NORWEST CORPORATION

now

Stantec

Technical Report

Huguenot Coal Project Liard Mining Division
British Columbia

Report Date:
July 31, 2018

Report Effective Date:
July 2, 2018

Prepared for:

Colonial Coal International Corp.

Prepared by:

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Certificate of Qualifications

I, Warren A. Evenson, CPG, do hereby certify that:

I am currently retained as an associate Senior Geologist by Norwest Corporation now Stantec Consulting Services, Inc., 300 Capitol Street, Suite 810, Charleston, WV 25301, USA.

I graduated with a Bachelor's of Art's degree from the University of Montana in 1971 and with a Master's of Science degree from the University of Southern California in 1973.

I am a member of the American Institute of Professional Geologists, CPG #4980; I am licensed as a Professional Geologist from the Commonwealth of Kentucky, Board of Registration for Professional Geologists (0233 Professional Geologist) and certified as a Profession Geologist in Tennessee #TN2375 and Virginia #22.

I have worked as a geologist for a total of 45 years since my graduation from university, working in over twenty states and five foreign countries. The work throughout my career has been primarily in coal, including exploration, mine operations, property evaluation, resource assessment, coal sales, and consulting.

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

I am responsible for the preparation of Sections 1 through 28 of the Technical Report titled "Huguenot Coal Project Liard Mining Division British Columbia" dated September 19, 2013 (Technical Report), with an Effective Date of September 1, 2013. I have reviewed and, where appropriate, updated these Sections for the current report entitled "Huguenot Coal Project Liard Mining Division British Columbia" dated July 30, 2018.

I personally inspected the Huguenot Property on July 17 and July 18, 2012, and September 2 through 7, 2012. Subsequent to the above site inspections, the author has observed public records of recent: aerial photos, land development activity including O&G exploration, plus records of significant climatic events and/or fires. Observations of these public records have not identified any material change in the physical environment of the property that would represent a material change from those observations undertaken by the author in 2012.

Prior to being retained by Colonial Coal International Corp. in connection with the preparation of this Technical Report, I was also the qualified person for two Technical Reports both of which are entitled "Huguenot Coal Project Liard Mining Division British Columbia" one dated August 31, 2012, and the other September 23, 2013. Norwest was also retained by Colonial in 2012 to conduct field investigation and assist in the interpretation of geology for the property.

As of the effective date of the Technical Report, to the best of my knowledge, information and belief, the parts of the Technical Report for which I am responsible contain all scientific and technical information that is required to be disclosed to make the parts of the Technical Report for which I am responsible not misleading.

I am independent of the issuer applying all of the tests in Section 1.5 of NI 43-101.

I have read NI 43-101 and Form 43-101F1, and the Technical Report has been prepared in compliance with that instrument and form.

Dated at Charleston, West Virginia, this 30th day of July 2018.

Certificate of Qualifications

“Original Signed By Author”

Warren A. Evenson

Senior Geologist, Stantec

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1.0 SUMMARY

1.1 PROJECT SYNOPSIS

Colonial Coal International Corp. (Colonial) is proposing to develop its Huguenot hard coking coal (HCC) project located approximately 83 kilometres (km) south-southeast of the town of Tumbler Ridge, British Columbia (BC). The project will consist of an open pit and underground mining operation, with associated surface coal handling and preparation plant and supporting facilities, projected to produce 89 million tonnes (Mt) of HCC over a period of 31 years. Off-site infrastructure will include an 85km rail spur that would join the existing rail line south of Tumbler Ridge and a 78km, 230 kilovolt (kV) power transmission line.

Overall initial capital expenditures have been estimated at US$661 million (M) with a further US$178M estimated for sustaining capital over the planned mine life. The average annual operating cost is estimated at US$95.50 per clean coal tonne, excluding royalties and mineral taxes.

Based on a projected coal price of US$172, a financial analysis indicates the project would yield an after tax, internal rate of return (IRR) of 33% with a net present value (NPV) of US$1,166M at a discount rate of 7.5%. This analysis further indicates that the "break-even" coal price is less than US$116, US$120 and US$125 per tonne for discount rates of 5%, 7.5% and 10%, respectively, and that a coal price of US$135 per tonne is required for an IRR of 15%.

1.2 INTRODUCTION

The following Technical Report was prepared by "Norwest Corporation (Norwest) now Stantec Consulting Services Inc." (Stantec) for Colonial, a mineral exploration and development company with corporate offices in Vancouver, BC, Canada. This Technical Report summarizes the findings of a Preliminary Economic Assessment (PEA) originally prepared in 2013 by Norwest (Evenson, 2013) which has now been updated with regard to current economic parameters and US$: CAD$ exchange rates for the current (2018) report. Approaches to mining and coal treatment were reviewed for current applicability as were Section 19 (Markets and Contracts), which provided revised coal pricing forecasts, and Section 20 (Environment Studies, Permitting and Social/Community Impacts). As no further exploration has been conducted by Colonial on the Huguenot property since the preparation of the 2013 Technical Report, no further re-estimations of coal resources, coal resource classifications, or reviews of coal quality have been undertaken; those estimates reported in the 2013 Technical Report are repeated herein. This Technical Report has been prepared in accordance with National Instrument (NI) 43-101 and Form 43-101F1 (Canadian Securities Administrators, 2011).

1.3 LOCATION, ACCESS AND TENURE

The Huguenot Coal Project is located in northeastern BC, approximately 690 km north-northeast of Vancouver, close to the provincial boundary with Alberta. It is situated approximately 83km south-southeast of the town of Tumbler Ridge and 120km southwest of the city of Grande Prairie (Alberta).

Access into the project area is provided by a network of Provincial paved highways and un-paved, all-weather roads built for forestry purposes and oil and gas (O&G) exploration and development. The main roads link with a number of logging roads and trails constructed for previous coal exploration. The property is located approximately 75km southeast of a rail line which terminates at the Quintette wash plant and coal load-out facility (approximately 17km south of Tumbler Ridge). This rail line joins the CN Rail main line just north of Prince George and provides direct access to the coal export facility at Ridley Island, Prince Rupert, over a total distance of approximately 1,000km.

The property covers a total area of 9,531 hectares (ha) and consists of one contiguous block of 17 coal licenses that encompass previously explored coal deposits. These licenses are held beneficially for Colonial by a BC company, 0735513 B.C. Ltd., which is a wholly-owned subsidiary of Colonial. A royalty of 1.5% is payable to project stakeholders on all coal production from the property.

1.4 HISTORY

The Huguenot property covers part of the old Belcourt property previously owned by Denison Mines Limited (Denison) and later, joint ventured with Gulf Canada Resources Inc. (Gulf). Exploration of the property began in 1970. This work defined three major targets for open pit mine development; two (Red Deer and Holtslander) are located north of the Huguenot property and one (Omega) lies to the south. Recent exploration on these three areas was carried out in 2005 and a feasibility-level study supporting surface mines on the Belcourt North (Red Deer) and Belcourt South (Holtslander) projects was completed in January 2009. The Belcourt South pit lies just north of the Huguenot property boundary.

1.5 GEOLOGY

The Huguenot Coal Project lies within a belt of Mesozoic strata that form part of the Rocky Mountain Foothills of northeastern BC. The stratigraphic succession broadly represents an alternating sequence of marine shale and marine and non-marine clastic lithologies. These strata were uplifted during the Laramide Orogeny, resulting in the development of thrust faults and intense folding. The main structural feature in the region is the broad, northwest-plunging, Belcourt Anticlinorium. Lower Cretaceous coal measures are located along the western and eastern margins of this structure, with the Huguenot property located along its northeastern limb.

The coal seams of greatest potential are found within Lower Cretaceous strata of the Gates Formation. At Huguenot, the Gates Formation contains ten coal seams and/or coal zones numbered, in ascending order, from 1 to 10. The thickest is Seam 5, which ranges between 2.59 and 9.71 metres (m) (but is typically between 5 and 6m thick). The seams correlate northwest and southeast with those being evaluated by Belcourt Saxon Coal Limited (BSCL).

The property consists of mostly easterly dipping strata that lie within three main structural blocks; each block being separated from the other by thrust faults. The North Block is underlain by the Holtslander North Thrust and is located in the north of the property. It contains near-homoclinal, moderate, northeasterly- to easterly-dipping coal measures. The Middle Block is carried on the Holtslander South Thrust. Strata dip northeasterly throughout most of this thrust sheet. In this block, strata have moderate dips with localised steepening in the centre of the area. The South Block is situated in the southeast of the property, where the strata are steep, easterly-dipping to slightly overturned and form the eastern limb of an asymmetric anticline, the fold axis of which defines the western limit of the coal measures.

1.6 EXPLORATION

Within the area now covered by the Huguenot property, a total of 2,451m of drilling (from eight diamond drill holes) and approximately 138 hand trenches were completed as part of several helicopter-supported exploration programs conducted between 1976 and 1979. Drilling and sampling was conducted in a manner similar to current exploration practices. Much of the exploration data generated from these programs are available from the BC government, as well as various reports generated from these programs.

Exploration conducted by Colonial in 2008 consisted of 17 air rotary holes (1,623m) and ten large diameter (6-inch/152 millimetre (mm)) holes (comprising 88m of core and 334m of percussion drilling), 19 mechanical trenches, and 36 hand trenches. Work focused on the northern part of the North Block. Exploration conducted by Colonial in 2011 consisted of 16 air rotary holes (3,006m), plus 13 HQ core holes (3,399m), two PQ core holes (182.50m), and two large diameter holes (31.25m of core and 118.37m of percussion drilling). The 2011 exploration activities focused predominantly on the Middle and South Blocks. During 2012, Colonial conducted an exploration program that consisted of 11 air-rotary holes (602m), 6 HQ core holes (964m), 19 large diameter holes (154m core and 744m of percussion drilling), and 5 hand excavated trenches. Additionally, seam outcrops were exposed along the access road constructed for the large diameter core drilling. Exploration activities in 2012 were conducted on the North, Middle and South Blocks.

1.7 MINERAL RESOURCES

Previous (2010) coal resource estimations for the North Block of the Huguenot property were carried out by Moose Mountain Technical Services (Perry & Morris, 2010). After completion of the 2011 exploration program, a Technical Report was prepared by Norwest (Evenson, 2012) that estimated the coal resources for all three blocks. Based upon additional exploration carried out in 2012, Norwest prepared a further Technical Report entitled “Huguenot Coal Project, Liard Mining District, British Columbia” (Evenson, 2013), that updated the geological interpretation, coal resources, coal resource classification and coal quality across the property. For both the 2012 and 2013 reports, Norwest reviewed data collection procedures, conducted data validation, reviewed geological interpretations, and formatted the data to support geologic model development for each of the North, Middle and South Blocks. This effort served as the basis for Norwest’s independent coal resource estimate and coal resource classification that was presented in the initial Huguenot Coal Project PEA completed by Norwest in 2013 (Evenson, 2013).

For this updated PEA, Stantec has reviewed and confirmed Norwest’s scoping-level mining study and adjusted the economic analysis to conform to current economic parameters and US$: CAD$ exchange rates. As no subsequent exploration has been conducted by Colonial on the Huguenot property, no further re-estimations of coal resources, coal resource classifications and coal quality have been undertaken; those estimates reported in Norwest’s 2013 Technical Report are repeated herein. In addition to the updated mining study and economic analysis, the section on environment studies, permitting and social/community impacts (Section 20) has been reviewed and updated as has Section 19 (Markets and Contracts). The term ‘mineable’ is used in this study to define resources to which mine plans have been applied, but economics have not been considered to a level of accuracy sufficient to define reserves.

Using a 0.6m minimum thickness, in-situ surface mineable Measured and Indicated resources totaling 132.0Mt and Inferred Resources of 0.5Mt were estimated for the combined North, Middle and South Blocks. Utilizing a minimum thickness of 1.5m, in-situ underground mineable Measured and Indicated resources of 145.7Mt and 118.7Mt of Inferred Resources were estimated for all three blocks.

Table 1.1 lists the coal resource estimates for each structural block.

TABLE 1.1 SUMMARY OF COAL RESOURCES

Block	Surface Resources				Underground Resources			
	Measured Mt	Indicated Mt	Measured & Indicated Mt	Inferred Mt	Measured Mt	Indicated Mt	Measured & Indicated Mt	Inferred Mt
North	58.32	7.91	66.23		7.18	30.41	37.59	86.84
Middle	37.88	9.02	46.90	0.53	11.67	19.50	31.17	1.58
South		18.82	18.82			76.97	76.97	30.24
Total	**96.20**	**35.75**	**131.95**	**0.53**	**18.85**	**126.88**	**145.73**	**118.66**

The resource estimates were completed in accordance with the guidelines presented in Geological Survey of Canada (GSC) Paper 88-21 (Hughes, et al, 1989), as required by NI 43-101.

Analytical results indicate that the Gates coal seams are metallurgical coals that would yield a coking coal product after beneficiation in a wash plant. Dry mineral matter free (dmmf) volatile matter contents indicate that the seams are overall medium volatile bituminous rank. Raw North Block seam ash values range from approximately 7.9% to 33.9%, although most are between 13% and 27%. Raw Middle Block seam ash values range from approximately 6.9% to 46.3%, although most are between 14% and 26%. Raw South Block seam ash values range from approximately 8.3% to 53.8%, although most are between 17% and 27%. For all three blocks, clean coal free swelling index (FSI) levels (from float/sink analysis run between specific gravities (S.G.) of 1.40 and 1.70) range from 4.5 to 9, sulphur contents range from 0.29% to 1.37% (although all but two clean coal composites (CCCs) are less than 1%) and phosphorus contents range from 0.006% to 0.235% (although most fall below 0.065%). Float/sink analysis indicated that cleaning to approximately 8% - 9% ash product is possible utilizing a S.G. of approximately 1.60.

Reported base to acid (B/A) ratios from clean coal analyses are lower than some comparable Canadian coals, suggesting good coke strength. Mineral compositions of ash, from float/sink analyses, indicate potential B/A ratios ranging from 0.029% to 0.640% (although most are less than 0.163%). Fluidity results from the 2008 to 2012 coal samples range from 1 to 611 dial divisions per minute (ddpm), while dilatation results range from negative 19 to positive 204. However, it is likely that many of the results were significantly affected by the age of the sample by the time the tests were carried out, as fluidity and dilatation are very sensitive to early stages of oxidation at low temperature. Mean maximum vitrinite reflectance (RoMax) values range from 1.00 to 1.39, and fall within the range for coking coals traded on the seaborne market. Overall, Huguenot can be expected to produce a low ash, low sulphur, mid-volatile HCC with coke strength after reaction (CSR) values predicted to be in the 65 to 70 range, which characterizes a high quality HCC.

1.8 MINING METHODS

There are sufficient quantities of near-surface resources that may support surface mining in the North, Middle and South Blocks. In addition, the dip and structure of the North Block may allow some coal seams to be amenable to underground longwall mining techniques. A PEA-level mine plan is presented that examines the economics of a combination of these surface and underground mining approaches.

Surface mining pit shells were proposed based on mining criteria typical of the region and a maximum incremental 'strip ratio' (bank cubic metres (bcm) of waste to raw tonnes of coal) of 14:1. Two pit shells were proposed that exploited the North, Middle and South Blocks using a conventional 'truck – shovel' mining technique with mid-sized excavators and mining trucks. One pit shell exploits the North Block and northern part of the Middle Block, while the second pit focuses on the southern part of the Middle Block and South Block.

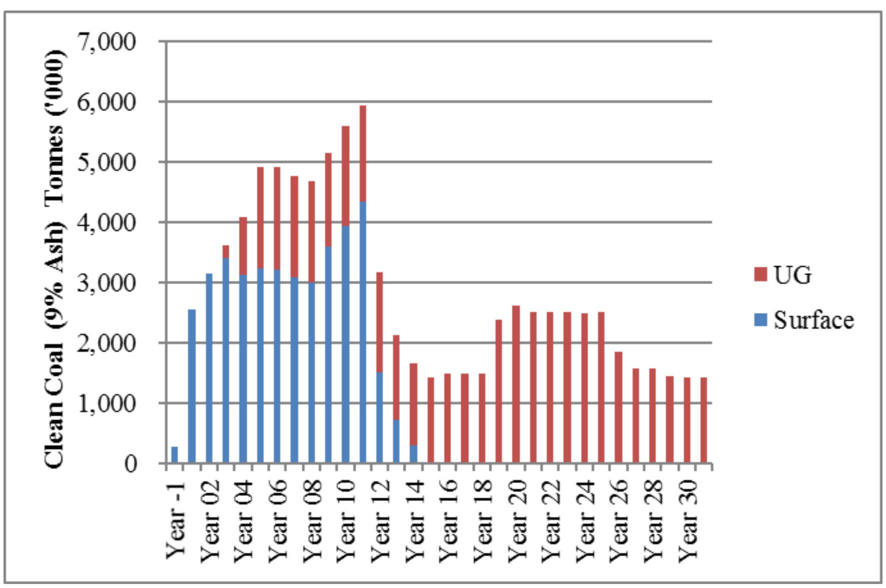
Longwall mining in the North Block was identified as the most productive of the underground mining methods likely to be economic for the Huguenot Project, given the resource size, areal extent, dip and thickness of the coal seams. A conceptual mine plan proposes that the longwall operations be accessed through a shaft located north of the surface mine pits.

It is proposed that run-of-mine (ROM) coal be sized, washed and loaded for transportation by rail at on-site Coal Handling and Coal Preparation plants.

Surface mining commences with pre-production in Year -1, and averages 3.2 million tonnes per annum (Mtpa) of clean coal through Year 12 at 'steady-state' production. Production is from the two surface pits which are developed and mined concurrently. Production from the longwall operation commences in Year 3 and averages 1.8Mtpa through Year 31 at 'steady-state'. Production of clean coal from the combined surface and underground mining operations averages approximately 3Mtpa, and ranges from 1.4Mtpa to 5.9Mtpa. The variance in coal production is driven by several factors, primarily the sequence in which coal seams of varying thickness are encountered by the longwall operations and constraints by the equipment available.

Preliminary mine planning for the surface and longwall operations has resulted in a proposed clean coal production schedule, as summarized in Figure 1.1.

FIGURE 1.1 CLEAN COAL PRODUCTION SCHEDULE



1.9 ENVIRONMENTAL AND PERMITTING

An environmental baseline program for the project site was developed and executed. Potential areas of environmental concern that are currently unconfirmed include declining caribou populations in the area as well as the release of selenium as a result of mining. Several of the environmental baseline reports completed to date have recommended gathering additional data in preparation for an Environmental Impact Assessment.

1.10 MARKETS

Laboratory analysis and coke testing on the physical and chemical characteristics and coking capabilities of Huguenot coal has been previously performed with the result that a HCC product was identified.

Huguenot coal was found to exhibit favorable characteristics across all quality parameters, consistent with internationally traded, high-value coking coal.

A long-term price estimate for Premium HCC of (2018) US$185 per tonne is forecast. HCC from Huguenot is expected to be priced at 92% to 94% of benchmark pricing for Premium HCC products, yielding an expected long-term price of US$172.00 (CAD$223.60) per tonne, using a 93% discount to the Premium HCC long-term price and assuming US$1.00 = CAD$1.30.

1.11 PROJECT ECONOMICS

The surface mine is projected to produce an average of 3.8Mtpa (average 4.5Mtpa at steady-state) ROM for 15 years, producing approximately 56Mt. The expected wash plant yield of 70% results in 39Mtpa saleable from the surface mine.

The underground mine is expected to begin production in the fourth year of mine operations producing 2.3Mt ROM over 29 years for a life-of-mine (LOM) total of approximately 66Mt ROM. The expected wash plant yield of 76% results in 50Mt saleable from the underground mine.

Based on PEA-level mine planning, a schedule of capital and operating costs for the combined surface / longwall mining operations, facilities and infrastructure was developed. These costs are summarized below in Tables 1.2 and 1.3.

TABLE 1.2 SUMMARY OF CAPITAL COST ESTIMATE (US$M)

Item	Capital Cost
Surface Facilities and Infrastructure	260.0
Surface Mine Equipment	9.0
Underground Mine Equipment	293.3
Reclamation Bond	25.0
Working Capital	73.6
Sub-Total	**660.9**
Sustaining Capital	178.1
Total Capital Cost	**839.0**

TABLE 1.3 SUMMARY OF OPERATING COST ESTIMATE (US$/CLEAN COAL TONNE)

Item	Operating Cost
Direct Open Pit Mining	54.44
Mining Equipment Lease	5.95
Direct Underground Mining	57.04
Plant and Administration	8.68
Average Site Operating Cost	**67.20**
Offsite Costs	25.39
Rail Tariff	2.91
Total Operating Cost (LOM)	**95.50**

Taking into account coal pricing, off-site costs (port charges, rail transport, etc.) and indirect costs such as taxes, depreciation and royalties, a cash flow was generated on which the NPV was based. The NPV results are summarized in Tables 1.4 and 1.5.

TABLE 1.4 ECONOMIC ANALYSES RESULTS (US$M)

Coal Price	NPV (US$M) at Varying Discount Rates with IRR			
	5%	7.5%	10%	IRR (%)
US$172/t	**$1,669**	**$1,166**	**$831**	**33%**
US$156/t	$1,203	$811	$551	25%
US$188/t	$2,134	$1,521	$1,109	40%

TABLE 1.5 ECONOMIC ANALYSES RESULTS (CAD$M)

Coal Price	NPV (CAD$M) at Varying Discount Rates with IRR			
	5%	7.5%	10%	IRR (%)
CAD$224/t	**$2,170**	**$1,516**	**$1,080**	**33%**
CAD$203/t	$1,564	$1,054	$717	25%
CAD$244/t	$2,775	$1,977	$1,442	40%

This PEA is preliminary in nature, and includes Inferred mineral resources. Inferred mineral resources are considered too speculative geologically to have technical and economic considerations applied to them that would enable them to be categorized as mineral reserves. Mineral resources that are not mineral reserves do not have demonstrated economic viability.

1.12 CONCLUSIONS AND RECOMMENDATIONS

It is concluded that further work on the property is justified in order to gather additional coal quality data, refine the geological models and upgrade coal resources currently classified as Inferred into the Indicated and Measured categories, particularly in the proposed underground mining area. The cost for the above recommended exploration work is estimated at approximately CAD$2.3M. In addition to the exploration work, it is recommended that Colonial undertake a study of the options for road haulage for transporting the coal from the mine to the existing rail line south of Tumbler Ridge, followed by an internal, scoping-level study for a stand-alone, surface mining operation. Studies should also be undertaken to evaluate the timing of production from the two surface operations and the underground operation to determine the effect of various production rates and scenarios on the economics of the project.

The accuracy of resource estimates is, in part, a function of the quality and quantity of available data and of engineering and geological interpretation and judgment. Given the data available at the time this report was prepared, the estimates presented herein are considered reasonable. However, they should be accepted with the understanding that additional data and analysis available subsequent to the date of the estimates may necessitate revision. These revisions may be material. There is no guarantee that all or any part of the estimated resources will be recoverable.

2.0 INTRODUCTION

This report was prepared for Colonial by Stantec. Colonial controls a block of coal licenses in northeastern BC, collectively referred to as the Huguenot Coal Project. This Technical Report summarizes the findings of a PEA originally prepared in 2013 by Norwest (Evenson, 2013) which is now updated with regard to current economic parameters and US$: CAD$ exchange rates. Approaches to mining and coal treatment were reviewed for current applicability as were Section 19 (Markets and Contracts), which provided revised coal pricing forecasts, and Section 20 (Environment Studies, Permitting and Social/Community Impacts). As no further exploration has been conducted by Colonial on the Huguenot property since the preparation of the 2013 Technical Report, no further re-estimations of coal resources, coal resource classifications, or reviews of coal quality have been undertaken; those estimates reported in the 2013 Technical Report are repeated herein. This Technical Report has been prepared in accordance with NI 43-101 and Form 43-101F1. Colonial retained Stantec for the preparation of a Technical Report in accordance with NI 43-101, Form 43-101F1. Mr. Warren Evenson CPG, who was Norwest's Qualified Person (QP) and author of the 2013 Technical Report, also acts as Stantec's QP

For the 2013 Technical Report, Mr. W. Evenson, (author) undertook a review of geological work carried out within the project area, including data obtained and interpretations generated by Colonial, and reviewed, and took responsibility for the entire report. Verification of the geology and coal development was completed through site visits and data reviews. Using verified geologic interpretations co-generated by Colonial's and Norwest's geologists, Norwest constructed 3D geologic models for the North, Middle and South Blocks and conducted resource estimation and resource classification for these blocks.

Once the geologic model and resource estimates were completed, Norwest developed a PEA of the project in 2013 which has now been updated by Stantec (in 2018) using revised cost and revenue estimates. This assessment involved the application of preliminary mine planning on a resource base that included Inferred geologic resources. The mine planning, cost estimates and economic analysis were based on conceptual studies only.

The purpose of the current report is to provide Colonial with a third-party update regarding the preliminary mine planning and associated economic analysis appropriate for a PEA-level evaluation, based upon the coal resources contained within the coal licenses collectively referred to as the Huguenot Coal Project. This report is prepared in a manner consistent with Canadian Securities Commission requirements as laid out in NI 43-101, by personnel who have substantial experience with the coal deposits of western Canada, and northeast BC in particular.

The report repeats the estimation and classification of coal resources for the North, Middle and South Blocks of the Huguenot property contained within the 2013 Technical Report. Resource estimations were based on Colonial's geologic database for the property generated from their 2008, 2011, and 2012 drilling programs plus past work carried out by previous operators. Potentially mineable resource estimates are based on a 2013 Norwest PEA analysis utilizing data from preliminary mine plans. The preliminary mine plans were constructed by Norwest using the geological models prepared for coal resource estimates. Information from Colonial indicates that field expenditures in excess of CAD$8.5M (excluding environmental studies) were incurred for the 2008, 2011, and 2012 field programs and subsequent data handling.

In order to prepare this report, the author has relied on data collected and reports generated by others and on exploration data collected by Colonial in 2008, 2011, and 2012. A full set of references is presented in Section 27. However, of these, the following have been relied upon to provide most of the historical material reviewed for this study:

> Belcourt Project, Geological Report; Denison Mines Limited, March 1979. Coal Assessment Report 463.
>
> Belcourt Project, Geological Report; Denison Mines Limited, December 1979. Coal Assessment Report 465.
>
> Huguenot Coal Project Technical Report, Liard Mining Division, British Columbia, for Colonial Coal Corporation, Perry, J. H. and Morris R. J., July 2010.
>
> Huguenot Coal Project Technical Report, Liard Mining Division, British Columbia, for Colonial Coal Corporation, Evenson W. A., August 2012.
>
> Huguenot Coal Project Technical Report, Liard Mining Division, British Columbia, for Colonial Coal Corporation, Evenson W. A., August 2013.

A site visit for the purposes of the 2013 PEA was undertaken by the author on 17 and 18 July 2012. The site visit consisted of a helicopter flight over the entire property including fly-over of the locations of the 2008 and 2011 drill holes and on ground observations of past drill hole and trench locations. Mr. Evenson also visited the property from September 2 to September 7, 2012. While on site Mr. Evenson visited some of the 2012 drill sites and hand trenching locations as well as conducted field reconnaissance to assist in the structural interpretation of the local geology. Subsequent to the above site inspections, the author has observed public records of recent: aerial photos, land development activity including O&G exploration, plus records of significant climatic events and/or fires. Observations of these public records have not identified any material change in the physical environment of the property that would represent a material change from those observations undertaken by the author in 2012.

The report entitled Huguenot Coal Project Technical Report, Liard Mining Division, British Columbia, for Colonial Coal Corporation, by Perry, J. H. and Morris R. J., July 2010, was reviewed. Norwest submitted the Technical Report entitled Huguenot Coal Project, Liard Mining Division, British Columbia, dated August 31, 2012, reporting NI 43-101-compliant resources. Norwest also submitted the Technical Report entitled Huguenot Coal Project, Liard Mining Division, British Columbia, dated September 23, 2013, reporting NI 43-101-compliant resources and details of a PEA completed for the project. Sections from these reports have been excerpted in whole or in part for this report, particularly in the narrative relating to the regional and site geology, site history and property location.

The accuracy of resource estimates is, in part, a function of the quality and quantity of available data and of engineering and geological interpretation and judgment. Given the data available at the time this report was prepared, the estimates presented herein are considered reasonable. However, they should be accepted with the understanding that additional data and analysis available subsequent to the date of the estimates may necessitate revision. These revisions may be material. There is no guarantee that all or any part of the estimated resources will be recoverable.

3.0 RELIANCE ON OTHER EXPERTS

This report has been prepared for Colonial Coal International Corp. The findings and conclusions are based on data provided by Colonial in addition to site visits and reports prepared by Norwest and others.

Stantec has relied wholly upon information, both private (provided by Colonial) and publicly available, as the basis for classification and reporting of coal resources for the property. Stantec has reviewed these data for completeness. While Stantec believes the data is accurate we cannot, in all circumstances, guarantee that they are reliable.

Stantec relied upon the findings of an independent study on market pricing and contracts (*Price Assessment for Huguenot Coking Coal*, Kobie Koornhof Associates Inc., April 2018 (Koornhof, 2018)), as summarized in Section 19. Coal pricing projections were drawn directly from this study and used in the preliminary economic analysis described in Section 22.

Stantec was provided a summary of environmental studies as summarized by Sage Resource Consultants Ltd. in their report (*Huguenot Coal Project, Environmental Studies, Permitting and Social / Community Overview,* April 2018 (Tate, 2018)). Stantec relied upon the conclusions of that work in presenting the status of environmental permitting, as covered in Section 20 of this report.

4.0 PROPERTY DESCRIPTION AND LOCATION

4.1 LOCATION

The Huguenot Coal Project is located in northeastern BC, within the Peace River Regional District, approximately 690 km north-northeast of Vancouver. It is situated near the Alberta border between Latitudes 54° 28' N and 54° 35' N, and Longitudes 120° 10' 30" W and 120° 22' 30" W. The project encompasses one contiguous group of coal licenses that lie within the Liard Mining Division and are located on NTS Map Sheets 93-I/08 and 93-I/09.

The property is approximately 17.7km in length and covers northwest-southeast trending coal measures situated between recent mining operations carried out near Grande Cache, Alberta (Grande Cache coal mine) and Tumbler Ridge (Trend coal mine); these mines are located approximately 95km to the southeast and 62km to the northwest, respectively. The town of Tumbler Ridge, which was built in the early 1980s to service the Quintette and Bullmoose coal mines, lies approximately 83km north-northwest of the property. The general location of the property is shown in Figure 4.1. The location of the property with respect to regional and local population centres, roads, rail lines, coal mines and other major coal deposits is shown in Figure 4.2. A detailed property map is depicted in Figure 4.3.

4.2 COAL LICENSES

The Huguenot Coal Project consists of one contiguous block of 17 coal licenses covering 9,531 ha. The recorded owner of the issued tenures is a BC numbered company, 0735513 B.C. Ltd. Additional ownership details are provided in Section 4.3.

The property lies within the Liard Mining Division and is covered by BC Coal Maps 93-I-08 and 93-I-09. Coal license data and descriptions are summarized in Table 4.1 and the locations of the licenses are shown in Figure 4.4. Information pertaining to coal license tenure is posted on the British Columbia Ministry of Energy, Mines and Petroleum Resources (BCMEMPR) web site; the posted records indicate that the issued licenses are in good standing.

No legal surveys have been undertaken either as a requirement for, or subsequent to acquisition of the coal licenses. Within BC, coal lands are acquired simply by application (paper "staking"); claim posts are not required. Colonial does not own surface rights over any of the property; there is no requirement to own surface rights in order to conduct mineral exploration within the Province. No search of land title, survey records or surface rights has been undertaken by Stantec.

TABLE 4.1 COAL LICENSE INFORMATION – HUGUENOT COAL PROJECT

Coal License No.	Current Owner	Area (ha)	NTS Map Series	Expiry Date
416919	0735513 B.C. Ltd.	1,202	093I049	2019,06,22
416920	0735513 B.C. Ltd.	1,203	093I049	2019,06,22
417014	0735513 B.C. Ltd.	827	093I049	2019,07,21
417156	0735513 B.C. Ltd.	901	093I059	2018,12,21
417614	0735513 B.C. Ltd.	151	093I049	2018,08,17
417615	0735513 B.C. Ltd.	301	093I049	2018,08,17
417616	0735513 B.C. Ltd.	76	093I049	2018,08,17
417617	0735513 B.C. Ltd.	151	093I049	2018,08,17
417618	0735513 B.C. Ltd.	301	093I049	2018,08,17
417619	0735513 B.C. Ltd.	76	093I059	2018,08,17
417620	0735513 B.C. Ltd.	301	093I059	2018,08,17
417621	0735513 B.C. Ltd.	301	093I059	2018,08,17
417622	0735513 B.C. Ltd.	151	093I059	2018,08,21
418559	0735513 B.C. Ltd.	1,426	093I059	2019,06,09
418570	0735513 B.C. Ltd.	959	093I049	2019,06,09
418571	0735513 B.C. Ltd.	151	093I049	2019,06,09
418572	0735513 B.C. Ltd.	1,053	093I049	2019,06,09
Total Licensed Area		**9,531**		

Under the Coal Act of BC, a licensee has the exclusive rights to explore for and develop coal on the license and, with the approval of the Chief Inspector of Mines, to mine and remove those quantities of coal that may reasonably be required for testing, to a maximum of 100,000 tonnes. The holder of a license is entitled to enter, occupy and use the surface of the location for exploring and developing coal and, subject to obtaining a free use permit or a license to cut under the Forest Act to use and remove timber that is on the location. Further, a licensee has the non-exclusive right to use sand, gravel and rock from the location, for use on the location for a construction purpose approved under the Mines Act, without the necessity of obtaining under the Land Act a license, lease, permit or other authorization.

A coal license is valid for a term of one year from the date of its issue and, subject to complying with the provisions of the license and the Coal Act, the coal license can be extended for further one-year terms on application by the licensee. Such application must be made before the license expires (although a 30-day grace period is available) and must be accompanied by a rental fee and certain information of data respecting the exploration, development and production of coal. Coal licenses will expire if renewal applications are not made in accordance with the provisions set out above. In addition, the government may suspend operations, refuse to renew a coal license, or terminate a coal license for failure to comply with the Coal Act, the license, the Mines Act or a permit under it. A restriction on the use of surface rights may be imposed by the BC government if the surface area is so situated that it should be used for purposes other than mining. Lands may also be expropriated under BC's Park Act.

The only financial obligation required on the part of the licensee to keep the coal licenses in good standing are the yearly renewal fees. For the first 5 years these are set at CAD$7/ha. This increases to CAD$10/ha for the second 5-year term and by an additional CAD$5/ha at the end of each 5-year period beginning with the 11th year. There is no financial or other obligation required from Colonial to retain the property. The current annual (2018) rental fee, paid to the Crown, for Colonial to keep the coal licenses in good standing is CAD$114,253.00.

As far as can be reasonably ascertained, the property appears to be free of any environmental liabilities associated with previous exploration activities. No mining has been undertaken within any of the license blocks, consequently there are no tailings ponds or waste dumps. Areas disturbed by historical exploration campaigns were reclaimed at the conclusion of each program. It is unlikely that any of these past exploration activities have generated, or have the potential to generate, any environmental liabilities. Reclamation was carried out on selected drill trails and drill sites during the 2008, 2011 and 2012 exploration programs. Certain drill sites and portions of drill trail were not reclaimed due to future work requirements; Colonial intends to reclaim these drill sites and trails in the future. It was observed during the 2012 helicopter reconnaissance (undertaken by the author for the purposes of the 2012 Technical Report) that old drill sites were well reclaimed and, consequently, not easily identified.

If a mine were to be developed, there would be adequate room for the mine surface and, possibly, waste dump and settling pond imprints within the current licenses. However, the selection of sites for waste dumps, coal processing and load-out facilities, tailings ponds and settling ponds would be subject to appropriate engineering and environmental studies and it is possible that some sites would be located outside the current property boundaries. It is worth noting that the northern boundary of the property is located approximately 470m south of the proposed Belcourt South open pit development and within 15km of the proposed Belcourt processing plant.

The surface expressions of the coal seams and locations of drill holes, trenches and previous access trails are shown on maps and diagrams included in various sections of the report as presented below, together with appropriate description and discussion. Historical studies by the previous operator are summarized in Section 6 whereas current estimates determined using historic data as well as data collected during the 2008-2012 exploration programs are presented in Section 14.

Parts of the property and its immediate surrounds are covered by a variety of tenures. The types and number of tenures and the areas they may cover are not known, as no title search has been undertaken. However, they can be expected to include petroleum and natural gas (including coal bed methane), forestry, wind farm, guide outfitting, and trapping tenures plus tenure applications. Significant levels of natural gas exploration and development currently exist around the project area. Most of these activities have occurred north of the property although some drilling has also taken place to the south and east, plus one O&G well to the west. One well is situated within coal license 417156 while another is present along the western boundary of this coal license. The status of individual O&G wells within or around the project area has not been determined; some are producing gas but these are located some distance from the main coal target areas.

Occasional areas of merchantable timber used to be present at lower elevations and a number of logged areas are present both on, and in the general vicinity of, the property. In 2014 the Red Deer Creek Forest Fire burnt a significant portion on the property rendering affected timber essentially non-merchantable. Apart from those areas that have been the focus of O&G and forestry activities, current land use appears limited to hunting, trapping, and recreational activities such as snowmobiling and driving ATVs. The property lies within an active guide-outfitter area.

Permits necessary for any exploration activities recommended in this report have yet to be acquired (see Section 20 for discussion on project permitting).

4.3 OWNERSHIP

The outline of property ownership, provided below, is derived from information obtained from Colonial.

The property is held beneficially for Colonial by a BC company, 0735513 B.C. Ltd. This company is a wholly-owned subsidiary of Colonial.

The core group of coal licenses (numbers 416919, 416920, and 417014) were originally granted to a Mr. I. Downie in mid-2005, while coal license 417156 was acquired that same year by Western Canadian Coal Corporation (WCCC). WCCC subsequently transferred this coal license to BSCL a joint venture company owned, at that time, by WCCC and NEMI Northern Energy and Mining Inc (NEMI). As a result of a swap of other coal licenses between Mr. Downie and BSCL, ownership of coal license 417156 was transferred to Mr. Downie in exchange for coal license 417015.

Mr. Downie subsequently transferred ownership of all four coal licenses to 0735513 B.C. Ltd. which, since inception, has held the licenses as trustee for and on behalf of Colonial. In June 2014, the government converted Colonial's coal license applications, which were referenced in the 2013 report, into a further nineteen coal licenses (numbers 418554 to 418557 and 418559 to 418573). Subsequently, in July 2016, Colonial relinquished all but four of these newer coal licenses and also reduced the size of coal license 417014, resulting in the current property configuration and area.

The property interests are subject to a retained production royalty of 1.5%, payable on all coal produced to private stakeholders in the project, including directors of Colonial.

5.0 ACCESSIBILITY, CLIMATE, LOCAL RESOURCES, INFRASTRUCTURE AND PHYSIOGRAPHY

5.1 ACCESSIBILITY

The Huguenot property is remote relative to population centres, but is reasonably easy to access. Road access to the property from Tumbler Ridge is via Highway 52, a paved secondary road (along a section called the Heritage Highway), to an area just west of Stony Lake. Here the route swings southeast along the un-paved, all-weather, Wapiti Forest Service Road (FSR), which is also referred to as the OJAY Main Road. At kilometre 62 of the Wapiti FSR, the route turns west onto the Red Deer FSR (6200 Road). The Red Deer FSR continues southwest and eventually terminates within Huguenot's northern coal licenses, along the western side of Holtslander Creek. A reclaimed southern extension of the Red Deer FSR, named the Belcourt Road (R00224), was originally constructed to access an abandoned O&G well site west of the southern part of the property. No drill trails were ever constructed within this license block during previous coal exploration phases as all exploration activities were helicopter supported.

The Wapiti FSR (OJAY) is maintained year-round in good, drivable condition in support of extensive gas-field development and operational traffic, and seasonal forestry operations throughout the general area. In good weather conditions, it takes about one and a half hours to drive from the property to Tumbler Ridge and between three and four hours to travel to Dawson Creek, Fort St. John, or Grande Prairie.

5.2 CLIMATE

The climate is typical of northeastern BC; that is, short, warm summers and long, cold winters interspersed with periods of very cold temperatures, in the range of –15°C to –30°C. The cold spells usually happen between January and March, but may occur as early as mid-November. Frost can occur throughout the year and the frost-free period averages less than 60 days per year. Precipitation ranges between 800 and 1,100mm annually; it occurs mainly as snow from October through March, with snowfalls of up to 36mm in 24 hours. The snow pack persists from October to June. The prevailing wind direction is from the southwest and extended periods of high winds in excess of 20km/h are common on ridge tops and exposed plateaus from October to the following June. Throughout this foothills belt, coal exploration programs are typically conducted between June and October, although winter programs can be carried out where there is road access.

5.3 LOCAL RESOURCES & INFRASTRUCTURE

The property is situated approximately 175km east-northeast of the city of Prince George and 120km southwest of the city of Grande Prairie (Alberta); the smaller cities of Fort St. John and Dawson Creek are located approximately 197km to the north and 140km to the north, respectively. Each of these cities is serviced by regularly scheduled flights from major western Canadian cities such as Vancouver, Edmonton and Calgary. The location of the property with respect to main population centres is shown in Figure 4.1.

Accessibility, Climate, Local Resources, Infrastructure and Physiography

The town of Tumbler Ridge is situated approximately 83km north-northwest of the property. The town and most of the existing industrial infrastructure was built to support the Quintette and Bullmoose coal mines, the plant sites for which are situated 18km south, and 30km west of the town, respectively. The Quintette coal mine operated from December 1983 to August 2000 and the Bullmoose coal mine operated from 1984 to 2003. Production capacity at Quintette was rated at approximately 6Mtpa, while that of Bullmoose was 2.3Mtpa.

Coal mining in the Tumbler Ridge region re-started in 2006 with the opening of the Perry Creek (WCCC) and Trend mines (NEMI), with the Brule Mine (WCCC) entering production in 2007. In 2011, NEMI's coal properties were acquired by Peace River Coal Inc. (PRC), a subsidiary of Anglo American PLC while WCCC was bought-out by Walter Energy Inc. (Walter) in 2011. The downturn in coal markets in 2013 through 2016 caused all of the aforementioned mines to be put into care and maintenance. In 2017, the Brule and Perry Creek mines re-started operations under the ownership of Conuma Coal Resources Limited (Conuma), who bought the wholly-owned coal assets of Walter out of bankruptcy in 2016.

PRC's currently idled Trend coal mine is located approximately 25km south of Tumbler Ridge. Before going into care and maintenance (at the end of 2014), total washed metallurgical coal production for 2014 was an estimated 1.71Mt (BC Ministry of Energy and Mines, 2015). Conuma is producing coal at the Perry Creek and Brule open pit mines approximately 15km west-southwest and 60km northwest of Tumbler Ridge, respectively. For 2017, estimated washed coal production at Perry Creek and Brule was 1.14Mt and 2.33Mt, respectively (BCMEMPR, 2018). The Belcourt Saxon properties previously operated as a joint venture between Walter and PRC are now owned entirely by PRC.

A rail line (operated by CN Rail) terminates at the Quintette wash plant and coal load-out facility located approximately 17km south of Tumbler Ridge and about 75km northwest of the property. The plant and load-out are still in place and a high-voltage power sub-station is also located in this area. Using the current road network, the distance between the property and the Quintette rail load-out is approximately 140km. PRC's rail load-out facility is located 4km north of the Quintette load-out. The Tumbler Ridge rail line joins the CN Rail main-line just north of Prince George and provides direct access to the coal export facility at Ridley Island, Prince Rupert. The rail distance from the PRC load-out to the Ridley Island terminal is approximately 960km (see Figure 4.1).

An airstrip suitable for light aircraft is located adjacent to Red Deer Creek, approximately 10km north of the property. The Tumbler Ridge Airport is located approximately 70km north-northwest of the property. A permanent trailer camp is situated adjacent to the Red Deer Creek airstrip.

There have been no improvements made to the property.

With regard to potential future mining operations, the property covers an area sufficient to host potential tailings storage and waste disposal areas, and potential processing plant sites, subject to the acquisition of appropriate surface rights. The project is well located with respect to sources of manpower and water to support possible future mining.

5.4 PHYSIOGRAPHY

The property lies within the foothills (Inner Foothills Belt) of the Rocky Mountains, east of the Hart Ranges. The topography comprises a belt of hills and low mountains dominated by a series of NW-SE oriented ridges that reflect the trend of the geological structure of this region. These ridges are truncated by a series of mature, northeasterly flowing rivers and major creeks that comprise the primary drainage system. The property is situated approximately mid-way between two major rivers, the Narraway and Wapiti Rivers, located approximately 14km to the south and north, respectively.

Three main creeks cut through the project area. These are, from north to south, Holtslander Creek followed by the informally named Pika and C-1 Creeks (see Figure 4.3). All empty into Belcourt Creek which is the main drainage in the area. The upper reaches of Belcourt Creek trend E-W and approximate the southern boundary of the property; further east, this creek turns northward to join with the Wapiti River, northeast of the property. Several small creeks also drain the central and southern parts of the property and empty directly into Belcourt Creek.

A structurally controlled, secondary drainage system is also present. Creeks of this type are typically contained within steep-sided valleys that parallel the ridges and enter the rivers and main creeks at right angles. All but the major rivers appear to be affected at some point along their length by the secondary drainage trend.

The topography of the project area is typical of that of the Rocky Mountain Inner Foothills. The topography rises from rolling hills in the east to a series of moderate- to steep-sided massifs that break to stretches of gently-sloping plateau, culminating in steep-sided ridges, in the central and western areas. The highest ridges within the license block vary in elevation between 1,700 to 2,000m while the lowest elevations range between 1,200 and 1,300m. The vertical relief over most of the property is in the order of 400m. Broad alpine saddles often connect the ridges and these features, combined with the primary drainage orientation, occasionally impart an NE-SW-trending grain to the topography.

Vegetation in the area is predominantly boreal to sub-alpine coniferous forest. Tree line in this region varies between 1,750 and 1,800m; above these elevations the alpine vegetation consists of stunted and/or dwarf varieties of spruce and fir, juniper, moss, heather and other alpine tundra flora, and occasional sub-alpine meadows. Below about 1,500m the area is heavily forested, consisting mostly of sub-alpine Engelmann and white spruce, sub-alpine fir, and lodgepole pine. Douglas fir, balsam poplar, aspen, willow, and alder are also found. Bogs and black spruce stands cover some lower areas. The timber on most of the property appears to be of little if any economic interest, although merchantable stands of timber are present in some areas of lower elevation. Recent logging, evidenced by large cut-blocks, has taken place in the northern parts of the property, on either side of Holtslander Creek. In 2014 the Red Deer Creek Forest Fire burnt most of the northern portion of the project area, stopping approximately mid-way between Pika and C-1 Creeks. The limits of the fire are shown in a number of the illustrations presented in later sections of this report. Timber burnt by the fire has essentially been rendered non-merchantable, thus leaving only the unburnt belt of forest in the southern and southeastern parts of the property as being of any potential value.

Exposed rock is common above tree line and usually composed of sandstone and conglomerate. Such resistive units can often be traced for several kilometres. Coal seams can be mapped by tracing coal “bloom” that may be present at surface and by mapping resistant seam roof and/or floor lithologies. Rock exposures decrease significantly on the treed slopes where they are often limited to the bottoms and steep sides of creeks. Since the forest fire, additional exposed rock can be seen on satellite imagery in areas previously covered by trees and other vegetation. Various surface materials and soils are present. Colluvium is the dominant material at higher elevation with poorly developed regosolic soils in alpine areas. Brunisolic soils are dominant below tree line with podzols developed in areas of better moisture supply. Benches of moraine deposits with assorted luvisolic soils are sometimes present at lower elevations, and major valleys may contain areas of finer-textured lacustrine and scattered organic deposits (mostly as bogs), glacio-fluvial fans and terraces.

6.0 HISTORY

6.1 INTRODUCTION

The Peace River Coalfield extends for 400km within the northeast part of the province. Coal was first discovered in the area in 1793. Due to lack of infrastructure, mining was restricted to small operations serving local needs. Prior to 1980, less than 100,000 tonnes were mined (Ryan, 2002). The expansion of steel production in the mid-1960s, led by the Japanese steel mills, stimulated worldwide exploration for metallurgical (or coking) coal. In western Canada, exploration focused largely on coal deposits located within the Rocky Mountain Foothills of BC and Alberta. By the mid-1970s, most of the land within the Peace River Coalfield that contained a potential for surface and underground mineable coal, had been acquired by various mining and oil companies. Coal licenses stretched almost unbroken for a distance of over 300km, from the Alberta border in the southeast (the original Saxon property) to north of the town of Hudson's Hope. A similar situation exists today.

6.2 PRIOR OWNERSHIP

The current Huguenot property was once part of the original Belcourt coal property, which was acquired by Denison in 1970, based upon published regional geology. The old Belcourt property was made up of 55 contiguous coal licenses that totaled approximately 14,209ha. In April 1978, Denison entered into an agreement with Gulf to form the Belcourt Coal Joint Venture (BCJV); Denison, through its subsidiary Denison Coal Ltd, was manager of the project. Shortly thereafter, the property was expanded to 144 coal licenses that covered an area of 36,442ha. During Denison's tenure, most of the current Huguenot property was referred to as Holtslander South. Denison's old Huguenot Block referred to an area immediately south of Belcourt Creek and not to Colonial's current Huguenot property.

While large tonnages of high quality coking coal were defined in several deposit areas on the former Belcourt properties, these projects were never placed into production Denison subsequently fell into financial difficulties and the Belcourt coal licenses (amongst others) were forfeited to the crown in the early 1990s due to high carrying costs.

Between June 1995 and June 1997, two private BC companies (Ensync Resource Management and 528951 B.C. Ltd.) acquired coal licenses that covered selected portions of the old Belcourt property. These coal licenses were subsequently transferred to WCCC (subsequently, Walter) and formed the project upon which WCCC completed its initial public offering to become a publicly traded junior mining company. Except for one small area in the north, the licenses held by these companies did not extend into ground now covered by the current Huguenot property.

6.3 SUMMARY OF PREVIOUS EXPLORATION

Exploration programs conducted across the property consisted of detailed geological mapping, hand trenching, diamond drilling, geophysical logging, coal core sampling and sample testing. Aerial photography was carried out and topographic maps were prepared at various scales for general and detailed coverage. Ground control survey stations were established throughout the area and all drill holes were surveyed and topographic maps updated to incorporate these data. Reclamation was carried out on areas of surface disturbance. Several adits were constructed for bulk sampling purposes on adjoining ground, but none were driven on the current property.

Initial exploration by Denison was carried out in 1971; the program consisted of a limited geological reconnaissance to confirm the presence of coal seams within the Lower Cretaceous Gates and Gething Formations (see Section 9). No further work was carried out by Denison on any part of their property until 1975, when detailed mapping was performed. This was followed, in 1976, by the drilling of two core holes to ascertain seam thickness and coal quality data; one of these holes (BD7601) is located within the current Huguenot licenses. Denison conducted a trenching program in 1977 which, again, focused upon the current Huguenot property.

Much larger exploration programs were undertaken during the ensuing three years across the expanded Belcourt property, to gather information on geological structure, coal quantities and coal quality in order to identify potential mining areas. Between 30% and 40% of the work performed in 1978 was carried out on the current Huguenot property which, at that time, was one of the main resource target areas of the former Belcourt property. Much of the later work focused on potentially surface mineable deposits discovered in the Red Deer (Belcourt North) and Holtslander North (Belcourt South) deposit areas. No further field work was conducted on the former Belcourt property after 1980 until a small rotary drilling program was conducted by WCCC during the winter of 1998, on the northern part of the Belcourt South pit area. In 2005, BSCL undertook major drilling programs on the Belcourt North and Belcourt South coal deposits (Borntreager, et al, 2009) and at Saxon East, Saxon South and Omega.

Historical exploration activities conducted upon what is now the Huguenot property are summarized in Table 6.1. This table does not include additional data points that lie adjacent to the property that are of importance in defining the geology. The locations of drill holes and trenches that lie both within and in the immediate vicinity of the current Huguenot property are shown in Figures 6.1 and 6.2. No work has been conducted on or immediately adjacent to the Huguenot property subsequent to the 2005 Belcourt-Saxon exploration field programs.

TABLE 6.1 SUMMARY OF EXPLORATION ACTIVITIES – HUGUENOT PROPERTY, 1971 TO 1979

Year	Drill Holes	Depth (m)	Geophysical Logs	Hand Trenches	Mechanical Trenches	Geological Mapping	Other	Assess Report
1971	-	-	-			Recon.	AP/Topo	457
1975	-	-	-			1: 2500	AP/Topo	458
1976	1(D/NQ)	59	-			-	Topo	460
1977	-	-	-	25		-	mss	461
1978	5(D/HQ)	1,388	d,g,n,c,fr,dev	84		1: 2500	Topo	462/463
1979	2(D/HQ)	1,004	d,g,n,c,fr,dev	29		1: 2500		465

Note: (D/HQ and D/NQ) = diamond drill hole/core size; mss = measured stratigraphic section; AP/Topo = air photography and topographic mapping; d,g,n,c,fr,dev = density, gamma, neutron, caliper, focused beam resistivity, and deviation survey logs.

Detailed geological mapping was carried out as part of each exploration campaign, from 1975 onwards; data points were located using modified plane table, chain and compass traverses.

6.4 HISTORICAL RESOURCES

Various tonnage estimates were conducted by Denison/BCJV between 1975 and 1979. While their reports refer to these estimates as "reserves," they are not reserves as defined under NI 43-101, and no attempt been made herein to classify these historic estimates as resources compliant with NI 43-101 criteria.

The most recent of these historical resource estimates (Denison, 1979b) includes the area now covered by the Huguenot property. In-situ tonnages were estimated using the cross-section method and were reported for thickness cut-offs ranging from 0.50 to 3.0m taken to a nominal depth of 500m below surface. Coal seam criteria and estimation procedures conform to a reasonable standard and were selected and conducted by geologists well versed in the requirements of coal projects located in the foothills of northeastern BC. Most of the approaches towards data reduction and resource estimation employed in the 1970s are the same as those used today, differing mostly by the advent of digital geophysical logging and computerized data analysis and handling.

Perry and Morris (2010) reported historical estimates from unpublished, internal work by Colonial, where the historical tonnage estimates were re-stated, to adjust for the current Huguenot property boundary. Tonnage estimates for minimum mining thickness cut-offs were: 0.5m = 181Mt; 1.0m = 159Mt; 2.0m = 134Mt; and, 3.0m = 111Mt.

Stantec's QP has not done sufficient work to classify these historical estimates as current mineral resources and no attempt is made in this report to classify any of the resources referred to above into NI 43-101 compliant resources.

7.0 GEOLOGICAL SETTING AND MINERALIZATION

The Huguenot Coal Project lies within a belt of Mesozoic strata situated along the eastern flank of the Rocky Mountains of northeastern BC. These strata were uplifted during the Laramide Orogeny and now form part of the Rocky Mountain Foothills. Intense folding and thrust faulting strongly affected the strata during the mountain-building. The coal seams of greatest potential are found within Lower Cretaceous strata, consisting of the Bullhead and Fort St. John Groups. These strata can be characterized as alternating sequences of marine and non-marine clastic lithologies deposited from a series of transgressive - regressive sedimentary cycles in response to periodic uplift of the Cordillera.

The thickest coal seams are contained within the Gates and Gething Formations and are believed to have formed within deltaic and marine strand-plain depositional environments. Marine strata of the Moosebar Formation separate these two phases of continental sedimentation. Minor coal seams are present within stratigraphically lower (Minnes Group) and higher (Boulder Creek Formation) units. However, these coals are thin and are considered not to have economic potential. The stratigraphic sequence in the study area is shown in Figure 7.1 while regional correlation of coal seams at Huguenot correlated with those present to the northwest (at Belcourt) and to the southeast (at Omega) is illustrated in Figure 7.2. The relationships between the various formations that occur within and adjacent to the Huguenot property together with the main structural geological features are shown on the regional geology map, Figure 7.3.

The stratigraphic succession exposed in the Huguenot area ranges in age from late Triassic to Upper Cretaceous. Triassic rocks are of limited distribution, and are restricted to small areas where the major drainages have exposed the core of a regional anticlinorium (the Belcourt Anticlinorium). These are overlain by an Upper Jurassic to Upper Cretaceous sequence of inter-bedded clastic lithologies of both marine and continental origin, some of which contain coal seams. Brief descriptions of the Upper Jurassic and Cretaceous Formations encountered in this region are presented below.

7.1 REGIONAL STRATIGRAPHY

7.1.1 Minnes Group

This is a thick sequence that ranges in age from Upper Jurassic to Lower Cretaceous. The lower portion of this unit contains massive sandstones and conglomerates while the upper part mostly comprises cyclic beds of argillaceous, fine-grained sandstone, siltstone, carbonaceous shale and coal seams. Coal seams are numerous but they are usually less than one metre thick and are discontinuous. The change from Minnes Group strata to the overlying Cadomin Formation is abrupt. Locally, the contact is disconformable, although there is a marked angular discordance regionally.

7.1.2 Cadomin Formation (Bullhead Group)

The Cadomin Formation is the basal unit of the Lower Cretaceous Bullhead Group and mainly consists of massive to poorly bedded, coarse to very coarse-grained conglomerate. A layer of coarse-grained sandstone, located immediately below the conglomerate, is included within this formation. Typically, the conglomerate is poorly sorted and contains well-rounded pebbles, cobbles and boulders of black, white, and green chert, white and grey quartzite, quartz, and (in places) minor limestone. The clasts are set within a siliceous matrix of fine- to coarse-grained sandstone, although portions of the conglomerate may also be clast supported. Discontinuous, lenticular, sandy horizons may be present. Owing to its highly resistant nature, particularly in comparison with contiguous units, the Cadomin is usually well exposed and forms a prominent marker horizon throughout the region. This, together with the rust coloured gravelly weathering of the conglomerate, makes the Cadomin Formation one of the best stratigraphic markers in the region. The thickness of this formation is highly variable but appears to be in the order of 10m thick on the property.

7.1.3 Gething Formation (Bullhead Group)

The Gething Formation conformably overlies the Cadomin and forms the upper unit of the Bullhead Group. In the Huguenot area it ranges from 60 to 100m in thickness (averaging approximately 70m) although, regionally, it may be considerably thicker due to various depositional factors. It is primarily a non-marine sequence composed of fine- to coarse-grained, calcareous sandstones, conglomerate, siltstone, carbonaceous claystone, and thin coal seams. Conglomeratic units typically occur in the lower and middle parts of this formation while a series of brown, calcareous, lithic, thinly-bedded (0.5 to 1m), and cross-laminated sandstones predominate in the upper parts. These upper sandstones commonly contain pebbles and coal stringers and often exhibit bioturbation and soft sediment deformation.

Historical exploration reports describe three coal zones named, in ascending stratigraphic order, Zones A, B, and C, located near the base, middle and top of the formation, respectively. Although projected across the length of the property, correlations are tentative over large distances due to variable coal zone development and limited data. The lowermost zone (A) appears to be the best developed. Zone C is located just below the Gething-Moosebar contact; the stratigraphic position of this coal zone is similar to that of the Bird-GT zone which was initially planned to be mined at the currently idled Trend Mine.

The presence of thin interbeds of bentonite characterize the uppermost part of the formation, while the upper contact of the Gething is defined by a thin bed of pebble conglomerate with clasts set within a mudstone matrix that contains aphanitic glauconite. This glauconitic horizon is considered equivalent to the Bluesky Formation found further east, and signifies the start of marine sediments belonging to the overlying Moosebar Formation.

7.1.4 Moosebar Formation (Fort St. John Group)

The Moosebar Formation is the lowermost formation of the Fort St. John Group. The Moosebar Gething Formation contact is abrupt and is placed at the base of a thin glauconite-bearing conglomerate, which represents the onset of the Moosebar marine transgression. The Moosebar is separated into two zones; a lower claystone/shale zone and an upper zone composed of alternating claystone, siltstone, and sandstone layers. The lower part consists of approximately 20m of monotonous dark grey to black shale grading upward to laminated siltstone and claystone; numerous sideritic concretions are present throughout. These beds grade upwards into a sequence of alternating claystone, siltstone, and very fine-grained sandstone which form the upper part of the formation. The sandstone beds thicken and become more numerous upwards (together with an overall increase in grain size) with an attendant decrease and gradual disappearance of siltstone and claystone. This inter-layered sequence of sandstone, siltstone, and claystone represents the prodeltaic transition from marine sediments to massive continental sands at the base of the overlying Gates Formation.

The top of the Moosebar Formation is described as being at the base of the first thick sandstone unit (typified by the first sandstone bed that is at least one metre in thickness) within the Gates Formation. The arbitrary selection of the Moosebar - Gates contact contributes to regional variability in formation thickness. Consequently, the thickness of this formation is somewhat variable across the property, but averages about 70m.

The Moosebar shales are recessive weathering, and exposures are normally restricted to areas of high relief where creek channels or gullies often cut along the strike of the easily eroded beds.

7.1.5 Gates Formation (Fort St. John Group)

The Gates Formation conformably overlies the Moosebar Formation. The Gates contains the largest systematically explored coal resources within the North-East Coal Block and is the main coal-bearing unit within the project area. To the north, in the Quintette–Bullmoose area, the Gates is divided into three informal sub-divisions; namely, Torrens member, middle Gates and upper Gates. The main coal seams occur within the middle Gates while thinner, non-economic, coal seams are present within the upper Gates. No sub-division of the formation has been attempted in the Huguenot area, other than recognition of the Torrens member. However, significant coal seams are present in the equivalents of both the middle and upper Gates. At Huguenot, the Gates Formation averages approximately 310m in thickness. A generalized stratigraphic section through the Gates Formation is illustrated in Figure 7.4.

Gates coal seams appear to have developed directly on marine strandplains. Longshore drift of sand played an important role in the formation of these strandplains, which became isolated behind barrier bar delta fronts. Extensive freshwater lagoons developed, which became sites of significant peat formation (Legun, 2002). Thick, lateral accumulations of peat developed shoreward of thick, regionally extensive sheets of shoreface sand and gravel, traceable along strike for about 230km (Lamberson and Bustin, 1989).

The Torrens member forms the lowermost sub-division of the Gates Formation. It includes the transition zone strata above the Moosebar contact plus an overlying, resistive, sandstone unit that forms prominent cliffs and ridges that can be used to outline the various structural configurations of the coal measures. At Huguenot, the Torrens member ranges from approximately 40 to 45m thick.

The Torrens member is overlain by several cycles of coal deposition represented by fining-upward sequences culminating with coal deposition. Coal seams developed in the lower cycles, particularly Seams 1 and 5, typically show the greatest seam thickness and continuity (see Sections 7.5 to 7.7). In the Quintette area, the middle Gates is overlain by a massive medium-to-coarse-grained, conglomeratic sandstone and pebble conglomerate sequence, informally called the Babcock member. The lateral equivalent of this unit at Huguenot may be represented by a thick, sandstone-dominated sequence with occasional conglomeratic lenses, located above Seam 5.

This sandstone unit is overlain by predominantly finer grained lithologies consisting mostly of intercalating fine-grained sandstone, siltstone and claystone with several thin coal seams (Seam 6 to 10). A very thin bed of chert pebbles with ferruginous cement marks the contact with the overlying marine sediments of the Hulcross Formation.

7.1.6 Hulcross Formation (Fort St. John Group)

The Hulcross Formation is a marine sequence predominantly composed of blocky, medium to dark grey, sandy shale with thin interbeds of siltstone and very fine-grained, often laminated or cross-laminated, sandstone. Although there is some similarity between the Hulcross and Moosebar shales they can usually be distinguished by their relationships to surrounding strata and the absence of glauconitic sandstones at the base of the Hulcross. Across the Huguenot property, the Hulcross varies in thickness from approximately 30 to 40m.

The sequence becomes increasingly silty towards the top, and thicker sandstone interbeds develop, resulting in a gradational contact with the overlying Boulder Creek Formation. At Huguenot, the contact with the overlying Boulder Creek Formation is placed at the base of the first major sandstone unit.

7.1.7 Boulder Creek Formation (Fort St. John Group)

The Boulder Creek Formation is composed of three lithological units. The lower unit consists mainly of light grey, fine- to coarse-grained sandstone and is approximately 20m thick; coarse-grained sandstones, conglomerates and carbonaceous beds are common. The middle unit is approximately 30m thick and consists of predominantly grey to black claystone and siltstone with occasional coaly and carbonaceous horizons. The upper 35m consists mostly of fine- to coarse-grained, grey to brown, sandstone and grey siltstone. A thin pebble conglomerate with a siltstone to claystone matrix marks the upper contact with the overlaying Shaftesbury Formation.

The thickness of the Boulder Creek Formation tends to increase as the Hulcross thins; in the Huguenot area it ranges between approximately 85 and 90m in thickness.

7.1.8 Shaftesbury Formation (Fort St. James Group)

The Shaftesbury Formation can be divided into three units which, mapped elsewhere, are referred to, in ascending stratigraphic order, as the Hasler, Goodrich, and Cruiser Formations. Historical assessment reports for the old Belcourt property indicate that Denison's geologists were able to differentiate between these units, but there was no attempt to map them separately.

The lower unit consists of dark grey to black, sideritic claystone, siltstone, minor sandstone and localized thin pebble conglomerate. The unit is almost homogenous and bedding is discernible only through occasional appearance of resistant thin beds of sandstone. The middle unit is predominantly a grey to brown, medium-grained, laminated to medium-bedded to massive, micaceous sandstone. Carbonaceous claystone and siltstone occur as interbeds. The upper unit comprises dark grey to black, laminated to thin interbeds of silty claystone, siltstone and fine-grained sandstone. Pebble bands occur locally. This unit is characteristically light orange to red in colour due to weathering of ferruginous beds.

7.2 COAL SEAM DEVELOPMENT

Exploration conducted by Denison throughout the former Belcourt property concentrated upon defining potentially economic coal resources contained within the Gates Formation. Localized potential for Gething coal seams is indicated by several thin seams typically in the order of 1 to 2.5m thick. The potential for coal seams in other formations appears very limited. The exploration conducted by Colonial in 2008 focused on Gates Formation coal seams, although one drill hole to test Gething coal seams was also completed. Exploration conducted by Colonial in 2011 and 2012 was concentrated on defining the coal resource potential within the Gates Formation.

7.2.1 Gething

On the Huguenot property, the Gething Formation typically contains three coal zones. Historically, in ascending order, these have been referred to as Zones A, B, and C. The best developed of these is Zone A, which is situated just above the contact with the Cadomin Formation. This zone contains up to four coal splits, the thickest two of which occur near the top of the zone. These splits can exceed 1.5m in thickness, while the others are generally less than 1.0m thick. In one instance, Denison trenched an 8.2m coal seam within this lower zone. However, this intersection is likely the result of fault thickening.

Thick sandstone separates Zones A and B; this latter zone consists of several thin, poorly developed coal seams. Zone C is close to the Gething-Moosebar contact and consists of two or three thin coal splits. The stratigraphic position of this upper coal zone appears to be similar to that of the Bird-GT zone found at the Trend Mine.

Within the North Block, the Gething seams are designated, in ascending order, GT1, GT2, and GT3. Seam GT1 ranges from 1.75 (BD7811) to 2.17m (HR08-05), Seam GT2 varies from 0.32 to 0.61m, and GT3 is 1.2m thick. Although geological mapping, trenching, and drilling suggest that the Gething coal seams offer limited potential, additional work is warranted to fully evaluate these coal measures.

