GENERAL EXPENSE.(continued)	Year	Total		Per Ton
Account No. 27	1912	648.86		.002
Engineering	1913	729.85		.002
	Increase	80.99		.000
Account No. 28	1912	6157.63		.018
Analysis	1913	6158.63		.013
	Increase	1.00	Decrease	.005

The decrease in cost per ton is due to the increased production.

Account No. 29	1912	545.70		.002
	1913	---		---
	Decrease	545.70		.002

There were no charges for relief fund after the Workmen's Compensation Law went into effect Sept. 1, 1912.

Account No. 30	1912	581.23		.002
Personal Injury Expense	1913	4594.22		.010
	Increase	4012.99		.008

The principal charges to this account in 1913 were as follows;-

Settlement in full with Henry Myllola		$3070.18
Settlement in full with Konsta Hermanson		699.59
	Total,	3769.77

The cost per month for the department is about $40.00.

Account No. 30a	1912	6173.40		.018
Mine Office	1913	7313.50		.016
	Increase	1140.10	Decrease	.002

The increase is due to increase in salaries in 1913, higher cost of welfare work, and larger average proportion of superintendent's salary in 1913 than in 1912. The decrease in cost per ton is due to the larger production in 1913.

Total General Expense	1912	14311.82		.043
	1913	19004.87		.041
		4693.05	Decrease	.002

MAINTENANCE.

Account No. 125	1912	2499.38		.007
Tracks and Yards	1913	1402.49		.003
	Decrease	1096.89		.004

In 1912 the labor for moving spotting tracks and steam shovel

MAINTENANCE.(continued)

tracks was charged to this account. In 1913 it was charged to steam shovel loading, Acct. No. 180. In 1912 such labor charged to Acct. No. 125 was $1240.00, and in 1913 only $27.00

Account No. 126	Year	Total	PerTon
Docks, Trestles and Pockets	1912	664.19	.002
	1913	671.71	.001
	Increase	7.52	Decrease .001

The decrease in cost per ton is due to the increased production.

Account No. 127	1912	464.68	.001
Buildings	1913	1070.36	.002
	Increase	605.68	.001

In 1913 new roofing was put on the dry, and a salt shed was built at the west end of the mine. Extensive repairs were made to the coal-dock.

Account No. 128	1912	64.93	.000
Shop Machinery	1913	73.42	.000
	Increase	8.49	.000
Account No. 129	1912	2037.77	.006
Boiler Plant	1913	4348.45	.009
	Increase	2310.68	.003

In 1912 the economizer was shut down one month for repairs, and new fire arches were built under the boilers. In 1913 the economizer was shut down half the time, and was entirely rebuilt. In November and December the boiler-settings, fire arches, etc. were nearly all rebuilt. The cost of economizer repairs in 1913 was $2940.14.

Account No. 130	1912	876.76	.003
Hoisting Machinery	1913	856.62	.002
	Decrease	20.14	.001
Account No. 131	1912	1550.05	.005
Compressors and Power Drills	1913	810.18	.002
	Decrease	739.87	.003

In 1912, 9 drills and fittings cost $1346.49. In 1913, 4 drills cost $663.04.

MAINTENANCE.(continued)	Year	Total	Per Ton
Account No. 132	1912	515.90	.002
Pumping Machinery	1913	878.22	.002
	Increase	363.32	.000

In 1913 a charge of $507.29 for enlarging pump-house was taken out of E. and A. No. 259 and charged to this account.

Account No. 133	1912	612.06	.002
Top Tram Engines And Cars	1913	575.77	.001
	Decrease	36.29	.001
Account No. 134	1912	899.33	.003
Skips and Skip Roads	1913	1221.08	.003
	Increase	321.75	.000

In February 1913 there was a charge of $136.39 for repairing the skip-road. A new bail and frame was built for the skips in 1913, also.

Account No. 135	1912	1295.67	.004
Underground Tracks and Cars	1913	2102.78	.004
	Increase	807.11	.000

The charges to this account were higher in 1913 because the mine worked 2 shifts instead of one.

Account No. 136	1912	4277.48	.012
Electric Tram Plant	1913	8209.31	.018
	Increase	3931.83	.006

The maintenance on tracks and cars was higher in 1913, because the mine worked two shifts, and in addition three motor cars were rebuilt.

Account No. 137	1912	794.97	.002
Telephones and Safety Devices	1913	1332.61	.003
	Increase	537.64	.001

Charges to this account in 1913 are higher than in 1912 on account of guard rails and netting around compressor fly wheel, top tram engine and shop machinery, repairs to the second outlet, and more labor underground around chutes, etc.

Total Maintenance	1912	16,553.17	.049
	1913	23,553.00	.050
	Increase	6,999.83	.001

MINING EXPENSE.

Account No. 150	Year	Total	Per Ton
Air Pipes	1912	1204.69	.004
	1913	1466.85	.003
	Increase	262.16	Decrease .001

The increase is due to the night shift work.

Account No. 151			
	1912	9223.86	.028
Compressors	1913	13417.86	.029
	Increase	4194.00	.001

The increase is on account of the double shift, and because this account has been charged with a higher percentage of boiler house expense since the electric pumps were started than before.

Account No. 152			
	1912	7983.88	.024
Hoisting	1913	11239.82	.024
	Increase	3255.94	.000

The increase is on account of the double shift in 1913.

Account No. 153			
	1912	12212.99	.036
Pumping	1913	7747.85	.017
	Decrease	4465.14	.019

The electric pumps were started in May, and have been more economical than the steam pump, both in labor and supplies.

Account No. 154			
	1912	863.38	.003
Sinking and Shaft Repairs	1913	26.29	.000
	Decrease	837.09	.003

The charges to this account in 1912 were for fixing up the plat on the fifth level in No. 4 shaft.

Account No. 155			
	1912	15361.65	.046
Rock Drifting	1913	27197.70	.058
	Increase	11836.05	.012

In 1912 there were 3,789 feet of drifting and raising done in rock @ $4.05 per foot, and 6,363 feet @ $4.27 in 1913.

MINING EXPENSE.(continued)

Account No. 156	Year	Total	Per Ton
Breaking Ore	1912	126,548.13	.377
	1913	194,212.81	.414
	Increase	67,664.64	.037

The increase in total expense is due to the greater tonnage produced, and to the higher rate of wages.

Of the increase in cost per ton about 1.3¢ is due to the increase in wages, the balance being due to the loss of ½ shift per week at night, and to the lower standard of efficiency of the miners, following the increase in the number of men working, it being impossible to get new men as good as the old ones.

Account No. 157	1912	15,324.47	.046
Tramming	1913	25,308.44	.053
	Increase	9,983.97	.007

The increase is due to double shift in 1913, the increase in wages on Feb. 1, and to the decrease in production per shift.

Account No. 158	1912	797.75	.003
Filling	1913	1182.43	.003
	Increase	384.68	.000

The increase is due to the double shift worked in 1913.

Account No. 159	1912	44,759.23		.133
Timbering	1913	56,923.65		.121
	Increase	12,164.42	Decrease	.012

The increase in mine-timber used is only $1,597.36, the balance being labor for repairing, retimbering, etc. on account of the double shift.

Account No. 160	1912	6189.25	.018
Captain and Bosses	1913	8201.02	.018
	Increase	2011.77	.000

The increase is due to the increase in wages Feb. 1, 1913, and to one more shift boss employed. There was also more Sunday work, on account of working double shift.

MINING EXPENSE.(continued)	Year	Total	Per Ton
Account No. 161	1912	$ 901.56	$ .003
Dry House	1913	2479.82	.005
	Increase	1577.82	.002

One dry-man was employed in 1912 and two in 1913. Previous to June 1913 heating charges for the dry had been seven tons of coal per month. At this time, however, the heating charge was raised to 45 tons of coal per month and a proportion of boiler-house expense.

Account No. 162	1912	2714.63	.008
Top Landing and Tramming	1913	4960.37	.011
	Increase	2245.74	.003

The increase in total charges is on account of double-shift, and in cost per ton on account of the smaller hoist per shift.

Account No. 163	1912	5574.33	.016
Stocking Ore	1913	4195.50	.009
	Decrease	1378.83	.007

Trestles for stocking ore in 1913 cost $2188.58, and $4021.96 in 1912. The charges were high in 1912 on account of the trestle built east of No. 1 shaft.

Account No. 166	1912	247.85	.000
Cave In	1913	1694.26	.003
	Increase	1446.41	.003

In 1912 the cost of operating the small pumps in the caves was charged to L. A. Drainage Expense, and in 1913 to this account. The cost of getting out the body of Matt Linna, who was killed by a cave-in was also charged to this account.

Account No. 167	1912	2787.78	.008
Lake Angeline Drainage Expense	1913	2258.31	.005
	Decrease	529.47	.003

In 1912 the expense of operating the pumps in the caves was charged to this account, and in 1913 to No. 166.

Account No. 170	1912	2878.41	.008
Stocking Ore At Presque Isle	1913	3230.82	.007
	Increase	352.41	Decrease .001

The Presque Isle stocking plant was operated four months in 1912,

MINING EXPENSE.(continued)

and four and a half months in 1913, at a cost of about $700.00 per month. The decrease in cost per ton is on account of the larger production at the mine.

Total Mining Expense	Year	Total	Per Ton
	1912	255,573.84	.761
	1913	365,743.36	.780
	Increase	110,169.52	.019

RECAPITULATION

Account	1912		1913		Increase		Decrease	
	Total	Per Ton	Total	Per Ton	Total	Per Ton	Total	Per Ton
General Expense	14,311.82	.043	19,004.87	.041	4,693.05			.002
Maintenance	16,553.17	.049	23,553.00	.050	6,999.83	.001		
Mining Expense	255,573.84	.761	365,743.36	.780	110,169.52	.019		
Cost Of Production	286,438.83	.853	408,301.23	.871	121,862.40	.018		

Lucien Eaton

LAKE MINE.

AVERAGE MINE ANALYSIS OF OUTPUT.

GRADE	IRON	PHOS.	
Lake Ore	58.35	.123	

AVERAGE ANALYSIS ON STRAIGHT CARGOES.

	MINE		LAKE ERIE	
	IRON	PHOS.	IRON	PHOS.
Lake Ore	58.05	.120	58.19	.

ORE STATEMENT DECEMBER 31ST,1913.

	LAKE ORE AT MINE	LAKE ORE STOCKED AT PRESQUEISLE	TOTAL	TOTAL LAST YEAR.
On hand Jan.1,1913,	78,015	104,363	182,378	285,052
Output for year	452,841	16,207	469,048	392,560
Other Ores dumped on Lake Stockpile at Presque Isle		1,257	1,257	416
Total	530,856	121,827	652,683	678,028
Shipments	497,457	19,600	517,057	495,650
Balance on hand	33,399	102,227	135,626	182,378
I ncrease in Output 19%			76,488	
Decrease in Ore on hand			46,752	

1913 - 2-8hr.shifts to Nov.30th;1-8hr.shift from Dec.1st to Dec.31st.
1912 - 1-10hr.shift to March 11th; 1-8hr.shift ,from Mar.11th to Dec.1st;
2-8hr.shifts from Dec.1st to Dec. 31st.

SHIPMENTS FOR 1913.

	POCKET	STOCKPILE	TOTAL	TOTAL LAST YEAR
Lake	309,710	207,347	517,057	495,650
Last Year	232,305	263,345	495,650	
Increase 4%			21,407	

LAKE MINE.

COMPARATIVE MINING COST FOR THE YEAR.

	1913	1912	INCREASE	DECREASE
PRODUCT	469,048	335,830	133,218	
General Expense	.041	.043		.002
Maintenance	.050	.049	.001	
Mining Expense	.780	.761	.019	
Cost of production	.871	.853	.018	
DEPRECIATION				
Plant	.021		.021	
Equipment	.001		.001	
New Construction	.015		.015	
Total depreciation	.037		.037	
Taxes	.118	.105	.013	
Central Office	.058	.059		.001
Sundry Expense	.017		.017	
COST ON STOCKPILE	1,101	1.017	.084	
Loading and shipping	.028	.030		.002
Total cost on cars	1.129	1.047	.082	
Number of days operating	301	299		
Number shifts and hours	2-8hr (276) 1-8hr (25)	1-10hr 1-8hr 2-8hr		

COST OF PRODUCTION				
Labor	.667	.623	.044	
Supplies	.204	.230		.026
Total	.871	.853	.018	

LAKE MINE.

STATEMENT OF COMPARATIVE WAGES.

	1 9 1 3	1 9 1 2	INCREASE	DECREASE
SURFACE				
Total number of days	21,581¼	17,903¼	3,678	
Average rate	2.41	2.34	.07	
Amount	52,104.60	41,877.69	10,226.91	
UNDERGROUND				
Total number of days	88,112-3/4	58,588½	9,524¼	
Average rate	2.96	2.86	.10	
Amount	261,248.97	167,714.69	93,534.28	
Total days	109,694	76,491-3/4	33,202¼	
Average rate	2.86	2.74	.12	
Total amount	313,353.57	209,592.38	103761.19	
Labor cost per ton	.557	.624		.067
No.shifts and hours	2-8hr 1-8hr	1-10hr 1-8hr 2-8hr		

Shifts and hours changed from 2-8hr to 1-8hr on Dec.1-1913.

Increased wages per day:

Surface	.07 ----	2.99%
Underground	.10 ----	3.50%
Total	.12 ----	4.38%

LAKE MINE.

COMPARATIVE AVERAGE WAGES AND PRODUCT

PRODUCT '13 469,048 Tons	SURFACE		UNDERGROUND		TOTAL	
PRODUCT ' 12 335,830 Tons	1913	1912	1913	1912	1913	1912
Avg. no. men working	69	58	282	196	351	254
Avg.wages per day	2.41	2.34	2.96	2.86	2.86	2.74
Avg.wages per mo.25 days	60.25	58.50	74.00	71.50	71.50	68.50
Avg. product per man per day	21.74	18.75	5.32	5.73	4.28	4.39
Labor cost per ton	.111	.125	.557	.499	.668	.624
Diff.in labor cost per ton	-.014	-.008	+.058	-.015	.044	-.023
Avg.product breakg.& trammg.			8.00	8.66		
Avg. wages for miners cont.			3.034	2.905		
Total avg.wages for cont.			3.034	2.905		

		Tons	%
Tons per man per day	Surface Increase	2.99	15.9
	UndergroundDecrease	.41	.7
	Suf.& U.G. Decrease	.11	.25

Proportion of Surface to Underground men:

1913 - 1 to 4.10
1912 - 1 to 3.38
1911 - 1 to 3.17
1910 - 1 to 5.52

LAKE MINE.

TIMBER STATEMENT FOR YEAR ENDING DECEMBER 31,1913.

KIND	LINEAL FEET	AVG.PRICE PER FOOT	AMOUNT 1913	AMOUNT 1912
6" to 8" Timber	40,243	.02	804.86	617.48
8" to 10" "	168,283	.04	6,731.32	4,811.52
10"to 12" "	134,359	.06	8,061.54	7,676.28
12"to 14" "	14,136	.08¼	1,166.37	1,267.85
14"to 16" "	1,040	.10-3/4	112.86	185.52
Total 1913	385,061	.0438	16,876.95	14558.65

	LINEAL FEET	PER 100'	1913	1912
5" Lagging	1,295,590	.465	6,025.00	5,700.00
7" "	63,133	.55	347.24	
8" "	26,700	.55	146.85	511.17
Poles	41,687	.95	396.15	755.51
Trestle Timber	2.124	.159	336.80	
Total 1913	1,429,234	.507	7,252.04	
Total 1912	1,397,568	.498		6,966.68

	1913	1912
Feet of timber per ton of ore	.82	.880
Feet of lagging	2.95	3.93
Feet of lagging per foot of timber	3.60	4.46
Cost per ton for timber,lagging and poles	.0514	.064
Equivalent of Stull Timber to Board measure	625,139	670,109
Feet board measure per ton of ore	1.33	2.00
Total Product	469,048	335,830

Total cost of timber and lagging - 1913	24,128.99
Total cost of timber and lagging - 1912	21,525.33
Total cost of timber and lagging - 1911	19,916.58
Total cost of timber and lagging - 1910	26,717.90
Total cost of timber and lagging - 1909	21,927,42
Total cost of timber and lagging - 1908	17,499.22
Total cost of timber and lagging - 1907	,21,989.00
Total cost of timber and lagging - 1906	22,620.32
Total cost of timber and lagging - 1905	20,880.31

LAKE MINE

STATEMENT OF EXPLOSIVES USED FOR BREAKING ORE.

