

1887

20

REPORTS

THE MEDICINE HAT

COAL AND MINING COMPANY-Limited.

The Medicine Hat Railway and Coal Company.

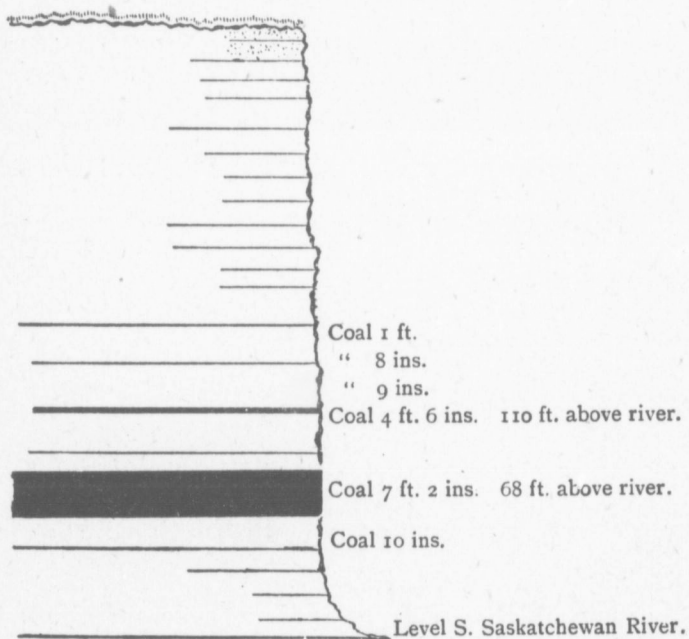
MEDICINE HAT, NORTH-WEST TERRITORIES, CANADA.

1887

PROFILE

Showing position of coal seams on river face of Section 5.

—————
Prairie surface 300 feet above river.



THE MEDICINE HAT
RAILWAY & COAL COMPANY.

INCORPORATED BY ACT OF PARLIAMENT, DOMINION OF CANADA,
2nd JUNE, 1886.

CAPITAL STOCK, - - - - \$75,000.00.
IN SHARES OF \$50 EACH.

A. R. BOSWELL, ESQ., - - - - PRESIDENT.

E. R. C. CLARKSON, ESQ., - - SECRETARY.

SECRETARY'S OFFICE :
NO. 26 WELLINGTON STREET EAST,
TORONTO, CANADA.

THE MEDICINE HAT
COAL AND MINING COMPANY.
(LIMITED.)

- CHARTER -

- The Charter of this Corporation grants to it all the rights and powers given by the "Canada Joint Stock Companies' Act, 1877," and the power
- A* To acquire by purchase, location or otherwise, a tract or tracts of Coal or Mineral lands in the Province of Manitoba, or in the North-West Territories, and to work and develop the resources of the same.
 - B* To purchase, take on lease, or in exchange, hire or otherwise acquire any real or personal property, and any easements, rights or privileges which the Company may think necessary or convenient for the purposes of their operations.
 - C* To develop Coal and Mineral Lands held by the Company or by others.
 - D* To mine, produce, mill, smelt and reduce coal; lignite, iron, gold, silver, copper and other minerals.
 - E* To purchase, manufacture, sell and deal in cordwood timber, timber lands and lumber of all kinds.
 - F* To build, acquire, own, charter or lease, navigate and use steamboats, sailing vessels, barges and other vessels or boats for the purposes of the Company.
 - G* To aid by way of bonus, gift of money or otherwise, in the construction and maintenance of a line or lines of steam-boats, steam-tugs or barges running to the lands of the Company from some point or points in the Province of Manitoba or in the North-West Territories.
 - H* To build, construct and maintain all the necessary wharves, and to make, build, provide and carry on, use and work tramways, telegraph lines, reservoirs, aqueducts, roads, streets and other works which may be deemed expedient or necessary in promoting the objects of the Company.
 - I* To purchase and sell coal, lignite and iron, gold, silver, copper and other ores anywhere in the Dominion of Canada; and
 - K* Generally to do all such other things as are incidental or conducive to the attainment of the objects aforesaid or any of them.

LOCATION OF MINES.

The mining properties of the Company are as follows :

- 1 UNDER CERTIFICATE OF OWNERSHIP, dated 6th April, 1887—No. 47, issued by the Dominion Government—the fee-simple of the North-West and South-West quarters of Section Number Thirty-two, Township Twelve, Range Six, and all that part of the South-East and South-West quarters of Section Number Six which lies to the South and West of the South Saskatchewan River, Township Thirteen, Range Six, west of the Fourth Meridian in the provisional District of Assiniboia, in the North-West Territories of the Dominion of Canada, containing by admeasurement

Acres - 558

- 2 UNDER AGREEMENT TO PURCHASE from the Canadian Pacific Railway Co. of Canada, the South-West and South-East quarters of Section Five, Township Thirteen, Range Six, and the North-East and South-East quarters of Section Thirty-one, Township Twelve, Range Six, in the said District

Acres - $\frac{410}{968}$

REPORTS.

3. These lands are situated some six miles west of Medicine Hat, the point where the Canadian Pacific Railway crosses the South Saskatchewan River. They are recognized as the most valuable and extensive coal deposits in that district. No seam of equal dimensions has as yet been discovered in any portion of the North-West Territory. Two seams, one of 4 feet 6 inches and the other 7 feet in thickness, have their outcrop on the bank of the south side of the river, and they have been traced a distance of twelve hundred feet. This thickness, and the geological formation of the district, is such as to preclude the possibility of the deposit being liable to interruption. An unquestionably competent authority estimates that

there are more than seventeen million tons of coal underlying these lands. A miner of many years' experience expressed his opinion in substance and effect as follows: "If these mines were worked for fifty years, and a thousand tons a day taken, the supply of coal remaining would still be great." For all practical purposes, then, it may be said that the supply is inexhaustible. Coal from this location has been successfully tested on the Canadian Pacific Railway by a master engineer and others, and they report that it burns clearly, without bad odors, is particularly clean in burning, forming a white ash and leaving no clinkers, irrespective of excessive heat. For domestic purposes it has already had a lengthy and satisfactory trial; it has been most successfully used in cooking ranges and various kinds of coal stoves, in "base-burners" and "open grates." The best of gas has been made from it. The following is a copy of an analysis made by Professor Ellis:—

TORONTO, 14th September, 1883.

SIR,—I have analysed the sample of coal that you left with me on the 5th inst., with the following result:—

Specific gravity.....	1'400
Moisture.....	16'32
Ash.....	9'05
Coke.....	53'50
Volatile combustible matter.....	21'13
	100'00

I am, Sir, yours faithfully,

TO DR. KENNEDY.

