COAL EXPLORATION AND DEVELOPMENT REPORT - BULLMOOSE COAL PROPERTY, BRITISH COLUMBIA, CANADA

VOLUME 1

Submitted to:
CANADIAN DEHUA INTERNATIONAL MINES GROUP INC.

May 24, 2013

NORWEST CORPORATION

136 East South Temple
12th Floor
Salt Lake City, Utah 84111
TEL (801) 539-0044
FAX (801) 539-0055
USA (800) 266-6351
slc@norwestcorp.com

300 Capitol Street
Suite 810
Charleston, WV 25301
TEL (304) 414-4500
FAX (304) 414-4505
charleston@norwestcorp.com

www.norwestcorp.com

NORWEST
CORPORATION

Pages E-5, E-7, E-8, E-9 and E-13, 2-2, all of Section 5, 7-10, 7-11, all of Section 9, pages 11.8 to 11.24, and Appendices E, F, M and N contain data that remain confidential under the terms of the *Coal Act Regulation*, Section 2(1). They have been removed from the public version.

http://www.bclaws.ca/EPLibraries/bclaws_new/document/ID/freeside/10_251_2004#section2

TABLE OF CONTENTS

VOLUME 1

List of Figures

List of Tables

VOLUME 2

APPENDIX A	**DEHUA COAL LICENSES**
APPENDIX B	**PREVIOUS REPORTS**
APPENDIX C	**CHALLENGER GEOPHYSICAL LTD. REPORT**
APPENDIX D	**WELL LOGGING STANDARD OPERATING PROCEDURES**
APPENDIX E	**RAW COAL ANALYSES SUMMARY**
APPENDIX F	**CLEAN COAL ANALYSES SUMMARY**
APPENDIX G	**AMEC HYDROLOGIC REPORT**
APPENDIX H	**PW12-26 PUMPING TEST DATA**
APPENDIX I	**PW12-26 AND PW12-10 BOREHOLE LOGS AND WELL COMPLETION DATA DETAILS**
APPENDIX J	**PW12-26 AND PW12-10 GROUNDWATER DISCHARGE ANALYTICAL CHEMISTRY RESULTS**
APPENDIX K	**NORWEST OBSERVATIONS OF BULLMOOSE HYDROGEOLOGY**
APPENDIX L	**GEOTECHNICAL TEST RESULTS SUMMARY**
APPENDIX M	**NORWEST PROPOSED GAS ESTIMATION METHOD**
APPENDIX N	**RESERVE BASE PARAMETERS AND TONNAGE ESTIMATES**

EXECUTIVE SUMMARY

INTRODUCTION

This Geologic Report has been prepared by Norwest Corporation (Norwest) for Canadian Dehua International Mines Group Inc. (Dehua) and focuses on the Bullmoose Coal Property (Bullmoose property). The Bullmoose property is a 12,783ha coal exploration license area located northwest of Tumbler Ridge in British Columbia, Canada as indicated in Figure E.1.

The purpose of this report is to summarize previous coal exploration work conducted within or nearby the Bullmoose property, and to use this information to produce a geologic model from which to estimate coal resources and a coal reserve base. Coal resource and reserve base estimates outlined in this report are not compliant with Canadian National Instrument (NI) 43-101 guidelines for the public reporting of coal resources on Canadian stock exchanges; however, the coal resources outlined in this report are in accordance with Norwest's understanding of best industry practice.

Three Norwest consultants conducted a site inspection of the Bullmoose property on October 18, 2012. Existing infrastructure and potential facilities sites were reviewed with Dehua staff while on site.

OVERVIEW

The Bullmoose property is located within the Peace River Coalfield (PRC) and metallurgical grade coal from the PRC is currently being extracted from surface mines in the region. Topographically, the Bullmoose property is situated within the eastern foothills of the Rocky Mountains and is comprised mainly of rolling hills with a series of northwest to southeast elongated ridges across the property.

Coal seams of interest at the Bullmoose property are contained within the Boulder Creek, Gates and Gething Formations. The majority of coal produced in the PRC is mined from the Gates Formation, predominantly by surface extraction methods.

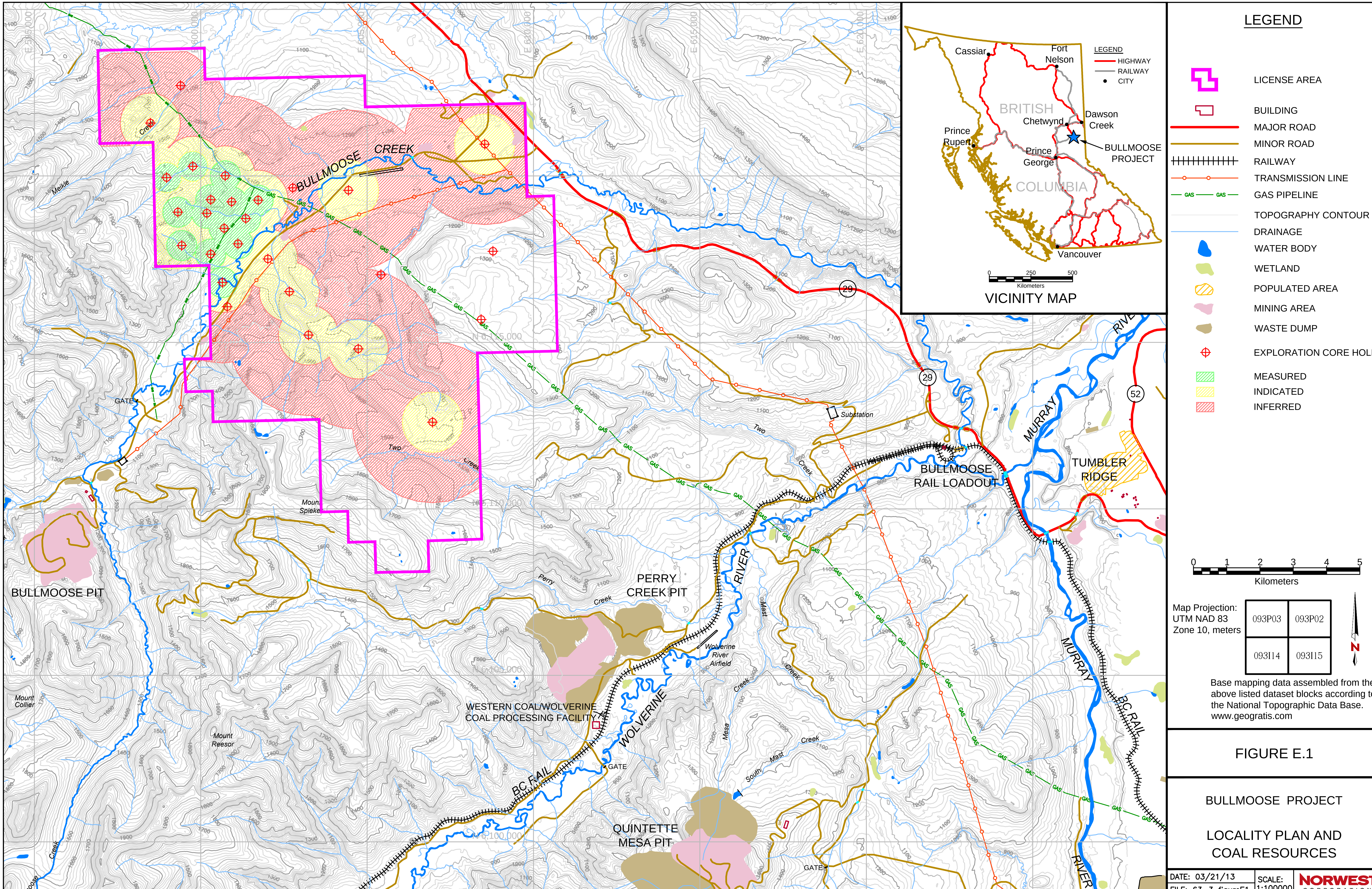


FIGURE E.1

BULLMOOSE PROJECT

LOCALITY PLAN AND COAL RESOURCES

Exploration data acquired by Dehua in the form of surface mapping, oil and gas exploration data and recent Dehua drilling program has identified a total of ten coal seams occurring on the property. These seams from top to bottom are designated: BC (Boulder Creek Fm), B, C, D, E1, E2 and E3, and F (Gates Fm), and the Superior and Trojan Seams (Gething Fm).

Coal resources have been reported by Norwest for all ten coal seams. Additional high-level mining studies completed by Norwest have determined that the seams with the best potential for underground extraction are the D, E1, F and Superior Seams. Only underground coal mining methods are considered in this report.

REVIEW OF EXPLORATION DATA

The selection of coal exploration methods used by Dehua has followed the typical industry standard for northeastern British Columbian coalfields. A literature research, interpretation of 2D seismic and oil and gas (O&G) exploration data were used to compile a conceptual understanding of the subsurface geology. This information was then used to identify coal exploration target areas. A total of 28 vertically orientated coal exploration holes were completed by Dehua. The location of these exploration drill holes is illustrated in Figure E.1, while Figure E.2 shows the locations Dehua's drill sites in relation to the 2D seismic lines and O&G wells used in the geological model. A hydrologic study was conducted in conjunction with the exploration program utilizing three pump testing wells completed adjacent to coal explorations holes BM-17, BM-24 and BM-26.

The quality of the exploration work completed by Dehua in general follows industry guidelines. The correct selection of drilling methods and appropriate use of geophysical logging tools has enabled Dehua to compile the necessary information for further development of the Bullmoose project. The selection of coal sample intervals by rock type as opposed to adjacent sample plys may limit the extent to which selective mining can be considered using current coal quality sample data. This is not considered to be of significant material impact at this stage of the project as the seams are not conducive to selective mining techniques. Methane testing data is currently incomplete and information is outstanding in order for Norwest to form an accurate opinion on methane gas potential on the property.

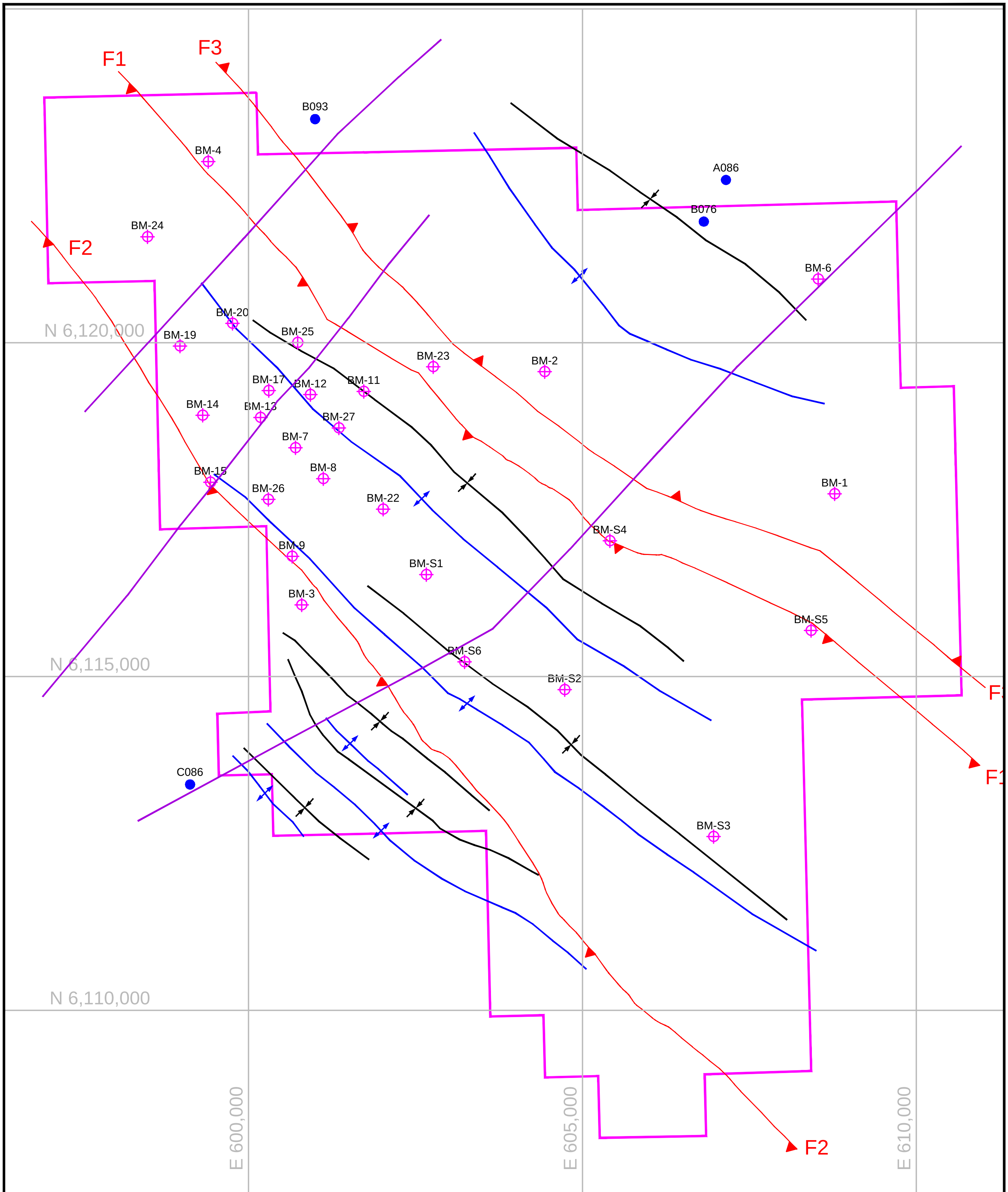


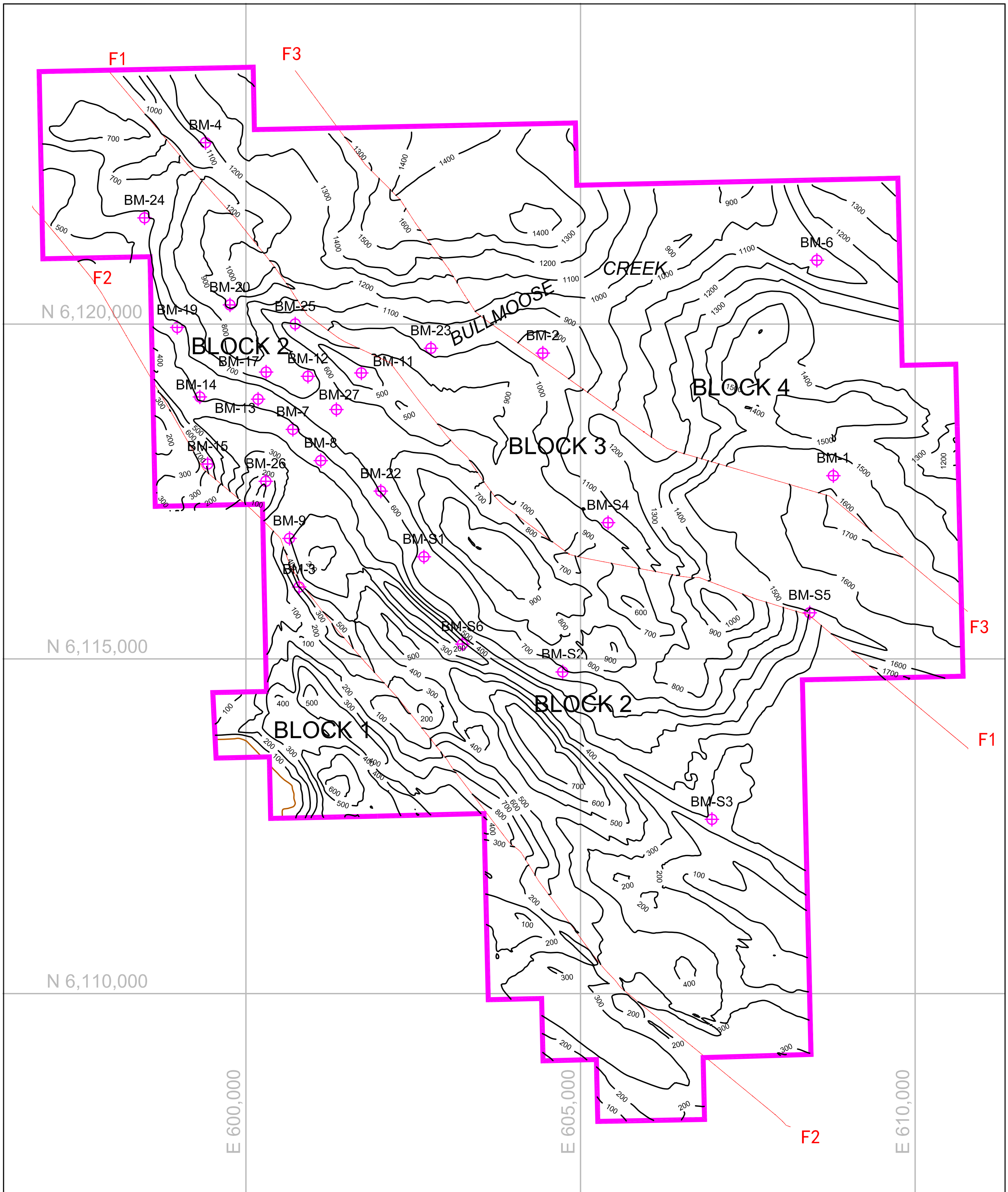
FIGURE E.2

BULLMOOSE PROJECT

BULLMOOSE COALFIELD MAP

Pages E-5, E-7, and E-8; Tables E.1 and E.2 contain coal quality data and remain confidential under the terms of the *Coal Act Regulation*, Section 2(1). They have been removed from the public version.

http://www.bclaws.ca/EPLibraries/bclaws_new/document/ID/freeside/10_251_2004#section2



LICENSE AREA

BM-2 DRILLHOLE

200 OVERBURDEN CONTOUR

FAULT

N

0 500 1000 1500

METERS

FIGURE E.3

BULLMOOSE PROJECT

FAULT BLOCKS
AND
D SEAM OVERBURDEN

DATE: 03/21/2013	SCALE:	NORWEST CORPORATION
FILE: 63-3 figureE3	1:2000	

Table E.5 Total Coal Resources Above 1000m depth

Classification	Million Tonnes (Mt) to 1000m Depth			
	True seam thickness cutoff range			
	> 0.7m	> 1.0m	> 1.2m	> 1.5m
Total Measured	92.1	83.8	74.9	64.1
Total Indicated	288.2	252.3	229.9	192.3
Measured plus Indicated	**380.4**	**336.1**	**304.8**	**256.4**
Total Inferred	578.2	501.5	477.3	349.1
Total	**958.6**	**837.6**	**782.1**	**605.5**

An estimate of the Bullmoose coal reserve base was made using limiting criteria from key mining parameters are outlined below:

- Minimum overburden: 50m
- Maximum overburden: 900m
- Minimum interburden: 15m
- Minimum mineable seam thickness: 1.0m
- Percent slope of seam dip for mining method/equipment selection/productivity.

The total estimated reserve base tonnes are outlined in Table E.6. Only underground mining methods are considered in the reserve base. The location of the mining reserve area is illustrated in Figure E.4.

Table E.6 Bullmoose Coal Reserve Base

Mineable Area (ha)	Mineable In-Place (Mt)	ROM Coal (Mt)	ROM OSD (Mt)	Total ROM (Mt)
11,418	392.5	193.3	25.0	218.3

HYDROGEOLOGY

Dehua contracted AMEC Environmental & Infrastructure, a division of AMEC Americas Limited (AMEC), to complete hydrological testing and characterization of the Bullmoose property. The large diameter (6 inch) hydrologic test wells completed by Dehua were located adjacent to Dehua slim-core exploration holes BM-17, BM-24 and BM-26 In addition, five additional water monitoring wells were completed by AMEC.

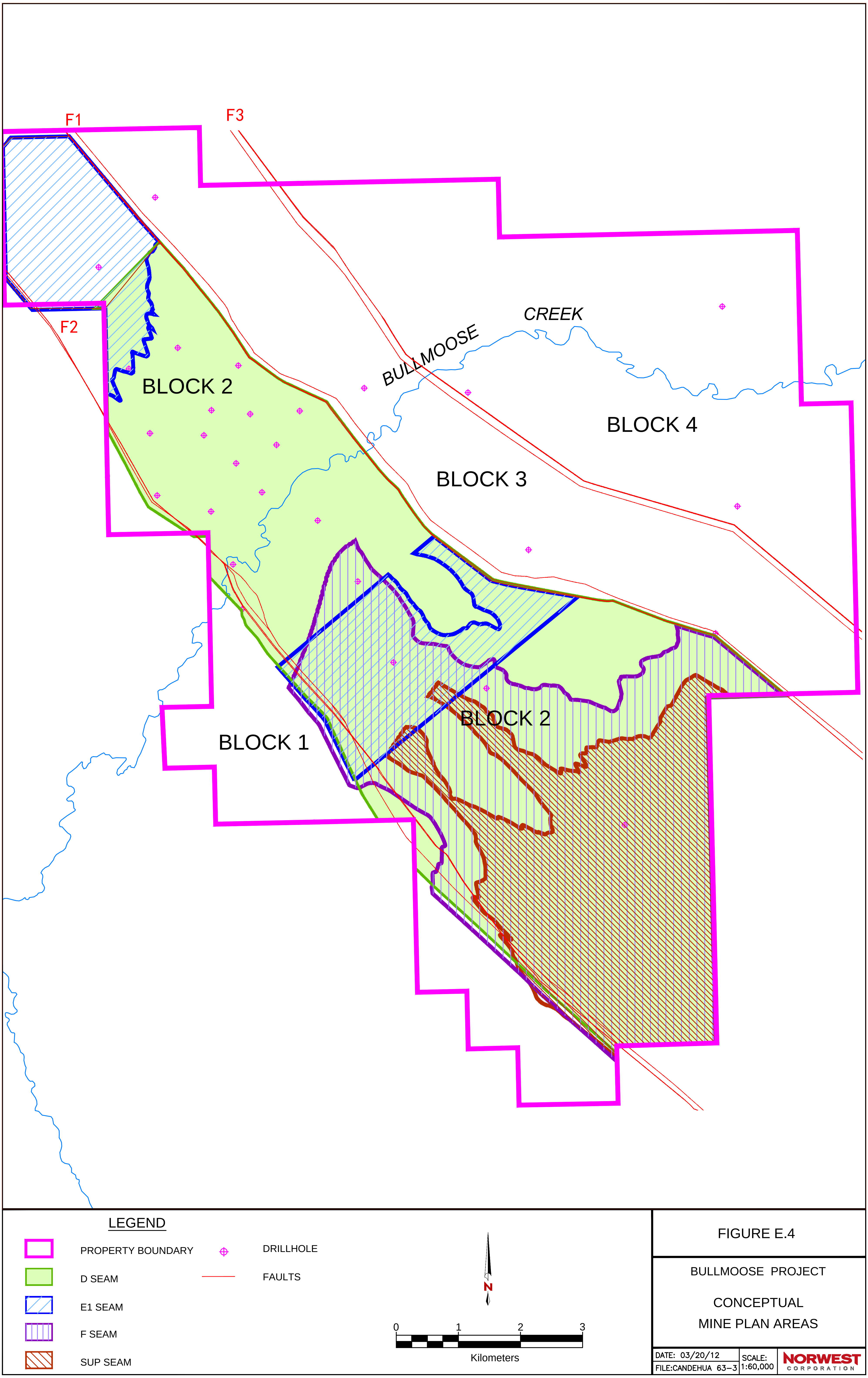


FIGURE E.4

BULLMOOSE PROJECT

CONCEPTUAL
MINE PLAN AREAS

DATE: 03/20/12
FILE:CANDEHUA 63-3
SCALE: 1:60,000
NORWEST CORPORATION

Results from the pump testing wells indicated that surficial water was the likely source of recharge in the Upper Gates Formation where proposed underground mining will likely take place. The water-bearing formation most likely to serve as a source of water to the proposed mine is the Upper Gates Formation. As preliminary design drawings for the mine shaft were not available to AMEC, specific comment cannot be made on the water inflow to the mine shaft.

Currently surface water can be accessed from the Bullmoose Creek which flows through the center of the property. Additional surface water can be supplied from the Wolverine River nearby the southern boundary of the property. Two wells have been drilled in the Bullmoose North coal mine area for use as water supply wells.

DEHUA GAS TESTING PROGRAM

The desorption test samples for the coal bed methane program were taken from major coal seams within the Gates Formation. A total of 19 gas desorption samples were taken in the field by Dehua geologists. These samples were later analyzed and interpreted by Hebei. At the time of writing the only sample results that have been received are for 16 samples. Sample weights for three of the samples are currently not available and the final processing of the data cannot be completed at this time. The preliminary results obtained by extrapolating on the short-term gas curves indicated that there will be at least moderate levels of methane gas to be considered in mine ventilation design.

Norwest reviewed results from Hebei on gas content and composition from holes located in the southern area of the Bullmoose property. The results are non-conclusive as the tests were performed long after the samples were taken and are not representative of in-place conditions.

GEOTECHNICAL STUDIES

Rock mechanics testing was conducted by the Hebei. Norwest reviewed the roof and floor sampling of the D Seam and E1 Seam. Test results for the D seam indicated a moderately strong roof but variable floor strength. The E1 Seam sampling suggested a strong roof and floor despite the predominantly mudstone roof and floor. The F Seam showed a strong roof and floor whereas the Superior Seam ranked moderate strengths for both.

COAL DUST EXPLOSIBILITY

Table E.7 summarizes available applicable explosibility data and index for the target mineable seams D, E1, F, and Superior. The data and general rank of the coal suggest that coal dust suppression measures will be required to lessen the likelihood of a coal dust explosion. The required measures to protect against coal dust explosions are published in the 2008 Health, Safety and Reclamation Code for Mines in British Columbia (Code) 6.44.1- 6.45.1. A copy of the code is provided in the report.

Table E.7 Summary of Available Explosibility Data for Target Mining Seams

Seam ID	No. of Samples	Average Moisture Content (%)	Average Ash Content (%)	Average Volatiles (%)
D	7	1.12	40.65	17.16
E1	9	0.82	24.53	19.29
F	1	0.95	20.02	19.18
Superior	2	0.84	11.83	18.93

SPONTANEOUS COMBUSTION

Spontaneous combustion testing was conducted in accordance with Chinese standard GB/T20104-2006 "*Method for identifying tendency of coal to spontaneous combustion by oxygen absorption with chromatograph*" by the Hebei Province Research Institute of Coal Geology.

Norwest has reviewed the analytical results of coal samples for spontaneous combustion conducted by the Chinese Hebei Province Research Institute of Coal Geology for Target Seams D and E1. There was insufficient information available for the F and Superior Seams. The D Seam averaged as a Level 2 with 0.66 m^3 oxygen absorbed and the E1 Seam averaged a Level 2 as well with 0.64 m^3 average oxygen absorbed.

ENVIRONMENTAL CONCERNS

Selenium and ARD/ML (Acid Rock Drainage/Metal Leaching) testing has not been observed by Norwest. These two critical environmental parameters need to be quantified. Prior to mining selenium and ARD/ML mitigation and management strategies will be important to the success of the mining operation. This will impact any water or waste material that will be brought to the surface during mining operations.

INFRASTRUCTURE

The Bullmoose coal property is located in a region where there are active coal mining operations and there is excellent support infrastructure. The property can easily be accessed via HW29 from

Tumbler Ridge located approximately 25km to the southeast. This underutilized paved road can be used haul run-of-mine (ROM) coal from the mining operations to a proposed rail loadout facility in the Wolverine River Valley few kilometers to the south of the property. There BC rail network connects Tumbler Ridge to the Prince Rupert coal export terminals.

GENERAL PROJECT ECONOMIC FINDINGS

The Bullmoose property is located in British Columbia, Canada and Canada is ranked in the 94 percentile according to Worldwide Governance Indicators (WGI) which indicates a very stable environment for project development. There are existing transportation infrastructure (highway, railway, and seaport) available for development of the target area of the Bullmoose coal property. Additionally, power and water resources are available near the project site. Norwest has identified a potentially mineable reserve base of approximately 218 million tonnes (Mt) ROM and 88Mt clean coal. This reserve base is contained in the D, E1, F, and Superior coal seams as presented in Table E.7. The average clean coal preparation yield for these mineable seams is approximately 40.1%, with the D seam being the lowest at 34.4% and the Superior seam being the highest at 57%.

An average annual ROM production rate of approximately 7.2Mt is budgeted to produce about 2.4Mt of clean coal annually at full production for approximately 30 years. The total LOM capital forecast (CAPEX) for this project is US$1,336M. Estimated CAPEX requirements for the initial construction and production ramp-up period, as well as sustaining capital, are summarized in Table E.8.

Table E.8 Summary CAPEX Project Forecast (US$M)

Category	Initial Construction & Production Ramp Up	Remaining Mine Life	Life of Mine Total	% of Total
ROM Coal Handling, CPP, & Surface Mobile Equipment	$ 200	$ 10	$ 210	16%
Surface Facilities (non-coal handling)	$ 56	$ 5	$ 61	5%
Site Access and Power	$ 18	$ -	$ 18	1%
Surface Miscellaneous	$ 16	$ -	$ 16	1%
Sub Total Surface	**$ 290**	**$ 15**	**$ 305**	**23%**
Underground Mine Infrastructure (on Surface)	$ 57	$ 157	$ 214	16%
Underground Mine Equipment	$ 204	$ 613	$ 817	61%
Sub Total Mine	261	770	1,031	
Contingency	$ -	$ -	$ -	0%
Total CAPEX	**$ 551**	**$ 785**	**$ 1,336**	**100%**

The total mine operating costs (OPEX) have been estimated for the life of the project in 2013 constant dollars and summarized in Table E.9.

Table E.9 Estimated LOM OPEX Costs

($/Tonne)				% of Total
#	**Category**	**ROM**	**Clean**	
1	Manpower	21.87	54.51	54%
2	Operating Materials & Supplies	9.21	22.96	23%
3	Maintenance Supplies Repairs & Overhauls	3.20	7.97	8%
4	Face Extensions	1.50	3.74	4%
5	Power	1.30	3.24	3%
6	Other Expenses	1.50	3.74	4%
7	Coal Processing Materials & Supplies & Power	2.10	3.87	4%
8	CONTINGENCY	-	-	0%
	Total Mine Cash Costs	**40.13**	**100.2**	**100%**
9	Depreciation	6.12	15.25	

Norwest does not conduct market supply and/or price forecasts. In the absence of this information, Norwest's approach for this study was to determine a product sales price which is required to achieve a project IRR of 8%. Norwest has determined that a product sales price of approximately US$188 per tonne loaded into the vessel at the port is required to meet the minimum IRR suitable project benchmark requirement of 8%.

CONCLUSIONS

The Bullmoose property is interpreted to be at a very early stage of development for an underground metallurgical coal mining operation. The exploration data compiled to date is adequate for the assessment of coal resources and high-level mining studies; however more field data would need to be acquired should Dehua decide to proceed further with the project.

The data acquired thus far for the Bullmoose project is believed to be scoping to prefeasibility level for a typical North American underground coal mining project.

RECOMMENDATIONS

The following items need to be addressed for further development of the coal property.

Additional Exploration Drilling

More concentrated (closely-spaced) exploration drilling is recommended for those areas identified as most suitable for underground mining. The current exploration data is sufficient for the identification of large fault/fold structures, however it is very likely that small scale faulting, channeling and folding (floor rolls) could be encountered over very short distances (within 100 to 200m). Closely spaced drilling on the order of 200 meters (m) for the first year of mining should be seriously considered to determine the extent to which these disturbances would interrupt mine development.

Bulk Sampling

Large diameter drill core sampling or trial mining bulk sampling should be completed to provide sufficient sample volume and mass for processing plant simulation studies and coal marketing purposes. Of particular importance is a reliable estimate of practical plant yields which are critical with respect to the profitability of the project. Current theoretical yield estimates from slim core drilling are inadequate for a robust estimate of expected practical plant yields.

Mine Portal and Geohydrology

The mine portal design for trial mining (bulk sampling) has not been reviewed by Norwest. The location and path of the portal (decline) would need to be made available in order for AMEC and Norwest to assess to what extent the decline will be impacted by groundwater ingress.

Till Depth
The current geological model has relied on drill hole log descriptions for establishing a depth to base of till horizon for limiting coal resources. Targeted shallow seismic programs or inexpensive rotary drilling programs would be required for a more accurate assessment of till depth in critical locations. The till depth in and around the proposed mine portal site is critical for establishing a safe and stable mine entry.

Exploration in Sub-crop Locations
The geological model is projecting there to be sub-cropping coal seams along the western boundary of the coal property and this represents an opportunity for surface mining in these areas. It is recommended that these areas be further explored through surface mapping and drilling. Drilling costs per completed hole for the proposed crop-line drilling would be significantly less than current costs per hole penetrating the deeper underground mineable areas.

Gas Data
Gas desorption testing was observed to be incomplete. Norwest recommends a method developed by analysing legacy data and applying regional experience. Results obtained from other properties in the PRC in similarly ranked coal, depth and pressure environments should yield similar results. Details of the alternative approach are provided in the body of the report.

Geotechnical Data
The currently available geotechnical test data is mostly limited to the D and E seams. More sample data is required for the remaining seams for an indication of expected roof and floor rock strengths.

Slake durability testing of seam floor samples was not observed. This simple inexpensive test is important determining stability of the floor rock when exposed to water over time.

Ground stability (soils) testing on planned surface facility locations would need to be conducted prior to construction.

Selenium and ARD/ML Testing
Selenium and ARD/ML testing has not been observed by Norwest. These two critical environmental parameters need to be tested and quantified should Dehua proceed with project development. Mitigation and management plans for Selenium and ARD/ML are required for mining permit applications.

Environmental Baseline Studies
Environmental base line studies including vegetation and wildlife studies would need to be conducted for a valid mining permit application.

Mine Plan and Financial Evaluation
Dehua may wish to analyze the alternative of a revised mine plan and sequencing that incorporates more clean coal in earlier years of the project. This alternative would require careful review of the possible mine plans, costs, resources recovery, and other implications on the project.

INTRODUCTION

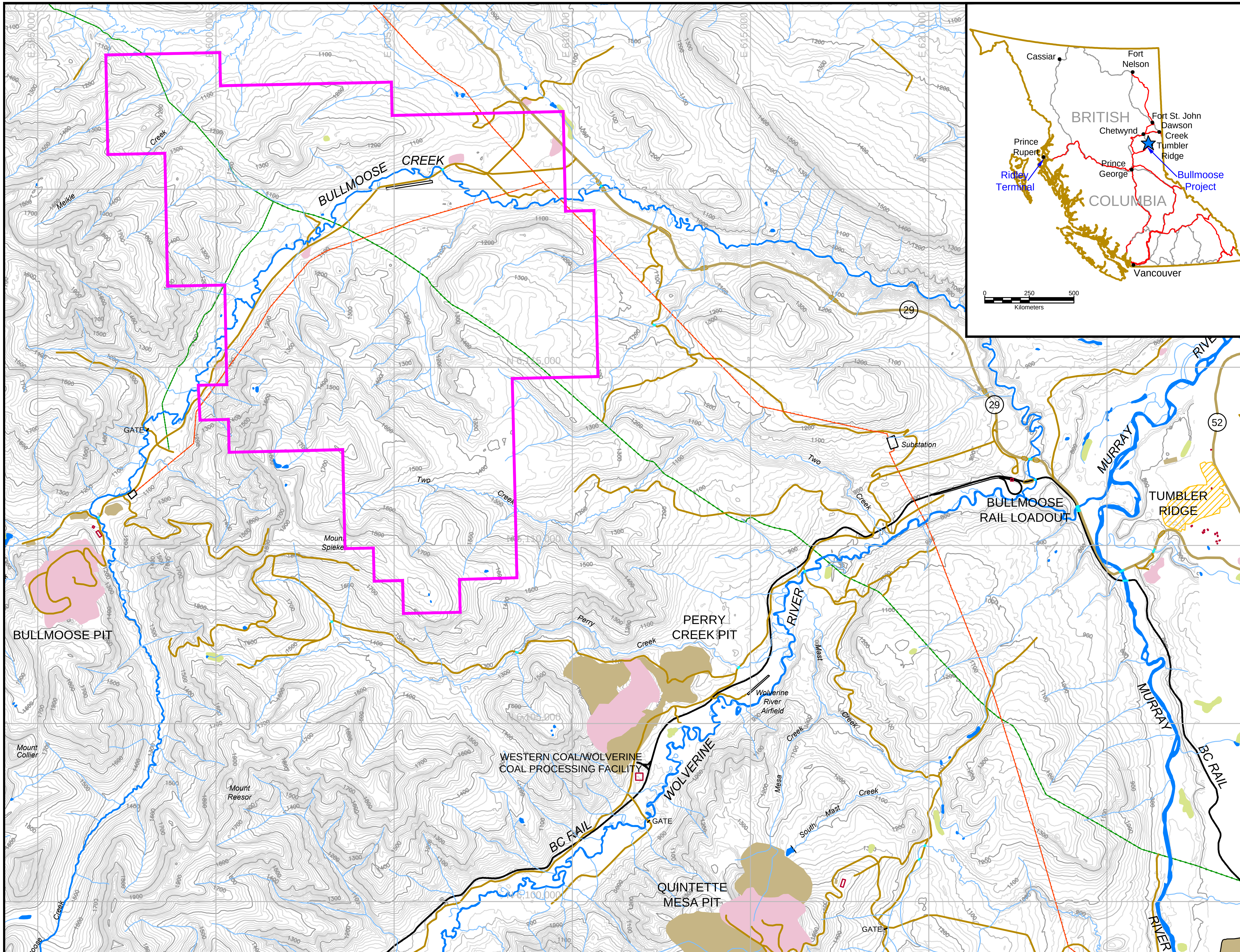
PURPOSE AND MISSION

This Geologic Report has been prepared by Norwest Corporation (Norwest) for Canadian Dehua International Mines Group Inc. (Dehua) and focuses on the Bullmoose Coal Property (Bullmoose property). The Bullmoose property is a 12,783 hectare (ha) coal exploration license area located northwest of Tumbler Ridge in British Columbia (BC), Canada, as shown in Figure 1.1.

The property is controlled through 20 contiguous coal exploration licenses issued by the BC Ministry of Energy, Mines and Petroleum Resources. Table 1.1 lists the Coal License number and corresponding Canadian National Topographic System map number. The location of the exploration licenses is illustrated in Figure 1.2 and copies of all license certificates can be found in Appendix A.

