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BC Geological Survey Coal Assessment Report 1021

COAL ASSESSMENT REPORT WATERFALL PROPERTY

PEACE RIVER DISTRICT

LOCATED AT UTM: 6089800 N, 622500 E

LICENSES: 416978, 416994, 416996, 410364, 410365, 417451, 417524, 418612, 418613, 418614

Peace River Coal Inc. - Anglo American Coal Pty Ltd 800 – 700 West Pender Street Vancouver, British Columbia V6C 1G8

Author: David Lortie P.Geo. September 15, 2016 This page left blank on purpose



COAL ASSESSMENT REPORT TITLE PAGE AND SUMMARY

TITLE OF REPORT: Coal Assessment Report Waterfall Property, Peace River District

TOTAL COST: \$254,888

AUTHOR(S): David Lortie SIGNATURE(S): David

NOTICE OF WORK PERMIT NUMBER(S)/DATE(S): **CX-9-058, 1641196** STATEMENT OF WORK EVENT NUMBER(S)/DATE(S):

YEAR OF WORK: 2015

PROJECT NAME: Waterfall Property

COAL LICENSE(S) AND/OR LEASES ON WHICH PHYSICAL WORK WAS DONE: 416978, 417451 COAL LICENSE(S) IN PROJECT AREA ON WHICH NO PHYSICAL WORK WAS DONE OVER THE CURRENT REPORTING PERIOD: 416994, 416996, 417524, 410364, 410365, 417524, 418612, 418613 AND 418614.

BC MINERAL INVENTORY MINFILE NUMBER(S), IF KNOWN:

MINING DIVISION: *Liard* NTS / BCGS: *093114* LATITUDE: *54° 56' 5.47"* LONGITUDE: *-120° 4' 48.32"* (at centre of work) UTM Zone: *10* EASTING: *622500* NORTHING: *6089800*

OWNER(S): Peace River Coal Inc.

MAILING ADDRESS: Suite 800 - 700 West Pender Street, Vancouver, BC V6C 1G8

OPERATOR(S) [who paid for the work]: *Peace River Coal Inc.*

MAILING ADDRESS: Suite 800 – 700 West Pender Street, Vancouver, BC V6C 1G8

REPORT KEYWORDS (lithology, age, stratigraphy, structure, alteration, mineralization, size and attitude. **Do not use abbreviations or codes**): **Coal, sandstone, siltstone, mudstone, shale, Gates Formation, folding, faulting**

REFERENCES TO PREVIOUS ASSESSMENT WORK AND ASSESSMENT REPORT NUMBERS: *Previous coal assessment report: #603 (1973), #618 (1984), #941 (2014).*



RECLAMATION REPORT WATERFALL

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1 SUMMARY

The property consists of contiguous coal licenses in the Waterfall area that Peace River Coal Inc. acquired in 2006 as part of the formation of the company. Until December 2006, the Trend Mine was owned and operated by NEMI Northern Energy and Mining Inc. (NEMI). In November 2, 2006 NEMI's assets were consolidated with Hillsborough Resources Ltd. and Anglo Canadian Coal Inc. assets to form a new coal mining company, Peace River Coal Limited Partnership (PRCLP). NEMI and Hillsborough Resources Ltd. remained as minority shareholders in PRCLP, and PRC managed the PRCLP assets as general partner.

In October 2011, the NEMI and Hillsborough Resources Ltd. minority interests were sold to PRC. PRC now manages the assets and is a wholly owned subsidiary of Anglo American plc. PRC operates as part of Anglo American's Coal business unit based in Brisbane Australia.

The property is located in the Peace River Regional District of Northeast British Columbia, Canada. The property is in the Inner Foothills of the Canadian Rocky Mountains near the town of Tumbler Ridge, British Columbia and about 725 km northeast of Vancouver, British Columbia. The property is readily accessible by provincial highway and an all-weather forestry service road. See Attachment 1 and Attachment 2.

Denison carried out drilling exploration on Roman Mountain in 1973 and 1984. The work included a two HQ diamond core borehole drilling program in 1973 as part of a regional drill program in the Babcock and Waterfall Creek areas. In 1984, seven rotary boreholes were completed.

