with spruce beetles. Relocation of timber licensees from adjacent areas to speed removal of infested areas resulted in 15 M cubic meters of wood harvested from 1981 to 1987 at rates of up to 700 loads per day. This was followed by replanting 62 M trees on 43,500 ha in-cluding 70% interior spruce, 28% lodgepole pine and 2% Douglas-fir. Much of the area is presently in second growth although some mature spruce stands are found along the Bowron River with trunks up to 20 m high and diameters up to 60 cm.

The Bowron River Valley ranges in elevation from 750 meters at river level to 800 on river ter-races and higher in a chain of hills to the west. The river is meandering, but fast flowing cutting through glaciofluvial gravels and till and flanked by a series of river terraces representing downcutting as the river flow volume waned episodically after the last glaciation. The terraces are variably drained with dry areas near the outer edegs of the escarpments vegetated by jack pine and spruce and swampier ground at the base of escarpments characterized by spruce, alder and poplar.

Coal was first discovered on the banks of the Bowron River by G.M. Dawson during geological surveys in 1871, but no development work took place until about 1910 when some small adits were dug to extract coal for sale in Prince George. This minor extractive work continued until about 1960 when coal licenses covering a large area of the Bowron Coal Basin were acquired by Northern Coal Mines Ltd. Exploration drilling programs by Northern Coal took place in 1964 to 1966 consisting of 32 holes drilled, and an additional 10 holes and 2 exploration adits in 1967. The property was optioned to Bethlehem Copper Mines in 1971 who drilled 5 holes and dropped the option when they determined that the coal was high volatile bituminous B, or thermal coal, and not the metallurgical grade suitable for their interests. In 1973, Northern Coal was reorganized under the name Norco Resources and exploration resumed in 1976 with the shipment of bulk coal samples for testing. Further drilling programs took place in 1977, 1980 and 1981 on the basis of which proven reserves have been calculated (Verzosa, 1981) of 49,904,280 tonnes in the six licences explored. No further exploration took place until the sampling work in 2015 by First Amber (Lucas and Ryan, 2016). More details on the exploration history, geology and amber characteristics of the Bowron Coal Basin are documented in the report by Ryan and Lucas (2016). The locations of drill holes from the early exploration work in the central zone of the property are shown in Figure 3. The network of drill access roads is now densely overgrown, but can be discerned on current satellite images (Google Earth, 2014)t

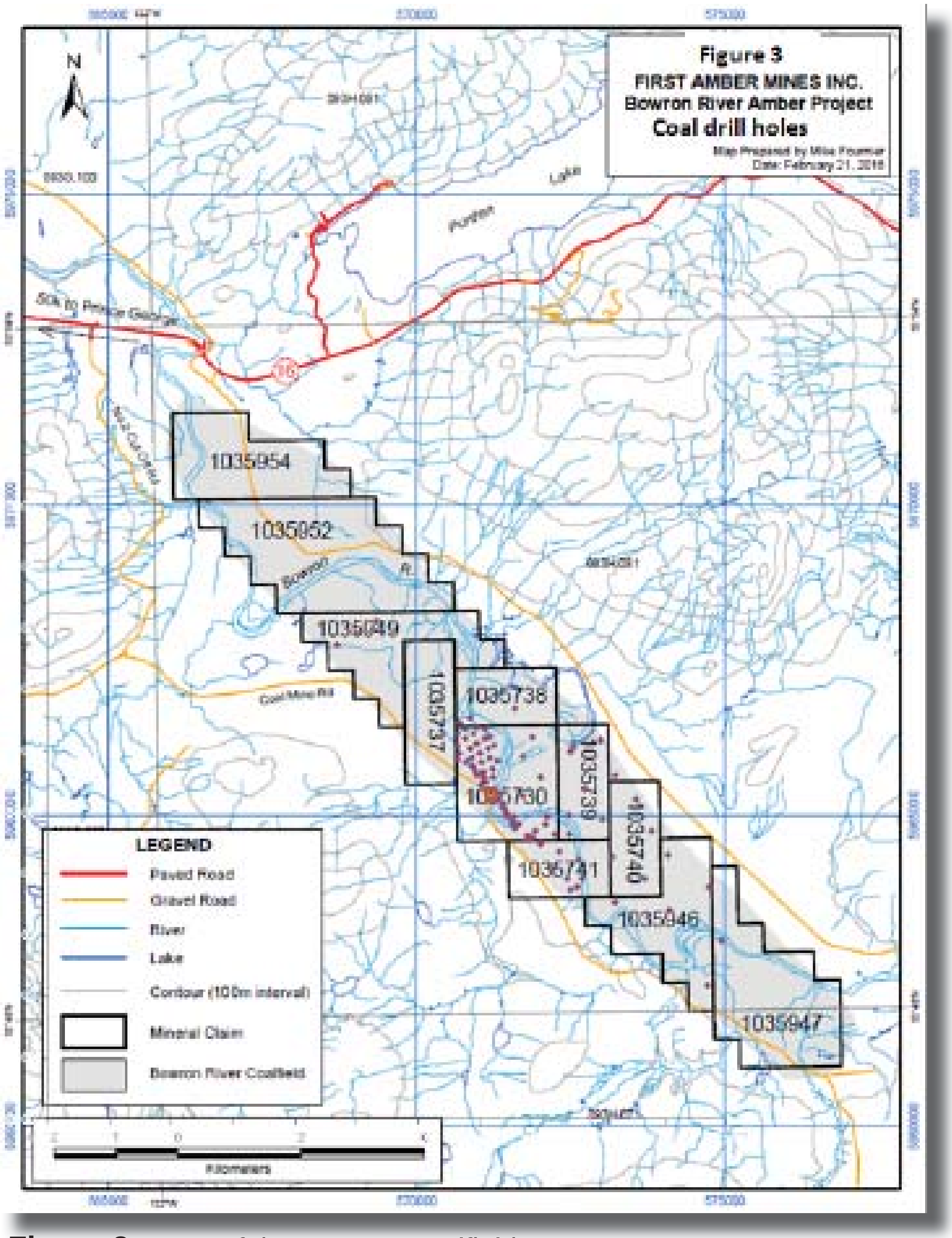

Figure 2: Map of the Bowron Coalfield.
Current First Amber mineral tenures shown with tenure numbers. Red dots are drill holes dating from exploration from the 1960s through 1980s. Grey shading covers the area of the coal-hosting Teriary strata.

The previous exploration work delineated the Bowron Coal Basin as a roughly 2.5 by 15 km asymmetric synclinal or graben structure (Fig. 2) up to 1200 meters deep, representing 700 meters of stratigraphic thickness, above an unconformable contact with Paleozoic volcanics of the Antler River Formation of the Slide Mountain Group. Normal faults define much of the length of both margins of the graben though these are not well exposed under Pleistocene cover. The coal measures are mainly located in the lower 100 meters

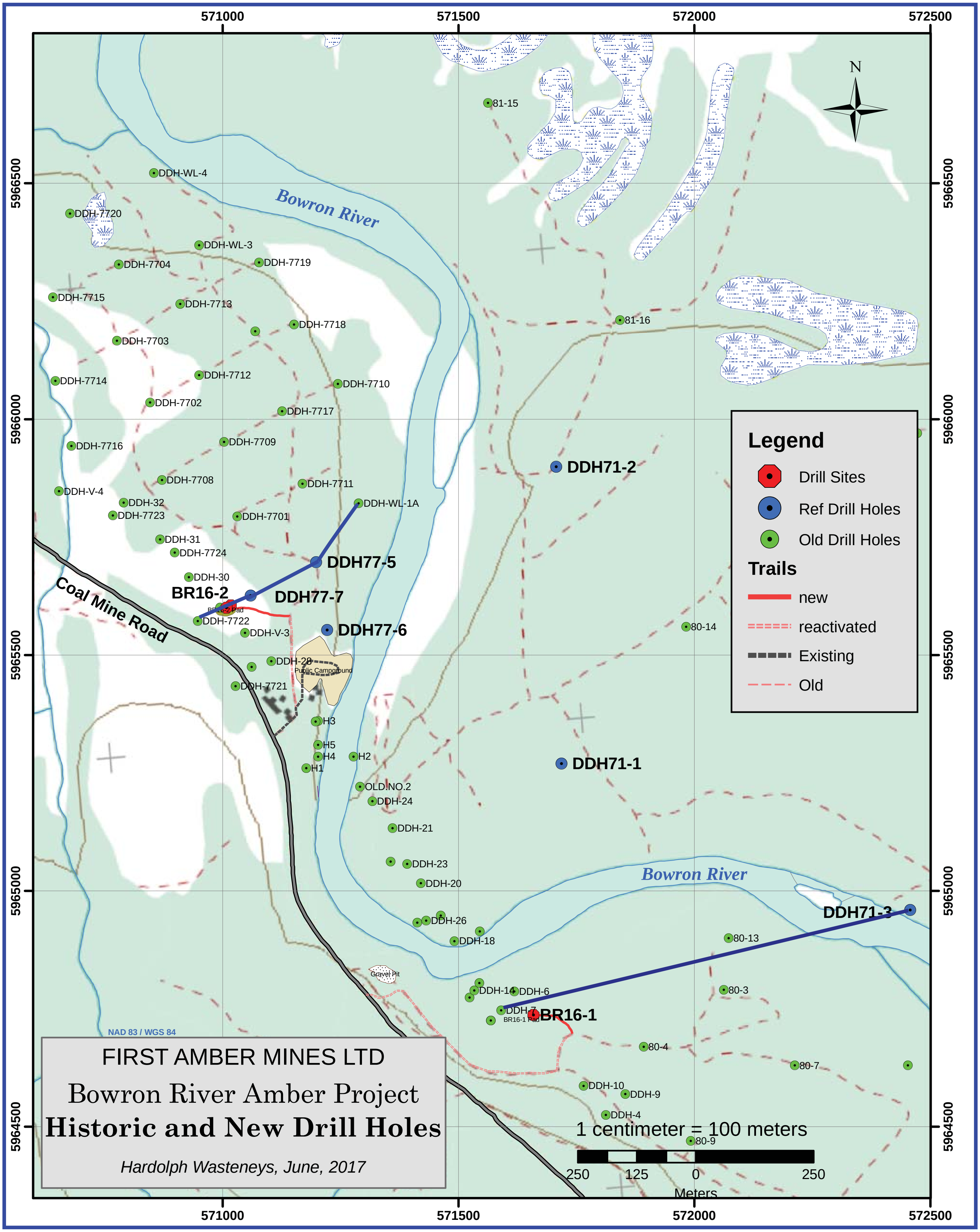

Figure 3: Map of the central area of the Bowron Coal Basin.
Historic drill holes are shown in green and blue. Blue highlighted holes have well recorded sections and were compared with the new 2016 drill holes. Section lines used to locate new holes are shown in blue.

of the sedimentary section and comprise three main coal zones with variable numbers of seams (Kucera, 1971; Trenholme, 1974; Kerr, 1978; Borovic, 1981) . The lowest is the most laterally persistent, but varies in thickness and separation from the other main coal zones of which the lower 2 are the most important and the source of calculated reserves. The lowest zone is described in places as only being one coal seam up to 5 meters in thickness, but varies to several closely spaced beds. The second or upper zone is less well developed and can achieve and aggregate thickness of almost 5 meters. Individual seams thin towards the lateral basin margins or conversely are thicker in the center of the basin with a decrease in thickness of intervening sediment. Basal conglomerates include clasts from the Antler Formation and include greenstones, chert, and limestone.

Relative rates of graben subsidence and sediment accumulation were similar in the early stages of basin formation promoting the development and maintenance of peat bog or swamp condition conducive to coal generation. Higher rates of subsidence relative to deposition, indicated upwards in the stratigraphic section and on the east side of the basin, inhibited the development of coal above the coal zones at the base of the section Within the main coal-bearing zones the host rocks, in addition to the conglomerates commonly appearing below coal seams, include flaser-bedded fine to coarse quartz arenites with shale or mudstone streaks and vary to carbonaceous and coaly shales and siltstones. Coalified plant material is common and the amber occurs in coal and carbonaceous shales. Above the basal unit shale beds dominate the section ranging from thin beds to units hundreds of meters thick. A depositional model for the Bowron suggests predominantly swampy conditions, particularly in the lower section, interrupted by lagoonal and fluviatile conditions. The Bowron sediments can be grouped into three distinct sedimentary facies ranging from lacustrine facies, through transitional facies to alluvial fan or plain facies. Palynomorph assemblages in shales of the lacustrine facies were determined to represent a warm-temperate wet paleoclimate correlatable with the Mid to Late Paleocene (Linds 1980).

The occurrence of amber in the Paleocene rocks of the Bowron Basin is attributed to resins from coniferous trees which predominated in the forests of the region during Tertiary times. Ryan and Lucas (2016) document and discuss the various chemical and gemological classifications of amber based on composition and appearance as well as thermal properties. During the early exploration, amber was considered for industrial resins, but presently the sole interest is gemological either as intact single specimens or to form larger manufactured ornamental objects by amalgamating several small pieces.

Previous Work by First Amber Mines

First Amber Mines Ltd staked mineral claims over the Bowron Coal Basin in early 2015 (Fig. 2) motivated by rising market prices for jewellery grade amber in China. Coal reports from exploration programs in the 1960s through the 1980s consistently reported substantial proportions of amber in the coal with undocumented estimates as high as 8%, but with more credibility ranging from ca. 1 % to 2%. Mineral claims were staked to evaluate this apparent amber resource. No material remains from the estimated 26,000 meters of core drilled in previous exploration programs. First Ambers initial work involved compilation of available drill data by Barry Ryan and Duane Lucas followed by sampling of riverside coal outcrops with the objective of obtaining small bulk samples for amber separations (Ryan and Lucas, 2016). Coal outcrops in the Bowron are limited and restricted to a few sites along the banks of the Bowron River near the centre of the previous drilling campaigns where the river has eroded through the Quaternary alluvium. In November of 2015 a series of NE dipping coal beds known as the Hepburn Showing and located along the west bank of the river (Fig. 4) were sampled by Duane Lucas and Mike Fournier who collected a total of 25 samples. The total coal sampled amounted to about 20 kg of which a 3.5 kg subsample from one of 2 samples showing obvious amber was test separated at Birtley Coal and Mineral Testing of Calgary, Alberta (Ryan and Lucas, 2016). The amber was floated from the finely ground coal in an aqueous salt solution (SG of 1.1) returning 7.35 grams of amber coated with bituminous fines and indicating a weight percentage of 0.21. This is significantly below the numbers reported in drill programs, the most conservative of which average 1.05% (Kerr, 1978). However, the old estimates are volumetric estimates and not weight percent so higher than equivalent weight percents, coal having the higher specific gravity. As well, outcrop weathering may have decreased the amber content and it was decided that the only valid comparisons could be obtained from drill core of *in situ* coal seams.

Current Work Program (2016)

Preliminary research for the proposed drill program was conducted by Barry Ryan, the former coal geologist for the BC Geological Survey, in order to locate probable sites where in situ coal beds could be intercepted at moderate depths. Coal bearing strata in the subsident, Bowron River Coal Basin form a broad NW trending synclinal structure at depths varying from near surface proximal to poorly-defined basin-bounding normal faults to over 800 meters in the center of the basin structure. However most of the geology of the basin is derived from drill hole data as outcrops of the coal bearing strata are rare. Low relief and a thick mantle of glaciofluvial gravels and till cover most of the coal bearing rocks. To minimise exploration expenditure for drilling, drill sites were selected in the shallower parts of the basin near the SW bounding fault, but sufficiently inside the basin to minimize the risk of drilling on the wrong side of the fault through overburden and directly into basement rocks. Locations of previous drill holes are available in the BC government archives (Figs. 2 and 3) and Ryan used these in conjunction with geological cross-sections constructed by previous exploration geologists to locate probable coal bearing strata at nominal depths of 100 meters (Figs. 5 and 6). The old drill data and cross sections incurs risks from inaccuracy of the surveys used at the time of drilling to locate the holes. Original surveys would have been ground based and then referred to survey stations for geographic coordinates in the NAD 27 datum. A few coordinates for some old drill sites ended up plotting inexplicably in the river after projecting into the current NAD 83 datum and are thus somewhat suspect either in the original survey or in the projection parameters used for the archived data. Overwhelmingly though, the most important risk is geological interpolation along cross sections where there is the possibility of rapid facies changes between drill holes.