7.2.2 Gates

The Gates Formation is well established as being the most prolific coal-bearing formation in northeastern BC. From northwest to southeast, significant thicknesses of Gates coal first occur in the Bullmoose Mountain area and continue southeast to the provincial border (a distance of almost 140km) and beyond.

On the Huguenot property, coal seams and coal zones are numbered in ascending stratigraphic order with 1 representing the oldest and 10 the youngest. The term 'coal zone' has been used historically to encompass a number of closely-spaced coal horizons within a distinct lithological unit. Such units were used for correlation in areas where individual coal seams were difficult to recognize due to changes in seam characteristics or their transition into carbonaceous and coaly intervals. Individual coal splits within a coal zone were distinguished by letter (e.g., Seams 6A, 6B, 6C, and 6D). Wherever possible, historical seam/zone/split designations have been maintained, although some modifications have occurred based upon results from the more recent work.

Correlations have been established for the main coal seams across the Huguenot property, although continuous correlations have not been definitively demonstrated for some of the minor seams. Seam correlations are well established with the adjoining Belcourt South deposit, situated immediately to the north. The Torrens sandstone provides a marker horizon for the base of the Gates' coal measures. The more important characteristics of the seams that reach minimum mining section thickness criteria (i.e., 0.60m) are summarized in Sections 7.5 to 7.7.

7.3 STRUCTURE

Structural geology within the region is characterized by large-scale folding and associated thrust faulting within alternating layers of competent sandstone and incompetent mudstone and coal. The regional structural trend is NW-

SE, parallel to the Rocky Mountain structural belt. Structural style may vary along and across this trend reflecting differences in lithologies and distance from the Front Ranges of the Rocky Mountains.

Folding within stratigraphic units dominated by finer-grained lithologies can be extremely complex, often typified by short-wavelength, chevron folds. More competent sequences, such as those containing the coal measures, typically form macroscopic, long-wavelength folds ranging from relatively tight anticline-syncline pairs to open, box folds. Less competent strata, contained within the broader competent sequences, maintain the same structural style as the unit as a whole. Typically, the major fold axes plunge gently to moderately northwest or southeast. Folding of major fold limbs is uncommon but, where present, varies from gentle warps to chevron fold pairs.

Often, the macroscopic folds are cut by thrust faults that slice longitudinally through the belt of coal-bearing strata. Commonly, these structures dip towards the southwest, although smaller, northeasterly-dipping thrusts may be present. Within the major thrust sheets, faulting preceded folding; older thrusts are folded resulting in northeasterly-dipping, and northeasterly-verging, thrusts. On a regional scale, the large thrust faults display staircase-type geometry, characterized by wide “flats” sub-parallel to bedding, joined by narrow “ramps” oblique to bedding. The “flats” are often developed in less competent strata whereas “ramps” are generally contained within competent lithologies. The major faults tend to maintain a constant angle of about 30° to bedding. However, this is not always the case, particularly where smaller structures are involved and where thrusts die out. Minor thrusts frequently splay from the major faults.

7.4 PROPERTY GEOLOGY

The Huguenot Coal Project is located along the northeastern limb of a broad, northwest-plunging anticlinorium (the Belcourt Anticlinorium). Lower Cretaceous coal measures are located along the western and eastern margins of this structure, while Triassic and Jurassic strata occupy the central portions. The western extent of the anticlinorium is defined by a major, westerly-dipping thrust fault that emplaced Palaeozoic rocks upon the Lower Cretaceous strata. Eastward from the core of the Anticlinorium, the Cretaceous succession is continuous, the youngest strata being those of the Kaskapau Formation (Late Cretaceous). The Huguenot property is located within a narrow, northwesterly-trending band of tight to relatively open folds and associated northeasterly-verging thrust faults that have placed older units upon younger.

The Gates coal measures are repeated by two easterly-dipping and easterly-verging thrust faults, the Holtslander North and Holtslander South Thrusts. The main features of the property geology are depicted in Figure 7.5; cross-sections illustrating the main structural elements are presented in Figure 7.6 and 7.7. For descriptive purposes, the three structural slices are referred to as the North, Middle, and South Blocks.

The North Block sits structurally above the Holtslander North Thrust Fault and therefore sits structurally above the Middle and South Blocks. The Holtslander North Thrust Fault is interpreted to be the oldest of thrusts on the property. The coal measures occupy the western limb of a broad synclinal structure called the Holtslander Synclinorium. In the North Block area, this limb is near homoclinal with moderate northeasterly dips. Dip values decrease somewhat at depth, towards the axis of the fold.

The Middle Block, situated between the Holtslander North and Holtslander South Thrust Faults, exhibits moderate to steep, northeast-dipping, near-homoclinal strata that decrease in dip towards the south. A north-south-trending, upright, open, anticline-syncline pair is present along the eastern limit of mapping. Fault imbrications in the floor of the

Holtslander South Thrust are also present. A high-angle, eastward-dipping reverse fault, referred to as the Pika Fault, bisects the central portions of this block, repeating the Seams 1 to 6 Lower (6L).

The South Block lies structurally below the Holtslander South Thrust. Here, the coal measures occur as steep to very steep, mostly easterly-dipping beds that form the eastern limb of an asymmetric anticline. Vertical to steep, westerly-dipping, overturned beds occur within the eastern limb of this anticline and in the footwall of the thrust.

7.4.1 Mineralization

The following summary of coal seam descriptions and structural geology is divided into three parts, dealing with the North, Middle and South Blocks, respectively. Based on exploration programs carried out between 2008 and 2012 detailed information is available for all three blocks and resources have been estimated and reported under NI 43-101. In the discussion below, the term 'mining section' refers to that part of a coal seam that is considered to be potentially minable. Mining sections have been defined either from discrete coal seams where all, or most, of the coal-bearing interval forms a single mining section, or as parts of a coal zone where one or more coal layers occurring in relatively close vertical proximity to one another, form separate mining sections. Thin, internal, rock bands, if present, are included in the mining sections but thicker rock bands (in this instance 0.31m or more, as defined in GSC Paper 88-21) are omitted, even though, in practice, some would almost certainly be mined with coal in medium- to large-scale production scenarios. In the discussions presented below, the mining sections are taken to a minimum true thickness of 0.60m. Coal at Huguenot can form discrete coal seams of variable thickness, or form thin seams interbedded with coaly shale and carbonaceous shale to form coal zones which, in themselves, are mappable stratigraphic units. Some "zones" consist of only one mappable coal layer/ply where other zones may include multiple mappable coal layers.

7.5 NORTH BLOCK

A total of ten coal seams and/or coal zones are present within the North Block. Seam/coal zone nomenclature used in this report follows that used by Denison across their former Belcourt property; in ascending order they are numbered 1 through 10. The main coal splits that form part of a coal zone are assigned the number of the zone plus a letter. The letter 'A' indicates the lowermost coal split in a series; however, this is complicated in Coal Zone 6 by the presence of coal splits below Seam 6A. Consequently, this part of the zone is referred to as 6_L.

All seams/coal zones with the exception of Seams 7 and 10 provide potentially mineable coal intervals. The main coal seams are Seams 1, 5, 6B, and 8; these are the thickest and most laterally continuous of the coal seams. Typically, the minor seams (i.e., 2A, 3B/3B Lower ($3B_L$), 3D, 4, 6_L, 6A, 6C Lower ($6C_L$), 6D, and 9) meet seam thickness or coal to rock (C/R) ratio minimums only over portions of the blocks. Seams not considered to be potentially mineable, can still be traced geologically throughout the remainder of the block. Other coal seams/splits such as 3A, 8B and some splits above Seam 9 might locally exceed 0.60m in thickness but are not currently deemed to be persistent enough to present mineable targets.

The distributions of the main Gates coal seams are illustrated in Figure 7.5 while correlations of each of these coal seams are shown in Figures 7.8 to 7.10. Thickness ranges for the coal seams, together with mining section thicknesses extracted from those seams, are presented in Table 7.1. There is no evidence of thickening or thinning of coal seams due to structural deformation. The following text refers to specific drill holes; drill hole locations within the North Block are shown in Figure 6.1.

TABLE 7.1 NORTH BLOCK COAL SEAM & MINING SECTION TRUE THICKNESS RANGES

Seam	Seam Thickness (m)		Mining Section (m)		Mining Section Average Thickness
	Overall Minimum	Overall Maximum	Min. (>0.60m)	Max	>0.6m
9	0.22	0.67	0.66	0.67	0.67
8	2.56	3.38	2.56	3.38	3.02
6D	0.27	1.61	0.61	1.61	0.76
$6C_L$	0.22	0.88	0.60	0.60	0.60
6B	1.41	2.76	1.41	2.76	2.19
6L	1.08	4.95	1.08	4.95	1.87
5	3.39	8.34	3.39	8.34	5.93
4_U	0.34	0.84	0.60	0.84	0.71
3D	0.34	0.72	0.65	0.72	0.68
3B	1.25	1.44	1.25	1.44	1.37
$3B_L$	0.48	0.89	0.73	0.89	0.77
2A	0.49	0.89	0.60	0.89	0.72
1	1.49	4.39	1.49	4.39	3.41

The above seam true thicknesses are from drill data only

7.5.1 Seam 1

This is the basal seam within the Gates Formation and occurs approximately 40 to 46m above the Moosebar Formation contact and is persistent throughout the property. Seam 1 is well developed throughout the North Block. The true seam thicknesses are the same as those used for the mining sections and range from 1.49 (HR11-01) to 4.39m (HR08-14).

Seam 1 is characterized by a thick, comparatively clean lower section and an often thinner, but variable upper section that contains one to four thin, carbonaceous claystone bands. The development of these rock bands across the North Block is illustrated in Figure 7.8. The number of rock bands increases from the western end of the block (HR08-07) towards the east such that, immediately east of Holtslander Creek, where the 2012 large diameter cores were obtained, the upper part of the seam contains four main rock bands. Towards the eastern end of the block, the thickness of each of the coal splits separating these rock bands diminishes, such that Seam 1 is composed only of the lower coal section (see Figure 7.8, HR11-01), which accounts for the thinner mining sections in this part of the block. The floor of Seam 1 typically comprises a thin layer of claystone, often with carbonaceous bands, that overlies the fine- to medium-grained, resistant sandstone of the Torrens Member. This seam correlates to Belcourt South's Seam 1 lower.

Seam 1 and Zone 2 (also referred to herein as 2Z) are separated by approximately 15m of strata. These consist of almost equal thicknesses of interlaminated, fine-grained sandstones and siltstones at the bottom, fine- to medium-grained, calcareous sandstone in the middle and inter-bedded siltstone and claystone at the top.

7.5.2 Zone 2 (Seam 2A)

Coal Zone 2 typically varies from approximately 3 to 5m thick across the North Block. It consists of one main, relatively clean, basal coal split (2A) overlain by three, thin, coaly plies separated from one another by thin rock bands (Figure 7.8). Only Seam 2A is considered to be of potential economic importance. It always exceeds minimum thickness criteria except in the middle parts of the block (as seen in HR08-14 and BD7814). Where this seam shows thicknesses that exceed the minimum cut-off, it ranges from 0.60 (HR12-08 and HLD12-04) to 0.89m (HLD12-10) thick.

Zone 2 and Zone 3 are separated by approximately 6 to 20m of interlaminated siltstone, sandstone and beds of bioturbated, fine-grained, calcareous sandstone. The inter-seam thickness increases from west to east.

7.5.3 Zone 3 (Seams 3B/3B$_L$ and 3D)

This coal zone is composed of four coal splits separated by rock bands of variable thickness. In ascending order, the coal splits are named 3A to 3D (Figure 7.8). The overall thickness of the zone varies from 7.5 (HR08-07) to 14.5m (HR12-11): most of this thickness range is due to variations in the 3C/3D rock band. Only Seams 3B/3BL and 3D are considered to be of potential economic importance.

Seam 3B lies approximately 1 to 2.5m above 3A. A thin (0.15 to 0.40m) rock band is often present in the middle of the seam. This rock band thickens westward such that, west of Holtslander Creek, only the lower portion of this seam is thick enough to be of potential economic interest; here it is referred to as Seam 3BL. Where 3BL exceeds the minimum mining section thickness, it ranges from 0.73 (HR08-01 and HR12-11) to 0.89m (HR12-08) thick. East of Holtslander Creek, the mining section is represented by the full 3B coal split and ranges in thickness from 1.25 (HR11-03) to 1.44m (HR11-01). This seam is correlated with Seam 3 at Belcourt South.

Seam 3D is located between 2 to 8m above 3B. It forms a clean seam which ranges from 0.34 (HR08-07) to 0.72m (HR11-03) in thickness, but forms a mining section only in the central portion of the North Block in drill holes BD7814 (0.66m), HR08-14 (0.65m) and HR11-03 (0.72m).

The inter-seam separation between Zone 3 and Seam 4 ranges from approximately 57m in the west to approximately 30m in the centre of the block, around Holtslander Creek, and is approximately 18.5m in the east. The lower half of the sequence is predominantly calcareous, fine-grained sandstones with siltstone inter-beds; occasional conglomeratic lenses are present in the west. The sandstone-siltstone sequence is overlain by approximately 10m of claystone with several thin coal plies; this coaly horizon persists throughout the eastern half of the North Block and throughout the Middle and South Blocks. This, in turn, is followed by fine-grained, bioturbated, calcareous sandstone which is in contact with a carbonaceous zone below Seam 4.

7.5.4 Seam 4

Seam 4 typically consists of a lower, high-ash coaly horizon, referred to as 4 Lower (4_L), overlain by a relatively clean coal split called 4 Upper (4_U) (Figure 7.9). Only in the South Block is 4_L incorporated into a mining section with 4_U. Other than in the western portion of the North Block, Seam 4_U always forms a mineable thickness, ranging from 0.60 (HR08-01 and HR12-09) to 0.84m (HR11-03).

Seam 4 is separated from Seam 5 by approximately 10 to 20m of clean, fine-grained, calcareous sandstones with occasional silty laminae. This sequence thickens from west to east.

7.5.5 Seam 5

Seam 5 is one of the most consistently developed coal seams on the property and maintains potentially mineable thickness over the entire length of the Huguenot deposit. Within the North Block, prospective mining sections vary from 3.39 (HR08-07) to 8.34m (HR11-03) although most intersections are between 5 and 6m thick. Seam 5 is characterized by a relatively clean lower section (typically, 3.0 to 3.5m) and an upper section which contains one to three carbonaceous rock or poor coal bands (Figure 7.9). The most distinctive of these is situated immediately above the lower section and ranges in thickness between 0.15 and 0.30m. One to two thinner rock bands sit above this horizon. Floor and roof lithologies of Seam 5 consist of coaly/carbonaceous claystone with occasional thin coal stringers. Seam 5 correlates with Seam 5 at Belcourt South.

The inter-seam separation between the top of Seam 5 and the bottom of Zone 6 varies between approximately 12.5 and 35m. It is thinnest around drill hole HR08-01 but thickens to the west and east. The sequence is commonly composed of inter-layered claystone and carbonaceous claystone with minor siltstone and fine-grained sandstone lenses. In the east, where thickest, the inter-seam strata are dominated by a fining-upward, coarse- to medium-grained, sandstone sequence; thin conglomeratic lenses may also be present.

7.5.6 Zone 6 (Seams 6L, 6B, $6C_L$ and 6D)

Coal Zone 6 contains five main coal splits separated by rock bands that often contain thin coal plies. In ascending order, the coal splits of interest are named 6L, 6A, 6B, 6C, and 6D; for simplicity they are referred to below as coal “seams”. This zone exhibits variable thickness; in most of the drill holes it is approximately 20m thick, although it reaches approximately 27m in HR08-01 due to the presence of a sandstone lens between Seams 6A and 6B. The vertical separation between these coal seams varies across the block. In the west, Seams 6L and 6A (Figure 7.9) form a lower coal interval while Seams 6B, 6C, and 6D form an upper interval, with a 9 (HR08-07) to 16m (HR08 01) separation. The thickness between the upper and lower coal intervals decreases towards the central parts of the block such that, around Holtslander Creek, the coal seams have a more regular distribution through the zone, being separated from one another by between 2 and 5m. East of Holtslander Creek, 6L separates from 6A, which appears to stay closer to 6B.

For previous resource estimations, (Perry & Morris 2010) the 6B-6D coal interval was considered to form two mining sections. In the west of the block, the lower coal ply of Seam 6C ($6C_L$) was added to Seam 6B to form the composite mining section $6BC_L$. In the central and eastern areas, the interval between 6B and $6C_L$ thickens such that each coal split was evaluated separately; Seam 6D was always reported separately. However, for subsequent resource estimations, including herein, each coal split was evaluated separately. It should be noted that in most practical mining scenarios, the 6BCD section represented in the west of the block would potentially be mined in its entirety. Here, the 6B – 6D interval ranges between 3.84 (HB08-6CA) and 5.71m (HR08-01) in thickness. As the 2008 "bulk" sample was taken within the western part of the North Block, it represented the entire 6BCD interval and was treated as one continuous mining section (see Section 13). The 6BCD interval correlates with 6 Upper at Belcourt South.

Seam 6L is the lowest seam of potential economic importance within Coal Zone 6. In the North Block, 6L forms a concentration of coal splits and highly carbonaceous claystone and coaly bands that increase in coal content towards the east. Throughout most of the block, the 6L mining section is composed of two coal plies separated by a thin (0.15 to 0.30m) rock band. The mining sections vary in thickness from 1.08 (HR08-10) to 4.95m (HR12-05); they increase in thickness towards the east, eventually incorporating higher coal splits due either to a thickening of these splits or a thinning of the intervening rock band, or both. The 6L horizon continues to degrade northwesterly, to become a carbonaceous-coaly zone on the Belcourt South property (BD7801).

Seam 6A in the western part of the block is situated just above Seam 6L, being separated only by a thin (<1m) rock band. In the central and eastern portions of the block, 6L and 6A are separated by as much as 12m. Seam 6A is characterized by a central coal ply with thin rock bands near the floor and roof. It meets thickness cut off criteria in the west but has not been included in the resource estimates presented herein. It is poorly developed or absent in the eastern half of the North Block. The 6A-6B interval is quite variable in thickness, ranging from 8.80 (HR08-06) to 15.60m (HR08-01) in the west, but thins to 2.4m in the centre of the block (BD7814). At Belcourt South, 6A is called 6 Lower.

Seam 6B consistently forms a mining section throughout the North Block. Typically, it has a clean lower half and an upper half that contains one to two thin rock bands (Figure 7.10); the thicknesses of 6B ranges from 1.41 (HLD12-15) to 2.76m (HR11-03). West of Holtslander Creek, the 6B-6C parting decreases to between 0.2 to 0.3m such that the lower ply of 6C could be added to 6B, resulting in the composite mining section, $6BC_L$. Such a mining section would range in thickness from 2.44 (HB08-6C-B) to 3.33m (HR08-01).

Seam 6C is usually composed of two coal plies separated by a relatively thin rock band. The lower coal ply ($6C_L$) represents good coal while the upper ply ($6C_U$) is high in ash. Ply $6C_L$ meets the 0.60m thickness cut-off only in HD11-11 and HD11-12. As stated above, data from other drill holes demonstrates instances where thinner intersections of $6C_L$ could be incorporated with Seam 6B to form a $6BC_L$ mining section. Where incorporated into the composite mining section $6BC_L$, the $6C_L$ ply varies between 0.22 and 0.88m in thickness.

Seam 6D is the uppermost seam in Zone 6. It is a relatively clean seam which occasionally has a thin band of high-ash coal or coaly rock near its centre. This seam is consistently developed throughout the North Block although it can locally drop below the mining section thickness cut-off. Mining sections vary between 0.61 (HR08-07) and 1.61m (HLD12-14).

The inter-seam separation between Zone 6 and Zone 8 typically ranges between approximately 70 and 80m. The inter-seam strata are composed of a sequence of fine-grained sandstones with siltstone inter-beds which fine upward into a claystone to carbonaceous claystone sequence. It should be noted that several uneconomic coal plies and a series of small carbonaceous bands are present within the claystone sequence; these are loosely referred to as Zone 7. The strata above Zone 7 contain occasional sandstone and siltstone interbedded lenses.

7.5.7 Zone 8 (Seam 8)

This coal zone is composed of two component seams called 8 and 8B. Overall, this zone ranges in thickness from approximately 5 (HR08-06) to 7m (HR11-11).

Seam 8 ranges from approximately 2.56 (HR12-01) to 3.38m (HB08-8A) and is characterized by relatively thick lower and upper coal plies, separated by a rock band (Figure 7.10). The lower coal ply varies in thickness from approximately 1.20 to 2.10m, contains a thin 0.2 to 0.3m rock band near its top and has a thick, relatively clean, bottom section. The main rock band varies between approximately 0.30 and 0.75m in thickness and sometimes contains a thin coal ply. The upper ply typically ranges in thickness from 0.80 to 1.30m, has a clean top half and a high-ash bottom section due to one to two thin rock bands. A thin rider is situated between approximately 0.20 and 0.45m above the main seam. Although in some instances, the internal rock band might exceed NI 43-101 guidelines, in most practical mining scenarios Seam 8 can be expected to be mined in its entirety. The bulk samples taken to date have treated the entire coal seam accordingly (see Section 11).

Seam 8B is situated approximately 1.5 to 4.0m above Seam 8. It comprises a thin, relatively clean, coal split that falls below the 0.60m true thickness cut-off.

The separation between Zone 8 and Seam 9 ranges between approximately 13 to 19m, although for most of the block it is at the higher end of this range. The strata consist of fine- to medium-grained, siliceous sandstone which grades upward into a claystone/siltstone sequence, followed by a carbonaceous interval which forms the floor of Seam 9.

7.5.8 Seam 9

Seam 9 is a thin coal seam that tops a coaly to carbonaceous interval (Figure 7.10). Mining thicknesses are restricted to the eastern half of the North Block and range from 0.66 (BD7814) to 0.67m (HD11-11).

The separation between Seam 9 and Zone 10 is approximately 18m and consists of variable thicknesses of interbedded siltstone and claystone with sandstone horizons.

7.5.9 Zone 10

Zone 10 has been intersected only in holes HD11-11 and HD11-12 where it comprises a pair of thin coal seams separated from one another by approximately 1m of rock. Neither of these thin seams offers economic potential in the North Block.

7.5.10 Structure

The structural geology of the North Block is illustrated on the structure contour maps for Seams 1, 5, and 8 (Figure 7.11) and is shown on the cross-sections (Figures 7.12 to 7.15). The North Block sits structurally above the Holtslander North Thrust Fault. Gates Formation coal measures occupy the western limb of a broad synclinal structure called the Holtslander Synclinorium. In the west, the strata are near homoclinal with moderate (approximately 45°) north-northeasterly dips. To the east, the strike swings easterly such that dips are to the north.

Dips are also steeper in the east, reaching approximately 50°. Dip values decrease at depth to between 30° and 35°, reflecting proximity to the axial zone of the syncline.

7.6 MIDDLE BLOCK

A total of ten coal seams and/or coal zones are present within the Middle Block. All seams/coal zones with the exception of Seam 7 provide potentially mineable coal intervals. The main coal seams are Seams 1, 5, 6L, and 8; these are the thickest and most laterally continuous of the coal seams. Minor seams 2A, 3B, 4_U, 6B and 9 meet seam thickness and C/R ratio minimums across the Middle Block, whereas seams 2D, 2EF, 2HI, 6D and 10 meet mining section criteria locally. Where these latter seams do not meet seam thickness or C/R ratio minimums, they can still be traced geologically. Coal seams in the Middle Block are progressively terminated towards the south by the Holtslander South Thrust Fault such that the lowermost seams only extend as far south as the central portion of the block. Only seams stratigraphically higher than Seam 6B are present at the southern end of the block.

The distributions of the main Gates coal seams are illustrated in Figure 7.5 while correlations of each of these coal seams are shown in Figures 7.16 to 7.18. Thickness ranges for the coal seams, together with mining section thicknesses extracted from those seams, are presented in Table 7.2. Occasional fault repeats are present in the section as are some instances of fault-thinning. Seam thicknesses provided below exclude any structural thickened or thinned values. The following text refers to specific drill holes; drill hole locations within the Middle Block are shown in Figure 6.2.

TABLE 7.2 MIDDLE BLOCK COAL SEAM & MINING SECTION TRUE THICKNESS RANGES

	Seam Thickness (m)		Mining Section (m)		Mining Section Average Thickness
Seam	Overall Minimum	Overall Maximum	Min (>0.60m)	Max	>0.6m
10	0.60	0.98	0.60	0.98	0.73
9	0.64	0.96	0.64	0.96	0.77
8	1.27	2.71	1.27	2.71	1.72
6D	0.48	0.83	0.66	0.83	0.74
6B	0.64	1.24	0.64	1.24	0.89
6L	1.86	4.98	1.86	4.98	3.27
5	4.37	9.71	4.37	9.71	6.55
4_U	0.75	1.58	0.75	1.58	1.10
3B	0.61	1.08	0.61	1.08	0.82
2HI	0.23	0.98	0.98	0.98	0.98
2EF	0.73	1.43	0.99	1.43	1.21
2D	0.41	1.32	1.09	1.32	1.20
2A	0.70	2.17	0.70	2.17	1.07
1	3.77	9.94	3.77	9.94	7.88

The above seam true thicknesses are from drill data only

7.6.1 Seam 1

Seam 1 is essentially the same as seen in the North Block, that is, it is a consistently developed seam characterized by a thick, comparatively clean lower section and a thinner upper section that contains one to two thin, carbonaceous claystone bands (Figure 7.16). Mining sections range from 3.77 (HR11-09) to 9.94m (HD12-06) and the seam thickens from north to south. Localized thinning of Seam 1, similar to that seen in the eastern portion of the North Block (HR11-01) does not appear to be present. Seam 1 is not present in the southern half of the Middle Block as it is truncated to the south against the Holtslander South Thrust Fault (Figure 7.5).

Inter-seam separation between Seam 1 and Zone 2 measures approximately 2.5 to 8m. The strata consist of a coarsening-upward sequence comprising claystones with occasional thin coaly horizons at the base to interlaminated, fine-grained sandstones and siltstones at the top.

7.6.2 Zone 2 (Seams 2A, 2D, 2EF and 2HI)

Coal Zone 2 typically varies from approximately 3.34 to 13.19m thick and is similar to the North Block in that it consists of one main, relatively clean, basal coal split (2A) overlain by three, thin, coaly plies (2D / 2EF / 2HI) separated from one another by thin rock bands (Figure 7.16). Seam 2A exceeds minimum thickness criteria across the block, ranging from 0.70 (HR11-06) to 2.17m (HR11-12) thick. Seams 2D, 2EF and 2HI only exceed minimum true thickness criteria in the central part of the Middle Block in drill holes HR11-12 (2D = 1.32m; 2EF = 0.99m; 2HI = 0.98m) and HD12-06 (2D = 1.09m; 2EF = 1.43m). As with Seam 1, Zone 2 is not present in the southern half of the block as it terminates against the Holtslander South Thrust Fault.

Zone 2 and Zone 3 are separated by approximately 20 to 40m of interlaminated siltstones and sandstones. Claystone horizons are present immediately below Zone 3.

7.6.3 Zone 3 (Seam 3B)

This coal zone is composed of four coal splits separated by rock bands of variable thickness. In ascending order, the coal splits are named 3A to 3D (Figure 7.16). The overall thickness of the zone varies from approximately 5.3 (HR11-09) to 6.3m (HLD11-03). Within the Middle Block, only Seam 3B is considered to be of economic importance.

Seam 3B lies approximately 1.5m above 3A. It varies between 0.61 (BD7906) and 1.08m (HLD11-03) in thickness and exhibits similar characteristics to 3B intersections from the eastern half of the North Block, particularly the presence of a thin rock band near the middle of the seam.

The inter-seam separation between Zone 3 and Seam 4 ranges from 35m in the northwest to approximately 50m in the central-south part of the block. This is a mixed sequence of sandstone with occasional thin conglomeratic lenses, and inter-bedded siltstone and claystone horizons. At Pika Creek, the sandstones likely represent channels as they vary from only a few metres in thickness to approximately 15 to 20m over short distances (as may be seen in HLD11-03, HR11-09 and HR11-06). Such thick sandstones have not yet been encountered elsewhere within this sequence. Typically, a coaly zone consisting of three to four coal splits over a 3 to 5m interval is present just below Seam 4. This horizon (CZ4L) persists throughout the southern half of the North Block and throughout the Middle and South Blocks.

7.6.4 Seam 4

Seam 4 typically consists of a lower, high-ash, coaly horizon, referred to as 4_L overlain by a relatively clean coal split called 4_U (Figure 7.16). Throughout the Middle Block, Seam 4_U always forms a mineable thickness, ranging from 0.75 (BD7906) to 1.58m (HLD11-03).

In the northern part of the Middle Block, Seam 4 is separated from Seam 5 by approximately 26m. This interval comprises a coarsening-upward sequence of siltstone, silty sandstones, and sandstones, eventually succeeded by 2 to 4m of interbedded claystone/siltstone and sandstone that immediately underlies Seam 5. The inter-seam sequence thins to the southeast such that, in the mid-portion of the block, it is approximately 12.5m thick. Here, while the sequence still coarsens upward, the strata are finer grained and the sandstones are essentially missing.

7.6.5 Seam 5

Seam 5 mining sections vary from 4.37 (HD11-04) to 9.71m (BD7805). From north to south, this seam extends approximately three-quarters of the way through the Middle Block and terminates against the Holtslander South Thrust Fault southeast of drill holes HD11-04 and BD7805 (Figure 7.5).

As seen in the North Block, this seam is characterized by a relatively clean lower half and an upper half that contains one to three carbonaceous rock or poor coal bands (Figure 7.17). The most distinctive of these is situated immediately above the lower half; another distinctive rock band is sometimes present near the top of the seam. Both the floor and roof lithologies of Seam 5 consist of coaly/carbonaceous claystone with occasional thin coal stringers.

The inter-seam separation between the top of Seam 5 and the bottom of Zone 6 varies between approximately 12 and 50m although it mostly varies between 23 and 36m. It is thinnest around drill hole BD7805 and thickest in drill hole HD11-08. The sequence is commonly composed of inter-layered claystone, siltstone and sandstone lenses; thicker sandstone units, possibly representing channel sands are often present at differing horizons within this sequence. A thin coal horizon may occasionally be present near the middle of the sequence.

7.6.6 Zone 6 (Seams 6L, 6B and 6D)

The most important coal seams within Coal Zone 6 are Seams 6L, 6B and 6D. The other seams (6A and 6C) are often represented but, where present, they either do not attain potentially economic thickness or they contain too many (or thick) rock bands. This coal zone varies in thickness from approximately 30 to 49m; the wide thickness range is often due to the presence of sandstone lenses. Seam 6L is separated from the sequence that contains 6A - 6D; this separation typically makes up 65 % to 75 % of the overall zone thickness.

Seam 6L is the lowest seam of potential economic importance within Coal Zone 6. It forms a far more “coherent” coal seam than is present throughout most of the North Block, although minor coal splits in the roof and/or floor can complicate seam picks (Figure 7.17). Throughout most of the block, the 6L mining section contains two to three rock bands. Mining section thickness varies from 1.86 (BD7805) to 4.98m (HD11-08).

Although thin, Seam 6B forms a consistent mining section throughout the Middle Block. This seam typically has a relatively clean lower section and an upper section containing one or two thin partings (Figure 7.17). The thickness of 6B across the Middle Block ranges from 0.64 (HR11-04) to 1.24m (HR11-15).

Seam 6D is the uppermost seam in Zone 6. It forms a mining section only at the southeastern end of the property in drill holes BD7805 (0.66m) and HD11-03 (0.83m) (Figure 7.18). Throughout the rest of the Middle Block, 6D does not meet the minimum thickness cut off and/or is too high in ash to be considered a potential mining section.

The inter-seam separation between Zone 6 and Seam 8 typically ranges between approximately 64 and 86m. The inter-seam strata are composed of a sequence of fine-grained sandstones with siltstone inter-beds and interbedded siltstone and claystone. A number of coal splits are present over a wide interval; these form a loosely defined Zone 7. None of the Zone 7 coal splits are currently considered to have economic potential.

7.6.7 Seam 8

Seam 8 ranges from approximately 1.27 (HR11-04) to 2.71m (HLD11-01). In most drill hole intersections, it is characterized by a relatively thick lower coal ply with one or more rock bands in the upper half of the seam (Figure 7.18). In the northern half of this block, Seam 8 is essentially the same as that described for the North Block. The rock bands thicken towards the south such that the potential mining sections need to be adjusted to eliminate one or more of the upper rock bands (and associated coal splits) in order to maintain acceptable C/R ratios. The thin rider seen in the North Block is sometimes present. Seam 8B is not present in the Middle Block.

The separation between Seams 8 and 9 thickens from north to south, ranging from approximately 13 to 20m. The strata mostly consist of finer-grained lithologies, with occasional thin sandstone horizons, except for the central area where a thick sandstone occupies the lower part of the sequence.

7.6.8 Seam 9

Seam 9 is a consistently thin coal seam that occurs throughout the block. One or two thin coal splits are often present in the roof (Figure 7.18). Mining thickness ranges from 0.64 (HR11-04) to 0.96m (HR11-07).

The separation between Seam 9 and Seam 10 varies from approximately 7.5 to 12.5m and typically comprises variable thicknesses of interbedded siltstone and claystone with sandstone horizons which sometimes demonstrate a gentle coarsening-upward sequence until just below Seam 10.

7.6.9 Seam 10

Seam 10 has been intersected across the Middle Block. It forms a single seam with one or two very thin rock bands and ranges in thickness from 0.60 (HR11-11) to 0.98m (HD11-06).

7.6.10 Structure

The structural geology of the Middle Block is illustrated on the structure contour maps for Seams 1, 5 and 8 (Figure 7.19) and is shown on the cross-sections (Figures 7.20 to 7.26). The Middle Block sits structurally below the Holtslander North Thrust and above the Holtslander South Thrust. The coal measures occupy the western limb of a broad synclinal structure called the Holtslander Synclinorium. At the northern end of the Middle Block the strata dip northeasterly, between 45° and 55°. Dip values increase to between 50° and 85° towards the centre of the block, decreasing to between 30° and 65° at the southern end. A northerly-trending, open, upright, anticline-syncline pair is mapped along the eastern edge of the thrust slice. These structures are interpreted to affect the Holtslander South Thrust as well as the overlying coal measures.

7.7 SOUTH BLOCK

Of the 10 coal seams and/or coal zones present within the South Block all seams/coal zones except 3, 7 and 10 provide potentially mineable coal intervals. The thickest and most laterally continuous of the coal seams are Seams 1,2Z, 4, 5, and 6L; Seams 6B, 6D, 8 and 9 are present in the southern half of the block. The distribution of the Gates coal measures within the South Block is largely determined by the presence and attitude of the Holtslander South Thrust Fault. Surface traces of the stratigraphically higher coal seams (above 6L) are progressively terminated towards the north by this thrust fault; this fault also forms the northern limit of the coal seam traces and of the South Block as defined herein.

The distributions of the main Gates coal seams are illustrated in Figure 7.5 while correlations of each of these coal seams are shown in Figures 7.27 and 7.28. Thickness ranges for the coal seams, together with mining section thicknesses extracted from those seams, are presented in Table 7.3. Occasional fault repeats are present in the section as are some instances of fault-thinning. Seam thicknesses provided below exclude any such fault-thickened or -thinned values. Structurally thickening other than by recognisable fault repeats has not been observed within this block. The following text refers to specific drill holes; drill hole locations within the South Block are shown in Figure 6.2.

TABLE 7.3 SOUTH BLOCK COAL SEAM & MINING SECTION TRUE THICKNESS RANGES

Seam	Seam Thickness (m)		Mining Section (m)		Mining Section Average Thickness
	Overall Minimum	Overall Maximum	Min. (>0.60m)	Max	>0.6 m
9	0.19	0.62	0.62	0.62	0.62
8	0.64	1.95	0.64	1.95	0.96
6D	0.39	0.79	0.79	0.79	0.79
6B	0.58	0.92	0.85	0.92	0.89
6L	1.48	4.98	1.48	4.98	3.00
5	2.59	6.65	2.59	6.65	4.37
4	1.43	2.32	1.43	2.32	1.93
2Z	2.00	5.18	2.00	5.18	3.64
1	1.44	3.71	1.44	3.71	2.99

The above seam true thicknesses are from drill data only

7.7.1 Seam 1

Seam 1 mining sections range from 1.44 (HD11-07) to 3.71m (HD12-02), although throughout most of the South Block this seam exceeds 2.72m in thickness. The seam is thinnest in the northern third of the block, ranging between 0.58 (HD11-05) and 1.44m (HD11-07). Seam 1 is essentially the same as seen in the other two blocks (Figure 7.27), with the exception of HD11-05 (0.58m) located in the northern-central portion of the block, where the seam is considerably thinner; it is not clear if this is due to stratigraphic or structural reasons.

Throughout the South Block, Zone 2 lies in very close proximity to Seam 1, essentially forming one overall coal zone. The greatest rock thickness between the two seams is 2.30m (HD11-05) but, generally, this rock band is less than 0.40m thick.

7.7.2 Zone 2

Coal Zone 2 typically consists of three main coal splits, separated by two rock bands; other minor rock bands may be found within each of the main coal splits. Individual coal split and rock band thicknesses vary, but the zone maintains reasonably constant characteristics throughout all of the drilled intersections (Figure 7.27). Overall zone thickness ranges from 2.00 (HD11-07) to 5.18m (BD7914).

Zone 2 is separated from Seam 4 by approximately 60 to 105m. The lower strata are composed principally of interlayered sandstone and conglomerate while the upper strata comprise a mixed sequence of interbedded siltstone, claystone and sandstone. Coal Zone 3 is represented only by Seam 3D, which is always too thin to comprise a mining section. Seam 3D is situated in the upper parts of the inter-seam sequence, approximately 9 to 23m below Seam 4. Seam 3D is overlain by the coaly zone referred to as CZ4L; the separation between this coaly zone and Seam 4 increase southwards, from 2m in HD11-05 to 13m in HD11-02.

7.7.3 Seam 4

Seam 4 (Figure 7.27) is a combination of the upper and lower splits that are seen in the Middle and North Blocks where they are referred to as 4_U and 4_L, respectively. The lower portion is composed either of several, thinly-interlayered coal plies and rock bands, or two coal plies separated by one thin rock band, plus a thin rock band that separates 4_L from 4_U. Typically, this latter rock band is only one or two decimetres thick. The upper coal split is comparatively clean of rock bands. Overall, Seam 4 ranges in thickness from 1.43 (BD7914) to 2.32m (HD11-07).

At the northern end of South Block, Seams 4 and 5 are separated by approximately 15m of coarsening-upward strata represented, in ascending order, by siltstone, silty sandstones, and sandstones. These are overlain by 2 to 4m of interbedded claystone and siltstone immediately below Seam 5. The inter-seam sequence thins rapidly to the southeast such that, south of HD11-05, the thickness stays within the range of approximately 0.70 to 4.50m.

7.7.4 Seam 5

Seam 5 mining sections vary from 2.59 (HD11-01) to 6.65m (HD11-07). As seen throughout the other blocks, this seam is characterized by a relatively clean lower half and an upper half that contains one to three carbonaceous rock and poor coal bands (Figure 7.27). This seam thins from north to south, due to the loss of the uppermost coal ply (or plies) and associated rock band(s). The seam floor comprises a coaly zone consisting of thin coal plies and carbonaceous claystone.

The inter-seam separation between Seam 5 and Zone 6 (i.e., 6L) varies between approximately 31 to 47.5m, although most of the intersections extend over the narrower range of 31 to 38m. The bottom portions of the inter-seam sequence comprise a claystone - siltstone unit that, in the south, contains a thin channel sandstone horizon.

This is overlain by a predominantly sandstone - siltstone, fining-upward sequence, with interbedded claystone at the top.

7.7.5 Zone 6

Complete Zone 6 intervals have only been intersected in the southern half of the South Block. In the northern half of the block, drilling has missed the upper portions of this zone either due to drill hole placement or to the northward termination of near-surface projections of this zone against the underside of the Holtslander South Thrust Fault. In the southern part of the block, Zone 6 varies in thickness from approximately 32 to 66m. The thicker intervals are attributed to the presence of sandstone lenses. Similar to the Middle Block, Seam 6L is separated from 6A - 6D; this separation typically comprises 75 % to 80 % of the overall zone thickness.

Seam 6L is the only seam of economic importance within Coal Zone 6 across the entire South Block, with mining section thickness varying from 1.48 (BD7914) to 4.98m (HD11-02). This seam typically contains two rock bands; one is located near the roof and the other just above the floor (Figure 7.28). The floor of this seam occasionally comprises a coaly zone consisting of thin coal splits and stringers and highly carbonaceous claystone.

Seam 6B, while thin, forms a mining section only in the southern part of the South Block. It is intersected twice in HD12-03 due to a fault repeat, and ranges in thickness from 0.85 to 0.92m.

Seam 6D is the uppermost seam in Zone 6. It also only forms a mining section in the southern part of the block, where it was intersected by drill hole HD12-03 (0.79m).

The inter-seam separation from the top of Zone 6 to Seam 8 is approximately 105m. The sequence consists of interbedded claystone and siltstone with thin, fine-grained sandstone layers. A number of coal splits are present over a wide interval; these form a loosely defined Coal Zone 7; none of these splits are currently considered to have economic potential.

7.7.6 Seam 8

Seam 8 has only been intersected in the southern half of the South Block as near-surface projections of this coal seam are cut off to the north by the Holtslander South Thrust Fault. The seam ranges from approximately 0.64 (HD11-09 and HD12-03) to 1.95m (HD11-01). It is characterized by two coal splits, each of similar thickness to one another, separated by a rock band. In some intersections, a thinner, rock band - coal ply pair is present at the top of the seam (Figure 7.28); this might be equivalent to the rider seam seen elsewhere. Seam 8B is not present in the South Block.

The separation between Seams 8 and 9 is approximately 15 to 26m. The strata mostly consist of interbedded claystone and siltstone with occasional, thin, fine-grained sandstone layers.

7.7.7 Seam 9

Seam 9 is a consistent, thin coal seam that occurs throughout southern part of the block. One or two very thin rock bands may be present near the top of the seam. Seam thickness ranges from 0.19 (HD12-01) to 0.62m (HD11-01); the latter represents the mining section thickness for this block (Figure 7.28). Seam 9 has only been intersected in the southern half of the South Block as near-surface projections of this coal seam are cut off to the north by the Holtslander South Thrust Fault.

7.7.8 Structure

The structural geology of the South Block is illustrated on the structure contour maps for Seams 1, 5, and 8 (Figure 7.29) and is shown on the cross-sections (Figures 7.23 to 7.26). The South Block forms the lowest structural unit. Most of the coal seams are contained within steep, easterly-dipping beds (60° and 75°) which steepen towards the south (70° and 85°); they are often overturned along their up-dip sections (to provide very steep, southwesterly dips). These strata form the eastern limb of an asymmetric anticline, the fold axis of which almost defines the western limit of the coal measures. This anticline may represent the eastern side of a large northerly-trending, box fold.

8.0 DEPOSIT TYPES

This section discusses the designation of the Huguenot property's North, Middle and South Blocks coal deposits for which formal resource estimations are presented (see Section 14), in terms of both 'Geology Type' and 'Deposit Type' as defined in GSC Paper 88-21 ("A Standardized Coal Resource/Reserve Reporting System for Canada").

8.1 GEOLOGY TYPE

The following is extracted from GSC Paper 88-21:

"Four categories of geology type are proposed to address differences in the complexity of seam geometry within deposits. These differences may result both from sedimentary processes at the time of coal deposition and from subsequent deformation, which may have folded and faulted the coal measures. Primary categories are termed low, moderate, complex, and severe."

The North and Middle Blocks of the Huguenot property are considered to conform to the Moderate Geology Type. Although the dip of the strata in these blocks at times exceeds 30° it is consistent and the coal seams can be traced and correlated easily across the area. The South Block is considered to be Complex Geology Type. These geology types are defined as:

- Moderate – "Deposits in this category have been affected to some extent by tectonic deformation. They are characterized by homoclines or broad open folds (wavelengths greater than 1.5km) with bedding inclinations of generally less than 30°. Faults may be present, but are relatively uncommon and generally have displacements of less than ten metres. Deposits in this category would include many of the outer Foothills coalfields in western Alberta (and) some deposits farther west in the Front Ranges of the Rocky Mountains."
- Complex – "Deposits in this category have been subjected to relatively high levels of tectonic deformation. Tight folds, some with steeply inclined or overturned limbs, may be present, and offsets by faults are common. Individual fault-bounded plates do, however, generally retain normal stratigraphic sequences, and seam thicknesses have only rarely been substantially modified from their pre-deformational thickness. Most of the coal deposits in the inner Foothills and Front Ranges of western Alberta and BC are included in this category."

8.2 DEPOSIT TYPE

The following is extracted from GSC Paper 88-21:

"Deposit type refers to the probable extraction method that would be used to recover coal, as the mining method in many instances dictates the manner of calculating quantification parameters such as seam thickness. Four categories are proposed and are designated surface, underground, non-conventional, and sterilized. Surface mineable deposits are those that would be extracted by removal of overburden from the surface using truck/shovel, dragline or other mining techniques. Underground mineable deposits would be extracted utilizing room-and-pillar, shortwall, longwall or hydraulic techniques from surface drivages". The North, Middle and South Blocks deposits are considered to be potentially Surface and Underground Mineable deposits.

9.0 EXPLORATION

The relative location of exploratory trenches in the project area can be seen on Figures 6.1 and 6.2.

9.1 DENISON 1971 – 1979

Details of Denison's exploration conducted between 1971 and 1979 are presented in Section 6.3 of this report and a discussion of the results obtained from their work is presented in Section 6.4. All the detailed work was carried out from 1975 onwards; the only work conducted prior to 1975 was reconnaissance mapping during 1971. Exploration targeted coal seams contained within the Lower Cretaceous Gates and Gething Formations (see Section 7). In 1976, one core hole was drilled on the current property to ascertain seam thickness and coal quality data (Denison, 1977). Twenty-five hand trenches were dug during 1977 as part of a detailed mapping program. Between 1978 and 1979, seven core holes were drilled and 113 hand trenches excavated; 1: 2500 scale mapping was also carried out. In total, 2,451m of core were obtained from 8 diamond drill holes, and 138 hand trenches excavated. Resource estimates as a result of Denison's historical work have been summarized in previous reports by Perry and Morris (2010) and Evenson (2012).

9.2 COLONIAL 2008

Colonial first carried out exploration on Huguenot in 2008; fieldwork commenced in early September and was completed by the end of October.

Due to access considerations, work focused on the northern part of the property and was essentially confined to the upper thrust slice (i.e., the North Block). The proposed Belcourt South surface mine (of BSCL) is situated immediately north of the Huguenot property; the southern pit limit comes to within 477m of the property boundary. The geology of Huguenot's North Block is an extension of that defined within the Belcourt South deposit. The purpose of the 2008 work was to confirm and refine the geological interpretation, coal quality and resources previously outlined by Denison and BCJV between 1970 and 1980 and to demonstrate geological, coal seam and coal quality continuity between the North Block and the Belcourt South coal deposit.

Exploration was undertaken throughout the North Block although drilling, mechanized trenching, and associated trail construction was restricted to the northwestern half of the block (i.e., the area northwest of Holtslander Creek). South of the creek, only geological mapping and hand trenching were carried out; some of these activities also extended onto adjacent portions of the Middle Block. Exploration personnel were housed at a local, permanent camp. The main exploration activities carried out during the 2008 program are summarized in Table 9.1.

TABLE 9.1 SUMMARY OF 2008 - 2012 EXPLORATION ACTIVITIES

Year	Hand Trenches	Mechanical Trenches	Geological Mapping	Access Trail (km)	Surveying
2008	36	19 (246m)	Rec. & 1:2500	5.5	Drill Holes/Trenches/Trails
2010	-	-	-	4.2	Drill Holes/Trails
2011	-	-	1:2500	3.2	Drill Holes/Trails
2012	5	-	1:2500	1.1	Drill Holes/Trenches/Trails

Nineteen back-hoe trenches totaling approximately 246 linear metres and 36 hand trenches were excavated. The back-hoe trenches were geologically logged to provide infill data on seam continuity, characterization, thickness, and for roof and floor bedding measurements. Hand trenches were constructed to confirm continuity of the coal seams and provide data regarding the precise positions of the exposed seams plus bedding dips. Of the 36 hand trenches, 13 were excavated on the northwest side of Holtslander Creek and 23 were completed to the south. A number of the trenches south of Holtslander Creek were positioned to confirm the location of coal seams at the sites of trenches excavated by previous operators in 1978/79. Many of the trenches have been used to provide data points for resource classification purposes.

Detailed geological mapping was carried out to further define outcrop locations, seam thicknesses and strata geometry to aid in structural interpretations; data points were located using modified plane table, chain and compass traverses. Approximately 5.5km of access trail was constructed.

9.3 COLONIAL 2010

Exploration was carried out during the months of August and November. For both phases, personnel were housed at a local, permanent camp.

August's activities focused on re-surveying most of the 2008 drill hole locations which had originally been surveyed using a handheld GPS. A total of 18 drill holes were resurveyed using a more accurate geodetic survey system. Additional activities included the reconnaissance of potential future drill sites and identifying possible access routes for the planned 2011 drill program.

Access trail reconnaissance and construction was undertaken during November. Approximately 1,500m of newly excavated trail was constructed and approximately 2,700m of previously excavated trail was modified. This work focussed on providing access to the eastern half of the North Block and to the northern parts of the Middle Block.

9.4 COLONIAL 2011

In 2011, fieldwork commenced in early July and was completed by the end of October. Exploration personnel were housed at a local, permanent camp.

Work focused on the Middle and South Blocks and was designed to confirm and refine the previous geological interpretations and to demonstrate geological, coal seam and coal quality continuity within these blocks. In addition to drilling, the main exploration activities included geological mapping, surveying and trail construction. Seven old trenches from the (1970s) were located, re-opened and re-surveyed as part of the geological mapping work.

Work on newly constructed trails and re-opening/modification of existing trails totaled approximately 3,200m. This provided access to drill sites across the eastern half of the North Block and to the northern parts of the Middle Block.

9.5 COLONIAL 2012

In 2012 fieldwork again commenced in early July and was completed by the end of October. Exploration activities occurred on each of the three resource blocks. Personnel were housed at a local, permanent camp.

Work was undertaken within the central part of the Middle Block and southern half of South Block to confirm and refine the previous structural geology interpretations and to demonstrate geological, coal seam and coal quality continuity within these blocks. A large diameter core program was carried out in the central part of the North Block to advance definition of coal quality, coal washing and carbonization parameters.

In addition to drilling, exploration activities included geological mapping, surveying and trail construction. One old trench from the (1970s) was located and re-opened and five new hand-trenches were dug, in support of geological mapping. Approximately 1,012m of new access trail was constructed along the eastern slopes of Holtslander Creek in support of the large diameter core drilling.

The results obtained from the 2008, 2011 and 2012 exploration, in conjunction with selected data from historical programs, are sufficient for the definition of the targeted coal seams across the North, Middle and South Blocks and allow reliable resource estimation and classification plus coal quality characterization. Details of the results obtained and interpretations formed from the 2008, 2011 and 2012 exploration are presented together with the retained historical data in Sections 10 through 14 of this report.

10.0 DRILLING

Drilling activities carried out on the Huguenot property are summarized in Table 10.1; drill hole locations are shown in Figures 6.1 and 6.2. The first hole drilled on the property was by Denison in 1976, as a follow-up to earlier mapping and trenching programs in order to confirm initial coal seam thickness estimates and coal quality. Widely-spaced, helicopter-supported drilling was carried out by Denison and BCJV during 1978 and 1979 to provide information for structural geological interpretation, resource estimation and coal quality characterization. The information gathered during these programs is contained in historical Assessment Reports listed in Section 27.

Drilling conducted in 2008 focused on the area northwest of Holtslander Creek. The purpose of the 2008 work was to demonstrate geological, coal seam and coal quality continuity between the North Block and the Belcourt South coal deposit and to provide sufficient data to allow estimation of North Block coal resources and coal quality. The 2008 drilling program consisted of 17 air rotary holes and 10 large diameter (152mm) core holes. In order to obtain an adequate size of bulk sample for the required analyses, two sets of large diameter coal core were recovered for each seam.

The drilling conducted in 2011 focused mostly on the Middle and South Blocks and was designed to confirm and refine the previous geological interpretations and to demonstrate geological, coal seam and coal quality continuity within these blocks. Limited drilling was also carried out in the North Block. During the 2011 drilling program 16 air rotary holes, 13 diamond core holes, and 4 large diameter (152mm (2 holes) and 85mm (2 holes)) core holes were completed.

The focus of the 2012 drilling conducted by Colonial was to obtain additional large diameter core samples for coal testing and analysis and to conduct additional HQ diameter diamond core hole drilling in the Middle and South Blocks to refine the previous geological interpretations. During the 2012 drilling program 11 air rotary holes, 6 diamond core holes, and 19 large diameter (152mm) core holes were completed. In order to obtain an adequate size of bulk sample for the required analysis, three sets of large diameter coal core were recovered for each main target seam.

Drill holes were geophysically logged to provide density, gamma, neutron, caliper, focused beam resistivity, deviation, and, in some 2008 drill holes, dip meter logs. Drill hole angles vary across the property from vertical to approximately 60° from surface. For non-vertical drill holes, azimuths vary across the property from approximately N. 175° to N. 255°.

Drilling on the Huguenot property currently totals 104 for all types of drill hole, for an overall total of 13,697m. Historical drilling accounts for 8 holes (totaling 2,451m), while drilling conducted by Colonial from 2008-2012 totals 96 holes (for 11,246m). Details of historical and recent exploration are provided in Sections 6 and 9.

Drilling

TABLE 10.1 DRILLING SUMMARY

Year	Operator	Core (HQ)	Air Rotary	Large Diameter (Bulk Samples)	Total Holes	Metres Drilled	Geophysical Logs
1976	Denison	1 (NQ)	-	-	1	59	-
1978	Denison – Gulf JV	5	-	-	5	1,388	d,g,n,c,fr,dev
1979	Denison – Gulf JV	2	-	-	2	1,004	d,g,n,c,fr,dev
2008	Colonial	-	17 (1,623m)	10 (422m)	27	2,045	d,g,n,c,fr,dev, (+/- dm)
2011	Colonial	13 (3,399m)	16 (3,006m)	4 (332m)	33	6,737	d,g,n,c,fr,dev
2012	Colonial	6 (964)	11 (602)	19 (898)	36	2,464	d,g,n,c,fr,dev
Total		**27**	**44**	**33**	**104**	**13,697**	

Note: Large diameter = air rotary + 152mm or 83mm (PQ3) core; m = metres; d,g,n,c,fr,dev,dm = density, gamma, neutron, caliper, focused beam resistivity, deviation survey, and dipmeter logs.

The geology of the property has been characterized from geological mapping, trenching, drill core descriptions, and interpretations of geophysical logs obtained from both core and non-core holes. Analytical data obtained from HQ-size drill core and bulk sample large diameter cores have been used for coal quality characterization.

In addition to the drilling shown in Table 10.1, the drill hole database also contains hole BD7801. This drill hole is located within the Belcourt South deposit area and lies approximately 800m north of the property boundary. Data from this drill hole has been used to provide additional control for the northernmost portions of the North Block, but is not included in Table 10.1.

Coal seam thicknesses from exploration drill holes are measured along the length of the hole. As the angle of intersection between the hole and the seam is often not perpendicular, these intersections represent an ‘apparent’ rather than ‘true’ thickness of the seam. Adjustment from apparent to true seam thickness has been made for coal resource estimation as outlined in Section 14.

11.0 SAMPLE PREPARATION, ANALYSES AND SECURITY

11.1 SAMPLING METHOD AND APPROACH

Historically, apart from one hole drilled for NQ-sized core, all drill samples from Huguenot coal seams were obtained from HQ-sized cores produced by diamond drilling. Other than for two PQ-sized core holes drilled in 2011, diamond drilling conducted by Colonial since 2008 provided HQ-size core to sample the coal seams. In addition, in the North Block and near the northern end of the Middle Block, selected seams were sampled using large diameter drilling.

For core samples, these general procedures were followed: at the drill rig, cores were placed into numbered wooden boxes that were covered prior to transport to camp for description and sampling. In some instances, a plastic liner was used to wrap the coal core sections. Drill cores were described for general lithology, bed thickness and structural data. Coal seams were logged in detail; the coal was logged according to 'brightness'. Typically, coal seam samples were placed into plastic sample bags, with the large samples often being double-bagged. These plastic sample bags would then be packed together into larger plastic or burlap bags and trucked to the selected laboratory for testing. Each sample bag contained a sample tag that recorded drill hole number, seam, and sample number; in some instances, the sampled interval and initial analyses required were also added. All but the latter information was also written on the outside of the sample bags. A second set of sample tags was retained by the company.

None of the sample collection was conducted by an employee, officer, director, or associate of Stantec.

11.1.1 Large Diameter Core (2008 - 2012)

- Since 2008, Colonial has used large diameter cores for bulk sampling. All cores were described and sampled at the drill rig by Colonial's geologists. Sample increments were selected on a geological basis (modified as necessary for core recovery).
- Sample thickness ranged up to 1.4m; the minimum sample size was predicated by the need for sufficient weight required to complete a variety of analyses. Rock bands and poor (high ash) coal plies were usually taken as separate samples if greater than 0.10m thick.
- Samples of rock were taken at the roof and floor of each coal seam to determine the nature of potential out-of-seam dilution that would occur during mining. The bulk samples included all coal and non-coal plies that were considered to form part of a practical mining section (which, in certain cases, required the inclusion of some rock bands normally excluded from resource estimations due to GSC Paper 88-21 criteria).
- Core recoveries were determined by reconciling the core descriptions with the detailed density geophysical logs. The majority of coal seam recoveries from the large diameter core drilling ranged between 80% and 96%although the overall range was from 16% and 100%.

11.1.2 HQ Core (2011 - 2012)

Coal handling, description and sampling procedures used by Colonial in 2011 and 2012 for HQ-size core are as follows:

- All core samples were sent to independent laboratories for testing.
- For each sample, the entire core was submitted for analysis. Immediate roof and floor lithologies were also sampled.
- Core recoveries were obtained by comparing the lithological logs to the detailed density geophysical logs. For the coal seams, recoveries varied widely, however approximately 65% of the coal seams of interest reported greater than 50% core recovery. Coal quality data from seams with lower than desired core recoveries should be used with caution.
- The samples were shipped by Canadian Freightways to Birtley Coal & Mineral Testing (Birtley) (a division of GWIL Industries) in Calgary, Alberta.
- Coal core logging and sampling followed prescribed guidelines to ensure a consistent approach by each geologist. The approach used for sample selection is consistent with industry standards.

11.1.3 Discussion

All 2008, 2011, and 2012 drill holes that intersected the coal measures were geophysically logged for gamma ray, sidewall density, calliper, focussed beam resistivity, neutron, deviation and, for several holes drilled in 2008, dip meter logs. The geophysical logs were evaluated for lithological types in addition to comparison and reconciliation of the detailed density logs to coal seam core descriptions, in order to ensure accurate determinations of seam thickness, identification of internal lithological variations, core recoveries and appropriate characterization of any missing core.

In northeast BC, coal core recovery from HQ-size core drilling of Gates Formation coal seams is often highly variable. While core recoveries of less than 100% could potentially impact reliability of results, characterization of Gates Formation coal quality data typically rests on those coal seam intersections that show the highest core recoveries supported by bulk sample data from adits (yielding 100% recovery) and/or large diameter core (often with very high recoveries). Drill data from intersections with moderate or low core recoveries have been used in a semi-quantitative to qualitative way to either extrapolate or confirm basic coal quality data across the deposit.

For Gates coal seams, potential sample bias is of concern mostly with regard to quantification of in-situ ash content and, hence, S.G. and washing yield. The variability exhibited for in-situ ash content primarily reflects the thickness and continuity of in-seam rock partings. Although inherent ash produces some variability, its effect is usually minor in comparison to the in-seam partings. Rock partings and coal splits are quantifiable from the geophysical logs and so the effects of minor rock and/or coal loss can reasonably be mitigated by mathematical adjustments to the coal quality data. Consequently, it is considered that coal quality data presented herein are representative and that any sample bias is within laboratory and industry standards.

In order to establish the roof and floor of a seam (and, hence, the mining thickness) where there are multiple interbedded rock bands and coal splits, or where there are one or more thin coal splits near the seam roof or floor, a theoretical (plant) yield was determined using assigned S.G.'s for rock and coal. Peripheral rock bands and coal splits were incorporated into the coal seam until overall seam theoretical yield fell below 60% while maintaining, with minor exceptions, the thickness criteria for coal and rock inclusion and exclusion outlined in the GSC Paper 88-21 guidelines.

The results obtained from representative samples and composites are presented in Section 13 of this report.

11.2 LABORATORIES

Sample preparation and analysis was carried out at commercial laboratories experienced with requirements for coal testing, and can be summarized accordingly:

For the 2008 to 2012 large diameter and HQ-sized cores, samples were sent to Birtley in Calgary, Alberta. Subsequently, blends of washed (clean), simulated product metallurgical coal from these seams were submitted to CanmetENERGY, (Canmet) Ottawa for carbonization testing using Carbolite and/or sole heated ovens (SHO). Pearson & Associates (Pearson) (Victoria, B.C.) carried out coal petrographic analyses.

Each laboratory adheres to internal QA/QC protocols and criteria. Elements of quality control employed by Colonial included reviews of analytical data obtained from incremental (in-seam) samples and full seam sample composites. This involved comparisons of various results obtained from one sample (e.g., for ash vs. S.G. and/or ash vs. FSI) and for composited data sets representing individual coal seams. Also included were comparisons of analyses with core descriptions and/or detailed geophysical logs. Samples deemed to be anomalous, or potentially anomalous, were re-analyzed. Minimal re-analysis of samples obtained from the 2008, 2011 and 2012 Huguenot exploration was required; the few performed, principally required re-analyses of ash content and FSI.

The laboratories used for the 2008, 2011 and 2012 programs are recognized across the Canadian coal industry and internationally for their expertise and experience in coal testing and analysis. Birtley subscribes and adheres to Quality Associates International®, LLC's Coal/Coke Quality Conformance Program™ (CQCP™). This is a quality system designed specifically for accreditation of coal and coke laboratories using American Society for Testing and Materials (ASTM), Committee D 05 on Coal and Coke, standards. Canmet is an internationally-recognised research and testing institute and is part of Natural Resources Canada. Dr. David Pearson (of Pearson) is an Accredited ICCP (International Committee for Coal & Organic Petrography) Petrographer, and is Canada's representative on ISO/TC27 Working Group 19 (on Coal Petrography), and wrote the section on sample preparation of the new ISO 7404 "Methods for the Petrographic Analysis of Coals". Therefore, it is the opinion of the authors of this report that the sample preparation, security and analytical procedures meet current industry standards.

The analytical methods used by Birtley are shown in Table 11.1.

TABLE 11.1 ASTM PROCEDURES USED (BIRTLEY, 2008/2011/2012)

Parameter	Lab Method
Preparation of Coal Samples	ASTM D 2013
Air Dried Moisture Loss%	ASTM D 3302
Residual Moisture wt%	ASTM D 3173
Ash wt%	ASTM D 3174
Volatile Matter wt%	ASTM D 3175
Sulphur wt%	ASTM D 4239

Parameter	Lab Method
Specific Gravity	ISO 1014 (modified)
Calorific Value (Cal/g)	ASTM D 5865
Free Swelling Index	ASTM D 720
Carbon, Hydrogen, Nitrogen wt%	ASTM D 5373
Light Transmittance% (Oxidation)	ASTM D 5263
Hardgrove Grindability Index	ASTM D 409
Ruhr Dilatation	ASTM D 5515
Gieseler Fluidity	ASTM D 2639
Mineral Analysis of Ash	ASTM D 3682
Phosphorous Analysis of Ash	ASTM D 2795
Sieve Analysis	ASTM D 4749
Washability (Float/Sink)	ASTM D 4371
Froth Flotation	ASTM D 5114

11.3 SAMPLE PREPARATION AND ANALYSES

11.3.1 Large Diameter Core 2008

Bulk samples taken by Colonial during the 2008 programs consisted of two sets of large diameter cores for Seams 6(BCD), 5 and 1 and three sets of large diameter cores for Seam 8 (third core required due to poor coal seam recoveries). One additional large diameter core was obtained for Seam 6L for preliminary coal quality tests.

For the four sets of paired cores, work on the first set of samples included the following:

- Each core was dropped seven times; photographs were taken before drop shatter and after the 2nd, 4th & 7th drops. After the 7th drop the core was sized from 3-inch down to 100 mesh and the +3-inch was crushed to pass 3-inch and re-screened.
- Dry attrition was then performed; each core was tumbled for three minutes (no steel cubes). Core was then wet crushed for five minutes (water & steel cubes prorated for weight). Core was then screened from 1¼ inch down to 325 mesh. The +1¼ inch size fraction was then crushed to pass 1¼ inch and re-screened.
- Representative sub-samples (⅛) were taken from each of the full 1¼ inch x 16 mesh fractions; sub-samples were taken from splits of the -16 mesh fractions and screened down to 325 mesh. All screen sizes were then analyzed for percent ash and a simulated head raw sample was made up from these screen sizes and analyzed for proximate, sulphur, FSI and S.G.
- Composites were made up for each of the four seams and float/sink analysis was performed on the 1¼ inch x ⅜ inch, ⅜ inch x 16 mesh, and 16 x 60 mesh at the following S.G.s: 1.30, 1.35, 1.40, 1.45, 1.50, 1.60, 1.70 & 1.80. Three seams were re-floated, at 1.55 (Seams 5 and 8) and at 1.65 S.G. (Seam 6BCD), to provide further detail over a reduced S.G. range.

- A representative split of the 60 mesh x 0 size fraction was frothed by the modified tree flotation procedure in which kerosene and MIBC (methyl isobutyl carbinol) were used as collector and frother. The modified tree flotation required the sample to be frothed and the froth and tails to be re-frothed in order to produce 3 froth and 3 tail stages, pulp density was 8%. This was intended to simulate what would happen in a plant froth cell. The rest of the 60 mesh x 0 size fraction was bulk frothed at 10% pulp density to simulate the 2nd stage percent yield and percent ash obtained from the modified tree flotation results.

- All float, sink and froth fractions were analyzed for proximate (moisture %, ash %, volatile matter % and fixed carbon %) and FSI, except for the tree flotation sinks, that were analyzed for ash only.

- After examining the float/sink results the bulk float sinking of the 16 x 60 mesh size fraction was done at 1.75 S.G.

- Simulated CCCs for each of the four seams were made up from the S.G. and froth fractions in the correct proportion as per the cut-points determined by Colonial in conjunction with Stantec. The +16 mesh fractions used the -1.55 floats for Seams 5 and 8, the -1.60 floats for Seam 1, and the -1.65 floats for Seam 6BCD to target an overall ash content of approximately 8% for all seams combined.

- The clean products were analyzed for proximate, sulphur, FSI, Gieseler fluidity and dilatation, mineral analysis of ash, calorific value, Hardgrove Grindability Index (HGI) and S.G.; petrography splits were sent to Pearson.

- An overall simulated seam product (SSP) was made up from these four CCCs calculated in the correct proportion according to yield of each CCC. This SSP was analyzed for proximate, sulphur, phosphorus, S.G. and FSI.

Once work on the first set of cores was complete, the set of second cores were crushed to pass 1¼ inch; each seam was then screened at 16 mesh and 60 mesh. The 1¼ inch x 16 mesh and 16 x 60 mesh fractions were bulk washed at the same gravities selected for the first cores (above), while the -60 mesh x 0 fractions were bulk frothed using the same parameters selected previously. Samples split from the floats/froths and sinks/tails were analyzed for ash.

