

NORTH JACKSON MINE  
ANNUAL REPORT  
YEAR 1933

1. GENERAL:

This mine has been idle since 1908.

6. SURFACE:

(1) The fence posts along the road, adjacent to the West end of the open pits, were broken by snow plows during the winter. This fence was repaired in the Spring, also all other fences around the caves inspected and necessary repairs made.

10. TAXES:

	<u>1 9 3 3</u>		<u>1 9 3 2</u>	
	<u>Valuation</u>	<u>Taxes</u>	<u>Valuation</u>	<u>Taxes</u>
<u>Realty</u>				
47% of Jackson Taxes, Sec. 1-47-27	190,350	5281.07	211,500	6029.86
Collection Fees		<u>52.81</u>		<u>60.30</u>
Total		5333.88		6090.16
 <u>Rented Buildings:</u>				
Old Jackson Office	700	19.42	700	19.96
Collection Fees		<u>.19</u>		<u>.20</u>
Total		19.61		20.16
 Total Taxes North Jackson		5353.49		6110.32
 Tax Rate City of Negaunee		2.774		2.851

Valuation of mine property decreased 10% and tax rate 2.7%, resulting in decrease of \$756.83, or 12.4%, in tax.

SOUTH JACKSON MINE  
ANNUAL REPORT  
YEAR 1933

1. GENERAL:

This property has been idle for a number of years and it is not likely that it will be operated again for many years.

4. ESTIMATE  
OF ORE  
RESERVES:a. Available Ore:

Above present pit available by present system of mining:

On Southwest side	35,000 tons
North of Lucy Pit	5,000 "
South and Southwest of Lucy Pit	<u>3,000 "</u>
Total	43,000 "

Below present pit and above drainage tunnel available by millings:

West of Crusher	186,000 tons
Area below bottom of present pit shown by churn drilling	<u>105,226 "</u>
Total	291,226 "

Grand Total 334,226 "

c. Estimated Analysis:

	<u>Iron</u>	<u>Phos.</u>	<u>Silica</u>	<u>Alum</u>	<u>Mang</u>	<u>Lime</u>	<u>Mag.</u>	<u>Sul.</u>	<u>Igni.</u>	<u>Moist</u>
Natural	34.55	.066	36.00	1.42	2.00	.435	.175	.010	2.00	7.00

6. SURFACE:

There has been no watchman at this property since January 1931.

All the equipment has been removed and stored with the exception of the crusher. The buildings are inspected frequently and are usually found to have been broken into between inspections. Lumber from the buildings is being stolen, evidently for building camps and for fire-wood. There is not enough material of value to warrant the employment of a watchman and it will be advisable to dismantle the balance of the plant if a need for the material develops.

10. TAXES:

	<u>1933</u>		<u>1932</u>	
	<u>Valuation</u>	<u>Taxes</u>	<u>Valuation</u>	<u>Taxes</u>
53% of realty as described, Sec. 1-47-27	214,650	5955.25	238,000	6799.64
Collection Fees		<u>59.55</u>		<u>68.00</u>
Total Taxes		6014.80		6867.64
Tax Rate		2.774		2.851

Taxes decreased due to \$23,350 decrease in assessed valuation and lower tax rate.

GWINN DISTRICT MINES  
ANNUAL REPORT  
YEAR 1933

1. GENERAL:

Conditions in the Gwinn District as regards employment were about the same as in 1932. There were many families dependent on county aid and more men given employment on county road and C. W. A. work. Ground for garden plots was provided by the Company and the County Poor Commission furnished garden seeds and potatoes for all that were unable to provide them. Free wood was also provided by the County Poor Commission, the men cut the wood and assisted in hauling it to their homes.

The population increased, as ten more houses were occupied than in 1932. Part of the increase was due to the marriage of young people and part to new families coming in in connection with the C. C. C. camps established near Gwinn.

Business in the town was somewhat better due to two Civilian Conservation Corp camps, one four miles, and another 18 miles distant; Gwinn being the nearest town, most of the \$5.00 per month spending money of the 500 boys in the two camps was expended there. In the Fall, the camp four miles from Gwinn moved to Gwinn and occupied the buildings at the Archibald Mine property.

Savings deposits in the Gwinn bank decreased only \$14,000 as compared with \$30,000 in 1932. They are now at the lowest figure in many years due to conditions beyond control of the depositors.

A local committee functioned with the County Poor Commission in distribution of supplies to needy families, and as a result relief work was handled in a very efficient manner.

The Gwinn schools continued in operation on a full time schedule with very little curtailment in general school work. Although the reduction in property taxes reduced the funds ordinarily available, the school finished the year in fairly good financial condition. All the children in the township come to the Gwinn school, transportation being provided by three busses.

a. Statement Showing Total Ore Produced in District by C. C. I. Co., 1903 to 1933, Inclusive:

<u>Year</u>	<u>Austin</u>	<u>Princeton</u>	<u>Stephenson</u>	<u>Gwinn</u>	<u>Francis</u>	<u>Gardner-Mackinaw</u>	<u>Total</u>
Total to							
1933	1,582,616	1,584,333	3,798,890	988,665	522,602	638,615	9,115,721
1933	0	0	0	0	0	3,405	3,405
Total	1,582,616	1,584,333	3,798,890	988,665	522,602	642,020	9,119,126

b. Statement Showing Total Ore Shipments by C. C. I. Co. From 1905 To 1933 Inclusive:

<u>Year</u>	<u>Austin</u>	<u>Princeton</u>	<u>Stephenson</u>	<u>Gwinn</u>	<u>Francis</u>	<u>Gardner-Mackinaw</u>	<u>Total</u>
Total to							
1/1/33	1,589,018	1,453,446	3,678,086	988,325	324,926	446,488	8,480,289
1933	0	0	15,900	0	11,262	147,146	174,308
Total	1,589,018	1,453,446	3,693,986	988,325	336,188	593,634	8,654,597

c. Ore in Stock at Mines Dec. 31, 1933:

<u>Princeton</u>	<u>Stephenson</u>	<u>Francis</u>	<u>Gardner-Mackinaw</u>	<u>Total</u>
130,887	121,594	186,414	48,386	487,281

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5. LABOR  
AND  
WAGES:

The number of shifts worked by employees in 1933 was 2,518, as compared with 7,016½ in 1932, or only 37% as many.

In addition to the above work there was some employment on account of ore shipments and operation of the district crushing plant. The shifts worked at these jobs do not appear in the above total.

Work at the Gardner-Mackinaw Mine until April 8th was confined to sinking the auxiliary shaft, unwatering the mine below the 6th level in November, and resumption of sinking operations near the end of November.

Wages were increased 15% on July 16th and salaries also partly in July and August and for Mining Captain in November.

10. TAXES:

The following statement gives the taxes in detail for 1933 and 1932 for all property in the district except mines, where the totals only are shown in the summary, as the detail for each mine is included in the report on the mine.

In the summary is also included the tax paid by the Cliffs Power & Light Company and Cliffs Electric Company in order to show the total tax paid in Forsyth Township by The C. C. I. Co., exclusive of taxes paid by the Land Department.