W. H. ELLIS.

As to market the Canadian Pacific Railway Co., must necessarily be an extensive consumer for use on the main line of their railway, as at present located from Winnipeg westward, *via* Medicine Hat and Calgary, to and across the Rocky Mountains. Such a railway market, though enormous in itself, must necessarily increase annually. The great natural resources of the North-West Territories are well known, but these resources are but partially developed by the main line of the C. P. R. Lines to the north, west and south towards the United States, have been projected and located by capitalists, and in a very short time construction work on colonization lines will have been commenced. Doubtless one or more of these lines will make Medicine Hat their starting-point. This place, from its favorable position as a Railway Centre, in addition to its being a terminus on a river navigable towards the north (where is found a section of country unequalled from an agricultural point of view) is beyond all doubt destined to become a point of great importance. The settlement of the country eastward and westward from Medicine Hat is progressing at a rate that in other countries has been unheard of. Numerous cities, towns and villages are springing up at various points, and farming along the entire railway is being extensively carried on. This in itself speaks of the enormous domestic consumption of coal that must take place. It should also be borne in mind that such consumption is

of a local character, though fractional as compared to other demands. Wood in the North-West cannot be classed as marketable fuel. When obtainable, it is and must ever remain in demand for house-building purposes. The fact that coal is found underlying a vast area of the North-West, is most apt to prove misleading as regards the few, (exceptionally few, it is asserted) favorably situated mines. To the experienced miner the situation of a mine is the sole factor that regulates its value. And then, again, the existence of this vast area of coal lands merely proves that nature has supplied coal as a fuel in a country devoid of wood. Small and limited seams are, so to speak, but pointers to the few rich and inexhaustible deposits; such small and limited seams have been discovered eastward from Medicine Hat. Already some have been worked out, and these have proved to be, what other similar small seams are, utterly valueless. These few remarks apply in an undeniable manner to the coal lands east of Medicine Hat, but westward of the boundaries of the Province of Manitoba.

Coal lands westward from Medicine Hat are now being worked by companies, but the attempts to develop these mines have already demanded an enormous outlay of capital. Such must ever be the case with mines less favorably situated than the one herein referred to. In the case of the former, before the coal taken out can be placed on an equal footing with that of Medicine Hat, it must either be transported by water at very large outlay for a distance of some 160 miles on that portion of a river which at best is only navigable for eight or ten weeks in the year, or by a railroad extending over almost the same distance. The cost of the construction of such a railway cannot be expressed in thousands. These obstacles must, for years to come, defy competition, even setting aside the first cost of freighting the coal, which must be considerable, even should a railway thus built be solely in the hands of a Coal Company owning the mines. It is evident, therefore, that the Medicine Hat coal mine described above, can, speak only of its naturally favorable position, never suffer from competition. From the position of the coal seams, which are horizontal and on the river bank, coal shafts will be unnecessary. Tunnels and air shafts can be excavated with a minimum amount of labor expended thereon. The thickness of the seams is such that the tunnels pass through pure coal and no other substance. In these tunnels small horses, or native ponies, hauling tram-cars, can be employed. The natural drainage of the tunnels is simply marvellous. This is clear from the decided slope towards the Saskatchewan River, and has called forth expressions of admiration and astonishment from English and Nova Scotian miners employed in excavation. It is questionable if even a small hand-pump will even be in demand; a simple drain made with pick and shovel is found adequate. The small amount of timber, obtainable at small cost, required in the tunnels, is a point, and one of inestimable value, in favor of the mine. To convey the coal from the mine to the main line of the C. P. R., and on the extensive sidings of that Company at Medicine Hat, a short line of some seven miles (at greatest

estimation) will require to be constructed and so extremely favorable is the country passed over that such a line amply suitable to meet the demands required of it, can be constructed at a closely approximate cost of from \$7000 to \$9000 per mile. Several other methods could be employed to convey the coal to the railway at the point above-mentioned, and presumably at considerably less cost, which, however, by the plans specified, is so trifling as to forbid of deviation, more particularly from the fact that its adoption places the mine on best possible footing as regards successful development. It is estimated, and soundly so, that the coal so mined can be thus laid down on the C. P. R. siding at less than \$2.00 per ton. Its present selling price there is \$5.00 per ton. The mine could be equipped in eight weeks in a manner than would really permit of 300 tons per day being taken out after a few months' work, with coal taken out at above rate, at least a thousand tons per day could be mined.

The property has been partially developed by the opening of one or two tunnels of about 20 feet each. The following reports have been made with special reference to the locations offered. (1.) Letter from George M. Dawson, Esq., Assistant Director of the Geological Survey of Canada :—

DEPARTMENT OF THE INTERIOR, CANADA,
Geological and Natural History Survey,
OTTAWA, Oct. 23rd, 1888.

J. A. GEMMILL, Esq., Ottawa.

My Dear Sir,--In answer to your inquiries in reference to the Medicine Hat Coal, I may state that two important seams occur in that locality and are well shown in natural exposures in the banks of the South Saskatchewan River for several miles. The seams are nearly horizontal, or effected by light, undulating dips only, and though the thickness and character of the coals differ somewhat in the various sections, the persistence of the coal bearing character of the horizon is such as to give every confidence in its maintaining a workable thickness for a considerable, though as yet undefined distance, both north and south of the river. The manner in which the coal is naturally exposed in the scraped banks of the river renders its extraction easy and inexpensive, and where it has been already opened it proves to have a good sound roof and floor requiring little timbers, while water scarcely occurs in the measures. The exposures in the vicinity of areas marked on your sketch indicate that the seams are here at least as well developed as in any part of the district, and with means of transport provided it will be a locality well situated for working.

The fuel, though strictly speaking a lignite coal, has been proved by actual trial to be well suited for all ordinary purposes, and its geographical position and proximity to the Canadian Pacific Railway line gives it a very considerable advantage in the eastern markets as compared with most of the coals of the North-West.

Yours very truly, GEORGE M. DAWSON.

REPORT OF ROBERT WARD (CONTRACTOR FOR THE SASKATCHEWAN COAL MINES) ON THE ABOVE MENTIONED PROPERTY.

The principal seam is seven feet thick on the south-eastern corner of Section 6, and continues with that thickness down to 4 feet for a distance of 400 yards east down the river, and west of the 7-foot seam it becomes reduced to 3 feet 6 inches, when the average would be about 4 feet 9 inches. The quantity is unlimited—at least 6,000,000 tons to the square mile. Its quality as a steam coal is fairly satisfactory, the only objection being that it is light and it is carried through the smoke-stack before its properties are fully consumed. This can be overcome by regulating fire-box and smoke-stack of engine. As a house coal it is first-class. The cost of production at present would be \$1.00 per ton at the pit's mouth, but this can be reduced materially by bringing in miners. The crossing of the river with the coal, hoisting to the bank, and laying of track to the Woodworth track, would be much more costly than the construction of a line from the pit by the N. E. side of the river to a point on the C. P. R. a short distance east of Medicine Hat. The mine could be worked quite as cheaply by the sinking of shafts and bringing coal to the surface. The distance from the mine to railway would be about 6 and one-half miles, and would cost from \$9,000 to \$10,000 per mile.

