#2076

ANNUAL REPORTS AND STATISTICS

DEPARTMENT OPERATIONS

YEAR ENDING NOV. 30, 1 9 0 3

I N D E X


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THE CLEVELAND-CLIFFS IRON COMPANY

ISHPEMING, + + + MICHIGAN.

AGENT'S ANNUAL REPORT

FOR

YEAR ENDING NOVEMBER 30th, 1903.

I N D E X.

THE CLEVELAND-CLIFFS IRON CO.

Ishpeming, Michigan,
January 21st, 1904.

Mr. Wm. G. Mather, President,

Cleveland, Ohio.

Dear Sir:

I beg to submit herewith my annual report of the operations and present condition of the mines of the Cleveland-Cliffs Iron Co.

The detailed cost statements, inventory and maps appertaining to this report, have been sent you.

NEGAUNEE MINE. Copy to Lackawanna

When this mine was turned over to us September 2nd., 1903, 450 men were working on three 8-hour shifts. They had been crowded so thickly into the producing parts of the mine, that the cost of the ore must have been extremely high.

The force was at once reduced to 200 men, and the ten hour shift inaugurated. The property was in deplorable condition. No dead work had been done for eighteen months, but every effort had been made to get a maximum product without reference to the future operations of the mine, either from the standpoint of economy or safety.

On the 480 foot level, No.2 shaft, corresponding to the third level No.1 shaft, the ore body was opened 1250 feet to the North West; the breast of the main drift being stopped in mixed ore and jasper.

The system of mining consisted in driving drifts from the main level to the footwall, and putting raises to the hanging at an angle of about 45°. From the tops of these raises underhand stopes were opened about 45 feet wide and carried to the drift below without timbers of any kind. Between each stope pillars were originally left to support the hanging wall. A few months before surrendering the lease, they began drawing the pillars from the West end, and when we assumed control had taken them for a distance of 400 feet East of the breast of the main drift. Besides this, they had robbed the pillars for 400 feet farther East, leaving them so small that had not the hanging been unusually thick and strong there must have been a collapse attended with disastrous results.

The large stope at 28 is 180 feet high, and the ore has been entirely taken out from this point to the West end of the level, excepting the pillars left to support the main drift. It can thus be seen that an immense opening had been left,

Negaunee.

which was a constant menace to the mine, on account of the large reach, which in the event of a cave would undoubtedly have let in the quicksand from above.

Immediately on taking hold of the mine, all the openings on this level leading to the stopes were bulkheaded. As soon as this was completed raises were started to reach a point above the old stopes, and fill them by stoping down the hanging. This has been proceeding from No.25 raise West and is progressing rapidly. Just North of this raise the stope has been filled 120 feet high. It is proposed to leave from 15 to 20 feet of space between the filling and the back. This will give the capping a chance to break, but on account of the small opening and the thickness of the capping (170) feet will not permit the sand to enter. It will probably take six months to complete the filling.

No.27 contract is carrying a drift along the footwall through caved ground, for the purpose of reclaiming the ore which was left on the footwall by the former owners.

No.26 has raised 60 feet, and is taking ore off the footwall which had been left in the stopes. I think it will also be found that a large quantity of ore has been left beyond the tops of the stopes.

On the 4th level, the same methods were used as on the 3rd.

When we assumed control, work in the old deposit near No.1 shaft was immediately stopped. At this point they had been running the ore from the pillars on the level above, and this would in a short time have drawn No.1 shaft. This shaft had been closed by order of the Mine Inspector, and had not been repaired on account of the short life of the lease. In order to provide a second outlet for the men, and also to increase the hoisting capacity, this shaft is now being close timbered from top to bottom inside of the old timbers. The inside dimensions will be 8'2" x 8'2", which will be large enough for a cage or skip and a ladderway. This work was done with the full approval of the mine Inspector, who believes that it will be absolutely safe, and can be maintained without difficulty providing the shaft pillars are not disturbed. To the West of the shaft all the openings to the old stopes were bulkheaded. All the open stopes on this level are being filled from the level above, and the work is completed 600 feet East of the West end of the level.

200 feet East of the breast of the main drift, four raises have been put up 50 feet, two on the foot and two in the hanging. From this elevation a sublevel has been opened. The ore at this point is 140 feet wide, and is being followed East and West.

NEGAUNEE MINE.

The main drift has been extended 275 feet West, the last 150 feet in mixed ore and jasper. This drift will be continued as there is every reason to believe from the Maas drillings that ore must occur farther to the West. The hanging wall drift has been extended 260 feet West all in ore. No.5 contract is driving a cross cut in ore to meet this drift.

The water has been lowered to the bottom of the 5th level, and it has been found that the drifts and rooms are filled with sand to a heighth of 4 feet. When the disastrous cave occured two years ago it was reported that the incline from No.1 shaft came together, preventing the sand from filling the lower levels. This, however, is merely a surmise and is probably incorrect. It is estimated that 250,000 cubic yards of sand went into the mine, but much of it is undoubtedly in the old rooms on the upper levels near No.1 shaft.

No.5 winze has been sunk 25 feet, and two drifts started, one towards No.1 and one to No.2 shaft, 18 feet below the level at this point.

The North deposit which has been worked from No.2 shaft has not been opened on the 5th level, but there seems no reason to doubt that it extends to this depth.

A new pump house 32 x 40 x 10' high has been cut in No.2 shaft, 140 feet from surface, for the new Prescott pump, which is to be delivered in the course of the next ninety days.

Since taking hold of the property, all of our energies have been bent towards getting the mine in safe condition, regardless of output. The most dangerous places are now as safe as they can be made, and from now on the product will gradually increase. Unless something unforseen happens we shall be able to mine the 175,000 tons estimated for 1904.

We have had control of this property for so short a time, and our operations have been so largely confined to dead work, that no statements will appear in my report this year.

L U C Y M I N E.

In January the mine buildings, consisting of boiler house, engine house, blacksmith shop, carpenter shop, office, warehouse and dry, were completed, and two 50 H P boilers erected. Pumping began February 15th., and by the end of the month the water had been lowered 43 feet. The timbers above the water level in No.3 shaft were in such bad condition that they had to be replaced for a distance of 48 feet. By the end of March the water had been lowered 155 feet below the collar of the shaft. On May 4th the bottom of No.3 shaft was reached. The men were at once put to work cleaning up the second and 5th levels, and barring down the back preparatory to mining.

No.5 shaft 400 feet South East of No.3 had caved at the surface, but had to be reopened, so as to afford a second outlet from the mine. This was much more expensive than at first anticipated, as it had to be retimbered for a distance of 150 feet.

NO.3 SHAFT.

On the 2nd level, 280 feet South West of No.3 shaft, two stopes were started, No.2 to the South and No.3 to the West. Both have ore in the breast. About 1200 tons were broken at this point before it was decided to discontinue mining, and confine the work to exploration and development.

The ore from No.2 stope averages 52.90 in iron, 9.90 in manganese, and .024 in phosphorus, and from No.3 stope 37.30 in iron, 23.80 manganese, and .025 in phosphorus.

The 5th level had been opened 100 feet North and 130 feet South. From the North drift two stopes were started to the West, which have been numbered 5 and 6 on the map for convenience of reference. They were both stopped when work on the 2nd level was discontinued. Both places had an excellent quality of ore in the breast. About 400 tons were broken in each stope. The ore from No.5 stope averages 57.90 in iron, 2.35 manganese, and .146 phosphorus, and from No.6,61.60 iron, 1.95 manganese and .211 phosphorus.

The only work done on the 6th level No.3 shaft by the former owners, was a drift 100 feet North, all in jasper. This was extended 210 feet, but no ore of merchantable quality was found. Forty feet North of the shaft a cross cut was driven 180 feet West, which at 140 feet crossed the ore shown on the 5th level. This was followed 40 feet South and 70 feet North, both drifts stopping in mixed ore. 30 feet South of the shaft a cross cut was driven 100 feet South West, all in rock. A drift was driven 235 feet South East to connect with the stope on the same level No.5 shaft. The last 100 feet of this was in ore. 180 feet South East of the shaft cross cuts were started at right

Lucy.

angles to the drift. When the mine closed both breasts were in ore. Cross cuts were also driven East and West from No.5 shaft stope. The East cross cut struck mixed material in 50 feet; the West went in 55 feet, all in ore, and had ore in the breast running 62% iron 2% manganese and .05 phosphorus. The main ore body on this level has been proved for a distance of 310 feet in length, and 160 feet in width, and the limits have not yet been reached.

Just South of No.3 shaft a pump house and sump have been cut out. They were only finished a few days before the close of the year. Early in November a winze was started in the cross cut 180 feet South East of No.3 shaft, which had reached a depth of 15 feet at the end of the month. The ore in the bottom runs 61% iron, 1% manganese, and .061 phosphorus. This winze was to have been sunk 50 feet, and from the bottom drifts driven to No.3 and No.5 shafts. No.5 shaft is already sunk to the 7th level, and bottomed in ore, but it would be necessary to raise to reach the bottom of No.3.

The developments since reopening the mine have been of the most encouraging nature, and justify me in estimating that we could produce 5,000 tons per month for the coming year.

Just before the mine closed, samples were taken from all the stopes and drifts in ore with the following results:

Description of sample.	Iron	Phos.	Manganese	
No.3 shaft 2nd level stope No.2.	52.90	.024	9.30	
2nd level stone No.3.	37.30	.025	23.80	
6th level Drift N E No.4	55.50	.094	3.75	
5th level stope No.5	57.90	.146	2.35	
5th level stope No.6	61.60	.211	1.95	
6th level drift S W No.8	62.10	.050	2.00	
6th level drift No.2 S W No.8	48.00	.026	9.30	
6th level drift North No.9	39.20	.181	18.15	
6th level drift South No.9	57.30	.174	3.50	
6th level drift East No.9	44.60	.281	13.45	
6th level drift N W No.9	39.40	.203	18.10	
6th level drift North No.11				
6th level drift S W no.12	35.30	.292	16.40	
6th level stope No.13	49.80	.022	7.85	
6th level stope No.14	53.00	.031	3.95	
No.5 shaft 5th level No.15	50.30	.048	10.05	
5th lwel No.16	61.50	.031	1.30	
4th level No.17	56.70	.047	2.30	
No.3 shaft 6th level S E sides of drift from No.3 to No.5 shafts	45.80	.074	11.05	

The ore is very variable, but by grouping the high and low manganese stopes, and assuming that the same quantity of ore would come from each stope and drift analyzed, two grades of ore could be made of the following composition:

	Iron	Phos.	Manganese	
Lucy	57.61	.090	3.44	
Lucy Manganese	44.30	.108	13.97	

L U C Y M I N E.

When there is again a demand for ore, I feel confident that it will not take long to pay for the original cost of the property and the reopening charges.

In his recent report Mr. Smyth, says, "It seems to me possible that such ore as has already been found at the Lucy may belong to irregular fingers and upward spurs of a very important deposit in the bottom of the basin on the siamo footwall."

The cost of opening and equipping the mine was as follows:

BOILER PLANT		
Cost and erecting two boilers	$1562.99	
One additional boiler and erecting	1494.37	
Smoke stacks and erecting, two boilers	86.73	
Feed pump and Heater	298.35	
Pump for feed and fire use	241.04	
Piping to hoisting engine and compressor	194.80	
Water supply	618.17	
Water tank and erecting	171.87	
Total		4668.32
COMPRESSOR PLANT		
Rand compressor and erecting	4356.85	
Six 3½ Rand Drills	1235.78	
Total		5592.63
HOISTING PLANT		
Hoist complete on foundation	2314.13	
Wire rope and skip	429.26	
Total		2743.39
Piping complete in mine		1643.01
Piping complete on surface		693.98
Pumping expense		4077.98
Launder from shaft to Creek		303.17
Shop Equipment		69.90
Underground tracks and cars		1056.49
Top Tram plant		663.61
BUILDINGS & SURFACE EQUIPMENT		
Shaft house and pocket	1039.93	
Railroad pocket	1166.55	
700 feet trestle	2122.13	
Engine and Boiler House	848.67	
Dry House	165.24	
Office and Warehouse	176.89	
Blacksmith & Carpenter shop	178.55	
Coal trestle, capacity 1500 tons	1145.44	
Horse shed	73.23	
Powder house	37.06	
Total		6953.69
MISCELLANEOUS		
General Expense Mine office	549.13	
Engineering	75.62	
Tools in general use	85.33	
Surface expense, roads etc.,	280.08	
Removing old machinery	33.81	
Repairing No.3 shaft	1297.06	
Repairing No.5 shaft	3415.12	
Fire Equipment	258.42	
Dry House expense	20.15	
Stocking ground	284.44	
Total		6299.16

L U C Y M I N E.

Cost of Opening and Equipping, Continued.

Total cost,	$34765.33

The following estimate of ore in sight is necessarily approximate, owing to the limited amount of development work, and the uncertainty of the extent of the ore body between the 5th and 6th levels, which has not been tested by raises:

2nd level	6,000 tons	
3rd level	5,000 tons	
4th level	5,000 tons	
5th level	5,500 tons	
6th level	98,000 tons	
Below 6th level	50,000 tons	
Total	169,500 tons	

M A A S M I N E.

On April the 15th., the ledge on the North side of the shaft was struck at a depth of 150 feet 10 inches. It was standing at an angle of nearly 75°, which greatly increased the difficulty of anchoring the shaft. It was not until July 10th., and at a depth of 168 feet 5 inches, that the South side of the shaft reached the slate.

This is by far the deepest sand shaft in the Lake Superior region, and I consider that we were extremely fortunate in completing it without any accident.

It may seem that the work has progressed slowly, but when the difficulties are taken into consideration, this is not a fact.

On July 22nd., owing to the breaking of the discharge pipes, the shaft was flooded, and it was not until July 31st., that the water was under control.

Owing to the enormous pressure the 14 x 14" oak timbers in the bottom of the shaft were broken, and it was found necessary to line the shaft from top to bottom. This reduced the dimensions from 10 x 15' to 8 x 13' but in no way interfered with the efficiency and capacity of the shaft. The cage will be smaller, and therefore the timber cannot be lowered on cars. This is to be regretted, but under the circumstances, was unavoidable.

The retimbering was begun on August 1st., and completed September 14th. The shaft is about three feet out of the perpendicular.

Following is statement of cost of sinking in sand and ledge from October 1st, 1901 to November 30th, 1903:

No. feet	In sand 166'5½"	In ledge 43'6½"	Total 210'
GENERAL EXPENSE			
Mine Office	6873.07	422.34	7295.41
Engineering	137.20	39.41	176.61
Prop. Central Office	3225.00	217.04	3442.04
Total,	10235.27	678.79	10914.06
SINKING SHAFT			
Sinking to ledge	28680.37		28680.37
Sinking in ledge		4461.58	4461.58
Hoisting and top landing	9110.21	902.95	10013.16
Pumping and cleaning launder	40656.68	3835.40	44492.08
Piping in shaft	4499.79	234.55	4734.34
Setting derricks	1528.03	42.59	1570.62
Timbering	13314.01	214.04	13528.05
New Skip road,	299.51		299.51
Dry House expense	536.32	264.48	800.80
Compressor		669.55	669.55
Total	98624.92	10625.14	109250.06
Grand Total	108860.19	11303.93	120164.12
Approx. Cost per foot,	653.81	259.86	

Maas.

Graphic Log Sinking in Ledge
8 Log by Engineer

MAAS MINE.

Statement of General Expense and Plant and Equipment accounts from October 1st, 1901 to Nov.30th,1903.

GENERAL EXPENSE		
Insurance	161.61	
Relief fund	362.40	
Taxes	12625.92	
Depreciation Inventory	259.64	
Total		13629.97
TEMPORARY PLANT & EQUIPMENT		
Temporary buildings	1507.84	
Boiler plant describe ?	8278.24	
Hoisting Plant	3137.37	
Unloading & Trussing material	478.45	
New Baldwin Kiln road perfect	2281.25	
Drainage, Launder & Ditch	3071.59	
Tools in general use	460.75	
Heating system "	1833.74	
Shop equipment	755.32	
Piping to shaft why not charged to both, also some of these other items	1993.26	
Fire Equipment	526.85	
Installing compressor	281.11	
Air pipes	98.57	
New derricks	266.62	
Rock trestle	994.58	
Wire rope, sheaves and Pulley stands	432.32	
Ladders and Guides	116.50	
Tram cars	60.86	
Total,		26579.82
Grand Total		40209.79

Name.

BARASA MINE.

After thoroughly exploring this property by drifting and raising, without finding ore, the option was surrendered.

Under the terms of the agreement the Barasa Mining Co., had the privilege of buying the machinery at an appraised value, but they elected not to do so.

The stockpile, amounting to 6768 tons was shipped to Presque Isle, and went into the Salisbury mixture.

Before closing the mine a strong concrete dam was built in the trespass drift 35 feet East of the Negaunee line. This will enable us to take the Negaunee Mine ore next the Barasa line without danger from water. of such estimates - have similar comparisons made all along the line

VOLUNTEER MINE.

The balance of the stockpile, amounting to 7395 tons was shipped. This showed a shortage of 1921 tons. of arrangement made Ld Sm Co

MICHIGAMME MINE.

The small stockpile left at this property was shipped during the year, and showed an overrun of 611 tons.

IMPERIAL AND WEBSTER MINES.

No work has been done at these mines during the year. A watchman is employed to look after the property, as now that the Beaufort Mine is operating there are a large number of men in that neighborhood, who might damage the machinery and buildings.

For the Ashland, Crosby and Austin mines, I have used the reports of the Superintendents. They give the work in detail at each of these properties.

ASHLAND MINE.

Mr. H. F. Ellard, Superintendent, submits the following report for the year 1903:

Conditions underground continue very promising and, while with our restricted output, we are endeavoring to carry on a considerable amount of explatory and development work and withholding operations in many places where good ore could be very cheaply and readily obtained, I am pleased to report that our costs are not enhanced and promise even a slight reduction below the average for the year.

ASHLAND MINE.

Our costs in providing stocking grounds and facilities have been higher than ordinarily, due to the large balances carried over, but most of these have now been met, and we hope for a substantial reduction during the coming months.