Description	1933		1932	
	Valuation	Taxes	Valuation	Taxes
Mineral Lands Gwinn Fee				
SW¼ of SW¼ Sec. 26-45-25 - 40 Acres	80	1.34	80	2.57
S½ " SE¼ " 27-45-25 - 80 "	160	2.66	160	5.13
NW¼ " SE¼ " 27-45-25 - 40 "	80	1.34	80	2.57
NE¼ " SE¼ " 28-45-25 - 40 "	80	1.34	80	2.57
N½ " NE¼ " 34-45-25 - 80 "	160	2.66	160	5.13
SE¼ " NE¼ " 34-45-25 - 40 "	80	1.34	80	2.57
NE¼ " NW¼ " 34-45-25 - 40 "	80	1.34	80	2.57
NE¼ " SE¼ " 34-45-25 - 40 "	80	1.34	80	2.57
NW¼ " " 35-45-25 -160 "	320	5.29	320	10.26
Lots 1,2 & 3 " 36-45-25 - 52 "	100	1.74	100	3.20
Lots 7,8 & 9 " 36-45-25 - 98.92 Acres	200	3.37	200	6.42
Lot 11 " 36-45-25 - 13.3 "	20	.36	20	.64
S½ of N½ " 22-45-25 -160 "	500	8.22	500	16.02
S½ of NE¼ " 28-45-25 - 80 "	130	2.15	130	4.16
N½ of NW¼ " 22-45-26 - 87.08 "	90	1.49	90	2.88
NE¼ of " 2-45-26 -165.61 "	190	3.14	190	6.09
Total	2,350	39.12	2,350	75.35
Collection Fees		.39		.75
Total		39.51		76.10

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10. TAXES: (Cont)

<u>Description</u>	<u>1933</u>		<u>1932</u>	
	<u>Valuation</u>	<u>Taxes</u>	<u>Valuation</u>	<u>Taxes</u>
<u>Gwinn Township-Surface Only</u>				
Lot 17, Block 5, Nyquist Lot				
NE $\frac{1}{4}$ of NW $\frac{1}{4}$ Sec. 21-45-25 - 27.4 Acres	150	2.49	150	4.81
That part of S $\frac{1}{2}$ of NW $\frac{1}{4}$ Sec. 21-45-25 not included in Plat of Gwinn, 25.01 Acres	200	3.29	200	6.41
E $\frac{1}{2}$ of SE $\frac{1}{4}$ Sec. 21-45-25 - 65.84 "	140	2.33	140	4.48
That part of W $\frac{1}{2}$ of SE $\frac{1}{4}$ Sec. 21-45-25 not included in Plat of Gwinn, 38.80 Acres	300	4.94	300	9.62
Gwinn Townsite Plat	90,895	1502.71	86,245	2764.67
Part of W $\frac{1}{2}$ of SE $\frac{1}{4}$ Sec. 21-45-25 (Supt's Res. 1.2 Acres)	3,000	49.18	3,150	101.01
NW $\frac{1}{4}$ of NE $\frac{1}{4}$ Sec. 21-45-25 except 5 Acres in Gemetry, 35 Acres	100	1.64	100	3.20
Part of S $\frac{1}{2}$ of NE $\frac{1}{4}$ Sec. 21-45-25 - 50.88 Acres	300	4.94	300	9.62
Total	95,085	1571.52	90,585	2903.82
Collection Fees		15.72		29.04
Total		1587.24		2932.86
Lot 16, Block 5, J. Entry - Bank			5,400	174.91
Total			95,985	3107.77
<u>Gardner-Mackinaw Dwellings:</u>				
N $\frac{1}{2}$ of NE $\frac{1}{4}$ Sec. 35-45-25 - 87.35 Acres	5,000	81.96	5,000	160.35
Collection Fees		.82		1.60
Total		82.78		161.95
Personal - District Office - includes fee	500	8.30	270	8.75
N $\frac{1}{2}$ of NW $\frac{1}{4}$ Sec. 27-45-25, Dis. Crusher - includes fee	1,000	16.54	1,000	32.39
Total C.C.I.Co. Forsyth, personal	1,500	24.84	1,270	41.14
<u>Austin Location</u>				
Part of Lot 5 SW $\frac{1}{4}$ of NE $\frac{1}{4}$ Sec. 20-45-25 - 14.35 A.	3,500	57.40	3,500	112.24
NW $\frac{1}{4}$ of SE $\frac{1}{4}$ Sec. 20-45-25	5,000	81.96	6,500	208.45
NE $\frac{1}{4}$ of SW $\frac{1}{4}$ Sec. 20-45-25	260	4.29	320	10.26
Part of SW $\frac{1}{4}$ of SE $\frac{1}{4}$ Sec. 20 Austin B.H.			30	.96
Total	8,760	143.65	10,350	331.91
Collection Fees		1.44		3.32
Total		145.09		335.23
<u>Summary</u>				
Stephenson Mine	137,060	2,246.45	152,060	4,876.51
Princeton Mine	216,260	3,544.66	241,260	7,737.12
Francis Mine	160,500	2,630.62	175,500	5,631.27
Gardner-Mackinaw Mine	165,080	2,705.70	185,080	5,935.46
Mineral Lands	2,350	39.12	2,350	75.35
Gwinn Townsite	95,085	1,571.52	95,985	3,078.73
Austin Location	8,760	143.65	10,350	331.91
Gardner-Mackinaw Location	5,000	81.96	5,000	160.35
Gwinn District Office	500	8.20		
Gwinn District Crusher	1,000	16.39		
Total C. C. I. Co.	791,595	12,988.29	868,855	27,867.84
Collection Fees		129.88		276.49
Total C. C. I. Co.		13,118.17		28,144.33
Less Adjustments			5,400	177.95
Total Taxes, C.C.I.Co. Mines, Etc.	791,595	13,118.17	863,455	27,966.38

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10. TAXES: (Cont)

<u>Summary (Cont)</u>	<u>1 9 3 3</u>		<u>1 9 3 2</u>	
	<u>Valuation</u>	<u>Taxes</u>	<u>Valuation</u>	<u>Taxes</u>
Total Taxes, C.C.I.Co. Mines, Etc. (Brot Forward)	791,595	13,118.17	863,455	27,966.38
Cliffs Power & Light Co.	93,815	1,553.99	93,815	3,008.50
Cliffs Electric Co.	4,500	74.54	4,500	144.31
Total (includes fee)	98,315	1,628.53	98,315	3,152.81
Collection Fees				31.53
Total Taxes		1,628.53		3,184.34
GRAND TOTAL	889,910	14,746.70	961,770	31,150.72
Rate		1.639		3.207

Taxes Levied - Forsyth Township

	<u>1933</u>	<u>1932</u>	<u>1931</u>	<u>1930</u>	<u>1929</u>
State	853.97	5449.87	6883.97	7742.15	8837.14
County	8673.33	11957.01	14112.00	16180.47	15619.99
County Road	735.85	-	4330.45	5679.86	6697.18
Contingent (Township)	3296.16	4500.00	4504.14	4007.74	3016.00
Highway Improvement	-	2500.00	4327.50	5009.91	4008.95
Highway Repair	-	3000.00	4008.76	5011.13	4009.25
County Debt	1965.39	-	-	-	-
Library	-	-	-	-	100.00
School and One Mill	7954.82	23607.06	31904.50	36101.82	38239.35
Cemetery	-	500.00	-	-	-
Township Debt	1023.32	-	-	-	-
Rejected	156.57	21.98	(Included in roll)		
Total	24659.41	51535.92	70071.32	79733.08	80527.86
Amount paid by C. G. I. Co.	14746.70	31150.72	40159.72	44811.89	46664.44
Percent paid by C. G. I. Co.	59.8	60.44	57.30	56.20	57.96

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16. WATER SUPPLY:  
GWINN DISTRICT:

The water supply pump station on the Escanaba River operated without a shutdown during 1933. The operating cost was practically the same as in the previous year. The water was treated with chlorine all year; samples of water were taken weekly and sent to the State Laboratory at Houghton, Michigan, for analysis. The water was pronounced safe for drinking at all times; however, the amount of chlorine used was varied as indicated by the analysis. The chlorinator was overhauled in the Fall by a maintenance engineer from the company manufacturing this equipment.

