

50-QUARTZINO 1900(D)C

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REPORT ON THE
BRITISH COLUMBIA (KOSKREMO) COAL FIELDS
OWNED BY
THE WEST VANCOUVER COMMERCIAL COMPANY .

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R E P O R T S
ON THE
BRITISH COLUMBIA (KOSKEEMO) COAL FIELDS.
OWNED BY THE WEST VANCOUVER COMMERCIAL COMPANY.

This property consists of about 7,500 acres, divided into two plots, one of about 5,500 acres containing the coal fields and the deposits of slate and building stone mentioned below, and one of about 2,000 acres containing clearly defined veins of copper. The property is situated on the Sounds of Koskeemo or Quatsino, Vancouver Island, British Columbia, and is covered with valuable timber. It is held by Grant direct from the Crown, free of all rent or royalties.

Coal of good quality, for which there is great demand, is scarce on the Pacific Coast, extensive supplies of coals suitable for steam-ships and gas-making being found only near Nanaimo on Vancouver Island. The Koskeemo coal field is shown by the reports mentioned below to be at once more extensive, valuable and accessible than any other on Vancouver Island, whilst it is believed that it possesses more value than any other on the Pacific Coast.

This property is on the Northeast side of Vancouver Island about 240 miles from Victoria. The depth of water in Koskeemo Sound is sufficient for steamships of 2,000 tons to lie beside two of the coal seams.

Boring and explorations have been made under the personal direction of Mr. J. Preston Moore and Mr. M. B. Silver, Mining Superintendents, and their reports, dated 1884 and 1888, state that on the east side of Coal Harbor they found " a vein 3 $\frac{1}{2}$ 6 in. thick, and the coal of excellent quality. " Other borings, 1,000 ft. distant, proved that " the vein was very uniform in thickness and character 5 ft. to 5 ft 6 in ". Borings 2,500 ft. further off passed through the same vein, and Mr. Moore says : " The vein had the same thickness, 5 ft. 6 in. and I am fully of opinion that this is a valuable vein of coal, and that it under-

lies the whole eastern portion of your property. " Four miles to the westward they sank a shaft, and Mr. Moore says : " The vein was not less than 6 to 8 ft in thickness. It evidently underlies the whole property " Another vein " enlarged in sinking on it to 12 feet. "

THE MINISTER OF MINES FOR BRITISH COLUMBIA, in an official report dated 1874. " An account of mining operations for coal &c in the Province of British Columbia " incorporates a portion of a report made by Mr. J. J. Landale, C.E. and M. E. The Minister speaks of him as " an able Mining engineer " and quotes from his report on the Koskeemo seams :-

" THE QUANTITY OF COAL CONTAINED IN THE BASIN (OF NEARLY EIGHT SQUARE MILES) WOULD? ACCORDING TO THE CALCULATIONS ALREADY GIVEN? BE ABOUT 41,350,000 TONS; DEDUCTING, HOWEVER, ONE-FIFTH FOR THE ACTION OF THE FAULTS, A LARGE ESTIMATE, THERE YET REMAINS 33,080,000 TONS ,OR 600,000 TONS PER ANNUM FOR A PERIOD OF FIFTY-FIVE YEARS.

" MY OPINION IS DECIDED THAT THE KOSKEEMO COAL FIELD IS THE BEST YET DISCOVERED IN VANCOUVER ISLAND, though unopened out, not only on account of the superior quality of the coal, but the ready accessibility of the mines from the Pacific, without the tedious inland navigation for reaching the mines on the eastern seaboard of the Island. "

ROBERT BROWN, ESC., E.R.G.S., who made several scientific explorations on behalf of the local government, also made a geological examination of these coal seams, and found, in 1875, Mr. Landale's report " exceedingly accurate ". He says " the coal contains an unusually high percentage of carbon - fully as high as the Queen Charlotte Anthracite. "

SIR SANFORD FLEMING, K.C.M.G., Engineer- in- chief of the Canadian Pacific Railway for nine years while that road was Government work, made a report in 1877 on that line for the Canadian Government, and appended his Geological surveys on the Vancouver coal fields . He accepts as accurate the reports of Messrs. Landale and Brown on the Koskeemo Coal Seams, includes them among his " documents.".... and replete with detailed description

and inserts their figures and estimates in his Government Blue Book.