I estimate necessary and suitable machinery as follows:—

1 Double Engine, 40 horse-power	\$2,500 00
Sinking of Shaft, 208 feet, about	750 00
40 Drills, at \$5 00, laid down	200 00
40 Coal Sledges, \$3 00, laid down	120 00
200 Picks, \$2 00, laid down	400 00
Pit Rails (8 lbs. to the yard) 20 to 25 tons required, cost... \$75 per ton laid down	1,875 00
Mine timbers for supporting, procurable west of Calgary, estimated	1,000 00

N. B.—No pumps required.

The consumption of coal in Manitoba and the North-West Territories will not at present exceed 250,000 tons per year. It is now worth (1882) \$6 00 to \$7 00 per ton at Medicine Hat and an average of \$10 per ton at points of importance east and west. I would recommend the employment of experienced miners, and contract (which they prefer) to dig by the running yard which in headings consists of 8 feet wide and 1 yard in; their rate is \$7 00 a yard here, and find everything, powder and grub, oil, &c. The running yard will give an average of four and one-half tons. In this manner of conducting the mine the cost of production is much reduced.

ROBERT WARD,

Contractor Saskatchewan Coal Mines.

REPORT OF JOHN P. LAWSON, ESQ., M. E.

To CAPTAIN COTTON, Regina, N. W. T.

Sir,—The following section of strata from Prairie Level to the Saskatchewan River level, taken near the south-eastern angle of section 6, range 6, Tp. 18, west of P. Meridian, on your coal area in the Medicine Hat Coal District, will give you an idea of the position of the coal seams.

	Thickness in		Depth below
	ft.	in.	Prairie Level ft. in.
Prairie Level	0	0	
Drift	15	0	
Boulder Drift	12	0	27 0
Sandy clays	29	0	56 0
Sandstone band	4	0	60 0
Light clay shales	31	0	91 0
Sandy shales	16	0	107 0
Sandstone band	2	0	109 0
Dark grey shales	8	0	117 0
Clay shales	30	0	147 0
Good coal	1	0	148 0
Clay	4	0	152 0
Coal seam	0	6	152 6
Clay	3	0	155 6
Coal	0	6	156 0
Shales	30	0	186 0
Good coal top seam	4	6	190 6
Dark grey shales	37	0	227 6
Iron stone band	0	8	228 2
Sandy clays	6	0	234 2
Good coal, main seam	7	0	241 2
Clay	2	0	243 2
Brown sandy clays	40	0	283 2
Grey sandy clays	9	0	292 2

(Saskatchewan River Level.)

The shales and clays vary very much; no two sections taken one hundred yards apart agree. By reference to the above section it will be seen there are two workable coal seams on this area, the top seam measuring four feet six (4 ft. 6 in.) inches of good coal, and the lower or main seam measuring seven feet (7 ft.) all good coal, with the exception of 2½ inches of calcereous clay in the centre of the seam. The character of this coal ranks high. It has proved to be a good steam coal, and is well liked for domestic purposes. It gives out a strong heat, burns up freely, and leaves neither clinker nor cinder.

An analysis gave

Water	5.3
Volatile combustible matter	36.5
Fixed carbon	52.9
Ash light and firm	5.3

Mr. Richardson, an Inspector of coal mines in England, says of this coal:—"The composition of this coal is typical of the coal found in Wyoming and Colorado Territories, and is a true coal of the bituminous, with less water and ash than many such varieties found in the cretaceous, superior to some of the Vancouver Island and New Zealand lignites. It is more lustrous and of a jet-light color and hardness; specific gravity 1.370. This Canadian coal is a fuel which ranks as one of the best found in the cretaceous rocks. One land section, or 640 acres of this coal seam, will contain six millions five hundred thousand (6,500,000) tons of coal. The two seams together will contain about eleven million tons of coal."

I had the coal from the large or main seam tested in both stationary and locomotive engines with very satisfactory results.

Mr. J. P. Murray, engineer of locomotive No. 78, after using the coal for two days, stated in his report that the coal was equal to the best steam coal imported into this country, and Mr. Dailey, Mechanical Supt. at Medicine Hat, gave a report equally favorable. While the character of the coal in the different coal seams appears to be much the same, this seam is the largest and will be the most profitable seam to work in this district. The cheapest method to open and equip a mine here would be by constructing an incline from the coal seam up to Prairie Level and haul the loaded tub coals up the incline by a stationary engine to Prairie Level, where it can be dumped into coal cars and by them conveyed to the C. P. R. at Medicine Hat, a distance of about five and one-half ($5\frac{1}{2}$) miles. This method would require the construction of about five and one-half miles of railway over rolling prairie, with down-grades for the loader cars, and a not very objectionable up-grade for the empty ones returning to the pit. There are no engineering difficulties in the way, neither will there be any expensive bridging. The water ways would only be for the snow melting in spring.

To ship coal by the Saskatchewan River would require the construction of a number of barges and a steam tug boat, which method would give double handling to the coal—*i. e.*, loading the barges and then loading the coal cars from the barges, which would break it up very much, and only give five or six months' shipment, with an idle mine for the balance of the year.

I am, sir, your obedient servant,

COAL MINE, Medicine Hat, Nov. 7th, 1888.

J. P. LAWSON, M. E.

P. S.—Opening the mine by a shaft would prove the neatest working arrangement, but it would take a much longer time to develop the mine and be much more expensive. By the first proposed method, after the levels or headings were extended far enough south, a shaft could be sunk to one of them, and hoist the coal through it, and save a long haul underground. Then the slope or incline could be used for a year or two until the shaft was ready. Of course the sinking of the shaft and further development of the mine would be as the market warranted the outlay, governed by the market.

J. P. L.

SASKATCHEWAN COAL.

THE HOME ARTICLE LIKELY TO TAKE THE PLACE OF AMERICAN COAL.—YESTERDAY'S TEST AT THE PENITENTIARY.

(*Times*, 13th December, 1883.)

Warden Bedson, of the Provincial Penitentiary, will soon be in a position to write a book of greater worth on what he knows about the fuel question than the work of the late lamented Greeley on what he knows about Farming. The Warden has been experimenting on the subject in the institution over which he presides. The year before last he had wood burned. The next season he tried anthracite coal, which he found to be cheaper than wood. This year he began burning American soft coal. The latter article he found to be much cheaper than either wood or anthracite, but it had some very disagreeable drawbacks. In the first place it kept the institution very dirty, because of it being so dusty and smoky; secondly it makes clinkers very fast, and thirdly it was almost next to impossible to keep the boiler tubes clear—the engineer having to have them cleaned out every eight hours. Hearing so much about the success of the Saskatchewan coal the Warden decided to give it a trial, and a test was accordingly made at the Penitentiary yesterday—the President, the Vice-President and Mr. Luxton being present by invitation. The trial agreeably surprised the Warden, the coal burning much brighter than the American, making no clinkers and little ash or soot, and the engineer was well satisfied that it would not be necessary to have the boiler tubes cleaned more frequently than once in the 24 hours—a most important advantage over the American coal, which made it necessary to clean them every eight hours. The engineer, by request, prepared a written report on the test. We give it in full:—

“ I have the honor to report that there were 4,000 lbs. of American coal used in twenty-four hours, beginning at 9 a. m., on the 1st inst. The average temperature of the atmosphere during the day was $12\frac{3}{4}$ degrees above zero.