NO.3 SHAFT.

On the 2nd level we have drifted West along the footwall for 50 feet in a seam of hard ore left when this territory was previously worked. The hanging side of the drift is in caved ground and we have hoped to find a pillar or some solid ground in which to raise and cross cut.

On the 3rd level No.26 party is drifting East along the dyke, and scramming a small amount of hard ore. The prospects are not bright here, but better returns may be made later.

On this level contract No.28 has drifted West from the North cross cut for 60 feet, and also raised 25 feet, mostly in ore. The floor of the drift looks well and some places the prospects are very encouraging. We are putting in a second crew here now, and we will push the work vigorously, connecting with the work done from No.4 shaft 3rd level subs West, and also by a raise with the 4th level of this shaft.

At this point (4th level) Contract No.30 has raised to the back of an old room to the West of the shaft and cross cut to connect with this. Most of this work was done in ore and the place has more than met our expectations, but the ore is generally quite high in phosphorus. From this point we expect to raise and hole to No.28 on the 3rd level.

Nothing is doing between this and the 7th level where the main transfer and pockets are. These are working very satisfactorily, but we hope to find a scram East from the shaft on the 4th level that will lead us close to No.4 shaft, so that we may transfer some ore at this point, and have it in readiness for the handling of No.4 shaft pillar above this level.

NO. 4 SHAFT.

Third level at contract No.28 we have drifted West 150 feet, and have shown up a large area of caved ground, which will surely yield fair returns in ore. The drift is now in mixed ore, rock and timbers.

On the sub below contract No.2 we are caving back on the East side of the cross cut in a small block of ore.

ASHLAND MINE.

On the sub above the 3rd. level contract No. 18 has a nice showing of ore going West above No. 8 and on the 2nd. sub up the deposit has been followed still farther with good returns. This is apparently the same deposit and the same dyke on which we are now working on the 3rd level No.3 shaft, and we are now starting out to connect these points and handle this ore direct to No.3 shaft.

While the ground is badly mixed with sand, rock and timbers there is a large field and at some points the returns are very good. We have hopes of meeting a body of clean ore, but will go over the ground thoroughly in any event as returns more than pay expenses. At the west end there is a point showing a fairly clean deposit with a width of 15 feet.

In the footwall deposit the process of caving continues, and there is nothing new to report. Six gangs are cutting this out, and have about enough ground to last until spring. The 2nd sub above the 4th level is quite generally active and a gang (No.6) has reopened an old mill from the 4th level through which to take the last of this deposit at this point. We will start now to prepare the deposit for work below the 4th level by opening mills from the 5½ level. This will be done gradually so as to provide working places as those above are worked out. This deposit as you know is being worked quite sparingly in order to more surely maintain ore grade, but we will have to develope something to take its place within the coming year, or witness the cutting of our product of Ashland ore at this end of the mine. This no doubt will be done in the territory including No.4 shaft pillar and the ground west of this and No.3 shaft.

On the 5½ level the contracts continue to produce very well, but we have considerable difficulty from the high phosphorus here encountered at times.

NO. 9 SHAFT.

First Level (Old No.6 shaft). One party is still at work here, and is now working East along the footwall at the junction of this with the dyke. There is a small quantity of good ore remaining at this point.

First level (old No.7 shaft pillar) On the 2nd sub above the level contract No.27 is drifting East from the hanging side of the shaft and making good returns. To the West two gangs have been at work, but the ground is badly mixed with sand and timber and the ore that is left cannot be taken for a time.

On the 1st sub two gangs are at work, one East and one West of the shaft. No.14 going East has followed the foot for 75 feet, and the prospects here are very good. To the West the ground is mixed with sand and timber.

ASHLAND MINE.

On the 1st level (old No.7 shaft) contract No.31 is cross cutting through dyke to the south and will look for ore along the foot as now worked on sub above. This should give us some ore within the next ten days.

Second level. The first sub above at the East end continues to look very promising, but the work is not crowding here as the ground is quite well developed, and we have not men enough to supply all the places. At the West end the work in the North deposit looks very promising and the raise at the extreme west is now up 55 feet in mixed ground. This will be pushed, but the progress is necessarily slow as the ground is treacherous.

At No.15 we are raising from the 4th sub and have gone through 18 feet of clean ore. This we hope will continue to surface.

Contract No.12 is drifting south and west on the 4th sub through caved ore looking very promising. They are now in about 50 feet south and 25 feet to the west. In this deposit farther east everything looks encouraging. At No.8 the ore is making North and while bunchy as at points still farther east, it is high grade and persistent in height.

In the subs to the East the prospects brighten daily, and as we are probably less than 60 feet from surface, we have decided to raise and hole at one point and use this inlet to simplify the handling of timber to this territory.

Some lean slatey ore was encountered during the month, but this does not seem to reduce the quantity of the high grade ore, which is increasing slightly in width as we raise. The average width of the whole will probably be over 20 feet.

Business is very lively now on this level, as we have completed the main drift to the north deposit east and west as far as No.8 mill, and are now using the two ton cars and horses for nearly all our tramming.

On the 3rd level contract No.17 at the Norrie boundary continues to look well and the caving of the ground continues.

Contract No.25 is climbing the dyke to the north from old rooms worked out a year ago.

Below the 4th level (old No.6 shaft) we are drifting west along the foot in a narrow seam of high grade ore, no doubt the same deposit as our footwall deposit at No.4 shaft. This has now been followed for a distance of 140 feet, and is looking well, but very narrow, probably not averaging over 5 feet in width.

ASHLAND MINE.

On the 5th level contracts No.4 and 11 are caving and scramming west of old No.6 shaft. The prospects are not very encouraging, but a little ore is obtained.

We are pushing the work on the main drift east on this level, and have holed to No.7 shaft and are branching out, as shown on the map, to open a main outlet to all our new ground east between this and the 2nd level.

At No.7 shaft we encountered ore among old square set timbers, showing that mining has been done in the immediate vicinity of this outlet and we will now push ahead in this along the footwall to the east and develop this territory toward No.8 shaft. We are in hopes of making expenses or better in this direction and we will also soon commence to open one or more sub levels east from No.7 shaft below our 2nd level. This can now be done to advantage, using the shaft for a mill and tramming on this (5th) level.

On the 6½ level very little is doing, as at the east and too much ground is already opened up and at the west the level has been exhausted.

On the 7th level west we are producing quite heavily from the old teritory west of No.6 shaft and except for the work of repairing the level for about 60 feet during the month, there is nothing new to report. In our main drift east we have again encountered ore which we hope will pan out. We are also about ready to begin the raise to the territory opened up by the 6½ level and subs east.

On the 8th level we have cross cut north through the dyke which carries No.23 deposit on the 10th level and have not quite reached the fault zone where some ore is expected. These men have been at work in No.9 shaft removing the pentice and completing the shaft below the 10th level. They will return, however, and push this cross cut some distance farther before we give up this exploration.

On the 10th level contract No.23 is doing fairly well and two gangs are at work there. As you know we get timber now by way of the 8th level and the rock is dumped into rooms opened here during the year. We also take large quantities of rock from other points in the shaft above and lower it on the cage to the 8th level and dump through this raise to these rooms.

We have raised in our exploratory work from this to the 9th level, and have proved a very small amount of very hard ore, which is also very good. We are now drifting West in this about 20 feet below the 9th level. This is hardly to be considered as a find as we knew we had this floor on the 9th level, where it carries a width of 30 feet.

ASHLAND MINE.

Nothing of value has been found at any other point on this level.

On the 11th level we are still cross cutting north and are now 230 feet from No.7 shaft. We should soon encounter the dyke on which No.23 ore is found. We are also drifting east and west and while some encouraging features have presented themselves from time to time, nothing of value has been developed.

This is our most favorable point however, from which to explore this end of the mine, and the work will be pushed as rapidly as possible. The rock is dumped through a raise coming from the 13th level room, and in this way the expense is considerably reduced.

On the 13th level nothing has been done during the month, but exploring will begin here again very shortly. The rails and runners are placing in No.9 shaft, and as soon as this is completed, work on the level will be taken up at once.

Our product for the month has been 21,364 tons of Ashland ore of which 2,739 tons have been shipped. We also hoisted 2,046 tons of rock, and our total rock product was approximately 3,500 tons.

From our experience during the shipping season just closed, we feel convinced that our overrun on this will reach fully 10%, and beginning with the records of the coming year we will estimate our product somewhat more liberally, as excessive overruns, especially when carried forward for a number of years, quite disarrange figures of cost etc. overruns must be minimized

We find that a considerable difference in weight results from producing a larger or smaller proportion of caved ore, and this year the balance has proved to be favorable to us.

Our costs for the month are very satisfactory, considering our new and exploratory work carried on, and the total charges at this end will amount to approximately $1.20 per ton, mine tally.

Our analysis for the month shows results as follows:

	Iron	Phos.
Total ore to stockpile	59.90	.047
Total ore shipped	59.45	.046

ON SURFACE.

We continue the building of trestles for stockpiling, which are now about completed. We have completed the ditching for the vacuum heating system for which the pipes have not yet arrived.

ASHLAND MINE.

We are now receiving and piling large quantities of mine timber, of which a sufficient quantity has been bargained for at current prices.

Reviewing the work of the year just closed, I am pleased to record a very satisfactory condition of affairs generally at the mine. While the product during the year has been heavy our ore reserves show very healthy proportions, and an estimate by Mr. Eaton, which will be forwarded you, shows a total of ore actually in sight of 843,500 tons, which figures I am free to say are ultra-conservative.

Our product for the year has been as follows:

Month	Product ore	Rock	
December 1902	24,356	2,930	
January 1903	30,636	2,430	
February	25,153	2,952	
March	29,859	4,275	
April	31,461	4,595	
May	32,500	4,994	
June	35,352	4,756	
July	40,241	3,501	
August	42,168	2,849	
September	35,621	3,858	
October	26,299	2,972	
November	21,364	2,046	
Total	375,010	42,158	

It is a matter of regret that the curtailment found necessary during the months of October and November has prevented our product exceeding the 400,000 ton mark, as had this not interfered, and had our balances been shipped we would surely have had a credit of 425,000 tons including the overrun.

Our balances in stock are as follows:

Ashland ore 80,717 tons, Taylor ore 66,653 tons, Total 147,370 tons.

Our sinking (No.9 shaft) during the year has been 251 feet.

Our raising (No.9 shaft) during the year has been 210 feet.

Our drifting in the mine, including raising in rock principally for explaratory work, during the year has been 5,529 feet.

Our product per man during the first half of the year was 2.24 tons per day.

Our product per man during the second half of the year was 2.98 tons per day, an average for the year of 2.57 tons per day.

This is a gratifying increase over our expectations one year ago, when this was estimated at 2.25 tons.

ASHLAND MINE.

In the matter of costs we have not quite met our expectations, though very nearly, and it is believed with the shipment of our stockpiles, and the credits thereby obtained our estimated cost of production ($1.00) per ton, will be practically accomplished.

As to our costs throughout the ensuing year, it is difficult to make any estimates, so much uncertainty exists in regard to tonnage required and also in wage matters. assume same gain as at present

FATAL ACCIDENTS.

We have had four fatal accidents during the year as follows:

On January 22nd., John Boyle was killed by falling into the skip pit on the 13th level of No.7 shaft. As there were no witnesses to the accident, it is thought that being unable to get the cage, he started to climb up the ladderway, and while doing so fell from it to the bottom of the shaft.

On February 19th., Oscar Anderson had just filled a car of ore in Room 6, and was removing a block of wood from under wheel of car in order to tram the car to the chute, when about a car of dirt fell from back and buried him.

On May 20th., Thomas Bria and his partners were ordered to put blocking into a drift, in order to block the entrance to an old working (No.19). They had commenced hauling in the blocking, but instead of blocking up the entrance to old room No.19, they proceeded to fill the room itself, and while doing so about a ton of dirt fell from back of room and buried Bria, killing him instantly.

On November 18th., Ernest VanLeisberge while attempting to get on the cage with a number of other men, fell into the shaft and was killed. This was due to the cage being hoisted while VanLeisberge was about to step onto it.

For further particulars in regard to the above accidents, reference is made to the evidence before the Coroner's Jury in each case.

Our relations with the City, County and general public continue very satisfactory and harmonious.

Ashland.

ASHLAND MINE.

The following estimate of ore in sight was prepared by Mr. Lucien Eaton, our Mining Engineer:

To those portions of the Mine where no work has been done during the past year, I have given the estimate made by Mr. Elliott last year. In most cases I have made little or no allowance for ore supposed to be in old workings, as this cannot properly be considered in sight. In all other cases I have confined my estimate to ore actually proven.

Estimate of ore in sight.

Shaft	Level	Tons	Developed in 1903	
3	3	1,500 -	500	
3	4	3,000-	1,500	
3	5	1,500-		
3	7	7,000 -		
4	4	52,000 -	11,000	
4	5	29,000 -		
4	5½	43,000 -	5,000	
4	5½ to 7	50,000		
4	9 & 10	10,000		
9	1	1,000 -		
9	2	101,000 -	45,000	
9	5	15,000-		
9	5½	12,000 -	12,000	
9	6½	10,000 -		
9	7	73,000 -		
9	7	32,000-(floor)		
9	8	22,000-(West)		
9	8	50,000-(East & subs)		
9	8½	20,000-		
7	1	10,000-		
7	3	35,000-		
7	6½	133,000 -	13,000	
7	7	30,000-		
7	8	49,000-		
7	9	20,000-		
7	10	19,000 -		
7	13	14,000 -		
	Total	844,000	89,000	

The estimate of ore proven in 1903 shows only the amount of ore proven in excess of that mined from the same territory during the past year.

The following figures will explain:

Estimate for 1902	1,056,000 tons	
Estimate for 1903	844,000 tons	
Difference	212,000 tons	
Output for 1903	375,000 tons	
New ore proved and mined	163,000 tons	
New ore proved and not mined	89,000 tons	
Total ore developed in 1903	252,000 tons	

ASHLAND MINE.

The footwall deposit on the 4th and 5½ levels in No.4 shaft has been proven to extend as far east as No.6 shaft at an elevation of 300 feet, but is very narrow near the shaft. The ore is 20 feet wide in places, however, and will probably overrun the estimate.

On the second level No.9 shaft, the estimate made by Mr. Elliott of the deposit East of No.7 shaft has proven to be excessive. A horse of rock approximately 40 feet wide has been struck between the ore body and the foot, reducing the ore to 45 feet on the level itself, and on the first sub above. The ore body also becams very narrow as it approached the boundary.

New ore has been found on the North vein by following the dyke up from the 3rd level in No.7 shaft. This ore gives promise of large tonnage, and willprobably go to the sand, but at the present date no cross cutting has been done on the top subs to determine the width, so that the estimate has been reduced. Considerable ore has also been found in ground previously worked between 5 and 6 shafts.

On the 5th level the shaft pillar around No.7 shaft has been found to have been mined almost completely, but a strip of ore one set wide was left along the foot and is expected to extend to No.8 shaft. This ore is not included in the estimate.

On the 6½ level in No.7 shaft, the ore has been proved slightly higher than Mr. Elliott's estimate, but not so wide nor so long. The ore did not extend so far along the dyke as expected.

The 7th, No.9 shaft, likewise does not show as much ore as estimated last year. It is in the estimate of the 2nd and 7th levels in No.9 shaft, and the 6½ in No.7 shaft that the difference between the 1902 and 1903 estimates is most apparent.

In conclusion I will say that in my opinion the mine has nearly as much ore proved up this year as last, and the prospects of finding new ore bodies are very good.

ASHLAND MINE.

ORE SHIPMENTS FOR 1903.

	POCKET	STOCKPILE	TOTAL	TOTAL LAST YEAR
Ashland	217265	46869	264134	259940
Taylor	8900	1104	10004	36770
Globe				1352
Total	226165	47973	274138	298062
Decrease 8%,			23924	

AVERAGE ANALYSIS OF MINE SAMPLES FOR 1903.

	Iron	Phos.
Ashland	60.01	.043
Taylor	57.75	.050

ORE STATEMENT NOVEMBER 30th, 1903.

	ASHLAND	TAYLOR	TOTAL	TOTAL LAST YEAR
On hand December 1st, 1902,	9789	36708	46497	34858
Output for year	335064	39943	375012	309701
Total	344853	76656	421509	344559
Shipments	264134	10004	274138	298062
Balance in stock	80719	66652	147371	46497
Increase in ore in stock 217%			100874	
Increase in product 21%			65311	

AVERAGE CARGO ANALYSIS FOR 1903.

	Iron	Phos
Ashland	60.35	.0392

AVERAGE WAGES AND PRODUCT.

Product 1903, 375,012 tons		SURFACE	UNDERGROUND		TOTAL	
Product 1902, 309,701 tons	1903	1902	1903	1902	1903	1902
Average number men working	86	98	391	389	477	487
Average wages per day	2.00	1.97	2.19	2.19	2.16	2.15
Average wages per mo.25 days	50.00	49.25	54.75	54.75	54.00	53.75
Average product per man per day	14.29	9.82	3.15	2.55	2.58	2.04
Labor cost per ton	.140	.189	.696	.837	.836	1.026
Difference in labor cost per ton	-.049		-.141	+.010	-.190	+.010
Average product, Breakg & Tramming			5.33	5.69		
Average wages for miners			2.40	2.47		
Average wages for trammers			2.08	2.11		
Average wages for contractors			2.35	2.35		

Ashland.

ASHLAND MINE.

The mining cost for the year is as follows:

	1903	1902	Increase	Decrease
PRODUCT	375012	309701	65,311	
General Expense	.046	.055		.009
Maintenance	.072	.055	.017	
Mining Expense	1.011	1.109		.098
Cost of Production	1.129	1.219		.090
Exploratory		.027		.027
DEPRECIATION				
Inventory	.008	.020		.012
Improvement	.000	.016		.016
New Construction	.036	.166		.130
New coal dock	.003		.003	
Total Depreciation	.049	.204		.155
Taxes	.053	.052	.001	
Central Office	.035	.039		.004
Cost on stockpile	1.266	1.541		.275
Loading and Shipping	.012	.018		.006
Total cost,	1.278	1.559		.281

STATEMENT OF EXPLOSIVES USED FOR BREAKING ORE.