Figure 4: Coal seams on west bank of Bowron River south of public campground; Hepburn Showings

The geology of the basin shows rapid lateral variations from fluviatile to lacustrine environments, which break lateral continuity of coal seams, and in general stratigraphy is potentially discontinuous. The dominant facies of the basin include lacustrine facies, an alluvial fan to plain facies and transitions in between. Conglomeratic units are common but irregular and generally interbedded with carbonaceous and coaly shales and sandstones. The most abundant lithologies in the basin are shales and siltstone. Coal seams or zones containing coal seams include a lower zone estimated to stratigraphically lie 50 to 100 meters above the basement unconformity. An upper seam is generally placed about 50 meters above the lower. At higher levels in the basin coal development has been generally inhibited by rapid marine inundation or erosion by meandering streams, but lateral facies changes also make continuity of the coal seams unpredictable.

Two general locations for drill sites were recommended by Ryan for the program (Fig. 3), each involving a primary and provisional site, the latter to be drilled only if the primary site was barren. The sites are each near two old underground workings known as the No. 1 and No. 2 Mines on the western side of the Bowron River which is near the Coalmine Road mainline logging road. Access was another consideration in the choice of sites and old drill, mining and logging roads were located from old maps and interpretation of satellite imagery (Google Earth). In early 2016 Duane Lucas and Mike Fournier located and marked out the 4 potential drilling sites by handheld GPS units and identified old overgrown road beds leading from Coalmine Road that could be reactivated near the sites. From the reactivated roads, short segments of exploration trail and drill pad areas were marked. The original program was planned for the summer of 2016, but was delayed until October. In late September, the writer visited the proposed sites and organized a road building contractor, and local feller

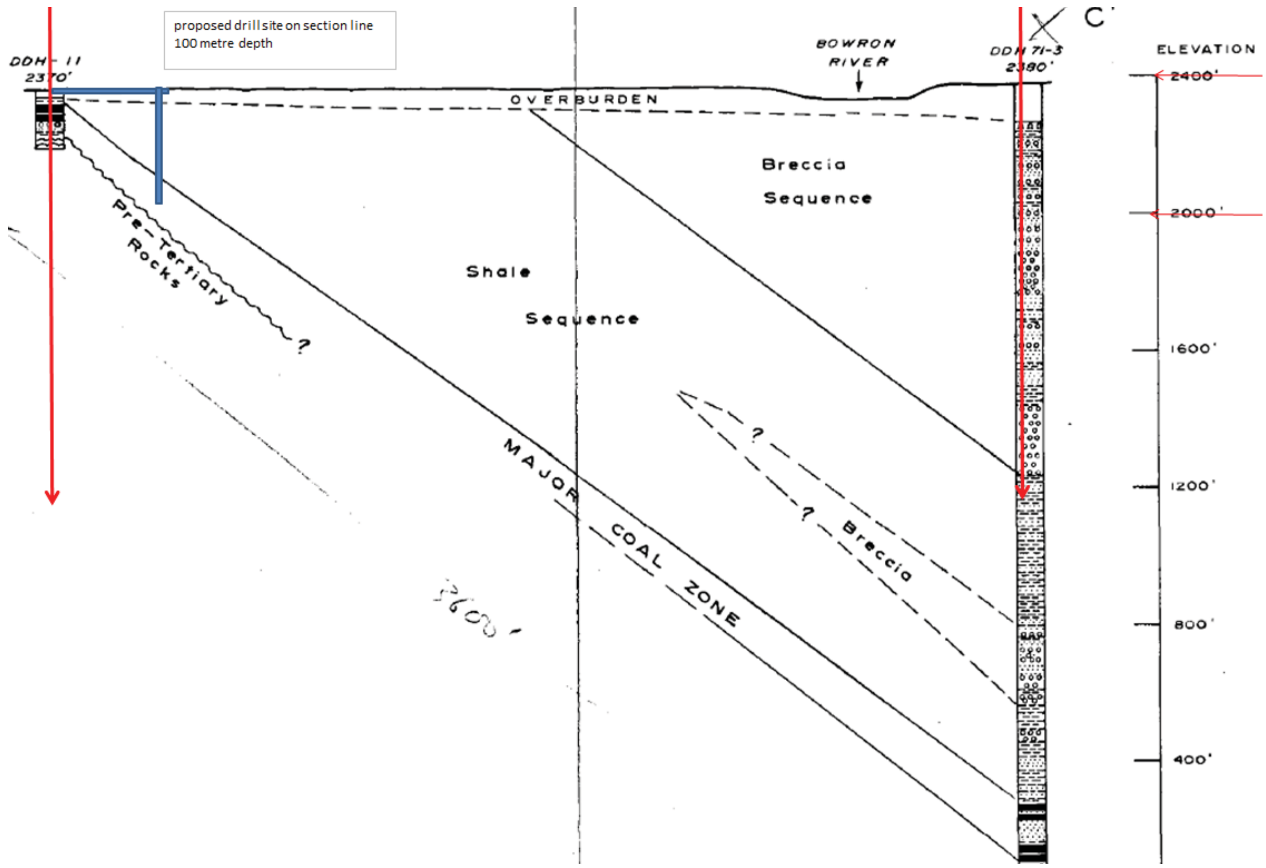

Figure 5: Drill Section (Kucera, 1971) used to estimate location for BR16-1.
The objective was to find a location where the projected coal bed could be intersected at about 100 m depth, shown in blue.

to construct the drill pads and clear access trails for a drill program in October.

Access work for the drill sites involving felling about 12 large spruce trees (merchantable size) by Marcel Gagnon of All Nations Safety and Security LLP. Trail and pad work was completed by contractor Eagle Valley Holdings (John Tereshuk) using “Hurricane 250” and “Gyro Trac GT25” brush mulchers and a Hitachi 160 excavator. About 750 meters of old exploration trails were reactivated and 400 meters of new temporary trail built. Reactivation work involved mulching of deadfall and brush using the track-mounted mulchers with minor excavator work to install a temporary culvert at one location and reducing a steep ramp to a lower slope. New trail building and pad work consisted mainly of laying down a 8 to 12 inch layer of coarse wood chips generated by the mulchers by grinding down stumps, brush and some of the felled timber. The remaining logs and branches were set aside for reclamation work. At the conclusion of the drilling program all trails and pads were deactivated and reclaimed using an excavator. Felled trees were bucked to less than 8 foot lengths and scattered on pads and trails in ground contact, drill sumps were refilled, cut brush was scattered by machine and hand across the sites.

Initially, the program was designed around current coal sampling practices in Cretaceous coal measures using Rotary Air Large Diameter Core (LDC) drilling either from large truck mounted rigs or tracked vehicles. The rotary air method is used because it provides a large sample volume and is more likely to recover friable coal intact than conventional high water pressure diamond drilling. For efficiency of sampling coal measures using LDC the procedure relies on percussion drilling of as much of the strata above the coal as can be reliably ascertained from previous records of nearby drilling. Where this is not accurately known and particularly in steeply inclined strata such as exists in the proposed Bowron sites pilot holes using cheaper, smaller diameter

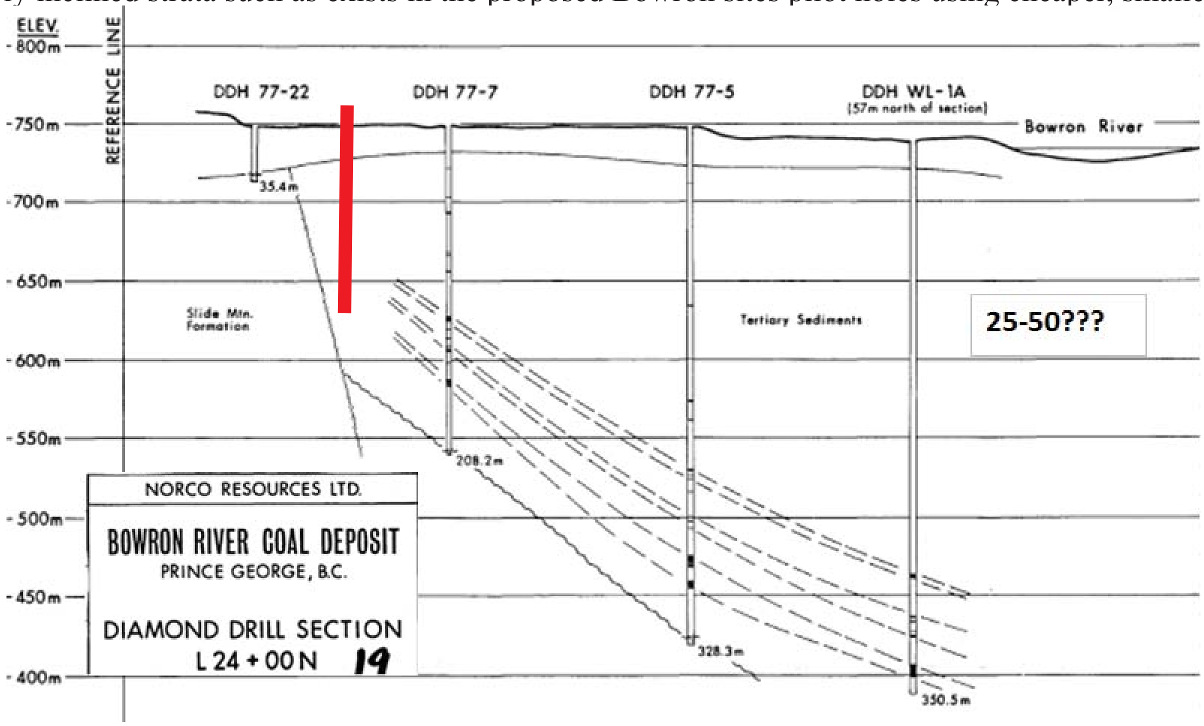

Figure 6: Drill section from Kucera (1971) used to locate drill hole BR16-2 shown in red.

percussion /hammer drilling are used near the proposed LDC site to determine an exact depth interval for the coal by observation of chips and subsequently using downhole geophysics. This introduces the additional cost of a geophysical operator on standby, which for the proposed 2 holes would be considerable.

During a review of the objectives of the program, it was realized that the Tertiary coals of the Bowron Basin are generally harder than more deformed Cretaceous coals and that in the past NQ diamond drilling had been used successfully. Another objective reviewed was the obtaining of a large volume sample for a float sink separation to determine more accurately the volume percentage of amber in the coal. With more clarification by First Amber that the amber type of interest was for the gem amber market and not industrial resins it made sense to refocus on visual observation in core including accurate volumetric estimates. It was realized that the same surface area of a single LDC core could be obtained by drilling 2 smaller diameter PQ core holes, doing less expensive coring of longer intervals and thus reducing the need for pilot holes. The proposed procedure was to drill one hole using mostly air rotary coring, determine exact coal depth by logging the core and then if warranted drill a second sampling hole nearby using percussion drilling down to a point above the coal and then switch to coring to sample to coal. This would have the advantage of obtaining significantly more geological information about local lateral variations the coal bearing strata as well as a complete geological section. Less material volume would be obtained for separation work, but it was not clear that this was a priority compared to standard prctices in the coal industry. With this in mind contract bids were obtained from Geotech for use of a track mounted drill and Anderson Water Services of Fort St John using truck mounted rigs. It was decided that the soft site conditions would be more readily handled without significantly greater access construction by track mounted rigs than trucks and for that reason the Geotech bid was accepted.

The southern site, BR16-1 (Fig. 3) is located on a flat, heavily forested meander plane of the Bowron River that lies at an elevation a few meters above river level and is incised by a few abandoned side channels. Access to the site was built by reactivating an old mine or logging roadbed from the Coalmine Road (Fig. 3) using a tracked mulcher and a small excavator operated by Eagle Valley Holdings of Prince George to descend to the level of the meander plane. About 100 meters of trail and a drill pad area were cleared by felling a few large spruce trees and producing a wood chip drill pad from mulched logs and stumps (Fig 7 and 8). The northern

Figure 7: Adding rods to the articulating drill head.

Figure 8: Utility Marooka positioned opposite trackdrill.

sites are located on a glaciofluvial terrace north of a present-day water access point near an old coal mine adit that has been reclaimed. An active road leads from a higher terrace on which Coalmine road is built to this terrace and old road beds lead to with a few hundred meters of the site BR16-2 (Fig 3; map). Again, access was built using a tracked mulcher and excavator with minor tree felling.

Drill mobilization began on October 4, 2016 by low bed transport of equipment from Geotech's main facility in Prince George. Two low ground pressure tracked "Marookas" and a tracked drill were unloaded on the Coal Mine road and driven to the pad site BR16-1. One Marooka carried an integrated, large-volume air compressor for percussion and rotary air drilling. The other was used as a drill rod carrier, tool shop and platform for rod changes. The Geotech drill is a "FRASTE" track-mounted multipurpose unit adaptable for diamond drilling, percussion drilling or rotary air drilling in sizes up to PQ, and perhaps LDC (Figs. 7 & 8). Rotary air drilling requires high pressure air to clear out drill cuttings and a small volume of water injected into the air stream for lubrication and cooling. The drill crew used a heavy duty four-wheel drive truck to bring in supplies. However, the truck wheels tended to break through the chip pad, which was partly built on soft sediments of an abandoned side channel of the river that forms a shallow curvilinear depression on the southwest side of the drill pad. The pad was, however, ideal for the track mounted Marookas and the drill and considerable effort was saved by running a pump line from the river, which was located about 300 meters to the north, to intermittently fill water tanks near the drill. The northern sites were farther from water and so drilling water was transported by pickup truck in 1000 litre tanks filled at the campsite on the Bowron. This increased the heavy traffic on the pad and additional excavator work was required to make the site suitable for truck access.

The writer supervised access construction, drilling activities and personally logged all the core and cuttings on site as they were drilled. Core boxes are constructed to hold 2 rows of PQ core 5 feet in length. Core was sequentially photographed with 2 frames taken for each two boxes showing the left, or upper end, and right or lower half of each pair (Photos for the lowest core interval of BR16-2 are shown in Appendix 3). Drill logs (Appendix 4) were transcribed to a spreadsheet formatted and coded to allow drill sections to be plotted using "Linear Referencing" in ArcGIS (Appendix 2 and figures below). No downhole surveys were taken and it was assumed that the drilled holes were close to vertical throughout their length, which is probably a fair assumption for the PQ rotary air core holes, but less so for the one smaller diameter percussion drilled pilot hole. Most of the core from BR16-1 was discarded at ehe conclusion of field work, but representative samples of significant lithologies were preserved in about 8 core boxes and stored at the BR16-2 site. Core from the upper two intervals of BR16-2 were also cross-stacked and stored in on site, while the entire final interval of 36 meters from this hole were transported to company offices in Richmond, BC for storage and analysis.

Drilling Program

Figure 9: Finely laminated mudstone/claystone unit in BR16-1.
The fine laminations are sub-millimeter in thickness and alternate dark grey silt and pale brown clay dominated layers. Thin sandy layers containing bituminious plant debris are marked in yellow.

BR16-1 Logistics

The first drill hole of the program, BR16-1, was started on October 5, 2016 and completed at a depth of 151.5 meters on October 14th. The drill crew consisted of the driller, Noah Naylor, and two assistants operating a single 12-hour day shift which included travel and various mandatory safety meetings and equipment inspections. Progress was initially slowed by a broken casing bit that required restarting the hole and later by core slippage through the core springs, which was eventually remedied by use of different style of core spring.

Once casing was set rotary air PQ coring was initiated due to the possibility that coal would be encountered at shallow depth. Core recovery and progress was good to a depth of about 35 meters whereupon core recovery decreased markedly as result of core slippage out of the core tube during extraction. This problem was mainly resolved a few days later when a "basket" style new type of core spring or lifter was obtained. Use of lower amounts of lubrication water also helped prevent the core from slipping out of the tube. The rock involved is a finely laminated mudstone or claystone with bedding angles of up to 45 degrees to the core axis. This rock readily cleaves and its soft nature and high clay content may have lowered the grip of the original core spring teeth. Drilling thereafter progressed steadily but slowly averaging a rate of about 15 meters per shift with only one shift each day. Towards the bottom 30 meters the capacity of the air compressor was challenged causing occasional overheating of the unit and increased difficulty in blowing cuttings out of the hole.