KIND	QUANTITY	AVERAGE PRICES	AMOUNT 1 9 1 3	AMOUNT 1 9 1 2
40% Powder				190.00
50% "	78,650	.11	8,651.50	6,886.00
Total powder	78,650	.11	8,651.50	7,076.00
Fuse	200,800	.3836	797.47	633.41
Caps	64,800	6.37	412.84	332.27
Cap Crimpers	20	19	3.91	4.25
Electric Exploders				3.04
Connecting wire	1		.33	1.62
Total fuse,etc.			1,214.45	974.59
Grand total			9,865.95	8,050.59
Product			469,048	335,830
Pounds powder per ton ore			.168	.192
Cost per ton for powder			.0185	.021
Cost per ton for fuse,caps,etc.			.0025	.003
Cost per ton for all explosives			.021	..024
Avg.price per lb.for powder			.11	.1097

Respectfully submitted,

W W Duncan

Agent.

RECORDS REFERRAL OUTCARD

DEPARTMENT	DATE
LABOR W.D.C AUG	2 1988
DIVISION	

RECORD REQUESTED

0213595

PERSON REQUESTING	LOT	BOX
BP	841	189

DEPARTMENT OF MANAGEMENT AND BUDGET
OFFICE SERVICES DIVISION
STATE RECORDS MANAGEMENT SERVICES

DMB 509 1/87

-:-

<u>IRON CLIFFS COMPANY</u>

<u>MINING DEPARTMENT</u>.

A G E N T ' S A N N U A L R E P O R T

F O R

YEAR ENDING DECEMBER 31ST, 1913.

-:-

I N D E X .

IRON CLIFFS COMPANY.

Ishpeming,Michigan,

January 1,1914.

Mr. Wm. G. Mather, Pres.,

Cleveland,Ohio.

Dear Sir:-

I beg to submit the following report of the operations and present condition of the mines of this Company. The maps, statements, and inventories to accompany this report will go forward to you under separate cover.

ANNUAL REPORT (1913)

OF THE

CLIFFS SHAFT MINE.

PRODUCTION.

The Cliffs Shaft Mine worked 300 days in 1913, and produced 284,352 tons of ore, an average of 948 tons per day. An estimated overrun of 15,000 tons in the stock-pile was taken up in the annual production making the total for the year 299,352 tons, and the average per day 998 tons. Nearly all the product was crushed up to the sixth of February, but after that date, with the exception of a few short periods, all the product was screened. The production by grades was as follows;-

Lump---------- 98,172 Tons

Crushed----------186,180 "

Total, 284,352 "

16,770 tons of rock were broken during the year, all of which was dumped underground.

The mine worked on single, eight-hour shift throughout the year, with the exception of two contracts in rock on the fifteenth level, and part of the time one contract on the first level in "B" shaft and one each on the eight and tenth levels in "A" shaft, both of which were in rock.

Table I.

Comparison of Product.

Year	Days Worked	Ore Tons	Rock Tons	Ore & Rock Tons	Ore Per Day Tons	Rock Per Day Tons	Ore and Rock Per Day Tons
1912	295	261,320	18,286	279,606	886	62	948
1913	299	284,352	16,770	301,122	951	56	1007
Overrun		15,000			50		
Total 1913		299,352	16,770	316,122	1001	56	1057

Table II.

Distribution of Product.

Level	"A" SHAFT Ore Tons	"A" SHAFT Rock Tons	"A" SHAFT Total Tons	"B" SHAFT Ore Tons	"B" SHAFT Rock Tons	"B" SHAFT Total Tons	TOTAL Ore Tons	TOTAL Rock Tons	TOTAL Ore & Rock Tons
1				20,170		20,170	20,170		20,170
2	8,508		8,508				8,508		8,508
3	1,053		1,053				1,053		1,053
4	7,858		7,858	7,612		7,612	15,470		15,470
5	11,045		11,045	17,878	10	17,888	28,923	10	28,933
6	27,416	168	27,584	34,159	416	34,575	61,575	584	62,159
7	28,293	650	28,943	14,337	152	14,489	42,630	802	43,432
8	21,935	1074	23,009	12,696	44	12,740	34,631	1218	35,849
9	31,889		31,889	10,896	768	11,664	42,785	768	43,553
10	9,219	1552	10,771	19,388		19,388	28,607	1552	30,159
15		5086	5,086		6850	6,850		11936	11,936
Total	147,216	8530	155,746	137,136	8240	145,376	284,352	16870	301,222

Table III.

Production by Months.

Month	Days	Ore Per Day Tons	Crushed Tons	Lump Tons	Total Ore Tons	Rock Tons	Total Ore and Rock Tons
January	26	851	20,506	1,633	22,139	1,768	24,907
February	23	896	13,528	7,100	20,628	1,360	21,988
March	24	900	13,268	8,334	21,602	2,598	24,200
April	25	921	14,288	8,748	23,036	1,164	24,200
May	26	932	15,315	8,908	24,223	1,878	26,101
June	24	932	14,522	7,859	22,381	1,050	23,431
July	25	978	15,841	8,613	24,454	678	25,132
August	26	991	15,933	9,841	25,774	626	26,400

Table III.(continued)

Month	Days	Ore Per Day Tons	Crushed Tons	Lump Tons	Total Ore Tons	Rock Tons	Total Ore and Rock Tons
September	25	1031	15,909	9,877	25,786	456	26,242
October	27	991	16,671	10,087	26,758	1646	27,404
November	24	936	14,374	8,060	22,434	1634	24,068
December	25	1005	16,025	9,112	25,137	1912	27,049
Total	300	948	186,180	98,172	284,352	16770	301,122
Stock-pile Overrun					15,000		15,000
Grand total	300	998	186,180	98,172	299,352	16770	316,122

During the latter part of the year it was necessary to hoist half a shift extra from "A" shaft occasionally at night in order to clean up the ore that had been dumped in the chutes.

Shipments from the pocket began on April 23rd and continued until Nov. 15th. Total shipments for the year are shown in the following table;-

Table IV.

SHIPMENTS.

Crushed----------273,043 Tons

Lump----------85,810 "

Total, 358,853 "

The ore in stock at the end of the year is shown in the following table:-

Table V.

Ore in Stock Jan. 1, 1914.

Crushed----------49,549 Tons

Lump----------12,981 "

Total, 62,530 "

DELAYS.

Date	Hours	Tons Lost	Cause	Cost of Repairs.
Jan. 13	1½	120	Top Tram Controller out of order	
" 21	1	100	Belt of pull-back on lower tram broken	.78
" 21	1½		"A" shaft only. Motor off track on 10th level.	
" 29	1		Dump-wheel on "B" shaft skip broken off	1.94
Feb. 4	½	50	Lower tram car off the track	
" 4	1	100	Lump chute blocked	
" 5	2	100	Lump chute blocked	
" 10	1½	150	Scraping boxes on new head-sheave, "B" shaft,	.78
March 1	2½	100	1½ hrs. changing top-tram car. 1 hr. thawing out air lifts.	1.30
" 6	1½	100	Changing from loading at pocket to stocking ore.	
" 8	1	90	"A" shaft skip out of order.	
" 14	8	870	Top floor of crusher building burned	504.26
" 15	2½	250	No current on main line. 75 men home	
April 2	4	350	Motor for No. 5 crusher burned out	22.90
" 29	3	150	Runner broke in "B" shaft-house	17.75
May 12	1	100	A plate broke away in "A" shaft-house pocket	
June 6	4	400	No current. Main line trouble.	
" 11	1½	150	Hoisting engine broke a connecting-rod	1.01
" 13	2	200	Crusher motors out of order.	
" 27	4	550	No current. Main line trouble.	
Sept. 10	1	30	Runner broke in "B" shaft	17.05
" 11	1½	30	Motor off the track on 10th level "A" shaft	
" 12	2	80	"B" shaft skip broke a horn	4.32
Oct. 10	1	120	No railroad cars	
" 13	1	150	Bearings on hoist-motor got hot	
" 22	½	50	No railroad cars	
" 23	1½	250	Bearings on hoist motor burned out	
" 31	1	150	No railroad cars	

DELAYS.(continued)

Date	Hours	Tons Lost	Cause	Cost of Repairs.
Nov. 10	3	400	No. 5 crusher motor burned out. No railroad cars.	
" 11	1	160	No. 5 crusher motor burned out. No railroad cars.	21.08
" 13	1	160	Rope tangled on top-tram drum & sheaves	1.56
" 17	1	100	Air-lift, 10th level "A" shaft, broken	.52
" 21	1½	120	No. 5 crusher motor burned out coil	19.33
" 22	3	400	Top tram controller out of order	8.78
Dec. 4	1	130	Lower tram motor blowing fuses	
" 20	2	120	Lower tram motor burned out	8.78
Total	68	6,380		638.78

Table VI.

Delays caused by lack of Electric Current due to main line trouble.

Date	Hours	Tons Lost	Remarks
March 15	2½	250	Blizzard
June 6	4	400	Thunderstorm
" 27	4	550	"
Total	10½	1200	Bad Weather.

Table VII.

Estimate of Ore Reserves.

	"A" Shaft Tons	"B" Shaft Tons	Total Tons
Pillars	963,000	518,000	1,481,000
Floors	1,609,000	971,000	2,580,000
Partly Developed	636,000	190,000	826,000
Total	3,208,000	1,679,000	4,887,000
Less 10% for Rock	321,000	168,000	489,000
Net Total	2,887,000	1,511,000	4,398,000
To support Surface	1,430,000	804,000	2,234,000
Available Ore Jan. 1, 1914	1,457,000	707,000	2,164,000

The ore reserves in the whole mine were carefully re-estimated and recorded, previous estimates on some of the levels being reduced. The partly developed ore below the tenth level "B" shaft was reduced 100,000 tons for reasons that will be given later in the report. On account of the large amount of rock work that developed no ore on the fifteenth level, and because development of the South-East Vein on the tenth level in "A" shaft has been postponed until the electric pumps are running, less new available ore was developed during the year than was mined. The reserves in "A" shaft, if not in "B" shaft, will be increased in 1914. Factors of 8, 9, and 10 feet were used, according to the quality and cleanness of the ore.

SURFACE.

Crusher Building.

The lump-pocket and trestle for stocking lump ore were not satisfactorily completed until Feb. 6, on which date screening ore commenced, and was continued steadily throughout the balance of the season. Loading at the pocket commenced on April 23rd and continued until Nov. 16th.

In October and November stock-pile trestles were built to allow the use of side dump cars for stocking ore, as it was impossible to handle the ore fast enough with end dumpers.

The foundations of the old crusher building have been all torn out, and most of the rock obtained from there has been hauled away. The oily ore and fine rock that had accumulated under the building was used as road dressing about the plant.

Repairs to Buildings.

Both shaft-houses were repainted during the summer, and the shed at "A" shaft had new roofing put on it in November.

On Feb. 1 the head sheave in "B" shaft-house cracked in the rim. It was temporarily repaired and another sheave was put up on the following Saturday night and Sunday.

Several legs and caps were replaced in the coal-dock, part of the roof was repaired, and most of the south side was painted.

A large room was finished off in the warehouse in January to be used as an office for the clerks.

The old powder house was repaired in May, and is now used as a warehouse for carbide.

New roofing was put on the shop building and on the dry in June and July.

Pumping.

The launder from "A" shaft carrying the discharge from the mine pump was replaced in October and November by a 12 inch tile pipe where it crosses under the railroad tracks. The rest of the launder will have to be replaced next year.

Hoisting Machinery.

The hoist was started on electricity on Sept. 22, and was run on electric power for one month. Much trouble was experienced with the bearings on the drive shaft, and the motor was disconnected October 23rd. The hoist has been run by steam since then.

Fire Loss.

On February 14th the mine was idle on account of fire, which broke out about 4 a. m. in the controller-room on the top floor of the crusher-building. It took about an hour and a half to put out the fire, which had by that time destroyed all the electrical apparatus and most of the wood-work on the top floor. A gang of men was put to work right away making repairs, and the mine was ready to work at seven o'clock the next morning. The fire occurred in the midst of a severe blizzard.

About one o'clock Saturday morning, May 10th, fire broke out in the stable on Graham Street, completely destroying the upper half of the building and its contents. Nine of the horses were so badly burned that they had to be killed and four recovered from their injuries. Eight others were unharmed.

Temporary quarters for the horses were fixed up in No. 5 engine-house at the Hard Ore, and the building proved so satisfactory that the boilers and foundations were torn out, and it was made into a permanent stable. The carriage shed on Graham Street, which had been uninjured by the fire, was sold to the Hard Ore Mine, torn down, moved, and rebuilt on Seventh Street, about 75 feet south of No. 5 engine-house. This construction work is covered by E. and A. No. 270, a statement of which is given in the report of the Moro Mine.

New Construction.

A new room was built on the east end of the dry and fully equipped. This is covered by E. and A. No. 263.

A 500 H.P. electric motor was connected by gearing to the South end of the pinion-shaft of the hoist. This work is covered by E. and A. No. 258.

ORE BODIES IN "A" SHAFT.

The names given the ore bodies in "A" shaft this year are the same as those used in 1912. They are as follows;-

1. North Deposit. The North Deposit is a rather flat ore body, or series of ore bodies, that lies north of the great East and West fault.

2. Main Vein. The Main Vein extends east and west from the shaft, dipping to the south and pitching to the east. It is developed for 1850 feet east of the shaft.

3. Small Body. This is an isolated body, practically exhausted, 300 feet north-east of the shaft. There has been no work done in it this year.

4. South Lens. This is not really a lens of ore, but a "U" shaped deposit lying in the bottom of a trough. It extends 300 to 1300 feet south-east of the shaft.

5. South Vein. This ore has been opened on the tenth level. It is apparently the continuation of the ore in the old Incline Mine.

ORE BODIES IN "B" SHAFT.

The same names have been used this year as last for the ore bodies in "B" shaft. They are as follows;-

1. Main Vein. This vein strikes north-east and south-west, and extends from a point 400 feet north-east of the shaft on the upper levels to a point approximately 1500 feet south-west of the shaft on the tenth level.

2. North Deposit. This ore extends from 500 feet north-east of the shaft to 800 feet north-west of the shaft, and lies on the north side of the main east and west fault.

3. Fault Vein. The main east and west fault has been found to carry ore of varying width in its western part, where it swings to the south-west, below the fifth level, and this ore has been developed on the sixth, seventh, eighth and ninth levels, from 700 to 1400 feet south-west of the shaft.

GENERAL.

The same system has been maintained in mining in 1913 as in 1912, namely, to clean up all the available ore on the upper levels and in the isolated deposits, concentrating the reserves as much as possible on the lower levels and in the larger and better defined ore bodies. Development work has not been pushed as rapidly on the tenth level in both shafts as in 1912, but will be prosecuted more vigorously in 1914. Work on this level has been retarded by the increased amount of development work on the upper levels, and by the high cost of rock-work in the shaft and on the fifteenth level, the cost per ton having been at times as high as 18 cents for rock-work alone. The south-east drift on the tenth level in "A" shaft has been allowed to remain idle for over half the year in the hope that the water would drain off, about half the water in the mine coming from this drift. There has been little diminution, however, in the flow.

The raise from the fifteenth level to the tenth, 840 feet west of "B" shaft, was a great disappointment, in as much as it proved that the

ore extended very little below the tenth level. Drill holes in the bottom of the level also found little ore. However, the ore has been developed over a greater area on the tenth level than was expected.

The most favorable developments in "A" shaft have been the extension of the Main Vein eastward on the eighth and ninth levels, and the development of the North Deposit on the sixth, seventh and eighth levels. In "B" shaft the North Deposit has also been developed over a larger area on the fifth, sixth and seventh levels, and the Fault Vein has been followed west on the sixth, seventh and eighth levels, and has been cut by diamond drill holes on the ninth and tenth levels.

GENERAL DESCRIPTION OF UNDERGROUND WORK.

"A" SHAFT

First Level.

There was no work on this level during the year.

Second Level.

One gang mined floors in the North Deposit for three months, 470 feet north-east of the shaft, finishing the available ore in that part of the level.