KIND	QUANTITY	AVG.PRICE	AMOUNT	AMOUNT 1902.
27% Powder	102550	.092	9434.60	5752.30
30% Powder	4500	.095	427.50	1368.00
35% Powder				105.00
40% Powder	19250	.10½	2021.25	1374.25
50% Powder	5850	.119	697.00	299.50
Fuse	289500	.004½	1230.38	876.46
Caps	93900	.0055	516.45	359.15
Total			14327.18	10134.66

	1903	1902
Product	375012	309701
Pounds powder per ton of ore	.352	.301
Cost per ton for explosives	.0382	.033

Ashland.

ASHLAND MINE.

STATEMENT OF COMPARATIVE WAGES.

	1903	1902	Increase for 1903
SURFACE.			
Total number days	26242¾	29659½	
Average rate	2.00	1.97	.03
Amount	52439.64	58548.83	
UNDERGROUND			
Total number days	119129½	118334¾	
Average rate	2.19	2.19	
Amount	260986.41	259245.16	
Total days	145372¼	147994¼	
Average rate	2.16	2.15	.01
Total amount	313426.05	317793.99	

Statement of Timber used Year ending November 30th,1903.

CRIBBING.

Size	Lineal feet	Avg.price per foot.	Amount	Amount 1902
Cribbing,	118956	.0114	1341.40	651.87
6 x 8' timber	218629	.028	6110.33	7635.46
12 x 14' timber	1820	.03627	66.01	
Total	339405	.02213	7517.74	8287.33
Total for 1902	316776	.0329	8287.33	
LAGGING.				
7' Lagging	933188	.00367	3419.10	3206.95
8' Lagging	397750	.00343	1363.63	1374.63
10' Lagging				32.06
Poles	46155	.01684	777.06	73.11
Total	1377093	.00404	5559.79	4686.75
Total for 1902	309093	.008	4686.75	

	1903	1902
Feet of timber per ton of ore	.905	.749
Feet of lagging per ton of ore	3.546	2.24
Feet of lagging per foot of timber	3.922	2.99
Cost per ton for timber, lagging and poles	.035	.042
Equivalent of stull timber to board measure	297868	301834
Feet board measure per ton of ore	.794	.975
Total product	375012	309701

Ashland.

S W A N Z Y.

The cost of opening the Austin Mine is higher than it would have been, had the Railroad been extended from the Princeton Mine. how much

All material had to be hauled for more than a mile over very bad roads. I recommend that the question of railroad connection to this property be decided as soon as possible, so that work can be begun early in the spring.

Mr. G. R. Jackson, Superintendent of the Austin Mine submits the following report of the operations at the Austin Mine, and the explorations at Swanzy:

AUSTIN MINE.

When it was decided to open the Austin Mine, the latter part of December 1902, work in the Office was at once started to pick out the most favorable position for the shaft. The place chosen was on a line between drill holes Nos. 1 and 6 on the Escanaba River Land & Iron Co's land. From this position all of the ore on this property could be mined at the least expense. Accordingly the shaft was located on the ground, and the site for the buildings determined. The mine buildings were placed at a point about 500 feet North East of the shaft, or off of the iron formation. Work on these buildings was started about the middle of January, and everything put in readiness to start the shaft.

ABANDONED SHAFT.

Early in February the carpenters started on the erection of the shaft house, and on February 28th., the bearers for the shaft were set and bolted to the sills of the shaft house. Work at sinking was started on March 2nd, the surface being sand. On March 4th water was struck and quicksand began to flow into the shaft. It was necessary to drive lath to get in the sets, and the shaft could not be dropped on account of the shaft house overhead. We worked here until March 11th., and then when the ground began to settle, and the shaft house had to be jacked to keep it plumb, it was decided to abandon this shaft, as very little headway was being made. When abandoned the shaft was 16 feet deep.

AUSTIN SHAFT.

Captain Larson who had charge of the work at the abandoned shaft immediately started framing timbers for a drop shaft. This we located 56 feet South West of the first shaft. Close timber sets were built up to a heighth of 12 feet from the ground, the bottom set being bevelled. On the outside of the shaft lath were fastened, the bottom row of 6" oak bevelled, but projecting about 6" below the bevelled set. In the four corners were placed upright timbers, which were bolted to each set. These were so placed as to keep the shaft in shape.

AUSTIN MINE.

This shaft was built up in a hole about 10 feet deep, which had been previously dug to receive it. The time consumed in these preparations, putting up the derrick etc., took until March 24th.

On the afternoon of March 24th, sinking was started at this shaft. On the 26th the water level was reached and pumps installed, but on the morning of the 27th., the ledge was reached on the South West side, and on the 28th., we had ledge all around the bottom of the shaft, depth 21 feet. On April 6th our first bearers to support hanging sets were set.

Captain Larson who had been in charge of the work at the shaft was not giving the work the attention it should have, so he was relieved of his position on April 11th. John Ellis of Negaunee was chosen to take his place, and took up his duties on the 13th.

On April 1st the air compressor was started, and when the ledge was struck we were soon able to use our Sullivan power drills. The work of sinking was carried on as fast as possible, the only delays being caused by the pumps once in a while, and in cutting out the first level plat and subdividing the shaft.

Near the surface the jasper ledge was more or less broken up, but as the sinking progressed, it was found to be more compact. When at a depth of about 100 feet seams of ore of varying thickness began to appear, and we were able to save a bucket once in a while, and place it on the stockpile. The first ore was hoisted on June 9th.

The ore shown in hole No.6 which we expected to cut at about 115 feet, did not materialize in the shaft, and the ore body was not reached until we had sunk 169 feet. We found this body to be very clean, and 22.5 feet thick. The strike being North West and South East, and dipping to the South West from 15° to 20°.

The black slate underlying the ore extended from 191.5 feet to 227.5 feet and then the shaft passed into granite. The top 10 feet of the granite we found very hard but below that it seems to be softer. Sinking was continued to a depth of 255 feet, which was reached November 1st. The ore, as I have mentioned, we found lying very flat. It was necessary then to start the levels so that the greatest amount of ore could be taken out at the least expense, and especially to do away with as much rock drifting as possible. The first level plat was cut out 121.5 feet from the collar of the shaft and a drift started North East through the jasper to cut the ore. The 2nd level was located at 181 feet, and the 3rd level at 235 feet.

AUSTIN MINE.

At present we have two pumps in operation in the shaft. A No.6 Knowles pump takes the water from the 2nd and 3rd levels, and lifts it to the first level, where it, with the first level water, is pumped to surface by a No.8 Knowles. In a week or so we expect to carry all of the water in pipes to the bottom of the shaft, and from there pump it to the surface with a single No.8 Knowles pump. The bottom of the shaft is about 10 feet lower than the 3rd level skip pit, and this will be used as a sump.

FIRST LEVEL.

The drift in the jasper hanging wall cut the ore 116 feet from the shaft, and it was found to be 99 feet from hanging wall to the slate footwall. This point has just been reached anddrifts will start at once in both directions along the foot. On this level we have very little water. Most of it coming from the contact between the jasper and ore. Practically all has been very high grade, and only that lying within 3 or 4 feet of the footwall being high in phosphorus.

SECOND LEVEL.

The 2nd level was opened at the ore body in the shaft, at 181 feet from surface. Drifts from the shaft and parallel with the strike of the formation, have been started. A shaft pillar will be left and the drifts then turned to cross cut the formation until the footwall is reached. The drifting will then be carried along the footwall as at the first level.

THIRD LEVEL.

This level is started in the granite just below the contact with the slate, and the drift from the shaft is now in 40 feet. Here we are drifting South West, cross cutting the black slate.

GENERAL REMARKS.

During the entire sinking of the shaft we had no serious accidents, and the work went along very smoothly. The shaft men did all the timbering, and cut out the first level plat, and when sinking was stopped, they cut out the third level plat. By November 23rd the surface preparations being completed, one of the skips was hung in the shaft and is now in general use.

At the top of the shaft on the close timber a perforated pipe has been placed. Water from this pipe runs down the timbers, keeping them at all times moist, to prevent any chance of fire. As soon as possible a raise will be carried from the 1st level to the surface to provide for a second opening.

AUSTIN MINE.

SURFACE WORK.

During the year there has been built at the mine an office and warehouse, Engine House, Boiler house, Carpenter and Blacksmith shop, Machine shop, Barn and Powder House, while at the Shaft the shaft house was built and moved 56 feet South West over the shaft. Trestles from the shaft house run to the ore and rock dumps, and pulley stands have been erected between the shaft and engine house.

MACHINERY, BOILERS ETC.

In the engine house has been placed a Nordberg hoist and a Sullivan straight line air compressor, as well as a feed pump and water heater. In the boiler house are two boilers, one of 150 H P and the other an emergency boiler, which we are now installing.

During the summer and fall months a combination of wood and coal has been used with good results, and a material saving in cost. During the winter months coal alone will be used, as the wood is too wet to burn without first having a chance to dry.

Our supplies have cost more here, than they would in most places, as we have no railroad into the mine, and they have to be hauled either from Princeton one mile away or Swanzy, which is six miles from here. The roads at no time have been in the best condition.

GENERAL SURFACE.

In June a survey line was run from the mine to the C & N W branch track into the Princeton Mine. This survey was tied onto by the L S & I survey from Little Lake.

Rough surveys and elevations were taken along the Escanaba River to consider the question of water power for the mine. Three sites for dams were found, where heads of ten, fourteen and eighteen feet respectively could be had. The expense of building dams at these points has not yet been estimated.

To the East of the mine on the plateau West of the Escanaba River about ten acres of land have been cleared, and a portion of it platted. There are now five double miner's dwellings and the Superintendent's residence on this plat.

Water to supply the mine boilers and the dwellings is pumped from the Escanaba River. The pipes carrying the water being five feet underneath the surface, to prevent freezing in winter. Water hydrants are provided to protect against fire, and particularly forest fires, which are of common occurence in the spring and fall.

AUSTIN MINE.

Cost of Opening the Austin Mine from January 1st.,1903 to November 30th, 1903.

General Expense	4504.12	
Boiler Plant	5210.05	
Hoisting Plant	4419.45	
Compressor Plant	3826.10	
Total		17959.72
BUILDINGS		
Boiler house	375.69	
Engine house	415.36	
Office and Warehouse	514.15	
Dry House	296.17	
Shaft House and Pocket	2493.80	
Permanent trestles	1671.70	
Stockpile ground	1141.36	
Pulley stands and Turn sheaves	940.46	
Water tank	222.83	
Shop buildings	520.92	
Boarding House	2252.23	
Powder house	89.22	
Barn	340.93	
Clearing site	75.54	
Miscellaneous	366.89	
Total		11717.27
MISCELLANEOUS		
Shop tools	862.80	
No.10 Knowles pump erected	203.53	
Piping to shaft and buildings	1350.26	
Piping in shaft for air, steam and water	535.23	
Air pipe underground	56.38	
Top tram cars	344.08	
Underground tram cars	1804.67	
Steam Heating in office, dry and shops	186.46	
Surface expense	848.35	
Tools in general use	368.64	
Fire protection	453.86	
Dry House expense	342.64	
Depreciation and Inventory	146.34	
Total		7512.20
Credit Opening Austin Mine,		1086.00
Total		6426.20
NEW SHAFT & DEVELOPMENT		
Mining Captain	1435.25	
Landing & Trimming	1722.74	
Abandoned shaft	330.70	
Sinking No.1 shaft	5902.63	
Hoisting	1941.76	
Compressor	1460.83	
Timbering	2910.57	
Temporary Hoisting plant	550.01	
Pumping	2762.08	
Skip roads and guides	197.85	
Drifting	2641.90	
Opening levels	318.08	
Total		22263.40
Austin. Grand Total		58366.59

SWANZY EXPLORATIONS.

During the whole year the work of exploring the lands under option has gone on without interruption. About the first of February it was decided to try holes to the South and East of where we had been exploring. Holes 15, 19, 20 and 21 were drilled on the C & N W land in section 29, 45-25. At 15, 19 and 21 the iron formation was passed through, but no merchantable ore found. Hole 20 contained little of the iron formation.

Hole 13 near the South East corner of section 20, 45-25 on the Escanaba River Land & Iron Co's land found a little ore, while holes 27 and 24 to the East on the same land found only rich formation. They were however at such a distance from No.13 that an ore body might exist without being discovered by these holes.

Holes 31, 22 and 26 on the Stephenson to the West and North West of the ore body, we had discovered on this tract, showed only rich iron formation, and hole 25 near the Eastern line of the Stephenson showed only a thin shell of the formation lying on the granite.

When it was decided to again go into the territory near where ore had been discovered, holes 29 and 30, on the Stephenson and 28 and 32 on the Chicago & Northwestern found ore. No.16 on the Stephenson having found ore in January. While holes 11 and 33 on the C & N W and 34 on the line between the Stephenson and Escanaba River L & I Co., found only rich formation, but no concentrated portion.

On the Escanaba River Land & Iron Co's land hole 14 near the Stephenson line found ore 44 feet in thickness, most of it running Bessemer. Hole 17 near the outcrop North East of our present shaft passed through about 40 feet, which analysed about 50% iron, but was low in phosphorus. At the mine our samples have been running considerably higher than the drill holes showed, so that most of the ore at hole 17 can probably be mined.

Hole 18 was North of No.17 and too near the outcrop to show any ore, and hole 23 was drilled at the location selected for the miners dwellings. This showed only altered granite.

Hole 1 section 33, 45-25 on the lands of the D M & M Co., found the iron formation after drilling through nearly 800 feet of slate and conglomerate. The formation line showed practically no oxidation and no other holes were drilled on these lands.

Prof. Smyth visited the explorations about the middle of August, and from that time the work has been carried on from his suggestions.

Swanzy.

SWANZY EXPLORATIONS.

Hole 35 near the South East corner of section 29 was drilled to a depth of 479 feet, where the conglomerate was reached. If ore exists there it must be at too great a depth to be economically mined. He was in hopes that there might possibly be a bending or faulting of the strata which might bring the formation near the surface at that point. The standpipe was left in this hole, so that drilling can be started again in case it is deemed best.

Holes 36 and 37 along the West side of section 29 were so located to find the Western extension of the iron formation. By No.37 it was found to take a sweep to the South East.

HOLES TO THE WEST.

To the West are no outcrops to guide one in the location of holes, so that the whole territory was absolutely unknown.

Hole 1, section 30, 45-25 found granite under 187 feet of surface.

Hole 1 section 25, 45-26 found granite underneath 120 feet of surface, and it now looks as if hole 2 section 25, 45-26 was in granite or some igneous rock from the sludge washed up.

HOLES TO THE EAST.

On the Chicago & Northwestern lands to the East on section 15, 45-25, two holes have tested ledge and on section 14, 45-26 one hole. These have all found granite. Hole 1 section 23, 45-25 near the lake in the S E $\frac{1}{4}$ of the N E $\frac{1}{4}$ of section 23, 45-25, the standpipe is nearly to ledge, which will be tested in a few days.

HOLES TO THE NORTH.

On section 18, Old Swanzy, holes 1 and 2 have been drilled. Hole 1 just North West of the old Swanzy pit found the formation dipping at a high angle. The jasper in this hole at times was rich, but no ore was found.

Hole 2 considerably to the West of No.1 found the jasper lean. Hole 3 to the East of No.1 and No.4, 750 feet North of No.2 are both in slate, standing at a high angle.

CONCLUSION.

In conclusion I want to say that Captain Ellis in charge of the work at the Austin shaft, and John Engstrom in charge of the diamond drilling are very conscientious about their work, and have done everything in their power to push it along as rapidly as possible.

Swanzy.

SWANZY EXPLORATIONS.

ESTIMATE OF ORE.

The estimate is made by taking average thickness of ore as shown by the drilling, with outside limits of the area being determined by a radius of 100 feet from each hole showing ore. From this estimate has been deducted 10% for rock.

The estimate of ore on the Escanaba River Land & Iron Co's land does not include ore at hole 13, but is that which can be developed by the Austin Mine:

Estimate of ore from drill holes, Swanzy Explorations.

Austin Mine--Escanaba River Land & Iron Co.

Total cubic feet,	15,018,000
10% rock etc.,	1,501,800
12 cubic feet per ton,	13,516,200
would give,	1,126,000 tons.

Stephenson tract, S½ of S W ¼ 20,45-25.

Total cubic feet	42,061,000
10% rock etc.,	4,206,100
12 cubic feet per ton,	37,854,900
would give	3,154,575 tons.

C & N W Ry, sections 29,45 and 25.

Total cubic feet	2,986,000
10% rock etc.,	298,600
12 cubic feet per ton,	2,687,400
would give,	223,950 tons.

Mr. Jackson's estimate of the ore shown by diamond drilling, I consider very conservative, not only because the allowance has been made for rock, but also for the reason that he has used 12 cubic feet per ton of ore. The grade of ore coming from this mine will not exceed 11 cubic feet per ton, and if it averages as high as our Lake Bessemer deposit, it will run but ten cubic feet per ton.

The amount of ore estimated however, is certainly very satisfactory.

You will note that with the exception of a small tonnage South of the Stephenson property, no ore has been found on the Northwestern lands. Our work on these lands is rapidly eliminating a large area, and I am of the opinion that nothing of value will be found on any of the options that we hold. At the old Swanzy no ore has yet been discovered, and the possibilities of this property grow less as the work progresses.
Swanzy.

CROSBY MINE.

Mr. S. R. Elliott, Superintendent of the Crosby Mine, submits the following report of the work done for the year:

SURFACE WORK.

During the early part of November we took forward 1,000 tons of coal. Since that time we have done away with the surface crew. Of course at times it is necessary to have a man or so on the surface to do an odd job. All such work here is taken care of by the carpenter and timber framer. I find that I can keep these two men busy continually. As far as I can see now there will be no further use for a service crew.

MINING TIMBER.