Table 1.1 Bullmoose Coal Exploration Licenses

Item	Tenure Number	Date Issued	Map Reference	Hectares	Status
1	417759	2/10/2011	093P.013	370	active
2	417760	2/10/2011	093P.013	444	active
3	417761	2/10/2011	093P.013	296	active
4	417762	2/10/2011	093P.014	591	active
5	417763	2/10/2011	093P.014	296	active
6	417764	2/10/2011	093P.014	518	active
7	417765	2/10/2011	093P.014	1,109	active
8	417766	2/10/2011	093P.014	1,109	active
9	417767	2/10/2011	093P.014	887	active
10	417768	2/10/2011	093P.014	887	active
11	417769	2/10/2011	093P.014	887	active
12	417770	2/10/2011	093P.013, 023	886	active
13	417771	2/10/2011	093P.023	1,180	active
14	417772	2/10/2011	093P.013, 014, 023, 024	738	active
15	417773	2/10/2011	093P.014, 024	296	active
16	417774	2/10/2011	093P.014, 024	443	active
17	417775	2/10/2011	093P.014, 024	296	active
18	417776	2/10/2011	093P.024	443	active
19	417777	2/10/2011	093P.024	443	active
20	417778	2/10/2011	093P.024	664	active
Total				**12,783**	All active



LEGEND

- LICENSE AREA
- BUILDING
- MAJOR ROAD
- MINOR ROAD
- RAILWAY
- TRANSMISSION LINE
- GAS PIPELINE
- TOPOGRAPHY CONTOUR
- DRAINAGE
- WATER BODY
- WETLAND
- POPULATED AREA
- MINING AREA
- WASTE DUMP

0 1 2 3 4 5
Kilometers

Map Projection:
UTM NAD 83
Zone 10, meters

093P03	093P02
093I14	093I15

N

Base mapping data assembled from the above listed dataset blocks according to the National Topographic Data Base.
www.geogratis.com

FIGURE 1.1

BULLMOOSE PROJECT

LOCALITY PLAN

DATE: 03/21/13
FILE: 63-3 figure1.1
SCALE: 1:100000
NORWEST CORPORATION

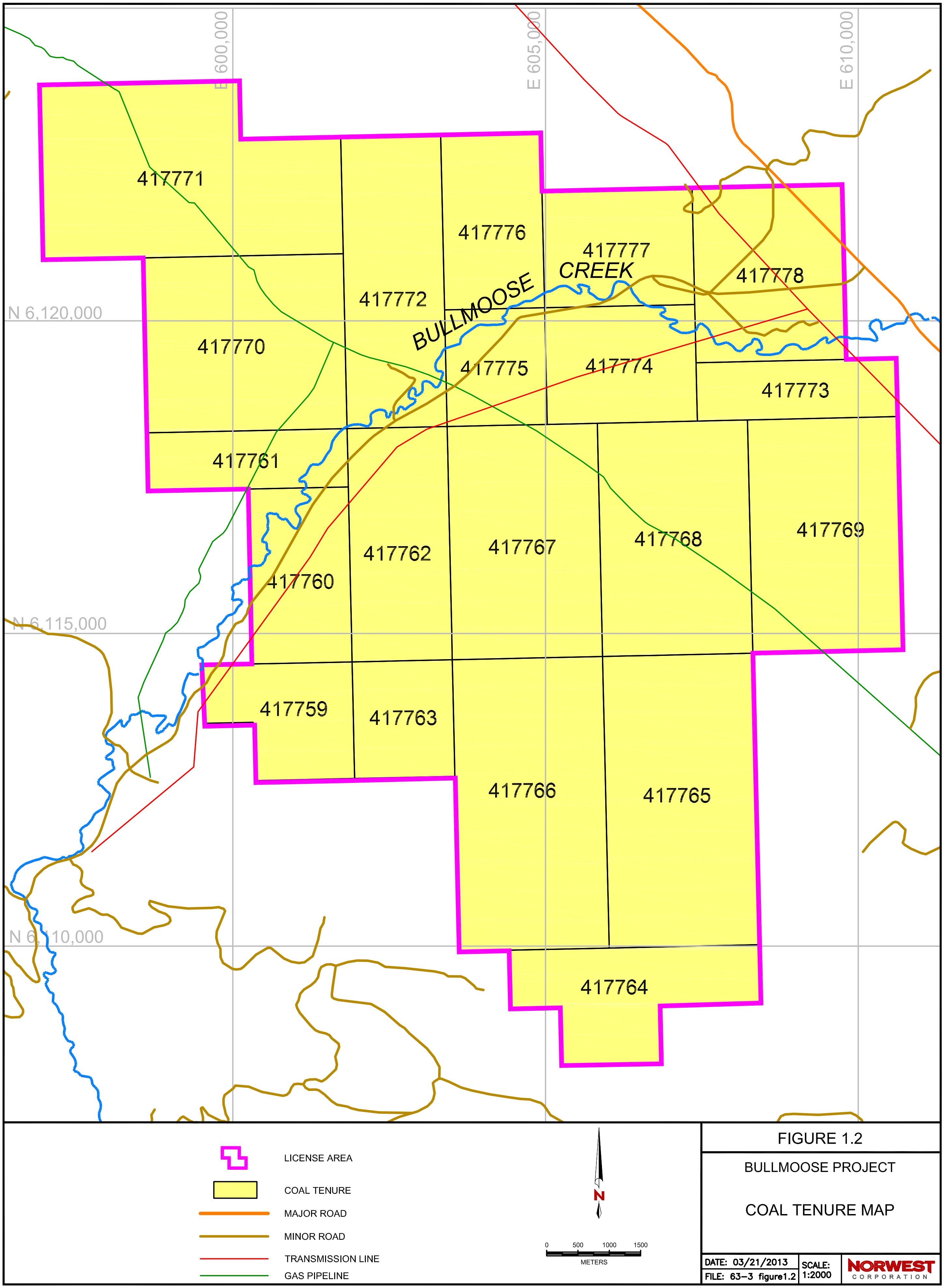


FIGURE 1.2

BULLMOOSE PROJECT

COAL TENURE MAP

DATE: 03/21/2013
FILE: 63-3 figure1.2
SCALE: 1:2000
NORWEST CORPORATION

The purpose of this report is to summarize previous coal exploration work conducted within or nearby the Bullmoose property and to use this information to produce a geologic model from which to estimate coal resources. The geologic model will form the basis for subsequent coal reserve base estimations using a conceptual mine plan, also presented in this report. Aspects pertaining to the associated fields of geotechnical properties, coal gas potential, and hydrogeology are addressed as well, at a level appropriate for an Exploration Report. Norwest did not participate in the field work or data collection in these areas, but has, at Dehua's request, reviewed appropriate data in each category and has reviewed the hydrogeology reports prepared by another consulting firm. Norwest's comments and validation work are included in this report and the initial reports prepared by other firms are attached as Appendices.

The Bullmoose property is located within the Peace River Coalfield (PRC). Metallurgical grade coal from the PRC is currently being extracted from surface mines in the region. Dehua's exploration to date within the property has recognized one major seam from the Boulder Creek Formation, four major coal seam groups of the Gates Formation and two major coal seams from the Gething Formation. The location of the exploration drillholes and seismic lines used in identification of these coal seams are illustrated in Figure 1.3. The coal seams within the property are generally too deep to be considered for surface mining in most areas and only underground mining is considered in this report.

Coal resource and reserve base estimates outlined in this report are not compliant with Canadian National Instrument (NI) 43-101 guidelines for the public reporting of coal resources on Canadian stock exchanges. The coal resources outlined in this report are in accordance with Norwest's understanding of best industry practice but do not strictly adhere to internationally accepted mineral resource reporting standards used for public disclosure of coal resources.

Three Norwest consultants conducted a site inspection of the Bullmoose property on October 18, 2012. Inspected were a number of the drilling sites and several potential facility locations. Attending was a Norwest mining engineer who had worked at the former Teck Resources Bullmoose surface mine and who brought detailed, site specific knowledge to bear on the facilities location evaluation.

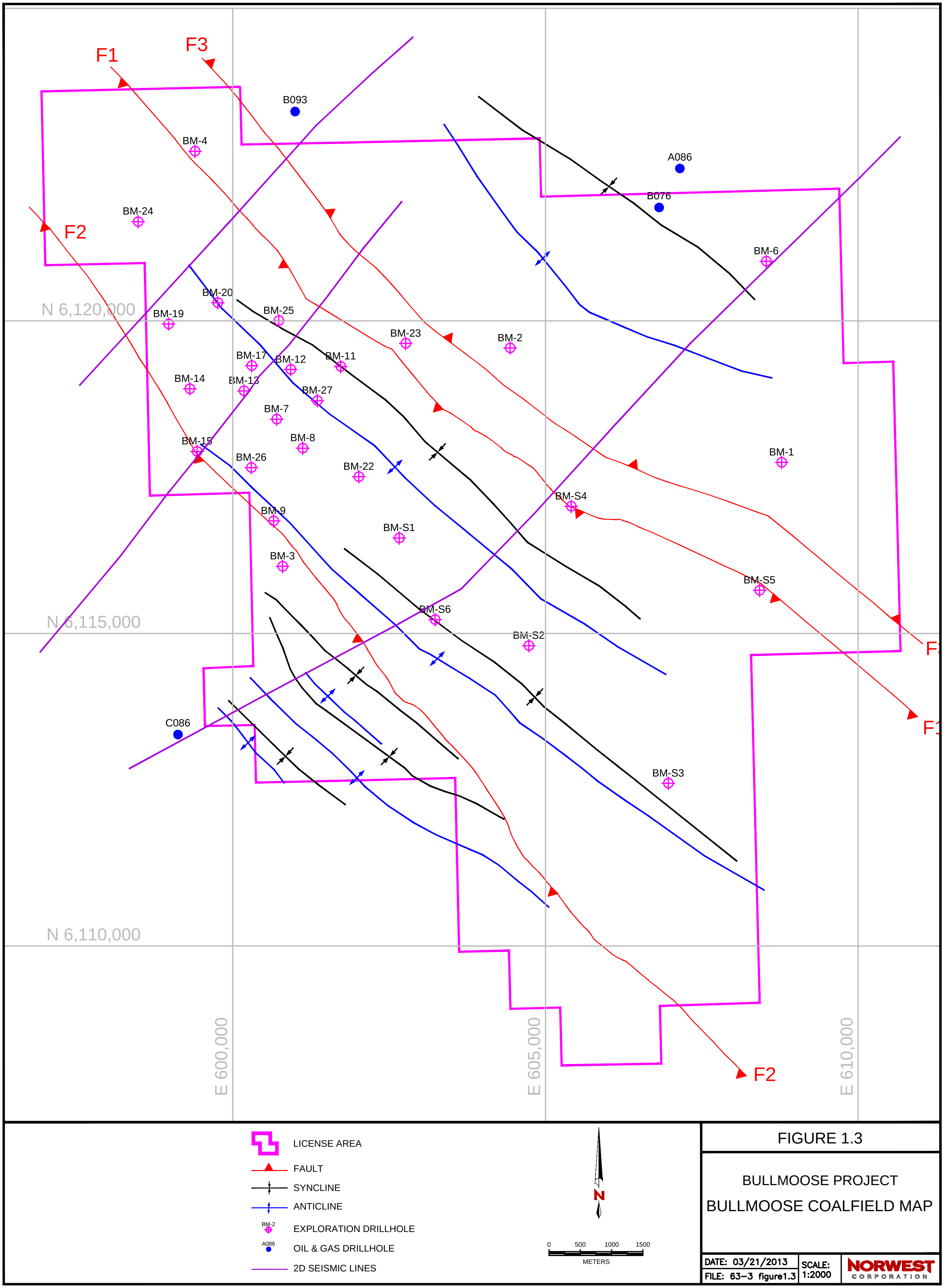


FIGURE 1.3

BULLMOOSE PROJECT

BULLMOOSE COALFIELD MAP

LOCATION AND TRANSPORTATION OF THE MINE FIELD

Location

The Bullmoose property covers an area of approximately 127km^2 and is located in northeastern British Columbia, Canada. The project area is located about 750km northeast of Vancouver, and lies within the Municipal District of Tumbler Ridge, which is part of the Peace River Regional District. Tumbler Ridge is a town of approximately 3,500 inhabitants; however the infrastructure can accommodate 6,000 to 8,000 people. Tumbler Ridge was established to service the emerging mining industry in 1980s, and is currently used by Dehua as a base from which to service other coal exploration and mining projects in the area.

Other nearby towns include Dawson Creek to the northeast, Fort St. John to the north, Chetwynd to the northwest, and Prince George to the southwest. The location of the Bullmoose property in relation to surrounding towns has been illustrated in Figure 1.1.

Nearby coal mines include the Quintette (Teck), Perry Creek (Walter Energy Inc.) and Bullmoose (Teck) mines. The Perry Creek mine is the only currently active mine. The idled Bullmoose surface mine is located approximately 8km southwest of Dehua's Bullmoose property and was closed in 2003 after Teck exhausted the economic surface reserves of that time and no plans were in place for underground mining. Current metallurgical coal prices have revitalized a number of idled operations and the northeastern BC province is experiencing mine restarts as well as new mine projects projected to come online in the next several years.

The Perry Creek surface mine is located approximately 5km southeast of the Bullmoose property and is currently owned by Western Canadian Coal, recently purchased by Walter Energy. The active surface mine is located along the northern bank of the Wolverine River. Another 5km southeast of the Perry Creek mine is the Teck-owned Quintette surface mine that is currently awaiting permit approval to restart coal production in 2014. There are no currently active underground coal mines nearby the Bullmoose property.

There is active exploration and development of the petroleum and natural gas in the area and production wells of the natural gas and natural gas pipelines are distributed throughout the area. A gas pipeline bisecting the Bullmoose property is illustrated in Figure 1.4.

LEGEND

HIGHWAY

RAILWAY

CITY

N

FIGURE 1.4

BULLMOOSE PROJECT

REGIONAL
INFRASTRUCTURE

DATE: 03/21/13
FILE: 63-3 figure1.5
SCALE: Shown
NORWEST CORPORATION

Transportation

The property can be accessed by paved and unpaved roads from the town of Tumbler Ridge located 25km to the east of the property. The central position of the project area can be accessed by traveling north along Highway 29 for approximately 25km and then turning left into an unpaved road. Traveling west on this road for 7km will be the approximate center of the Bullmoose property. These access roads to the Bullmoose property are in good condition and are used to service the natural gas, forestry, wind and coal mining industries in the region.

The distance from the Bullmoose property to the following towns and cities by way of the paved highway is approximately:

- Tumbler Ridge, 25km
- Chetwynd, 98km
- Dawson Creek, 120km
- Fort St John, 170km
- Prince George, 406km
- Prince Rupert Port, 1,128km
- City of Vancouver, 1,184km.

The nearest Canadian National Railway (BC rail) line is located 8km south of the property in the Wolverine River Valley. The nearest rail coal load facility is the Teck-owned facility located 15km southeast of the property nearby the confluence of Bullmoose Creek and the Wolverine River. The Canadian National Railroad/BC Rail network connecting to port facilities in Vancouver and Prince Rupert is outlined in Figure 1.4. Loadout facilities for the Bullmoose mine would be logically established on the BC Rail line at or nearby the historic Bullmoose loadout site.

There are regular service flights to Prince George, Fort St. John and Dawson Creek from Vancouver International Airport. Tumbler Ridge has an un-serviced airport approximately 7km to the south of the town. If required, emergency special air service can be provided to Tumbler Ridge.

PHYSICAL GEOGRAPHY

Topography

The Bullmoose project area is situated within the eastern foothills (Inner Foothills Belt) of the Rocky Mountains. The topography is comprised mainly of rolling hills with a series of northwest to southeast elongated ridges across the property. Major river courses and creek beds form alluvial valley floors and are orientated perpendicular to the northwest to southeast orientated ridges and hilltops. The topography in the hilltops and ridges ranges in elevation from 1,000m to nearly 1,500m above mean sea level (amsl). Elevation in the alluvial valley floors is between 700m and 800m amsl. Surface topography contours within and nearby the Bullmoose property are illustrated in Figure 1.5.

Hydrology

Bullmoose Creek is the most significant water course within the property. The creek flows through the center of the property from southwest to northeast. Drainage within the property mostly comprises minor ephemeral creeks that feed the Bullmoose Creek and Wolverine River located a few kilometers to the south of the property.

Weather

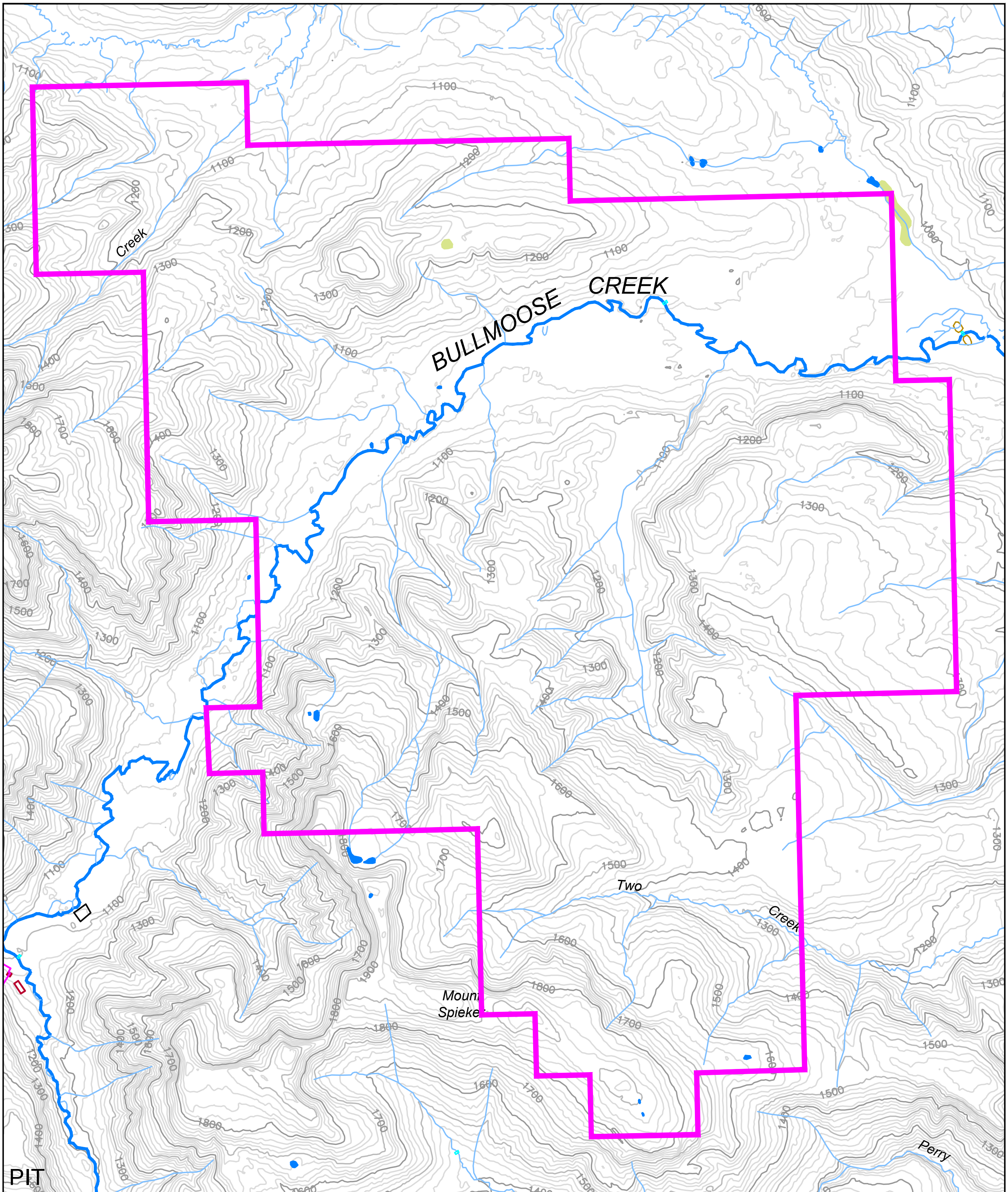
The climate is typical of northeastern British Columbia and is characterized by short, warm summers and long, cold winters. At Tumbler Ridge, the average July and January temperatures are +21º C and –5º C, respectively. The winter temperatures are interspersed with periods of very cold temperatures, in the range of –15º C to –30º C. These cold spells usually occur between January and March. The town averages 334mm of rain and 1.85m of snow per year.

Cooler summer and winter temperatures and higher precipitation can be expected in the mountainous areas that comprise most of the project area. Frost can occur throughout the year, and 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/hour are common on ridge tops and exposed plateaus.

PREVIOUS GEOLOGICAL WORK

Each component of the coal exploration work completed thus far is briefly described below[1].

[1] Exploration methodology for each component is described in more detail in Section 2 of the report



LICENSE AREA

TOPOGRAPHY CONTOUR

DRAINAGE

WATER BODY

WETLAND

N

0 500 1000 1500
FEET

FIGURE 1.5

BULLMOOSE PROJECT

SURFACE TOPOGRAPHY AND DRAINAGE

DATE: 03/21/13	SCALE: 1:2000	NORWEST CORPORATION
FILE: 63-3 figure1.5		

Public Domain Records

Various public domain technical reports describing the geology within and surrounding the Bullmoose property were obtained by Dehua[2]. The information gained from these reports were limited to surface mapping of geology and descriptions of subsurface geology in coal mines located within 20 miles of the Bullmoose property. A list of technical reports and maps obtained by Dehua and used in the compilations of this geologic report is provided in Appendix B.

The surface geological maps were regional in scale and detail, but were useful for correlation of major formations with drillhole records within the property. The direct correlation of subsurface geology described in nearby mines with Bullmoose exploration records[3] was not possible because of the off-strike location of the mines. The description of subsurface geology in nearby coal mines only provided an indication of potential surface and underground mining conditions that could be expected on the property.

Oils and Gas Exploration Data

Previous exploration on the Bullmoose property has been focused on the extraction of oil and gas (O&G) reserves approximately 2,000m below the coal bearing horizons. The information pertinent to coal resource evaluation that could be used from the O&G exploration data was limited to public domain geophysical log data and interpretation of the 2D seismic data within the stratigraphic horizons of the coal-bearing sediments. The locations of the O&G wells and seismic lines have been illustrated in Figure 1.3.

Four O&G wells within and nearby the Bullmoose property were identified as having geophysical log data that could be used for the direct correlation of coal bearing formations with recent Dehua coal exploration drillholes. The resolution of the geophysical log data was insufficient for the accurate identification of individual coal seams.

The coordinate locations for the O&G wells are outlined in Table 1.2.

Challenger Geophysical Ltd. was hired by Dehua to interpret 2D seismic data from three seismic lines purchased by Dehua. The 2D seismic data was purchased by Dehua from Sigma Explorations

[2] These public domain reports can be downloaded for free from the BC government website: www.gov.bc.ca/ener/
[3] Drilling records, 2D Seismic interpretations and regional surface mapping.

Inc. and Olympic Seismic Ltd. of Calgary. The seismic interpretation was used to delineate three major reverse faults within the project boundary as well as to identify areas most suitable for underground extraction of coal. The structural interpretation from the 2D seismic lines appeared to be consistent with regional surface geology plans available in the public records.

Ministry of Energy & Mines note: Longitude values in Table 1.2 are incorrect. UTM location values are correct, however they are in UTM Zone 10 (not 12). The UTM co-ordinates are NAD 83.

Table 1.2 Summary of Drillhole Data

Hole ID	Collar Elevation (m)	Collar Location			
		UTM Zone 12 WGS84		Geographic System	
		Easting (X)	Northing (Y)	Longitude	Latitude
BM-1	1,269	608,778	6,117,736	-109.2912	55.1942
BM-2	1,019	604,436	6,119,567	-109.3587	55.2116
BM-3	1,046	600,795	6,116,073	-109.4171	55.1810
BM-4	1,063	599,396	6,122,711	-109.4367	55.2409
BM-6	991	608,532	6,120,954	-109.2938	55.2232
BM-7	1,084	600,701	6,118,427	-109.4177	55.2021
BM-8	1,035	601,118	6,117,962	-109.4114	55.1979
BM-9	1,031	600,651	6,116,799	-109.4191	55.1875
BM-11	1,069	601,725	6,119,271	-109.4014	55.2095
BM-12	1,130	600,927	6,119,221	-109.4139	55.2092
BM-13	1,178	600,181	6,118,880	-109.4258	55.2063
BM-14	1,365	599,312	6,118,912	-109.4394	55.2068
BM-15	1,255	599,428	6,117,911	-109.4379	55.1978
BM-17	1,245	600,302	6,119,284	-109.4237	55.2099
BM-19	1,366	598,973	6,119,950	-109.4443	55.2162
BM-20	1,285	599,760	6,120,288	-109.4319	55.2190
BM-22	1,060	602,015	6,117,505	-109.3974	55.1936
BM-23	1,038	602,764	6,119,639	-109.3849	55.2126
BM-24	1,160	598,485	6,121,587	-109.4514	55.2310
BM-25	1,167	600,737	6,120,003	-109.4166	55.2163
BM-26	1,093	600,296	6,117,653	-109.4244	55.1953
BM-27	1,066	601,351	6,118,724	-109.4074	55.2047
BM-S1	1,176	602,660	6,116,525	-109.3877	55.1846
BM-S2	1,394	604,734	6,114,804	-109.3557	55.1688
BM-S3	1,398	606,963	6,112,602	-109.3216	55.1485
BM-S4	1,118	605,412	6,117,033	-109.3443	55.1886
BM-S5	1,361	608,425	6,115,688	-109.2975	55.1759
BM-S6	1,342	603,235	6,115,220	-109.3791	55.1728
B093	1,031	600,996	6,123,349	-109.4113	55.2463
A086	1,011	607,150	6,122,438	-109.3149	55.2368
B076	1,059	606,818	6,121,813	-109.3204	55.2313
C086	1,062	599,124	6,113,383	-109.4443	55.1571

Dehua Coal Exploration Drilling

In 2011 Dehua commenced a coal exploration drilling program targeting coal seams within the Gates and Gething Formations. The purpose of the coal exploration program was to acquire sufficient information for the purposes of estimating coal resources and ultimately planning for the establishment of an underground coal mining operation producing metallurgical grade coal on the property.

A total of 28 vertically oriented exploration drillholes were completed by Dehua and these holes were used for estimating coal resources and reserves[4] as outlined in this report. All exploration drilling was undertaken by Dehua geologists. The slim core (~60mm diameter) samples taken by Dehua geologist in the field were subject to detailed coal quality and geotechnical analyses that were conducted by the Hebei Province Research Institute of Coal Geology (Hebei) located in China.

The coordinate locations for the Dehua's exploration drillholes are outlined in Table 1.2 together with the interpreted depths of the Gates Formation and Gething Formation. The location of O&G wells and Dehua exploration holes has been illustrated in Figure 1.3.

Dehua Hydrologic Testing Program

Dehua contracted AMEC Environmental & Infrastructure, a division of AMEC Americas Limited (AMEC), to complete hydrological testing and characterization of the Bullmoose property. The objectives of this program was to obtain a preliminary estimate of hydraulic conductivity and piezometric head from three coal exploration drill sites and to use this data to estimate ground water inflows to underground mine workings. The large diameter (6 inch) hydrologic test wells completed by Dehua were located adjacent to Dehua slim-core exploration holes BM-17, BM-24 and BM-26. The locations of the hydrologic test wells are illustrated in Figure 1.3. Five additional water monitoring wells were completed by AMEC. The location of these five water monitoring wells is discussed in Section 6 of the report.

---
[4] Reserve base only.

Dehua Gas Testing Program

The desorption test samples for the coal-bed methane program were taken from major coal seams within the Gates Formation. A total of 19 gas desorption samples were taken in the field by Dehua geologists. These samples were later analyzed and interpreted by Hebei.

At the time of writing the only sample results that have been received are for 16 samples. Sample weights for three of the samples are currently not available and the final processing of the data cannot be completed at this time.

Norwest reviewed results from Hebei on gas content and composition from holes located in the southern area of the Bullmoose property. The results are non-conclusive as the tests were performed long after the samples were taken and are not representative of n-place conditions.

REVIEW OF EXPLORATION WORK AND QUALITY

In February 2010 Dehua acquired coal exploration licenses for land parcels covering the extent of the Bullmoose property. Shortly thereafter, Dehua initiated a coal exploration drilling program targeting coal bearing horizons identified from surface geologic maps, O&G wells and 2D seismic data. All drilling was completed by Dehua-owned drilling equipment and Dehua personnel with some assistance from AMEC in the completion of the hydrologic test wells. All laboratory analyses[5] completed on drill core samples were conducted by Hebei in China. The locations of all exploration drillholes, hydrologic test wells and 2D seismic lines are illustrated in Figure 2.1.

To date a total of 28 slim core exploration holes and 3 hydrologic test wells have been completed by Dehua for coal resource and reserve base estimates. A total length of exploration drilling completed by Dehua, including open-hole rotary drilling through soft overburden (glacial till) and core drilling through competent rock units, is 22,534m. Summary information and statistics from the Dehua exploration drilling program are outlined in Table 2.1

Table 2.1 Exploration Summary Statistics

Description	Quantity
Exploration drillholes	28
Exploration drilling meterage (m)	22,534
Hydrologic test wells	3
Oil and gas wells	4
Holes with geotechnical analyses	11
Coal quality samples	216
Geotechnical samples	174
Gas desorption samples	19
Number of 2D seismic lines	3
Total length of 2D seismic lines (m)	33,107

The exploration drills holes, supported by surface mapping, O&G drilling and 2D seismic data was used to compile a 3D geologic block model from which coal resource were reported for the Bullmoose coal property. Estimated coal resources for the

[5] Includes coal quality, geotechnical and methane gas analyses

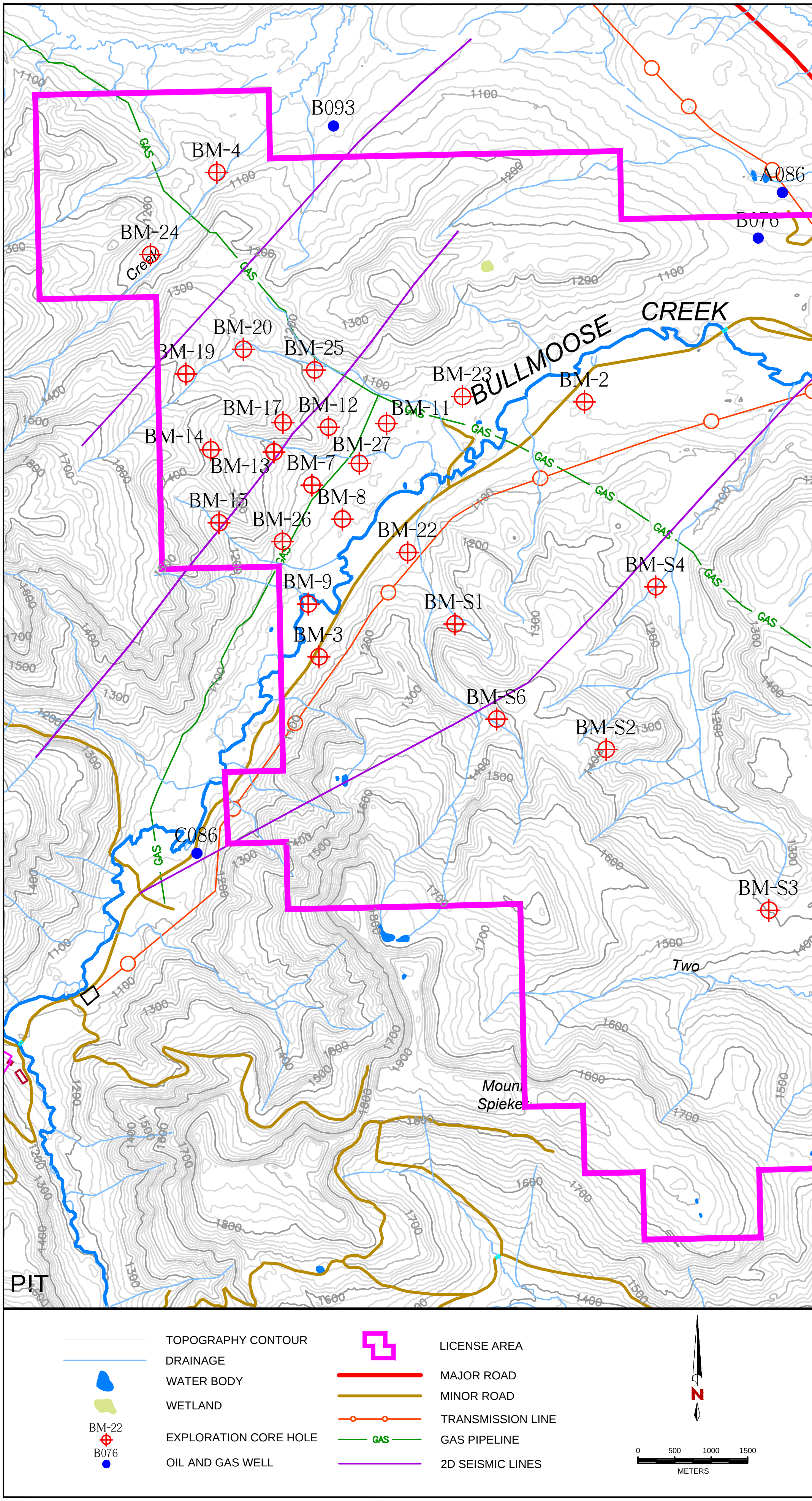


FIGURE 2.1

BULLMOOSE PROJECT

EXPLORATION PLAN

DATE: 03/21/13
FILE: 63-3 figure2.1
SCALE: 1:2000
NORWEST CORPORATION

EXPLORATION METHODS AND THE PROJECT LAYOUT

Selection of Exploration Methods

The selection of coal exploration methods used by Dehua has followed the typical industry standard for northeastern British Columbian coalfields. A literature research and interpretation of O&G exploration data[6] were used to compile a conceptual understanding of the subsurface geology. This information was then used to identify coal exploration target areas. Once there target areas were identified exploration drillhole locations were planned such that there would be an adequate sample density of the coal bearing formations for the estimation of coal resources and conceptual mine planning. The locations of the drillholes were further modified due to access restrictions on account of the topography, drainage and distance from access roads.

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

- Vertically oriented drillholes
- Rotary drilling through soft overburden
- Rotary and slim core drilling through competent units
- Slim core drilling through coal horizons
- Geophysical logging of completed holes
- Final collar survey of drillholes.

All of the above methods are viewed by Norwest as standard practice for coal exploration for northeastern British Columbian coalfields. Each of the above methods will be discussed in more detail in subsequent sections of the report.

Exploration Type

COMPLEXITY OF GEOLOGIC STRUCTURE

The license area is located within the PRC and forms part of the Rocky Mountain Foothills structural belt which lies to the east of the Canadian Rocky Mountain Trend. The Foothills belt is characterized by folded and faulted Mesozoic sediments that are in transition between the relatively gently-dipping, non-deformed formations of the Alberta Plateau to the east and the highly-deformed Rocky Mountain Trend to the west. Typical deformation in the Rocky Mountain belt involves complex and severe faulting, with overturned and convoluted folding that makes mining operations difficult in some places.

[6] Oil and gas wells, plus 2D seismic data

DEGREE OF STABILITY OF THE COAL SEAMS

Coal seams of interest at the Bullmoose property are contained within the Lower Cretaceous Gates Formation of the Fort Saint John Group, a significant unit of the Western Canadian Sedimentary Basin. The majority of coal produced in the PRC is mined from this formation, mostly by surface extraction methods. The Gething Formation is targeted for mining primarily in the very northern portion of the Foothills mining trend.

The Gates Formation represents the cyclical transgressions and regressions of the Late Cretaceous shoreline with the associated marine and non-marine environments of deposition. The lithotypes associated with the Gates Formation include interbedded and intercalated sandstones, siltstones, mudstones, carbonaceous mudstones and coals.

Coal seams from the Gething Formation are between 250m and 450m below the Gates coal measures, and therefore are for the most part beyond a practical mining depth within the property boundary based on drillhole records.

Ten coal seams[7] of consistent thickness were identified from exploration data acquired from the Dehua drilling programs. These seams from top to bottom are designated: BC, B, C, D, E, F, Superior and Trojan. The E seam is split into three sub-seams (splits) namely E1, E2 and E3 making the total of ten discreet seams identified from drilling. The BC Seam is found in the lower Boulder Creek Formation, whilst seams B through E are included in the underlying Gates Formation. The deeper Superior and Trojan Seams are contained within the Gething Formation.

Layout Principles of the Exploration Project

Drilling is the main method adopted for coal exploration and evaluation. Exploration drilling involves integrating lithologic core sample logging, geophysical well-logging, hydrologic testing and detailed laboratory testing of drill core samples for coal characterizations (quality), rock strength and gas testing.

GENERAL PRINCIPLES OF ENGINEERING LAYOUT

The layout of the drilling program is determined by the need to provide sufficient testing data to support a coal resource estimate

[7] Including seam splits

that would satisfy the requirements for a conceptual mine plan and provide the necessary information for future bulk sampling and infill exploration drilling.

LAYOUT PRINCIPALS OF DRILLING ENGINEERING

Drillhole spacing was largely determined by the interpretation of the property's structural complexity from previous geological mapping and O&G exploration (2D Seismic interpretation). Average drillhole spacing was decreased in areas recognized as favorable for underground extraction of coal where the target coal horizons were generally flat lying (<30 degrees dip) and mostly unfaulted. Average drillhole spacing varied from 600m in areas identified as most favorable for underground coal extraction to 2,500m in areas where there is less potential for underground extraction but serve as useful control points for enhanced geologic interpretation.

LAYOUT PRINCIPLES OF THE WELL-LOGGING ENGINEERING

Geophysical well-logging was completed for all drillholes. Weatherford Wireline Geophysical from Red Deer Alberta performed the down hole logging services.

CONSTRUCTION SEQUENCE

The sequence of drilling for the coal exploration drillholes was not dictated by the drillhole number but prioritized on[8]: ease of access, depth to the target horizons and predicted underground mining conditions. The location and drilling sequence of the hydrologic test wells were determined following advice from AMEC as well as targeting those areas where underground mining and bulk sampling had the greatest potential. The three hydrologic test wells were located adjacent to the coal explorations holes that served as test sites for draw-down monitoring.

REVIEW OF EXPLORATION PROJECTS AND QUALITY

Drilling Measuring

Planned drillhole locations were initially marked in the field using hand-held GPS systems. The marked drillhole locations in the field were slightly altered from the original planned locations to account for access constraints such as topography. Final drillhole collar surveys were completed by Integrated ProAction Corp. (IPAC) using a Trimble GNSS R8 RTK survey instrument. Points surveyed with this equipment configuration can be expected to be accurate within 5cm vertically and horizontally according to the

[8] In no particular order

manufacturer's specifications. Survey control was established by IPAC since no pre-existing control sites were identified. The ground positions were recorded in the UTM Zone 10N map projection and have been listed in Table 1.2 as well as Table 2.5 below.

Geological Mapping and Revision Survey

Dehua did not complete any geologic mapping on the property due to limited exposure of un-weathered beds on the surface. However, the identification of coal exploration targets has relied somewhat on publically available surface geologic maps that cover the Bullmoose property. The regional surface geologic map outlined in Figure 2.2 was used by Dehua for drillhole target identification prior to the recently completed drilling program. The regional geological map was compiled by the Geological Survey of Canada from aerial surveys with some field mapping along exposed beds.

The regional geologic map indicates surface exposure of the target Gates Formation to eastern and southern margins of the Bullmoose property. Structural complexity also tends to decrease from the southeast towards the northeast along strike. In the south of the property there is more intense folding with indicated fold axes less than 1km apart. In the central and northern portions of the property there is more open folding with fold axes more up to 4km apart. Illustrated faults within the property are described as thrust structures in northeast and western boundary of the deposit.

Two-Dimensional Seismic Work

Unprocessed data from three 2D seismic lines was purchased by Dehua from Sigma Explorations Inc. and Olympic Seismic Ltd. of Calgary. Dehua contracted Challenger Geophysical Ltd. (Challenger) to process the data and interpret seam depths, fold and fault structures. The locations of the 2D seismic lines are illustrated in Figure 2.1 and the Challenger interpretation report is attached in Appendix C. Figures 2.3 through 2.5 are images taken from the Challenger report illustrating the location of structural interpretation of the and coal bearing formations. Fault traces are indicated in red, the Boulder Creek Formation in pink-magenta, Gates Formation in blue and Gething Formation in green.