Another gang mined the floors along the tram road in the Main Vein from 350 to 425 feet north-west of the shaft, stripping the ore off the jasper for 10 to 15 feet below the level. They finished all the available ore in this part of the level.

Third Level.

One gang have been raising in the back of the old stope in the South Lens for three months, 280 feet south of the shaft. Another gang raised for three months in jasper 470 feet east of the shaft.

Fourth Level.

One gang stoped for four months in the South Lens 300 feet south-east of the shaft, following an irregular body of ore between walls of slate.

Another gang have been mining floors in the Main Vein from 640 to

760 feet east of the shaft since January. The ore extends only 12 to 15 feet below the level, and has to be handled twice.

Fifth Level.

One gang has been stoping since June in the North Deposit, cross-cutting and raising 600 to 700 feet north-east of the shaft. During the first part of the year they mined the ore in the back of the west stope 1010 to 1060 feet north-east of the shaft.

In the South Lens some ore was found in drill hole No. 202, 650 feet south-east of the shaft, but this has not been developed yet.

Sixth Level.

In the North Deposit 150 feet of drifting was done during the first part of the year, trying to find the extension of the ore west under the fifth level deposit. The results were not satisfactory, and work was temporarily stopped. The same gang followed the ore south for 80 feet 100 feet further east, and are still on the contact 860 feet north-east of the shaft.

Two other gangs have developed the ore on both sides of the main east and west stope, one following the hanging-wall contact and the other the footwall.

Another gang has followed drill hole No. 183 for 140 feet to the north boundary, and are stoping west along the line. For the last nine months another contract have been stoping north-east for 100 feet, and are now 1420 feet north-east of the shaft. All these gangs send their ore down to the tenth level.

Seventh Level.

On the seventh level in the Main Vein one gang crosscut north and raised to the east on the footwall, holing to the raise to the fifth level 870 feet east of the shaft. During the latter part of the year they have been mining the floor of the north stope in the South Lens 580 feet south-east of the shaft.

In the North Deposit three gangs have been working all the year,

one stoping west on the boundary 1320 feet north-east of the shaft, and one fifty feet further south. Another gang drove one stope to the east to the end of the ore 1560 feet north-east of the shaft, and are now driving another 50 feet further south. The ore in this deposit has now been proved up on this level for a length of 310 feet and a maximum width of 220 feet. A drill hole is now being drilled to the north-east, 1520 feet east of the shaft, to prove up the eastern extension of this ore.

Eighth level.

In the South Lens one gang followed drill hole No. 199 south in ore to the footwall for 100 feet, 760 feet south-east of the shaft, and are now stoping west from this crosscut 690 feet south-east of the shaft.

In the North Deposit one gang drifted north-east 140 feet in slate to reach the ore found in drill hole No. 192,1400 feet north-east of the shaft, and have driven a stope north 80 feet in the ore.

In the Main Vein one gang stoped west 50 feet to the end of the ore on the footwall 1100 feet east of the shaft, drove a short stope south from this one, 1200 feet east of the shaft, and then crosscut south to the hanging-wall from the main stope 1300 feet east of the shaft.

Another gang drifted east to the ore found in the middle of drill hole No. 193, but the ore proved to be only a small stringer. They drifted west along the hanging-wall 70 feet and cut the second ore found in drill hole No. 193. They have followed this ore east for 100 feet to a point 1730 feet east of the shaft. The vein is getting wider as they advance. The ore in this vein on this level has been proved to be almost continuous for a length of 1320 feet.

Ninth Level.

In the Main Vein the stope following the slate on the north boundary of the vein was continued east for 130 to a point 1530 feet east of the shaft, where the ore has nearly pinched out. Another stope was driven parallel with this, but 50 feet further south from 1240 to 1300 feet east of the shaft. At the end of the year both these stopes were idle, while

the miners were putting up a raise to the eighth level over their chute 1200 feet east of the shaft. Another raise has also been put up to the eighth level over the next chute 40 feet further west.

The stope following the hanging-wall east has been continued for 170 feet and is now 10 feet from the C. I. M. Co's boundary line. A stope has also been driven west along the slate contact south of the main drift from 940 to 850 feet east of the shaft, and two crosscuts started north 860 and 1120 feet east of the shaft.

In the South Lens the stope along the slate contact on the north was continued east to the hanging-wall 1090 feet south-east of the shaft, and other stopes driven south through the pillars, following the contact 280 feet.

Tenth Level.

In the Main Vein the footwall drift was enlarged for 90 feet, from 1110 to 1200 feet east of the shaft, and a raise put up to the ninth level 1180 feet east of the shaft. The main drift was extended from 1600 to 1810 feet east of the shaft. It has been in jasper for three months but the breast is now ore.

The south-east drift in the South-East Vein was extended 25 feet in ore and 55 feet in soap-rock. Three diamond drill holes were drilled from this drift near the end, No. 208 to the north to cut hole No. 4 on Section 10, No. 209 to the south and No. 210 to the east. No. 208 and No. 209 were both successful in finding ore. During the remainder of the year the ore found in hole No. 198 was followed south-east from 1260 to 1425 feet south-east of the shaft.

"B" SHAFT

First Level.

1200 Foot sub-level.

In the ore-body on the north side of the anticline two contracts have worked throughout the year. Two short cuts were driven south from the hanging-wall stope 360 feet south of the shaft, and the south stope was

continued south for 30 feet to the jasper footwall, which was followed west for 70 feet. Two stopes have been driven east from this south stope to the hanging-wall, and a raise is being put up on the jasper at the south end 550 feet south of the shaft.

On the south side of the anticline the ore in the two stopes being driven west, 660 and 720 feet south-east of the shaft, was cut off by rock, and a crosscut was driven north-west 120 feet through this rock. Two veins of ore were developed by this crosscut, but the first one did not amount to much. The second one is being followed west, and is opening out very satisfactorily. Two crosscuts were also driven in the pillar between the two old stopes 700 feet south-east of the shaft.

Second Level.

All the rock hoisted in "B" shaft has been dumped on this level.

Third Level.

A raise was put up from the fourth level, during the first part of the year, in the Main Vein, 1350 feet south-west of the shaft, and some of the floor mined around the raise.

Fourth Level.

In the Main Vein a raise was put up to the third level 1350 feet south-west of the shaft early in the year. Two raises were also put up from the fifth level near the hanging-wall 1340 and 1200 feet south-west of the shaft, and the floor mined around them. One gang is still working here.

Fifth Level.

In the Main Vein two raises have been put up to the fourth level 1340 and 1190 feet south-west of the shaft, and a raise was holed from the sixth level 1175 feet south-west of the shaft. Nearly all the ore mined in the floor of the fourth level has gone down through this raise to the sixth level.

The remainder of the floor of this level 450 feet ~~xxx~~ north-west of the shaft has been mined down to the 940 foot sub-level.

In the North Deposit the east stope has been driven ahead 110 feet, following the footwall 500 feet north-east of the shaft. During October and November the ore was almost cut off by jasper, but it improved in December.

The west stope was driven west 90 feet to the end of the ore 570 feet north-west of the shaft, and a short crosscut was driven south to the hanging-wall 40 feet back from the breast. A raise is now being put up on the footwall 590 feet north of the shaft.

Sixth Level.

In the North Deposit the west stope on the footwall was driven west for 40 feet to the end of the ore 800 feet north-west of the shaft, and a short crosscut was driven to the south 80 feet back from the breast. The ore has been followed east on the footwall 130 feet from the crosscut 700 feet north-west of the shaft. The hanging-wall was very low at first but is rising as the stope is advanced. The east stope on the footwall was driven east along the footwall 110 feet to a point 490 feet north-east of the shaft. There is a rock crossing in the breast. The parallel stope 50 feet further south was discontinued for part of the year on account of the hardness of the ore, until a better type of drill could be used. It is now being advanced in good ore.

On the 940 foot sub-level the floor of the fifth level was mined 450 feet north-west of the shaft, a cut was driven east through the pillar to the top of the raise 390 feet north-west of the shaft, and a stope has been driven north under the hanging-wall for 50 feet to a point 100 feet north of this raise. Work on this sub-level is nearly finished.

At the west end of the Main Vein 1350 feet south-west of the shaft a short crosscut was driven south-west in jasper to the ore found in drill hole No. 200. This ore proved to be of small extent on this level, and a raise is being put up in it to the fifth level. A raise was holed from the seventh level 1170 feet south-west of the shaft, and a stope is being driven to the south 1100 feet south-west of the shaft.

In the Fault Vein the ore was followed east from the crosscut 1050 feet south-west of the shaft for 80 feet, until it pinched out. The footwall was followed west for 130 feet to a point 1270 feet south-west of the shaft. The ore is getting wider but it is extremely hard. A raise was put up to the fifth level 1160 feet south-west of the shaft.

Seventh Level.

In the North Deposit a drift was driven east in jasper and slate for 60 feet from the stope 400 feet north of the shaft to the ore found in drill hole No. 205. This ore has been followed east 90 feet, and another gang is crosscutting south in it.

In the Main Vein two stopes were driven through the pillar 1080 feet south-west of the shaft, a raise was put up to the sixth level 1160 feet south-west of the shaft, and a short stope was driven east in the pillar 930 feet south-west of the shaft.

In the Fault Vein the west stope was large from 1250 to 1300 feet south-west of the shaft, but the ore was then cut off entirely by jasper. A stringer of ore was followed in the jasper on the north side for 30 feet, but it pinched out, and a drift was driven along the footwall contact. It was in jasper for 5 feet, but has since then been in ore, which is gradually getting wider. The breast is now 1390 feet south-west of the shaft.

Eighth Level.

In the Fault Vein two stopes have been driven west. The north stope, following a vein of ore between two walls of jasper and with jasper in the bottom nearly all the way, was driven west for 140 feet to the end of the ore 1190 feet south-west of the shaft. A raise is now being put up from this stope. The footwall stope was driven south-west for 110 feet to a point 1280 feet south-west of the shaft. The footwall was also followed east for 15 feet, 900 feet south-west of the shaft, but the ore was too poor to mine.

Ninth Level.

In the Main Vein one gang mined the ore in the back of the main

stope 860 and 970 feet west of the shaft, and drove a short cut west under the hanging-wall 870 feet west of the shaft. A drift was also driven north-west for 50 feet in rock from the main drift 540 feet north-west of the shaft and a stope driven 90 feet north-west in magnetite, but the ore was cut off by the hanging-wall in the breast.

In order to reach the Fault Vein a crosscut was driven south 100 feet in very hard jasper from the old stope 820 feet west of the shaft to the diorite footwall. A drift was then driven west in the footwall for 50 feet, until ore came in on the north side, along the contact. This ore is narrow, but is wider further west, as has been proved by two drill holes, Nos. 207 and 219. Another hole, No. 220, was drilled north-west into the hanging from the end of the west drift in the Main Vein.

Tenth Level.

In the Main Vein a short crosscut was driven in rock through the pillar to the north stope 650 feet north-west of the shaft, the floor of the north stope was taken up so that the grade of the track was towards the shaft, and a crosscut stope was driven south-west in the pillar 780 feet north-west of the shaft.

The stope south of the main drift 800 feet east of the shaft was continued south 100 feet to jasper, and another stope parallel to it is being driven south 50 feet further east. The breast is still in ore. Another stope 50 feet further east was started, but the ore was poor. The south stope near the hanging-wall was continued south across the main drift for 60 feet, and connection was made to it from the next stope to the east. The main drift was also enlarged to stope size as far west as the hanging-wall.

A raise from the fifteenth level was holed in November in the stope 840 feet west of the shaft. This raise showed practically no ore in the bottom of the tenth level, and drill hole No. 216 drilled in the bottom 100 feet further south also showed no ore. Holes Nos. 217 and 218 drilled in the bottom 60 and 130 feet north of the raise showed 15 and 13

feet of ore respectively.

Two drill holes, Nos. 211 and 214, were put in horizontally south of the main drift 1140 and 1317 feet west of the shaft to cut the Fault Vein. No. 211 showed 36 feet of ore, but No. 214 was blank. No. 215, drilled south from the stope 800 feet west of the shaft,was also blank. No. 212, drilled north-west from the main drift 1145 feet west of the shaft, went directly into the hanging, but No. 213 drilled to the north-west from the end of the main drift cut 23 feet of ore.

Fifteenth Level.

The main drift was enlarged for a side track, and a raise put up 250 feet in rock to the tenth level 840 feet west of the shaft.

The east drift was continued east across the position of "A" shaft, and was extended 55 feet beyond the shaft and enlarged to 16 feet width for the plat. The approach to the pump-house was also driven to the north. A skip pit was sunk 43 feet, and the shaft raised full size, holing to the skip pit below the tenth level on December 19th. At the end of the year the shaft was completed, except for removing some of the rock and putting in some of the skip guides.

DETAILS BY CONTRACTS.

"A" SHAFT

Second Level.

North Deposit.

No. 17 mined all the available ore left in the floor of the level 460 to 500 feet north-east of the shaft. They worked here, stripping the ore off the footwall, for three months, and went to the sixth level at the end of March.

Main Vein.

No. 15 holed their raise from the third level, 420 feet north-west of the shaft, in January, and worked on the second level for eight months, mining the ore left in the floor of the level south and south-east of this raise, that to the north having been already mined. The ore lay very flat

on the jasper from six to twelve feet thick. They finished in September and went to the third level.

All the rock hoisted in "A" shaft during the year has been dumped on this level.

Third Level.

Main Vein.

No. 15 finished their raise to the second level 420 feet north-west of the shaft, and moved to the second level in January.

South Lens.

No. 15 came down from the second level in September, and started raising to the north 280 feet south of the shaft. They continued raising here until the end of the year.

Main Vein.

No. 36 continued their raise in jasper to the elevation of the second level 470 feet east of the shaft, and were stopped in January.

Fourth Level.

Main Vein.

No. 24 came up from the fifth level in the middle of January, and started mining floors around the raise 650 feet east of the shaft. The ore extended only about 15 feet below the level, and they cut through the pillar on the east side of the raise in February and March. They went to the fifth level in April, and raised again east of this pillar. During the rest of the year they mined the floor of the fourth level, working toward the east, and at the end of the year were 760 feet east of the shaft. There was a large amount of rock piled on this ore, which had been left there in past years, and this had to be removed as the miners advanced.

South Lens.

No. 9 continued their stope west between two walls of rock, 330 feet south-east of the shaft, for two months, but the back got so bad that it was unsafe to work, so they moved to the old stope on the north side of the pillar, 15 feet north, and crosscut south through this pillar, passing

around the end of the rock until they holed to the end of the other stope. They finished here in April, and moved to the ninth level at the end of the month.

Fifth Level.

North Deposit.

No. 24 at the beginning of the year were stoping 590 feet north-east of the shaft, but the ore was not very good, and they were moved to the fourth level to get some better ore.

No. 26 mined the ore in the back up to the fourth level from 1100 to 1040 feet east of the shaft, for four months, and then moved to No. 24's stope 600 feet north-east of the shaft. Here they crosscut north through the pillar 600 feet north-east of the shaft. After the first few feet they had pretty good ore. Then they crosscut south 40 feet to the footwall 620 feet north-east of the shaft, and raised to the west, holing to the old raise to the fourth level in November. They mined ore in the back of these raises during the rest of the year.

Sixth Level.

North Deposit.

No. 20 drifted north-west for 40 feet in ore and jasper, starting from the end of their stope 870 feet north-west of the shaft, but got into clean jasper. They went back 40 feet, and drifted west and south-west, following the jasper contact, part of the time in ore, but mostly in jasper for 100 feet. They opened a small stope here in June, but the ore pinched out, and they moved east 120 feet, where they crosscut south, 900 feet north-east of the shaft. They continued this crosscut south during the rest of the year, but in November the ore had become so narrow that it was hardly wide enough for a drift.

No. 45 crosscut south from the main stope, 980 feet north-east of the shaft, for 75 feet to the footwall, and then turned east along the contact, holing to the next crosscut in September. They have continued

their stope east along the contact in the next pillar, and at the end of the year were 1010 feet north-east of the shaft.

No. 39 continued their crosscut stope north, reaching the hanging-wall 1075 feet north-east of the shaft. They moved to the next crosscut east, and drove a stope west through the pillar. They continued this stope west in the next pillar, following the contact as it turned to the south-west, until they holed into the main stope 1000 feet north-east of the shaft. In October and November they drove a stope east in the pillar 1100 feet north-east of the shaft, but were cut off by rock in the breast. They are now stoping west in this same pillar, starting from the next crosscut to the east, so as to avoid breaking the rock.