As in previous years, considerable expense was incurred in repair of the wood water mains. The wood main was installed in 1909, so they are now 25 years old, they are rotting and many leaks have to be repaired. Conditions are getting worse every year and it is questionable whether they will last for the life of the community.

The following statement gives the cost of operating the pump station in 1933 and 1932:

	<u>1933</u>	<u>1932</u>	<u>Increase</u>	<u>Decrease</u>
General Expense	63.58	72.07		8.49
Maintenance Labor	487.74	503.45		15.71
Maintenance Supplies	218.99	428.49		209.50
Operating Labor	1,452.32	1,446.76	5.56	
Operating Supplies	4,280.45	4,076.25	204.20	
Total	6,503.08	6,527.02		23.94
Cost per 1000 gallons	.025	.025		
Gallons Pumped	262,780,000	262,780,000		

Maintenance Supplies decreased \$209.50 due to heavy charge in 1932 for repairs to the pump motor.

Operating Supplies increased \$204.20 due to more power used in 1933 for operating pump. (Some power used for lights and heat).

The 1933 and 1932 operating costs were charged off as follows:

	<u>1933</u>	<u>1932</u>	<u>Increase</u>	<u>Decrease</u>
1. C. C. I. Co. Mines	35.00	0	35.00	
2. Water Rates Receivable	1,973.87	1,858.56	115.31	
3. Gwinn Townsite Exp.Gen.	4,494.21	4,668.46		174.25
Total	6,503.08	6,527.02		23.94

1. Increase due to steam shovel loading at Stephenson Mine, no loading in 1932.

2. Increase due to sale of water, November 14th to December 31st, to Civilian Conservation Corp Camp No. 685, housed in the Archibald Mine buildings, and to increase in sale of water to the L. S. & I. R. R. Co. for use in engines on account of shipping ore. This latter charge increased from \$8.06 in 1932 to \$88.90 in 1933.

3. This balance represents the cost to The C. C. I. Co. for operation of the plant.

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17. CONDITION  
OF  
PREMISES:

Gwinn Townsite:

The streets, alleys, and various parks throughout the town were kept clean at township expense. Although no prizes were given for the best kept premises, many were kept in as good condition as in previous years. There were ten more houses occupied than in 1932 and only ten vacant houses in the townsite at the end of the year. Due to elimination of every possible expense, very few repairs were made.

The expense for repairs and rents accrued in 1933, 1932, and 1931 are given in the following statement:

No. of Houses (123)

	<u>1933</u>	<u>1932</u>	<u>1931</u>
Rents accrued	7,249.51	8,027.35	13,150.00
Repair Expense	<u>597.32</u>	<u>597.54</u>	<u>2,925.51</u>
Excess accrued rents over repair costs	6,652.19	7,429.81	10,224.54
Actual rent collections	3,148.68		
Taxes Gwinn Townsite and Repair Cost	<u>2,115.05</u>		
Balance or net income	<u>1,033.63</u>		

Austin Location:

The alleys and streets in location were cleaned at company expense as has been the custom since this location was built. Due to low rents charged there was practically no expense incurred for repairs.

<u>No. of Houses (61)</u>	<u>1933</u>	<u>1932</u>	<u>1931</u>
No. occupied	32	33	
Rents accrued	1,452.50	1,652.50	2,654.00
Repair expense	<u>47.36</u>	<u>151.23</u>	<u>348.91</u>
Excess accrued rents over repair costs	1,405.14	1,501.27	2,305.09
Actual rent collections	543.00		

Princeton Location:

The streets and alleys at this location were cleaned by the township.

<u>No. of Houses (14)</u>	<u>1933</u>	<u>1932</u>	<u>1931</u>
No. occupied	10	8	
Rents accrued	499.00	480.50	694.75
Repair expense	<u>26.37</u>	<u>85.26</u>	<u>209.57</u>
Excess accrued rents over repair costs	472.63	395.24	485.18
Actual rent collections	229.00		

Gardner-Mackinaw Location:

This location is cleaned at company expense. Most of the houses are vacant and will never be occupied again. If they can be sold at low figure, it would be advisable as they are deteriorating at a rapid rate due to standing idle.

<u>No. of Houses (52)</u>	<u>1933</u>	<u>1932</u>	<u>1931</u>
No. Occupied	5	6	
Rents accrued	240.00	417.50	885.55
Repair expense	<u>28.20</u>	<u>109.35</u>	<u>170.50</u>
Excess accrued rents over repair costs	211.80	308.15	715.05
Actual rent collections	273.50		

Repair expense in 1933 was for rebuilding chimney and cleaning alleys.



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17. CONDITION  
OF  
PREMISES: (Cont)

Statistical Statement of Rented Buildings for 1933

<u>Location</u>	<u>No. Vacant</u>	<u>No. Occupied</u>	<u>Total</u>	<u>Cost of Repairs</u>	<u>Avg. Cost per House</u>	<u>Rent Accrued</u>	<u>Rent Collected</u>
Princeton	4	10	14	26.37	1.88	499.00	229.00
Austin	29	32	61	47.36	.78	1452.50	543.00
Gardner-Mackinaw	47	5	52	28.20	.54	240.00	273.50
Gwinn Townsite	<u>15</u>	<u>108</u>	<u>123</u>	<u>597.32</u>	<u>4.84</u>	<u>7249.51</u>	<u>3148.68</u>
Total	95	155	250	699.25	2.78	9441.01	4194.18

Excess rent collected over repair cost \$3,494.93

19. GWINN ASSOCIATION  
GWINN HOTEL

(1) Gwinn Associations:

The value of Mr. Mather's gift of the Club House has never been so apparent as during the past few years when so many men were idle. It is the only meeting place in the district and provides the only place for recreation. The Association had a cash balance of \$1,112.71 on January 1st, 1933, and finished the year with a cash balance of \$1,025.75. This was possible by virtue of the school paying \$2,500.00 for supervision of athletic work and use of the gymnasium and equipment. Collections from dues were a negligible amount due to lack of employment.

In order to reduce operating expenses, a permit to cut wood was obtained from Mr. Bush, Agent of the Land Department, and about 50 cords were cut and hauled to the club house. For work done on this job, 57 men were given credit for their year's dues to the Association.

The report of the Secretary is included in full in the annual report of the Welfare Department and is deserving of careful study. It gives a true picture of the value of the club house to the community. A brief summary is given herewith in order to bring out clearly the great value of the club house and the many activities under control of the Gwinn Association.

The physical and athletic work covers supervision of baseball, basketball, kittenball, football, speed ball, soft ball, archery, skating rink, tennis courts, and horse shoe pitching courts. There is also supervision of swimming in the club house pool. There were 593 supervised periods during the year.

There were a total of 269 meeting and social events held at the Club House. These covered meetings of the American Legion, Red Cross, to supervise distribution of clothing, etc., church socials, Womens Study Club, Town Club, dances, social parties, Girl Scout parties, annual Christmas treat for children, Annual Physical Training Exhibition, and many others.

The two troops of Girl Scouts were active during the year with memberships of 30 and 22 girls respectively.

The Bass Lake Camp was open from June 25th to September 4th. The camp was in constant use after July 15th. The boats at the camp are in bad condition and new ones are needed.

The library and reading rooms were in constant use. There are four weekly magazines, eighteen monthly, two daily, and two weekly newspapers available in the reading room.