Simulated CCCs for each of the 4 seams was compiled from the S.G. and froth fractions in the correct proportion and were analyzed for proximate, sulphur, FSI, S.G., dilatation, and Gieseler fluidity. Finally, an overall SSP was made up from each of the four seams CCC using proportions determined from the overall yields from the first set of cores (these yields were considered to be more representative due to higher core recoveries). This SSP was analyzed for proximate, sulphur, S.G., and FSI.

An overall, clean, “product” weighing 450kg (332kg from the second SSP and 118kg from the first SSP) was formed from the SSPs derived from each set of cores. A 5kg representative split was taken for proximate, sulphur, FSI, S.G., dilatation, Gieseler fluidity, ultimate, and mineral analysis of ash with a sub-split sent to Pearson for petrography. Three barrels (445kg in lined drums) of this clean “product” were sent to Canmet in Ottawa for carbonization tests.

11.3.2 Large Diameter Core 2011

In 2011 six seams were sampled from large diameter cores; four seams (9, 8, 6L, and 5) were taken as 6-inch cores and two seams (2A and 1) were taken as PQ-sized cores. Coal sample preparation and analyses procedures were the same as those described above for the 2008 large diameter core, with the following exceptions:

- Each large diameter core was dropped 12 times in comparison to 7 times in 2008. No photographs were taken.
- No ply analysis was performed on individual/combined seam samples.
- No dry attrition tests were performed.
- No bulk froth flotation tests were performed.
- No simulated clean coal product composite was produced from any combination of the various seams sampled.
- Simulated CCCs were formed for each individual seam by compositing float and froth products, which targeted ash contents of approximately 8%, but which also took yield values into account. For the +16 mesh material, floats were selected at S.G. cut points 1.50 for Seam 6L and 1.60 for Seams 9, 8, 5 and 2A/1. For the 16 x 60 mesh material a 1.70 S.G. cut point was selected for all of the seams. For the 60 mesh x 0 fraction, F1 froths were selected using the modified tree froth flotation method. Due to the very low core recovery for Seam 1 and the small sample weight for Seam 2A, these two samples were combined. The weight of Seam 1 was further supplemented by the addition of coal from HD11-12, in order to reach the weight necessary for carbonization testing.
- CCCs of each of the main seams were sent to Canmet for SHO carbonization.

No Carbolite oven testing was performed.

11.3.3 Large Diameter Core 2012

Bulk samples taken by Colonial during 2012 consisted of three sets of large diameter cores from Seams 8, 6B, 6L 5, and 1. Certain coaly zones from the roof or floor of Seams 8, 6L, 5 and 1 were also sampled within these cores. One core sample was also taken from Seams 4_U, 3D and 3B for preliminary coal quality testing. The three cores from each seam were labeled A, B and C, where Core A represented the seam with the highest core recovery.

The coal sample preparation and analyses procedures followed in 2012 were similar to those undertaken in 2008, with the following exceptions:

- Each Core A was dropped 12 times in comparison to 7 times in 2008. No photographs were taken.
- The float/sink analyses for Core A included 1.55 and 1.65 S.G. for all seams.
- CCCs from Core A were analyzed for ultimate analysis, forms of sulphur, equilibrium moisture and light transmittance. Some Core A CCCs were also analyzed for calorific value.

- Ply analysis was performed on a ⅛ portion of Core B.
- Core B (⅞ portion) and Core C (100%) were used to make up the simulated clean coal product.
- A modified froth flotation process was undertaken using the starvation method to obtain a low ash product. In this procedure, the coal sample is initially placed into a container, mixed for 10-20 seconds to ensure the coal is wetted and allowed to stand for 3 minutes. The sample is then transferred to a Denver Floatation cell, topped-up with water and one half of the frothing reagent is added. The pulp is conditioned for 2 minutes before frothing; once the air is turned on, froth is scraped off for 2-3 minutes (time varies) until Froth 1 is exhausted. The 2nd half of the reagent is then added. The pulp is conditioned for another 2 minutes; the air is turned on again and the second froth is scraped off until completion (Froth 2). Once flotation is finished, Froth 1, Froth 2 and tails are filtered and dried.
- Simulated CCCs for each of the 5 main seams were made up by compositing float and froth products primarily targeting ash contents of approximately 8%, but also taking into account yield values. For the +16 mesh material, floats were selected at a S.G. cut point of 1.50 for Seams 8, 6L and 1 and 1.55 for Seams 6B and 5. For the 16 x 60 mesh material a 1.60 S.G. cut point was selected for all seams. For the 60 mesh x 0 fraction, F1+F2 froths were selected using the modified froth starvation method.
- CCCs of each of the main seams were sent to Canmet for SHO carbonization.
- A 554kg simulated clean coal product of the 5 main seams was made up in approximate proportion to the 2012 seam resource distribution for North Block and sent to Canmet for Carbolite and SHO carbonization tests.

11.3.4 HQ Core 2011 - 2012

Sample preparation and analyses procedures followed for HQ-size core in 2011 and 2012 are summarized below. In addition to the coal seams, a number of seam roof and floor coaly zones also underwent testing and analysis; the testing of these coaly zones was often less comprehensive than the coal seams. Laboratory procedures were as follows:

- All ply samples were air- dried and crushed to -⅜ inch; retains were re-crushed until 100% passed the ⅜ inch screen. One-eighth by weight was taken for preliminary tests and for subsequent head raw analysis (if required), while the remainder was retained for float/sink (washability) tests and succeeding analyses.
- Initial analyses were then performed on both coal and rock ply samples. For coal plies, these included: as received moisture (%), and, on an air-dried basis, Proximate, total sulphur % (S), FSI and S.G. Rock samples were analyzed for as received moisture (%), and, on an air-dried basis, moisture%, ash%, S% and S.G.
- Selected coal seam (and coaly zone) ply samples were proportionally combined (by weight), using the retained (⅞) fraction, to form a seam composite.
- Head raw analysis comprising air-dried proximate, S%, S.G. & FSI was performed on each seam composite.

- The composites were divided into two screen size fractions. These were 3/8-inch x 60 mesh and 60 mesh x 0. Screen sizing analysis was run for each size fraction where Weight, Ash%, S and FSI were determined.
- A series of float/sink tests were conducted for the ⅜ inch x 60 mesh size fraction using the following S.G.: 1.40, 1.50, 1.60, 1.70 and 1.80; in some instances, the number of S.G. increments were less due either to the sample size or to raw ash content. The 60 mesh x 0 size fraction underwent time-limited froth flotation process using a Wemco flotation machine with a speed of 1200 revolutions per minute. Flotation tests were performed for specified times at 30-second intervals, using kerosene and MIBC as reagents and at 8% pulp density. The pulps went through a conditioning time of one minute before skimming.
- For each float/sink and froth/tail, weight, proximate and FSI analyses were completed.
- CCCs were generated by compositing float and froth products primarily targeting ash contents of approximately 8%, but also taking into account yield values. For the ⅜ inch x 60 mesh material, floats were selected over the 1.40 to 1.70 S.G. range. For the 60 mesh x 0 fraction, froths were selected over a range of 30-seconds to 120-seconds frothing time.
- Most CCCs underwent proximate analysis, S%, FSI, HGI, calorific value, light transmittance (%), % phosphorous-in-coal, ultimate analysis, Gieseler fluidity, Ruhr dilatation and mineral analysis of ash. Split samples taken from the CCCs underwent petrographic analysis. Due to sample size or elevated ash contents, some samples underwent an abbreviated selection of the analyses listed above.

11.3.5 Discussion

It should be noted that, for each of the 2008, 2011 and 2012 campaigns, by the time the coal samples sent to Canmet underwent carbonization, they were quite old. In each case, the laboratory priority for these samples was attrition testing, detailed washability testing and coal characterization. In addition to the time taken to acquire, ship and conduct the tests described above, delays were encountered at the laboratories due to a number of factors relating, primarily, to limitations with laboratory equipment availability/serviceability and manpower, assessment of test results, and availability of the appropriate coke ovens. The age of the coal samples, from time of coring to carbonization testing was:

- 2008 Carbolite: 300 to 318 days
- 2011 SHO: 270 to 293 days
- 2012 SHO: 150 to 195 days
- 2012 Carbolite: 180 to 229 days.

The results obtained from representative samples and composites are presented in Section 13 of this report.

11.4 SECURITY

Special security measures are not commonly employed for coal projects, due to the low-value nature of the commodity. Concerns that pertain to sample security are typically directed towards proper bagging and labeling for shipping and proper handling procedures and storage at the laboratory to ensure no “mix-up” occurs between samples and sample tags.

Sample tracking sheets were completed for each set of samples sent to the laboratory. The information recorded on sample tracking sheets included which samples were sent, the date the samples left site, the date received by the trucking company and the sample numbers received by the laboratory and date of receipt. No samples were lost. These measures are common within the coal industry and are considered adequate for the secure delivery and storage of coal samples.

None of the sample preparation was conducted by an employee, officer, director, or associate of either Colonial or Stantec.

12.0 DATA VERFICATION

Geological interpretations of Huguenot were developed by geologists employed by Denison (1970-1980) and Colonial (since 2008). Preliminary geological modeling for the North Block was completed by MMTS using the updated geology generated by Colonial. MMTS provided Mr. R. J. Morris, P. Geo, to oversee the initial geological modeling for the North Block (Perry & Morris, 2010).

Norwest subsequently generated 3D geological models for all of the blocks using Mintec's 'MineSight™' software (Evenson, 2012 and 2013). The North Block was modeled utilizing the preliminary models developed by MMTS, supplemented by digitized structure contour maps derived from cross-sections developed by Colonial. The 3D geological models generated by Norwest for the Middle and South Blocks utilized updated geologic cross sections generated by Colonial and verified by Stantec's QP by comparing the model output to the original geological cross sections. Available drill hole and trench data was also used in the 3D geologic modeling by Norwest.

Norwest provided Mr. W. A. Evenson, P. Geo., an Independent QP, to review and verify the data utilized for geological interpretations and to assist in the construction of Colonial's geologic cross sections. Norwest completed numerous levels of verification, including:

- Site visit, 17 and 18 July 2012 and from September 2 to September 7, 2012, which included:
  - helicopter flights over the property
  - fly-over of the 2008, 2011 and 2012 drill hole locations
  - location check of four of the 2011 drill holes via GPS
  - viewing core indicating fault locations in two holes
  - reviewing core logging procedures
  - reviewing sampling procedures
  - reviewing geophysical log picking procedures
  - reviewing data collection procedures
  - conducting on ground observations to aid in geological structure interpretation
- Numerous telephone and e-mail discussions in addition to visits to Colonial's offices for reviews and discussions, including:
  - mineable coal seam thickness
  - minimum mineable rock parting thickness
  - coal seam details

    - input into the structural geological interpretation
    - coal quality parameters
    - classification of resource categories.

- Review and checking of the geological models for consistency in general interpretation, coal seam thickness, rock parting thickness, oxidation limits, overburden thickness, geological cross sections and extrapolation of coal quality data by comparing outputs of model against drill holes and previously generated cross sections.
- Reviewing seam correlations of 2008, 2011 and 2012 drill holes with Colonial personnel by comparison of geophysical logs.
- Reviewing seam thicknesses by comparing data base thicknesses to geophysical logs.

Subsequent to the above site inspections, the QP and author (Mr. W. A. Evenson), now a representative of Stantec, has observed public records of recent: aerial photos, land development activity including O&G exploration, plus records of significant climatic events and/or fires. Observations of these public records have not identified any material change in the physical environment of the property that would represent a material change from those observations undertaken by the author in 2012.

Stantec's Independent QP (Mr. W. A. Evenson, Professional Geologist) and has experience within the Peace River Coal Block, and many other properties throughout Canada, United States and other countries. No samples were taken during the site visits, and no new data were generated. Historical data and interpretations incorporated into this study were collected, generated and/or compiled directly by, or under the immediate supervision of, professionals well versed in the geological and engineering requirements of coal projects located in this region. In light of the foregoing, the available historical information is considered to be adequate for resource estimation.

13.0 MINERAL PROCESSING AND METALLURGICAL TESTING

Data presented in this section include historical coal quality taken from Denison (1979a, 1979b, and 1981), and results obtained from Colonial's 2008, 2011 and 2012 exploration programs.

13.1 RAW COAL QUALITY

The overall, in-situ coal quality data for the seams of interest in the North, Middle and South Blocks, are presented in Tables 13.1 through 13.3, respectively. All data are from the exploration programs carried out by Colonial in addition to selected historical data. The values of in-situ (or raw) coal quality presented in Tables 13.1, 13.2, and 13.3 below, are weight averages using the true seam intersections from each of the cored and non-cored (percussion) drill holes. Adjustments to the coal quality were made for sections of core loss and coal qualities were assigned to each seam intersected by percussion holes. These adjustments were achieved by comparison of geophysical logs and evaluation of the coal quality results using incremental ply samples from coal seam intersections from adjacent drill holes which exhibit higher core recoveries.

Huguenot property residual moisture values are typical of un-oxidized coals found within the Gates Formation; that is, usually less than 1%. Volatile matter on a dmmf basis ranges from 22.74% to 30.87% for the North, Middle and South Blocks. This indicates that all of the coal seams fall within the medium volatile bituminous classification.

TABLE 13.1 NORTH BLOCK IN-SITU COAL QUALITY SUMMARY (AIR DRIED BASIS)

Seam	RM %	Ash %	VM %	FC %	S %	Dmmf VM %
9	0.65	16.82	26.66	55.86	1.06	30.87
8	0.74	26.94	21.42	50.90	0.37	27.27
6D	1.26	6.78	23.97	67.99	0.71	25.43
$6C_L$	1.76	23.76	20.74	53.74	0.81	25.67
6B	0.50	17.41	22.46	59.63	0.41	25.98
6L	0.65	26.51	19.45	53.38	0.36	24.39
5	0.50	16.31	23.28	59.91	0.31	26.75
4_U	0.54	12.34	22.54	64.58	0.86	24.77
3D	0.52	12.77	26.10	60.61	0.86	29.22
$3B_L$	0.50	20.72	20.73	58.05	0.45	24.48
3B	0.58	28.15	20.32	50.95	0.43	26.00
2A	0.52	26.45	21.41	51.61	0.67	26.96
1	0.58	18.25	21.85	59.31	0.39	25.48

TABLE 13.2 MIDDLE BLOCK IN-SITU COAL QUALITY SUMMARY (AIR DRIED BASIS)

Seam	RM %	Ash %	VM %	FC %	S %	Dmmf VM %
10	0.86	17.70	24.00	57.44	0.82	28.04
9	0.58	14.51	24.22	60.70	0.82	27.27
8	0.53	24.51	22.10	52.86	0.39	27.39
6D	0.59	28.75	20.93	49.72	0.69	26.93
6B	0.73	17.45	22.49	59.32	0.55	26.03
6L	0.48	25.94	20.13	53.45	0.42	25.09
5	0.49	14.50	22.48	62.54	0.29	25.33
4_U	0.60	7.18	22.50	69.72	0.54	23.77
2A/2AB	0.57	23.43	21.79	54.20	0.49	26.8
1	0.46	10.48	23.27	65.79	0.31	25.34

TABLE 13.3 SOUTH BLOCK IN-SITU COAL QUALITY SUMMARY (AIR DRIED BASIS)

Seam	RM %	Ash %	VM %	FC %	S %	Dmmf VM %
9	0.57	17.65	21.71	60.07	1.98	24.27
8	0.88	27.93	19.82	51.37	0.41	25.32
6D	0.65	32.09	19.85	47.41	0.90	26.36
6B	0.54	28.62	18.86	51.98	0.65	23.92
6L	0.69	25.76	18.80	54.74	0.41	23.25
5	0.62	15.86	21.34	62.18	0.29	24.31
4	0.61	24.16	19.22	56.00	0.45	23.41
2Z/2A	0.62	51.52	14.78	33.08	0.47	24.14
1	0.51	10.10	21.03	68.36	0.35	22.74

The variability exhibited in raw ash contents primarily reflects the thickness and continuity of in-seam rock partings. Although inherent ash (such as mineral matter) produces some variability, its effect is usually minor in comparison to that of the in-seam partings. Except for Seam 9, most of the coal seams are low to very low in sulphur. Values are typically less than 1% although most are less than 0.6%. For Seam 9, sulphur values for the North, Middle and South Blocks are 1.06%, 0.82%, and 1.98% respectively.

13.2 CLEAN COAL QUALITY

Clean coal analyses were conducted on 139 samples. CCCs were generated, by selecting simulated floats and froths to create a target ash of 8% air dried basis (adb). These underwent a variety of tests and analyses; those carried out in each campaign are listed in Section 11.

The clean coal quality, from laboratory analysis, of each seam is presented for each block in Tables 13.4 to 13.6, below. In most instances, the clean coal summary data were generated using arithmetic averages derived from two or more drill core intercepts that had higher core recoveries. Several exceptions to this exist due to poor core recoveries which required either the use of data from a single, higher-recovery, coal seam intersection (North Block Seams 9, 2A; Middle Block Seams 8, 6B, 6L, 2A), or of lower-recovery coal seam intersections (Middle Block, Seams 10, 6D, 2EF; with core recoveries ranging from approximately 47% to 55%). Other than for these latter three intersections, all the data presented in Tables 13.4 to 13.6 were derived from intercepts with core recoveries greater than 72%. The coal quality data and geophysical logs for the coal seam intersections used for the tables below were compared to the analytical data and geophysical logs from the same coal seams intersected by other drill holes, for which there were lower core recoveries. This was done to ensure that the selected analytical data were not biased by any core loss in the sampled coal seam.

Variables that affect the theoretical yields obtained for any one coal seam include geological factors, drill core recoveries and the procedures used in producing the clean coal sample. As the tests targeted production of a specific ash content, yields were not optimized. Thinner coal seams, particularly those that had lower core recoveries, often provided insufficient material to conduct the full set of float tests or any froth tests. Based upon reviews of the geophysical and descriptive logs and of the “washing” criteria of the lower-recovery coal seams presented above, theoretical yields would likely be expected to improve over the values listed for a number of these coal seams, albeit at slightly higher ash contents.

For HQ-size core, CCCs for each mining section were generated from 9.5mm x 2.5mm floats and associated -2.5mm x 0 froths (although, not in every case for the latter, due to insufficient fines being available). S.G. cut points for floats typically ranged from between 1.50 and 1.60 although some CCCs were generated from 1.4 and 1.70 floats. Froth time typically ranged between 30 and 120 seconds. Float/sink and froth cut points for CCCs generated for each seam using large diameter core samples are described in Section 11.3. The ranges for cut points in 2008 were =16 mesh = 1.55 to 1.65; 16 x 60 mesh = 1.75; -60 mesh = froth to completion; 2011 were: +16 mesh = 1.50 to 1.60; 16 x 60 mesh = 1.70; -60 mesh = Fl (using modified tree flotation); and, 2012 were: +16 mesh = 1.50 to 1.55; 16 x 60 mesh = 1.6; -60 mesh = Fl + F2 (using modified tree flotation).

TABLE 13.4 NORTH BLOCK CLEAN COAL QUALITY SUMMARY (DRY BASIS)

Seam	Core Rec %	Theor. Yield %	Ash%	VM (dmmf)	S%	FSI	% Phos in coal	B/A ratio	Fluidity ddpm	Dilatation % SD 2.5	RoMax%
9	100.0	62.0	9.3	30.9	0.82	8.5	0.168	0.10	166	65	1.00
8	95.3	67.5	7.5	28.3	0.49	6.5	0.031	0.12	5 - 15	(-10) - 10	1.04
6D	74.3	73.9	4.2	26.5	0.79	7.0	0.055	0.09	2 - 29	(-2) - 0	1.11
6B	77.4	73.3	6.9	26.2	0.46	6.5	0.084	0.08	3 - 42	0 - 31	1.12
6L	89.3	63.4	8.5	24.7	0.42	6.0	0.116	0.07	1 - 4	26	1.15
5	96.4	84.9	7.8	25.5	0.34	7.0	0.035	0.10	2 - 13	6	1.16
4U	96.3	90.2	5.4	24.5	0.91	7.5	0.037	0.09	4 - 5	(-8) - (-7)	1.19
3D	98.1	76.7	5.0	28.7	1.21	9.0	0.098	0.27	400 - 611	183 - 265	1.16
2A	100.0	60.7	7.9	26.1	1.37	9.0	0.015	0.08	544	186	1.22
1	89.2	89.5	7.9	25.1	0.42	6.5	0.036	0.60	5 - 37	0 - 11	1.17

TABLE 13.5 MIDDLE BLOCK CLEAN COAL QUALITY SUMMARY (DRY BASIS)

Seam	Core Rec %	Theor. Yield %	Ash%	VM (dmmf)	S%	FSI	% Phos in coal	B/A ratio	Fluidity ddpm	Dilatation % SD 2.5	RoMax%
10	46.8	67.9	8.6	29.0	0.93	8.0	0.187	0.13	290	52	1.06
9	91.5	77.2	7.2	27.6	0.84	7.0	0.091	0.10	40 - 274	30 - 66	1.06
8	84.6	68.7	8.8	27.2	0.51	6.0	0.038	0.16	4	0	1.09
6D	54.7	31.5	6.8	26.1	0.95	8.5	0.007	0.06	195	119	1.19
6B	78.8	46.0	6.3	25.0	0.81	8.0	0.085	0.06	185	85	1.14
6L	82.2	59.1	8.9	25.2	0.45	6.5	0.093	0.08	6	(-6)	1.12
5	84.9	83.6	8.3	24.6	0.31	5.5	0.032	0.13	3	0	1.21
4U	85.0	93.6	4.8	24.3	0.56	7.5	0.148	0.09	4 - 5	(-8) - (-7)	1.24
3B	84.0	54.2	9.1	24.0	0.51	7.5	0.031	0.05	4	-5	1.24
2A	100.0	71.1	8.2	26.6	0.60	9.0	0.019	0.11	130	85	1.22
2EF	52.0	51.3	9.2	24.0	0.41	8.0	0.158	0.06	21	16	1.24
1*	92.8	92.6	7.8	23.4	0.37	6.5	0.023	0.10	5 - 8	(-9) - 0	1.24

Note: 1*: values are the average of North Block and South Block Seam 1 data

TABLE 13.6 SOUTH BLOCK CLEAN COAL QUALITY SUMMARY (DRY BASIS)

Seam	Core Rec %	Theor. Yield %	Ash%	VM (dmmf)	S%	FSI	% Phos in coal	B/A ratio	Fluidity ddpm	Dilatation % SD 2.5	RoMax %
9	92.8	95.3	4.5	27.2	0.66	8.0	0.042	0.05	468	89	1.10
8	71.9	60.3	7.5	26.1	0.62	6.5	0.043	0.06	42 - 611	8 - 121	1.16
6D	79.8	40.2	6.5	27.6	0.97	8.0	0.060	0.06	670	184	1.15
6B	89.4	41.5	7.0	24.6	0.83	8.5	0.080	0.08	187	86	1.26
6L	82.4	66.6	6.9	24.1	0.54	7.5	0.067	0.09	23 - 49	20 - 32	1.28
5	72.0	73.9	7.8	24.7	0.38	6.5	0.035	0.15	5 - 6	(-15) - (-9)	1.24
4	84.3	86.8	5.6	23.7	0.61	7.5	0.030	0.07	7 - 27	(-3) - 39	1.28
2Z	85.6	44.4	8.6	23.7	0.46	8.0	0.067	0.13	28 - 108	28 - 58	1.31
1	95.3	92.4	7.8	21.7	0.34	6.5	0.011	0.14	8	(-9)	1.32

Volatile matter on a dmmf basis for clean coal ranges from 21.7% to 30.9% across the property, and is consistent with dmmf values calculated from raw coal data. RoMax values fall within the range for coking coals traded on the seaborne market. RoMax values range from 1.00 to 1.39, confirming these coals as being of medium volatile bituminous rank.

Huguenot coal seams typically clean to a low sulphur product. Overall, CCC sulphur contents range between 0.29% and 1.37%. However, with the exception of HD11-12 Seam 2A (1.37%) and HD12-03 Seam 6D (1.03%), all other CCCs returned a sulphur content less than 1.00%. Concentration of sulphur from raw to washed coal is not evident.

The mineral analysis of ash provides acid and base oxides contained in the ash. For coke making purposes, minimal basic components are desired. The ash basicity can be reported using a ratio of the base oxides over the acid oxides:

Base/Acid = $(CaO+MgO+Fe_2O_3+K_2O+Na_2O)/(SiO_2+Al_2O_3+TiO_2)$

Overall CCC B/A ratios range from 0.029 to 0.640, although the majority (90%) returned B/A ratios of less than 0.163. Todoschuk et. al. (2003) found that to make a minimum 60% CSR coke, the ash basicity of the coal needed to be less than or equal to 0.163.

The phosphorus-in-coal contents for all mining section CCCs range from 0.006% to 0.235%. However, for the major Seams (8, 6B, 5, and 1 in the North Block, and 8, 6L, 5, and 1 in the Middle and South Blocks), 77% of the CCCs returned phosphorus contents of less than 0.065. The upper (younger) coal seams tend to be higher in phosphorus than the lower (older) seams.

Rheological characteristics of the Huguenot coal seams are as follows; FSI values range from 4.5 to 9, although the majority are equal to, or greater than, 6; maximum fluidity values range between 1 and 670 ddpm; and dilatation ranges from negative 19 to positive 265. Fluidity is extremely sensitive to oxidation, which begins as soon as the drill core is extracted from the ground. The amount and rate of fluidity degradation can vary depending on factors such as coal rank, maceral type, size consist, storage method, and whether the sample has undergone washability testing using water-based or organic liquid separation. Since there were significant delays in getting the drill core to the laboratories for testing, and considering the use of organic liquids during washability testing, it is expected that coal produced from Huguenot will report higher fluidities than reported here. Deterioration of fluidity over time has been well documented. A study by Galvin and Iveson (2010), for the Australian Coal Association Research Program, found that perchloroethylene has a detrimental effect on the fluidity and coking properties of many coals.

Between 2011 and 2012, at total of 11 SSPs were created for small scale carbonization purposes. Most of the SSPs were comprised of samples taken from 152mm diameter exploration core that had undergone attrition and detailed washability studies using organic liquids. One SSP was formed from a combination of 83mm (PQ-size) and 63.5mm (HQ-size) cores. These clean products were carbonized in Canmet's 12.5kg capacity carbonization SHO as per ASTM D2014-97(2010). Canmet has found a strong linear relationship between CSRs measured in smaller-scale SHOs and CSRs obtained from their larger-scale (350kg-capacity) ovens, indicating that the CSR of the coke samples produced using both methods are very similar (MacPhee et. al, 2011). Analyses from the samples that underwent SHO testing are presented in Table 13.7.

CSR values range from 56.1 to 70.7 with the exception of 2011 Seam 8 which resulted in a CSR of 41.1. The reason for this lower Seam 8 CSR is likely attributed to the greater age of this sample. Coke reactivity indices (CRIs) range from 20 to 36, except for an outlier value of 46 reported for 2011 Seam 8.

TABLE 13.7 CSR VALUES FROM SOLE HEATED OVEN CARBONIZATION - NORTH AND MIDDLE BLOCKS

Year	Coal (dry basis)							Coke	
	Seam ID	RoMax%	Ash%	VM (dmmf)	FSI	Fluidity (ddpm)	B/A Ratio	CSR	CRI
2012 North Block	1, 5, 6B, 6L, 8	1.12	8.10	26.05	7.0	15	0.14	58	32
	8	1.01	6.09	28.02	7.0	22	0.17	57	36
	6B	1.10	7.90	26.95	7.5	32	0.09	68	24
	6L	1.13	8.74	24.67	6.5	4	0.13	67	26
	5	1.15	8.35	25.66	7.5	22	0.14	56	36
	1	1.14	9.63	23.99	7.5	15	0.11	64	30
2011 Middle Block	9	1.07	8.55	27.44	7.5	40	0.08	71	20
	8	1.09	8.79	27.20	6.0	4	0.16	41	46
	6L	1.12	8.92	25.22	6.5	6	0.08	63	24
	5	1.21	8.68	24.92	6.0	3	0.15	57	33
	1, 2A	1.21	7.19	25.13	7.5	4	0.12	66	28

In 2008 and 2012, larger SSPs were made for the purposes of pilot scale carbonization. Approximately 400kg of clean coal was charged in Canmet's moveable wall Carbolite oven that is used to simulate industrial coke ovens. Analyses from the samples that underwent Carbolite oven testing are presented in Table 13.8.

TABLE 13.8 CSR VALUES FROM CARBOLITE OVEN CARBONIZATION - NORTH BLOCK

Year	Coal								Coke	
	Simulated Product	Seam Blend	Ash% (db)	VM (dmmf)	FSI	Fluidity (ddpm)	B/A Ratio	RoMax%	CSR	CRI
2008	Huguenot North	8, 6(BCD), 5, 1	8.10	24.84	6.5	2.1	0.08	1.14	52.7	32.0
2012	Huguenot North	8,6B, 6L, 5, 1	8.10	26.05	7.0	15.0	0.14	1.12	61.4	28.7

Slightly different seam blends were used each year due to clean coal mass limitations. The 2008 blend was based upon seam thickness and represented all of the material recovered from washing the four coal seams. The 2012 blend was created to more accurately reflect the North Block resource percentages (based upon in situ resource reported in 2012) utilizing five coal seams.

The 2012 Blend Coke achieved a CSR of 61.4, while the 2008 Blend Coke achieved a CSR of 52.7. Again, the difference is attributed to the age of the samples tested.

Given the known effects that sample age, oxidation levels and organic liquids have on coking properties, it is possible that fluidity and CSR values for Huguenot coal will report higher values if performed on fresh coal samples, and in the absence of organic liquids during the plant scale preparation of the clean coal.

Observations about potential product coal quality from the Huguenot Project, with comparisons to western Canadian coking coal brands, are presented in Section 19. In addition to the role of each seam within the resource distribution, the product quality as discussed in Section 19 takes into consideration the anticipated mining plan, and the resultant coal recovery.

13.3 PROJECTED PREPARATION PLANT YIELDS

Yield curves were developed for the major mineable coal seams for the North, Middle and South Blocks. The yield curves graph ROM ash versus yield and were based on the detailed washabilities run on large diameter cores for the seams of interest. These curves were generated using Limn® software that simulates running the coal through a preparation plant and not strictly from laboratory washability analyses. The input to this software was the laboratory washability data generated from the comprehensive washability program developed for the Huguenot seams. Key information derived from the washability program was post-attrition particle size distribution as well as density distributions in three distinct size ranges; namely, +9.5mm, 9.5mm x 1mm, and 1mm x 0.25mm.

The estimated raw in-place ash values were from averaged seam ash taken from quality analysis with core loss reconciled against geophysical logs. ROM ash values were estimated using the following formula:

$$\text{ROM Ash}_{ADB} = \frac{\text{Raw Coal Ash}_{ADB} \times (\text{TThk Coal} - \text{TThk Coal Loss}) \times \text{Coal S.G.}_{in\text{-}situ} + (\text{DilutionAsh}_{ADB} \times \text{TThk Dilution} \times \text{Dilution S.G.}_{in\text{-}situ})}{(\text{TThk Coal} - \text{TThk Coal Loss}) \times \text{Coal S.G.}_{in\text{-}situ} + (\text{TThk Dilution} \times \text{Dilution S.G.}_{in\text{-}situ})}$$

The out-of-seam dilution used for the above calculation was 0.2m for each seam. To account for non-recovered coal during mining, 0.2m was subtracted from the thickness of each seam. In addition, an overall mining recovery factor of 95% was utilized. In-situ coal S.G. used was 1.43 tonnes/m^3. The in-situ out-of-seam dilution S.G. used was 2.2 tonnes/m^3.

Figures 13.1 through 13.4 visually characterize the potentials for both product ash and yields for the coal seams, as a function of heavy media cyclone (HMC) cut points, where information was available and the data analyzed (i.e., Seams 1, 5, 6L, 6B and 8).

A weight-averaged yield of 70% and 76% was estimated for coal produced in the surface and underground mine plans, respectively, based on the curves generated assuming: a product ash of 9% dry basis (db) for Seams 8, 6L, and 5; 8.6% (db) for Seam 6B; and, 8.8% (db) for Seam 1. A practical yield of 50% was assumed for all seams for which data was not available. Yield by seam is summarized in Tables 13.9 and 13.10 for surface and underground mining.

FIGURE 13.1 SEAM 1 GROUP PRODUCT YIELD AS A FUNCTION OF HMC CUT POINT

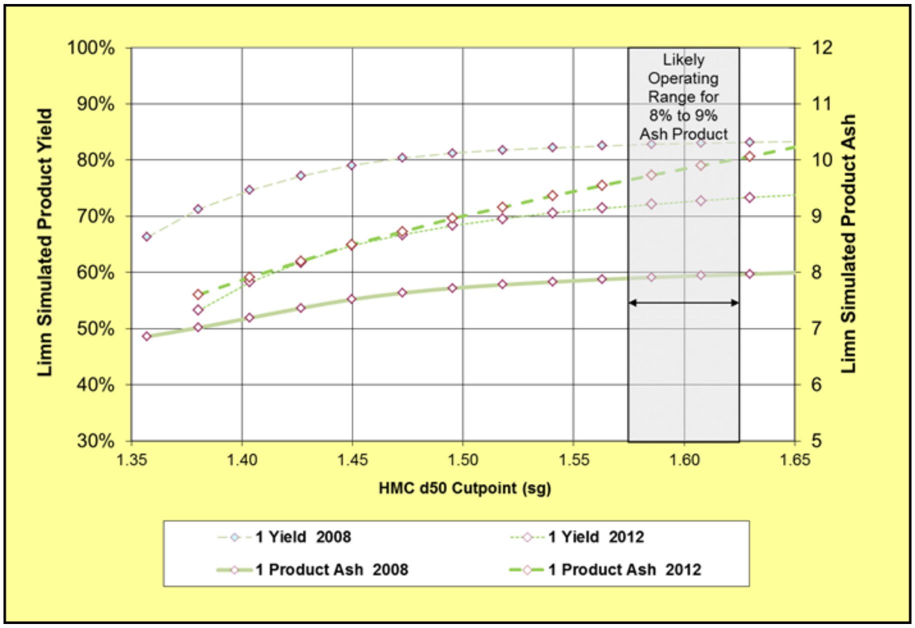


FIGURE 13.2 SEAM 5 GROUP PRODUCT YIELD AS A FUNCTION OF HMC CUT POINT

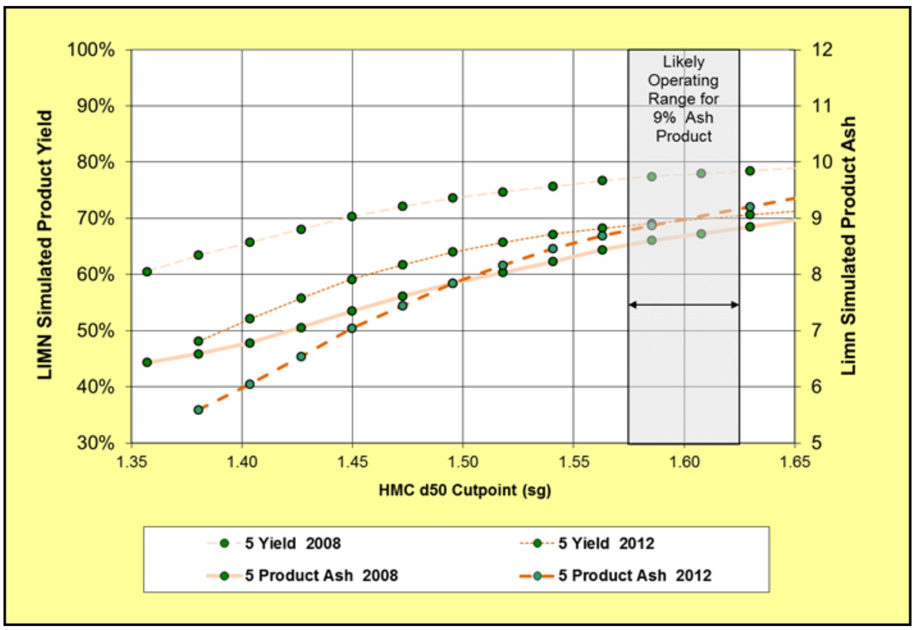


FIGURE 13.3 SEAM 6 GROUP PRODUCT YIELD AS A FUNCTION OF HMC CUT POINT

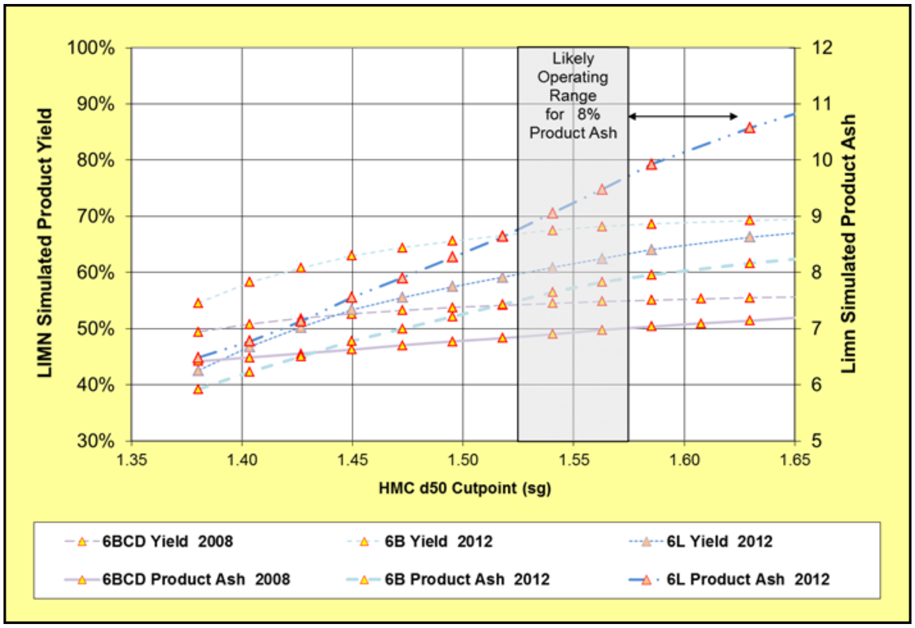


FIGURE 13.4 SEAM 8 GROUP PRODUCT YIELD AS A FUNCTION OF HMC CUT POINT

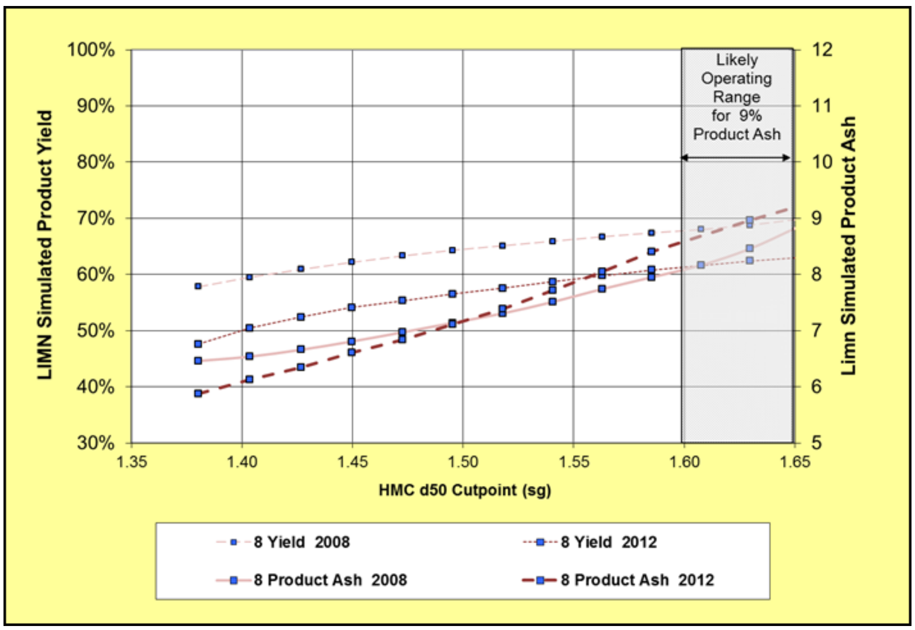


TABLE 13.9 AVERAGE PROPOSED YIELDS (BY SEAM): SURFACE MINING

Seam	Average Yield (%)
Seam 1	81.2
Seam 2	50.0
Seam 3B	50.0
Seam 4_U	50.0
Seam 5	80.7
Seam 6B	58.2
Seam 6D	50.0
Seam 6L	53.9
Seam 8	60.2
Seam 9	50.0

TABLE 13.10 AVERAGE PROPOSED YIELDS (BY SEAM): UNDERGROUND MINING

Seam	Average Yield (%)
Seam 8	64.2%
Seam 6B	70.0%
Seam 5	82.5%
Seam 1	87.1%

13.4 POTENTIAL LIFE-OF-MINE COAL PRODUCT

The potential LOM product coal quality from the Huguenot Project is presented in Table 13.11. In addition to the role of each seam within the resource distribution, the product quality takes into consideration the anticipated mining plan, and the resultant coal recovery. Variations in product quality due to the foregoing parameters are anticipated to fall within the ranges specified in Table 13.11.

TABLE 13.11 LIFE-OF-MINE POTENTIAL PRODUCT

Moist% (arb)	Vol% (db)	Ash% (db)	S% (db)	P% (db)	FSI	RoMax%	Fluidity (ddpm)	B/A Ratio	CSR
9	22.5 - 23.5	8.5 - 9	0.40	0.044	6.5 - 7	1.15 - 1.20	100	0.08 - 0.010	60 - 65

Further observations on potential product quality are presented in Section 19, together with a comparison of Huguenot product quality to coking coals currently produced and exported from mines in western Canada.

14.0 MINERAL RESOURCE ESTIMATES

14.1 INTRODUCTION

Coal resource estimations for the North, Middle and South Blocks of the Huguenot property were completed by Norwest (Evenson, 2013). Within each of these structurally defined blocks, coal resources have been categorized as mineable using either surface or underground mining methods.

Geological models completed by Norwest used the interpretation of the geology developed by Colonial's geologists, as well as the author.

Norwest provided a senior coal geologist (the author, Mr. W. A. Evenson, CPG) to undertake site visits. The most recent site visit was undertaken by Mr. Evenson from September 2 to September 7, 2012 (see Section 12). Subsequent to these site inspections, the QP and author (Mr. W. A. Evenson), now a representative of Stantec, has observed public records of recent: aerial photos, land development activity including O&G exploration, plus records of significant climatic events and/or fires. Observations of these public records have not identified any material change in the physical environment of the property that would represent a material change from those observations undertaken by the author in 2012.

Under Mr. Evenson's direct supervision, Norwest completed data validation, reviewed and assisted in Colonial's geological interpretation and formatting of data to support model development. This was followed by Norwest personnel completing a 3D resource model, resource estimation and resource classification. The 3D resource model comprises a 3D-block model compiled using MineSight™ software. Mr. Evenson the Independent QP and co-author of this report and takes responsibility for the resource estimates.

Resource estimates were completed in accordance with the procedures and guidelines of GSC Paper 88-21 as recommended by NI 43-101 Companion Policy (CP). Total in-situ surface mineable resource estimates using a 0.60m thickness cut-off are: 132.0Mt of Measured and Indicated (Measured = 96.2Mt; Indicated = 35.8Mt), plus 0.5Mt of Inferred. Total underground mineable resource estimates, using a 1.5m minimum thickness, are: 145.7Mt in-situ Measured and Indicated (Measured =18.9Mt; Indicated = 126.9Mt), plus 118.7Mt of in-situ Inferred resources. Resource estimates are rounded to one decimal place.

The accuracy of resource and reserve estimates is, in part, a function of the quality and quantity of available data and of engineering and geological interpretation and judgment. Given the data available at the time this report was prepared, the estimates presented herein are considered reasonable. However, they should be accepted with the understanding that additional data and analysis available subsequent to the date of the estimates may necessitate revision. These revisions may be material. There is no guarantee that all or any part of the estimated resources or reserves will be recoverable. There are no known issues related to environmental, permitting, legal, title, taxation, socio-economic, marketing, political, or other relevant factors that would have material effect on resource estimates.

14.2 GEOLOGICAL SURVEY OF CANADA PAPER 88-21 RESOURCE ESTIMATION GUIDELINES

As recommended by NI 43-101, Stantec has utilized the referenced document, GSC Paper 88-21, “A Standardized Coal Resource/Reserve Reporting System for Canada” in identification, classification and reporting of coal resources for the Huguenot Coal Property. Discussions regarding Geology and Deposit Types, as referenced in GSC Paper 88-21, are provided in Section 8.

14.3 METHODOLOGY & GENERAL CRITERIA

Factors affecting estimation of resources within the North, Middle and South Blocks are summarized below.

14.3.1 Model Extent & Geometry

Two 3D block models were developed with each delineating either surface mineable coal resources or underground mineable coal resources. Both block models were oriented along strike of the northeasterly-dipping Gates Formation at an azimuth of 20°. Table 14.1 outlines the model extent and block dimensions for each of the two model types.

TABLE 14.1 GEOLOGIC MODEL DIMENSIONS

Dimensions (m)	Surface Model	Underground Model
Along Strike length	12,400	12,400
Dip direction length	5,900	5,900
Maximum elevation	2,000	2,000
Minimum elevation	800	200
Block size along strike	25.0	25.0
Block size dip direction	10	10
Block size vertical	5	5

14.3.2 Topography & Weathered (Till) Surface

Digital LIDAR topography was provided by Colonial. This topography was used to generate a digital elevation model. The drill hole data were ‘draped’ to the digital data and the drill hole collar elevations were adjusted to fit the topography.

The base of the weathered surface defines the extent of glacial-fluvial cover over bedrock. No coal seams are modeled above the base of the weathered surface. The weathered surface was created by using an inverse distance algorithm to estimate the thickness of the weathered surface from each drill hole into the model. This value was then subtracted from the topography surface to create the base surface of the weathered horizon.

14.3.3 Oxidation Horizon

The base of oxidation surface represents an estimate of the horizon where in-situ coal has been sufficiently exposed to oxidizing elements to alter its metallurgical characteristics. Oxidized coal is defined as coal within 5m of the base of the weathered surface. This estimate was made from experience with other mining projects in the region.

14.3.4 Geological Data & Geological Interpretation

All of the drill hole, surface mapping and trench data available for this property were used to develop the geological models, in addition to data from a single, off-property, drill hole that was used for control purposes. Coal seam correlation was determined by Colonial using down-hole geophysical logs plus surface mapping and trenching. The geological structural interpretation was developed by Colonial by integrating the seam correlations with bedding to core angles logged in drill core as well as bedding dips observed at surface.

To complete the geologic model Colonial provided Norwest the following basic data: LIDAR surface data plus drill hole, trench and surface mapping databases. For the North Block, structure contour maps for seams 1, 5, 6B, 8, and the Holtslander North Thrust (the block- bounding fault) were also provided. For the Middle and South Blocks, across-strike cross-sections were provided for structural control. These data were sufficient to correlate coal seams, fault strike and displacement between cross sections, and drill hole intercepts. Seam roof and floor surfaces were digitized by Norwest from these cross-sections and used to create solid objects. These seams solids were then used to code a 3D block model with percentage coal on a per seam basis.

Coal seam thicknesses from exploration drill holes are measured along the length of the hole; because the angle of intersection between the hole and the seam is often less than perpendicular, these intersections represent an 'apparent' rather than 'true' thickness of the seam. Adjustments from apparent to true seam thickness were made in the modeling of in-situ coal resources. The resource model is based on true seam thickness, as defined mathematically through the relationship between drill hole geometry and interpreted bedding geometry.

While the resource estimates are based primarily on drill hole data supported by selected trench data, the assignment of resource categories takes all of the geological data into account.

14.3.5 Mineable Thickness

On the basis of the current interpretation, the North and Middle Blocks of the Huguenot deposit are classified as a moderate, potentially surface and underground mineable deposit. The South Block is considered a complex, potentially surface and underground mineable deposit. Resource assumptions for mineable thicknesses conform to GSC Paper 88-21 guidelines at 0.6m for surface deposits and 1.5m for underground deposits. Rock partings greater than 0.3m true thickness were omitted from in-situ resource estimations.

It should be noted that the mineability of a given seam is not simply tied to its individual seam thickness, but also to its quality, and the number and thickness of seams and partings immediately adjacent to it. Furthermore, mineability is greatly determined by mining methodology and equipment selection.

14.3.6 Specific Gravity

S.G. used in modeling seam densities and resource estimation were based on the analyzed coal ash percent and the semi-quantitative extrapolated ash percent. To arrive at seam densities the following formula devised by Quintette Coal Ltd (the "Quintette" formula) was utilized:

$$S.G. = (211.4306/(172.0854-Ash\%_{ADB}).$$

The formula takes into account that coal seams in the Gates have an in-seam porosity of approximately 4%. The ash values utilized in the formula were based on actual coal quality analysis. Where core recoveries were less than 100% the mineable seam sections, for which there was coal quality data, were compared (utilizing visible core and geophysical logs) to seam sections for which quality was not available. Ash values were then assigned to the lost core based on the comparison of geophysical log signatures to geophysical log signatures of known recovered core and its corresponding analysis.

14.3.7 Modeling Seam Extents

Seam roof and floor surfaces were digitized from control points that included: drill hole intercepts, surface trenches, surface mapping, across-strike cross sections and structure contour maps prepared by Colonial. The roof and floor surfaces were then used to construct solids for each seam where the true seam thickness is interpreted to be greater than 0.6m for surface mineable resources and greater than 1.5m for underground mineable resources. The seam solids did not extend into the zone of oxidation. These seam solids were then used to code a 3D block model with percent coal for each model block to a maximum depth of 900m below surface.

14.4 SURFACE MINEABLE RESOURCES

To define the zone of surface mineable resources, a pit shell was created for coal-bearing zones within the license boundaries. A Lerchs-Grossman algorithm was used to determine the shape of the pit shell targeting a maximum incremental stripping ratio of 20:1 bcm/tonne for extracting coal seams at greater than 0.6m true thickness. An overall stripping ratio of 12:1 bcm/tonne was calculated for the final pit shell and this stripping ratio was deemed acceptable by Norwest after benchmarking the results with current surface mining costs. The overall pit slope used in the pit shell calculations is 47° based on Norwest's experience of pit slope stabilities in neighboring active surface mines. The surface mineable resources defined herein have not been proven to be economically extractable.

Current surface mineable resource estimates for the North, Middle and South Blocks of the Huguenot coal property for the 0.6m minimum mineable seam thickness model are summarized in Table 14.2. Each model constrains the coal within a pit with 47° slopes and a strip ratio of less than 20:1 bcm/tonne (a pit delineated resource with an incremental strip ratio of 20 bcm of waste to one tonne of in place coal). The overall cumulative strip ratio is 12:1bcm/tonne.

TABLE 14.2 SUMMARY OF IN-SITU SURFACE MINEABLE COAL RESOURCES

Resource Category	Total (Mt)
Measured	96.20
Indicated	35.75
Total (Meas. + Ind.)	131.95
Inferred	0.53

Tables 14.3 to 14.5 summarize surface mineable resources by seam/coal zone.

TABLE 14.3 SUMMARY OF TOTAL MEASURED SURFACE MINEABLE RESOURCES BY SEAM/COAL ZONE

Measured - Surface											
North Block			Middle Block			South Block			Totals		
Seam	Total Coal Mt	% Total	Seam	Total Coal Mt	% Total	Seam	Total Coal Mt	% Total	Seam	Total Coal Mt	% Total
10			10	0.63	1.7	10			10	**0.63**	**0.65**
9	0.24	0.4	9	0.90	2.4	9			9	**1.14**	**1.18**
8	7.93	13.6	8	1.94	5.1	8			8	**9.87**	**10.26**
6D	1.46	2.5	6D	0.57	1.5	6D			6D	**2.03**	**2.11**
6B	6.01	10.3	6B	1.36	3.6	6B			6B	**7.37**	**7.66**
6L	6.89	11.8	6L	6.18	16.3	6L			6L	**13.07**	**13.58**
5	18.51	31.7	5	12.21	32.2	5			5	**30.72**	**31.94**
4_U	1.66	2.9	4_U	1.54	4.1	4_U			4_U	**3.20**	**3.34**
4			4			4			4		
3D	0.40	0.7	3D			3D			3D	**0.40**	**0.42**
3B	2.51	4.3	3B	0.89	2.3	3B			3B	**3.40**	**3.53**
2HI			2HI	0.08	0.2	2HI			2HI	**0.08**	**0.09**
2EF			2EF	0.22	0.6	2EF			2EF	**0.22**	**0.23**
2D			2D	0.02	0.1	2D			2D	**0.02**	**0.02**
2A	2.02	3.5	2A	1.38	3.6	2A			2A	**3.40**	**3.53**
2Z			2Z			2Z			2Z		
1	10.69	18.3	1	9.96	26.3	1			1	**20.65**	**21.46**
Total	**58.32**			**37.88**						**96.20**	

TABLE 14.4 SUMMARY OF TOTAL INDICATED SURFACE MINEABLE RESOURCES BY SEAM/COAL ZONE

Indicated - Surface											
North Block			Middle Block			South Block			Totals		
Seam	Total Coal Mt	% Total	Seam	Total Coal Mt	% Total	Seam	Total Coal Mt	% Total	Seam	Total Coal Mt	% Total
10			10	0.13	1.5	10			10	**0.13**	**0.37**
9	0.10	1.3	9	0.09	1.0	9	0.10	0.5	9	**0.29**	**0.82**
8	1.73	21.8	8	1.39	15.4	8	0.44	2.3	8	**3.56**	**9.95**
6D	0.11	1.4	6D	0.01	0.1	6D	0.09	0.5	6D	**0.21**	**0.57**
6B	0.84	10.6	6B	0.57	6.3	6B	0.36	1.9	6B	**1.77**	**4.94**
6L	1.50	19.0	6L	1.38	15.2	6L	3.15	16.7	6L	**6.03**	**16.85**
5	2.76	34.9	5	2.73	30.3	5	5.78	30.7	5	**11.27**	**31.53**
4_U	0.20	2.5	4_U	0.34	3.8	4_U			4_U	**0.54**	**1.50**
4			4			4	2.11	11.2	4	**2.11**	**5.91**
3D			3D			3D			3D		
3B	0.13	1.7	3B	0.18	1.9	3B			3B	**0.31**	**0.86**
2HI			2HI			2HI			2HI		
2EF			2EF	0.13	1.5	2EF			2EF	**0.13**	**0.37**
2D			2D			2D			2D		
2A	0.08	1.0	2A	0.25	2.8	2A			2A	**0.33**	**0.93**
2Z			2Z			2Z	4.50	23.9	2Z	**4.50**	**12.59**
1	0.46	5.9	1	1.82	20.2	1	2.29	12.2	1	**4.57**	**12.82**
Total	**7.91**			**9.02**			**18.82**			**35.75**	

TABLE 14.5 SUMMARY OF TOTAL INFERRED SURFACE MINEABLE RESOURCES BY SEAM/COAL ZONE

Inferred - Surface											
North Block			Middle Block			South Block			Totals		
Seam	Total Coal Mt	% Total	Seam	Total Coal Mt	% Total	Seam	Total Coal Mt	% Total	Seam	Total Coal Mt	% Total
10			10	0.01	2.0	10			**10**	**0.01**	**2.05**
9			9			9			**9**		
8			8	0.15	28.2	8			**8**	**0.15**	**28.16**
6D			6D			6D			**6D**		
6B			6B			6B			**6B**		
6L			6L			6L			**6L**		
5			5			5			**5**		
4_U			4_U			4_U			**4_U**		
4			4			4			**4**		
3D			3D			3D			**3D**		
3B			3B	0.02	4.1	3B			**3B**	**0.02**	**4.13**
2HI			2HI			2HI			**2HI**		
2EF			2EF	0.35	65.7	2EF			**2EF**	**0.35**	**65.66**
2D			2D			2D			**2D**		
2A			2A			2A			**2A**		
2Z			2Z			2Z			**2Z**		
1			1			1			**1**		
Total				**0.53**						**0.53**	

The total Measured, Indicated and Inferred tonnes depicted in this report (Evenson, 2013) are 1.7% higher for the potentially surface mineable coal compared to the previous report prepared by Norwest (Evenson, 2012). The percentage of Measured, Indicated and Inferred resource in this report (72.6%, 27.0%, 0.4%, respectively) compared to the previous report (61.5%, 9.2%, 29.3%, respectively) have changed due to the latest exploration activities increasing the number of data points thereby improving the overall assurance categories.

14.5 UNDERGROUND MINEABLE RESOURCES

The underground mineable resource estimates for the North, Middle and South Blocks of the Huguenot coal property, for 1.5m minimum mineable seam thickness models are summarized in Table 14.6. The resources are limited to those coal seams below the surface mining pit and are exclusive of the surface mineable coal resources. The underground mineable coal resources are considered to be of 'immediate interest'.

TABLE 14.6 SUMMARY OF IN-SITU UNDERGROUND MINEABLE COAL RESOURCES

Resource Category	Total (Mt)
Measured	18.85
Indicated	126.88
Total (Meas. + Ind.)	145.73
Inferred	118.66

Tables 14.7 to 14.9 summarize underground mineable resources by seam/coal zone.

TABLE 14.7 SUMMARY OF TOTAL MEASURED UNDERGROUND MINEABLE RESOURCES BY SEAM/COAL ZONE

Measured - Underground											
North Block			Middle Block			South Block			Totals		
Seam	Total Coal Mt	% Total	Seam	Total Coal Mt	% Total	Seam	Total Coal Mt	% Total	Seam	Total Coal Mt	% Total
10			10			10			**10**		
9			9			9			**9**		
8	1.62	22.5	8	2.76	23.7	8			**8**	**4.38**	**23.24**
6D			6D			6D			**6D**		
6B	0.71	9.9	6B	0.01	0.1	6B			**6B**	**0.72**	**3.80**
6L	0.68	9.5	6L	3.30	28.3	6L			**6L**	**3.98**	**21.11**
5	2.27	31.6	5	3.64	31.2	5			**5**	**5.91**	**31.33**
4_U			4_U			4_U			**4_U**		
4			4			4			**4**		
3D			3D			3D			**3D**		
3B			3B			3B			**3B**		
2HI			2HI			2HI			**2HI**		
2EF			2EF			2EF			**2EF**		
2D			2D			2D			**2D**		
2A			2A			2A			**2A**		
2Z			2Z			2Z			**2Z**		
1	1.90	26.5	1	1.96	16.8	1			**1**	**3.86**	**20.52**
Total	**7.18**			**11.67**						**18.85**	

TABLE 14.8 SUMMARY OF TOTAL INDICATED UNDERGROUND MINEABLE RESOURCES BY SEAM/COAL ZONE

Indicated - Underground											
North Block			Middle Block			South Block			Totals		
Seam	Total Coal Mt	% Total	Seam	Total Coal Mt	% Total	Seam	Total Coal Mt	% Total	Seam	Total Coal Mt	% Total
10			10			10			**10**		
9			9			9			**9**		
8	6.58	21.6	8	2.94	15.1	8	2.16	2.8	**8**	**11.68**	**9.20**
6D			6D			6D			**6D**		
6B	3.72	12.2	6B	0.31	1.6	6B			**6B**	**4.03**	**3.18**
6L	4.54	14.9	6L	3.33	17.1	6L	13.45	17.5	**6L**	**21.32**	**16.81**
5	9.58	31.5	5	5.93	30.4	5	20.27	26.3	**5**	**35.78**	**28.19**
4_U			4_U			4_U			**4_U**		
4			4			4	7.26	9.4	**4**	**7.26**	**5.72**
3D			3D			3D			**3D**		
3B			3B			3B			**3B**		
2HI			2HI			2HI			**2HI**		
2EF			2EF			2EF			**2EF**		
2D			2D			2D			**2D**		
2A			2A			2A			**2A**		
2Z			2Z			2Z	23.67	30.8	**2Z**	**23.67**	**18.66**
1	5.99	19.7	1	6.99	35.8	1	10.16	13.2	**1**	**23.14**	**18.24**
Total	**30.41**			**19.50**			**76.97**			**126.88**	

TABLE 14.9 SUMMARY OF TOTAL INFERRED UNDERGROUND MINEABLE RESOURCES BY SEAM/COAL ZONE

Inferred - Underground											
North Block			Middle Block			South Block			Totals		
Seam	Total Coal Mt	% Total	Seam	Total Coal Mt	% Total	Seam	Total Coal Mt	% Total	Seam	Total Coal Mt	% Total
10			10			10			**10**		
9			9			9			**9**		
8	17.87	20.6	8	0.06	4.0	8	4.36	14.4	**8**	**22.29**	**18.78**
6D			6D			6D			**6D**		
6B	11.30	13.0	6B	0.01	0.4	6B			**6B**	**11.31**	**9.53**
6L	11.99	13.8	6L	0.56	35.5	6L	9.96	32.9	**6L**	**22.51**	**18.97**
5	29.44	33.9	5	0.83	52.8	5	3.40	11.3	**5**	**33.67**	**28.38**
4_U			4_U			4_U			**4_U**		
4			4			4	3.11	10.3	**4**	**3.11**	**2.62**
3D			3D			3D			**3D**		
3B			3B			3B			**3B**		
2HI			2HI			2HI			**2HI**		
2EF			2EF			2EF			**2EF**		
2D			2D			2D			**2D**		
2A			2A			2A			**2A**		
2Z			2Z			2Z	6.78	22.4	**2Z**	**6.78**	**5.71**
1	16.24	18.7	1	0.12	7.3	1	2.63	8.7	**1**	**18.99**	**16.00**
Total	**86.84**			**1.58**			**30.24**			**118.66**	

14.6 ASSURANCE OF EXISTENCE CLASSIFICATION

Model block distances from valid seam intercepts in the drill hole and trench records are used to assign resource classification codes. The Geology Type for the North and Middle Blocks is considered to be Moderate. As such, valid seam intercepts (data points) within a maximum search radius of 450m are used to define Measured resources, with 900m for Indicated resources and 2,400m for Inferred resources, as prescribed in GSC Paper 88-21.

As discussed in Section 8, the Geology Type in the North and Middle Blocks is considered Moderate. Although the bedding in the North and Middle Blocks often exceeds 30° the dips are consistent or change gradually along strike, coal seams can be correlated both down dip and along strike with confidence and the encountered faults have minor offsets and are not traceable over distance.

The Geology Type for the South Block is considered Complex in accordance with GSC Paper 88-21 guidelines. For the Complex Geology Type, resources require a minimum of three data points within regularly spaced cross-sections defined by fence line drilling across-strike of the coal beds. As prescribed in GSC Paper 88-21 the assurance of existence criteria for the Complex Geology Type is outlined in Table 14.10.

TABLE 14.10 COMPLEX GEOLOGY TYPE CLASSIFICATION CRITERIA

Criteria	Assurance of Existence Category		
	Measured	Indicated	Inferred
Cross section spacing (m)	150	300	600
Minimum number of data points per section	3	3	3
Mean data point spacing along section (m)	100	200	400
Maximum data point spacing along section (m)	200	400	800

The areas covered by the various resource categories for the main coal seams are shown in Figure 14.1.

15.0 MINERAL RESERVE ESTIMATES

This report summarizes the findings of a PEA, which includes Inferred mineral resources that are considered too speculative geologically to have the economic considerations applied to them that would enable them to be categorized as mineral reserves. There is no certainty that the PEA will be realized. No economically recoverable reserves have been defined in this study.

16.0 MINING METHODS

To date, mine planning for the Huguenot Project, as summarized in this report, has been performed at a conceptual or 'scoping' level and is considered insufficient as the basis of an estimation of reserves. Mine planning is based on pricing forecasts as reported in Section 19. Adjusting assumptions about coal pricing might lead to the proposal of alternate mining methods and mine planning.

16.1 INTRODUCTION

As described previously, the deposit consists of numerous seams, of varying thickness and with some areas of significant dip. In addition, there are known faults. The deposit is therefore considered to be of moderate geology type for the North and Middle Blocks and complex geology type for the South Block. There are sufficient quantities of near-surface resources that may support surface mining in all three blocks. In addition, the dip and structure of the North Block may allow some seams to be amenable to underground longwall mining techniques. A mine plan is presented that examines the economics of a combination of these surface and underground mining approaches. The surface mine is started first due to the relative ease of establishing the mine and producing coal in significant volumes within one year of start-up. It continues to operate for fourteen years until the economic pit limits are reached. The underground mine begins operation in year 3 and reaches full production in year 5 and continues to operate until year 31. This concurrent operating strategy provides a much shorter pay-back period compared to a level production plan. The term 'mineable' is used in this study to define resources to which mine plans have been applied, but economics have not been considered to a level of accuracy sufficient to define reserves.

16.2 SURFACE MINE PLAN

Stantec has developed a conceptual mine plan for a surface mine operated in conditions representative of the northeastern BC coal fields where the Huguenot property is located. The conceptual plan is developed around the three major coal blocks. A detailed pit layout and timing schedule has not been developed for this PEA.

The specific project parameters discussed in this section are summarized below as follows:

- Geologic and geotechnical conditions
- Mining method
- Mine layout
- Mining equipment
- Production and productivity levels.

As part of the scoping study evaluation, a series of pit shells were developed for those areas deemed to be of potential for surface mining. These pit shells were used to develop strip ratio – tonnage relationships for estimation of coal tonnages amenable to surface mining at increasing strip ratios. Strip ratio, one of the key constraints involved with surface mining, represents the volume in cubic metres of waste that must be removed to recover one tonne of coal. An average strip ratio range of 8.6 :1 (bcm of waste: ROM tonnes) was selected as being suitable for scoping level evaluation based on the size of the resource and planned production levels for the operation. The strip ratio range was chosen as this is the average strip ratio used for other mines in the region. Future studies should include a more detailed analysis based on a number of variables including coal sales prices, transportation costs, mining costs and capital costs.

16.2.1 Mining Areas

As shown in Table 16.1 below, a substantial amount of coal exists that may be recovered using surface mining techniques. Surface minable locations were defined by analysis of economic strip ratios. Parameters used to develop the surface minable areas include:

- Minimum seam true thickness of 0.8m
- Minimum interburden or parting true thickness of 0.3m
- Maximum (incremental) strip ratio (cut-off ratio) of 14 to 1 (average strip ratio of 8.6 to 1)
- Minimum oxidized coal zone of 5m depth on outcrop
- Overall pit slopes of 45°
- Roof and floor dilution of 15cm
- Mining recovery of 95%.

Two surface mineable areas were developed to mine separate seams as listed in Table 16.1. The waste volumes, ROM coal tonnes and stripping ratios are shown for each mining area. Maps detailing the individual mining areas are presented in Figure 16.1. Both the 'North Block' and 'South Block' pits contain portions of the Middle Block, thus the two mining areas are referred to herein as the 'North / Middle (north)' and 'South / Middle (south)' pit areas, respectively.