In the summer of 2006 Hillsborough Resources completed an open-hole rotary and diamond drill (HQ) coring program. Exploration access was established via existing dormant roads and trails. A total of 1,805 metres of drilling was completed, which included 1581 metres of open-hole percussion drilling (10 boreholes) and 224 metres of HQ diamond core drilling (4 boreholes)

During the winter of 2013 and 2014 a drill program was carried out on the Waterfall property by Peace River Coal Inc. under Notice of Work permit CX-9-058. The purpose of the program was to retest some of the area that had been drilled in 1984 and to expand the structural and quality information along the southwest portion of the area towards the area drilled in 2006. The work consisted of 13 rotary percussion boreholes and 4 PQ core boreholes.

The exploration work for all the programs focused on the area south of the Murray River and was centered on coal licences 410364, 410365, 416978 and 416996.

In 2015 Peace River Coal Exploration undertook reclamation activities during the summer of 2015 at its Waterfall property. The purpose of the reclamation program in Waterfall was to return the areas disturbed in 2013 and 2014 to an end land use of wildlife habitat. The reclamation work completed for Waterfall followed the Reclamation Plan for Waterfall Surface Exploration Program (Stantec 2014), which was submitted as part of the Notice of Work permit requirements for Peace River Coal's Waterfall property (CX-9-058)



2 INRODUCTION

2.1 Purpose of Report

This report has been prepared to report on the reclamation activities undertaken in 2015 on the Waterfall property as part of the requirements under the Mines Act. The reclamation program was undertaken under Notice of Work permit CX-9-058.

2.2 Project Description

Peace River Coal Inc. (PRC) is a producer of high-quality metallurgical coal in Canada. In addition to holding significant coal resources in western Canada, PRC conducts mining operations at the Trend Mine in the Tumbler Ridge area of northeast British Columbia

Until December 2006, the Trend Mine was owned and operated by NEMI Northern Energy and Mining Inc. (NEMI). In November 2 2006 NEMI's assets were consolidated with Hillsborough Resources Ltd. and Anglo Canadian Coal Inc. assets to form a new coal mining company, Peace River Coal Limited Partnership (PRCLP). NEMI and Hillsborough Resources Ltd. remained as minority shareholders in PRCLP, and PRC managed the PRCLP assets as general partner.

In October 2011, the NEMI and Hillsborough Resources Ltd. minority interests were sold to PRC. PRC now manages the assets and is a wholly owned subsidiary of Anglo American plc. PRC operates as part of Anglo American's Coal business unit based in Brisbane Australia.

2.3 Property Description & Location

The Waterfall coal deposit located on Peace River Coal Inc. owned licenses are: 416978, 416994, 416996, 410365, 410365, 417451, 417524, 418612, 418613 and 418614.

This property is located in the Peace River Coalfield of British Columbia approximately 25km southsouthwest of the town of Tumbler Ridge. Tumbler Ridge is about 400 km northeast of Prince George, British Columbia by Highways 97 and 29. Dawson Creek is 115 km to the northeast via Highways 97 and 52. The Waterfall property is accessed via the Heritage Highway and the Murray River Forest Service Road. The centre of the property is in UTM Zone 10, NAD 83 at coordinates 6089800 Northing, 622500 Easting.

2.4 Mineral Rights & Surface Title

The Waterfall property occurs on several Crown Coal Licences. Table 2.4.1 lists the licences and their present status including data concerning the coal licences. The company advises that the property has not been legally surveyed.



Tenure Type	Coal License									
Tenure Number	410364	410365	416978	416994	416996	417451	417524	418612	418613	418614
Site	Waterfall									
Name	Waterfall									
Holder	PRC									
Holder %	100	100	100	100	100	100	100	100	100	100
Area	298	298	818	1487	75	891	520	75	75	223
Units	На									
Expiry Date	2017.09.15	2017.09.15	2017.09.15	2017.09.15	2017.09.15	2017.09.15	2017.09.15	2017.09.15	2017.09.15	2017.09.15

Table 2.4.1: Summary of Mineral Rights

2.5 Accessibility, Climate, Infrastructure & Physiography

The Waterfall Project area is accessed from Tumbler Ridge via the paved Heritage Highway and an allweather gravel road named Murray River Forest Service road. See Attachment 2.

All weather data was obtained from the Trend Mine weather station between 2006 and 2009. The station is located in UTM Zone 10, NAD 83 at coordinates 6085666 Northing, 630950 Easting and 1,434 m above mean sea level.