We now have on hand about 30,000 lineal feet of timber, which will not cost us more than three cents per foot delivered on the ground. About three fourths of this timber is in 20 foot lengths, we paying for it as being 16 feet long. We try to cut this timber so that there is no waste.

CORD WOOD AND LAGGING.

We cut in November 56 cords of lagging at $1.75 per cord. This is rather high for cutting it, but the timber is so scattered that it could not be cut for less. At the end of December we will probably have 125 cords on hand.

At the present time the team has not much to do outside of hauling wood and coal to the boiler house, so that we have plenty of time to haul in the lagging. On account of the small amount of work for the team I have gotten rid of the swamper.

On the 1st of December we had on hand 459 cords of wood. This amount from now on will be gradually decreased, as there is no more wod to cut.

In November we used 24 tons of coal and 68 cords of wood. You can readily see that with 1,000 tons of coal in addition to the wood we have on hand, there is no danger of our running short of fuel for a good many months to come.

HEATING SYSTEM.

Owing to the rough way in which the mine buildings were constructed, we find it expensive and difficult to heat. The shanty on the trestle, the Dry, engine house, carpenter shop, blacksmith shop and oil house, are all heated with live steam. I am anxious to use the exhaust steam from the hoist to at least help in the heating. This heating of buildings is a very expensive item and should be cut down.

CROSBY MINE.

WAGES.

Beginning with the first of December there was a general reduction of wages. At the present time I could get some branches of the work done a few cents cheaper per day by employing an inferior class of men.

I now have a first class, well organized crew, and we lose no money by paying them fairly good wages. My men do not lose time on account of drinking, and in an out of the way place like this, such men are very valuable, and should get good wages.

The following is a list of the original and reduced rates.

	Original.	Present rate
Bosses (Underground)	$5.00 (Per month)	$75.00
Miners (Co.Acct)	2.25	2.00
Trammers	2.10	1.80
Skip tenders	2.00	1.75
Pumpmen	2.25	2.00
Firemen	2.25	2.00
Teamster	2.25	2.00
Swamper	2.00	1.60
Pipemen	2.10	1.90
Brakemen	2.35	2.15
Carpenter	2.75	2.50
Timber Framer	2.50	2.25
Top Lander	2.00	1.80
Blacksmith	2.75	2.50
Helper	2.00	1.80
Watchman	2.00	1.60
Surface laborers	1.90	1.60

Men are very plentiful and are anxious to work. We are able to get more work out of them now, although the wages are considerably lower. The price for testpitting has also been reduced. The regular price throughout the range has been $1.10 for the first 20 feet, and an increase of 10 cents per foot for each succeeding 20 feet. We have cut this price 10 cents for each foot.

Crosby.

CROSBY MINE.

DRILLING & TESTPITTING.

The drilling was finished when hole 192 was completed, on lease two, at a depth of 150 feet.

There has been a small body of ore shown up on Lease One, but as we have proven that the drilling done in this territory is not accurate, there is a probability of there being a large error at this place.

The only way to test this ore body would be by putting down a small shaft. This would be expensive as there seems to be an unusually large amount of water. We were unable to sink any pits over the ore body deeper than 18 or 20 feet. From time to time I have reported to you the result of the test pitting. This work has proven beyond a doubt that the drilling which has been done here is extremely inaccurate, and in many cases where ore has been reported it does not exist.

Up to date we have checked up four holes, and are working on two others. In every case where we have checked up the drilling, we find it to be incorrect.

I will give the result of the checks, the comparison will show the amount of ore as shown up by the drill hole to the depths to which we were able to sink the pits.

Hole 153: Ore reported from 73 to 96 feet. Check shows no ore at all. Nothing but rock with small seams of ore. The shaft was sunk on this hole.

Hole 110: 106 feet of ore reported averaging 59.16%. We have checked up all except 12 feet and only find 30 feet which will go 56.24%.

Hole 123: Reported 69 feet of first class ore. We find only 20 feet of an inferior grade.

Hole 133: Shows 33 feet of ore, while the pit only shows 20 feet.

Hole 116: From 48 to its present depth shows rock pure and simple. The sample from 50 to 55 feet ran 41.41 instead of 62.48. It is simply ridiculous to call such stuff ore.

Hole 465: To a depth of 35 feet has shown nothing but mixed ore, and sand and rock.

I want to call your attention to hole 113, 116 and 153. You will notice that ore is found, or at least reported in every case at the exact point at which the pit was stopped, although the material in the bottom of these pits was worthless.

CROSBY MINE.

In my opinion not one hole on the entire property is correct. We have every reason for believing that ore does not exist below our present level, unless it is in hole 465.

The analyses of hole 110 shows that it was the best hole on the property. We have proven that this material below our level is not ore. The samples in the winze are higher than they should be for the reason that the water has washed out the greater portion of the soft white material.

ESTIMATE OF AMOUNT OF ORE.

In my estimate I have cut out the following holes as containing, in my opinion, no ore. They are 113, 116, 153 and 461.

As a rule on this range if two drill holes 300 feet apart show ore, it is customary to assume that ore is continuous between them. It is also the rule to assume that ore extends half way between two pits, one showing ore, and the other rock. From our work, we are lead to believe that this is the exception to the rule. In most cases I have figured the ore extending only one third of the distance between two pits, one showing ore and the other rock.

In the West deposit there were a number of the pits which could not be sunk on account of quick sand and water, so we have to take the result of the drill holes.

I figure in the West deposit 298,000 tons of ore which will average 56% or better.

It is only natural as we have found every drill hole which we have checked to be very inaccurate, to assume that others are as equally inaccurate. In this case my estimate would be reduced to a much smaller amount.

In the East ore body for a distance of about 400 feet North of the shaft, we have a very good idea of the amount of ore. The raises show us its thickness, and the pits show us approximately its width.

From the information which we have, relying again to a great extent upon the result of drill holes which are thought to be incorrect, I have figured that all of the ore outside of the West deposit will not be over 427,000 tons, or a total in the two deposits of 725,000 tons.

In figuring these two deposits I have assumed that the ore will run 13 cubic feet to the ton. As this was the amount originally used in the estimate.

A test just completed by Mr. Longyear shows that it only runs 12 cubic feet for ore that will assay from 50 to 55%.

Crosby.

CROSBY MINE.

UNDERGROUND.

Accompanying this report will be found blue prints showing the result of all of the work. It is not necessary for me to describe these maps, as I think that they are perfectly simple.

The drifting was practically begun on the first of July. Since that time to the first of December we have drifted 1664 feet and raised 757 or a total of 2421 feet.

I would like to call your attention to the cost per foot for labor and supplies in the two main drifts and also for raising.

EAST DRIFT.

September	116 feet	Cost 2.66 per foot
October	159 feet	2.21
November	177½ feet	1.65

WEST DRIFT.

September	155 feet	2.70
October	146 feet	2.38
November	119½ feet	2.42

RAISING.

September	155 feet	.62
October	198 feet	.50
November	188 feet	.56

The West drift has been hard for two months, hence the cost is up.

In November we did a great deal of raising through rock. Raising should not cost us more than 40 cents per foot in soft ground.

The whole level up to the present date is in rock. A few samples of it will run as high as 50%, but the great mass will not assay more than 40%.

I have one gang starting a sublevel at a heighth of 35 feet from the rail in raise No.14. They will first drift back to No.12 in order to give an outlet and also a place to handle timber through. When this is finished we will start cross cutting from No.14.

I feel quite sure that we will find a very regular ore body extending over our East drift. I have assumed that this ore is continuous, and extends to the line from pit 154, varying in width from 66 feet, to as much as 130 feet. Its thickness I believe will average 40 feet. The surface has been removed to the ore from pit 157 to a point opposite pit 160 for a width of 25 feet. I think that there is quite an area that can be cleaned up at a small cost and milled.

Crosby.

We may also be able to mill a small body, which has been uncovered to the West side of the pit. The rock between the level and the ore, over the West drift, is extremely hard and at least 20 feet thick. On this account we would only be able to mill a small portion of it.

In the South end of the mine near the shaft where the ore body is very irregular, I see no way of getting it out except on timbers.

MESABI EXPLORATIONS.

Mr. J. E. Jopling submits the following report of our explorations on the Mesabi Range for the past year:

The Company's explorations upon the Mesabi Range for the year of 1903, were confined to the completion of work begun during the previous year, with the exception of the Akeley-Nelson tract.

At the beginning of the year 1903, the ore body on the Chisholm State Lease on section 10 had been defined, and a certain amount of ore shown up on the Crosby. The results of this year's work have been disappointing, and the explorations have been expensive. It will require a longer time to define the amount of ore in sight at the Crosby Mine. Except on the Chisholm lease above referred to, the Company has not discovered or acquired any other ore body.

The Range as a whole is now pretty thoroughly explored, except on such tracts of land as are held by a few Companies, and the ore found during the last year is generally low grade, or lies in isolated and comparatively inaccessible bodies. Offers have been few and it is estimated that comparatively little ore is now for sale.

The chances of discovering new ore bodies of good grade that are not deeply buried are so small that I would not recommend any further work of exploring, except in partly developed properties.

Explorations on the Range were active until the middle of the summer, but the work has largely been stopped. The former known ore limits have not been materially increased, nor have any finds been made in new Districts.

The Company has not done any work on the Vermillion Range during the past year. I understand practically all explorations on that Range have been stopped, with the exception of that on the famous section 30, 63-11, where some ore has been found.

The monthly blue prints furnished by E J Longyear of Hibbing and Cole & McDonald of Virginia show the progress of the work described in this report. All of the explorations were under the supervision of one or the other of these Engineering firms.

AKELEY & NELSON.
Sections 10 & 15, 56-23.

These options were obtained in February by Mr. Mather from Mr. L W Hill of the Great Northern Ry.

The Akeley lands are
S W ¼ of the S W ¼ of section 10, 56-23.
E½ of the N W ¼ of " 15, "
W½ of the S W ¼ of " 15, "

The Nelson
The West ½ of the N W ¼ of section 15, 56-23.

Mesabi.

AKELEY & NELSON, Continued.

They were taken on the strength of our discoveries of ore on the Chisholm State Lease in the N W ¼ of the S W ¼ of section 10, reported last year, and which showed ore on the South boundary.

Messrs. Cole & McDonald of Virginia tok the work of exploration under contract, at the rate of $3.00 a foot for test pitting and churn drilling through ore and soft material, and $5.50 a foot for diamond drilling through taconite. Two of the churn drills belonging to us were used, and two were borrowed from Mr. Hill, Cole & McDonald furnishing the diamond drills. Messrs. Cole & McDonald were very accomodating, getting the outfit on the ground promptly, and pushing the work with vigor.

Blue prints furnished by them show the progress of the work. Most of the first 14 holes had been completed by Mr. Hill before we took over the land, and they had shown up an area of lean ore. Union holes 1, 2 and 3 had been drilled by us.

Less than two months were spent in this work, completing the holes started by Mr. Hill, and drilling the nine new ones, at the positions most likely to be in the trend of the local enrichment.

Next the boundary of the Chisholm lease some 200,000 tons of ore were found, running about the same as on that property, namely iron 57%, phos.031. With this exception no ore was found on any of the property, and while it could not be regarded as a thorough exploration, enough was done to discourage us from asking further time in which to prosecute the work.

The ore reported as discovered by Mr. Bailey on the Nelson lands was followed up, and we have reason to believe that he was mislead by incorrect results from the drillmen.

Mr. Bailey of Duluth, I understand, still holds the lease on this land, and has recently offered to sell us his interest in the 200,000 tons above mentioned, so far without agreeing on a price, which we consider reasonable. In this connection Messrs. Cole & McDonald assure us that they feel satisfied the ore found on section 10 will mine as well as the drillings show, and that the material is not the same as found at the Crosby.

These options were returned to Mr. Hill about April 1st.

Mesabi.

MESABI EXPLORATIONS.

CROSBY LEASES.

Mr. Elliott's report, which covers the work at the mine, gives in a general way, the results of our explorations.

Last year's report describes the position of the lands, and the conditions under which they were taken.

This year's work was very discouraging, for several reasons, the chief one being that the ore opened up on Lease No.3 did not hold up to the grade shown by the drilling.

In order to hasten the work, we tried, during the first six months, to add to the contractors equipment of five drills, but without success, as explorers were still very busy. Added to this Messrs. Hawkins and Crosby of the East Itasca Co., forced us to do more work than we believed necessary, and which belief the results later on justified.

In brief the work on the different leases is as follows:

LEASE ONE.

Explorations were continued until March, with one drill, at which time it was supposed we had discovered more than 150,000 tons of ore running 57% in iron and low in phosphorus.

As it was difficult to obtain drills it was thought best to take this drill to hurry up the work on Lease 4 to 7.

It was not until September that this work was resumed, and it was completed early in December. The ore area is in the East ½ of the South forty, and lies under some 30 feet of sand. It is irregular in shape.

Mr. Longyear estimates the amount of ore shown up as 567,254 tons running 57.21% in iron and .034 in phosphorus, taking in an area of 75 feet outside the drill holes. In making this estimate he has included all the material shown as ore upon the blue prints. From our experience in developing the ore on lease No.3, it has been found that where the drill samples are mixed with particles of sand, the ore is likely to mine from 2 or 3% to 10% lower in iron. Mr. Longyear states that the samples from the lower part of hole No.256 are so mixed. An estimate which I made using 50 feet outside the holes gave 265,000 tons. This ore will run about the same as Mr. Longyear's estimate.

On showing up this ore with the drills, it was thought best to prove it as much as possible with test pits, and a number were started in the supposed ore area. It was found that this territory was too wet to permit of sinking without a pump, and the work had to be abandoned without proving any of the ore.

MESABI EXPLORATIONS.

CROSBY LEASES.

Outside the ore territory the ground is reasonably dry.

Mr. Longyear's report casts such a doubt on the results of the drilling, that neither Mr. Elliott nor I are willing to make a close estimate. As test pits have failed, the only means that can be employed to prove up the property is by sinking a shaft for which a boiler etc., will be necessary. From this shaft drifts would be driven in different directions. Stripping and milling would be the best method of mining this ore.

LEASE TWO.

In January 1903, when Mr. Longyear estimated there were over two million tons of ore on Lease Two and Three, there was included an area in Lease No.2, and as we were in a hurry to finish drilling leases 4 to 7, it was thought best to take the drills from this land.

It was not until August 1903 that the work of exploring Lease No.2 was resumed, and it was completed in December.

Mr. Longyear's estimate gives 221,431 tons averaging 57.16% iron and .035 phosphorus. Mr. Elliott and I think this is too large as the drill samples show some sand. Besides which the ore bodies are so located as to make the cost of mining very high.

We recommend that this lease be surrendered.

LEASE THREE.

Mr. Elliott's report gives the details of opening the mine on this lease and the discouraging results.

In the South East part which had been stripped, not only was the ore banded with fine white silica, but there were irregular masses of hard rock in it, preventing its being milled from the open pit as had been intended. Subsequent opening on the East body shows an amount of ore which Mr. Elliott estimated as over 400,000 tons.

Mr. Longyear's estimate of the oreon this lease is as follows, as shown in his letter of December 19th, 1903.

West deposit	809,200 tons
East deposit	598,905
Near the North boundary	202,117
Around hole 465,	260,994
Total	1,871,216 tons averaging 57.32% in iron,

phosphorus not stated; last year's estimate gave .041.

Mesabi.

Of this total subsequent explorations by sinking a pit on hole 465 will probably cut out all that amount of 260,994 tons.

The development of the mine this winter will give a reasonable means of checking the amount in the East deposit and near the North boundary. While not admitting that there are 801,022 tons there, it is probable that Mr. Elliott's estimate of 400,000 tons is too conservative.

At a meeting between Mr. Mather and Mr. Longyear early in January 1904, the latter consented to supervise the sinking of test pits or small shafts on the critical holes in the West deposit, or change his estimate to conform with the results.

In comparing this estimate with that of a year ago, there must be added the ore he has estimated on Lease No.2, namely, 221,431 tons

Which added to the above stated,	1,871,216 tons
makes a total of	2,092,647 tons
His January 1903 estimate was	2,392,961 tons
Shortage	300,314 tons

This shortage is more likely to be increased than decreased, as more holes are reached, and show a lower grade of ore than the samples.

Mr. Longyear's explanation is that the formation at the Crosby is different from that at the mines on this part of the Range; the only property to which it can be compared being the Arcturus. The fine white silica with which part of the formation is banded, is so light that it floats in the water, and cannot all be collected in settling tanks when the ore is drilled. Even the Hawkins Mine immediately South of the Crosby has been proved to contain ore as rich in iron as the drill holes show. Mr. Longyear has been exploring on the Mesabi Range since the start, and his estimates have been found to be so accurate that his work was never doubted by us. I can see no reason now how we can help accepting his explanation, particularly as he offers to do what he can to make the final estimate as correct as it is possible to do so.

The payment of seven cents a ton on the ore developed makes it highly important to follow up this work.

I have been unable to learn of a single property on the Mesabi Range, except this one, where the ore has not averaged about the same as the drill holes showed.

MESABI EXPLORATIONS.

CROSBY LEASES.

LEASES FOUR AND FIVE.

Messrs. Crosby ad Hawkins agreed that if the two deep drill holes started in December should fail to strike ore that these leases be given up.

The holes were completed in February and the leases surrendered.

LEASES SIX AND SEVEN.

Messrs. Hawkins and Crosby told me in May that they considered Leases 6 and 7 practically explored. After this they withdrew their consent to the surrender, and to avoid a lawsuit we continued the work putting down six more holes. These were completed without finding ore on Lease 7 or 6. Lease 7 was surrendered in August, and Lease 6 in September.

The work was much delayed by lack of equipment and unavoidable delays.

SECTION 30, 57-22.

Explorations were continued on the South ½ of the S E ¼ of section 30, a lease of which we were compelled to take out, as the Mississippi Land Co., refused to grant an extension of their option, and we were under contract with Messrs. Sweeney and Chesebrough to explore the same.

The result of all our work on this land has been a complete disappointment. Early in the year we hoped to find a small body of stripping ore near the South East corner and adjoining the Crosby, and of the same grade. In May the drilling then done showed a larger ore body than we had anticipated, and we hoped to at least show a profit on our expenditure. Mr. Longyear who was watching the drilling in our interest, did not give a written estimate of the ore in sight, but told me that it would run over 300,000 tons.

