BC Geological Survey
Coal Assessment Report
1006

DMT Geosciences

Final Report

Coal Assessment Report for the Year 2014 for the Murray River Coal Property, Peace River Coalfield, British Columbia

Effective Date:	March 31, 2015
Report Date:	December 31, 2015
DMT File Number:	2012CMAA.038

Prepared for:

HD Mining International Ltd.
Vancouver, British Columbia

Prepared by:

DMT Geosciences Ltd.
Calgary, AB, Canada

Section 2.3, Appendix 1, and a portion of Appendix 2 remain confidential under the terms of the Coal Act Regulation, and have been removed from the public version.

http://www.bclaws.ca/civix/document/id/complete/statreg/25
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COAL ASSESSMENT REPORT TITLE PAGE AND SUMMARY

Coal Assessment Report for the Year 2014 for the Murray River Coal Property, Peace River Coalfield, British Columbia

TOTAL COST:

$17,112,000

AUTHOR(S):

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Jin Zhang, HD Mining International Ltd., Vancouver, British Columbia.

SIGNATURE(S):

The effective date of publication of this report is March 31, 2015. The date of publication is December 31, 2015

Peter Cain, Ph.D., P.Eng
(APEG Registration 171620)
Director, Engineering and Consulting
DMT Geosciences Ltd

Jin Zhang.
Project Manager
H.D. Mining international Ltd.

NOTICE OF WORK PERMIT NUMBER(S)/DATE(S):

1. January-December 2014 CX.9.44

STATEMENT OF WORK EVENT NUMBER(S)/DATE(S):

1. January-December 2014

YEAR(S) OF WORK:

2014

PROPERTY NAME:

Murray River Coal Project

CLAIM NAME(S) (on which work was done):

417453, 417448

COMMODITIES SOUGHT:

COAL

MINERAL INVENTORY MINFILE NUMBER(S),IF KNOWN:

093I 035

MINING DIVISION:

Liard Mining Division

NTS / BCGS (at centre of work):

55°00’54”N, 121°02’38”E
UTM Zone 10 (NAD83), 622865E, 6104600N

OWNER AND OPERATOR:

HD MINING INTL. LTD.

MAILING ADDRESS:

Suite 2288 – 1177 West Hastings Street
Vancouver, BC
V6E 2K3

REPORT KEYWORDS

Murray River, Bituminous, Coal, Gates Formation, Underground bulk sample

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EXECUTIVE SUMMARY

The Murray River Coal Property lies to the southwest of Tumbler Ridge in the northeast of British Columbia. It was acquired by Canadian Dehua International Mines Group Inc. (Dehua) from Kennecott Canada Exploration Inc. (KCEI) in the summer of 2009. In that summer they drilled 11 boreholes and conducted an assessment of previous work. This drilling and assessment was summarized by Norwest (2010), and the Norwest report was accepted as the Coal Assessment Report required by the Coal Act for the 2010 exploration year.

In July 2009, Dehua signed an agreement with Huiyong Holding Group Co., Ltd (Huiyong) to develop the property and build a 6,000,000 tonne per year underground coal mine and associated infrastructure on the property. The property is now operated by HD (Huiyong Dehua) Mining International Ltd (HD) which is currently responsible for filing assessment reports on the property.

HD have retained DMT Geosciences Ltd. (DMT) of Calgary, AB to assist them with regulatory compliance and in late fall of 2014 DMT was requested to assist in the preparation of the assessment reports for 2011, 2012 and 2013. Table 1 describes the work completed on the property in the three years of interest.

This report describes the work conducted in 2014, which included:

- Development of 1000 m of rock tunnel from surface towards the target coal seams as described in the notice of work for the bulk sample permit.

The work was carried out by HD Mining International Ltd.

The summary of work and apportioned costs is shown in Table 1.

Table 1: Summary of Work and Apportioned Costs

2014				
TYPE OF WORK IN THIS REPORT		**EXTENT OF WORK (in metric units)**	**ON WHICH CLAIMS**	**PROJECT COSTS APPORTIONED (incl. support)**
TUNNELING (total metres)				
Tunnel	Total meters: Width: Height: Azimuth Gradient Portal Northing(1) Portal Easting(1) Portal Elevation(1)	1000 5.5 m 5 m N11.59.41E -16 degrees 6096895 624881 785.98 masl	417453	$17,112,000
			COST	**$17,112,000**
			TOTAL COST	**$17,112,000**

Note (1) UTM Zone 10 NAD83

The work on the property was carried out to access the target coal seams for metallurgical and other testing. During 2014 no coal seams were intersected and excavation of the tunnel continued into 2015.

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Appendices are attached at the end of the report,
in the following order

1.0 INTRODUCTION

1.1 Location

The Project is located 12.5 km southwest of the town of Tumbler Ridge, British Columbia (Figure 1-1). The coordinates are W 120°57'48"-121°7'38", N 54°59'42"-55°5'4". The property consists of 57 coal licences covering an area of 16,024 hectares and is situated on Crown land within the Peace River Regional District (PRRD).

The central position of the project area can be arrived at through going south for about 15 km from Tumbler Ridge to the Monkman Park Road, going west for 9 km to the Quintette Mesa mining field road, and going west for 4 km to the Quintette coal washery.

1.2 Accessibility and Infrastructure

The Project falls within the PRRD. The region has well established regional infrastructure to support resource activities, including forestry, oil and gas exploration, coal mining, wind energy. Existing infrastructure in the immediate vicinity of the Project include: BC Hydro transmission line; Pacific Northern Gas distribution system; CN Rail line; and forest service roads. The District of Tumbler Ridge and other regional communities have capacity to support growth.

The Murray River Coal Property lies about 1,184 km northeast of Vancouver and in the administrative district of the Tumbler Ridge (this area is part of the Peace River basin). The adjacent coal mines include Quintette, Perry Creek and Bullmoose. The exploration and development of the petroleum and natural gas in this area are active, and production wells of the natural gas and natural gas pipelines are distributed everywhere in the area. Some infrastructures owned by Quintette coal mine are still preserved in the Murray River Coal Property, including 13 km of belt conveying corridor from the Mesa mining area to the Quintette coal-washing plant closed for standby currently.

There are two Provincial highways from the Murray River Coal Property to Tumbler Ridge: going to the south from Chetwynd, then passing through No. 29 highway (95 km), or going through No. 97 highway from Dawson Creek to the southwest direction first, then passing No. 25 highway (Feller's Heights Road). The population of Tumbler Ridge is about 3,500, however, the infrastructure can accommodate 6,000 people.

The roads of Monkman Park and Quintette Mesa are in good service condition, and the two roads serve for the production of natural gas within the region. The Mast Creek Road traverses the western boundary of the property.

1.3 Physiography

The Murray River Coal Property is situated within the eastern foothills (Inner Foothills Belt) of the Rocky Mountains. The topography is comprised of a belt of hills and low mountains dominated by a series of northeast to southwest elongated ridges. Two major water courses, namely the Murray River in the south and east, and the Wolverine River in the north, flow through the project area and bisect the Inner Foothills Belt (Figure 1-2).

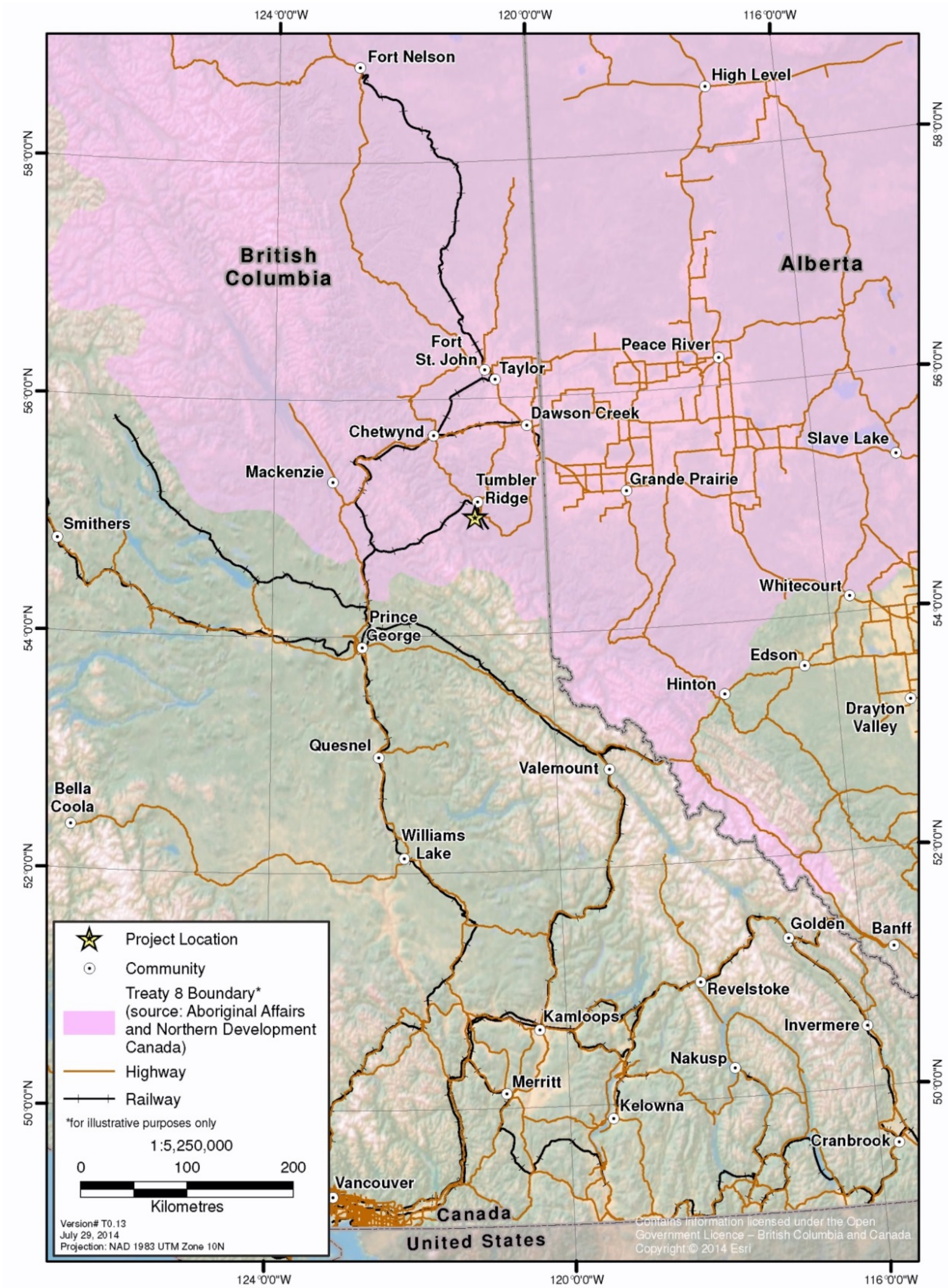

Figure 1-1: Project Location

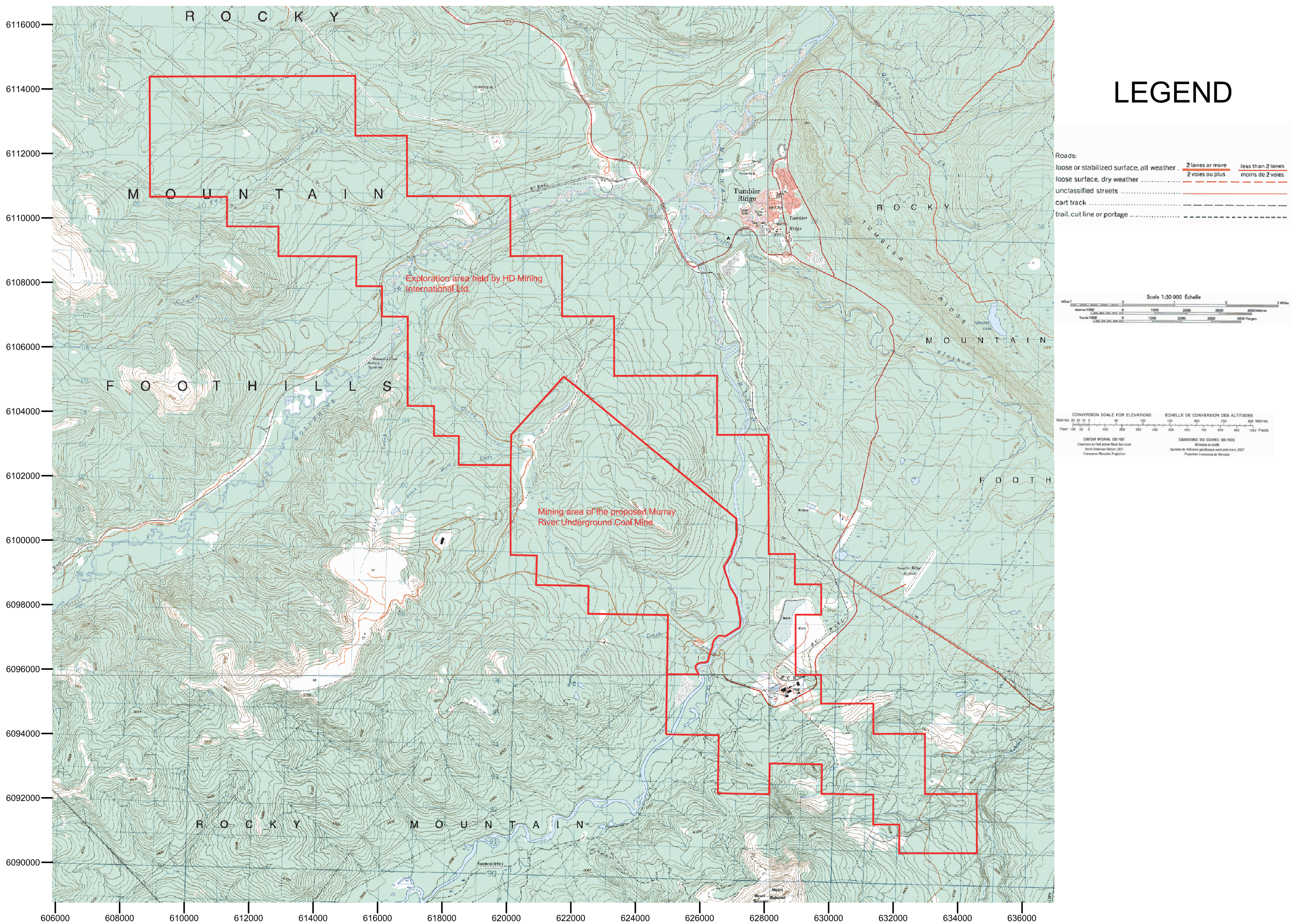

Figure 1-2: Topographic Map of the Exploration Area in the Murray River Coal Property

1.4 Climate

The climate in this area is characterized by a long, cold winter, a warm spring, and a short, cool summer because of the influences of the Rocky Mountains, the Pacific warm current, and the dry cold air from the northern polar region.

The average monthly temperature changes in the year are from -7.2°C to 15.2°C. The highest temperature recorded in history is 34°C and the lowest temperature of the year was -46.0°C, which are typical temperatures in the north east of British Columbia. The average temperatures in July and January in Tumbler Ridge are respectively 21°C and -5°C. Occasionally temperatures between -15 and -30°C occur in winter, generally from January to March.

The average annual rainfall in the area is 334 mm, and the snowfall is 1.85 m. Compared with the other regions in the Murray River Coal Property, the summer in the mountainous areas is cool and with heavy rainfall, and the winter is cold. Ice areas can be seen all year around, with continuous snow accumulation in winters between October and June. The dominant wind direction is southwest wind, and the wind with velocity of over 20 km/h is quite common in the top of the mountain ridge and the higher areas.

1.5 Mineral Tenure, Exploration and Permitting History

1.5.1 Mineral Tenure

The Murray River property consists of 57 coal licenses covering an area of 160 km2. The proposed underground mine and surface facilities are within 19 of the licence areas in the southeast portion of the licence block (Figure 1-2 and 1-3) with a total area of 37.45 km^2. As part of the Mines Act permitting process, HD Mining International Inc. (HD Mining) will seek to convert these licenses to a coal lease.

1.5.2 Exploration History

Previous exploration in the area was conducted by various major oil and gas companies in the 1970s (Lortie 2010), Quintette Coal Limited (Quintette) and more recently in 2006 and 2007 by Kennecott Coal Exploration Inc. (Kennecott). The exploration programs in the 1970s were generally regional in nature, comprised of widely spaced seismic lines and drilling of a small number of primarily oil and gas wells. These programs helped Quintette and Kennecott identify target areas for more detailed coal exploration and eventual mining. The target seams for the Project are part of the Gates Formation (Fort Saint John Group).

Kennecott's exploration program is the only known coal-specific exploration program previously conducted within the Murray River licence area. It consisted of one rotary (Lane 2006) and three core holes (BC MEMNG 2006) (two others were abandoned), surface mapping and interpretation of two seismic lines. Because of difficulties encountered during drilling, only one core hole was completed through the Gates Formation.

Du Pont completed two holes in 1979 west of the Murray River property as a preliminary investigation of the Gates Formation coal seams. One hole did not penetrate into the zone on contact between upper Gates and Hulcross formations due to the interception of a postulated fault zone (Du Pont of Canada Exploration Ltd. 1980).

Table 1–1: Claims Held by Dehua international forming the Murray River Coal Project

Coal Property No.	Map Sheet No.	Coal Property No.	Map Sheet No.	Coal Property No.	Map Sheet No.
417404	093P014	417423	093P005	417442	093P005
417405	093P014	417424	093P005	417443	093P005
417406	093P014	417425	093P005	417444	093P005
417407	093P014	417426	093P005	417445	093P005
417408	093P014	417427	093P005	417446	093P005
417409	093P014	417428	093P005	417447	093I095
417410	093P014	417429	093P005	417448	093P005
417411	093P014	417430	093P005	417449	093I095
417412	093P014	417431	093P005	417452	093I095
417413	093P014	417432	093P005	417453	093I095
417414	093P014	417433	093P005	417454	093I095
417415	093P014	417434	093P005	417455	093I095
417416	093P005	417435	093P005	417456	093I095
417417	093P015	417436	093P005	417457	093I095
417418	093P005	417437	093P005	417458	093I096
417419	093P005	417438	093P005	417459	093I096
417420	093P015	417439	093P005	417460	093I096
417421	093P005	417440	093P005	417461	093I096
417422	093P005	417441	093P005	417462	093I096

In 2009, Canadian Dehua International Mines Group Inc. obtained the Murray River coal property. Detailed exploration consisting of 12 drill holes was carried out in 2009 and 2010, focusing on the central part of the property (about 37.45 km^2). HD Mining took over responsibility for the exploration program in August 2010, and additional exploration was performed on the property. In total, 20 holes (17,850 m) have been drilled; two of the holes were tested for hydrogeologic properties.

