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The development of Mine Number One of the Chinook Coal Company, Limited, Lethbridge, Alberta, Canada

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THE DEVELOPEMENT OF MINE NUMBER ONE OF THE CHINOOK COAL COMPANY, LIMITED. LETHBRIDGE, ALBERTA, CANADA.

BY

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-CONTENTS-

-ILLUSTRATIONS-

-APPENDIX-

THE DEVELOPEMENT OF MINE NUMBER ONE OF THE CHINOOK COAL COMPANY, LIMITED.

LOCATION.

The Lethbridge Mining District lies about 50 miles north of the International Boundary and approx - imately 280 miles north of Great Falls, Montana.

The country is rolling prairie with deeply cut river vallies and is practically treeless except for a few willows along the river bottoms.

The rainfall is moderate but the climate is severe; the summers being short and hot while temperatures of -50 degrees F. are not uncommon during the long winters.

On account of the severe winters and the scarcity of timber there is a good market for coal during the entire year as it is the only domestic fuel available.

Transportation facilities are good, there being three transcontinental railway systems with numerous branches operating in the Province.

HISTORY.

Coal was first discovered in the Province by the employees of the Hudson Bay Company. The early reports of the company's officials mention coal as early as 1790.

Mining coal was first attempted in the Lethbridge district about 1881 but very little was accomplished until the railroad was built in 1888. The Galt Mines started shipping immediately and have worked continuously since that time.

The first production records were kept in 1901 and the output of the Province has grown steadily since then. The official figures are:

Year.	Production in tons.
1901.	346,649.
1902.	510,674.
1903.	622,939.
1904.	782,931.
1905.	811,228.
1906.	1,385,000.
1907.	1,834,745.
1908.	1,845,000.
1909.	2,174,329.
1910.	3,036,757.
1911.	1,694,564.
1912.	3,446,349.

The greatly decreased output in 1911 was due to a strike of eight months duration which practically paralized the coal industry of the Province.

The Lethbridge district produces Lignite Coal, only, and the output for the last two years recorded was;

1911.	411,796 tons.
1912.	760,687 tons.

THE MINES OF THE DISTRICT. (See Drawing No.1.)

There are 36 mines operating in the district but only 9 of them are producing more than a few tons per day. These small mines sell to consumers in their immediate neighborhood and seldom ship to outside markets.

Of the 9 large mines the 5 largest are in the immediate vicinity of the City of Lethbridge. These mines are;

The Galt Mines, Canadian Pacific Railway, with an output of 7200 tons per day.

The Lethbridge Colleries, output 3000 tons per day.

The Royal Colleries, output 1600 tons per day.

The Diamond Coal Company, output 2000 tons per day.

The Chinook Coal Company, output 2400 tons per day.

THE CHINOOK COAL COMPANY.