The results we were at that time obtaining by developing the supposed ore bodies at the Crosby, made us fear that this ore would not come up to grade in mining, so we concluded to sink test pits on the drill holes as the ore was reported under some 35 feet of sand. In June and July the pits reached the ore, which was found several points lower in iron than showed by the drill holes. The worst result was found in verifying hole No.7, where 60% ore was reported. Here the pit samples gave nothing better than 50%. The other pits were closed to the drill results being usually from 2 to 5 points lower in iron. The result of this operation showed there was no merchantable ore in any of the explorations.

In August the lease was surrendered to the fee owners.

Mesabi.

MESABI EXPLORATIONS.

SECTION 18,58-18.

This consists of a State Lease on Lots 2 and 3 from Chisholm and others, on which we obtained an option through Mr. Hill. The test pitting was done in the summer of 1902. Owing to the scarcity of drills we were compelled to await until March 1903, before Cole & McDonald could undertake the diamond drilling, as specified in the agreement. Their price on the drilling was $6.00 a foot. Nine holes averaging 47 feet deep were drilled, all in taconite. Only in No.5 in the North East corner was there any material approaching iron ore. Although in a territory where so many rich deposits have been found, this part of section 18, appears to be absolutely worthless.

The work was completed in June, and the option surrendered.

SECTION 36, 58-18.

This is a State Lease in the South West ¼ of section 36, 58-18, which was bought through Mr. Hill. A few pits were put down in 1902 without reaching the ledge.

A southwestern extension of the Eveleth ore bodies was hoped for in the North East corner, from information we obtained from work on adjoining lands. Messrs. Cole & McDonald drilled four holes for us from June to September. Their contract prices were $3.00 for churn drilling and $6.00 for diamond drilling.

No material rich enough in iron to be analysed was encountered, and some slate was found in every hole. This slate probably belongs to the hanging or overlying series, and was here found banded with the taconite. Some of the material found was soft and rather indicated a possible proximity to an ore deposit, but the chances of discovering any body of merchantable ore seemed too remote to encourage further work.

This State Lease which is owned by the Company will be allowed to lapse.

ROCK OPTION.

The explorations by the Company were on the first two of the descriptions included in this option.

S E ¼ of S E ¼ section 28, 59-18.
N E ¼ of N E ¼ " 33, "
N W ¼ of N E ¼ " 33, "
N E ¼ of N W ¼ " 33, "

Up to February 23rd, Messrs. Cole & McDonald had drilled four holes in the hard taconite found on this land, the four holes averaging 64½ feet each. The cost to us being $6.00 per foot.

The result of these holes, and of the test pits sunk last year, being all in hard and unpromising taconite, the fee owners released us from our contract to spend $5,000 in explorations on the stipulation that after the question of the Eastern boundary Mesabi.

ROCK OPTION, Continued.

had been decided in their favor we were to agree to drill one more hole 200 feet deep. This question has now been decided in their favor. I understand the Supreme Court has affirmed the decision of the lower Court, which entitled them to a strip of land about 200 feet wide, which was claimed by their neighbors. This strip is next the Donora Iron Co's find at Little Mesabi Lake, and it is possible that a hole on the debated strip will show ore.

DANIELS.

This option was for the purchase of the fee of the following lands for the sum of $20,000:

N W ¼ of the N W ¼ section 29, 59-14.
E ½ of the N E ¼ section 31, 59-14.
N E ¼ of the S E ¼ section 31, 59-14.

The reasons for taking this option are given in last year's report. It was hoped that a small body of ore of good structure might be found as had been encountered on some of the adjacent sections.

Four drill holes averaging 82 feet in depth were drilled in hard taconite in the East ½ of the N E ¼ of section 31. The results were discouraging, and it was thought best not to continue the work.

The work was done by this Company's men under the supervision of E. J. Longyear.

The option was surrendered in February.

Does he mention all four leases 29. Sec 10.

VIVIAN.

This was an option on State Lease property with a $50,000 bonus in case of taking the same.

S E ¼ of the N E ¼ section 22, 59-14.
N E ¼ of the S E ¼ section 22, 59-14.
N W ¼ section 33, 59-14.
N ½ of the S W ¼ section 33, 59-14.

The work was begun in November 1902 by the Company's men under the supervision of E. J. Longyear. The surface sand hardly averaged 15 feet deep, and 23 test pits, scattered over the land, were put down, striking hard taconite. Six short holes were drilled in these pits, without showing any encouragement. In fact the formation consists of hard taconite, containing very little sign of ore; most of it being magnetic.

MESABI EXPLORATIONS.

VIVIAN, Continued.

Mr. Longyear thought the land had been explored as far as practicable, and the option was surrendered in February 1903. This work was also done by the Company's men, in charge of John Engstrom, the diamond drill Superintendent, who I think showed energy and judgment in getting the work done as cheaply as possible. The expense includes bringing the drills from section 11, 58-23.

As will be noted from the reports of Messrs. Elliott and Jopling, the results of the work on the Crosby Mine, and the leases from the East Itasca Mining Co., have been extremely disappointing.

AITKIN COUNTY MINNESOTA LANDS.

In March 1903, the attention of the Company was called, by Mr. Samuel P. Snider, of Minneapolis, to a probable extension of the Iron Ranges in Aitkin County, Minnesota.

An examination of the surface indications in company with Mr. Snider was made before the snow melted. At that time I reported the occurence of lean iron deposited near some springs in section 2, 49-23, and also quartzite outcrops in section 3, 46-25, which appear to belong to the underlying quartzite series of the iron ranges.

The U S Geological Survey report on the Mesabi Range indicates a connection of the Ranges passing through this part of the country, besides which the Minnesota State survey, has collected certain facts which lead us to believe that an occurence of ore is likely to be found near these outcrops.

An agreement was entered into with Mr. Snider to purchase these lands, and to explore the same, it being recognized that if no iron was found the value of the lands for farming purposes would probably enable us to sell them for an advanced price, as the country becomes more settled.

Mr. V. S. Hillyer of Ishpeming was sent by the Company to explore this tract of country, and he made a report accompanied by maps. Prof. H. L. Smyth later on went over the ground again with Mr. Hillyer. While neither of them came to a definite conclusion where first to explore, they recognize the rocks as indicating the presence of the iron bearing series. I understand that explorations with a churn drill were begun during last summer at a point South of Kimberley, near the land purchased by this Company, but the work was not continued long enough to determine the nature of the rocks under the surface sand. No explorations have yet been made by this Company on its holdings.

TAXES.

There has been such a large increase in taxes, that I have thought it worth while to send you very complete statements for our several Companies.

The slight variation in the valuation at the different mines on the Marquette Range, is due to the item of personal property alone.

The increased rate at Marquette and Ishpeming comes largely from the increase in State taxes.

At Ishpeming, the city taxes are also higher. This is due, first; to $20,000 of water bonds falling due in 1904; second, to the expense of repairing the City Hall; third, the appropriation for the support of the Carnegie Library, and fourth, to the increased amount voted by the Council for Highway purposes.

At Negaunee the rate has been lowered on account of an increase in the valuation of mines, other than our own.

On the Gogebic Range the relative values of the different mines are based on the previous year's shipments. This accounts for the increase in the valuation at the Ashland Mine.

There is no doubt that during boom times, there is a tendency on the part of City and County Officials to be extravagant in their expenditures. This is a matter that will be given immediate attention by the Heads of the different Departments of the Cleveland-Cliffs Iron Co., and it is hoped that they will be successful in reducing the tax levy for municipal and county purposes.

ASSISTANT SUPERINTENDENT.

On July first, Captain J. H. Rough, was appointed Assistant Superintendent of the Company.

His principal duties are to keep in close touch with the underground operations, and his wide experience in mining eminently fits him for this position.

I wish to place on record my appreciation of the work of the Heads of the different Departments, who have at all times most heartily and loyally cooperated with me in securing the best results from the different properties under their charge.

I beg to transmit herewith the report of our Master Mechanic on the operations of his Department, for the past year.

Respectfully submitted,

M. M. Duncan Agent.


2

THE CLEVELAND-CLIFFS IRON CO.

MISCELLANEOUS DATA

PIONEER FURNACE DEPARTMENT:

1 Comparative Statement of Pig Iron Costs
2 " " " Bessemer Pig Iron Cost
3 " " " Non-Bessemer Pig Iron Cost
4 Refined Alcohol Cost Sheet, Plant No.1
5 Crude " " " " " "
6 Refined " " " " " 2
7 Comparative Statement of Acetate Plant No. 1
8 " " " " " " 2
9 Improvement & New Construction
10 Comparative Tax Statement
11 Loading & Hauling Matthews Wood
12 " " " Parsons "
13 " " " Limestone "
14 Operating Portable Railway
15 Statement of Legal Expenses
16 " " Furnace General Expense
17 Comparative Wood Report
18 Weekly Pig Iron Stock Report, Nov. 30th, 1903
19 Stock Report " " "
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21 List of Unpaid Vouchers
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23 Charges to Rented Houses & Rents Received
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69 " " " " Time Lost By Holidays
70 " " " " All Mines
71 " " " " Summary Showing Product Lost
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73 " " " " Cost Repairing Damage to Machinery & Plant
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84 Nationalties at Different Mines

MISCELLANEOUS:

BOX 2-27 ~~88~~ Copies of Reports Furnished Government

~~91~~ Report of Hoyt, Dustin & Kelley on Various Lawsuits Pending

" 2-27 92 Beach Iron Annual Report Furn. Secretary of State of Michigan

" " " 93 Poor's Manual of Railroads, Annual Report, All R.R.'s

" " " 94 C.C.I.Co. Annual Report Furn. Secretary of State of Michigan

" " " 95 Data relative to " " " " " " " " C.C.I.Co. & M.P.L. Co.

" " " 96 M.P.L. Co. Annual " " " " " " "

STOCK USED

1903

Ore	Tons	Price	Amount	Cost Per Ton	Percent of Ore used
Lake	48544-0918	2.894	140508.97	3.614	67.0
Salisbury	4163-1776	2.962	12335.26	.317	5.7
Cliffs Shaft	6490-1595	3.854	25011.01	.644	8.9
Bedford	7489-0580	2.688	20142.18	.518	10.3
Foster	720-1150	1.843	1327.23	.034	1.0
Lake Bess. Sil.	3098-0118	1.536	4759.95	.122	4.3
Verona	202-0150	2.071	418.46	.011	.3
Pewabic	1812-1773	5.566	10085.03	.260	2.5
Wood			142.77	.004	
Debit acct. year's analysis of ore			1127.99	.029	
			215858.85	5.553	
Credit acct. year's analysis of ore			399.06	.010	
Total	72521-1340	2.970	215459.79	5.543	100.0
Limestone	3198-0910	.903	2890.11	.074	
	Bushels				
Charcoal	3364675	.0737	247931.23	6.377	

STOCK USED

1902

Ore	Tons	Price	Amount	Cost Per ton	Percent of Ore Used
Lake	47626-1669	2.516	119867.24	3.038	63.8
Salisbury	14782-1037	2.544	37611.96	.957	19.8
Foster	4797-0254	1.898	9100.86	.232	6.4
Cliffs Shaft	5442-1384	3.257	17729.99	.459	7.3
Volunteer	68-1980	2.761	190.26	.005	.1
Bedford	213-0580	2.640	562.43	.015	.3
Lake Bessemer	856-0960	3.655	3129.51	.080	1.1
Pewabic	757-1390	4.024	3048.92	.078	1.0
Tilden Silica	101-1660	1.171	119.27	.003	.2
Scrap Iron			46.08	.001	
Wood			275.72	.007	
Debit acct. year's analysis of ore			2046.91	.052	
	74646-1954	2.589	193729.15	4.927	100.0
Credit acct. year's analysis of ore			420.14	.011	
Total	74646-1954	2.589	193309.01	4.916	100.0
Limestone	4306-1300	.900	3875.17	.099	
	Bushels				
Charcoal	3397613	.0696	236817.33	6.022	

The Cleveland-Cliffs Iron Co.
PIONEER FURNACE No. 1

Comparative Statement of Pig Iron Cost Sheets for 1902 [redacted]

Tons Made Blast No 2 : 161864	Iron Made in 1903 38875 tons — Labor	Supplies	Total	Cost per ton	Iron Made in 1902 29198 tons — Labor	Supplies	Total	Cost per ton
General Expense								
Insurance		354 29	354 29	009		246 00	246 00	006
Taxes		3254 52	3254 52	084		4461 00	4461 00	113
Analysis	671 82	78 218	750 10	019	737 46	145 30	882 76	022
Salaries & other Expenses	838 230	3290 13	11672 143	300	1365 966	3189 22	16848 88	435
Total	9054 121	6977 221	16031 34	412	11397 12	8041 52	22438 64	576
Maintenance								
Tracks & yard	1735 22	1408 217	3143 139	081	✓ 257 52	7468	326 20	✓ 008
Trestles & Hock	1336 47	3239 53	4574 00	118	✓ 354 15	3256 68	679 83	✓ 017
Buildings	2421 94	3512 64	5933 58	153	✓ 537 58	686 64	1224 22	✓ 031
Machinery	660 48	607 06	1267 54	032	✓ 563 95	527 84	1091 79	✓ 027
Tuyeres	48 87	646 61	695 48	018	✓ 96 23	545 72	641 95	✓ 016
Relinings & Renewals		3890 20	3890 20	100	✓	3932 50	3932 50	✓ 100
Water Supply	51 17	85 56	136 73	004	✓ 27 45	12 96	40 41	✓ 001
Pig Iron Trucks, Coal & Ore Buggies	279 03	101 21	380 24	009	✓ 449 54	78 87	528 41	✓ 016
Stack	28 54	18 88	47 42	001	✓ 31 29	90	32 19	001
Stoves	1217 64	58 72	1863 6	005	✓ 96 23	196 81	293 04	✓ 007
Cleaning W/s.	177 216	16 00	193 216	005	✓ 49 69	2 78	52 47	001
Total	6869 62	13582 68	20452 30	526	2457 63	6385 38	8843 01	225
Operating								
Machinery	2364 85	724 39	3089 24	079	2303 58	589 39	2892 97	074
Electric Light	244 30	169 25	413 55	011	242 56	54 56	297 12	008
Bottom Fillers	8729 216	135 91	8865 17	228	7673 94	81 01	7754 95	198
Top Fillers	2612 67	13 98	2626 65	068	2530 50	9 27	2539 77	065
Handling Iron	540 145	57	5408 02	139	5205 73	11 40	5217 13	132
Handling Cinder	2848 27	200 98	3049 25	079	2812 83	271 00	3083 83	078
Weighing & Grading Iron	654 60		654 60	016	638 75		638 75	016
Founders, Keepers & Helpers	9653 247	1500	9668 247	249	9242 51		9242 51	235
Coal Pitchers	9401 03	156 47	9557 50	246	9082 62	72 00	9154 62	232
Casting Tools	201 19	2780 1	4792 0	012	2279 1	2618 5	4897 6	012
Sand & Clay	903 80	1032 50	1936 30	050	741 27	1080 52	1821 79	047
Filtering	4 00	471 55	475 55	012	11 81	497 97	509 78	014
Wood	48 022	278 50	326 522	008	23 56	43 64	67 20	000
Cleaning Stoves	346 16	281 06	627 221	017	309 83	203 60	513 43	013
Total	43418 86	3758 17	47177 03	1214	41047 40	3176 21	44223 61	1124
Stock Used								
Ore		215459 79	215459 79	5543	14 28	193294 73	193309 01	4916
Charcoal		247931 23	247931 23	6377		236817 33	236817 33	6022
Limestone		2890 11	2890 11	074		3875 17	3875 17	099
Total		466281 13	466281 13	11994	14 28	433987 23	434001 51	11037
Cost of Production	59342 60	490599 20	549941 80	14146	57916 43	451590 34	509506 77	12962
Depreciation								
Construction Acct.		19451 00	19451 00	500		2 50	19712 50	500
Improvement "		2849 25	2849 25	073		5532 78	5532 78	140
Total		22300 25	22300 25	573		25245 28	25245 28	640
Credits		887 85	887 85	023		671 27	671 27	017
Total		21412 40	21412 40	550		24573 01	24573 01	623
Total Cost on Yard	59342 60	512011 60	571354 20	14696	57916 43	476164 35	534080 78	13585
Loading & Switching	1903	1902						
Loading Cars, Tons	26922½	28789	1461 66	1536 66	1615 32	060	1743 39	1743 39	060
Switching "	26922½	28789	173 15	181 84	354 99	013	209 76	126 22	335 98	012
Total Loading Cars			1634 81	3355 50	1970 31	073	1953 15	126 22	2079 37	072
Loading Vessels, Tons	6337	11537	57 621	769 82	827 443	131	285 42	1272 78	1558 20	135
Grand Total			61035 03	513116 92	574151 95	14769	60155 00	477563 35	537718 35	13717
Construction Acct. not sunk off				34256 41				59007 27		
Improvement " " " "				3515 03				3259 09		
Cost per ton for Labor					1570					529
Summary of Cost per ton	On Yard	On Cars	On Vessel		On Yard	On Cars	On Vessel	
Cost on yard as above	14 696	14 696	14 696		13 585	13 585	13 585	
Cost to load		073	131	Vicinity		073	135	Vicinity
Total	14 696	14 769	14 827	Ore 536	13 385	13 657	13 720	Ore 525
Commissions & Expenses, Cleveland Office.	350	350	350	Coal 863	350	350	350	Coal 863
Total Cost	15 046	15 119	15 177	Flux 184	13 935	14 007	14 070	Flux 245

The Cleveland-Cliffs Iron Co.,
PIONEER FURNACE No. 1

Comparative Statement

of

Pig Iron Cost Sheets
1902 and 1903

S T O C K U S E D
1 9 0 2

Ore	Tons	Price	Amount	Cost Per Ton	Percent of Ore Used
Lake Bessemer	856-0960	3.655	3129.51	3.379	49.9
Pewabic	757-1390	4.024	3048.92	3.292	44.2
Tilden Silica	101-1660	1.171	119.27	.129	05.9
Total	1715.1770	3.670	6297.70	6.800	100.0
Limestone	137-1810	.901	124.22	.134	
	Bushels				
Charcoal	83586	.0702	5764.96	6.226	