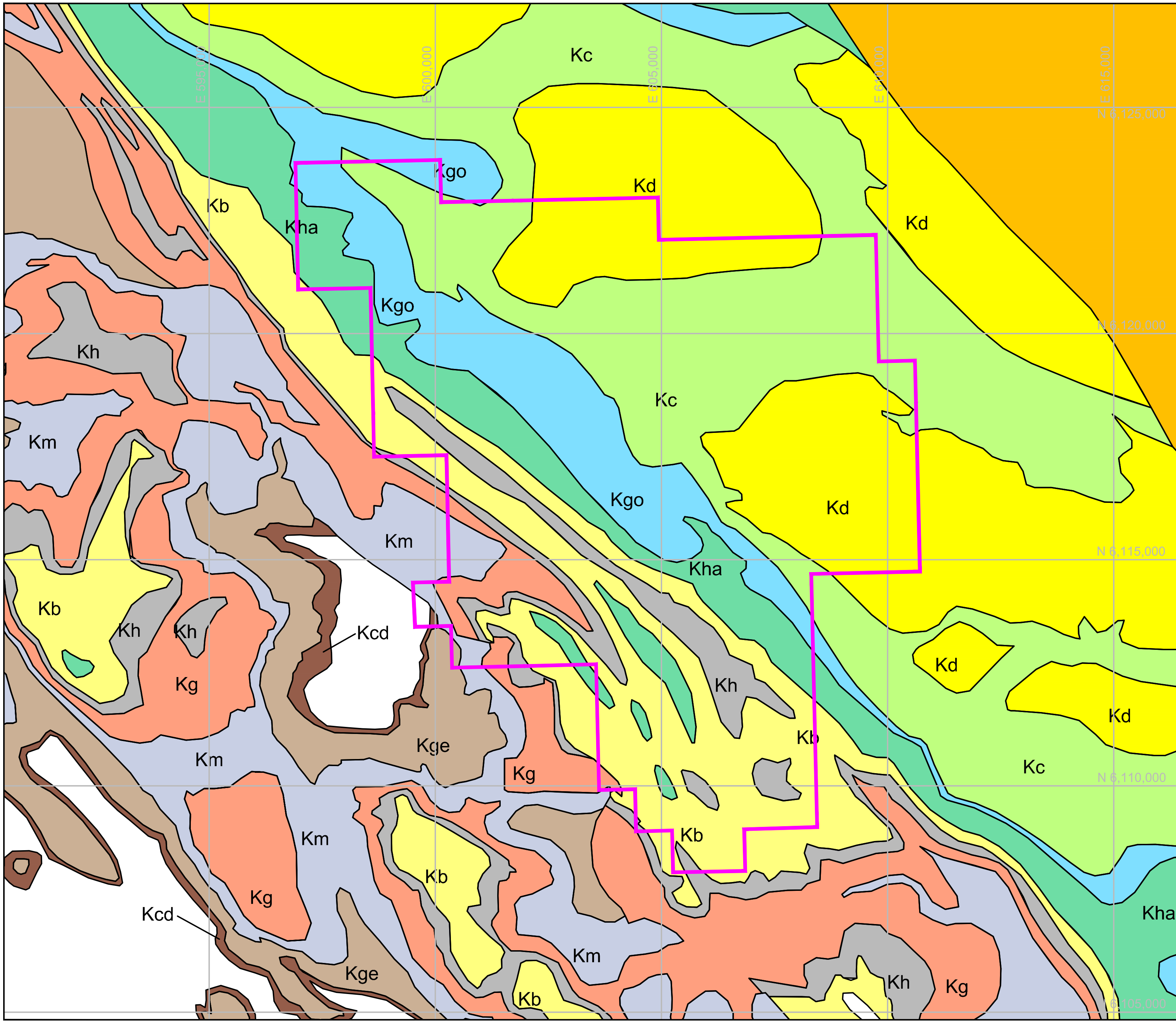


FIGURE 2.2

BULLMOOSE PROJECT
REGIONAL GEOLOGY MAP

Challenger's interpretation was able to confirm the decrease in structural complexity from the southeast to the northwest of the property, with more open folding evident in the northernmost 2D seismic line (Figure 2.3) against the tight folding and more intense faulting observed in the southern-most 2D seismic line (Figure 2.5). Major faults appeared to be southwesterly dipping thrust faults with relatively minor high-angle reverse faults dipping towards the northeast.

Figure 2.3 Challenger 2D Seismic Interpretation CX5-00001

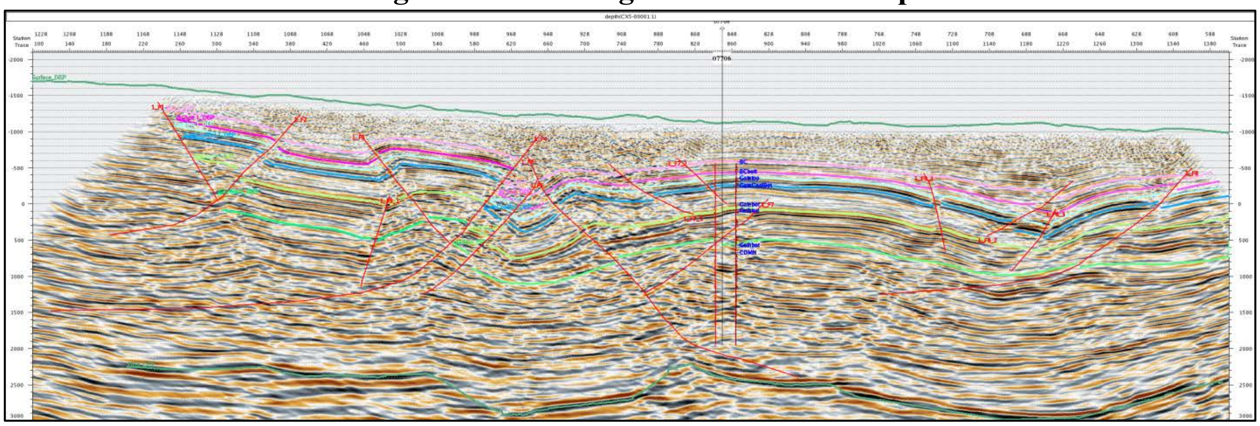


Figure 2.4 Challenger 2D Seismic Interpretation BX26

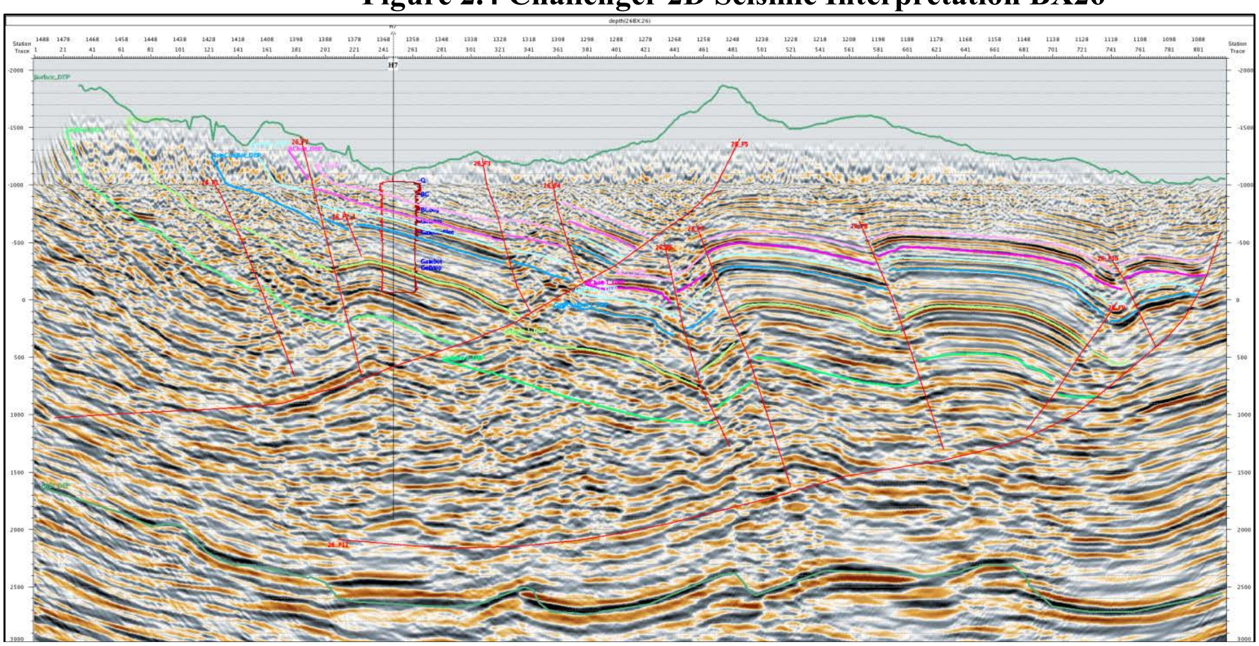
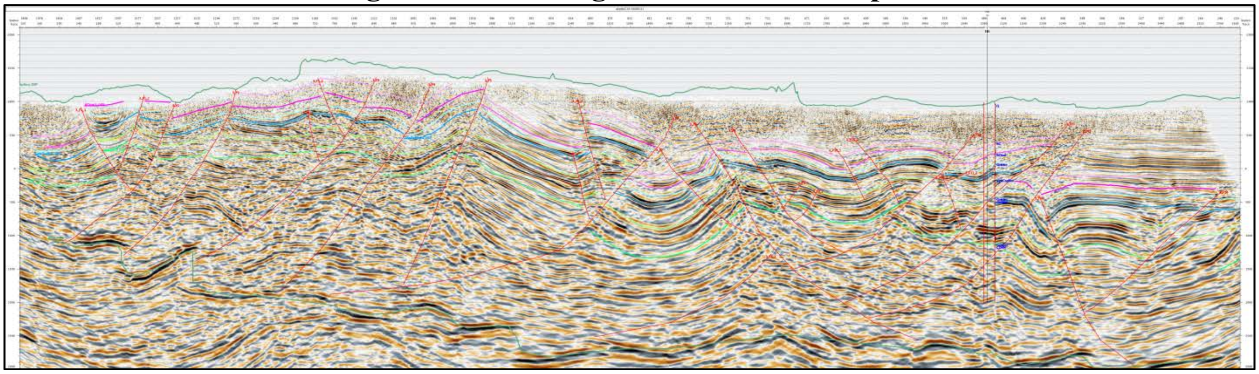


Figure 2.5 Challenger 2D Seismic Interpretation CX5-00003



Drilling Engineering

DRILLING LAYOUT AND ENGINEERING QUANTITY

The regional surface mapping and 2D seismic interpretation was used in the location and planning of Dehua's Bullmoose coal exploration program. A total of 28 drillholes were completed by Dehua. The location of the vertically orientated drillholes has been illustrated in Figure 2.1. A list of the completed drillhole collar coordinates and final depth is provided in Table 2.5. Included in Table 2.5 are four additional O&G wells and hydrologic testing wells. The O&G wells were only used to identify the approximate depths of the major coal-bearing formations.

PROJECT QUALITY

Norwest's observation of the provided Dehua exploration data is that the methods used and overall approach was to industry standards for coal exploration and evaluation. Specific items relating to the drillhole collar surveys, drilling method, core recovery, depth reconciliations, and hole deflections are discussed separately below.

Final collar surveys were completed by a professional surveying company using appropriate GPS survey equipment. This is standard practice and Norwest has no reason to believe that there would be survey errors in the data that would materially impact the results of the coal exploration program.

Ministry of Energy & Mines note: UTM system as listed in this table is incorrect. It is UTM Zone 10, NAD 83. the co-ordinates are correct.
July 3, 2014

Table 2.5 Bullmoose Property Drillhole Locations and Depth

Hole ID	Type	Collar Elevation (m)	Collar Location UTM Zone 12 WGS84 Easting (X)	Northing (Y)	Final Depth (m)
BM-1	Core	1268.63	608777.7	6117736.2	996
BM-2	Core	1018.77	604435.8	6119566.9	1009.99
BM-3	Core	1046.47	600795	6116073.3	882
BM-4	Core	1063.15	599395.64	6122711.04	846
BM-6	Core	991.12	608532.4	6120954.1	1109
BM-7	Core	1083.83	600700.7	6118427.2	1021.7
BM-8	Core	1034.79	601117.8	6117961.6	493.5
BM-9	Core	1030.69	600650.7	6116798.9	663
BM-11	Core	1068.7	601724.6	6119270.9	980
BM-12	Core	1129.5	600926.6	6119221.2	786
BM-13	Core	1178.02	600180.5	6118879.7	553.1
BM-14	Core	1365.28	599311.8	6118911.6	1062
BM-15	Core	1255.23	599428.03	6117910.55	837.86
BM-17	Core	1245.4	600301.75	6119283.75	765
BM-19	Core	1365.97	598972.89	6119950.27	689
BM-20	Core	1284.76	599760.34	6120287.83	952.18
BM-22	Core	1059.99	602014.69	6117505.38	693
BM-23	Core	1037.51	602764.32	6119639.34	747
BM-24	Core	1159.95	598484.77	6121587.44	651
BM-25	Core	1166.74	600736.5	6120003.1	678.77
BM-26	Core	1093.22	600296.3	6117652.5	852
BM-27	Core	1065.84	601351.4	6118724.1	735
BM-S1	Core	1175.79	602660.4	6116524.84	683
BM-S2	Core	1393.75	604733.6	6114804.3	754
BM-S3	Core	1398.38	606963.02	6112602.4	776
BM-S4	Core	1118.29	605411.95	6117033.4	947
BM-S5	Core	1360.57	608425.4	6115688.3	890
BM-S6	Core	1341.6	603234.9	6115220.4	481
B093	Oil & Gas	1031	600996.42	6123348.635	3480
A086	Oil & Gas	1011	607149.8335	6122437.514	4003.5
B076	Oil & Gas	1059	606818.2841	6121813.431	4386
C086	Oil & Gas	1062	599123.6785	6113382.618	1876

The drilling method used by Dehua for coal exploration included open rotary drilling through the unconsolidated sediments followed by either open rotary drilling or wireline core drilling through competent horizons below. Larger HWT (114mm) size holes were completed through the unconsolidated sediments to allow room for PVC casing to prevent the hole from caving. When drilling through competent horizons, the hole diameter was reduced to HQ (88.9mm) up to an approximate 800m depth and then reduced further to NQ (68.9mm) below 800m to improve productivity. There was typically coring within 50m of the expected Gates and Gething Formations. Coring intervals also included the BC seam in the lower Boulder Creek Formation. Dehua's selection of drilling method is industry standard.

Core recovery through the consolidated sandstone and mudstone horizons as observed from core photos is very good. However, as expected core recover through the softer carbonaceous mudstone and coal horizons is viewed as somewhat variable due to the overall structural complexity and syn-depositional deformation that is commonly encountered in the PRC. For this reason, Dehua has relied on wireline geophysical log signatures to make necessary seam depth and thickness adjustments. Norwest assisted Dehua in making these depth corrections and only depth-corrected drillhole data has been used for resource modeling and evaluation.

Norwest observed downhole deviation surveys in 13 of the 28 Dehua exploration holes. The highest deflection of approximately 19^o was observed in hole MB-S6, which is viewed as an outlier given that the next highest deviation from the vertical is only 5^o. The majority of the observed deviations were less than 2^o from vertical. The overall extent of the drillhole deviations is viewed as acceptable given that depth of the holes range from 481m to 1,109m.

Well Logging

Geologic Tasks and the Workload of Well Logging

Attached in Appendix D are Dehua's standard operating procedures (SOP) for well logging. Norwest's summary of key components of Dehua's well logging SOP are discussed briefly below.

- Dehua states that the all onsite geologists should follow coal exploration regulations of Canada and British Columbia. These regulations are outlined in Terms and Conditions attached to each coal exploration license found in Appendix A.

- The geologists should have an understanding of the expected formations to be encountered in each hole, depth to coal-bearing horizons and coring points. Dehua geologists should cooperate with all exploration team members in an efficient and safe manner.
- The acquisition and sorting of all logging records should be done on a timely matter using Dehua's standardized forms. A personnel diary recording the drilling progress is also required.
- The methods used for lithologic and geotechnical logging of core samples as well as recording of core losses and gains is described in the SOP and there is a library of descriptive codes for standardising observations.
- Sampling and handing of core for coal quality analyses, geotechnical testing, gas testing, photography and long term storage is outlined in the SOP.

The Dehua SOP manual in Appendix D is industry standard. The forms and descriptive codes are modified from forms and standards currently being used by Norwest for coal exploration projects in North America, South America and Mongolia.

A summary of the penetrated formations and coal seams as well as the type of sample coverage is provided in Table 2.6.

INSTRUMENT AND EQUIPMENT FOR WELL LOGGING AND METHODOLOGY

Weatherford was contracted by Dehua to complete the post drilling geophysical wireline logging of the drillholes. Measured parameters included: gamma ray[9], neutron, density[10], resistivity, dip angle, well temperature, caliper and well deviation. Table 2.7 provides a summary of the geophysical log parameters tested per hole. Although not all of the available parameters were completed in every hole, the most critical parameters for coal interpretation, gamma and density, were included in all holes.

[9] Natural and induced
[10] Short and long spaced density

Table 2.6 Drillhole Logging and Sample Coverage

Hole ID	Final Depth (m)	Penetrated Formations	Penetrated Coal Seams	Sample Coverage		
				Quality	Geotech	Gas
BM-1	996	3	0			
BM-2	1009.99	4	7	x	x	x
BM-3	882	3	6	x		
BM-4	846	3	1	x		
BM-6	1109	4	4	x	x	x
BM-7	1021.7	6	10	x		x
BM-8	493.5	3	5	x		
BM-9	663	2	5	x		
BM-11	980	6	5	x		x
BM-12	786	4	6	x		x
BM-13	553.1	4	5	x		
BM-14	1062	6	10	x		x
BM-15	837.86	4	7	x		x
BM-17	765	4	6	x	x	
BM-19	689	4	6	x	x	
BM-20	952.18	5	6	x	x	
BM-22	693	4	6	x	x	
BM-23	747	3	0			
BM-24	651	4	6	x	x	
BM-25	678.77	4	6	x		
BM-26	852	4	8	x	x	
BM-27	735	4	5	x		x
BM-S1	683	4	6	x		
BM-S2	754	4	6	x	x	
BM-S3	776	5	10	x	x	
BM-S4	947	3	1	x	x	
BM-S5	890	4	1			
BM-S6	481	3	6	x	x	

Table 2.7 Geophysical Logging Testing Parameters

Hole ID	Gamma Ray	Neutron	Density	Electric Resistivity	Dip Angle	Well Temperature	Caliper	Well Inclination
BM-1								x
BM-2	x	x	x	x	x		x	x
BM-3	x	x	x	x	x		x	x
BM-4								
BM-6	x	x	x	x	x		x	
BM-7	x	x	x	x	x		x	
BM-8	x	x	x	x	x		x	x
BM-9	x	x	x	x	x		x	
BM-11	x	x	x	x	x		x	x
BM-12	x	x	x	x	x		x	
BM-13	x	x	x	x	x		x	
BM-14	x	x	x	x	x		x	
BM-15	x	x	x	x	x		x	
BM-17	x	x	x	x	x	x	x	x
BM-19	x	x	x	x	x		x	
BM-20	x	x	x	x	x		x	
BM-22	x	x	x	x	x		x	x
BM-23								
BM-24	x	x	x	x	x	x	x	x
BM-25	x	x	x	x	x		x	
BM-26	x	x	x	x	x		x	x
BM-27	x	x	x	x	x		x	
BM-S1	x	x	x	x	x		x	x
BM-S2	x	x	x	x	x		x	x
BM-S3	x	x	x	x	x		x	x
BM-S4								
BM-S5								
BM-S6	x	x	x	x	x		x	x

Prior to logging the geophysical contractor was charged with ensuring that all geophysical logging probes were calibrated. When completed, the geologists received hardcopy data in both PDF and tiff format. The data was also presented in softcopy (LAS-file format) for processing by the geologists using software packages such as Strater™.

Dehua's approach and selection of geophysical logging parameters conformed with industry standards.

PHYSICAL CHARACTERISTICS OF THE STRATA

The gamma and density readings were critical for making later adjustments to the driller's depths for true seam depth and thickness measurements. These depth/thickness adjustments were completed by Dehua with some assistance by Norwest prior to geologic modeling and resource estimation.

The natural gamma readings are most useful in separating coal from shale horizons or sandstones from shale horizons because of the higher content of radiation emitting from potassium (K) in shale. Density readings are the most useful for determining coal from non-coal (rock) horizons. Resistivity measurements are most useful in determining the moisture content of the intercepted stata.

Hydrological Geology Work

AMEC Environment and Infrastructure (AMEC) conducted hydrogeological studies in 2012 at the Bullmoose North mine site to obtain data to characterize the groundwater hydrology. As described below, the data were collected for use in calculating potential mine water inflows and for evaluating the suitability of groundwater quality for water supply and disposal.

PACKER TESTING

Packer testing was performed at 20 zones in three exploration drillholes to obtain hydraulic conductivity and piezometric head data. Eight constant head injection tests were done at two locations (WB12-17 and WB12-24) using a triple packer assembly. Four constant head injection tests were done at one site (WB12-26) using a double packer assembly. For each test the flow rate of injected water into the tested geologic unit was recorded while the injection pressure was held constant at five discreet gauge pressures. The hydraulic conductivity was calculated for each tested pressure and a representative hydraulic conductivity was interpreted for each interval.

PIEZOMETRIC HEAD MEASUREMENT

Multi-level piezometers were installed at each of the three drillholes used for the packer tests to estimate piezometric heads adjacent to the proposed underground mine workings. The multi-level systems were installed by Schlumberger Canada using their proprietary Westbay MP38 piezometers. The Westbay systems allowed measurement of piezometric head at multiple zones within each drillhole. After installation of the Westbay systems pressure tests were conducted to produce pressure profiles for each tested interval. Comparison of pressure profiles allowed interpretation of vertical hydraulic gradients and interconnection between water-bearing units.

Small-diameter (50mm) monitoring wells were installed at five locations (SW12-7, SW12-10, SW12-11, SW12-20, and SW12-26) to characterize the piezometric head in the surficial Quaternary sediments and shallow bedrock. At each location the monitoring well screens were installed within the uppermost saturated zone in the unconsolidated sediments. Following development each well was equipped with a non-vented pressure transducer to allow continuous monitoring of hydraulic head pressure.

PUMPING TEST

A pumping test was performed at well PW12-26 to characterize the anisotropy of groundwater flow in the fractured bedrock. A step-rate test was performed first to determine a sustainable flow rate for the constant discharge test. The test indicated a pumping rate of 5gpm could be maintained. Following the step-rate test a constant rate pumping test was conducted at well PW12-26 while head changes were recorded at nearby monitoring well SW12-26 and drillhole WB12-26. At the end of the 72-hour pumping test recovery was monitored in the pumping and observation wells. Data from the test were used to calculate the transmissivity of the Upper Gates Formation and estimate the interconnection with the overlying Quaternary aquifer.

WATER QUALITY ASSAY

Groundwater samples were collected from two pumping wells installed in the Bullmoose North area for use as water supply wells. The samples were delivered to an analytical laboratory for chemical analysis. The analytical data can be used to determine the suitability of the groundwater for makeup water or other mine-related uses or, conversely, treatment requirements for discharge.

Sampling and Testing of the Coal Seams and Rocks

In this section the basic geotechnical, coal quality and gas sampling procedures are described.

Dehua's geotechnical field sampling procedures (rules):

- When coring more than 50m above the Gates coal series[11] and Gething coal series, one sample within a uniform lithologic unit is taken every 20m.
- When coring within 50m above the Gates coal series[12] and Gething coal series, a minimum of two samples within a lithologic unit is taken every 6m.

[11] Including BC Seam

- Sampling immediate roof and floor of each coal seam is completed only for those coal seams greater than 0.6m thick. Each roof and floor sample should represent a uniform lithologic unit having a maximum thickness of up to 0.3m.
- Each sample is wrapped with plastic and foam and prevented from freezing.

Coal and rock parting field sampling procedures (rules) for quality testing are summarized as follows:

- For coal seams with partings greater than 0.5m, describe and take samples for both the upper and basal parts of the coal seam.
- Only coal seams with thickness greater than or equal to 0.7m are to be sampled.
- Take coal samples in regular segments based on the length of the coal core.
- Coal samples should be isolated from partings.
- For coal seams that are less than or equal to 1.0m ta single sample is taken.
- For coal seams that are greater than 1.0m, but smaller or equal to 4.0m, two separate coal samples are taken.
- For coal seams that are greater than 4.0m, one sample is to be taken for every 2m of coal core. If the residual length is less than 0.3m in length, than include the residual in the previous coal sample. For instance, 4.25m coal seams should be separated into 3 samples, and the third sample should be 2.25m in length.
- Samples will be promptly sealed in plastic bag to prevent moisture loss;
- Samples for coal gas desorption tests will be collected from selected wells by relevant staff.

The desorption test samples for the coal-bed methane were taken from major coal seams within the Gates Formation and the lower Boulder Creek Formation. A total of 16 gas desorption samples were taken from the major coal seams. Sample weight ranged from 300g to 600g, with an average of 414g. Sample length ranged from 0.1 to 0.20m, with an average of 0.13m. Sample depth ranged from 226.5m to 1,062m, with an average of 553m.

---

[12] Including BC Seam

For more information on sampling and handling procedures, refer to Dehua's field SOP manual in Appendix D.

Geological Record and Synthetical Arrangement of the Data

METHODOLOGY, PROCESS AND QUALITY OF THE DRILLING GEOLOGICAL RECORD

This section covers key aspects of the basic field operational procedures for receiving and describing drill core by the Dehua geologists during the operation of drill rig. As interpreted from Dehua's field SOP manual, Norwest understands that the following procedures were followed by Dehua's geologists:

- The geologists standardize all geological data records, samples collection and packing and core storage prior to and during the drilling program.
- Accurate checking, calculation and recording of drilling progress, total depth, and core recovery was performed, and appropriate supervision was to be done to ensure minimal core loss as a result of drilling technique (drilling operator error).
- Proper coordination of methane gas sampling in coal seam and wireline logging was to be coordinated.
- Coring points and seam intercept prognoses were predetermined based on geological interpretation prior to drilling. Coring was typically started 50m above the Gates and Gething coal zones.
- The Core logging procedures were as follows:
  - Core Run Alignment
  - Core Run Cleaning
  - Core Run Measurement
  - Core Run Fracture/Joint and RQD Recording
  - Core Run Photography
  - Marking Core Sample Interval (Rock and Coal)
  - Core Description
  - Rock/Coal Sampling
  - Packing Cores and Samples.

For more information on the receiving and description of drill core please refer to Dehua's field SOP manual in Appendix D.

COLLATION AND RESEARCH OF GEOLOGICAL DATA

Prior to the sighting (marking) of each drillhole in the field, Dehua had compiled a conceptual geologic model of the Bullmoose property. This model was comprised of a surface geologic map derived from the BC Ministry of Mines as well as a structural interpretation of the three 2D seismic lines across the property. This data was used to predict the approximate depth of the target coal horizons for each drillhole. As drilling progressed the geologists gained more experience in identifying marker horizons. Regular updating of the conceptual geologic model with the new information resulted in better placement of outstanding drillholes and more accurate predictions of depths to coal horizons.

After completion of each drillhole, the geologist's field log sheets were scanned to PDF and stored both as paper copies and electronic PDF format. The handwritten logs were then re-typed into MS Word and MS Excel forms. English translations of these typed forms, plus original handwritten field logs were provided to Norwest for review. The overall quality of the information provided to Norwest for review conformed to current coal industry standards.

Examples of the field logging forms are provided in Dehua's SOP manual found in Appendix D.

STORAGE OF THE GEOLOGICAL DATA AND SAMPLES

All original hardcopy forms and electronic copies[13], laboratory certificates and core photos are stored at Dehua offices in Tumbler Ridge or Vancouver. Retained, unsampled drill core is stored in core boxes at the BC government core repository in Fort St John, per provincial regulations.

[13] PDF, TIFF and JPG format files

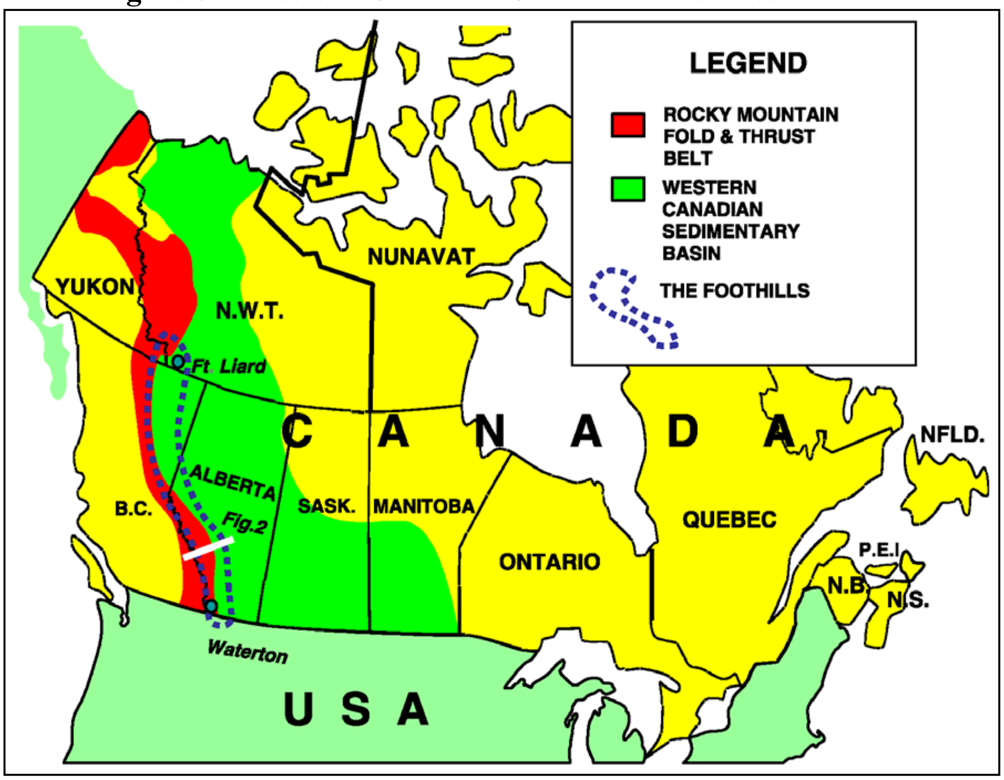
REGIONAL GEOLOGY AND GEOLOGY OF THE EXPLORATION AREA

REGIONAL GEOLOGICAL CHARACTERISTICS

Regional Stratum

The license area is located within the Peace River Coalfield (PRC) and forms part of the Rocky Mountain foothills structural belt which lies to the east of the Canadian Rocky Mountain Trend. The Foothills belt is characterized by folded and faulted Mesozoic sediments that are in transition between the relatively gently-dipping, non-deformed formations of the Alberta Plateau to the east and the highly-deformed Rocky Mountain Trend to the west, as located in Figure 3.1. Typical deformation in the Rocky Mountain belt involves complex and severe faulting, with overturned and convoluted folding that makes mining operations extremely difficult in some locations. The Foothills domain is less structurally disturbed than the Rocky Mountain Belt but does contain faulted and folded strata that can present challenges to mining operations.

Figure 3.1 Western Canadian Structural Provinces



From Newson, 2004

The two main coal-bearing units occurring throughout the Foothills region are the Gates and Gething Formations. The Lower Cretaceous age coal seams from these two formations were subjected to varying depths of burial prior to Laramide[14] deformation and mountain-building episodes. The subsequent structural deformation during the mountain-building episodes resulted in increased pressures and heat flows that have imparted metallurgical properties to the coal seams as evidenced from the vitrinite reflectance, swelling characteristics and overall maturity of the coal seams.

Most of the coal seams of interest within the Bullmoose property are contained within the Lower Cretaceous Gates and Gething Formations of the Fort Saint John Group, a significant unit of the Western Canadian Sedimentary Basin. The majority of coal produced in the PRC is mined from the Gates Formation, mostly by surface extraction methods. The Gething Formation is targeted for mining primarily in the very northern portion of the Foothills mining trend, while the Gates Formation coals represent the economic deposits of the central and southern regions of the PRC.

The Gates and Gething Formations represent cyclical transgressions and regressions of the Late Cretaceous shoreline with the associated marine and non-marine environments of deposition. The lithotypes associated with the Gates Formation include interbedded and intercalated sandstones, siltstones, mudstones, carbonaceous mudstones and coals.

A summary of the typical stratigraphy for the PRC can be found in Table 3.1.

[14] Most of the tectonic deformation in the area is result of the collision of the Pacific and North American plates between 70 and 40 million years ago and is generally referred to as Laramide orogeny (mountain building event).

Table 3.1 Upper Jurassic-Upper Cretaceous Stratigraphy of NE British Columbia

Upper Cretaceous		Dunvegan	Fine- to course-grained sandstone; conglomerate; carbonaceous shale; coal
Lower Cretaceous	Fort St. John	Cruiser	Dark grey marine shale with sideritic concretions; minor sandstone
		Goodrich	Fine-grained, cross-bedded sandstone; shale; mudstone
		Hasler	Silty dark grey marine shale with sideritic concretions; minor sandstone and pebble conglomerate; siltstone in lower part; basal pebble layer
		Boulder Creek	Fine-graned, well-sorted sandstone; carbonaceous sandstone; massive conglomerate; siltstone; marine and nonmarine mudstone; minor coal
		Hulcross	Dark grey marine shale and siltstone, with sideritic concretions
		Gates	Fine-grained, well-sorted marine and nonmarine sandstones; carbonaceous sandstone and mudstone; coal; shale; minor conglomerate
		Moosebar	Dark grey marine shale with sideritic concretions; siltstone; glauconitic sandstone; chert pebble conglomerate at base (Bluesky Member)
	Bullhead	Gething	Fine- to coarse-grained, brown, calcareous, carbonaceous sandstone; coal; carbonaceous shale and conglomerate; siltstone
		Cadomin	Massive conglomerate with chert and quartz pebbles; minor coarse-grained sandstone, carbonaceous shale, and coal
	Regional Erosional Unconformity		
Jurassic	Minnes		Quartzose sandstone; fine-grained sandstone; silty shale; mudstone; minor carbonaceous sediments

Modified from Stott (1982) and Kelman & Hovis (2007)

The western margin of the Foothills belt is considered to be defined by the easternmost major fault which thrusts Paleozoic strata over Mesozoic strata. The eastern margin is a series of en echelon thrust faults which separate the folded and faulted strata of the Foothills from the gently dipping strata of the Alberta Plateau (Holland, 1976). Structural deformation is considerable near the western margin of the Foothills and diminishes in extent and complexity toward the eastern margin.

GEOLOGY OF THE EXPLORATION AREA

Stratum in Bullmoose Exploration Area

The primary units occurring within the Bullmoose property primarily range between the Hasler and Gething Formations. Units penetrated by drilling to date within the tenure typically begin in the Upper Fort St. John units and terminate in the Gething Formation. The O&G wells target the considerably deeper lower Paleozoic units, and penetrate the full Mesozoic sequence.

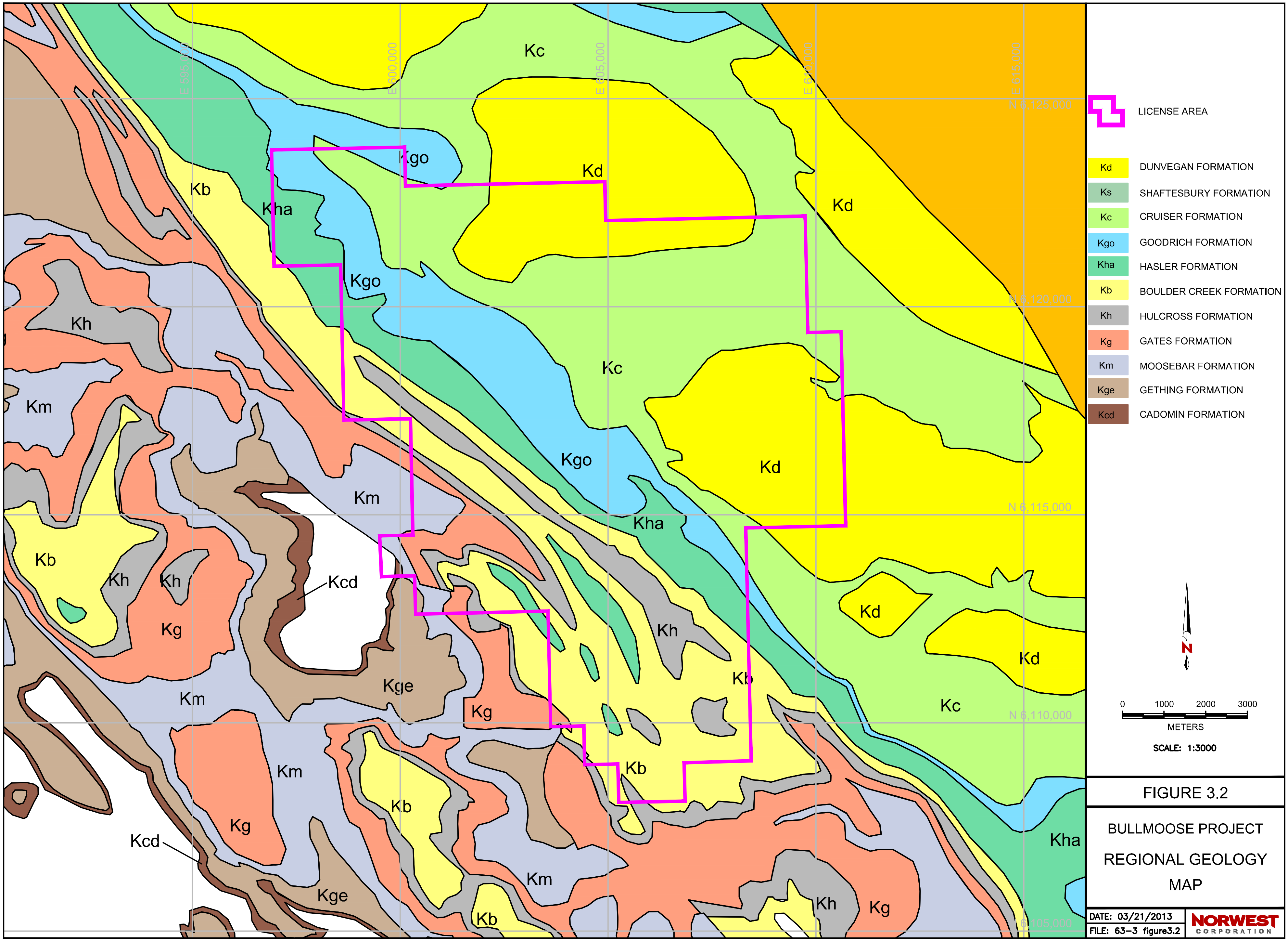
The targeted coal seams within the Bullmoose property are the coal seams within the Boulder Creek Formation, Gates Formation and Gething Formation. There is only a single seam (BC Seam) of consistent thickness within the Boulder Creek Formation and is typically located approximately 120m above the Gates Formation's upper seams. Coal seams from the Gething Formation are between 250m and 450m below the Gates coal measures.

Based on current exploration drillhole information, the coal seams of consistent and mineable thickness comprise eight major seam groups. The BC Seam is found in the lower Boulder Creek Formation and Seams B, C, D, E and F are included in the underlying Gates Formation. The E Seam is divided into three sub-seams (splits), namely E1, E2 and E3.The remaining and deepest seams are the Superior and Trojan Seams which occur in the Gething Formation.

Structural Features of the Exploration Areas

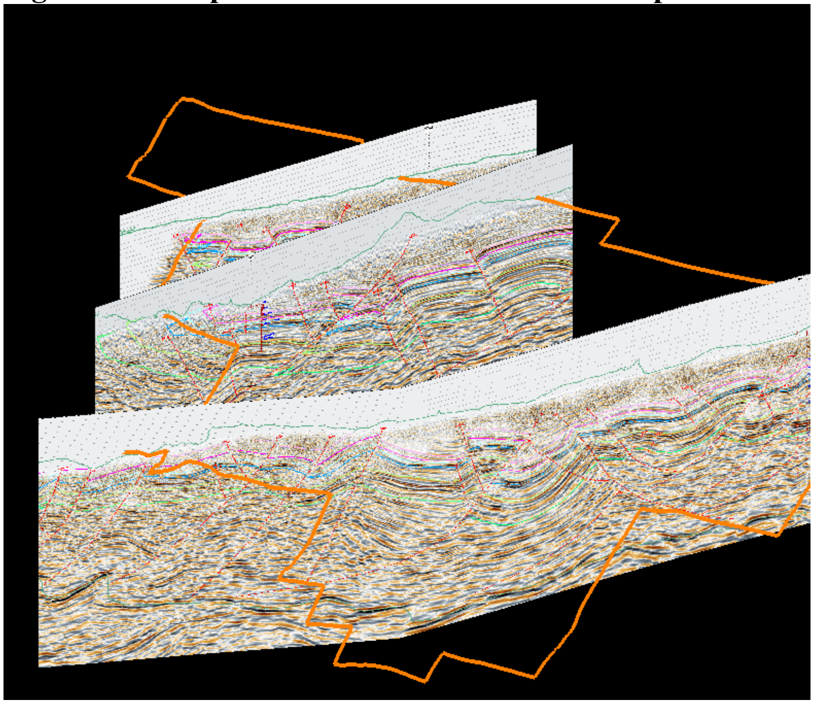
The Bullmoose property structural features are similar to that encountered on Dehua's Murray River property located approximately 30km southeast but along strike of the Foothills belt. The structural regime on the property comprises a series of westerly dipping thrust faults with numerous high-angle easterly dipping reverse faults displacing beds on the limbs of folds.