TABLE 16.1 SURFACE MINEABLE QUANTITIES

Pit Area	Target Seam(s)	Waste (M bcm)	ROM Coal (Mt)	Strip Ratio (bcm/tonne)
North / Middle (north)	Seam 1, Seam 2 Seam 3B, Seam 4_U, Seam 5, Seam 6L, Seam 6D, Seam 6B, Seam 8, Seam 9	384.82	42.65	9.0
South / Middle (south)	Seam 1, Seam 2 Seam 2Z, Seam 4, Seam 4_U, Seam 5, Seam 6L, Seam 6B, Seam 8, Seam 9	99.20	13.79	7.2
	Totals	**484.02**	**56.44**	**8.58**

16.2.2 Mining Method

The selected open pit mining method is a conventional truck and shovel operation utilized at, and proven to be the most efficient method for, similar mines in northeastern BC. Large hydraulic excavators have been selected for overburden removal which is consistent with mining practices in the region. The equipment selection for coal removal centres on coal recovery with the use of relatively small backhoes to clean and mine the coal. Given the size and scale of this deposit, it does not support other methods of surface mining. This conventional truck and shovel operation consists of six-unit operations:

- Soil stripping
- Drilling
- Blasting
- Loading and hauling waste
- Cleaning, loading and hauling coal
- Pit backfill and reclamation.

16.2.3 Surface Mining Equipment

In Stantec's judgment, the fleets selected would allow for waste mining at reasonable unit costs while meeting desired production levels. The use of smaller excavators for coal mining with separate truck fleets achieves a balance between selectively mining smaller seams while trying to maintain low unit costs. Given the life of the surface operation and the production level, it is expected that surface mine operations would be carried out by an owner-operated fleet of mining equipment. None of the major equipment is expected to be replaced over this relatively short mine life.

16.2.4 Waste Mining

In order to meet production requirements, the waste mining fleet sizes are proposed as follows:

For the combined North / Middle (north) pit area:

- Loading: 4 x Hydraulic shovel (Hitachi 5600 or equivalent)
- Haulage: 18 x 222 tonne capacity rear-dump trucks (Komatsu 830 or equivalent)
- Drilling: 3 x Rotary blasthole drills 10-inch (254mm) hole diameter, 11m depth.

For the combined South / Middle (south) pit area:

- Loading: 2 x Hydraulic excavators (Hitachi 3600 or equivalent)
- Haulage: 10 x 136 tonne capacity rear-dump trucks (Cat 785 or equivalent)

- Drilling: 2 x Rotary blasthole drills 10-inch (254mm) hole diameter, 11m depth.

16.2.5 Coal Mining

The proposed coal mining fleet sizes for the combined North / Middle (north) pit area are as follows:

- Loading: 1 x Front-end loader (WA 1200 or equivalent)
- Haulage: 5 x 222 tonne capacity rear-dump trucks (Komatsu 830 or equivalent).

The proposed coal mining fleet sizes for the combined South / Middle (south) pit area are as follows:

- Loading: 3 x 7m^3 hydraulic backhoes (CAT 390 backhoe or equivalent)
- Haulage: 3 x 136 tonne capacity rear-dump trucks (Cat 785 or equivalent).

16.2.6 Support Equipment

Support equipment for the project would be required for the various tasks, including:

- Clean-up and support for in-pit waste and coal loading
- Movement of waste on rock dumps and re-sloping of dumps
- Maintenance of haul roads
- Loading and control of raw and clean coal stockpiles
- Maintenance of the clean coal haul road
- Maintenance of mining equipment.

The exact size and configuration of the support equipment fleet would be determined in a pre-feasibility-level study. Cost estimates included in this study are based on a typical regional spread of support equipment for an operation of this size. It is expected that the fleet would include units of the following type:

- 6 x Track-type dozers (CAT D10 equivalent)
- 3 x Motor graders (CAT 16M or equivalent)
- 1 x Front-end loaders (CAT 988 to 992 or equivalent)
- 1 x Water truck for road dust control (12,000 gallon)
- Various maintenance vehicles: lube truck, heavy forklifts, tow truck, flat deck truck.

It is assumed that support vehicles required for loading blastholes would be provided by the blasting contractor.

16.2.7 Production Capacity

Estimates have been prepared for equipment production and productivity based on the scoping level mine layout and Stantec's current understanding of planned production targets and plant capacity. Productivity levels have been evaluated based on the following parameters:

- 10m bench heights for waste loading
- 5m bench heights for coal loading
- Coal seam dip range of 35° - 50°
- 24-hour production, two 12-hour shifts, 350 operating days per year
- 83% operational efficiency
- 85 - 90% availability on major equipment
- Loading units are assigned sufficient trucks to maintain full production
- Generalized waste and coal truck path based on average distances from proposed pits to dumps, facilities, etc.
- Equipment selection as proposed in sections 16.2.4 and 16.2.5.

Based on these assumptions, the estimated monthly production capacity for each fleet is shown in Tables 16.2 and 16.3, below. It should be noted that the production estimates shown represent production for each fleet and not the combined production of all fleets.

TABLE 16.2 FLEET PRODUCTION CAPACITY, NORTH / MIDDLE (NORTH) PIT AREA

Fleet	Number of fleets at full production	Waste Production per Fleet (Kbcm / month)	Coal Production per Fleet (Ktonnes / month adb)
Waste fleet	4	700 - 750	n.a.
Coal mining fleet	1	n.a.	140 - 180

TABLE 16.3 FLEET PRODUCTION CAPACITY, SOUTH / MIDDLE (SOUTH) PIT AREA

Fleet	Number of fleets at full production	Waste Production per Fleet (Kbcm / month)	Coal Production per Fleet (Ktonnes / month adb)
Waste fleet	2	450 – 500	n.a.
Coal mining fleet	1	n.a.	80 - 100

These production levels represent production capacities based on the scoping level mine plan. As more detailed mine planning and evaluation work is completed, production levels will vary as mining progresses throughout the property due to a number of factors including changing pit geometries and haul distances, production constraints and other factors.

16.2.8 Production Schedule

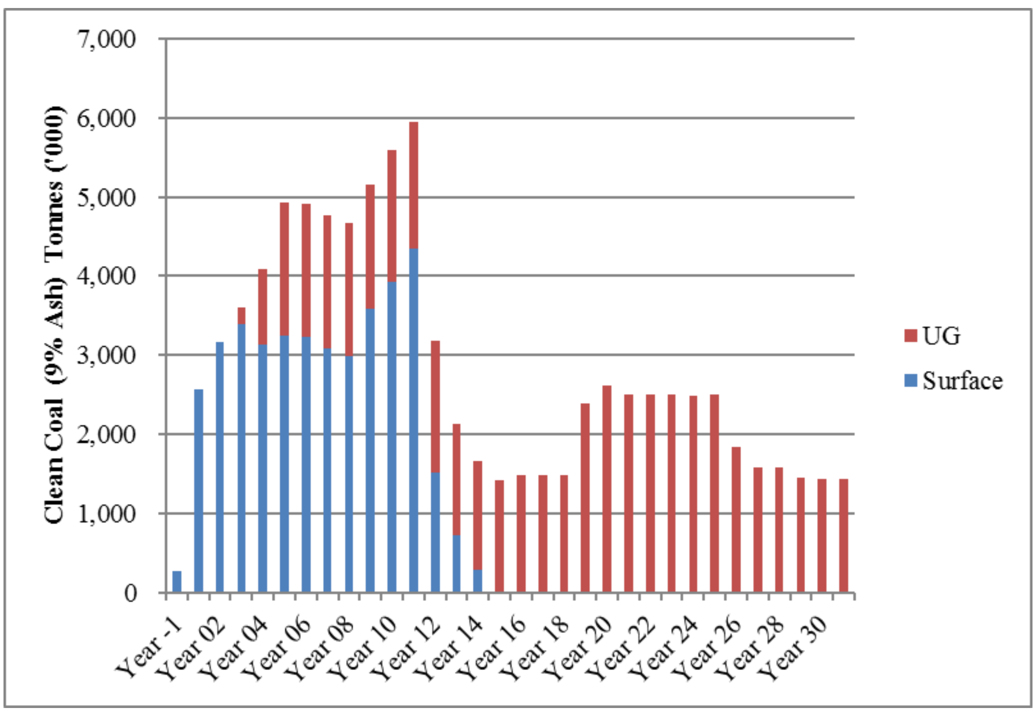
Surface mining commences with pre-production in Year -1, and averages 3.2Mtpa (ranging from 1.5 to 4.3Mtpa) of clean coal during surface mining 'steady-state' production (Years 1 through 12). Two surface pits are developed and mined concurrently. The North / Middle (north) pit provides the majority of surface production (averages approximately 2.5Mtpa of clean coal) from Year -1 through Year 12. For Years 1 through 14, a second pit, the South / Middle (south) pit, provides approximately 0.7Mtpa of clean coal.

Production from the longwall operation commences in Year 3 and averages 1.8Mtpa (ranging from 1.4 to 2.6Mtpa) of clean coal during underground mining 'steady-state' production (Years 5 through 31).

Production of clean coal from the combined surface and underground mining operations averages approximately 3Mtpa, and ranges from 1.4 to 5.9Mtpa. The variance in coal production is driven by several factors, primarily the sequence in which coal seams of varying thickness are encountered by the longwall operation, and constraints on the equipment.

Preliminary mine planning for the surface and longwall operations has resulted in a proposed clean coal LOM production schedule, as summarized in Figure 16.2.

FIGURE 16.2 LIFE-OF-MINE PRODUCTION SUMMARY



16.3 UNDERGROUND MINE PLAN

16.3.1 Mining Areas

As presented in Section 14, significant coal resources are available for underground mining within all three blocks. However, as described below, only those within the moderately-dipping portions of the North Block are considered to offer potential for near-term development. Longwall mining was identified as the most productive of the mining methods likely to be economic for the Huguenot Project.

Longwall is the preferred method for the North Block of the Huguenot property for the following reasons:

- Large mineable resource base.
- Areal extent of the North Block (1,580m wide and 3,700m long) and shape is well suited for ease of conceptual layout. It is envisioned that main development entries could be developed from the outcrop or slope along the western or eastern side with long panels running diagonal along the strike (slightly up-dip).
- The vast majority of the resource is contained in areas where the average dip is just over 19° (35%) with the steepest dips located along the southern boundary at greater than 25° (47%), which is manageable for grade-specified longwall equipment.
- Coal thickness of the target seams would provide good productivity. However, rear caving methods would have to be utilized to safely recover the full thickness of Seam 5 and Seam 1. The expected life of today's longwall face supports exceed 60,000 movement cycles. One set of longwall face supports are projected to complete the longwall mining in the North Block. Longwall equipment should be designed to work in the 2 to 4m range with maximum expected mining heights of 3.5m.

For these reasons, longwall mining in the North Block is identified as the preferred method and forms the basis for the remainder of the study.

The average dip of 19° in the North Block allows for orientation adjustments for conveyor belt coal haulage and the use of track mounted mining equipment at apparent dips less than 15°. Room and pillar main development with angled crosscuts for ventilation, haulage, and access are possible utilizing continuous miners or roadheaders. The utilization of longwall mining is also possible at productive rates in areas with slope gradients less than 25°. The proposed layout of the longwall operations is shown in Figures 16.3 through 16.6.

16.3.2 Underground Mining Method Selection

Two production methods were investigated; room and pillar mining, and longwall. After a preliminary analysis, longwall mining was identified as the most productive of the mining methods likely to be economic for the Huguenot Project.

Longwall mining, in general has broad applications throughout the world. It's most productive setting is in coal seams of moderate thickness (up to 6m), fairly uniform structure and simple geology (i.e., minimal faulting or channeling, slight grades and moderate overburden). Longwalls operate in a wide variety of ground conditions or strength of materials, settings much more difficult than those that appear to be exhibited by the Huguenot property. With adverse conditions productivity is reduced but there is little doubt that there are potentially significant amounts of coal that could not be recovered by any other means than longwall. Longwall equipment is relatively inflexible to radical changes in seam conditions. It is also impossible to drill densely enough to detect every geologic anomaly, with the result that mine plan adjustments are commonly made as conditions change. Detailed mine mapping and drilling, help mitigate adverse impacts on productivity of the longwall.

The shape and extent of the mineable areas allow for longwall panel orientations in an east-west orientation (possibly slightly angled to minimize gateroad development grades). Longwall panels in these mineable blocks range from 1,250 to 1,275m in length with average panel widths of 250m. The mineable areas exhibit a wide range of depths; as such consideration has to be given to the possibility of implementing a longwall panel – barrier system, where a large barrier of coal is left between longwall panels to reduce the chance of geological stress-related outburst conditions. The requirement to implement this type of system becomes necessary at depths exceeding 600m. Since the mineable areas in the North Block overlay one another, a top down sequence is recommended starting in Seam 8 with completion in Seam 1. The coal seams targeted for underground mining in the North Block have a wide range of thickness ranging from 1.7 to 5.8m. The two thickest seams (Seam 5 and 1) will likely have safe full seam mining thickness at the depths and slope gradients indicated. The use of rear-caving longwall shield supports would allow a standard mining thickness between 2.5 and 3.5m with recovery of the additional remaining coal using a rear conveyor behind the supports.

Shaft access north of the surface mining pit allows both surface and underground operations to expand with very little impact to the other operation. Positioning of the surface facilities must consider the impact of underground mine subsidence when selecting the surface facility site. The possible positioning of the shaft and surface facilities are shown in Figure 16.1

16.3.3 Constraints to Mineable Resources

From a mining recovery perspective, longwall is the most efficient recovery method for the panels themselves, but recovery reductions must be considered for multi-seam effects as well as overall recovery (including mainline and submains).

There are many factors that affect and determine the types and impacts of multiple seam mining interactions. These factors can be divided in two categories; geological and mining. Geological factors are inherent to the deposit and may not be changed whereas mining factors are those which result from the mine plan and may be altered. Table 16.4 presents a listing of the geologic and mining factors which should be considered for multiple seam mining, all of which require detailed investigation.

TABLE 16.4 GEOLOGICAL AND MINING FACTORS APPLICABLE TO MULTIPLE SEAM MINING

Geological Factor	Mining Factor
In-situ horizontal stress conditions	Sequence of mining
Overburden thickness and rock type	Mining method
Upper seam thickness	Installed mining support
Lower seam thickness	Mining layout and dimensions
Upper seam immediate roof and floor	Extraction percentage of both seams
Lower seam roof and floor	Relative location and orientation of upper and lower workings
Interburden thickness and rock type	Mining height
Interburden hardrock percentage	Mining direction
Number of rock layers contain in interburden	Time between mining of upper and lower seams
Coefficient of friction between rock layers	
Seam inclination	
Rock mechanics properties of the lower and upper seam coals	
Existence of ground water	
Surface subsidence issues	
Geological anomalies	

Modified from Peng (2008)

Many of the geologic and mining factors summarized in Table 16.4 were taken into account when constraining the mineable resource (see Section 14) in order to identify a portion of the resource to which a mine plan may be applied.

The mineable resource estimate was constrained according to the following parameters:

- Minimum overburden: 50m
- Maximum overburden: 900m
- Minimum interburden: 25m
- Minimum seam mining thickness: 1.2m
- Maximum grade (dip): 30° or approximately 58%.
- Minimum surface pit barrier: 100m
- Minimum outcrop barrier: 50m
- License boundary barrier: 30m.

By applying these constraints, a potentially recoverable portion of the resource was estimated, as summarized in Table 16.5. Approximately 41% of the in-situ mineable resources are contained in the shallower depth range (100 to

500m) with approximately 67% (34.8Mt) of the shallower depth range classified as "Measured" and "Indicated". Of the mineable resource summarized in Table 14.7 (above), approximately 127Mt is considered applicable to mine planning after applying geological and mining factors and constraints.

The remaining 59% of the resources are in the deeper range (500 to 900m) with only 7% of the deeper resources (4% of total) classified as "Measured" and "Indicated".

TABLE 16.5 NORTH BLOCK – UNDERGROUND MINEABLE AREA RESOURCES TONNES BY CLASSIFICATION BY OVERBURDEN THICKNESS RANGE (MT)

Seam	100 – 500m Overburden Thickness			500 – 900m Overburden Thickness			Total M+I (Tonnes)	Total Inferred (Tonnes)
	Measured	Indicated	Inferred	Measured	Indicated	Inferred		
8	2.99	5.60	10.06	-	-	14.87	8.59	24.93
6B	2.18	3.68	2.90	-	0.03	10.57	5.89	13.47
5	5.86	8.80	4.20	-	1.01	28.15	15.67	32.36
1	3.93	1.78	0.02	0.23	4.01	15.67	9.95	15.70
Total	**14.96**	**19.86**	**17.19**	**0.23**	**5.05**	**69.27**	**40.10**	**86.46**

The slope gradient of the resources must be considered for the selection of mining methods, material haulage (product, equipment and mining supplies), and potential level of productivity. Seam dip averages 21° in the deposit for depths ranging from 100 to 500m, decreasing to approximately 18° in depths ranging from 500 to 900m.

16.3.4 Run-of-Mine Production

Stantec utilized two programs from the National Institute for Occupational Safety and Health (NIOSH) for basic pillar and barrier design for a five-roadway main development and for two roadway longwall gateroads (minimal cross-cuts – 300m centres). The Analysis for Retreat Mining Pillar Stability (ARMPS) and the Analysis for Longwall Pillar Stability (ALPS) results provided a means to determine a percentage recovery for each mineable seam based on a depth and mining height. The percent recoveries for the North Block projected in Table 16.6 are the results based on the following parameters:

- 30m barrier at the license boundary
- Pillars and barriers based on the average mining depth for each mineable area
- Roadway openings averaging 3m high by 6m wide
- Five roadway main development
- Two roadway longwall gate roads and a two-roadway bleeder system
- One un-mined longwall panel 200m wide left as a barrier in depths greater than 600m
- Longwall recovery of 98% in seams less than 3.5m average thickness

- Longwall recovery in seams greater than 3.5m in thickness is 98% in the first 3.5m and 70% in the remaining average thickness.
- Out-of-seam dilution averages 2.5% of ROM tonnes and ranges from 2% to 7% of ROM tonnes depending on the thickness of the seam.

Table 16.6 details the ROM tonnes for the seams targeted in the North Block underground area.

TABLE 16.6 HUGUENOT NORTH BLOCK UNDERGROUND RUN-OF-MINE COAL TONNES

Seam	Mineable MTRC (M)	Mineable Resource Recovery (%)	ROM Coal MTRC (M)	ROM MTRC w/ OSD (M)
8	33.5	57	19.2	19.5
6B	19.4	56	10.9	11.5
5	48.0	47	22.7	22.9
1	25.6	46	11.9	11.9
Total	**126.5**	**51**	**64.7**	**65.8**

16.3.5 Production Capacity

Roof conditions will dictate the selection of development equipment. The need for geotechnical testing of the coal and the surrounding rock material will help determine whether roadway development can be supported by using roof bolts and square set supports or if openings need to have an arched roof and steel arch supports. Certainly, the deeper portion of mineable areas within the North Block would be considered for arched openings and steel arches.

A recommended operations schedule would be seven days per week with 10-hour production shifts and an 8-hour overlapping shift for maintenance, belt and power moves, and section setup. The extent of the mineable areas is not large enough to require long travel times so no production shift overlap is anticipated. The differences in seam thickness and mining depth will likely result in two planned production levels for development and the potential for two seams to utilize rear caving.

Roadheader (RH) development of arched headings is expected to range from 90 to 120 tonnes ROM per shift. Annual production per RH unit is projected between 80,000 to 110,000 tonnes ROM. Longwall productivity rates are based on panel length and number of longwall moves per year. Average annual production is based on 44 weeks (308 days) per year with the remaining weeks for longwall moves. Seam thickness or mining height limits ranging from 2.5 to 3.5m would be expected to produce 6,000 to 9,700 tonnes per day (tpd) or 2.35 to 3.8Mt ROM annually. The potential top coal-caving recovery of 1.5 to 4m of head coal could add an additional 1,000 to 3,000tpd or 0.4 to 1.2Mt ROM annually. Table 16.7 below summarizes the indicated productivity and annual production levels by seam.

TABLE 16.7 NORTH BLOCK – UNDERGROUND PRODUCTIVITY AND PRODUCTION LEVELS

Type	Productivity (tonnes per day)	Annual Production (Mt)
RH Development 8, 6B, 5 and 1 (4 units)	1,000 - 1,144	0.21 - 0.36
8, 6B Longwall	5,200 - 6,200	1.6 – 1.9
5 and 1 Longwall (with rear caving)	6,200 - 9,600	1.9 – 2.95
Annual Average Production Seams 8, 6B	6,200 - 7,344	1.81 – 2.26
Annual Average Production Seams 5, 1	7,200 – 10,744	2.11 – 3.31

16.3.6 Underground Mining Equipment

Development would be accomplished with continuous miner or RH unit equipment utilizing, shuttle cars/coal haulers or conveyor bridge equipment, mobile roof bolters, feeder breakers and face scoops. Where a place-change system is difficult, an extendable conveyance system along with alternative support systems will be required. Road openings are designed to have a maximum width of 6.1m and a maximum height of 3.0m. Development equipment should be sized to operate at a minimum height of 2.5m. The longwall face equipment is projected to utilize a double drum shearer designed to operate in a cutting range from 2.0 to 4.0m. The face haulage system is a chain/flight conveyor oriented to move material down gradient. An up-gradient system can be considered at the expense of panel width and increased horsepower requirements. Once the face conveyor aspect exceeds 25°, up-gradient haulage becomes less efficient. A face support system with optional rear caving capability provides a second chain conveyor to be installed in Seam 5 and possibly Seam 1. The face supports would have additional retractable rear canopies that would allow remaining head coal to flow into the trailing (rear) conveyor. Recovery of the uncut head coal is projected to average 70%.

17.0 RECOVERY METHODS

Handling and processing of coal typically occurs within the confines of the Coal Handling and Preparation Plant (located within the plant site area, Figure 16.1). The plant has two components; the Coal Handling Plant (CHP) as well as the Coal Preparation Plant (CPP). The CHP receives raw coal from the mines, sizes it and feeds it to a stockpile or to the washery, or CPP. Clean coal is then typically conveyed and loaded for transportation to port, while refuse from the washing process is loaded for transportation to disposal facilities. The 'scoping' level study summarized in this report included an assessment of CHP and CPP needs that is conceptual in nature, and based on a commonly used approach. Detailed designs, flowsheets, energy and water requirements etc. have not been estimated or prepared.

17.1 COAL HANDLING PLANT

For the purposes of this PEA, costs of a CHP have been assumed consistent with the need to handle a maximum of 8Mtpa of ROM coal to produce 6Mtpa of clean coal. ROM material is typically first transported from surface or underground workings to a ROM stockpile in the vicinity of the CHP. The ROM stockpile allows the CHP to operate somewhat independently of the mine, providing the CHP operations the ability to schedule maintenance without disrupting the mining activity. Reclaim from the ROM stockpile would typically be performed with the use of dozers and pile activators.

17.2 COAL PREPARATION PLANT

The CPP will be required to process an estimated maximum of 8Mtpa of ROM coal to produce 6Mtpa of clean coal.

As discussed in Section 13 above, Stantec has estimated average yields of 70% for surface mined coal and 76% for underground mined coal, washing the various coal seams to an approximate 9% ash as received basis (arb). In general, a CPP uses heavy media cyclone, spiral concentrators and froth flotation methods to remove ash from the coal in order to reduce the ash to a target level.

After washing, clean coal is stored and covered to ensure that weather doesn't increase the moisture content until shipment as well as to mitigate blowing coal dust. The washing process is optimized to enhance mechanical de-watering of the coal. The goal of this is to offset moisture content increases during rail haulage and stockpiling at the shipping docks during wet weather, in order to achieve an average 9% maximum moisture level on-board the ship.

18.0 PROJECT INFRASTRUCTURE

18.1 RAIL LINK

For the purposes of this study, it is assumed that a third-party would build and own an approximately 85km long rail link connecting the Huguenot Project with the PRC rail-loadout at a cost of approximately US$306M, and charge a fee to Colonial, and other potential customers, for access to that link (see Section 21.4.1). A conceptual rail route is shown in Figure 18.1

The base case in the financial analysis assumes that the Huguenot Project will bear 50% of the cost of the rail construction over a 15-year period. The financial analysis also includes a sensitivity assuming the Project bears 100% of the rail cost. As noted in the recommendations section of this report, given the substantial capital required to construct the rail line, it is recommended that a study of the options for road haulage be conducted.

18.2 RAIL LOADOUT

Coal will be trucked and stockpiled in windrows adjacent to the rail line and loaded onto unit trains by front-end loader units. This system is similar to that used by PRC in the Tumbler Ridge area. The scoping study assumes a front-end loading (FEL) unit will be dedicated to the rail loadout facility.

A rail loop or siding will be constructed to accommodate a unit train. The cost of a typical loadout is included in the capital cost estimate.

18.3 ROAD UPGRADE

To provide an access route to transport materials and supplies between the mine and the Heritage Highway, which is located approximately 25km to the north, the existing unpaved FSR will need to be improved. Improvements may include re-grading, repair, re-surfacing, drainage controls, bridging and crossings, and the addition of truck ‘turn-outs’ (as implemented on logging roads) to improve the safety and efficiency of two-way traffic.

18.4 POWERLINE

The combined power requirements for the surface and underground mine workings as well as the CHP and CPP will likely exceed what can be practically and economically achieved through the use of generator sets. It is assumed, for the purposes of cost estimation, that a 230kV powerline will be constructed to connect the Huguenot property to the BC Hydro grid near the Quintette substation, approximately 78km from the Huguenot Project site (see Figure 18.1). This study takes into account tying into the existing system as well as the cost of distribution of power throughout the project site.

18.5 SHOP, OFFICES AND CAMP

Surface facilities would likely include; a maintenance shop and warehouse building, mine offices, the mine ‘dry’ (bathhouse facilities), a fuel depot, “ready-line”, etc. It is proposed that the surface facilities be shared between the surface and underground mining teams as much as possible, in order to maximize the efficiency of the space available (see Figure 16.1).

A camp site will need to be developed at a convenient location for access to the mine site. It is assumed that the camp buildings will be prefabricated single-storey buildings and will include dormitories, kitchen / dining facilities and a recreation building.

Electricity will be provided initially by a diesel generator until an overhead power supply line is installed from the new 230kV substation at the CPP. Mine-use water (fire protection, dust suppression, equipment washing, potable water, etc.) will be provided from on-site wells and will be treated as necessary. Sanitary wastewater will be drained / pumped to a sewage treatment lagoon.

18.6 PONDS

A key component of the mine development costs are the sedimentation control ponds. Conceptual ponds have been located to capture the mine drainage to meet BC's requirements for sedimentation control. The Huguenot property is situated in challenging terrain, which requires the crossing of multiple drainages. It is assumed this will require eight sedimentation and clean water diversion ponds to be built.

18.7 REFUSE HANDLING

Stantec has assumed that coal process wastes will be a combination of the dewatered coarse coal and fine coal streams. The process wastes will be back hauled to active waste dumps and blended with waste rock generated from the mine.

19.0 MARKETS AND CONTRACTS

The discussion presented below has been adapted from the document titled "Price Assessment for Huguenot Coking Coal" prepared by Kobie Koornhof Associates Inc. (KKA) (Koornhof, 2018). The HCC price outlook provided below is valid for April 19, 2018.

19.1 QUALITY OF HUGUENOT COKING COAL

In August 2013, KKA completed a quality assessment on Huguenot coking coal (Koornhof, 2013), based on drilling, washability and carbonization studies carried out by Colonial. That assessment was prepared in conjunction with, and subsequently formed part of, a PEA report compiled by Norwest (Evenson, 2013). Since then, no additional coal quality data have been obtained. Consequently, this assessment is based on the coal quality findings presented in the 2013 report (restated in Table 19.1, below), which shows the major quality parameters of the anticipated Huguenot HCC in relation to HCC exports from Canada.

TABLE 19.1 QUALITY COMPARISON: HUGUENOT HCC VS. CANADIAN EXPORT COKING COALS

	Huguenot Coking Coal[1]	Canadian NEBC HCC[2]	Canadian SEBC HCC[2]
Total Moisture (% as received)	9	8 - 9	8
Volatile Matter (% dry)	22.5 - 23.5	23 - 24.5	21.0 - 27.0
Ash Content (% dry)	8.5 - 9	8.25 - 8.60	8.5 - 9.6
Sulphur Content (% dry)	0.40	0.45 - 0.55	0.35 - 0.75
Free Swelling Index (FSI)	6.5 - 7	7 - 8	6 - 8
Mean Max Reflectance of Vitrinite (%)	1.15 - 1.20	1.15 - 1.25	1.08 - 1.35
Maximum Fluidity (ddpm)	100	150 - 300	40 - 300
Phosphorus in Coal (% dry)	0.044	0.008 - 0.040	0.010 - 0.065
Base/Acid Ratio of Ash	0.08 - 0.10	0.12 - 0.18	0.07 - 0.10
Coke Strength after Reaction (CSR)	60 - 65	58 - 60	68 - 72

1) Results based on laboratory scale washing and testing of exploration samples.
2) Results based on full washing plant under operating conditions.

Huguenot is expected to produce coking coals that are in many respects comparable to the top Canadian coking coal brands.

19.2 RECENT MARKET OVERVIEW

The metallurgical coal market in 2016 and 2017 was characterized by two price surges. The first of these, from October 2016 to January 2017, was the result of increased buying from China, due to numerous factors encroaching on supply availability of domestic coal. During this time, spot prices were above US$300 per tonne for more than a month.

The second price surge was more short-lived; it was caused by the supply shock to Australian coking coals following Cyclone Debbie, which hit Queensland in April 2017. The price spike lasted barely 3 weeks, with only minimal tonnages sold at US$300. Prices quickly dropped to the US$145 – 165 level in the May-July period, as fears of supply shortages subsided.

Since August 2017 the industry has experienced a return to a demand led price cycle, as opposed to the previously supply constrained markets. The market spiked above US$200 per tonne in Aug/Sep before falling back to an apparent floor of US$180 per tonne through to the end of November 2017, before again breaking US$200 per tonne in December, with peaks at US$260 per tonne. The driver for the extended price run has been a global uplift in steel margins, coupled with increasing demand in all regions.

Price robustness has been buoyed by strong Indian buying, as well as weather disruptions in Queensland. However, with the seaborne price in March 2018 higher than domestic Chinese HCC prices, a correction was in order. In early April the price dropped rapidly as more supply came on board, dropping below US$200 for the first time in over 4 months.

19.3 STEEL PRODUCTION

Global steel production recovered strongly in 2017, after reporting only 2% growth from 2013 to 2016, and indeed contracting from the peak of 2014. The resurgence in global steel production has seen 2017 volumes up 5.3% or 85Mtpa. While China has grown strongly, up 5.7% or 45Mtpa for the year, ex-China production is also up, increasing 4.9% or 40Mtpa.

Table 19.2 summarizes the recovery in steel production in 2017 compared to 2016 and summarizes steel production from the first quarter of 2017 compared to the first quarter of 2018. For 2017 over 2016, the table indicates increased steel production in all coking coal importing countries, with the exception of Japan which is down by just 0.1%. For the first quarter of 2018, steel production has continued the overall upward trend seen in 2017, except for Germany and Taiwan, which are unchanged, and Russia which has seen a correction.

TABLE 19.2 STEEL PRODUCTION 2017 OVER 2016 AND 2018 OVER 2017 (JAN-MAR ONLY)

	Steel Production 2017 Over 2016			Steel Production 2018 Over 2017 (January-March Only)		
(Mt)	**2017**	**2016**	**% Change**	**2018**	**2017**	**% Change**
By Region						
EU 28	168.7	162.0	+4.1%	43.1	42.7	+0.9%
CIS	102.0	101.9	+0.1%	23.8	24.9	-4.4%
North America	116.0	110.6	+4.9%	29.5	28.9	+2.1%
South America	43.7	40.2	+8.7%	11.1	10.4	+6.7%
Asia	1151.8	1090.0	+5.7%	292.7	279.8	+4.6%
Others	109.0	101.6	+7.3%	25.0	21.8	+14.7%
Global Total	**1691.2**	**1606.3**	**+5.3%**	**425.2**	**408.5**	**+4.1%**
By Major Country						
China	831.7	786.9	+5.7%	210.8	200.0	+5.4%
Japan	104.7	104.8	-0.1%	26.4	26.2	+0.8%
India	101.4	95.5	+6.2%	26.7	25.7	+3.9%
USA	81.6	78.5	+3.9%	20.7	20.3	+2.0%
Russia	71.3	70.5	+1.1%	16.6	17.7	-6.2%
South Korea	71.1	68.6	+3.6%	17.8	17.3	+2.9%
Germany	43.6	42.1	+3.6%	11.0	11.0	-
Turkey	37.5	33.2	+13.0%	9.5	8.8	+8.0%
Brazil	34.4	31.3	+9.9%	8.6	8.2	+4.9%
Italy	24.0	23.4	+2.6%	6.4	6.2	+3.2%
Taiwan	23.2	21.8	+6.4%	5.7	5.7	-
Others	266.7	249.7	+6.8%	65.0	61.4	+5.9%
Global Total (Excl. China)	**859.5**	**819.4**	**+4.9%**	**214.4**	**208.5**	**+2.8%**

Source: World Steel Association

19.4 STEEL OUTLOOK

Steel consumption remains intrinsically linked to economic growth, and it is assumed that, short of major interventions, the industry will continue its path of slow but steady growth, supported by current worldwide economic growth. At the same time, steel pricing has returned to healthy levels.

The World Steel Association (World Steel) forecasts global steel demand will reach 1,648.1Mt in 2018. Steel demand excluding China is forecast to reach 882.4Mt, an increase of 3.0% over 2017.

19.5 COKING COAL OUTLOOK

Demand for HCC has recovered to robust levels as the steel industry fundamentals remain a strong driver for seaborne coking coal imports.

Ongoing structural reform in China underpins longer-term demand for high-quality steelmaking coal. With ongoing moves to improve the financial condition of the steel and coal industries through capacity reductions and shedding of uneconomic performers, high quality coal imports are expected to benefit where domestic capacity reductions restrict the local supply.

Major steel growth areas, all of which will require imported HCC, besides China, are India and Southeast Asia, with a number of integrated steel mills in the planning stage. These are among the beneficiaries of the One Belt One Road (OBOR) initiative.

Metallurgical coal will still be required for the majority of global steel production going forward. In India, the International Energy Agency (IEA) expects 190Mt of metallurgical coal required for steel production in 2040, to meet the more than 300Mtpa of steel production by 2040, an increase of more than 200Mtpa from current levels.

19.6 PRICE BENCHMARKING OF HUGUENOT COKING COAL

For the 2013 report, Huguenot pricing was benchmarked off then current exports of HCC from NEBC, which had seen a steady market presence for the greater part of a decade. Since 2013 however, NEBC coking coal has not been consistently competitive in the market, with only one of the former coking coal mines recently returning to production.

With insufficient benchmarking price points available from Canada in 2018, this report benchmarks Huguenot coking coal off comparable coals from Australia, in particular the mid vol coking coals with CSR in the range 60-65.

The supply of these Tier 2 coals is currently tighter than that of the premium coking coals; as a result, these coals have in 2018 been priced at 92-94% of premium low volatile HCC, compared to earlier levels below 90% of premium low vol pricing.

19.7 PRICE OUTLOOK FOR HUGUENOT COKING COAL

With steady demand growth for seaborne HCC in the mid-term, constrained supply can be expected to continue to support prices at elevated levels. It is difficult to see a rapid expansion of export tonnes even at current higher prices, due to many projects being pushed back or cancelled during the long and painful price decline from mid-2012 to mid-2016.

While expansion is on the cards for several existing mines, a number of operations face reserve depletion. This emphasizes the role of new projects in attempting to bridge the gap between supply and steady demand growth. Since very few projects have been committed beyond 2019, many more will need to come to fruition in order to close the gap.

HCC supply on the seaborne market remains concentrated in Australia, Canada, the USA, and Russia, which account for the bulk of seaborne coking coal supply. Higher prices (and possibly limited supply from Australia) will enable newer exporters such as Mozambique and Indonesia to take advantage of demand growth, but it remains to be seen whether any meaningful tonnage increases will be forthcoming.

It is expected that, in the medium term, benchmark HCC prices could settle in the US$180 – 210 per tonne level; from 2021 on, long term prices are expected in the range US$170 – 200 per tonne.

Table 19.3 indicates a range of prices for Huguenot based on the anticipated ranges in market pricing.

TABLE 19.3 PRICE OUTLOOK FOR HUGUENOT HCC

HCC Products	Price of HCC (%)	Current Market (US$)	Medium Term Price 2018-2020 (US$/Tonne)	Long Term Price 2021 Onwards (US$/Tonne)
Benchmark HCC Price	100%	190	180 - 210	170 - 200
Tier 2 HCC Pricing	92 - 94%	175 - 179	166 - 197	156 - 188
Huguenot HCC Price Range	92 - 94%	175 - 179	166 - 197	156 - 188

20.0 ENVIRONMENTAL STUDIES, PERMITTING & SOCIAL/COMMUNITY IMPACTS

The following, prepared by Sage Resource Consultants Ltd. (Sage), is an update of Section 20, also prepared by Sage, that was presented in the original, 2013 Huguenot PEA.

20.1 ENVIRONMENTAL STUDIES

As described below, several environmental studies were performed and data collected for the Huguenot Project, mainly between February 2012 and October 2013, in support of a possible environmental assessment application that was being considered at the time. This information was summarized by Sage and is presented in Table 20.1. The findings and key points of this work are repeated here and updated where necessary.

20.1.1 Environmental Setting

The Huguenot Project lies within the foothills of the Rocky Mountains, and extends from valley bottoms to alpine ridges, covering various forest types as well as wetlands and riparian zones. The Project area is subject to at least four main drainages (referred to as Holtslander and Pika Creeks, and two unnamed creeks referred to herein as C-1 and C-2 Creeks) which drain to Belcourt Creek; other major drainages in the Project region include Huguenot Creek, Red Deer Creek and the Wapiti River. Mining activities proposed in this study, including possible waste-rock dump sites, might disturb the headwaters and upper reaches of Holtslander and Pika Creeks, and Creeks M-1 and M-2.

Fisheries field work found bull trout in varying abundances within the four drainages of the immediate Project area, though restrictions to fish distribution in the upper reaches of some of the creeks, and to some parts of the Project area itself, are known to exist. Bull trout are considered a Species of Special Concern in BC (BCCDC 2012) and by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) and are considered a species of special management concern in Alberta.

Results of water quality monitoring showed that surface water quality varied little among creeks and was of generally good quality. Sediment quality sampling indicated that three metals and four polycyclic aromatic hydrocarbons (PAHs) exhibited concentrations in Holtslander Creek that exceeded BC and Canadian Council of Ministers of the Environment (CCME) interim sediment quality guidelines, including: arsenic, cadmium, nickel, dibenz(a,h) anthracene, 2-methylnaphthalene, naphthalene and phenanthrene.

It has been previously noted that the Huguenot Project and surrounding area contains habitat used by the Narraway caribou herd, with a major and secondary migration route appearing to be located south and north of the Project area, respectively. Telemetry data presented by the BC Ministry of Environment in February 2013 was not able to confirm the presence of caribou in the main target area during recent winters. Colonial has not seen results of telemetry data from recent years.

To obtain seasonal habitat use information for caribou and other wildlife in the Huguenot Project area that can be used in exploration and development planning and mitigation, Colonial commissioned four seasonal (February, May, July, and September) aerial surveys, that were conducted by helicopter in 2012 both within and immediately adjacent to the Huguenot Project area. Ground transects and plots were also conducted in conjunction with the summer aerial survey to identify wildlife signs and vegetation communities within the main target area. Observations were made of the presence of wildlife, including caribou, deer, moose, bear, goats, wolves and wolverines.

20.1.2 Environmental Studies Completed

In early 2011, Colonial sought to position the Huguenot Project to be in a state of readiness to engage with the BC Environmental Assessment Office (BCEAO) as well as the Canadian Environmental Assessment Agency (CEAA). The environmental work was to focus on the main area targeted for potential future mining and to allow for assessment of potential environmental impacts on both local and regional scales. An environmental baseline program was then developed and executed. The various components of the program are summarized in Table 20.1.

TABLE 20.1 ENVIRONMENTAL BASELINE PROGRAMS COMPLETED TO DATE[1]

Program	Description of Work	Consultant**	Date of Work
Aquatic	Collected one year of aquatic resource data including: aquatic habitat, fish distribution, benthic invertebrate communities, sediment quality, periphyton analysis (sampling conducted in July and October).	Hatfield	2011
Archaeology	Completed an archaeological overview assessment of the Project area.	Archer	2012
ARD/ML	Completed static testing on all representative rock units (excluding coal and coaly intervals, plus coarse coal refuse and tails) – report pending.	BGC	2012
Climate	Installed a climate station that is collecting data year-round.	Levelton/WSP	2011 - present
Hydrology	Collected two years of hydrology data from automated hydrometric monitoring station plus site visits (eight sites visited on four occasions in 2011 (July, August, October, and November), five occasions in 2012 (May, June, July, September, and late October/early November) and one occasion in 2013 (May).	Hatfield	2011 - October 2013
Snow	Completed two years of snow surveys (monitoring carried out at eight survey stations during February, April, and May)	Hatfield	2012 - May 2013
Surface Water Quality	Collected two years of surface water quality data (eight sites visited on four occasions in 2011 (July, August, October, and November), five occasions in 2012 (May, June, July, September, and late October/early November) and one occasion in 2013 (May).	Hatfield	2011 - May 2013
TEM	Completed a desktop scoping exercise for terrestrial wildlife and ecosystem mapping.	Aurora	2011
Wildlife	Conducted four aerial wildlife reconnaissance surveys, representative of each season; plus during the summer survey completed ground transect and plots to identify wildlife sign and vegetation communities.	Ardea	2012

** List of Consultants
Hatfield Consultants, North Vancouver, BC
Archer CRM Partnership. Ft. St. John, BC

[1] Reproduced from the report *Environmental Studies, Permitting and Social / Community Overview*, Sage Resources Consultants, Ltd., July 2013; table updated March 2018.

BGC Engineering Inc., Vancouver, BC
Levelton Consultants Ltd.(now WSP), Richmond, BC
Aurora Wildlife Research, Nelson, BC
Ardea Biological Consulting, Smithers, BC

20.1.3 Potential Environmental Issues

The overview report prepared by Sage in July 2013 identified no known environmental issues for the Huguenot Project that would prohibit Project advancement or impact the ability to extract the resource. However, it was noted that declining caribou populations and the release of selenium as a result of coal mining are issues of growing concern in the region and these factors remain relevant to date.

20.1.4 Caribou

In November 2017, the governments of Canada and BC reached a draft Conservation Agreement regarding southern mountain caribou to address concerns related to the continuing decline of caribou populations in Canada and the impact this is having on biodiversity and on Indigenous Peoples, in particular. The long-term goal of the Conservation Agreement is to achieve self-sustaining populations in the Central Group of the Southern Mountain Caribou which includes the Pine River, Quintette and Narraway herds.

One strategy to achieve this will be through the avoidance, mitigation and off-setting of impacts on caribou habitat, particularly high elevation winter and summer tenured habitat, and to a lesser extent, non-high elevation habitat. Section 8: Recovery Measures for Southern Mountain Caribou of the draft Conservation Agreement states that:

“Additional planning and analysis will be required to ensure full consideration of existing tenure rights (and any limits on those tenure rights) to achieve necessary habitat protection in a timely and cost-effective manner over time.”

The final agreement is expected in the spring of 2018.

Colonial will be required to submit a Caribou Mitigation and Monitoring Plan before conducting any further work that causes ground disturbance.

20.1.5 Selenium

The release of selenium from coal mining is a known concern. In response, a significant amount of research is being done to understand the release of selenium during mining and what causes it to be problematic in the environment, in addition to research into solutions for management and mitigation of the effects of selenium on the environment. While selenium has not been confirmed as an issue for the Huguenot Project, it is anticipated that there will be a need to manage for selenium as the Project moves into mine operations. The nearby Trend Mine has installed a selenium water treatment plant.

20.1.6 Recommendations

Several of the environmental baseline reports completed to date have recommended gathering additional data in preparation for an Environmental Impact Assessment (EIA), in addition to completing outstanding studies including ecosystem mapping, groundwater monitoring, terrain hazards mapping, air quality monitoring, additional wildlife studies, and others. The scope of some of this additional work will be contingent upon further development of economic mine plans.

20.2 PROJECT PERMITTING

20.2.1 Existing Permits

The understanding of the current permitting / regulatory environment presented herein is based upon what is known at this time.

To conduct coal exploration in BC, a company must hold tenure under coal license and possess a valid *Mines Act* permit.

Colonial currently holds title to 17 coal licenses which comprise the Huguenot Coal Project. Coal licenses do not have an expiry date, though tenure can only be retained through an annual rental payment. Colonial is up to date on their payments.

Mines Act permit CX-9-036 was issued to Colonial on August 29, 2008 to conduct coal exploration activities on the Huguenot Coal Project. As the work program expanded, amendments to the Permit were issued on November 4, 2010, and July 22, 2011. These amendments expired on December 31, 2012. A Notice of Work application for a new permit to carry out further exploration activities was submitted on May 9, 2018. The reclamation security currently held in association with permit CX-9-036 is CAD$75,000.

The Ministry of Environment issued Wildlife Act permit FJ08-48814 on October 6, 2008, under the provisions of the Motor Vehicle Prohibition Regulation. This permit, referred to as a Motor Vehicle Variance Permit (MVVP), allows for exploration activities utilizing motor vehicles to occur within a region that is subject to a year-round closure to motor vehicles above a certain (for Huguenot, 1400m) elevation; Colonial's permit was valid from October 6, 2008, to November 30, 2008. On March 5, 2013, Colonial acquired a second MVVP, permit FJ11-71221, from the Ministry of Forest, Lands and Natural Resource Operations, which allowed motor vehicle use above 1400m to occur from July 15, 2013 to January 14, 2014.

20.2.2 Permitting Mining Projects in BC

To advance a project to mine development in BC, the project must first acquire a provincial Environmental Assessment Certificate and a federal Decision Statement. These authorizations allow a project to proceed to acquire the many permits required for mine construction, operation and closure.

Presently, large-scale mining projects will trigger an environmental assessment under both the *Canadian Environmental Assessment Act* and the BC *Environmental Assessment Act*. The environmental assessment process is managed by both the CEAA and BC Environmental Office (BCEAO). Both processes provide opportunities for public, First Nations and regulator input during both the pre-application and application review stages. Timelines in preparing and approval of these documents vary and can take two to three years depending on the project. In 2012, changes to the *Canadian Environmental Assessment* allowed the BCEAO to request a substitution from CEAA. This means that instead of running two parallel environmental assessment processes, CEAA can substitute the BC environmental process for the federal process, thereby eliminating much duplication.

However, changes are in process federally to repeal the *Canadian Environmental Assessment Act* and replace it with the *Impact Assessment Act* (Bill C-69) and to replace the Canadian Environmental Assessment Agency with a new independent authority, the Impact Assessment Agency of Canada. The new *Impact Assessment Act* will have revised timelines compared to CEAA, increased Indigenous participation, broadened alternatives assessment, amongst other changes. The Bill passed second reading in March 2018. The Act is expected to come into effect in 2019. Additionally, in early 2018 the BC government initiated an environmental assessment revitalization process which is to conclude in late fall 2018. This process is focused on enhancing public confidence and meaningful participation, advancing reconciliation with First Nations, protecting the environment and supporting sustainable development.

Numerous permits, approvals, licenses and authorizations related to the construction, operation and closure of a mine are required to be in hand prior to the commencement of any development work. Generally speaking, these permits are applied for following submission of the environmental assessment application, though there is the option under the Concurrent Approval Regulation of the *Environmental Assessment Act* to apply for permits concurrently.

Table 20.2 provides a listing of some of the numerous provincial permits, approvals, licenses and authorizations that are required prior to the start of any development activities. Of note, until a *Mines Act* permit is issued, no other permits, approvals, licenses or authorizations can be issued. Table 20.3 provides a listing of possible federal permits. Amendments to the *Fisheries Act* and the *Navigation Protection Act* (to be renamed the Canadian Navigable Waters Act) are currently being proposed under Bills C-68 and C-69, respectively.

TABLE 20.2 PROVINCIAL PERMITS, APPROVALS, LICENCES AND AUTHORIZATIONS NEEDED FOR MINE DEVELOPMENT[2]

Provincial Permits	Description	ACT
Mines Act permit	Approval to construct, operate and reclaim mine and its infrastructure	*Mines Act*
Coal Lease	Land occupancy for mine (sub-surface rights)	*Mineral Tenure Act*
Surface Lease	Surface land occupancy for mine and site infrastructure	*Land Act*
License of Occupation	Land occupancy for other features (e.g. borrow pits)	*Land Act*
Statutory Right of Way	Land occupancy for linear features	*Land Act*
Waste Discharge Permit – Water	Approval to discharge mine effluent and sewage into the environment	*Environmental Management Act*
Waste Discharge Permit – Air	Approval to discharge air emissions into the environment	*Environmental Management Act*
Occupant License to Cut	Approval to remove timber (mine, infrastructure, borrow areas)	*Forest Act*
Road Use permit	Approval to use existing forestry roads	*Forest and Range Practices Act*
Special Use permit	Approval to construct new roads	*Forest Practices Code of B.C.*
Water License	Approval to construct, maintain and decommission water works	*Water Sustainability Act*
Section 11 Approval	Approval to make changes in and about a stream	*Water Sustainability Act*
Section 10 Approval	Approval for short term use of surface water	*Water Sustainability Act*
Authorization for Public Highway Use	Approval to use public highways	*Transportation Act*
Exemption Permit	Approval to haul concentrate (if required)	*Transportation Act*
Health Authority Permits and Approvals	To construct and operate a potable water system	*Drinking Water Protection Act*

[2] Reproduced from the report *Environmental Studies, Permitting and Social / Community Overview*, Sage Resources Consultants, Ltd., July 2013; table updated March 2018.

TABLE 20.3 FEDERAL PERMITS, APPROVALS, LICENCES AND AUTHORIZATIONS NEEDED FOR MINE DEVELOPMENT[3]

Federal Permits	Description	ACT
Navigable Waters Approval	Approval to build bridges across navigable waterways	*Navigation Protection Act*
Section 35(2) Authorization	Allows for the harmful alteration, disruption or destruction of fish habitat (HADD) (e.g. stream diversion)	*Fisheries Act*
Explosives Magazine License	Approval to store explosives	*Explosives Act*
Radio Licenses	Approval to operate radios	*Radio Communications Act*

20.3 SOCIAL / COMMUNITY ISSUES

Social and community related requirements and plans for the Huguenot Project include keeping those First Nations with an interest in the Project area and local communities informed about planned Project activities and advancement plans.

20.3.1 First Nations

The Huguenot Project is located within Treaty 8 First Nations Territory. First Nations (Treaty 8 and non-Treaty 8) with interests and asserted claims in the Huguenot area are the:

- West Moberly First Nations (Treaty 8 First Nation)
- McLeod Lake Indian Band (Treaty 8 First Nation)
- Saulteau First Nations (Treaty 8 First Nation)
- Halfway River First Nation (Treaty 8 First Nation)
- Lheidli T'enneh First Nation
- Kelly Lake Communities made up of:
    - Kelly Lake First Nation
    - Kelly Lake Cree Nation
    - Kelly Lake Metis Settlement Society.

Other First Nations with potential interests in the Project area are:

- Doig River First Nation (Treaty 8 First Nation).

Colonial communicated (by way of a letter) during 2012 with all of the First Nations listed above in order to introduce the company and the Huguenot Project, and to encourage them to contact Colonial if they had any questions or

[3] Reproduced from the report *Environmental Studies, Permitting and Social / Community Overview*, Sage Resources Consultants, Ltd., July 2013; updated March 2018.

concerns. Follow-up meetings were subsequently held with three of these First Nations both during, and since, 2012. Prior to 2012, communications with First Nations were intermittent and related to planned work programs and permitting. Since 2012, letters have also been sent to First Nations in order to provide regular updates regarding the activities of the company.

20.3.2 Local Communities

Given that the Huguenot Project is at the exploration and PEA stage, community engagement has been minimal to date but has, since 2012, included meetings with the Mayors, Councilors and Economic Development Officers of Tumbler Ridge and Chetwynd. The goal of these meetings was to introduce the company and the Project, as well as to initiate regular contact with these communities. In addition, since 2012, regular corporate update letters have been sent to these two communities.

20.4 CLOSURE CONSIDERATIONS

As a condition of their Mines Act permit, Colonial is required to continually and progressively reclaim the surface of the land affected by their activities. To date, Colonial has reclaimed those areas no longer required for future exploration activities.

20.5 CONCLUSIONS

There are no known environmental issues that could impact the ability to extract the Huguenot coal resource, although the extent and scope of caribou and selenium management methods and requirements have yet to be determined. Monitoring, management, mitigation and permitting issues are expected to be similar to other coal development projects of similar size in the region. The most recent coal project in northeast BC to receive a provincial Environmental Assessment Certificate (October 1, 2015) and federal Environmental Assessment Decision Statement (December 14, 2017) was the Murray River underground coal mining project.

21.0 CAPITAL AND OPERATING COSTS

Costs and revenues have been generated based on information provided from a variety of sources including:

- Stantec's internal cost database
- Recently completed projects
- Published cost data.

Capital and operating cost estimates have been prepared for the major cost items and activities of the conceptual mine design. There are no contingencies included in capital or operating costs. All cost estimates are in constant US$ 2018.

The initial capital cost to achieve full production of both the surface mines and the underground mine is taken as the total capital expended until the end of Year 4 and is estimated at US$661M. This excludes the leased surface mine equipment discussed below and the rail link cost of approximately US$306M. An additional US$178M has been estimated for sustaining capital to replace and add equipment (principally underground mining equipment) and facilities necessary to sustain production over the planned mine life. Table 21.1 below shows the initial capital by year.

TABLE 21.1 CAPITAL REQUIRED TO REACH FULL PRODUCTION (US$ 000'S)

	Year -2	Year -1	Year 01	Year 02	Year 03	Year 04	Total
Facilities and Infrastructure*	65,000	65,000	65,000	65,000	-	-	**260,000**
Surface Mining Equipment**	1,500	1,500	1,500	1,500	1,500	1,500	**9,000**
Underground Mining Equipment	-	-	32,874	98,129	102,774	59,536	**293,313**
Reclamation Surety	25,000	-	-	-	-	-	**25,000**
Working Capital	-	7,824	65,739	-	-	-	**73,563**
Total	**$91,500**	**$74,324**	**$165,113**	**$164,629**	**$104,274**	**$61,036**	**$660,876**

*Excludes rail link
**Excludes leased equipment

21.1 SURFACE MINE CAPITAL AND OPERATING COSTS

21.1.1 Capital Requirements Surface Mine

It is assumed that all major rolling stock mining equipment (trucks, loaders, etc.) will be leased with expenses considered as operating costs (see Section 21.1.2). The annual lease payments are based on lease terms of 5 years, no residual value, 7% implicit interest rate and the equipment is owned by the lessee at the end of the lease term. If the major mining equipment were purchased instead of leased, the capital required for this equipment is approximately US$193M. Table 21.2 below shows the proposed equipment fleet and capital cost if purchased. Table 21.3 shows the annual lease payment schedule for the major mining equipment.

TABLE 21.2 MAJOR SURFACE MINING EQUIPMENT (TO BE LEASED) (US$ 000'S)

Equipment	Year -2	Year -1	Year 1	Year 2	Total
Hydraulic Shovel (28m^3)	9,500	9,500	19,000	-	**38,000**
Excavator (21m^3)	-	7,459	7,459	-	**14,918**
Haul Truck (222 tonne)	23,100	26,950	26,950	11,550	**88,550**
Haul Truck (136 tonne)	7,200	7,200	9,600	7,200	**31,200**
FEL (20m^3)	4,673	-	-	-	**4,673**
Backhoe (7m^3)	1,706	1,706	1,706	-	**5,119**
D-10 Dozer	1,087	2,173	3,260	-	**6,520**
Cat Grader (12m^3)	820	820	820	-	**2,461**
Water Truck (12,000 gallon)	129	-	-	-	**129**
Loader - CAT-988	1,100	-	-	-	**1,100**
Total Major Equipment Costs	**$49,315**	**$55,809**	**$68,795**	**$18,750**	**$192,669**

TABLE 21.3 ANNUAL LEASE PAYMENT SCHEDULE

Year	Lease Payment (US$ 000's)
-2	12,027
-1	25,638
1	42,417
2	46,990
3	46,990
4	34,962
5	21,351
6	4,572
Total	**$234,950**

Capital spending is projected to begin in Year -2, one year before the start of production from surface mining operations. Due to the 14-year life of the surface mine, none of the major mining equipment is planned to be replaced. An annual allowance, as a recurring capital item, of US$1.5M has been made for small and medium duty vehicles, pumps, welders, small support equipment and other miscellaneous capital items. Capital requirements for project infrastructure are assumed to serve both the surface and underground mining operations and are discussed separately, below (see Section 21.3).

21.1.2 Operating Costs Surface Mine

Operating costs for the surface operation have been based on operating costs from Stantec's internal database with adjustments for site specific conditions and data from other operations in the region. Costs are developed on a unit cost basis for the overburden and coal production units from the mine plan. For the North / Middle (north) pit, cost per bcm of overburden is assumed to be US$3.96. This includes hourly labour and direct supervision, drilling and blasting, loading and hauling. For the South / Middle (south) pit, the cost per bcm is US$4.62. The difference is due to the smaller equipment fleet assigned to the South / Middle (south) pit. Cost per tonne of coal hauled for both the North / Middle (north) and South / Middle (south) pits is assumed to be US$2.96 per tonne. This also includes hourly labour and direct supervision, drilling and blasting, loading and hauling. Overall mine administration costs are assumed to be US$7.4M annually, with surface mine administration accounting for approximately US$3.4M of this amount. This includes labour costs for mine management and administration personnel and mine administration expenses. This cost is also based on other mines in the region.

21.2 UNDERGROUND MINE CAPITAL AND OPERATING COSTS

21.2.1 Capital Requirement Underground Mine

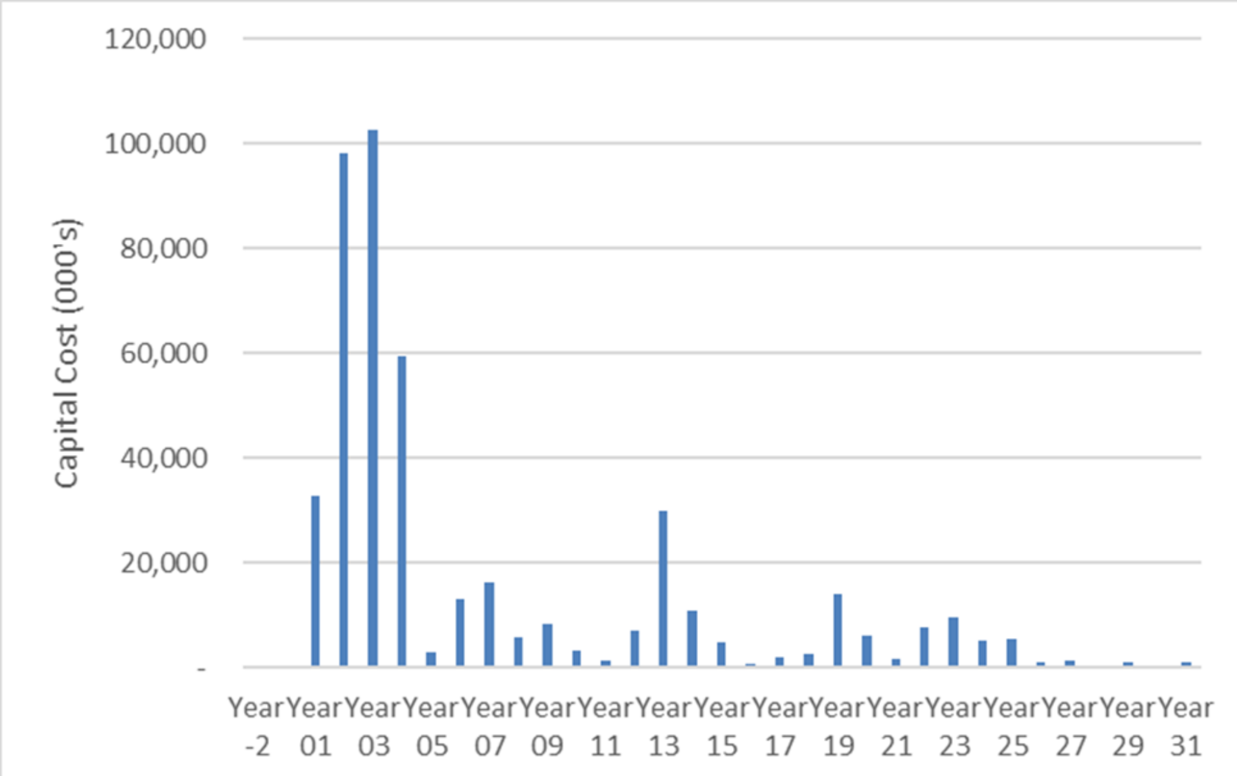
A summary of the individual capital costs for underground mining equipment items is presented in Table 21.4.

TABLE 21.4 INITIAL DEVELOPMENT & EQUIPMENT CAPITAL, UNDERGROUND

Description	Capital Cost (US$ 000's)
Shafts and Hoists	129,500
Fans, Ventilation	20,700
Production Access Belts	2,700
Mainline Conveyor System	12,600
Longwall Conveyor System	6,100
Safety Equip. (incl. de-gas system)	3,180
Development Unit (CMs, conveyors)	26,722
Longwall System (shearer, shields, etc.)	82,521
Utility Vehicles	9,290
Total Initial Development and Equipment Capital	**$293,313**

The accumulation of capital costs over the LOM is shown in Figure 21.1. Capital spending is projected to begin in Year 1, two years before the start of production from underground mining operations. The 'start-up' capital through Year 5 totals US$293M. Total capital expenditures over the LOM reach US$458M as mining equipment is added, either due to increasing production demands or through replacement.

FIGURE 21.1 UNDERGROUND CAPITAL REQUIREMENTS, LIFE-OF-MINE



21.2.2 Operating Costs Underground Mine

Operating costs for the underground mine were developed by utilizing industry standards, Stantec's knowledge of the region and industry costing guides. The operating cost is presented in Table 21.5 on a unit cost basis, i.e., dollars per ROM tonne of coal produced and is divided into categories involved with the cash cost of operations. Labour costs were developed from the manpower and shift schedule required to meet the production in the mine plan and average wage and benefit rates in the region. The operating cost totals US$43.20/ROM tonne.

TABLE 21.5 OPERATING COSTS, UNDERGROUND

Description	Operating Cost (US$ per ROM tonne)
Supplies and Services	
Roof Support	9.14
Longwall (Operating)	1.31
Maintenance (Longwall)	0.86
Maintenance (Other)	0.50
Major Overhaul	1.50
Electricity	1.30
Contract Services	0.50
Degas	1.36
Mine Extension	1.50
Miscellaneous	2.65
Sub-Total	**20.62**
Labour	**22.58**
Total	**43.20**

21.3 FACILITIES, COAL HANDLING AND PREPARATION PLANT, CAPITAL AND OPERATING COSTS

21.3.1 Capital Costs: Facilities, Coal Handling and Preparation Plant

The projected capital costs for the Huguenot coal washing and coal handling systems as well as the facilities to support the operations are estimated at US$260M and include the following major components:

- Site preparation including access improvement, stripping and grading
- Construction of the maintenance/warehouse complex and office/dry facility
- Construction of a 230kV powerline to the site
- Development of pit access and pre-stripping
- Water management structures
- Coal wash plant which includes processing equipment, and a building shell with an overhead crane
- Raw coal feed bin and conveyor system
- Clean coal stacking conveyor and stockpile area

- Rail loop and train loading system including scales and car sprayer system.

Capital costs for the surface operation facilities and infrastructure (including construction) have been based on estimates from recently completed projects in the region and on Stantec's internal database with adjustments for site specific conditions. Table 21.6 summarizes the mine capital costs.

TABLE 21.6 CAPITAL REQUIREMENTS, SURFACE

Item	Capital Cost (US$ 000's)
Powerline	45,000
Shop	20,000
Plant	75,000
Office, dry, camp	15,000
Ponds	10,000
Road	20,000
ROM Coal Handling	15,000
Rail loadout	35,000
Future Studies, exploration, etc.	25,000
Total	$**260,000**

21.3.2 Operating Costs: Facilities, Coal Handling and Preparation Plant

Combined facilities and plant costs have been estimated at approximately $4.00 per ROM tonne, based on costs typical of the industry and region.

21.4 OFF-SITE AND CORPORATE OVERHEAD COSTS

21.4.1 Off-site Costs

As described previously, for the purposes of this study, it is assumed that a third-party would build and own an approximately 85km long rail link connecting the Huguenot Project with the PRC rail-loadout, and charge a fee to Colonial, and other potential customers, for access to that link. For conservatism, it is further assumed that the Huguenot Project would be subject to 50% of the total rail charges, even though a preliminary analysis of other projected operations and production in the region served by such a rail line suggest that Colonial's contribution to the rail usage (based on tonnages and position on the line) would be closer to 25% (the effects of taking on the entire cost of the rail link is included as a sensitivity in the economic analysis of this study). A charge-out cost, or rail tariff, including financing, profit, etc., is estimated at approximately US$17.3Mpa for the initial 15 years of project life. Other off-site costs include rail transport from the mine (including the 85km rail link) to the Ridley terminal, load-out costs and port charges (see Table 21.7, below). Combined off-site costs including all rail transport and off-site handling average US$28.30/clean tonne over the LOM.

21.4.2 Corporate Overhead

A provision of US$2.5M annually is included for corporate overhead allocations. An additional US$1.0M annually has been included for property and liability insurance. Because the project does not lie within the boundaries of a municipal tax district in BC, there is no provision for local property taxes.

21.4.3 Other Cash Requirements

The cash flows and NPV's include a capital requirement for working capital totaling US$74M in the first two years of the operation. This is recovered in the last year of the operation. There is also a capital requirement prior to the start of operations for reclamation surety of US$25M. This is also recovered in the last year of mining as reclamation work is completed.

21.5 OPERATING COST SUMMARY

Total direct mine costs, including surface and underground mining as well as the plant and administration, are estimated at US$67.20 per clean tonne, while the off-site costs total US$28.30 per clean tonne, including the rail tariff. Table 21.7 shows the cost for surface and underground tonnes separately and on a combined clean tonne basis.

TABLE 21.7 OPERATING COST SUMMARY

Site Costs	LOM Costs (US$M)	$/ROM Tonne		US$/Clean Tonne
Direct Surface Mining [1]	2,150	38.08		54.44
Surface Equipment Lease[1]	235	4.16		5.95
Direct Underground Mining[2]	2,844	43.20		57.04
Surface Plant and Administration[3]	776	5.43		7.43
Sub-Total Site Costs	**6,005**			
Average Site Operating Cost/Tonne		**49.11**		**67.20**
Off-Site Costs	**Costs (US$M)**	**US$/Clean Tonne**		
	LOM	**Years 1 - 14**	**Years 15 - 31**	**LOM**
Rail Transport to Ridley	1,718	19.23	19.23	19.23
Loadout	138	1.54	1.54	1.54
Port Charges	412	4.62	4.62	4.62
Rail Tariff	260	4.59	-	2.91
Sub-Total Off-Site Costs	**2,528**	**29.98**	**25.39**	**28.30**
Total Operating Costs, LOM	**8,533**	**-**		**95.50**

1. Cost based on surface mine tonnes
2. Cost based on underground mine tonnes.
3. Cost based on LOM tonnes.

22.0 ECONOMIC ANALYSIS

22.1 PRINCIPAL ASSUMPTIONS

Annual coal production is based on the mine plans described in Section 16 of this report. The surface mine will begin operations in Year -1, with the underground mine beginning operations during Year 3. This allows time to develop an area to access the underground mineable coal seams. The combined mining operation is planned for 32 years.

The surface mine is projected to produce an average of 3.8Mtpa (average 4.5Mtpa at steady-state) ROM for 15 years, producing approximately 56Mt. The expected wash plant yield of 70% results in 39Mt saleable from the surface mine.