STOCK USED

1903

Ore	Tons	Price	Amount	Cost Per Ton	Percent of Ore used
Pewabic	1812-1773	5.563	10085.03	9.053	.90
Verona	202-0150	2.070	418.46	.376	.10
Total	2014-1923	5.213	10503.49	9.429	1.00
Limestone	77-1000	.$00	69.75	.062	
	Bushels				
Charcoal	102600	.068	6976.80	6.263	

The Cleveland-Cliffs Iron Co.,
PIONEER FURNACE No. 1

Comparative Statement of Bessemer Pig Iron Cost Sheets for 1902 and 1903

	Iron Made in 1903 — 1111 Tons						Iron Made in 1902 — 926 Tons					
	Labor	Supplies	Total	Cost per ton			Labor	Supplies	Total	Cost per ton		
General Expense												
Insurance		9 35	9 35		008			6 83	6 83		007	
Taxes		78 60	78 60		070			67 10	67 10		073	
Analysis	22 40	3 34	25 74		024		21 49	3 24	24 73		027	
Salaries and other Expenses	352 12	142 70	494 82		444		404 38	75 16	479 54		517	
Total	374 52	233 99	608 91		546		426 87	152 33	579 20		624	
Maintenance												
Tracks and Yard	3 99	1 76	5 75		005		5 50	2 28	7 78		008	
Trestles and Dock	86	1 10	1 96		001		1 01	61	1 62		002	
Buildings	6 94	14 95	21 89		020		22 23	16 81	39 04		042	
Machinery	17 88	36 67	54 55		050		17 49	16 68	34 17		036	
Tuyeres	1 77	2 32	4 09		004		1 15	1 31	2 46		003	
Retorts and Generators		111 40	111 40		100			92 20	92 20		100	
Water Supply							2 63	51	3 14		003	
Pig Iron Trucks, Coal and Ore Buggies	3 23	1 08	4 31		004		2 25	1 13	3 38		004	
Stock							31 29	1 10	32 19		035	
Stoves	8 75	1 80	10 55		009		1 05	11 50	12 55		013	
Cleaning up							7 09	50	7 59		008	
Total	42 42	171 08	213 50		192		90 69	149 43	240 12		260	
Operating												
Machinery	60 96	18 32	79 28		071		60 40	6 57	66 97		072	
Electric Light	8 25	3 01	11 26		010		6 70	1 73	8 43		009	
Bottom Fillers	266 23	3 38	269 61		242		208 20	2 94	211 14		228	
Top Fillers	82 84	02	82 86		074		70 10	18	70 28		076	
Handling Iron	139 55		139 55		125		130 58	28	130 86		141	
Handling Cinder	87 21	5 93	93 14		085		75 72	15 78	91 50		099	
Weighing and Grading Iron	21 06	3 06	24 12		019		14 52	3 30	17 82		019	
Founders, Hookers and Helpers	311 22		311 22		279		265 35		265 35		287	
Coal Hoisters	319 41	7 96	326 47		292		257 81	3 73	261 54		282	
Casting Tools	4 25	7 87	12 12		011		3 96	10 86	14 82		016	
Sand and Clay	24 64	30 42	55 99		049		22 05	34 85	56 90		061	
Pitting		15 01	15 01		014			16 22	16 22		018	
Wood	3 16	16 38	19 54		018		3 98	23 38	27 36		030	
Cleaning Stoves												
Total	1337 01	107 20	1444 21		1294		1110 24	111 52	1221 76		1320	
Stock Used												
Ore		10303 49	10303 49		9429			6297 70	6297 70		6800	
Charcoal		6976 80	6976 80		6263			5764 96	5764 96		6226	
Limestone		69 75	69 75		062			124 22	124 22		134	
Total		17550 04	17550 04	15	754			12186 88	12186 88	13	160	
Cost of Production	1760 85	18059 91	19820 76	17	792		1626 37	12591 48	14218 03	15	354	
Depreciation												
Construction Acct.		357 00	357 00		500			463 00	463 00		500	
Improvement "								19 14	19 14		021	
Total												
Credits												
Total		357 00	357 00		500			482 14	482 14		521	
Total Cost on Yard	1760 85	18616 91	20377 76	18	292		1626 37	13073 62	14700 14	15	875	
Loading and Switching	1903 / 1902											
Loading Cars, Tons	1111											
Switching " "												
Loading Cars	66 84		66 84		060							
Switching "	6 58	6 90	13 48		013							
Total Loading Cars	73 42	6 90	80 32		073							
Loading Vessels, Tons 1140							15 62	104 70	120 32		128	
Grand Total	1834 27	18633 81	20457 88	18	363		1642 99	13178 30	14820 29	16	003	
Construction Acct. not sunk off												
Improvement " " " "												
Cost per ton for Labor				1	580						1	774
Summary of Cost per ton	On Yard	On Cars	On Vessel				On Yard	On Cars	On Vessel			
Cost on Yard as above	18 292	18 292	18 292				15 875	16 875	18 875			
Cost to Load " "		073		Yard						128	Yard	
Total	18 292	18 365	18 292	Ore	15	32	15 875	16 003	16 003	Ore	15	32
Commissions and Expenses, Cleveland Office	350	350	350	Coal	2	92	350	350	350	Coal	2	90
Total Cost	18 642	18 715	18 642	Flux	1	14	16 225	16 353	16 353	Flux	1	33

STOCK USED

1902

Ore	Tons	Price	Amount	Cost Per Ton	Percent of ore used
Lake	47626-1669	2.516	119867.24	3.122	65.3
Salisbury	14782-1037	2.544	37611.96	.980	20.3
Foster	4797-0254	1.898	9100.86	.237	6.5
Cliffs Shaft	5442-1384	3.257	17729.99	.462	7.5
Volunteer	68-1980	2.761	190.26	.005	.1
Bedford	213-0580	2.640	562.43	.014	.3
Scrap Iron			46.08	.001	
Wood			275.72	.007	
Debit acct. year's analysis of Ore			2046.91	.053	
			187431.45	4.881	
Credit acct. year's analysis of ore			420.14	.006	
Total	72931-0184	2.570	187011.31	4.875	100.0
Limestone	4168-1730	.900	3750.95	.098	
	Bushels				
Charcoal	3314027	.0697	231052.37	6.017	

STOCK USED

1903

Ore	Tons	Price	Amount	Cost Per Ton	Percent of ore used
Lake	48544-0918	2.894	140508.97	3.721	68.9
Salisbury	4163-1776	2.962	12335.26	.327	5.9
Cliffs Shaft	6490-1595	3.854	25011.01	.663	9.2
Bedford	7489-0580	2.688	20142.18	.534	10.6
Foster	720-1150	1.843	1327.23	.035	1.0
Lake Bess. Sil.	3098-0118	1.536	4759.95	.126	4.4
Wood			142.77	.004	
Debit Acct Year's analysis of ore			1127.99	.028	
			205355.36	5.438	
Credit acct. Year's analysis of ore			399.06	.010	
Total	70506-1657	2.907	204956.30	5.428	100.0
Limestone	3L20-2150	.900	2820.36	.075	
	Bushels				
Charcoal	3262075	.0738	240954.43	6.381	

The Cleveland-Cliffs Iron Co.
PIONEER FURNACE No. 1

Comparative Statement of Non-Bessemer Pig Iron Cost Sheets for 1902 & 1903

	Iron Made in 1903 347761 Tons						Iron Made in 1902 382772 Tons					
	Labor		Supplies		Total	Cost per ton	Labor		Supplies		Total	Cost per ton
General Expense												
Insurance			344 94		344 94	001			239 17		239 17	006
Taxes			3176 52		3176 52	009			4393 90		4393 90	114
Analyses	643 42		71 94		715 36	002	715 94		142 09		858 03	022
Salaries & other Expenses	8028 18		3143 43		11171 61	032	13255 51		3113 06		16368 57	1127
Total	8676 60		6745 83		15422 43	044	13971 45		7889 19		21860 64	569
Maintenance												
Tracks & Yard	1731 23		1406 51		3137 74	009	246 02		74 40		320 42	008
Trestles & Dock	1335 61		3236 43		4572 04	013	353 14		325 07		678 21	018
Buildings	2418 00		3497 69		5915 69	017	515 35		669 83		1185 18	030
Machinery	602 68		570 39		1212 94	003	546 46		512 26		1058 72	028
Tuyeres	47 10		600 29		647 39	002	93 08		544 41		637 49	017
Relinings & Renewals			3778 80		3778 80	011			3839 90		3839 90	100
Water Supply	81 17		55 56		136 73	000	24 82		12 45		37 27	001
Pig Iron Trucks, Coal & Ore Buggies	273 80		100 13		373 93	001	444 29		78 74		526 03	014
Rack	25 54		18 88		44 42	000						
Stoves	118 89		56 92		175 81	000	90 18		185 31		281 49	007
Cleaning up	177 26		16 00		193 26	000	42 60		2 28		44 88	001
Total	6824 20		13411 60		20235 80	058	2306 94		6244 65		8011 59	224
Operating												
Machinery	2294 89		706 07		3000 96	009	2243 18		582 82		2826 00	074
Electric Light	236 65		166 24		402 89	001	235 86		52 83		288 69	008
Bottom Fillers	8463 03		132 53		8595 56	025	7469 74		78 07		7547 81	197
Top Fillers	2529 83		13 96		2543 79	007	2466 45		9 09		2475 49	064
Handling Iron	5267 90		57		5268 47	015	5075 18		11 12		5086 30	132
Handling Cinder	2760 86		195 25		2956 11	008	2737 11		255 22		2992 33	078
Weighing & Grading Iron	633 54				633 54	001	621 23				621 23	016
Founders, Keepers & Helpers	9342 05		15 00		9357 05	026	8984 96				8984 96	234
Cast Fixers	9081 62		149 41		9231 03	026	8825 11		68 27		8893 38	231
Casting Tools	196 94		270 14		467 08	001	223 95		250 99		474 94	012
Sand & Clay	879 23		1002 08		1881 31	005	719 22		1050 67		1769 89	046
Filtering	4 00		456 54		460 54	001	11 81		481 75		493 56	013
Wood	44 86		262 12		306 98	001	19 58		20 26		39 84	001
Cleaning Stoves	346 15		281 06		627 21	002	309 33		203 60		513 43	014
Total	42080 95		3650 91		115731 92	331	39931 16		30644 69		113001 85	1126
Stock Used												
Ore			204956 30		204956 30	5 428			141 28		186997 03	187011 31	4 870
Charcoal			240954 43		240954 43	6 381					231052 37	231052 37	6 017
Limestone			28203 6		28203 6	075					3750 95	3750 95	098
Total			474873 09		474873 09	11 884			141 28		421800 35	421814 63	10 985
Cost of Production	57681 98		467539 49		530121 24	14 039	56289 86		463098 88		519388 74	12 898
Depreciation												
Construction Acct.			18894 00		18894 60	500					19249 50	19249 50	500
Improvement "			2849 25		2849 25	075					5513 64	5513 64	144
Total			21743 25		21743 25	575					24763 14	24763 14	644
Credits			887 85		887 85	023					671 27	671 27	017
Total			20855 40		20855 40	552					24091 87	24091 87	627
Total Coston Yard	57681 98		446339 89		550976 64	14 591	56289 86		463098 75		519388 61	13 525
Loading & Switching	1903		1902									
Loading Cars, Tons	25808		28789									
Switching "	"		"									
Loading Cars	1361 39		528 60		1889 99	013	1953 15		126 22		2079 37	071
Loading Vessels, Tons	6337		10597									
	5462		764 82		5227 44	131	269 80		1168 08		1437 88	136
Grand Total	50200 46		448443 31		538644 07	14 663	58512 81		464385 05		522897 86	13 663
Construction Acct. not sunk off					34256 41						59007 27	
Improvement " " "					3515 03						3259 09	
Cost per ton for Labor						1 567						1 523
Summary of Cost per ton	On Yard		On Cars		On Vessel		On Yard		On Cars		On Vessel	
Cost on yard as above	14 591		14 591		14 591		13 525		13 525		13 525	
Cost to Load " "			073		131	Yield			011		136	Yield
Total	14 591		14 664		14 722	Ore 538	13 525		13 536		13 661	Ore 526
Commissions & Expenses, Cleveland Office	350		350		350	Coal 863	350		350		350	Coal 863
Total Cost	14 941		15 014		15 072	Flux 185	13 875		13 886		14 011	Flux 243

Form 23. 200. 6/02.

THE CLEVELAND-CLIFFS IRON CO.

PIONEER FURNACE.

Refined Alcohol Cost Sheet.

PLANT NO. 1 Month of Year · 1903

Gallons Produced, 1 Month, ...

Gallons Produced, ... Months 2250521 ✓

		LABOR	SUPPLIES	TOTAL	COST PER GALLON 1 Mo.	..... Mos.
GENERAL EXPENSES						
Office Expense		150060	147918	197978		008
Fire Insurance			495000	495000		022
Analysis		62368	6773	69141		003
Taxes			55000	55000		003
MAINTENANCE	Total	212428	604691	817119		036
Tanks and Stills		84265	118014	202279		009
Condensers		17663	129648	147311		007
Machinery		18883	19081	37964		002
Boilers		20350	39559	59909		003
Fans and Pulleys		12097	31550	43647		002
Smoke Mains		50233	323124	373357		017
Buildings		58724	23836	82560		003
Water Supply		2195	7639	9834		000
Ditch						
Cleaning Up		22161	646	22807		001
	Total	286591	693097	979668		044
OPERATING						
Superintendent		68750		68750		003
Stillmen		53606		53606		024
Engineers		141253	25	141278		007
Firemen		237586	49	237635		010
Machinery			21031	21031		001
Boilers		29011	29159	58170		002
Fuel	✓	1046263	058180	3162806		140
Electric Light		21588	14124	35712		002
Lime		13204	626000	639204		028
Chemicals			54680	54680		002
Hose		638	40151	40789		002
	Total	1147262	381339	1490661		221
Cost of Production		1614261	5141876	7856448		349
DEPRECIATION						
Construction Account			147780	147780		019
Improvement Account			1283326	1283326		057
	Total		1701106	1701106		076
Total Cost		1614261	6842938	8488554		377
LOADING AND SWITCHING						
Barrels 13573 Gals.			675250	675250		030
Loading 221610 "		10325		10325		000
Switching "		1092	1152	2244		000
	Total	11417	676402	687819		030
Total Cost on Cars 1 Month						
Cost per Gallon 1 "						
Total Cost on Cars ..... Months	✓	1657678	7518695	9176373		
Cost per Gallon ..... "						407

Construction Account not sunk off 949456

Improvement " " " " 801548

Smoke Rec'd from ..... Cords, 1 Mo.

" " " ..... Mos.

Yield of Alcohol per Cord of Wood

" Pyroligneous Acid per Cord of wood

Average cost per gallon, plants No. 1 and 2.

Impossible to determine yield for year, account allowing smoke to escape in air while Plant was not ready to receive it

Form 23. 20. 6.02.

THE CLEVELAND-CLIFFS IRON CO.

PIONEER FURNACE.

Crude / ~~Refined~~ Alcohol Cost Sheet.

PLANT NO. 1 Month of Year 1903

Gallons Produced, 1 Month, ...

Gallons Produced, 1 Months 23987

	LABOR	SUPPLIES	TOTAL	Cost Per Gallon 1 Mo.	Cost Per Gallon 1 Mos.
General Expenses					
Office Expense	111 74	221 78	333 52		014
Fire Insurance		457 50	457 50		019
Analysis	48 12	10 54	58 66		002
Taxes		263 63	263 63		011
Maintenance Total	159 86	953 45	1113 31		046
Tanks and Stills	39 42	39 19	78 61		003
Condensers					
Machinery	12 22	55 57	67 79		002
Boilers	68 00	16 95	84 95		004
Fans and Pulleys	46 18	11 30	57 48		002
Smoke Mains	128 84	73 90	202 74		010
Buildings	13 68	2 19	15 87		000
Water Supply					
Ditch					
Cleaning Up	2 10		2 10		000
Total	310 44	199 10	509 54		021
Operating					
Superintendent	62 50		62 50		003
Stillmen	507 09	5 00	512 09		022
Engineers	128 94		128 94		005
Firemen	185 15	3 75	188 90		008
Machinery		11 42	11 42		000
Boilers	19 24	17 60	36 84		002
Fuel	822 7	2220 43	2302 70		096
Electric Light	23 99	11 02	35 01		001
Lime	11 74	336 00	347 74		015
Chemicals		37 20	37 20		002
Total	1020 92	2642 42	3663 34		154
Cost of Production	1491 22	3794 97	5286 19		221
Depreciation					
Construction Account		379 80	379 80		015
Improvement Account		116 66	116 66		048
		1346 46	1346 46		063
Over-run Chem. Supplies		160 13	160 13		006
Total		1386 33	1386 33		057
Total Cost	1491 22	5181 30	6672 52		278
Loading and Switching					
Barrels 214374 Gals.		630 70	630 70		026
Loading " "	10 40		10 40		000
Switching " "	1 09	1 06	2 15		000
Total	11 49	631 76	643 25		026
Total Cost on Cars 1 Month					
Cost per Gallon 1 "					
Total Cost on Cars 1 Months	1502 71	5813 06	7315 77		
Cost per Gallon 1 "					305
Construction Account not sunk off			911 76		
Improvement " " " "			807 28 82		
Smoke Rec'd from ..... Cords, 1 Mo.					
" " " ..... " Mos.					
Yield of Alcohol per Cord of Wood					406
" Pyroligneous Acid per Cord of wood					
Average cost per gallon, plants No. 1 and 2.					

Plant No. 2

The Cleveland-Cliffs Iron Co.,
PIONEER FURNACE No. 1

Comparative Statement of Refined Alcohol Cost Sheets for 1902 & 1903.