“ During the following twenty-four hours there were 2,900 lbs. of Saskatchewan coal used. The average temperature of the atmosphere was five degrees above.

“ The average pressure of steam whilst using American coal was 26 5-6 lbs., being a small fraction of a pound more than when using the Saskatchewan coal.

“ While using the American coal the wind was very high a good part of the time, which would drive the warm air out of the building, thus requiring more steam.

“ There was also considerable steam required for heating water for bathing and scrubbing, which partly accounts for the amount used of American coal being so great.

"A more correct idea of the merits of the two kinds of coal would be got by finding the amount of water a ton of each kind of coal would convert into steam."

SASKATCHEWAN COAL.

(The Editor of the Times.)

SIR,—As there has been considerable discussion as to the merits of the Saskatchewan coal, permit me to say a few words in its favor. Both for domestic as well as for steam purposes I have made numerous experimental tests with the coal in a thoroughly practical way, and I must certainly say it comes up to my ideas of a good, serviceable coal.

It is true it is not as strong a coal as the ordinary furnace coal, but it must be borne in mind that it is very much cheaper, or rather, I should say on account of the closeness of the mines to this district, it can be furnished very much cheaper than American coal. Besides I have ascertained for myself that it does not encrust the boiler tubes like ordinary soft coal. I regard this as a very important feature.

I think as you have known me for some years in different parts of the Dominion, I am sure that you can safely say that I have no other object in speaking of the Saskatchewan coal as I do, than to maintain that it is of good quality and cheaper than the other coal mentioned, and certainly much cleaner than soft coal. The Court House Board has purchased 150 tons, and it is giving satisfaction.

Yours, &c.,

W. R. CAHOON,

Engineer Court House Board.

WINNIPEG, Dec. 11.

REPORT OF E. J. CHAPMAN,

PROFESSOR IN UNIVERSITY COLLEGE AND SCHOOL OF PRACTICAL
SCIENCE TORONTO AND CONSULTING MINING ENGINEER.

TO HECTOR CAMERON, ESQ., Q. C., M. P., &c., TORONTO.

SIR,—In accordance with your instructions I have made a careful examination of the coal property of your Company on the south bank of the South Saskatchewan River, near Medicine Hat, and I have now the honor to present a condensed statement of the results of my investigation.

Site and General Description of the Property.—In the lithographed plate accompanying this Report, Figure 1 shows the limits of the property on the right bank of the South Saskatchewan River, and Figure 3 shows the situation of the property as regards Medicine Hat, on the line of the Cana-

dian Pacific Railway. The property itself (according to my instructions) comprises three entire, two nearly entire, and two broken quarter-sections, namely: The S. W. and S. E. quarters of Section 6, (approximately 250 acres), S. W. and S. E. quarters of Section 5 (approximately 90 acres) in Township 13, Range 6; N. E. quarter of Section 31 (160 acres); N. W. and S. W. quarters of Section 32 (320 acres), in Township 12, Range 6, all west of the fourth principal meridian, in the North-West Territories of Canada.

On Sections 5 and 6 the ground ranges for two miles along the bank of the river, rising abruptly, in an almost perpendicular escarpment, to an average elevation of 290 or 300 feet. This is broken, near the dividing line of Sections 5 and 6, by a broad coulée or gully, (dry at the time of my visit) which runs back, with lateral branches or irregular sub-divisions, to a distance of about 1200 feet. The seams of coal, described below, are visible along the steep sides of this gully, although hidden in places by slides and accumulations of debris fallen from above. At the top of the escarpment, the ground forms the level surface of the prairie. The soil, although somewhat sandy, would yield under cultivation fair crops of cereals and roots, as shown at places in the vicinity. From the coal property to the small town of Medicine Hat, where the Canadian Pacific Railway crosses the river, the distance over the almost level prairie is $6\frac{1}{2}$ miles. There would be no streams to cross, nor any engineering difficulties to overcome, in the construction of a light line of railway from the mine to Medicine Hat. For the greater part of the distance the rails might be laid on the practically unbroken surface of the ground. In opening the mine, the construction of a railway of this kind is indispensable, as the river is only navigable during a small portion of the year, and there are difficulties in the way of using it for transportation during the winter months.

2. Coal Seams Underlying the Property.—On the face of the escarpment fronting the river, and on the sides of the coulée running back from the river at almost right angles, several beds or layers of coal are distinctly traceable. Five of these layers vary in thickness, individually, from about eight or nine inches to a foot, but two additional seams are of workable dimensions. The lower of the two seams outcrops at an elevation of 68 or 70 feet above the average level of the river, and presents a uniform thickness of at least seven feet. Where measured at several places, one hundred feet or more apart, on the escarpment and east side of the coulée, it showed 7 feet 2 inches. An average thickness of seven feet may therefore be fairly given to it. The upper (workable) seam presents a thickness of 4 feet 6 inches, and outcrops at an elevation above the river of 110 feet, as shown in the section, Figure 2, of the lithographed plate which accompanies this Report. These workable seams must necessarily underlie the entire area of the Company's property, and so far as regards the limits of this property I do not think that any fear need be entertained of the seams diminishing in thickness. East of the property, however, and on the north side of the river, the coal seams evidently decrease in thickness, running

down on approaching Medicine Hat to between 3 and 4 feet. The seams, with their associated strata, although exhibiting slight undulations, are practically horizontal. The interstratified beds comprise alternations of clay shales, sandy clays, thin-bedded sandstones, plastic clays, bands of disintegrating fresh water shells (chiefly *unios*), and thin layers of ironstone; the whole capped by from 20 to 30 feet of drift gravel, holding boulders of crystalline rock. The plastic clays have been cited as "fire-clays," but they are scarcely fire-clays, properly so called as they contain a certain amount of iron, and thus assume a pale-red or tawny color on ignition. They would form a good material, however, for the manufacture of pottery or a fine quality of brick. The ironstone bands average only seven or eight inches in thickness, and are thus of no commercial value.

Deducting the area of the coulée and its ramifications, and that of the broken river-front, from Section 6, the area of good, workable coal under the property may be fairly estimated at 770 acres. This, with the average specific gravity of the coal equal to 1.31, gives the large amount of 9,580,340 Canadian tons (of 2000 lbs) for the contents of the 7 feet seam; and 6,163,850 tons for the 4½ feet seam. Allowing for pillars and loss, about one-third of this amount, or in round numbers, three millions of tons from the lower seam, alone, would be immediately available; and about two millions from the upper seam. Assuming that only the lower seam were worked, and that the average annual output were fifty thousand tons (or about 150 tons a day), a period of sixty-five years would only exhaust the immediately available portion of this seam, and the coal pillars would then supply an equal amount for a still longer period.