1.5.3 Permitting History

As part of exploration of the coal deposit, HD Mining has received the following approvals from the BC Government to mine a 100,000 tonne bulk sample:

- Coal Exploration Permit CX-9-44 (BC Ministry of Energy, Mines, and Petroleum Resources), initially issued in December 2010, and amended in March 2012 to approve the Bulk Sample program;
- Occupant Licence to Cut (BC MFLNRO), issued in May 2011 to support exploration activities;
- Approval AE105825 under the BC Environmental Management Act (BC MOE), issued in February 2012, authorizes temporary discharge of effluent from the Murray River Bulk Sample initial surface preparation construction activity;

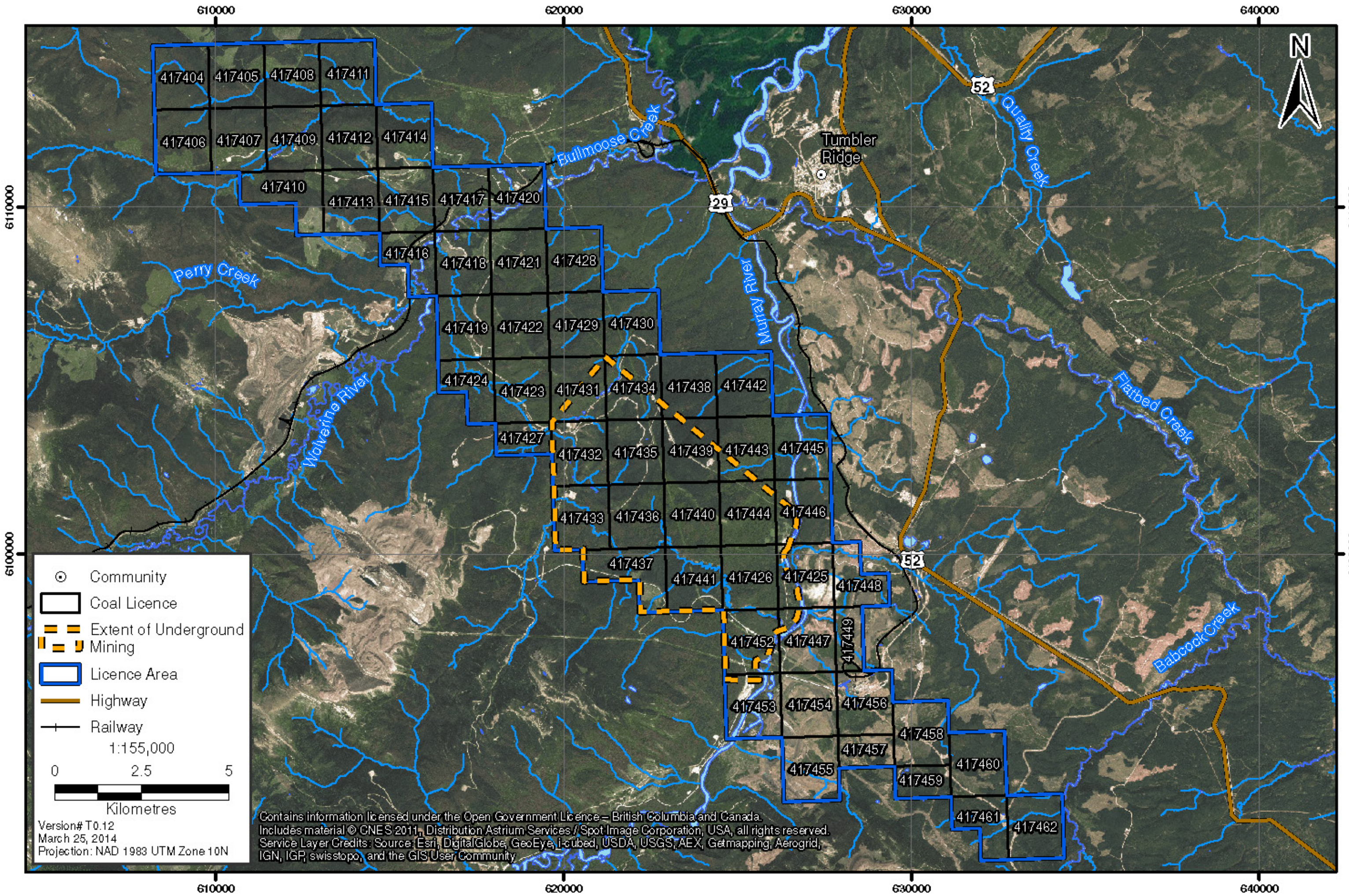

Figure 1-3: Murray River Coal Property and Proposed Underground Mining Area

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- Approval AE105878 under the BC Environmental Management Act (BC MOE), issued in March 2012, authorizes discharge of effluents from the Murray River Bulk

- Sample construction and operation activities; and

- Permit 106666 under the BC Environmental Management Act (BC MOE), issued in October 2013, replacing Approval AE105878; authorizes discharge of effluents from the Murray River Bulk Sample construction and operation activities.

The purpose of the Bulk Sample program is to test the coal for use as a coking coal and to perform coal washability testing. The raw coal mined for the bulk sample will be shipped by train directly to the port in Prince Rupert for testing to be completed overseas.

In 2012 and into 2013, HD Mining completed surface preparations to mine the bulk sample. Following approval of mining equipment, underground development of a decline began in January 2014.

2.0 GEOLOGY

2.1 Regional Setting

The Murray River property is located within the Peace River Coalfield (PRC) in the eastern foothills of the Canadian Rocky Mountains of northeastern BC. The western margin of the Foothills Belt is classified as the easternmost major thrust fault that emplaced Paleozoic strata over Mesozoic strata. The eastern margin is a series of echelon thrust faults that separate the Foothills from the gently dipping strata of the Alberta Plateau (Holland 1976). The Foothills Belt is characterized by folded and faulted Mesozoic sediments. The deformation within the Foothills Belt is variable – mostly decreasing in complexity toward the eastern margin. Deformation within the Rocky Mountains involves complicated folding and faulting. Regional axes for folding and faulting trend northwest, dipping to the southeast. In the Foothills Belt, dips tend to be 20° or less with local folds and undulations significantly modifying this value.

In the PRC there are two main coal-bearing units: the Gates Formation and the Gething Formation (British Columbia Geological Survey n.d.). Both Lower Cretaceous units were subjected to varying degrees of burial prior to the Laramide deformation and mountain-building episodes that took place approximately 40 to 70 million years ago when the Pacific and North American plates collided. The Laramide Orogeny increased the overall maturity of the coal seams. Based on drill core information from the neighbouring Quintette mine (immediately adjacent north of the Murray River Forest Service Road), coal seams of the Gates Formation can be comprised of up to 10 separate seams and the average cumulative thickness of the coal seams is as high as 17 metres.

2.2 Stratigraphy

The regional geology and stratigraphy of the PRC is provided in Figure 2-1 and Figure 2-2. Descriptions of the formations are provided below. The information is sourced primarily from Johnson (1985).

2.2.1 Moosebar Formation

The basal sequence of the Moosebar Formation is a dark grey to black marine shale with sideritic concretions, bentonite, and siltstone. The upper parts comprise banded or fissile sandy shale, very fine-grained sandstone, and sandstone intercalated shale. This transition is a pro-deltaic (highstand systems tract) transition from marine sediments to the massive continental sandstones that mark the overlying Gates Formation. The Bluesky Member is a chert pebble conglomerate that is found locally at the base of the Moosebar Formation.

2.2.2 Gates Formation (Fort St. John Group)

The Gates Formation conformably overlies the Moosebar Formation. The lower portion of the formation is termed the Quintette or Torrens member and consists of massive, light gray, mediumgrained sandstone, with minor carbonaceous and conglomeratic horizons.

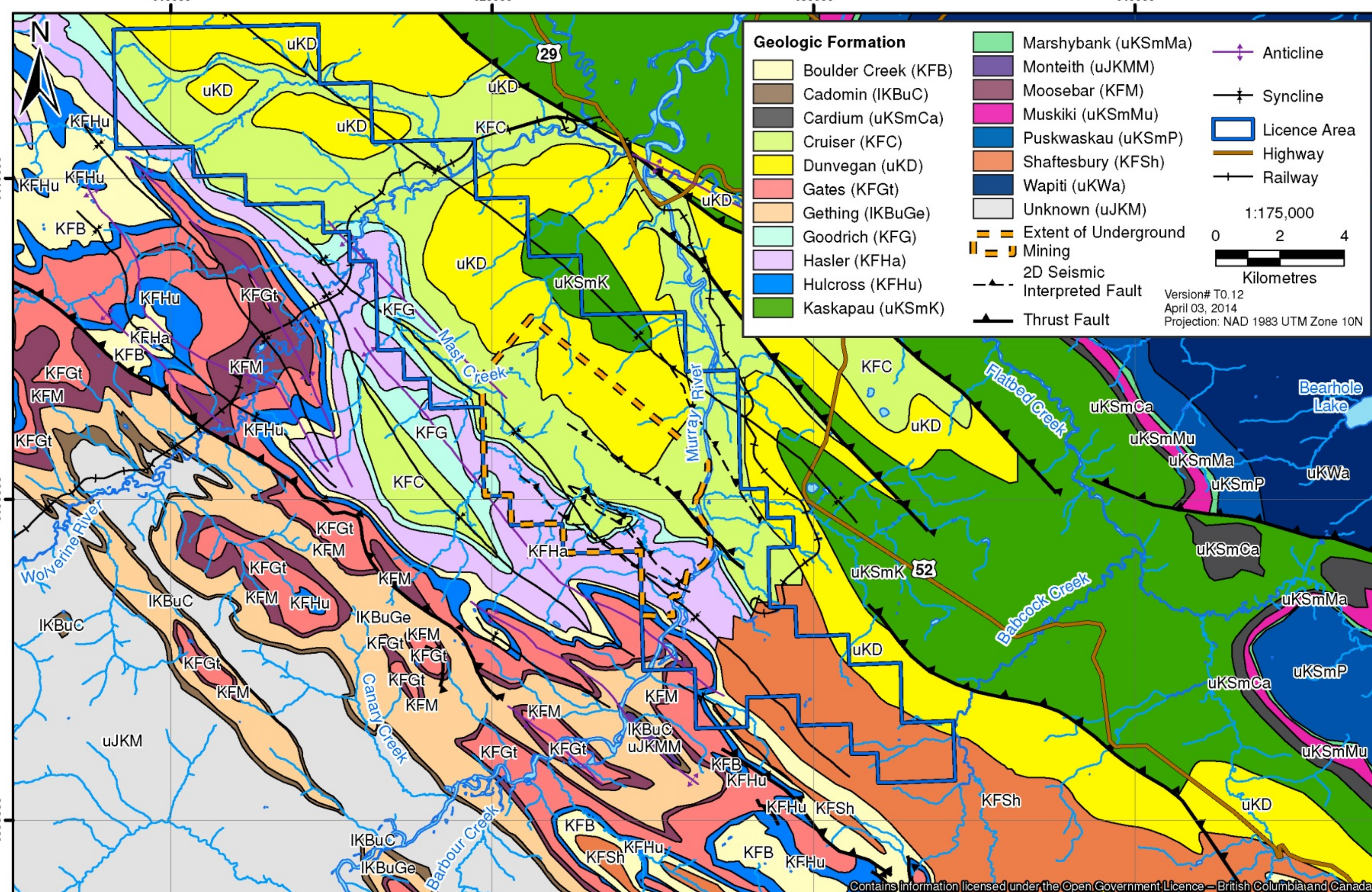
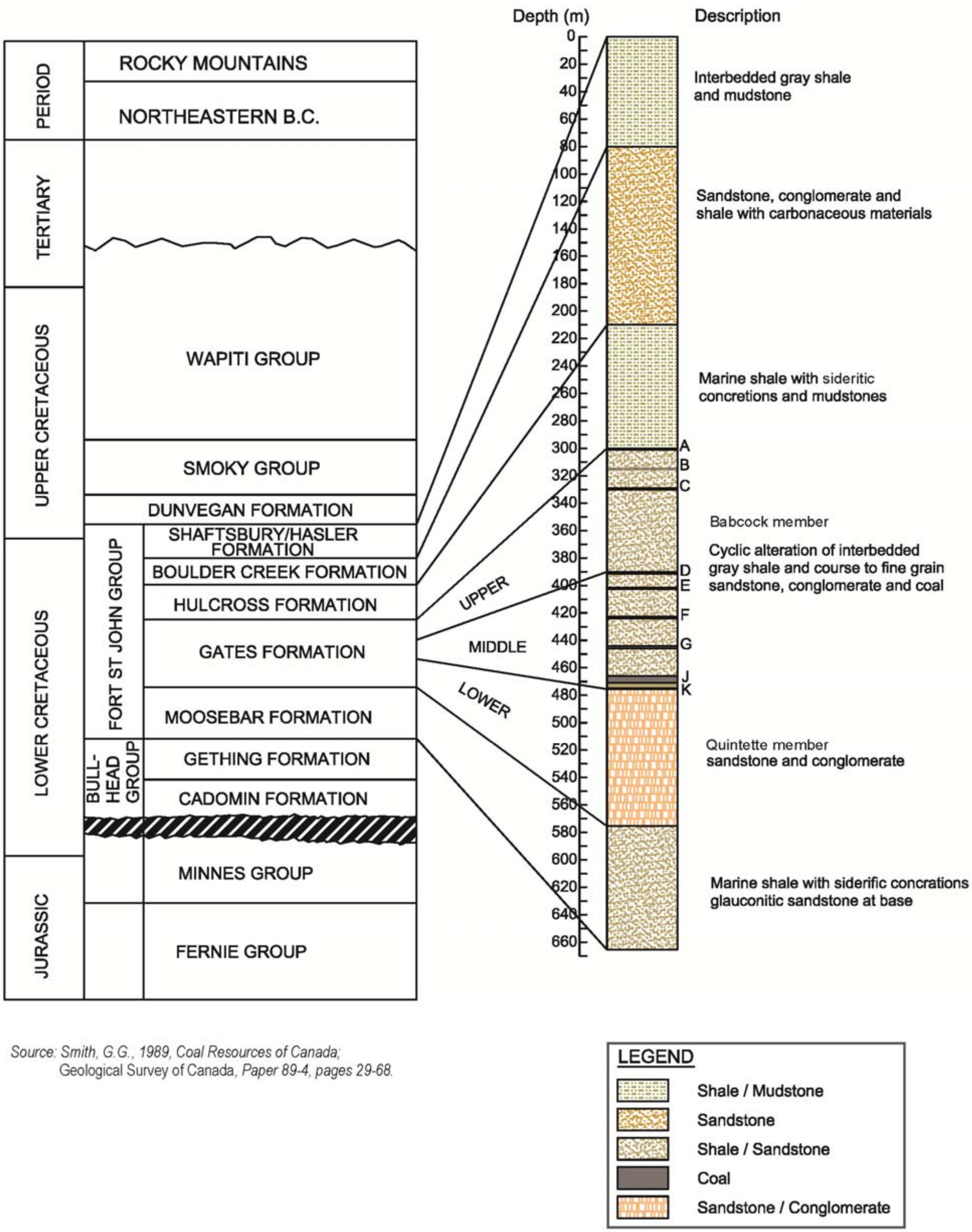


Figure 2-1: Regional Geological Setting of the Murray River Project

Earth | Insight | Values

DMT



Source: *Smith, G.G., 1989, Coal Resources of Canada; Geological Survey of Canada, Paper 89-4, pages 29-68.*

Figure 2-2: Typical Stratigraphic Column in the Murray River Project Area

The Quintette member is overlain by several cyclical sequences of coal deposition that occur over a stratigraphic interval of approximately 80 m collectively referred to as the Middle Gates. Each cycle normally begins with laminated, medium- to fine-grained sandstone at the base, transitioning to carbonaceous shale and coal. Coal seams are thickest and more continuous in the lowermost cycle: the D through K seams are economical to mine. Individual coal seams within the higher cycles may coalesce to form a single seam, e.g., the G and I seams are typically referred to as the G/I seam. The lower portion of the Upper Gates is massive, medium- to coarse-grained sandstone and overlain by a predominantly shale sequence containing two to three poorly developed coal seams (A to C) intercalated with sandy shale and very fine sandstone. A very thin bed of chert pebbles with ferruginous cement marks the contact of the Upper Gates with the overlying marine sediments of the Hulcross Formation.

2.2.3 Hulcross Formation

The Hulcross Formation is comprised predominantly of dark grey marine shale approximately 100 metres thick. The base of the Formation is more homogeneous and arenaceous, and can contain sideritic concretions. The upper portion of the Formation is dominated by thinly laminated interbeds of siltstone and very fine-grained sandstone. A few kaolinitic beds have also been observed. The Hulcross Formation is usually distinguished from the Moosebar Formation by the absence of glauconitic sandstones at the base of the Hulcross.

2.2.4 Boulder Creek Formation

The Boulder Creek Formation is a 130 to 200 metre thick sequence of shale, greywacke, and conglomerate that conformably overlies the Hulcross Formation. The Boulder Creek Formation is a coarsening upward sequence with massive conglomerate and conglomeratic sandstone in the upper portions of the Formation and alternating medium- to fine-grained sandstones and shale in the middle of the Formation (Du Pont of Canada Exploration Ltd. 1980).

2.2.5 Hasler Formation

The Hasler Formation is predominantly dark grey marine shale with sideritic concretions and a minor sandstone and pebble conglomerate component; the basal layer is frequently pebbly (British Columbia Ministry of Energy and Mines 2011).

Above the Hasler Formation, the Goodrich and Cruiser Formations form the uppermost units in the Fort St. John Group. According to regional geology maps, the Hasler, Goodrich, and Dunvegan formations comprise the majority of bedrock outcrop on the property.

2.3 Mineral Resources and Reserves

[redacted]

[redacted]

3.0 CONSTRUCTION OF THE AUXILIARY DECLINE

Table 3–1 shows the details of the construction of the auxiliary decline.

Table 3–1: Summary of the Details of the Auxiliary Decline Construction

Approval number	CX-9-44
Period	January to December, 2014
Claims	417453
Number of Tunnels	1
Total meters	1000
Size	5.5 m wide, 4.5 m high, nominal
Core storage location	None
Cost	$17,112,000

Excavation began mid-January, 2014 and was undertaken according to the conditions set out in the Bulk Sample Permit CX-9-44 (attached as Appendix 1).

The work was conducted according to the procedures described in:

"Review of an Application for a Coal Bulk Sample Project, Murray River Project, British Columbia." prepared by DMT Geosciences Ltd of Calgary, AB for HD Mining international Ltd dated November 2012

The report was required by MEM to satisfy the requirement that a professional engineer registered in BC had certified the proposed work. It is attached as Appendix 2

The decline was excavated by a Chinese-manufactured road-header. The broken rock was loaded out on a conveyor and trucked to the approved waste rock pile at the North site (Drawing 3-1, at the end of the report).

Details of monthly construction and cost are shown in Table 3–2 overleaf. Monthly advance is shown in Drawing 3-2 (at end of report).

Geological mapping of the face was carried out and in conjunction with the results of previous exploration boreholes an interpreted cross section of the geology along the decline was constructed (Drawing 3-3, at the end of the report)

The first 500 m of excavation was supported using steel arches set at a nominal spacing of 1.0 m. The remaining 500 m excavated in 2014 was supported using rock bolts, rib bolts, mesh and straps, augmented by cable bolts as required.

In order to monitor the performance of the roof support in the roof-bolted decline, a series of single-point wire extensometers, or "tell-tales" were installed in the roof at regular intervals (Drawing 3-4, at the end of report). Any movement of the roof indicating a weakness of the roof support and hence a potential hazard to the workforce could be detected from regular inspection. No unexpected movement of the roof was detected, indicating a satisfactory roof support design.

Table 3–2: Summary of Expenditure, 2014

Canadian Dollars, thousands	Pre-2014	2014 Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total 2014	TOTAL
Mine Construction	1	30	83	173	326	176	377	214	349	413	603	1,100	1,224	5,068	5,069
Civil Construction	25	119	9	35	38	0	67	0	43	99	131	0	39	578	602
Installations	69	176	198	108	241	213	251	299	257	372	283	19	32	2,448	2,516
Total Construction	**95**	**324**	**290**	**316**	**604**	**389**	**694**	**513**	**648**	**884**	**1,017**	**1,119**	**1,295**	**8,093**	**8,188**
Equipment Purchases	29	17	0	0	0	12	0	11	0	213	10	42	325	629	657
Other	136	403	375	549	683	717	790	735	802	897	807	779	854	8,391	8,527
TOTAL	**260**	**743**	**666**	**865**	**1,288**	**1,118**	**1,483**	**1,258**	**1,450**	**1,994**	**1,833**	**1,940**	**2,474**	**17,112**	**17,372**
Metres Advanced		17	29	73	145	156	118	120	4.7(1)	43(2)	120	130	44(3)		
Cumulative Metres		17	46	119	264	420	538	658	662.7	705.7	825.7	955.7	999.7		

Notes:
1 Decline sinking in this month is only 4.7 meters (encountered hard sandstone and used up all cutting bits; purchased explosives; hired licensed blasters; built explosive magazine; encountered gas and water).
2 Early September, u/g advanced drilling training. Middle September, started advanced drilling, and drilled up to 101 meters. Late September, resumed decline sinking
3 December 9th to December 19th, advanced drilling up to 105 meters, normal geology and no gas encountered

In addition to geological mapping, geotechnical mapping was also conducted, using the "Q" system of rock mass characterization[1]. The rock mass characteristics were regularly assessed by the HD geologist. The value of "Q" along the decline is shown in Drawing 3-5 (at end of report).