	Gallons Produced year 1903 66588				Gallons Produced year 1902 104542			
	Labor	Supplies	Total	Cost per gal.	Labor	Supplies	Total	Cost per gal.
General Expense								
Office Expense	1612 34	663 27	2275 61	034		32 26	32 26	000
Fire Insurance		2250 00	2250 00	034		1375 20	1375 20	013
Analysis	671 78	78 26	750 04	011	737 46	145 31	882 77	009
Taxes		813 63	813 63	012		1116 27	1116 27	011
Total	2284 12	3805 16	6089 28	091	737 46	2669 04	3406 50	033
Maintenance								
Tanks & Stills	290 45	1238 98	1529 43	023	376 01	1434 29	810 30	008
Condensers					15 12	32	15 44	000
Machinery	24 40	58 80	83 20	001	29 99	19 15	49 14	000
Boilers	196 31	402 26	598 57	009	68 50	127 41	195 91	002
Gas Mains	213 78	436 28	650 06	010				
Buildings	31 09	7 70	38 79	000	33 91	103 01	136 92	001
Ditch	100 14	12	100 26	002	58 75		58 75	001
Cleaning up	4 67	26	4 93	000	13 20	60	13 80	000
Total	860 84	2144 40	3005 24	045	595 48	684 78	1280 26	012
Operating								
Superintendent	750 00		750 00	011	750 00		750 00	007
Stillmen	2942 51	5 00	2947 51	044	3798 33	2 98	3801 31	036
Engineers	914 05		914 05	014	924 92		924 92	009
Firemen	612 75	3 57	616 32	010	898 25		898 25	009
Machinery		159 04	159 04	002		142 61	142 61	002
Boilers	96 65	159 67	256 32	004	127 43	73 18	200 61	001
Fuel	367 86	5333 01	5700 87	086	496 25	4800 34	5296 59	046
Electric Light	243 45	109 35	352 80	005	242 56	54 56	297 12	003
Lime	5 00	2697 00	2702 00	041		6090 38	6090 38	058
Chemicals		359 90	359 90	005		538 80	538 80	005
Hose	6 74	4 49	7 23	000	1 16	280 96	282 12	003
Total	5939 01	18827 03	24766 04	372	7238 90	21983 81	29222 71	279
Cost of Production	9083 97	24776 59	33860 56	508	8571 81	25337 63	33909 44	324
Depreciation								
Construction Acct.		5834 88	5834 88	087		5834 88	5834 88	056
Improvement "		319 00	319 00	005		212 73	212 73	002
Total		6153 88	6153 88	092		6047 61	6047 61	058
Overrun Supply Acct.		160 12	160 12	002		75 11	75 11	001
Total		5993 76	5993 76	090		5972 50	5972 50	057
Total Cost	9083 97	30770 35	39854 32	598	8571 81	31310 13	39881 94	381
Loading & Switching	1903 / 1902							
Barrels, gals.	65219 / 113353 1/2							
Barrels, gals.		1554 95	1554 95	030		3471 95	3471 95	030
Loading "	31 47		31 47	000	66 05		66 05	000
Switching "	364	360	724	000	6 85	3 51	10 36	000
Total	35 11	1558 55	1593 66	030	72 90	3475 46	3548 36	030
Total cost on cars for year	9119 08	32328 90	41447 98		8644 71	34785 59	43430 33	
Cost per gallon " "				622				411
Smoke Recd from 8872 Cds. 1903								
" " " 12937 " 1902								
Yield of Alcohol per cord of Wood				751				808
Construction Acct. not sunk off			46068 46				51903 34	
Improvement " " " "			100				319 00	

Plant No. 1

The Cleveland-Cliffs Iron Co.,
PIONEER FURNACE No. 1

Comparative Statement of Gray Acetate of Lime Cost Sheets for 1902 & 1903.

	Production for 1903 2022208 lbs. Average per day 5777 "							Production for 1902 1595312 lbs. Av. 4431 "						
	Labor		Supplies		Total		Cost per 100 lbs.	Labor		Supplies		Total		Cost per 100 lbs.
General Expense														
Office Expense	845	37	198	15	843	52	042			14	37	14	37	000
Analysis	111	96	13	06	125	02	006	123	34	23	46	146	80	009
Fire Insurance			11	00	11	00	000			12	00	12	00	001
Total	957	33	222	21	979	54	048	123	34	49	83	173	17	010
Maintenance														
Buildings	45	99	1	68	47	67	003	2	42		92	3	34	000
Tanks	14	83	48	86	63	69	003	89	90	6	91	94	81	006
Ovens								54	08	38	47	92	55	006
Dryer	15	47	6	04	21	51	001							
Generator Hay Floor	10	20		93	11	13	001							
Piping	23	97	74	46	98	43	005							
Boilers			4	67	4	67	000							
Motors	5	19		84	6	03	000							
Conveyors	9	57	13	14	22	71	001							
Total	125	22	150	62	275	84	014	144	40	46	30	190	70	012
Operating														
Raking	742	82		15	742	97	037	1827	41	7	90	835	31	053
Skimming	1250	17	7	48	1257	65	062	1681	88			1681	88	106
Firemen	622	23	1	25	623	48	031	176	00			176	00	005
Fuel	214	77	7176	49	7391	26	365	1 56	66	808	88	865	54	054
Electric Light	39	62	35	94	75	56	004	40	45	9	14	49	59	003
Total	2869	61	7221	31	10090	92	499	2682	40	825	92	3508	32	221
Cost of Production	3752	16	7594	14	11346	30	561	2950	14	922	05	3872	19	243
Depreciation														
New Construction Acct.										627	94	627	94	039
Improvement "			1500	00	1500	00	074			728	80	728	80	045
Total			1500	00	1500	00	074			1356	74	1356	74	084
Total Cost	3752	16	9094	14	12846	30	635	2950	14	2278	79	5228	93	327
Loading & Switching														
	1903	1902												
Sacks	2022208	1595312	1	66	719	55	721	21	036			674	23	674	23	042
Loading	2022208	1653612	74	14			74	14	004	88	60			88	60	005
Switching	2022208	1653612	8	53	8	78	17	31	001	7	18	4	22	11	40	000
Storing	412095	1595312	231	44	24	70	256	14	015	311	38	23	43	334	81	021
Total	315	77	753	03	1068	80	053	407	16	701	88	1109	04	068		
Total Cost on Cars	4067	93	9847	17	13915	10	688	3357	30	2980	67	6337	97	395		
Improvement Acct. not sunk off												5838	30			

Impossible to determine yield on account of allowing smoke to escape in air part of season.

Plant No. 2

The Cleveland-Cliffs Iron Co.,
PIONEER FURNACE No. 1

Comparative Statement of Gray Acetate of Lime Cost Sheets for 1902 and 1903.

	Production for 1903 1061433 lbs. Average per day 4005 "						Production for 1902 1689311 lbs. Average per day 4693 "					
	Labor	Supplies	Total	Cost per 100 lbs.			Labor	Supplies	Total	Cost per 100 lbs.		
General Expense												
Office Expense	645 37	193 53	838 90	079				14 43	14 43	001		
Analysis	111 94	13 06	125 00	012			123 28	23 46	146 74	009		
Total	757 31	206 59	963 90	091			123 28	37 89	161 17	010		
Maintenance												
Building	26 83	28 00	54 83	005				44 55	44 55	003		
Tanks	76 60	45 12	121 72	012			70 91	16 93	87 84	005		
Ovens	2 12	30	2 42	000			30 00	19 60	49 60	003		
Dry Floor	74 81	25 04	99 85	010								
Piping	10 44	14 84	25 28	002			2 40	29	2 69	000		
Boilers New Power	62 78	81 68	144 46	014			7 18	41 16	48 34	003		
Pumps Tanks 5	4 27	43	4 70	000			1 836	36 64	55 00	003		
Total	257 85	195 41	453 26	043			128 85	159 17	288 02	017		
Operating												
Raking	702 12	4 30	706 42	067	✓		778 25	16 05	794 30	047	✓	
Skimming	1195 85	22	1196 07	112	✓		1649 19	1 78	1650 97	097	✓	
Engineers	456 61		456 61	043	✓		462 13		462 13	027	✓	
Firemen	304 26	167	305 93	028	✓		449 14		449 14	026	✓	
Fuel	181 41	6672 28	6853 69	645	✓		2436 66	7331 72	75768 38	448	✓	
Electric Light	39 58	19 13	58 71	006	✓		40 53	9 10	49 63	003	✓	
Boilers Power	9 12	8 23	17 35	002	✓		32 87	20 00	52 87	004	✓	
Pumps Tanks 5		9 00	9 00	001	✓			21 49	21 49	000	✓	
Total	2888 95	6714 83	9603 78	904	✓		3655 77	7400 14	11055 91	652	✓	
Cost of Production	3904 11	7116 83	11020 94	1038			3907 90	7597 20	11505 10	679		
Depreciation												
New Construction Acct.		741 00	741 00	070				741 00	741 00	044		
Improvement "								106 30	106 30	006		
Total		741 00	741 00	070				847 30	847 30	050		
Total Cost	3904 11	7857 83	11761 94	1108			3907 90	8444 50	12352 40	729		
Loading & Switching												
	1903	1902										
Sacks	1061433	1689311		527 79	527 79	050		858 16	858 16	051		
Loading	1068849	1796957	64 87		64 87	006	107 75	2 95	110 50	006		
Switching	1068849	1796957	5 43	5 28	10 71	001	8 84	5 38	14 22	002		
Storing												
Total	70 30	533 07	603 37	057			116 59	866 29	982 88	059		
Total Cost on Cars	3974 41	8390 90	12365 31	1165			4024 49	9310 79	13335 28	788		
Construction Acct. not sunk off	37 41		000				938		000			
Improvement " " " "			6049 15						6790 15			
Yield per Cord of Wood				120						132		

THE CLEVELAND-CLIFFS IRON CO. FURNACE DEPARTMENT

STATEMENT OF NEW CONSTRUCTION AND IMPROVEMENT FOR THE ~~MONTH OF~~ YEAR 1903.

Auth. No.	DESCRIPTION	Amount Authorized	Cost to End of Last Fiscal Year	Cost for Current Year ~~to End of Last Month~~	Cost for Current Month	Total Cost to Date	Unexpended Balance	CHARGED OFF: To End of Last Fiscal Year	CHARGED OFF: During Current Year ~~to End of Last Month~~	CHARGED OFF: During Current Month	CHARGED OFF: Total to Date	Balance to Charge Off
	Furnace		200119 77			200119 77		141112 50	24750 86		165863 36	34256 41
67	New Cast House Walls	3222 53		1594 16		1594 16	1628 37		1594 16		1594 16	0 00
	Chemical Plant No. 1		71279 63			71279 63		57607 27	4557 60		62164 87	9114 76
54	Enlarging Chemical P. #1		68840 66	28046 45		96887 11			16158 29		16158 29	80728 82
	Kilns		25047 79			25047 79		13743 22	6566 10		20309 32	4738 47
K	10 - 60 Cord Kilns	6845 30	6026 90			6026 90	818 40					6026 90
53	20 - 80 Cord Kilns	23509 22	22659 23	242 66		22901 89	607 33					22901 89
	Experimental Kiln & Ret't		1108 24			1108 24						1108 24
	Rented Houses		12739 84			12739 84		10437 68	408 15		10845 83	1944 01
1	5 Double Tenement Houses	4531 10	4244 60			4244 60	286 50					4244 60
9	1 Double Tenement House	850 00	850 00			850 00		700 00			700 00	150 00
40	5 Double Tenement Houses	4657 45	4689 71			4689 71						4689 71
58	5 Double Tenement Houses	6037 40	5010 64			5010 64	1076 76					5010 64
59	Club House	3298 30	3259 00	255 94		3515 03						3515 03
	Repairs Rented Houses		5307 34	1925 87		7233 21		5307 34	1343 08		6650 42	582 79
2	Tenement House Well No. 1	547 19	547 19			547 19						547 19
43	Tenement House Well No. 2	516 65	516 65			516 65						516 65
	Clear'g. site, walks & Fenc's		495 04			495 04						495 04
	Acetate Plant No. 1		1255 04			1255 04		1255 04			1255 04	0 00
55	Rebuilding Acet. Plant #1		5838 30	7386 30		13224 60			1500 00		1500 00	11724 60
39	Retorts		58499 72			58499 72		5758 15	4938 70		10696 85	47802 87
39	Acetate Plant No. 2	111989 49	7963 40			7963 40		1173 25	741 00		1914 25	6049 15
39	Chemical Plant No. 2		61141 90			61141 90		9238 56	5834 88		15073 44	46068 46
49	Feed Water Heater C. P.#2	679 21	638 03			638 03	41 18	319 03	319 00		638 03	0 00
65	New Barn	260 74		260 74		260 74			130 37		130 37	130 37
	Math. Port. R'y. Const.		3832 17			3832 17			1693 27		1693 27	2138 90
	Portable Railway Equp't.		22246 55	213 38		22459 93		1326 97	2749 35		4076 32	18383 61
56	Mathews R'y. Main Spur	4114 93	3939 96			3939 96	174 97		2246 58		2246 58	1693 38
70	Mathews Round House	770 00	667 07			667 07	102 93		275 87		275 87	391 20
60	Mathews-Delta Railway			1422 75		1422 75						1422 75
69	Mathews-Delta Camp	1237 50		337 85		337 85						337 85
63	Parsons Spur	5912 50		4224 82		4224 82	1687 68					4224 82
68	Parsons Camp	880 00		479 15		479 15	400 85					479 15
66	Limestone Camp			588 54		588 54			116 45		116 45	472 09
	Limestone Barn	1996 77		771 07		771 07	130 54					771 07
				506 62		506 62						506 62
			598814 46	48256 30				77379 01	75923 71		323902 72	323168 04

NOTE: a. If after estimate of cost has been made it is found necessary to increase the cost, the authorization of the President must be procured to continue work under such amended estimate, and the fact of the change noted under the head of Remarks.
b. When any piece of work is completed, the fact should be noted opposite the item on this report.

THE CLEVELAND=CLIFFS IRON CO.

Pioneer Furnace No. 1

Comparative Statement of Taxes. 1902 and 1903.

	1903			1902	
	Acres	Valuation	Taxes	Valuation	Taxes
CITY OF GLADSTONE					
City Lots & Gov. Lot 3		8380 00	281 77	9560 00	339 52
Founders House		800 00	26 18	800 00	25 53
Manager's House				3000 00	95 75
Clerk's House		1050 00	34 36	1100 00	35 11
Master Mech's. House		1100 00	36 00	1080 00	65 79
Barn Boss House		550 00	18 00	600 00	19 15
Personal Property				623 00	19 89
Total		11880 00	396 31	16763 00	600 74
BRAMPTON TOWNSHIP				Masonville Tp. '02.	
Furnace Plant Real	36 1/5	180000 00	3449 35	180000 00	4805 03
Furnace Plant Personal		65000 00	1375 85	65000 00	1735 11
Limestone Quarry	40	100 00	1 92	100 00	2 67
Total	76 1/5	245100 00	4827 12		
MASONVILLE TOWNSHIP					
Section 2	480	4800 00	105 92	2880 00	76 96
" 3	640	6400 00	141 24	3840 00	102 62
" 4	640	6240 00	137 69	3840 00	102 62
" 5	640	3840 00	84 52	1600 00	42 66
" 6	320	2560 00	56 44	1360 00	36 32
" 9	640	6400 00	141 24	3840 00	102 62
" 10	640	6400 00	141 24	3840 00	102 62
" 11	160	1480 00	32 68	880 00	23 48
" 18	320	3200 00	70 62	1920 00	51 30
" 30	160	1520 00	33 49	960 00	25 65
Total	4640	42840 00	945 08	270060 00	7209 66
LIMESTONE TOWNSHIP					
Section 13	440	1100 00	56 56	1100 00	52 48
" 15	320	1120 00	57 59	1120 00	53 34
" 21	320	1120 00	57 59	1120 00	53 34
" 22	320	1120 00	57 59	1120 00	53 34
" 24	480	1680 00	86 40	1680 00	80 07
" 36	160	480 00	24 68	480 00	22 88
Total	2040	6620 00	340 41	6620 00	315 45
MATHIAS TOWNSHIP					
Section 7	160	450 00	20 56	500 00	25 11
" 18	640	2400 00	109 73	2400 00	120 46
" 28	640	2200 00	100 92	2200 00	110 40
" 29	320	800 00	36 82	1200 00	60 22
" 30	160	500 00	22 88	600 00	30 11
" 31	640	1300 00	59 56	2000 00	100 43
" 32	640	1350 00	61 83	2400 00	120 43
" 33	480	2000 00	90 58	2200 00	110 40
" 34	320	1600 00	71 14	1600 00	80 32
Personal		30375 00	1388 45	20800 00	1043 87
Total	4000	42975 00	1962 47	35900 00	1801 75

Form 72. 500. 6-03. N.

THE CLEVELAND-CLIFFS IRON CO.

PIONEER FURNACE No. 1.

Cost of Loading and Hauling Mathews **Wood,** Year **1903**

LOADED AND HAULED THIS MONTH, _____ CORDS.

LOADED AND HAULED 12 MONTHS, 48968½ CORDS.

	LABOR	SUPPLIES	TOTAL	COST PER CORD 1 Month	COST PER CORD 12 Mos.
Teaming—					
Teamsters,	11321 87	4 39	11326 26		231
Swampers,	12270 10	81 85	12351 95		252
Car Loaders,	2057 43	7 55	2064 98		042
Foreman,	606 50		606 50		013
TOTAL,	26255 90	93 79	26352 69		538
Roads—					
Making and Maintaining,	102 00		102 00		002
TOTAL,	102 00		102 00		002
Barn—					
Hay,	13 40	2720 71	2734 11		056
Oats,	12 12	2983 35	2995 47		061
Feed and Bran					
Shoeing and Shoes	500 00	78 39	578 39		012
Oil and Grease	15 00	47 00	62 00		001
Horse Medicine		81 76	81 76		002
Barn Boss,	652 19		652 19		013
TOTAL,	1192 71	5911 21	7103 92		145
Repairs—					
Wagons and Drays,	60 00	12 16	72 16		001
Sleighs,	52 00	35 03	87 03		002
Harness,	30 00	51 15	81 15		002
Buildings		350	350		000
TOTAL,	142 00	101 84	243 84		005
COST TO LOAD,	27695 61	6106 84	33802 45		690
Miscellaneous—					
Depreciation,		3081 66	3081 66		063
Moving Equipment,					
TOTAL,	27695 61	9188 50	36884 11		753
Credit		30 70	30 70		001
Total Cost on Cars 1 Month,					
Total Cost on Cars 12 Months,	27695 61	9157 80	36853 41		752

Remarks:

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Form 72, 500, 6-03. N.