3. Method of Winning or Mining the Coal.—In consequence of the character of the ground, the coal on this property would have to be raised by an ordinary shaft, sunk inland at a suitable distance from the river front. The exact position of the shaft must, of course, be left to the engineer in charge of the mine, but a spot near the south-west corner of Section 5 would probably be selected. The depth of the shaft with its sump would be about 40 fathoms, or 240 feet. A day-level could be run from the shaft to the outcrop of the coal on the river bank; and another could be driven, if necessary, so as to open on the side of the coulée or gully in the west. The shaft would, of course, be dead-work, but the adits or levels would be driven in the coal itself. Good ventilation and drainage would thus be obtained. There seems to be little apprehension of fire-damp, and the underground works would, I think, prove unusually dry. At the Woodsworth mine, on the opposite side of the river, I went with a naked candle 300 feet into a low drift, and found the air at that distance practically as good as at the entrance, and there was no water to speak of. The seam there is only 4 ft. 8 in. in thickness, and, as the natural roof has not been taken out, the height is not sufficient to allow the use of ponies in the bords or coal passages. This adds about 15 cents per ton to the cost of getting the coal—a drawback which the 7-foot seam on the Company's property would be free from.

Items of cost and other engineering details as regards the opening and equipment of the mine do not belong properly to the present Report, but should be obtained from a specially qualified engineer conversant with prices ruling in the North-West Territories. I may state, however, from data kindly furnished by Mr. Lawson, an engineer of many years' experience in the coal-pits of Nova Scotia, now Superintendent of the Woodworth Mines, that the entire cost of getting the coal from the 7-foot seam ought not (on an assumed output of 150 tons per day) to exceed 80 or 85 cents per ton delivered on the cars at Medicine Hat,* and that a sum of about \$110,000 would be sufficient to open and equip the mine, and construct the branch railway and siding. In the estimated cost of getting the coal, 5 cents per ton have been allowed for timbering, 55 cents per ton for winning or mining, and \$80 per day for underground and surface hands, including fireman, engineer, haulers, loaders, carpenter, blacksmith, bottom-man, bank-man, &c., and feed of horses.

4. Quality of the Coal.—The coal which underlies this property, like that of the region generally, is a brown coal of Upper Cretaceous age, intermediate in character between ordinary lignite and ordinary bituminous coal of the Carboniferous Formation proper. It ignites readily, burns with vivid flame, and leaves comparatively little ash without forming clinkers. The ash, if covered up, remains in ignition for several hours. For culinary and other domestic use the coal is of excellent quality, and some of exactly similar character from the other side of the river has been tried on locomotives with very satisfactory results. The non-formation of clinkers is an especially good character, as there is thus no adhesion to the grate or bars, and no stoppage of the draught. The general freedom of the coal from pyrites or "brasses," so common in ordinary coals, is another favorable character. There is, however, one defect attached to the coal, namely, its tendency to fall into small pieces or "slack" when exposed to the weather, and also general brittleness by which loss is occasioned in mining it, if heavy shots are used and the coal be recklessly handled. As the mining would be done, however, by contract, the miner, from self-interest, would take care to make as little slack as possible. The tendency of the coal to disintegration may be entirely overcome by keeping the coal under cover. Where stored at Winnipeg or other places, covered sheds should be provided for its storage. The slack coal might be rendered available for local consumption by mixing it with a sufficient amount of the associated plastic clay to serve as a binding material, and moulding the mixture roughly into bricks. These would remain ignited after the volatile matter of the coal had burnt off and would throw out a considerable amount of heat. Anything in the shape of fuel, it must be remembered, is of high value in that practically woodless region, with its long and severe winters. There can be no doubt, therefore, that the coal would meet with a ready sale along the line of the Canadian Pacific Railway, both at Winnipeg and

*At a daily out-put of 300 tons the cost would be reduced to 75 cents per ton.—E. J. C.

at intermediate towns and settlements, as Moose Jaw, Regina, Brandon, Portage la Prairie, &c., more especially as coal does not seem likely to be discovered, in workable quantity, in the immediate vicinity of the line east of Medicine Hat.

The following are the results of analyses made personally in my laboratory at the School of Practical Science, Toronto :—

1. Sample of coal taken from an opening 40 feet from out-crop on face of escarpment, near bottom of seam :

Moisture	13.61
Volatile combustible matter	36.02
Fixed Carbon	46.11
Sulphur0
Ash	4.28

2. Sample taken as above, but from near centre of seam :—

Moisture	13.36
Volatile combustible matter	36.33
Fixed Carbon	45.98
Sulphur0
Ash	4.39

Sample taken as above, but from upper part of seam :—

Moisture	13.58
Volatile combustible matter	35.95
Fixed Carbon	46.04
Sulphur0
Ash	4.4

4. Small sample taken from out-crop of the upper workable seam, on west face of the lateral coulée, Section 6.—

Moisture	18.22
Volatile combustible matter	33.78
Fixed Carbon	42.35
Sulphur0
Ash	5.63

These analyses—sample No. 4 being understood to be partially weathered—indicate a brown coal of unusually good quality, more especially as regards its freedom from sulphur and its comparatively low amount of ash. Taking into consideration, therefore, the favorable position of this property, the amount of coal and the thickness of the principal seam upon it, and the good quality of the coal, I have no hesitation in expressing my conviction that the property, under judicious arrangement, should yield a very ample return for the capital invested in its development.

E. J. CHAPMAN, PH. D.,

*Professor in University College and School of Practical Science,
Toronto, and Consulting Mining Engineer.*

TORONTO, July 15, 1884.

The Medicine Hat
Coal and Mining Company.
(LIMITED.)

Incorporated under "The Canada Joint Stock Companies' Act, 1877," by Letters
Patent under the great seal of the Dominion of Canada, dated June 30th, 1885.

CAPITAL STOCK, - - - - \$200,000.00

DIVIDED INTO

2,000 SHARES OF \$100.00 EACH.

- - Officers - -

JOHN SMALL, ESQ., M. P., - - - PRESIDENT.

E. R. C. CLARKSON, ESQ., - - SECRETARY.

SECRETARY'S OFFICE
NO. 26 WELLINGTON ST. EAST,
TORONTO, CANADA.

Report of J. C. Bailey, Civil Engineer, upon location of railroad from
Medicine Hat to the mines.

Copy of Act of Incorporation giving power to directors to give Bonds to the
extent of \$15,000 per mile, or say \$100,000, to aid in construction
of road.

Copy of a Report of a Committee of the Honorable Privy Council approved
by His Excellency the Governor General in Council, July 6th,
1887, granting a subsidy of 6,400 acres of land per mile in aid of
the construction of the Medicine Hat Railway and Coal Company ;
and

Copy of a Report of such Committee locating and reserving 51,854 acres of
land as therein stated, pending the construction of the road.

REPORT OF J. C. BAILEY,
CIVIL ENGINEER, UPON LOCATION OF RAILROAD FROM THE MINES
TO MEDICINE HAT.

TORONTO, August 10th, 1887.