During decline development a number of water inflows were encountered. These have been investigated as part of the ongoing mine hydrogeological investigation, the results of which will be available in 2016. Drawing 3-6 (at the end of the report) shows the locations of the inflows with brief details and estimates of the amount of water flowing from them.

Drawing 3-7 shows the results of a survey of water flow in the decline (conducted in 2014 by Co-Op program students from the University of British Columbia) combined with the rock mass parameter data. The larger water flows are seen to be associated with the weaker rock types.

[1] Barton, N.R.; Lien, R.; Lunde, J. (1974). "Engineering classification of rock masses for the design of tunnel support". Rock Mechanics and Rock Engineering (Springer) **6** (4): 189–236.

4.0 CERTIFICATES

4.1 Peter Cain, Ph.D., P.Eng.

As the co-author of this report entitled "Coal Assessment Report for the Year 2014 for the Murray River Coal Property, Peace River Coalfield, British Columbia" dated December 31, 2015 ("the Report"), I, Peter Cain, do hereby certify that:

1. I am employed by and carried out this assignment for:

   DMT Geosciences Ltd.,
   Suite 415 – 708 11th Avenue SW,
   Calgary, Alberta, T2R 0E4, Canada.
   Telephone: (403) 264-9496
   Fax: (403) 263-7641

2. I hold the following academic qualifications:
   - Bachelor of Science – University of Wales, University College Cardiff, 1977
   - Doctor of Philosophy – University of Wales, 1982

3. I am a registered member of the:
   - Association of Professional Engineers and Geoscientists of British Columbia, Licence - 37663.
   - Association of Professional Engineers, Geologists and Geophysicists of Alberta, Member - 63684.
   - Association of Professional Engineers and Geoscientists of Saskatchewan, Licence - 25843.

4. I have worked as a mining engineer for a total of 38 years since my undergraduate degree from university. I have worked in grassroots to advanced stage mining projects. I have experience with underground and open pit and quarry operations from the pre-production stage to closure. I have the following experience in coal and coal mining:
   - I hold a First Class Certificate of Competency – Underground Coal - from the Province of BC.
   - I hold an Underground Coal Mine Manager's Certificate from the Province of Alberta.
   - Preparation of a coal resource/coal reserve estimate of the PT Senemas Energindo Mineral coal mine in Kalimantan, Indonesia for Agritrade Resources Ltd (2012)
   - Completed a due diligence review of coal lands owned by Chugach Alaska Corporation in the Chugach hills for Canada Coal Inc.
   - Engineering work on the feasibility study for a new underground coal mine development near Cucuta in Norte de Santander Department in northwest Colombia for Compañia Minera Cerro Tasajero (2010-2011).
   - Engineering lead for DMT on the PT Indika Energy technical team working on the potential acquisition of PT Bayan Resources, Citibank as financial advisor (2010).

- Engineering lead for DMT on the PT Indika Energy technical team working on the potential acquisition of PT Berau, Citibank as financial advisor (2009).
- Due diligence review of certain coal assets in Cordoba Department, Colombia, on behalf of Prime Natural Resources.
- A technical review of various coal assets in Norte del Santander Department, Colombia on behalf of Vitol SA.
- Technical assistance to several coal mines in the Cucuta area in Norte del Santander Department, Colombia on behalf of a potential investor. Included safety audits and operational assistance as well as reviewing the design of exploration projects.
- Review of certain coal assets on the island of Borneo on behalf of Indika Energy Inc. (2007-2008) including the South Gobi and PT Berau properties.
- Technical due diligence on the assets of the Taiyuan Sanxing Coal Gasification (Group) Co Ltd. owned by China Coal Energy Holdings Ltd. of Hong Kong. Completed for Pine Street Capital (Elliott Advisors (HK) Ltd.

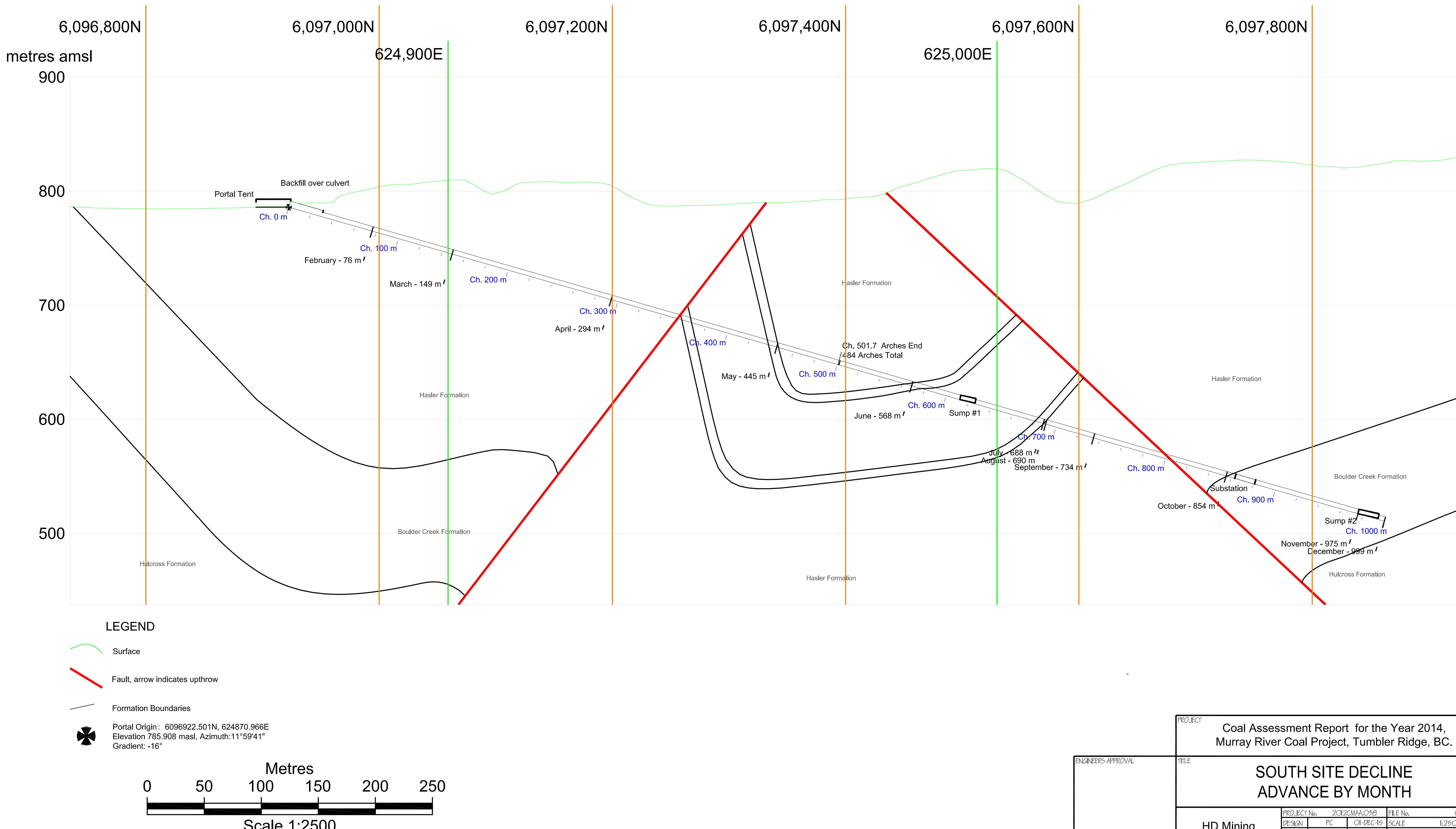
5. Prior to joining DMT I spent six months designing an underground coal mine in Iran and two months writing an NI 43-101 Technical Report on coal mining properties in Colombia.
6. From 2000 to 2004 I was Mine Manager for Grande Cache Coal Corporation responsible for all aspects of mine design, planning and costing for their No. 7 Mine, including preparation for a successful stock market launch in 2004. Prior work experience includes:

1998 – 2000	**Smoky River Coal Limited** Senior Geotechnical Engineer.
1993 – 1998	**NRCan – CANMET-CRL** Group Leader - Strata Control.
1987 – 1993	**Jacques Whitford and Associates Ltd.** Senior Mining Engineer.
1986 – 1987	**Webster Machine Company Ltd.** Mining Engineer.
1982 – 1986	**NRCan – CANMET-CRL** Research Scientist.

Dated at Calgary, AB. this 31st Day of December, 2015.

Peter Cain, Ph.D., P.Eng.
Director, Engineering and Consulting
DMT Geosciences Ltd.

北
N
KMR06
建井矸石排放场及沉淀水池
Waste Rock Stockpile & Settling Pound in North Site
Mast Rd
230kv Exist Power Line
SUMP #2
Dec 31, 2014
Nov 30, 2014
Oct 31, 2014
Sep 30
Jul 31,Aug 31
SUMP #1
Jun 30
Last Arch
May 31
Apr 30
Mach 31
Jan 28, 2014
Twenty Creek
森林服务道路
Murray Forest Service Rd
Murry Forest Service Rd
MURRAY RIVER
墨玉河
8003317
8014530
Aux Decline Portal:
X=6,096,922.501
Y=624,870.966
Z=785.908
Azimuth: 11°59'41"
Dip: -16°,-28.67%
Parking Lot
#1 Settlement Pond
#2 Settlement Pond
Generator
Cap Maz
Powder Maz
图 例 LEGEND
资产地境界 The Boundary of Property
井田境界 The Boundary of Mining Area
The Area of Planning on Surface
The Area of Designed Mine Plan
The Area of Designed Mine Plan in Laste Stage.
The Entry Road of Mine Site
给水 The Line of Water Supply
The Designed Power Line
Exist Forest Service Road
Exist 230kv Power Line
既有 铁路 Exist CN Railway
Designed New Site Railway
The Protect Zone of Gas Line
River or Creek
湿地 Swamp
HD矿业国际公司 HD Mining International Ltd.
设计 DRAWN BEN. JIAO
审核 CHECKED P. CAIN
Mine Surface Layout
MURRAY RIVER COAL MINE
共 张 TOTAL NUM.:
第 张 NUMBER:
重量 Weight (kg)
比例 SCALE 1:3000
出版日期 ISSUED DATE 2015.11.30
DRAW NO. Dwg 3-1
会签栏 SIGNATURES
专业 Specialty
姓名 Name
签字 Signature



PROJECT

Coal Assessment Report for the Year 2014,
Murray River Coal Project, Tumbler Ridge, BC.

ENGINEERS APPROVAL

TITLE

SOUTH SITE DECLINE ADVANCE BY MONTH

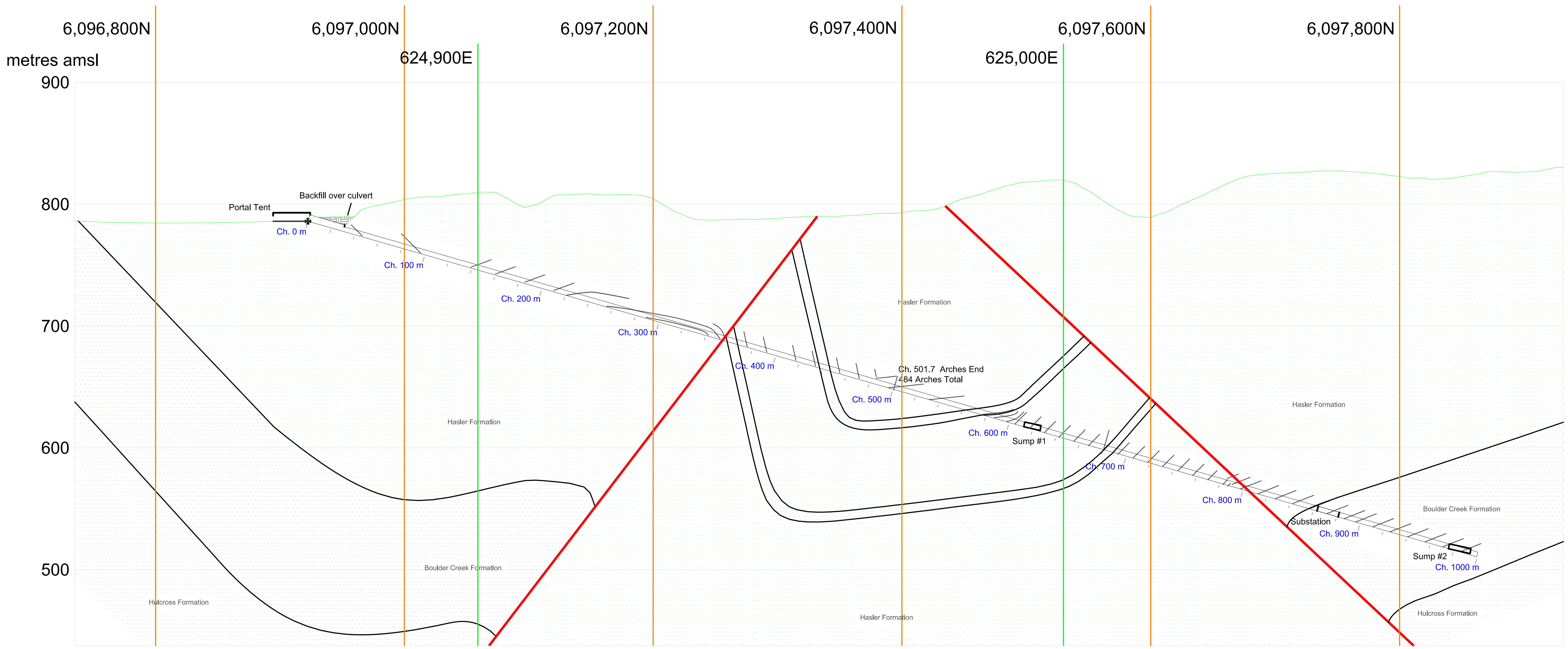
HD Mining International Ltd.

PROJECT No.	2012CMAA.038	
DESIGN	PC	01-DEC-15
CADD	PC	01-DEC-15
CHECK	-	-
REVIEW	-	-

FILE No. 038-3020

SCALE 1:2500 on 11 x 17

Dwg 3-2



LEGEND

Backfill		Surface	
Hasler Formation - undifferentiated mudstones, silty mudstones and siltstones with two sandstone markers as indicated		Fault, arrow indicates upthrow	
Boulder Creek Formation - mudstones and siltstones		Inclination of bedding as mapped.	
Hulcross Formation - Not intercepted.		Portal Origin: 6096922.501N, 624870.966E Elevation 785.908 masl, Azimuth:11°59'41" Gradient: -16°	

Metres

0 50 100 150 200 250

Scale 1:2500

ENGINEERS APPROVAL	PROJECT Coal Assessment Report for the Year 2014, Murray River Coal Project, Tumbler Ridge, BC.
	TITLE GEOLOGICAL CROSS SECTION OF THE SOUTH SITE DECLINE

HD Mining International Ltd.	PROJECT No.	2012CMAA.038		FILE No. 038-3020
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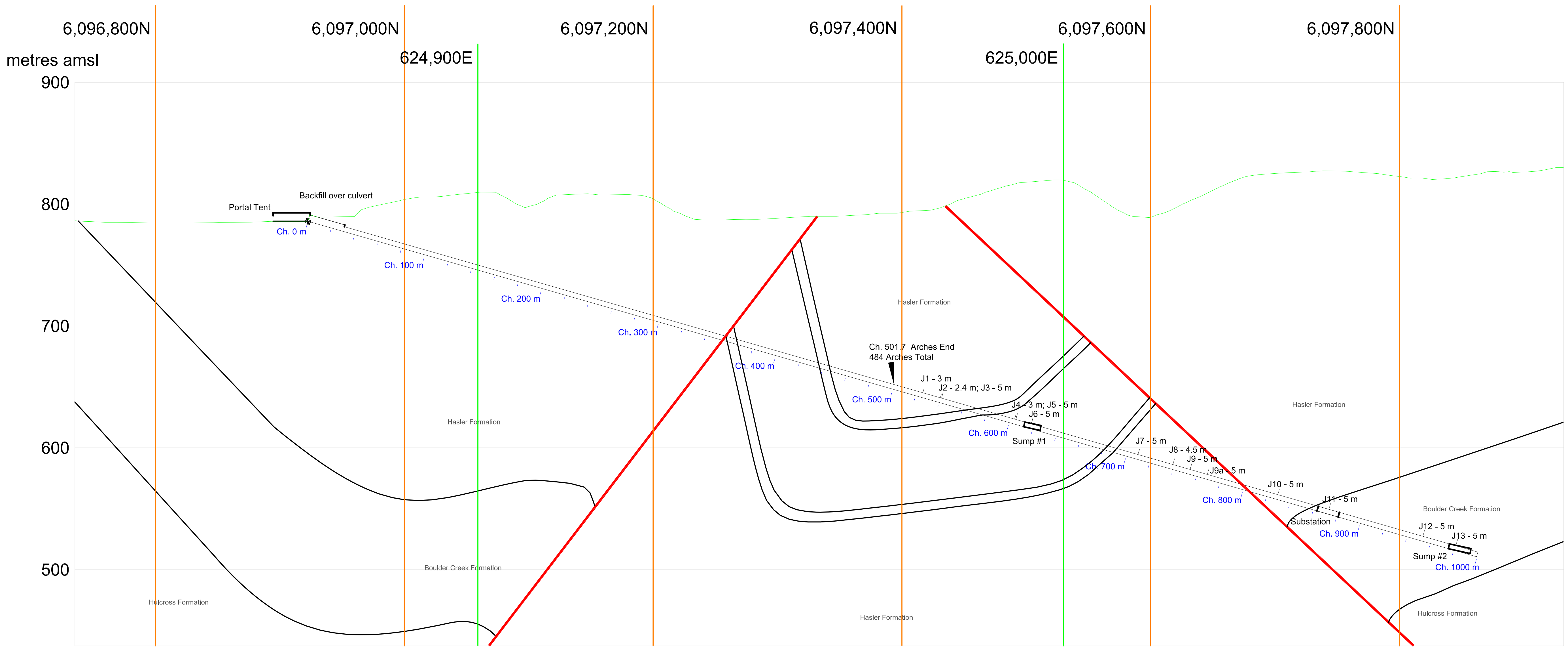

LEGEND

Surface

Fault, arrow indicates upthrow

Formation Boundaries

Portal Origin: 6096922.501N, 624870.966E
Elevation 785.908 masl, Azimuth:11°59'41"
Gradient: -16°