The underground mine is expected to begin production in the fourth year of mine operations producing 2.3Mtpa ROM over 29 years for a LOM total of approximately 66Mt ROM. The expected wash plant yield of 76% results in 50Mt saleable from the underground mine.

Capital and operating costs have been estimated as shown in Section 21. It was assumed that mine closure costs would have relatively little effect on the NPV, and they were not considered at this conceptual level of study.

Depreciation is based on the capital costs described in Section 21 of this report and the declining balance method prescribed by the Canada Revenue Agency. The majority of the capital is in Class 43 which carries a 25% depreciation rate.

Income tax rates of 11% for BC Provincial tax and 15% for Canadian Federal tax have been applied.

22.2 NET PRESENT VALUE ANALYSIS

Cash flow summaries are shown in Tables 22.1 and 22.2, NPVs and IRRs are shown in Tables 22.3 and 22.4. Due to the preliminary nature of this study, capital and operating costs are within a range of ±50%, contingency costs were not included in the economic model. As described above (Section 21), for the purposes of this study, it is assumed that a third-party would build and own the rail line and that the Huguenot Project would be subject to 50% of the total rail charges. Payback of the project capital is expected to occur within 5 years from start of production, in Year 5. The following figures and tables are shown in both US$ and CAD$. The exchange rate used for this report is US$1.00 = CAD$1.30.

For the NPVs provided in Tables 22.3 and 22.4, coal prices have been derived as:

- 92% of the lower value of the overall benchmark range (US$170); yielding US$156;
- 93% of the mid-value of the overall benchmark range (US$185); yielding US$172; and,
- 94% of the higher value of the overall benchmark range (US$200); yielding US$188.

Canadian dollar equivalents are rounded to the nearest dollar.

TABLE 22.1 CASH FLOW SUMMARY (US$M)

	Year -2	Year -1	Year 1	Year 2	Year 3	Year 4	Year 5	Years 6-10	Years 11-15	Years 16-20	Years 21-25	Years 25-31	Total
Gross Revenue	-	46.9	441.4	543.5	620.7	704.5	847.2	4,315.3	2,466.4	1,625.3	2,153.5	1,603.8	**15,368.6**
Off-site Costs	-	24.3	82.5	97.5	108.9	121.3	142.4	723.5	433.3	239.9	317.8	236.7	**2,528.2**
Production Taxes & Royalties	-	0.7	9.2	11.9	13.8	28.2	58.3	320.5	180.9	119.7	160.8	119.7	**1,023.7**
Direct Mine Costs	-	23.7	183.3	207.7	238.5	267.8	324.8	1,548.2	849.7	608.8	800.2	605.0	**5,657.9**
Equipment Lease	12.0	25.6	42.4	47.0	47.0	35.0	21.4	4.6	-	-	-	-	**235.0**
Corporate Overhead	-	3.5	3.5	3.5	3.5	3.5	3.5	17.5	17.5	17.5	17.5	21.0	**112.0**
Income Tax	-	-	8.3	28.2	32.5	42.9	58.7	392.0	233.8	154.2	213.7	155.9	**1,320.3**
Capital Costs	66.5	66.5	99.4	164.6	104.3	61.0	4.4	54.3	59.0	25.7	29.4	5.4	**740.4**
Other Cashflow	25.0	7.8	65.7	-	-	-	-	-	-	-	-	(98.6)	**-**
Total Yearly Cash Flow	**$(103.5)**	**$(105.2)**	**$(53.0)**	**$(17.0)**	**$72.2**	**$ 144.8**	**$233.8**	**$1,254.8**	**$692.2**	**$459.4**	**$614.0**	**$558.6**	**$3,751.1**

TABLE 22.2 CASH FLOW SUMMARY (CAD$M)

	Year -2	Year -1	Year 1	Year 2	Year 3	Year 4	Year 5	Years 6-10	Years 11-15	Years 16-20	Years 21-25	Years 25-31	Total
Gross Revenue	-	61.0	573.8	706.5	806.9	915.9	1,101.4	5,609.9	3,206.3	2,112.9	2,799.6	2,085.0	**19,979.2**
Off-site Costs	-	31.5	107.2	126.8	141.6	157.7	185.1	940.6	563.3	311.8	413.2	307.7	**3,286.6**
Production Taxes $ Royalties	-	0.9	12.0	15.5	17.9	36.7	75.8	416.6	235.2	155.6	209.1	155.6	**1,330.8**
Direct Mine Costs	-	30.8	238.3	270.1	310.1	348.1	422.3	2,012.7	1,104.6	791.5	1,040.3	786.5	**7,355.3**
Corporate Overhead	15.6	33.3	55.1	61.1	61.1	45.5	27.8	5.9	-	-	-	-	**305.4**
Corporate Overhead	-	4.6	4.6	4.6	4.6	4.6	4.6	22.8	22.8	22.8	22.8	27.3	**145.6**
Income Tax	-	-	10.8	36.7	42.2	55.8	76.3	509.6	303.9	200.5	277.8	202.7	**1,716.4**
Capital Costs	86.5	86.5	129.2	214.0	135.6	79.3	5.7	70.5	76.7	33.4	38.2	7.0	**962.6**
Other Cashflow	32.5	10.2	85.5	-	-	-	-	-	-	-	-	(128.1)	**-**
Total Yearly Cash Flow	**$(134.6)**	**$(136.8)**	**$(68.8)**	**$(22.2)**	**$93.9**	**$188.3**	**$303.9**	**$1,631.2**	**$899.9**	**$597.2**	**$798.2**	**$726.2**	**$4,876.5**

TABLE 22.3 ECONOMIC ANALYSES RESULTS (US$M)

Coal Price	NPV (US$M) at Varying Discount Rates with IRR			
	5%	7.5%	10%	IRR (%)
US$172/t	**$1,669**	**$1,166**	**$831**	**33%**
US$156/t	$1,203	$811	$551	25%
US$188/t	$2,134	$1,521	$1,109	40%

TABLE 22.4 ECONOMIC ANALYSES RESULTS (CAD$M)

Coal Price	NPV (CAD$M) at Varying Discount Rates with IRR			
	5%	7.5%	10%	IRR (%)
CAD$224/t	**$2,170**	**$1,516**	**$1,080**	**33%**
CAD$203/t	$1,564	$1,054	$717	25%
CAD$244/t	$2,775	$1,977	$1,442	40%

This PEA is preliminary in nature, and includes Inferred mineral resources. Inferred mineral resources are considered too speculative geologically to have technical and economic considerations applied to them that would enable them to be categorized as mineral reserves. Mineral resources that are not mineral reserves do not have demonstrated economic viability.

22.3 SENSITIVITY ANALYSIS

The sensitivity of NPV to discount rate (at a LOM price of US$172.00 per clean tonne) is shown on Figure 22.1 and 22.2.

FIGURE 22.1 SENSITIVITY OF NPV TO DISCOUNT RATE IN US DOLLARS

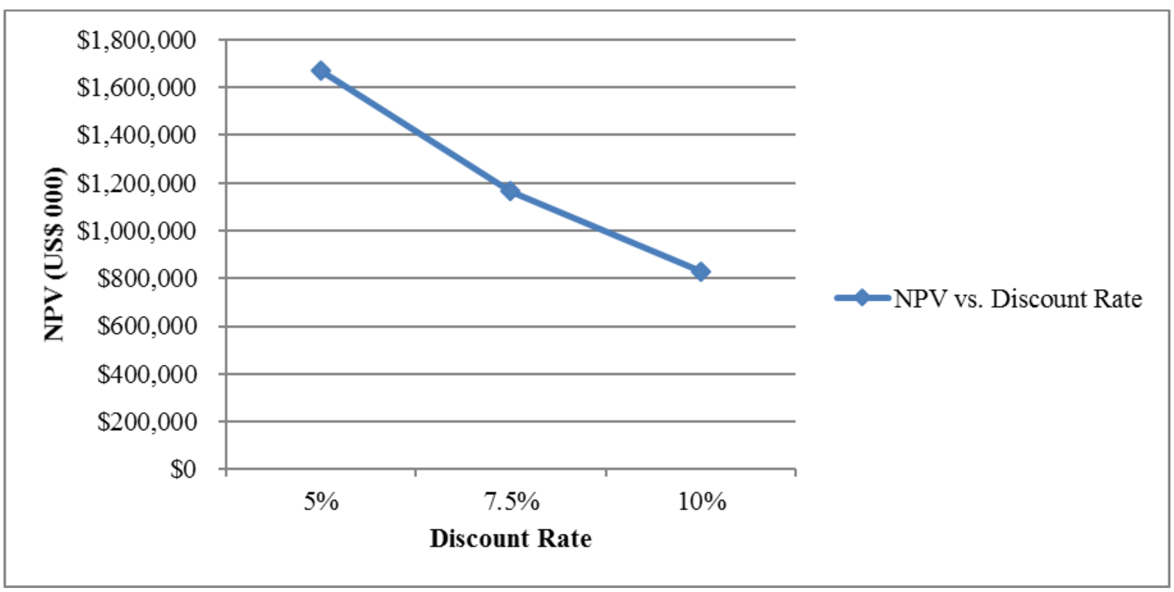
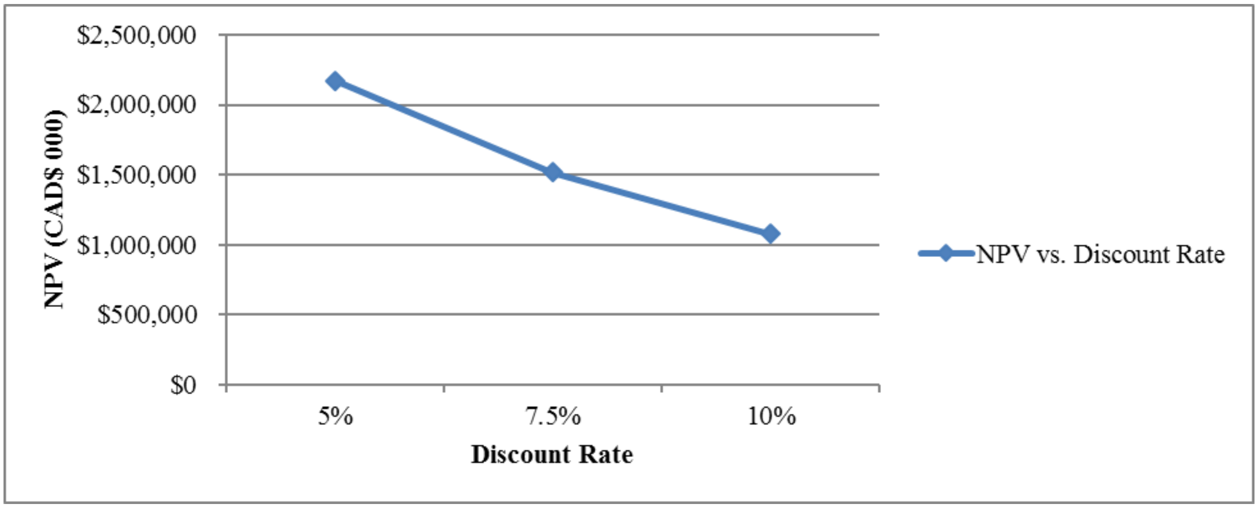


FIGURE 22.2 SENSITIVITY OF NPV TO DISCOUNT RATE IN CANADIAN DOLLARS



The sensitivity of NPV to variances in coal price ($ per clean tonne), at various discount rates, is shown on Figures 22.3 and 22.4. This analysis suggests that the “break-even” price is less than US$116, US$120, and US$125 per tonne for discount rates of 5%, 7.5% and 10%, respectively. A coal price of US$135 per tonne is required for an IRR of 15%.

FIGURE 22.3 SENSITIVITY OF NPV TO COAL PRICE (US DOLLARS)

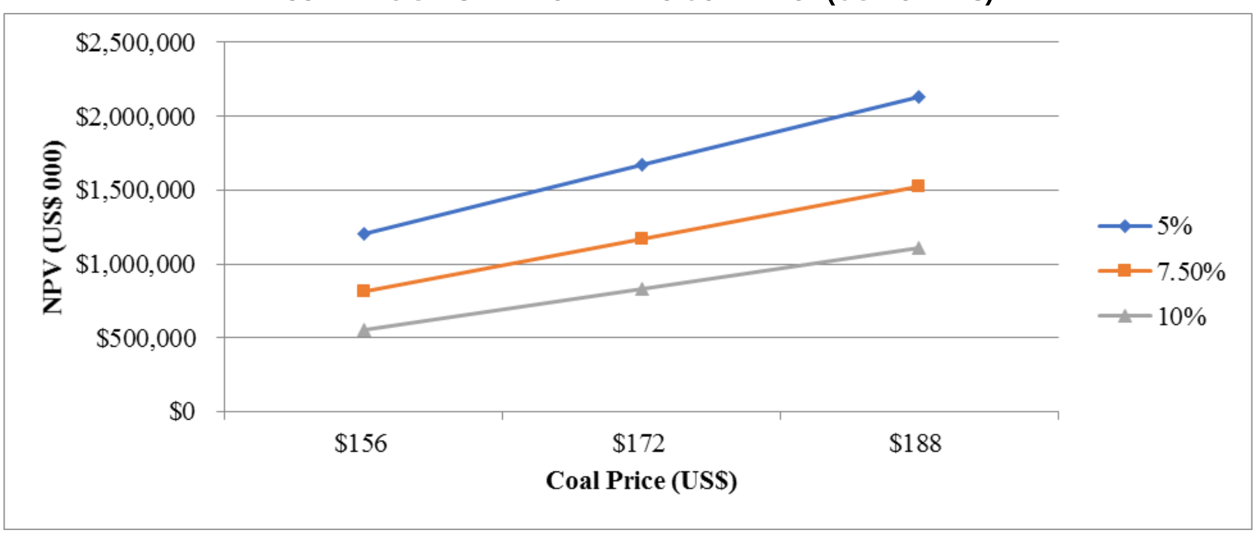
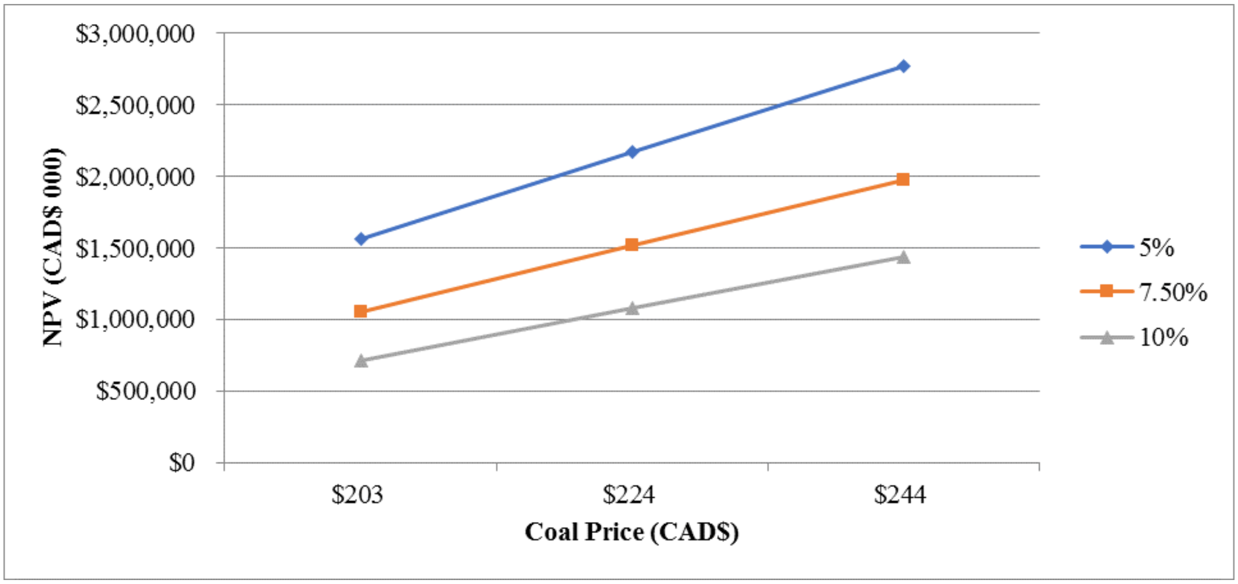


FIGURE 22.4 SENSITIVITY OF NPV TO COAL PRICE (CANADIAN DOLLARS)



The sensitivity of NPV to variances in operating and capital costs ($ per clean tonne) is shown on Figure 22.5 and 22.6. This analysis suggests that project economics might be more sensitive to operating costs than to capital costs.

FIGURE 22.5 SENSITIVITY OF NPV TO COST VARIANCES (US DOLLARS)

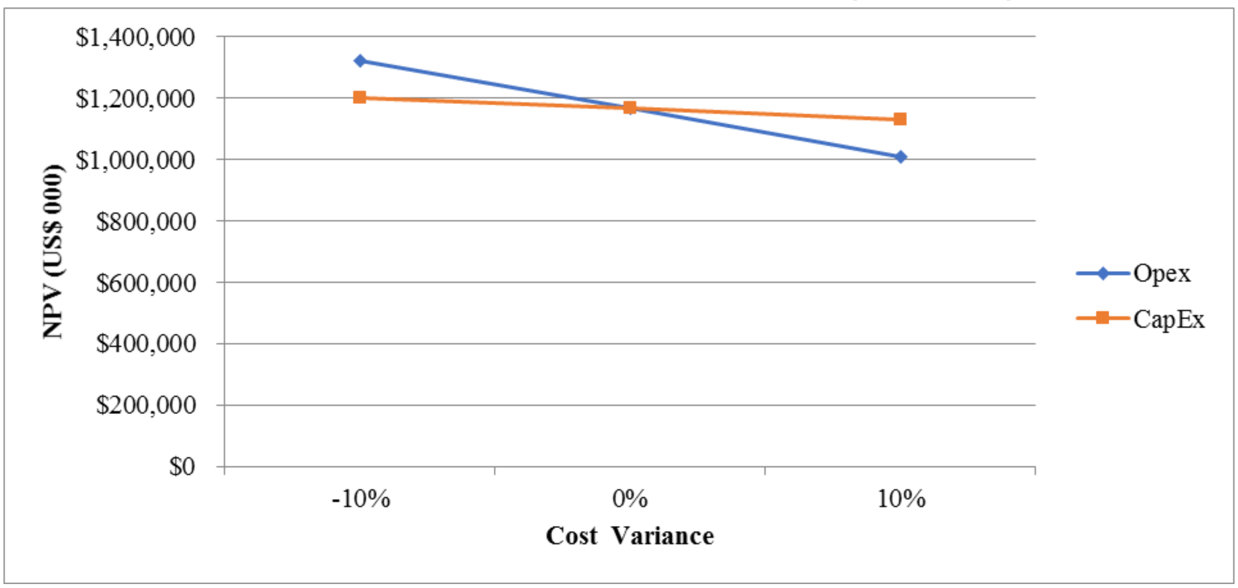
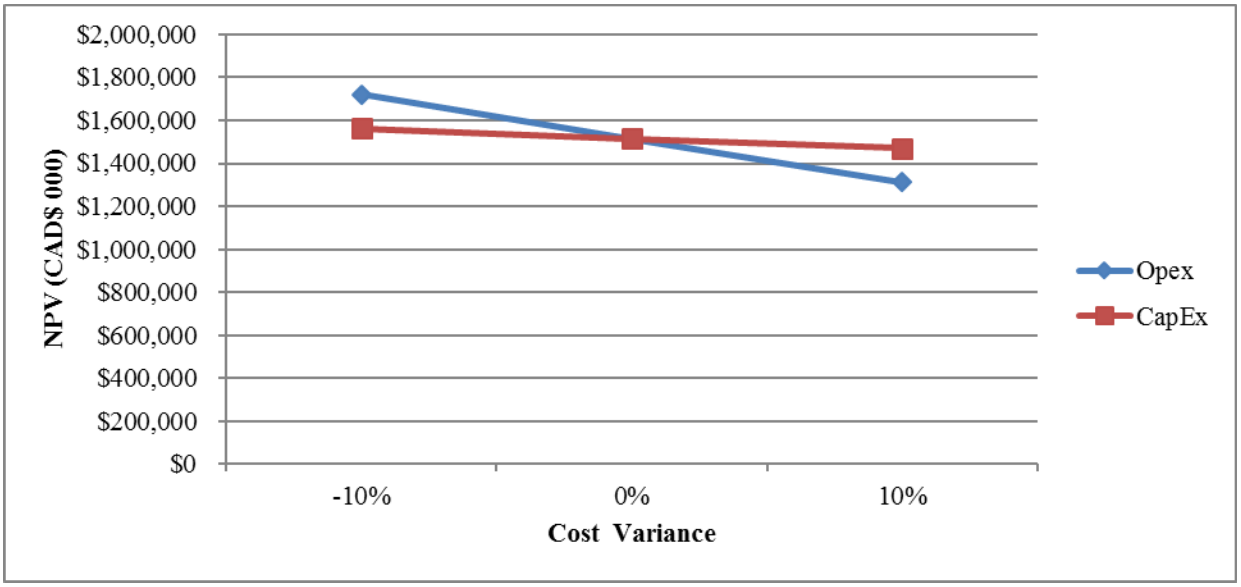


FIGURE 22.6 SENSITIVITY OF NPV TO COST VARIANCES (CANADIAN DOLLARS)



The sensitivity of NPV to variances in rail share (% of shared rail costs) is shown on Figures 22.7 and 22.8.

FIGURE 22.7 SENSITIVITY OF NPV TO RAIL SHARE (US DOLLARS)

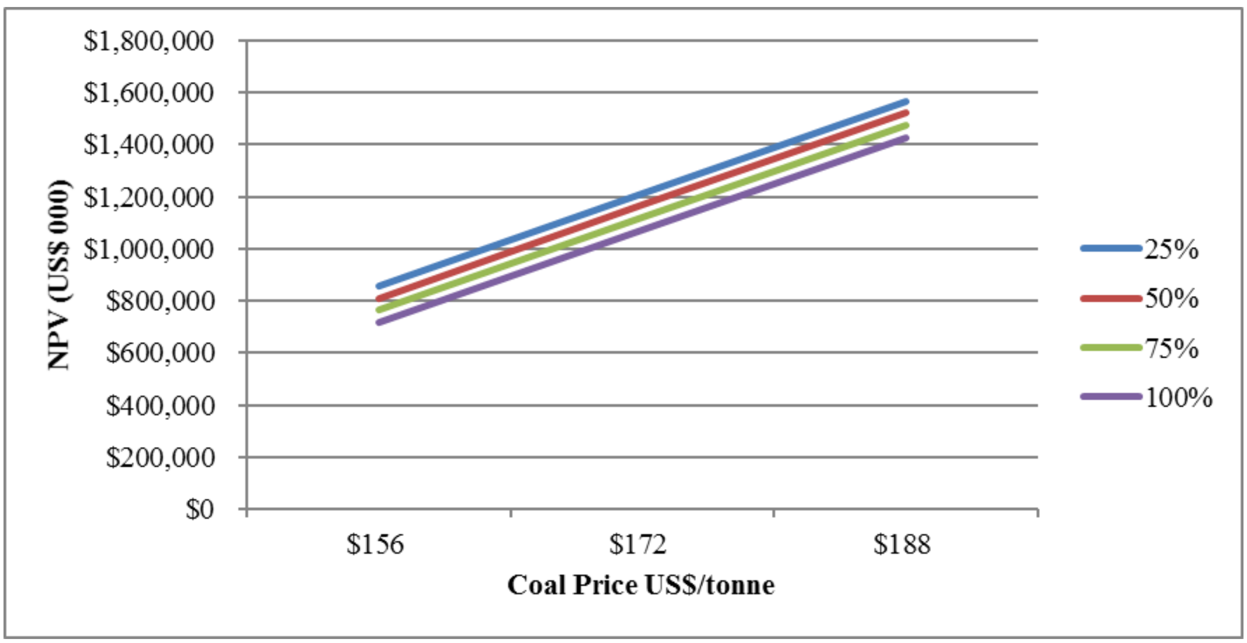
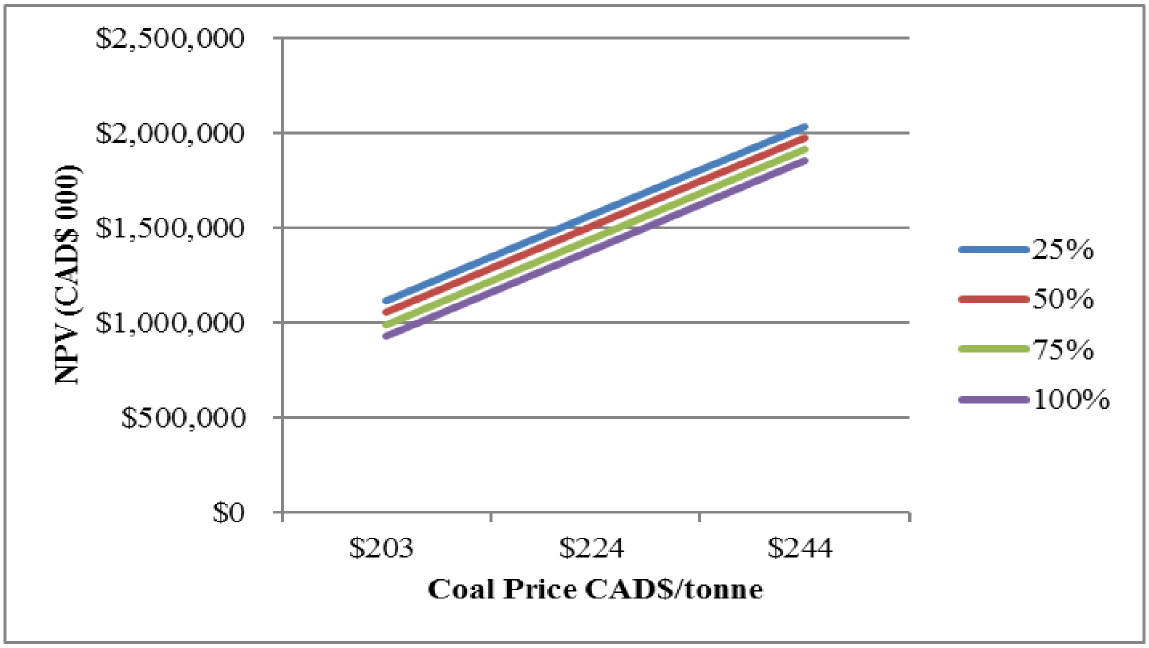
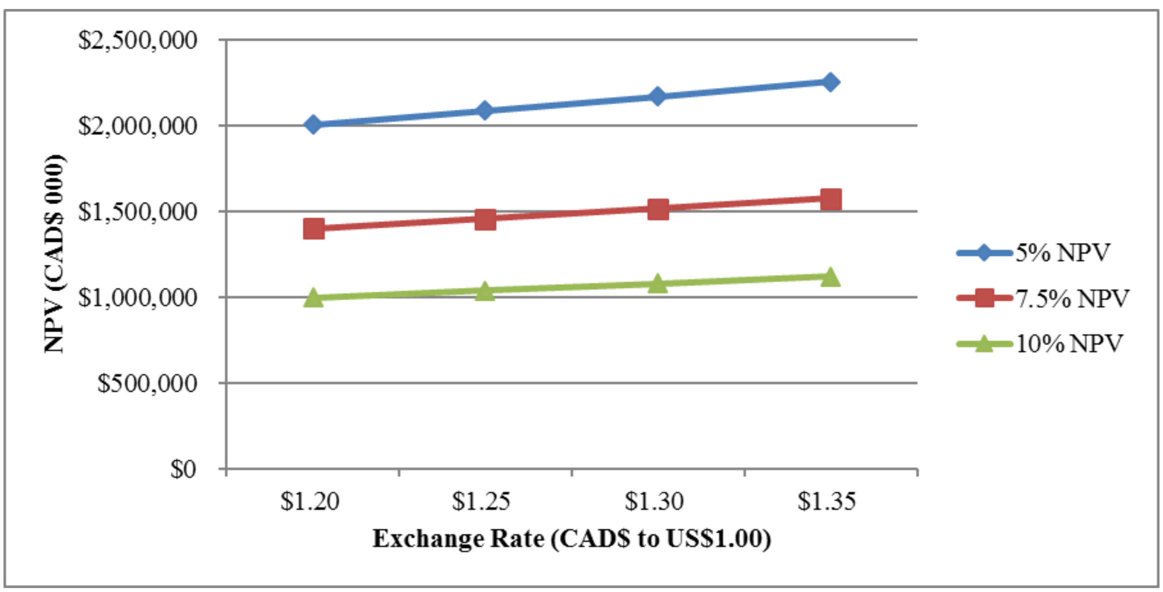


FIGURE 22.8 SENSITIVITY OF NPV TO RAIL SHARE (CANADIAN DOLLARS)



The sensitivity in Canadian dollars of the various NPV scenarios due to variances in exchange rate is shown on Figures 22.9.

FIGURE 22.9 SENSITIVITY OF NPV TO EXCHANGE RATES (CANADIAN DOLLARS)



23.0 ADJACENT PROPERTIES

The Huguenot property lies within a geological trend that contains a number of contiguous historical and operating metallurgical coal mines and properties. Colonial did not rely on resource estimates or other information from other nearby operations or properties.

As described in Section 10, the database upon which Norwest based its resource estimates includes a drill hole located within the Belcourt South deposit area. Data from this drill hole was used to provide additional structural control for geologic modeling.

24.0 OTHER RELEVANT DATA AND INFORMATION

Excluded from the scope of work for this report was the independent verification by Stantec of leases, deeds, agreements of sale, surveys or other property control instruments. Colonial has represented to Stantec that Colonial controls surface rights and mineral rights for the property indicated on the property maps in this report, and Stantec has accepted these as being a true and accurate depiction of the surface and mineral rights owned/controlled by Colonial.

25.0 INTERPRETATION AND CONCLUSIONS

25.1 INTERPRETATION

The North, Middle and South Blocks of the Huguenot property cover coal measures belonging to the Gething and Gates Formations. The presence of potentially economic coal seams within the Gates Formation is demonstrated by substantial amounts of drilling, trenching, geological mapping, and coal sampling testing from both historical and recent (2008, 2011 and 2012) exploration programs. Potentially important coal seams within the Gething Formation have also been demonstrated, although these coal seams have seen significantly less work than those belonging to the Gates Formation.

Verification of the structural geology, coal development, and assurance of existence of the Gates coal measures within the North, Middle and South Blocks of the Huguenot property were established by site visits, data reviews and subsequent reviews of the geological model and resource estimations.

25.2 RISKS AND UNCERTAINTIES

Risks and uncertainties that may affect the reliability or confidence of the geologic resource estimates include geological factors such as; geometry of the major thrust faults as they truncate the coal seams at depth, variations in the attitude of coal seams at depth and potential variations in coal seam thickness due to structural thickening and/or thinning.

Risks and uncertainties that may affect the reliability or confidence of the findings of the PEA, as reported in Sections 16 through 22, include the following:

- There are several issues surrounding surface mining through the major drainages (Pika and Holtsander Creeks) that were not accounted for in this PEA. It was assumed that there would be no loss of coal under the creeks. If this were not correct, the quantity of mineable resources in the area of the drainages would be adversely affected. It was further assumed that mining through the drainages would be permitted and approved (in fact, there are instances in BC and Alberta of such permits failing to get approved). Exclusion of the drainage areas because of permitting or regulatory problems would eliminate a significant portion of the economically recoverable resource.

- Selenium treatment is a growing concern among regulators in Canada, particularly in BC and Alberta. Other operations in Gething and Gates Formation coals in the region are understood to have concerns with selenium treatment, as identified in the Sage Resources Inc. environmental overview report (see Section 20). Selenium treatment costs were not accounted for in this PEA, but would likely present a significant additional cost if selenium treatment is determined to be required.

- The PEA surface mining plan was not based on any geotechnical information specific to the Huguenot Project site. Instead, broad assumptions were made based on typical conditions at other operations throughout the region. Such data should be gathered, analyzed and accounted for in subsequent Pre-Feasibility and Feasibility-level mine planning. Geotechnical conditions more adverse than what was assumed in this study will effectively increase open-pit stripping ratio and costs, and negatively impact project economics.

- Similarly, the conceptual underground longwall mine plan did not take into account any specific geotechnical information. Given the proposed depths of the underground resources, adverse geotechnical stability could have a significant impact on the economic recoverability of underground mineable coal.
- The conceptual underground mine plans were based on a relatively large portion of Inferred resources, and are therefore not considered sufficient for the definition of reserves. Additional exploration leading to greater geologic assurance may adversely affect the estimate of what is considered recoverable using underground longwall mining methods.
- The presence and effect of methane gas on the conceptual underground mine plan was assumed to be manageable utilizing typical drainage unit costs and standard methane drainage techniques. Should future methane studies indicate that these assumptions are invalid, the underground mine plan and economics must be re-evaluated.
- To fully evaluate potential wash plant recoveries and marketable product quality, additional bulk sample washability tests needs to be performed on all of the seams expected to be mined.
- Mine operating and capital costs are based on recent costs from various sources. Changes in the availability and cost of various inputs such as labor, diesel fuel, explosives, steel, equipment costs will have an effect on the economics of the project. As noted in the Marketing Section of this report, changes in metallurgical coal prices will occur over time. The extent and duration of prices swings will affect project economics.

25.3 CONCLUSIONS

Based upon the available information, it is concluded that:

- The Huguenot property is located within a region where coal mining is being conducted and other coal mines are being developed.
- Delineation of coal reserves for future development is also taking place on adjoining projects.
- The property has seen substantial historical and recent work programs involving significant exploration budgets.
- Work undertaken by the previous operator (Denison) provides a reliable compilation of geology, resource potential and coal quality for the property as indicated by the results obtained from the most recent phase of exploration and from comparison to historical resource estimates for the North Block.
- Exploration carried out within the North Block during 2008, 2011 and 2012 and the Middle and South Blocks during 2011 and 2012 met expected objectives by sufficiently defining deposit geology to allow quantification of resources and coal quality according to NI 43-101 classification standards. Only coal resources contained within the Gates Formation have been evaluated.

- Based upon GSC Paper 88-21 guidelines, the Geology Type for the North and Middle Blocks is classified as Moderate. The Geology Type for the South Block is considered Complex. The data density supports the resource tonnages estimated to date and the coal quality assigned to them. The results of the exploration and their interpretation have been consistent over time, lending confidence to the conclusions that have been reached. The North, Middle and South Block deposits remain open to infill drilling, with the potential for up-grading the level-of-assurance of the coal resources. The acquisition of coal licences subsequent to preparation of the 2013 PEA provides potential for the definition of additional underground mineable resources in the North Block.

The North, Middle and South Block resource estimates are in accordance with the guidelines of GSC Paper 88-21 as required by NI 43-101. Overall in-situ resource estimates are:

- Surface: using a 0.60m thickness cut-off: 132.0Mt of Measured and Indicated surface resources plus 0.5Mt of Inferred.
- Underground: using a 1.5m thickness cut-off: 145.7Mt of Measured and Indicated, plus 118.7Mt of Inferred.
- These resources are considered to be of immediate interest.

Drilling, trenching and detailed mapping have outlined areas within the property where coal resources present an opportunity for low to moderate strip ratio surface mining. Underground mining potential exists below and alongside potentially surface mineable resources. Other than roads and access trails, there are no major infrastructure elements within or proximate to the project area that can be used in mine development without further work.

Using ASTM criteria and reflectance values, Gates Formation coals on the Huguenot property are classified as medium volatile bituminous. The coals are of metallurgical quality and would form a suitable coking coal product after beneficiation in a wash plant.

Analysis of washed, simulated products reported (on a dry basis): ash = 8.10%, volatile matter = 23.43% - 24.53%, fixed carbon = 67.37% - 68.47%, FSI = 6.5 - 7, and phosphorus = 0.047% - 0.051%. These simulated product coals have B/A ratios ranging from 0.078 to 0.140, as determined from the mineral composition of ash.

Initial carbonization tests indicate that Huguenot coals can be expected to form a coking coal with favorable coking indices, low to very low sulphur, and low phosphorus contents. It remains for future work to supply fresh samples for carbonization in order assess the coal’s maximum coking potential.

26.0 RECOMMENDATIONS

It is recommended that further work be conducted on the property, principally to:

- increase the confidence level of the resources for the area targeted in the PEA for underground mining;
- test for additional coal resources to the east of the North Block underground mineable resource area;
- obtain geotechnical and coalbed methane data from cores in support of underground mine evaluation;
- infill coal quality within the proposed open pit and underground mining areas; and,
- conduct additional bulk sampling and testing to include all seams that could potentially be mined and provide "fresh" coal for rheological and carbonization tests.

Cost estimates for these recommendations are presented in Table 26.1.

TABLE 26.1 EXPLORATION ESTIMATED COSTS

Description	Estimate (CAD$)
Drilling	1,200,000
Geophysical Logging	50,000
Bulk Sampling and Coal Quality Assessment	300,000
Geotechnical: Sampling and Testing	80,000
Field Personnel	70,000
Trail Construction	300,000
Coal Bed Methane Testing	50,000
Resource Update	50,000
Contingency	210,000
Maximum Total	**2,310,000**

After the exploration and resource definition program described above is completed, more detailed mine planning and cost estimation is required. As part of that, or as stand-alone evaluations, it is recommended that Colonial undertake a study of the options for road haulage for transporting the coal from the mine to the existing rail line near the PRC loadout south of Tumbler Ridge, followed by an internal scoping-level study for a stand-alone, surface mining operation. Studies should also be undertaken to evaluate the timing of production from the two surface operations and the underground operation to determine the effect of various production rates and scenarios on the economics of the project. While there has been ongoing baseline data collection and permitting work to date, consideration should also be given to developing a plan to carry the permitting effort forward including a detailed timeline to secure all the necessary permits required for mining. This timeline would then be used to prepare a mine development schedule.

27.0 REFERENCES

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28.0 ILLUSTRATIONS

Illustrations

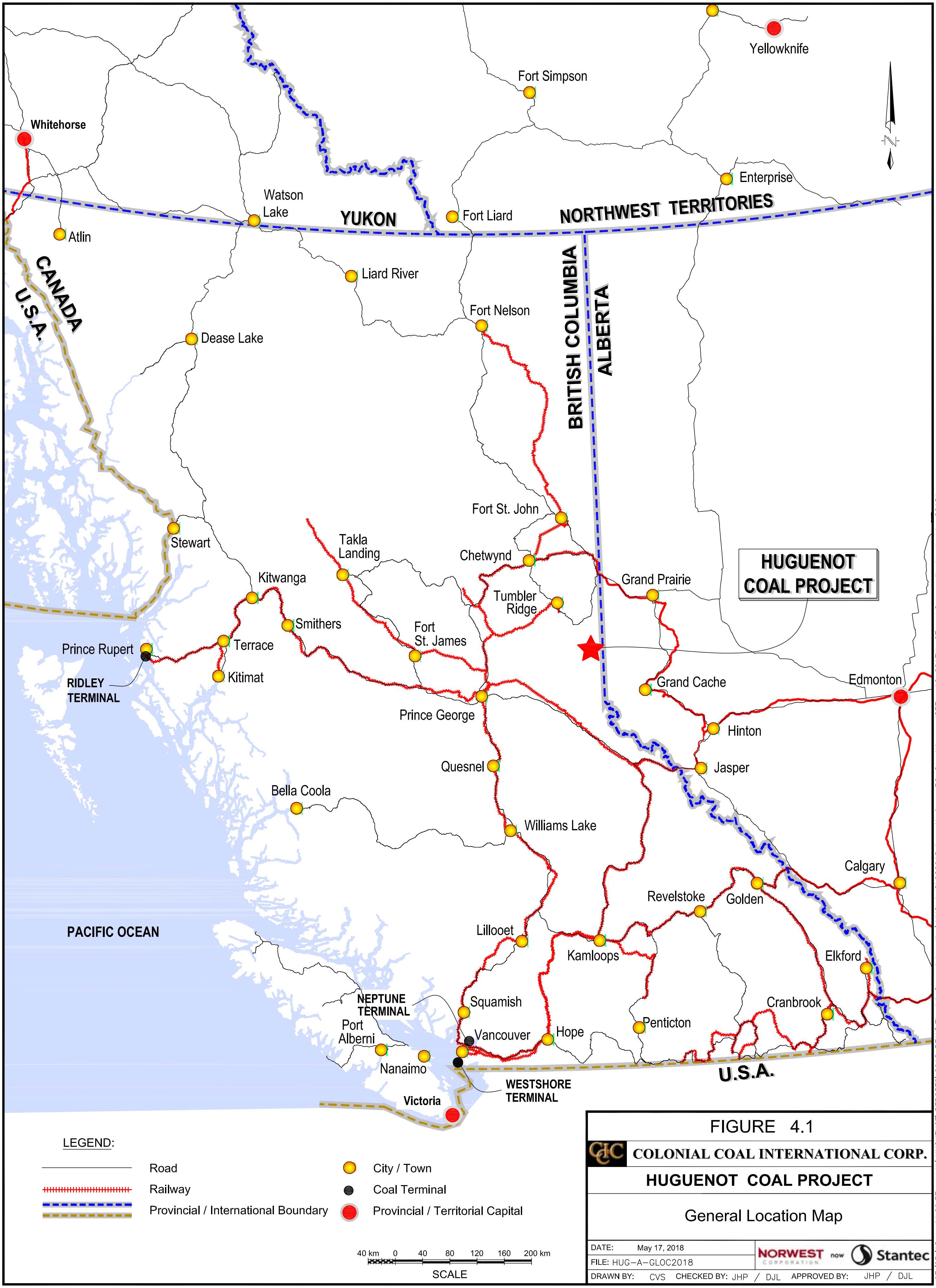

FIGURE 4.1

COLONIAL COAL INTERNATIONAL CORP.

HUGUENOT COAL PROJECT

General Location Map

DATE: May 17, 2018
FILE: HUG-A-GLOC2018
DRAWN BY: CVS CHECKED BY: JHP / DJL APPROVED BY: JHP / DJL

NORWEST CORPORATION now Stantec

K:\HUGUENOT\REPORTS\2018 PEAU\Fig 4.1 General Location\HUG-A-GLOC2018.dwg Xrefs: x-BC-CoastLine_nad83Zone10_2017Nov27 x-Community_Landmarks 2018June

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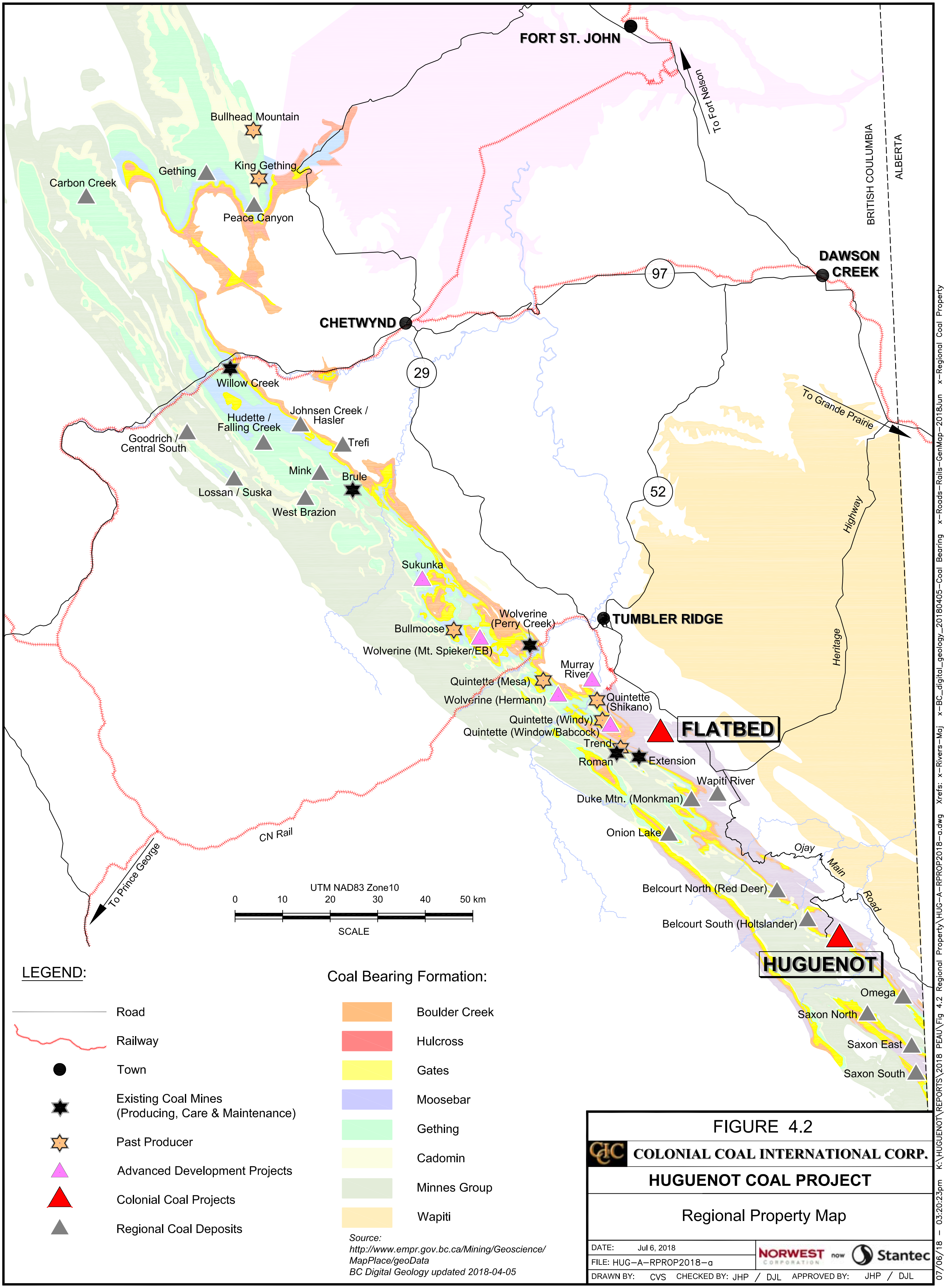
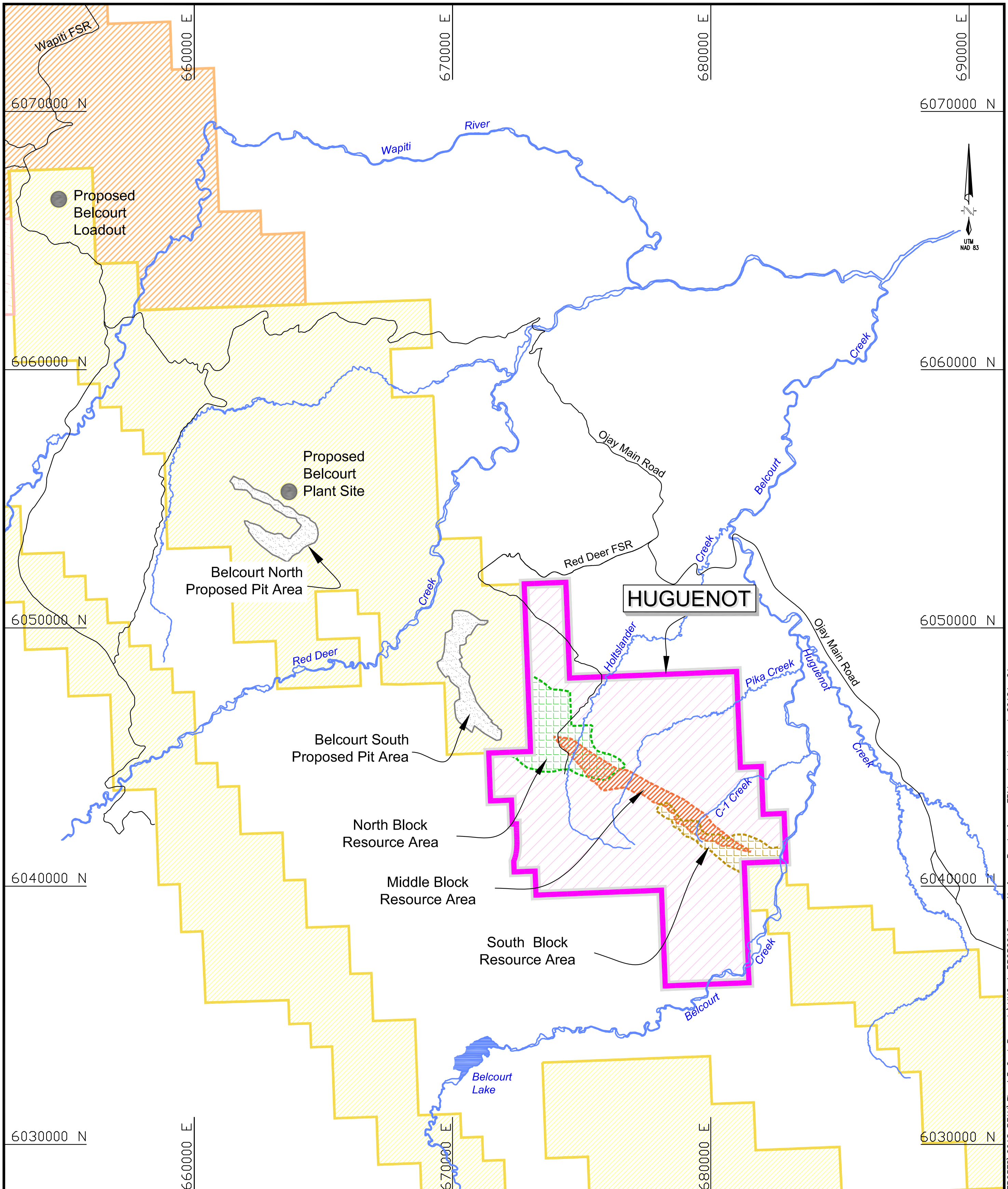

FORT ST. JOHN
To Fort Nelson
BRITISH COULUMBIA
ALBERTA
Bullhead Mountain
Gething
King Gething
Carbon Creek
Peace Canyon
DAWSON CREEK
97
CHETWYND
29
Willow Creek
To Grande Prairie
Johnsen Creek / Hasler
Hudette / Falling Creek
Goodrich / Central South
Trefi
Mink
Brule
Lossan / Suska
West Brazion
52
Highway
Heritage
Sukunka
Wolverine (Perry Creek)
TUMBLER RIDGE
Bullmoose
Wolverine (Mt. Spieker/EB)
Murray River
Quintette (Mesa)
Wolverine (Hermann)
Quintette (Shikano)
Quintette (Windy)
Quintette (Window/Babcock)
FLATBED
Trend
Roman
Extension
Wapiti River
Duke Mtn. (Monkman)
Onion Lake
Ojay
Main
Road
CN Rail
To Prince George
UTM NAD83 Zone10
0 10 20 30 40 50 km
SCALE
Belcourt North (Red Deer)
Belcourt South (Holtslander)
HUGUENOT
Omega
Saxon North
Saxon East
Saxon South
LEGEND:
Road
Railway
Town
Existing Coal Mines (Producing, Care & Maintenance)
Past Producer
Advanced Development Projects
Colonial Coal Projects
Regional Coal Deposits
Coal Bearing Formation:
Boulder Creek
Hulcross
Gates
Moosebar
Gething
Cadomin
Minnes Group
Wapiti
Source:
http://www.empr.gov.bc.ca/Mining/Geoscience/MapPlace/geoData
BC Digital Geology updated 2018-04-05
FIGURE 4.2
COLONIAL COAL INTERNATIONAL CORP.
HUGUENOT COAL PROJECT
Regional Property Map
DATE: Jul 6, 2018
FILE: HUG–A–RPROP2018–a
DRAWN BY: CVS
CHECKED BY: JHP / DJL
APPROVED BY: JHP / DJL
NORWEST CORPORATION now Stantec
07/06/18 – 03:20:23pm K:\HUGUENOT\REPORTS\2018 PEAU\Fig 4.2 Regional Property\HUG–A–RPROP2018–a.dwg Xrefs: x–Rivers–Maj x–BC_digital_geology_20180405–Coal Bearing x–Roads–Rails–GenMap–2018Jun x–Regional Coal Property



LEGEND:

- Colonial Coal Corp.
- Canadian Dehua
- Teck Coal Ltd.
- Peace River Coal

2 km 2 4 6 8 10 km

SCALE

FIGURE 4.3

COLONIAL COAL INTERNATIONAL CORP.

HUGUENOT COAL PROJECT

Property Map

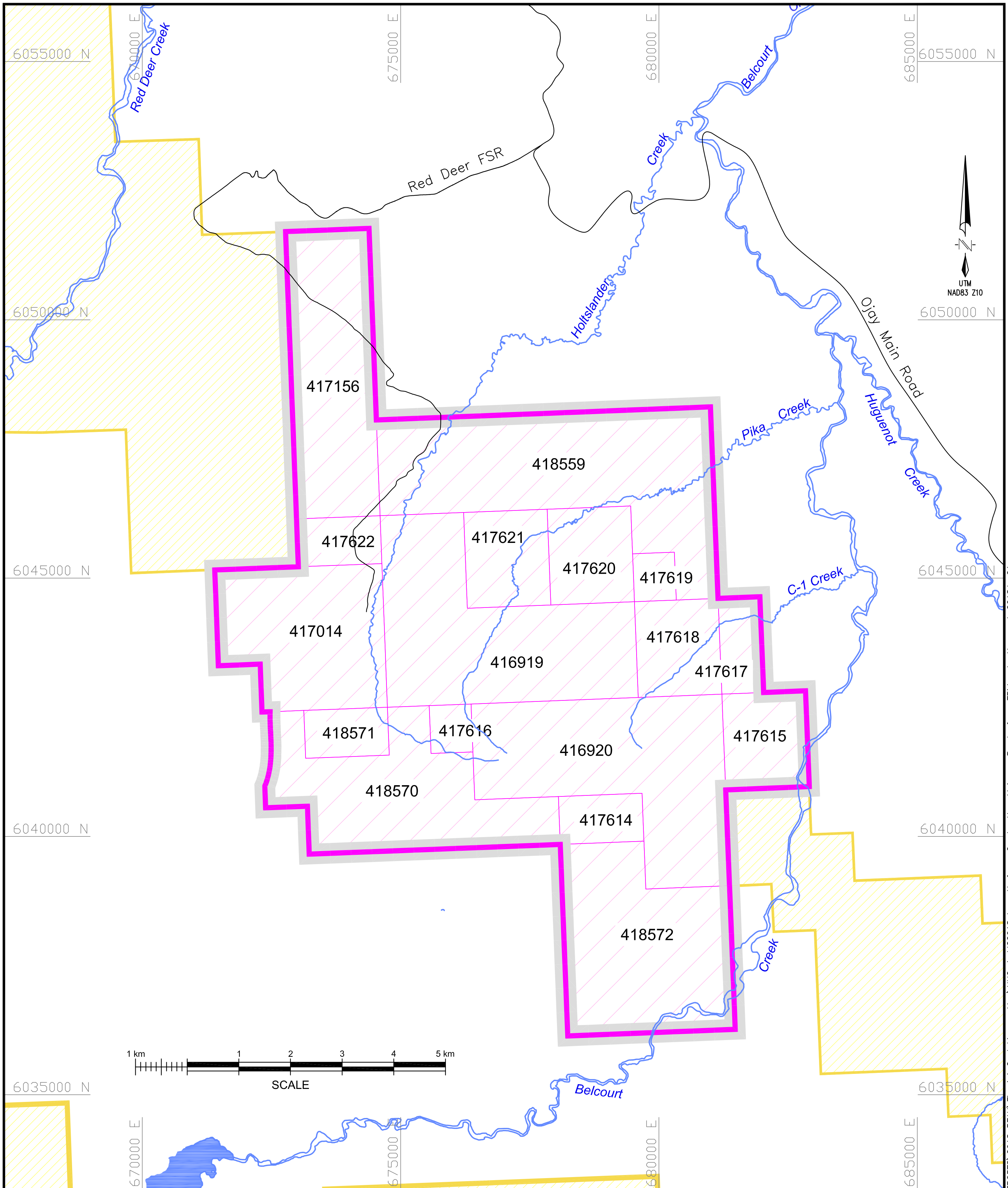
DATE: Jul 5, 2018

FILE: HUG–A–PROP2018

DRAWN BY: CVS CHECKED BY: JHP / DJL APPROVED BY: JHP / DJL

NORWEST now Stantec

07/05/18 – 12:47:00pm K:\HUGUENOT\REPORTS\2018 PEAU\Fig 4.3 Coal Property\HUG–A–PROP2018.dwg Xrefs: x–Roads_from_TRidge_to_Huguenot_2018Jun21



LEGEND:

Coal Property Boundary

Road

Main Creek

FIGURE 4.4

COLONIAL COAL INTERNATIONAL CORP.

HUGUENOT COAL PROJECT

Coal License Map

DATE: Jul 5, 2018	NORWEST now Stantec
FILE: HUG–A–LIC2018	
DRAWN BY: CVS	CHECKED BY: JHP / DJL APPROVED BY: JHP / DJL

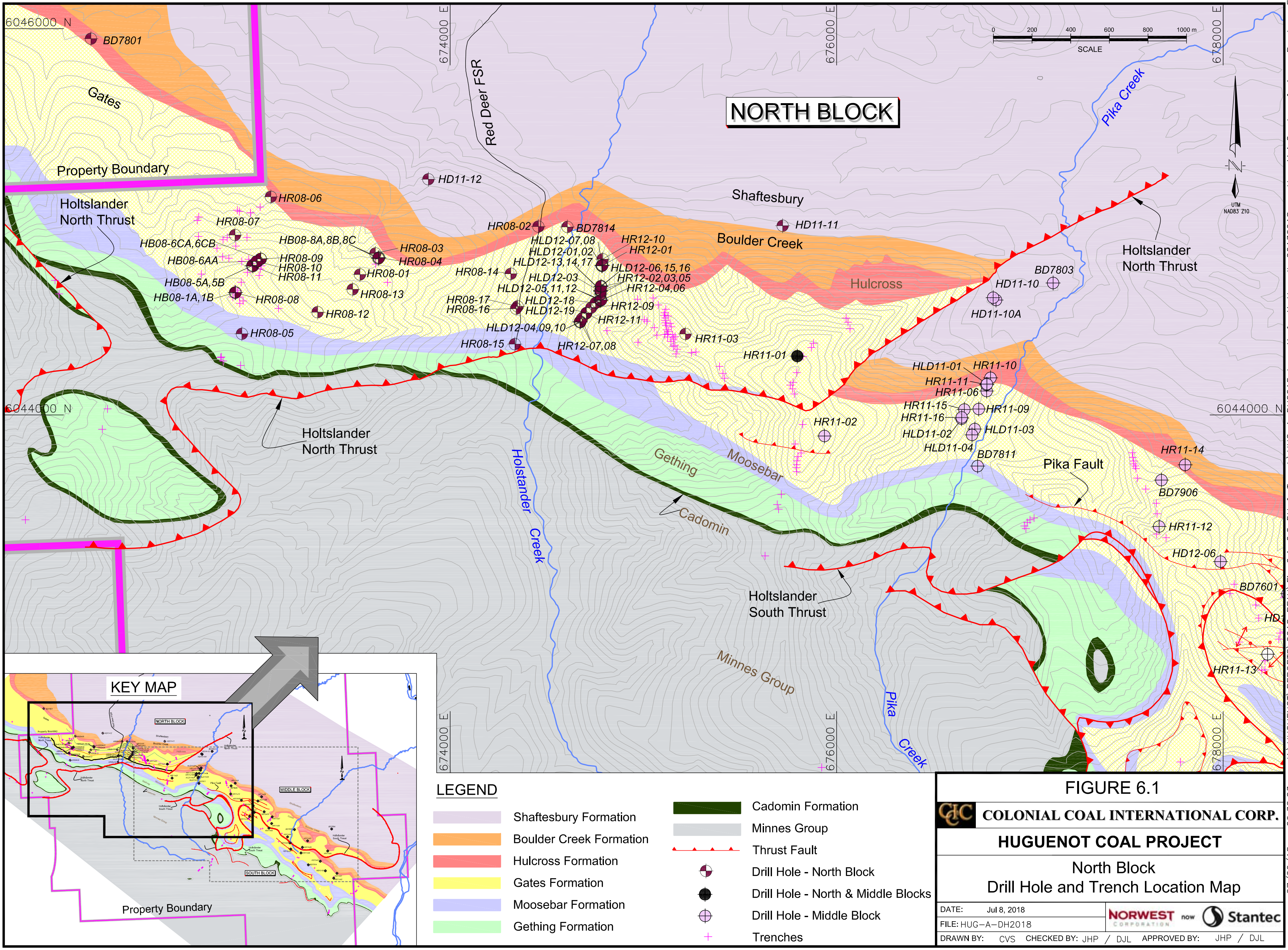


FIGURE 6.1

COLONIAL COAL INTERNATIONAL CORP.

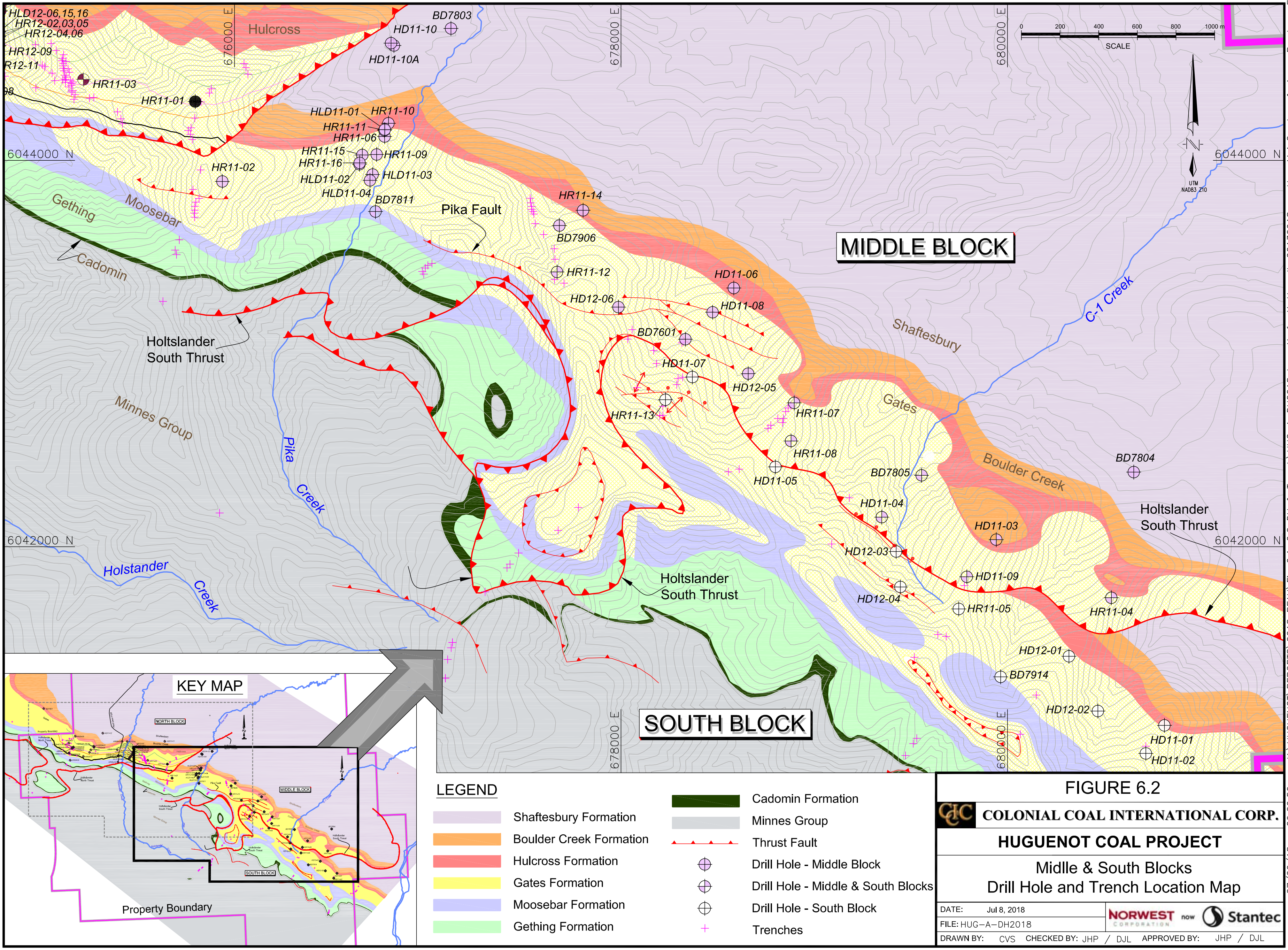
HUGUENOT COAL PROJECT

North Block
Drill Hole and Trench Location Map

DATE: Jul 8, 2018
FILE: HUG-A-DH2018
DRAWN BY: CVS CHECKED BY: JHP / DJL APPROVED BY: JHP / DJL

NORWEST CORPORATION now Stantec

K:\HUGUENOT\REPORTS\2018 PEA\Fig 6.1-6.2 DH & Trench\HUG-A-DH2018.dwg Xrefs: X-Hug dh 20130918 x-Hug-MainCreeks_ &_AccessRoad x-Faults-Major 07/09/18 - 09:32:23am



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07/09/18 - 09:29:59am

Series	Group	Formation		Lithology	Unit Thickness (Meters)
LOWER CRETACEOUS	FORT ST. JOHN	Shaftesbury		Dark grey marine shales, sideritic concretions, some sandstone grading to silty, dark grey marine shale, siltstone and sandstone in lower part, minor conglomerate.	+450
		COMMOTION	Boulder Creek	Fine-grained, well sorted, non-marine sandstone, mudstone and carbonaceous shale, conglomerate, few thin coal seams.	115
			Hullcross	Dark grey marine shale in the north grading to extremely fossiliferous shaly beds interlayered with sandstone and thin coal seams in the south.	35
			Gates	Fine-grained marine and non-marine sandstones; conglomerate, coal, shale and mudstone.	365
		Moosebar		Dark grey marine shale with sideritic concretions, glauconitic sandstones and pebbles at base.	60
	BULLHEAD	Gething		Fine to coarse brown calcareous sandstone, coal, carbonaceous shale, and conglomerate.	70
		Cadomin		Massive conglomerate containing chert and quartzite pebbles.	10
	MINNES	Nikanassin		Thin-bedded grey and brown shales and brown sandstones, containing numerous thin coal seams.	

Note:

Modified From Denison Mines Limited (1979b)

FIGURE 7.1

COLONIAL COAL INTERNATIONAL CORP.