JOHN SMALL, ESQ.,

SIR.—According to your instructions, I left this city for Medicine Hat on July the 25th, and on arriving at that place I began at once to make the necessary reconnoissance of the ground to enable me to decide as to the best location for the proposed railway between the mine and the Canadian Pacific Railway. I found that by keeping in the valley and following the south bank of the Saskatchewan River, as some of those interested proposed was, if not impracticable, altogether too expensive to think of building, inasmuch as the line would necessarily cross so many deep ravines, or as they are locally termed coulees, that to get over them would call for the building of several expensive trestles. I therefore abandoned this line and took no further trouble with it, and came to the conclusion that the best and most economical way was to begin on the table land or level of the prairie and thus avoid all objectionable features as spoken of. I propose therefore to begin the railway on the level of the prairie (some three hundred feet above the level of the river) and keep on this level until within three miles of Medicine Hat village, where lower ground is reached, thence skirting the side hill all the way until it strikes a point on the track of the Canadian Pacific Railway in the neighborhood of the machine and repair shops, this line is at the back of the village, running through the least valuable property, consequently causing no damage to village lots, etc., etc.

A gradient of 84 feet per mile will be necessary to get down to the level of the Canadian Pacific Railway rails, but this I consider quite easy, and it must be borne in mind that this gradient or incline is with the traffic or load, as nothing but the empty cars will have to be drawn up. See plan and profile.

I examined the mine carefully and judging from appearances I would come to the conclusion that the deposits of coal is almost inexhaustible, the main seam being a little over seven feet in thickness, with various others of one, two and four feet six inches thick.

The people in and around the village of Medicine Hat speak of this coal in the highest terms and prefer it altogether to that obtained from the Galt mine, stating that it never forms clinkers and gives a nice steady heat. No wood whatever is used now in this neighborhood, nothing but this coal for cooking and other purposes, and I have no doubt when this mine is thoroughly opened, that the demand for the material will be enormous and consumed hundreds of miles east and west obviously so, for there is no wood of any consequence in this country, the best being poplar and which is a very poor, if no substitute at all for this coal, particularly when the thermometer sinks below zero. The people all along the line seem delighted to think

that there is a probability of the Medicine Hat mine being opened at an early date and thus provide them with cheap fuel, one of the chief necessities in this country.

There is no doubt whatever but that the quality of the coal will improve as it is mined away from the river, because the pressure has been greater, hence the coal will be more compact and heavier, and for this reason I would not recommend that the coal be taken, as at present, from face of bank at river, but a shaft sunk at once on top of bank or prairie level, thereby coming at once to the best coal. I think the shaft will be the cheapest, as I noticed very expensive works in the shape of crib-work would be required to prevent bank sliding and caving in; if mined at river, to begin and sink this shaft on top avoids all this useless outlay, because this inclined plane could not possibly be used very long before a shaft would be necessary.

Enclosed please find estimate, plan and profile. Although both of the latter can be varied to suit the circumstances of the case when actual building begins, and whatever Engineer is sent up to take charge of the work had better come to me for detailed explanations as to construction and other things.

Medicine Hat is beautifully situated in a valley through which flows that magnificent stream, the South Saskatchewan River; it is also one of the Divisional points on the Canadian Pacific Railway containing engine sheds, repair shops, tanks, turn-tables, etc., etc., together with the emigration office and a large and commodious building erected purposely for the use of the emigrants en route for the West. A large body of the Mounted Police are stationed here and six or seven very handsome buildings have been erected for their use as barracks, on the opposite side of the river, where a splendid view of the surrounding country can be obtained from the rising slope on which they are built.

Before concluding this report it might not be out of place to mention that clay of the finest quality for making bricks and terra cotta work can be obtained in the immediate vicinity of the mine on the banks of the Saskatchewan, and in unlimited quantities. Where fire had run over the ground I noticed that the clay burnt by the same was of a beautiful pink color and of very close texture, in fact it resembled the finished terra cotta work as closely as possible, and this clay should, in my opinion, form one of the most important industries of Medicine Hat. Bricks are very scarce in this country, and the article is here right at hand with which to manufacture them of the very best quality, and if it pays to carry bricks all the way from St. Louis to Winnipeg, surely it would be a paying investment to begin to manufacture them at Medicine Hat where everything required is right on the spot—clay, sand, water and coal. If once brought in the market, without any doubt they would at once command a ready sale and be largely sought after hundreds of miles East and West, and until these bricks are manufactured the unsightly stovepipe, instead of the neat and fire-proof chimneys will continue to disfigure the otherwise handsome cottages and residences on the prairies and towns of this country. Again, if this industry

were started it would at once induce the people in all the towns to erect brick instead of frame buildings.

Yours truly,

(Signed) J. C. BAILEY,
Civil Engineer.

Memorandum of approximate cost of Medicine Hat Railway, length 6½ miles, siding one mile.

Right of Way.....			\$ 2,080
4875 Cubic Yards Earth Excavation.....			12,188
1200 " " Ballast.....	25c.		4,200
4169 Rods Wire Fencing.....	35c.		3,328
7½ Miles Track Laying.....			1,125
18000 Railway Ties.....	\$ 150		5,000
7½ Miles Rails and Fastenings Complete.....	2,500		18,750
2 Crossings and Cross Boards.....	10		20
4 Switches and Frogs.....	40		160
5 Wooden Culverts.....	80		400
300 L Feet Trestle.....	10		3,000
1 Large Platform Scales.....			1,000
1 Large Platform Scales.....			500
			<u>\$51,751</u>
			5,175
			<u>\$56,926</u>

Add 10 per cent.

ROLLING STOCK REQUIRED.

1 Secondhand Locomotive.....		\$ 5,000 00
50 Dump Cars C.....	\$ 425	21,250 00
50 Ordinary Cars.....	325	16,250 00
1 Caboose Car.....		500 00
		<u>\$43,000 00</u>

REQUIRED TO OPEN MINE.

1 Double Engine 40 H. Power.....		\$ 2800 00
Sinking Shaft.....		800 00
40 Drills.....		200 00
40 Coal Sledges.....		120 00
200 Picks.....		400 00
Pit Rails (8 lbs. to the yard) 25 tons cost \$50. per ton laid down.....		1,250 00
Mine Timber for Support.....		1,000 00
		<u>\$6,570 00</u>
1 Blacksmith Shop with Forge.....		\$ 800 00
1 Building or Boarding House.....		2,500 00
4 Cottages for Married Men.....		2,400 00
1 Turn-table or Y.....	\$600	600 00
1 Well for use of Employees also for Stationary Engine Furniture, Stoves, &c., &c., required for the above Building.....		300 00
		<u>484 00</u>
		<u>\$7,084 00</u>

MEDICINE HAT RAILWAY AND MINE.
SUMMARY.

Building Railway.....	\$56,926 00
Rolling Stock.....	43,000 00
Plant for Mine.....	6,570 00
Buildings, etc., etc.....	7,084 00
Etceteras say.....	400 00
	<u>\$113,980 00</u>

(Signed)

J. C. BAILEY,

Civil Engineer.

An Act to Incorporate the Medicine Hat Railway and Coal
Company.

Assented to, 2nd June, 1886.