Geology of BR16-1:

Bedrock in hole BR16-1 was hit at a depth of 14 meters at the base of overburden consisting of an indeterminate thickness of recent fluvial silt, clay, and sand, and Pleistocene glaciofluvial gravels. The geological section of the drilled rock was predominantly in lacustrine facies consisting of finely laminated clay or mudstone and some argillite in the top of the hole and varying upwards from more calcareous laminated siltstones and mudstones at the bottom with sporadic thin layers of coal and shaley coal. No significant fluvial or terrestrial facies rock types such as conglomerates or coarse sandstone were encountered and the minor amounts of coal were associated with thin sandy layers possibly indicating an intermittent shallow marine or shallow lacustrine environment. Bedding throughout the hole dips at an angle of about 45 degrees to the core axis, probably reflecting a 45 degree easterly dip. Drill logs are in Appendix 4 and illustrated in geological sections of the drill hole in Figure 23. Only very minor occurrences of amber were observed, some associated with coal layers, but also sporadically in sandy layers within sections of mudstone.

From 14 meters, down to 33 meters the section is dominated by a sooty, black, finely laminated argillite. Minor faults were observed in the top several meters of the black argillite that intersperse a few meters of pale brown to tan coloured mudstone and siltstone. The argillite is a competent rock with conchoidal fracture although it breaks moderately easily along bedding planes. Lithologically, it is characterized by sporadic pale grey tuffaceous layers and small marcasite

Figure 10: Bituminious plant debris in laminated mudstone BR16-1. Black shapes above the grey mudstone layer are small fossilized leaves.

nodules or concretions. Below 33 meters the mudstone unit dominates most of the section and there are no further occurrences of the black argillite. The mudstone unit is generally pale brown, rhythmically alternating between light brown silt and darker clay-rich laminae less than 1 mm thick. It cleaves easily along bedding planes and is generally soft consisting of a high proportion of hydrated clays in the finer grained laminae. Fine bituminous material commonly forms thin laminations within or bordering thin layers of very fine ripple-laminated or flaser bedded sand. The bituminous material appears coaly in thicker layers, but where thinner consists of identifiable plant debris, possibly needles or very small lanceolate leaves (Figure 10). Between 75 and 111 meters, fine sandy layers and associated bituminous laminations are cyclically interspersed within the mudstone at intervals varying from a few meters to several layers per meter with increasing frequency downhole. Amber blebs, marcasite nodules and lenses, and coaly laminations up to a few cm thick are typically associated with the sandy beds. For example, a clear yellow amber nodule 3 mm in diameter was observed at a depth of 58 m in a 1 cm bed of finely laminated bituminous material and mudstone-siltstone (Figure 13).

Figure 11: Fine sandy layers with bituminous debris laminae and minor coal lenses.

Below 110 meters the rock is more calcareous and more broadly banded than above though it remains dominated by mudstone, but with an increasing proportion of siltstone and sandstone towards the bottom of the hole. The transition is shown within the interval from 112 m to 121 where the rock is broadly banded pale greyish green and maroon brown siltstone and argillite interspersed with fine sandstone and associated bitumi-

Figure 12: BR16-1 coarse sandstone and minor coal beds.
Higher in the section fine bituminous debris and thin coal seams are associated with thin sandstone beds.

nous laminae and flakes of organic debris. A narrow interval between 121 and 124 shows characteristics like those of the thinly laminated mudstones higher in the section. Below this is a 20-meter section to 134 m containing the only significant coal beds intersected by BR16-1 (Figure 12) but limited to beds less than 10 cm thickness. The coal beds are commonly below or within dark shale layers or coaly shale and overlie sand or siltstone beds. The sandstone beds are thicker than those higher in the section, and have sharper contacts with underlying shaly beds. Gradational, upward fining bedding is displayed in sandstone and siltstone beds between 134 and 137 meters characterizing a transition to a section alternating beds of siltstone and fine sandstone that continues to the end of the hole. No significant coal beds greater then a few cm thick are present, but bituminous laminations and fine debris layers are common throughout the sandstone-siltstone unit. Ochrous colourations were observed at a depth of 138 m. Amber occurrences are generally sporadic and minor in volume throughout the hole and are probably less common than marcasite lenses and concretions. The amber pieces observed, (e.g. Fig. 13) appear to have been deposited with the bituminous debris which appears to represent storm or small surge deposits.

Figure 13: Small amber grain in laminated coal/ bituminous siltstone.

In general, the stratigraphic section at BR16-1 shows an upward transition from sandstones and siltstone associated with minor coal beds and coaly shale that may have been formed *in situ*. Some of the thinner coaly laminations and bituminous fragments appear to be clastically deposited with sand possibly by storms. The top of the drilled section represents a lacustrine environment in which clay settled out from still water occasionally disrupted by minor storms that washed fine sand and plant debris from adjacent vegetated land.

BR16-2 Drilling Logistics

This drill hole was located about 2 km NNW of BR16-1. The actual PQ core hole was preceded by a smaller diameter percussion pilot hole to determine the approximate depth of coal bearing intervals for core drilling so that the remainder of the hole could be hammer-drilled to save time and coring costs. The pilot hole was drilled with 10-foot percussion rods and cuttings were continuously monitored by observing the air-water exhaust blasted into the sump and by intermittent collection in a sieve of cuttings. The writer examined the cuttings and noted the drillers observations as drilling progressed. In the drilling air exhaust stream coal intervals were indicated by a black oily film on the surface of the effluent water in the sump and the driller confidently estimated within a few feet the depth and thickness of coal seams. Cutting samples were collected continuously in a large sieve from each 10 foot interval or with any observable change in the exhaust stream and deposited in ordered and labelled piles. Rock types were visually identified and logged.

Pilot Hole Geology

Numerous coal seams, clustered into 3 zones were indicated over the length of the 200-meter pilot hole. Two seams up to a meter thick were intercepted immediately below the casing at depths of 15 to 20 meters. The next was encountered at 28 m depth and was estimated at 1.5 meters' thickness. The next occurred at about 45 meters' depth. The final intervals occurred from about 85 to 100 meters' depth and consisted of 3 separate seams within shale and coaly shale. Below 100 meters it became progressively more difficult to resolve individual coal seams in the return air and water flow probably because of dilution with chips from longer intervals. The last clearly identifiable coal was encountered at about 105 meters. Sedimentary rocks including shales, sandstones and siltstone of the Bowron section continued to be identified to at least 128 meters and appeared to be underlain by a section of conglomerates interpreted from the wide distribution of fragment lithologies. However, minor coal was identified with the conglomerate chips at about 132 meters, although it could not be confirmed that this was the source. Below about 150 meters, greenstone fragments suggested that the hole had passed into Paleozoic basement rock of the Slide Mountain Group. Sticky clay coatings on chips were interpreted as representing a regolithic weathered zone at the unconformity in the basement rocks. Below this zone chips of black slate, and siltstone, sandstones and argillites were of somewhat ambiguous origin. The Paleozoic-Paleocene unconformity is interpreted to have been intercepted at a depth of 140 meters.

BR16-2 Rotary Air Drill Hole Geology

The PQ rotary air core hole was started on October 18 at a site about 10 meters SE of the pilot hole in order to step down section to intercept the full thickness of a coal seam that was encountered immediately below the casing in the pilot hole. It was assumed for the projection of this coal seam that it dips moderately to the east as shown in previously interpreted sections and displayed in outcrops on the Bowron River (Appendix 2). Below this depth, the planned core intervals were based a projection of the coal intercepts observed in the pilot hole (Appendix 2; Figure 23) to the horizontal position of the Rotary Air Core hole, assuming a bedding dip of 45 degrees. Thus, coring was warranted for the coal bearing intervals from 25 to 35, 58 to 65 and below 100 meters with the intervals in between hammered, but planning to continue coring for 5 meters beyond any significant coal intercept. Core was obtained for the intervals from 17 to 43 meters, 53 to 67 and below 100 meters with the end of hole at a depth of 136 meters. Core recovery was consistently good throughout the hole except for one interval. Coal beds were intercepted in all three intervals and roughly correlate with the observed intervals in the percussion pilot hole. One thin coal bed observed in pilot hole was omitted from the selected intervals and was observed in the percussion chips in the hammered interval from 67 to 100 meters. Amber was only observed in the third interval.

The first core interval began immediately below casing at 17 meters depth (Figure 14). The rock intercepted included numerous thin coal seams from a few mm to a few cm in thickness and 2 thicker seams up to 1 meter. Host rock types included wispy layered mudstone, shaley coal, and siltstone in the top of the interval and interbedded sandstone, grits and conglomerate below the coal-bearing rocks. The mudstone to siltstone

Figure 14: First core interval in BR16-1.
Flaser bedded siltstones and minor conglomerate alternate with coaly shale and thin coal seams. Conglomerate, or breccia, is in center of view

lithology observed throughout the interval are characteristically poorly laminated with irregularly oriented, wispy lenses or filaments of bituminous matter. Laminations may have been generally disrupted by bioturbation and only a few planar laminated intervals were observed. The uppermost distinct coal seams occur in the interval from 21.7 to 23.3 where 6 seams varying from 1 cm to 10 cm occur in poorly layered dirty mudstones varying from brown to grey. Brownish siltstones and sandstones laced with thin bituminous wisps vary to dark grey to black coaly shale in the interval above some distinct, massive coal seams at 30.1. to 30.4 and 31.8 to 32.8 meters. Poorly bedded brown to grey interbedded mudstone - siltstones continue to the end of the interval at 43.1 m only interrupted by a distinctive, angular conglomerate or grit layer at 36.0 to 36.6 m.

Figure 15: Thin coal seams near top of BR16-2.
Flaser bedded silstone and coaly shales intervene between coal seams.

The interval from 43.1 m to 53.4 was percussion drilled after which rotary air coring resumed from 53.4 to 67.35 m depth. The cored interval was characterized by numerous cycles of interbedded sandstone, coaly shale and thin coal beds with the clastic sediments varying to muddy grey siltstone and fine grained sandstone with abundant bituminous wisps in places accumulated into thin coaly laminae. Bedding in siltstone and fine sandstones is similar to that in the first interval showing wavy, diffuse and non-parallel interbedding of fine sand and dark silt or mud representing flaser bedding in tidal rhythmites. Coal beds are generally thin from a few cm to 20 cm in thickness and grade into coaly shale or carbonaceous mudstone. The coal is generally hard, has a brittle fracture and bright vitreous lustre. Macerated plant debris consisting of bituminous wisps and filaments are commonly observed scattered throughout the various units and particularly noticeable in lighter coloured siltstones. Discordant, thin lenses of coal fill lens-shaped fractures at high angles to bedding that may be interpreted as syneresis cracks. The most distinct unit is a 40-cm thick coarse sandstone bed at 65.7 m displays and abrupt lower contact, upward fining and dark muddy cross laminations. A few thin, poorly bedded lenses of coarse sandstone also occur within coaly shale.

Figure 16: Breccia (conglomerate) below flaser-bedded siltstones .
Thin coal seam (1 cm) at start of core. Coarser layers in top row are cross-bedded sandstones

The next interval was percussion drilled to a depth of 100 meters, passing through a minor coal seam, observed in the pilot hole, that was judged not to warrant coring. The third and final core interval, continued from 100 meters to the end of the hole at 136 meters. Coal intercepts were much more substantial than in the upper intervals and amounted to a total coal thickness of about 10 meters including the lowest section which was nearly continuous for 5 meters. Amber was observed throughout the interval both in and associated with

Figure 17: Start of third interval from 100 to 136 m showing coal and coaly shale.
Reddish brown siltstones indicate oxidation. Flaser bedded siltstone-sandstones in bottom 2 rows.

coal. The lower major coal interval is directly underlain by several meters of coarse conglomerate and sandstone within which unit the hole was terminated.

Coal was intercepted immediately in coring past 100 meters consisting of 3 thin seams embedded in dark grey coaly shale. Bedding dips of about 30 degrees were measured assuming verticality of the drill string. Beneath the coal-bearing unit grey siltstones with diffuse, wavy bedding are intermixed with sporadic thin lenses of coarse sandstone. An unusual ochre coloured siltstone bed, 20 cm thick occurs at 101.8 m just underlying and interspersed with a thin coal seam. Grey siltstones continue to about 105 meters below which alternating coal seams and coaly shale beds occupy most of the section to about 113 meters depth. About 40% of this interval is solid coal albeit in thin seams within coaly shale. Numerous amber grains were observed from the beginning of the core interval, with amber occurring both in coal and in coaly shale. Below 113 grey siltstones interlayered with minor coaly shale dominates the rock to about 123 meters where coal seams increase in frequency. From 123 to about 130 meters massive coal beds dominate the section interbedded with a minor component of dark shale and coaly shale. The massive coal beds sharply overlie a grey breccia of siltstone fragments that grades downwards into coarse grey sandstone with lenses of angular conglomerate. The sandstone varies from massive bedded to gradationally bedded from sandstone to dark grey siltstone. The sandstone is in turn underlain by a coarse, angular fragment, heterolithic, clast-supported conglomerate with a sharp erosional base in grey

Figure 18: Large amber grain in thin coal seam.
Coal seam is about 1 cm thick and lies within an narrow coaly shale band in siltstone. Core is 85 mm in diameter (PQ).

sandstone at 135 m. The hole was terminated in the sandstone unit at 135.64 m.

The amber content of the coal measures is the primary subject of this drilling campaign. Amber was reported by most of the historical drilling programs in the Bowron Coal Field, but with widely varying quantitative estimates and generally lacking much information on the estimation method. Visual estimates are commonly used in many mineral resource drilling programs, but are generally verified by geochemical analyses of the same material. Published estimates for amber in the Bowron range from about 1 to 8% mainly assumed to be weight percent. Conversion to volume percentages would yield higher number because amber has a lower sg than coal, about 1.05 compared to 1.5. Mineral separation of amber by flotation from crushed coal would be required for bulk verification of visual estimates and this was attempted in the previous program by First Amber on one of the surface samples. However, visual estimates are a necessary and valuable first step and can yield more details information about distribution of amber in the host rocks than can flotation separations. For this program, all occurrences of amber were logged including the number and size of amber grains around the circumference of the core.

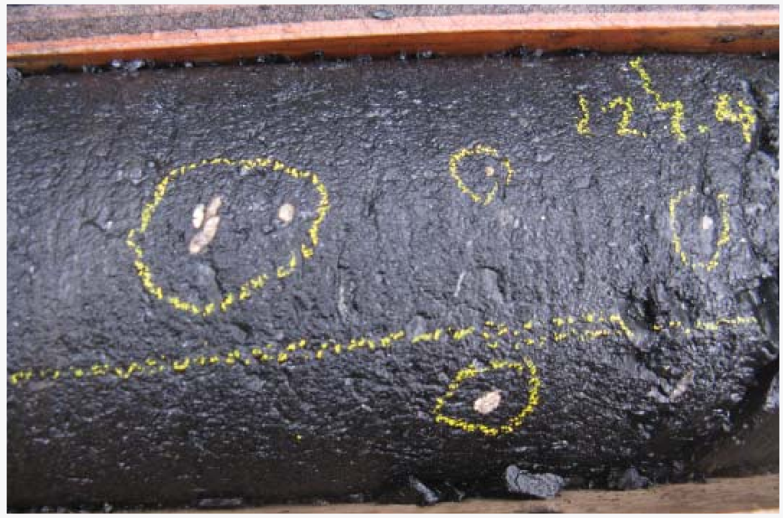

Figure 19: Cluster of small amber grains in massive coal.

Generally, it was observed that amber grains form ellipsoidal or lens shaped grains varying in size from a few millimeters to about 2 cm in maximum dimension and with the long axes lying in the bedding plane. Smaller grains, characterized by maximum dimensions of 4 mm, appear to have a consistently prolate ellipsoidal form and constitute the majority of grains observed commonly occurring in clusters. The clustering seems to be oriented parallel to bedding suggesting that they have a weakly stratiform distribution even within thick massive coal beds. Larger grains of amber, up to 2 cm, are more irregular in shape, but nevertheless have a lens like or oblate ellipsoidal form. Volume estimates of individual grains can be easily made by measuring the 3 ellipsoidal axes of each grain for calculation and inputting into the formula of an ellipsoid. Of course, this involves observation from the core surface which only shows a random section through the grains and so axis measurements were by inferring the shape of individual grains by observing several in a common cluster displayed around circumference of the PG core. To account for the probability of amber grains not exposed at the core surface an additional highly subjective estimate had to be made based on the distribution of grains occurring in clusters. Larger grains were assumed to be solitary while smaller ones were assumed to have a even spacing represented by the spacing on the core surface.