No. 5 at the beginning of the year were crosscutting north in jasper 1360 feet north-east of the shaft. They got into ore in February, and stoped north, following drill hole No. 183, for five months, until the ore was cut off by slate in the breast 1410 feet north-east of the shaft. They crosscut north through this slate, which gradually rose in the back until they could open out a stope, 1450 feet north-east of the shaft. This stope is close to the north boundary line, which they are now following to the west.

No. 17 came down from the second level in April, and drifted east through 10 feet of slate on the east side of the stope 1330 feet north-east of the shaft. They opened out in the ore on the east side of the slate, having slate in the back, however, and stoped north-east for 80 feet. They turned east in October, and continued in that direction during the rest of the year.

Seventh Level. South Lens.

No. 29 stoped in the back under the hanging-wall 430 feet south-east of the shaft, during half of January, but the ore became too poor, and they moved to the eighth level.

No. 36 mined floors 540 feet east of the shaft from September until the end of the year.

Main Vein.

No. 36 started a crosscut north in steel ore 840 feet east of the shaft in July, and holed to the next crosscut to the east at the foot of the raise on the footwall. They finished in September, and moved to the South Lens.

North Deposit.

No. 32 continued their stope west along the north boundary line in good ore for 130 feet. They are still stoping west in good ore, 1320 feet north-east of the shaft.

No. 8 continued their stope south-east along the footwall for one month, until they were cut off by slate in the breast 1550 feet north-east of the shaft. They moved to the other side of the main stope, and stoped west parallel to No. 32 but 50 feet further south. They have had some rather poor ore, but the average has been pretty good. They are now stoping west 1340 feet north-east of the shaft.

No. 3 continued their stope east 50 feet south of No. 8's east stope, for 90 feet, holing into the latter, near the breast. They had their ore cut off by slate in the breast also, and moved south 50 feet in the main stope, where they started another stope to the east. They are now 1480 feet north-east of the shaft. Their ore has been variable like No. 8's.

Eighth Level.

Main Vein.

No. 27 continued their stope west and south along the jasper for five months, until the ore pinched out 1110 feet east of the shaft. They moved east 100 feet, and crosscut south 40 feet, until the ore was cut off by jasper again. They moved south-east 100 feet again in September 1280 feet east of the shaft. They have followed the contact west and holed to the next crosscut in December.

No. 21 continued their drift east in jasper 25 feet, until they cut drill hole No. 193,1590 feet east of the shaft. The ore proved to be only 18 inches wide, however, and they moved to the hanging-wall drift 60

feet further south, where they followed the contact east in rock, until they reached the ore shown in drill hole No. 193, 1625 feet east of the shaft. The ore widened out from this point eastward, and they now have a good stope 1725 feet east of the shaft.

North Deposit.

No. 29 came down from the seventh level in January, and started a crosscut north-east in rock, 1280 feet east of the shaft, to reach the ore found in drill hole No. 192. They crosscut 140 feet in slate, and opened a stope in ore in June, 1400 feet north-east of the shaft. They have stoped north along the drill hole, with occasional seams of rock or jasper for 70 feet, and are now getting into better ore.

South Lens.

No. 18 started at the beginning of the year, and crosscut south following diamond drill hole No. 199, 740 feet south-east of the shaft. They passed through 4 feet of slate, and then opened out in the ore, in which they stoped south 100 feet to the footwall. They followed the contact west for 15 feet, and then moved north 50 feet, where they started another stope west. They have driven this stope 60 feet west, and are still in ore.

Ninth Level.

Main Vein.

No. 4 continued their stope east along the slate contact on the north from 1390 to 1550 feet east of the shaft, at which point the ore has nearly pinched out. In December they started a raise, with No. 9, over their chute 1200 feet east of the shaft.

No. 9 came down from the fourth level in May, and started a stope south-east from No. 4's stope 1270 feet east of the shaft. They went in 40 feet in very hard ore, but struck jasper, and turned to the north to hole to No. 4's stope again. In December they started raising with No. 4 over the chute 1200 feet east of the shaft.

No. 43 raised from the back of No. 4's stope 1175 feet east of

the shaft to the eighth level in October and November, holing in the first week in December. This raise will be continued later to the seventh level. No. 43 have gone to the sixth level in "B" shaft.

No. 25 started a crosscut north in November 1120 feet east of the shaft, and continued working there until the end of the year.

No. 31 started in June to drive No. 18's old stope west again along the slate contact on the south, 940 feet east of the shaft. They followed the slate north-west until they holed to the main drift, which they enlarged to stope size for 80 feet as they followed the slate contact west. In November and December they drove a crosscut stope north to the footwall 860 feet east of the shaft.

No. 34 continued their stope east under the hanging-wall from 1660 to 1830 feet east of the shaft. The ore was pretty narrow during the early part of the summer, but is now widening out rapidly. The breast is 10 feet from the C. I. M. Co's line, and 60 feet from hole No. 4 on Section 10.

South Lens.

No. 25 continued their stope east from 1050 to 1100 feet south-east of the shaft, until they reached the hanging-wall. They turned north along the contact, stoped the ore on the slate for three months, and then cut through the two pillars to the south, keeping close to the hanging-wall. They followed the slate around to the west, behind the jasper at the south end of their crosscut stope 1020 feet south-east of the shaft, holing to the next crosscut west, 990 feet south-east of the shaft, in October. They drove a short cut west to the rock, 100 feet further north, and moved to the Main Vein.

Tenth Level.

Main Vein.

No. 41 continued the main drift south-east 120 feet in ore, 20 feet in jasper, 20 feet in ore again, and 45 feet in jasper. They now have ore in the breast. For the last 45 feet the drift is 8 feet wide, being

14 feet wide for the remainder of the distance. In June and July they did not work in the east drift, but enlarged the footwall drift from 1110 to 1200 feet east of the shaft, so that it could be used for motor haulage. The breast of the east drift is now 25 feet from the C. I. M. Co's boundary line.

South-East Deposit.

No. 16 continued their drift east in ore for two months, reaching the footwall 1850 feet south-east of the shaft. They drifted east 55 feet in diorite, and then moved back to a point in the main drift 1270 feet south-east of the shaft, where they crosscut south-east 80 feet in rock and ore to get the ore found in drill hole No. 198. They opened out in good ore 1340 feet south-east of the shaft, and followed the slate contact south-east for 60 feet, at which point the ore was cut off by jasper in the breast. In October they turned south and crosscut 30 feet through the slate, opening out in fine ore again. They were stoping south in this ore at the end of the year.

First Level.

1200 Foot sub-level.

No. 48 had their ore cut off in the breast of their stope to the west under the hanging-wall 320 feet south of the shaft, and drove two short crosscuts south to the rock from the south side of this same stope 10 feet and 50 feet back from the breast. Then they moved to No. 30's stope, 440 feet south of the shaft, and drove a stope east 50 feet. They moved south 50 feet, and drove another stope east 50 feet to the hanging-wall. Then they moved back to their other stope and continued it east 30 feet further.

No. 30 continued their crosscut stope south 20 feet to the jasper, 520 feet south of the shaft, then turned west and followed the contact for 70 feet. They have been raising for three months, following the jasper up towards the south, and are now 565 feet south of the shaft.

No. 49 had their ore cut off by rock in the breast of their west

stope 660 feet south-east of the shaft, and crosscut south through the pillar 70 feet further east. In June they started a drift north-west, from the end of their west stope 660 feet south-east of the shaft, working with No. 42, and drove it 70 feet in dike. Here they found some ore, and opened a small stope in it, 600 feet south-east of the shaft; but the ore pinched out, and they crosscut north-west again 40 feet, passing through 20 feet of dike and 20 feet of ore. They opened a stope in this ore, and are following it west. They are 580 feet south-east of the shaft.

No. 42 drove the south stope west for five months, until the ore was cut off by rock in the breast 730 feet south-east of the shaft. They joined No. 49 in the rock drift in June. During the last two months they have drifted part way through the pillar 700 feet south-east of the shaft, and have followed the ore in the west stope upwards on the rock in the breast.

Third Level.

Main Vein.

No. 43 raised from the fourth level in January 1350 feet south-west of the shaft, and moved to the sixth level.

No. 1 mined floors around No. 43's raise during part of March and April.

Fourth Level.

Main Vein.

No. 43 raised to the third level 1350 feet south-west of the shaft in January.

No. 1 mined floors 1350 feet south-west of the shaft in January and February, raised from the fifth level 1510 feet south-west of the shaft in March, and mined the floors around this raise. In April they raised from the fifth level again 1200 feet south-west of the shaft, and have been mining the floor around this raise ever since.

Fifth Level.

Main Vein.

No. 1 raised to the fourth level 1320 feet south-west of the shaft in March, and again 1190 feet south-west of the shaft in April.

No. 43 raised from the sixth level 1170 feet south-west of the shaft in February.

No. 22 mined the floor of the level down as far as the 940 foot sub-level, 400 to 480 feet north-west of the shaft, for four months.

North Deposit.

No. 38 continued their stope east and south-east on the footwall for 135 feet. The breast is now 490 feet north-east of the shaft. In October and November the ore nearly pinched out. They then crosscut south 20 feet to the hanging-wall 40 feet back from the breast. In October they started a raise, in which they are still working, on the footwall 580 feet north of the shaft.

Sixth Level.

Main Vein.

No. 35 in August, September and October crosscut south-west through 15 feet of jasper, and opened a small stope in the ore found in drill hole No. 200, 1360 feet south-west of the shaft, but the ore was cut off on all sides except the back by jasper, and they moved east 250 feet, where they are now crosscutting south.

No. 43 in December started a raise in the back of No. 35's stope 1360 feet south-west of the shaft.

Fault Vein.

No. 11 continued their stope south-west in the fault vein throughout the year, from 1140 to 1270 feet south-west of the shaft.

No. 43 raised from the breast of the north stope 1160 feet south-west of the shaft to the fifth level in February.

No. 2 drove a small stope east from the crosscut 1040 feet south-west of the shaft for 80 feet, holing into the old stope on the footwall

980 feet south-west of the shaft. As the ore was badly mixed with rock, and the back was bad, they were stopped here, and moved to the tenth level in May.

North Deposit.

No. 37 continued their stope west for 45 feet, until the ore was cut off. They moved back 75 feet, and drove a crosscut 10 feet south, but ran up against rock again. They moved 60 feet east again, and started a stope east on the footwall on the east side of the north crosscut, 680 feet north-west of the shaft. They have driven this stope east 125 feet, having good ore low down all the way and conglomerate in the back.

No. 13 continued their stope on the footwall, 500 feet north-east of the shaft, in fine ore for 120 feet, until October. At this time the ore was almost cut off by rock on the right side of the breast. They have continued to work in this stope part of the time, but are working mostly in No. 35's old stope 140 feet south-west, 420 feet north of the shaft, where they cut through a band of rock in November, and now have a fine breast of ore.

No. 35 continued their stope east for 50 feet, 430 feet north of the shaft, keeping parallel with No. 13, but the ore was almost cut off by a seam of rock, and the remainder was so hard that they could do little with it. They moved to the west end of the level in August.

940 Foot sub-level.

No. 22 mined the floor of the fifth level down to the elevation of this sub-level from 400 to 480 feet north-west of the shaft for four months. They stoped west under the jasper 515 feet north-west of the shaft for one month, and cut through the pillar to the east to the top of the raise 400 feet north-west of the shaft. They moved north 60 feet, and drove a crosscut stope north 45 feet under the hanging-wall 430 feet north-west of the shaft. They are still working here, but their ore is getting small.

Seventh Level.

Main Vein.

No. 28 crosscut north 35 feet in the pillar 1080 feet west of the shaft, and holed through east and west to the stopes on either side. In May, June and July they raised from the main stope 1160 feet west of the shaft to the sixth level.

No. 14 drove a short cut into the pillar on the east side of the crosscut 950 feet west of the shaft. They ran up against jasper here, and moved to the eighth level.

Fault Vein.

No. 23 continued their stope south-west in the Fault Vein for 25 feet, passing through one 5 foot crossing of slate, until the ore was cut off by slate and jasper 1300 feet south-west of the shaft. They followed a small leader of ore in the jasper on the north side of the breast for 10 feet but it pinched out, and they drifted 25 feet south-west in jasper. They were stopped in April.

No. 28 came to No. 23's stope in August, and drifted south-west in the slate on the south side. They passed through 5 feet of rock, and then got into ore, which they have followed south-west for 60 feet. The ore is narrow, but is getting wider in the breast.

North Deposit.

No. 14 came up from the eighth level in March, and drifted east 60 feet in jasper and soap-rock, 400 feet north of the shaft. Here they opened out in ore, which they followed east for 65 feet. In November and December they crosscut south in good ore at the west end of this stope.

No. 6 came up from the ninth level in November, and took No. 14's place in the east stope 400 feet north of the shaft. The ore has nearly pinched out in December.

Eighth Level.

Fault Vein.

No. 19 continued their stope south-west on the footwall from

1160 to 1270 feet south-west of the shaft. The ore is getting wider in the breast.

No. 46 drove their stope west 140 feet between walls of jasper, until the ore was cut off 1190 feet south-west of the shaft and 200 north of No. 19. They are now raising in the back 1100 feet south-west of the shaft.

No. 14 stoped east on the footwall 890 feet south-west of the shaft during the month of February, and went back to the seventh level.

Ninth Level.

Main Vein.

No. 33 came up from the tenth level in February, and drifted north-west in rock for 50 feet, starting from the main drift 540 feet from the shaft, and opened out in magnetite ore. They followed this ore north-west on the footwall for 90 feet, but had slate in the breast at the end of the year.

No. 6 continued their stope east on the jasper for 30 feet holing to the old stope about 15 feet above the track 850 feet west of the shaft. They moved 90 feet north in April, and drove a short stope west under the hanging-wall. In May they moved to the west end of the footwall stope, and raised on the jasper to the north. They finished this ore in October and went to the seventh level.

Fault Vein.

No. 2 started a crosscut south in jasper in June, 820 feet west of the shaft, to reach the Fault Vein. They continued this crosscut south 95 feet to the diorite contact. They drifted west 40 feet in the diorite, and then cut out in ore on the north side of the drift. They are following this ore west.

Tenth Level.

Main Vein.

No. 33 continued their raise to the elevation of the ninth level 630 feet north-west of the shaft, and moved to the ninth level in February.

No. 2 came down from the sixth level in May, and crosscut north through 25 feet of diorite to the end of No. 32's stope 630 feet north-west of the shaft. They moved to the ninth level in June.

No. 10 continued their stope south near the hanging-wall 890 feet west of the shaft, and holed to the main drift in January. The continued their stope south for 40 feet further, until they encountered jasper in the breast. They moved to the next stope to the east, and stoped west behind the jasper 60 feet south of the main drift. Leaving a 20 foot pillar, they turned north around the end of the jasper, and holed to the south-east corner of their last stope in July. They moved north to the main drift, and enlarged it to stope size as far west as the hanging-wall. In September they took up the bottom of No. 33's stope, west of the place where No. 2 drifted through the rock pillar, and in October started a stope to the south-west from No. 33's old stope 780 feet north-west of the shaft. They continued to work here until the end of the year.

No. 40 continued their stope south to the jasper for 100 feet, 800 feet west of the shaft, and then moved 50 feet further east, where they have driven another stope south for 75 feet from the main drift. They are working here at the end of the year.

No. 6 came down from the ninth level in October, and started a crosscut south from the main drift 710 feet west of the shaft, but they had lean material, and went up to the seventh level in November.

No. 44 holed their raise from the fifteenth level 10 feet north of the main drift 840 feet west of the shaft in November, and took the cribbing out, storing it on the tenth level.

Fifteenth Level.

No. 44 finished widening the main west drift for a siding in January, and started a raise 840 feet west of the shaft. They went up 60 feet at an angle of about 50° to the north, and then turned vertical. They were in rock until close to the floor of the tenth level, and holed in November. This raise was cribbed from the knuckle, to insure safety, and the

cribbing was removed in December, and stored on the tenth level.

No. 12 continued the east drift for 55 feet beyond the line of "A" shaft, widened it out to the full size of the plat, and crosscut north 15 feet from the shaft for the entrance to the pump-house.