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19. GWINN ASSOCIATION  
GWINN HOTEL

(1) Gwinn Association: (Cont)

The billiard and pool tables have been moved into the room formerly used for silent pictures. This has improved the appearance of the club house.

The building needs a complete overhauling as no money has been spent recently on upkeep. Finances this year did not permit of any expenditures for this purpose.

Great credit is due the Secretary, Mr. E. L. Miller, for the efficient operation of the club house and the many activities sponsored by the Association.

(2) Gwinn Hotel:

The hotel was operated during the year under the same management as in previous years. It had a better year than in 1932 due to the two C. C. C. camps established in the vicinity of Gwinn. The manager maintains the equipment but has not been able to pay rent, light, and water charge.

f. Gwinn District Crushers:

The crusher operated 83 days in 1933. The ore crushed was as follows:

	<u>1933</u>		<u>1932</u>
Stephenson Ore	1,532	tons	0
Mackinaw "	<u>147,146</u>	"	<u>0</u>
Total	<u>148,678</u>	"	<u>0</u>

The cost for years 1933 and 1931 were as follows:

	<u>1933</u>		<u>1931</u>		Decrease Cost per Ton
	Amount	Per Ton	Amount	Per Ton	
General Expense	14.18	.000	157.81	.007	.007
Maintenance	0	.000	50.00	.002	.002
Operating	<u>3,095.66</u>	<u>.021</u>	<u>910.51</u>	<u>.039</u>	<u>.018</u>
Total Operating Cost	<u>3,109.84</u>	<u>.021</u>	<u>1,118.32</u>	<u>.048</u>	<u>.027</u>
Switching	<u>1,378.85</u>	<u>.009</u>	<u>214.00</u>	<u>.009</u>	<u>.000</u>
Grand Total	<u>4,488.69</u>	<u>.030</u>	<u>1,332.32</u>	<u>.057</u>	<u>.027</u>
Tons Crushed	148,678		23,123		
Increase in tonnage crushed		125,555			

The cost per ton decreased in 1933 due to lower wages and less general and maintenance expense. Larger tonnage also responsible for lower operating cost.

Considerable repairs are required before the plant goes into operation again.

STEPHENSON MINE  
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1. GENERAL:

This mine was abandoned in 1927. On account of ore in stock, taxes are still being paid on the land under lease from the I. Stephenson Co. and C. & N. W. Ry. Co.

The shaft house was wrecked in the summer as a safety measure. All usable material in the head frame has been salvaged and removed from the property. The balance of steel will be cut up and sold for scrap next Spring. The combined engine and boiler house is gradually being dismantled and the brick sold. The pump equipment of value has been removed, also all pipe. There will be some further salvage from sale of brick and scrap iron, otherwise the ore in stock represents the only values left on the property.

2. PRODUCTION,  
SHIPMENTS &  
INVENTORIES:

b. Shipments:

<u>Grade</u>	<u>1933</u>	<u>1932</u>
Stephenson	9,590	0
Stephenwood	2,937	0
Northdale	3,373	0
Northwood	0	0
Total	<u>15,900</u>	<u>0</u>

c. Stockpile Inventories:

	<u>1933</u>	<u>1932</u>	<u>Decrease</u>
Stephenson Lease - Sec. 20:			
Stephenwood Ore	101,817	114,344	12,527
C. & N. W. Ry. Co. Lease - Sec. 29:			
Northwood Ore	<u>19,777</u>	<u>23,150</u>	<u>3,373</u>
Grand Total	<u>121,594</u>	<u>137,494</u>	<u>15,900</u>

Ore Statement:

	<u>Stephen- son</u>	<u>Stephen- wood</u>	<u>North- dale</u>	<u>North- wood</u>	<u>Total</u>	<u>Total Last Year</u>
On Hand Jan.1,1933	0	114,344	0	23,150	137,494	137,494
Output for Year	0	0	0	0	0	0
Transfers-Overruns	9,590	9,590	3,373	3,373		
Total	<u>9,590</u>	<u>104,754</u>	<u>3,373</u>	<u>19,777</u>	<u>137,494</u>	<u>137,494</u>
Shipments	<u>9,590</u>	<u>2,937</u>	<u>3,373</u>	<u>0</u>	<u>15,900</u>	<u>0</u>
Balance on Hand	0	101,817	0	19,777	121,594	137,494
Decrease in ore on hand					15,900	

8. COST OF  
OPERATING:

a. Comparative Mining Costs:

	<u>1933</u>	<u>1932</u>	<u>Increase</u>	<u>Decrease</u>
Underground Costs	3.97	5.20		1.23
Surface Costs	743.73	727.71	16.02	
General Mine Expense	968.22	14.65	953.57	
Total	<u>1,715.92</u>	<u>747.56</u>	<u>968.36</u>	
Loading & Shipping	1,113.97	0	1,113.97	
Taxes	2,268.91	4,925.28		2,656.37
Track Agreement with E.L.S.Ry.	<u>313.18</u>	<u>0</u>	<u>313.18</u>	
Total Cost at Mine	<u>5,411.98</u>	<u>5,672.84</u>		<u>260.86</u>

STEPHENSON MINE  
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8. COST OF OPERATING: (Cont)

a. Comparative Mining Costs: (Cont)

Underground Cost in both years was in account "Cave-in" and covered cost of repairing fences around pits and caves.

Surface Cost slightly higher on account of dismantling shaft house and steel supports as a safety measure due to rotting of timbers.

General Mine Expense: Large increase on account of Ishpeming Office charge of \$894.08 personal injury expense in 1933. There was a charge of \$48.14 for analysis of ore shipped - no expense in 1932 as no ore shipped.

Loading & Shipping Expense: Cost per ton ore shipped was high on account of cleaning up balance of Northdale ore, also nearly all of Stephenson ore in stock. Also cargo of Stephenwood ore loaded from pit late in season. No loading and shipping expense in 1932 on account of no ore shipped.

Decrease in taxes due to decrease of 10% in valuation and 48% in tax rate.

Total cost in 1933 - \$260.86 lower than in 1932 due to large decrease in taxes.

10. TAXES:

	<u>1 9 3 3</u>		<u>1 9 3 2</u>	
	<u>Valuation</u>	<u>Taxes</u>	<u>Valuation</u>	<u>Taxes</u>
<u>Stephenson Mine Lease</u>				
60 Acres - S $\frac{1}{2}$ of SW $\frac{1}{4}$ Sec. 29-45-25	1,000	16.39	1,000	32.07
80 " - N $\frac{1}{2}$ of NW $\frac{1}{4}$ " 29-45-25	160	2.66	160	5.13
Personal Property - Ore in stock	135,000	2,212.65	150,000	4,810.45
Personal Property - In Warehouse	900	14.75	900	28.86
Total	<u>137,060</u>	<u>2,246.45</u>	<u>152,060</u>	<u>4,876.51</u>
Collection Fees		22.46		48.77
Total Taxes		<u>2,268.91</u>		<u>4,925.28</u>
 Tax Rate		 1.639		 3.207

PRINCETON MINE  
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1. GENERAL:

This mine has been idle since 1921. No ore was shipped in 1933. The permanent trestles at the shaft were dismantled as it was unsafe to leave them standing on account of rotting of the timber. The wooden shaft house is in bad condition and should be wrecked in 1934 as a safety measure. A small amount of timber was salvaged from the wrecked trestle, which was used for shaft timber in the Mackinaw auxiliary shaft.