The only significant occurrence of amber was in the final interval of this drill hole BR16-02. To make a visual volumetric estimate, amber grains were logged in a spreadsheet with approximate axial measurements or estimates and an estimation of the number observed in each cluster on the surface plus a factor estimating those not exposed. The half axial measurements were input into the formula $4/3\pi xyz$, where x, y, and z are the half axial lengths of the ellipsioid, and the calculated volumes summed over a length of core and divided by the core volume. The sensitivity of the total volume estimate to assumptions about the number of grains in a given volume of core was tested by a range of values above the visual estimates. The final most plausible estimate came out at 0.09% by volume for the massive coal bearing interval from 123.5 to 130 m. This is in the same order of magnitude as the weight estimate by mineral separation of 0.21% done on an outcrop sample reported in Ryan and Lucas, (2016). However 0.09% is significantly lower than the 1 to 8% previous visual estimates reported in various coal assessment reports from coal drilling programs in the 1970a and 1980s (e.g. Kucera (1971, Kerr (1977), Borovic (1981)).

Interpretation

Comparison of the stratigraphic sections for BR16-1 and BR16-2 to available drill sections and strip logs suggests that they represent high and low levels, respectively, of the stratigraphic section in the Bowron Coalfield. BR16-1 differs considerably from most of the available strip logs in Kucera (1971) and Kerr (1977) with the exception of DDH71-4 from the south end of the basin, which also shows a considerable thickness of shales (Figure 20). Strip logs for the upper sections of DDH71-1 and -2, also shown in Figure 20, have distinctive intervals of conglomerate within the shale dominated stratigraphy as well as some thin coal seams not observed in the section of BR16-1. Coal in BR16-1 consists of only a few very thin lenses below 100 meters depth. Abundant bituminous debris, consisting of fine plant fragment, are found in discrete sandy beds throughout much of the section and probably represent storm deposits from adjacent subaerial features. BR16-1 thus appears to represent either a high level of stratigraphy, similar to that show in DDH71-1, and 2 or a distinct lateral facies change within the basin perhaps represented by DDH71-4. The proximity to the basin edge and to holes with significant coal intersections suggests a few models for the development of the marine-dominated section: 1. it could be a post depositional structural block showing a high level stratigrphic section or 2. a rapidly subsiding syn-depositional block that inhibited development of coal seams, but was somehow not near streams flowing into the basin that carried coarse sediments.

Continuity of coal zones across the lower stratigraphic levels of the basin is indicated by comparison of BR16-2 to DDH71-1, -2, and -3 (Kucera, (1971) in Figure 21, which all show significant coal thicknesses albeit with considerable variations in thickness and spacing of seams. The sections from Kucera (1971) represent the deeper, eastern part of the basin within a few km of BR16-2 (locations shown in Figure 3). The lowest coal beds in each are shown aligned in Figure 21 for comparison. Commonly, the basal coal zones in each are underlain by coarse clastic sediments including angular conglomerates and are near the base of the Paleocene stratigraphic section at the Paleozoic unconformity. Although, BR16-2 did not core into the basement rocks, the pilot hole, located 10 meters west, did, indicating that the bottom of the core hole was close to the unconformity (Figure 23; Appendix 2). The three comparison holes show considerable differences from BR16-2 in cumulative coal thickness as well as possible greater separation of an upper coal zone from the basal zone. Higher level sections of DDH71-1 and 2 are shown in Figure 20. Amber content was not reported on the Kucera (1971) logs.

Amber content was reported in strip logs from Kerr (1977) including drill holes DDH77-5, 6 and 7 located within a few hundred meters of BR16-2. The amber estimates in the strip logs range from 1 to 2% and are shown for intervals spanning continuous coal seams. The closest hole, DDH77-7 located 50 meters east of BR16-2, is shown in Figure 22 at the same scale as BR16-2 and with respective basal coal zones aligned, although the bottom of DDH77-7 is about 40 meters deeper. A very similar distribution of coal seams is evident, with a nearly continuous basal zone comprising about 5 meters of coal in a few seams overlying conglomerates and coarse sandstones. Above this in both sections is a broader zone with numerous thin coal seams distributed over about 15 meters and interspersed with coaly shales and siltstones and underlain by conglomerates. In both drill holes amber was only observed in these 2 lower coal zones although several significant coal seams occur higher in the section. In Figure 22, amber occurrences in BR16-2 are indicated by yellow diamond symbols along the right side of the graphic log, whereas in DDHG77-7 percentages are show in the strip log adjacent to the coal seams. The DDH77-7 estimates, highlighted on Figure 22, appear to be categorically classified as 1%, 1 to 2% or 2%, with no indication of how the visual estimation were done. The similarity and proximity of the two drill holes suggests, with no other known control on amber concentration, that they should have similar concentrations. However, the measured estimates for BR16-2 would have to be in error by underetimation of all grain dimensions by a factor of 2 or underestimating the grain count by a factor of 10. Generally, the amber content is highly variable along the core length and some historically high estimates may reflect estimates from clusters of amber in short sections of core and the percentage extrapolated over the entire length of the coal intercept.

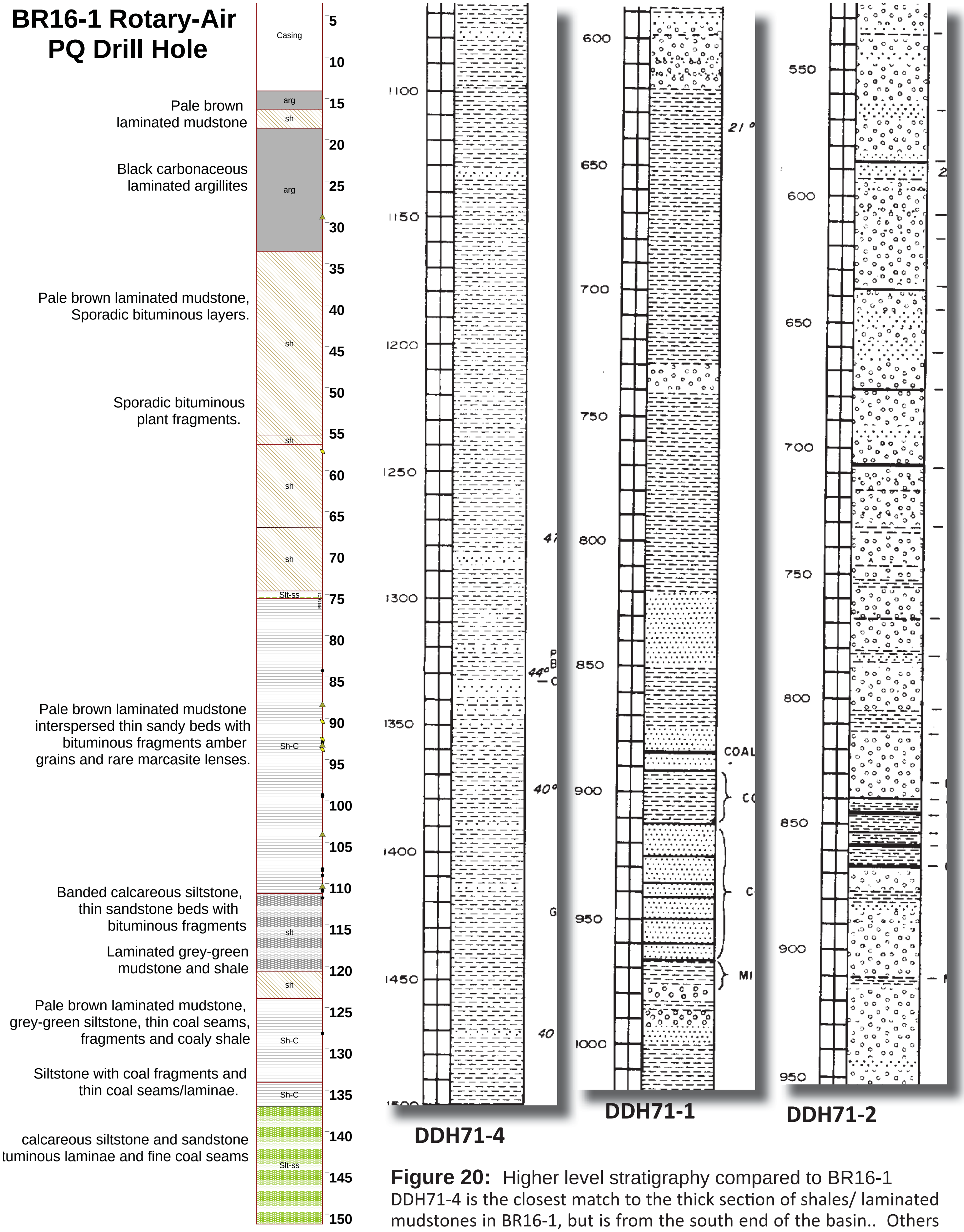

Figure 20: Higher level stratigraphy compared to BR16-1

DDH71-4 is the closest match to the thick section of shales/ laminated mudstones in BR16-1, but is from the south end of the basin.. Others show more lenses of breccia and conglomerate.

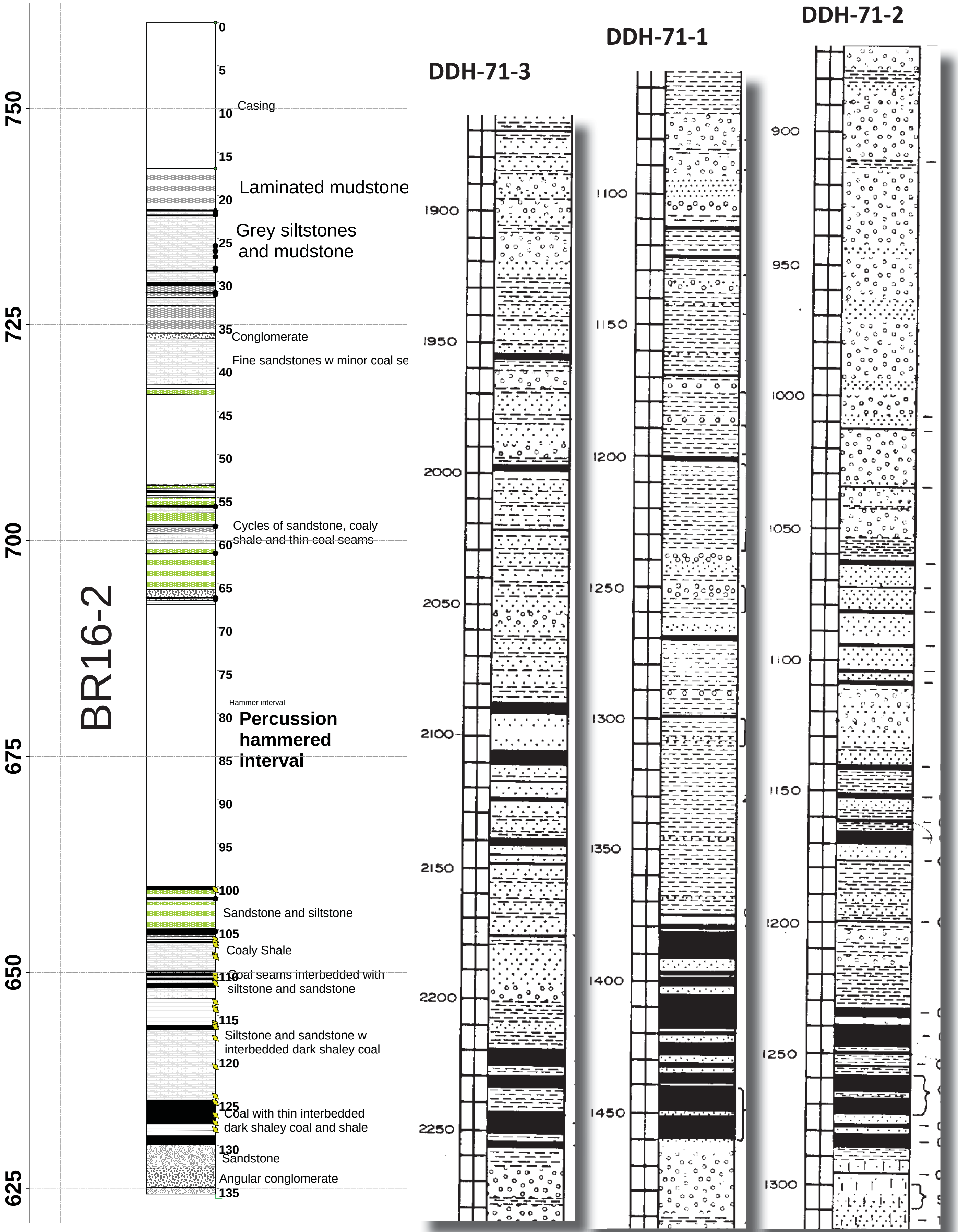

Figure 21: Schematic sections of BR16-2 pilot and main boreholes.
Main coal seams in historic boreholes on east side of Bowron Coal Basin (Kucera, 1971) are aligned with those in BR16-2 to show stratigraphic variation across basin.

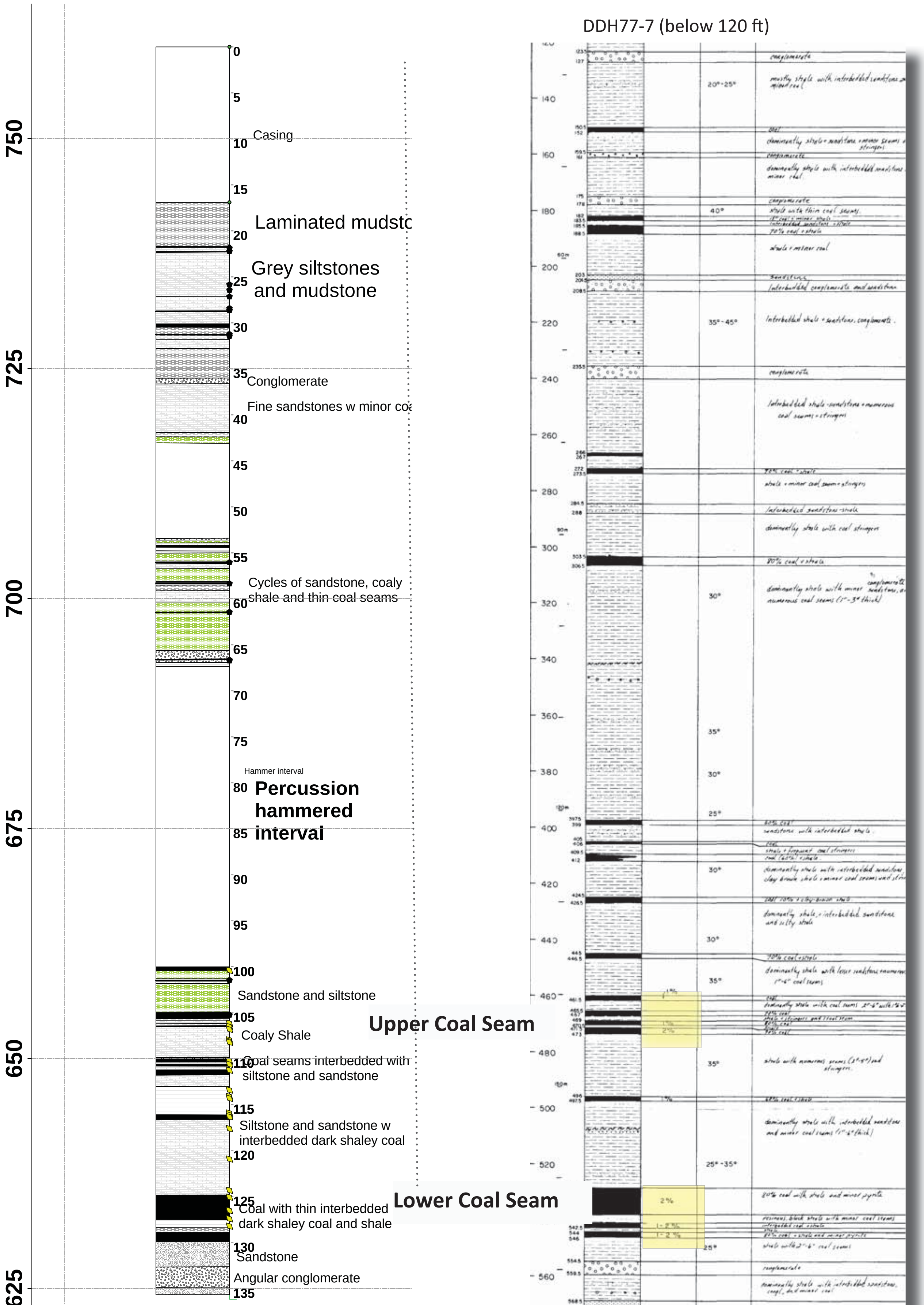

Figure 22: Comparison of coal zones in BR16-1 and DDH77-7 (Kerr, 1978).
A similar sequence and thickness of coal seams is evident in the 2 holes, which are 50 meters apart. However, amber estimates in DDH77-7, highlighted in yellow, are probably too high..