The climate within the project area is characterized by long, cold winters, from November through March, and short, cool summers, from June through August. Summer temperatures generally range between 5°C and 15°C but maximum values of up to 30°C have been recorded. Average winter temperatures range between -10°C and -5°C with minimum temperatures as low as -30°C. Rainfall occurs during the summer months with an annual average of 306 mm. Snow pack at the Trend South Mine normally averages 200 cm per annum but may exceed 275 cm. Wind speeds vary throughout the year averaging approximately 16 km per hour. Maximum wind speeds of up to 111 km per hour have been recorded.

The centre of the Waterfall Project area is located about 100 km south of Dawson Creek, British Columbia and 175 km south of Fort St. John, British Columbia. Dawson Creek and Fort St. John have populations of approximately 11,000 and 17,400 respectively. In addition, the Waterfall Project is located approximately 175 km northeast of Prince George, British Columbia and 120 km southwest of Grande Prairie, Alberta both of which have populations greater than 40,000. Each of these cities has regularly scheduled flights to and from major western Canadian cities such as Vancouver, Edmonton and Calgary. Tumbler Ridge is a small town with a population of approximately 2,500 located 20 km to the north of the Waterfall Project.

The nearest railhead is the CN Rail Tumbler Subdivision, which terminates 12 km south of Tumbler Ridge at the Quintette rail load-out. PRC constructed a rail load-out facility in 2005 located approximately 4 km north of the Quintette rail load-out which also connects with the CN Rail Tumbler Subdivision railhead. Distance from this load-out to the Ridley Terminal Inc., in Prince Rupert, British Columbia is approximately 1,000 km. An airstrip is situated 11 km south of Tumbler Ridge along the Heritage Highway. The unmanned airstrip is primarily used for chartered flights. Primary industrial development activities in the region include oil and natural gas exploration and production, coal exploration and mining, forestry and wind energy generation.

The Waterfall Project is located in the Rocky Mountain Foothills of British Columbia. The Foothills consist of a series of ridges and valleys that parallel the Rocky Mountains to the west. The topography of the Waterfall Project area varies from gentle slopes to rugged cliffs and steep valleys. The total elevation change across the project area is approximately 700 m, from 800 m above mean sea level at the Murray River, to 1,500 m above mean sea level at the top of the southwest ridge.

3 RECLAMATION PROGRAM

In 2015 Peace River Coal Exploration undertook reclamation activities during the summer of 2015 at its Waterfall property. The purpose of the reclamation program in Waterfall was to return the areas disturbed in 2013 and 2014 to an end land use of wildlife habitat.

The reclamation work completed for Waterfall followed the Reclamation Plan for Waterfall Surface Exploration Program (Stantec 2014), which was submitted as part of the Notice of Work permit requirements for Peace River Coal's Waterfall property (CX-9-058)

3.1 General Practices

The basis for the general practices that were used were derived from The Handbook for Mineral and Coal Exploration in British Columbia (BC MEMPR 2009), The Health, Safety and Reclamation Code for Mines in British Columbia (BC MEMPR 2008), and The Reclamation Plan for Waterfall Exploration program (Stantec 2014).

- Exploration trails and drill sites proposed for reclamation will be recontoured to original ground slope.
- Soils will be decompacted and/or scarified as part of the recontouring process, to allow for formation of microsites and to promote seed germination.
- Ditches will be re-sloped to allow for reestablishment of natural drainage patterns.
- Culverts and stream crossings will be removed and stream channels restored to their natural state.
- Recontoured sites will be covered with topsoil material and coarse woody debris where available.
- Recontoured sites will be revegetated as described in "Revegetation Prescriptions".
- Predator access blocks will be installed along exploration trails near core caribou habitat.

3.2 Revegetation Prescriptions

Sites and exploration trails were seeded based on the recommendations from the Reclamation Plan for Waterfall. Seed mixes and seed mix application densities are dependent on slope gradients with respect to erosion and sediment control, as well as biogeoclimatic zones. In Waterfall two seed mixes were used depending on the biogeoclimatic zone. Table 3.2.1 and 3.2.2 list the two seed mixes used on the property. See Figure 3 for a map of the different biogeoclimatic zones identified on the Waterfall property.