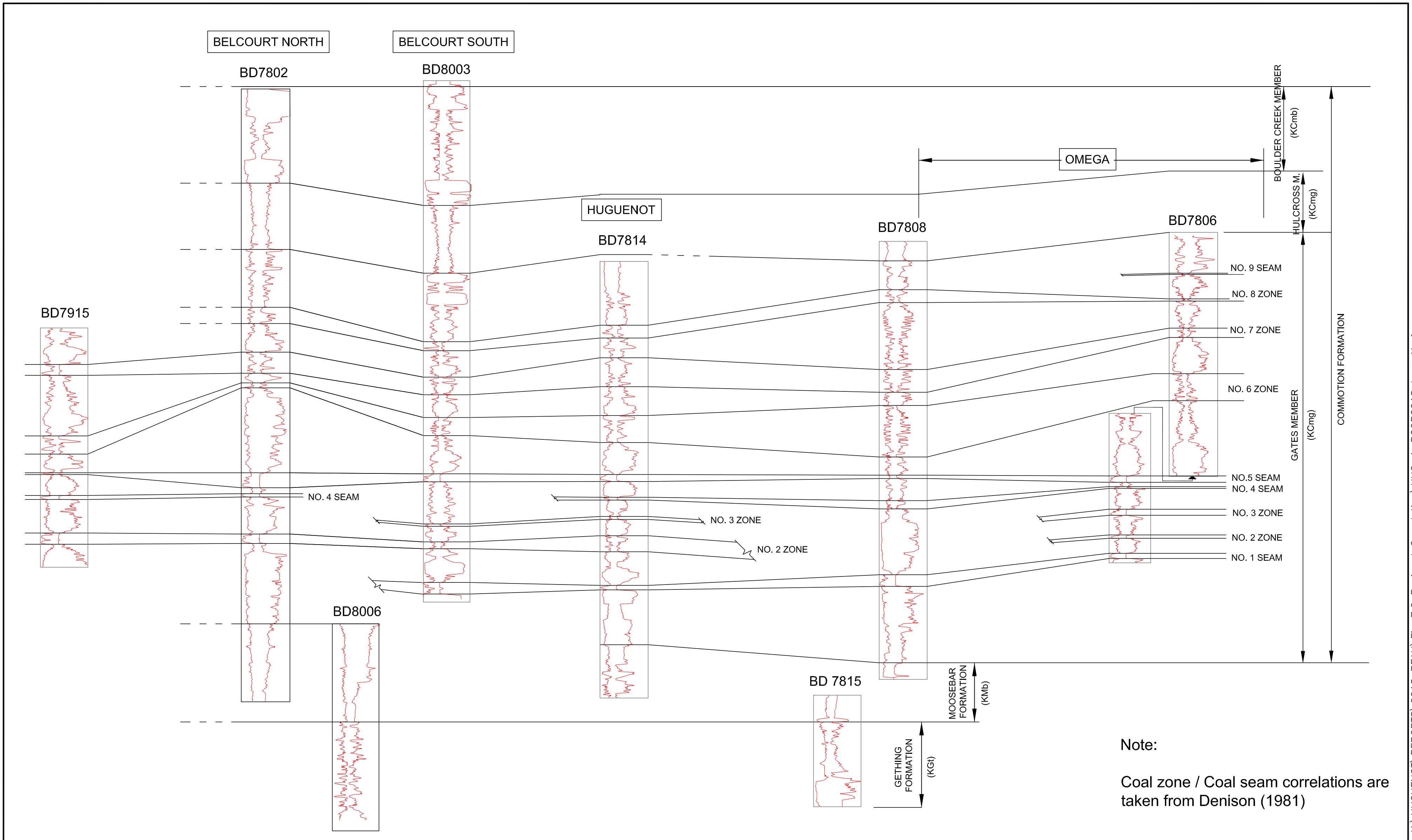
HUGUENOT COAL PROJECT

Regional Stratigraphy

DATE: Jul 5, 2018
FILE: HUG–A–RSTR2018
DRAWN BY: CVS CHECKED BY: JHP / DJL APPROVED BY: JHP / DJL

NORWEST CORPORATION now Stantec

07/05/18 – 01:49:19pm K:\HUGUENOT\REPORTS\2018 PEAU\Fig 7.1 Regional Stratigraphy\HUG–A–RSTR2018.dwg Xrefs:



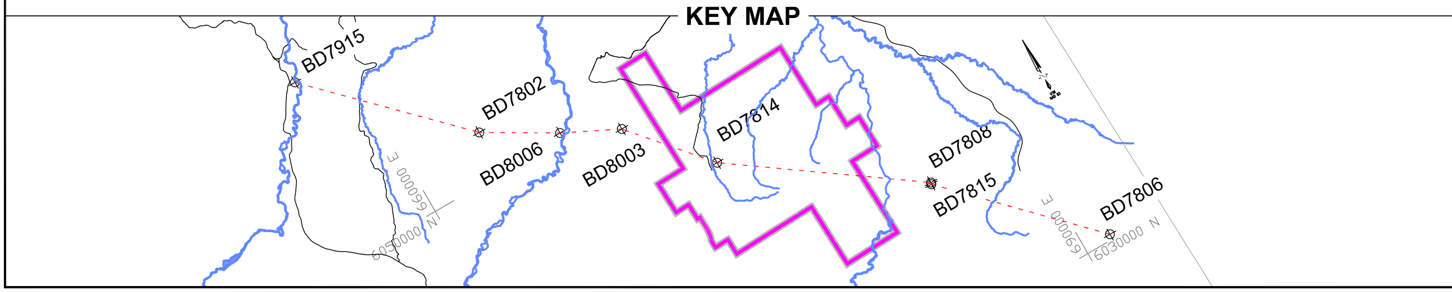


FIGURE 7.2

COLONIAL COAL INTERNATIONAL CORP.

HUGUENOT COAL PROJECT

Regional Correlation Chart

DATE: Jul 5, 2018
FILE: HUG–A–RCOR2018
DRAWN BY: CVS CHECKED BY: JHP / DJL APPROVED BY: JHP / DJL

NORWEST now Stantec

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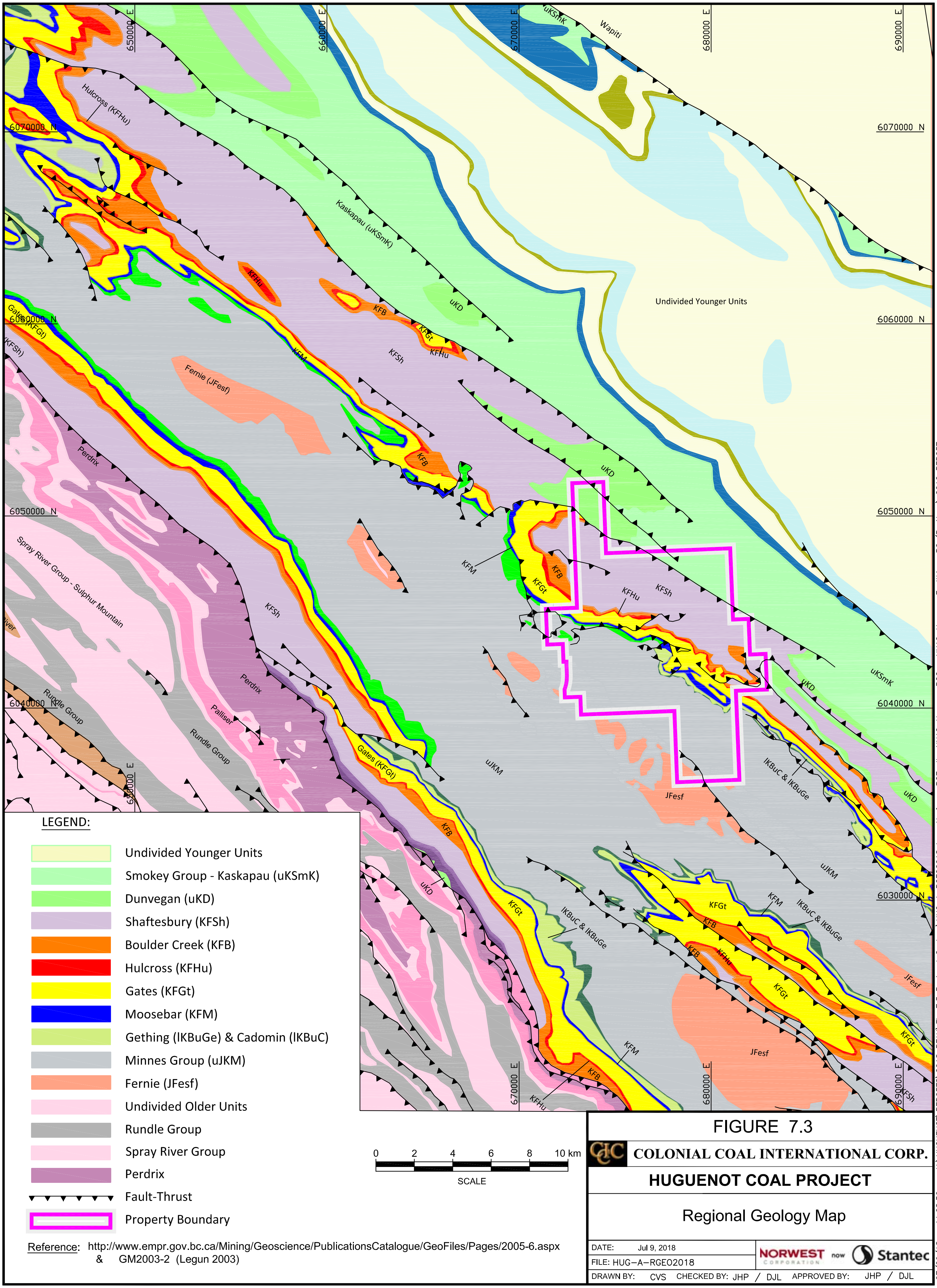

FIGURE 7.3

COLONIAL COAL INTERNATIONAL CORP.

HUGUENOT COAL PROJECT

Regional Geology Map

DATE: Jul 9, 2018	NORWEST CORPORATION now Stantec
FILE: HUG–A–RGEO2018	
DRAWN BY: CVS	CHECKED BY: JHP / DJL	APPROVED BY: JHP / DJL

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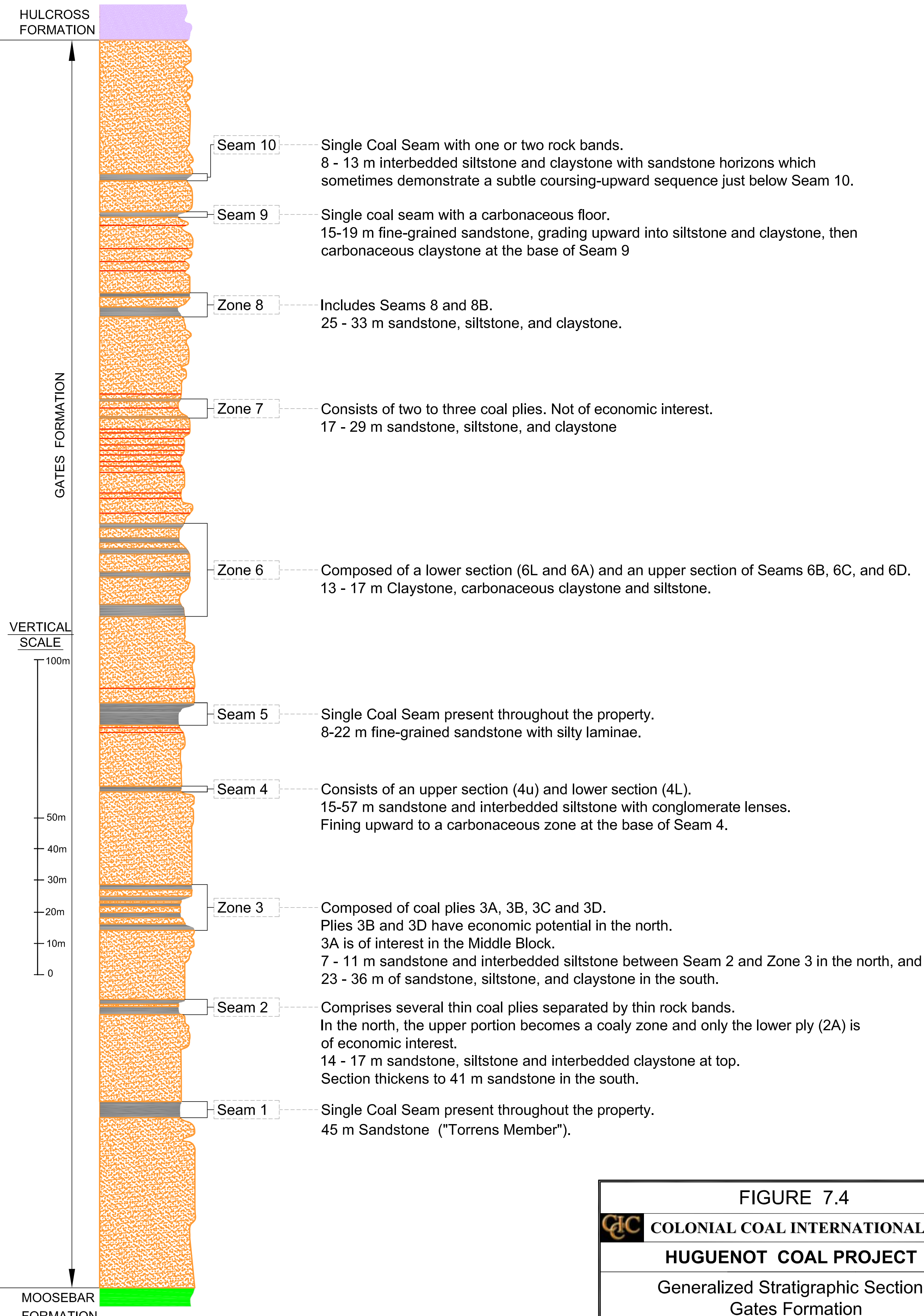

FIGURE 7.4

COLONIAL COAL INTERNATIONAL CORP.

HUGUENOT COAL PROJECT

Generalized Stratigraphic Section - Gates Formation

DATE: Jul 9, 2018
FILE: HUG-A-GSTR2018
NORWEST CORPORATION now Stantec
DRAWN BY: CVS CHECKED BY: JHP / DJL APPROVED BY: JHP / DJL

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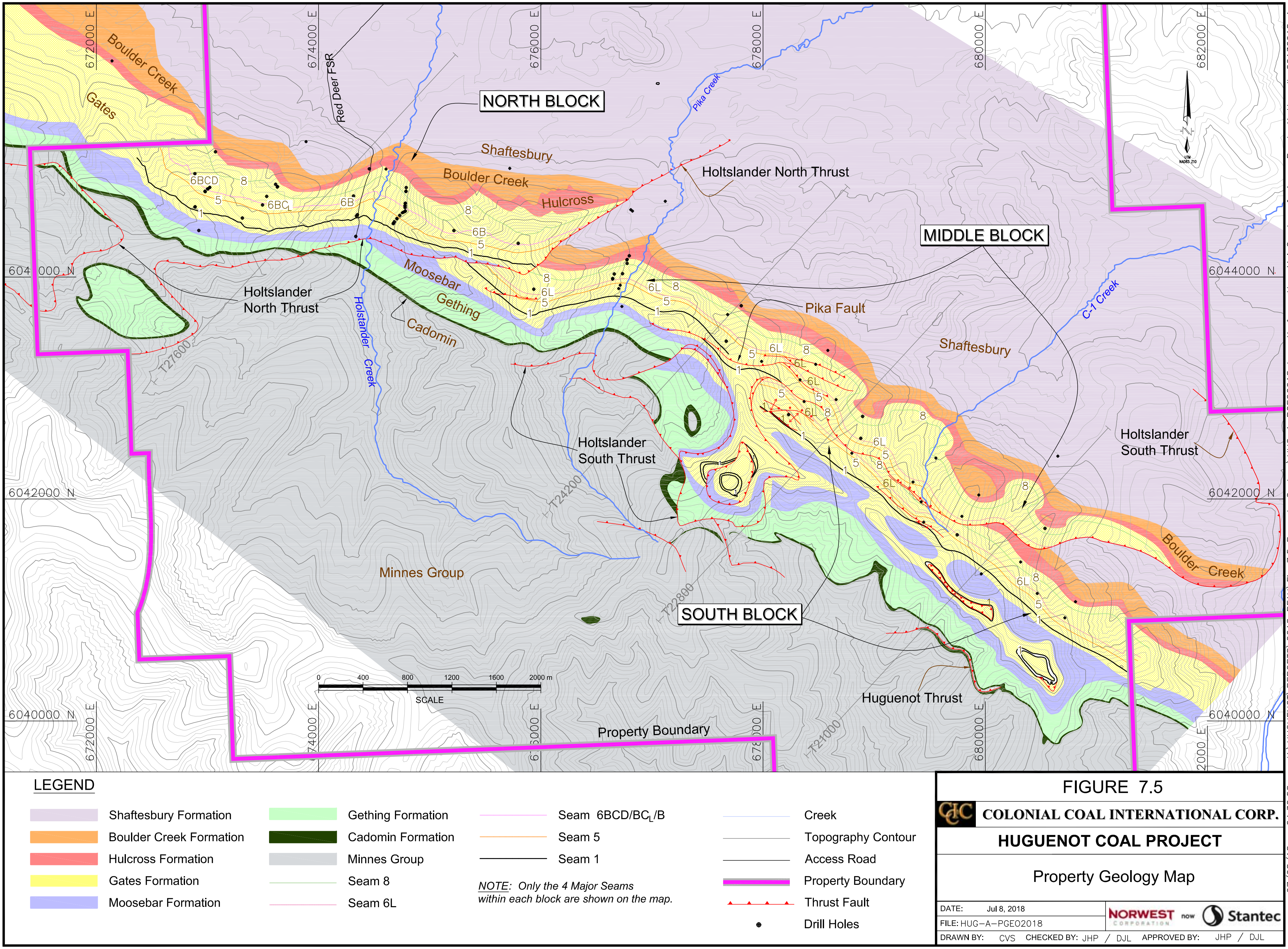


FIGURE 7.5

COLONIAL COAL INTERNATIONAL CORP.

HUGUENOT COAL PROJECT

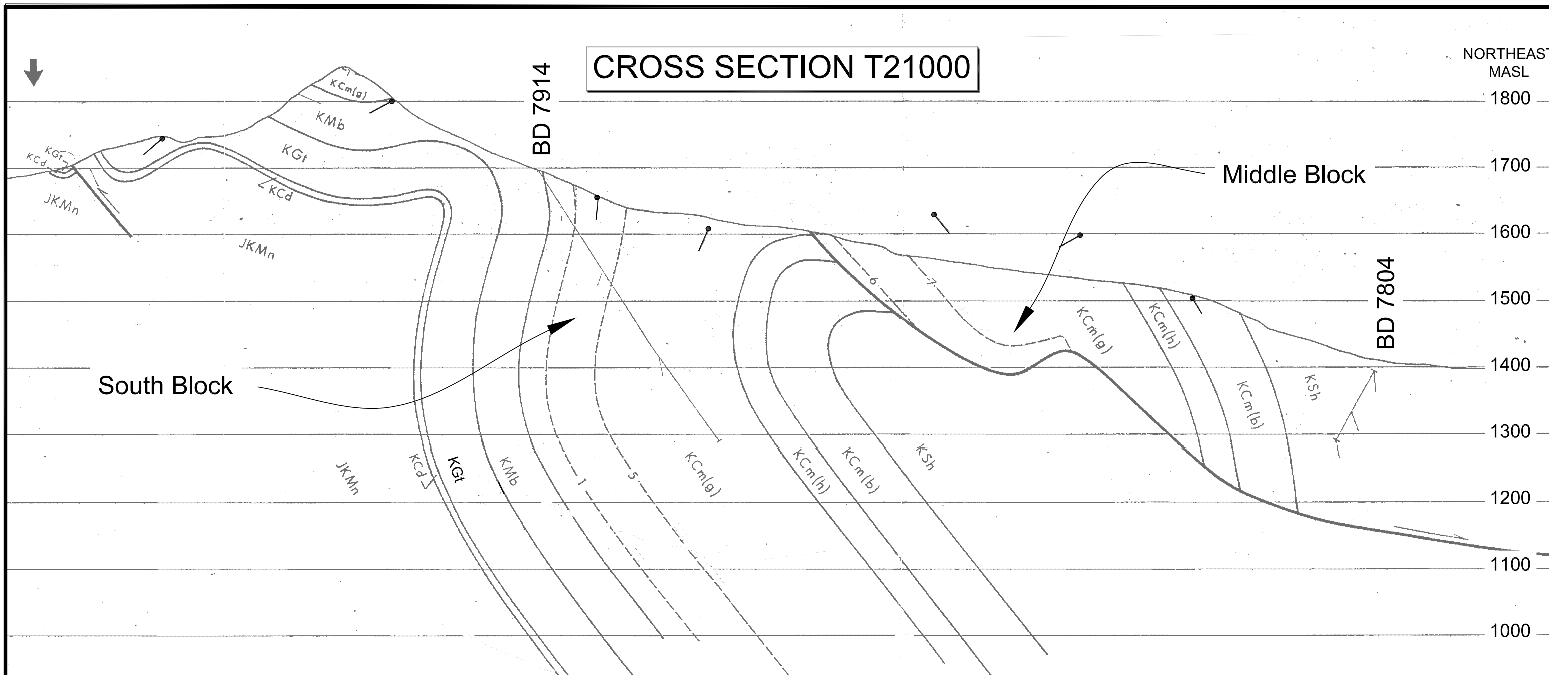
Property Geology Map

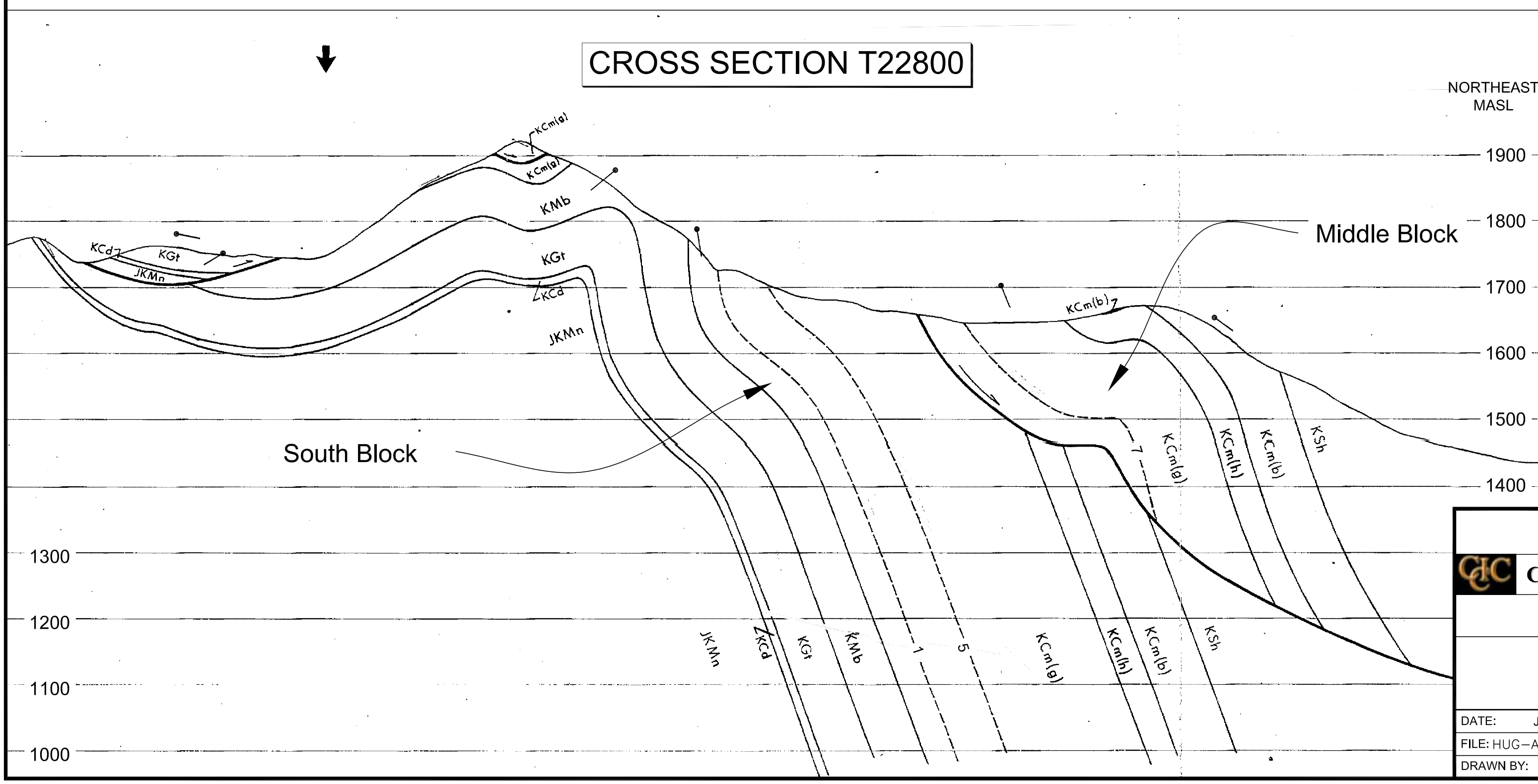
DATE: Jul 8, 2018

FILE: HUG-A-PGEO2018

DRAWN BY: CVS CHECKED BY: JHP / DJL APPROVED BY: JHP / DJL

NORWEST now Stantec





LEGEND:

KSh	Shaftesbury Formation
KCm(b)	Boulder Creek Formation
KCm(h)	Hulcross Formation
KCm(g)	Gates Formation
KMb	Moosebar Formation
KGt	Gething Formation
KCd	Cadomin Formation
JKMn	Minnes Group
BD7906	Drill Hole
↓	Baseline Location
	Thrust Fault
	Bedding

0 100 200 300 400 500 m

SCALE

NOTE:

The locations of the Cross Sections are shown on Figure 7.5

Taken from Denison (1979b)

FIGURE 7.6

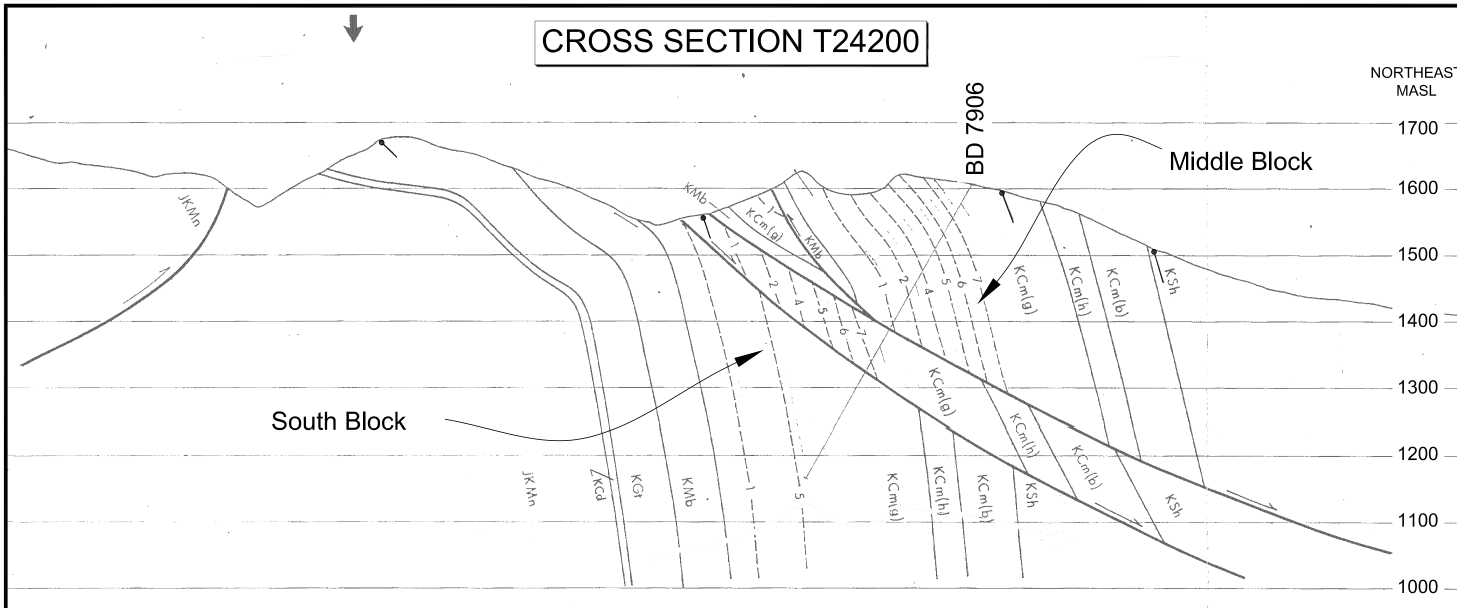
COLONIAL COAL INTERNATIONAL CORP.

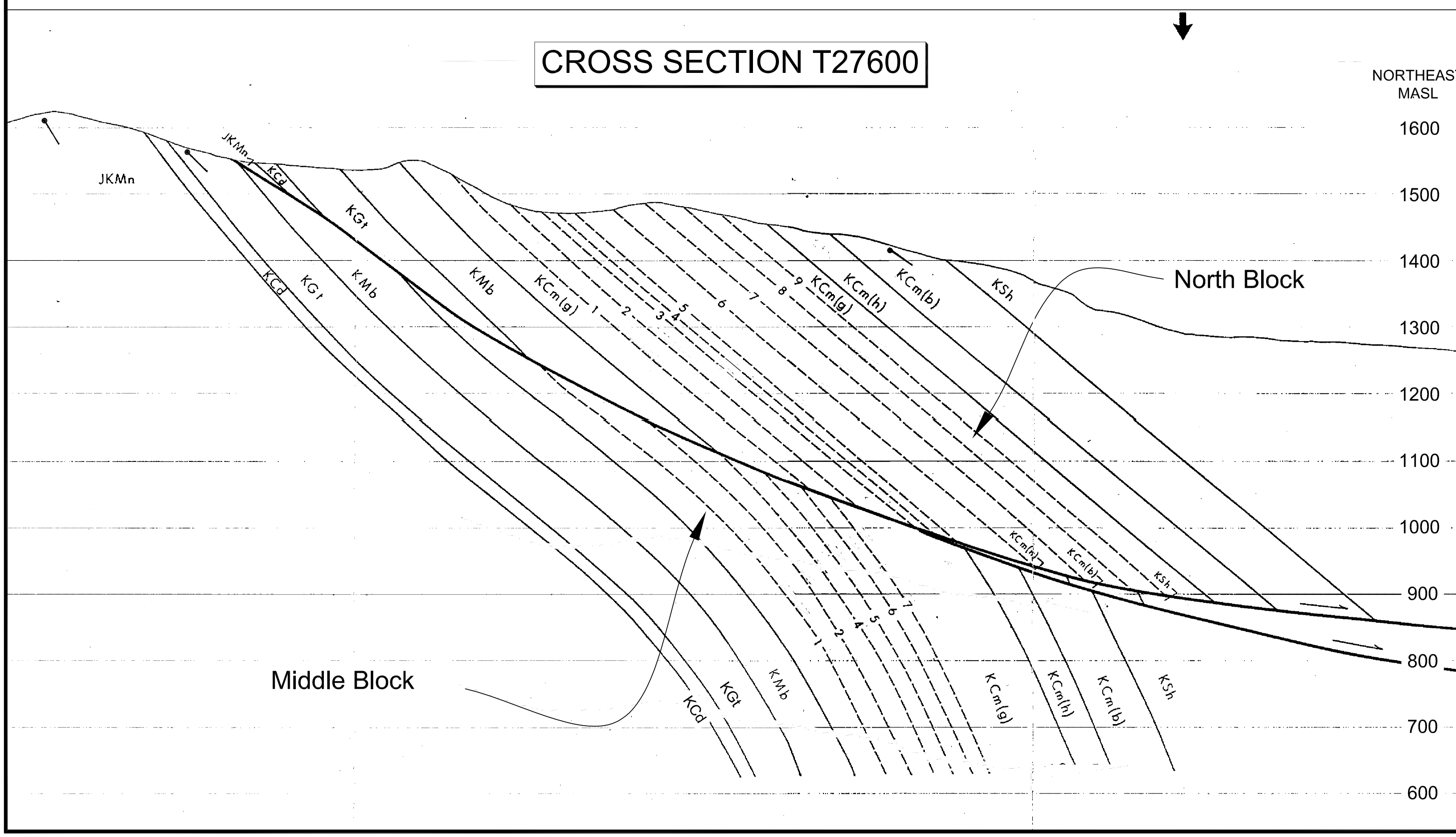
HUGUENOT COAL PROJECT

Structural Cross Sections
T21000 -T22800

DATE: June 3, 2018
FILE: HUG-A-STRSEC2018
DRAWN BY: CVS CHECKED BY: JHP / DJL APPROVED BY: JHP / DJL

NORWEST CORPORATION now Stantec





LEGEND:

KSh	Shaftesbury Formation
KCm(b)	Boulder Creek Formation
KCm(h)	Hulcross Formation
KCm(g)	Gates Formation
KMb	Moosebar Formation
KGt	Gething Formation
KCd	Cadomin Formation
JKMn	Minnes Group
BD7906	Drill Hole
↓	Baseline Location
	Thrust Fault
	Bedding

0 100 200 300 400 500 m
SCALE

NOTE:

The locations of the Cross Sections are shown on Figure 7.5

Taken from Denison (1979b)

FIGURE 7.7

COLONIAL COAL INTERNATIONAL CORP.

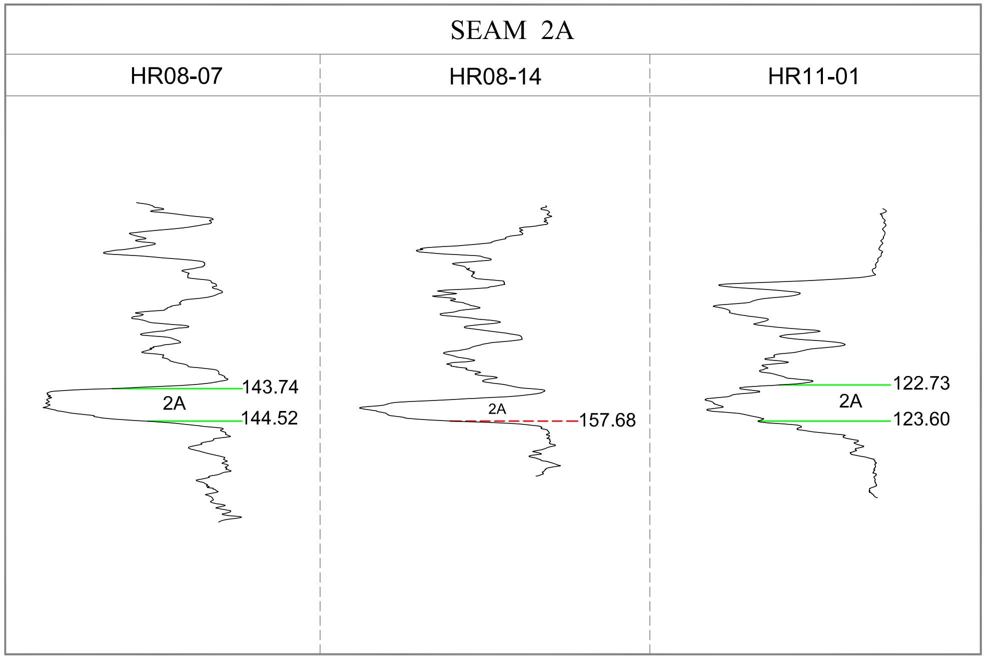
HUGUENOT COAL PROJECT

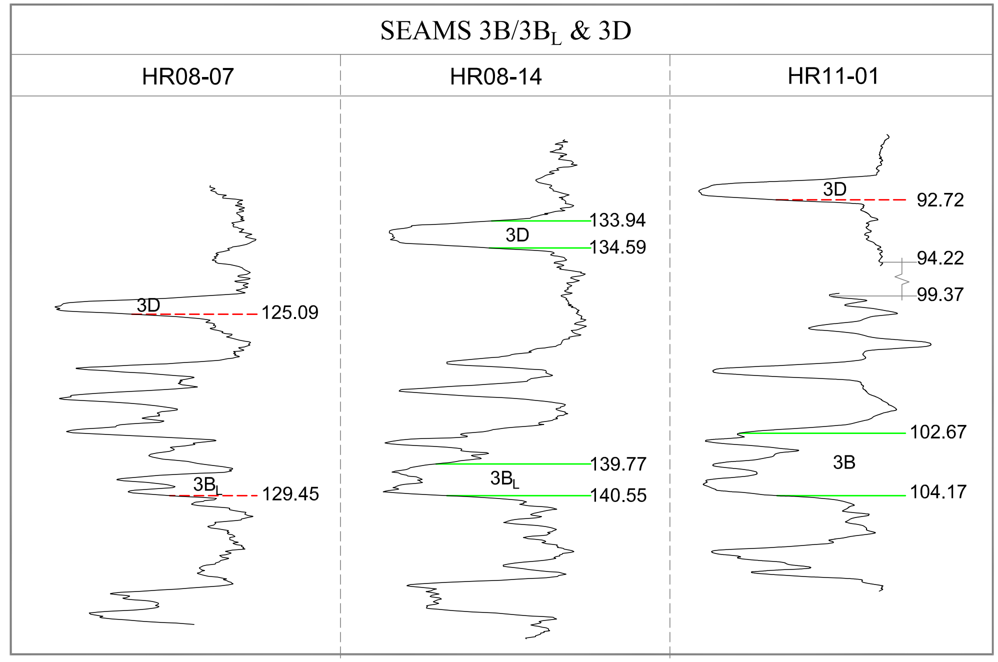
Structural Cross Sections
T24200 -T27600

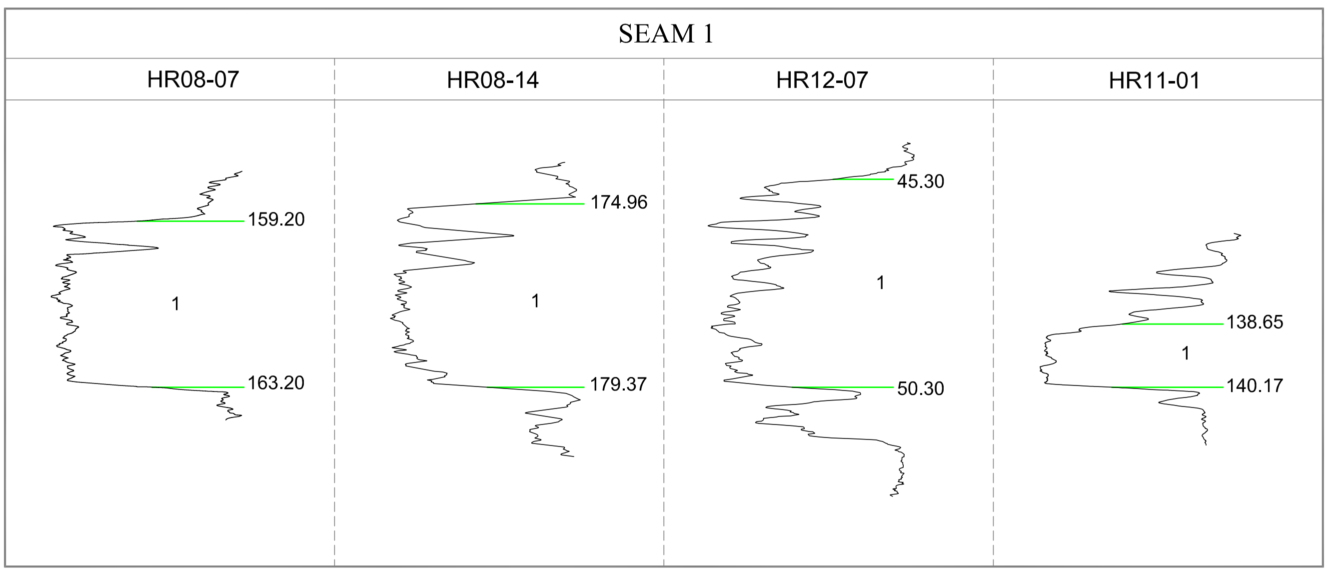
DATE: June 3, 2018
FILE: HUG–A–STRSEC2018
DRAWN BY: CVS CHECKED BY: JHP / DJL APPROVED BY: JHP / DJL

NORWEST CORPORATION now Stantec

North Block (Seams 1, 2A, 3B/3B$_L$ & 3D)







LEGEND:

Mining Section

Non-Mining Section

NOTE:

Seam traces taken from Detailed Density Logs

FIGURE 7.8

COLONIAL COAL INTERNATIONAL CORP.

HUGUENOT COAL PROJECT

Seam Correlation (North Block)
Sheet 1 of 3

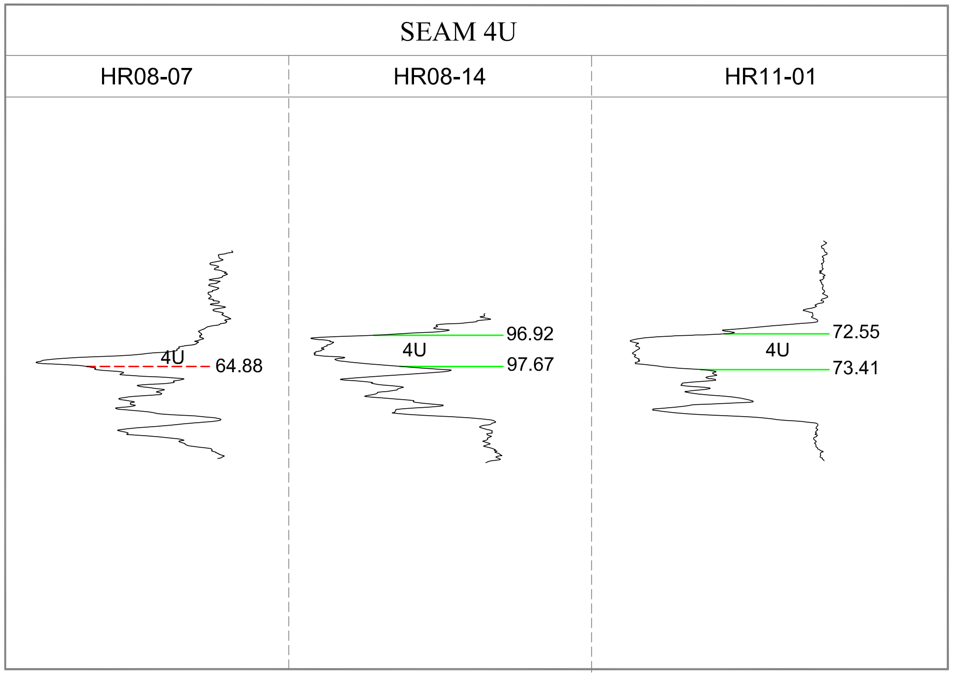
DATE: Jul 6, 2018

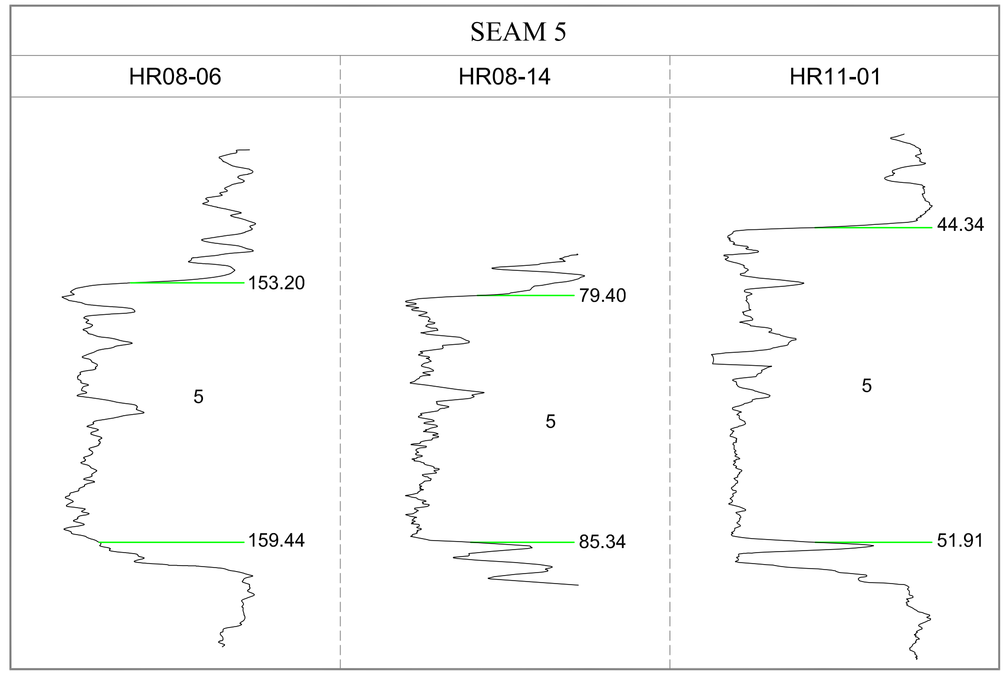
FILE: HUGN–A–SMCORR2018

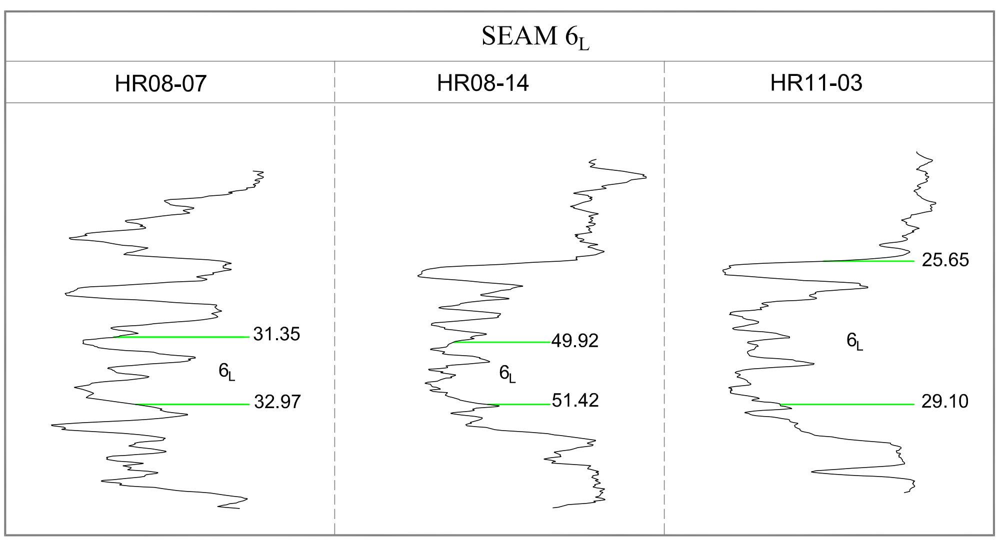
NORWEST now Stantec

DRAWN BY: CVS CHECKED BY: JHP / DJL APPROVED BY: JHP / DJL

North Block (Seams 4U, 5 & 6_L)







LEGEND:

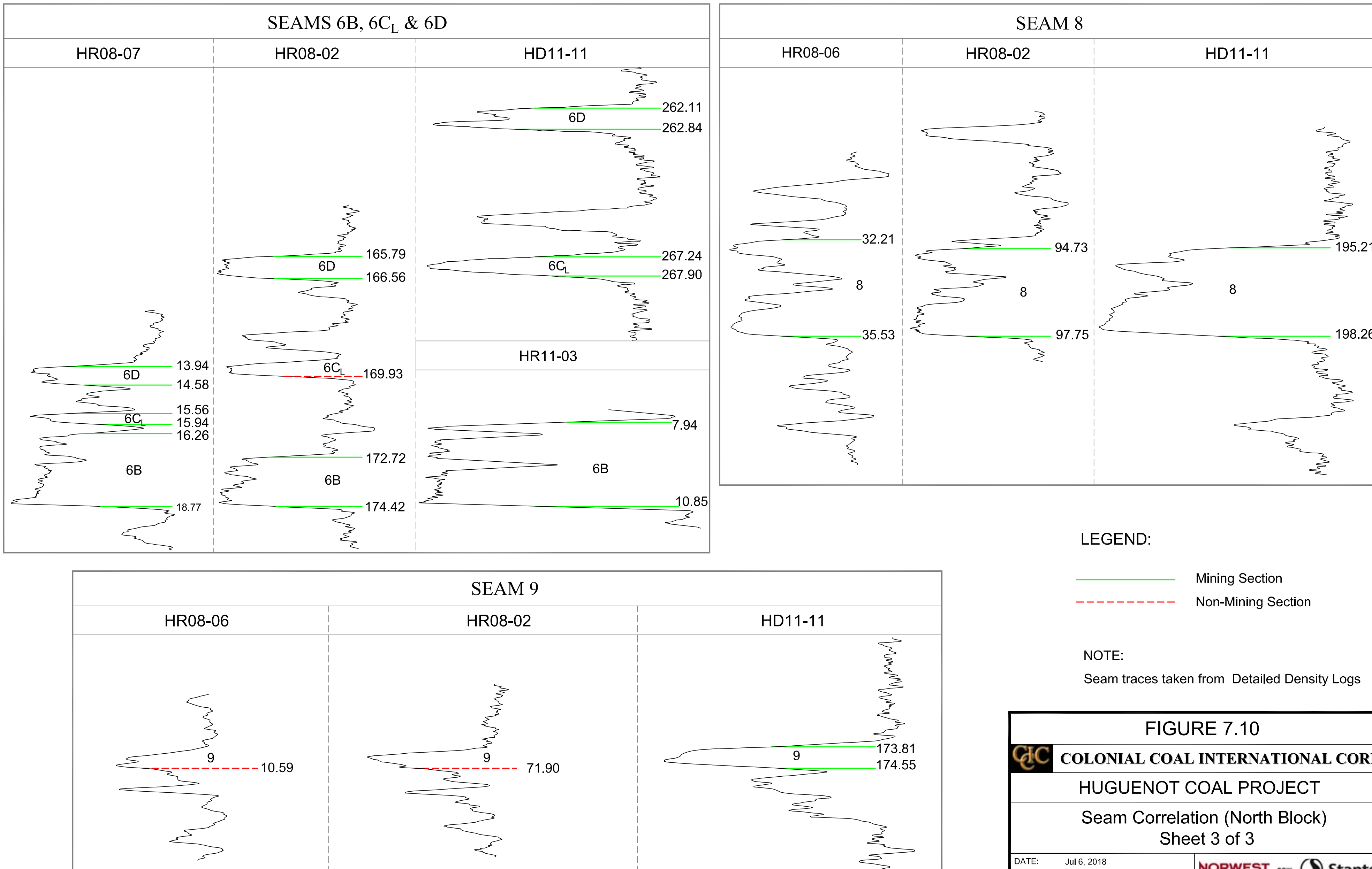
- Mining Section (green solid line)
- Non-Mining Section (red dashed line)

NOTE:

Seam traces taken from Detailed Density Logs

FIGURE 7.9	
COLONIAL COAL INTERNATIONAL CORP.	
HUGUENOT COAL PROJECT	
Seam Correlation (North Block) Sheet 2 of 3	
DATE: Jul 6, 2018	NORWEST CORPORATION now Stantec
FILE: HUGN-A-SMCORR2018	
DRAWN BY: CVS CHECKED BY: JHP / DJL	APPROVED BY: JHP / DJL

North Block (Seams 6B, 6C$_L$, 6D, 8 & 9)



LEGEND:

Mining Section

Non-Mining Section

NOTE:

Seam traces taken from Detailed Density Logs

FIGURE 7.10

COLONIAL COAL INTERNATIONAL CORP.

HUGUENOT COAL PROJECT

Seam Correlation (North Block)
Sheet 3 of 3

DATE: Jul 6, 2018
FILE: HUGN-A-SMCORR2018
DRAWN BY: CVS CHECKED BY: JHP / DJL APPROVED BY: JHP / DJL

NORWEST CORPORATION now Stantec

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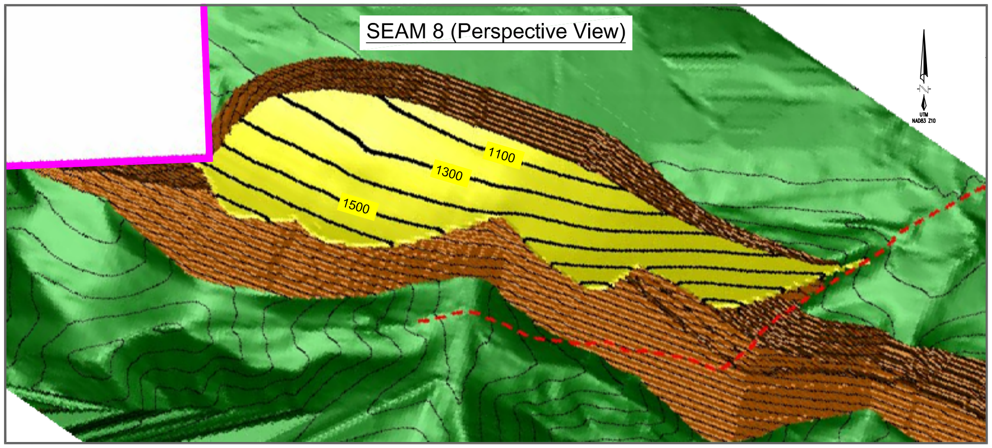
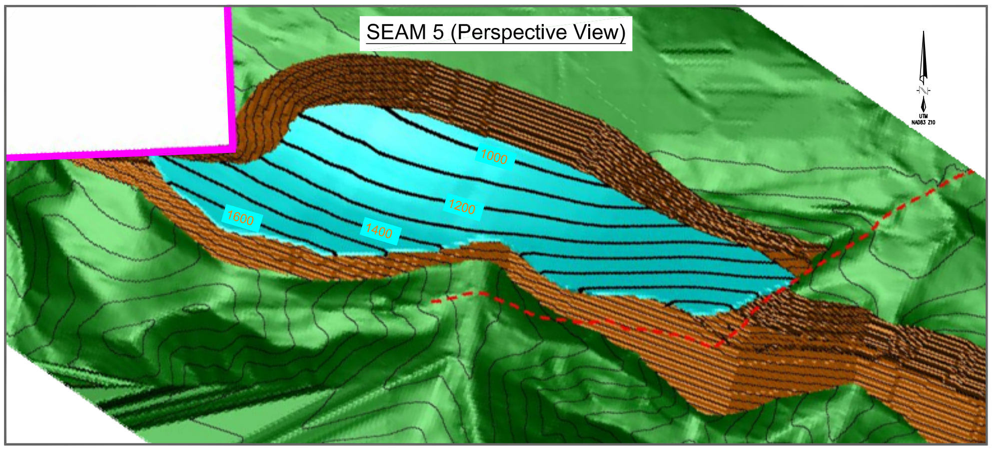
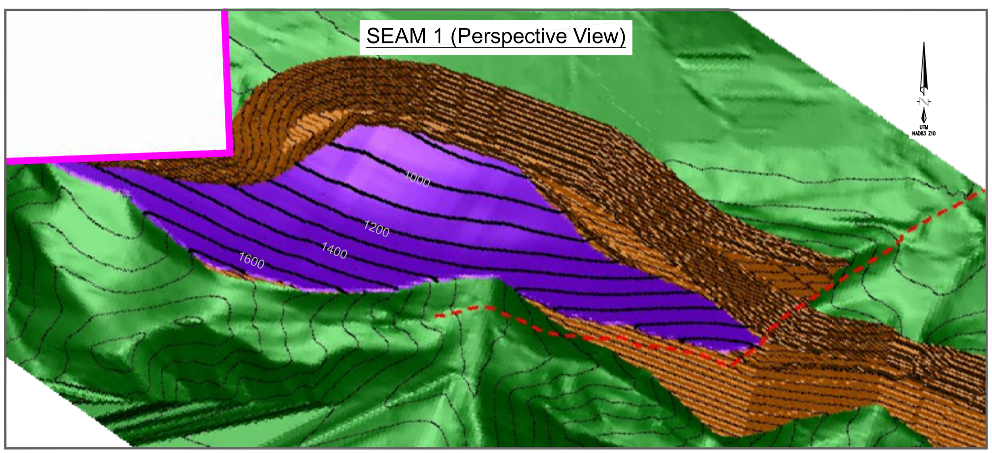
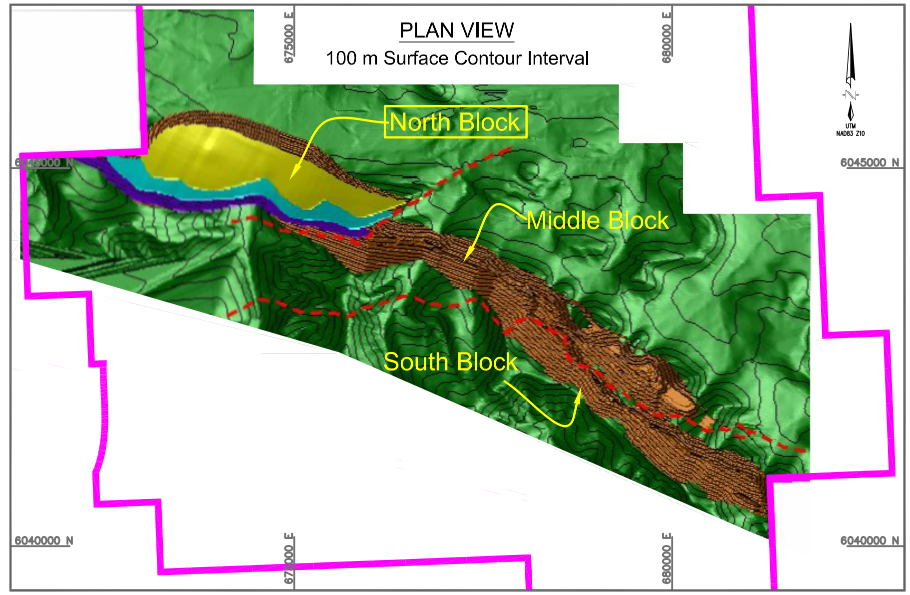
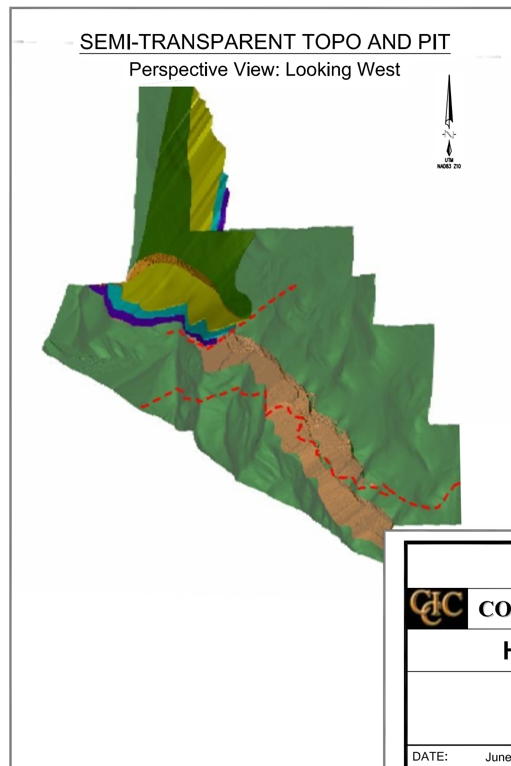










LEGEND:

- Seam 8
- Seam 5
- Seam 1
- Topography
- Surface Pit
- Surface Projection of Major Faults Separating Fault Blocks
- Property Boundary
- Topo / Pit Contours (50 m Interval)
- Seam Contour (100 m Interval)
- 1400 Elevation (m)

FIGURE 7.11

COLONIAL COAL INTERNATIONAL CORP.

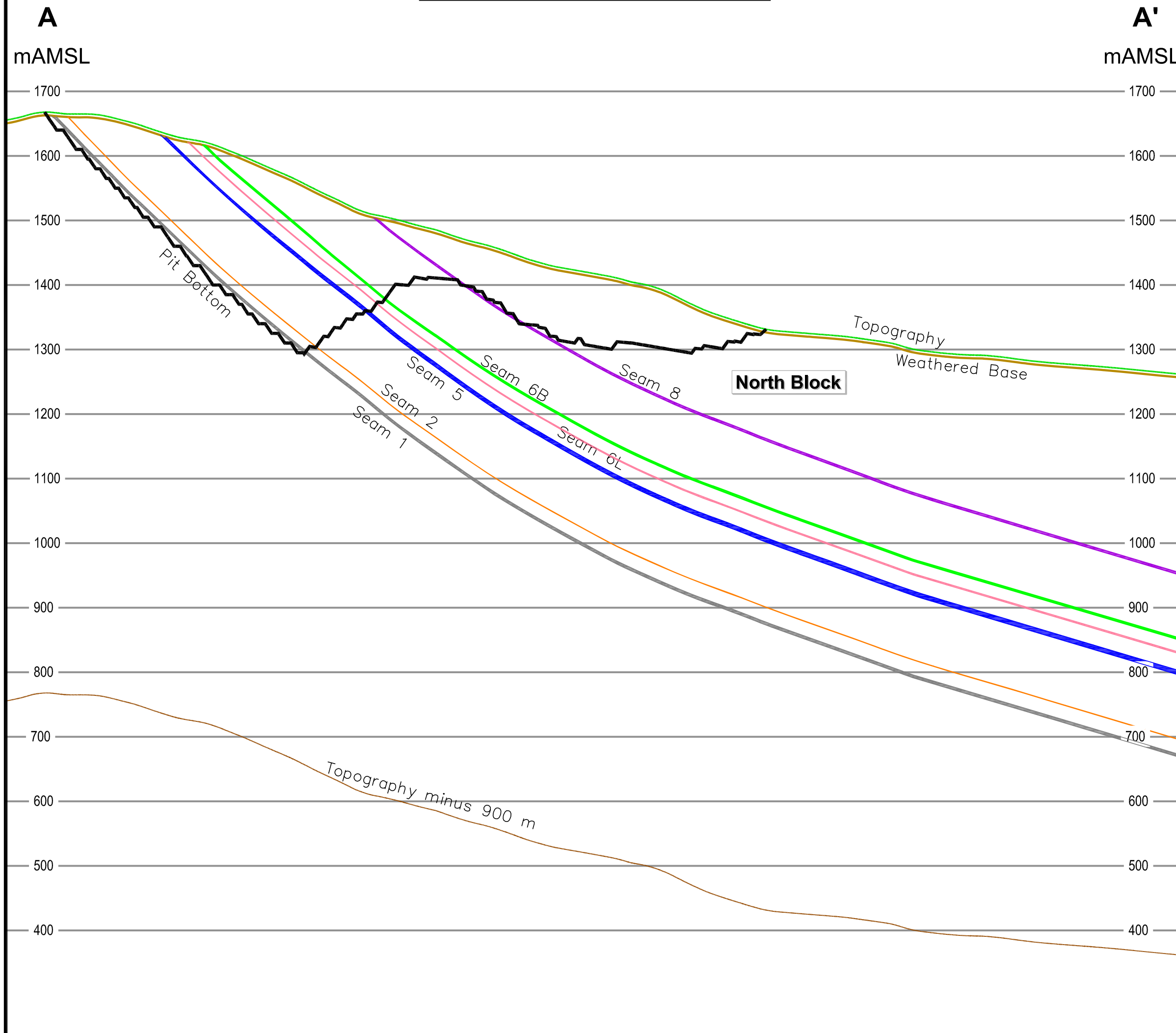
HUGUENOT COAL PROJECT

North Block
Seam Structure

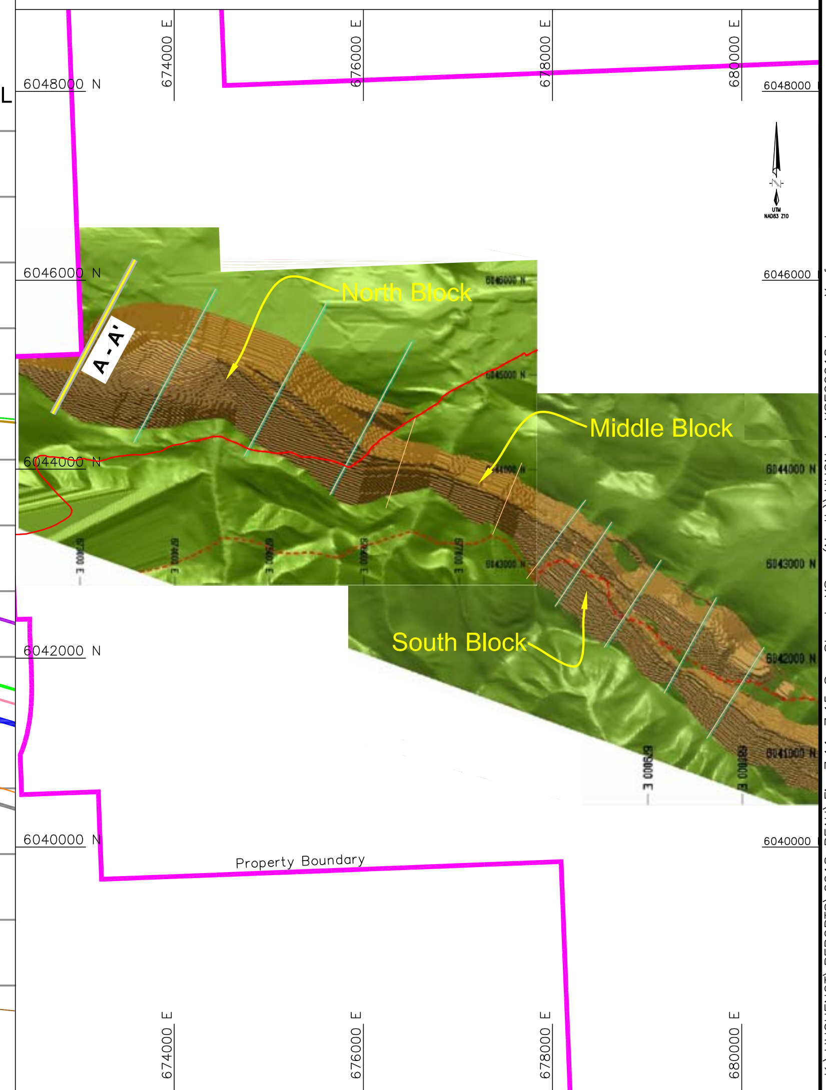
DATE: June 1, 2018	NORWEST now Stantec
FILE: HUGN–A–SMSTRUC2018	
DRAWN BY: CVS CHECKED BY: JHP / DJL	APPROVED BY: JHP / DJL

07/06/18 – 04:37:43pm K:\HUGUENOT\REPORTS\2018 PEAU\Fig 7.11–7.15 Sm Struct–XSec (North)\HUGN–A–SMSTRUC2018.dwg Xrefs:

CROSS SECTION A-A'



PLAN VIEW



LEGEND:

Topography	Fault	Seam 6L	A-A' Cross Section Line	Topography
Pit Bottom	Seam 1	Seam 6B	Fault at Surface	Pit Bottom
Weathered Base	Seam 2	Seam 8	Property Boundary	
Topo Minus 900 m	Seam 5			

FIGURE 7.12

COLONIAL COAL INTERNATIONAL CORP.

HUGUENOT COAL PROJECT

North Block
Cross Section A-A'

DATE: Jul 6, 2018
FILE: HUGN–A–XSEC2018
DRAWN BY: CVS CHECKED BY: JHP / DJL APPROVED BY: JHP / DJL

NORWEST CORPORATION now Stantec

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07/06/18 – 04:49:35pm

LEGEND:

	Topography		Fault		Seam 6L	B-B'	Cross Section Line		Topography
	Pit Bottom		Seam 1		Seam 6B		Fault at Surface		Pit Bottom
	Weathered Base		Seam 2		Seam 8		Property Boundary		
	Topo Minus 900 m		Seam 5						

FIGURE 7.13

COLONIAL COAL INTERNATIONAL CORP.