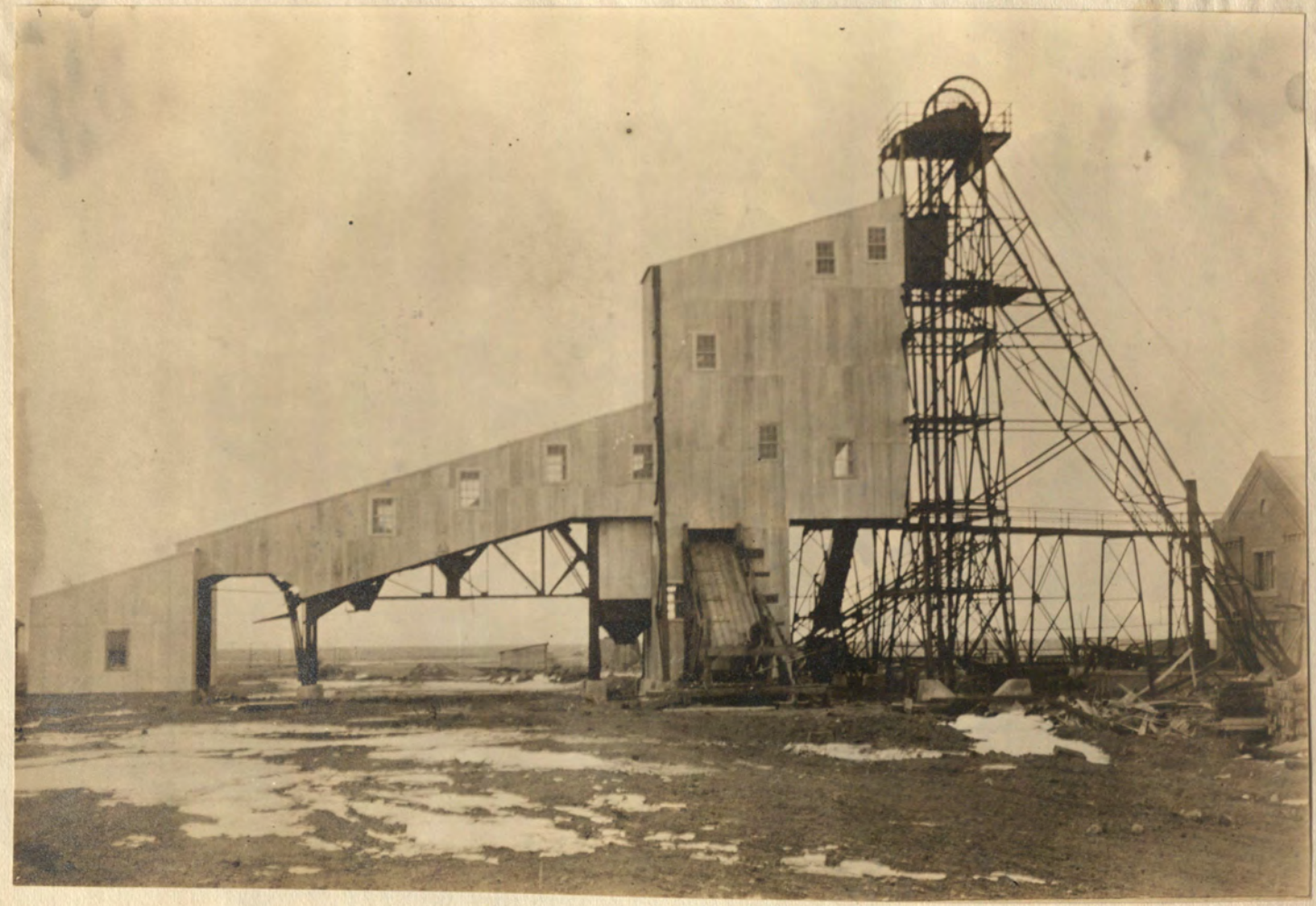
The Chinook Coal Company was organized and incorporated with a capital of $3,000,000 in the fall

of 1909 and at once secured leases of the coal rights on several sections of land in the Lethbridge district and began diamond drill prospecting. Later the company secured other leases and now control the coal rights on the following land; Sections 11, 12, 14, 16, 20, 22, 24, 28, 29, 30, 34, and 36 in Township 10 N., Range 20 W. of the 4th meridian. The surface rights to the N.W. quarter of Section 12 were also acquired and, as soon as the location of the shaft was decided, 20 acres in the South half of this section were secured for the surface plant of the mine.

PRELIMINARY ESTIMATE OF COST OF PLANT.

The preliminary estimate of the cost of plant and bringing the mine to a productive stage of 1200 tons per shift was as follows;

General Plant.	
Sinking machinery and installation.	$ 5,500.
Sinking two shafts(about 425' each)	20,000.
Lumber.- all kinds, temporary headframes and buildings.	12,500.
Tipple, capacity 1200 tons per 8 hours. - Complete.	15,000.
Boiler Plant.- 750 H.P.	28,000.
Hoisting Engine.	6,725



Tipple.

Compressed Air plant, including 12 mining machines.	$ 11,950.
Electric Plant.	5,000.
8 foot fan with engine.	6,800.
Miscellaneous pipe and fittings.	3,000.
Self dumping cages.	1,000.
Box car loader.- installed.	3,500.
150 ton track scale.	3,500.
Wire rope, sockets, etc.	350.
Miscellaneous equipment and tools.	4,600.
Labor installing equipment.	5,500.
100 pit cars @ $75.	7,500.
T-rail, splices and spikes.	3,500.
Timber.- Props, etc.	2,500.
Total.	$146,525.

Development of Mine.