WHEREAS the construction and operation of a railway from some point in or near Medicine Hat, in the North-West Territories, on the line of the Canadian Pacific Railway, in a south-westerly direction, to the coal fields in or near townships twelve and thirteen, range six, west of the fourth principal meridian, would be for the general advantage of Canada; and whereas a petition has been presented, praying for the incorporation of a company for that purpose, and it is expedient to grant the prayer of the said petition Therefore Her Majesty, by and with the advice and consent of the Senate and House of Commons of Canada, enacts as follows :

1. Hector Cameron, of the city of Toronto, barrister; Arthur A. Boswell, of the same place, barrister; John Small, of the same place, esquire; William G. McWilliams, of the same place, barrister; Thomas Davies, of the same place, brewer; Charles McMichael, of the same place, esquire; Arthur Armstrong, of the village of Lloydtown, in the Province of Ontario, esquire; and John Lamb, of the city of Toronto, merchant, together with such persons as become shareholders in the company hereby incorporated, are hereby constituted a body corporate and politic, under the name of "The Medicine Hat Railway and Coal Company," hereinafter called the Company; and the said railway and the works hereby authorized are declared to be for the general advantage of Canada.

2. The head office of the Company shall be in the city of Toronto, but the board of directors may establish one or more offices in other places in Canada or elsewhere.

3. The Company shall have full power and authority to lay out, construct and complete a railway of a gauge of four feet eight and one-half inches, from a point in or near Medicine Hat, in the North-West Territories, on the

line of the Canadian Pacific Railway, thence in a south-westerly direction to the coal fields on the south bank of the Saskatchewan River, in or near townships twelve and thirteen, range six, west of the fourth principal meridian.

4. The persons mentioned by name in the first section of this Act, with power to add to their number by a resolution passed by a majority of any meeting at which five in number are present, are hereby constituted provisional directors of the Company (of whom four shall be a quorum), and shall hold office as such until the first election of directors under this Act, and shall have power forthwith to open stock books and procure subscriptions of stock for the undertaking, and to receive payments on account of stock subscribed, and to cause plans and surveys to be made, and to deposit in any chartered bank of Canada moneys received by them on account of stock subscribed.

5. The capital stock of the Company shall be seventy-five thousand dollars, divided into shares of fifty dollars each; and the money so raised shall be applied in the first place, to the payment of all fees, expenses and disbursements for procuring the passing of this Act, and for making the surveys, plans and estimates hereby authorized; and all the remainder of such money shall be applied to the making, equipping, completing and maintaining of the said railway, and other purposes of this Act.

6. The Company may receive from any Government, or from any persons or bodies corporate, municipal or politic, who may have power to make or grant the same, in aid of the construction, equipment and maintenance of the said railway, bonuses in land, or loans or gifts of money, or securities for money.

7. So soon as thirty seven thousand five hundred dollars of the said capital have been subscribed as aforesaid, and ten per cent. thereof paid into some chartered bank in Canada, the hereinbefore mentioned directors shall call a meeting of the shareholders of the Company, at the city of Toronto, at such time and place as they think proper, giving at least two weeks' notice in the *Canada Gazette*, and in one or more of the daily newspapers published in the city of Toronto, and also in one newspaper published in Medicine Hat, or in the newspaper published nearest thereto, at which meeting the shareholders shall elect seven directors from the shareholders possessing the qualifications hereinafter mentioned, of whom four shall form a quorum, which directors shall hold office until the next annual meeting of the shareholders.

8. No person shall be a director of the Company unless he is a shareholder, holding at least ten shares in the stock of the Company, and has paid up all calls made thereon.

9. The directors of the Company, under the authority of the shareholders to them given at any general meeting called for the purpose, at which meeting shareholders representing at least two-thirds in value of the capital stock are present, are hereby authorized to issue bonds under the seal of the

Company, signed by its president or other presiding officer, and countersigned by its secretary, and such bonds may be made payable at such times and in such manner, and bearing such rate of interest, as the directors think proper; and the directors shall have power to issue and sell or pledge all or any of the said bonds at the best price and upon the best terms and conditions, which, at the time, they may be able to obtain, for the purpose of raising money for prosecuting the said undertaking: Provided, that the amount of such bond so issued, sold or pledged, shall not exceed fifteen thousand dollars per mile of the said railway and branches, to be issued in proportion to the length of railway constructed or under contract to be constructed:

2. Notwithstanding anything in this Act contained, the Company may secure the bonds to be issued by them by a mortgage deed creating such mortgages, charges and incumbrances upon the whole of such property, assets, rents and revenues of the Company, present or future, or both, as are described in the said deed, but such rents and revenues shall be subject, in the first instance, to the payment of the working expenses of the railway; and by the said deed the Company may grant to the holders of such bonds, or to the trustee or trustees named in such deed, all and every the powers and remedies granted by this Act in respect of the said bonds, and all other powers and remedies not inconsistent with this Act, or may restrict the bondholders in the exercise of any power, privilege or remedy granted by this Act, as the case may be; and all such powers, rights and remedies as are so contained in such mortgage deed shall be valid and binding, and available to the bondholders, in manner and form as herein provided; and every such deposit mortgage deed shall be deposited in the office of the Secretary of State of Canada, of which deposit notice shall be given in the *Canada Gazette*.

10. The bonds hereby authorized to be issued shall be taken and considered to be the first preferential claim and charge upon the Company and the franchise, undertaking, tolls and income, and real and personal property thereof, now or at any time hereafter acquired, save and except as provided for in the next preceding section; and each holder of the said bonds shall be deemed to be a mortgagee or incumbrancer upon the said securities *pro rata* with all other bondholders; and all the proceedings upon the bonds shall be taken through the trustee or trustees regularly appointed.

11. If the Company make default in paying the principal or interest of any of the bonds hereby authorized at the time when the same by the terms of the bond, become due and be payable, then at the next annual general meeting of the Company, and all subsequent meetings, all holders of bonds so being and remaining in default, shall, in respect thereof, have and possess the same rights and privileges and qualifications for being elected directors and for voting at general meetings, as they would possess them as shareholders if they had held fully paid up shares of the Company to a corresponding amount; Provided nevertheless, that the right given by this section shall not be exercised by any bondholder, unless the bonds in respect

of which he shall claim to exercise such right have been first registered in his name, in the same manner as is provided by law for the registration of the shares of the Company; and for that purpose the Company shall be bound, on demand, on default made in principal or interest, to register such bonds and any transfers thereof, in the same manner as a transfer of shares; Provided also, that the exercise of the rights given by this section shall not take away, limit or restrain any other of the rights or remedies to which the holders of the said bonds shall be entitled.

12. All bonds, debentures and other securities hereby authorized may be payable to bearer, and shall, in that case, be transferable by delivery, unless and until registry thereof is made in manner provided in the next preceding section, and while so registered they shall be transferable by written transfers, registered in the same manner as in the case of shares.