Regional mapping completed by the Canadian Geological Survey indicated an increase in structural complexity from north to south within the property as illustrated in Figure 3.2. The regional surface mapping did not delineate the thrust faults interpreted from 2D seismic surveys but nevertheless the overall geometry of folding is confirmed from the 2D seismic data. Figure 3.3 is a perspective view of the 2D seismic interpretation through the center of the Bullmoose property.



Kc
Kd
Kgo
Kha
Kb
Kh
Km
Kg
Kge
Kcd
N 6,115,000
N 6,110,000
LICENSE AREA
Kd DUNVEGAN FORMATION
Ks SHAFTESBURY FORMATION
Kc CRUISER FORMATION
Kgo GOODRICH FORMATION
Kha HASLER FORMATION
Kb BOULDER CREEK FORMATION
Kh HULCROSS FORMATION
Kg GATES FORMATION
Km MOOSEBAR FORMATION
Kge GETHING FORMATION
Kcd CADOMIN FORMATION
N
0 1000 2000 3000
METERS
SCALE: 1:3000
FIGURE 3.2
BULLMOOSE PROJECT
REGIONAL GEOLOGY
MAP
DATE: 03/21/2013
FILE: 63-3 figure3.2
NORWEST CORPORATION

Figure 3.3 Perspective View of 2D Seismic Interpretations



FOLDS

The form and intensity of folding within the Bullmoose property is directly related the compressional regime in place during the Laramide mountain building episode producing the Foothills Belt. The folds represent parts of stacked thrust fault ramp structures and typically have flat tops where reverse faults are more widely spaced, i.e. more than 1km apart. It is the tops of these large thrust-induced fold structures that are potential targets for underground mining because of favorable depths[15] and generally low seam gradient[16].

In the southern portion of the property there is more intense folding with interpreted fold axes less than 1km apart. In the central and northern portions of the property there is more open folding with interpreted axes approximately 4km apart. Indicated faults within the property are described as thrust structures in the northeast and western boundary of the deposit. Fold axes are interpreted to be mostly upright and strike northwest to south east across the property. The fold axes follow regional structural trends.

[15] Less than 1,000m below surface
[16] Less than 20 degrees

Bedding inclinations along fold limbs taken from drill core samples varied from between 20 degrees for open folds to 60 degrees for more steeply dipping areas. Bedding inclination measurements taken from drill cores by Dehua geologists were observed to be inconsistent down the vertically oriented drillholes. These inconsistencies are not uncommon within the Gates and Gething Formations and are due to a combination of factors:

- Syn-depositional [17] deformation of the sedimentary units
- Competency contrasts between soft mudstone units and harder, less compactable sandstones and conglomerates
- Difficulty in separating cross-bedding versus horizontal bedding from narrow[18] core samples.

FAULTS

The type and extent of faulting within the Bullmoose property is largely determined from the 2D Seismic interpretation and subsequent Dehua drilling program. Challenger's interpretation of the 2D Seismic survey illustrated two distinct fault orientations. The first phase of faulting appears to be the development of easterly dipping reverse faults that appears to be associated with folding during the first stages of regional compression. These reverse faults were later offset by westerly dipping large displacement thrusts that have uplifted the coal bearing formations to practical mining depths.

Figures 3.4 through 3.6 are images taken from the Challenger report illustrating the location of structural interpretation of the coal bearing formations. The two phases of faulting can be observed in these figures. Fault traces are indicated in red, the Boulder Creek Formation in pink-magenta, Gates Formation in blue and Gething Formation in green.

[17] Soft sediment deformation prior to lithification
[18] Less than 60mm diameter

Figure 3.4 Challenger 2D Seismic Interpretation CX5-00001

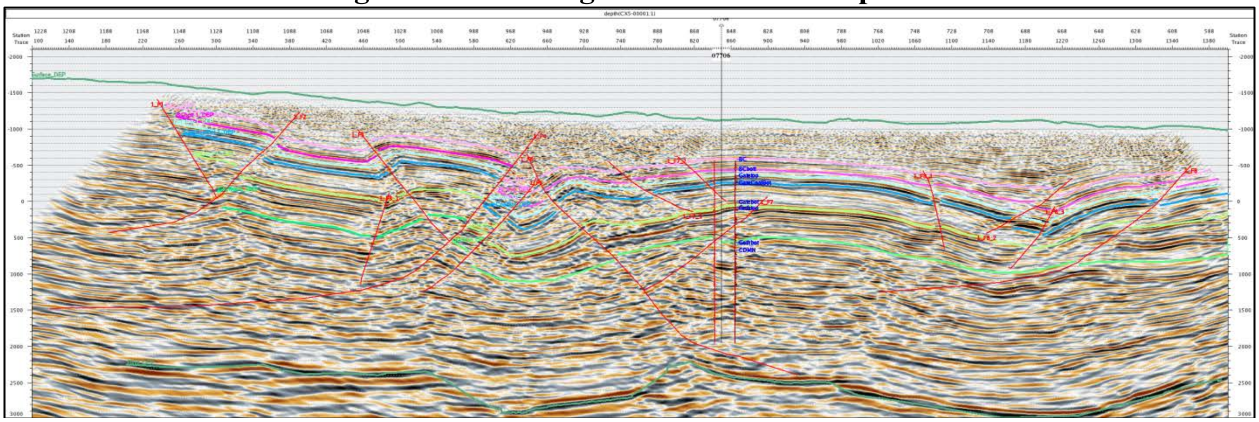


Figure 3.5 Challenger 2D Seismic Interpretation BX26

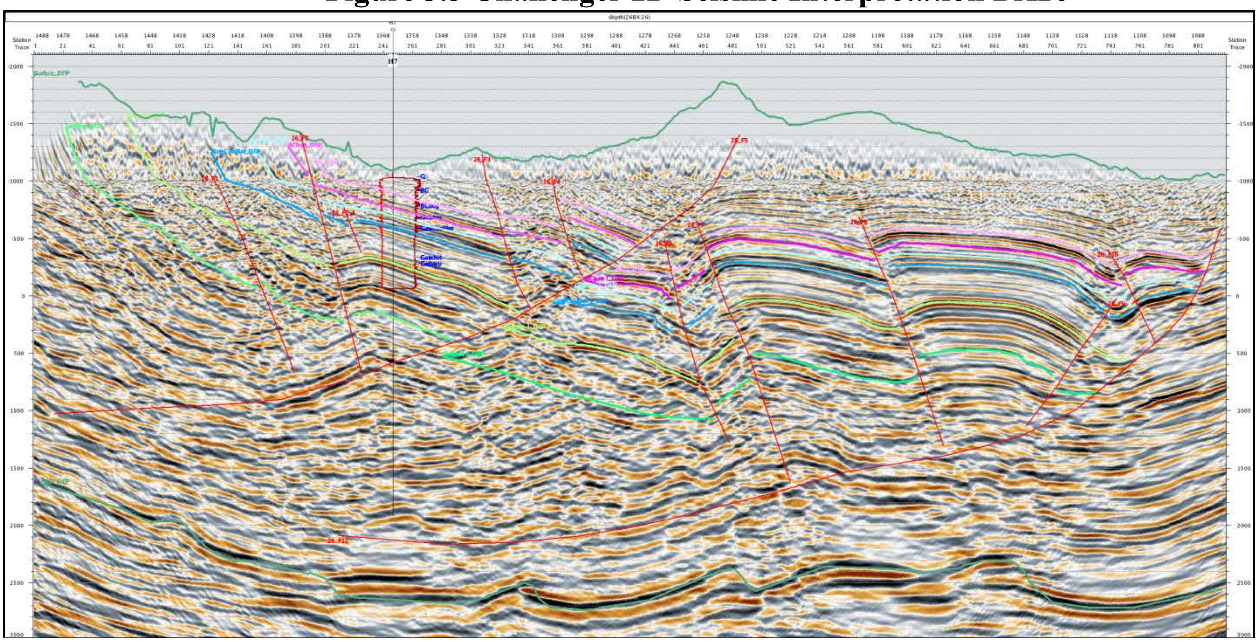
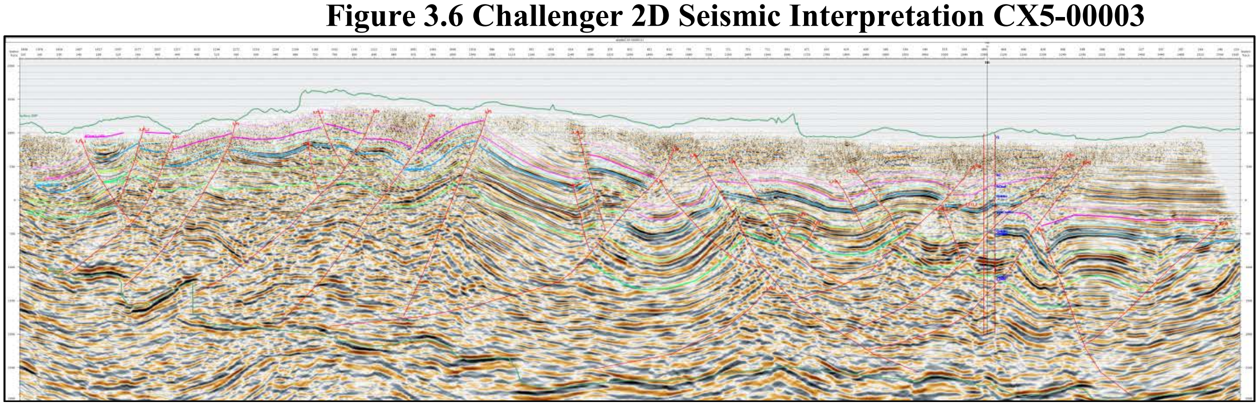


Figure 3.6 Challenger 2D Seismic Interpretation CX5-00003



The severity of faulting interpreted from the 2D Seismic data was not confirmed in Dehua's exploration drilling program. Norwest is of the opinion that the degree of accuracy in seismic survey interpretations is approximate, especially at relatively shallow depths from surface where impacts of groundwater may negatively impact the resolution of strata continuity.

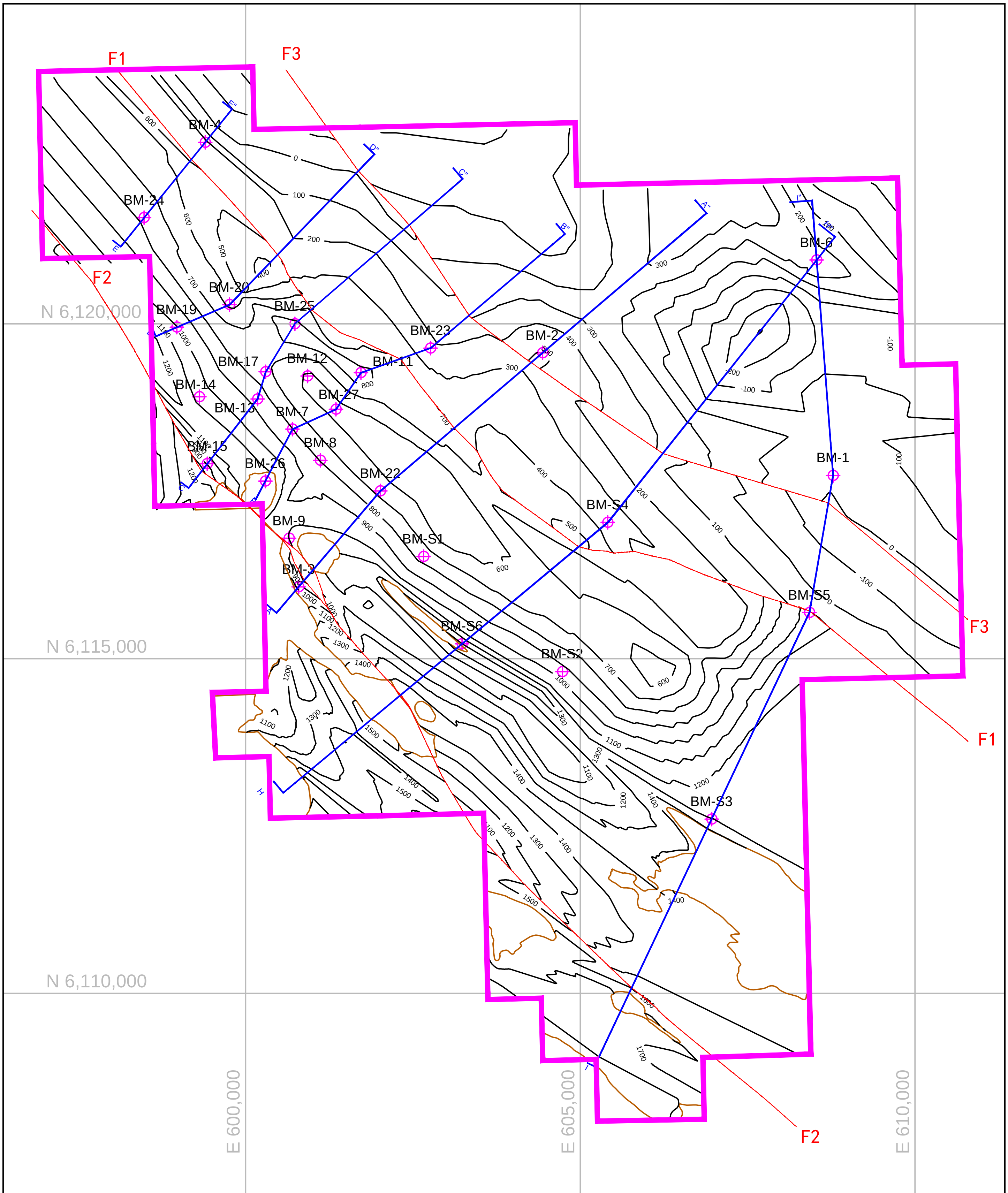
Nevertheless, Dehua geologists were able to confirm the approximate location of three major thrust faults striking northwest to southeast across the property. These thrust faults are labeled F1, F2 and F3 in Figure 3.7, the BC Seam floor elevation contour plan compiled by Dehua geologists. Similar floor elevation contour plans for the D Seam and E1 Seam are illustrated in Figure 3.8 and Figure 3.9 respectively, also compiled by Dehua geologists.

The locations of seven geologic cross-sections drawn perpendicular to regional strike are illustrated in Figure 3.10 through 3.16. These cross sections are ordered from north to south across the Bullmoose property. These seam floor elevation plans and geologic cross-sections were provided to Norwest by Dehua and formed the basis for the construction of a 3D block model and coal resource estimate that is described in Section 9 of this report.

The estimated dip and displacement for each of the three main faults illustrated in the plans and sections (Figures 3.7 through 3.16) is outlined in Table 3.2. These three faults define four main fault blocks within the property. These faults blocks are labeled Block 1 through Block 4 from west to east and are illustrated in Figure 13.17.

Table 3.2 Fault Inclinations and Displacement

Section	Inclination (degrees)			Vertical Displacement (m)		
	F1	F2	F3	F1	F2	F3
E-E' (North)	65			400		
D-D'	65		64	400		150
C-C'	65	77	64	240	350	150
B-B'	52		64	350		150
A-A'	52	54	64	260	130	150
H-H'	40	54	64	220	120	150
I-I' (South)	40		64	830	70	150



LICENSE AREA

DRILLHOLE

ELEVATION CONTOUR

FAULT

SECTION LINE

N

0 500 1000 1500

METERS

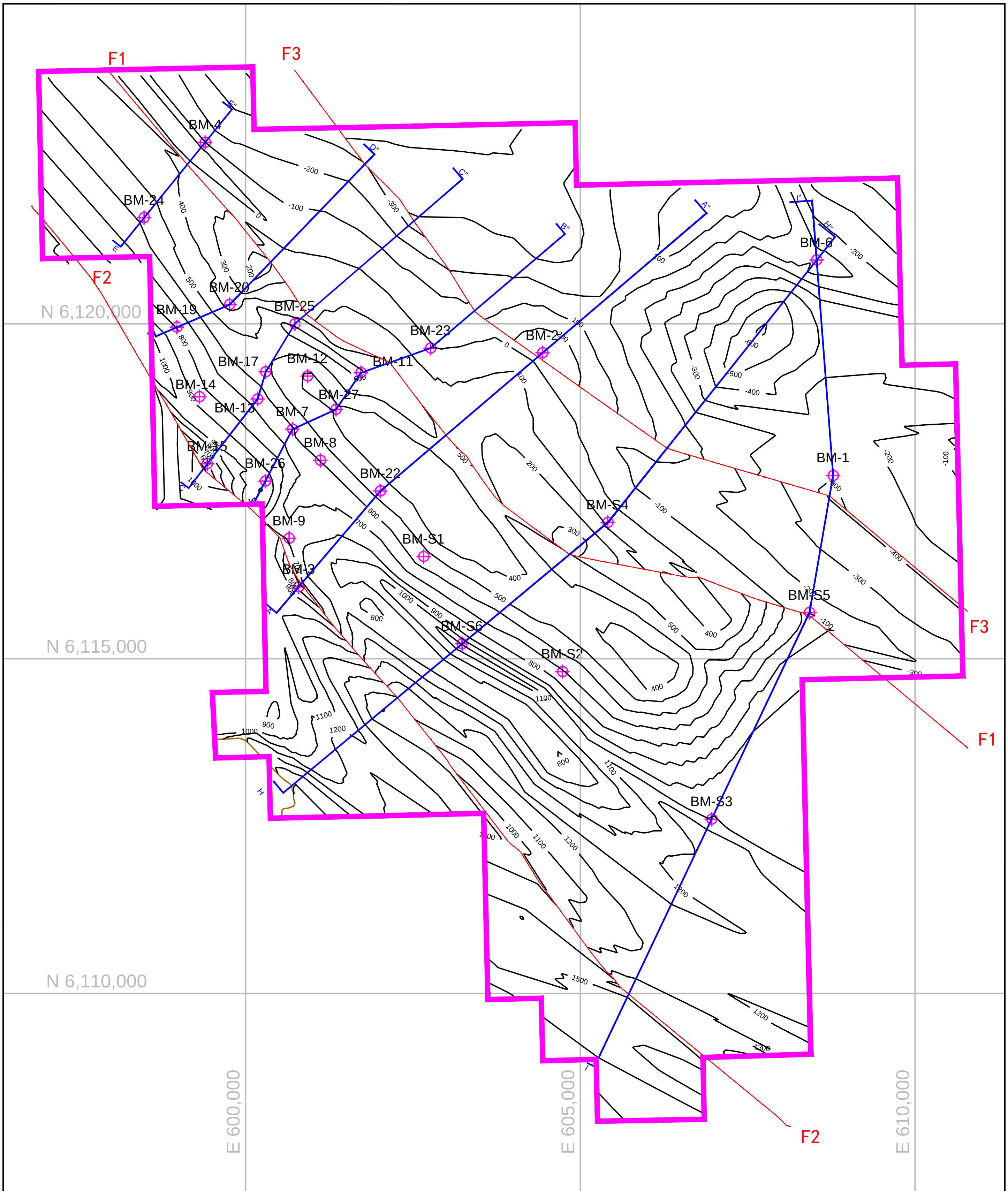
FIGURE 3.7

BULLMOOSE PROJECT

BC SEAM

FLOOR STRUCTURE PLAN

DATE: 03/21/2013	SCALE: 1:2000	NORWEST CORPORATION
FILE: 63-3 figure3.7		



LICENSE AREA

BM-2 DRILLHOLE

200 ELEVATION CONTOUR

FAULT

SECTION LINE

N

0 500 1000 1500
METERS

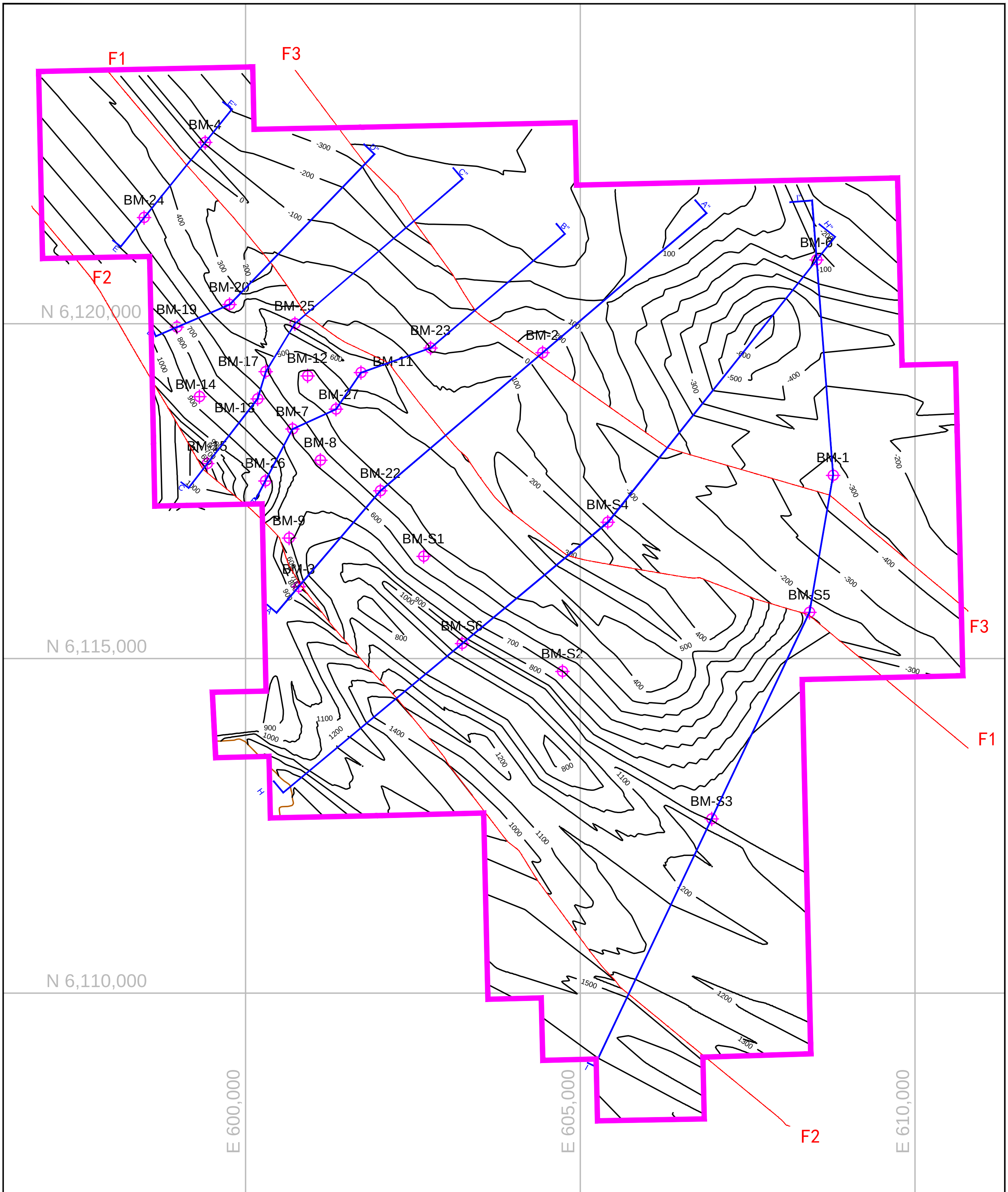
FIGURE 3.8

BULLMOOSE PROJECT

D SEAM

FLOOR STRUCTURE PLAN

DATE: 03/21/2013	SCALE:	NORWEST CORPORATION
FILE: 63-3 figure3.8	1:2000	



LICENSE AREA

DRILLHOLE

ELEVATION CONTOUR

FAULT

SECTION LINE

N

0 500 1000 1500

METERS

FIGURE 3.9

BULLMOOSE PROJECT

E1 SEAM

FLOOR STRUCTURE PLAN

DATE: 03/21/2013	SCALE: 1:2000	NORWEST CORPORATION
FILE: 63-3 figure3.9		

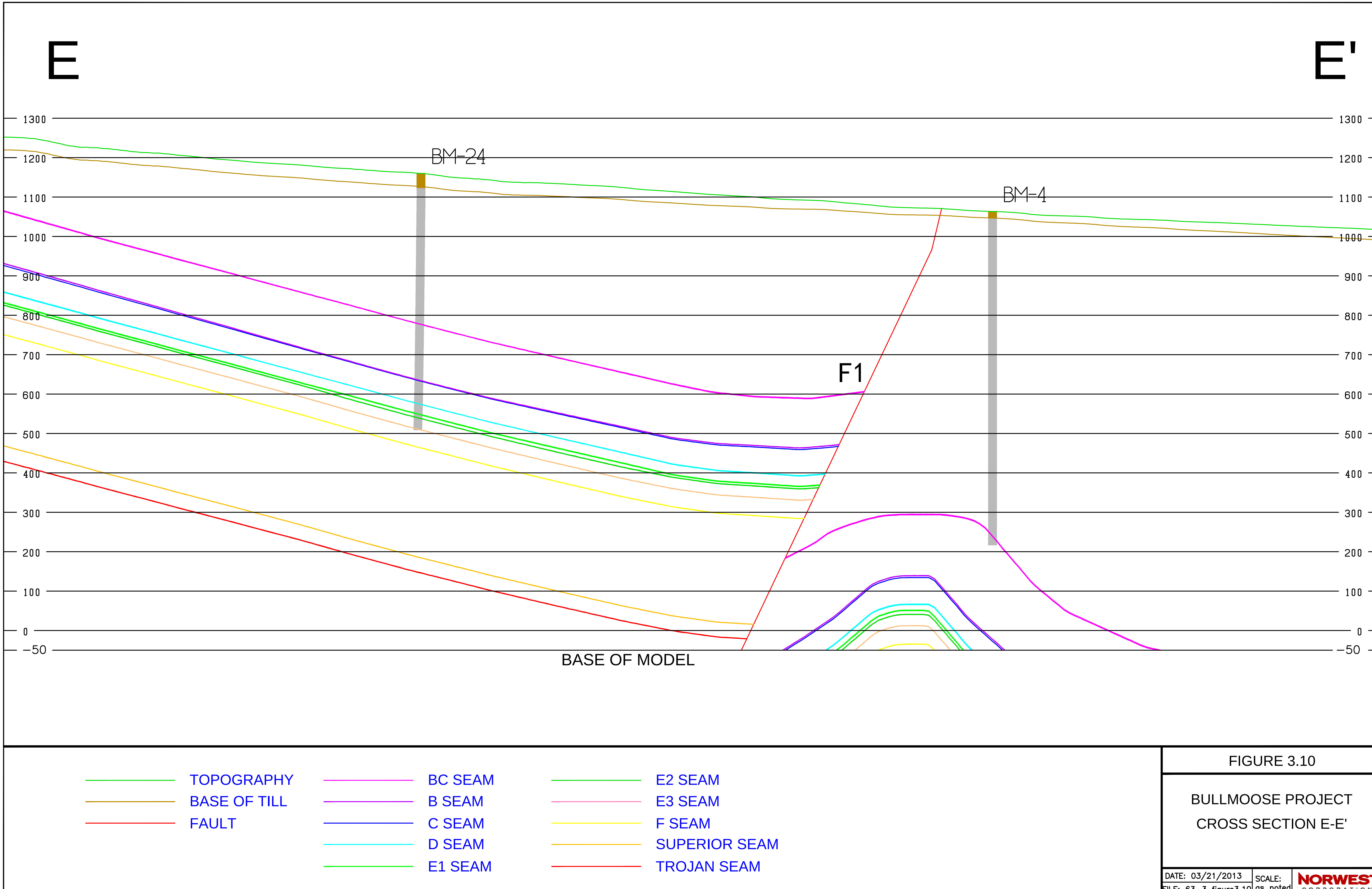


FIGURE 3.10

BULLMOOSE PROJECT

CROSS SECTION E-E'

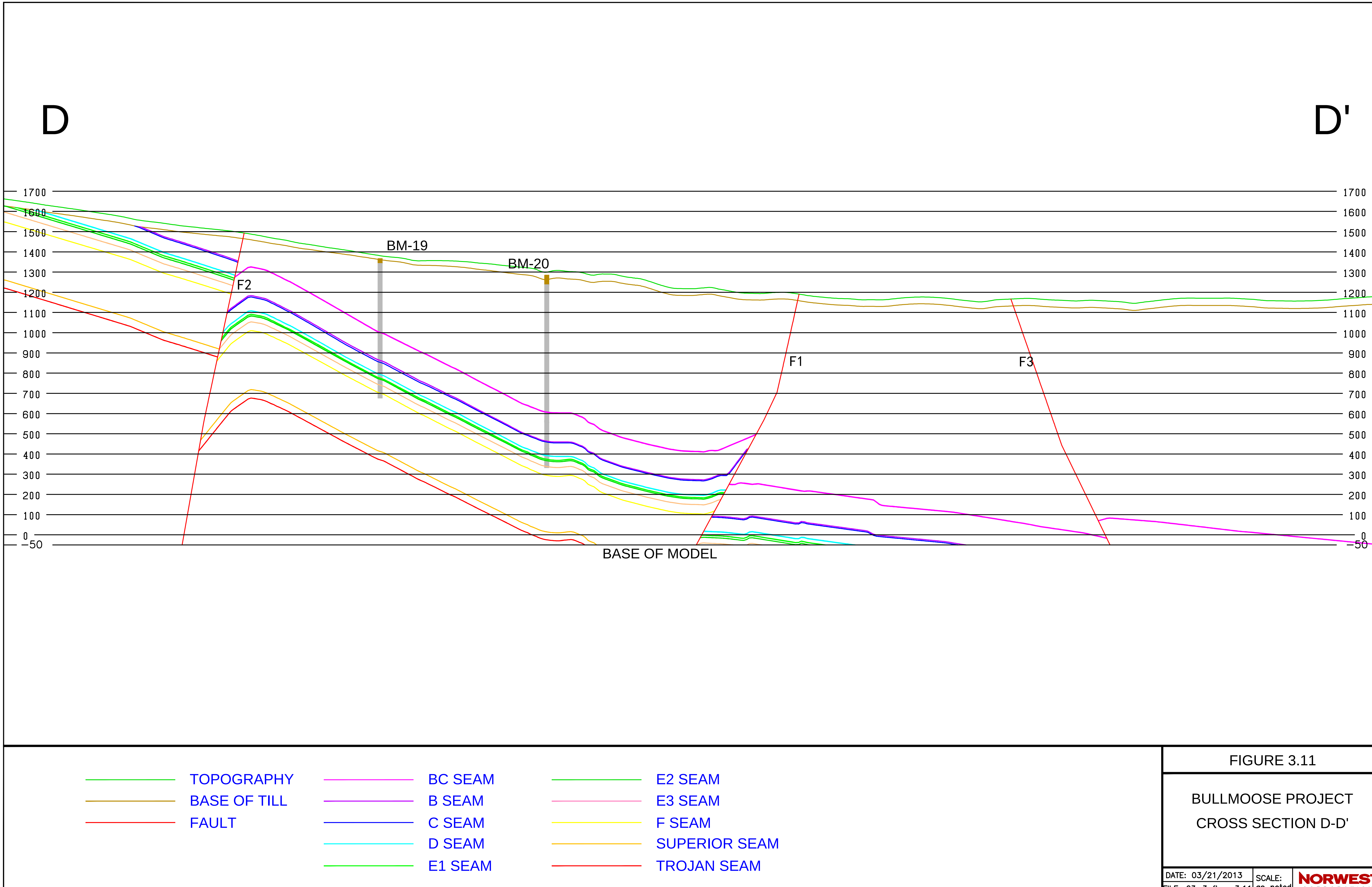
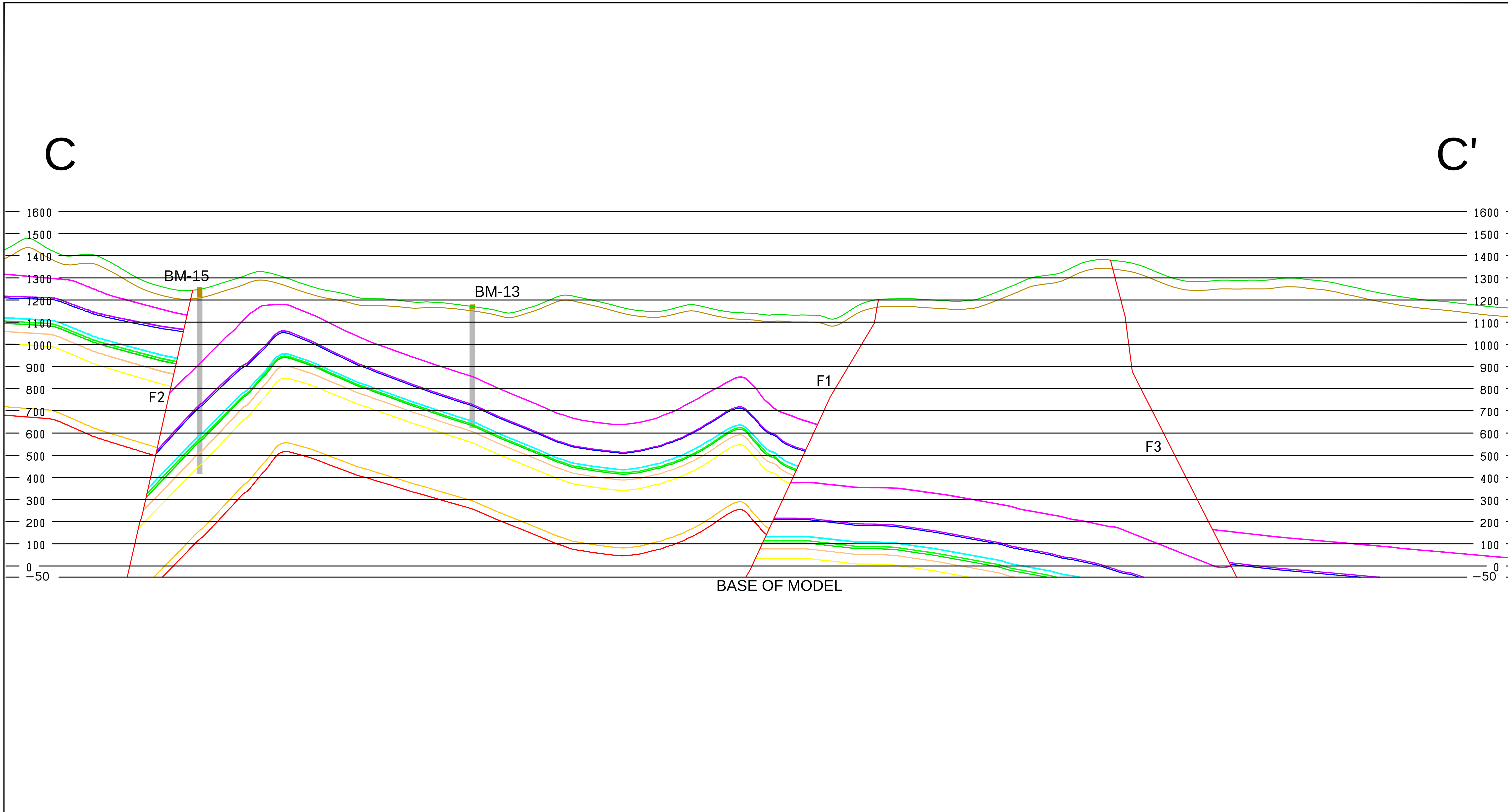


FIGURE 3.11

BULLMOOSE PROJECT

CROSS SECTION D-D'

DATE: 03/21/2013	SCALE: as noted
FILE: 63-3 figure3.11	NORWEST CORPORATION

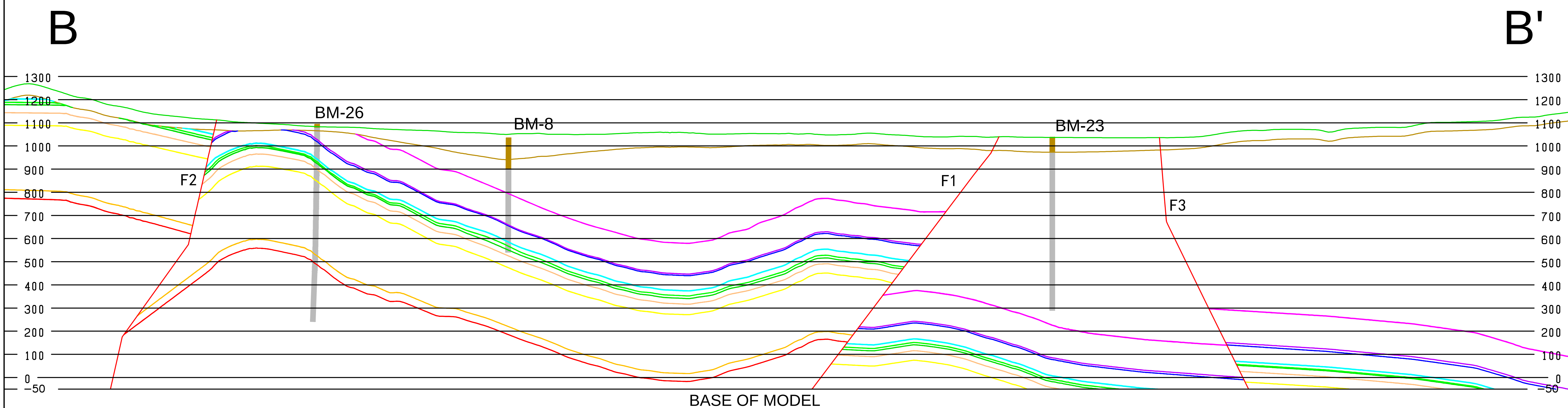


TOPOGRAPHY
BASE OF TILL
FAULT
BC SEAM
B SEAM
C SEAM
D SEAM
E1 SEAM
E2 SEAM
E3 SEAM
F SEAM
SUPERIOR SEAM
TROJAN SEAM

FIGURE 3.12

BULLMOOSE PROJECT
CROSS SECTION C-C'

DATE: 03/21/2013
FILE: 63-3 figure3.12
SCALE: as noted
NORWEST CORPORATION



TOPOGRAPHY	BC SEAM	E2 SEAM
BASE OF TILL	B SEAM	E3 SEAM
FAULT	C SEAM	F SEAM
	D SEAM	SUPERIOR SEAM
	E1 SEAM	TROJAN SEAM

FIGURE 3.13

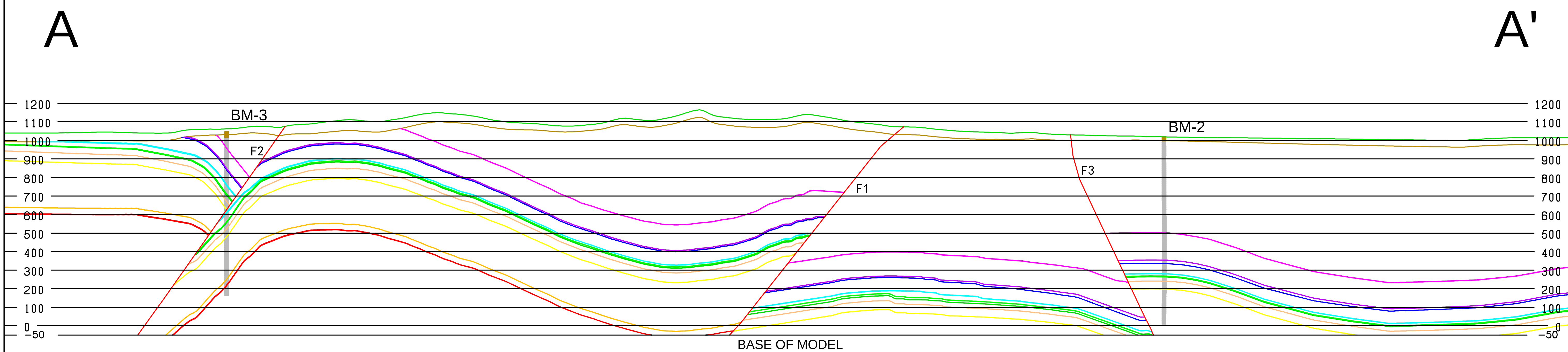
BULLMOOSE PROJECT

CROSS SECTION B-B'