Sir William Dawson, C.M.G. & LL. D., Principal of McGill University, Montreal, in his recent work "Canadian Geology", describes the Vancouver Coal area. He writes under date of September, 1899 :- "The useful minerals of the Cretaceous are the coals, which are of the greatest economic importance in Vancouver Island. These rocks constitute on the Coast the true coal-bearing horizon..... The most important area includes the coal mining regions at Nanaimo and Comox..... numerous smaller patches holding more or less coal, some of which may yet prove important....and the coal-bearing beds at Quatsino Sound. . . The formation consists of sandstone and shales, and holds valuable coal seams near its base. . . . The fuel obtained from these measures is a true bituminous, with - according to the analysis of Dr. Harrington - an average of 6.29 per cent of ash, and 1.47 per cent of water. It is admirably suited for ordinary purposes.... owing to its superior quality".

Mr. Landale in his report, also says :- "The coal in seam "G" is the best household coal yet seen on these coasts, and would take the market in any part of the world. The coal in seam "H" is well-suited for coke-making. In addition to the coal, there exists an immense quantity of best timber in the world for spars, ship-building, lumber, &c. There are also upon the property immense deposits of slate and freestone at superior quality, and well suited for building and other purposes." It is proposed that subsidiary companies be formed to work these deposits and the lumber. Reports favourable to the property and the enterprise generally, have also been made by Professor W. P. Blake, Dr. E. Von Hasslocker, and others.

A ready market for this coal is available at San Francisco, Los Angeles, San Diego, Portland, Victoria and other parts of the Pacific. San Francisco is the chief market and chiefly

derives its supplies from Vancouver Island and from England and Australia. California possesses no good coals, and is therefore dependent on imported supplies. San Francisco is the initial and terminal point of several lines of railway and of steamers plying to Australia, China, Japan, Sandwich Islands, British Columbia and Central and South America. It is used as a coaling station for Men-of-War, and possesses many important foundries, manufactories, ship-building yards and gas works.

The situation of these mines is not only the best on Vancouver Island, but better than any north of Cape Flattery, first, as to easy access, and second, as to excellence and security of harbour. There is simply the unobstructed navigation of the Pacific, the Sounds of Koskeemo being on the ocean side of the Island. Vessels can make a clean run up to the entrance of the main Sound. No difficulties are presented to the mariner in making the position in all weathers. Vessels of the largest draught can sail with ease and safety up the main Sound into any of the Arms or Sounds that may be desired; and it is to be particularly noted that the passage from the entrance to the anchorage opposite the coal fields would take only two or three hours.

The cost of opening up the coal fields of Koskeemo would be less than that of any other of which I have a knowledge upon this Coast. My observations extend to Nanaimo, Bellingham Bay, Herewood, The Pacific Coal Company's Works and the Fuca Straits Mine, with all of which, excepting Bellingham Bay, I have been professionally connected.

C O P P E R .

The best defined copper lodes or vein, is that at Akiar, on the South side of East Arm, upon the 2,000 acre tract. The vein appears about three feet wide in the out-crop, and contains black oxide of copper and gray copper ore. Many extensive and valuable copper and other mineral lodes have been discovered on Vancouver Island and Queen Charlotte Islands. Several of these mines are now being actively developed, and

would afford constant employment to large smelting works.

Smelting works might be most conveniently and cheaply erected upon the borders of the coal fields; all the material for making and carrying on such an establishment exists there upon the spot.

A "New Swansea", rivalling Swansea itself, and surpassing all other on these Coasts, might be erected with ease, and made to yield large and permanent profits.