Conclusions:

1. Drill site BR16-1 encountered a thick section of finely interlaminated siltstone and mudstone with sporadic thin beds of sandstone mixed with bituminous fragments. Minor coal seams were encountered between 100 and 150 meters. The drilled section appears to either have been too high in the stratigraphic section for a 150-meter hole to penetrate into coal bearing zones or the local section was in lacustrine facies and representing a lateral change from reference drill hole DDH-11 shown in Figure 3, with no coal zone present. Amber was observed but only in volumetrically insignificant amounts sporadically associated with coal seams and thin sandstone layers containing bituminous debris.

2. Drill hole BR16-2 cut through several coal zones over its 135-meter length. Host rocks were typically flaser-bedded very fine sandstones and siltstones or mudstones. The major coal intercepts occurred in the lower 35 meters of the drill hole in 2 zones with up to 10 m of coal including one nearly solid zone 5 m thick. A thick section of coarse angular conglomerates underlies the lowest coal seam and a lesser thickness under the upper zone. Amber was found in the lower 2 coal zones both in coal and less commonly in coaly shales. Amber was absent from coal seams higher in the drilled section of BR16-2. The amber concentrations are highly variable with most occurrences consisting of numerous prolate ellipsoidal blebs ca. 4 mm in length and 2 mm in shorter axes. Sporadic larger grains are lens-like and up to 15 mm long, by 5 mm thick. The calculated amber content, measured by estimating ellipsoidal axes of amber grains, which are generally elongate parallel to bedding, worked out to 0.09% by volume in the coal seams. Amber grains vary in colour and uniformity. Larger grains commonly show a dark orange rim and a lighter yellow core.quality. Small grains appear to be uniform in colour or have very thin rims and are mainly a resinous medium, yellow-brown (amber). A few grains appear to be a light green in colour. Most grains are translucent, but few are clear or transparent attributed to the presence of microscopic inclusions.

3. One of the unrealized objectives of the drill program was to obtain 4 PQ size drill samples of significant coal seams from 2 locations. One site was essentially devoid of coal and at the other a single drill hole appeared to provide sufficient information. Samples from two closely spaced drill holes at each site would provide greater confidence in estimates of amber content than from a single drill hole even with larger diameter core. This methodology appears to remain valid if the program is continued. An additional rationale for 2 holes per site is that in the event that the first hole misses coal that the second can be aborted and drilled elsewhere using stratigraphic information for the core to update historical stratigraphic sections. Given the uncertainties in the sections extrapolated from previous drilling campaigns any further drilling should consider continuous coring, perhaps using diamond drilling in NQ or larger size core.

Recommendations

The one drill hole completed with excellent intercepts of coal, BR16-2, showed a very low volume percent of amber on the basis of measured visual estimates and grain counts and would not appear to encourage further investigations. The original prospects from historical reports suggested up to 8% amber might be present, and more conservatively 1%, but the current estimate of ca. 0.1% estimate from an excellent coal zone intercept puts these in considerable doubt. Amber grains also vary considerably in size, with most grains measuring under 5 mm in size and very few grains larger than 10 mm in main dimension and none larger than 20 mm. Accordingly, there does not appear to be a significant resource of amber neither in total volume of small grains nor of large grains of value as individual gems. No further drilling work on the property with respect to an amber resource is recommended.

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Appendix 1:

Mineral Claim Exploration and Development Work/Expiry date change

BRITISH COLUMBIA

Print and Close   Cancel

Mineral Titles Online

Mineral Claim Exploration and Development Work/Expiry Date Change

Confirmation

Recorder:	FIRST AMBER MINES INC. (281548)	**Submitter:**	FIRST AMBER MINES INC. (281548)
Recorded:	2017/APR/18	**Effective:**	2017/APR/18
D/E Date:	2017/APR/18		

Confirmation

If you have not yet submitted your report for this work program, your technical work report is due in 90 days. The Exploration and Development Work/Expiry Date Change event number is required with your report submission. **Please attach a copy of this confirmation page to your report.** Contact Mineral Titles Branch for more information.

Event Number: **5646201**

Work Type: Technical Work
Technical Items: Drilling, Geological, PAC Withdrawal (up to 30% of technical work required)

Work Start Date: 2016/JAN/01
Work Stop Date: 2016/OCT/30
Total Value of Work: $ 180302.76
Mine Permit No:

Summary of the work value:

Title Number	Claim Name/Property	Issue Date	Good To Date	New Good To Date	# of Days For-ward	Area in Ha	Applied Work Value	Sub-mission Fee
1035730	AMBER CENTRE	2015/APR/28	2017/APR/28	2022/AUG/28	1948	305.31	$ 18833.14	$ 0.00
1035737	AMBER01	2015/APR/28	2017/APR/28	2022/AUG/28	1948	190.77	$ 11767.78	$ 0.00
1035738	AMBER02	2015/APR/28	2017/APR/28	2022/AUG/28	1948	152.61	$ 9413.80	$ 0.00
1035739	AMBER03	2015/APR/28	2017/APR/28	2022/AUG/28	1948	152.66	$ 9416.58	$ 0.00
1035740	AMBER04	2015/APR/28	2017/APR/28	2022/AUG/28	1948	152.69	$ 9418.41	$ 0.00
1035741	AMBER05	2015/APR/28	2017/APR/28	2022/AUG/28	1948	152.70	$ 9419.37	$ 0.00
1035946	AMBER06	2015/MAY/06	2017/MAY/06	2022/AUG/28	1940	305.46	$ 18708.19	$ 0.00
1035947	AMBER07	2015/MAY/06	2017/MAY/06	2022/AUG/28	1940	420.11	$ 25730.39	$ 0.00
1035949	AMBER08	2015/MAY/06	2017/MAY/06	2022/AUG/28	1940	286.10	$ 17522.44	$ 0.00
1035952		2015/MAY/06	2017/MAY/06	2022/AUG/18	1930	533.87	$ 32405.41	$ 0.00
1035954	AMBER09	2015/MAY/06	2017/MAY/06	2022/AUG/18	1930	304.97	$ 18511.46	$ 0.00

Financial Summary:

Total applied work value: $ 181146.97

PAC name: FIRST AMBER MINES
Debited PAC amount: $ 844.21
Credited PAC amount: $ 0

Total Submission Fees: $ 0.0

Total Paid: **$ 0.0**

Please print this page for your records.

APPENDIX 1

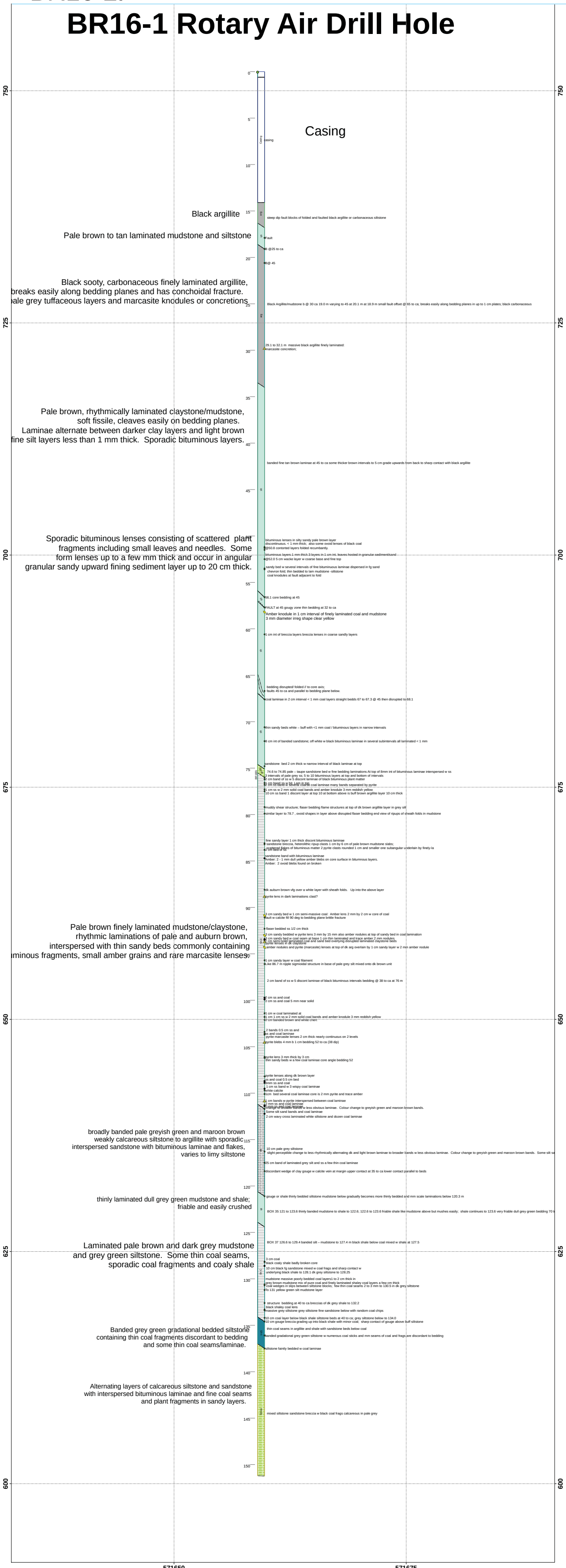
Cost Statement for the Bowron River Amber Project

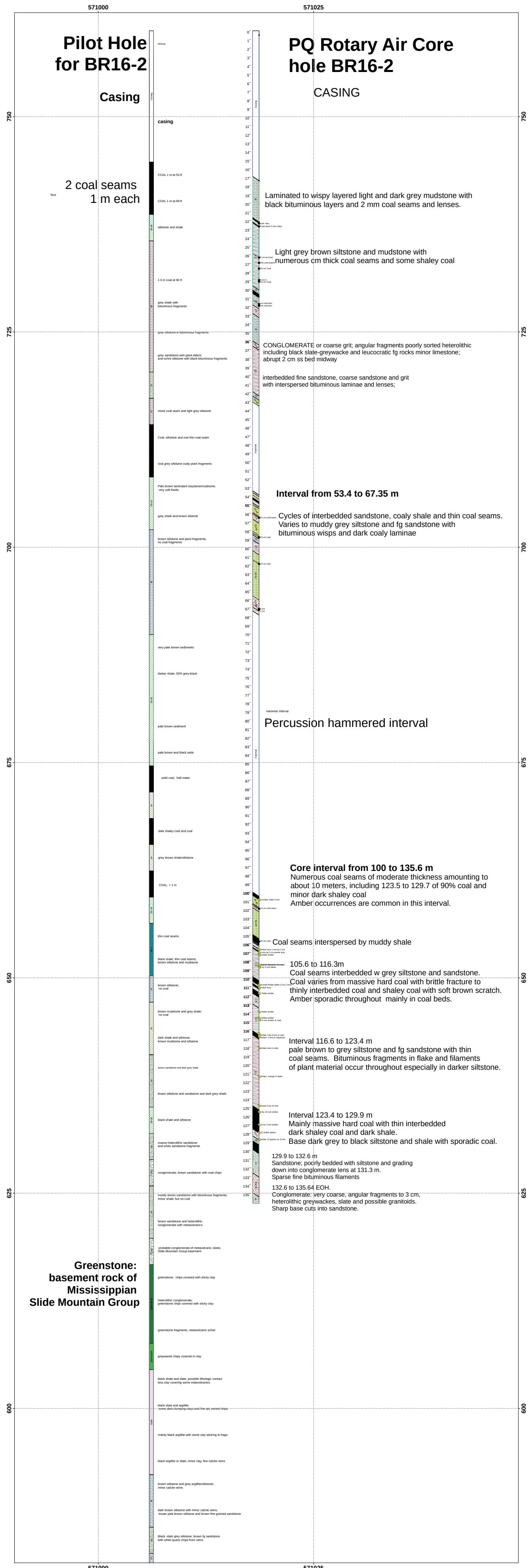
Exploration Work type	Comment	Days				Totals
Personnel (Name)* / Position	**Field Days (list actual days)**	**Days**		**Rate**	**Subtotal***	
Duane Lucas	May 2-5, 2016		3	$700.00	$2,100.00	
Hardolph Wasteneys	Sept 22, 23; October 4 - 25, 2016		24	$800.00	$19,200.00	
Mike Fournier				$0.00	$0.00	
				$0.00	$0.00	
				$0.00	$0.00	
					$21,300.00	**$21,300.00**
Office Studies	**List Personnel (note - Office only, do not include field days**					
Literature search			0	$0.00	$0.00	
Database compilation	Barry Ryan		1	$700.00	$700.00	
Computer modelling				$0.00	$0.00	
Reprocessing of data	First Amber personnel			$0.00	$2,700.00	
General research	Duane Lucas		16.5	$700.00	$11,550.00	
Report preparation	Hardolph Wasteneys		9.7	$800.00	$7,760.00	
Other (specify)	Bob Hart consulting		2.5	100	$250.00	
					$22,960.00	**$22,960.00**
Ground Exploration Surveys	**Area in Hectares/List Personnel**					
Geological mapping						
Regional		*note: expenditures here*				
Reconnaissance	2	*should be captured in Personnel*				
Prospect		*field expenditures above*				
Underground	Define by length and width					
Trenches	Define by length and width				$0.00	
					0	**$0.00**
Drilling	**No. of Holes, Size of Core and Metres**	**No.**		**Rate**	**Subtotal**	
Diamond				$0.00	$0.00	
Reverse circulation (RC)				$0.00	$0.00	
Rotary air blast (RAB)				$0.00	$0.00	
Rotary Air Coring				$0.00	$112,016.01	
					$112,016.01	**$112,016.01**
Other Operations	**Clarify**	**No.**		**Rate**	**Subtotal**	
Trenching				$0.00	$0.00	
Bulk sampling				$0.00	$0.00	
Underground development				$0.00	$0.00	
Other (specify)	Drill access development	1.15 km		$0.00	$9,258.00	
					$9,258.00	**$9,258.00**
Reclamation	**Clarify**	**No.**		**Rate**	**Subtotal**	
After drilling	pad and trail deactivation and reclamation		1	$0.00	$1,000.00	
Monitoring				$0.00	$0.00	
Other (specify)				$0.00	$0.00	
					$1,000.00	**$1,000.00**
Transportation		**No.**		**Rate**	**Subtotal**	
Airfare	Vancouver - Prince George		9	$0.00	$3,119.63	
Parking				$0.00	$36.00	
truck rental	24 days		2	$0.00	$1,713.98	
kilometers				$0.00	$0.00	
ATV				$0.00	$0.00	
fuel	rental truck fuel			$0.00	$923.41	
Helicopter (hours)				$0.00	$0.00	
Fuel (litres/hour)				$0.00	$0.00	
Other						
					$5,793.02	**$5,793.02**
Accommodation & Food	**Rates per day**					
Hotel				$0.00	$2,508.05	
Camp				$0.00	$0.00	
Meals	day rate or actual costs-specify			$0.00	$790.94	
					$3,298.99	**$3,298.99**
Miscellaneous						
Telephone				$0.00	$0.00	
Other (Specify)						
					$0.00	**$0.00**
Equipment Rentals						
Field Gear (Specify)	chain saw rental, field supplies			$0.00	$583.74	
Other (Specify)						
					$583.74	**$583.74**
Freight, rock samples						
	core storage			$0.00	$1,218.00	
				$0.00	$0.00	
					$1,218.00	**$1,218.00**
TOTAL Expenditures						**$177,427.76**

Appendix 2

Detailed Drill hole sections

Figure 23: Detailed sections for BR16-1 and BR16-2.