Raising "A" Shaft.

No. 12 started raising "A" shaft in April, and went up 42 feet, built a pocket, and then sunk the skip pit 44 feet, timbered it, and built the shaft pocket. They were delayed a good deal in raising at first on account of a slip of bad ground on the east side, which had to be caught up and timbered. The last 34 feet of the skip pit was in hard jasper. In September they started raising again, and holed to the bottom of the shaft on December 19th. Above the fifteenth level the shaft is diorite. It was raised full size and timbered as it was put up.

NEW CONSTRUCTION

E. and A. No. 254.

Electric Haulage, Tenth Level, "A" Shaft.

This was partly finished in 1912, but was not entirely completed until June 1913, at which time the motor started running on the fifteenth level in "B" shaft. As the original estimate was larger than needed to make the installation on the tenth level, extra cars were built and charged to this account, under heading No. 6, making it possible to handle economically all the rock from sinking and raising "A" shaft, and from the rock raise west of "B" shaft. Nearly all the expense of extending the power line to the fifteenth level and of putting in trolley-boards, wire, etc. was taken up in the maintenance accounts. The final statement of this E. and A. is as follows:-

E. and A. No. 254. Electric Haulage.

No.	Account	Total Expense	Estimate
1	75 KW Motor Generator Set	2050.91	2400.00
2	Freight and handling	2.86	125.00
3	Foundation and erecting	92.92	200.00

E. and A. No. 254.(continued)

No.	Account	Total Expense	Estimate
4	Two 6-ton locomotives and spare armatures	3254.83	4200.00
5	Freight, unloading and lowering in mine	203.55	300.00
6	30 motor cars complete	5985.94	4320.00
7	Transmission line to tenth level	1011.92	1000.00
8	Trolley and bonding wires	2821.35	2000.00
9	Widening gauge of track	519.85	200.00
10	Bonding rails already laid	192.43	200.00
	Total	16136.61	14945.00
	Add 10% for contingencies		1494.50
	Grand total	16136.61	16439.50

The excess of expenditure over estimate in account No. 6 has been explained above, the estimate having been made for 18 cars instead of 30.

The excess in account No. 8 is due to the fact that such a long time elapsed from the time the original estimate was made until the installation was complete that the track had been extended considerably beyond the estimated distance.

The excess in account No. 9 was due to the necessity of taking up the bottom of the south-east drift for about 200 feet to bring the track down to grade. This drift was very wet, and the ore packed so hard in the bottom that it was difficult to clean it down to the bottom of the excavation. For this reason the grade had been left too steep, when the drift was driven.

E. and A. No. 258. Electric Hoist and Pumps.

The steam hoist was changed over to electric power during the summer, and was run by electricity for one month, but there were several delays due to hot bearings, and the steam engine was reconnected on October 23rd. Owing to the fact that it was impossible to shut down any boilers

on account of running the hoist by electricity, it was decided to wait until the pumps were started before using electric power again.

The change to electric power was made by shrinking a coupling on the end of the pinion-shaft of the hoist, and extending the shaft about six feet. On this extension a herring-bone gear is mounted, which is driven by a small pinion on the shaft of a 500 H.P. motor. When running by electricity the eccentrics and connecting rod of the steam engine are taken off.

As the pump house has not been cut, the electric pumps are in storage at the present time, but will probably be set up in May or June.

The expenditures to date are shown in the following table:-

E. and A. No. 258. Electric Hoist and Pumps.

No.	Account	Total Expense	Estimate
	Hoist.		
1	500 H.P. Motor and Switchboard	2991.53	2680.00
2	Gears and shaft extension	1320.33	1500.00
3	Foundation and erection	1160.62	500.00
4	Wiring	209.27	300.00
	Pumps.		
5	Centrifugal Pump	3069.27	3170.00
6	Plunger pump	7098.40	7965.00
7	Wiring in shaft	71.49	1200.00
8	Extension of water column		1200.00
9	Station piping		400.00
10	Foundation and erection	1.88	500.00
	Total	15922.79	19415.00
	Add 10% for contingencies		1941.50
	Total		21356.50
	Less salvage on present steam-pump		4500.00
	Grand Total		16855.50

The excess of expenditure over estimate in account No. 3 is due largely to difficulties in aligning shafting and bearings.

E. and A. No. 263.

Addition to the Dry.

As there were not enough lockers for the men changing in the dry, and as there was no room to put in any more in the building as it was, an additional room was built on the east end of the dry-building and fitted up in the same way as the other locker rooms. 56 lockers were installed. Following is a statement of the expenses incurred in this construction:-

E. and A. No. 263. Addition to the Dry.

No.	Account	Total Expense	Estimate
1 & 2	Addition to building and concrete floor	927.03	1250.00
3	56 steel lockers	271.39	275.00
4	Ventilating hoods	78.54	100.00
5	Heating	45.04	100.00
6	Lighting	3.72	25.00
7	Clothes racks	38.70	50.00
8	Miscellaneous, benches, etc.	26.34	
	Total	1390.76	1800.00
	Add 10% for contingencies		180.00
	Grand Total	1390.76	1980.00

This E. and A. is completed.

ANNUAL REPORT

(1913)

OF THE

CLIFFS SHAFT MINE.

COMPARISON OF COST SHEETS FOR 1912 AND 1913.

PRODUCTION

	Total	Per Day
Year 1912	261,320 Tons	886 Tons
Year 1913	299,351 "	998 "
Increase	28,031 "	112 "

LABOR.

	Year 1912	Year 1913
Average number of men	255	268
Average rate per day	$2.64	$2.83
Tons Per Man Per Day.		
Surface	16.50	16.38
Underground	4.27	4.79
Total	3.39	3.71
Cost of Production.		
Labor	$7.78	$7.65
Supplies	.316	.291
Total	1.094	1.056

GENERAL EXPENSE.

Account No. 26	Year	Total	Per Ton
Insurance	1912	$ 190.85	.001
	1913	165.54	.000
	Decrease	25.31	.001

Decrease in cost per ton is due mostly to increased product.

GENERAL EXPENSE.(continued)

Account No. 27	Year	Total	Per Ton
Engineering	1912	$1966.92	.008
	1913	1786.50	.006
	Decrease	180.42	.002

The charges in 1912 were high on account of special surveys to the 15th level, and to work on the cross-sections.

Account No. 28	1912	1627.98	.006
Analysis	1913	1931.41	.007
	Increase	303.43	.001

The increase is due to more frequent sampling in the stopes underground in 1912.

Account No. 29	1912	645.00	.002
Relief Fund	1913	---	---
	Decrease	645.00	.002

There has been no charge for relief fund since the Workmen's Compensation Law went into effect Sept. 1, 1912.

Account No. 30	1912	533.55	.002
Personal Injury Expense	1913	2805.68	.009
	Increase	2272.13	.007

In 1913 the principal charges were as follows;

Half earnings of the men on day of Emil Aho's funeral	$ 297.38
Settlement in full for Emil Aho's death	2151.30
Settlement in full to Oscar Kuoppila	350.00
Total,	2798.68

Account No. 30a	1912	6194.17		.024
Mine Office	1913	6602.92		.022
	Increase	408.75	Decrease	.002

The increase in total charge is due to wages helper in warehouse, first aid and fire helmet drills, etc. The decrease in cost per ton is due to the increase in production.

Total General Expense	1912	11,158.47	.043
	1913	13,292.05	.044
	Increase	2,133.58	.001

MAINTENANCE.

Account No. 125	Year	Total	Per Ton
Tracks and Yards	1912	$1385.83	.005
	1913	1498.93	.005
	Increase	113.10	.000

The principal item of extra expense charged to this account in 1913 was clearing away the refuse and tearing out the foundations of the old crusher building.

Account No. 126	1912	1064.60	.004
Docks, Trestles and Pockets	1913	1131.89	.004
	Increase	67.29	.000
Account No. 127	1912	3734.61	.014
Buildings	1913	2801.61	.009
	Decrease	933.00	.005

In 1912 the principal charges in this account were for painting all buildings, changes in the crusher building, and repairs to roofs. In 1913 the coal-dock was repaired, both shaft-houses were painted, and new roofing put on the dry and shops.

Account No. 128	1912	221.37	.001
Shop Machinery	1913	215.86	.000
	Decrease	5.51	.001
Account No. 129	1912	648.82	.002
Boiler Plant	1913	1292.11	.004
	Increase	643.29	.002

The principal charges in this account in 1913 are for repairs to grates and arches in the boiler-settings.

Account No. 130	1912	1795.80	.007
Hoisting Machinery	1913	1691.94	.006
	Decrease	103.86	.001

In 1912 a new head-sheave was put up in "A" shaft at a cost of $478.26. In 1913 a new head-sheave was put up in "B" shaft at a cost of $353.36.

MAINTENANCE.(continued)

Account No. 131	Year		
Compressors and Power Drills	1912	985.88	.004
	1913	3688.99	.012
	Increase	2703.11	.008

In 1913, 15 new drills were charged out at a cost of $3283.82.

Account No. 132	1912	336.59	.001
Pumping Machinery½	1913	1391.73	.005
	Increase	1055.14	.004

In 1913 charges for cutting entrance to pump-house were $634.93. Repairs to pumps, and water column in "A" shaft from 10th to 15th level cost $756.80.

Account No. 133	1912	1975.16	.008
Top Tram Engines and Cars	1913	846.03	.003
	Decrease	1129.13	.005

In 1912 repairs to the top tram motor were heavy, and it was moved to a concrete foundation on the ground.

Account No. 134	1912	2275.60	.009
Skips and Skip-Roads	1913	2151.14	.007
	Decrease	124.46	.002

The decrease per ton is due mostly to the increased product.

Account No. 135	1912	7352.48	.028
Underground Tracks and Cars	1913	5858.23	.020
	Decrease	1494.25	.008

In 1912 extensions of tracks on the 15th level were 1610 feet, and 25 sets of roller-bearing wheels and axles were purchased.

Account No. 136	1912	1.24	.000
Electric Tram Plant	1913	2567.20	.009
	Increase	2565.96	.009

The tram-plant started in November 1912. In 1913 the charges to this account include the cost of the track and trolley wire on the 15th level, the extensions on the 10th level, "A" shaft, and 10 new car trucks, nearly completed.

MAINTENANCE.(continued)	Year	Total		Per Ton
Account No. 137	1912	$1657.55		.006
Telephones and Safety Devices	1913	1510.43		.005
	Decrease	147.12		.001

In 1912 the protection of the shop machinery was completed, and a railing was built around the coal-dock.

Account No. 138	1912	4431.11		.017
Crushing and Screening	1913	2679.72		.009
	Decrease	1751.39		.008

In 1912, 3 new stock-pile cars cost $705.34. Crushper parts cost $1435.32.

Account No. 140	1912	224.44		.001
Fire Loss	1913	504.26		.002
	Increase	279.82		.001

The charges in 1912 were for a fire in the coal-pile, and in 1913 for a fire in the crusher building, March 14th

Total Maintenance	1912	$28091.08		$.107
	1913	29830.07		.100
	Increase	1738.99	Decrease	.007

MINING EXPENSE.

Account No. 150	1912	2068.20		.008
Air Pipes	1913	2128.02		.007
	Increase	59.82		.001
Account No. 151	1912	10529.35		.040
Compressors	1913	11047.35		.037
	Increase	518.00	Decrease	.003

There were more drills operated in 1913 than in 1912, and air was bought from the Morris Mine after Nov. 24th at about 15,000,000 cu. ft. per month, costing about $30.00 per 1,000,000 cu. ft.

Account No. 152	1912	8799.78		.034
Hoisting	1913	9232.81		.031
	Increase	433.03	Decrease	.003

The increase in total charge is due to operating the electric hoist for one month. Decrease in cost per ton is due to increased production.

MINING EXPENSE.(continued)	Year	Total	Per Ton
Account No. 153	1912	$9262.55	$.035
Pumping	1913	10732.44	.036
	Increase	1469.89	.001

The amount of water pumped has increased about 15% during the year.

Account No. 154	1912	916.81	.004
Sinking and Shaft Repairs	1913	12845.10	.043
	Increase	11928.29	.039

In 1913 "A" shaft was sunk 43 feet below the 15th level, and raised 190 feet to the bottom of the skip pit below the 10th level, at an average cost of $51.03.

The charges in 1912 in this account were for shaft-repairs, and for the plats at both shafts on the 15th level.

Account No. 155	1912	23,635.93	.090
Rock Drifting	1913	29,070.26	.097
	Increase	5,434.33	.007

In 1912 there was 2503 feet of drifting done at $9.44 per foot. In 1913, 2682 feet at $10.83 per foot. The higher cost per foot is due to No. 44's raise from the 15th level, "B" shaft, and to No. 21's drift on the eighth level, "A" shaft, both of which were extremely hard.

Account No. 156	1912	104,326.97	.399
Breaking Ore	1913	100,562.12	.336
	Decrease	3,764.85	.063

The decrease is due to the larger number of Leyner drills in use, and to the fact that the increased tramming efficiency in "A" shaft, on account of the electric haulage, allows these drills to the worked to capacity.

Account No. 157	1912	61,833.06	.237
Tramming	1913	68,688.46	.229
	Increase	6,855.40 Decrease	.008

The increase in total charges is on account of the increased tonnage produced. The decrease in cost per ton is due to the help of the

MINING EXPENSE.(continued)

roller-bearing cars in "B" shaft and the electric haulage in "A" shaft. The increase in wages, Feb. 1st, 1913, amounted to about 1¢ per ton for tramming.

Account No. 158	Year	Total		Per Ton
Filling	1912	$2576.47		$.010
	1913	1558.92		.005
	Decrease	1017.55		.005

The decreased cost for handling rock underground in 1913 is due to improved facilities in "B" shaft on the sixth level.

Account No. 159				
	1912	1665.45		.006
Timbering	1913	3856.14		.013
	Increase	2190.69		.007

The increase in charges to this account is due to the timbering of No. 44's raise from the 15th to the 10th level in "B" shaft, and to re-timbering the drifts in the rock dumps on the third and fourth levels.

Account No. 160				
	1912	7401.56		.028
Captain and Bosses	1913	8102.67		.027
	Increase	701.11	Decrease	.001

The increase is due partly to wage increase Feb. 1, 1913, and partly to the absence of any second captain during part of 1912.

Account No. 161				
	1912	891.48		.003
Dry House	1913	1167.13		.004
	Increase	275.65		.001

The increase in 1913 is due to the wage increase Feb. 1, and to the increase in heating charges made in 1913.

Account No. 162				
	1912	2301.47		.010
Top Landing and Tramming	1913	2740.60		.009
	Increase	439.13	Decrease	.001

The increase is due to the wage increase Feb. 1, and to the extra hoisting at night in 1913.

MINING EXPENSE.(continued)	Year	Total	Per Ton
Account No. 163	1912	$2024.11	.008
Stocking Ore	1913	3091.17	.010
	Increase	1067.06	.002

There were two stock-pile trestles built in 1913, one for lump and one for crushed ore. Lump ore was stocked during the winter months in 1913, and not in 1912. Two more men are required when lump ore is stocked.

Account No. 164	1912	4176.88	.016
Sorting Ore	1913	4341.58	.015
	Increase	164.70 Decrease	.001

The increase is due to the wage increase Feb. 1, 1913.

Account No. 168	1912	2816.43	.011
Crushing Ore	1913	533.57	.002
	Decrease	2282.86	.009

In 1912 there were 135,957 tons of ore crushed, and only 25,354 tons in 1913.

Account No. 169	1912	1317.02	.005
Screening Ore	1913	3298.57	.011
	Increase	1981.55	.006

In 1912 there were 125,363 tons of ore screened, and 258,997 tons in 1913.

Total Mining Expense	1912	246,733.52	.944
	1913	272,996.91	.912
	Increase	26,263.39	.032

RECAPITULATION.

	1912		1913		Increase		Decrease	
Account	Total	Per Ton	Total	Per Ton	Total	Per Ton	Total	Per Ton
	$							
General Expense	11,158.47	.043	13,292.05	.044	2,133.58	.001		
Maintenance	28,091.08	.107	29,830.07	.100	1,738.99			.007
Mining Expense	246,733.52	.944	272,996.91	.912	26,263.39			.032
Cost of Production	285,983.07	1.094	316,119.03	1.056	30,135.96			.038

Lucien Eaton

CLIFFS SHAFT MINE.