2. PRODUCTION,  
SHIPMENTS &  
INVENTORIES:b. Shipments:

<u>1933</u>	<u>1932</u>
0	0

c. Stockpile Inventories:

	<u>1933</u>	<u>1932</u>
Cambridge	106,573	106,573
Princeport	9,160	9,160
Sec. 19 Cambridge	13,841	13,841
Sec. 19 Princeport	<u>1,313</u>	<u>1,313</u>
Total	130,887	130,887

4. ESTIMATE  
OF ORE  
RESERVES:a. Developed Ore:

Assumption: 12 cu. ft. equals one ton  
10% deduction for rock  
10% deduction for loss in mining  
Percentage of Bessemer equals 0

	<u>Prince-</u> <u>port</u>	<u>Cambridge</u>	<u>Sec. 19</u> <u>Princeport</u>	<u>Sec. 19</u> <u>Cambridge</u>	<u>Total</u>
Ore above 2nd level	2,552				2,552
" " 4th "		78,325			78,325
" " 5th "	20,000	58,778			78,778
" " 6th "	60,318	445,694	9,000	57,128	572,140
Total	<u>82,870</u>	<u>582,797</u>	<u>9,000</u>	<u>57,128</u>	<u>731,795</u>

b. Prospective Ore:

Ore below 6th level	20,000	418,815	5,000	46,921	<u>490,736</u>
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Total Ore

1,222,531

c. Estimated Analysis:

<u>Grade</u>	<u>Iron</u>	<u>Phos.</u>	<u>Silica</u>	<u>Mang</u>	<u>Alum</u>	<u>Lime</u>	<u>Mag.</u>	<u>Sul.</u>	<u>Igni</u>	<u>Moist</u>
<u>Princeport</u>										
Dried 212°	59.50	.300	7.73	.505	1.214	1.605	1.037	.023	2.235	
Natural	50.60	.256	6.57	.429	1.032	1.365	.882	.020	1.900	15.00
<u>Cambridge</u>										
Dried 212°	59.75	.853	4.42	1.193	.937	3.676	.840	.023	1.447	
Natural	50.80	.725	3.76	1.014	.797	3.125	.714	.020	1.230	15.00

PRINCETON MINE  
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4. ESTIMATE OF ORE RESERVES: (Cont)

d. Estimated Tonnage as required by State Tax Commission:  
Non-Bessemer Ore:

Developed	1. Princeton	91,870 Tons	
	2. Cambridge	<u>639,925</u> "	
	Total Developed		731,795 Tons
Prospective	1. Princeton	25,000 Tons	
	2. Cambridge	<u>465,736</u> "	
	Total Prospective		<u>490,736</u> "
	Grand Total		1,222,531 "

The above estimates of ore in the mine were made in December 1921.

8. COST OF OPERATING:

a. Comparative Costs:

	<u>1933</u>	<u>1932</u>	<u>Increase</u>	<u>Decrease</u>
Underground Costs	0	6.47		6.47
Surface Costs	857.33	742.57	114.76	
General Mine Expense	<u>15.63</u>	<u>14.79</u>	.84	
Total	872.96	763.83	109.13	
Loading & Shipping	0	0		
Taxes	<u>3,580.11</u>	<u>7,814.49</u>		4,234.38
Total	4,453.07	8,578.32		4,125.25

Underground Costs: No expense in 1933, in previous year small amount for repair of fences around pits.

Surface Costs: Expense for policeman increased \$71.27 due to change in wage scale. Some expense both years for dismantling top tram equipment. Balance of expense - \$96.06 - for dismantling permanent trestles at the shaft house.

General Mine Expense: Small change on account of personal injury expense in both 1933 and 1932.

Taxes: Large decrease on account of lower valuation and tax rate. Total expense for this idle mine decreased \$4,125.25, or 48%.

10. TAXES:

	<u>1933</u>		<u>1932</u>	
	Valuation	Taxes	Valuation	Taxes
NE $\frac{1}{4}$ of NE $\frac{1}{4}$ Sec. 19-45-25 (C & N W)	10,000	163.90	10,000	320.70
158.27 Acres in Sec. 18-45-25	5,000	81.96	5,000	160.35
160.00 " " NW $\frac{1}{4}$ Sec. 20-45-25	85,000	1,393.16	100,000	3,206.97
NW $\frac{1}{4}$ of NE $\frac{1}{4}$ Sec. 19-45-25 Location	420	6.93	420	13.46
S $\frac{1}{2}$ of NE $\frac{1}{4}$ " 19-45-25	840	13.86	840	26.92
Personal Property	<u>115,000</u>	<u>1,884.85</u>	<u>125,000</u>	<u>4,008.72</u>
Total	216,260	3,544.66	241,260	7,737.12
Collection Fees		35.45		77.37
Total Taxes		<u>3,580.11</u>		<u>7,814.49</u>
Tax Rate per \$100.00		1.639		3.207

The assessed valuation decreased 10% and tax rate 48%, making net decrease in taxes 54%.

GARDNER MACKINAW MINE  
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1. GENERAL

Work at this mine in 1933 was confined to sinking the auxiliary incline shaft from the 7th to the 9th Level. This work, which was started in 1932, was underway from January 1st to April 8th, and again from November 28th to December 31st. The mine was idle from April 8th to November 9th, or seven months. From November 9th to November 28th the water that had accumulated on the levels below the 5th was bailed out. During the idle period pumping was confined to the area above the 5th Level, the pumps below the 5th were idle. This saved the pumping expense and wages of one pumpman.

From January 1st to April work in shaft was on day and night shift, with six crews of men each working two days per week. From November 28th to end of year there were four crews of men, each working three days per week.

On January 1st stripping of the shaft from 7th to 8th Level was underway and a depth of 102' below the 7th had been reached on January 1st. Stripping of the raise in line of shaft to full size of the shaft was completed to the 8th Level in January, an advance of 100' for the month. In February sinking below the 8th was started and on April 8th the shaft was down 114' below the 8th Level. In November and December it was sunk 64', making a total depth on December 31st of 179' below the 8th Level, at a mean sea elevation of -367'. The grade of the ore encountered in the shaft was good in iron, phos. and sulphur for a depth of about 80 ft. below the 8th Level, after which the sulphur increased. Footwall rock was encountered in the shaft in December coming in on the left side of shaft and gradually extending clear across. It had the appearance of a roll in the footwall that had carried the rock out into the area of the shaft.

It was decided to open the 9th Level in ore just above the rock or at a depth of approximately 134' below the old 8th Level and to cut a new 8th Level plat one half way between the 9th and 7th levels. This would bring the 8th and 9th Levels almost exactly the same distance apart as the upper levels, i.e., about 125' vertically or 165' on the incline. The shaft has been sunk for a skip pit below the 9th level elevation.

The developments at depth were not as favorable as had been expected but nevertheless they proved the continuation of the ore body below surface a distance of 1478' and the possibility of extension to greater depth. The area developed by the shaft is only a small rectangle near the footwall and it is impossible to form any opinion as to analysis or extent of ore body from the small shaft section. The development of the two new levels will be awaited with great interest as the future of the property depends on opening up ore of merchantable grade. There is every indication of a large tonnage of ore from the 7th to the 9th levels - possibly 1,000,000 tons - the question is how much of it will run low (.800 or lower) in sulphur and also not over .100 in phosphorus.

It is planned to open the two levels and start production, probably in February.

All ore produced in 1933 came from the shaft sinking operations.

There was a small decrease in number of gallons of water pumped per minute in 1933.

The splendid record of no lost time accidents was extended for 365 days or the full year of 1933. The record of 951 days a year ago has been extended to 1316 days, or 139 days less than four years, without a single lost time accident.