DATE: 03/21/2013 SCALE: as noted

FILE: 63-3 figure3.13

NORWEST CORPORATION



TOPOGRAPHY	BC SEAM	E2 SEAM
BASE OF TILL	B SEAM	E3 SEAM
FAULT	C SEAM	F SEAM
	D SEAM	SUPERIOR SEAM
	E1 SEAM	TROJAN SEAM

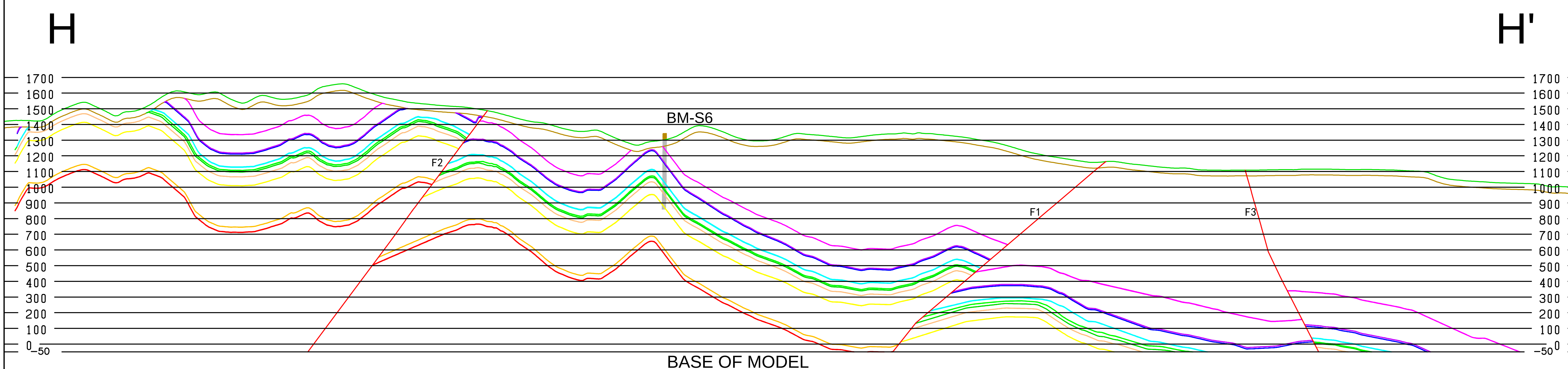
FIGURE 3.14

BULLMOOSE PROJECT

CROSS SECTION A-A'

DATE: 03/21/2013
FILE: 63-3 figure3.14
SCALE: as noted

NORWEST CORPORATION

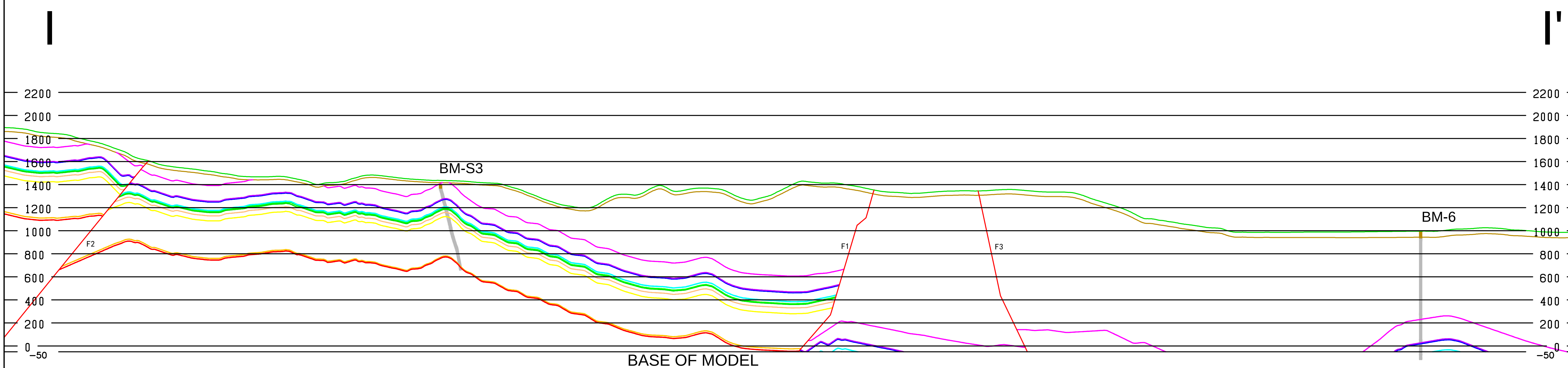


TOPOGRAPHY
BASE OF TILL
FAULT
BC SEAM
B SEAM
C SEAM
D SEAM
E1 SEAM
E2 SEAM
E3 SEAM
F SEAM
SUPERIOR SEAM
TROJAN SEAM

FIGURE 3.15

BULLMOOSE PROJECT
CROSS SECTION H-H'

DATE: 03/21/2013 FILE: 63-3 figure3.15	SCALE: as noted	NORWEST CORPORATION

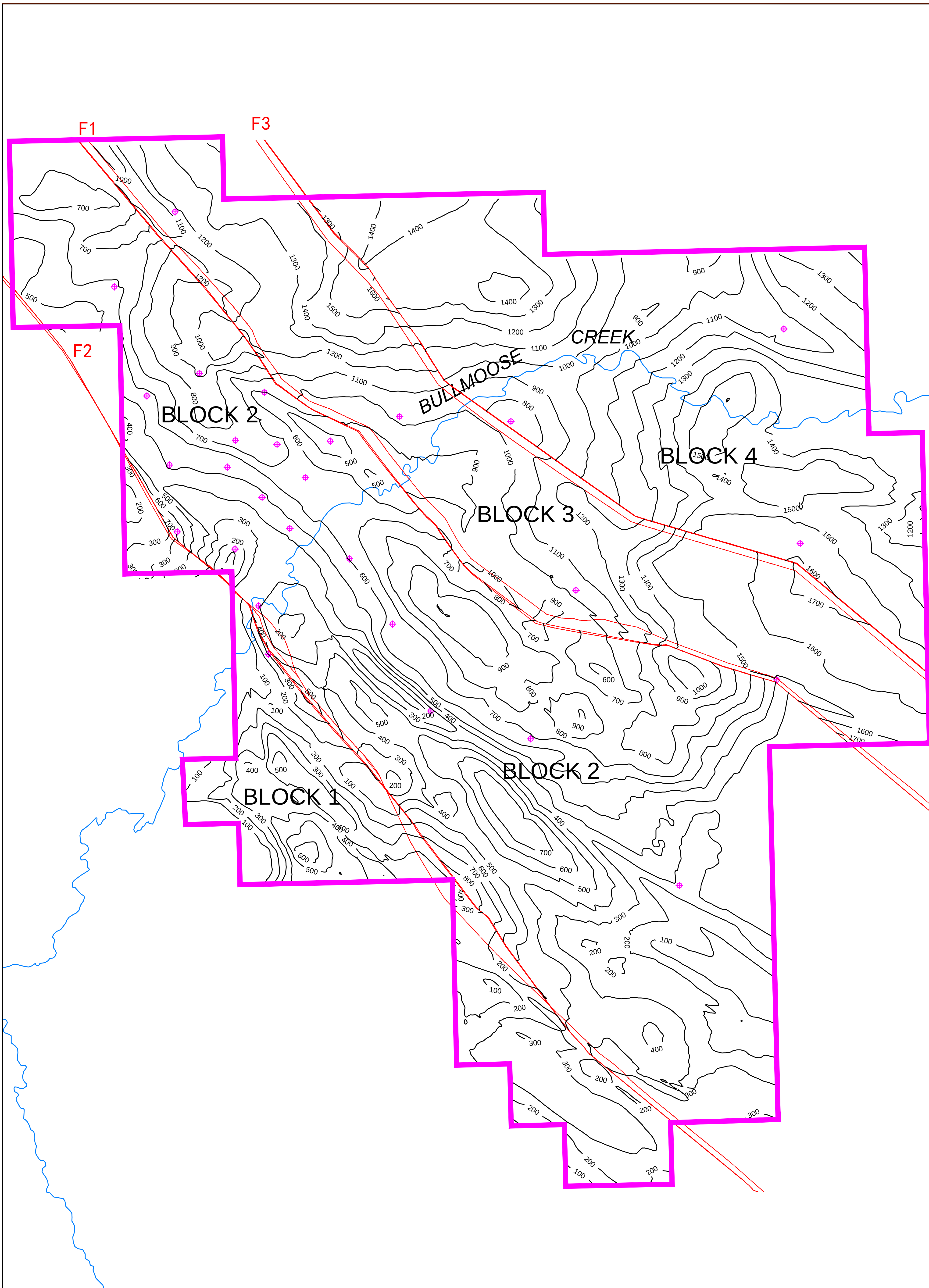


TOPOGRAPHY
BASE OF TILL
FAULT
BC SEAM
B SEAM
C SEAM
D SEAM
E1 SEAM
E2 SEAM
E3 SEAM
F SEAM
SUPERIOR SEAM
TROJAN SEAM

FIGURE 3.16

BULLMOOSE PROJECT
CROSS SECTION I-I'

DATE: 03/21/2013
FILE: 63-3 figure3.16
SCALE: as noted
NORWEST CORPORATION



LEGEND

PROPERTY BOUNDARY

DRILLHOLE

FAULTS

OVERBURDEN

N

0 1 2 3

Kilometers

FIGURE 3.17

BULLMOOSE PROJECT

FAULT BLOCK DESIGNATIONS AND D SEAM OVERBURDEN

DATE: 03/20/12
FILE:CANDEHUA 63-3
SCALE: 1:60,000

NORWEST CORPORATION

Fault Block 1 is found on the western boundary of the property in a thin area between the F2 thrust and the western license boundary. The uplifted coal beds in this fault block region are projected to be near surface or cropping at surface but there are no drillholes actually found within this block, only several holes nearby within Block 2. Due to the limited drillhole coverage and the tenure boundary limiting the block size, this area is not considered a primary target for the mining reserve base at this time.

Block 2 is bounded by F2 on the west and F1 on the east and is the primary area of current interest for underground mining within the property. It is over 18km long and has an average of approximately 4km in width. While Gates Formation seams occur at potentially mineable depths through much of Block 2, Gething seams only reach potentially mineable depths in the southern-most portion of Block 2.

Fault Block 3 is a graben-like structure bound by the F1 and F3 faults. Downward displacement within this block has resulted in target seams being located beyond a practical depth[19] for underground mining. Similarly coal measures in Fault Block 4 are downthrown an additional 150m and this easternmost area is not considered a potential underground mining target.

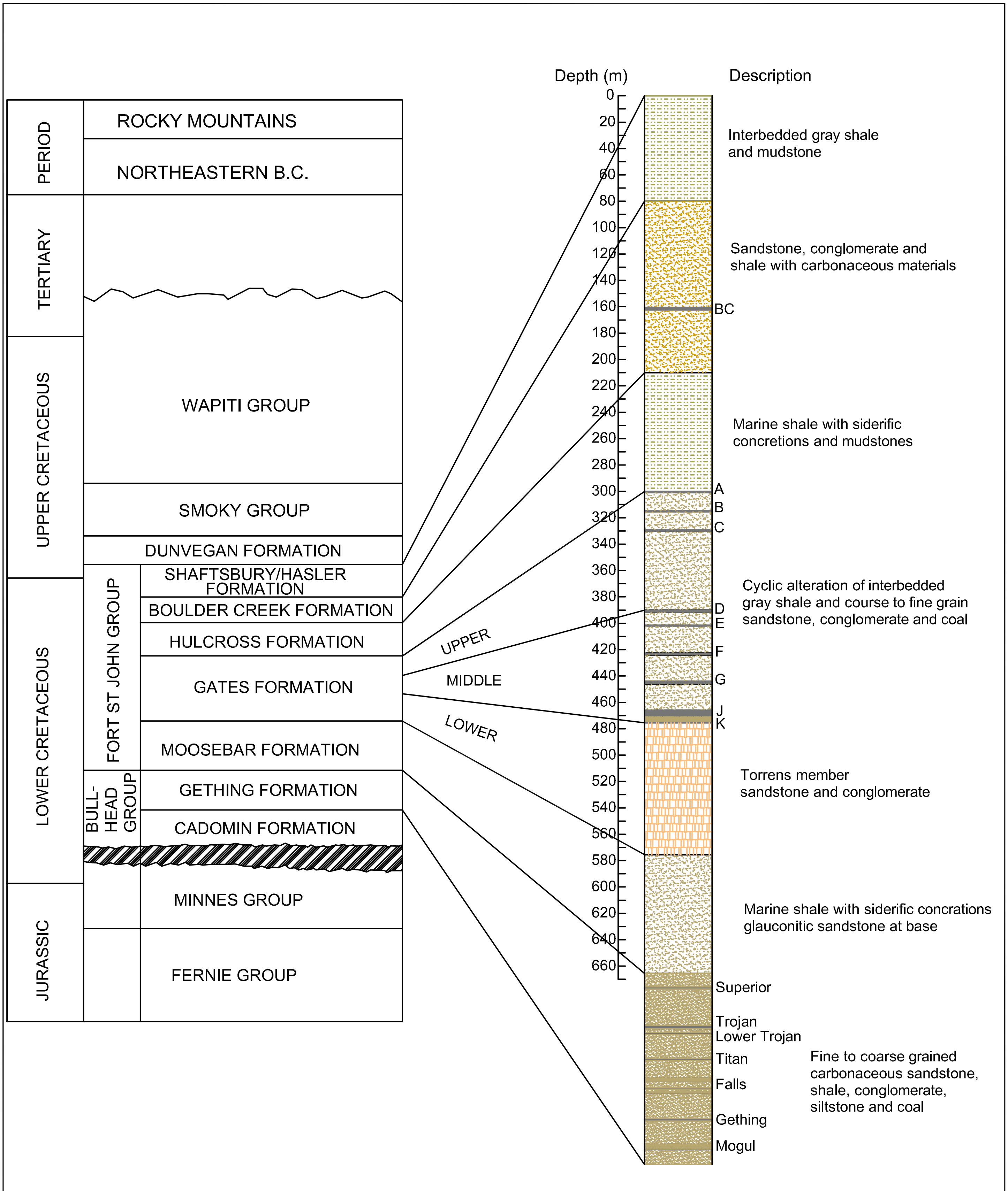
[19] Usually 1000m depth from surface is considered a maximum depth limit for underground mining.

COAL SEAMS

COAL-BEARING PROPERTY

Within the Bullmoose property the target formations with potential metallurgical grade coal seams are the Boulder Creek, Gates and Gething Formations. Information from neighboring properties indicates that these formations could host in total as many as 17 coal seams that may be split into 3 or more sub-seams. The stratigraphic sequence for these 17 coal seams is illustrated in Figure 4.1.

The Boulder Creek Formation is known to contain one major seam known as the BC Seam. Approximately 120m below the BC seam is the A, B and C coal seams of the Gates Formation. These seams are separated from the BC Seam by the Hulcross formation marine shales. Below the C seam there is a shale-sandstone interburden of about 60m until another series of seams D, E, F, G, J and K are developed in the model section of the Gates Formation. Below the gate there is an interburden of 250m to 450m before coal seams of the Gething Formation are developed. As indicated in Figure 4.1 the stratigraphic sequence of the Gething coal seams from top to bottom are: Superior, Trojan, Lower Trojan, Titan, Falls, and Mogul. An important marker bed between the Gates and Gething Formation are the Moosebar Formation dark grey to black mudstones.



LEGEND

- Shale / Mudstone
- Sandstone
- Shale / Sandstone
- Coal
- Sandstone / Conglomerate

FIGURE 4.1

BULLMOOSE PROJECT
PEACE RIVER COALFIELD
STRATIGRAPHY

DATE: 03/21/2013 | SCALE: NTS
FILE: 63-3 figure4.1

NORWEST CORPORATION

WORKABLE COAL SEAMS

Control Conditions and Stability Evaluation to Each Workable Coal Seam

Based on current exploration drillhole information, the major coal seams identified within the Bullmoose property comprise eight seams. These include the BC Seam of the Boulder Creek Formation; seams B, C, D, E and F of the Gates Formation; and the Superior and Trojan seams of the Gething Formation. The Gates Formation E Seam is split into three sub-seams namely E1, E2 and E3. A generalized stratigraphic section for the Boulder Creek and Gates Formation coal seams (upper seams) are illustrated in Figure 4.2 and the Getting Formation seams (lower seams) in Figure 4.3.

Statistics on seam thickness and number of pierce points for each seam from drillhole records is outlined in Table 4.1. The total number of pierce points greater than 1.2m thick per seam as outlined in Table 4.1 provides an indication of number of mineable coal seam intersections.

Table 4.1 Bullmoose Property Coal Seam Statistics

Seam ID	Average Thickness (m)	Minimum Thickness (m)	Maximum Thickness (m)	No. Pierce Points Total	No. Pierce Points >1.2m Thick
BC	1.59	0.14	4.48	22	12
B	0.93	0.10	3.07	22	5
C	0.32	0.05	0.79	16	0
D	2.44	0.46	5.46	23	21
E1	1.52	0.20	4.07	23	16
E2	0.94	0.28	2.26	20	5
E3	0.85	0.25	2.50	7	1
F	1.20	0.43	2.40	8	4
Superior	0.96	0.19	2.87	5	1
Trojan	1.72	0.60	3.07	4	2

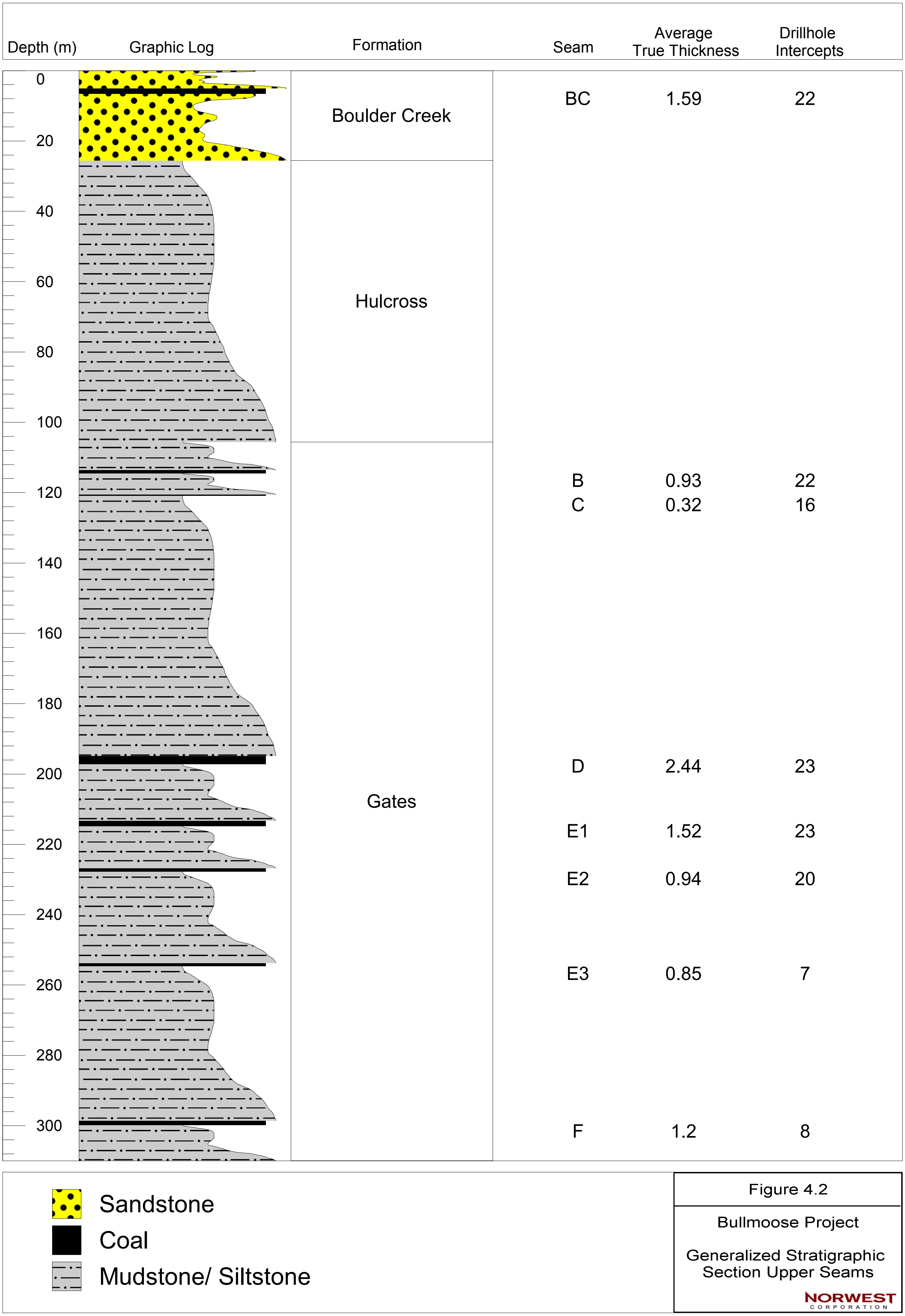


Figure 4.2

Bullmoose Project

Generalized Stratigraphic Section Upper Seams

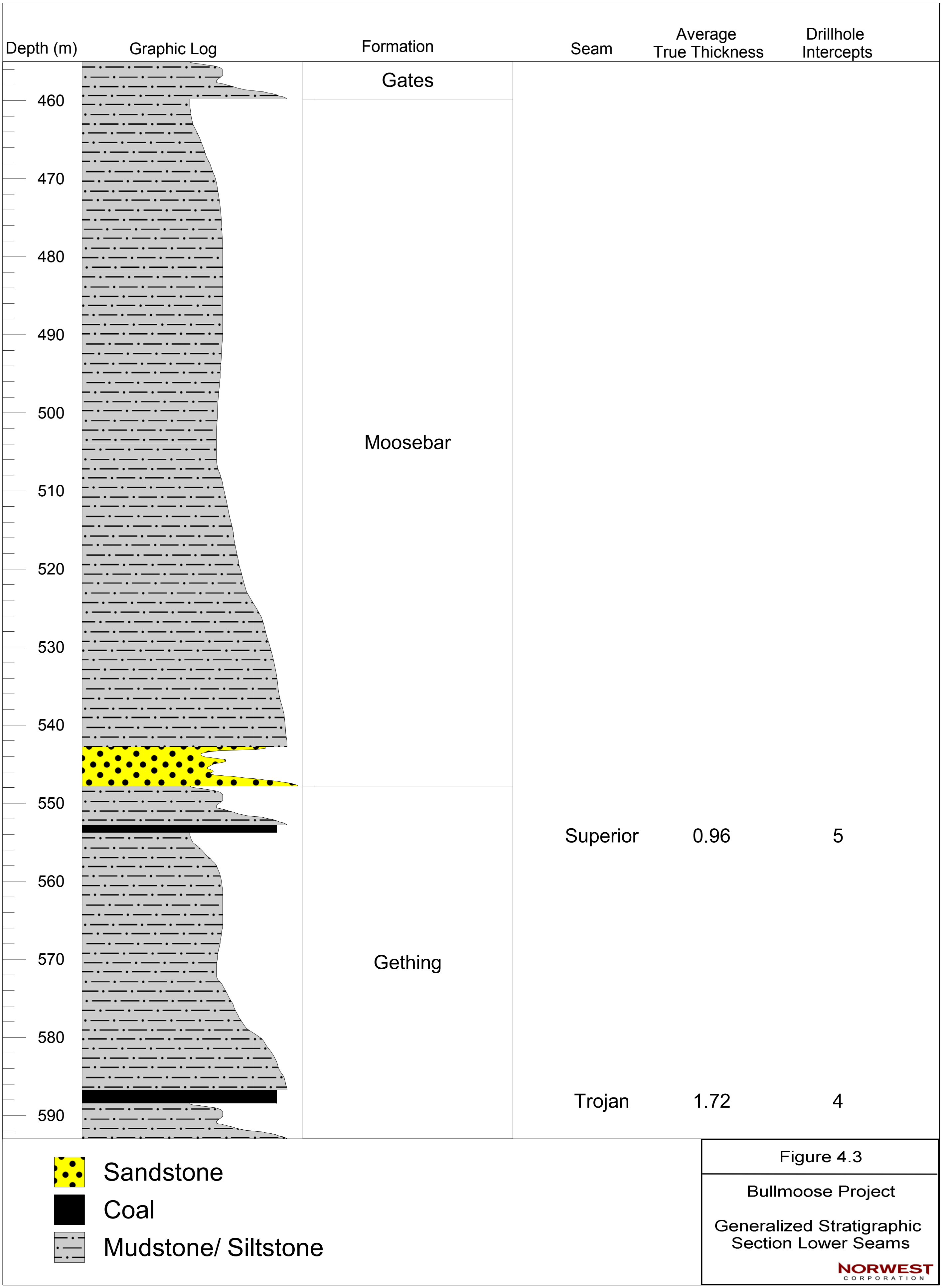


Figure 4.3

Bullmoose Project

Generalized Stratigraphic Section Lower Seams

NORWEST CORPORATION

Occurrence State and the Variation Law of the Workable Coal Seams

The spatial distribution in of individual seam thicknesses as derived from the drillhole records is described in this section. Each seam is discussed separately below:

BC SEAM

The BC seam ranges in thickness from 0.2m to 4.5m with an average true thickness of 1.6m. This seam is the thickest in the northwest portion of the property and thins to the southeast as seen in Figure 4.4.

B SEAM

The B seam ranges in thickness from 0.1m to 3.1m with an average true thickness of 0.9m. The B seam is thickest on the western edge of the property near drillhole BM-9 and thins over the rest of the property as seen in Figure 4.5.

C SEAM

The C seam thickness ranges from 0.1m to 0.8m with an average of 0.3m. The seam is thickest near the western edge of the property and thins out in all directions from there. The distribution of thickness for the C seam can be seen in Figure 4.6.

D SEAM

The D seam is one of the thickest seams on the property ranging from 0.5m to 5.5m with an average thickness of 2.4m. The D seam is thickest on the western edge of the property continuing down to the southeast and thins out in the northwest corner as seen in Figure 4.7.

E1 SEAM

The E1 seam is thickest in the northeast corner of the property and thins in all directions from there. The seam has an average thickness of 1.5m ranging from 0.2m to 4.1m. The distribution of thickness for the E1 seam can be seen in Figure 4.8.

E2 SEAM

The E2 seam is fairly thin throughout the entire property reaching its thickest on the western edge near drillhole BM-15 as seen in Figure 4.9. The E2 seam has an average thickness of 0.9m ranging from 0.3m to 2.3m.

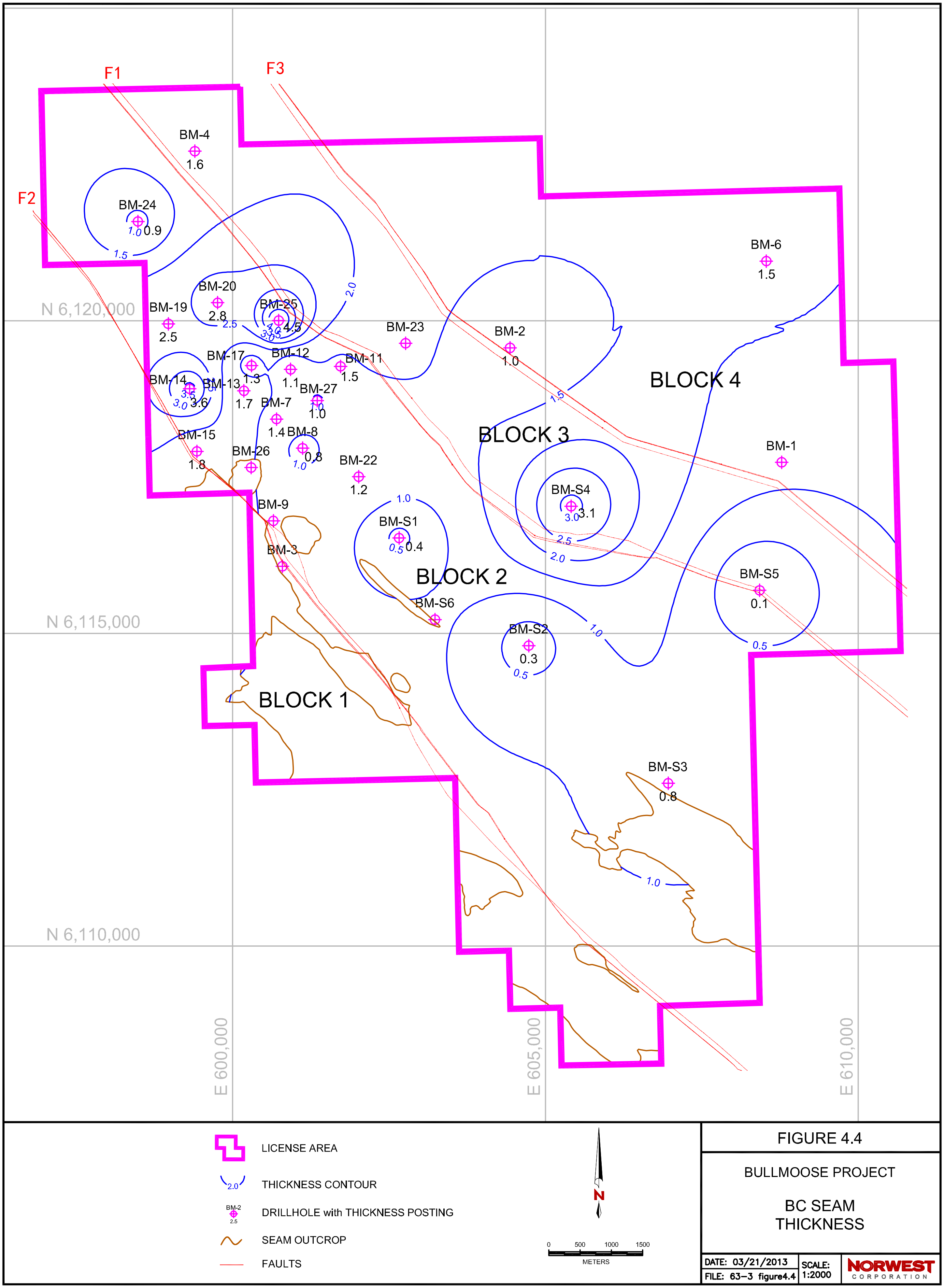


FIGURE 4.4

BULLMOOSE PROJECT

BC SEAM THICKNESS

DATE: 03/21/2013 | FILE: 63-3 figure4.4 | SCALE: 1:2000 | NORWEST CORPORATION

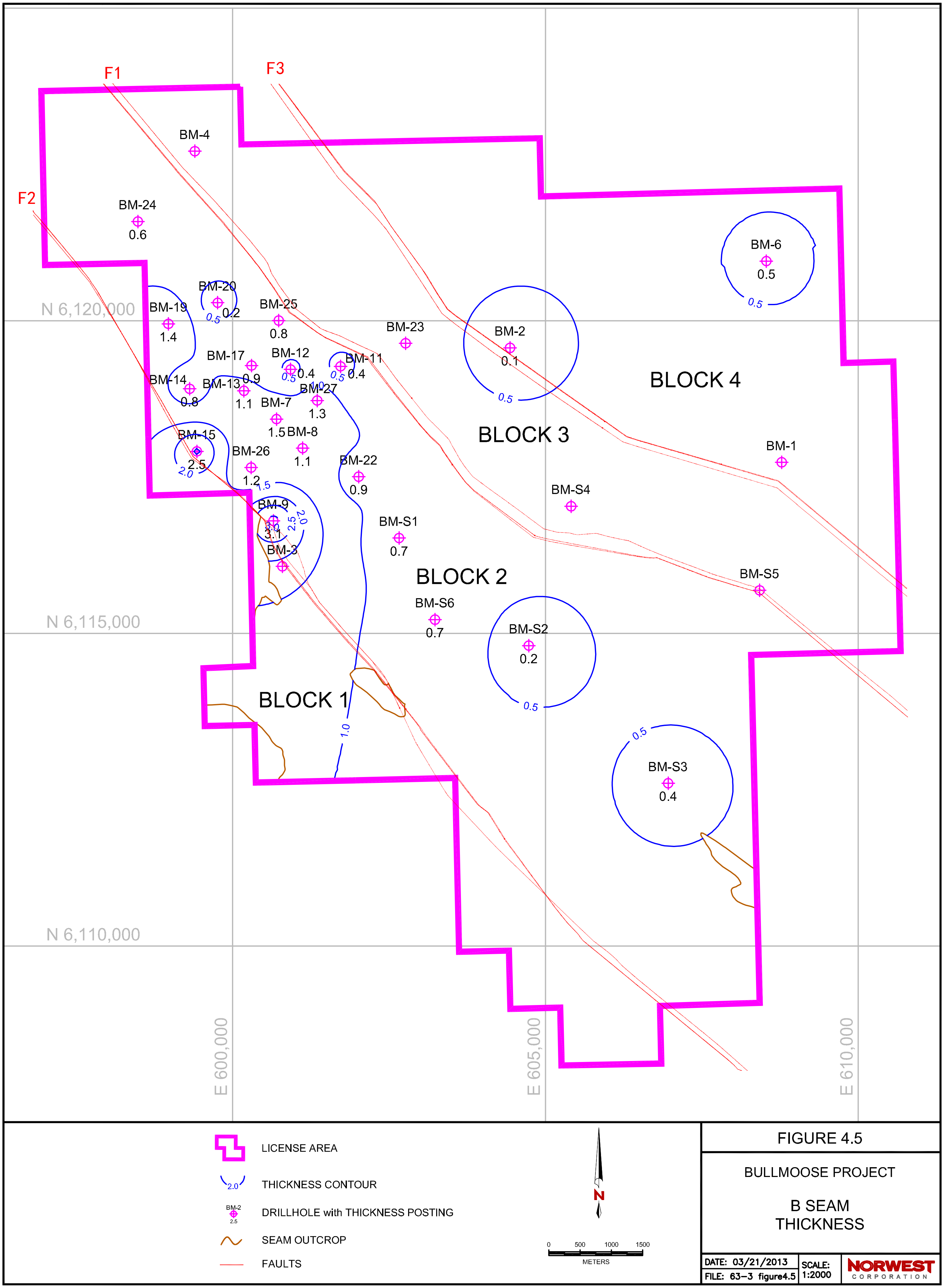


FIGURE 4.5

BULLMOOSE PROJECT

B SEAM THICKNESS

DATE: 03/21/2013 SCALE: 1:2000
FILE: 63-3 figure4.5

NORWEST CORPORATION

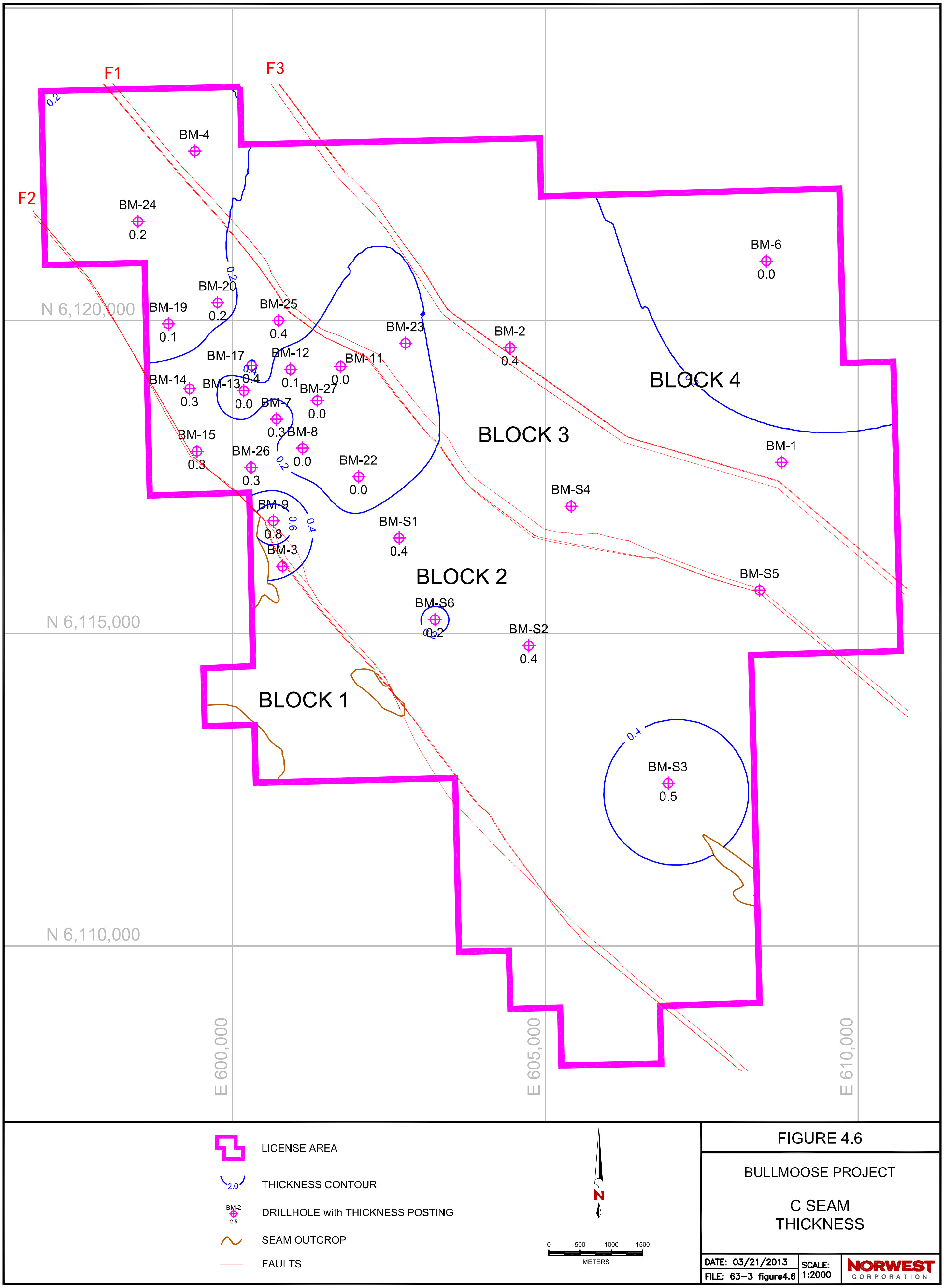
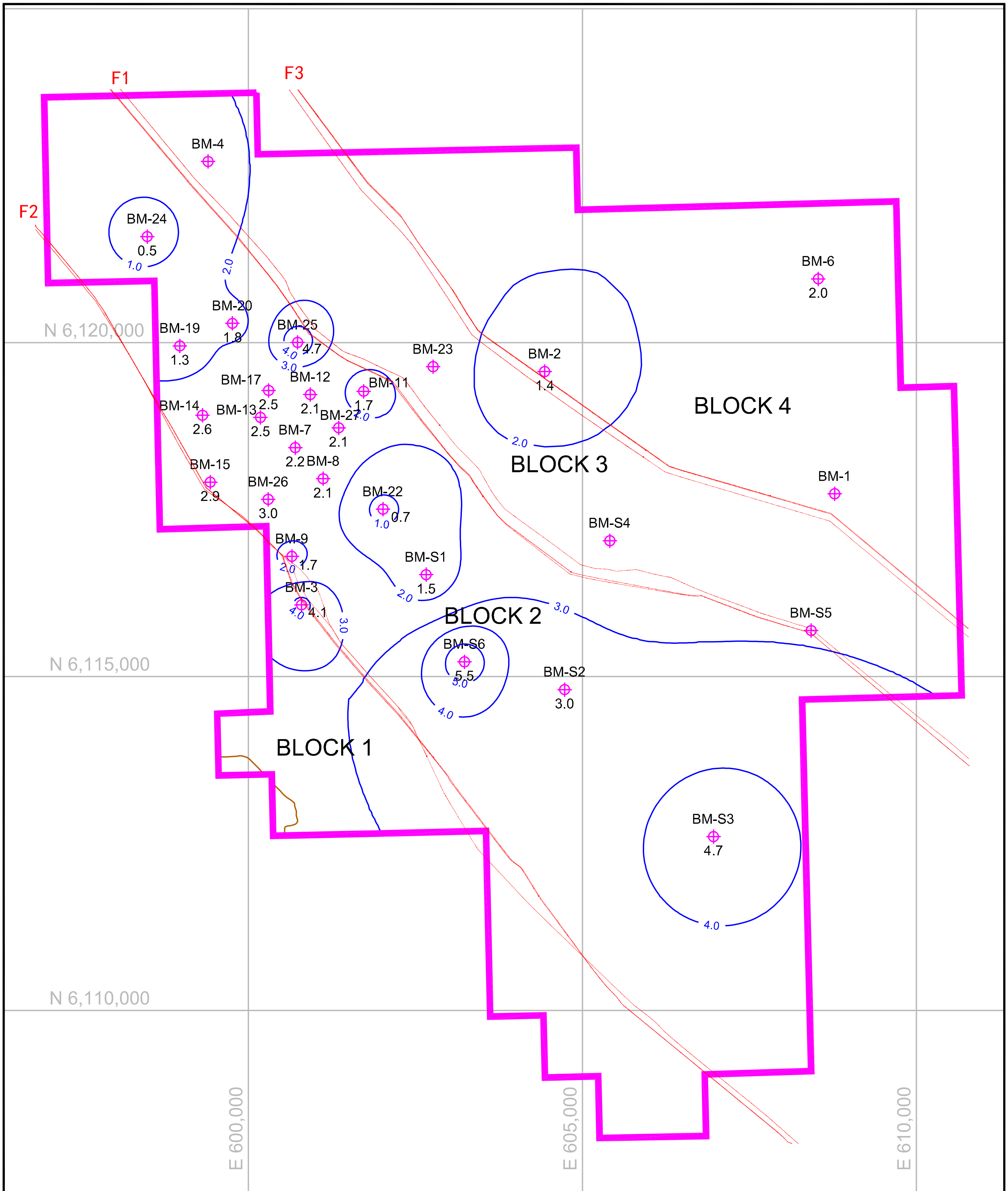