13. The Company may become party to promissory notes and bills of exchange for sums not less than one hundred dollars; and any such note or bill made, drawn, accepted or endorsed by the president or vice-president of the Company, and countersigned by the secretary, shall be binding on the Company; and any such note or bill of exchange so made, drawn, accepted or endorsed shall be presumed to have been made with proper authority, until the contrary be shown; and in no case shall it be necessary to have the seal of the Company affixed to such promissory note or bill of exchange, nor shall the president or vice-president, or secretary, be individually responsible for the same, unless the said promissory note or bill of exchange has been issued without proper authority; Provided, however, that nothing in this section shall be construed to authorize the Company to issue any note or bill payable to bearer, or intended to be circulated as money, or as the note or bill of a bank.

14. The Company may also construct an electric telegraph or telephone line for the purposes of their undertaking, in connection with the railway.

15. The Company may enter into an agreement with any other railway company whose line of railway is crossed by the line of the Company hereby incorporated, or with which it connects, for conveying or leasing to such company the railway of the Company hereby incorporated, in whole or in part, or any branch thereof, or any rights or powers acquired under this Act, as also the surveys, plans, works, plant, material, machinery and other property to them belonging, on such terms and conditions and for such period as may be agreed upon, and subject to such restrictions as to the directors seem fit, provided that the said conveyances, leases, agreements and arrangements have been first sanctioned by a majority of the votes, at a special general meeting of the shareholders called for the purpose of considering the same, on due notice given, and also by the Governor in Council: Provided, that before such sanction by the Governor in Council shall be given, notice of the application therefor shall be published in the *Canada Gazette*, and in one newspaper in Medicine Hat or the newspaper published nearest thereto, for at least two months prior to the time therein

named for the making of such application ; and such notice shall state a time and place where and when the application shall be made, and that all parties may then and there appear and be heard on such application.

16. The Company may use and exercise such powers of mining for coal, iron and other minerals as are granted to the Company by the Government of Canada.

17. The railway shall be commenced within two years, and be completed within four years, from the passing of this Act.

*Certified Copy of a Report of a Committee of the Honorable the Privy Council,
approved by His Excellency the Governor General in Council, on
the 6th July, 1887.*

On a Memorandum dated 30th June, 1887, from the Minister of the Interior, stating that by the Act 50-51 Vic., Cap. 23, the Governor in Council is empowered to grant a subsidy of 6,400 acres of land, in aid of the construction of the Medicine Hat Railway and Coal Company, for each mile of the Company's Railway, from a point at or near Medicine Hat on the line of the Canadian Pacific Railway to the Coal field in or near Township 12 and 13, Range 6, West of the 4th Principal Meridian a distance of about eight miles.

The Minister therefore recommends that a grant of 6,400 acres of land be made to the Medicine Hat Railway and Coal Company for each mile of the Company's Railway, for the distance above mentioned, upon the following terms and conditions :

1. That the lands to be granted in aid of the construction of this railway shall be made up out of the unoccupied odd-numbered sections at the disposal of the Government nearest the line of the railway.
2. That the Company do reimburse to the Government the cost of surveying the land and incidental expenses, the same being hereby fixed at ten cents per acre.
3. That the location, mileage, gauge and grades of the railway be submitted to and approved by the Government and shall be according to specifications hereto attached.
4. That the land grant applicable to the railway shall not be conveyed to the Company until the whole line is completed, and the work thereon reported to be satisfactory by the Chief Engineer of Government Railways or by an Engineer approved of by the Government.
5. That the Company shall equip, complete adequately and have running the said eight miles of the railway not later than the 31st December, 1888.
6. That each *bona fide* settler found on the land granted to the Company at the time such grant is earned, the Minister of the Interior being the judge in the event of any dispute as to his *bona fides*, shall have the right to retain the land occupied by him to the extent of not exceeding 320 acres on

paying the Company therefor at a rate not exceeding in any case \$2.50 per acre, payable, one-fourth in cash, and one-fourth in each of the three succeeding years with interest on the unpaid balances at a rate not exceeding six per cent. per annum.

The Committee submit the above recommendations for Your Excellency's approval.

(Signed)

JOHN J. MCGEE,

Clerk, Privy Council.

To the Honorable
The Minister of the Interior.

A.

SPECIFICATION AND DESCRIPTION.

1st. The Railway shall be a single track line with gauge four feet eight and one-half inches, with necessary sidings.

2nd. The alignments, gradient and curvature shall be the best the physical features of the country will admit of, the maximum grade not to exceed sixty (60) feet to the mile, and the minimum curvature not to be of less radius than nine hundred and thirty-three (933) feet.

3rd. In all wooded sections the land must be cleared to the width of not less than fifty (50) feet on each side of the centre line; all brush and logs must be completely burnt and none thrown on the adjacent land.

4th. All stumps must be grubbed out within the limits of cuttings under three feet in depth, or embankments less than two feet in height.

5th. All stumps must be close cut where embankments are less than four feet and more than two feet in height.

6th. Through settlements, the railway must be enclosed with substantially built legal fences of wire or wood, with the necessary gates and crossings to accommodate the farmers.

7th. Road crossings with cattle guards and sign boards shall be provided at all public highways crossing the Railway on a level with the rails.

8th. The width of cuttings at formation level shall be twenty (20) feet, embankments sixteen (16) feet.

9th. Efficient drainage must be provided by open ditches and under drains.

10th. All bridges, culverts, and other structures must be of ample size and strength for the purpose intended; piers and abutments of truss bridges must be of massive masonry, and culverts under embankments over twelve feet in height must be of well built, strong second-class masonry, or iron, made of durable and suitable materials, thoroughly permanent in character, and equal in every essential particular to the best description of like work employed in similar railway work in the Dominion. Open or Beam Culverts in embankments less than twelve feet in height may be of Cedar wood, not less than 10x10 feet. Superstructure of truss bridges may be of White or Georgia Pitch pine wood.

11th. The rails shall be of steel, weighing not less than pounds per lineal yard, of approved section, and with the most approved fish plate.

12th. The railway must be well ballasted with either gravel or other suitable material. The sleepers to be 8 inches face by 6 inches thick and 8 feet long—2,600 to the mile.

13th. Sufficient siding accommodation, stations, tanks, turn-tables or Y's, and such other structures and buildings as may be necessary to meet the requirements of the traffic shall be provided by the Company.

14th. Sufficient rolling stock necessary to accommodate and to conduct promptly and efficiently the traffic and business of the line shall be provided by the Company.

Certified Copy of a Report of a Committee of the Honorable the Privy Council, approved by His Excellency the Governor General in Council, on the 9th August, 1887.

On a Memorandum dated 20th July, 1887, from the Minister of the Interior, recommending that the odd numbered sections of land at the disposal of the Government in Townships 17 and 18, Ranges 5, 6 and 7, and the North half of Section 33 in Township 16, Range 5, all West of the Fourth Principal Meridian, containing about 51,354 acres, be reserved for the purpose of the Land Subsidy of 6,400 acres per mile, granted to the Medicine Hat Railway and Coal Company for the whole distance of that Railway, about eight miles, by the Act 50-31 Vic., Cap. 23, and the Order in Council of 6th July, 1887.

The Committee concede in the foregoing recommendation and advise that the same be approved accordingly.

(Signed)

JOHN J. McGEE,

Clerk, Privy Council.

To the Honorable
The Minister of the Interior.