Construction of shaft bottom.	$ 6,500.
Labor and material timbering shaft bottom.	2,160.
Driving and Timbering.	
Main entries and airways.	7,500.
Stub entries and airways.	4,500.
Stoppings, doors, brattices, emergency and contingent expenses.	3,500.
Air and water pipe.- fitting only.	900.
Total.	$ 25,060.

Mine Buildings.

Engine Room.	$ 2,500.
Boiler House.	3,000.
Shop and equipment.	4,000.
Wash House and Lockers.	2,500.
Stables.	2,500.
Office.	1,500.
Store House.	1,000.
Magazine.	500.
Total.	$ 17,500.

Water Works.	$ 27,271.
Railway Yards.	$ 19,155.

Summary.

Plant.	$146,525.
Mine.	25,060.
Buildings.	17,500.
Water Works.	27,271.
Railway Yards.	19,155.
Grand Total.	$235,511.

THE SURFACE PLANT. (See Drawing No.2.)

All the mine buildings are constructed of brick on concrete foundations. The bricks were made

by the company from clay found on the property and wereof excellent quality.

The mine buildings are as follows:

Office and Warehouse.

Engine House.

Boiler House.

Machine and Carpenter Shop.

Fan House.

Powder House.

Stables.

Pump House at river.

THE POWER PLANT. (See Drawing No.3.)

The power plant is equipped as follows:

5- Leonard and Sons Return Tubular Boilers of 150 horse power each with space for an additional unit.

2- Forced draft fans.

1- Feed water Heater.

1- Sullivan WB2 Straight line Air Compressor.

1- Danville 24x36 Hoist.

1- 125 Kilowatt Generator with Ideal Engine.

THE MINE FAN.

The ventilating fan is an 8 1/2 foot Sullivan reversable, run by an Ideal Engine and is guaranteed to deliver 250,000 cubic feet of air per minute against a 4" water gauge. The fan house is constructed of brick with explosion doors in the roof.

THE HEADFRAME AND TIPPLE. (See Drawing No.4.)

The headframe and tipple are of all steel construction. The headframe is 85 feet from ground to the sheaves which are 9 feet in diameter.

The coal is hoisted in mine cars on self dumping cages to the top of the tipple where it is dumped over a bar screen with bars spaced at 3/4".

After passing over the screen the coal falls into the weigh basket and from the basket to the shaking screens. These screens are in three sections as follows;

No. 1. 20'x6' with 1" round holes.

No. 2. 12'x6' with 1 1/2" round holes.

No. 3. 12'x6' with 2" round holes.

General View of Plant from the South west.

The coal passing through the screens falls into hoppers and is loaded into cars. The lump coal passing over the screens falls directly into the cars or goes to the box car loader.

THE PUMP HOUSE.

The pump house is located on the banks of the Belly River about 3 miles from the mine. It is equipped with a 4 stage centrifugal pump run by electric power from the mine and furnishes all water for the power plant and for domestic use in the townsite.

THE SHAFTS. (See Drawing No. 5.)

The hoisting shaft is 17'0"x8'6" in the clear and has three compartments: two hoisting compartments 6'6"x8'6" and a pipeway 3'0"x8'6".

The air shaft is 13'10" x 8'0" in the clear and is divided into two compartments, an airway 8'0"x8'0" and a manway 4'0" x 8'0".

Both shafts were started in December 1910 and

the rate of sinking was as follows:

	Feet Sunk.	
Month.	Hoisting Shaft.	Air Shaft.
December.	35	15
January.	65	45
February.	82	70
March.	114	110
April.	130	129
May.	---	65
Total.	426	434

The cost of sinking and timbering is shown in the following table.

Item.	Hoisting Shaft.	Air Shaft.
Labor.	$ 9,185.80	$ 6,979.84
Timbering.	7,183.36	4,488.61
Supplies of all kinds.	586.20	390.16
Total Cost.	$ 16,955.36	$ 11,858.61
Cost per foot.	$ 39.80	$ 27.32

The timber used was shipped from British Columbia and cost $25.00 per thousand feet f.o.b.mine.