Species	Scientific Name	Percent by weight	Plant type	Persistence	Growth habit
Canada milkvetch	Astragalus alpinus or canadensis	3	Native legume	Perennial	Rhizomatous legume
Slender wheatgrass	Elymus trachycaulus	32	Native grass	Perennial	Bunch/tufted grass
Rocky Mountain fescue	Festuca saximontana	10	Native grass	Perennial	Dense bunch/tufted grass
Annual ryegrass (diploid)	Lolium multiflorum	10	Agronomic grass	Annual	Bunch/tufted grass
Alpine bluegrass	Poa alpine	6	Native grass	Perennial	Dense, low bunch/tufted grass
Fall rye	Secale cereal	36	Agronomic grass	Annual	Bunch/tufted grass
Spike trisetum	Trisetum spicatum	3	Native grass	Perennial	Bunch/tufted grass



Species	Scientific Name	Percent by weight	Plant type	Persistence	Growth habit
Annual ryegrass (diploid)	Lolium multiflorum	15	Agronomic grass	Annual	Bunch/tufted grass
Fall rye	Secale cereal	45	Agronomic grass	Annual	Bunch/tufted grass
Bluejoint reedgrass	Calamagrostis canadensis	4.5	Native grass	Perennial	Sod grass
Slender wheatgrass	Elymus trachycaulus	15	Native grass	Perennial	Bunch/tufted grass
Fuzzy-spiked wild rye	Leymus innovatus	13	Native grass	Perennial	Tufted grass
Fowl bluegrass	Poa palustris	4.44	Native grass	Perennial	Bunch/tufted grass
Spike trisetum	Trisetum spicatum	2.2	Native grass	Perennial	Bunch/tufted grass
Mountain/sitka alder	Alnus viridis	.63	Native shrub	Perennial	Multi-stemmed shrub
Fireweed	Epilobiun angustifolium	.23	Native forb	Perennial	Rhizomatous

Table 3.2.2 Seed Mix B, used for BWBS biogeoclimatic zones

3.3 2015 Waterfall Reclamation Summary

A review was made of the Waterfall area and the decision was made to totally reclaim all the trails and drill sites built by PRC on the property during 2013 and 2014.

Work was started July 28, 2015 and completed August 27, 2015.

A total of 8 drill pads and 9 km of trails reclaimed on the property. The work included:

- Recontouring and sloping backed to original ground
- Woody material was placed for slope stability.
- Seeding with the prescribed seed mix.

The main access trail within the CANFOR cut block that had been used to access the South Limb of the property were partially reclaimed with erosion bars and cross ditching.

The office site was flattened and reseeded at the entrance to the CANFOR cut block.

To help with caribou habitat preservation, 3 predator access blocks were installed along exploration trails in the South Limb near core caribou habitat (Appendix 1, picture 13). Figure 2 displays the reclamation work that has been carried out on the Waterfall property in 2015.

The equipment used to undertake the reclamation was a John Deere 210 excavator hoe and a Hitachi 270 excavator hoe (Appendix 1, picture 14).

3.4 2015 Waterfall Reclamation

Planning for the 2015 reclamation work in Waterfall commence in March 2015 with an assessment of the current Summary of Work (SoW) submitted for the Waterfall Notice of Work permit CX-9-058 under approval number 13-1641196-1119. The Waterfall property was split into three areas, North Limb, Central area and South Limb (Figure 1). Drill sites and trails were identified from the 2013 and 2014 exploration programs and the amount of disturbed that required reclamation was calculated. Two biogeoclimatic zones (Figure 2) were identified from work undertaken by Stantec and seed mixes for both areas were sourced from Twin Sisters Native Plants Nursery Ltd located in Moberly Lake BC.

Reclamation work on the Waterfall project started on July 27, 2015 with the removal of cross ditches and erosion bars on the main access trail on the North Limb (Figure 2, Appendix 1, picture 1 - 6). Once access was completed to the area, all the trails and drill pads were inspected and a decision was made on what type of reclamation was required. On the steeper sloped areas slope gradient greater than 60%, the seed mixture was spread at a rate of 35 kg/ha was applied, while on the terrain with the slope gradient less than 60 % the rate of application was 20 kg/ha. The reclamation was completed in the North Limb on August 9, 2015.