Metres

0 50 100 150 200 250

Scale 1:2500

PROJECT	Coal Assessment Report for the Year 2014, Murray River Coal Project, Tumbler Ridge, BC.				
ENGINEERS APPROVAL	TITLE: SOUTH SITE DECLINE EXTENSOMETER LOCATIONS				
	HD Mining International Ltd.	PROJECT No.	2012CMAA.038	FILE No.	038-3020
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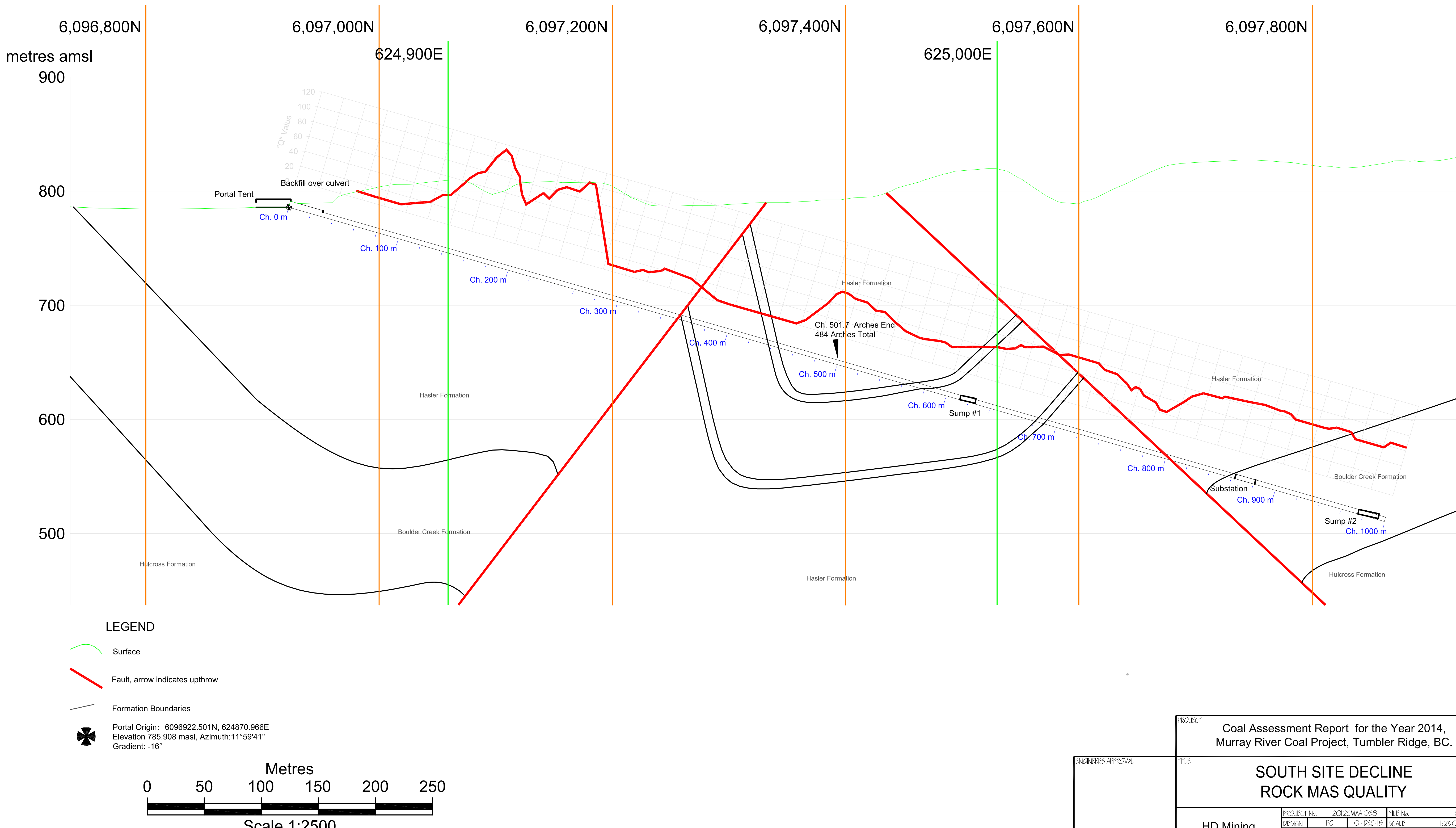

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ENGINEERS APPROVAL	TITLE	SOUTH SITE DECLINE ROCK MAS QUALITY		
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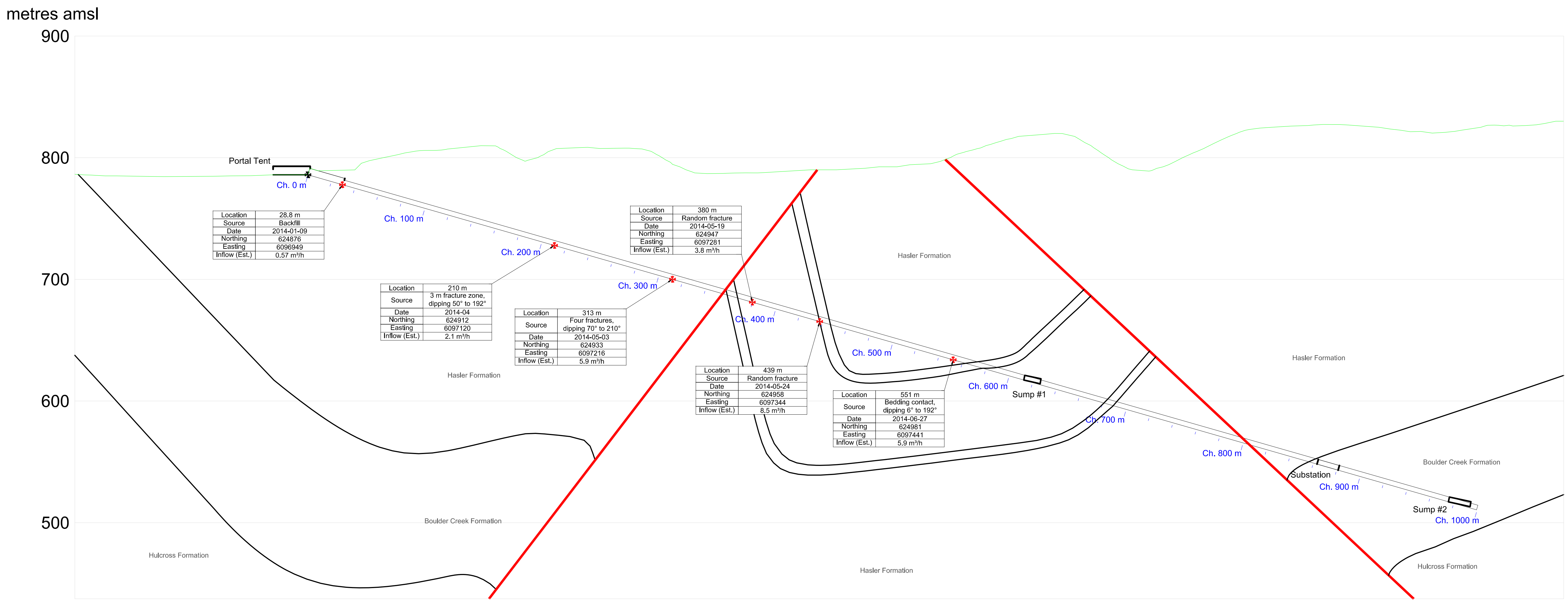

LEGEND

- Surface
- Fault, arrow indicates upthrow
- Formation Boundaries
- Portal Origin: 6096922.501N, 624870.966E
  Elevation 785.908 masl, Azimuth:11°59'41"
  Gradient: -16°

Metres
0 50 100 150 200 250
Scale 1:2500

PROJECT	Coal Assessment Report for the Year 2014, Murray River Coal Project, Tumbler Ridge, BC.
ENGINEERS APPROVAL	
TITLE	SOUTH SITE DECLINE iNFLOW LOCATIONS
	HD Mining International Ltd.

PROJECT No.	2012CMAA.038	
DESIGN	PC	01-DEC-15
CADD	PC	01-DEC-15
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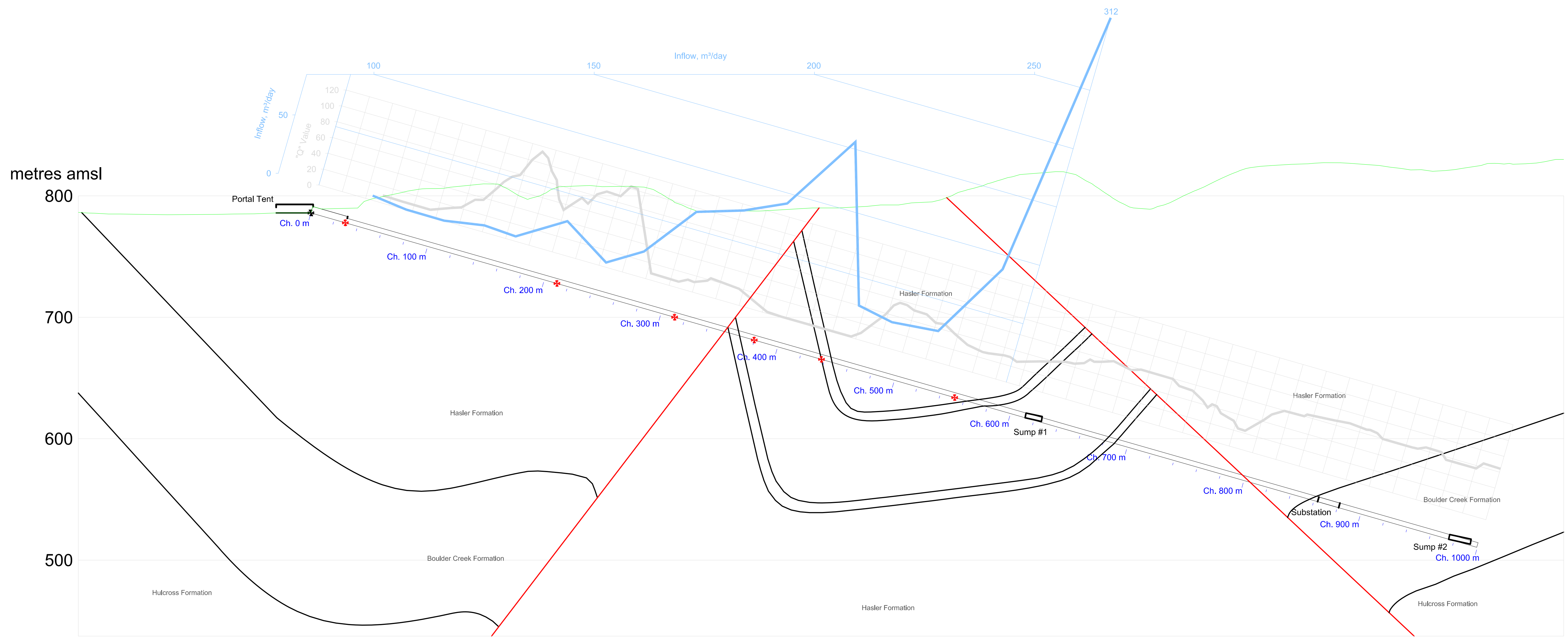
Dwg 3-5



LEGEND

Surface

Fault, arrow indicates upthrow

Formation Boundaries

Portal Origin: 6096922.501N, 624870.966E
Elevation 785.908 masl, Azimuth:11°59'41"
Gradient: -16°

Major Inflow Locations (see Dwg 3-6 for details

Metres
0 50 100 150 200 250
Scale 1:2500

ENGINEERS APPROVAL	PROJECT: Coal Assessment Report for the Year 2014, Murray River Coal Project, Tumbler Ridge, BC.				
	TITLE: SOUTH SITE DECLINE INFLOW RELATED TO Q INDEX				
	HD Mining International Ltd.	PROJECT No.	2012CMAA058	FILE No.	058-3020
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		CHECK	-	-	
		REVIEW	-	-	

APPENDIX 1

Bulk Sample Permit CX-9-44 as amended, Issued March 15, 2012

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APPENDIX 2

“Review of an Application for a Coal Bulk Sample Project, Murray River Project, British Columbia.” prepared by DMT Geosciences Ltd of Calgary, AB for HD Mining international Ltd dated November 2012.

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DMT Geosciences

Review of an Application for a Coal Bulk Sample Project, Murray River Project, British Columbia.

Prepared For:

HD Mining International Limited
Vancouver, British Columbia

Prepared By:

DMT Geosciences Ltd.
Calgary, Canada

November, 2012

November 12, 2012

DMT Geosciences Ltd.
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Lingyun Zuo
General Manager
HD Mining International Ltd.
Suite-433 595 Burrard Street, P.O. Box 49161
Vancouver BC
Canada V7X 1J1

Dear Sir:

RE: Letter of Transmittal, General Arrangement Drawings, Murray River Property

HD Mining International Ltd. (HDMI) controls coal licenses for its Murray River Project near Tumbler Ridge, British Columbia. HD is owned by Huiyong Holdings (BC) Ltd., Canadian Dehua International Mines Inc. (Dehua), and Hong Kong Staray Investment Co. The Murray River coal is a coking coal. At this stage of the project definition, there are over 481 Million tonnes (Mt) of demonstrated coal resources in several seams.

In December 2010 HDMI was awarded a permit (CX-9-44) for coal exploration on the property by the British Columbia Ministry of Energy and Mines (MEM). Subsequent applications in May, August and December of 2011 for amendments to the permit for geotechnical drilling and approvals for surface site facilities at the North Shaft and South Decline Sites were granted.

In warly 2012 HD sought to obtain permission to extract a 100,000 t bulk sample of coal. This bulk sample would be used to test coal for use as a coking coal and assist in developing markets for this coal. Coal washability testing would also be performed on this coal. In order to obtain the bulk sample, HD was required by the BC Mines Act (RSBC 1996 c. 293) to obtain an amendment to their permit, prior to which a "..plan outlining the details of the proposed work…" had to be filed with an inspector.

HDMI retained Norwest Consultants of Utah to prepare a "..plan outlining the details of the proposed work…" at the mine site. The bulk sample operation was to consist of a decline containing a conveyor and a rail haulage and a shaft for men and material access with a small room and pillar section providing 100,000 t of coal for metallurgical testing.

After review of the application, including the Norwest submission, MEM suggested some changes, which were subsequently made and submitted by HDMI staff. While this amended application was accepted by MEM and a permit awarded for the proposed bulk sample operation (March 15, 2012), MEM noted that neither the original Norwest document nor the amended HDMI submission was certified by a professional engineer registered in British Columbia.

DMT Geosciences (DMT) of Calgary Alberta was commissioned by HD Mining International Ltd (HDMI) to assist with the development of their proposed Murray River Mine by the Ministry of Mines and Energy of British Columbia (MEM). DMT was asked to review the submissions and to certify them in accordance with MEM's requirements.

As a result of subsequent discussions between HDMI and MEM regarding equipment, HDMI made a decision to restrict the initial application to the decline portal and decline development. DMT has extracted the decline development general arrangements described by Norwest from the full permit application, as modified by HDMI's supplementary submission, in the following document.

DMT has reviewed the overall content of the submissions by HDMI for compliance with applicable legislative requirements at the permitting stage. Both HDMI and DMT undertand that additional documents, certified by a professional engineer registered in British Columbia, will have to be prepared as outlined in the permit conditions.

Please contact the undersigned if you have any questions.

Yours Truly
DMT Geosciences Ltd

// ORIGINAL SIGNED BY AUTHOR //

Peter Cain, Ph.D., P.Eng.
Head of Mining Engineering

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1 INTRODUCTION

1.1 Background

HD Mining International Ltd. (HD) controls coal licenses for its Murray River Project near Tumbler Ridge, British Columbia. Figure 1-1 shows the general location of the Murray River Project. Figure 1-2 shows the Murray River Project Coal Tenures within the Peace River Coalfield.

HD is owned by Huiyong Holdings (BC) Ltd., Canadian Dehua International Mines Inc. (Dehua), and Hong Kong Staray Investment Co. Dehua conducted exploration drilling on Murray River in 2009 and in 2011 completed an exploration program. The Murray River coal is a coking coal. At this stage of the project definition, there are over 481 million tonnes (Mt) of demonstrated coal resources in several seams.

HD sought to obtain a 100,000 t bulk sample of coal. This bulk sample would be used to test coal for use as a coking coal and to assist in developing markets for this coal. Coal washability testing would also be performed on this coal. In order to obtain the bulk sample, HD was required by the BC Mines Act (RSBC 1996 c. 293) to obtain a permit, prior to which a "..plan outlining the details of the proposed work…" had to be filed with an inspector.

HD asked Norwest Corporation (Norwest) to develop the bulk sample plan, which they did out of their Salt Lake City and West Virginia offices. The plan was based upon information provided by HD, the Shenyang Coal Mine Design Institute (Shenyang), Rescan Environmental Services Ltd., and Norwest. The following areas were described in the plan:

- Surface facilities
- Vertical Shaft and Inclined Shaft (Decline) access to the coal seam
- Bulk sample mining
- Construction and mining schedule.

Additional documents outlined the means to conserve cultural heritage resources and the protection and reclamation of the land.

Bulk sample collection using room and pillar mining methods was proposed. The target coal seam, F Seam, would be accessed by one inclined shaft (referred to in this plan as the "decline") and one vertical shaft.

The project was initially planned to occur in two phases; the first phase was to be the construction of the necessary temporary/portable surface facilities and the excavation and equipping of the two shafts, the second phase was to be the mining of the coal.

Norwest completed a plan for the two phases of the bulk sample collection and presented it to HD, who in turn submitted it to the BC Ministry of Energy and Mines

(MEM) in support of HD's application for a permit for the bulk sample program (Norwest, 2011).

HD was awarded an amendment to their Permit CX-9-44 on March 15, 2012 permitting the bulk sample collection program.

Subsequent to the award of the permit amendment, HD entered into discussions with MEM regarding the proposed use of surface and underground mining equipment manufactured in China. Discussions relating to the approval of this equipment for use in underground coal mines in British Columbia are ongoing, particularly with regard to the approval of electrical equipment and shaft sinking and hoisting equipment.

Because of the delays resulting from these discussions, the project schedule has been re-evaluated. The immediate emphasis is on the establishment on the surface facilities at the decline portal site and the commencement of decline construction. Shaft-sinking has been delayed until 2013.

Among the conditions attached to the amended permit were the following:

- The underground bulk sample shall not exceed 100,000 tonnes of mined coal under the terms of this permit.
- The proponent shall ensure that the following engineering drawings, stamped and approved by a P.Eng. licensed in British Columbia, are provided to the Senior Regional Permitting Inspector of Mines a minimum of 60 days prior to the commencement of:
    - Collaring the portal to the decline ramp,
    - Mine Shaft Development, and
    - Installation of any hoisting system, head frame, building or other permanent structure.
- All underground mine openings shall be sealed by the construction of engineered stopping that satisfy the requirements of the Code and the needs of the Province for reclamation at the time of permanent abandonment, or if the site is to be dormant for a period in excess of 18 months.
- Only approved explosives and detonators shall be utilized in decline developments within 30 metres of a coal seam. This does not apply if all workers are removed from the mine during blasting.
- In addition to the required ventilation plan, the manager shall provide a plan for the gas\air monitoring within the mine that includes the location and specification of all monitoring equipment in both intake and return airways. The plan shall also address the identification, monitoring and mitigation of potential spontaneous combustion. This plan shall also include the specification of all automated equipment shut downs associated with the monitoring system.

1.2 Scope of Work

HD Mining has retained DMT Geosciences Ltd. (DMT) of Calgary, AB to provide engineering design services in two stages.

The initial stage of the engineering work is to review the document prepared by Norwest in support of the permit application for the bulk sample program, to update it with respect to the decline construction only and to issue it certified by a professional engineer registered in the Province of British Columbia.

The second stage of work the work includes compiling the engineering drawings required to meet the conditions imposed by MEM on the permit, specifically:

- The proponent shall ensure that the following engineering drawings, stamped and approved by a P.Eng. licensed in British Columbia, are provided to the Senior Regional Permitting Inspector of Mines a minimum of 60 days prior to the commencement of:
  - Collaring the portal to the decline ramp,
  - Mine Shaft Development, and
  - Installation of any hoisting system, head frame, building or other permanent structure.

HD has also asked DMT to address the following engineering aspects of the decline development:

- Cross section;
- Support of the opening;
- Ventilation and safety;
- Power distribution;
- Haulage with extensible belt conveyor;
- Haulage with the winch and mine cars on tracks as well as safety measures;
- Water supply and dewatering system;
- Other components related to the inclined shaft construction.