THE CLEVELAND-CLIFFS IRON CO.

PIONEER FURNACE No. 1.

Cost of Loading and Hauling Parsons **Wood,** Year **1903**

LOADED AND HAULED THIS MONTH, _____ CORDS.

LOADED AND HAULED 12 MONTHS, 11142 3/8 CORDS.

	LABOR	SUPPLIES	TOTAL	COST PER CORD 1 Month	COST PER CORD 12 Mos.
Teaming—					
Teamsters,	2953 25	3 60	2956 85		265
Swampers,	137 05	1 64	137 69		123
Car Loaders,	83 46		83 46		075
Foreman,	37 75		37 75		034
TOTAL,	5541 51	5 24	5546 75		497
Roads—					
Making and Maintaining,	29 39		29 39		027
TOTAL,	29 39		29 39		027
Barn—					
Hay,		693 27	693 27		062
Oats,		804 62	804 62		072
Feed and Bran					
Shoeing and Shoes	221 00	32 96	253 96		023
Oil and Grease		19 35	19 35		002
Horse Medicine		11 75	11 75		001
Barn Boss,	178 25		178 25		016
TOTAL,	399 25	1561 95	1961 20		176
Repairs—					
Wagons and Drays,	4 60	44 05	48 65		004
Sleighs,		9 76	9 76		001
Harness,		104 57	104 57		009
		84 64	84 64		008
TOTAL,	4 60	243 02	247 62		022
COST TO LOAD,	6242 75	1810 21	8052 96		722
Miscellaneous—					
Depreciation,		662 56	662 56		060
Moving Equipment,	12 10	35 55	47 65		004
TOTAL,	12 10	698 11	710 21		064
Total Cost on Cars 1 Month,					
Total Cost on Cars 12 Months,	6254 85	2508 32	8763 17		786

Remarks:

FORM 12. SM. LIB. X

THE CLEVELAND-CLIFFS IRON CO.

PIONEER FURNACE No. 1.

Cost of Loading and Hauling Limestone **Wood,** Year **1903**

LOADED AND HAULED THIS MONTH, _____ CORDS.

LOADED AND HAULED 12 MONTHS, 44,502½ CORDS.

	LABOR	SUPPLIES	TOTAL	COST PER CORD 1 Month	COST PER CORD 12 Mos.
Teaming—					
Teamsters,	1045 52		1045 52		211
Swampers,	985 49	20 33	1005 82		203
Car Loaders,	428 72		428 72		08
Foreman,	149 10		149 10		030
TOTAL,	3608 83	20 33	2629 16		531
Roads—					
Making and Maintaining,	152 49		152 49		031
TOTAL,	152 49		152 49		031
Barn—					
Hay,		288 00	288 00		058
Oats,		355 00	355 00		072
Feed and Bran					
Shoeing and Shoes	90 00	14 02	104 02		021
Oil and Grease		6 35	6 35		001
Horse Medicine					
Barn Boss,	65 28	1 00	66 28		013
TOTAL,	155 28	664 37	819 65		165
Repairs—					
Wagons and Drays,		17 45	17 45		004
Sleighs,					
Harness,		17 85	17 85		003
TOTAL,		35 30	35 30		007
COST TO LOAD,	2916 60	720 00	3636 60		734
Miscellaneous—					
Depreciation,		269 09	269 09		055
Moving Equipment,					
TOTAL,		269 09	269 09		055
Total Cost on Cars 1 Month,					
Total Cost on Cars 12 Months,	2916 60	989 09	3905 69		789

Remarks:

Form 71. 100 9-1901. N.

THE CLEVELAND-CLIFFS IRON CO.

PIONEER FURNACE.

COST OF OPERATING PARSONS PORTABLE RY. Year 1903

Wood Hauled Mo. Cords.

Wood Hauled 12 Mos. 48968 Cords.

	Labor	Supplies	Total	Cost Per Cord Mo. / Mos.
Engine—				
Engineers,	907 77		907 77	019
Brakemen,	825 30	39 00	864 30	018
Fuel,	9 52	1754 40	1763 92	036
Repairs,	129 51	253 40	382 91	008
Oil and Waste,		51 27	51 27	001
Water Supply,		105 50	105 50	0021
Fireman	374 85		374 85	008
Total,	2246 95	2203 57	4450 52	092
Tracks—				
Making and Maintaining,	1561 29	415 91	1977 20	040
Track Foreman,	509 15		509 15	010
Team Labor,				
Total,	2070 44	415 91	2486 35	050
General Expense—				
Traveling,				
Stationery and Printing,				
Depreciation,		1958 73	1958 73	040
Expense of Wreck		56 00	56 00	001
Total		2014 73	2014 73	041
Grand Total,	4317 39	4634 21	8951 60	183
Credits		102 30	102 30	002
Total Cost on Cars One Month,				
" " " " 12 Months,	4317 39	4531 91	8849 30	181

Credit:- Work done on Math Delta Ry.

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THE CLEVELAND-CLIFFS IRON CO.,
Pioneer Furnace No. 1

Legal Expenses Year, 1903.

G. R. Empson,

Retainer from Sept. '02 to Dec. '03	125.00
As Attorney in trespass case brought by Peter Mathews, including Expenses.	58.00
Drafting deeds and bill of sale a/c sale of Manager's Residence to W. F. Hammel.	3.00
As Attorney in Alger Co. Tax Matters	15.00
Expenses to Ishpeming in connection with New Township matter	6.30
Fees and Expenses at Lansing in New Township matter	1050.00

C. B. Fuller,

Expenses at Lansing in connection with Formation of New Township	500.00

George Gallup,

Fees in connection with New Township Matters at Lansing	250.00

A. P. Smith, County Clerk,

Recording deed in sale of Manager,s Residence	2.50

W. P. Belden,

Salary & Expense a/c, June - Dec.	158.26
Total	2168.06

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THE CLEVELAND-CLIFFS IRON CO.

Pioneer Furnace No.1

Comparative Statement of Furnace General Expenses, Years 1903 and 1902.

	Charged Direct 1903	Gen'l.Office 1903	Furn.Genl.Exp. 1902
Manager		5666.64	6500.01
Bookkeeper		1275.00	1800.00
Clerk		637.50	785.00
Extra Clerks		1805.85	187.50
Stenographer		810.00	720.00
Chief Engineer		1874.99	2499.96
Barn Boss		600.00	600.00
Fire Insurance	354.29		246.00
Taxes	3254.52		4461.00
Analysis and Testing	750.10		882.76
Petty Office		89.22	10.61
Stationery & Printing	25.03	374.97	529.49
Telephones & Telegrams	3.00	401.21	414.34
Stable Expense		400.33	510.74
Exchange		116.15	109.60
Freight & Express		26.86	11.50
Traveling		495.06	195.70
Postage	25.35	164.12	175.47
Launch		225.02	848.98
Entertaining		41.48	7.75
Accident			4.30
Papers & Periodicals		14.95	29.00
Livery		147.50	88.30
Donations			496.75
Inventory		27.68	97.85
Watchman		50.47	47.53
Legal		1118.06	79.00
Political		309.75	99.50
Moving Mr. Farrell		23.52	
Manager's Man		45.00	
Cost Running Club	31.13		
New Township	700.00		
Furnace Genl. Expense 65%	5143.42	16741.33	22438.64
of Total Genl. Office	10887.92		
Total Furnace Genl. Exp.	16031.34		

In May the salaries of Manager, Bookkeeper, Chief Clerk and Chief Engineer were divided, Pioneer Iron Company assuming 50 percent.

THE CLEVELAND=CLIFFS IRON COMPANY

PIONEER FURNACE NO. 1

COMPARATIVE WOOD REPORT FOR YEARS ENDING NOVEMBER 30, 1903 AND 1902.

WOOD RECEIVED	1903 Cords	1903 32nds	1902 Cords	1902 32nds
Inventory Dec. 1, 1902, Furnace Kilns	3850		2670	
" " 1, 1902, " Yard	27	24	314	
From.....Parsons	11142	08	32345	
" .....Mathews	48968	08	21617	16
" .....Jobbers	401	24	1875	08
" .....Munising East	148			
" .....Munising West	3608	24		
" .....Limestone	4950	08		
" .....Along Munising R'y	1159	08		
" .....Whitefish	25	24		
Total Received at Furnace	74282		58821	24

WOOD CONSUMED				
Carbonized at Furnace Kilns	59325	08	40659	
" " " Retorts	8592		12637	
" " Retort Experiment			3	24
" " Kiln "			235	24
Used at Chemical Plant No. 1	780	16	311	
" " Acetate Plant No. 1	27		227	
" " Retorts,- Fuel	98		100	
" to Thaw Ore	174	24	178	16
" at Furnace Boilers	114	08	87	08
" by Locomotive	6		14	
" at Experimental Kiln,- Fuel			2	
Sold to Tenants	387		300	
Shortage - Parsons			188	24
Total Consumed	69504	24	54944	
Inventory Dec. 1, 1903, Furnace Yard	355	08	27	24
" " 1, 1903, " Kilns	4422		3850	
TOTAL	74282		58821	24

Form 43. 250. 9-'03 D

THE CLEVELAND-CLIFFS IRON CO.

PIONEER FURNACE NO. 1.

PIG IRON STOCK REPORT FOR THE WEEK ENDING November 30th 1903

PIG IRON GRADES	Total For Week	Previous For Month	Total For Month	Over and Short	Total from Dec. 1, 1902	Transfers	In Stock Dec. 1, 1902	Total	Shipped Since Dec. 1, 1902	Balance On Hand
A Scotch	0 500		0 500		385 500	2		383 500	310 500	73
B Scotch					385	2		387	349	38
C Scotch	0 1120		0 1120		487 1120		17	504 1120	279 1120	225
No. 1 Special		9	9		2158	32		2126	2004	122
No. 1 Foundry		191	191		3872	156	42	4072	4018	54
No. 2 Low	17	205	222		11385	124	13	11496	3856	118
No. 2 High	244	470	714		5085		17	5102	4053	1052
No. 3 Low	355	891	1246		7897		102	7999	6268	1729
No. 3 High	162	293	455		3804	1	20	3825	2972	853
No. 3 Malleable					1015	1	10	1024	821	203
No. 4 Low	52	115	167		1972			1972	1711	261
No. 4 High	117	144	261		1981		25	2006	1851	155
No. 5	95	147	242		2430		18	2448	1974	474
No. 6	91	69	160		1929		99	2028	1679	349
Spotted										
Castings										
Bessemer Special					1114			1114	1114	
Bessemer										
Bessemer										
Total	1033 1620	2534	3567 1620		38903 1620		363	39265 1620	33259 1620	6006
Lake Erie Ports					28			28	28	
	1033 1620	2534	3567 1620		38874 1620		363	39237 1620	33231 1620	6006

PIONEER IRON COMPANY

AUSTIN FARRELL, SUPERINTENDENT.

GEO. A. GARRETSON, PRESIDENT.
WM. G. MATHER, VICE-PRESIDENT.
FRED. A. MORSE, TREASURER.
E. V. HALE, SECRETARY.

GLADSTONE, MICH. March 25, '04.

Mr. R. C. Mann, Auditor,
Cleveland, O.

Dear Sir:

Replying to yours of March 23 regarding a difference of 350 cords between stock report from Nov. 30, Munising West and Eben Wood, and the wood cost for the corresponding date. This difference is exactly 350¼ cords, you evidently having disregarded fractions of a cord, and it is owing to a transfer made on our books from the stock of Munising West wood to Eben wood of that amount of wood, which was hauled by the Ebe during the month of November; this appearing to be the si way of handling this complication, as it keeps the cost o hauling in the job that is actually doing the work, althou they were hauling wood from another camp's territory or co The total shipments from Eben and Munising West will be fou on the cost sheet to equal the same items on the stock repo the stock report, of course, showing the actual balances at one of the camps.

We have been hauling from Munising West cordage wi the Eben teams all winter in order to clean out a particular inaccessible section during the winter, while the swamps were frozen, and this same transfer has been made each month of th amount so handled, a note being made on the cost sheet to that effect.

Yours truly,

C. D. Mason

Assistant Auditor.

April 18th, 1904

Mr. C. D. Mason, Asst.Auditor,

Gladstone, Mich.

Dear Sir:-

In getting up some figures today relative to wood on hand, we notice the following difference between your Wood Cost Sheet and the Stock Report of Pioneer Furnace No.2 as of Nov. 30th, 1903.

On the Stock Report you show a total of 27060 cords shipped from Munising West tract during the year and on your Wood Cost Sheet you show a total of 26709 (23101 to Marquette and 3608 to Gladstone) a difference of 351 cords.

Also on the Stock Report you show a total of 9521 cords shipped from Eben Tract and on the Wood Cost Sheet a total of 9871 cords, a difference of 350 cords.

As these two differences are nearly identical, it is possible there is a transposition somewhere. However in order to bring our records in line, will you kindly state where this difference occurs, and oblige.

Yours truly,

CGH. Auditor.

THE CLEVELAND-CLIFFS IRON CO.—PIONEER FURNACE.

STOCK REPORT FOR THE WEEK ENDING November 30th 1903

		Total for Week	Previous for Month	Total for Month	Total from Dec. 1st, 1902	In Stock Dec. 1st, 1902	Total	Shipped or used since Dec. 1st, 1902	Balance on
ORE.	Lake Ore,			4170 300	47655 2200	1844 503	49500 463	48544 92	955 1785
	Lake "								
	Lake Bessemer " Utica				3839 790		3839 790	3098 118	741 672
	Salisbury "			2393 80	6219 2140	194 203	6414 103	4163 773	2250 567
	~~Salisbury~~ " Retford				7489 580		7489 580	7489 580	
	Foster "				720 1150		720 1150	720 1150	
	Cliffs Shaft "				6234 740	3420 767	9655 267	6490 595	3164 172
	Section 12 "								
	Veronica Swamp				202 150		202 150	202 150	
					1812 1773		1812 1773	1812 1773	
	TOTAL,			6563 380	74174 1563	5459 233	79633 1796	72521 1340	7112 455
WOOD.	Cords of Wood in Furnace Yard,			333 24	2835 16	27 24	2863 08	2508	355 08
	" " " Furnace Kilns,			4936 16	59649 08	3850	63499 08	59077 08	4422
	" " " Furnace Retorts,			996	8592		8592	8592	
	" " at Ford River,				464 04	136	600 04	600 04	
	" " " Felch Mountain,								
	" " " Section 27,					140 24	140 24	140 24	
	" " " Parsons Job,			2649 12	31649 16	8947 28	40597 12	11142 08	29455 04
	" " " Mathews Job,			1266 04	21130 16	47248 04 5647	68378 20	48968 08	19410 12
	" " " Munising East Br. Job,								
	" " Limestone			184	8592 20		8592 20	4950 08	3642 12
	" " Along Whitefish				25 24		25 24	25 24	
	TOTAL,			10365 24	132939 08	60350 16	193289 24	136004 20	57285 04
	Charcoal, Bushels,			291690	3342435	26440	3368875	3364675	4200
	Limstone, Tons,			944 140	3165 2210	137 1190	3303 1160	3198 910	105 250
	Alcohol, Refined Plant No. 1, Gallons,				225052	6051	231103	221651	1400 Refined 9229 Crude 84%
	Alcohol, " Plant No. 2, Gallons,			9353	66588	4042½	70630½	65229	5401½
	Gray Acetate of Lime, Plant No. 1, Pounds,			257024	2022208		2022208	2022208	
	Gray Acetate of Lime, Plant No. 2, Pounds,			142668	1061433	33300	1094733	1068849	25884
						Nov 1st 1903			
	Alcohol, Crude, Plant No 1			23987	23987	9329	33316	24374	8942

THE CLEVELAND=CLIFFS IRON COMPANY

PIONEER FURNACE NO. 1

Land Purchases and Options for the Year 1903

PARSONS TRACT LANDS:

Purchases:

Geo. Summerville	W½ of SW¼ Sec. 7-41-17 80 acres @ $5.00 (Charging up bal. of purchase. Option paid in 1902.)	345.00
Arthur Bergeron	N½ of SE¼ Sec. 5-41-17 80 acres at $5.00 (Charging up bal. of purchase. Option paid in 1902.)	350.00
Arthur Demars	S½ of SW¼ Sec. 8-41-17 80 acres @ $5.00 (Charging up bal. of purchase. Option paid in 1902.)	390.00

Options:

Herman Winkel	NW¼ Sec. 33-42-17 160 acres @ $5.00	70.00
Gilbert Olson	S½ of NE¼ Sec. 18-41-17 80 acres @ $5.00	10.00
Jos. Gouin	E½ of SW¼ Sec. 7-41-17 & NE¼ of NW¼ Sec. 18-41-17 120 acres @ $5.00	15.00
Phillip Gouin	E½ of SE¼ Sec. 12-41-18 80 acres @ 5.00	10.00
R. J. Bellows	S½ of SE¼ Sec. 18-41-17 80 acres @ 3.50	10.00
F. J. Harris	SE¼ of SW¼ Sec. 18-41-17 40 acres @ 3.50	5.00
	Total	1205.00

MATHEWS TRACT LAND:

Purchases:

E. E. Loop	N½ of NE¼ & N½ NW¼ Sec. 28-44-21 160 acres @ $5.00	800.00

Options:

Jno. Miller	SE of SE of 31-44-21 40 acres @ 5.00	10.00
Geo. Duchane	NE of SE of Sec. 31-44-21 40 acres @ 5.00	10.00
	Total	820.00