Appendix 3:

Core photos for interval 3 of BR16-2

Figure 24: BR16-2; interval 3 boxes 17 and 18, 100 to 105.6 meters.
Coal seam evident at start of core at 100 m.

Figure 25: BR16-2, Int 3, Boxes 19 and 20, 105.6 m to 111.1 meters
Several thin coal seams within sandstones and siltstones.

Figure 26: BR16-2, Int 3, Boxes 21 and 22, 111.1 to 116.3 meters.

APPENDIX 3

Figure 27: BR16-2, Int 3, Boxes 23 and 24, 116.3 to 122.0 meters.
Siltstone and sandstone interbedded with coaly shale and minor masssive coal.

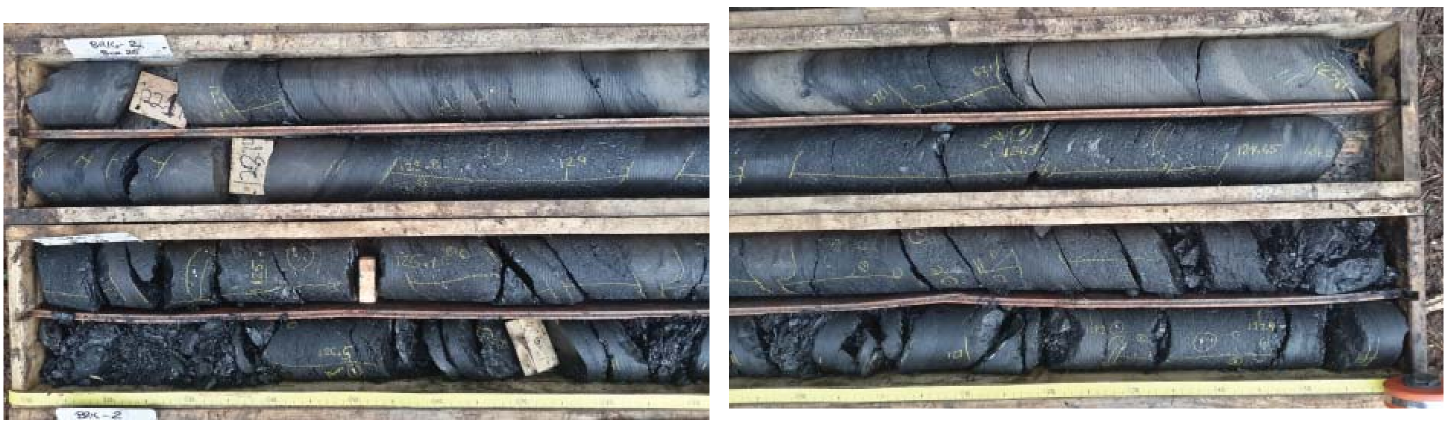


Figure 28: BR16-2, Int 3, Boxes 25 and 26, 122.0 to 127.5 meters.
Main thick coal seam interspersed with minor coaly shale. Numerous occurrences of amber circled in yellow.

Figure 29: BR16-2, Int 3, Boxes 27 and 28, 127.5 to 133.0 meters.
Top of coarse conglomerate bed underlies grey sandstone.

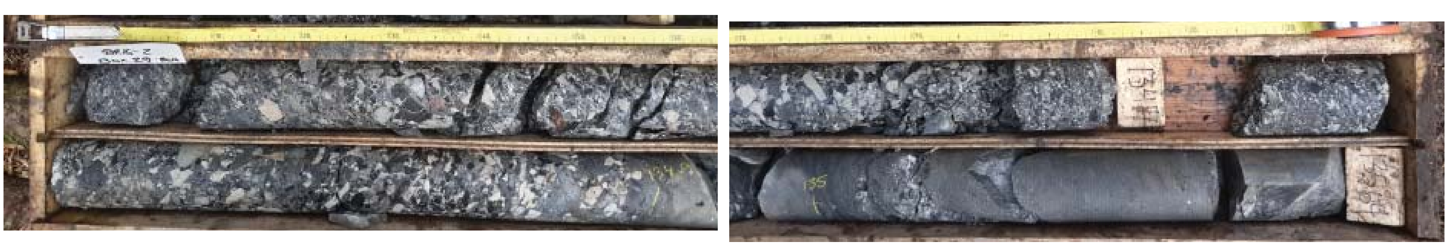


Figure 30: BR16-2, Int 3, Box 29 (last box), 133.0 to 135.6 EOH.
Base of coarse conglomerate in contact wiht coarse sandstone.

Appendix 4:

Core Log for BR16-1

HOLE	Unit	From1	T01	FROM	TO	description	feature	AT
BR1601	stickup	0	0.6	0	0.6	stickup		
BR1601	casing	0.6	14.1	0.6	14.1	casing		
BR1601		14.1	16.3	14.1	16.3	steep dip fault blocks of folded and faulted black argillite or carbonaceous siltstone		
BR1601	sh	16.3	18.6					
BR1601	slt	18.6	18.6	16.3	18.6	tan coloured finely bedded laminated siltstone mudstone b @-40 to ca		
BR1601		18.6	18.6			Fault	F	17.4
BR1601						B @25 to ca	B	18.6
BR1601						B@ 45	B	20.1
BR1601	arg	18.6	33.5	18.6		Black Argillite/mudstone b @ 30 ca 19.0 m varying to 45 at 20.1 m at 18.9 m small fault offset @ 65 to ca; breaks easily along bedding planes in up to 1 cm plates; black carbonaceous		
BR1601	arg					Box 3 20.1 to 23.1 contd all black carbonaceous argillite/mudstone finely bedded to finely laminated; at 20.3 m graded bed of tan mudstone 1 cm thick		
BR1601	arg					Box 4: 23.1 to 26.1 black argillite; massive poor bedding definition to 26.3 parts along smooth conchoidal surfaces ? Bedding. 25.1 m grey wispy tuff layers shows fine laminations inb bedding asnd distorted surface inclusions; 26. 1 end of run some core loss cm		
BR1601	arg					Box 5 26.1 to 29.1m all black argillite finely laminated no colour contrasts b @ 45 consistently; conchoidal fracture across bedding planes carbaonaceous argillite; sooty dust stains		
BR1601	arg			29.1	32.1	Box 6: 29.1 to 32.1 m massive black argillite finely laminated: at 29.3 1 cm pyrite knodule/concretion; bedding at 45; @ 31.3 b @ 45 grey laminations @31.8 m pyrite knodules distributed along b plane 3 mm to 11 mm ; rock competely nearly massive unbroken runs of core; pale brown silty layers weakly calcareous.	1 cm pyrite coı	29.3
							3 to 11 mm py	31.8
BR1601	arg				33.5	Box 7: 32.1 ti 35.1 black argillite continues to 33.5		
BR1601	sh	33.5	74.6	33.5	34.3	banded fine tan brown laminae at 45 to ca some thicker brown intervals to 5 cm grade upwards from back to sharp contact with black argillite		
BR1601	sh			34.3		very finely laminated brown tan mudstone very fissile on some badding planes; alternating tan and pale brown layers		
BR1601	sh					Continuation of pale brown laminated claystone/mudstone very soft fissile.		
BR1601	sh			36.6	38.1	run from 36.6 to 38.1 half ground up mislatch perhaps; short intervals of mudstone retrieved mostly chunks		
BR1601	Sh-slt			38.1		Box 9 38.1 to 41.4 continue in very finely laminated mudstone consists of alternating dark clay layers less than 1 mm thick and very fine silt layers of lighter brown colour and fine granularity; some darker layers are bituminous and coal like but << 1 mm thick and lensey; bituminous laminae appear more commonly adjacent to buff coloured aphanitic layers that are thicker than 2 mm.		
BR1601						NOTE: drilling continues to be problematic in this zone; frequent “mislatches” resulting in ground core; core fine, but does not stay in tube when pulled; lifters slipping.		
BR1601	Sh-slt					Box 10 42.9 to 47.1 40% recovery: More brown laminated mudstone; pale brown silty layers <1 mm thick intersprsed with very thin dark clay laminae. 41. 1 to 42.1 (100%) 42.6 to 45.6 only 1 m recovered.		
BR1601	Sh-slt					Box 11 47.1 to 51.09 continues in brown and pale brown laminated mudstone @50.3 layers more distinct and thicker.		
BR1601	CS					@ 50.7 bituminous lenses in silty sandy pale brown layer lenses distinct discont. < 1 mm thick; also some ovoid lenses of black coal , 1 cm by 2 to 3 cm long		50.7
BR1601	slt					@50.8 contorted layers folded recumbantly.		50.8
BR1601	CS					@51.0 cont bituminous layers 1 mm thick 3 layers in 1 cm int. Photos of coal lenses; bituminous lenses equivalent to coal distinctly broken into discrete irregular lenses possibly individual leaves hosted in granular sediment/sand and discordant to other layering.		51
BR1601	sh					Box 12 51.0 to 54.6 finely laminated brown mudstone w silty and rare sandy layers		
BR1601	ss					@52.0 5 cm wacke layer w coarse base and fine top		52
BR1601	Ss-slt			52.9	53.1	sandy bed w several intervals of fine bituminuous laminae dispersed in fg sand		53
BR1601	Sh-slt					chevron fold in core thin bedded to lam mudstone -siltstone coal knodules at fault adjacent to fold; 53.2 – 54.6 30 cm recovery mostly ground up lam mudst		53.1
BR1601						Box 13 54.6 to 57.6 broken core to 56.1 solid 56.1 to 57.6		
BR1601						56.1 core bedding at 45		56.1
BR1601	Sh-slt					bedding steepens to parallel to core axis and changes abruptly at 56.8 across gouge fault at 30 to CA; coal laminae at 56.1, 57.0; 57.3		
BR1601	sh					FAULT at 45 gougy zone thin bedding at 32 to ca		57.2
BR1601	sh					Box 14 57.6 to 60.6 100% recovery; bedding steeper shallower and to core tube axis		
BR1601	CS					Amber knodule in 1 cm interval of finely laminated coal and mudstone 3 mm diameter irreg shape clear yellow; b @ 25 deg to ca laminated pale brown mudst	Amber 3 mm	57.7
BR1601	sh					57.6 to 59.1 m 50 cm recovery broken core; 59.1 to 60.6 solid run; 57.6 t		
BR1601	sh					BOX 14 ; continue in laminated pale brown and brown claystone/mudstone to 59.4 where bedding disrupted by fault at 50 deg to ca faulted zone for 50 cm to 59.9 with chunks of laminated mst at 10 deg to CA gradually returns to 30 to ca at 60.0 m		
BR1601	ss					1 cm int of breccia layers breccia lenses in coarse sandly layers		60.1
BR1601	sh					Box 15; 60.6 to 62.1 nil recovery; 62.1 to 65.1 100% laminated mudstone and argillite sporadic black argillite layers 1 mm to 1 cm interspersed in brown or pale brown mudstone b @ 45 to ca consistently; black intervals do not appear to be coal just carbonaceous argillite.		
BR1601	sh					Box 16: 65.1 to 68.1 bedding 45 to ca in laminated brn and pale brown mudstone		
BR1601	sh					bedding disrupted folded to 0 to ca and continues to 67.0 m at faults 45 to ca and parallel to bedding plane below.		66.2
BR1601	sh					coal laminae in 2 cm interval < 1 mm coal layers straight beds 67 to 67.3 @ 45 then disrupted to 68.1		67.1
BR1601	sh					Box 17 68.1 to 71.1 100% rec some broken core at 70.0 finely laminated mudstone pale to dark auburn brown mudstone/ claystone b @45 to ca		
BR1601	sh					thin sandy beds white – buff with <1 mm coal / bituminous layers in narrow intervals		70.1
BR1601	sh					folded strata		70.2 to 70.4
BR1601	sh					steeper bedding at 30 to ca changes to 70 to ca at 71.3		70.4 to 71.3
BR1601	sh					Box 18 71.1 to 75.1		
BR1601	sh					8 cm int of banded sandstone; off white w black bituminous laminae in several subintervals all laminated < 1 mm		71.6
BR1601	Sh-c					72.6 to 74.1 20 cm rec. All soft claystone laminated pale brown- auburn brown		
BR1601	Sh-c					B @ 38 to ca sandstone bed 2 cm thick w narrow int of black laminae at top of int		74.3
BR1601	ss	74.6	75.5	74.6	74.85	74.6 to 74.85 pale – taupe sandstone bed w fine bedding laminations At top of 8mm int of bituminous laminae interspersed w ss		
BR1601						Box 19 75.1 to 77.1 (not full box, but 100 % rec)		