All drawings are to be signed and certified by a professional engineer registered in BC and in accordance with the requirements of the BC Ministry of Energy and Mines.

This report completes Stage 1 of DMT's scope, the review and updating of the document prepared by Norwest with respect to the decline construction only and its issue over the certification of a professional engineer registered in the Province of British Columbia.

2 GEOLOGY OF THE AREA

The following was prepared by Norwest and is included for completeness. DMT believes that the descriptions provided below are accurate representations of the geology.

2.1 Geologic Setting

The proposed bulk sample site 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 age sediments that in places involve complex and severe faulting. Structural deformation is considerable near the western margin of the Foothills and diminishes in extent and complexity toward the eastern margin.

The two main coal-bearing units occurring throughout the Foothills region are the Gates formation and Gething formation. The Lower Cretaceous age coal seams from these two formations were subjected to varying depths of burial prior to Laramide 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.

2.2 Stratigraphy

The coal seam of interest for the bulk sample program is the F Seam which is one of several coal seams contained within the Lower Cretaceous Gates formation of the Fort Saint John Group.

Table 2-1 summarizes the typical stratigraphy for the PRC in Northeast British Columbia. The primary units occurring within the Murray River property and planned bulk sample area range between the Hasler and Gething formations.

The coal-bearing horizons are found both within the Gates formation and Gething formation. This bulk sample plan only includes Gates formation coal due to these coal measures being relatively shallow (<800 m) in target areas and accessible for drilling and sampling. The target coal seam for the bulk sample program is the F Seam which is estimated to average 4.1 m thick within the planned bulk sample areas.

Table 2-1: Typical Peace River Coalfield Stratigraphy

Geologic Age	Group	Formation	Rock Descriptions
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-grained, well-sorted sandstone; carbonaceous sandstone; massive conglomerate; siltstone; marine and non-marine 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 coarsegrained sandstone, carbonaceous shale, and coal
	Regional erosional Unconformity		
Jurassic	Minnes		Quartzose sandstone; fine-grained sandstone; silty shale; mudstone; minor carbonaceous sediments

3 PROJECT OVERVIEW

[redacted] They have a permit from BC MEM to obtain a 100,000 t bulk sample from the F Seam in the Gates formation for metallurgical testing and to provide data on the mining conditions likely to be encountered in a full-scale operation.

The bulk sample program includes the development of a vertical shaft and an inclined shaft (decline) to access a portion of the resource identified for the bulk sample. Both the inclined shaft (decline), which will house a conveyor belt and a rail haulage, and the vertical shaft, have been sized for the full scale production mine, although initial equipment is designed for the bulk sample phase only.

Figure 3-1 shows the bulk sample project area including the bulk sample surface facilities boundary, the proposed north (vertical shaft) and south (inclined shaft) access locations and the surrounding area. These locations are at elevations above the Murray River. The Mast Creek road is adjacent to the North Shaft Site and provides access to this Site. The Murray River Forest Service Road provides access to the South Site. Travel between the two sites would be on the public roads. Figure 3-2 shows the South site in additional detail.

The bulk of the facilities and infrastructure shown in Figure 3-2 will all be temporary in nature, and will exist only for the duration of the construction of the inclined shaft:

- Temporary access roads will be reclaimed.
- The temporary portable buildings installed to support the development work will be removed and will be replaced with permanent buildings at the North Site; the site will be reclaimed.
- The rail turnout and marshaling yard will be dismantled and the hoist used only for intermittent access and conveyor belt inspection.
- The conveyor used for development will be entirely replaced with a conveyor and structure capable of sustaining a 6 Mtpa ROM coal output.
- The settling pond will remain to ensure long term environmental protection of the site.

The development of the shaft is expected to occur in 2013 after discussions with MEM regarding equipment have been concluded. The development of the decline is scheduled for late 2012 and comprises the following stages:

- Development of the portal cut and construction of the portal cover
- Development of surface facilities and infrastructure required for decline construction
- Decline construction.

4 DEVELOPMENT OF THE PORTAL CUT

The initial design reviewed by MEM was deficient in that it failed to address the variable thicknesses of overburden materials present and did not address the hazards associated with soil and rock slopes.

HD retained Golder Associates of Burnaby BC to assess surface geotechnical conditions, AMEC out of Vancouver to address foundation designs and Armtec of Edmonton to design, provide and supervise construction of a steel portal structure to protect the face-up of the decline.

These designs and construction drawings have been submitted to MEM and construction approval has been given.

The revised location of the start of the inclined shaft (overburden cut) is N6096895.1, E624880.85 at an elevation of 785.98 masl.

A surface cut 11 m wide dipping at 16° at an azimuth of 012° will host a 7 m wide corrugated sectional steel bridge culvert on a concrete foundation and solid concrete floor. Drainage provisions will ensure that water does not collect beneath the floor, but will flow into the tunnel for collection, pumping to the surface, treatment and ultimate release. The face-up point will be at an elevation of 771.73 masl, or lower as required to provide a competent face for initial tunnel development.

The design of the surface cut, foundations and steel portal have been completed by others and reviewed by MEM. DMT understands that construction is currently underway, including boundary water diversion water treatment ponds and the layout of stockpile areas.

5 DECLINE SURFACE FACILITIES

The temporary surface facilities associated with the decline include the following:

- Temporary electrical supply for mining equipment
- Temporary water supply
- Temporary mine nuisance water management facilities
- Temporary waste rock handling
- Temporary Offices and Warehousing
- Decline Tracked Haulage
- Temporary conveyor belt drive for the underground conveyor
- Temporary magazines for detonators and explosives

5.1 Temporary Electrical Supply

The electrical supply for the decline development will be provided by a suitably sized generator or generators. Discussions with MEM are ongoing regarding whether the surface supply for the mine should comply with the Canadian Electrical Code or with the more rigorous and mine-specific requirements of the CAN/CSA M421 "Use of Electricity in Mines" standard (M421) , which is followed in the rest of Canada. Unfortunately the Health Safety and Reclamation Code of British Columbia (HSRC) is badly formulated with regards to this aspect of mine design, establishing three mutually exclusive regulatory requirements.

DMT is of the opinion that M421 is the only logical standard and that this standard should apply to facilities within the surface perimeter. Where the proposed equipment does not exactly conform to the M421 requirements the "equivalent safety or safer than" provisions of M421 should be applied.

General Arrangement Drawings were presented for the electrical supply but these have been superseded by the current discussion son electrical standards. Detailed design drawings will be presented at a later date.

5.2 Temporary Water Supply

The general arangements for water supply, including firefighting water, are shown in Figure 5-1.

5.2.1 Process Water

A tank will be maintained at the portal with a minimum quantity of 100,000 L of water available at all times. This water will be filtered and pumped from the surface settling pond and made up with tankered water as required.

An electric water pump will provide the pressure required for dust abatement and other process uses in the decline development. It will be backed up with an emergency diesel powered pump capable of ensuring sufficient water pressure for fire-fighting.

5.2.2 Firefighting Water

The process water tank will ensure that the volume requirements of Section 3.11.2, HSRC, are met. The stand-by pump will ensure that firefighting pressures can be achieved even in the event of a generator failure.

The firefighting provisions of Sections 3.11.1 to 3.11.6 will be met in addition to the other relevant provisions of the HSRC.

5.3 Temporary Nuisance Water Management

During the development of the decline there will be some out-flow of water from the strata, although this is not anticipated to be of great quantity. The underground outflow of water will be collected at intermediate sumps along the length of the decline and at the face of the decline and pumped to the surface through the intermediate sumps by electric powered submersible pumps (Figure 5-1). If warranted by the pumping quantities, automatic control of these pumps will be installed.

Water pumped from underground will be pumped into a surface holding pond where it will initially settle. Some of the water will be filtered and pumped back into the water tank while the overflow, if any, will enter the surface water management scheme.

DMT understands that the surface water control features for the two sites, designed by Rescan and already reported to MEM (*"Murray River Bulk Sample Waste Discharge Permit Application Technical Assessment Report and Notice of Work - Addendum: Comments and Responses"*, prepared for HD Mining International Ltd. by Rescan Environmental Services Ltd., January 2012), have been constructed and are ready to operate.

5.4 Temporary Waste Rock Handling

During construction of the decline all waste rock will be conveyed to the surface on the temporary conveyor and then hauled by truck to the engineered waste rock disposal areas at the North Site. The truck route will be on the public roads between the Sites.

Figure 5-2 is a basic diagram of the surface materials flow handling system for the construction and bulk sample mining. The bulk sample coal will be stored on site until it is transported for coal processing at a local coal processing facility and/or trucked to a rail load out for shipment to China. No coal processing would be conducted on site except crushing and screening.

An Acid Rock Drainage and Metal Leaching plan and rock disposal plan has been developed by Rescan. This information may be found in the Rescan report mentioned above. Potentially acid generating materials will be stockpiled separately from inert materials and will be hauled by truck to a lined dump at the North Site for permanent disposal.

5.5 Temporary Offices and Warehousing

Temporary modular or portable type buildings to the extent possible will be used for the office, mine change house, shop, warehouse, air compressor and other functions, generally arranged as in Figure 3-2. Roads and other miscellaneous features on the site are shown.

Warehousing for small parts which are not temperature sensitive will be provided in containers established on grade within the perimeter.

Roof-bolt and cable-bolt resins do not install, mix or set properly if they are allowed to cool or to freeze. Temperature controlled storage for the resins and other temperature-sensitive materials will be required.

Trailer mounted units complying with BC construction standards utilizing oil furnace heating or electric heating are envisaged, the exact details to be determined later.

5.6 Decline Tracked Haulage

A tracked haulage has been specified for men and materials transportation in the decline. The gradient of the decline may exceed the braking capability required to arrest man-riding conveyances or materials wagons under emergency conditions. HDMI is currently exploring options to ensure that the system can be operated safely. Trapped rail haulage is a potential alternative to an open rail system. In either case the haulage system will have the following characteristics:

- Single rope drop haulage with a haulage engine located in a temporary surface structure.
- Track from the winch house to the portal set on a gentle (3°) slope into the mine to allow the conveyances to run rope off the drum easily.
- A 90° right hand turn-out (looking north) into the marshaling yard comprising two or three tracks for materials wagons and man-trip storage arranged for easy loading of materials
- Materials and man-trip operated with a manned guard car under radio communication with the haulage engine driver
- Interlocked barrier gates at the portal and inby

Other safety features will be considered as the design proceeds.

General surface arrangements are shown in Figure 3-2.

5.7 Temporary Underground Conveyor

A temporary belt conveyor will be installed in the decline for clearing the decline waste rock and for loading the bulk sample coal to the surface. The conveyor will consist of the following major elements:

- A delivery jib to deliver waste rock, and later coal, onto the ground or into trucks for transport.
- An engineered steel frame head-set at the portal designed to resist the tensions required for correct belt operation and secured with an engineered foundation
- A twin motor/gearbox drive acting on the return belt
- A belt splicing unit to allow for the replacement and repair of belt segments and joints.
- An an intermediate elevating section to raise the belt from the floor mounted stands to the steel frame head set.
- A tail section with a track for the traveling end of the stage loader
- A stage loader between the road-header and the main belt.

Where there is the potential for adverse contact, the conveyor structure will be enclosed in mesh guards.

An emergency stop pull-wire with lock-out switches will be installed on the travel side of the conveyor. A tannoy connected to the surface communications centre will be positioned at each lock-out box and will broadcast a pre-start warning whenever the belt is started. The belt will not operate if the emergency cord is pulled until after the lock-out has been removed.

Proper design and installation and operation of the conveyor system are the primary means to minimize the cleanup of muck from the decline construction and coal from the bulk mining. A properly designed, installed, maintained and tracked conveyor should have minimum spillage.

For most of the decline the belt will run on floor mounted metal stands on the rock floor at a height which allows debris to be cleared from beneath the rollers and from around the belt. Since the decline is in rock, there is not expected to be a significant quantity of coal dust in the debris during development. For production operations the decline floor will be concreted and any accumulations of coal dust will be easily washed from the conveyor.

The belt drive has been designed to allow a single lift within the decline, so there will not be any transfer points in the decline itself.

HD does appreciate the importance to prevent material spillage and clean up as necessary accumulations of material. HD will comply with clean up type requirements as stated on in Part 6.44.1 of the Code.

The belt conveyor will be provided with an anti-rollback device to hold the conveyor belt in place when the conveyor is stopped. Construction design will be provided, which will be signed by a professional engineer.

5.8 Temporary Magazines

Extensive use of explosives is not anticipated during the decline development. However, limited quantities of both explosives and detonators may be required to assist in mining through hard units and in the excavation of intermediate sumps in the decline.

The proposed location of the magazines for explosives and detonators at the North Site meet the requirements of both MEM and NRCan regulations pertaining to magazines.

The construction, lighting, monitoring and inspection of the magazines will comply with regulatory standards. Consideration will be given to remote monitoring of the magazines in addition to regular inspection by mine officials.

The locations of the magazines were determined by applying the distances from the “Quantity-Distance Table for Hazard Divisions 1.1&1.5” which is a part of the “Explosives Magazine and Use Permit Application for Mining Purposes” from the British Columbia Ministry of Energy, Mines, and Petroleum Resources Mining and Minerals Division.

In addition to the above distances, the Natural Resources Canada publication “Blasting Explosives and Initiation Systems Storage, Possession, Transportation, Destruction and Sale” requires a distance of 400 m from building where 20 or more people may assemble. All the magazines are at least 400 m from public roads.

6 DECLINE DESIGN AND CONSTRUCTION

6.1 Design

The conveyor decline will be driven at a 16 degree angle, which is the maximum angle for efficient operation of a belt conveyor carrying run-of-mine bituminous coal. The steep angle is required to reduce the decline length to the target coal seam. Even so, the planned length is approximately 1,700 m. The approximate length of the decline in each formation is shown in Table 6-1. Finished dimensions will be 5.5 m wide and 4.35 m high with a flat top and rounded corners to mitigate stress concentration problems.

Table 6.1: Decline Rock Volume Summary

Formation	Meters	LCM
Overburden(till)	63	24,251
Hasler	915	32,180
Boulder Creek	160	5,627
Hulcross	83	2,919
Gates	467	16,424
Totals	**1,688**	**81,401**

Waste rock from the decline construction would total approximately 81,000 loose cubic meters (LCM). This waste rock would be permanently stored at the construction rock disposal site at the North Shaft site.

Figure 6-1 shows a section along the decline. The different geological formations are outlined, as interpreted for the boreholes shown. The properties of the strata on which the roof support categories are based (see later section) are also shown.

6.2 Construction in Overburden

The details of the excavation of the surface overburden materials to the face-up point of the rock tunnel and the construction of the portal protection structure has previously been supplied to MEM. DMT understands that this work is now underway and should be complete in the near future.

The initial portion of the decline will be housed in a prefabricated steel cover which will be set on concrete foundations and concreted up to the rock face at the start of the rock heading. The steel cover will ultimately be covered and then backfilled with the material removed during the construction of the portal.

Figure 6-2 shows a cross section through the steel structure and its relationship to the finished tunnel profile.

6.3 Construction in Rock

6.3.1 Cuttable Rock – Road-header

In the sections of the decline where the rock is suitable for cutting by mechanical means it will be excavated by a road-header. The cutter head is able to slew and elevate to cut the required profile. The rock falls on to the apron and is loaded onto the clearing belt by gathering arms. The rock passes through the machine and onto a stage loader connecting the back of the road-header to the 1 m wide main belt in the decline which raises it to the portal. From the portal the rock is hauled by truck to the rock disposal pile at the North Shaft site.

6.3.2 Hard Material – Drill/Blast

Where the rock is too hard to be excavated effectively by the road header, the traditional drill and blast method is proposed. Prior to drilling out each round the road-header will be backed away from the face.

Drilling will be by using hand-held pneumatic drilling machines. Drill holes would be 43 mm diameter in a 22 mm diameter drill steel and 3.2 m in length. The spacing between blast holes will be about 0.3 m, subject to detailed drill pattern design by the explosives contractor. All holes will be drilled with water for dust suppression and cleaned with compressed air before charging.

After drilling, the blast holes will be charged with explosives and stemmed using clay or water-gel capsules. In blast holes with water, water-resistant explosives must be used or water-resistant sheaths shall be used to avoid detonation problems by water.

HD intends to use a blasting contractor for the supply of explosives, management of magazines, charging of shot-holes and shot-firing. HD mining will ensure that the contractor fulfills all the legislative requirements and conducts blasting operations safely and in compliance with the applicable legislation.

The most convenient method of clearing the blasted material is to use the gathering arms/apron of the road-header once the blast has cleared and inspection reveals that it is safe to re-enter the workplace. The blast pattern will need to be optimised to generate small material without projecting it too far from the face. An alternative to using the road-header to clear the material would be to introduce a bucket loader, although this would probably only be efficient if the length of roadway to be blasted was significant.

6.4 Utilities

Utility lines (water supply pipeline, water drainage pipeline, compressed air line, and communications/monitoring cables) are to be suspended along the side of the decline supported on a steel frame work attached to the decline rib. The water and air lines are 108 mm in diameter. The water supply line is designed to provide 15 m^3 per hour (/hr). A water supply line for firefighting is also located in the decline.

The drainage system is sized for 53 m^3/hr. Small pumps will be used to gather mine waste water. The small pumps will transfer water to large pumps which will be located in the side of the declines (Figure 5-1). The size of the dewatering pump stations will depend upon capacity of the pumps.

The compressed air system is designed for 30 m^3 per minute (/min).

The communication and monitoring lines are also on the steel support framework on the along the side of the decline. These provide phone service to the decline and mine and also link monitoring systems for equipment and atmospheric monitoring.

The electrical power cables are suspended on insulated cable hooks which are hung from the roof of the decline.

6.5 Roof Support and Ground Control

The roof support design is based on the current understanding of the properties of the strata that the decline will pass through. It ranges from roof bolted support to steel arch support supplemented with roof bolts. The designs are based on empirical relationships observed between roof support and the rock properties expressed as a Protodyakonov Index (PI), a Russian rock strength index that is not widely used in the West.

In the base rock section, support will be by a combination of rock bolts, mesh, and shotcrete. The rock bolts will be installed using rotary pneumatic drills with water flush and will have the following characteristics:

- Fully resin grouted tensioned ribbed G60 or G75 rebar
- Installed using fast/slow set resin combination and torque nut
- Drill bit and bolt size calbrated for an annulus of no more than 6 mm
- 2.4 m length with 1 m between bolts and bolt rows.

Figure 6-1 shows the PI value of the rock intersections in the decline. Figure 6-3 and 6-4 show the variation in support design for the various rock property index values.

In weaker ground, rock bolts will be augmented by shotcrete, cable bolts and/or steel arches. In stronger ground the base case can be relaxed with wider bolt spacing and thinner shotcrete.

DMT has been asked to advise on the rook support design in Stage 2 of their work. DMT will be recommendaing that HD conduct core drilling, geotechnical testing and monitoring of support installations to ensure that adequate levels of safety and security are maintained during all aspects of the bulk sample program.

6.6 Ventilation

During the development of the decline, ventilation will be supplied to the decline from a fan installation located on the surface. The proposed fan installation is a twin-fan contra-rotating design with an installed power of 110 kW. Both forcing and exhausting configurations are being considered, although it is expected that a forcing configuration will be selected as this will assist in heating and managing the dust. An xhausting configuration could be implemented if any significant length of development was required using blasting as the main development method; an exhausting system would all

Figure 6-5 shows in more detail the location of the fan on the surface, in this case in the exhausting configuration. The fan is offset from the decline by 5 m and the ducting includes a pressure relief panel. In both the forcing and exhausting configuration steel ductwork of 1.25 m diameter will be used to maintain adequate air velocities and sufficient fan capacity to cope with leaks and obstructions. The ducting will be hung from the back on specially installed hangers by chain or cable of sufficient load-bearing capacity.