GARDNER-MACKINAW MINE  
ANNUAL REPORT  
YEAR 1933

2. PRODUCTION,  
SHIPMENTS &  
INVENTORIES:

a. Production by Grades:

<u>Grade</u>	<u>1933</u>	<u>1932</u>	<u>Decrease</u>
Gardner Ore	0	0	
Mackinaw Ore	3,405 tons	24,769 tons	21,364 tons
Total	3,405 "	24,769 "	21,364 "
Rock	539 "	20 "	
Total Hoist	3,944 "	24,789 "	

b. Shipments:

<u>Grade of Ore</u>	<u>Pocket</u> <u>Tons</u>	<u>Stockpile</u> <u>Tons</u>	<u>Total</u> <u>Tons</u>	<u>Total</u> <u>Last Year</u>
Gardner	0	0	0	0
Mackinaw	0	147,146	147,146	0
Total	0	147,146	147,146	0
Increase 1933			147,146	

c. Stockpile Inventories:

<u>Grade of Ore</u>	<u>Dec. 31, 1933</u>	<u>Dec. 31, 1932</u>	<u>Decrease</u>
Gardner	24,808	24,808	
Mackinaw	23,578	167,319	143,741
Total	48,386	192,127	143,741

d. Division of Product by Levels:

	<u>1933</u>	<u>%</u>	<u>1932</u>	<u>%</u>
6th Level	0	0	6,753	27.3
7th Level	0	0	14,465	58.3
Shaft above 8th level	941	28	3,551	14.4
Shaft above 9th level	2,464	72	0	0
Total	3,405	100	24,769	100.0

All product in 1933 came from the shaft.

e. Production by Months:

<u>Month</u>	<u>Mackinaw Ore</u> <u>Tons</u>	<u>Rock</u> <u>Tons</u>	<u>Total</u> <u>Tons</u>
January	941		941
February	891		891
March	871		871
April	209		209
November	108		108
December	385	539	924
Total	3,405	539	3,944



GARDNER-MACKINAW MINE  
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2. PRODUCTION,  
SHIPMENTS &  
INVENTORIES:

f. Ore Statement:

	<u>Gardner</u>	<u>Mackinaw</u>	<u>Total</u>	<u>Total</u> <u>Last Year</u>
On Hand Jan. 1, 1933	24,808	167,319	192,127	167,358
Product for Year	0	3,405	3,405	24,769
Total	24,808	170,724	195,532	192,127
Shipments	0	147,146	147,146	0
Balance on Hand	24,808	23,578	48,386	192,127
Decrease in output			21,364	
Decrease in ore on hand			143,741	

1933 - January 1st to April 8th - 6 crews sinking shaft, 2 days<sup>each</sup>/per week day and night shift.  
 Mine idle April 8th to November 9th  
 November 9th to November 28th - unwatering shaft below 5th level  
 November 28th to December 31st - 4 crews sinking shaft, 3 days<sup>each</sup>/per week day and night shift.

1932 - 1 8-hr shift, 2 days per week, Jan. 1st to May 31st  
 Mine idle June 1st to November 1st.  
 Nov. 1st to Dec. 15th - 3 crews sinking shaft, 2 days per week each day and night shift. (E & A 566)  
 Dec. 15th to Dec. 31st - 6 crews sinking shaft, 2 days per week each day and night shift. (E & A 566)

g. Delays:

Shaft sinking was delayed from Dec. 23rd to 31st inclusive on account of coils burning out in the auxiliary hoist motor on the 5th level. The motor was replaced by 200 h.p. motor formerly used on Austin Mine hoist. The mine will resume work on Jan. 2nd, 1934.

h. Delays from lack of current:

There were no delays from lack of current.

3. ANALYSIS:

a. Average Mine Analysis on Output:

<u>Grade</u>	<u>1933</u>			<u>1932</u>		
	<u>Iron</u>	<u>Phos.</u>	<u>Sul.</u>	<u>Iron</u>	<u>Phos.</u>	<u>Sul.</u>
Mackinaw	63.17	.051	.867	61.80	.121	.786

The grade of output entirely from shaft sinking operations was higher in iron and sulphur but lower in phosphorous than the output in 1932.

c. High Sulphur Ore:

The ore encountered near the roll in the footwall in sinking the auxiliary shaft ran higher in sulphur than the ore encountered either above or below the 8th level. The proximity of black slate in the footwall accounts for the increase, as pyrites in the black slate is the source of the sulphur in the ore. Some samples here ran over 1%. This may merely be local to this locality and not at all indicative of the sulphur in the ore body. The real high sulphur area lies to the Northwest of the auxiliary shaft on the 6th and 7th levels, presumably also on the 8th and 9th levels.

GARDNER-MACKINAW MINE  
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3. ANALYSIS: (Cont)

c. High Sulphur Ore: (Cont)

The winze located 200 ft. Northwest of the shaft on the 7th level was sunk in low sulphur ore, the drift on 8th level back to the shaft was also in fairly low sulphur ore. It seems probable that a larger area of ore running less than 1% sulphur will be developed on the 8th level and possibly the 9th level to the Northwest of the auxiliary shaft. If this proves to be the case, the available tonnage might readily be greatly increased. Definite limits of the high sulphur ore will be determined by the drifts on the 8th and 9th levels within the next six months. The large reserves of high sulphur ore running from 1% to 2% sulphur above the 7th level in the area Northwest of the shaft must not be overlooked. It is possible future furnace practice will permit of the use of this ore.

4. ESTIMATE OF ORE RESERVES:

a. Developed Ore:

Assumption: 12 cu. ft. equals one ton  
10% deducted for rock  
10% deducted for loss in mining  
Estimate is of available ore only

<u>Non-Bessemer:</u>	<u>Mackinaw</u>	<u>Total</u>
5th Level to 6th Level	10,718	10,718
6th Level to 7th Level	42,036	42,036
Below 7th Level	<u>112,104</u>	<u>112,104</u>
Total Developed Ore Dec. 31, 1933	164,858	164,858

Statement showing ore reserves and new ore development for the following years:

	<u>1929</u>	<u>1930</u>	<u>1931</u>	<u>1932</u>	<u>1933</u>
Ore in Mine Jan. 1st	439,725	282,785	139,349	135,992	71,312
Production	<u>117,224</u>	<u>125,157</u>	<u>79,439</u>	<u>24,769</u>	<u>3,405</u>
Balance	322,501	157,628	59,910	111,223	67,907
Ore in Mine Dec. 31st	<u>282,785</u>	<u>139,349</u>	<u>135,992</u>	<u>71,312</u>	<u>164,858</u>
New Ore Developed	-39,716A	-18,279B	76,082C	-39,911D	96,951E

- A. Estimate decreased on account of unavailable ore pillars not reported this year.
- B. Reported 50% of ore unavailable instead of 40%
- C. Increase due to ore proved up on and below the 7th level
- D. Decrease due to elimination of high sulphur ore areas.
- E. Increase due to sinking of incline shaft to a distance of 40 ft. below proposed 9th level, and inclusion of a small high sulphur ore area above 7th level.