AVERAGE MINE ANALYSIS OF OUTPUT - 1913.

GRADE	IRON	PHOS.
Lump Cliffs Shaft	59.96	.100
Crushed Cliffs Shaft	58.73	.104

AVERAGE ANALYSIS ON STRAIGHT CARGOES FOR 1913.

	MINE		LAKE ERIE	
	IRON	PHOS.	IRON	PHOS.
Lump Cliffs Shaft	59.99	.097	60.05	
Crushed Cliffs Shaft	58.90	.101	59.10	

ORE STATEMENT - DECEMBER 31ST, 1913.

	Lump CL.SHAFT	CRUSHED CL. SHAFT	TOTAL	TOTAL LAST YEAR
On hand Jan. 1st,1913,	621	121,411	122,032	200,816
# Output for year	98,170	201,181	299,351	261,320
Total	98,791	322,592	421,383	462,136
Shipments	85,810	273,043	358,853	340,104
Balance on hand	12,981	49,549	62,530	122,032
Increase in Output 15%			38,031	
Decrease in Ore on hand			59,502	

Includes 15,000 tons estimated stockpile overrun

1913 - 1-8hr shift during year.
1912 - 1-10hr shift to Mar.11th; 1-8hr.shift from Mar.11th to close of year.

SHIPMENTS FOR 1913.

	POCKET	STOCKPILE	TOTAL	TOTAL LAST YEAR
Lump Cliffs Shaft	61,776	24,034	85,810	81,497
Crushed Cliffs Shaft	99,405	173,638	273,043	258,607
Total	161,181	197,672	358,853	340,104
Total Last Year	143,359	196,745	340,104	
Increase 6 %			18,749	

CLIFFS SHAFT MINE.

CLIFFS SHAFT MINE.

COMPARATIVE MINING COST FOR YEAR.

	1913	1912	INCREASE	DECREASE
PRODUCT	299,351	261,320	38,031	
General Expense	.044	.043	.001	
Maintenance	.100	.107		.007
Mining Expense	.912	.944		.032
Cost of production	1.056	1.094		.038
Exploratory	.019	.015	.004	
DEPRECIATION				
Equipment	.000	.001		.001
New construction -new crusher	.067	.051	.016	
New store house	.003		.003	
Total Depreciation	.070	.052	.018	
Taxes	.139	.177		.038
Central Office	.064	.071		.007
Sundry Expense	.024		.024	
COST ON STOCKPILE	1.372	1.409		.037
Loading and shipping	.031	.030	.001	
Total cost on cars	1.403	1.439		.036
Number of days operating	.300	295	5	
Number shifts and hours	1-8hr	1-10hr 1-8hr		
Avg.daily product	998	886	112	
COST OF PRODUCTION				
Labor	.765	.778		.013
Supplies	.291	.316		.025
Total	1.056	1.094		.038

CLIFFS SHAFT MINE.

STATEMENT OF COMPARATIVE WAGES.

	1 9 1 3	1 9 1 2	INCREASE	DECREASE
SURFACE				
Total Number of days	18,289	15,844¼	2,444-3/4	
Average rate	2.45	2.27	.18	
Amount	44,780.88	36,044.94	8,735.94	
UNDERGROUND				
Total number of days	62,480	61,182½	1,297½	
Average rate	2.94	2.73	.21	
Amount	183,542.45	167,114.73	16,427.72	
Total days	80,769	77,026-3/4	3,742¼	
Average rate	2.83	2.64	.19	
Total amount	228,323.33	203,159.67	25,163.66	
Labor cost per ton	.763	.778		.015
No.shifts and hours	1-8hr	1-10hr 1-8hr		

Increase wages per day:

Surface	.18	7.93%
Underground	.21	7.69%
Total	.19	7.20%

CLIFFS SHAFT MINE.

COMPARATIVE AVERAGE WAGES AND PRODUCT.

PRODUCT '13 299,251 Tons	SURFACE		UNDERGROUND		TOTAL	
PRODUCT '12 261,320 Tons	1913	1912	1913	1912	1913	1912
Avg. no men working	61	49	207	206	268	255
Avg.wages per day	2.45	2.27	2.94	2.73	2.83	2.64
Avg.wages per mo.25 days	61.25	56.75	73.50	68.25	70.75	66.00
Avg.product per man per day	16.38	16.50	4.79	4.27	3.71	3.39
Labor cost per ton	.150	.138	.613	.640	.763	.778
Diff. in labor cost per ton	.012	-.036	-.027	-.008	-.015	-.044
Avg. product breakg. & tramng.			7.02	5.66		
Avg. wages for miners contr.			2.96	2.77		
Avg.wages for trammers contr.			3.00	2.69		
Total avg.wages for contr.			2.98	2.74		

The above costs per ton are figured on the same basis as other statements, viz, 299,351 tons, which includes 15,000 tons accumulated overrun for 4 years.

		Tons	%
Tons per man per day	SURFACE Decrease	.12	.727
	UNDERGROUND Increase	.52	12.25
	SURF.& U.G. Increase	.32	9.5

Proportion of surface to underground men: 1913 - 1 to 3.40
1912 - 1 to 4.20
1911 - 1 to 3.35
1910 - 1 to 3.57

CLIFFS SHAFT MINE.

STATEMENT OF EXPLOSIVES USED FOR BREAKING ORE.

KIND	QUANTITY	AVERAGE PRICES	AMOUNT 1 9 1 3	AMOUNT 1 9 1 2
40% Powder				9.00
60% "	18,550	.113	2,102.93	2,078.00
50% "	181,432	.10	18,164.69	18,164.83
80% "	2,150	.135	290.25	526.95
Total powder	202,132	.1018	20,557.87	20,778.78
Fuse	255,500	3.83	979.35	991.98
C aps	48,900	6.38	311.81	311.40
Cap Crimpers			5.00	3.50
Total fuse,etc.			1,296.16	1,306.88
Grand Total			21,854.03	22,085.66
Product			299,351	261,320
Pounds powder per ton ore			.675	.781
Cost per ton for powder			.069	.080
Cost per ton for fuse,caps,etc.			.004	.005
Cost per ton for all explosives			.073	.085
Avg.price per lb.for powder			.1018	.1018

ANNUAL REPORT

(1913)

OF THE

SALISBURY MINE.

Production and Shipments.

The Salisbury Mine worked 295 days in 1913, and produced 118,719 tons of ore, exclusive of stock-pile overrun, an average of 403 tons per day. The following table shows the average per day and totals for the different grades for the year.

Table I.

Production by Grades.

Grade	December 1913	Total for Year 1913	Average per Day 1913	Average per Day 1912
Bessemer	Tons	Tons	Tons	Tons
Bessemer	2,378	24,934	85	92
Clinton	168	8,293	28	46
Salisbury		1,295	4	
Clinton Silica	6,931	88,661	302	263
Total	9,477	123,183	419	401
Rock	546	7,018	24	24
Total Rock & Ore	10,023	130,201	443	425

All the Bessemer in stock was shipped, and nearly all the Clinton, the amount remaining being overrun. The shipments were as follows;-

Table II.

Bessemer	24,350	Tons
Clinton	17,294	"
Salisbury	1,968	"
Clinton Silica	2,483	"
Total	46,095	"

The mine worked only 19 days in July, being idle from the second to the eleventh while repairs were being made to the shaft at the knuckle.

The stock-pile balances at the end of the year were as follows;-

Table III.

Bessemer	2,974 Tons
Clinton	4,958 "
Clinton Silica	154,112 "
Total,	162,044 "

The division of the production by levels is shown in the following table;-

Table IV.

Level	Bessemer Tons	Clinton Tons	Salisbury Tons	Silica Tons	Total Ore Tons	Rock Tons	Total Ore and Rock Tons
2	904			127	1,031	154	1,185
3	9,969	704	278	6,422	17,373	590	17,963
4	2,832	192	14	9,041	12,079	672	12,751
5	38	294		3,490	3,822	158	3,980
8	850	138	216	23,890	25,094	644	25,738
9	3,146	1,341	198	15,319	20,004	130	20,134
10	2,314			94	2,408	86	2,494
12				293	293	414	707
13	2,656	12		11,166	13,834	1,848	15,636
14	705	2	16	8,006	8,729	520	9,249
16	1,520	2,310	573	10,813	15,216	1,848	17,064
Total	24,934	4,993	1,295	88,661	119,883	7,018	126,901
Stock-pile Overrun		3,300			3,300		3,300
Grand total	24,934	8,293	1,295	88,661	123,183	7,018	130,201

Table V.

Production by Months.

Month	Days	Ore per Day	Bessemer	Clinton	Salisbury	Silica	Total Ore	Rock	Total Ore and Rock
January	26	419	2,194	402		8,305	10,901	562	11,463
February	23	410	1,332	336		7,752	9,420	544	9,964
March	25	386	1,858	394		7,408	9,660	460	10,120

Table V. (continued)

Month	Days	Ore per Day	Bessemer	Clinton	Salisbury	Silica	Total Ore	Rock	Total Ore and Rock
April	25	406	1,262	680		8,217	10,159	490	10,649
May	26	406	1,399	510	416	8,234	10,559	622	11,181
June	24	392	1,281	42	471	7,613	9,407	530	9,937
July	19	417	1,564	42	213	6,102	7,921	454	8,375
August	26	422	3,001	220	181	7,572	10,974	662	11,636
September	25	411	2,710	861	14	6,694	10,279	662	10,941
October	27	395	2,543	690		7,430	10,663	908	11,571
November	24	385	2,248	648		6,403	9,299	578	9,877
December	25	379	2,378	168		6,931	9,477	546	10,023
Total	295	403	23,770	4,993	1,295	88,661	118,719	7,018	125,737
Stock-pile Overrun			1,164	3,300			4,464		4,464
Grand total	295	418	24,934	8,293	1,295	88,661	123,183	7,018	130,201

DELAYS.

There were 13 holidays during the year on which the mine was idle. No hoisting was done from July 2nd to July 11th, while the shaft was being repaired at the knuckle. The other delays are tabulated as follows;-

Table VI.

Date	Hours	Tons Lost	Cause of Delay	Cost of Repairs $
Feb. 13	2	100	Skip off track with broken axle	7.50
" 26	1	60	Skip off track	1.10
March 14	2	40	No electric current. Trouble on main line	
" 15	4½	100	1½ hrs. No electric current. 3 hrs. skip broke. an axle	8.50
" 17	2½		No electric current	
" 24	2½	40	Rope frozen fast in skip-road	1.15
" 26	1½	20	Broken axle on skip	6.90
" 27	2½	30	Broken axle on skip. Skip off track at knuckle	8.00
April 26	2	40	Skip off track at knuckle	13.30

Table VI. (continued)

Date	Hours	Tons Lost	Cause of Delay	Cost of Repairs $
May 10	2	35	Skip off track at knuckle	2.20
June 27	6	90	Lightning struck main line, burning out the circuit breaker on the hoist	14.95
July 19	1	100	No current. Main line trouble.	
Aug. 7	1		No current. Main line trouble.	
Total	30½	655		63.60

The following delays were caused by lack of electric current due to trouble on the main line.

Table VII.

Date	Hours	Tons Lost	Remarks
March 14	2	40	Blizzard
" 15	1½	100	Blizzard
" 17	2½		Results of blizzard of 14th, 15th and 16th.
June 27	6	90	Thunderstorm
July 19	1	100	Thunderstorm
Aug. 7	1		Thunderstorm
Total	14	330	Weather conditions.

Table VIII.

Estimate of Ore Reserves.

Level	Bessemer	Clinton	Silica	Total
3			11,000	11,000
4	22,000			22,000
5	38,000	4,000	48,000	90,000
8	74,000	20,000	97,000	191,000
9	5,000	8,000	17,000	30,000
10		10,000	9,000	19,000
12		11,000	28,000	39,000
14	8,000		19,000	27,000
16	3,000	1,000	17,000	21,000
Total	150,000	54,000	246,000	450,000
Less 10% Rock and 10% Loss in Mining	30,000	11,000	49,000	90,000
Net total	120,000	43,000	197,000	360,000

Ore Reserves Jan. 1, 1913 -	453,000	Tons
Production 1913 -	118,719	"
Balance	334,281	"
Ore Reserves Jan. 1, 1914 -	360,000	"
Increase	25,719	"

SURFACE.

As no shipments were made from the Silica stock-pile during the year, additional ground was graded beyond the pile towards the south-west. The swamp south of the timber-yard was drained, and a new road was built across it. As the stock-pile advances it will cover the old road.

There was a shortage in deliveries of timber during the winter and spring, and at the end of the year there was only about one month's supply on hand. Deliveries on 1914 contracts are expected soon.

The cave over the Bessemer Deposit at the east end of the North Vein was considerably enlarged during the summer.

REPAIRS.

The mine was shut down from July 2nd to July 11th while repairs were being made to the shaft-timber at the knuckle. The skip-road was over six inches out of alignment at this point, and many delays were caused by the skip going off the track. Accidents of this kind have been very infrequent since the repairs were made.

The electric pump gave a good deal of trouble during the first part of the year, and it was necessary to run the Cornish-pump over a month.

NEW CONSTRUCTION.

E. and A. 249. Electric Equipment.

All accounts on this E. and A. were completed last year except No. 2, the compressor, the motor for which was not received until January. The compressor has been running very satisfactorily since February. The total expenditures on this E. and A. are as follows;-

E. and A. No. 249.

No.	Account	Total Expense	Estimate
1	Hoist	13,727,98	14,300.00
2	Compressor	4,950,93	7,150.00
3	Pump	9,050,51	11,385.00
4	Transmission Line	3,409,17	2,200.00
	Total	31,138.59	35,035.00

This E. and A. No. 249 is finished. Account No. 4 has been transferred to "Steam-Electric" installation.

UNDERGROUND

General.

North Vein

Bessemer Deposit.

The 285 foot sub-level, opened last year, was finished, the 305 foot sub-level opened in 1912 was finished, and four gangs are now opening up the 325 foot sub-level.

Footwall Deposit.

One gang scrammed a little ore for three months on the footwall on the 260 foot sub-level 500 feet east of the shaft, and did a little drifting on the footwall on the 370 foot sub-level near the air-shaft. Another gang has worked all the year on and above the 345 foot sub-level stoping a good grade of Silica ore on the footwall 700 to 800 feet south-east of the shaft.

South Vein.

One gang has stoped in the back of the fifth level throughout the year mining two small veins of rather good ore, one on the footwall and the other near the hanging-wall 1320 and 1450 feet south-east of the shaft.

Three gangs have been scramming throughout the year in the caved ground in the big room above the eighth level 900 to 1000 feet south-east of the shaft. They have had some very good ore.

The most important development of the year has been the discovery

of a body of ore east of the big open rooms that are found in this vein between the eighth and tenth levels. This corresponds to the Bessemer Deposit in the North Vein, which had been left behind in exactly the same way. This ore body has been opened on the eighth level, where it apparently is about 120 feet long and 120 feet wide. It is being opened on a sub-level 30 feet above the eighth level, but its upward extension has already been mined on the fifth level, where it is very small. The ore is generally high grade, but is usually too high in phosphorus for Bessemer. Two contracts are now working here.

In No. 4 shaft pillar one gang has been stoping throughout the year, and has finished most of the ore on the footwall down to the ninth level.

Three gangs have been scramming throughout the year in the loose dirt of the open room along the hanging-wall at the east end of the vein between the eighth and ninth levels.

South-West Deposit.

Two gangs have been working in the caved ground on the 715 and 725 foot sub-levels and on the thirteenth level, or 740 foot sub-level, throughout the year, and have mined some very good ore. Everything is now finished above the 13th level. Another gang has finished the 750 foot sub-level at the east end of the deposit, and are now working on the 760 foot sub-level.

Between the fourteenth and sixteenth levels four gangs have been working most of the year. Two of them have mined the ore on the footwall west of the shaft on the 815, 830 and 845 foot sub-levels. One of the others mined the ore on the footwall in the old workings 200 feet west of old No. 4 shaft from the 875 foot sub-level down to the sixteenth level. The other gang completed a raise to the fourteenth level, drifted east and west along the paint-rock at the south end of the ore, and drifted west to the hanging-wall 130 feet from the south cross-cut 300 feet south of the shaft. This last drift completes the exploration of the old workings on

the west side of the crosscut.