The main ventilation fan shall be capable of reversing the air in an emergency.

6.7 Men and Materials Transportation

A floor based rail system will be installed in the decline for men and materials transportation. HD has researched the possibility of using an open rail system but, at the gradients envisaged, the braking capability may not be sufficient to stop a runaway man-trip or materials trip. While braking options are currently being researched, DMT believes that a closed rail system, similar to the Becker trapped rail system, might provide a safer option.

BC regulations require two means of egress from the mine, and DMT believes that this will apply from the moment the shaft and decline are connected and during the extraction of the bulk sample. The decline will have to be equipped with a means of hauling men to the surface in the event the shaft is blocked, so sufficient man-cars will be required to enable the entire workforce to be hauled out in an emergency.

At no time will men be allowed to walk in the decline while the haulage is operating. The haulage will at all times be under the control of a guard, communicating via leaky feeder radio to the surface winch. Gates at the brow and at the inby end of the rail will prevent the cars from entering the decline or from endangering the workers at the face.

Material cars will be unloaded as close to the face as possible and the materials man-handled to the face.

6.8 Emergency Response

As mentioned above, there will be sufficient man cars to allow evacuation of the mine through the decline if required.

Safety in the decline will be provided by both engineering (barriers, lockouts and safety bays) and administrative means. The communications system mounted on the conveyor as part of the conveyor operating system will allow men in the decline to be alerted of haulage movement in the event of an emergency and safety bays will be provided in the rib on the man-walking side every 100 m. The safety bays will be 1.5 m wide (measured from the rib), 2 m long (along the decline) and 2.0 m high.

Section 6.13.1 of the Code states:

> *"Where a workplace in an underground mine is more than 300 m from a mine portal or from a shaft station which is used to access that workplace, the manager shall provide and maintain, in a suitable location for that workplace, a refuge station in accordance with section 6.13.3."*

Section 6.13.2 of the Code exempts a mine from the requirement to install a refuge station during adit development or shaft sinking. HD will comply with the the Code by installing a portable, prefabricated refuge station as soon as required by the Code and maintaining it within 300 m of the working face. In addition, HD will comply with section 6.13.3(5) by establishing at appropriate locations storage facilities with suitable equipment to allow for emergency exit from the mine.

7 EQUIPMENT AND REGULATORY APPROVAL

7.1 Equipment

HD mining has developed a list of the major equipment that it intends to use for the Murray River bulk sample project. The principal equipment list to deployed at the surface of the decline includes, but may not be limited to:

- Hoist, enclosed in a hoist house, and including safety controls, interlocks and communications equipment.
- A single lift extensible conveyor belt with twin drives/gearboxes to be used only for the decline development and bulk sample mining. It will be replaced with a higher rated belt and structure for production purposes.
- A water tank, with main and standby pumps (electric and diesel) for the provision of process and firefighting water at sufficient pressure to meet BC Code standards.
- A 10 kV generator to supply the underground through a cable and the surface through a step down transformer.
- A surface mine fan to provide forced ventilation air into the decline development.

Underground equipment includes, but may not be limited to:

- Transformer and switchgear to step down the power supply from the surface.
- An auxiliary fan/dust extractor for ventilation of the face.
- An electrically powered road-header of Chinese design and manufacture for development of the decline.
- An electrically powered stage loader to move waste rock from the road-header to the belt conveyor
- A underground air compressor to provide motive power for auxiliary equipment and possibly dust suppressing fogging sprays at the face.
- Pneumatic shotcrete machine and pneumatic drills for the installation of rock bolts, as well as chippers and pluggers for additional trimming and drilling work

7.2 Regulatory Requirements

All equipment, including the equipment mentioned above must, and will, comply with the following major regulations and/or standards:

- British Columbia Mine Act, Regulation and the Health Safety and Reclamation Code, 2009.
- CAN/CSA-M422-M87 Fire-Performance and Antistatic Requirements for Conveyor Belting
- CAN/CSA-M421-00 Use of Electricity in Mines
- NFPA 120 Standard for Fire Prevention and Control in Coal Mines.

The Canadian Standards Association is abbreviated by CSA and CAN stands for a standard of Canada.

There is currently some debate over the standards to be applied to the development of the decline.

HD Mining and their advisors believe that the greatest level of safety that can be achieved to protect the workforce is to adopt a hazardous location zoning approach to the decline. DMT agrees with this entirely. DMT believes that the entire decline should be zoned Class 1 Zone 2 using the CEC definitions and that electrical and other equipment suited to this zoning category should be deployed accordingly.

In an April 19, 2011 meeting between BC MEM, HD Mining and their advisors, HD were advised by MEM that all equipment used for the mine development and the mining of the bulk sample needed to be flameproof. This was re-iterated at a subsequent meeting on June 14, 2011 attended by the same parties.

HD Mining has chosen to specify equipment which has been approved as flameproof for use in underground coal mines in China. DMT has reviewed a report certified by a professional engineer registered in British Columbia which asserts that equipment approved for use in Chinese underground coal mines meets or exceeds the international standards for flameproof equipment. The author of the report has visited equipment manufacturers and equipment certification and testing facilities in China. DMT believes that the conclusions of this report should be accepted.

HD Mining and their advisors have also argued that CAN/CSA M421 “Use of electricity in Mines” applies to all installations at a mine whether surface or underground as the surface facilities, particularly power supplies and transformers, are intractably connected to the underground reticulation and must therefore provide the same degree of safety. Since the highest hazard is associated with the underground workings, any departure from M421 for surface or underground installations at an underground mine demanded by regulators must be carefully considered and justified.

7.3 Explosives

HD has designed locations of magazines which meet Federal standards and will select an explosives contractor who will provide the transportation from the magazines to the site and the qualified blasters for shot firing.

HD has been advised by MEM that non-permissible explosives can be used in the decline, but that permissible explosives must be used within 30 m of a coal seam unless workers are all evacuated before shot firing. When shot firing in the decline all men will be withdrawn and access will be restricted thereafter until the atmosphere is safe.

LEGEND
- HIGHWAY
- RAILWAY
- CITY

Reviewed by
Peter Cain, PhD., P.Eng
November 10, 2012

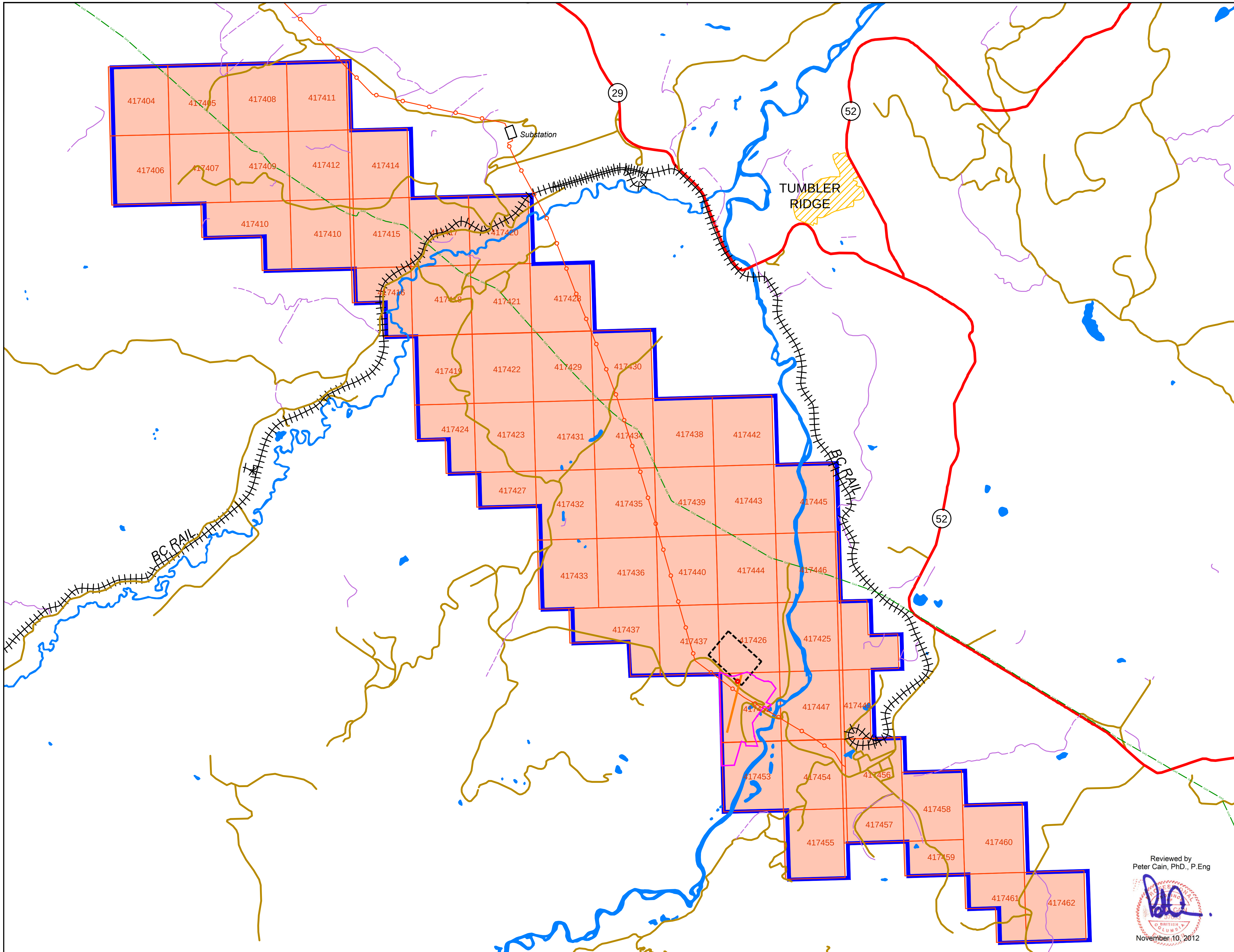
N

0 125 250
Kilometers

FIGURE 1.1

MURRAY RIVER
PROJECT
GENERAL LOCATION

DATE: 06/09/2011
FILE: 4827\FIG-1
SCALE: 1:210000
NORWEST CORPORATION



LEGEND

- LICENSE AREA
- COAL TENURE AREA
- MAJOR ROAD
- MINOR ROAD
- TRAIL
- RAILWAY
- TRANSMISSION LINE
- GAS PIPELINE
- WATER BODY
- POPULATED AREA
- CONVEYOR DECLINE
- SHAFT
- BULK SAMPLE SURFACE FACILITIES AREA
- BULK SAMPLE AREA

Coal Tenure Map as required by Section 3.1 of Mineral and Coal Exploration Notice of Work Application

Map Projection:
UTM NAD 83
Zone 10, meters

0 1 2 3 4 5
Kilometers

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 1.3

MURRAY RIVER PROJECT
COAL TENURE
MAP

DATE: 06/21/2011
FILE: 4827\TENURE
SCALE: 1:2500
NORWEST CORPORATION

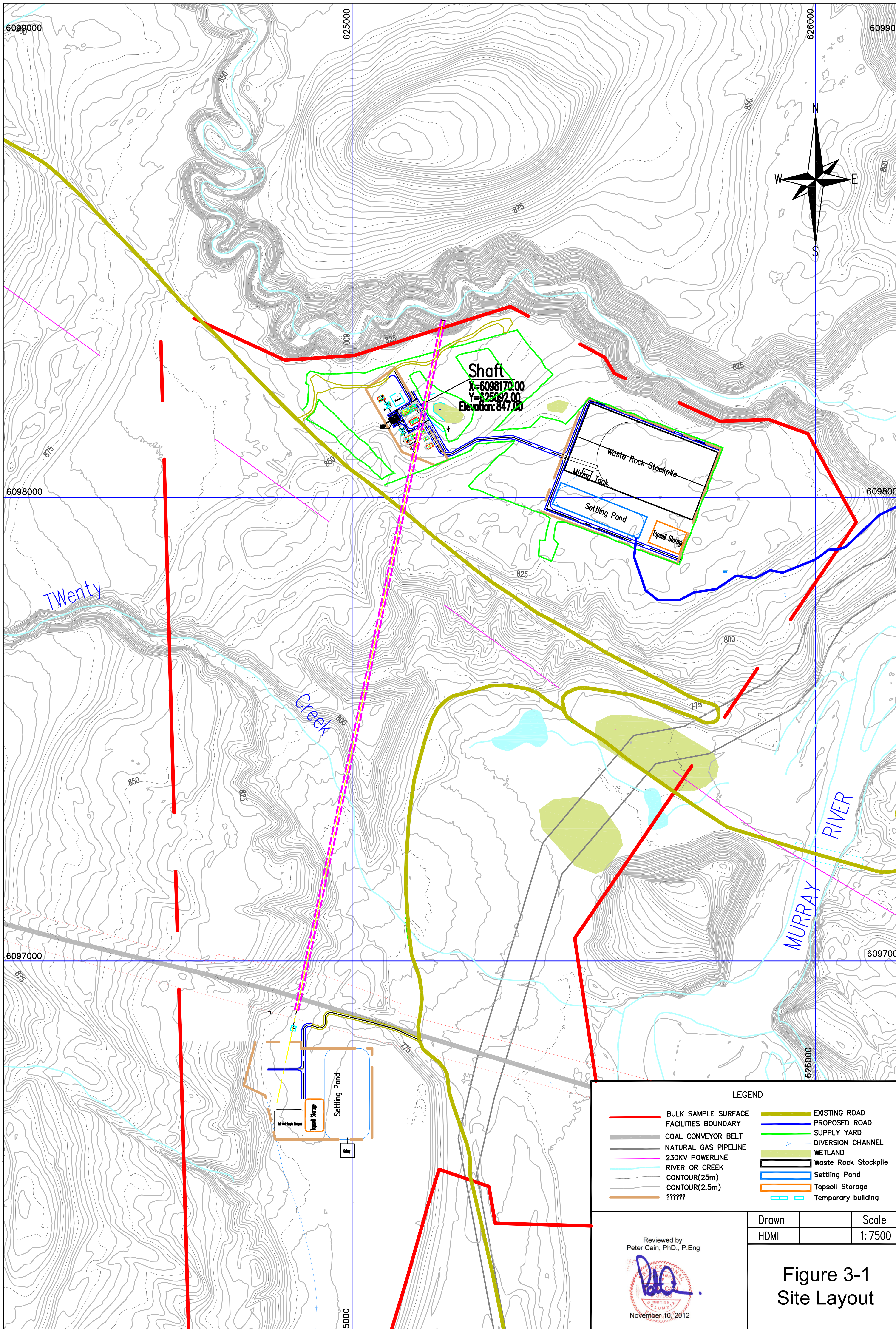
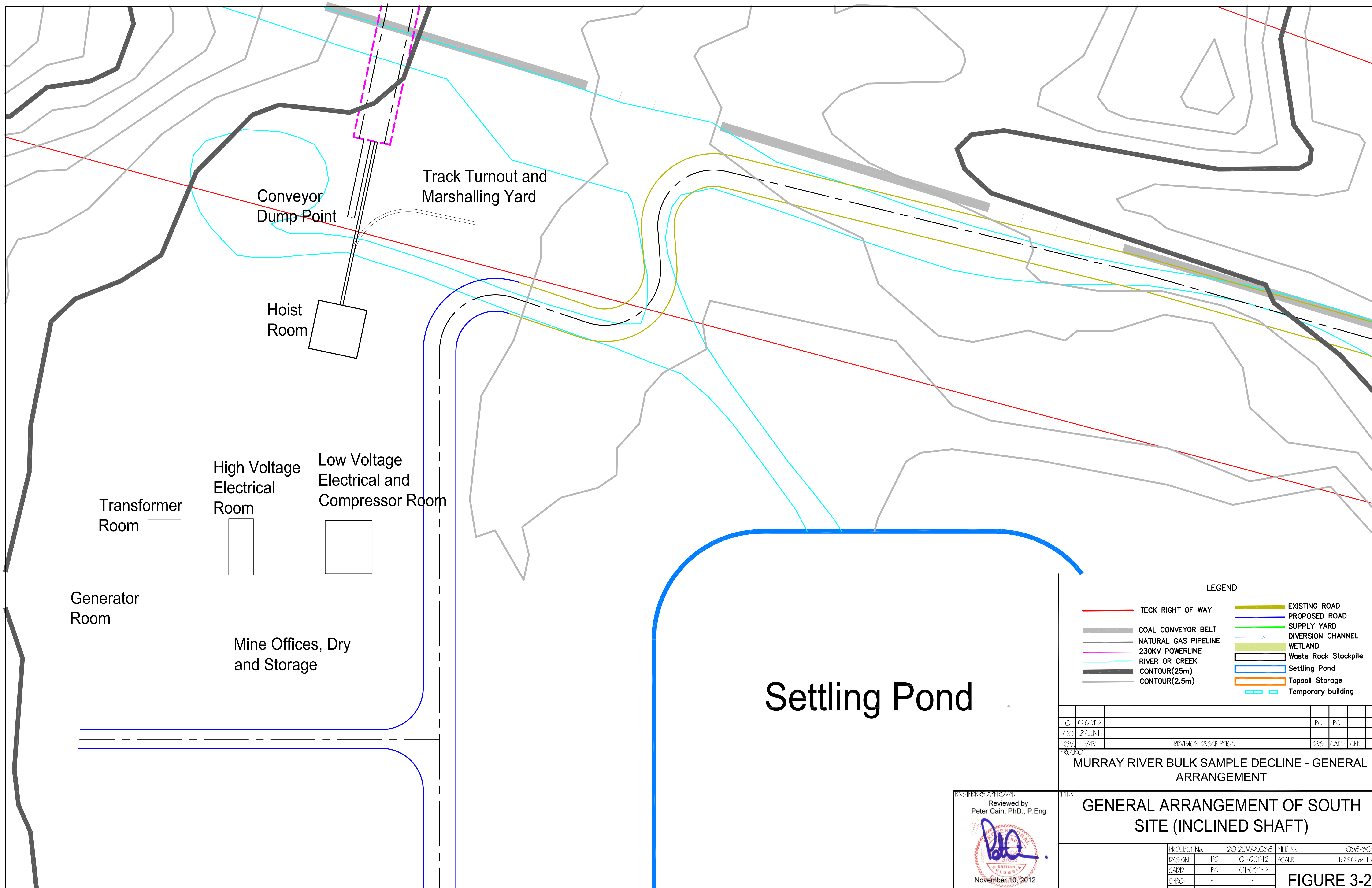