FIGURE 4.6

BULLMOOSE PROJECT

C SEAM THICKNESS

DATE: 03/21/2013
FILE: 63-3 figure4.6
SCALE: 1:2000
NORWEST CORPORATION



LICENSE AREA

THICKNESS CONTOUR

DRILLHOLE with THICKNESS POSTING

SEAM OUTCROP

FAULTS

N

0 500 1000 1500
METERS

FIGURE 4.7

BULLMOOSE PROJECT

D SEAM
THICKNESS

DATE: 03/21/2013
FILE: 63-3 figure4.7
SCALE: 1:2000

NORWEST CORPORATION

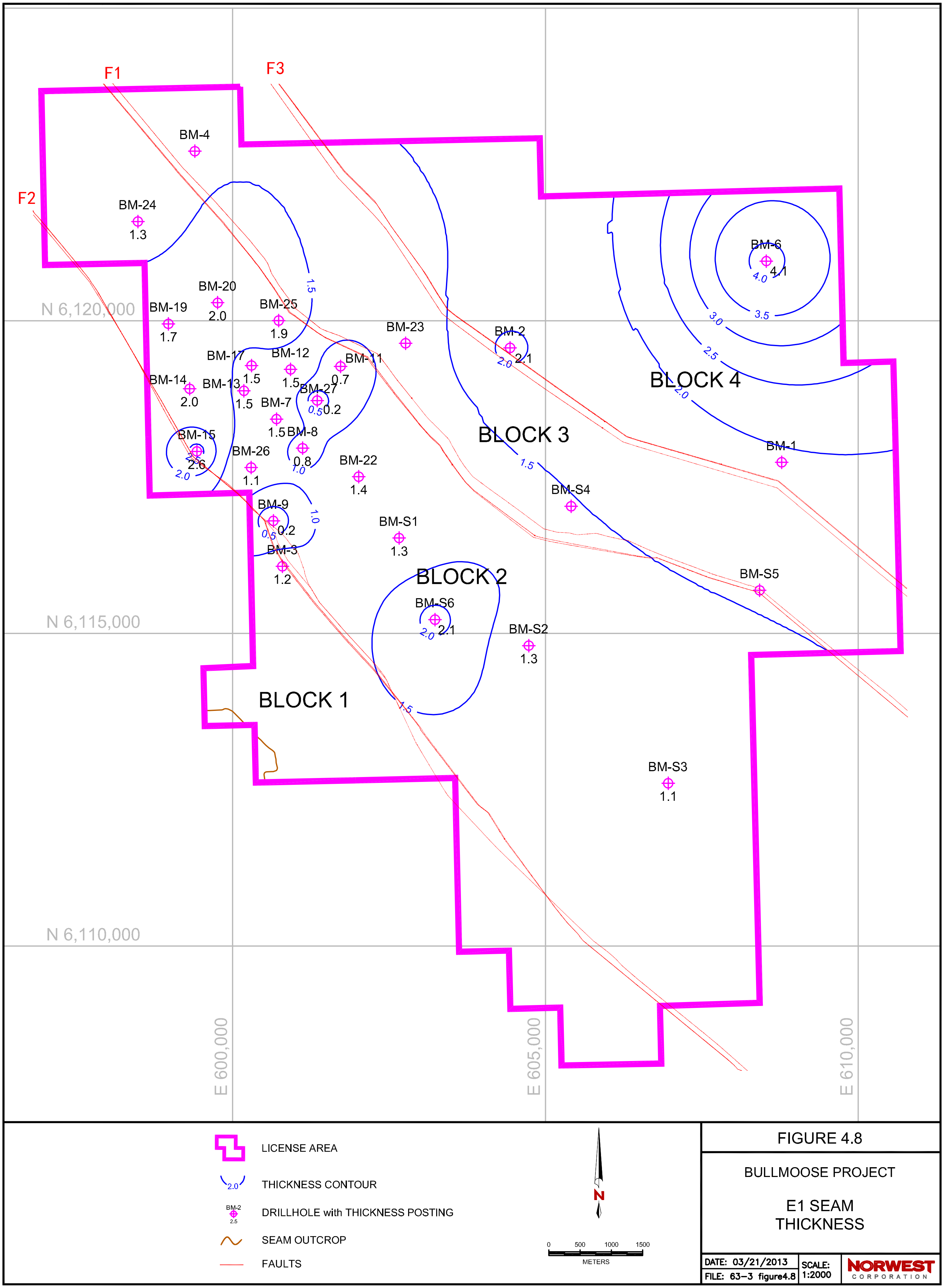


FIGURE 4.8

BULLMOOSE PROJECT

E1 SEAM THICKNESS

DATE: 03/21/2013
FILE: 63-3 figure4.8
SCALE: 1:2000
NORWEST CORPORATION

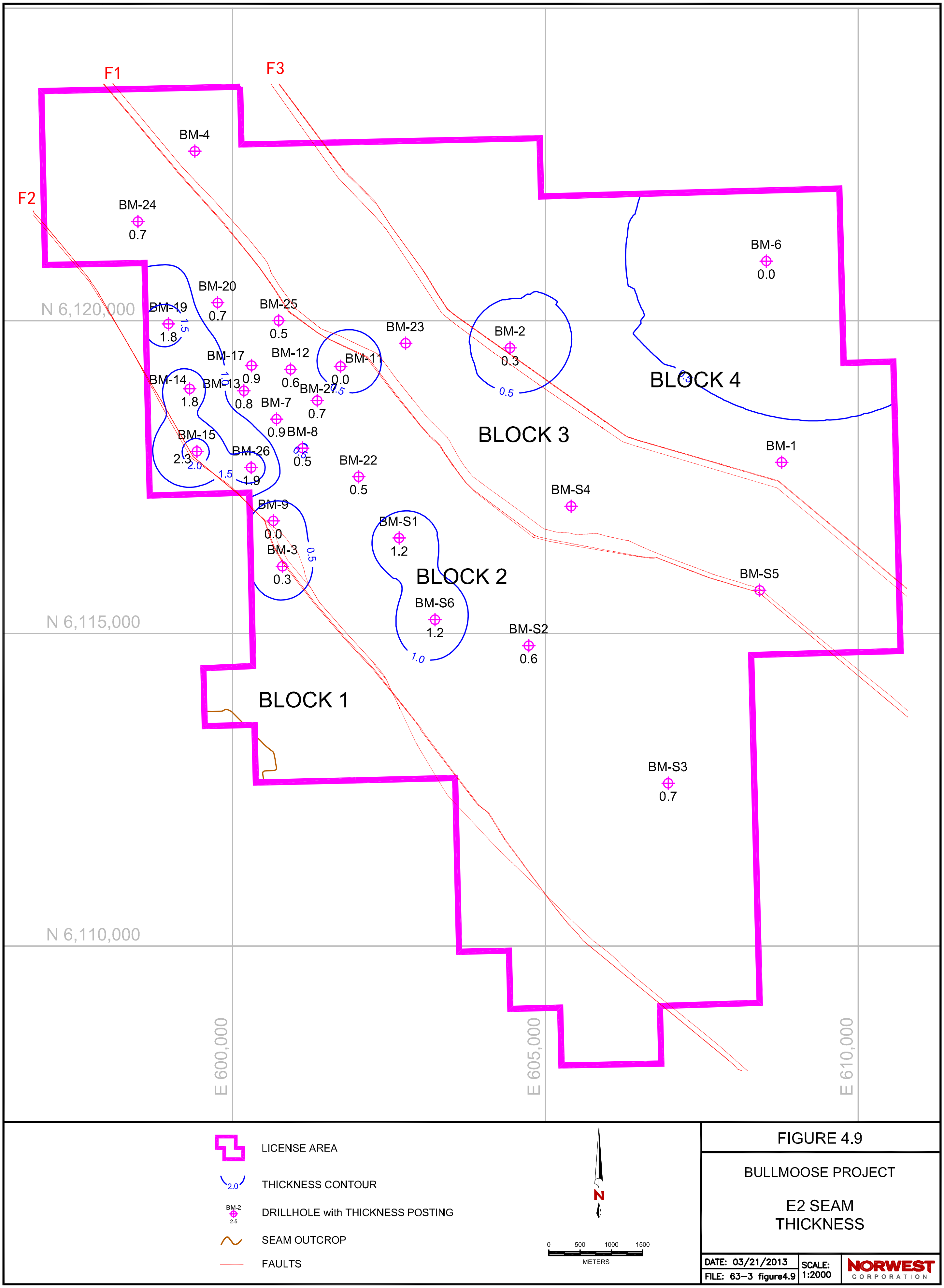


FIGURE 4.9

BULLMOOSE PROJECT

E2 SEAM THICKNESS

DATE: 03/21/2013
FILE: 63-3 figure4.9
SCALE: 1:2000
NORWEST CORPORATION

E3 SEAM

The E3 seam ranges in thickness from 0.3m to 2.5m with an average of 0.9m. As illustrated in Figure 4.10, the E3 seam is at its thickest on the western edge of the property near drillhole BM-15 and thins in all directions from there.

F SEAM

The F seam has an average thickness of 1.2m ranging from 0.4m to 2.4m. As seen in Figure 4.11, the F seam is thickest in the southern part of the property and thins to the north.

SUPERIOR SEAM

The Superior seam was only intercepted five times on the property with the thickest intercept being in the south at drillhole BM-S3. The thickness of the Superior seam ranges from 0.2m to 2.9m with an average of 1.0m. The distribution of thickness for the Superior seam can be seen in Figure 4.12.

TROJAN SEAM

The Trojan seam was intercepted four times on the property and ranges in thickness from 0.6m to 3.1m with an average of 1.7m. The seam is the thickest in the south and southwest and thins to the north. The distribution of thickness for the Trojan seam can be seen in Figure 4.13.

CORRELATION OF THE COAL SEAMS

Correlation Basis of the Coal Seams

Wireline gamma-density geophysical measurements were the main method used for seam correlation between drillholes. The basic most common method of seam correlations is to hang the geophysical log rock density signatures on a common marker horizon. This being typically the roof or floor contact of a major seam or prominent sandstone bed that contrast with surrounding mudstone units. To best illustrate how this is done, Norwest has aligned the geophysical log signatures for three of the most prominent (thickest) coal seams encountered within the Bullmoose property. Each of the three major seam geophysical log signatures is described separately below.

CORRELATION BASIS OF THE BC COAL SEAM

The density log signatures for the BC Seam hung on the roof of the seam are illustrated in Figure 4.14. The BC seam is fairly consistent in thickness and does not typically contain any rock partings. In most drillholes, there is a thin boney coal interval approximately 4-5m above the seam and a thin boney coal interval 8-9m below the seam.

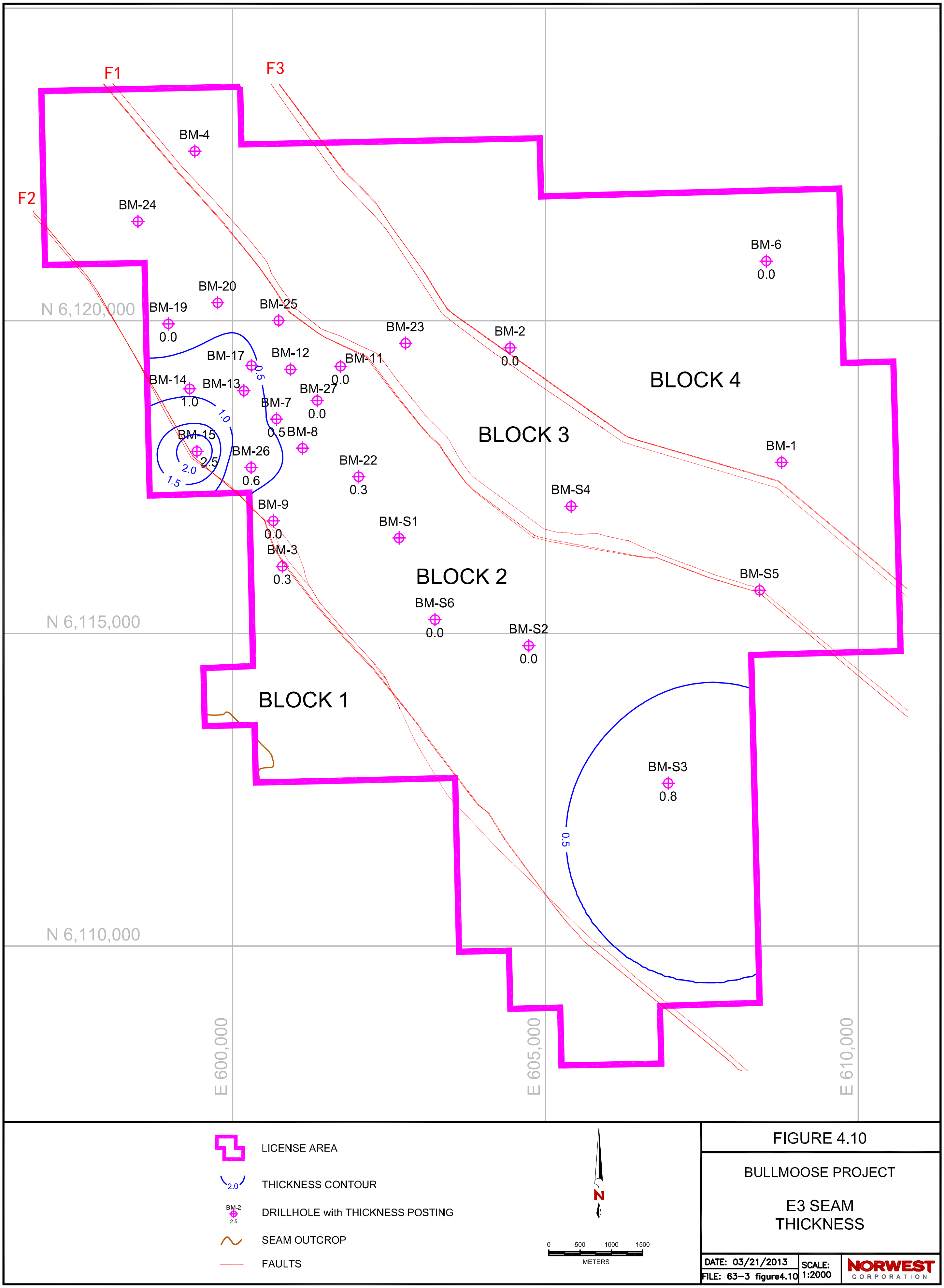


FIGURE 4.10

BULLMOOSE PROJECT

E3 SEAM THICKNESS

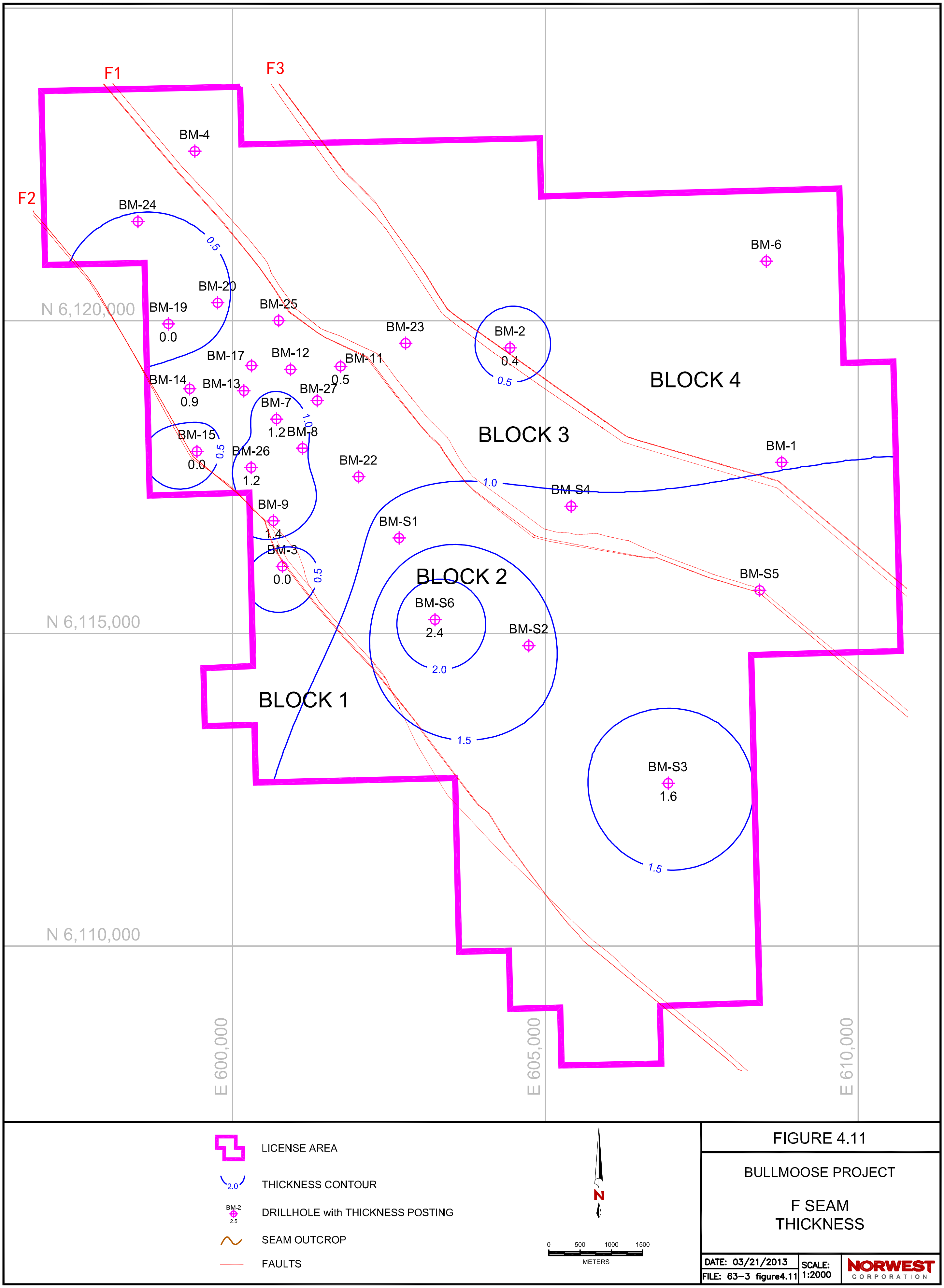


FIGURE 4.11

BULLMOOSE PROJECT

F SEAM THICKNESS

DATE: 03/21/2013 | SCALE: 1:2000
FILE: 63-3 figure4.11

NORWEST CORPORATION

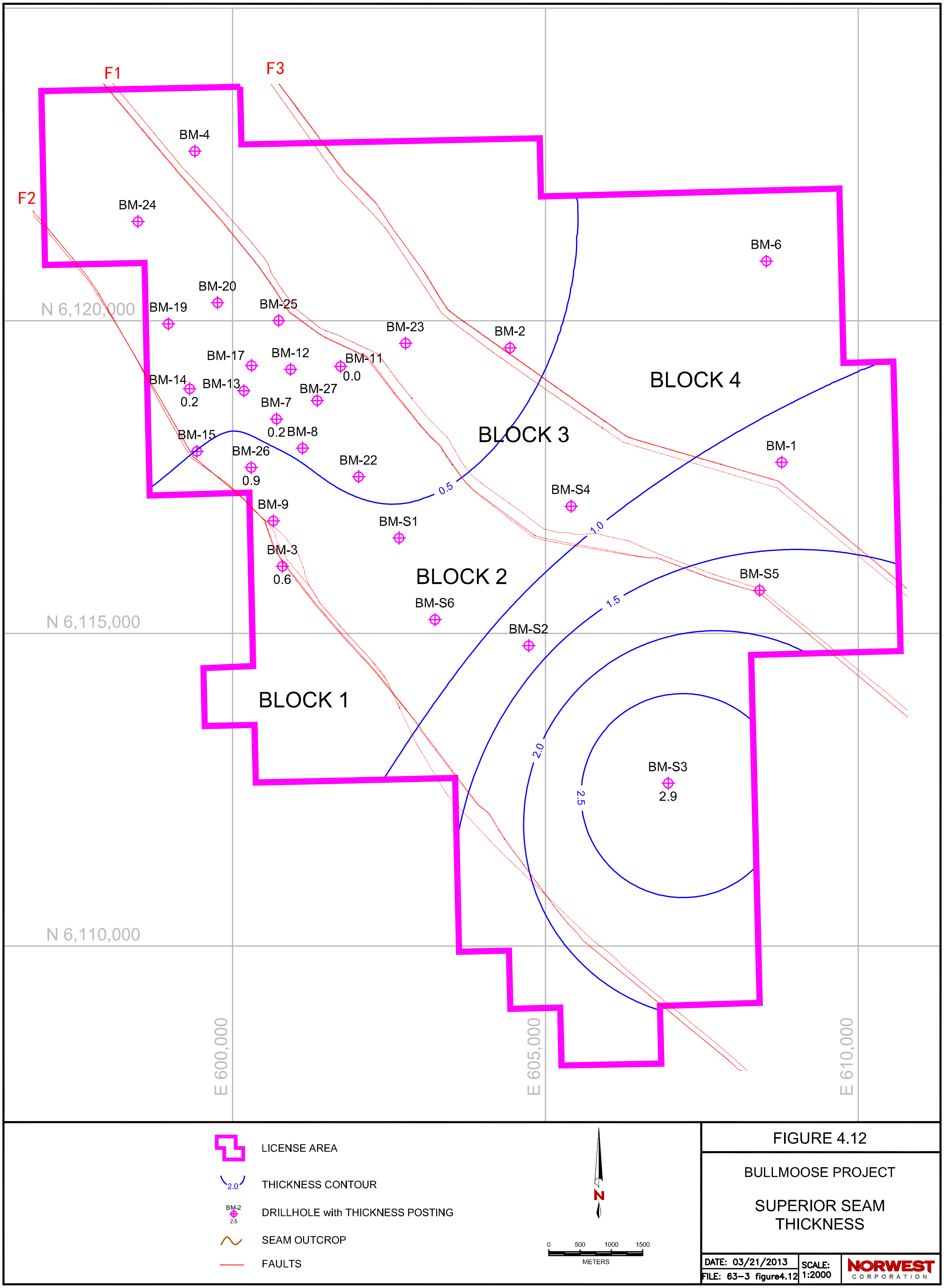


FIGURE 4.12

BULLMOOSE PROJECT

SUPERIOR SEAM THICKNESS

DATE: 03/21/2013
FILE: 63-3 figure4.12
SCALE: 1:2000
NORWEST CORPORATION

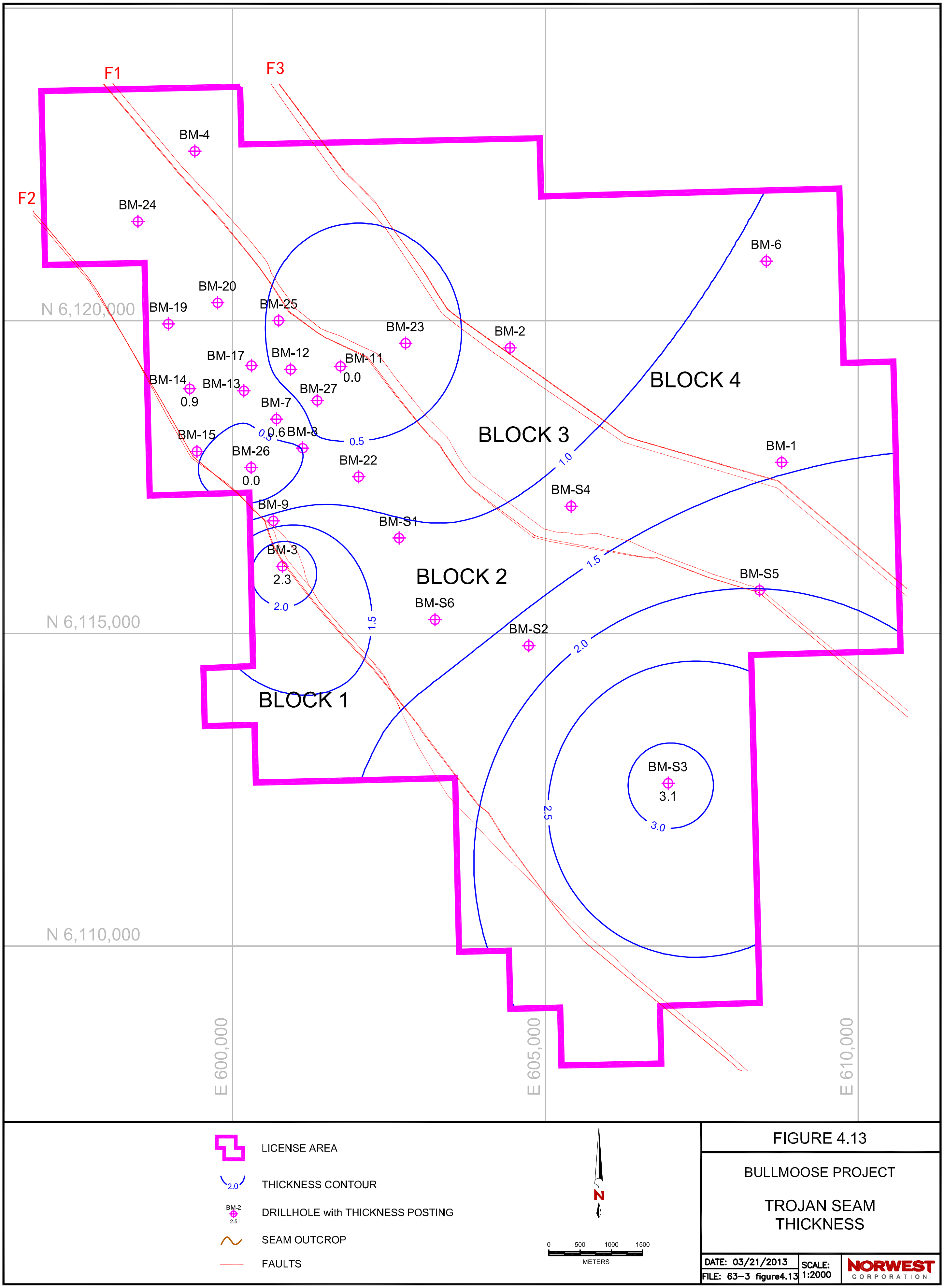


FIGURE 4.13

BULLMOOSE PROJECT

TROJAN SEAM THICKNESS

DATE: 03/21/2013	SCALE: 1:2000	NORWEST CORPORATION
FILE: 63–3 figure4.13		

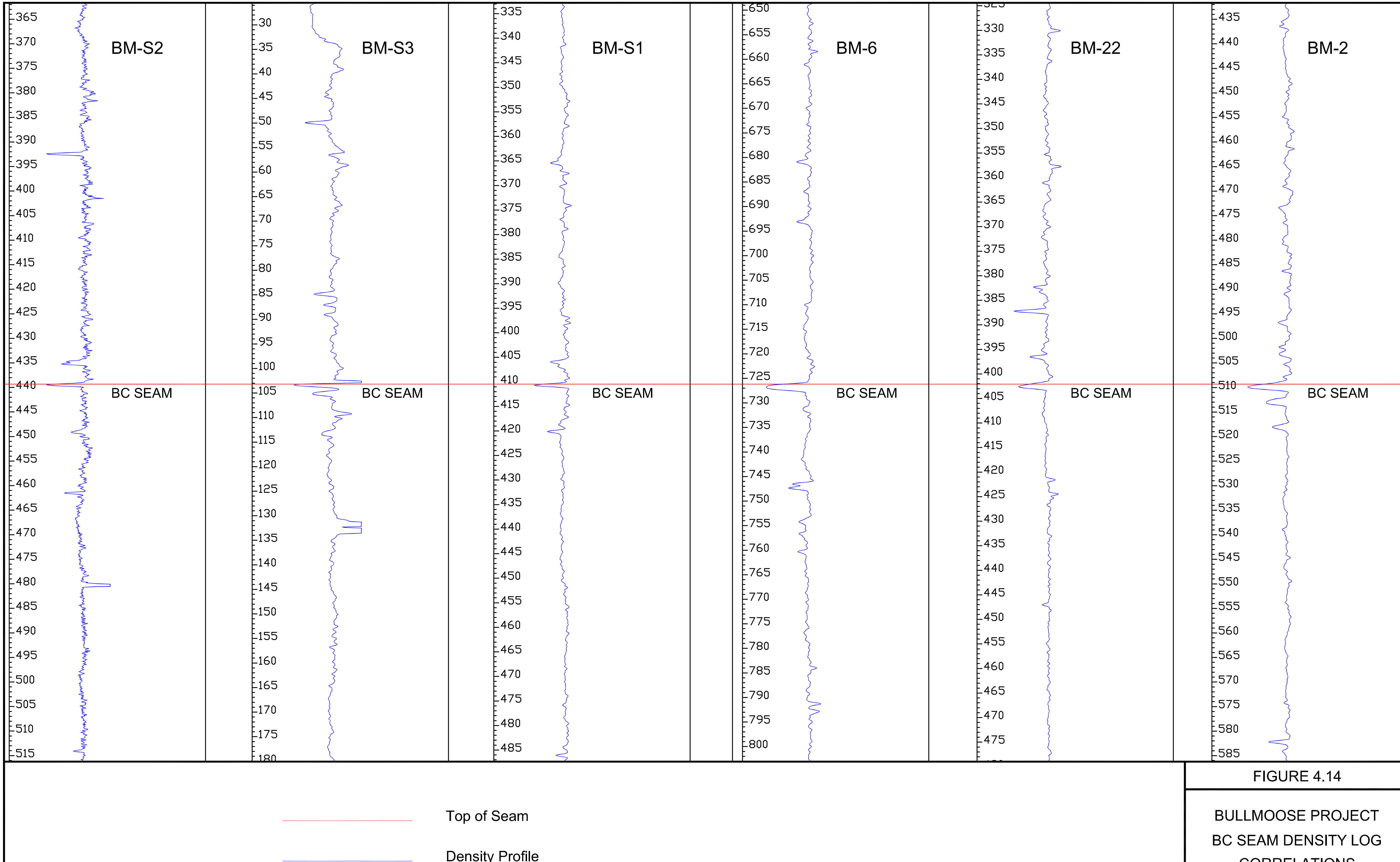


FIGURE 4.14

BULLMOOSE PROJECT
BC SEAM DENSITY LOG CORRELATIONS

DATE: 03/21/2013
FILE: 63-3 figure4.14
SCALE: as noted
NORWEST CORPORATION

CORRELATION BASIS OF THE D COAL SEAM

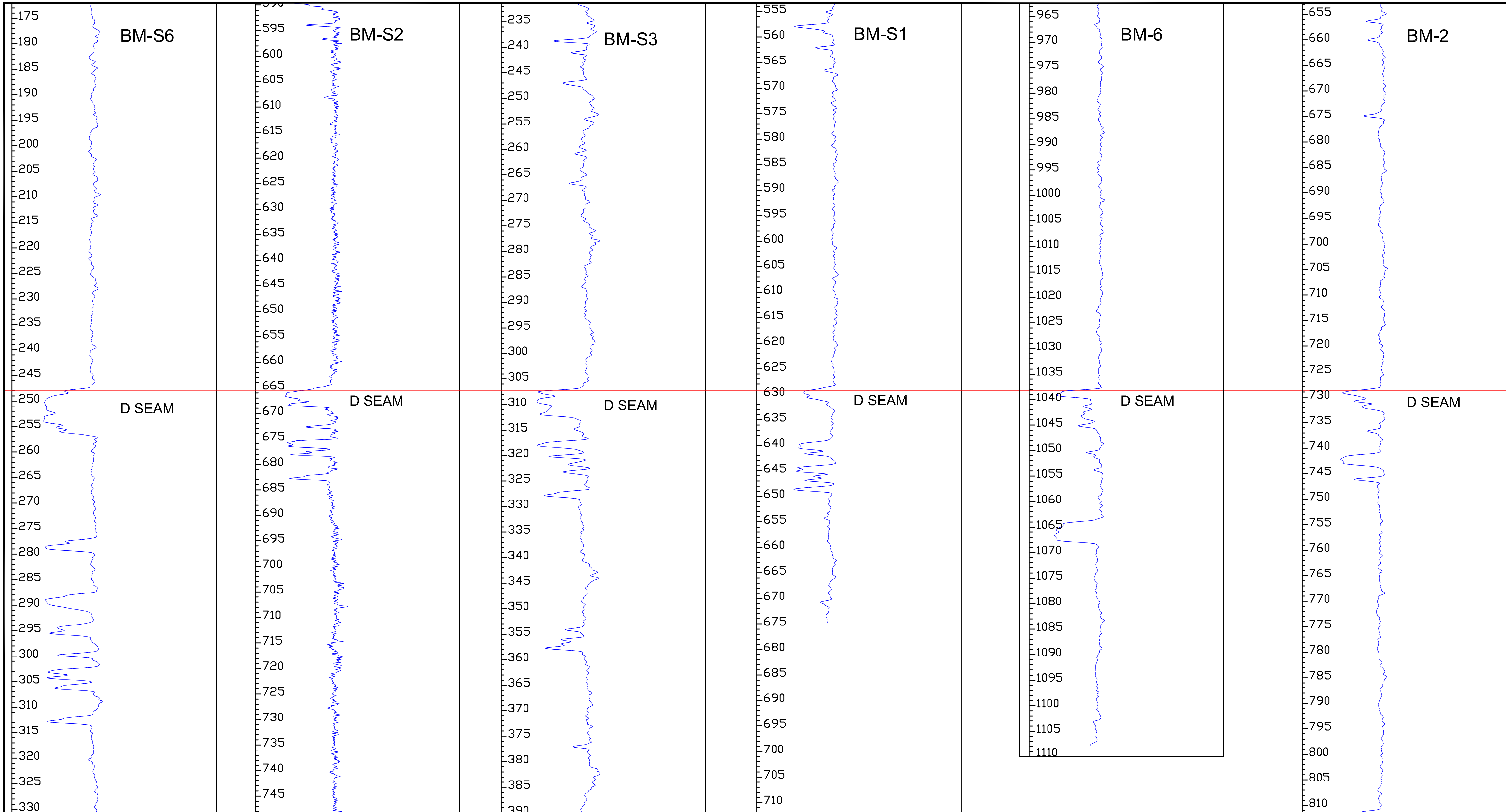
The density log signatures for the D Seam hung on the roof of the seam are illustrated in Figure 4.15. The D Seam varies in thickness more than the BC seam and typically contains a few thin rock partings. The roof of the seam is fairly clean with most of the variations coming in the floor as boney coal or carbonaceous mudstones. The coal directly below the D seam, approximately 8-15m, is the E1 seam,

CORRELATION BASIS OF THE E COAL SEAM

The density log signatures for the E1 Seam hung on the roof of the seam are illustrated in Figure 4.16. The E1 Seam is fairly consistent in thickness and rarely contains rock partings. The seam is approximately 8-15m below the D seam and 5-10m above the E2 seam. When there are rock partings in the E1 seam, they usually occur near the bottom of the seam and are no thicker than 0.5m.

Evaluation of the Reliability Level of the Correlation of the Coal Seams

Norwest's observations of Dehua's correlation of the coal seams encountered in the Bullmoose property appear to be sound and follow typical industry standards for PRC exploration. Significant stratigraphic variations in coal seam thickness and number of partings is very common within the PRC and is expected once mining commences.