GARDNER-MACKINAW MINE  
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4. ESTIMATE  
OF ORE  
RESERVES: (Cont)

c. Estimated Analysis:

Ore Reserves: Approximate Expected Natural Analysis:

Developed Ore:

	<u>Iron</u>	<u>Phos.</u>	<u>Silica</u>	<u>Mang.</u>	<u>Alum</u>	<u>Lime</u>	<u>Mag.</u>	<u>Sul.</u>	<u>Igni.</u>	<u>Moist</u>
Mackinaw	52.90	.126	3.10	0.22	1.64	1.88	1.20	.800	2.45	12.50

Ore in Stock: Average Natural Analysis:

	<u>Iron</u>	<u>Phos.</u>	<u>Silica</u>	<u>Mang.</u>	<u>Alum</u>	<u>Lime</u>	<u>Mag.</u>	<u>Sul.</u>	<u>Igni.</u>	<u>Moist</u>
Gardner	50.94	.096	2.10	.258	1.65	3.06	2.214	.597	4.20	12.50
Mackinaw	53.80	.138	2.80	0.20	1.65	1.90	1.09	.664	2.48	11.50

The only change in analysis this year is the sulphur which is 0.2 higher in developed ore and 0.036 in ore in stock.

5. LABOR  
AND  
WAGES:

a. Comments:

(1) Labor

There has been an excess of labor all year due to general unemployment in the district.

(2) New Constructions:

None in 1933. See 12. NEW CONSTRUCTION for comments.

GARDNER-MACKINAW MINE  
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5. LABOR  
AND  
WAGES: (Cont)

b. Comparative Statement of Wages and Products:

	<u>1933</u>	<u>1932</u>	<u>Increase</u>	<u>Decrease</u>
<u>PRODUCT</u>	3,405	24,769		21,364
No. Shifts and Hours	1- 8	1-8		
<u>AVERAGE NO. MEN WORKING:</u>				
Surface	10	14		4
Underground	9	28		19
Total	19	42		23
<u>AVERAGE WAGES PER DAY:</u>				
Surface	3.65	3.84		.19
Underground	3.88	4.18		.30
Total	3.76	4.08		.32
<u>AVERAGE WAGES PER MONTH:</u>				
	9 $\frac{1}{2}$ Days	9 Days		
Surface	36.50	34.56	1.94	
Underground	34.92	37.62		2.70
Total	35.72	36.72		1.00
<u>PRODUCT PER MAN PER DAY:</u>				
Surface	2.45	12.03		9.58
Underground	3.02	5.00		1.98
Total	1.35	3.53		2.18
<u>LABOR COST PER TON:</u>				
Surface	1.492	.319	1.173	
Underground	1.286	.838	.448	
Total	2.778	1.157	1.621	
<u>AVERAGE PRODUCT MINING:</u>				
Stoping	-	13.21		13.21
Ore Development	-	10.94		10.94
Total	-	12.94		12.94
<u>AVERAGE WAGES CONTRACT LABOR</u>	4.74	4.48	.26	
<u>TOTAL NUMBER OF DAYS:</u>				
Surface	1,390 $\frac{1}{2}$	2,059 $\frac{1}{2}$		668 $\frac{3}{4}$
Underground	1,127 $\frac{1}{2}$	4,957		3,829 $\frac{1}{2}$
Total	2,518	7,016 $\frac{1}{2}$		4,498 $\frac{1}{2}$
<u>AMOUNT FOR LABOR:</u>				
Surface	5,079.08	7,898.12		2,819.04
Underground	4,379.89	20,749.23		16,369.34
Total	9,458.97	28,647.35		19,188.38
<u>AVERAGE WAGES PER MONTH BASED ON MEN CARRIED ON MINE PAYROLL: (a)</u>				
	9 $\frac{1}{2}$ Days per Month	9 Days per Month		
Surface	36.50	34.56		
Underground	34.92	37.62		
Total	35.72	36.72		

(a) Wages were increased 15% on July 16th, 1933, and salaries partly in July and August, and Mining Captain in November.

GARDNER-MACKINAW MINE  
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5. LABOR  
AND  
WAGES: (Cont)

b. Comparative Statement of Wages and Product: (Cont)

Proportion of Surface to Underground Men:

1933 - 1 to .90 - 1 8-hr shift, 2 days per week, Jan. 1st to April 8th  
 3 " " " Nov. 10th to Dec. 31st  
 Mine Idle from April 8th to Nov. 9th  
 Reopening Mine, bailing water Nov. 10th  
 to Nov. 24th.  
 Sinking Auxiliary Shaft Nov. 28th to  
 Dec. 31st.

1932 - 1 to 2.00 - 1 8-hr shift, 2 days per week, Jan. 1st to June 1st  
 2 " " " Nov. 1st to Dec. 31st  
 Mine idle June 1st to Nov. 1st.

6. SURFACE:

a. Buildings, Repairs:

No expense was incurred in 1933 for repairs to building. The heating plant was idle all year, heat being supplied by stoves in the engine house, shops, dry, and office.

b. Stockpiles:

Shipments in 1933 of 147,146 tons made it necessary to dismantle the wood stocking trestles. The trestle legs in the ore pile were nearly all rotted and only a few were salvaged. The trestle timber was salvaged and most of it can be used again.

In November, after orders to reopen the mine were received, 12 bents for stocking ore were assembled and erected. If more are required before shipping starts, they can be erected on short notice. There is stocking room available for over 150,000 tons of ore.

d. Grounds:

No expense was incurred in 1933 for care of grounds.

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7. UNDERGROUND

a. Shaft Sinking (Auxiliary Incline Shaft)

On December 31, 1932, this shaft was down 102 ft. below the 7th level. In 1932 a winze was sunk to the 8th Level elevation and a drift driven to the line of the auxiliary shaft. An 8' x 8' raise was put up on line of shaft which holed to the skip pit below the 7th Level. Stripping of the shaft was then started and as stated the shaft was down 102' at the end of 1932. Stripping and timbering were completed to the elevation of the 8th Level at the end of January, a distance of 202' below the 7th Level. Sinking was continued below the 8th and on April 8th, when the mine closed, the shaft was down 113' on the incline below the 8th Level. At a depth of 110' or 3' above the bottom, a small drift was driven in April to locate the hanging. The drift was extended 42' in ore and an 11' test hole drilled at the end with no sign of hanging rock. An 8' test hole on the foot side of the shaft failed to find the footwall. The proven width of ore body at this point was 72' and as neither foot or hanging were encountered, it may be 15' or more wider. It will not likely be over 90' to 100' in width. At a depth of 45' below the 8th Level, a local roll in the ore formation was encountered on the hanging side of the shaft and as sinking progressed the roll extended across to the foot side. The sulphur in the ore increased from .403 at a depth of 35' below the 8th to 1.7% at a depth of 70' and then receded to 1% at a depth of 80', rose to 2% at a depth of 85' and at a depth of 100' was 1.394%. It continued to average above 1% sulphur for the balance of sinking done in 1933. The drift driven in April at a depth of 110' below the 8th Level to locate the hanging wall, was in ore throughout its entire length, averaging .785 sulphur. Sinking in November and December was in ore averaging above 1% sulphur and the ore near the roll in the footwall near the present bottom of the shaft, ran higher in phosphorus. To this point, or for a distance of over 130', below the 8th Level, the ore ran low in phosphorus, in fact it was Bessemer grade for most of this distance. In November the shaft was sunk 11' and in December 53', or a total of 64 feet since sinking was resumed on November 28th. An indication of the flattening of the footwall was evidenced at a depth of 125' by a gradual lowering of the iron content. At a depth of 140' a seam of mixed jasper and graphitic slate entered the northwest side of the shaft and caused a sudden increase in the phosphorus content of the ore from .037 to .874. At a depth of 148' the true footwall entered the floor of the shaft and at 168' the shaft was in the footwall except for a mixed jasper-ore contact which persisted in the southeast hanging corner of the shaft to the bottom depth of 177' in 1933.