Figure 3-1
Site Layout



REV.	DATE	REVISION DESCRIPTION	DES	CADD	CHK
01	01OCT12		PC	PC	
00	27JUN11				

PROJECT
MURRAY RIVER BULK SAMPLE DECLINE - GENERAL ARRANGEMENT

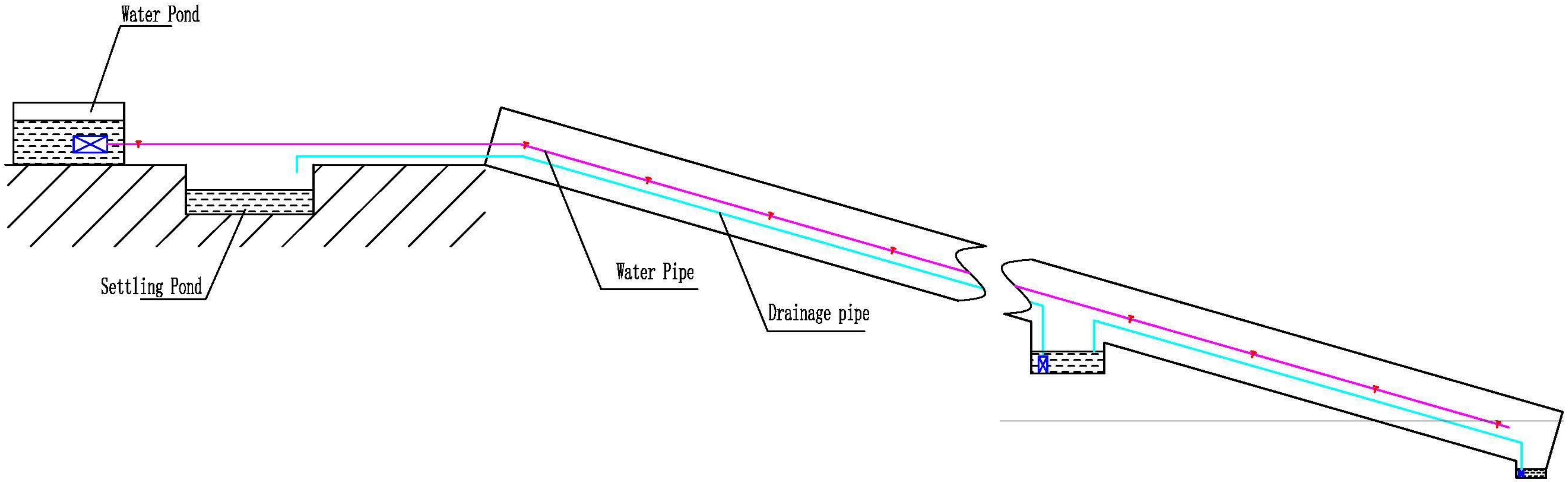
ENGINEERS APPROVAL
Reviewed by
Peter Cain, PhD., P.Eng
November 10, 2012

TITLE
GENERAL ARRANGEMENT OF SOUTH SITE (INCLINED SHAFT)

PROJECT No.	2012CMAA.038	
DESIGN	PC	01-OCT-12
CADD	PC	01-OCT-12
CHECK	-	-
REVIEW	-	-

FILE No. 038-3020
SCALE 1:750 on 11 x 17

FIGURE 3-2

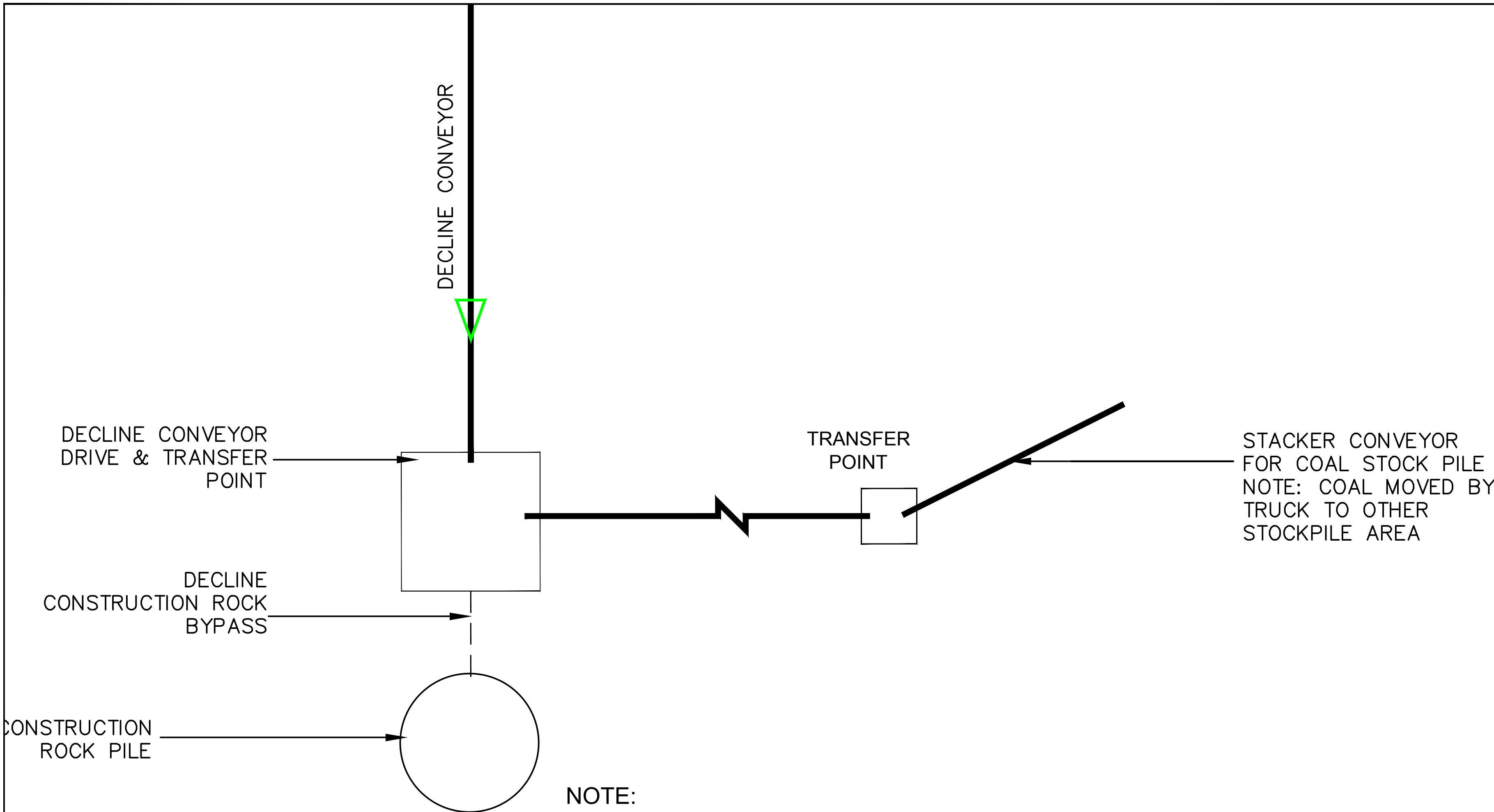


LEGEND

- Water Pump
- Valve

Reviewed by
Peter Cain, PhD., P.Eng
November 10, 2012

Bulk Sample Mining Design of Murray Coal Mine, BC, Canada			
Water Supply and Drainage System of Decline (Conceptual)	Figure 5-1 Water Supply and Pumping GA		
	Designed by	Checked by	Scale
Date	Dec. 2011	Sino-coal International Engineering Group Shenyang Design and Research Institute	



NOTE:
DECLINE CONSTRUCTION
ROCKS LOADED INTO TRUCKS

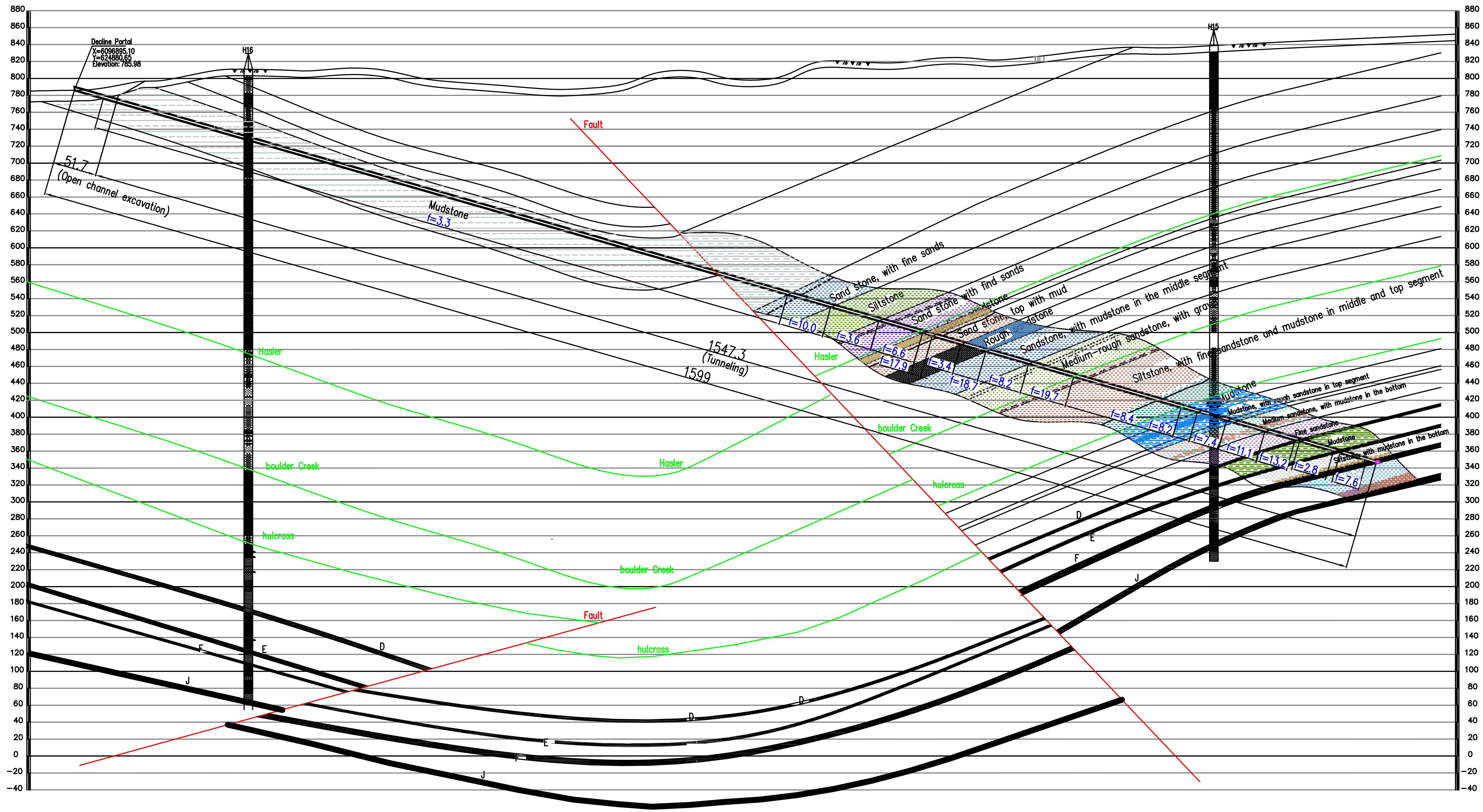
Reviewed by
Peter Cain, PhD., P.Eng
November 10, 2012

NOT TO SCALE

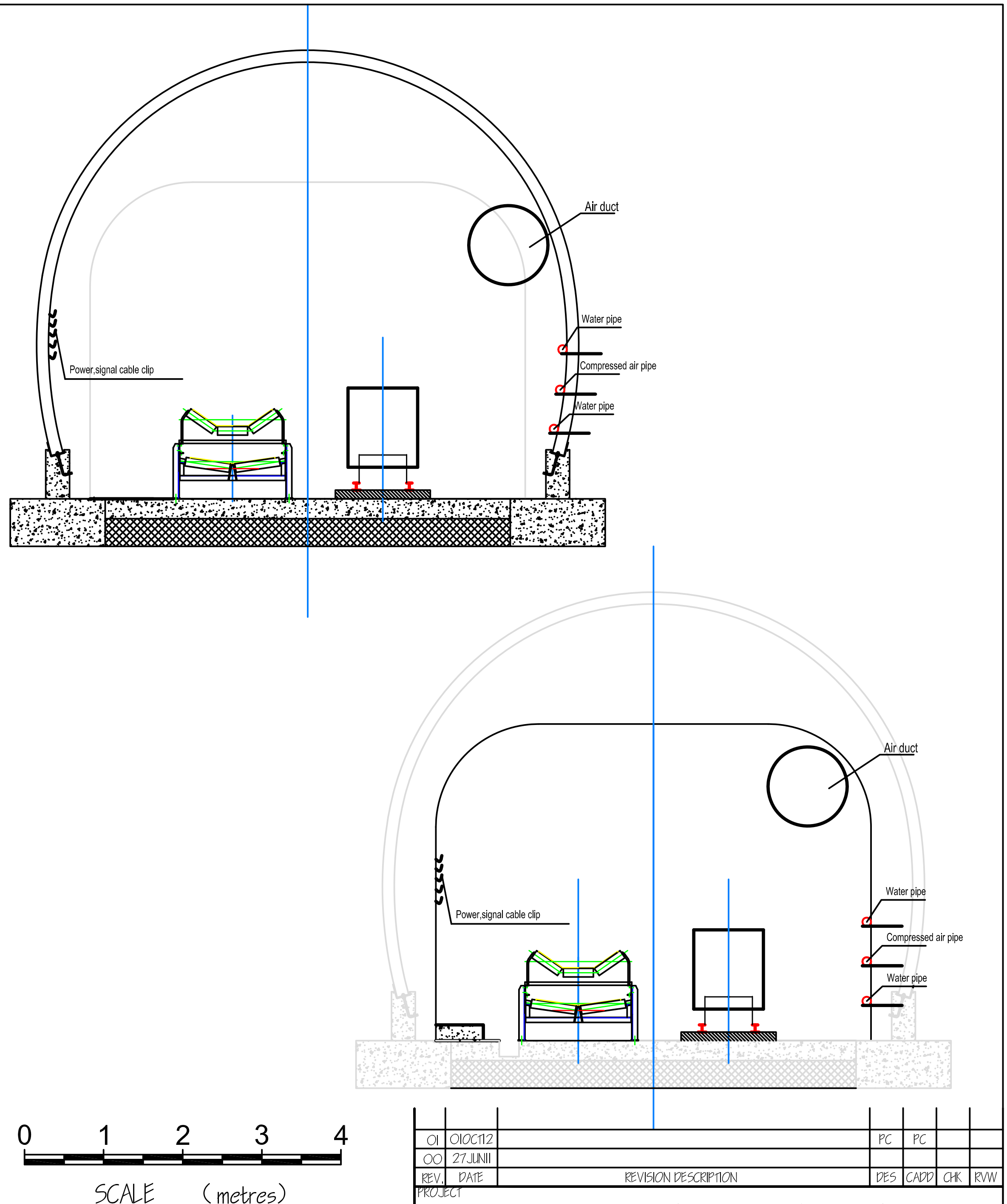
FIGURE 5-2

SOUTH DECLINE
MATERIAL HANDLING
FLOW DIAGRAM

DATE: 06/23/2011	PROJECT: 4827	NORWEST CORPORATION
FILE: 4827FIG-2-09		



Reviewed by Peter Cain, PhD., P.Eng November 10, 2012	Figure 6-1: Section Along Decline	
	Designed	Scale
	HDMI	1:5000



REV.	DATE	REVISION DESCRIPTION	DES	CADD	CHK	RVW
01	01OCT12		PC	PC		
00	27JUN11					

PROJECT
MURRAY RIVER BULK SAMPLE DECLINE - GENERAL ARRANGEMENT

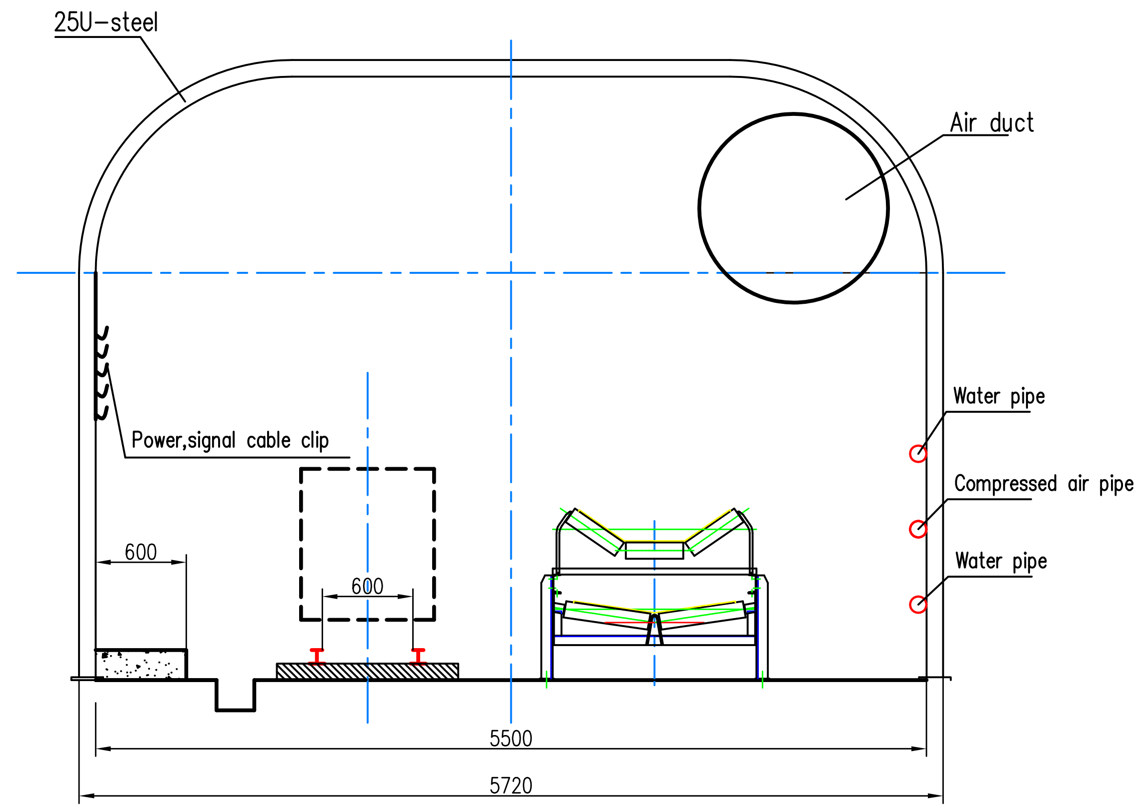
ENGINEERS APPROVAL
Reviewed by
Peter Cain, PhD., P.Eng
November 10, 2012

TITLE
Decline Cross Sections

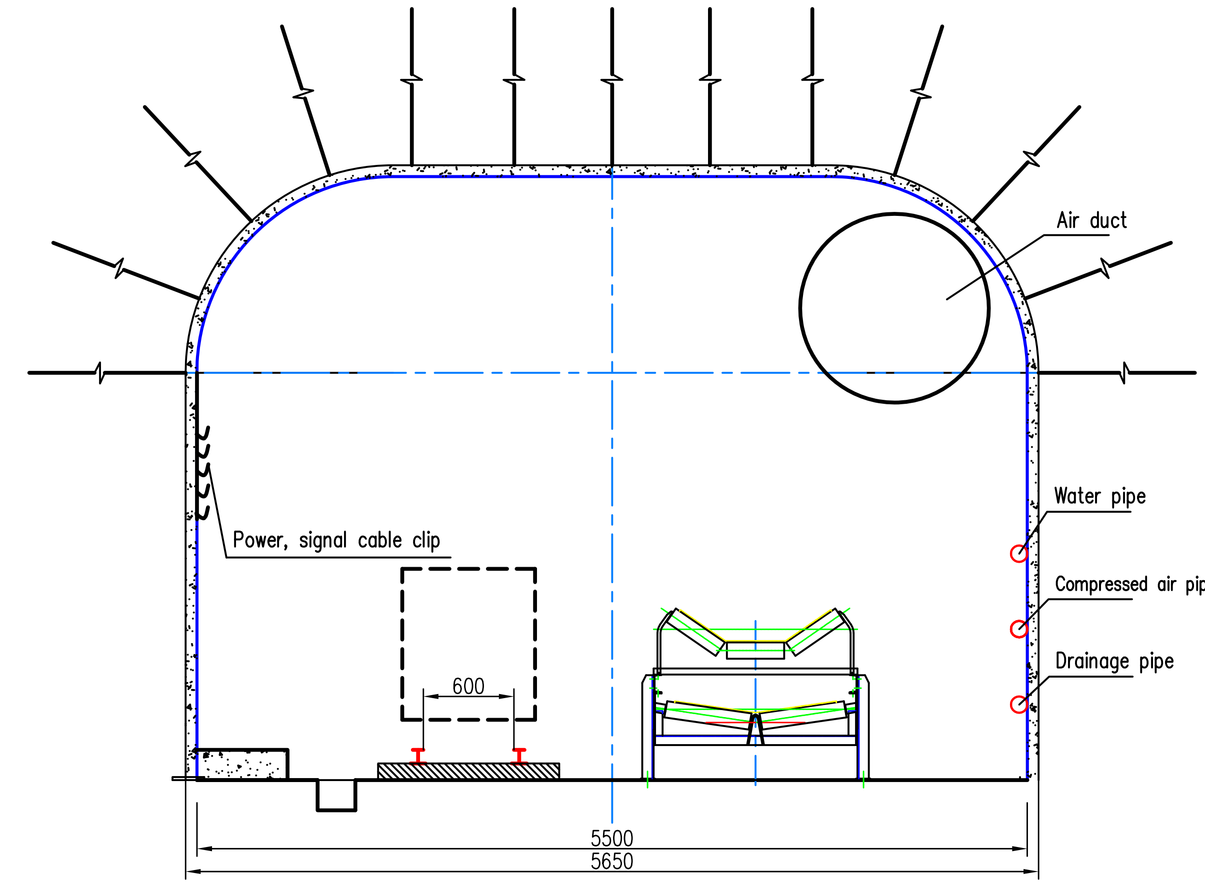
PROJECT No.	2012CMAA.038	
DESIGN	PC	01-OCT-12
CADD	PC	01-OCT-12
CHECK	-	-
REVIEW	-	-