APPENDIX 4

BR1601

BR1601	ss				75.1	75.5	3 intervals of pale grey ss 75.5 4 cm int of ss w 5 to 10 bituminous layers at top and bottom of intervals		75.5
BR1601	sh		75.5	111.2			2 cm band of ss w 5 discont laminae of black bituminous intervals bedding @ 38 to ca at 76 m		75.7
BR1601	sh						1 cm band ss w bit. Lam in top		76.1
BR1601	sh						2 cm ss band w several coarse coal aminae many bands separated by pyrite; very rough bituminous Laminae < 1 mm		76.3
BR1601	sh						1 cm ss w 2 mm solid coal bands and amber knodule 3 mm reddish yellow		76.8
BR1601	sh						10 cm ss band 1 discont layer at top 10 at bottom above is buff brown argillite layer 10 cm thick		77
BR1601	sh						Box 20 77.1 to 80.1		
BR1601	sh				77.1	78.6	rubble of pale brn lam mudstone bedding at 35 to ca thoughout all very fine laminated		
BR1601	sh						muddy shear structure; flaser bedding flame structures at top of dk brown argillite layer in grey silt		78.7
BR1601	sh						similar layer to 78.7 , ovoid shapes in layer above disrupted flaser bedding end view of ripups of sheath folds in mudstone		79.4
BR1601	sh				80.1	84.6	**Box 21 80.1 to 84.6: 80.1 to 81.6 10 cm 7%; 81.6 to 83.1 85 cm 50%; 83.1 to 84.6 75 cm 50%. continues in finely laminated pale brown mudstone-claystone w massive vfg taupe pale brown argillite layers**		
BR1601	sh					82.7	fine sandy layer 1 cm thick discont bituminous laminae		82.6
BR1601	ss				82.7	83	82.7 to 83 sandstone breccia unit strong planar alignment heterolithic breccia w ripup clasts 1 cm by 6 cm of pale brown mudstone slabs; scattered flakes of bituminous matter 2 pyrite clasts rounded 1 cm and smaller one subangular underlain by finely-laminated mudstone		82.7
BR1601	sh				83		2 cm bed of ss		83.3
BR1601	sh						1 cm band of ss w 4 bit layers 2 of which are 2 mm thick. Thicker layers are only 50% bitumin very fine laminae 10 in 2 mm w silt between; Amber 2 - 1 mm dull yellow amber blebs on core surface in bitumnous layers. Amber: 2 ovoid blebs found on broken surface edge of bituminous layer forming 1 mm by 2 mm ellipsoids	ss+c	84.2
	sh							Amb	84.2
BR1601	sh						**Box 22 84.6 to 87.6** continue in laminated mudstone auburn brown q pale brn laminae		
BR1601	sh						dk auburn brown vfg over a white layer with sheath folds. Up into the above layer		87.6
BR1601	sh						**BOX 23 87.6 to 90.6**		
BR1601	sh						pyrite lens in dark laminations clast?	py	88.3
BR1601	sh						BOX 24 90.6 to 93.6. continued pale brown auburn sandstone		
BR1601	sh						fault w calcite fill 90 deg to bedding plane brittle fracture	F	90.6
BR1601	sh						3 cm sandy bed w 1 cm semi-massive coal: Amber lens 2 mm by 2 cm w core of coal	amber in coal	90.4
BR1601	sh						flaser bedded ss 1/2 cm thick	ss	91.8
BR1601	sh						3 cm sandy bedded w pyrite lens 3 mm by 15 mm also amber nodules at top of sandy bed in coal lamination	Amb, ss, py	92.5
BR1601	sh						3 cm sandy bed w coal seam at base 1 cm thin laminated and trace amber 2 mm nodules	ss+c	92.9
BR1601	sh						2 cm semi-solid laminated coal and sand bed overlying disrupted laminated claystone beds	ss+c	93
BR1601	sh						pyrite lenses in dk claystone	py	93.2
BR1601	sh						BOX 25 93.4 to 96.3 continued in laminated claystone mudstone bedding consistently 37 to ca		
BR1601	sh						amber nodules and pyrite (marcasite) lenses at top of dk arg overlain by 1 cm sandy layer w 2 mm amber nodule	Amb, ss, py	93.8
BR1601	sh						1 cm sandy layer w coal filament	ss	95.2
BR1601	sh						Like 86.7 m ripple sigmioidal structure in base of pale grey silt mixed onto dk brown unit		95.6
BR1601	sh						BOX 26 96.3 – 99.0 b@ 38 to 98.4 then changes to across structures to 50 to ca.		
BR1601	sh						BOX 27 99 to 101.9 continued lam mudstone		
BR1601	sh						2 cm ss and coal	ss+c	99.2
BR1601	sh						2 cm ss and coal 5 mm near solid	ss+c	99.4
BR1601	sh						1 cm w coal laminated at		100.9
BR1601	sh						1 cm 1 cm ss w 2 mm solid coal bands and amber knodule 3 mm reddish yellow		101.3
BR1601	sh						2 cm banded brown and white chert		101.6
BR1601	sh						BOX 28 101.9 to 104.1		
BR1601	sh						2 bands 0.5 cm ss and		102.9
BR1601	sh						pyrite marcasite lenses 2 cm thick nearly continuous on 2 levels		103.2
BR1601	sh						ss and coal laminae		103.1
BR1601	sh								103.8 ss anc
BR1601	sh						pyrite blebs 4 mm b 1 cm bedding 52 to ca (38 dip)	py	104
BR1601	sh						BOX 29 104.1 to 107.1 broken core 105 to 105.6		
BR1601	sh						pyrite lens 3 mm thick by 3 cm		105.6
BR1601	sh						thin sandy beds w a few coal laminae core angle bedding 52		105.7
BR1601	sh						BOX 30 107.1 to 110.1 100% recovery		
BR1601	sh						pyrite lenses along dk brown layer		107.7
BR1601	sh						ss and coal 0.5 cm bed	ss+c	108.2
BR1601	sh						3mm ss and coal	ss+c	108.4
BR1601	sh						1 cm ss band w 3 wispy coal laminae	ss+c	109
BR1601	sh						white calcite		109.2
BR1601	sh						1cm bed several coal laminae core is 2 mm pyrite and trace amber		109.6
BR1601	sh						BOX 31 110.1 to 113.1 continued finely laminated mudstone to 111.2		
BR1601		4	111.2	120.6	111.2		slight perceptible change to less rhythmically alternating dk and light brown laminae to broader bands w less obvious laminae. Colour change to greyish green and maroon brown bands. Some silt sand bands and coal laminae		111.2
BR1601		4					1 cm bands w pyrite interspersed between coal laminae	c=py	110.3
BR1601	Ss-C						2 mm ss and coal laminae	ss+c	110.8
BR1601	Ss-C						2 mm ss and coal laminae	ss+c	110.9
BR1601	Slt-c						2 cm wavy cross laminated white siltstone and dozen coal laminae; bedding at 58 to ca generally calcareous siltstone – argillite ; rock is much more competent and supports long fractures // to core axis across numerous bands without cleaving // to bedding	ss+c	111.7
BR1601	slt						BOX 32 113.1 to 115.8 massive bedded siltstone/limestone gradations colour banding lighter grey brown calcareous of more solid darker brown bands faint gradational contacts between dk brown and grey green bands ; no ss no coal beds or laminae		
BR1601	slt						BOX 33 115.8 to 118.5 m same lith as above but 2 pale grey fine sand and silt bands		
BR1601	slt						10 cm pale grey siltstone		115.8
BR1601	Ss-slt						25 cm band of laminated grey silt and ss a few thin coal laminae		117
BR1601	slt						discordant wedge of clay gouge w calcite vein at margin upper contact at 35 to ca lower contact parallel to beds		117.9
BR1601	slt						BOX 34 118.5 to 121 continued in diffusely banded calcareous siltstone brown grey green		

BR1601

BR1601	Sh-slt				120.6	gouge or shale thinly bedded siltstone mudstone below gradually becomes more thinly bedded and mm scale laminations below 120.3 m		120.6
BR1601	sh	120.6	123.9	120.6		BOX 35 121 to 123.6 thinly banded mudstone to shale to 122.6; 122.6 to 123.6 friable shale like mudstone above but mushes easily; shale continues to 123.6 very friable dull grey green bedding 70 to ca throughout		
BR1601	sh				123.9	BOX 36 (123.6 to 126.6 m) laminated pale brown and dark grey mudstone Faults and fractures at 25 to ca and 90 to bedding at 124.7 and 126; minor 1 mm calcite veining bedding 68 to ca minor offset more gouge fx zone at 126.5 to 126.6		
BR1601	Slt-sh	123.9	134.1			BOX 37 126.6 to 129.4 banded silt – mudstone to 127.4 m black shale below coal mixed w shale at 127.5		
BR1601	COAL			127.7	127.68	3 cm coal		127.65
BR1601	CS					black coaly shale badly broken core		127.7
BR1601	Ss-C					10 cm black fg sandstone mixed w coal frags and sharp contact w underlying black shale to 128.1 dk grey siltstone to 128.25	ss+c	128.1
BR1601	sh					black coherent shale to 129.6		
BR1601	slt					BOX 38 129.4 to 132.2 banded grey green brown siltstone b 50 to ca thin bedded at 50 ca		
BR1601	Slt-c					coal wedges in slips between siltstone blocks; few thin coal seams 2 to 3 mm to 130.5 in dk grey siltstone		130.2
BR1601	sh					To 131 yellow green silt mudstone layer		130.7
BR1601	Sh-c			130.2	134.1	**thin coal seams in argillite and shale**		
BR1601	Sh-c					mudstone massive poorly bedded coal layers 130.4 to 130.8 1 to 2 cm thick in grey brown mudstone mix of pure coal and finely laminated shaley coal layers a few cm thick		130.1
BR1601	Sh-c					131.4 to 132.1 dk siltstone mix mess with coal coal fragments lenticular		
BR1601	Slt-ss					structure bedding at 40 to ca breccias of dk grey shale to 132.2		132.1
BR1601	Slt-ss					BOX 39 132.2 to 134.4: 132.2 to 132.8 continue in siltstone breccia fragments of coal vague bedding at 50 to ca at 132.8 black shaley coal lense.		
BR1601	Slt-ss					black shaley coal lens		132.8
BR1601	Slt-ss					massive grey siltstone grey siltstone fine sandstone below with random coal chips		132.9
BR1601	Slt-ss					10 cm coal layer below black shale siltstone beds at 40 to ca; grey siltstone below to 134.0		133.7
BR1601	Slt-ss					10 cm gouge breccia grading up into black shale with minor coal; sharp contact of gouge above buff siltstone		134.1
BR1601	Slt-ss					BOX 40 134.4 to 137.1 graded ss coarsens down to 134.8 m sharp contact swirly bedded fine ss and coal at 135.0 (2 cm broken coal) thin coal laminae at 135.1 in 2 cm intervals; fine sand bed base at 135.3 m 135.3 to 135.9 coarse sand bed with coal sticks and chips basal coal at 135.9 b @45		
BR1601	Sh-c	134.1	137	134.1	137	**thin coal seams in argillite and shale with sandstone beds below coal**		
BR1601	ss			135.3	135.9	coarse sandstone bed		
BR1601	Slt-c			135.9	136.7	banded gradational grey green siltstone w numerous coal sticks and mm seams of coal and frags are discordant to bedding (thin coal slip at 135.6m)	C	135.6
BR1601	Slt-c			136.7	137	massive coal lenses and chunks mixed w sub parallel to bedding in grey brown siltstone		
BR1601	Slt-c					siltstone faintly bedded w coal laminae		137
BR1601	Ss-slt					BOX 41 137.1 to 139.7 siltstone and sandstone plus thin coal seams and banded siltstone with distinctive ochre layers interspersed by dk grey		
BR1601	Slt-c			137	137.4	finely bedded laminated bituminous layers in siltstone w core of sandstone		
BR1601	Slt-ss	137	151.2	137.4	137.9	mixed siltstone sandstone breccia w black coal frags calcareous in pale grey		
BR1601	Slt-ss			137.9	139.2	finely banded siltstone grey to dk grey sandy bed at 138.8 has ruptured into a sand dyke through overlying silt; black laminae in silty coal shale		
BR1601	Slt-ss			139.2	140	dull grey to dk grey sandstone and siltstone coarse layers to 10 cm contains coal fragments		
BR1601	Slt-ss					BOX 42 140 to 143.7 core lost 141.6 to 143		
BR1601	Slt-ss			140	140.3	light grey calcareous siltstone w fine coal frags imparting grey colour		
BR1601	Slt-ss			140.3	143.9	dull grey banded siltstone mainly diffuse bedding at 45 with minor black layers and fine laminations		
BR1601	Slt-ss			143.4	143.6	gouge breccia perpendicular to bedding 10 cm wide		
BR1601	Slt-ss					BOX 43 143.7 to 147 grey and greenish grey siltstone and minor sandstone gouge from 146.1 to 146.5		
BR1601	Slt-ss			143.7	144	finely laminated pale grey sandstone w black wispy laminae		
BR1601	Slt-ss			144		black siltstone varies to yellow grey at 144.3 diffuse bedding in black and yellow grey siltstone beds 2 cm orange at 44 to ca		
BR1601	Slt-ss			146.1	146.5	gouge breccia fault or drilling breccia		
BR1601	Slt-ss			146.5	147.5	dull grey siltstone		
BR1601	Slt-ss					BOX 44: 147 to 149.5 m grey and greenish grey siltstones diffusely banded on 3 cm interval of coalified laminae w 2 mm by 2 cm lens of amber of a greenish colour		
BR1601	Slt-ss		151.2		151.2	BOX 45: 149.5 to 151.2 EOH light grey siltstone end at clay breccia gouge		
BR1601	Slt-ss							

APPENDIX 4

Core Log for BR16-2

BR1602

Hole	Unit		FROM	TO	Description	AT		Amber
BR1602	casing	Casing	0	16.9		0		
BR1602			16.9	21.7	laminated to wispy layered light and dark grey mudstone w black bituminous layers and 2 mm coal seams and lenses bedding 55-70 to ca	16.9		
BR1602	COAL		21.7	21.85	COAL seam massive bed at 65 to ca	21.7		
BR1602			21.85	22.2	fine grained ss with clay matrix; dull grey w discordant veinlets of coal 20 cm long and 5 cm wide at thickest point 65 to ca	21.85	C	coal lens
BR1602	COAL		22.2	22.3	COAL seam 3 mm chips coarse grained	22.2	C	Coal seam 3 mm chips
BR1602	COAL	coal seams in siltstone	22.3	29.6	numerous cm thick coal seams @22.4; 22.5; 22.7 (10 cm) 23.3 all in lt grey to med grey brown fg siltstonemixed w mudstone and streaked by black coal filaments and laminae In places hair thin coal layers are developed and many discontinuous filaments scattered; shaley coal 5 cm at 25.8; 26 to 26.7 1 cm coal seams at 65 to ca; 27.1 43 cm C; 28.4 3 cm C; 28.6 32 cm C	25.8	C	5 cm sh-Coal
						26.4	C	thin coal seams
						27.1	C	43 cm Coal
						28.4	C	3 cm C
						28.6	C	32 cm Coal
BR1602	ss	Coal-ss	29.6	29.65	very coarse grained sandstone bed 3 cm thick below 2 cm coal seam; sandstone angular leucocratic frags imbedded in coal lenses			
BR1602	slt	siltstone	29.65	30	dark grey to black siltstone w fine filamentous lamina of coal densely packed in black interval 10 cm 29.9-30			
BR1602	COAL	Coal-siltstone	30.1	30.5	COAL massive bed 2-3cm intervals of siltstone at 70 to ca			
BR1602	slt	Slt-Coal	30.5	31.8	dark grey siltstone w cm coal beds at 31. 2, 31.4 and fine filamentous coal mixed into siltstone imparting dark colour	31.2	C	cm coal lens
						31.4	C	cm coal lens
BR1602	CS	coal and shaley coal	31.8	32.8	massive coal varying to shaley coal in upper half of each bed (breaks easily in cleavage lenses) no amber			
BR1602	slt	siltstone w coal filaments	32.8	36	continuation of siltstone unit w filamentous coal laminae			
BR1602	Cong	coarse grit	36	36.6	CONGLOMERATE or coarse grit; angular fragments poorly sorted heterolithic including black slate-greywacke and leucocratic fg rocks minor limestone; abrupt 2 cm ss bed midway			
BR1602	CS	Silt-coal-ss	36.6	41.9	same as above dirty siltstone w fine coalified layers and minor sandstone beds to 5 cm thick			
BR1602	slt	Siltstone-ss	41.9	42.4	orange coloured siltstone and fg sandstone w few black laminae; bedding is disrupted by soft sediment deformation			
BR1602	Ss-slt	interbedded ss and grit w bitumin la	42.4	43.1	interbedded fg ss; cg ss and grit interspersed bituminous laminae and lenses; more continuous and thin repetition in fg ss and discontinuous cuspate lenses in cg ss; grit layers are a few cm thick heterolithic and black argillite/slate greywacke and probable granitoid frags			
BR1602	hammer	nil	43.1	53.4	END OF CORE INTERVAL; percussion hammer			
BR1602	congss	gritty lenses in fg ss	53.4	53.6	coarse grit lenses in fg grey sandstone w bituminous laminae			
BR1602	Slt-ss	interbedded slt-ss and coal	53.6	53.9	interbedded pale grey siltstone and lesser fg sandstone w interspersed coal seams			
BR1602	CS	thin coal in coaly shale	53.9	54.2	5 cm coal and massive grades up into 15 cm of black coaly shale or mudstone 55 to ca ; grades down into grey siltstone w large cuspate coal lenses			
BR1602	COAL	3 cm coal	54.2	54.4	3 cm massive coal seam at 70 to ca			
BR1602	Ss-C	Slt-ss minor coal	54.4	54.8	2 cm coal above pale grey fg ss bed w sharp contact at 54.5 over muddy siltstone w bituminous wisps to 54.8			
BR1602	CS	interbedded slt-ss and coal	54.8	55	3 massive coal seams 2 cm each interspersed w black coal shale			
BR1602	Slt-ss	wips of coal in slt-ss	55	55.9	pale grey fg ss and siltstone- muddy and laced w discontinuous wisps of black bitumin			
BR1602	CS		55.9	56.7	coal and shaley coal seams at 60 to ca: 56.0 15 cm coal seam; 56.4 to 56.7 coal broken from jointing at 15 to ca bedding 65 to ca	56	C	15 cm coal seam
BR1602	Slt-ss	interbedded slt-ss with bitumin	56.7	58.1	muddy grey siltstone and fine grained sandstone interbedded w sporadic bituminous wisps and some continuous fine dark laminae 55 to ca			
BR1602	CS	coal and coally shale	58.1	58.5	coal and shaley coal: 58.1to 58.3 coaly shale and shaley coal scratches brown and fg; 58.3-58.4 massive coal; 58.4 -58.5 mixed shaley coal and coal seams at 60 to ca: 56.0 15 cm coal seam; 56.4 to 56.7 coal broken from jointing at 15 to ca bedding 65 to ca	58.3	C	10 cm coal
BR1602	slt	grey siltstones	58.5	59.1	dark muddy grey siltstone b 60 to ca deformed soft sed deform poorly defined by few black wispy laminae			
BR1602	CS	friable coal and claystone gouge	59.1	59.6	friable coal mixed w grey clay gouge fault zone? 59.2-59.4 all clay gouge varying from pale brown to dark grey 59.4-59.6 fg coal all broken and cohesive mess			
BR1602	CS	coaly shale and ss	59.6	59.9	dk grey muddy coaly shale interbedded w cg sandstone bed 10 cm thick wisps of black bitumen			
BR1602	CS	coal and coaly shale	59.9	60.35	coal and coaly shale 25 cm massive coal bounded by coaly shale brown scratch marks-- soft			
BR1602	Ss-slt	interbedded slt-ss	60.35	65.6	Interbedded pale muddy grey siltstone and fg sandstone sporadic cuspate coal flakes and small lenses and few seams of massive coal: at 61.4 10 cm coal sandstone above w black flakes of bitumen dark shaley mudstone ss at 62 degrees to ca; 62.0 to 63.2 coarse ss at base to fine ss and mudstone w dark coaly shale near top; 63.2 65.6 siltstone -mudstone pale grey siltstone dark grey mudstone poorly bedded but w wispy laminations in pale grey siltstone defined by balck laminae and flakes.	61.4	C	10 cm coal
BR1602	Cong	Cong-ss interbedded	65.6	66.9	Conglomerate / grit in 5 coarse to fine cycles of grit to sandstone fg -ss contains flakes and laminae of bituminous matter			
BR1602	Slt-C	thin coal lenses in	66.9	67.35	dark grey muddy siltstone w irregular and sporadic massive coal lenses commonly cuspate; 66.6 coal 5 cm seam of massive ; 66.7 1 cm coal seam END OF INTERVAL	66.6	C	5 cm
						66.7	C	1 cm
BR1602	hammer		67.35	100	**Percussion interval: some coal seams in interval judged to be minor; restart coring at 100 m to 135.6m**			