HUGUENOT COAL PROJECT

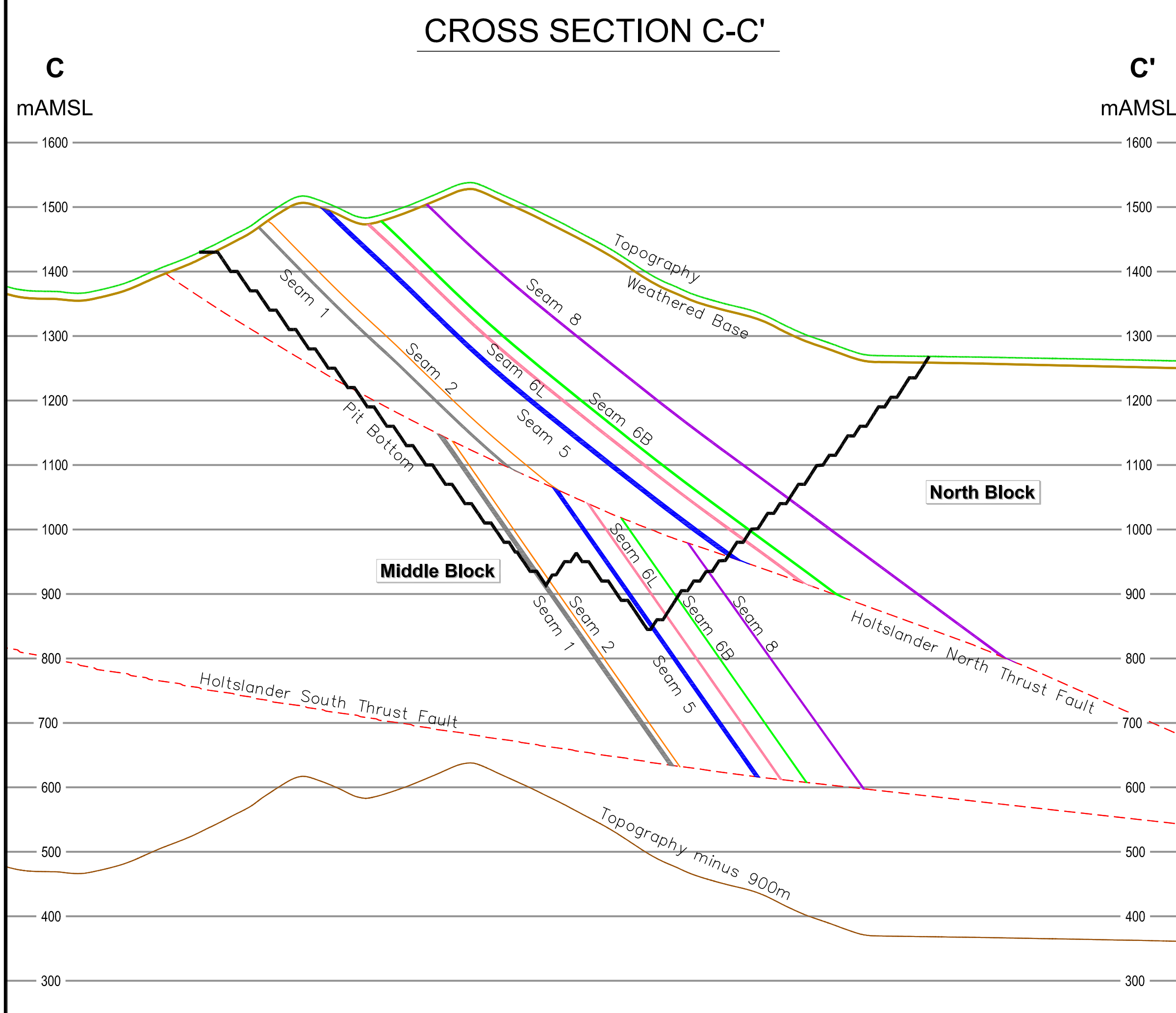
North Block
Cross Section B-B'

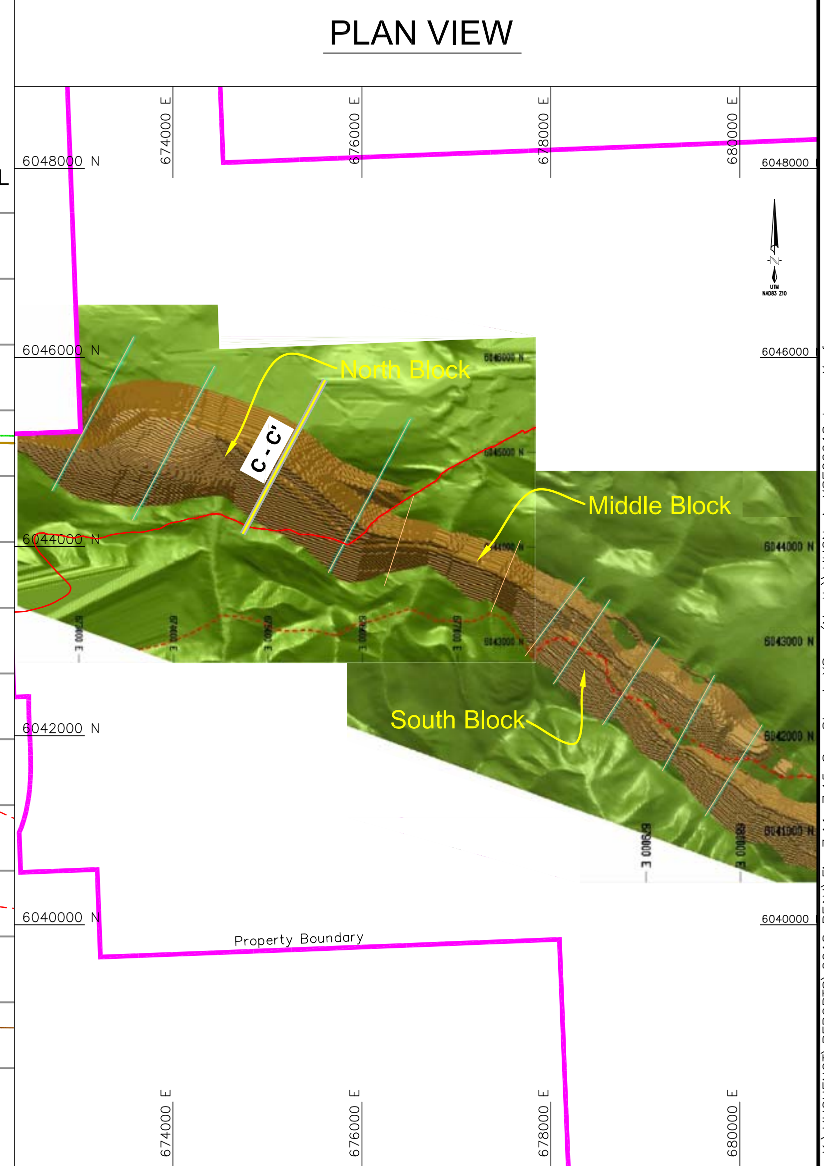
DATE: Jul 6, 2018

FILE: HUGN-A-XSEC2018

DRAWN BY: CVS CHECKED BY: JHP / DJL APPROVED BY: JHP / DJL

NORWEST CORPORATION now Stantec





LEGEND:

Topography	Fault	Seam 6L	C-C' Cross Section Line	Topography
Pit Bottom	Seam 1	Seam 6B	Fault at Surface	Pit Bottom
Weathered Base	Seam 2	Seam 8	Property Boundary	
Topo Minus 900 m	Seam 5			

FIGURE 7.14

COLONIAL COAL INTERNATIONAL CORP.

HUGUENOT COAL PROJECT

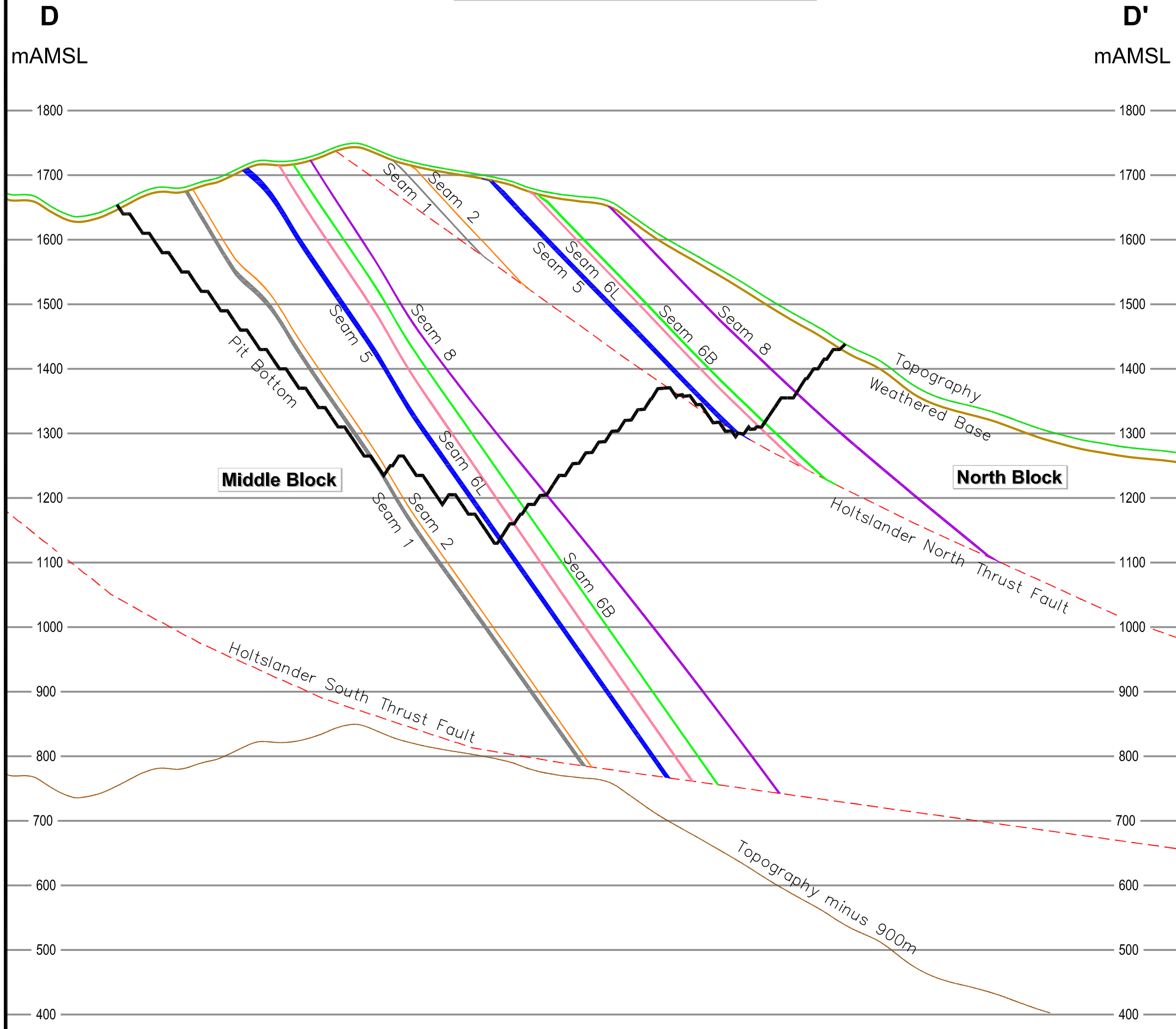
North Block
Cross Section C-C'

DATE: Jul 6, 2018
FILE: HUGN-A-XSEC2018
DRAWN BY: CVS CHECKED BY: JHP / DJL APPROVED BY: JHP / DJL

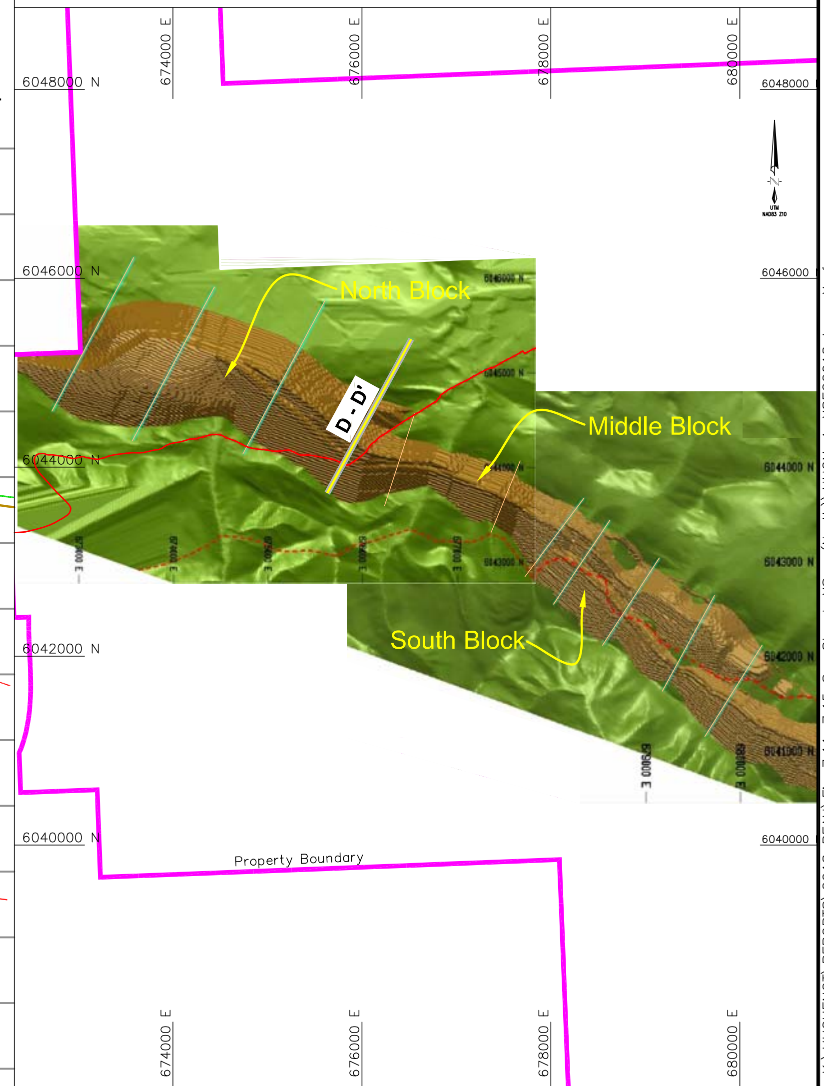
NORWEST CORPORATION now Stantec

K:\HUGUENOT\REPORTS\2018 PEAU\Fig 7.11-7.15 Sm Struct-XSec (North)\HUGN-A-XSEC2018.dwg Xrefs:
07/06/18 - 04:52:00pm

CROSS SECTION D-D'



PLAN VIEW



LEGEND:

- Topography
- Pit Bottom
- Weathered Base
- Topo Minus 900 m
- Fault
- Seam 1
- Seam 2
- Seam 5
- Seam 6L
- Seam 6B
- Seam 8
- D-D' Cross Section Line
- Fault at Surface
- Property Boundary
- Topography
- Pit Bottom

FIGURE 7.15

COLONIAL COAL INTERNATIONAL CORP.

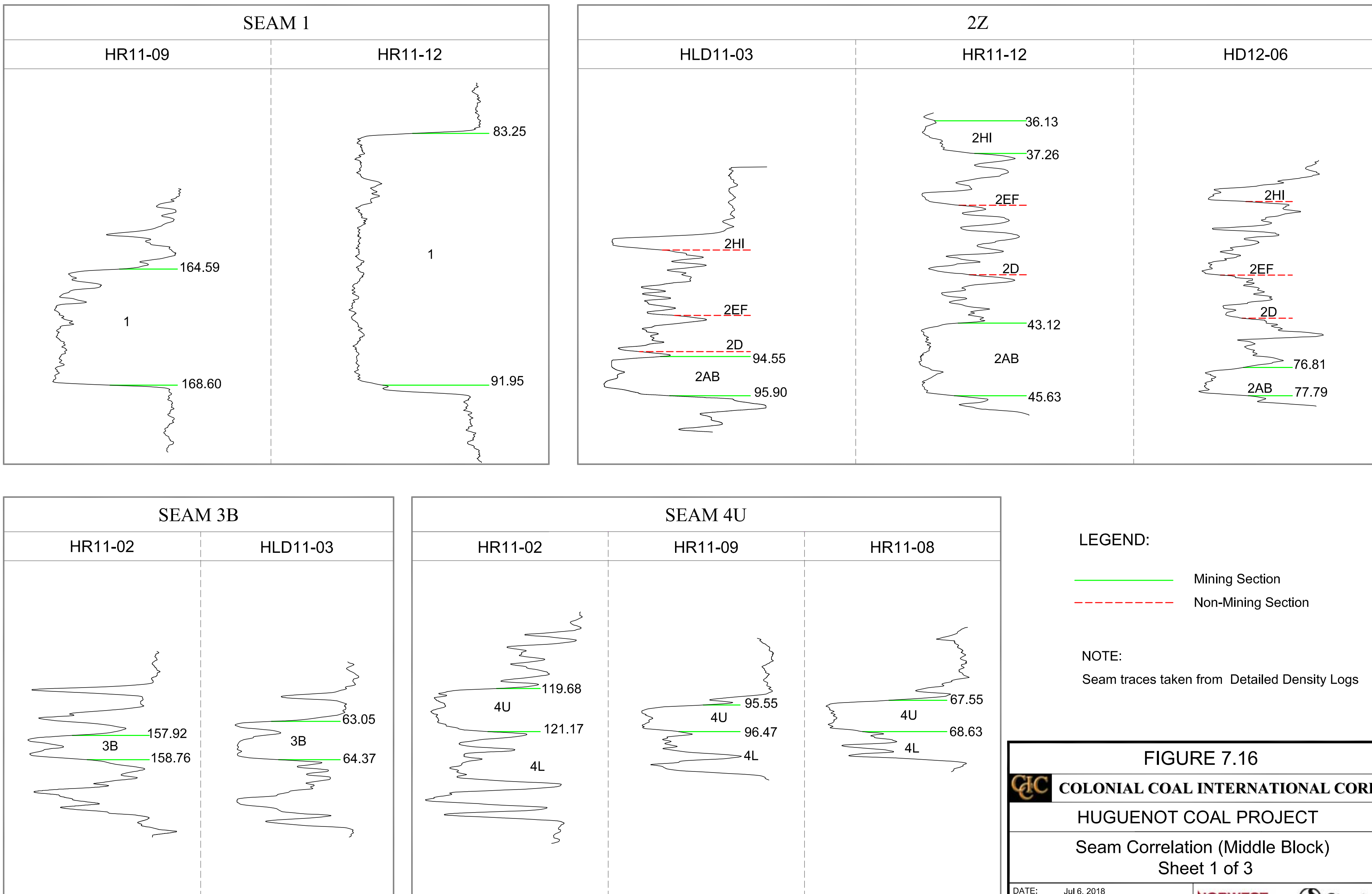
HUGUENOT COAL PROJECT

North Block
Cross Section D-D'

DATE: Jul 6, 2018
FILE: HUGN–A–XSEC2018
DRAWN BY: CVS CHECKED BY: JHP / DJL APPROVED BY: JHP / DJL

NORWEST now Stantec

Middle Block (Seams 1, 2Z, 3B & 4U)



NOTE:

Seam traces taken from Detailed Density Logs

FIGURE 7.16

COLONIAL COAL INTERNATIONAL CORP.

HUGUENOT COAL PROJECT

Seam Correlation (Middle Block)
Sheet 1 of 3

DATE: Jul 6, 2018

FILE: HUGM–A–SMCORR2018

NORWEST CORPORATION now Stantec

DRAWN BY: CVS CHECKED BY: JHP / DJL APPROVED BY: JHP / DJL

Middle Block (Seams 5, 6L & 6B)

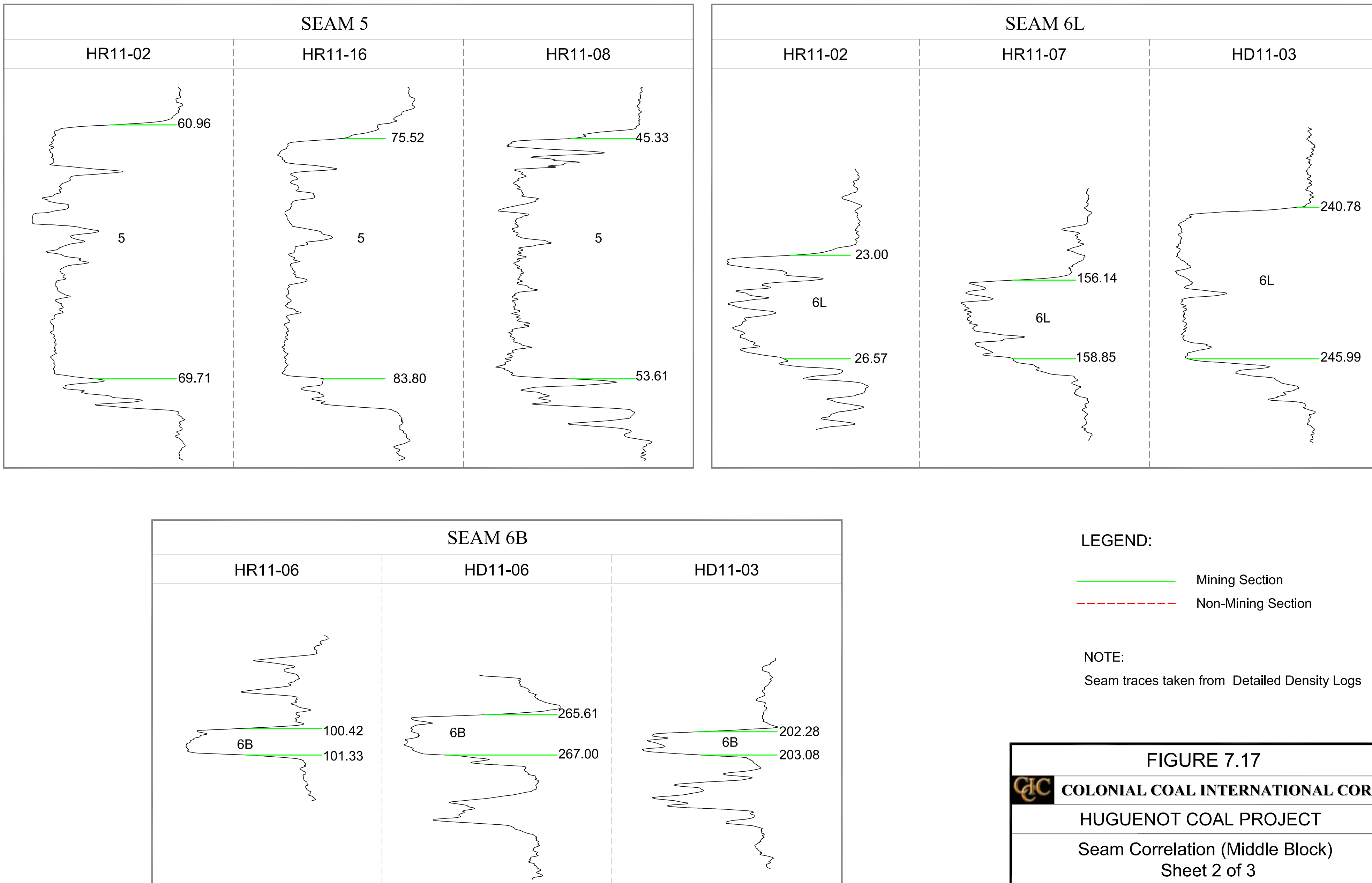


FIGURE 7.17

COLONIAL COAL INTERNATIONAL CORP.

HUGUENOT COAL PROJECT

Seam Correlation (Middle Block)
Sheet 2 of 3

DATE: Jul 6, 2018

FILE: HUGM–A–SMCORR2018

NORWEST now Stantec

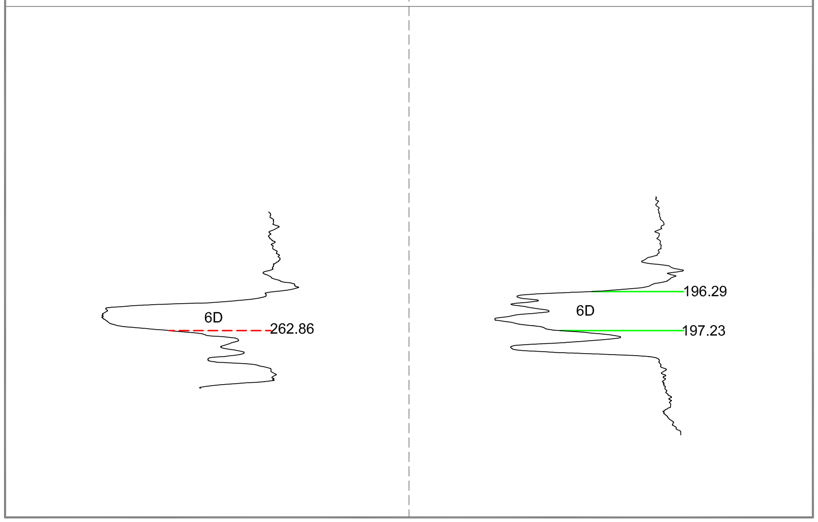
DRAWN BY: CVS CHECKED BY: JHP / DJL APPROVED BY: JHP / DJL

07/06/18 – 05:03:06pm K:\HUGUENOT\REPORTS\2018 PEAU\Fig 7.16–7.18 Sm Corr Mid\HUGM–A–SMCORR2018.dwg Xrefs:

Middle Block (Seams 6D, 8 & 9)

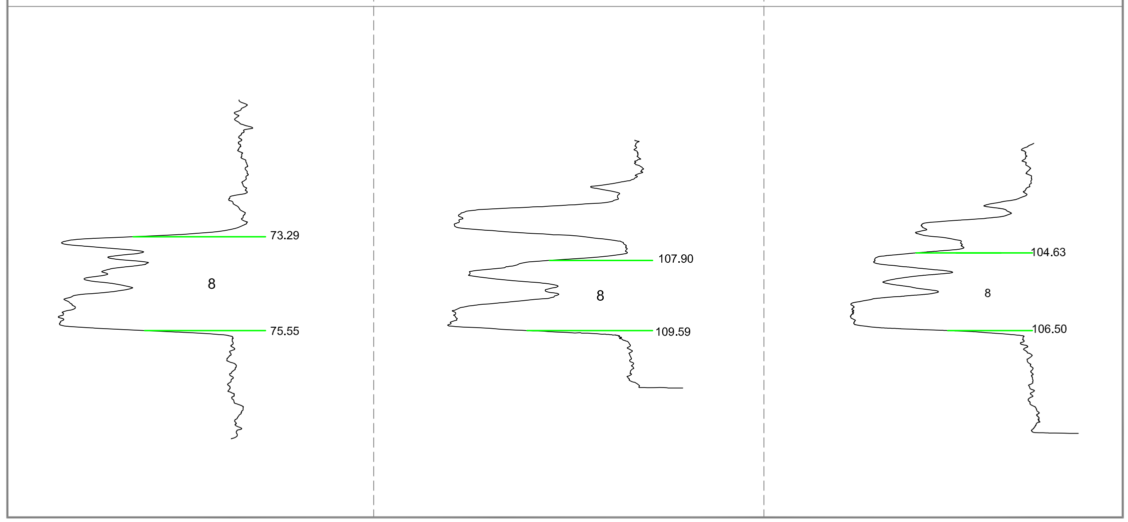
SEAM 6D

HD11-06	HD11-03



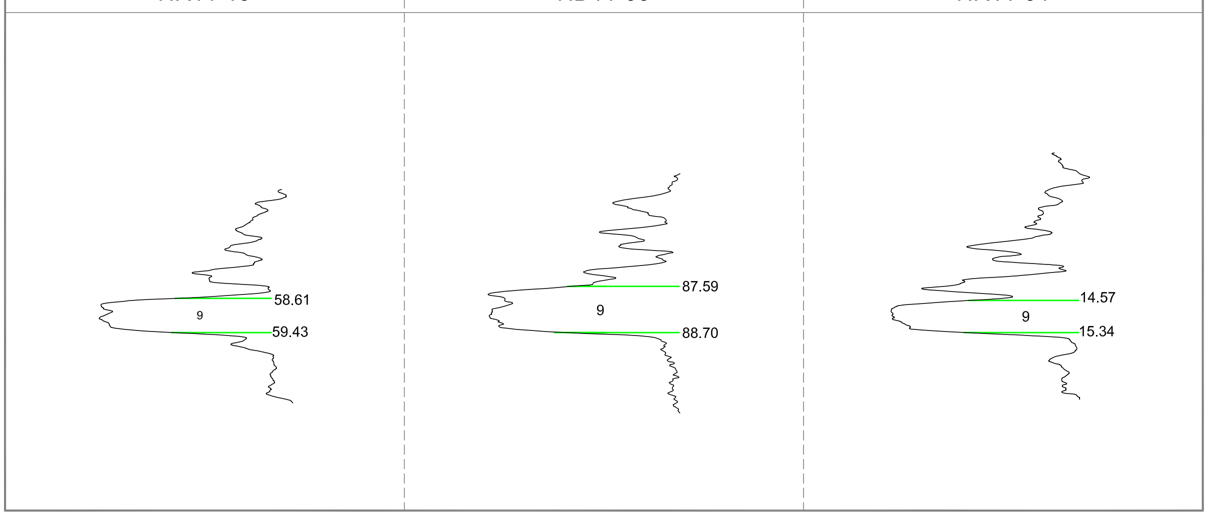
SEAM 8

HR11-10	HD11-06	HD11-03



SEAM 9

HR11-10	HD11-06	HR11-04



LEGEND:

- Mining Section (green solid line)
- Non-Mining Section (red dashed line)

NOTE:

Seam traces taken from Detailed Density Logs

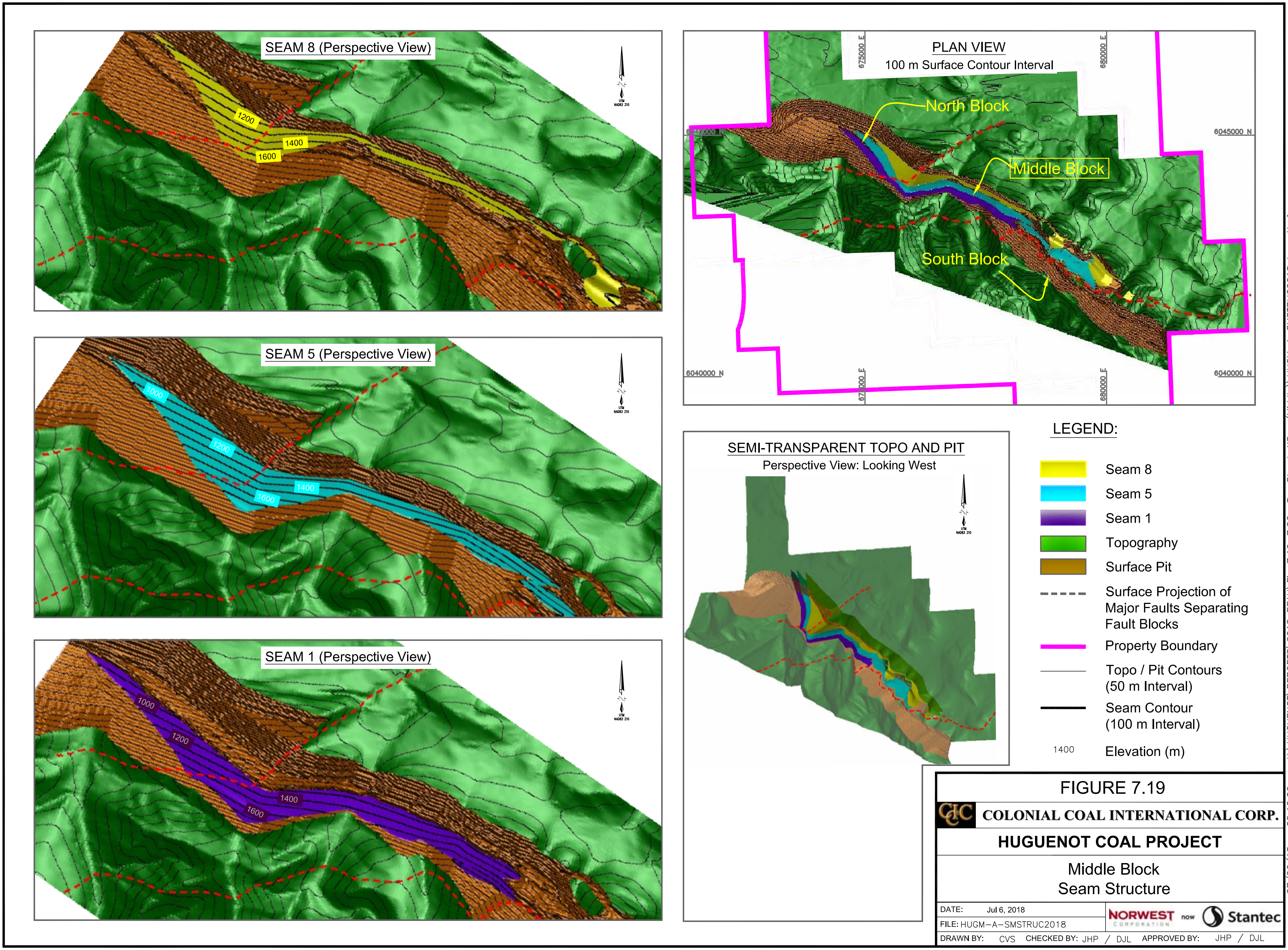
FIGURE 7.18

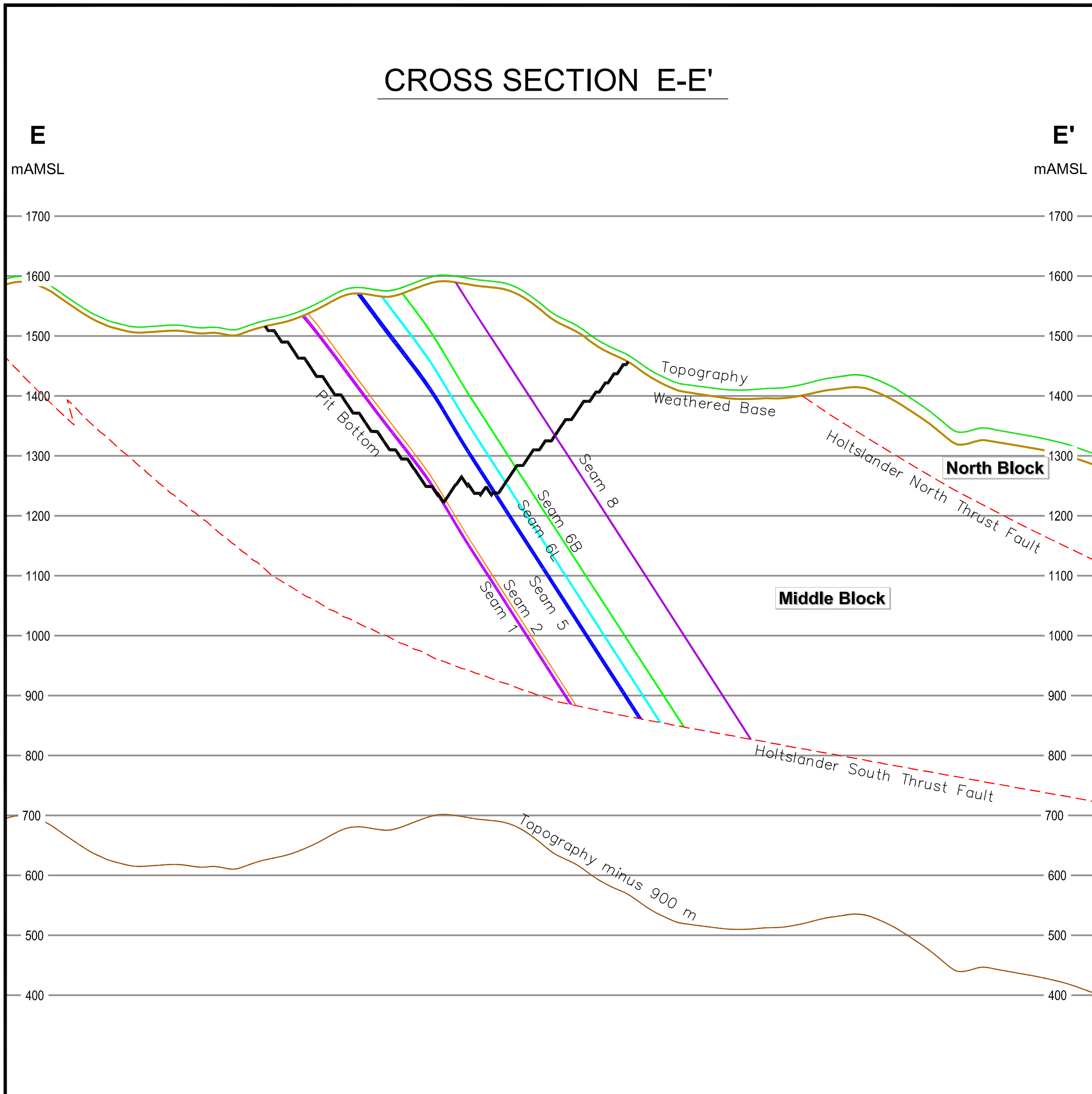
COLONIAL COAL INTERNATIONAL CORP.

HUGUENOT COAL PROJECT

Seam Correlation (Middle Block)
Sheet 3 of 3

DATE: Jul 6, 2018	NORWEST CORPORATION now Stantec
FILE: HUGM–A–SMCORR2018	
DRAWN BY: CVS	CHECKED BY: JHP / DJL · APPROVED BY: JHP / DJL


SEAM 8 (Perspective View)
1200
1400
1600
SEAM 5 (Perspective View)
1000
1200
1400
1600
SEAM 1 (Perspective View)
1000
1200
1400
1600
PLAN VIEW
100 m Surface Contour Interval
675000 E
680000 E
6045000 N
6040000 N
North Block
Middle Block
South Block
SEMI-TRANSPARENT TOPO AND PIT
Perspective View: Looking West
LEGEND:
Seam 8
Seam 5
Seam 1
Topography
Surface Pit
Surface Projection of Major Faults Separating Fault Blocks
Property Boundary
Topo / Pit Contours (50 m Interval)
Seam Contour (100 m Interval)
1400 Elevation (m)
FIGURE 7.19
COLONIAL COAL INTERNATIONAL CORP.
HUGUENOT COAL PROJECT
Middle Block
Seam Structure
DATE: Jul 6, 2018
FILE: HUGM-A-SMSTRUC2018
NORWEST now Stantec
DRAWN BY: CVS CHECKED BY: JHP / DJL APPROVED BY: JHP / DJL
07/06/18 - 05:12:00pm K:\HUGUENOT\REPORTS\2018 PEAU\Fig 7.19-7.26 Sm Struct-XSec (Middle)\HUGM-A-SMSTRUC2018.dwg Xrefs:



LEGEND:

	Topography		Fault		Seam 6L	E-E'	Cross Section Line		Topography
	Pit Bottom		Seam 1		Seam 6B		Fault at Surface		Pit Bottom
	Weathered Base		Seam 2		Seam 8		Property Boundary		
	Topo Minus 900 m		Seam 5						

FIGURE 7.20

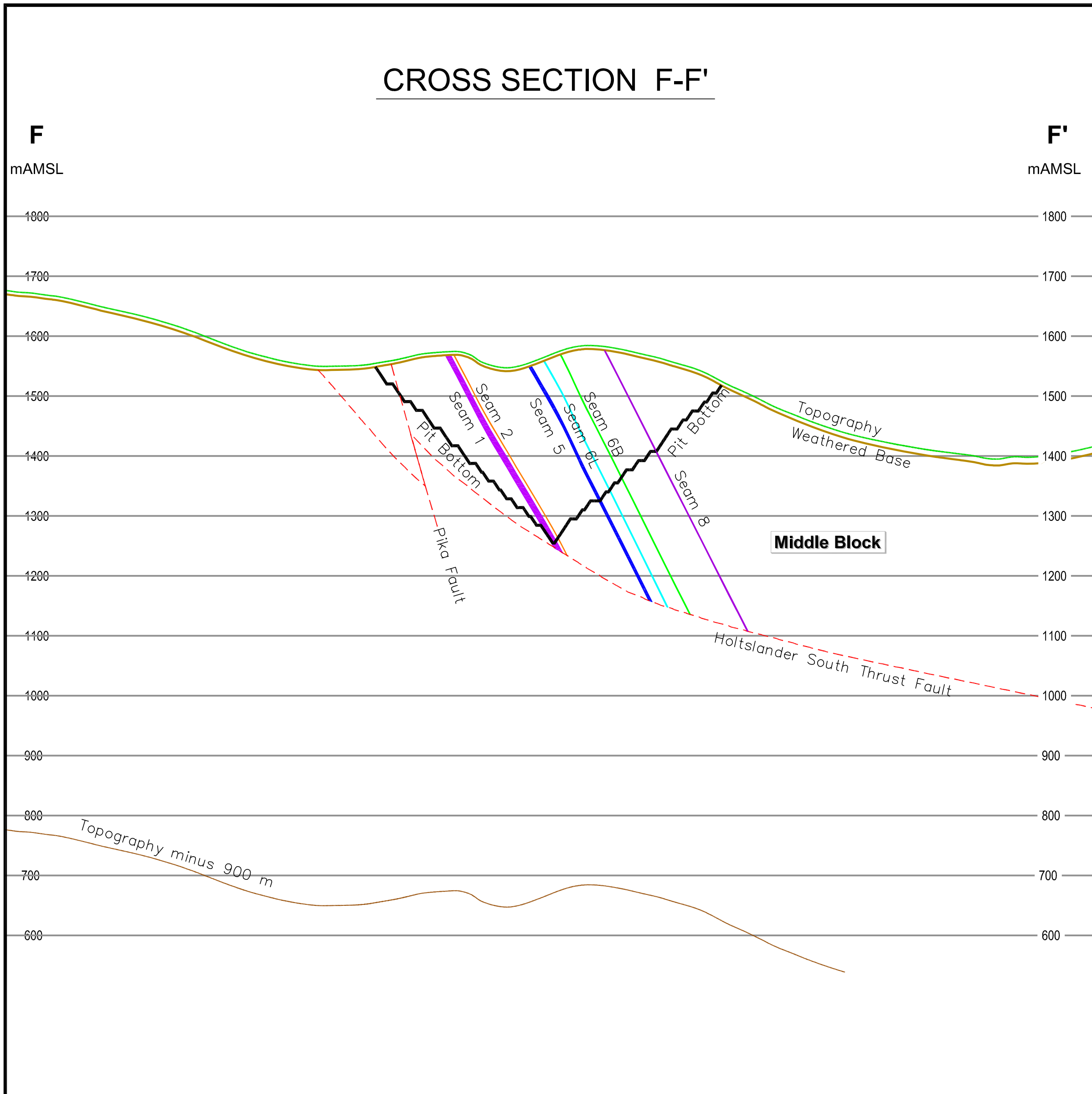
COLONIAL COAL INTERNATIONAL CORP.

HUGUENOT COAL PROJECT

Middle Block
Cross Section E-E'

DATE: Jul 6, 2018
FILE: HUGM–A–XSEC2018
DRAWN BY: CVS CHECKED BY: JHP / DJL APPROVED BY: JHP / DJL

NORWEST CORPORATION now Stantec



LEGEND:

Topography	Fault	Seam 6L	Cross Section Line (F-F')	Topography
Pit Bottom	Seam 1	Seam 6B	Fault at Surface	Pit Bottom
Weathered Base	Seam 2	Seam 8	Property Boundary	
Topo Minus 900 m	Seam 5			

FIGURE 7.21

COLONIAL COAL INTERNATIONAL CORP.

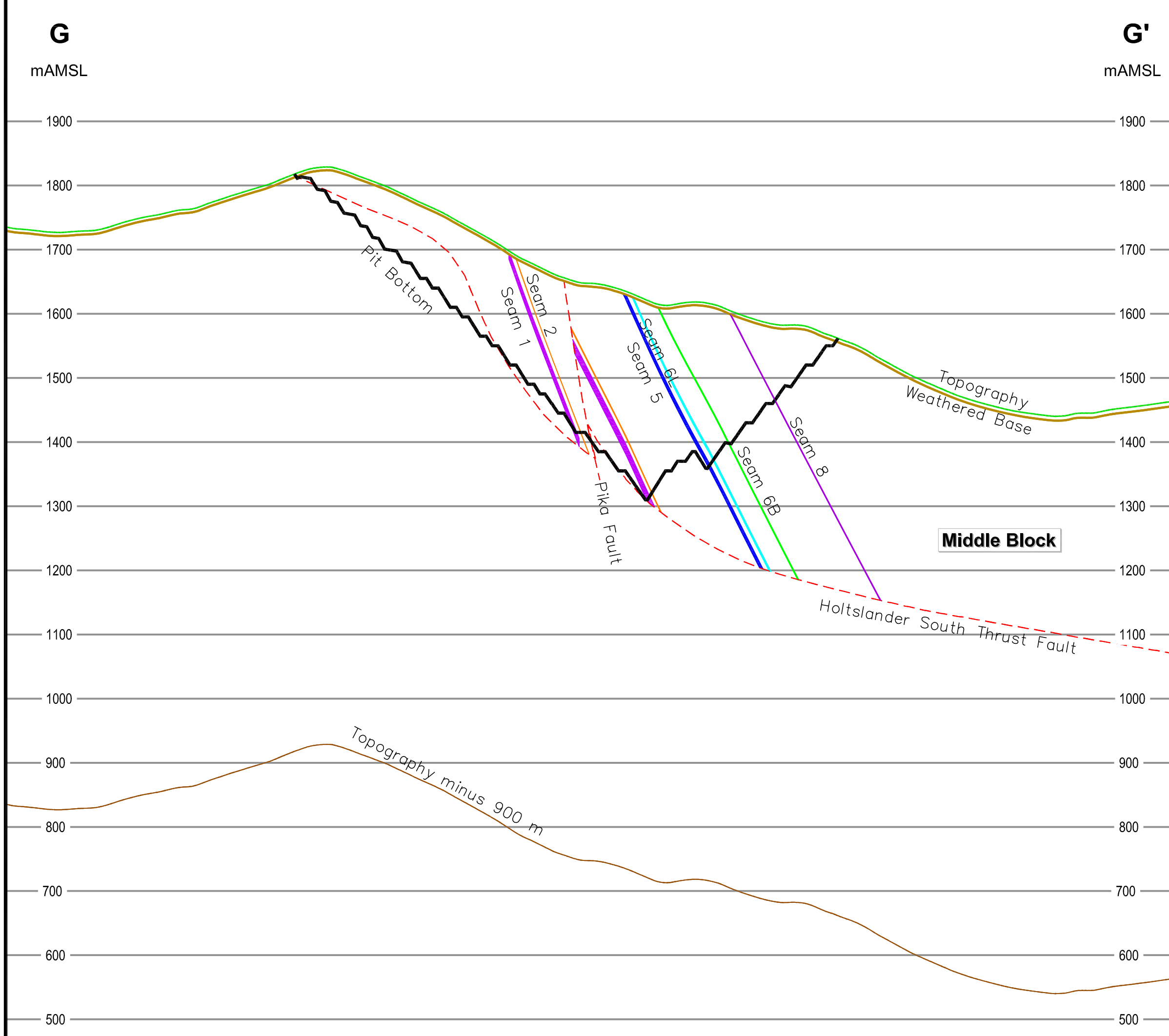
HUGUENOT COAL PROJECT

Middle Block
Cross Section F-F'

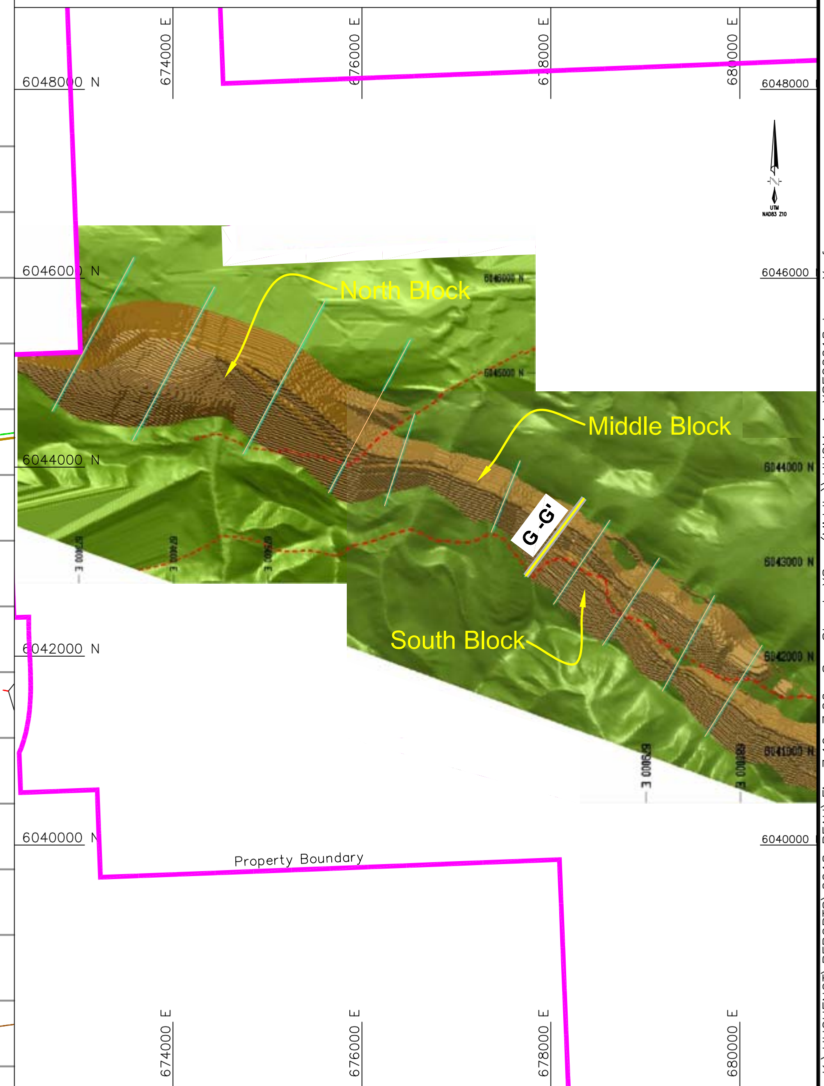
DATE: Jul 9, 2018
FILE: HUGM–A–XSEC2018
DRAWN BY: CVS CHECKED BY: JHP / DJL APPROVED BY: JHP / DJL

NORWEST CORPORATION now Stantec

CROSS SECTION G-G'



PLAN VIEW



LEGEND:

Topography	Fault	Seam 6L	Cross Section Line (G-G')	Topography
Pit Bottom	Seam 1	Seam 6B	Fault at Surface	Pit Bottom
Weathered Base	Seam 2	Seam 8	Property Boundary	
Topo Minus 900 m	Seam 5			

FIGURE 7.22

COLONIAL COAL INTERNATIONAL CORP.

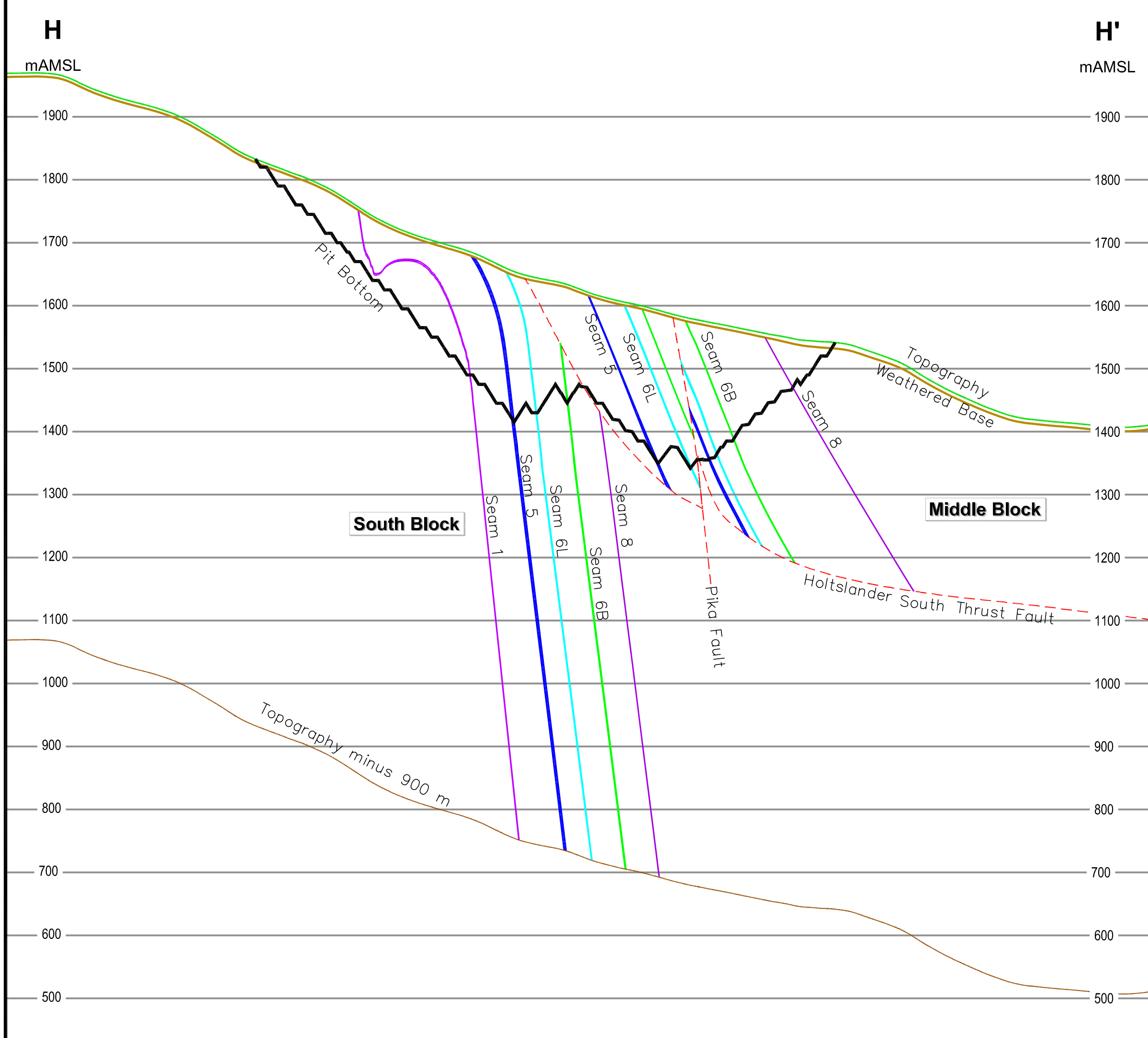
HUGUENOT COAL PROJECT

Middle Block
Cross Section G-G'

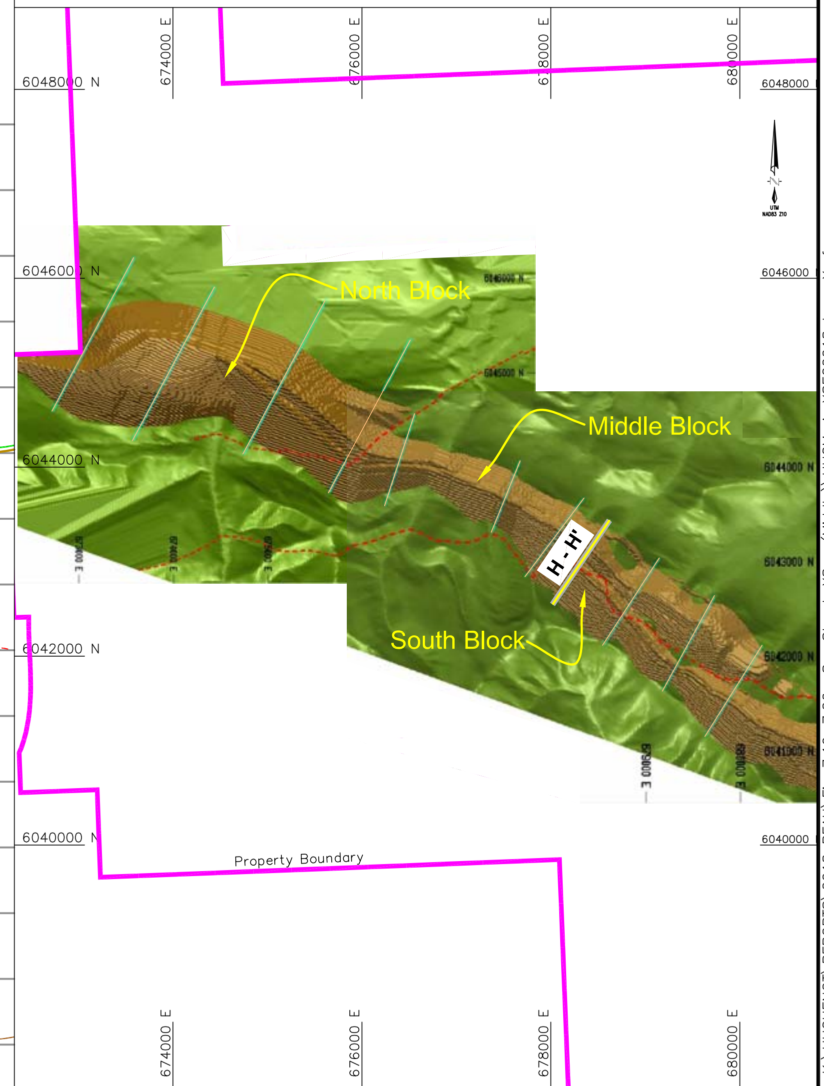
DATE: Jul 6, 2018
FILE: HUGM–A–XSEC2018
DRAWN BY: CVS CHECKED BY: JHP / DJL APPROVED BY: JHP / DJL

NORWEST CORPORATION now Stantec

CROSS SECTION H-H'



PLAN VIEW



LEGEND:

	Topography		Fault		Seam 6L	H-H'	Cross Section Line		Topography
	Pit Bottom		Seam 1		Seam 6B		Fault at Surface		Pit Bottom
	Weathered Base		Seam 2		Seam 8		Property Boundary		
	Topo Minus 900 m		Seam 5						

FIGURE 7.23

COLONIAL COAL INTERNATIONAL CORP.

HUGUENOT COAL PROJECT

Middle-South Block
Cross Section H-H'

DATE: Jul 6, 2018

FILE: HUGM–A–XSEC2018

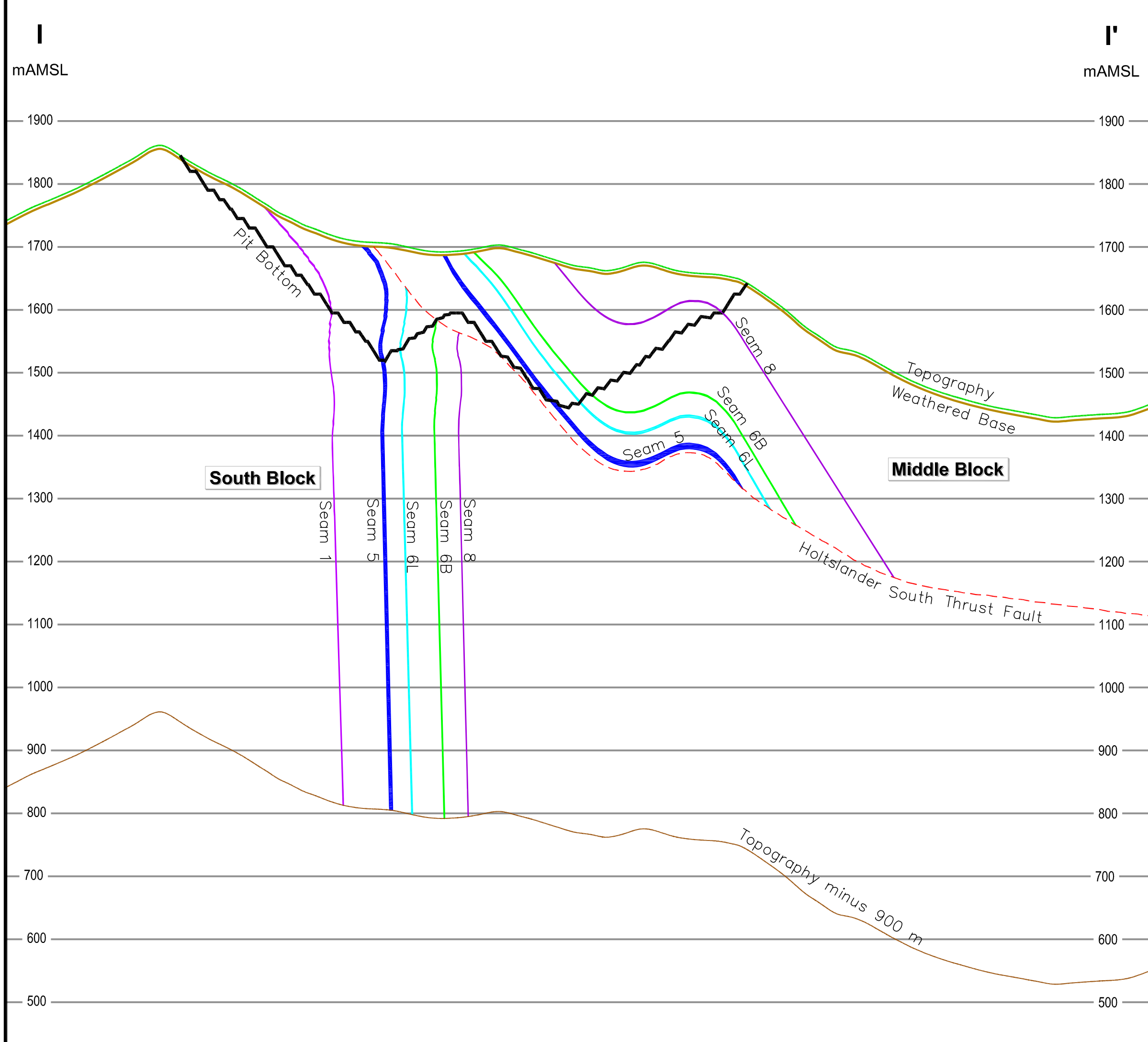
DRAWN BY: CVS CHECKED BY: JHP / DJL APPROVED BY: JHP / DJL

NORWEST CORPORATION now Stantec

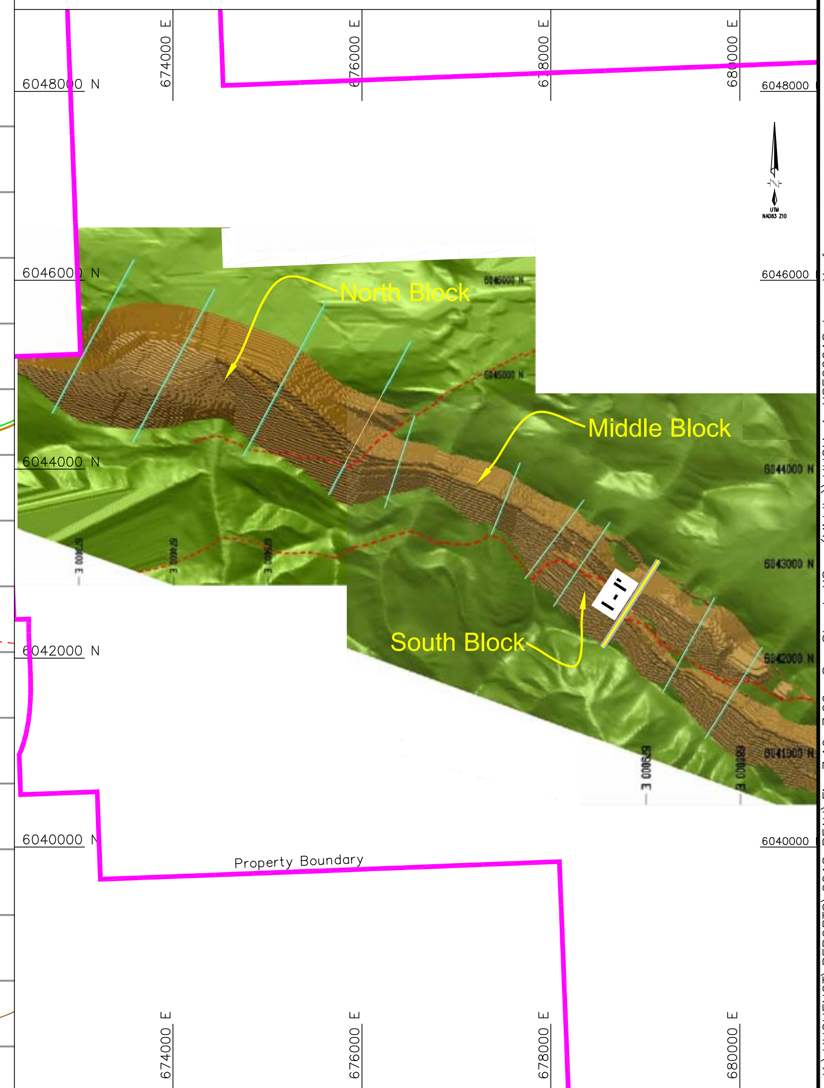
K:\HUGUENOT\REPORTS\2018 PEAU\Fig 7.19–7.26 Sm Struct–XSec (Middle)\HUGM–A–XSEC2018.dwg Xrefs:

07/06/18 – 05:19:07pm

CROSS SECTION I - I'



PLAN VIEW



LEGEND:

Topography	Fault	Seam 6L	I - I' Cross Section Line	Topography
Pit Bottom	Seam 1	Seam 6B	Fault at Surface	Pit Bottom
Weathered Base	Seam 2	Seam 8	Property Boundary	
Topo Minus 900 m	Seam 5			

FIGURE 7.24

COLONIAL COAL INTERNATIONAL CORP.