T I M B E R .

The shores of the Sounds of Kosekeemo abound with timber of the following kinds, viz: spruce, pine, yellow and white pine, hemlock, cedar, crab and alder. There exists an immense quantity of the best timber in the world for spars, ship-building, lumber etc. Pine suitable for spars is found everywhere, sometimes of enormous size. This timber is well-known to be of superior quality. The demand for spars, timber and lumber generally, is already large, and is increasing, in fact, faster than the present means of supply. There are ready and open the markets of British Columbia, Washington, Oregon, California, Mexico, Sandwich Islands, Australia and China.

SLATE AND BUILDING STONE.

About half a mile from the head of the West Arm, there is a mile of slate section, consisting of several varieties, blue, violet and black, of good quality, and well-suited for roofing, billiard tables, etc.

Some two feet above the seam of coal "H" is found a deposit of very fine freestone about 4 feet in thickness, well-suited for grindstones or building purposes. It would dress well with the chisel, is not liable to crack or flake off, and lies in bands with regular vertical cleavages.

REPORT BY J. PRESTON MOORE, ESQ.

TO THE PRESIDENT AND DIRECTORS OF THE WEST VANCOUVER COMMERCIAL CO.

Gentlemen:-

Gentlemen:-

Most of the prospecting on your property was done under the superintendency of Mr. Silver, my predecessor, and myself.

The former owners sank a shaft fifty feet deep on the shore of Coal Harbor, to cut the vein of coal that crops out on the beach at this place. The vein shows on the beach from 2 to 3 feet in thickness, and where they passed through it in the shaft they had 24 and 10 inches of good coal, with a small quantity of fire clay between. It was from this vein that the British Man-of-War "Hecate" coaled when in Quatsino Sound. In Mr. Landale's report of the engineer of the "Hecate".

At the coal croppings on Third Creek, he started an incline in the edge of the creek and soon had a 3-foot vein of good coal. Higher up in the bluff, he ran some distance before striking the vein, but fairly into it, he found it 3 ft. 6 in. thick, and the coal of excellent quality.

While Mr. Silver was at work here, the large croppings of a vein were discovered on the East Bank of the Natsinuchtum. These croppings are about 1,000 feet higher up the stream than the drill hole at its mouth. Under-lying them is a stratum of fire-clay, 2 to 3 feet thick, and overhead sandstone with a few inches of shale between it and the coal. As far as examined, the vein was very uniform in thickness and character - 5 ft to 5 ft 6 in.

I moved the drill to the Wegstee, and not far from where this little stream enters Coal Harbour, about 2,500 feet south of the Natsinuchtum. Here at the depth of 37 ft 6 in., the drill went through this same vein of coal. It had the same sandstone over it and the same fire-clay under it; it was evidently of much better quality than in the drift. This vein had the same thickness, 5 ft. 6 in.. I am fully of the opinion that it underlies the whole eastern portion of your property.

Before Mr. Silver left I had been up the West Arm of the Sound to examine this part of your property, and particularly the large coal-croppings that show on the beach some four miles from the settlement. In a small shaft that Mr. Silver had sunk on them

I soon satisfied myself that this vein was not less than 6 to 8 feet in thickness, and with a heavy stratum of fire-clay underlying it; I think this will also prove to be the largest vein and yield the best quality of coal. It evidently underlies the whole property for it shows near your western boundary line, and the dip of all the strata is to the east-south-east. In none of the holes drilled did we bore through this vein.

You have a very valuable property.

The timber on it is of itself a very valuable factor, and converted into lumber would be worth from \$12 to \$30 per thousand in San Francisco market; and your shipping facilities are unsurpassed by any place on the coast.

Respectfully submitted,

J. PRESTON MOORE, Mining Sup't.

King's River,

June 18th., 1886.

EXTRACT FROM REPORT BY PROFESSOR BLAKE M. E.
TO A. B. FORBES, ESC. PRESIDENT OF THE WEST VANCOUVER
COMMERCIAL COMPANY.