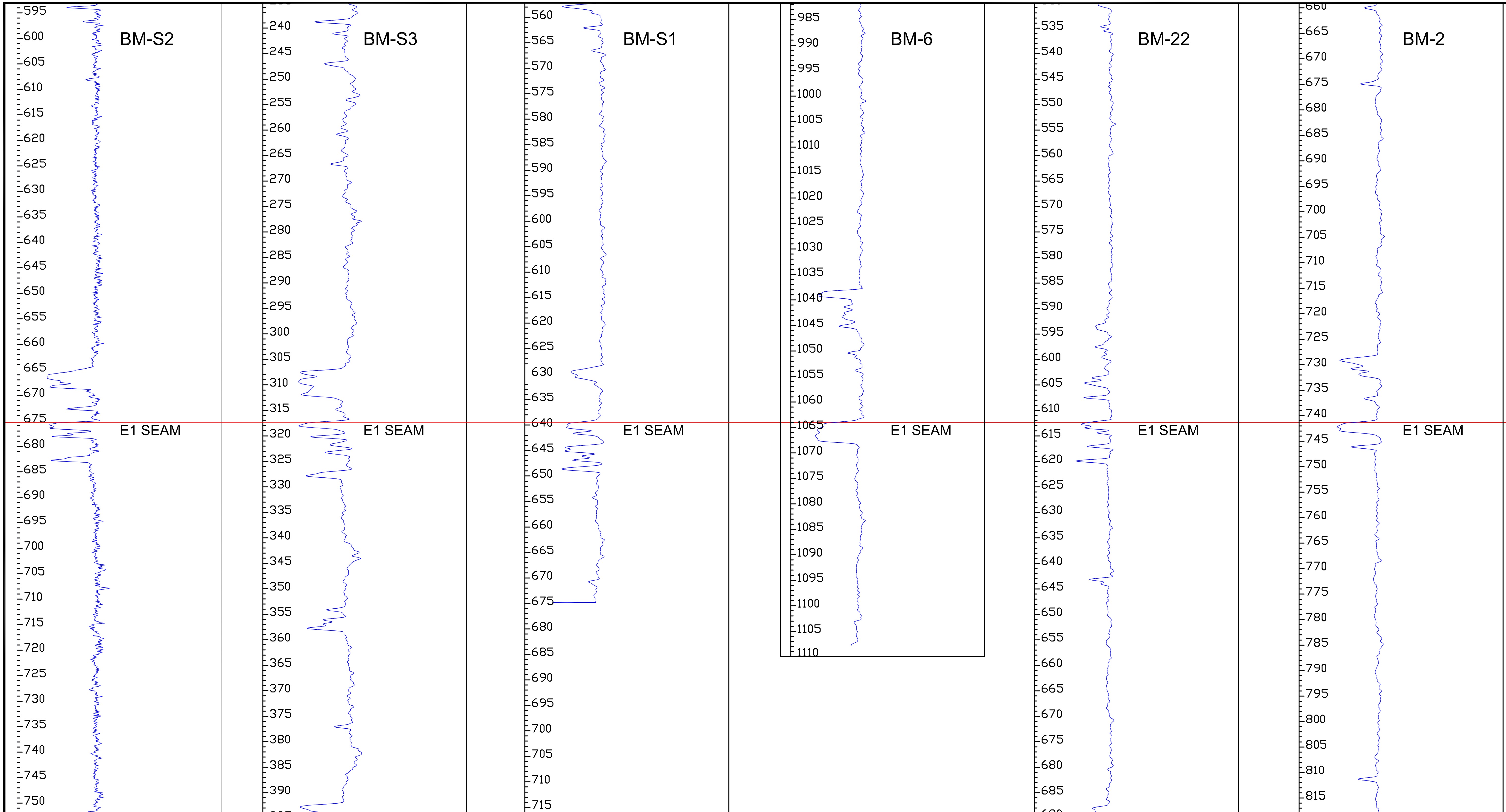
Top of Seam

Density Profile

FIGURE 4.15

BULLMOOSE PROJECT
D SEAM DENSITY LOG
CORRELATIONS

DATE: 03/21/2013 | SCALE: as noted | NORWEST CORPORATION
FILE: 63-3 figure4.15



Top of Seam

Density Profile

FIGURE 4.16

BULLMOOSE PROJECT
E1 SEAM DENSITY LOG
CORRELATIONS

DATE: 03/21/2013	SCALE:	NORWEST CORPORATION
FILE: 63-3 figure4.16	as noted	

Section 5 contains coal quality data and remains confidential under the terms of the *Coal Act Regulation*, Section 2(1). It has been removed from the public version.

http://www.bclaws.ca/EPLibraries/bclaws_new/document/ID/freeside/10_251_2004#section2

HYDROGEOLOGY

The regional hydrogeological profile of the Bullmoose North Coal Mine area is described in the AMEC Environment & Infrastructure (AMEC) report Mine Water Inflow Design Parameters Proposed Bullmoose Underground Coal Mine Tumbler Ridge, BC, included in Appendix G. Relevant excerpts from the AMEC report are used in this section of the report.

Additional information on the regional hydrogeology is provided by a previous report for the Murray River Coal Field, located 30km to the southeast, titled Coal Exploration Report for the First Prospecting Area of the Murray River Coal Property in Northeastern British Columbia, Canada by Huiyong Holding Group, LTD.

Pump test data, borehole logs and water chemistry data described in this section can be found in Appendix H through J. Norwest's review the AMEC report and further comments on the Bullmoose hydrogeology can be found in Appendix K.

REGIONAL HYDRO-GEOLOGICAL PROFILE

Hydrogeology has been investigated in bedrock at three locations (WB12-17, WB12-24 and WB12-26) and in the unconsolidated sediments at five locations (SW12-7, SW12-10, SW12-11, SW12-20 and SW12-26) on the Bullmoose North coal field. The locations of these test sites are illustrated in the AMEC report in Appendix G. During 2011, pumping tests were performed at two locations on the Murray River coal field (approximately 30km southeast of Bullmoose). Hydrogeological conditions in the Hasler, Boulder Creek and Gates Formations at Murray River were reported in AMEC's report entitled *Single Well Response Tests, Proposed Murray River Underground Coal Mine, Tumbler Ridge, B.C.*, dated 6 January 2012.

At Murray River, piezometric heads across the Gates, Boulder Creek and Hasler Formations ranged between 1,134m amsl and 815m amsl. On the basis of six recovery tests performed in Gates, Boulder Creek and Hasler Formations, hydraulic conductivities at Murray River ranged between $4x10^{-10}$ m/sec (Hasler at H2) and $3x10^{-8}$ m/sec (Hasler at H16W). The Gates hydraulic conductivity at Murray River was estimated at $6x10^{-9}$ m/sec.

HYDRO-GEOLOGICAL CONDITIONS OF THE COAL FIELD

Review of the drill core at Bullmoose was beyond AMEC's scope of work. Further, AMEC personnel were on-site only during drilling of Borehole #26. Consequently identification of water-bearing formations was performed by Canadian Dehua International Mines Group (CDIMG) personnel based on borehole geophysical profiles. Specifically, zones selected for packer testing at Boreholes #17 and #24 were selected on the basis of CDIMG interpretation of borehole geophysical profiles. At Borehole #26, continuous packer testing was performed along the length of the borehole to 441m below grade.

Water-bearing and Water-resisting Formation

Generally, coal bearing formations are considered to be more transmissive than the host sandstones, mudstones and conglomerates. On the basis of primary porosity among the host lithological units, sandstones are considered to be the most transmissive. Mudstones and conglomerates are generally considered to be the least transmissive.

However, secondary porosity (that is fractures) is the dominant control of groundwater flow through the bedrock. On the basis of stratigraphic sections developed from CDIMG lithological logs, an anticlinal fold is inferred to exist in the vicinity of PW12-26. As a consequence of tension in the rock mass of an anticlinal fold, the existence of fractures oriented perpendicular (and possibly oblique) to the bedding is considered to be likely. Based on observation of pressure changes at SW12-26 and WB12-26 during a 72 hour pumping test conducted at PW12-26, an isotropic fracture pattern is inferred to exist in the Upper Gates Formation above the D seam (consistent with the anticipated fracture pattern associated with an anticlinal fold).

Hydro-geological Characteristics of the Faults

A significant fracture zone was reported anecdotally by CDIMG at Borehole 24 between 235m and 275m below grade. The lithologic log for Borehole 24 (Appendix I) between 223m and 227m below grade reports slickenslided surfaces. Slickenslides are generally associated with fault zones. Otherwise there is no further indication of a fault zone reported in the lithlogic log. The reported fault zone straddles the contact between the top of the Boulder Creek Formation and the base of the Hasler Formation. No other fracture zones were reported by CDIMG.

Groundwater flows of 13,600 L/hour (60USgpm) were recorded discharging from the fracture zone at Borehole #24 with piezometric heads of up to 80m above grade. Piezometric heads from this zone between 235m and 275m were recorded in a Westbay piezometer (WB12-24 - Details of this installation is provided in AMEC's report (Appendix G), at 78m above grade. However, maximum piezometric heads were recorded in the BC coal seam at WB12-24 at 102m above grade.

The elevated piezometric heads reported at Borehole #24 are considered to be a consequence of the synclinal fold pattern observed in section adjacent WB12-24.

Simple Single-well Hydrologic Test
Between September 29 and October 3, 2012 Canadian Dehua Drilling Company completed the following pumping tests in a 200mm diameter pumping well (PW12-26) completed 23.6m north of WB12-26 and 12.1m south of SW12-26.

A summary of tests performed as part of the pumping test is provided in Table 6.1.

Table 6.1 PW12-26 Pumping Test Summary

Test Performed	Time Started	Time Ended	Duration (Hours)
Step Test	October 4, 2012 14:15	October 4, 2012 17:15	3
Constant Discharge Test	October 6, 2012 15:15	October 9, 2012 15:15	72
Recovery Test	October 9, 2012 15:15	October 10, 2012 17:45	1.5

The submersible pump was operated by Canadian Dehua Drilling Company. Groundwater discharge was directed from the BQ drill rod into a flow totalizer (having an accuracy of ±0.5 liters). The flow rate was determined by calculating the volume of water discharged over an elapsed time period. The depth to water was recorded at PW12-26 using a calibrated electric sounder. Unencumbered access to the pumping water level was provided by means of a 25mm diameter PVC sounding tube.

During the pumping test at PW12-26, groundwater pressures were recorded at SW12-26 (12.1m from PW12-26) at 1 minute intervals using a non-vented pressure transducer. Also piezometric pressures were recorded by AMEC personnel at WB12-26 at roughly 4 hour intervals throughout the PW12-26 constant discharge pumping test and subsequent recovery test.

PUMPING TEST DATA

Pumping test data is presented in Appendix H. In order to estimate a sustainable flow rate at which the 72 hour pumping test could be conducted without drawing the water level below the pump intake, a three hour step test was conducted such that groundwater was discharged from PW12-26 at three different pumping rates (4.6USgpm, 7.1USgpm, and 11.0USgpm) for one hour each. The step test data is presented graphically in Appendix H. Based on the fact that the drawdown during each step never equilibrated suggests that the aquifer transmissivity is relatively low and that most of the groundwater discharge is drawn from storage. Based on the results of the step test, the target pumping rate for the 72 hour constant discharge test was 5USgpm.

TEST DATA AT PW12-26

The constant discharge pumping test curve is presented in Appendix H. With drawdown presented on the primary Y-axis and pumping rate shown on the secondary Y-axis, it can be seen from the graph that the pumping rate was, in fact, not constant but generally fluctuated between 3 and 7USgpm. The mean pumping rate over the 72 hour period was calculated to be 5.2USgpm. The maximum drawdown achieved during the 72 hour test period was 55.92m after 1,380 minutes of pumping.

The recovery test curve is presented in Appendix H. Time in the recovery test curve presented in Appendix H progresses from right to left. If a straight-line projection of the recovery test curve is extended through to zero residual drawdown, the projection of that recovery curve intersects the X-axis at a T/T' value greater than 3. This suggests that pumping from the bedrock aquifer induced some recharge into the aquifer from some extraneous source of water other than the bedrock aquifer.

TEST DATA AT SW12-26

Drawdown recorded at SW12-26 during the constant discharge pumping test are also presented in Appendix H. The drawdown at SW12-26 graph clearly shows the effect of pumping from the Gates Formation at PW12-26 on the groundwater in the Quaternary sediments at SW12-26. The graph shows that groundwater levels at SW12-26 began to be affected after 128 minutes of pumping from PW12-26. The graph also shows that a maximum drawdown of 0.37m was experienced at SW12-26 during the 72 hour pumping period. Based on the drawdown observed at SW12-26 during the constant discharge pumping test, it is likely that the extraneous source of water that recharged the bedrock aquifer during the pumping test was the shallow aquifer in the Quaternary unconsolidated sediments.

TEST DATA AT WB12-26

Pressure profiles recorded in the Gates and Hulcross Formations at WB12-26 during the constant discharge and recovery tests are also presented in Appendix H. Of the 23 pressure profiles presented, one profile is the baseline pressure profile recorded on September 18, 2012 (provided for purposes of comparison), eighteen profiles were recorded during the constant discharge pumping test and four pressure profiles were recorded during the recovery test.

As much of the detail is lost in a single plot of 23 pressure profiles from 15 measurement ports, several additional detailed pressure plots are provided in Appendix H. Based on an overview of the pressure profiles recorded at WB12-26 during the constant discharge pumping test, the following observations are made:

- The first observed effect at WB12-26 was a pressure increase (4m of water) at Port 11a. This pressure increase is commonly observed in zones of lower permeability whereby depressurization of the fractures causes fractures to contract. It is the contraction of the bedrock fractures that causes localized increases in pressure at some of the pressure zones at the Westbay.
- As the pressure at Port 11a equilibrates with the pressure deficit created by the pump at PW12-26, a strong increase in pressure is observed developing at Port 11b. This pressure increase reported at Port 11b is much more extensive (as high as 66m of water above grade) and lasts longer (as long as 16 hours) than the pressure increase observed at Port 11a. This extensive pressure increase suggests that the transmisivity at the upper layers of Zone 11 are less transmissive than the lower layers of the same zone.
- The first observation of a downward vertical gradient at WB12-26 Zone 15 was after approximately 360 minutes of pumping. This is consistent with the first decrease in groundwater level observed at SW12-26 (following 128 minutes of pumping). The downward vertical gradient was

observed at Zone 15 for the remainder of the pumping test (with the exception of a brief return to an upward vertical gradient recorded after approximately 54 hours of pumping). This gradient reversal after 54 hours of pumping is attributed to local reduction of fracture transmissivity either by infilling of fractures by unconsolidated sediments or by the contraction of fractures as consequence of fracture depressurization.

- A quasi steady-state flow condition is observed in Zone 11 after 28 hours of pumping. As might be expected, the quasi steady-state condition shows a lower pressure at Zone 11a (adjacent the PW12-26 wells screen) than at Zone 11b.
- Pressure build-up and resultant strong downward vertical gradients were observed at Zone 15 between 16 and 19 hours of pumping from PW12-26;
- At Zone 14 (A and B seams) no pressure build-up was observed. Rather a consistent pressure decrease was recorded until approximately 22 hours of pumping, when groundwater originating from the overlying Quaternary aquifer began infiltrating the A and B coal seams.
- Similarly no pressure increase was observed at Zone 13 and the pressure decreased by a maximum of 32.5m following 9 hours of pumping. After this time, a pressure build-up originating from Port 11b, coupled with infiltration from the overlying Quaternary aquifer began increasing pressures at Zone 13.
- At Zone 9 (beneath the PW12-26 screened interval) there is no clear trend between the time steps as pressure periodically builds-up and is released. Several pressure build-up and release cycles are observed throughout the pumping period. A strong upward vertical gradient is observed from Zone 9 to Zone 10 throughout the pumping period.
- Effects from pumping at PW12-26 were observed as low as Zone 5 at PW12-26. However, these effects observed at Zone 5 are similar to the cycles of pressure build-up followed by release and are generally inconsistent. The most significant effect at Zone 5 was an 8.5m of pressure build-up after approximately 9 hours of pumping;
- No significant pressure decreases were observed below Zone 11.

The pressure build-ups at Port 11b and briefly at Zone 15 and the relatively large downward vertical gradient between Zones 14 and 11 are seemingly suggestive of an anisotropic fracture pattern. However, the large downward vertical gradient between Zones 14 and 11 is present in the baseline profiles and consequently is considered to be indicative of regional boundary conditions rather than an indication of anisotropy in the fracture pattern. Furthermore, the fact that the pressure build-ups are not sustainable and eventually the pressure is released suggest a local anisotropic fracture pattern but a more regional isotropic fracture pattern. The infiltration of groundwater from the overlying quaternary aquifer into the bedrock aquifer is considered to be strong evidence of a more isotropic fracture pattern.

The isotropic fracture pattern is consistent with the fracture pattern expected of an anticlinal fold (observed in Section A-A').

Hydro-geological Exploration Type

No hydrogeological exploration has been performed as part of this investigation.

ANALYSIS ON THE WATER-FILLING FACTORS

Schafer's equation was used to determine the critical time at which the effect of casing storage can be considered negligible:

$$T_c = \frac{0.017(d_c^2 - d_p^2)}{Q/s}$$

where $\mathbf{T_c}$ is the critical elapsed time beyond which casing storage effects become negligible, $\mathbf{d_c}$ is the inside diameter (in mm) of the casing, $\mathbf{d_p}$ is the outside diameter (in mm) of the drop pipe, **Q** is the mean discharge rate (in m^3/day) from the well, and **s** is the drawdown (in m) at time T_c.

Using the Schafer equation the critical time at which casing storage effects become negligible at PW12-26 was calculated to be 960 minutes. Since there is no clear trend observed in the constant discharge test data beyond the elapsed time of 960 minutes, the constant discharge data set could not be used to reliably estimate the transmissivity of the bedrock aquifer.

However a clear trend was observed in the late-time recovery data set. This data set was used to estimate the bedrock aquifer transmissivity using the Cooper-Jacob approximation of the modified non-equilibrium equation:

$$T = 2.3Q/4\pi\Delta s'$$

Were **T** is the aquifer transmissivity (in m^2/day), **Q** is the pumping rate (in m^3/day), and **Δs'** is the residual drawdown across one log cycle of the straight-line projection of the late-time recovery data on the semi-logarithmic recovery test curve.

Using the Cooper-Jacob approximation and the late-time PW12-26 recovery data set, the bedrock aquifer transmissivity was estimated to be 0.3 m^2/day. Taking the aquifer thickness to be 99.9m (=128 m-28.1m), this estimated transmissivity is equivalent to a hydraulic conductivity of $3x10^{-8}$ m/sec. This hydraulic conductivity is an order of magnitude less than the hydraulic conductivity reported for the packer test performed between 43m and 132m below grade at Borehole 26 ($3x10^{-7}$ m/sec).

In order to estimate the aquifer storage coefficient, the drawdown recorded at Zone 11a at WB12-26 (23.6m from PW12-26) was plotted versus elapsed time. This drawdown graph is presented in Appendix H. The Cooper Jacob approximation of the modified non-equilibrium equation was used to estimate the aquifer storage coefficient:

$$\mathbf{S=(2.25Tt_o)/r^2}$$

Where T is the aquifer transmissivity (in m^2/day), r is the distance (in m) between PW12-26 and WB12-26, and t_o is the intercept (at zero drawdown) of the straight line projection of drawdown data at WB12-26. The last two points of drawdown graph at Port 11a of WB12-26 are used to estimate t_o in days. By this method, the aquifer storage coefficient is estimated to be $2x10^{-6}$.

Since only the last two points of the drawdown curve at WB12-26 were used to estimate t_o, a distance-drawdown graph was used to estimate the aquifer storage coefficient. The distance drawdown graph was plotted by taking the drawdown recorded by the final measurement at WB12-26 (elapsed time of 4,268 minutes or 2.96 days) and using twice the slope from the time-drawdown graph. Using the distance-drawdown graph, the aquifer storage coefficient is estimated to be $2x10^{-5}$. Consequently the aquifer storage coefficient is estimated to range between $2x10^{-5}$ and $2x10^{-6}$.

WATER INFLOW OF THE MINE SHAFT

As preliminary design drawings for the mine shaft were not available to AMEC, specific comment cannot be made on the water inflow to the mine shaft.

Water-filling Factors of the Mine Shaft

The pumping test has shown that the bedrock fracture pattern adjacent PW12-26 is isotropic and that leakage can be expected from the shallow unconfined aquifer overlying the bedrock aquifer. As a consequence of the isotropic fracture pattern, the estimated hydraulic conductivities are expected to be relatively consistent throughout the bulk sample area and less susceptible to the orientation of the underground mine workings.

Calculation Methods and the Formula

Inflow rates to a tunnel (as at the decline and bulk sample area) are determined using the Goodman Approximation (Freeze and Cherry, 1979) for estimating flows into tunnels:

$$q = \frac{2\pi K \Delta h}{\ln(2\Delta h / r)}$$

where **q** is the groundwater flux (in m^3/sec/m) into the tunnel perm of tunnel, **K** is the hydraulic conductivity (in m/sec), Δh is the distance (in m) between the center of the tunnel and the piezometric head and **r** is the radius of the tunnel (in m).

Groundwater inflows to the men and materials shaft can be estimated using the Thiem equation:

$$Q = \frac{2.73\ T\ (H-h)}{\mathrm{Log}\ R/r}$$

where **Q** is the inflow rate to the men and materials shaft, **r** is the borehole radius of the men and materials shaft, **R** is the radius of influence of the pumping well, **H-h** is the available drawdown (piezometric head less the base elevation of the formation) in the pumping well, and **T** is the transmissivity of the aquifer. The transmissivity **T** can be calculated by multiplying the hydraulic conductivity (**K**) by the aquifer thickness **b**.

Water Supply Source

PRESENT STATUS OF WATER SUPPLY

Currently surface water can be accessed from the Bullmoose Creek which flows through the center of the property. Additional surface water can be supplied from the Wolverine River nearby the southern boundary of the property.

Application Possibility and Purpose of Well Water

Two wells have been drilled in the Bullmoose North coal mine area for use as water supply wells. Well PW12-26 was used for the 72-hour pumping test and was only able to maintain a pumping rate of 4 to 6gpm for the duration of the test, making it unsuitable as a water supply well. The second well, PW12-10, was completed in the unconsolidated alluvium of the Bullmoose Creek valley. AMEC reported that pump testing indicated a sustainable yield of 105gpm making this well suitable for water supply.

OTHER MINING TECHNICAL CONDITIONS OF THE ENGINEERING GEOLOGY

GEOLOGICAL CHARACTERISTICS OF ROCK ENGINEERING

Roof and Floor Engineering Geological Characteristics of Top and Bottom Plates of the Major Workable Coal Seams

Lithology logs and, where available, geophysical logs of the property were examined by a geologist familiar with the stratigraphy and coal occurrences of the region. The field logs do not contain any systematic descriptions of fracture types, orientation and frequency that can be used for quantitative geotechnical characterization of potential mining horizons. As such, the following discussion should be viewed as a qualitative review of the zones aimed more at identifying potential problem areas and to aid in the design of a more thorough geotechnical characterization program prior to more detailed mine design work.

The Bullmoose property is recognized as having considerable folding and faulting present. Faulting, both known and unrecognized, is likely to be present in the subsurface and is not accounted for in this approach. Additional challenges in mine design will be found in the moderate to steep dips found in sections of the property, and by the moderately deep to deep nature of the coal resources. The lowermost coal seams of interest, the E1 and E2, are observed to exceed 700m depth in parts of the resource area. This is considered deep by current mining standards and the high lithostatic pressures will increase the risk of roof failure, floor swelling and problems, and rock bursts.

Rocks types that are generally recognized as having relatively high compressive strength such as sandstone, siltstone, and conglomerate, will typically be easier to manage in a mine and are considered to be “good” prospects for the purpose of this study. Conversely, rocks such as mudstone, particularly carbonaceous and containing thin bands of coal or other potential weaknesses, are considered poor from a mining standpoint and will require additional ground support. Mixed packages of rocks can present different scenarios. A strong rock such as sandstone can form the immediate roof of a mining horizon. However, if the bed is thin and followed above by a weak mudstone or thin coal, this can be considered a “false roof” and create poor mining conditions and require additional support. This can be a factor when considering floor conditions but is generally less so. However, given the potential mining depths on the

Bullmoose property, the risk of swelling and rock bursts from the floor is increased in this scenario. Other factors to consider in mine design are the interburden separations between the seams. A relatively thick package with a competent roof is good, whereas a thinner, heterogeneous package containing weak rocks is more problematic.

The general approach to this study is as follows. The lithologic logs for the property were examined and, where available, geophysical logs. Seams showing competent roof and floor rocks are considered good prospects whereas seams with weak rock types considered poor. Seams with mixed packages of rock types are judged as likely to be good, moderate, or poor depending on the position or thickness of the rock units.

BC Seam

The immediate roof of the BC Seam is typically a mudstone with some evidence of carbonaceous mudstones. Locally, this appears to be part of a wider fine-grained and carbon rich zone that can contain other, generally thin coal seams that could present deeper failure issues. As such, the roof is considered to be of "poor" potential and will require additional evaluation and likely considerable ground support.

The floor of the BC seam is generally observed to be on or close to competent rocks such as sandstone, siltstone, and conglomerate. However, in some locations this seam is observed to have a "seat earth" or floor of mudstone/carbonaceous mudstone. As such, the floor is given a "moderate" rating.

B Seam

The roof of the B seam appears to be generally a mixed zone. Some holes show this to be a competent sandstone of sufficient thickness to form a solid roof. Other holes show carbonaceous mudstone and coal above a thinner sandstone suggesting a false roof, and yet other holes show thin beds of carbonaceous mudstone above the seam that would likely be problematic. Overall, the roof can be considered "moderate" in terms of support needed subject to further evaluation.

The floor is most commonly mudstone, carbonaceous mudstone, with locally thin coals and is considered "poor". Locally, however, the floor does contain competent rocks such as sandstone and conglomerate.

C Seam
The C seam is observed as a either a discreet thin seam or as a zone of thin seams and is not considered prospective for mining. The seam is commonly found within a sandstone package and is thus surrounded by competent rocks. Where found in a package, the package is typically a mix of very thin coals and mudstones.

D Seam
The Roof of the D seam is commonly dominated by a thick sequence of sandstone and siltstone. In many cases, however, a relatively thin layer of mudstone and carbonaceous mudstone is found between the more competent rocks and the coal. The roof of the D seam is about evenly split in this regard between a "moderate" rating and a "good" rating.

The floor of the D seam is dominated by mudstones and sometimes thin coals and is overall considered "poor". Locally however, competent sandstones are found. In a few cases, a thin, lower, non-mineable split of the D seam is found separated from the main seam by a thin sandstone. In these handfuls of cases the floor exhibits moderate and good characteristics.

E1 Seam
The E1 Seam is the topmost split of the E Seam package which comprises E1, E2 and E3 seam splits. The roof and floor of the E1 Seam consists predominantly of mudstones to silty mudstones which exhibit moderate rock strengths.

E2 Seam
The roof of the E2 seam is the interburden sequence noted above and is dominated by carbonaceous mudstone and mudstone. As such, and considering the proximity to the potential mining horizon of E1, the roof is overwhelmingly of "poor" quality. There are a handful of cases, however, where sandstone or siltstone beds are thick enough to support the roof with a good or moderate rating. The floor of the E2, conversely, is dominated by a widespread conglomerate and sandstone bed and is considered to be "good". In only a single case is a bed of mudstone present that would result in a poor rating.

The interburden between the E2 and the underlying E3 seam averages 29m with a minimum of 21.2 m.

E3 Seam
The E3 seam is generally considered too thin to mine. The seam is surrounded by sandstone and conglomerate suggesting good stability potential. However, thin beds of mudstone and carbonaceous mudstone are observed locally. This occurs in about half of the holes for the roof, but only a handful of times in the floor. Accordingly, the roof is about evenly split between "good" and "poor" conditions, and the floor can generally be considered "good".

F Seam
The F seam is considered too thin and discontinuous to mine except for the southern portion of Block 2. It is commonly found within a sandstone and conglomerate package and would typically exhibit "good" stability characteristics. Locally, however, thin mudstone beds are found above and below the coal that would cause minor stability problems.

Superior Seam
The Superior Seam is the top most seam of the Gething Formation and is an important seam regionally. At the Bullmoose property the seam is observed to be deep, relatively thin, and discontinuous, and is not considered in the current reserve base estimate. Locally, the Superior is found just beneath a prominent glauconitic sandstone marker bed that could contribute to roof stability. At other times the seam is surrounded by sandstone, siltstone, or mudstone, indicating that stability would be highly variable. The floor is rated as moderate.

Trojan Seam
The Trojan is another seam found within the Gething Formation that is of interest regionally, but not at Bullmoose for the reasons listed for the Superior. Where encountered, the Trojan is most commonly bounded by mudstones suggestive of stability concerns. Occasional roof or floor units of sandstone are observed, suggesting that this is not always the case. The roof is rated as generally poor but tending to moderate. The floor is generally poor.

Table is 7.1 below provides a summary of the expected roof and floor conditions for each seam.

Table 7.1 Summary Roof and Floor Conditions

Seam	Roof	Floor
BC	Poor	Moderate
B	Poor+	Poor+
C	Too thin for mining	
D	Moderate+	Poor+
E1	Moderate	Moderate
E2	Poor+	Good
E3	Moderate	Good
F	Good-	Good-
Superior	Moderate	Moderate
Trojan	Poor+	Poor+

Evaluation of the Engineering Geology

Rock mechanics testing was conducted by the Hebei Province Research Institute of Coal Geology in China. Norwest review of the rock mechanics data was based upon information compiled from eight core holes and 107 geotechnical laboratory samples. From these samples Norwest summarized and categorized the testing results into eight different rock strata types. Detailed summary tables for each strata rock type are located in Appendix L. Table 7.2 presents an overall summary of the average rock mechanics properties by rock strata type.

Norwest focused a review of the available rock mechanics data on those determined by Norwest to limited assessment of coal seam roof and floor rock mechanics test data to the be targeted mineable seams which Norwest selected as the D Seam, E1 Seam, F Seam, and Superior Seam (refer to Section 9 of this report for explanation of selected minable seams). At the time of writing this report, the quantity of available rock mechanics testing data for the F Seam and Superior Seam was inadequate. Therefore, Norwest reviewed the provided data for the roof and floor of the D Seam and E1 Seam only and summarized the available roof and floor rock mechanics data into tables contained in Appendix L.

Table 7.2 Average Summary Rock Mechanics Properties by Rock Strata Type

Rock Strata Type Description	Number of Samples	Density (g/cm^3)	Moisture (%)	Porosity (%)	Proctor Hardness Coefficient	Compression Coefficient (Mpa)	Tensile Coefficient (Mpa)	Internal Friction Angle	Shear Cohesive Force Coefficient	Tangent Modulus (10^5 Mpa)	Deformation Parameter (10^5 Mpa)	Poisson Ratio
Allumini-mudstone	6	2.66	0.65	4.7	4.1	40.9	2.1	35°49′	5.63	0.25	0.22	0.24
Carb-Mudstone	8	2.59	0.73	6.8	4.0	40.1	2.0	35°78′	5.89	0.27	0.22	0.28
Conglomerate	6	2.51	0.40	6.92	6.54	65.4	3.5	40°20′	10.38	0.31	0.27	0.20
Sandstone	17	2.64	0.48	4.84	6.24	62.4	3.7	41°22′	10.51	0.30	0.25	0.21
Mudstone	29	2.61	0.68	6.09	3.71	36.2	1.6	34°77′	5.14	0.24	0.21	0.25
Siltstone	20	2.65	0.51	5.39	5.01	50.1	2.6	37°05′	7.23	0.28	0.24	0.24
Siltstone-Sandstone	8	2.62	0.60	5.08	5.75	57.5	3.2	40°20′	9.40	0.31	0.25	0.23
Mudstone-Siltstone-Sandstone	13	2.65	0.45	4.60	5.09	50.9	2.8	38°43′	8.22	0.28	0.24	0.23
	107											

The geotechnical testing data shows that compressive and tensile strength of the D Seam roof is strong, averaging 579MPa and 3.38MPa, respectively. The D Seam roof test samples consisted of mudstones, silty mudstones, sandstone, and siltstone. The geotechnical testing data shows that the compressive and tensile strength of the D Seam floor is 397Mpa and 2Mpa, respectively and that there is a high degree of variability in the strength of the floor material which is mainly of black mudstone.

The geotechnical testing data of the E1 Seam roof consisted mainly of a strong mudstone with compressive and tensile strengths averaging 535MPa and 23.90MPa, respectively. The geotechnical testing data of the E1 Seam floor primarily consisted of fairly strong mudstone samples with compressive and tensile strengths, averaging 46MPa and 2.3MPa, respectively.

GAS

The following is a brief summary of coal bed methane gas content estimate in Dehua's Bullmoose coal property. The gas content estimate is based on the data provided by Dehua.

Norwest relied on the field desorption data to estimate the gas content. The data Norwest has received is only considered to be obtained in initial desorption measurement period.

Gas Geological Exploration Engineering

Table 7.3 is a summary of the sample information. It is summarized from the data provided by Dehua. Table 1.3 shows that all samples were collected from coal core. Sample volume is low. Sample weight ranges from 300g to 600g, with an average of 414g. Sample length ranges from 0.1 to 0.20m, with an average of 0.13m. Sample depth ranges from 226.5m to 1062m, with an average of 553m.

Table 7.3 Summary of Gas Test Sampling

Well ID	Sample ID	Depth (m)		Sample Length (m)	Seam ID	Weight (g) (Air Dry)	Sample Type	Sampling Date
		From	To					
P3-BMR-06	2-CBM-01	727.86	727.98	0.12	D	410.00	Core	28-Sep-11
	2-CBM-02	742.00	742.20	0.20	E	500.00	Core	28-Sep-11
P3-BMR-05	6-CBM-01	1033.62	1033.80	0.18	D	300.00	Core	8-Nov-11
	6-CBM-02	1061.85	1062.00	0.15	E	500.00	Core	9-Nov-11
P1-BMR-15	7-CBM-01	478.70	478.83	0.13	D	380.00	Core	18-Nov-11
	7-CBM-02	494.87	494.97	0.10	E1	440.00	Core	19-Nov-11
	7-CBM-03	501.20	501.30	0.10	E2	460.00	Core	19-Nov-11
P1-BMR-21	8-CBM-01	226.5	226.63	0.13	BC	N/A	Core	21-Jun-12
	8-CBM-02	239	239.12	0.12	BC	N/A	Core	21-Jun-12
P1-BMR-13	11-CBM-01	460.50	460.65	0.15	D	600.00	Core	17-Nov-11
	11-CBM-02	481.90	482.00	0.1	E1	350.00	Core	17-Nov-11
	11-CBM-03	488.05	488.20	0.15	E2	380.00	Core	18-Nov-11
P1-BMR-10	14-CBM-01	514.65	514.75	0.1	D	380.00	Core	3-Dec-11
	14-CBM-02	528.40	528.50	0.1	E1	380.00	Core	3-Dec-11
	14-CBM-03	535.50	535.60	0.1	E2	400.00	Core	3-Dec-11
P1-BMR-16	15-CBM-01	334.90	335.03	0.13	BC	320.00	Core	17-Feb-12

The gas desorption sampling and desorption test was not completed as common practice in coal bed methane assessment. The following are a short list of the discrepancies.

- The canister can only hold 10cm or 13cm long of coal core, depending on the size of the canister being used. It is not adequate coal volume to do gas desorption test.
- The water bath temperature was not controlled, ranged from 1^{0}C to 16 ^{0}C.
- The water bath temperature was not adjusted to in-situ coal seam temperature. It seems to be lower than in-situ coal seam temperature. Gas desorption rate and gas content is significantly influenced by water bath temperature. In this particular case, low water bath temperature result in low gas desorption rate, which in turn may result in lower estimate of the gas content.
- During the gas desorption field measurement period, only single water bath temperature, single ambient temperature and single ambient pressure was recorded. The variance during the period is unknown.

- The gas desorption field measurement period was short, ranged from 2.5 to 71 hours, with majority of them less than 24 hours. It is considered only to be in initial desorption period.

Due to the reasons above, the gas content estimate is difficult. It is a challenge, especially to estimate gas content by using initial gas desorption measurement data. To complete this work and get the best possible gas content estimate, Norwest proposes a method developed on the basis of legacy data and experience. For details, please see Appendix L.

Comment on the Gas Content Estimate

The gas desorption sampling and desorption test was not completed as common practice in coal bed methane assessment. Especially, the desorption measurement was ceased at the initial desorption measurement stage, therefore only initial desorption measurement data can be used to estimate gas content. Norwest proposes a logarithmic correlation method to estimate gas content using initial gas desorption measurement data based on historic data study and experience. The data used for the study are obtained from the same coal rank and in the same coal basin as Bullmoose coal property. The proposed logarithmic correlation method is used for gas content estimate in this report.

However, the estimate gas content should be used with caution, and it is not recommended the estimate gas content is used for engineering design.

In addition to the discrepancies outlined in Section 1, the proposed method used to estimate gas content is verified by limited historic desorption data. Therefore, it is not guaranteed to be suitable to all conditions. On the other hand, only a portion of the coal in any of the coal seams was sampled for the gas desorption test. Experience has shown that different portions of a coal seam may have different gas content. The gas content of a coal seam should be the average of all gas content of desorption samples in the coal seam. The gas content of a single sample in a coal seam, as is the case in this program, may not adequately represent the average coal seam gas content.

It should also be mentioned, that no sampling of for gas content of other strata was conducted (sandstones, shales, etc.) which can be major contributors of methane gas if longwall mining is conducted.

In addition to the analysis described above, Norwest reviewed results from Hebei on gas content and composition from holes located in the southern area of the Bullmoose property. The results are non-conclusive as the tests were performed long after the samples were taken and are not representative of in-place conditions.

COAL DUST EXPLOSIBILITY AND BRITISH COLUMBIA REGULATIONS

The explosion potential of coal dust is dependent upon a number of factors which include ash content, moisture content, effective surface area as determined by particle size, internal surface area, porosity, temperature as well as the amount of energy and time of duration of the explosion initiator. However, volatile content is the most significant variable in determining coal dust explosibility whereas increased volatiles content increases the risk of explosion. Increased moisture and ash content, reduces the risk of explosion. The presence of methane or other explosive gases increases the explosibility of coal dust. Table 7.5 summarizes available applicable explosibility data for the target mineable seams D, E1, F, and Superior.

Table 7.5 Summary of Available Explosibility Data for Target Mining Seams

Seam ID	No. of Samples	Average Moisture Content (%)	Average Ash Content (%)	Average Volatiles (%)
D	7	1.12	40.65	17.16
E1	9	0.82	24.53	19.29
F	1	0.95	20.02	19.18
Superior	2	0.84	11.83	18.93

Required measures to protect against coal dust explosions are published in the 2008 Health, Safety and Reclamation Code for Mines in British Columbia (Code) 6.44.1- 6.45.1, which is included below:

6.44.1 Combustible Dust – Coal Mines

Treatment: *The floor, roof and sides of every road or part of a road that is accessible shall be treated (1) with water in the manner and at the intervals that will ensure that the dust on the floor, roof, and sides, respectively, is always combined throughout with 30% by weight of water in the intimate mixture, or (2) with incombustible dust in a manner and at intervals that will ensure the dust on the floor, roof, and sides, mixture containing not more than 50% of combustible matter if the volatile matter content of the coal does not exceed 22% as determined by one of the standard methods of analysis and computed on a dry, ash free basis.*

*(3) **Method:** Before the first application of incombustible dust as required by this part of the code, accumulated coal dust shall be removed from the roof, floor and sides of the roadway, so far as practicable.*

***6.44.2 Permissible Levels:** The maximum permissible percentage of combustible matter under section 6.44 1 shall diminish by 1.5% for each 1% increase of volatile matter of the coal until ithas been reduced to 35 in the case of coal having a volatile matter content of 32% or more.*

***6.44.3 Samples:** For the purpose of determining the volatile matter content of the coal under section 6.44.2**,** samples shall be taken either from representative sections of the seam or from a representative quantity of the run of mine coal from the seam.*

***6.44.4 Methane:** The permissible percentage of combustible matter in the dust found in an underground roadway shall be further decreased by one for each increment of 1/10 part of 1% in the methane content of the mine air beyond 1/4 of 1%.*

***6.44.5 Moisture:** The percentage of incombustible dust required under this section may be reduced by an amount equivalent to the percentage of water present in the mixture.*

***6.44.6 Exception:** The obligations imposed by this section do not apply to a roadway, if the natural conditions of it as regards the presence of incombustible dust and moisture are foundby tests made in accordance with this section to be such as to comply with the foregoing requirements.*

***6.44.7 Fineness of Dust:** The incombustible dust used for the purpose of this part of the code shall, whenever possible, contain not less than 50% by weight of fine material capable, when dry, of passing through a No. 80 sieve of the Canadian Metric Sieve Series.*

***6.44.8 Sampling:** If the amount of incombustible dust passing through the No. 80 sieve is less than 50%, the percentage of combustible matter specified as being the maximum permissible by sections 6.44.1(2), 6.44.2, 6.44.4 and 6.44.5 shall be decreased proportionately, but the percentage of the fine material shall never fall below 25%.*

***6.44.9 Sampling:** To obtain the composition of the dust mixture in a road or part of a road, the following procedure shall be adopted (1) representative samples of the dust shall be collected from the floor, roof, and sides over a section of the road not less than 30 m in length, the sections being not more than 135 m apart in the same roadway, and (2) each sample collected shall be thoroughly mixed and quartered, and a portion of the mixture shall then be sifted through a No. 315 sieve of the Canadian Metric Sieve Series.*

***6.44.10 Analysis of Roadway Dust:** If the roadway dust is known to contain only negligible percentages of either gypsum or carbonates (1) a weighed quantity of the dust that has passed through the sieve shall be dried at a temperature of 105 degrees Celsius and the weight lost shall be reckoned as moisture, and (2) the sample shall then be brought to a red heat in an open vessel until it no longer loses weight, and the weight lost by incineration shall be reckoned as combustible matter for the purpose of the test.*

6.44.11 Gypsum: *If the incombustible dust applied to a roadway consists of gypsum wholly or in part (1) a weighed quantity of the sieved dust shall be dried at a temperature between 135 degrees Celsius and 140 degrees Celsius and the weight lost shall be reckoned as moisture, and (2) the sample shall then be kept at a red heat in an open vessel until complete incineration, and the weight of the residue added to that of the moisture shall be reckoned as incombustible matter and expressed as a percentage of the total weight of sieved dust treated.*

6.44.12 Carbonate: *If the roadway dust contains an appreciable proportion of carbonates, the following method shall be followed(1) a weighed quantity of the dust that has passed through the sieve shall be dried at a temperature of 105 degrees Celsius, and one hundred times the weight lost divided by the number of grams of dust submitted to the test shall be reckoned as the percentage of moisture, and (2) one gram of the sample so dried shall then be treated with dilute hydrochloric acid in a suitable apparatus; the weight lost through the decomposition of the carbonates shall be ascertained and subsequently added to that of the incombustible solid residue of another gram of the same sample having been subjected in an open crucible and for not less than one hour to a temperature exceeding 925 degrees Celsius, and this total, plus the moisture previously determined, shall be recorded as incombustible matter.*

6.44.13 Tests to be Recorded: *The results of the tests of the roadway dust shall be recorded in a book kept at the mine for the purpose, and a copy posted at the mine entrance, and available on request.*

6.44.14 Frequency of Tests: *Tests of samples of roadway dust, so taken as to be representative of the normal composition of the roadway dust throughout the mine and on the floor, roof, and sides, respectively, shall be made as often as may be necessary, but not less frequently than once in each month.*

6.44.15 – removed from the code.