HUGUENOT COAL PROJECT

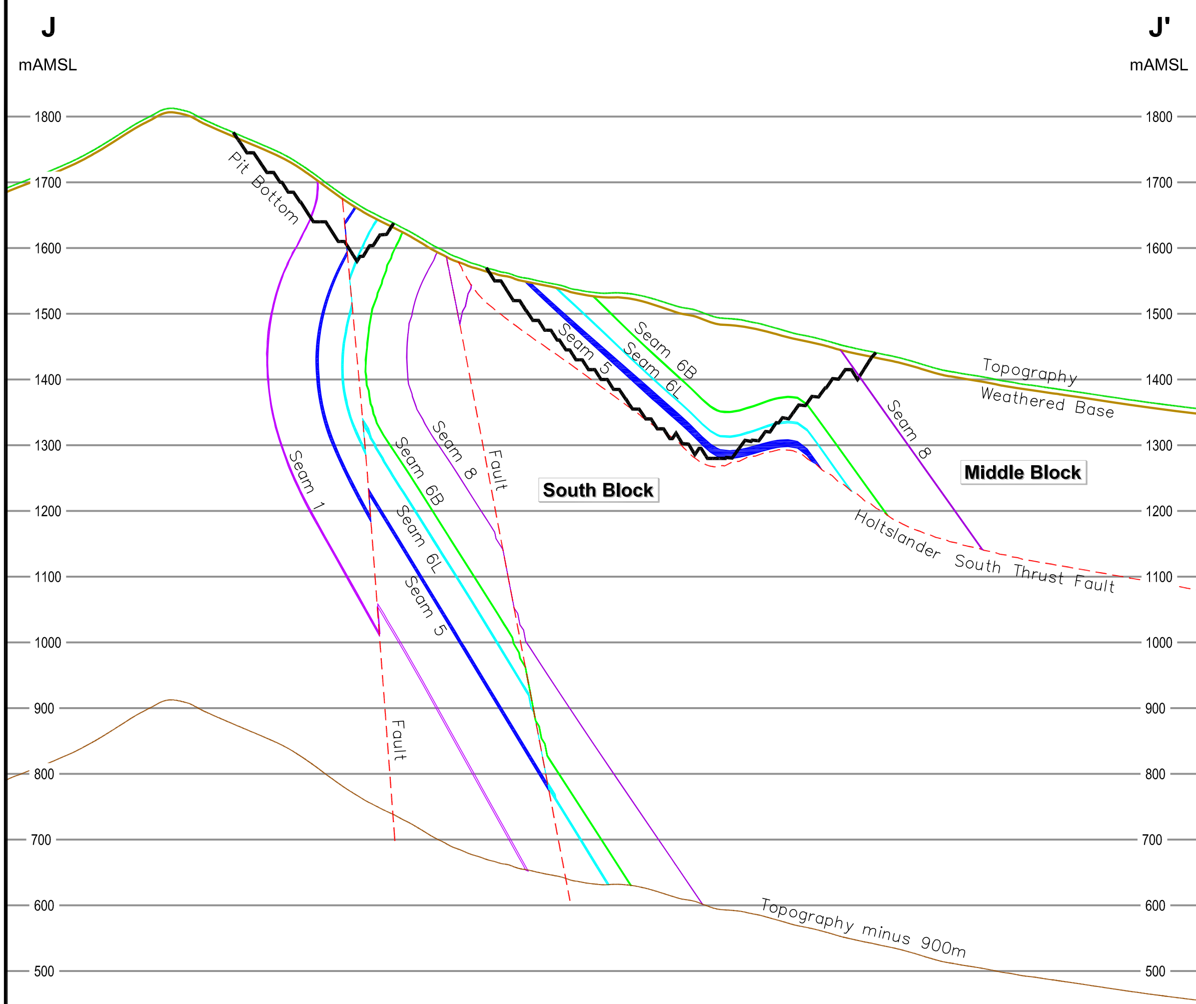
Middle-South Block
Cross Section I - I'

DATE: Jul 6, 2018
FILE: HUGM–A–XSEC2018
DRAWN BY: CVS CHECKED BY: JHP / DJL APPROVED BY: JHP / DJL

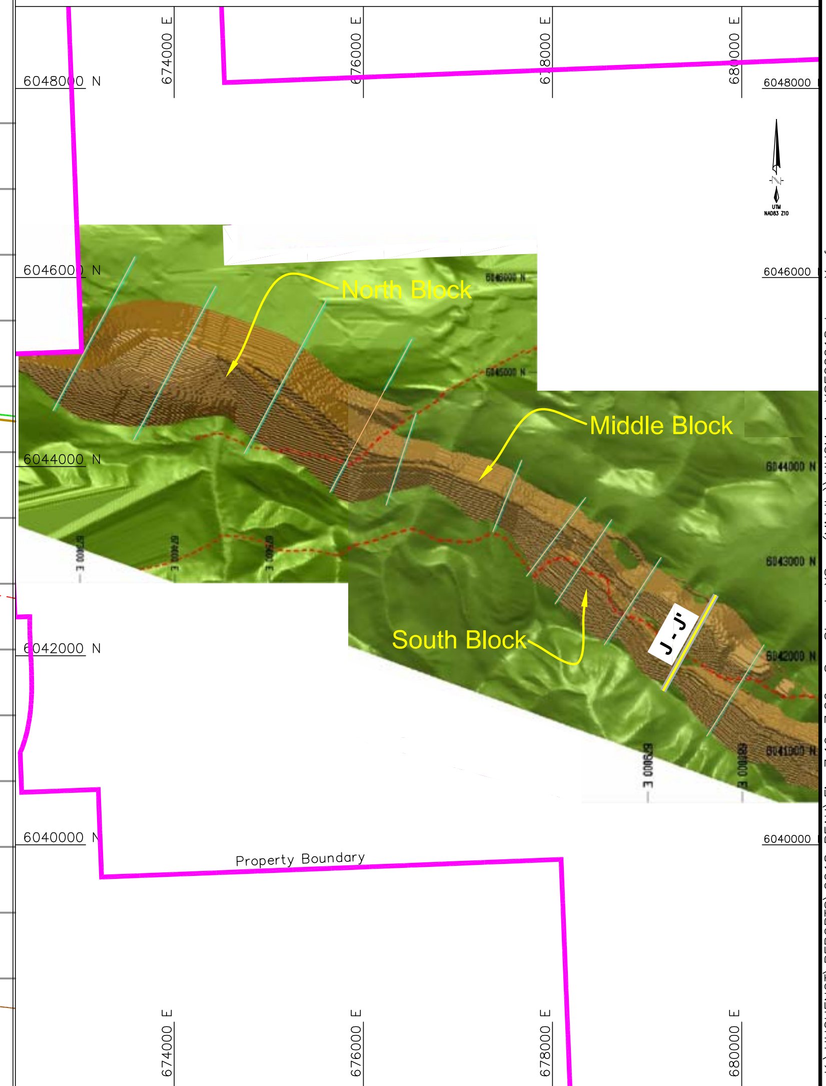
NORWEST CORPORATION now Stantec

K:\HUGUENOT\REPORTS\2018 PEAU\Fig 7.19–7.26 Sm Struct–XSec (Middle)\HUGM–A–XSEC2018.dwg Xrefs:
07/06/18 – 05:21:41pm

CROSS SECTION J-J'



PLAN VIEW



LEGEND:

Topography	Fault	Seam 6L	J-J' Cross Section Line
Pit Bottom	Seam 1	Seam 6B	Fault at Surface
Weathered Base	Seam 2	Seam 8	Property Boundary
Topo Minus 900 m	Seam 5		

Topography (plan view shading)
Pit Bottom (plan view shading)

FIGURE 7.25

COLONIAL COAL INTERNATIONAL CORP.

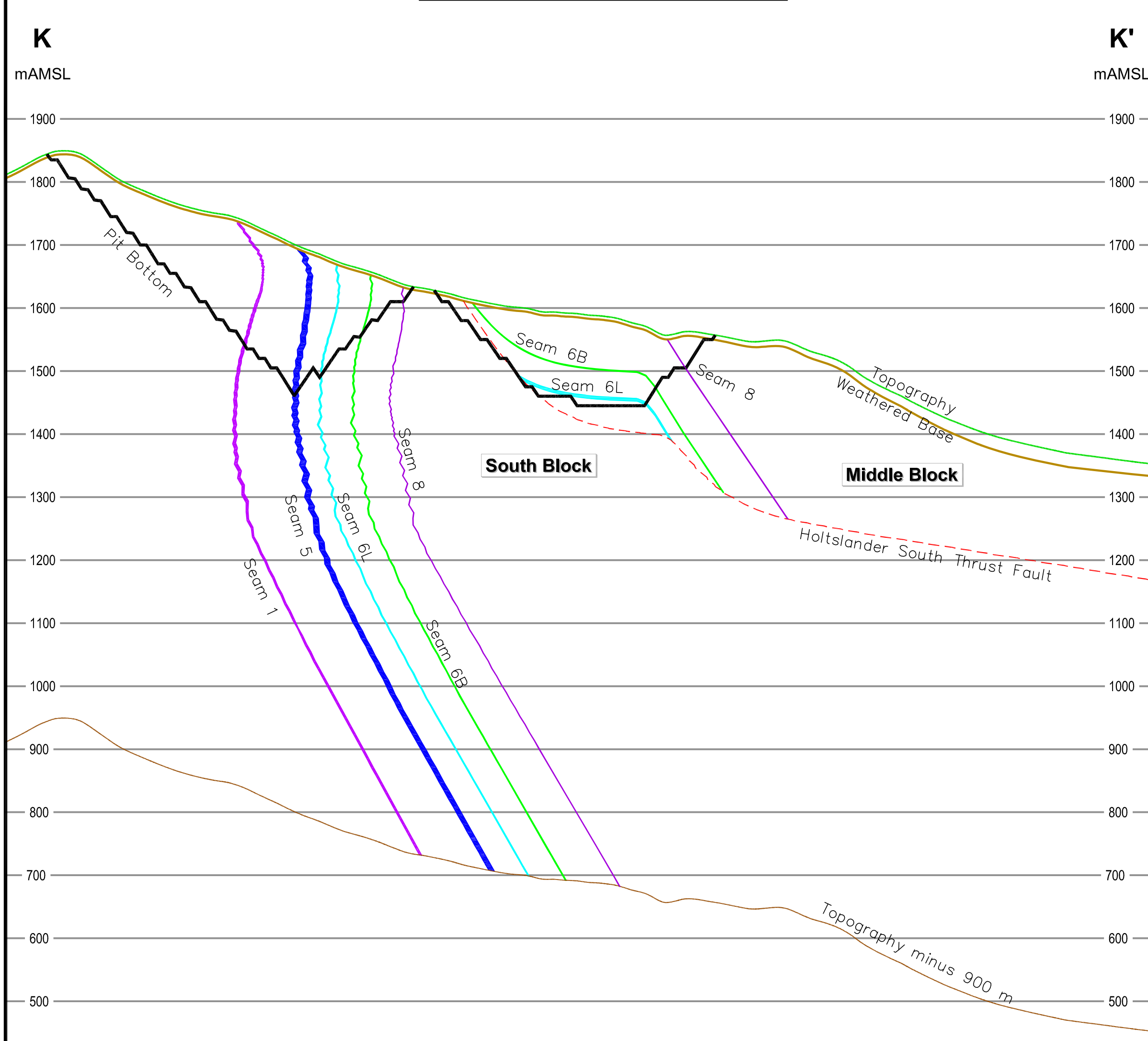
HUGUENOT COAL PROJECT

Middle-South Block
Cross Section J-J'

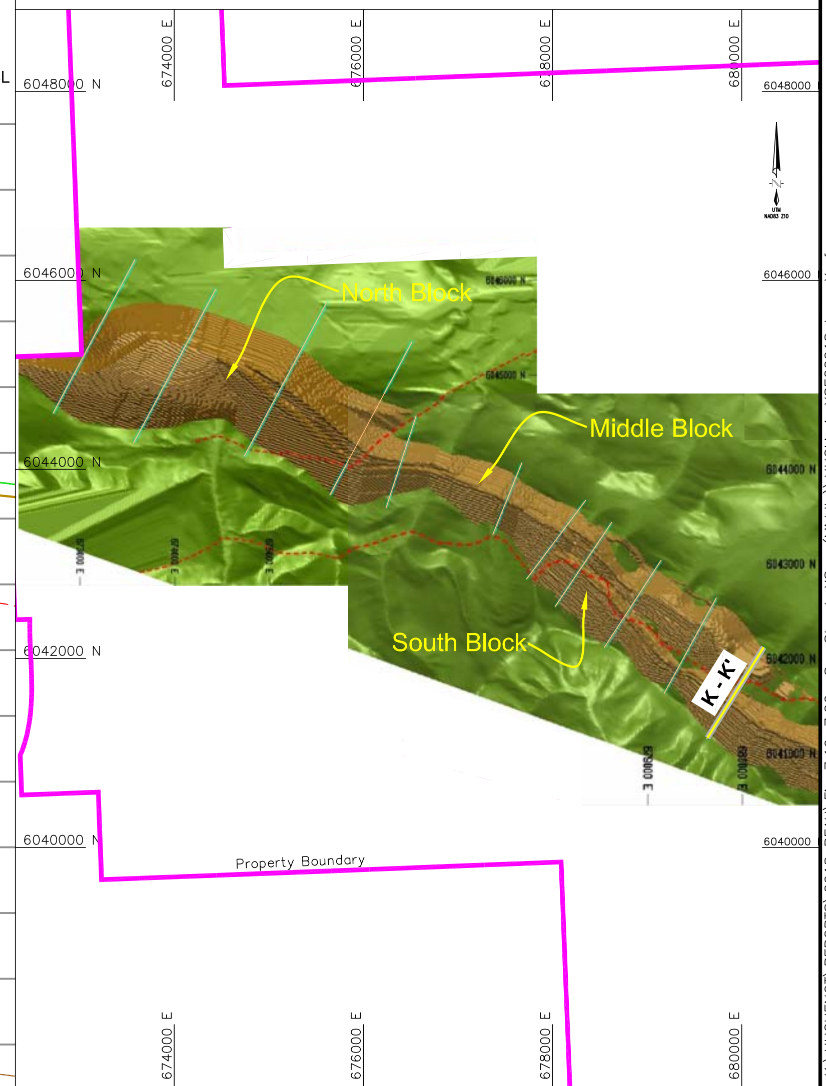
DATE: Jul 6, 2018
FILE: HUGM–A–XSEC2018
DRAWN BY: CVS CHECKED BY: JHP / DJL APPROVED BY: JHP / DJL

NORWEST now Stantec

CROSS SECTION K-K'



PLAN VIEW



LEGEND:

Topography	Fault	Seam 6L
Pit Bottom	Seam 1	Seam 6B
Weathered Base	Seam 2	Seam 8
Topo Minus 900 m	Seam 5	

K-K'	Cross Section Line
	Fault at Surface
	Property Boundary
	Topography
	Pit Bottom

FIGURE 7.26

COLONIAL COAL INTERNATIONAL CORP.

HUGUENOT COAL PROJECT

Middle-South Block
Cross Section K-K'

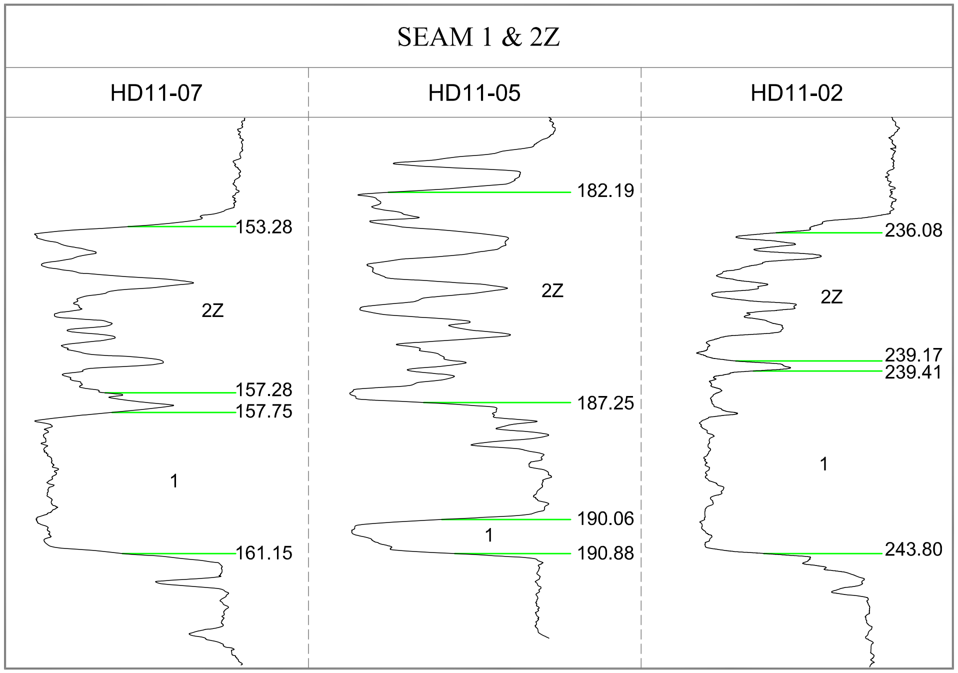
DATE: Jul 6, 2018
FILE: HUGM-A-XSEC2018
DRAWN BY: CVS CHECKED BY: JHP / DJL APPROVED BY: JHP / DJL

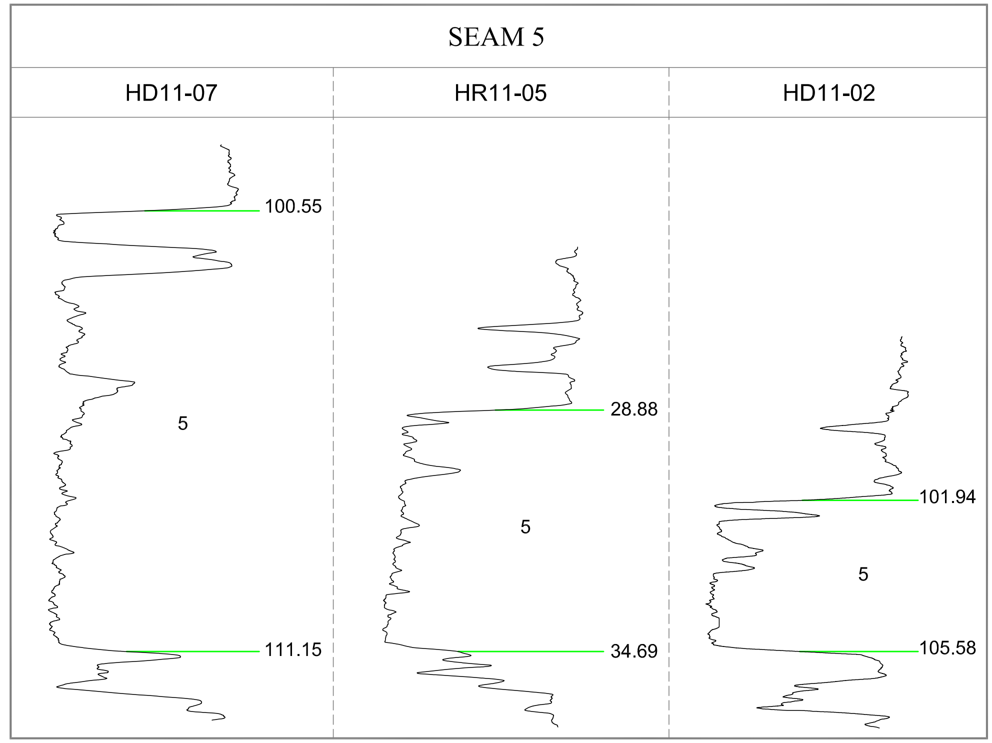
NORWEST CORPORATION now Stantec

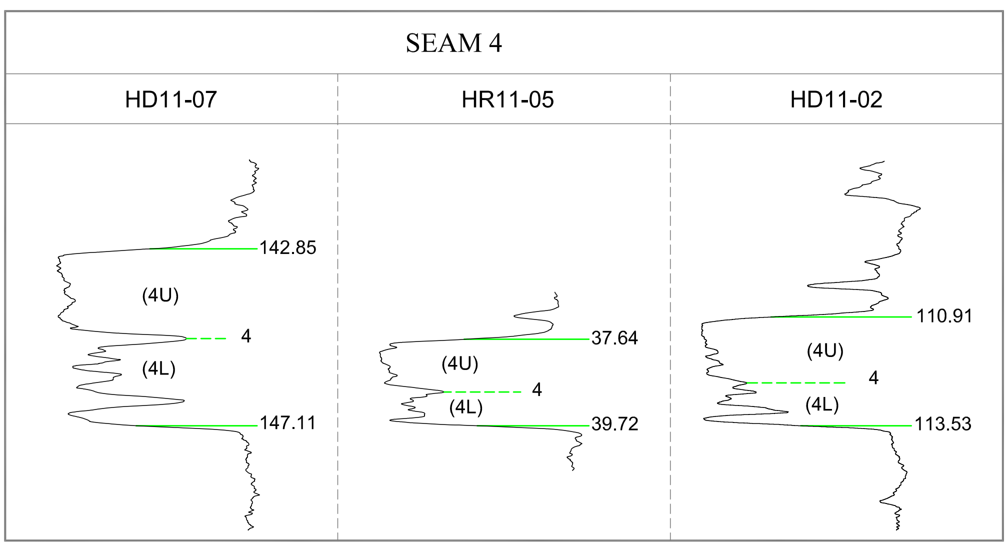
K:\HUGUENOT\REPORTS\2018 PEA\Fig 7.19-7.26 Sm Struct-XSec (Middle)\HUGM-A-XSEC2018.dwg Xrefs:

07/06/18 - 05:23:00pm

South Block (Seams 1, 2Z, 4 & 5)







LEGEND:

- Mining Section (green solid line)
- Non-Mining Section (red dashed line)

NOTE:

Seam traces taken from Detailed Density Logs

FIGURE 7.27	
COLONIAL COAL INTERNATIONAL CORP.	
HUGUENOT COAL PROJECT	
Seam Correlation (South Block) Sheet 1 of 2	
DATE: Jul 6, 2018	NORWEST CORPORATION now Stantec
FILE: HUGS–A–SMCORR2018	
DRAWN BY: CVS	CHECKED BY: JHP / DJL — APPROVED BY: JHP / DJL

07/06/18 – 05:30:49pm K:\HUGUENOT\REPORTS\2018 PEAU\Fig 7.27–7.28 Sm Corr South\HUGS–A–SMCORR2018.dwg Xrefs:

South Block (Seams 6L, 8 & 9)

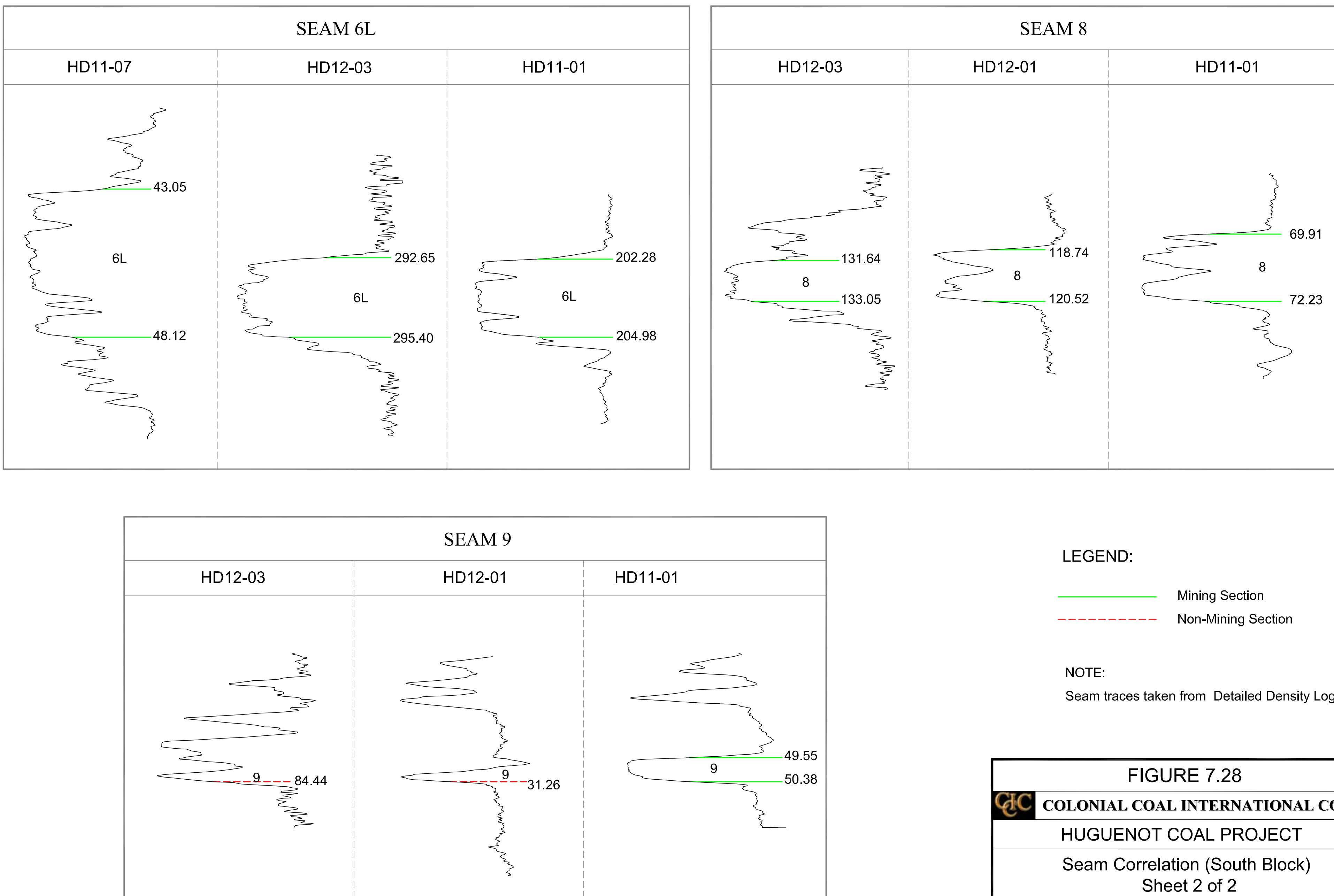


FIGURE 7.28

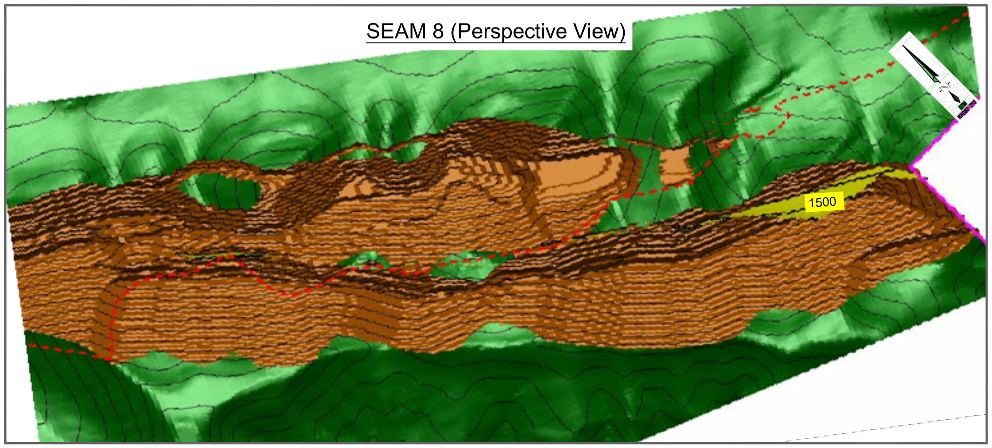
COLONIAL COAL INTERNATIONAL CORP.

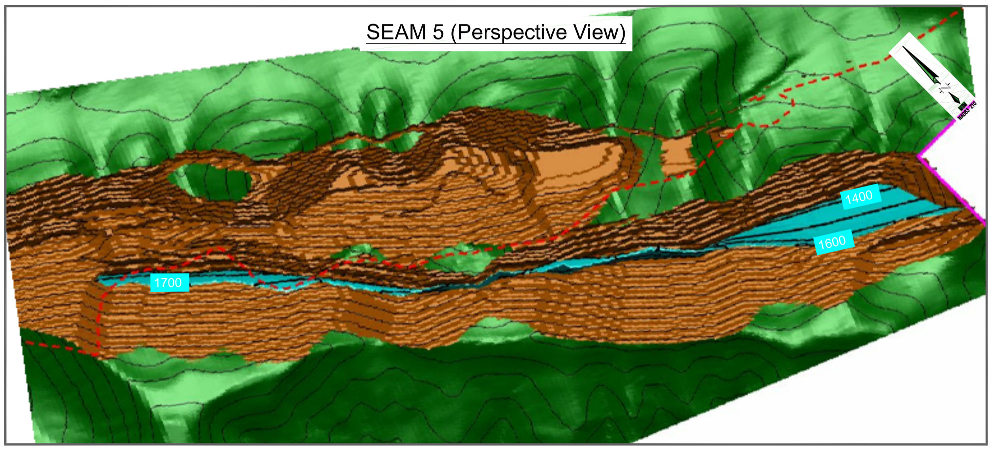
HUGUENOT COAL PROJECT

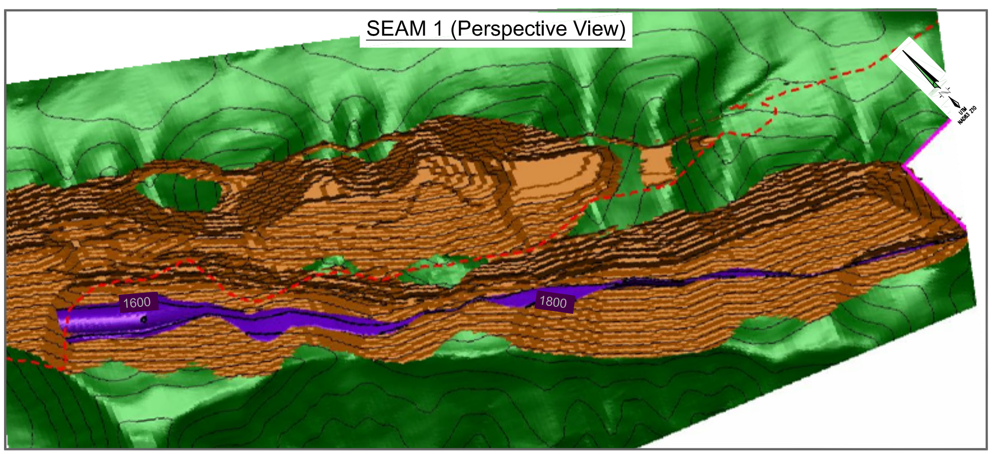
Seam Correlation (South Block)
Sheet 2 of 2

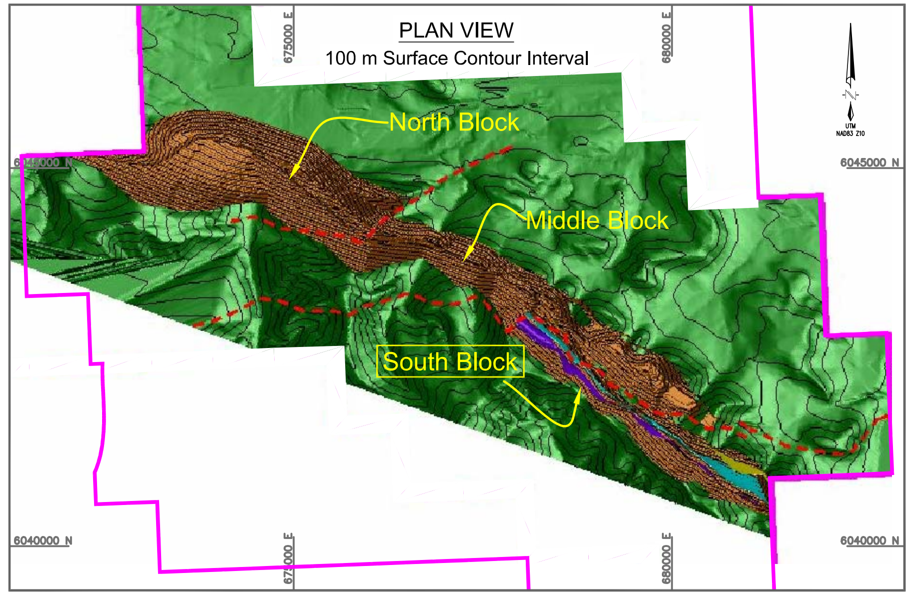
DATE: Jul 6, 2018
FILE: HUGS–A–SMCORR2018
DRAWN BY: CVS CHECKED BY: JHP / DJL APPROVED BY: JHP / DJL

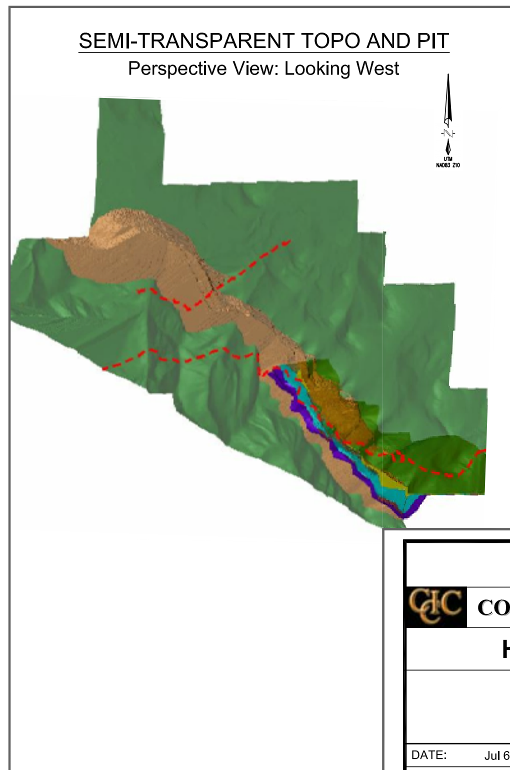
NORWEST CORPORATION now Stantec











LEGEND:

- Seam 8
- Seam 5
- Seam 1
- Topography
- Surface Pit
- Surface Projection of Major Faults Separating Fault Blocks
- Property Boundary
- Topo / Pit Contours (50 m Interval)
- Seam Contour (100 m Interval)
- 1400 Elevation (m)

FIGURE 7.29

COLONIAL COAL INTERNATIONAL CORP.

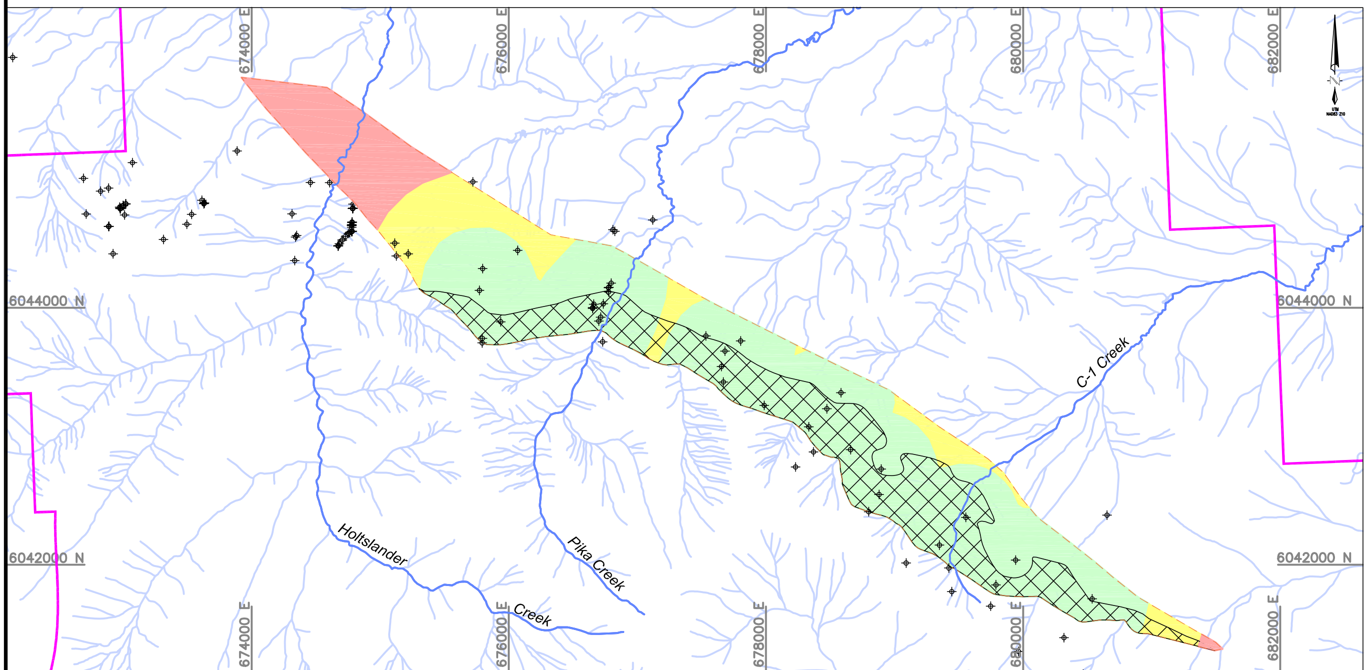
HUGUENOT COAL PROJECT

South Block
Seam Structure

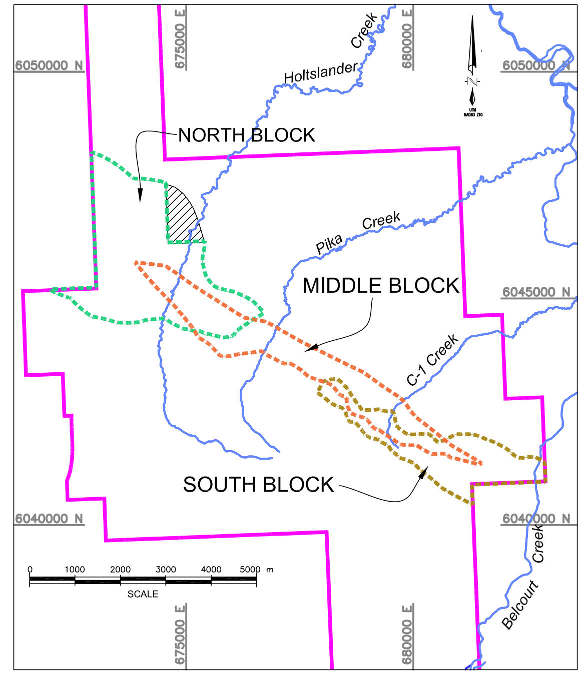
DATE: Jul 6, 2018		NORWEST now Stantec	
FILE: HUGS-A-SMSTRUC2018			
DRAWN BY: CVS	CHECKED BY: JHP / DJL	APPROVED BY: JHP / DJL	

07/06/18 – 05:35:53pm K:\HUGUENOT\REPORTS\2018 PEAU\Fig 7.29 Sm Struct (South)\HUGS-A-SMSTRUC2018.dwg Xrefs:

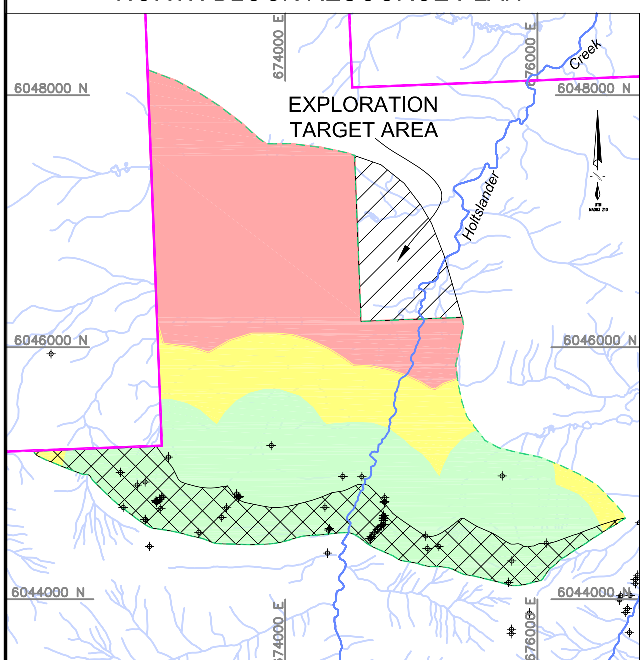
MIDDLE BLOCK RESOURCE PLAN



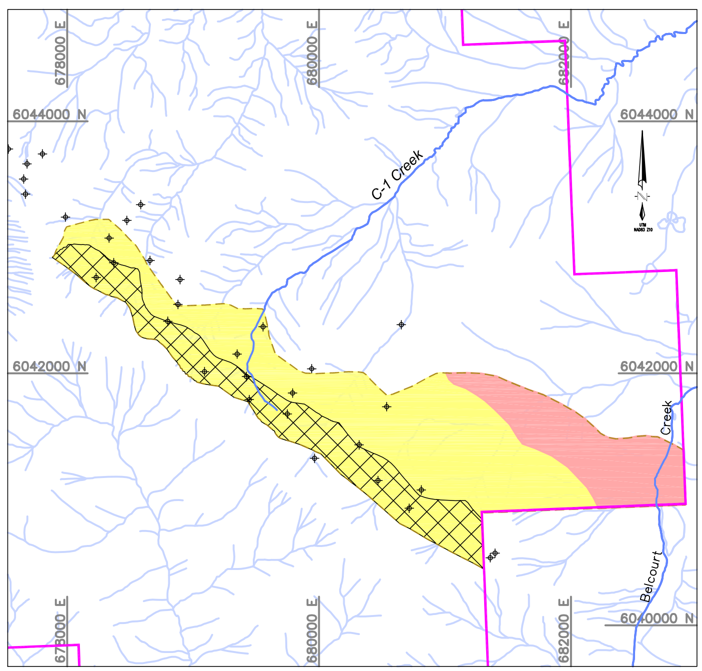
KEY MAP



NORTH BLOCK RESOURCE PLAN



SOUTH BLOCK RESOURCE PLAN



LEGEND:

- Resource Measured
- Resource Indicated
- Resource Inferred
- Property Boundary
- Drill Hole and Trench Sites
- Surface Mine Areas
- Exploration Target Area

0 400 800 1200 1600 2000 m
SCALE

FIGURE 14.1

COLONIAL COAL INTERNATIONAL CORP.

HUGUENOT COAL PROJECT

Resource Classification

DATE: Jul 6, 2018
FILE: HUG–A–RCLASS2018
DRAWN BY: CVS CHECKED BY: JHP / DJL APPROVED BY: JHP / DJL

NORWEST CORPORATION now Stantec

07/06/18 – 05:40:23pm K:\HUGUENOT\REPORTS\2018 PEAU\Fig 14.1 Classification_2018\HUG–A–RCLASS2018.dwg Xrefs: x–Hug–DH x–MainCrk x–Hug–Drainage–Fig14

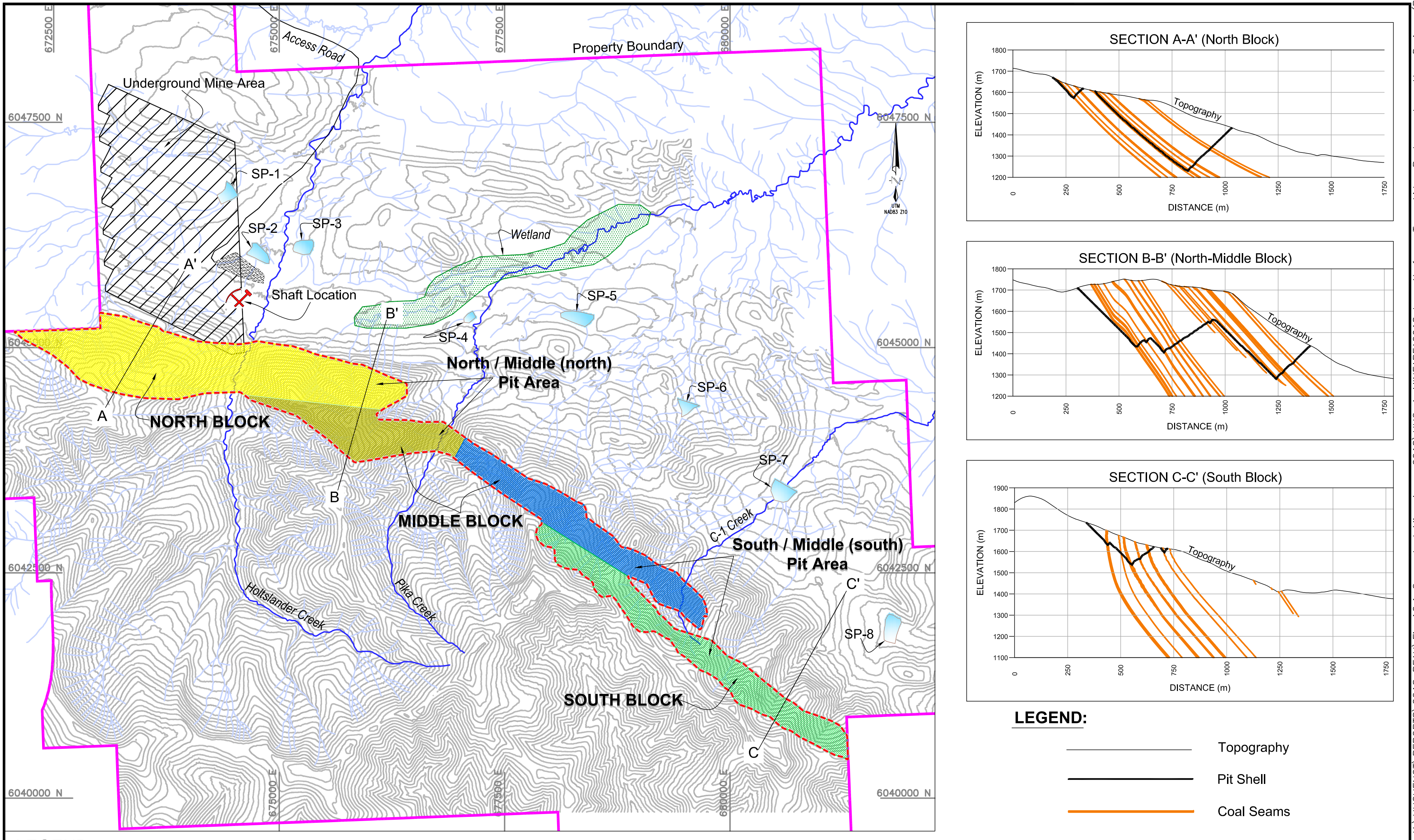
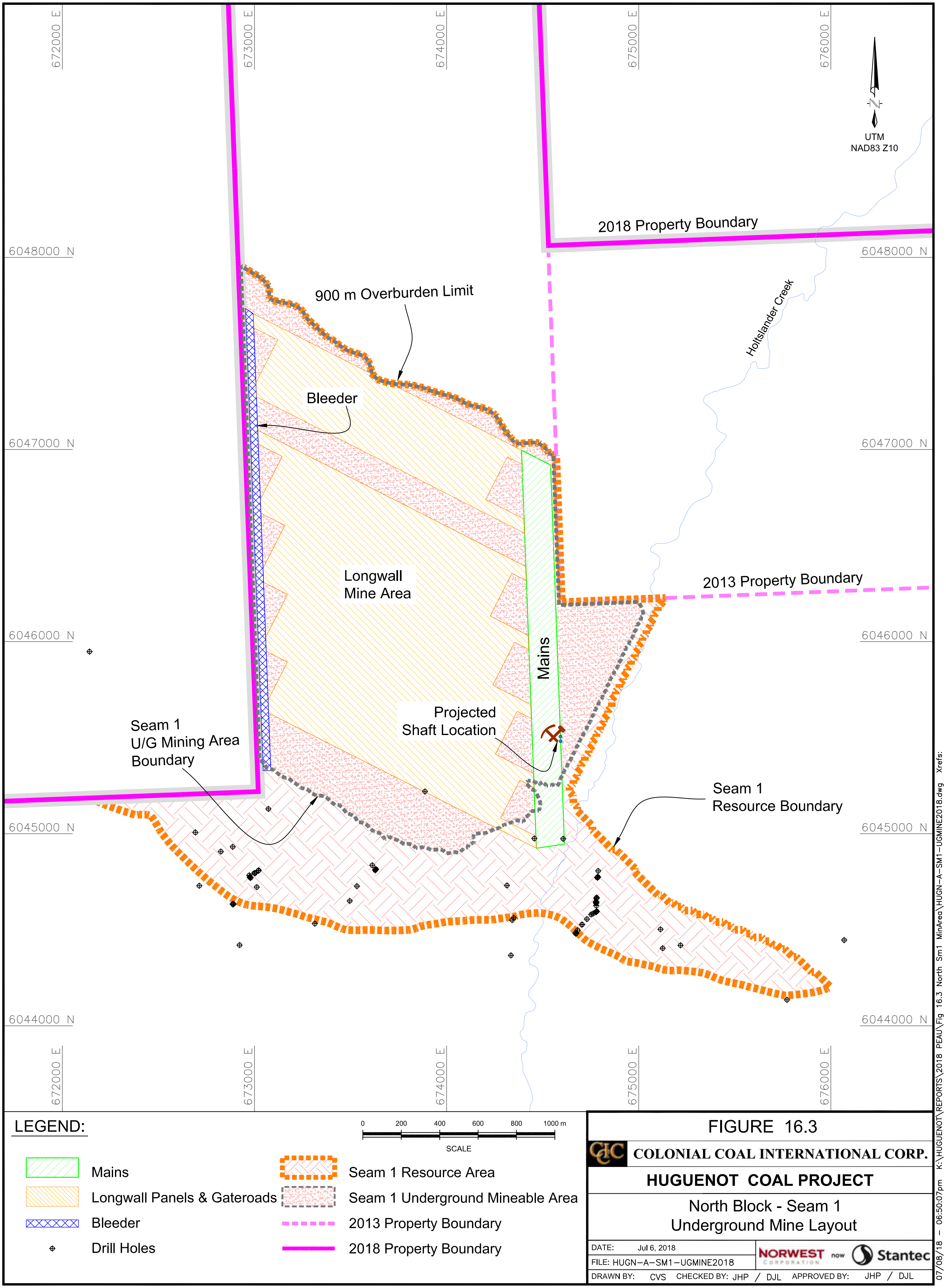
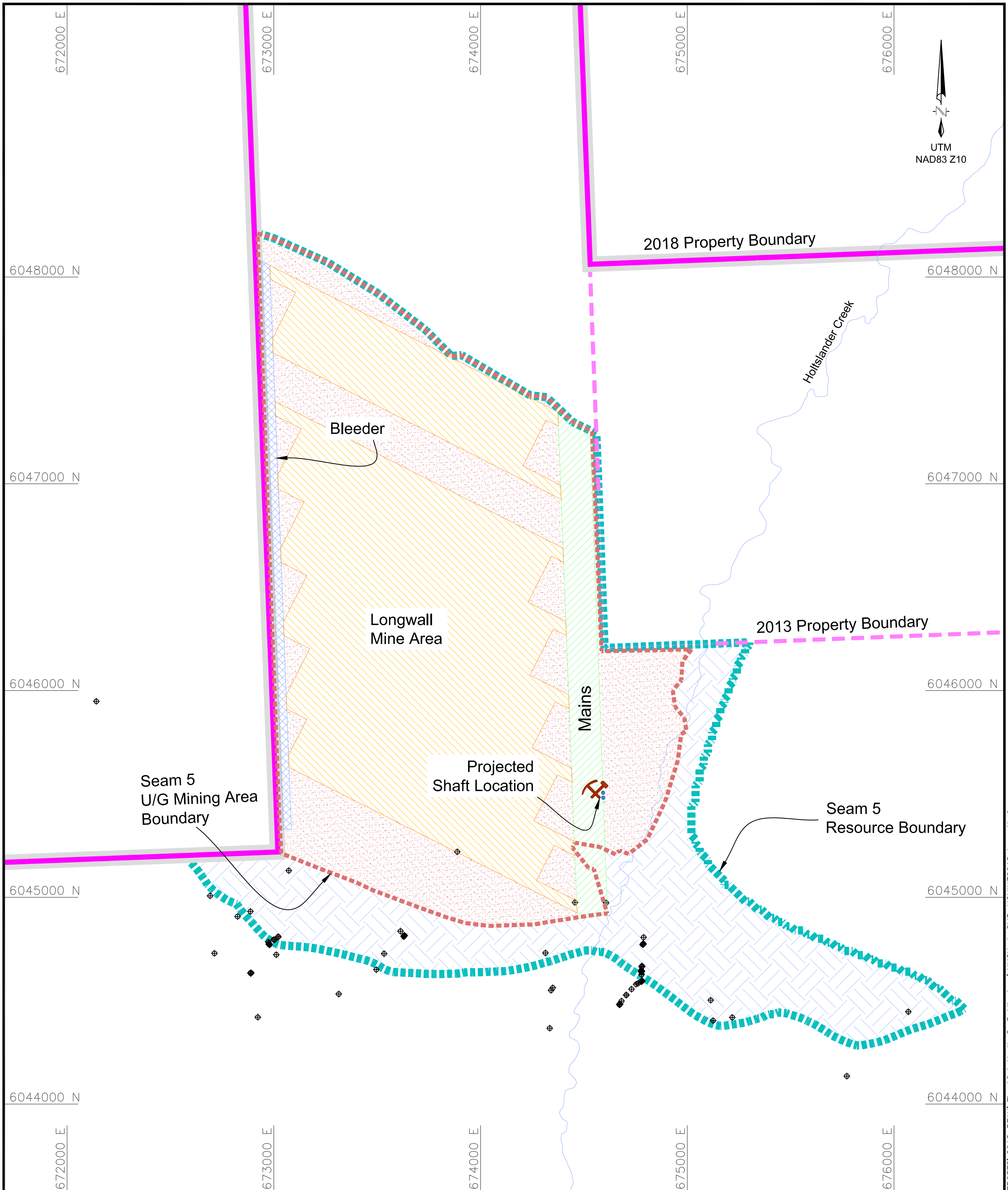


FIGURE 16.1
COLONIAL COAL INTERNATIONAL CORP.
HUGUENOT COAL PROJECT
Conceptual Mine Areas

DATE: Jul 6, 2018
FILE: HUG-A-MINEAREA2018
DRAWN BY: CVS CHECKED BY: JHP / DJL APPROVED BY: JHP / DJL
NORWEST now Stantec

07/06/18 – 04:07:04pm K:\HUGENOT\REPORTS\2018 PEAU\Fig 16.1 Conceptual Mine Areas 2018\HUG-A-MINEAREA2018.dwg Xrefs: x-Topo-Lidar-Background x-Hug-Drainage(Part)-peau-1


672000 E
673000 E
674000 E
675000 E
676000 E
6048000 N
6047000 N
6046000 N
6045000 N
6044000 N
UTM
NAD83 Z10
2018 Property Boundary
900 m Overburden Limit
Holtslander Creek
Bleeder
Longwall
Mine Area
2013 Property Boundary
Mains
Projected
Shaft Location
Seam 1
U/G Mining Area
Boundary
Seam 1
Resource Boundary
LEGEND:
Mains
Longwall Panels & Gateroads
Bleeder
Drill Holes
Seam 1 Resource Area
Seam 1 Underground Mineable Area
2013 Property Boundary
2018 Property Boundary
0 200 400 600 800 1000 m
SCALE
FIGURE 16.3
COLONIAL COAL INTERNATIONAL CORP.
HUGUENOT COAL PROJECT
North Block - Seam 1
Underground Mine Layout
DATE: Jul 6, 2018
FILE: HUGN–A–SM1–UGMINE2018
DRAWN BY: CVS
CHECKED BY: JHP / DJL
APPROVED BY: JHP / DJL
NORWEST CORPORATION now Stantec
Xrefs:
K:\HUGUENOT\REPORTS\2018 PEAU\Fig 16.3 North Sm1 MinArea\HUGN–A–SM1–UGMINE2018.dwg
07/08/18 – 06:50:07pm



LEGEND:

- Mains
- Longwall Panels & Gateroads
- Bleeder
- Drill Holes
- Seam 5 Resource Area
- Seam 5 Underground Mineable Area
- 2013 Property Boundary
- 2018 Property Boundary

FIGURE 16.4

COLONIAL COAL INTERNATIONAL CORP.

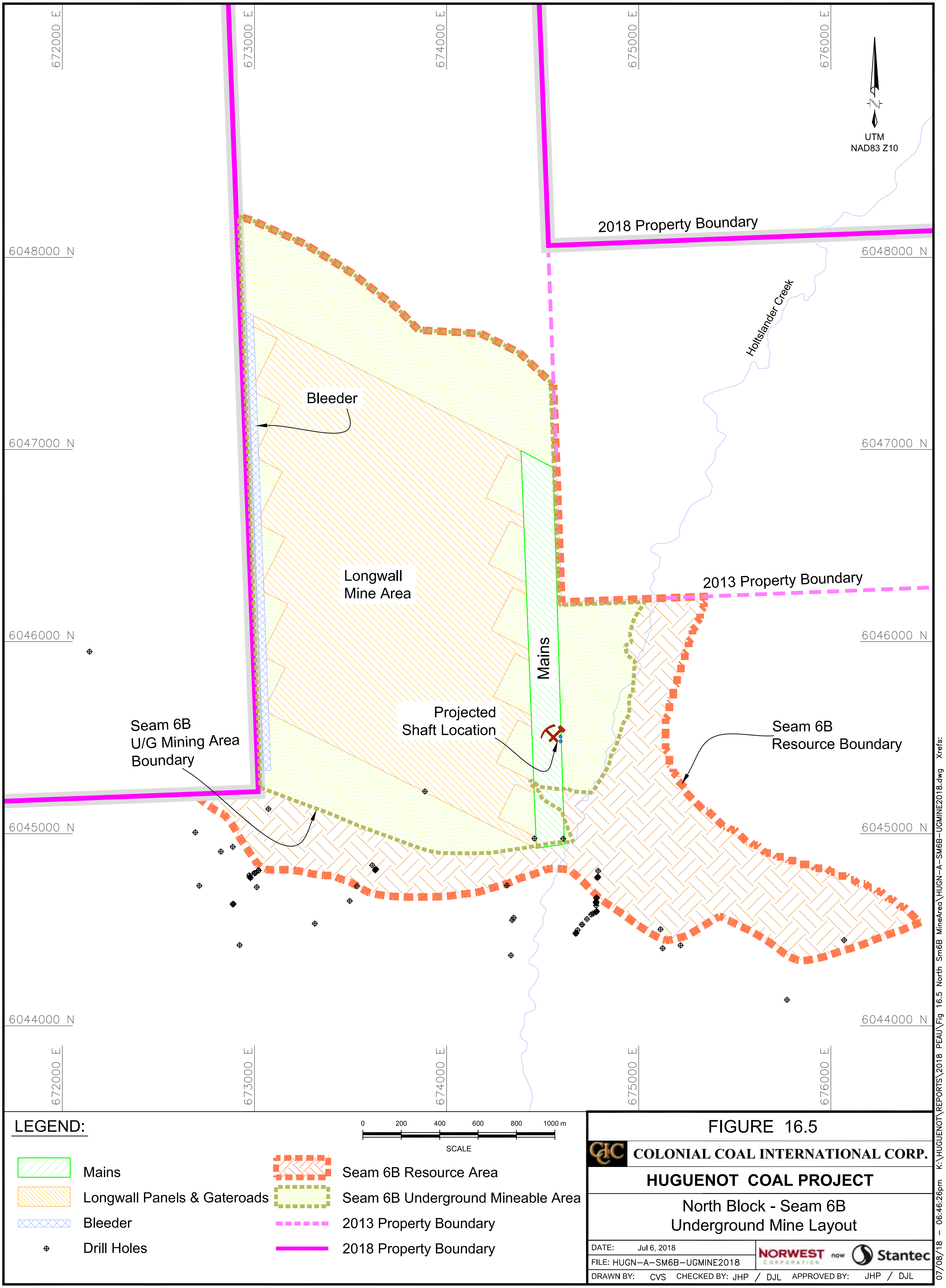
HUGUENOT COAL PROJECT

North Block - Seam 5
Underground Mine Layout

DATE: Jul 6, 2018
FILE: HUGN–A–SM5–UGMINE2018
DRAWN BY: CVS CHECKED BY: JHP / DJL APPROVED BY: JHP / DJL

NORWEST CORPORATION now Stantec

Xrefs: K:\HUGUENOT\REPORTS\2018 PEAU\Fig 16.4 North Sm5 MineArea\HUGN–A–SM5–UGMINE2018.dwg 07/08/18 – 06:48:41pm



672000 E
673000 E
674000 E
675000 E
676000 E
UTM
NAD83 Z10
6048000 N
6047000 N
6046000 N
6045000 N
6044000 N
2018 Property Boundary
Holtslander Creek
Bleeder
Longwall
Mine Area
Mains
2013 Property Boundary
Projected
Shaft Location
Seam 6B
U/G Mining Area
Boundary
Seam 6B
Resource Boundary
LEGEND:
0
200
400
600
800
1000 m
SCALE
Mains
Longwall Panels & Gateroads
Bleeder
Drill Holes
Seam 6B Resource Area
Seam 6B Underground Mineable Area
2013 Property Boundary
2018 Property Boundary
FIGURE 16.5
COLONIAL COAL INTERNATIONAL CORP.
HUGUENOT COAL PROJECT
North Block - Seam 6B
Underground Mine Layout
DATE: Jul 6, 2018
FILE: HUGN–A–SM6B–UGMINE2018
NORWEST CORPORATION now Stantec
DRAWN BY: CVS CHECKED BY: JHP / DJL APPROVED BY: JHP / DJL
07/08/18 – 06:46:26pm K:\HUGUENOT\REPORTS\2018 PEAU\Fig 16.5 North Sm6B MineArea\HUGN–A–SM6B–UGMINE2018.dwg Xrefs:

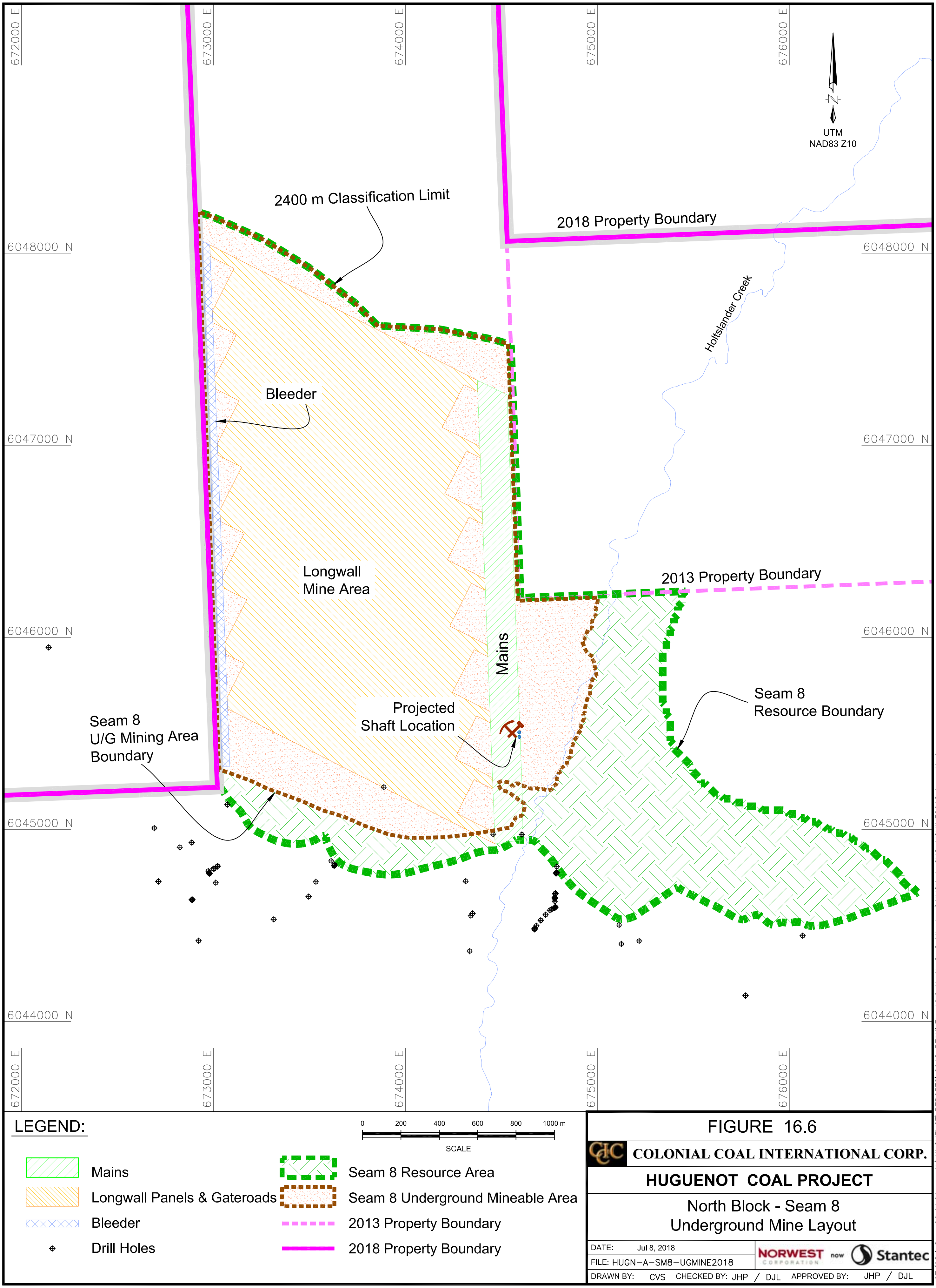


FIGURE 16.6

COLONIAL COAL INTERNATIONAL CORP.

HUGUENOT COAL PROJECT

North Block - Seam 8
Underground Mine Layout

DATE: Jul 8, 2018
FILE: HUGN–A–SM8–UGMINE2018
DRAWN BY: CVS CHECKED BY: JHP / DJL APPROVED BY: JHP / DJL
NORWEST CORPORATION now Stantec

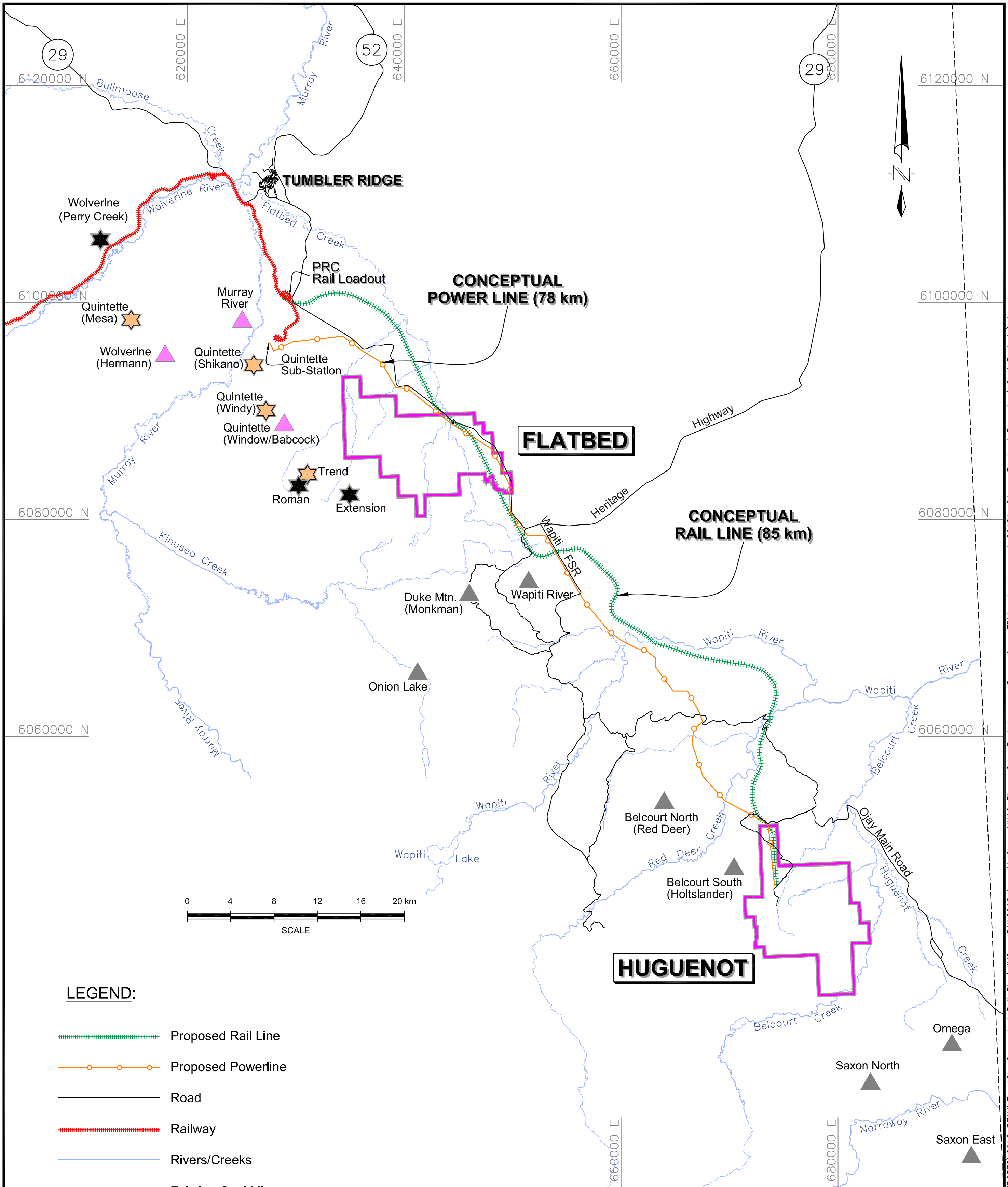


FIGURE 18.1

COLONIAL COAL INTERNATIONAL CORP.

HUGUENOT COAL PROJECT

Conceptual Plan:
Rail and Powerline

DATE: Jul 9, 2018
FILE: HUG–A–RAIL2018
DRAWN BY: CVS CHECKED BY: JHP / DJL APPROVED BY: JHP / DJL