Sir:-

The inspection of the property was made by a careful and competent coal miner. The formation is referable to the cretaceous period, and is, no doubt, the northern extension of the Nanaimo and Wellington coal field. The statements respecting the quality of the coals are confirmed to my satisfaction by examination, and by my own tests.

The coal is long-flame, bituminous, of high calorific power. It yields up its gas readily, and gives a bright, clean coke. It is a firm coal. The ash is white and light, and the coal is remarkably free from iron and sulphur. Two different samples gave me 69.5 and 70% of coke and 30.5 and 30 per cent of volatile of gaseous compounds, including one or two per cent moisture. It resembles the Wellington coal, which readily commands from \$1 to \$1.50 per ton more in San Francisco markets than any other coast coals.

The demand for both coal and coke is increasing. The rapid extension of the railway systems, the multiplication of cable roads in the cities, the establishment of plants for the electrical light, and of various industries, all increase the demand for coal. The Canadian Pacific Railway will rapidly promote the development of settlement upon the North-West Coast, and make all the available deposits of good coal more and more valuable.

My knowledge of the vast capacity of the Northwest for population and industry, make me somewhat enthusiastic regarding its future, and the prospective value of such stores of latent energy as these coal deposits represent. In my opinion, your Company has in its coal and timber lands on the navigable waters of Quatsino, a property of great and increasing value,

Your obedient servant,

Professor Wm. P. Blake,

Geologist and Mining Engineer.

New Haven, Conn.
March, 1890.

THE CANADIAN GOVERNMENT BLUE BOOK " GEOLOGICAL SURVEY
OF CANADA," DATED MARCH, 1899, CONTAINS THE FOLLOWING OF THE
KOSKEEMO COAL FIELDS.

The total length of this area is about seven miles, its greatest probable width about two miles, and its approximate area, not including under-water extension, about 5,630 acres.

The coal is bituminous and of excellent quality. An analysis of a specimen, made in the laboratory of the Survey, gives the following results : (in 100 parts; hygroscopic water, 1.05; volatile combustible matter, 34.38; fixed carbon, 54.01; ash, 10.55).

THE MINISTER OF MINES FOR THE GOVERNMENT OF BRITISH COLUMBIA. IN HIS OFFICIAL REPORT FOR 1874, MAKES THE FOLLOWING STATEMENTS:-

The Sounds of Koskeemo and Quatsino are situated on the Northwest Coast of Vancouver Island, about 240 miles from Victoria. The sound is one vast harbor, entered from the Pacific, and ramifying into a southern arm, an east arm and a west arm. The surveys were chiefly confided to Mr. J. J. Landale, who has already been mentioned as an able mining engineer. What follows is derived almost entirely from his memoranda.

The coal fields are situated on the northwestern side of Rupert Arm, and are contained within an area of 5,000 acres. The coal strata lies on a bed of calciferous sandstone many hundreds of feet in thickness. Through the whole formation, consisting of coars and fine conglomerate, sandstone, shales, fireclays and coal, are fossiliferous beds; the contained fossils leave no doubt that the age of the bed is cretaceous, probably belonging to the same horizon as the Nanaimo strata.

Most of the shales are more or less bituminous, and the different seams of coal are characterized by a shining cubical fracture, by regular lamination, and by an almost complete exemption from sulphur in the "cutters " of vertical division.

A large penine fault cuts off the whole basin by throwing it southwards, on which side of it are to be seen, at the surface,

the calciferous sandstone whereon the basin lies, and also the underlying metamorphic rocks.

Three seams of this basin are five in number, and have been found in outcroppings on various parts of the fields, and in small shafts sunk by Mr. Landale. The dip is southwards, with an average inclination of 1 inch in $3\frac{1}{2}$ or 4 inches. The first seam is seen outcropping out above two miles up the stream, called by the Indians Natsenuchtum. It varies in thickness from 2 ft. 8 in. to 2 ft. 11 in. It is an excellent household coal. Mr. Landale informs me, in his opinion the best on the coast. It contains an unusually high percentage of carbon, fully as high as the Queen Charlotte Island anthracite.