The two gangs on the 845 foot sub-level on the footwall west of No. 5 shaft are now the only contracts working on this level.

Details by Contracts.

North Vein.

Bessemer Deposit.

285 Foot sub-level.

No. 16 continued their drift east along the hanging-wall to the end of the ore, and then mined back toward the west, slicing the ore out on the north side. They moved to the 305 foot sub-level in March.

No. 5 crosscut north to the footwall from No. 16's drift, and sliced back towards the west. They moved to the 305 foot sub-level in April.

No. 15 crosscut north from the hanging-wall drift 20 feet east of No. 5's crosscut to the footwall, drifted east through the dike, and mined the ore east of the dike. They went to the 305 foot sub-level in April.

No. 4 drifted east from the north raise, and holed to No. 5's crosscut. They crosscut north from this drift through 21 feet of rock and 10 feet of ore to the footwall, and then mined this piece of ore. They went to the 305 foot sub-level in April.

305 Foot sub-level.

No. 16 came down in April from the 285 foot sub-level, crosscut north-east from the main drift by No. 4's raise to the jasper, and then drifted south-east to the main drift. This was in lean ore. They crosscut to the footwall again, mined some good ore on top-timber for one month, and moved to the east end of the main drift, where they stoped towards the west taking the ore on top-timber. They stoped back to the big raise, where they mined the pillars close by with No. 5, and moved to the 315 foot sub-level in November.

No. 5 came down from the 285 foot sub-level in April, drifted east through the dike with No. 15, and stoped the ore inside. They stoped the ore along the footwall drift back almost opposite the big raise, and then mined the pillars remaining near this raise with No. 16, going down to the 315 foot sub-level in December.

No. 15 came down from the 285 foot sub-level in April, drifted east through the dike with No. 5, and then moved to the 345 foot sub-level in the Footwall Deposit.

No. 4 came down from the 285 foot sub-level in April, drifted east from the old room 75 feet north of the big raise to No. 16's crosscut, and stoped the ore between the footwall and the main drift. In November they went to the 325 foot sub-level.

315 Foot sub-level.

No. 16 came down from the 305 foot sub-level in November, and drifted east from the hanging-wall raise 1250 feet south-east of the shaft.

No. 5 came down from the 305 foot sub-level in December, and drifted west from the big raise to meet No. 16. They holed, and No. 16 crosscut south to the hanging-wall. No. 5 are drifting east.

325 Foot sub-level.

No. 15 came from the 345 foot sub-level in July, crosscut north from the main drift to No. 4's raise, 1300 feet south-east of the shaft, and drifted east in lean ore and jasper past the big raise. They turned south-east to the hanging-wall, which they followed east for 135 feet, having ore nearly all the time for the last 100 feet. They have caved back the ore above and along this drift for 80 feet.

No. 4 came down from the 305 foot sub-level, and crosscut north from the north raise 30 feet in good ore to the footwall. They drifted east and south from this crosscut in jasper and lean ore, holing to No. 15's drift opposite the big raise, through which the timber is hoisted. They are now drifting west from their crosscut 15 feet north of the raise, and have good ore.

Footwall Deposit.

260 Foot sub-level.

No. 11 mined the ore left in the back at the north end of the crosscut 500 feet east of the shaft in August, September and October, and went to the 465 foot sub-level in the South Vein.

345 Foot sub-level.

No. 9 stoped the ore north-east and south-west of their raise, which is 820 feet south-east of No. 5 shaft, and then drifted west 150 feet along the footwall in ore that analysed 50% to 56% iron. They have been stoping the ore in the back of this drift during the latter part of the year.

No. 15 came down from the 305 foot sub-level in May, and put up two raises from No. 9's drift on the footwall.

No. 11 raised from the fifth level in May 720 feet south-east of the shaft, and drifted east 70 feet to No. 9's old stope, following a narrow band of ore between walls of jasper.

370 Foot sub-level.

No. 11 continued their drift west on the footwall for 60 feet to the end of the ore 245 feet south-east of No. 5 shaft, and went to the fifth level at the end of February.

Fifth Level.

No. 11 raised 53 feet in lean ore from the crosscut 720 feet south-east of the shaft in April and May, and drifted east on the 345 foot sub-level.

Eighth Level.

No. 3 raised to the south 43 feet in lean ore in March from the footwall 940 feet south-east of the shaft, and drove a short crosscut to the south to the jasper contact 33 feet above the level. They moved to the ninth level in April.

South Vein.

Fifth Level.

No. 13 mined the floor of the 365 foot sub-level down to the

fifth level on both sides of the crosscut 1450 feet south-east of the shaft, leaving, however, a pillar to protect the crosscut. They finished here in September, and moved back in the crosscut 120 feet nearer the shaft, where they raised in the back towards the north-east, following the ore on the footwall until it pinched out about 30 feet above the level. This place is now finished.

415 Foot sub-level.

No. 12 raised from the eighth level to this sub-level in January and February, 920 feet south-east of the shaft, and drifted east from the raise 130 feet along the hanging-wall to the end of the ore. They sliced back towards the west in the loose ground of the old room, sorting the rock from the ore and leaving it behind them on the lagging. In October they went down to the 430 feet sub-level.

No. 21 raised from the 430 foot sub-level to the 415 foot sub-level for a timber road 15 feet west of No. 12's raise in March, and crosscut north to the footwall from No. 12's drift 75 feet east of the raise. They sliced back with No. 12 until October, and then moved to the 430 foot sub-level.

430 Foot sub-level.

No. 7 continued their drift east in the old room to the end of the ore 1050 feet south-east of the shaft. They sliced back on both sides of the drift in the loose ground of the old room, sorting the ore as described under the heading of the 415 foot sub-level. At the end of the year they were 900 feet south-east of the shaft.

No. 21 came down from the 415 foot sub-level in October, and drifted east 100 feet along the hanging-wall from their raise, which is 920 feet south-east of the shaft. They holed into No. 7's stope, and are now slicing back.

No. 12 came down from the 415 foot sub-level in October, and crosscut north-east 65 feet from their raise to No. 7's drift. They are now slicing back 30 feet from the chute. Practically all the ore from this

sub-level and the 415 foot sub-level has come from the caved ground. Some has been Clinton and Bessemer, but most of it is Silica.

445 Foot sub-level.

No. 3 continued their drift east along the hanging-wall for two months, until the ore was cut off by rock in the breast, 1030 feet south-east of the shaft. They put up a raise to the 430 foot sub-level for a ladder-road 840 feet south-east of the shaft, and moved to the eighth level in March.

465 Foot sub-level.

No. 14 raised to this sub-level in September and October in two places 1200 feet south-east of the shaft. They crosscut south-east from the south raise 140 feet in ore to diorite, and turned south along the diorite contact for 30 feet. They are still in ore.

No. 11 crosscut south from No. 14's north raise in November, passing through 20 feet of jasper, and holed to No. 14's crosscut 25 feet further south in December. They are now drifting west in mixed ground 15 feet south of No. 14's raise.

Eighth Level.

No. 12 raised to the 415 foot sub-level 920 feet south-east of the shaft in January and February.

No. 17 came up from the 515 foot sub-level in May, and drifted east 60 feet in jasper and lean ore from the end of the drift 1110 feet south-east of the shaft. Here they struck ore, and soon holed into the raise that they had put up from the 515 foot sub-level. They followed the jasper hanging-wall east for 40 feet, and then crosscut north-east 50 feet to the footwall, which they followed east and south-east for 140 feet. Here they turned south along a small dike, which they followed for 60 feet, until they reached the hanging-wall diorite. They are drifting south-west along this contact in ore.

No. 8 came to this sub-level in November, and put up a raise on the footwall for 30 feet 1260 feet south-east of the shaft, but had jasper

on the hanging-wall side, and did not open out on the 465 foot sub-level. They crosscut south from the main drift 25 feet east of No. 11's raise, and are now in 25 feet in good ore.

No. 6 came to this level in December, tried to raise on the foot-wall, 1320 feet south-east of the shaft, but were cut off by rock, and drifted through the dike 10 feet further east, where No. 17 turned south. They are now drifting south-east in good ore.

515 Foot sub-level.

No. 17 crosscut south through the pillar 610 feet east of old No. 4 shaft, and holed to No. 8's raise in February. From this drift they drove a small stope east in good ore for 30 feet, one set above the 515 foot sub-level, but the ore was cut off by jasper, and they raised to the north 40 feet in fine ore from the top of their north raise from the ninth level. They went to the eighth level in May.

No. 8 scrammed in and along the side of the old room 1200 feet south-east of the shaft for three months, and then raised 40 feet in ore from the back of the stope over the top of their raise from the ninth level 640 feet east of old No. 4 shaft. They went back to the old room, and scrammed there until September, slicing out the pillars on the west side of the room. In September they raised to the north on the dike, and holed to No. 17's drift on the eighth level 660 feet east of old No. 4 shaft. They continued scramming in the old room until the end of October, and then moved to the eighth level.

In No. 4 shaft pillar No. 19 caved back their drift east of the raise 165 feet north-east of the shaft for four months, and went down to the 530 foot sub-level in May.

530 Foot sub-level.

No. 19 opened out in their raise 160 feet north-east of old No. 4 shaft in May, and drifted north-east 60 feet to the footwall, which they followed east for 80 feet to an old room filled with rock. They stoped the ore on both sides of the drift back almost to the raise, and mined a little

ore on the west side. In November they went down to the ninth level.

In April No. 3 crosscut 30 feet south-east from the timber-raise, 550 feet south-east of old No. 4 shaft, to the old room, and scrammed the ore along the edge of the old room for two months.

Ninth Level.

No. 19 came down from the 530 foot sub-level in November, and repaired the drift north and east of the raise 60 feet north-east of No. 4 shaft. They are now stoping the ore on both sides of this drift 240 feet east of the shaft, leaving a pillar to protect the inside raise to the eighth level.

No. 3 came down from the 530 foot sub-level in June, and scrammed in the old room 570 feet south-east of No. 4 shaft until October, when they went down to the 570 foot sub-level.

No. 2 scrammed in the old room south of No. 3 and 570 feet south-east of No. 4 shaft, mining the pillars between two old rooms, and went down to the 570 foot sub-level in October.

570 Foot Sub-level.

No. 3 came down from the ninth level in October, crosscut south from the timber raise to the old room 570 feet south-east of No. 4 shaft, and scrammed in the loose dirt on both sides of their crosscut, until the end of the year.

No. 2 also came down from the ninth level in October, and stoped back part of the pillars between two old rooms 470 feet south-east of the shaft.

South-West Deposit.

715 Foot sub-level.

No. 1 drove three crosscuts north from the timber drift 150 to 250 feet south-west of No. 4 shaft, and mined the ore on the footwall west of the timber raise. They also mined a little ore south of the timber drift, and moved to the 725 foot sub-level.

725 Foot sub-level.

No. 1 came down from the 715 foot sub-level in April, and cross-

cut south-east 90 feet from their raise, which is 220 feet south-west of old No. 4 shaft. They drifted east 80 feet from this crosscut 25 feet south of the chute, and crosscut north-west 70 feet to the footwall. They mined the ore on both sides of these drifts, and went down to the thirteenth level, or 740 foot sub-level, in August.

No. 20 continued their crosscut south to the hanging-wall 320 feet south-west of No. 4 shaft, and sliced back the Bessemer ore on both sides. They went down to the thirteenth level in May.

Thirteenth level.

No. 20 came down from the 725 foot sub-level in May, and repaired the drift east from the west raise for 60 feet, and crosscut south on the east side of their old crosscut to the hanging-wall 320 feet south-west of No. 4 shaft. They sliced out the Bessemer ore near the hanging-wall, and then crosscut north-west from the timber drift for 40 feet to the old room 150 feet south-west of No. 4 shaft, and mined the pillar left between this room and the timber-raise. At the end of the year they were scramming 25 feet north-west of No. 1's raise 220 feet south-west of No. 4 shaft.

No. 1 came down from the 725 foot sub-level in August, repaired the crosscut south of their raise, which is 220 feet south-west of No. 4 shaft, and crosscut north-east and east 100 feet, making a new timber-road. They stoped the pillars remaining on the east side of the timber-raise until December, and caved back the drift to their raise.

750 Foot sub-level.

No. 18 crosscut south-west to the old drift 230 feet south-west of No. 4 shaft, and scrammed out the ore on the east side. They crosscut north 10 feet through the rock on the north side of the drift 20 feet west of the chute, and drifted north-west 70 feet in ore, until they reached the timber-raise. Leaving a small pillar they sliced back the ore on the west side of this drift. They had a large amount of Bessemer ore here. They finished, and moved to the 760 foot sub-level in September.

760 Foot sub-level.

No. 18 came down from the 750 foot sub-level in September, and drifted north-west 50 feet from the raise. They stoped out the ore on the north, then drifted west through mixed ground for 80 feet, and scrammed out a little ore on the south side of the drift. This is all caved ground mixed with timber. They are now mining some fine Bessemer ore on the east side of the raise.

Fourteenth Level.

No. 14 holed their raise from the sixteenth level to the elevation of the fourteenth level in February, 300 feet south-west of No. 4 shaft, and made connections with the main drift in March by a crosscut 40 feet long. They went back to the sixteenth level in March.

815 foot sub-level.

No. 10 finished this sub-level on the footwall 150 feet west of No. 5 shaft in January, and went down to the 830 foot sub-level.

830 foot sub-level.

No. 10 came down from the 815 foot sub-level in February, and ran the old room west of the west raise full of rock. Standing on this rock they stoped the ore in the back on the west side, and caved it back. They went down to the 845 foot sub-level in September.

No. 23 mined the ore east of the east raise on square-sets, caved the sub-level back, and went down to the 845 foot sub-level in June.

845 Foot sub-level.

No. 23 drifted east along the footwall for 105 feet from the east raise, and opened a stope 3 sets wide 100 feet south-west of No. 5 shaft. They caved this drift back, and crosscut south 45 feet from the raise, 30 feet being in ore. They drifted east 30 feet from this crosscut in ore, and mined the ore on square sets, finishing the sub-level at the end of the year.

No. 10 came down from the 830 foot sub-level in September, and drifted west 100 feet from the east raise, passing the west raise, until

they reached the rock-filled room. They caved back, and finished at the end of December.

875 Foot sub-level.

No. 6 scrammed ore from the back of their drift, 160 feet south-west of No. 4 shaft for two months, and moved to the 885 foot sub-level in February.

885 Foot sub-level.

No. 6 drifted north-west on the footwall for 140 feet from their raise, which is 170 feet south-west of No. 4 shaft, until the ore was cut off by a dike. Moving back 30 feet, they crosscut south-west through the dike, and drifted north-west again for 40 feet in ore. They caved back the drift from this crosscut to the raise, and went down to the sixteenth level in September.

Sixteenth Level.

No. 6 came down from the 885 foot sub-level in September, and mined the ore under the 885 foot sub-level on the north side of the crosscut to No. 4 shaft. They repaired this crosscut, and mined the ore on the south side. In December they went to the eighth level.

No. 14 holed their raise to the fourteenth level in February 500 feet south-east of the shaft. They returned to the sixteenth level in March, and drifted west from the crosscut 500 feet south of the shaft for 40 feet in ore between two dikes. They caved this back, and drifted east from the crosscut 20 feet further north, following the north side of the pain-rock, until they holed into the old crosscut 240 feet south-west of No. 4 shaft. 300 feet south of No. 5 shaft they drifted west from the crosscut again, and went in 10 feet in ore and 115 feet in jasper until they reached the pain-rock hanging-wall. They went to the eighth level in September.

ANNUAL REPORT

OF THE

SALISBURY MINE.

COMPARISON OF COST SHEETS FOR 1912 AND 1913.

PRODUCTION.

	Total	Per Day
Year 1912	113,181 Tons	400 Tons
Year 1913	123,183 "	417 "
Increase	10,002 "	17 "

Year 1913 includes 3,300 tons estimated overrun from Clinton stock-pile. Both years include overrun from Bessemer stock-pile.

LABOR.

	1912	1913
Average number of men	140	148
Average rate per day	$2.63	$2.73
Tons per Man per Day.		
Surface	12.18	12.48
Underground	3.47	3.59
Total	2.70	2.79
Cost of Production.		
Labor	$ .980	$.982
Supplies	.281	.311
Total	1.261	1.293

GENERAL EXPENSE.