APPENDIX 4

BR1602

BR1602	COAL	coal and coaly shale	100	100.4	coal and coaly shale 3 bands of massive coal 10 cm thick in dark grey coaly shale base is ochrous brown siltstone		
BR1602	Ss-slt	Slt-ss	100.4	101.3	cross bedded unevenly bedded coarse and fine ss and siltstone. All muddy grey siltstone intervals contains cuspate coal lenses AMBER at 100.4 3 irregular chips about 5 mm large	100.4 A	3 amber chips 5 mm
BR1602	CS	coal and brown siltstone	101.3	101.8	coal and ochrous brown siltstone; s15 cm massive coal 101.35 to 101.5 thin coal lens at 101.8 ochrous brown siltstone is the same as the the lith at 100.4 appears to have soft-sed deformed cruse layering defined by bitumonous flakes and lenses	101.4 C	15 cm coal seam
BR1602	Ss-slt	Ss-slt	101.8	104.9	interbedded sandstone massive bedded and siltstone sandstone or muddy siltstone; dark wipsy laminae vary to coal bearing w wisp and flakes of bitumin throughout		
BR1602	COAL	coal in mudstone	104.9	105.6	COAL seams interspersed w dark muddy shale; 20 cm at 105 to 105.2	105.2 C	20 cm coal
BR1602			105.6	116.3	coal seams interbedded w grey siltstone and sandstone coal varies from massive hard coal w conchoidal fracture across domains up to 1 cm to thinly interbedded coal and shaley coal or dark shale w as soft brown scratch using a nail. Amber occurs sproadically throughout interval mainly in coal and shaley coal beds.		
BR1602	COAL		105.6	105.7	COAL		
BR1602	slt	siltstone	105.7	105.8	grey pale brown siltstone w cuspate coal inclusion		
BR1602	CS		105.8	106.15	massive coal and shaley coal at 106.15 lense of amber 1 mm thick by 2 cm long parallel to bed	106.15 A	amber lens 1 mm by 2 cm
BR1602	slt	slitstone w coal flakes	106.15	106.4	grey pale brown siltstone w coal flakes and cuspate lenses		
BR1602	COAL	10 cm coal seam	106.4	106.5	massive coal 10 cm; 4 mm by 3 cm amber lens ; amber is irregular in shape ragged edges and zones from dark orange rim to light yellow core	106.5 A	4 mm by 3 cm amber lens
BR1602	CS	Slt-Coal	106.5	109.8	coal seams at 107.2 10 cm; 107.7 25 cm; 108.4 8 cm. Amber occurrences: 106.8 6 ellipsoidal blebs 2 mm by 3 mm. 107.95 10 thin orangy brown lenses 1 mm by 8 to 12 mm in massive coal; 108.1 in 1 cm coal bed 3 mm by 15 mm yellow orange; 108.2 6 2 mm by 3 mm blebs	106.8 A	6 blebs Amber
						107.95 A	10 thin lenses in msv coal
						108.1 A	3 by 15 mm lens in coal
						108.2 A	2 by 3 mm blebs
BR1602	COAL		109.8	110.35	coal w minor dark shale at 110.1; amber in clusters at 110.25; 8 small ellipses 1 mm by 2 mm	110.25 A	8 small Amber blebs (1 by
BR1602	CS	shale w coal lenses	110.35	110.6	dark brown shale w coal lenses scattered		
BR1602	COAL		110.6	110.8	massive coal 20 cm w 2 amber lenses at base; 1 to 2 mm by 12 mm; 2 small blebs	110.6 A	amber lens
BR1602	CS	seams of coal in coaly shale	110.8	111.2	dark coal shale w few lenses or seams of coal		
BR1602	COAL	mixed msv coal and CS	111.2	111.75	massive coal 20% coaly shale; amber 7 blebs or lenses at 111.25 ellipsoids opaque 1.5 mm by 3 mm.	111.25 A	7 blebs amber
BR1602	CS		111.75	113	coal and shaley coal		
BR1602	Sh-C	pale brown grey siltstone and coaly	113	116.1	40 cm dark brown shale interval at 113.5 large amber rectilinear shape mainly pale brown grey siltstone at 60 to ca varying to coaly shale at 114; amber cluster at 113.4 3 ellipsoids 2 mm by 3 mm; at 114.1 – 3 1 by 2 mm ambers in shale; 114.3 2 5 mm amber in more coal; 115.9 3 perfect ellipsoids 2 mm by 3 mm: coal seam in intervals at 114.1 to 114.3 and 115.35 -115.4	113.4 A	3 blebs amber
						114.1 A	3 blebs amber
						114.3 A	2 5 mm Amber in coal
						115.9 A	
BR1602	COAL	coal w thin shale interbeds	116.1	116.6	massive coal w 1 cm shale at 116.2; 3 mm by 6 mm amber ellipsoid at 116.1 in msv coal. 3 by 10 mm amber and 3 spherical ones 3 mm diam all yellow and semi-translucent clay pale brown soft 10 cm thick at 116.3 separates 2 thin coal seams	116.1 A	Amber 3 by 6 mm in coal
						116.3 A	Amber: 3 mm in claystone
BR1602	CS	Grey-pale brown siltstone, ss and t	116.6	123.4	pale brown to grey siltstone to fg ss and coal seams bedding at 57 to ca; Amber 2 large lenses at 117.6 and 120.9; 117.6: nearly translucent 1 to 5 mm yellow w minor inclusions of black parallel to bedding in siltstone; 120.9 orange interior white edges; in dark shale; bituminous fragment flakes and filaments occur throughout interval to varying degrees indicated by darkness of the rock. Minor coal seams occur at 119.9 4 cm and 120.2 10 cm w sporadic mm thick seams in darker shale sections; from 122 to 123.4 the frequency of coal seams increases 112.2 10 cm 123.4 3 by 1 cm 122.8 15 cm. The base of the interval is marked by a 15 cm bed of pale grey coarse grained sandstone and cross bedded overlying fg ss to siltstone.	117.6	Amber lens in siltst
						120.9	Amber: orange in shale
BR1602	CS	coal and shaley coal	123.4	124.8	mainly massive coal and thin interbedded dark shaley coal and dark shale. Base is dark grey black siltstone.		
BR1602	COAL	coal w numerous amber grains	124.8	127.5	mainly coal: high amber content but <<1%; significant grains at 125.05; 6 mm by 15mm ellipsoidal pale yellow -green translucent amber. 126.5 dumbell shaped yellow amber 12 mm long by 4 mm wide. 127.2 to 127.5 12 amber grains from 1 mm to 3 mm by 4 mm	125.05	6 by 15 mm amber
						126.5	12 by 4 mm amber
						127.4	12 amber grains
BR1602	Sh-C	20% coal in shale	127.5	128.3	20% coal interspersed w dark grey shale; amber at 128.2 6 mod sized ellipsoids 5 by 12 mm some 2 by 6 mm in coal	128.2	Amber 12 grains ca. 6 mm
BR1602	sh	sooty shale	128.3	128.7	black sooty shale; lower section broken core in black and grey shale and siltstone		
BR1602	COAL	Coal-siltstone	128.7	129.9	COAL		
BR1602	ss	Slt-ss interbedded grading into con	129.9	132.6	Sandstone and siltstone grey poorly bedded sandstone and siltstone grading into conglomerate lens at 131.1; few bituminous filaments generally unit poorly bedded. 130.8 to 131.6 dark grey black siltstone;		
BR1602	Cong	gritty conglomerate	132.6	134.9	Conglomerate: very coarse angular fragments to 3 cm heterolithic; sharp base of unit cutting into grey sandstone below; black fragment grey wacke or slate pale yellow granitoid frags		
BR1602	Cong	grey ss and conglomerate	134.9	135.64	grey sandstone and minor conglomerate		
					EOH		

APPENDIX 5

Statement of Qualifications

Hardolph Wasteneys Ph.D., P.Geo.

I, Hardolph Wasteneys, Ph.D., P.Geo. resident at Strathcona Park Lodge, Campbell River BC, do hereby certify that:

I am a self-employed Professional Geoscientist and have worked primarily in mineral exploration, mining, geological and U-Pb geochronological research, and geological education since 1976.

I am a registered member of the Association of Professional Engineers and Geoscientists of British Columbia license number 32102.

I graduated with the degree of Bachelor of Science in Geological Engineering, Mineral Resources, in the Faculty of Applied Science, Queen's University, Kingston in 1979.

I graduated with a Doctor of Philosophy (Geological Sciences) from Queen's University, Kingston in 1990 in the field of economic geology with research specialized in the study of epithermal ore deposits of southern Peru under the supervision of Prof. Alan H. Clark.

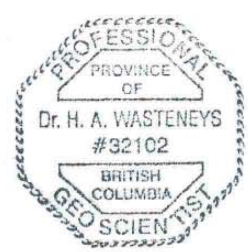
I conducted U-Pb geochronological research at the Jack Satterley Geochronology Laboratory in the Royal Ontario Museum directed by Dr. T. E. Krogh from 1990 to 1997 and completed numerous studies on the timing of ore deposition and regional metamorphism in collaboration with university and government survey geologists and resulting in several publications in peer reviewed international journals.

I have read the definition of "Qualified Person" set out in National Instrument 43-101 ("NI 43-101") and certify that by reason of my education, affiliation with a professional association (as defined in NI 43-101) and past relevant work experience, I fulfil the requirements to be a "Qualified Person" for the purposes of NI 43-101.

I have no beneficial interest in First Amber Mines Ltd. I am familiar with the Bowron River property held by First Amber Mines Ltd having completed a geological survey, supervised the October 2016 drill program and related access contracting operations.

Strathcona Park Lodge, Upper Campbell Lake, BC: June, 2017.

signed:



Hardolph Wasteneys, PhD, PGeo.

BR16-1 Rotary Air Drill Hole
571650
571675
750
725
700
675
650
625
600
Casing
Black argillite
Pale brown to tan laminated mudstone and siltstone
Black sooty, carbonaceous finely laminated argillite, breaks easily along bedding planes and has conchoidal fracture. pale grey tuffaceous layers and marcasite knodules or concretions.
Pale brown, rhythmically laminated claystone/mudstone, soft fissile, cleaves easily on bedding planes. Laminae alternate between darker clay layers and light brown fine silt layers less than 1 mm thick. Sporadic bituminous layers.
Sporadic bituminous lenses consisting of scattered plant fragments including small leaves and needles. Some form lenses up to a few mm thick and occur in angular granular sandy upward fining sediment layer up to 20 cm thick.
Pale brown finely laminated mudstone/claystone, rhythmic laminations of pale and auburn brown, interspersed with thin sandy beds commonly containing bituminous fragments, small amber grains and rare marcasite lenses.
broadly banded pale greyish green and maroon brown weakly calcareous siltstone to argillite with sporadic interspersed sandstone with bituminous laminae and flakes, varies to limy siltstone
thinly laminated dull grey green mudstone and shale; friable and easily crushed
Laminated pale brown and dark grey mudstone and grey green siltstone. Some thin coal seams, sporadic coal fragments and coaly shale
Banded grey green gradational bedded siltstone containing thin coal fragments discordant to bedding and some thin coal seams/laminae.
Alternating layers of calcareous siltstone and sandstone with interspersed bituminous laminae and fine coal seams and plant fragments in sandy layers.

571000
571025
Pilot Hole for BR16-2
Casing
casing
2 coal seams 1 m each
COAL 1 m at 55 ft
COAL 1 m at 68 ft
siltstone and shale
1.5 m coal at 90 ft
grey shale with bituminous fragments
grey siltstone w bituminous fragments
grey sandstone with plant debris and ochre siltstone with black bituminous fragments
minor coal seam and light grey siltstone
Coal, siltstone and one thin coal seam
coal grey siltstone coaly plant fragments
Pale brown laminated claystone/mudstone; very soft fissile.
grey shale and brown siltstone
brown siltstone and plant fragments; no coal fragments
very pale brown sediments
darker shale; 50% grey-black
pale brown sediment
pale brown and black seds
solid coal: half meter
dark shaley coal and coal
grey brown shale/siltstone
COAL, > 1 m
thin coal seams
black shale; thin coal seams, brown siltstone and mudstone
brown siltstone; no coal
brown mudstone and grey shale; no coal
dark shale and siltstone, brown mudstone and siltstone
brown sandstone and dark grey shale
brown siltstone and sandstone and dark grey shale
black shale and siltstone
coarse heterolithic sandstone and white sandstone fragments
conglomerate, brown sandstone with coal chips
mostly brown sandstone with bituminous fragments; minor shale, but no coal
brown sandstone and heterolithic conglomerate with metavolcanics
probable conglomerate of metavolcanic clasts; Slide Mountain Group basement
greenstone; chips covered with sticky clay
heterolithic conglomerate; greenstone chips covered with sticky clay
greenstone fragments, metavolcanic schist
greywacke chips covered in clay
black shale and slate; possible lithologic contact less clay covering some metavolcanics
black slate and argillite some dark clumping clays and fine qtz veined chips
mainly black argillite with some clay sticking to frags
black argillite or slate; minor clay, few calcite veins
brown siltstone and grey argillite/siltstone; minor calcite veins
dark brown siltstone with minor calcite veins, lesser pale brown siltstone and brown fine grained sandstone
Black -dark grey siltstone, brown fg sandstone with white quartz chips from veins
Greenstone: basement rock of Mississippian Slide Mountain Group
PQ Rotary Air Core hole BR16-2
CASING
Laminated to wispy layered light and dark grey mudstone with black bituminous layers and 2 mm coal seams and lenses.
Light grey brown siltstone and mudstone with numerous cm thick coal seams and some shaley coal
CONGLOMERATE or coarse grit; angular fragments poorly sorted heterolithic including black slate-greywacke and leucocratic fg rocks minor limestone; abrupt 2 cm ss bed midway
interbedded fine sandstone, coarse sandstone and grit with interspersed bituminous laminae and lenses;
Interval from 53.4 to 67.35 m
Cycles of interbedded sandstone, coaly shale and thin coal seams. Varies to muddy grey siltstone and fg sandstone with bituminous wisps and dark coaly laminae
Hammer interval
Percussion hammered interval
Core interval from 100 to 135.6 m
Numerous coal seams of moderate thickness amounting to about 10 meters, including 123.5 to 129.7 of 90% coal and minor dark shaley coal
Amber occurrences are common in this interval.
Coal seams interspersed by muddy shale
105.6 to 116.3m
Coal seams interbedded w grey siltstone and sandstone.
Coal varies from massive hard coal with brittle fracture to thinly interbedded coal and shaley coal with soft brown scratch.
Amber sporadic throughout mainly in coal beds.
Interval 116.6 to 123.4 m
pale brown to grey siltstone and fg sandstone with thin coal seams. Bituminous fragments in flake and filaments of plant material occur throughout especially in darker siltstone.
Interval 123.4 to 129.9 m
Mainly massive hard coal with thin interbedded dark shaley coal and dark shale.
Base dark grey to black siltstone and shale with sporadic coal.
129.9 to 132.6 m
Sandstone; poorly bedded with siltstone and grading down into conglomerate lens at 131.3 m.
Sparse fine bituminous filaments
132.6 to 135.64 EOH.
Conglomerate: very coarse, angular fragments to 3 cm, heterolithic greywackes, slate and possible granitoids.
Sharp base cuts into sandstone.
750
725
700
675
650
625
600

Appendix 2

BR16-1 and 2; detailed drill section at 1:600 scale