	1st. Analysis	2nd. Analysis.
	in 100 parts not dried.	
Carbon.....	70.00	71.00
Hydrogen.....	5.30	5.35
Nitrogen.....	1.28	1.10
Oxygen.....	10.01	11.55
Sulphur.....	0.41	0.60
Ash.....	13.00	10.40

It evolves a strong, continuous heat, leaving a small bulk of pure, white ash, easily fusible. The coke from it does not swell much. Mineralogically, it has a cubical fracture, horizontal laminae, and vertical cleavage planes, with thin films of carbonate of lime. The basin is calculated to contain 4,000 acres of this coal, and to be capable of yielding 2,100 tons per acre.

Immediately above the next seam lies a fine building stone. The thickness of this seam is from 1 ft. 10 in. to 2 ft. The coal is of denser quality than the former, and is well fitted for coke-making. There are about 3,500 acres of this coal, computed by Mr. Landale to yield 2,500 tons to the acre.

Of the next seam it is difficult to speak, as it is only seen at one point, lying close to the fault at the west of a point known as "Adamson's Hut". It appears to be a hard coal, and

in its natural condition probably of the cannel kind.

The next seam is 2 ft. 6 in. in thickness, highly impregnated with gas, and closely resembling the Torbanehill of Boghead gas coal. It would probably yield paraffine by distillation. This seam resembles the Torbanehill in another particular, viz:- in burning it loses immensely in weight, though but little in bulk. Mr. Landale computes that there at least 4,000 acres of this coal, capable of yielding 2,250 tons to the acre.

The main or fifth seam was found in a shaft close to Adamson's Hut, in the West Arm. It is 4 ft. 6 in. in thickness. There is some resemblance between this coal and that mined at Nanaimo. There is, however, this important difference, that the Nanaimo coal has its laminae and cleavage joints filled with a crust of earthy matter, consisting of carbonate of lime and iron, and often pyrites, to an extent that frequently renders the coal useless, while the only impurities in this seam are little laminae of shale of a dark color which burns nearly as well as the coal itself. For steaming purposes, an analysis of this seam shows it to be excellently adapted.

The whole of the Koskeemo coal basin is broken by four faults into three great divisions. The quantity of coal contained in the basin (of nearly eight square miles) would, according to the calculation already given, be about 41,350,000 tons.

Deducting, however, one-fifth for the action of the fault, a large estimate, there yet remains 35,080,000 tons, or 600,000 tons per annum for a period of fifty-five years.

Even this calculation does not embrace all, for the study of the Vancouver Coal Fields show that the lower conglomerate is rarely found nearer than 120 feet to the top of the series, and is generally much further off; so that in getting down beyond 120 feet, other seams of coal may be discovered of great extent and excellence.

Many copper seams being found in this vicinity, as well as in many other parts of Vancouver and Queen Charlotte Islands, smelting works might be conveniently established here.

upper seam of K closely resembles in many particulars the renowned Torbanehill or Hoghead Cannel Coal. It is highly impregnated with gas, and for this purpose it would command ready sale at San Francisco and other Cities where gas is consumed. The use of this coal would effect so large a saving in purifying machinery and even retorting, that a prompt and appreciative market could always be had.

The undermain seam "K" is unusually well adapted for steam purposes. It makes less klinker than any now in use on this Coast; it is above all, well nigh free from sulphur or other impurities. In a word, for steam purposes, this coal surpasses any yet discovered on the Pacific Coast.

The total yield of coal is at least 33,000,000 tons, or 600,000 tons per annum for a period of fifty-five years. This computation is limited to the present exploration. On sinking deeper, further and more valuable seams may be disclosed.