FILE No. 038-1020
SCALE As Shown

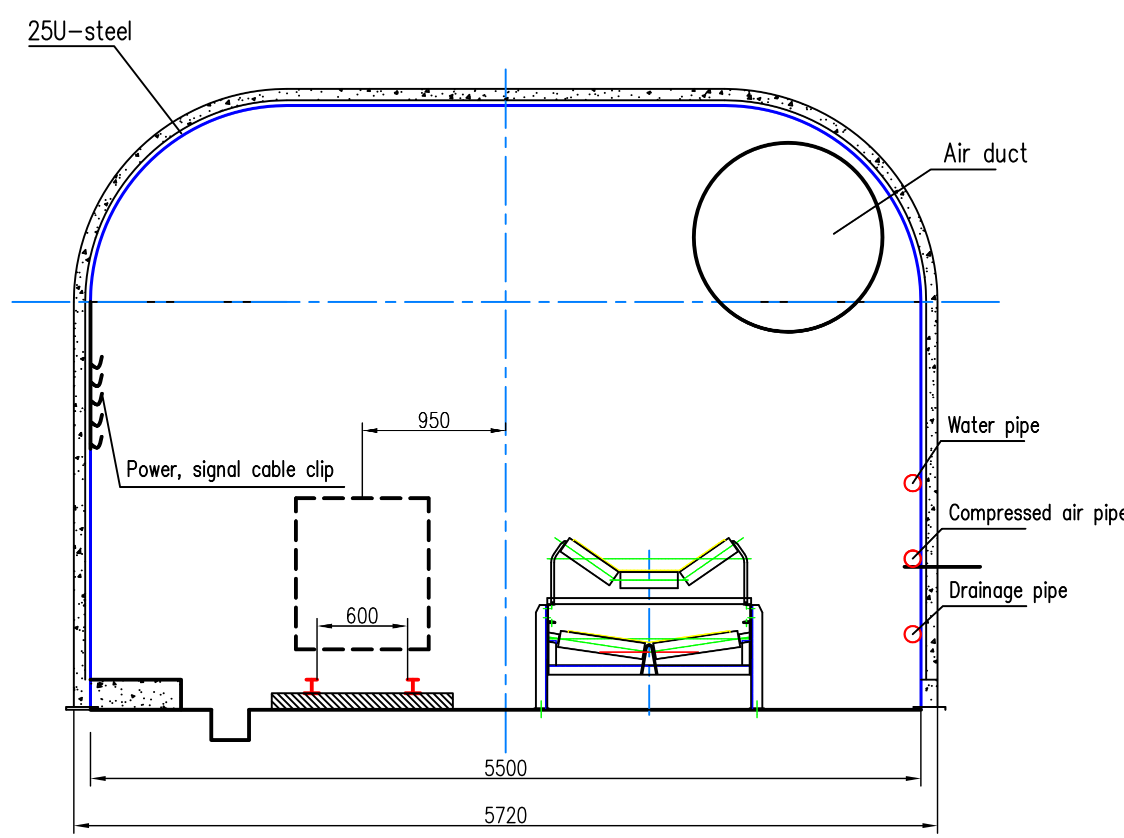
FIGURE 6-2



1-1



2-2



3-3

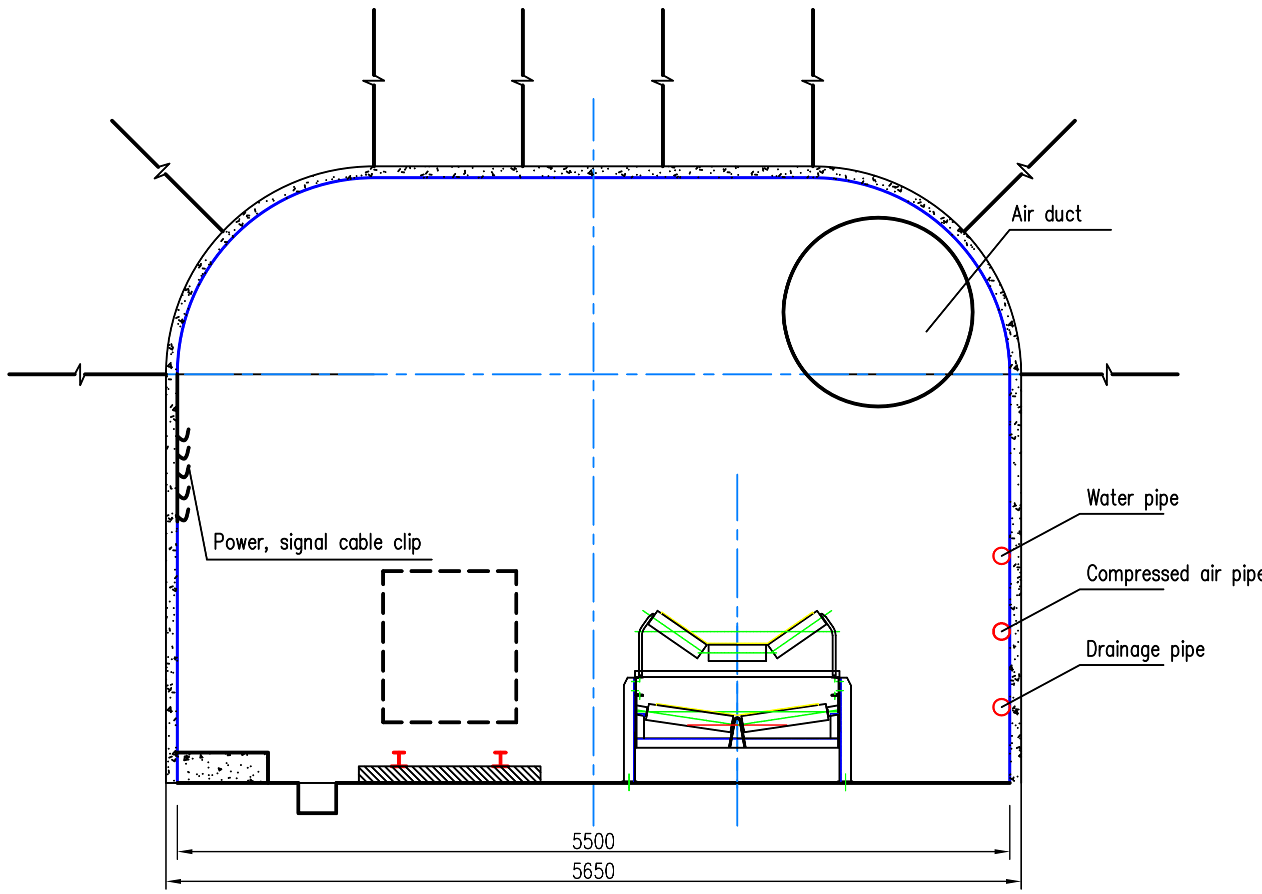
Code	Features	Conditions of surrounding rock
1-1	Support with U-Steel(1m spacing)	Surrounding rock is mudstone,f=3-4,complete and stable
2-2	Support with anchor bolts (0.8m spacing) + metal mesh + shotcreting	Surrounding rock are mudstone,f=4-5 and siltstone,f=3-5
3-3	Support with U-steel(1m spacing) + metal mesh + shotcreting	Surrounding rock is mudstone,f=3-4,with well developed fissures

Conveyor and track may be on opposite sides

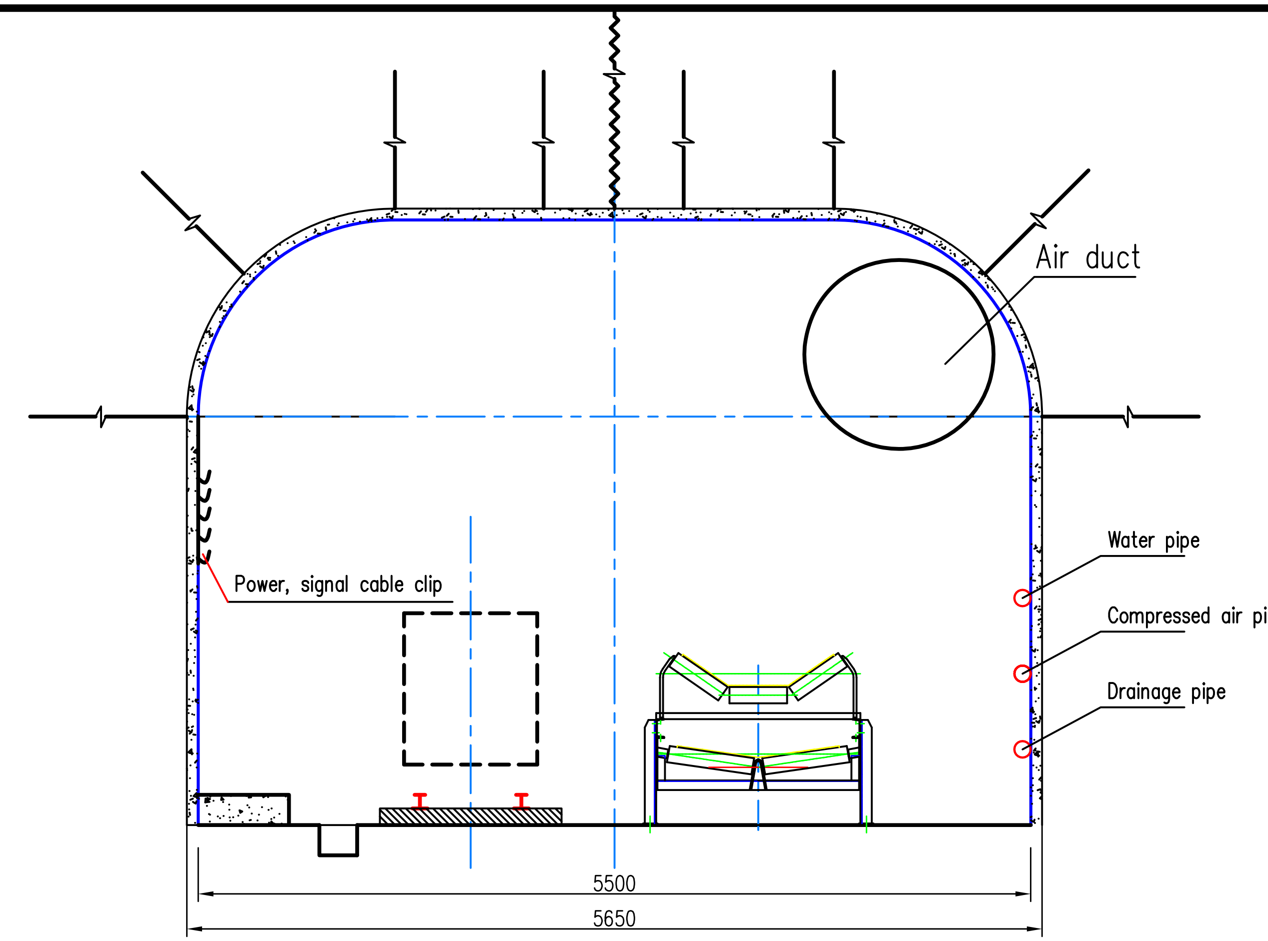
Reviewed by
Peter Cain, PhD., P.Eng
November 10, 2012

Figure 6-3: Roof Support Variations

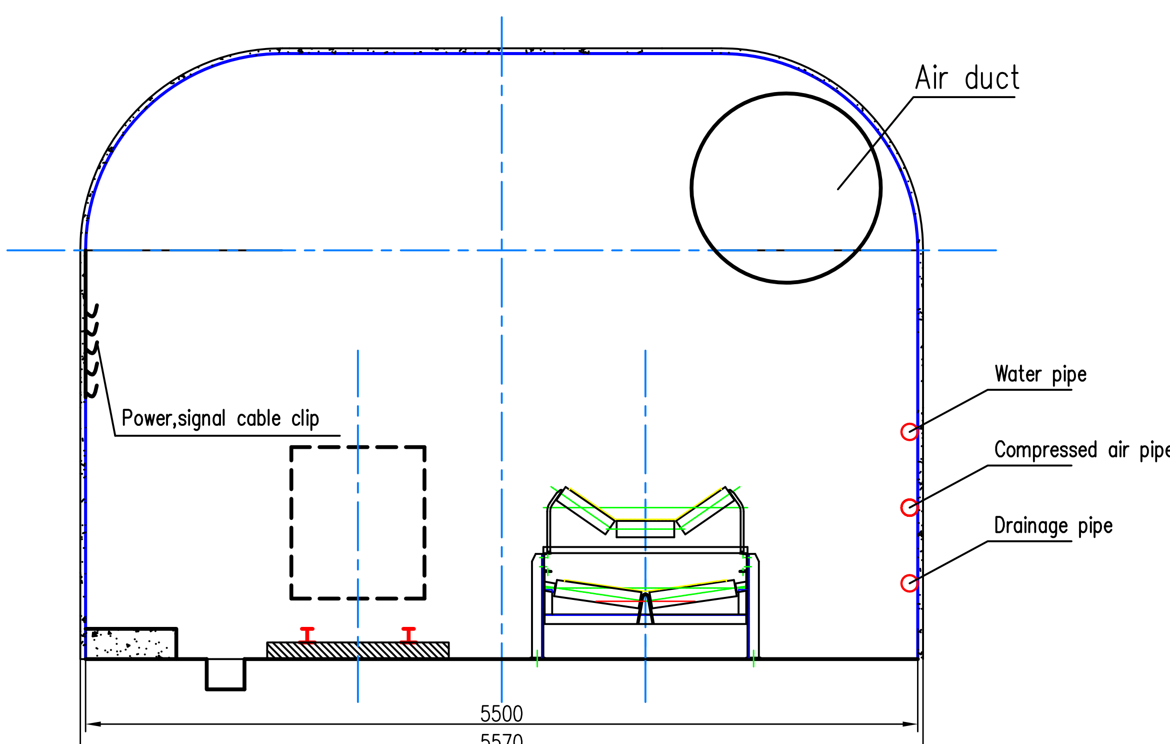
Designed		Scale
HDMI		1:50



4–4



5–5



6–6

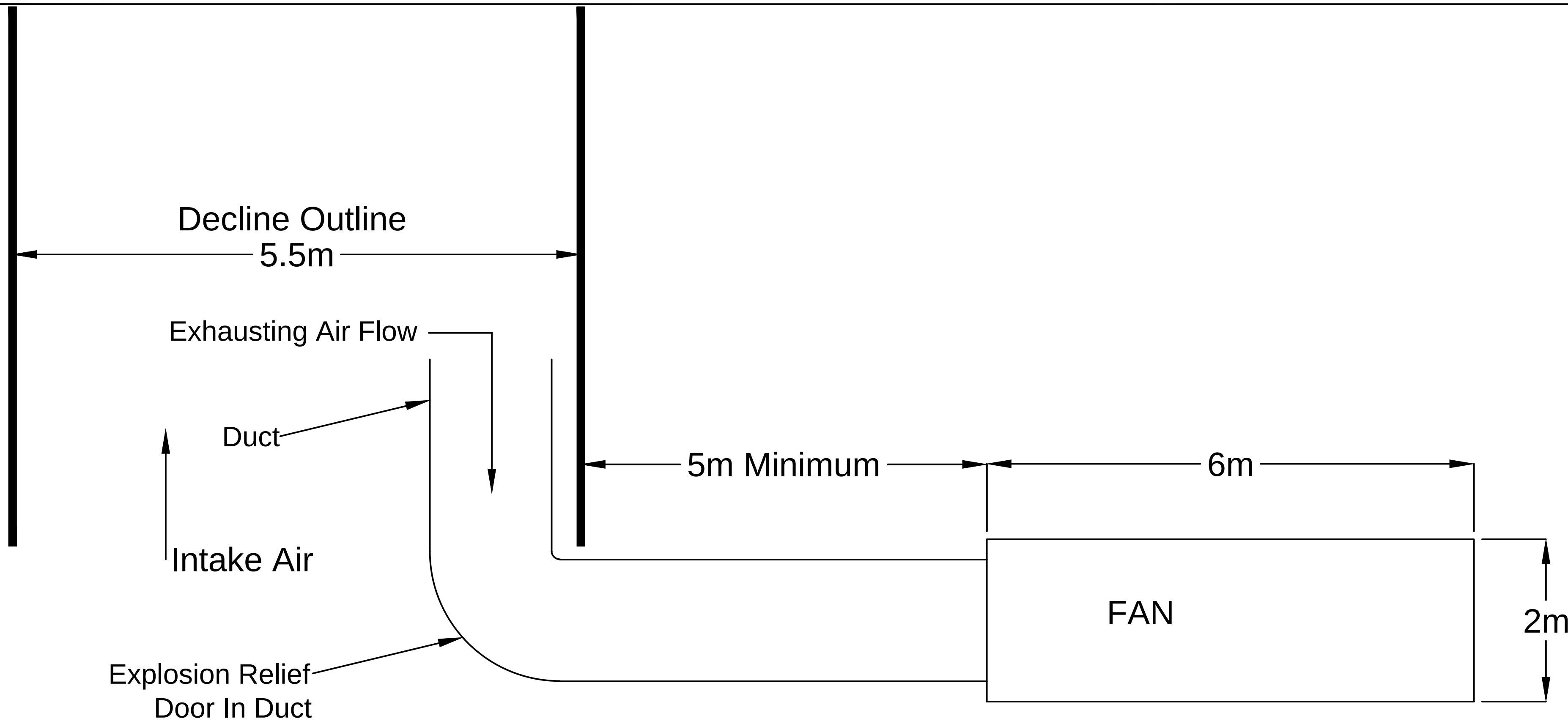
Section	Type of supporting	Conditions of surrounding rocks
4–4	Bolt (spacing1.0m?1.0m)+mesh+shotcreting	sandstone,f=5–8,rather stable; f>8,unstable
5–5	Bolt(spacing1.0m?1.0m)+cable(sapcing1m)+mesh+shotcreting	sandstone,f=5–8,unstable
6–6	shotcreting	sandstone,f>8, stable and integrate

Conveyor and track may be on opposite sides

Reviewed by Peter Cain, PhD., P.Eng
November 10, 2012

Figure 6-4: Roof Support Variations

Designed		Scale
HDMI		1:50



Note: Mirror image may apply

Note: Approximate Dimensions

Reviewed by
Peter Cain, PhD., P.Eng
November 10, 2012

SCALE: AS SHOWN

FIGURE 4.3

DECLINE CONSTRUCTION
FAN LOCATION
PLAN VIEW

DATE: 05/03/2011	PROJECT: 4827	NORWEST CORPORATION
FILE: 4827DECL-FAN		