Reclamation work shifted to the South Limb, (Figure 2, Appendix 1, picture 1, 7 - 10) the access along the main trail through the CANFOR cut block was re-establish with the removal of any erosion bars and the installation of culverts. Work was carried out from August 10, 2015 until August 20, 2015 on trails and drill pads. Work was completed as prescribed in section 3.3. Reclamation work shifted to the Central area, (Appendix 1, picture 1) the access along the trail into the drill hole to be reclaimed was re-establish with the removal of any erosion bars and the installation of culverts. Work was carried out from August 21, 2015 until August 27, 2015 as prescribed in section 3.3.

As in Horizon, trails and drill sites that had only been partially reclaimed in 2006 displayed abundant regrowth of natural plants and conifer seedlings. (Appendix 1, picture 11 and 12). This regrowth of conifers, suggest that with the reclamation completed in 2015 using natural grasses for stability and soil control will provide the right environment for the development of conifers over the next few years. The natural reseeding will provide a balanced mixture of the right conifer species for the area.

2015 Exploration Cost						
Total for Supplies	\$	3,233				
Total for Consultants	\$	-				
Total for Borehole and Trail Reclamation	\$	129,875				
Total for Project Horizon Reclamation	\$	133,108				
Coal Tenure	\$	65,329				
Staffing	\$	56,451				
Total Waterfall Reclamation cost	\$	254,888				

Table 3.4.1 2015 Exploration Cost



4 REFERENCES

- British Columbia Ministry of Energy, Mines and Petroleum Resources (BC MEMPR). 2008. Health, Safety and Reclamation Code for Mines in British Columbia. Mining and Minerals Division, Ministry of Energy, Mines and Petroleum Resources, Province of British Columbia. Victoria, BC.
- British Columbia Ministry of Energy, Mines and Petroleum Resources (BC MEMPR). 2009. Handbook for Mineral and Coal Exploration in British Columbia: A Working Field Guide. British Columbia Ministry of Energy, Mines and Petroleum Resources, British Columbia Ministry of Environment, Association for Mineral Exploration British Columbia, Mining Association of British Columbia. Victoria, BC. 145pp.
- 3. Stantec Consulting Ltd. (Stantec). 2014. Reclamation Plan for Waterfall Surface Exploration Program. Prepared for Peace River Coal, Inc. Vancouver BC. 16pp.



Figure 1 General Property Map





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Waterfall Report on 2015 Reclamation September 2016



Biogeoclimatic Map



Waterfall Report on 2015 Reclamation September 2016

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2015 WATERFALL LOCATIONS PICTURE 1



EXAMPLES OF RECLAMATION NORTH LIMB ACCESS TRAIL PICTURE 2



EXAMPLES OF RECLAMATION

NORTH LIMB ACCESS TRAIL RECONTOURED AND SEEDED AUGUST, 2015 PICTURE 3



EXAMPLES OF RECLAMATION

NORTH LIMB TRAIL BY HIKING TRAIL RECONTOURED AND SEEDED AUGUST, 2015 PICTURE 4



EXAMPLES OF RECLAMATION NORTH LIMB TRAIL BEFORE PICTURE 5



EXAMPLES OF RECLAMATION NORTH LIMB TRAIL RECLAIMED AND SEEDED AUGUST, 2015 PICTURE 6



EXAMPLES OF RECLAMATION SOUTH LIMB TRAIL BEFORE. PICTURE 7



EXAMPLES OF RECLAMATION SOUTH LIMB TRAIL RECONTOURED AND SEEDED AUGUST 2015. PICTURE 8



EXAMPLES OF RECLAMATION SOUTH LIMB DRILL SITE BEFORE. PICTURE 9



EXAMPLES OF RECLAMATION SOUTH LIMB DRILL SITE RECONTOURED AND SEEDED AUGUST 2015. PICTURE 10



EXAMPLES OF NATURAL REGROWTH NATURALLY RECLAIMED TRAIL SOUTH LIMB PICTURE 11



EXAMPLES OF NATURAL REGROWTH NATURALLY RECLAIMED TRAIL SOUTH LIMB PICTURE 12



EXAMPLES RECLAMATION PREDATOR ACCESS BLOCKS SOUTH LIMB PICTURE 13







EQUIPMENT PICTURE 14



Hitachi 270 excavator hoe

John Deere 210 excavator hoe

Appendix 2 Maps