6.44.16 Injurious Dust: *Incombustible dust that is ineffective or injurious to health shall not be used in a mine.*

6.45.1 Explosion Barriers – Coal Mines
Type *(1) In any underground coal mine which is dry and dusty, rock dust or water barriers of a type authorized by an inspector shall be installed at places designated in a scheme prepared by the manager and authorized by an inspector.*
Inspection *(2) Where explosion barriers are required in an underground coal mine, the manager shall appoint a person who holds an underground coal mine shiftboss certificate to examine the condition and position of the barriers*
Frequency *(3) The person appointed under subsection (2) shall examine the barriers at intervals of not more than 4 weeks and shall report the results of the examination in writing in a book to be kept at the mine.*

SPONTANEOUS-COMBUSTION TENDENCY OF COAL

The risk of spontaneous combustion of coal is dependent on several intrinsic coal factors, which include:

- Pyrite content and type
- Moisture content
- Particle size and surface area
- Rank
- Petrographic constituents
- Mineral matter composition.

There are several analytical testing methods which have been developed to predict the propensity for spontaneous combustion of coal seams. Spontaneous combustion testing was conducted in accordance with Chinese standard GB/T20104-2006 "*Method for identifying tendency of coal to spontaneous combustion by oxygen absorption with chromatograph*" by the Hebei Province Research Institute of Coal Geology. The method measures the quantity of oxygen absorbed at a temperature 30°C degree and pressure of 101.33kPa (1 atmosphere) when the volatile content of coal is greater than 18% (air dry ash free). The classification is based upon the volume (cm^3) of oxygen absorbed per gram of coal follows:

Level 1: $V_d > 0.7$
Level 2: $0.4 < V_d <= 0.7$
Level 3: $V_d <= 0.4$.

Norwest has reviewed the analytical results of coal samples for spontaneous combustion conducted by the Chinese Hebei Province Research Institute of Coal Geology for Target Seams D and E1. There was insufficient information available for the F and Superior seam. Table 7.6 and Table 7.7 summarizes spontaneous combustion test results for Seams D and E1, respectively.

Table 7.6 D Seam Spontaneous Combustion Results Chinese Standard GB/T20104-2006

Seam	Borehole ID	Sample ID	Oxygen Absorbed (cm^3)	Level
D	P3-BMR-05(#6)	Q3	0.76	Level 1
D	P1-BMR-15(#7)	Q7	0.66	Level 2
D	P1-BMR-13(#11)	Q5	0.56	Level 2
D	P1-BMR-07(#17)	Q5	0.65	Level 2
D	P1-BMR-03(#19)	Q6	0.58	Level 2
D	P3-BMR-08(#24)	Q3	0.71	Level 1
D	P1-BMR-27(#3)	Q2	0.70	Level 2
D	P1-BMR-16(#15)	Q6	0.67	Level 2
D	P1-BMR-04(#20)	Q3	0.66	Level 2
D	P1-BMR-29(#22)	Q5	0.67	Level 2
		Average	**0.66**	**Level 2**
		Maximum	**0.76**	
		Minimum	**0.56**	
		Median	**0.67**	
		STDEV	**0.06**	

Table 7.7 E1 Seam Spontaneous Combustion Results Chinese Standard GB/T20104-2006

Seam	Borehole ID	Sample ID	Oxygen Absorbed (cm^3)	Level
E1	P1-BMR-29(#22)	Q8	0.59	Level 2
E1	P3-BMR-05(#6)	Q5	0.67	Level 2
E1	P1-BMR-15(#7)	Q9	0.66	Level 2
E1	P1-BMR-07(#17)	Q8	0.61	Level 2
E1	P1-BMR-03(#19)	Q7	0.69	Level 2
E1	P1-BMR-16(#15)	Q9	0.61	Level 2
E1	P1-BMR-04(#20)	Q5	0.63	Level 2
		Average	**0.64**	**Level 2**
		Maximum	**0.69**	
		Minimum	**0.59**	
		Median	**0.63**	
		STDEV	**0.04**	

GROUND TEMPERATURE

Down hole temperature readings using a wire-line temperature probe were completed for two holes within the property (BM-17 and BM -24). Summary observations of the temperature variations with depth are provided in Table 7.8.

Table 7.8 Geothermal Gradient Measurements

Hole ID	Ground Temperature °C			Temperature Gradient C°/100m
	Depth 100m	Depth 650m	Depth 750m	
BM-24	12.0	20.0	-	1.5
BM-17	7.5	-	20.0	1.9

Given geothermal gradients of between 1.5°C to 2°C some additional cooling may not necessary if underground mining is going to be limited to less than 1000m depth from surface.

RADIOACTIVITY

No abnormally high radioactivity has been encountered on the Bullmoose property. Natural gamma radioactivity is expected to be within normal ranges for underground workings.

ENVIRONMENTAL GEOLOGY

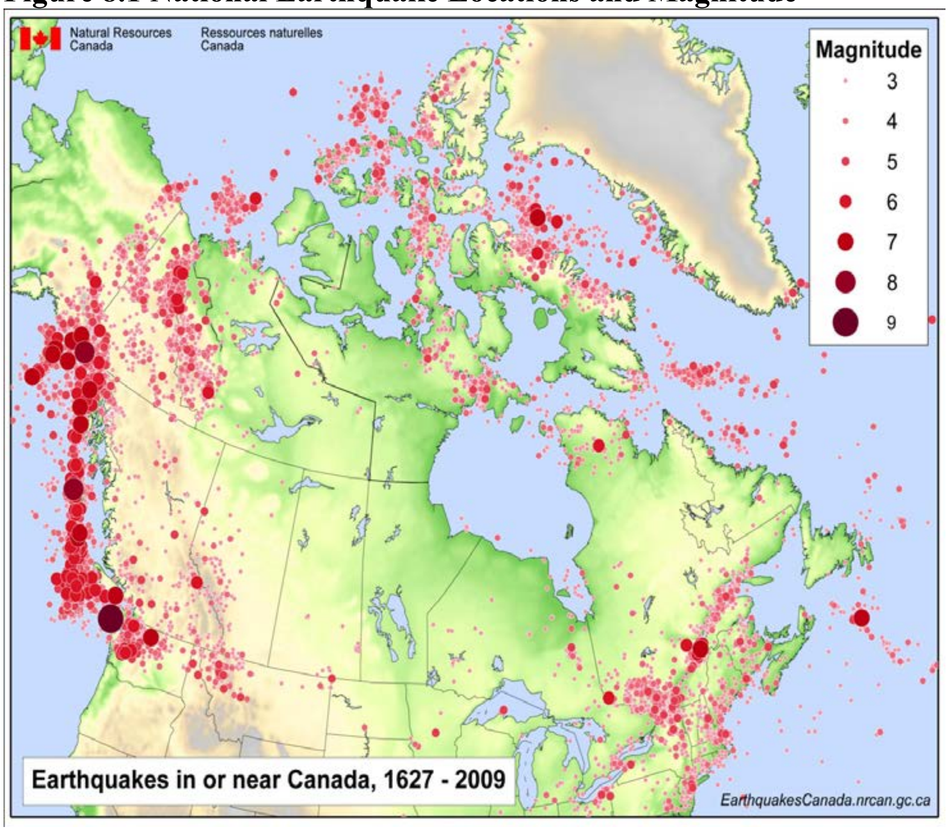
EARTHQUAKE AND THE MINING-AREA STABILITY

Earthquake

The Bullmoose property is in a region of moderate seismicity with natural earthquakes not uncommon by significantly less than that encountered in Vancouver. Natural seismicity is expected to be similar to that encountered through most of the rock mountain trend where there is active underground coal mining to the south in the United States.

The last major earthquake in the vicinity of the Bullmoose property occurred on April 16, 2011 in Dawson Creek. The earthquake had a magnitude of 5.3 and was the largest earthquake recorded in the area in 50 years. The largest previous earthquake was magnitude 4.6 and occurred in Grande Prairie in 1970. The location and magnitude of earthquakes recorded in Canada from 1627 to 2009 is illustrated in Figure 8.1.

Figure 8.1 National Earthquake Locations and Magnitude



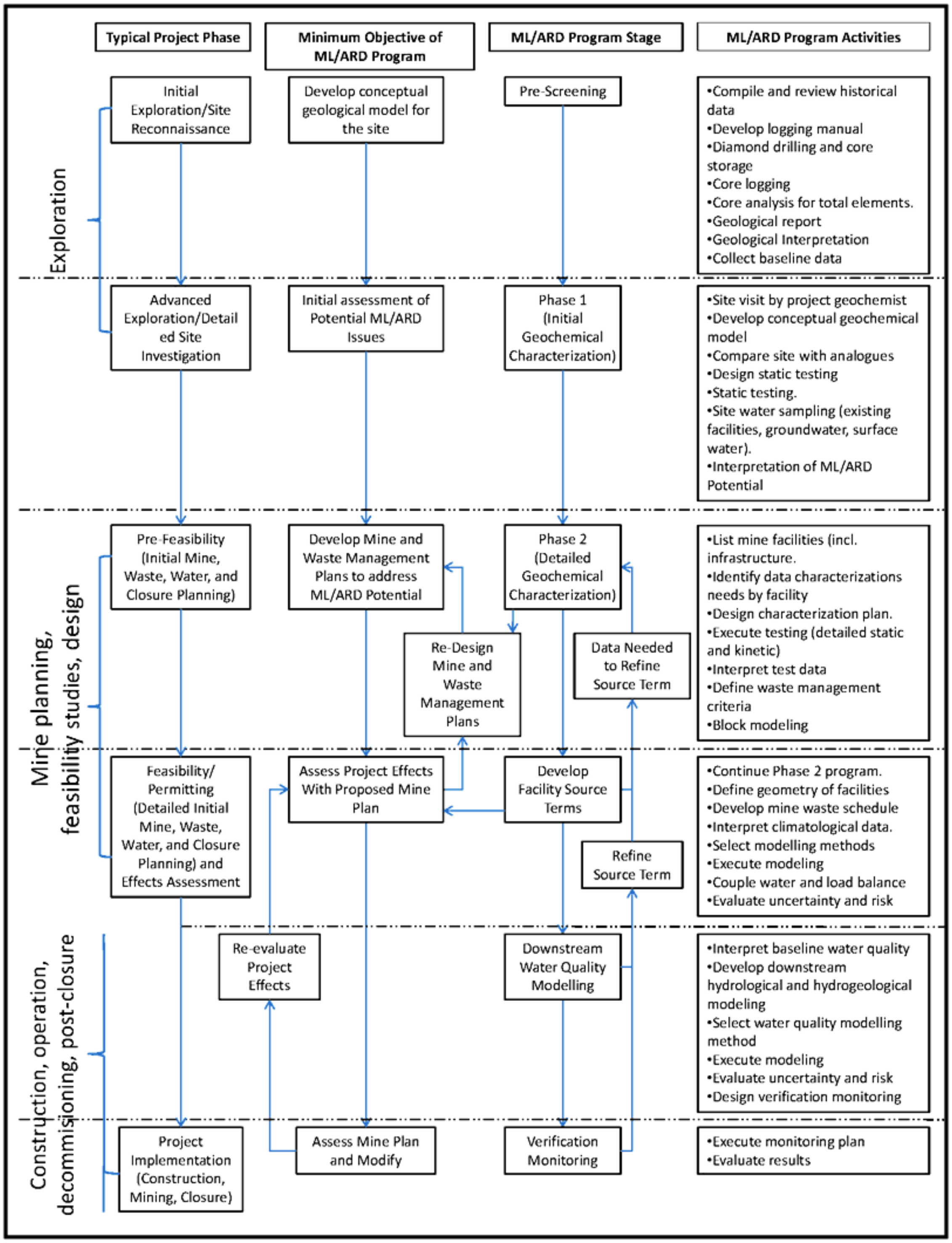
Stability of the Mining Area

The Bullmoose property is mountainous with interspersed alluvial valleys. Rock slides along the slopes of the mountains are not uncommon during the spring thaw. Flooding from temporary dams created from rock slides has been observed along the major water courses. The degree and severity of these hazards is difficult to assess with current information and land surveys are recommended to assess the impact or rock slides and associated temporary flooding on mine facilities.

MINE WASTE MANAGEMENT PLAN FOR ARD/ML

A waste rock management plan must be developed to minimize loadings from the mine site and to ensure environmental compliance with existing regulations. Investigations of the underground hydrology and surface hydro-meteorological conditions are imperative. ARD/ML (Acid Rock Drainage/Metal Leaching) mitigation strategies will be important to the success of the mining operation. Prediction of geochemistry is a critical component of mine planning as it relates to mine waste management and its impacts to water resources. Pre-mine material characterization, prediction and modeling of drainage geochemistry must consider the site-specific conditions and design of the mine. A schematic depiction of the progression in prediction objectives and activities associated with ARD/ML for the life of the mining project is illustrated in Figure 8.2.

Figure 8.2 Schematic of ARD/ML Progression in Prediction and Activities



Source: The International Network for Acid Prevention

SELENIUM MANAGEMENT PLAN

Selenium is a common earth element but it may become concentrated in food sources of aquatic animals and accumulate in their eggs, causing abnormalities, reducing reproductive success and/or increased mortality. It has been indicated that selenium toxicity thresholds for cold water fish are on the order of 22-30 µg/g. The anthropogenic sources are associated with coal mining activities and include: waste rock dumps; settling ponds; tailing ponds; mined-out pits; coarse reject piles; coal dryer ash disposal; coal dryer emissions (dust and/or gas); and, clean coal storage areas. Three waste rock disposal scenarios were identified because they have different potentials for releasing selenium into aquatic ecosystems, including valley in-fills with rock drains, waste rock dumps located adjacent to watercourses, and waste rock dumps located some distance from watercourses. Seeps from these waste rock dumps can discharge into settling ponds or directly into wetlands. Settling ponds likely represent one of the most important sources of selenium to aquatic ecosystems, with leakage from tailings ponds also being important in certain circumstances. Groundwater connections between mined-out pits and receiving waters may also contribute substantial loadings of selenium to aquatic ecosystems in some cases. Little is known about the contributions of selenium to aquatic ecosystems from coarse reject piles, dryer ash disposal activities, and clean coal storage piles.

Baseline studies for selenium levels in water, sediments, periphyton, benthic invertebrates, and fish must be conducted to characterize the pre-mining project status of the ecological systems which may be impacted by potential selenium releases from the project. A selenium management plan must be developed to obtain regulatory approvals for any proposed coal mine project. The province of British Columbia has developed Water Quality Guidelines (WQG) as presented in Table 8.1.

Table 8.1 BC Selenium Water Quality Guidelines

Water Use	Updated 2012 BC Se WQG
Aquatic Life	
Freshwater & marine water	
Alert concentration	**1 µg/L**
Guideline	**2 µg/L**
Dietary	
Invertebrate tissue (interim)	**4 µg/g (dw)**
Sediment - *Alert concentration*	**2 µg/g (dw)**
Tissue (fish)	
Egg/ovary (interim)	**11 µg/g (dw)**
Whole-body (WB)	**4 µg/g (dw)**
Muscle/muscle plug	**4 µg/g (dw)**
Wildlife	
Maximum water concentration	**2 µg/L**
Egg tissue Se	**6 µg/g (dw)**

Dry weight

COAL-BED METHANE AND OTHER BENEFICIAL MINERALS

COAL-BED METHANE

The currently available gas test data is insufficient for a reliable estimate of coal bed methane (CBM) potential on the property. As more data becomes available a more reliable assessment of the CBM potential within the property would be possible.

OTHER USEFUL MINERALS

There are no other known useful minerals identified on the property. There is active O&G exploration in the area, but drilling is focusing on sediments approximately 2,000m below the target horizons.

GENERAL RESEARCH ON THE ECONOMIC SIGNIFICANCE OF COAL DEVELOPMENT

SUPPLY-AND-DEMAND AND PRICE SITUATION IN THE COAL MARKET

To be supplied by Dehua as per Scope of Work.

Supply Forecast for the Product Market
To be supplied by Dehua as per Scope of Work.

Demand Forecast for the Product Market
To be supplied by Dehua as per Scope of Work.

Target Market and the Price Expectation for the Products
To be supplied by Dehua as per Scope of Work.

NATURAL CONDITIONS FOR COAL DEVELOPMENT AND CONSTRUCTION

Highway Transportation
The nearest paved road (highway) to the Bullmoose property is highway (HW) 29 which is on the northeastern boundary of the property. HW29 connects the town of Chetwynd in the north with Tumbler Ridge located 25km south of the property. An unpaved road through the center of the property connects the Bullmoose property with HW29.

HW29 is considered a vital public road network if is going to be used for the trucking of coal from Bullmoose property to off-site rail load-out facilities. HW29 is in excellent condition and from site observations appears to be underutilized with respect to current vehicular traffic. The nearest potential rail loadout facility is located nearby the Perry Creek mine in the Wolverine river valley a few kilometers south of the property. Approval for coal truck haulage for approximately 20km would need to be acquired from local authorities to access rail loadout facilities in the Wolverine River valley. The maximum load for tricking on paved (asphalt) roads is 63.5t.

For this study, Norwest has projected an overland conveyor to transport the clean coal from the portal, surface facilities and preparation plant site (in the northwest area of the license area) to a new rail loadout to BC Rail along the Wolverine River. This is shown in Figure 11.1.

An alternative to the overland conveyor would be the construction of an underground tunnel from the portal to the train loadout where the preparation plant would be located. This alternative could potentially have less surface environmental impact and would eliminate the need for the surface overland belt. This tunnel would be 19km long. A tunnel project of this magnitude would require extensive investigation (such as drilling to define the tunnel alignment) and engineering work. At this stage of evaluation, the time and cost to construct such a tunnel are assumed to be likely much greater than the overland conveyor option.

Other paved roads connecting Tumbler Ridge are HW52 (Heritage Highway) that connects the city of Prince George in the South and Dawson Creek to the north.

The Bullmoose property is connected to Highway 29 via an improved secondary road that at one time serviced the Teck Bullmoose surface mine. This road may require some rehabilitation to bring it to current standards for truck haulage, depending on the size and selection of trucks if truck haulage were to be used to transport the clean coal.

Railway Transportation

The nearest standard gauge railroad is the BC Rail line that runs along the Wolverine river valley a few kilometers south of the property. This rail link services the Teck's Quintette coal operations and Western Canadian Coal's Perry Creek mine. The most likely Locating rail load-out facilities for the Bullmoose project nearby Teck and Perry Creek facilities in the Wolverine valley appears to be the best site from which offload Bullmoose product coal product for rail transport to port facilities in Prince Rupert. Typical freight transportation by rail from Tumbler Ridge is as follows:

- 125 - 150 train wagons are loaded on every train
- Each railway wagon is 90 - 100t
- Total transportation capacity of each train is 12,000 to 15,000t
- Cost to port (Prince Rupert) is negotiated and can range anywhere from $C30 to $60 per tonne based on distance and frequency
- Haul cycle approximately four days for every train.

Sea Port
Prince Rupert Port is the major sea port for export and import goods distribution in the north-central part of BC province. This port will be used by Dehua for the transportation of coal product from the Bullmoose Coal Property to China and other Asian markets.

The main technical parameters of the Prince Rupert Port are as follows:

- Channel depth: 35m
- Berth depth: 17m
- Berth capacity: 250kt
- Annual maximum throughput: 12Mt, expanding to 25Mt by 2014
- Unloading capacity of the train: 6000t/h
- Shipment capacity: 9000t/h
- Maximum shipment height: 34 m
- Maximum shipment length: 240 m
- From Hong Kong: 5,286 sea miles
- From Shanghai: 4,642 sea miles
- Handling charges of tons of coal: $ 4.47.

Travel days from Prince Rupert Port to the coastal ports of China and the major Asian markets are provided in Table 11.1.

Table 11.1 Travel Time Prince Rupert to Major Ports

China		Korea		Japan	
Cities	Days	Cities	Days	Cities	Days
Dalian	13.1	Inchon	9.08	Kobe	11.4
Guangzhou	15	Busan	11.7	Nagoya	11
Hong Kong	14.8			Osaka	11.4
Shanghai	13			Tokyo	10.7
Tianjin	13.5			Yokohama	10.6
Zhanjiang	15.5				

Political Environment
The Worldwide Governance Indicators (WGI) are a research dataset summarizing the views on the quality of governance for countries by a number of survey institutes, think tanks, non-governmental organizations, and private sector firms. Table 11.2 compares the published 2011 percentile rank between Canada and the United States.

Table 11.2 Worldwide Governance Indicator Comparison

Government Index	Canada (%)	United States (%)
Voice and Accountability	94.8	85.9
Political Stability/No Violence	85.3	63.7
Government Effectiveness	97.2	88.6
Regulatory Quality	95.7	91.9
Rule of Law	94.8	91.1
Control of Corruption	95.3	85.3
Average Rank	**93.9**	**84.4**

Tax Policies

The financial evaluation for this project has been performed on an after tax basis which is based upon Canada and British Columbia tax regulations which are applicable to coal mining projects in British Columbia. Net income generated by a mining project is subject to a 15% Canadian Federal Income Tax Rate and a 10% British Columbia tax rate. Coal that is owned by the Crown (Government) is also subject to BC Mineral Taxes.

To determine the taxable income that is subject to the two income taxes, operating costs are allowed to be deducted from gross coal sales revenue. Capital expenditures may also be deducted from revenue based upon 30% per year and then the declining balance is used to determine annual depreciation deductions. Also 33% of the costs of mine construction and development CAPEX costs are deductible before the start of mine production.

As the coal is owned by the Canadian government, it is subject to the BC Mineral Taxes. The Mineral Taxes are 2% of the net current proceeds until the investment in the mine is recovered and after this the Mineral Taxes are 13% of the net revenue. An investment allowance rate is 3% per year as part of the determination of net revenue.

Power Supply Conditions

Power supply in the area of the Bullmoose project can be met by tying in to the high voltage power lines in the area. Project power usage and annual consumption should be tallied and further reviewed with BC Hydro to confirm availability and tariffs.

Water Source Conditions

Water is expected to be withdrawn from the nearby Bullmoose Creek or collected from site discharge ponds. Either of these sources can be treated in a water treatment facility located on site. While the water has not been tested for this report, it is expected that the water is suitable for use on site with minor treatment.

Other Construction Conditions

While the Tumbler Ridge BC area is remote, construction materials are available that can be transported to the site from various locations.

TECHNICAL CONDITIONS FOR COAL DEVELOPMENT AND CONSTRUCTION

In addition to the mining equipment the following infrastructure and support equipment will be required for the Bullmoose mining operation.

CONVEYOR SYSTEM

The conveyor belt systems will be used to transport the ROM coal from underground mining faces to the surface.

ELECTRICAL SYSTEM

The underground electrical system will be fed from a surface substation. Mining and permanent equipment is powered by electricity.

SUPPLY WATER SYSTEM

A water supply is required for dust suppression during mining and on conveyor systems and for fire suppression. Pipelines of various diameters would be used.

WATER REMOVAL SYSTEM

At this time, limited or no data is available on the potential for water in the mine although water inflows are likely. Water discharge systems will be required and it is likely that excess water will require treatment to meet effluent discharge requirements to natural creeks and rivers.

MAN AND MATERIAL TRANSPORTATION SYSTEM

Man and material transportation will be by rubber tired diesel equipment. Mantrips will be used for personnel transportation. Supply trailers would be used for the materials used for transportation of mining supplies and small equipment.

ROCK DUST SYSTEM

Rock is used to limit coal dust ignitions or explosions. Rock dust would be applied during the face mining cycle. A bulk transfer system using pipe is also anticipated for rock dusting areas outby the mining faces.

DESIGN SCALE AND THE SERVICE LIFE OF THE MINE

For this study the underground mine is projected for year round operation. Two shifts are scheduled each day for production and one shift for maintenance and mining section support activities.

The annual production capacity of the mine is 7.2Mtpy ROM. The average clean coal yield rate of is 40.1% of the ROM feed coal. This 40.1% is based upon the tonnage weighted average of the following four seam recovery rates and % of total ROM feed which is shown in Table 11.3. The coal processing plant is designed to process 1,200tph (operating) for 6,000 operating hours per year to process 7.2Mtpy.

Table 11.3 Seam Tonnes and Clean Coal Yield Rates

Seam	% Yield	ROM Mt	% of ROM Total	Clean Mt	% of Clean Total
D	34.4%	130	59%	45	51%
E1	36.3%	19	8%	7	8%
F	47.9%	41	19%	20	23%
Superior	57.0%	29	13%	17	19%
Average/Totals	**40.1%**	**218**	**100%**	**88**	**100%**

Note: The yield percentages incorporate Out of Seam Dilution estimates and an allowance for preparation plant efficiency in recovering clean coal from the ROM feed.

The average annual production of clean coal is 2.4Mtpy and ranges from 0.18Mt in the first year of mining to a maximum of 3.7Mt when the Superior seam is mined. This tonnage is based upon the potentially mineable coal seams and mining methods as follows:

- Potential mineable coal.
- The identified potentially mineable coal, for the purposes of this report and associated financial analyses, is approximately 218Mt ROM.
- Mining technical conditions.
- The technical mining conditions for this project require additional investigations and studies, but at this point there are no known reasons why mining would not be possible.

- Better coal quality and market competitiveness.
- Stable target market of coal.
- Transport conditions of coal.

For this study the mine life from the start of first coal production to the mining of the last potentially mine coal reserves is 34 years in which a total of 218Mt of ROM coal are mined which is an annual average of 6.4 Mt ROM including both the production ramp period and the end of mine life production decline. The approach used has been to keep the ROM annual production near to the 7Mtpy ROM level. Annual clean coal production levels will vary as the different coal seams are mined.

As requested by Dehua, the life of the mine may also be determined by the use of a Chinese provided formula which uses a reserve factor of 1.5.

Service life of the mine: T＝Z/KA with:
T - Service life of the mine in years
Z - Recoverable potentially ROM mineable coal reserves in the mine, 218Mt
A - Design production capacity of the mine shaft, ROM 7.2Mtpy
K - Reserve factor of mine reserves of 1.5.

The service life of the mine is:
T＝ 218/(1.5*7.2) = 20.2 years

EXTENSION WAYS AND METHODS OF COAL MINING IN THE MINE PLANNING

A key mining parameter review is detailed in Appendix N to identify mining issues, mineable areas and mineable seams within those areas. The area considered as the conceptual mine plan comprises 59km^2 and four mineable coal seams (D, E1, F, and Superior) have been identified in this review. The mining conditions in these seams dictate the use of longwall methods as the primary recovery method. The room and pillar mining method will provide development of ventilation and transportation headings to access longwall areas and as a limited secondary recovery method for areas too small for longwall methods. .

Mineable Seam Access

Access to the mineable seams requires the installation of ventilation shafts, conveyor belt declines (slopes) and driveable (rubber-tired equipment) access using spiral ramps. The D Seam is

Table 11.5 Labour Requirements For Project Life-of-Mine

Category	Years 1-22	Years 23-34 (Year 29 Peak)
Underground Hourly	728	1,435
Underground Management	151	216
Complex Management	27	30
Surface Management	19	19
Coal Preparation & Surface	95	95
Totals	**1,020**	**1,794**

The increase in labour starting in Year 23 occurs as mining transitions from the thicker more productive D seam into the thinner and steeper lower seams. Additional roadheader development and longwall mining units are needed to maintain product at the approximate 7Mtpy level.

Annual clean coal productivity per year ranges from about 700t per employee year during the initial D seam production ramp up period and about 6,400 at the end of mine life when roadheader development work is not needed and the clean coal recovery rate is higher in the Superior seam compared to the D Seam. Average overall labour productivity averages about 2,400 clean tonnes per employee per year over the life of the mine.

Capital Forecast

The total CAPEX of this project is US$1,336M for the Life of the Mine in 2013 constant US dollars. Approximately 41% (US$551M) is expended during the mine construction and production ramp up period and the remaining 59% (US$785M) is expended over the remainder of the mine life. Table 11.6 summarizes major categories of CAPEX spending during the construction period and throughout the LOM.

Table 11.6 Summary CAPEX Project Forecast (US$M)

Category	Initial Construction & Production Ramp Up	Remaining Mine Life	Life of Mine Total	% of Total
ROM Coal Handling, CPP, & Surface Mobile Equipment	$ 200	$ 10	$ 210	16%
Surface Facilities (non-coal handling)	$ 56	$ 5	$ 61	5%
Site Access and Power	$ 18	$ -	$ 18	1%
Surface Miscellaneous	$ 16	$ -	$ 16	1%
Sub Total Surface	**$ 290**	**$ 15**	**$ 305**	**23%**
Underground Mine Infrastructure (on Surface)	$ 57	$ 157	$ 214	16%
Underground Mine Equipment	$ 204	$ 613	$ 817	61%
Sub Total Mine	261	770	1,031	
Contingency	$ -	$ -	$ -	0%
Total CAPEX	**$ 551**	**$ 785**	**$ 1,336**	**100%**

The construction period of the project is estimated at two years while the total project life is estimated at 36 years. Forecasted CAPEX expenditures are modeled to be incurred to the calendar year as necessary for construction and/or equipment purchases.

INVESTMENT FUNDING

Dehua has provided information that CAPEX investment is to be from internal funding and loans. Internal funding (equity) shall be 30% of the CAPEX. Loans will provide 70% of the CAPEX cost during the two year construction period and the first five years of mine production. An annual loan interest rate is 6.8% is assumed for this study. Additional details concerning loan details are provided in the Financial Evaluation section of this report.

OPEX Forecast

OPEX costs have been estimated for the life of the project in 2013 constant dollars.

These costs include the following:

- Manpower costs for all hourly labor, supervisory, management, and administrative personnel.
- All operating materials and supplies such as ground support supplies, rock dust, etc. necessary for all underground and related surface project operations.

- All materials and supplies and components necessary for equipment maintenance and repair both on a routine basis and long term basis are included in the OPEX forecast.
- Costs to extend as the mine advances the mine infrastructure system such as the conveyor, electrical, water systems are included here.
- The cost of electrical power for all aspects of the project is included in this category.
- Other miscellaneous expenses include contracted technical services, training, safety equipment, security, etc.
- Costs for materials, supplies and power related to the processing of coal are included in the OPEX forecast.
- At this stage of evaluation, no contingency has been included in the OPEX forecast. **This variation is addressed in the Financial Analysis with Sensitivity section (see below).**
- The depreciation charge is based upon the life of mine CAPEX divided by the total coal production.

Table 11.7 Estimated LOM OPEX Costs ($/Tonne)

($/Tonne)				% of
#	**Category**	**ROM**	**Clean**	**Total**
1	Manpower	21.87	54.51	54%
2	Operating Materials & Supplies	9.21	22.96	23%
3	Maintenance Supplies Repairs & Overhauls	3.20	7.97	8%
4	Face Extensions	1.50	3.74	4%
5	Power	1.30	3.24	3%
6	Other Expenses	1.50	3.74	4%
7	Coal Processing Materials & Supplies & Power	1.55	3.87	4%
8	Contingency	-	-	0%
	Total Mine Cash Costs	**40.13**	**100.2**	**100%**
9	Depreciation	6.12	15.25	

FINANCIAL ANALYSIS WITH SENSITIVITY

At the time of this report, Dehua had not provided a sales price of the coal or the costs of rail transportation to a port on the west coast of British Columbia. The cost to load the clean coal into the vessel at a port has also not been provided. In an effort to provide preliminary indicative financial analysis results, Norwest has estimated total rail transportation and port loading costs at $40 per clean tonne.

Norwest has determined a coal sales prices at the port that is necessary to realize a project 8% Internal Rate of Return (IRR) on an after tax basis. **IT SHOULD BE NOTED THAT THE DETERMINATION OF THE COAL SALES PRICE NECESSARY FOR AN 8% RATE OF RETURN IS NOT A FORECAST BY NORWEST OF COAL PRICES FOR THIS PROJECT AS NORWEST DOES NOT CONDUCT SALES AND/OR MARKET STUDIES.**

In order to determine the coal sales prices Norwest used a Discounted Cash Flow (DCF) model. This model generates annual net cash flows for each year of the project life on a constant dollar basis. These annual net cash flows form the basis for IRR financial results.

The DCF model includes the impact of Canadian and British Columbia tax regulations as discussed above with respect to the tax treatment of revenue, CAPEX, depreciation, and other factors which affect the calculation of the annual net cash flows.

As discussed above, the CAPEX requirements of the project will be 30% funded by internal funds and 70% by loans during the construction period and the production ramp up period. During the time that the loans are in effect, interest is assumed to accrue and is added to the principal amount of the loans.

During the two years for construction (years -2 and -1) and the first four years of production, spending for CAPEX is significant. A total of $387M is borrowed is this time period. Starting in Year 5, this $387M with accumulated interest is repaid over a 20-year term at an 6.8% interest rate.

The base case requires a sales price of $188 per clean tonne at the port to generate an 8% IRR. Table 11.8 shows the projected cash flows for the 8% IRR Base Case including annual net cash flow and the inflow of cash from the loans and the outflow for the loan repayments.

Table 11.8 Base Case Cash Flows (US$M) 8% IRR

Year	IRR	-2	-1	1	2	3	4	5	6-25	26-34
Net Cash Flow (Before Loans)	**7.7%**	(81)	(244)	(90)	(112)	(90)	32	76	1,072	1,182
Cash Flow With Loans	**8.0%**									
Net Cash Flow Before Loans		**(81)**	**(244)**	**(90)**	**(112)**	**(90)**	**32**	**76**	**1,072**	**1,182**
Plus Loan Proceeds		57	171	39	33	45	41			
Minus Loan Payment								(47)	(897)	
Net Cash Flow With Loans or Repayments		(24)	(73)	(51)	(80)	(45)	73	29	174	1,182
$/Tonne Sales Price	**$ 188**									

Table 11.9 shows project IRR sensitivity to changes in the OPEX, CAPEX and coal sales price.

Table 11.9 Sensitivity Analysis Results IRR%

	% Change in Factor				
Factor	**-20%**	**-10%**	**0%**	**10%**	**20%**
OPEX	21	13.9	8	3.7	0
CAPEX	11.7	9.7	8	6.5	5.3
Sales Price	NM	0.6	8	17.6	26.9

Note NM is "Not Meaningful"

CONCLUSION

Norwest does not conduct market research or price forecasting, but for this project a product sales price of US$188 per tonne at the port and loaded into the vessel is required to achieve a project IRR of 8.0%.

CONCLUSION

EVALUATION OF EXPLORATION RESULTS

The Bullmoose property is interpreted to be at a very early stage of development for an underground metallurgical coal mining operation. The exploration data compiled to date is adequate for the assessment of coal resources and high-level mining studies; however more field data would need to be acquired should Dehua decide to proceed further with the project.

The data acquired thus far for the Bullmoose project is believed to be scoping to prefeasibility level for a typical North American underground coal mining project.

EXISTING PROBLEMS AND THE RECOMMENDATIONS FOR FUTURE WORK

The following items need to be addressed for further development of the coal property.

Additional Exploration Drilling
More concentrated (closely-spaced) exploration drilling is recommended for those areas identified as most suitable for underground mining. The current exploration data is sufficient for the identification of large fault/fold structures, however it is very likely that small scale faulting, channeling and folding (floor rolls) could be encountered over very short distances (within 100 to 200m). Closely spaced drilling on the order of 200m for the first year of mining should be seriously considered to determine the extent to which these disturbances would interrupt mine development.

Bulk Sampling
Large diameter drill core sampling or trial mining bulk sampling should be completed to provide sufficient sample volume and mass for processing plant simulation studies and coal marketing purposes. Of particular importance is a reliable estimate of practical plant yields which are critical with respect to the profitability of the project. Current theoretical yield estimates from slim core drilling are inadequate for a robust estimate of expected practical plant yields.

Mine Portal and Geohydrology
The mine portal design for trial mining (bulk sampling) has not been reviewed by Norwest. The location and path of the portal

(decline) would need to be made available in order for AMEC and Norwest to assess to what extent the decline will be impacted by groundwater ingress.

Till Depth

The current geological model has relied on drill hole log descriptions for establishing a depth to base of till horizon for limiting coal resources. Targeted shallow seismic programs or inexpensive rotary drilling programs would be required for a more accurate assessment of till depth in critical locations. The till depth in and around the proposed mine portal site is critical for establishing a safe and stable mine entry.

Exploration in Sub-crop Locations

The geological model is projecting there to be sub-cropping coal seams along the western boundary of the coal property and this represents an opportunity for surface mining in these areas. It is recommended that these areas be further explored through surface mapping and drilling. Drilling costs per completed hole for the proposed crop-line drilling would be significantly less than current costs per hole penetrating the deeper underground mineable areas.

Gas Data

Gas desorption testing was observed to be incomplete. Norwest recommends a method developed by analysing legacy data and applying regional experience. Results obtained from other properties in the PRC in similarly ranked coal, depth and pressure environments should yield similar results. Details of the alternative approach are provided in the body of the report.

Geotechnical Data

The currently available geotechnical test data is mostly limited to the D and E seams. More sample data is required for the remaining seams for an indication of expected roof and floor rock strengths.

Slake durability testing of seam floor samples was not observed. This simple inexpensive test is important determining stability of the floor rock when exposed to water over time.

Ground stability (soils) testing on planned surface facility locations would need to be conducted prior to construction.

Selenium and ARD/ML Testing
Selenium and ARD/ML testing has not been observed by Norwest. These two critical environmental parameters need to be tested and quantified should Dehua proceed with project development. Mitigation and management plans for Selenium and ARD/ML are required for mining permit applications.

Environmental Baseline Studies
Environmental base line studies including vegetation and wildlife studies would need to be conducted for a valid mining permit application.

MINE PLAN AND FINANCIAL EVALUATION

Table 11.3 shows the four seams to be mined with the effective preparation plant yields. The F and Superiors seams have the highest preparation plant yields of 48% and 57% respectively compared to the 34% and 36% of the D and E1 seams.

As discussed in the Coal Mining Method section, the seams will be mined in a sequential manner from the upper- most down to bottom-most seam. This mining sequence means the highest percentage of clean coal recovery and therefore more clean tonnes and higher cash flows occur in the later years of the project. This timing of higher cash flows in the later years effects the financial evaluation results of the project.

Dehua may wish to analyze the alternative of a revised mine plan and sequencing that incorporates more clean coal in earlier years of the project. This alternative would require careful review of the possible mine plans, costs, resources recovery, and other implications on the project.