The amount of timber used, in board feet, was,

Size.	Hoisting Shaft.	Air Shaft.
12x12x30'	720	
12x12x26'		664
12x12x20'	240	240
8x12x20'	106,000	74,000
8x12x14'	37,382	26,458
6x12x20'	42,000	30,000
6x12x14	18,000	13,080
6x8x18'	8,400	4,200
6x8x16'	3,200	1,600
3x12x16'	5,280	2,640
2x6x14'	1,700	848
6x6 diagonals.	3,000	3,000
2x3 diagonals.	1,700	
6x8 guides.	8,000	
Total.	392,352	156,730

The shafts were sunk through alternating beds of hard and soft shale and required very little powder to break the ground.

General View of Plant
from the Southeast.

THE MINE.

The shaft bottom was driven the full width of the shaft for a distance of 160 feet at which point it branched into a "Y" to meet the main haulage way. The bottom is double tracked and affords storage room for 80 cars of 2 ton capacity. The empty car is kicked off the cage by the loaded one and runs back to a car haul and is lifted to a gravity kick-back and then runs by gravity to gathering points on the main haulage way. (See Drawing No. 10.)

The mine is openedup on the room and pillar system the panels being 800' x 400' and the rooms and pillars each 20'. (See Drawing No. 8 and No. 9.)

The seam averages 5'6" of coal with a narrow band of fire clay about 2'6" from the bottom and with 3" to 8" of slate about 1' from the top. Under the coal is a bed of bone coal in which all under cutting is done. (See Drawing No. 6 and No. 7.)

The shale above the coal is very weak and hard to hold but if the top foot of coal above the slate is left in place an excellent roof results so this plan is used. It means the total loss of this coal but the saving in timber more than offsets this loss.

The coal is under-cut to a depth of 5' or 6' with punchers and then 6 or 8 holes are drilled along the top with a hand auger and loaded with 1/2 to 1 pound of black powder. The shots are fired with a squib.

Usually 6 to 7 tons of coal are broken per pound of powder used.

In the lower parts of the mine where water causes trouble in undercutting Radialaxe machines are used. They cut in the fire clay band in the seam. The upper part is then shot down with black powder and then the lower bench lifted with dynamite. The dynamite shatters the coal very badly and gives a large amount of slack which cannot be sold.

All entries are driven 8' between timbers and 6' above the rails so ample room is given in all haul-

age ways.

The room necks are turned in on the low side of the room so that all shoveling in the room is downhill and gives easy loading. The necks are driven 9' wide and 12' long the room then widening out to 20'.

All overcasts are of reenforced concrete and are considered strong enough to withstand a possible explosion. (See Drawing No.11.)

The ground is badly broken up by a number of small faults as shown in Drawings No. 7 and 9. which have caused trouble with the haulage system on account of the great variation in grades, but as the mine is opened up this trouble is growing less as a more comprehensive system is worked out. At present animal haulage is used but electric haulage will be installed as soon as conditions warrant.

There is little or no gas in the mine and open lights are used and, as the mine is a wet one, there is no dust problem to contend with.

LABOR AND WAGE SCALE.

The miners as a whole are a good class of workmen and usually give little trouble. The open shop system is used but all men are paid the union scale under an agreement with the United Mine Workers of America.

The wages paid are as follows:

Occupation .	Rate per day.	Hours.
Bottomman.	$2.89	10
Teamsters.	2.89	10
Blacksmiths.	3.85	10
Carpenters.	3.85	10

Power House Engineers.	3.40	8
Hoisting Engineers.	3.20	8
Machinists.	3.85	10
Other Labor. Not less than	2.47	10

Inside Wages.

All 8 Hour Shifts.

Shotlighter.	3.30
Bratticemen.	3.30
Timbermen.	3.30
Tracklayers.	3.30
Drivers.	3.03
Laborers.	2.75
Cagers.	3.30
Loaders	2.75
Miners.	3.30
Machinemen.	3.75
Pumpmen.	2.75

Contract Prices.

All coal to be paid for on basis of 2,000 pounds screened coal being considered one ton.

Pick Mining.

Pillars and stumps, 68 cents per ton.

Machine Mining.

Runners(rooms), 13 1/2 cents per ton.

Runners(narrow work), 19 1/2 cents per ton.

Scrapers(rooms), 10 cents per ton.

Scrapers(narrow work), 14 1/2 cents per ton.

Loaders(rooms), 52 cents per ton.

Loaders(narrow work), 80 cents per ton.

-INDEX-

Chinook Coal Company. (continued)