Account No. 26	Year	Total	Per Ton
Insurance	1912	$246.61	$ .002
	1913	237.85	.002
	Decrease	8.76	.000

GENERAL EXPENSE.(continued)

Account No. 27	Year	Total	Per Ton
Engineering	1912	$621.96	$ .006
	1913	565.30	.005
	Decrease	56.66	.001
Account No. 28	1912	2860.76	.025
Analysis	1913	2781.58	.023
	Decrease	79.18	.002
Account No. 29	1912	327.00	.003
Relief Fund	1913	--	--

There has been no charge for Relief Fund since the Workmen's Compensation Act went into effect, Sept. 1, 1912.

Account No. 30a	1912	3128.66	.028
Mine Office	1913	3983.31	.032
	Increase	854.65	.004

The increase is due to the increase in salaries at the mine, increase in proportion of Supt.'s and Asst. Master Mechanic's salary, increase in cost of welfare-work, and wages of inspection and safety committees.

Total General Expense	1912	$7184.99	$ .064
	1913	7568.04	.062
	Increase	383.05	Decrease .002.

MAINTENANCE.

Account No. 125	1912	856.25	.008
Tracks & Yards	1913	542.32	.005
	Decrease	313.93	.003

The decrease is due mostly to the new surface boss. The old surface boss, who died early in 1913, had only one arm, so that often one more man was needed than is now.

Account No. 126	1912	139.85	.005
Dockes, Trestles and Pockets	1913	844.26	.007
	Increase	704.41	.002

The increase is on account of the extension of the Silica stock-pile ground in 1913.

MAINTENANCE.(continued)

Account No. 127	Year	Total	Per Ton
Buildings	1912	$1195.32	$ .011
	1913	443.73	.004
	Decrease	751.59	.007

In 1912 the engine-house was painted inside and out, the roof and walls repaired, and an addition built for the compressor motor. The dry and office were painted, and new steam-line laid from the boiler-house to the office and dry. In 1913 new roofing was put on the shops.

Account No. 128	1912	47.38	.000
Shop Machinery	1913	50.80	.000
	Increase	3.48	.000
Account No. 129	1912	158.26	.002
Boiler Plant	1913	374.88	.003
	Increase	216.62	.001

In 1913 the feed-pipes were renewed, the main stack painted, and the brick work repaired in September and October.

Account No. 130	1912	1129.66	.010
Hoisting Machinery	1913	4437.85	.036
	Increase	3308.19	.026

In 1912 the principal items of expense were for one new rope, a new pulley-stand, and a turn sheave. Depreciation charges on the electric hoist were $347.41. In 1913 one new rope cost $354.61, heating in shaft $232.52, and depreciation of electric hoist $3054.32

Account No. 131	1912	705.11	.006
Compressors and Power Drills	1913	1843.18	.015
	Increase	1138.07	.009

In 1912 2 drills cost $246.68, and depreciation on electrical equipment $337.28. In 1913 one drill cost $121.89, and depreciation on electrical equipment $1530.69.

Account No. 132	1912	881.82	.008
Pumping Machinery	1913	3497.14	.028
	Increase	2615.32	.020

In 1912 the principal charges were for the extension of the water

column on surface, repairs to the pump and pump-rods, and $363.83 for depreciation of new plant. In 1913 the principal items were repairs to Cornish pump $297.50, repairs to electric pump $780.91, and depreciation of new equipment, $2436.42.

MAINTENANCE.(continued)

Account No. 133	Year	Total	Per Ton
Top Tram Engines and Cars	1912	$ 77.83	$ .000
	1913	165.34	.001
	Increase	87.51	.001

The top tram engine was overhauled and fitted with new brasses, and two new ropes were put on in 1913.

Account No. 134	1912	1616.68	.014
Skips and Skip-Roads	1913	1298.65	.011
	Decrease	318.03	.003

The knuckle was repaired in July, and after that date charges for repairs there and for broken wheels and axles were lighter than in previous months.

Account No. 135	1912	1320.52	.012
Underground Tracks and Cars	1913	1527.15	.012
	Increase	206.63	.000

The increase in 1913 is due to repairs to sub-level cars and to extensions of track on the eighth level.

Account No. 137	1912	149.44	.001
Telephones and Safety Devices	1913	113.20	.001
	Decrease	36.24	.000
Total Maintenance	1912	8278.12	.073
	1913	15138.50	.123
	Increase	$6860.38	$.050

MINING EXPENSE.

Account No. 150	1912	330.17	.003
Air-Pipes	1913	510.74	.004
	Increase	180.57	.001

The increase is for extensions in drifts and raises on the eighth level.

MINING EXPENSE.(continued)

Account No. 151	Year	Total	Per Ton
Compressors	1912	$4433.37	$ .039
	1913	3920.58	.032
	Decrease	512.79	.007

The decrease is due to the operation of the electric compressor, which started Feb. 1, 1913.

Account No. 152			
	1912	7945.00	.070
Hoisting	1913	6955.58	.057
	Decrease	989.42	.013

The decrease is due to the operation of the electric hoist in 1913.

Account No. 153			
	1912	5155.36	.046
Pumping	1913	4438.77	.036
	Decrease	716.59	.010

The decrease is due to the operation of the electric pump in 1913.

Account No. 154			
	1912	238.92	.002
Sinking and Shaft Repairs	1913	674.57	.005
	Increase	435.65	.003

The increase is for repairs to the shaft at the knuckle in July.

Account No. 155			
	1912	2893.01	.025
Rock Drifting	1913	3236.29	.026
	Increase	343.28	.001

In 1912 there were 547 feet of rock drifting done at $5.29 per foot, and in 1913, 545 feet at $5.94. Increase in wages raised rate per foot 20¢.

Account No. 156				
	1912	63865.70		.565
Breaking Ore	1913	68613.87		.558
	Increase	4748.17	Dec.	.007

The total increase is due to the larger production, and the decrease in cost per ton to the increased proportion of ore produced from stoping.

Account No. 157			
	1912	12417.35	.110
Tramming	1913	14187.61	.115
	Increase	1770.26	.005

The increase is due to the increase in wages on Feb. 1, 1913, and to the increased tonnage.

MINING EXPENSE.(continued)

Account No. 158	Year	Total	Per Ton
Filling	1912	$ 510.80	$ .005
	1913	46.26	.000
	Decrease	464.54	.005

In 1912 a good deal of rock was broken from the capping to form a mat above the stopes in the Bessemer Deposit.

Account No. 159			
Timbering	1912	18235.51	.161
	1913	20437.70	.166
	Increase	2202,19	.005

The increase in mine-timber is $289.76. The principal increase is in the amount of repairing on the 8th, 12th, 14th and 16th levels, and in the wage rate. The mine worked 283 days in 1912 and 295 in 1913.

Account No. 160				
Captain and Bosses	1912	5371.68		.047
	1913	5683.37		.046
	Increase	311.69	Dec.	.001

The increase is due to the increase in wages and to the greater number of days that the mine worked.

Account No. 161			
Dry-House	1912	1339.27	.012
	1913	2079.69	.017
	Increase	640.42	.005

The increase is due to the increase in wages, greater number of days worked, and principally to the increased proportion of boiler-house expense, since the electric equipment has been in operation.

Account No. 162			
Top Landing and Tramming	1912	3486.61	.030
	1913	4585.39	.037
	Increase	1098.78	.007

In 1912, 50,894 tons were stocked, and 99,546 tons in 1913.

MINING EXPENSE.(continued)

Account No. 163				
Stocking Ore	1912	$ 910.15		$ .008
	1913	1101.35		.009
	Increase	191.20		.001

In 1912, 50,894 tons were stocked, and 99,546 tons in 1913.

Account No. 166	1912	1.66		.000
Cave-In	1913	25.45		.000
	Increase	23.79		.000
Total Mining Expense	1912	127,139.96		1.123
	1913	136,497.22		1.108
	Increase	9,357.26	Dec.	.015

RECAPITULATION.

Account	1912		1913		Increase		Decrease	
	Total	Per Ton	Total	Per Ton	Total	Per Ton	Total	Per Ton
General Expense	7,184.99	.064	7,568.04	.062	383.05			.002
Maintenance	8,278.12	.073	15,138.50	.123	6,860.38	.050		
Mining Expense	127,139.96	1.123	136,497.22	1.108	9,357.26			.015
Cost of Production	142,603.07	1.260	159,203.76	1.293	16,600.69	.033		

Lucien Eaton

SALISBURY MINE.

AVERAGE MINE ANALYSIS OF OUTPUT.

GRADE	IRON	PHOS.	SILICA
Salisbury Bessemer	61.62	.044	
Salisbury	60.52	.074	
Clinton	60.40	.153	
C linton Silica	50.08	.062	22.26

AVERAGE ANALYSIS ON STRAIGHT CARGOES.

	Mine		Lake Mine	
	IRON	PHOS.	IRON	PHOS.
Salisbury Bessemer	All Mixed			
Salisbury	"	"		
Clinton	59.12	.202	58.66	
Clinton Silica	All Mixed			

ORE STATEMENT - DECEMBER 31st,1913.

	SALISBURY BESSEMER	SALISBURY	CLINTON	CLINTON SILICA	TOTAL	TOTAL LAST YEAR
On hand Jan. 1st,1913,	3,063		13,959	67,934	84,956	132,842
Output for year	24,261	1,968	8,293	88,661	123,183	113,181
Total	27,324	1,968	22,252	156,595	208,139	246,023
Shipments	24,350	1,968	17,294	2,483	46,095	161,067
Balance on hand	2,974	0	4,958	154,112	162,044	84,956
Increase in Output 18%					20,002	
Increase in Ore on hand					77,088	

1913 - 2-8hr.shifts during year.
1912 - 2-10hr.shifts to Mar.11th; 2-8hr.shifts for balance of year,

SALISBURY MINE.

SHIPMENTS FOR 1913.

	POCKET	STOCKPILE	TOTAL	TOTAL LAST YEAR
Salisbury Bessemer	14,157	10,193	24,350	23,650
Salisbury	1,968		1,968	626
Clinton	565	16,729	17,294	40,341
Clinton Silica	2,483		2,483	96,450
Total	19,173	26,922	46,095	161,067
Total Last Year	62,287	98,780	161,067	
Decrease 71%			114,972	

SALISBURY MINE.

COMPARATIVE MINING COST FOR YEAR.

	1913	1912	INCREASE	DECREASE
PRODUCT	123,183	113,181	10,102	
General Expense	.062	.064		.002
Maintenance	.123	.073	.050	
Mining Expense	1.108	1.123		.015
Cost of Production	1.293	1.260	.033	
Exploratory	.025		.025	
DEPRECIATION				
New construction	.004		.004	
Total depreciation	.004		.004	
Taxes	.030	.036		.006
Central, Office	.082	.085		.003
Sundry Expense	.025		.025	
COST ON STOCKPILE	1.459	1.381	.078	
Loading and Shipping	.012	.033		.021
Total cost on cars	1.471	1.414	.057	
Number days operating	295	283	12	
No. shifts and hours	2-8hr	2-10hr 2-8hr		
Avg. daily product	417	400	17	
COST OF PRODUCTION				
Labor	.982	.979	.003	
Supplies	.311	.281	.030	
Total	1.293	1.260	.033	

SALISBURY MINE.

SALISBURY MINE.

STATEMENT OF COMPARATIVE WAGES.

	1 9 1 3	1 9 1 2	INCREASE	DECREASE
SURFACE				
Total number of days	9,863½	9,286¼	577¼	
Average rate	2.49	2.36	.13	
Amount	24,553.61	21,932.28	$2621.33	
UNDERGROUND				
Total number of days	34,296	32,593	1,703	
Average rate	2.80	2.71	.09	
Amount	96,023.07	88,290.54	7,732.53	
Total days	44,159½	41,879¼	2,280¼	
Average rate	2.73	2.63	.10	
Total Amount	120,576.68	110,222.82	10,353.86	
Labor cost per ton	.979	.975	.004	
No.shifts and hours	2-8hr	2-10hr 2-8hr		

Increase wages for 1913: Surface .13 --- 5.51%
Underg. .09 --- 3.32%
Total .10 --- 3.80%

SALISBURY MINE.

COMPARATIVE AVERAGE WAGES AND PRODUCT FOR SALISBURY MINE.

PRODUCT '13 123,183 Tons	SURFACE		UNDERGROUND		TOTAL	
PRODUCT '12 113,181 Tons	1 9 13	1912	1913	1912	1913	1912
Avg. number men working	33	31	115	109	148	140
Avg. wages per day	2.49	2.36	2.80	2.71	2.73	2.63
Avg. wages per month 25 days	62.25	59.00	70.00	67.75	68.25	65.75
Avg. product per man per day	12.48	12.18	3.59	3.47	2.79	2.70
Labor cost per ton	.199	.194	.780	.781	.979	.975
Diff. in labor cost per ton	+.005	-.038	-.001	-.041	+.004	-.079
Avg.product breakg & trammg.			4.60	4.43		
Avg.wages for miners contr.			2.84	2.76		
Avg.wages for trammers			2.49	2.35		
Total avg.wages for contr.			2.78	2.69		

		Tons	%
Tons per man per day	Surface Increase	.30	2.4
	Underground "	.12	3.46
	Surf. and U.G."	.09	3.37

Proportion of Surface to Underground men:
1913 - 1 to 3.49
1912 - 1 to 3.51
1911 - 1 to 3.21
1910 - 1 to 3.08

SALISBURY MINE.

TIMBER STATEMENT FOR YEAR ENDING DECEMBER 31,1913.

KIND	LINEAL FEET	AVG.PRICE PER FOOT	AMOUNT 1 9 1 3	AMOUNT 1 9 1 2
6" to 8" Timber	39,724	.02	794.48	665.12
8" to 10" "	39,494	.04	1,579.76	1,057.60
10" to 12" "	21,141	.06	1,268.46	1,540.80
12" to 14" "	4,332	.0825	357.39	873.51
Total 1913	104,691	.038	4,000.09	
Total 1912	95,964	.043		4,137.03

	LINEAL FEET	PER 100'	1 9 1 3	1 9 1 2
5" Lagging (425½ cords)	361,675	.47	1,702.00	897.00
7" "	67,103	.55	369.07	954.79
Poles	103,280	.95	981.16	772.73
Trestle Timber	41	.15	6.15	25.50
Total 1913	532,099	.575	3,058.38	
Total 1912	447,512	.592		2,650.02

	1913	1 9 1 2
Feet of timber per ton of ore	.850	.848
Feet of lagging per ton of ore	3.48	3.24
Feet of lagging per foot of timber	4.10	3.82
Cost per ton for timber,lagging and poles	.0573	.060
Equivalent of stull timber to board measure	188,489	208,099
Feet board measure per ton of ore	1.53	1.84
Total product	123,183	113,181

Total cost of timber and lagging - 1913		7,058.47
Total cost of timber and lagging - 1912		6,787.05
Total cost of timber and lagging - 1911		7,228.23
Total cost of timber and lagging - 1910		7,065.06
Total cost of timber and lagging - 1909	13 months	7,756.19
Total cost of timber and lagging - 1908		7,089.14
Total cost of timber and lagging - 1907		6,264.14
Total cost of timber and lagging - 1906		6,976.67
Total cost of timber and lagging - 1905		6,752.55

SALISBURY MINE.

STATEMENT OF EXPLOSIVES USED FOR BREAKING ORE.

KIND	QUANTITY	AVERAGE PRICES	AMOUNT 1913	AMOUNT 1912
40% Powder	5,250	.09	472.50	778.50
50% "	31,350	.10	3,135.00	2,330.00
Total powder	36,600	.0985	3,607.50	3,108.50
Fuse	112,000	.377	422.06	355.86
Caps	38,350	6.37	244.47	192.03
Fuse Lighters				.25
Total Fuse,etc.			666.53	548.14
Grand total			4,274.03	3,656.64
Product			123,183	113,181
Pounds Powder per ton ore			.297	.282
Cost per ton for powder			.029	.027
Cost per ton for fuse, caps,etc.			.005	.005
Cost per ton for all explosives			.034	.032
Avg.price per lb. for powder			.0985	.097

LEASES: The only outstanding lease on lands of this Company is held by the Empire Iron Company, covering the E½ of the SW¼ of Section 19, 47-26.

Respectfully submitted,

W. W. Duncan

Agent.