When the true footwall was encountered at a depth of 148', it was decided to place the timber in the shaft to allow cutting out the 9th Level above the rock, or at a depth of 134' below the 8th Level. The floor of the proposed 9th Level (elevation 334' below sea level) provides a new reference datum

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7. UNDERGROUND

a. Shaft Sinking (Auxiliary Incline Shaft) (Cont.)

for shaft footages. In order to equalize stoping distances from the 7th to 9th Levels, a new 8th Level will be cut out about midway between these levels or about 30' on the incline above the present 8th Level. The following table transfers and lists footages and material in reference to the proposed 9th Level rather than the old 8th Level.

<u>INCLINE DEPTH</u>		<u>MATERIAL</u>	<u>Iron</u>	<u>Phos.</u>	<u>Sul.</u>
<u>Below old</u> <u>8th Level</u>	<u>Above or Below</u> <u>9th Level</u>				
0 - 35'	134' - 99' above	Ore	64.80	.058	.350
35' - 55'	99' - 79' "	"	63.50	.050	.825
55' - 113'	79' - 21' "	High Sulphur Ore	61.20	.040	1.426
113' - 135'	21' above to 9th level floor	" " "	60.20	.030	1.454
135' - 145'	1' - 11' below	Rock entering shaft from N.W.	51.60	.874	.781
145' - 150'	11' - 16' "	Rock entering shaft from floor	46.40	.728	.485
150' - 177'	16' - 43' "	Shaft in footwall-mixed jasper and graphitic slate.			

From 150' above to 5' below the 9th Level, the shaft is inclined at an angle of 50°; from 5' below to 25' the inclination is 49°; and from 25' to 43' the inclination is 48°. The elevation of the 9th level floor will be approximately 334' below sea level and the bottom of the shaft on December 31st was 367'.

Unwatering

Word to start operations at the mine was received on November 7th and preparations were made at once to start unwatering the incline shaft. During the idle period no pumping was done below the 5th Level. It was found, during the idle period from April 8th, that the water had reached a point 110' below the 6th Level on the inclination of the shaft. Bailing by skips started November 10 and the unwatering of the shaft was completed to a point 114' on the incline below the 8th Level on the 23rd of the month. Three crews were employed in the bailing operation, each crew consisting of a hoisting engineer and two men in the shaft to watch the skip.

When the work of unwatering the shaft was completed, it was necessary to clean down the shaft preparatory to sinking.

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7. UNDERGROUND:

e. Timbering:

This report is made up in the standard form but the cost per ton is of no value for comparative purposes as it represents lagging and poles used in timbering the shaft.

Statement of Timber Used:

	<u>Linear</u> <u>Feet</u>	<u>Avg. Price</u> <u>per ft.</u>	<u>Amount</u> <u>1933</u>	<u>Amount</u> <u>1932</u>
8" to 10" Stull Timber				23.60
10" to 12" " "				34.45
12" to 14" " "				77.86
14" to 16" " "				-
Total				135.91
		<u>Per 1000'</u>		
5 ft. Lagging	6,300	5.555	35.00	33.75
Poles - 9½ ft.	16,174	8.635	139.68	69.15
Total	22,474		174.68	238.81
Product			3,405	24,769
Feet of Timber per Ton of Ore			-	.00680
Feet of Lagging per Ton of Ore			1.85020	.19682
Feet of Lagging per foot of timber			-	2.8984
Feet of Poles per ton of ore			4.75000	.20013
Cost per ton for timber			-	.0055
Cost per ton for lagging			.01025	.0013
Cost per ton for Poles			.04105	.0028
Total Cost per ton - all timber			.05130	.0096
Equivalent of Stull Timber to Board Measure			-	6.0552
Feet of Board Measure per ton of ore			-	.002444
Total Cost for Timber, Lagging and Poles and Cost per Ton:				
<u>Year</u>	<u>Amount</u>	<u>Cost per Ton</u>		
1933	174.68	.0513		
1932	238.81	.0097		
1931	876.67	.0110		
1930	2300.66	.0184		
1929	1722.04	.0147		

Timber expense for 1933 charged to E & A 632.



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7. UNDERGROUND: (Cont)g. Explosives, Drilling and Blasting:

All explosives were used in sinking the shaft in 1933, so cost per ton for comparative purposes is of no value for in 1932 most of the ore hoisted came from mining operations. The cost for all explosives per ft. of shaft sunk was \$2.10.

Statement of Explosives Used:

	<u>Quantity</u>	<u>Average Price</u>	<u>Amount 1933</u>	<u>Amount 1932</u>
40% Gelatin Special				512.51
45% " "				93.75
50% " "				1,202.69
60% Gelex A	3,250	.125	406.69	273.75
Total Powder - 1933	3,250	.125	406.69	
" " - 1932	17,290	.120	2,082.70	2,082.70
Fuse				134.66
Caps	550		67.50	44.90
Connecting Wire	42		13.49	
Tamping Bags				3.22
Exploders	700		86.95	
Total Fuse, Etc.			167.94	182.78
 Total All Explosives			574.63	2,265.48
 Product			3,405	24,769
Pounds of Power per ton of ore			.9545	.6980
Tons of ore per pound of Powder			1.0477	1.4326
Cost per ton - Powder			.1195	.0841
Cost per ton - Fuse, Caps, Etc.			.0493	.0074
Cost per ton - All Explosives			.1688	.0915
Average price per pound for powder			.1251	.1200
100% of all powder used in 1933 was 60%				
26.5% of all powder used in 1932 was 40%				
4.3% " " " " " " " " 45%				
56.5% " " " " " " " " 50%				
12.7% " " " " " " " " 60%				
97.8% " " " " " " 1931 " 50%				

The following statement shows the cost per ton for explosives, exclusive of rock development, for the years 1933, 1932, 1931, and 1930:

<u>Year</u>	<u>Cost per Ton</u>	<u>Product</u>
1933	.1688	3,405
1932	.0841	24,769
1931	.1959	79,439
1930	.1429	125,157

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7. UNDERGROUND:j. Pumping:

The number of gallons pumped per minute during 1933, 1932, 1931, 1930 and 1929 are shown below:

<u>Month</u>	<u>1933</u>	<u>1932</u>	<u>1931</u>	<u>1930</u>	<u>1929</u>
January	210	241	463	100	116
February	205	223	419	101	113
March	205	236	470	100	111
April	203	244	377	126	115
May	181	231	332	102	101
June	184	223	314	114	104
July	181	225	302	104	109
August	180	222	273	111	106
September	172	218	192	128	109
October	189	218	263	180	99
November	224	215	260	236	99
December	221	211	253	350	99
Total Average	196	225	327	142	107

The average number of gallons pumped per minute over the last five years is as follows:

<u>Year</u>	<u>Gals per Minute</u>
1933	196
1932	225
1931	327
1930	142
1929	107

There was a decrease of 29 gallons per minute in water pumped in 1933, bringing gallons per minute below 200 for the first time since 1930. Apparently the decrease was due to partial blocking of one or more of the drill holes that could not be found and plugged underground.

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8. COST OF OPERATING:

b. Detailed Cost Comparison:

(1) Days and Shifts:

<u>Year</u>	<u>Shifts &amp; Hours</u>	<u>Men Employed</u>	<u>Total Days Worked</u>
1933	1 8-hr	61	2,518
1932	1 8-hr	78	5,596½
Decrease		17	3,078½

(2) Wages:

Wages were increased 15% on July 16th, 1933, and salaries partly in July and August, and Mining Captain in November.

Wages were reduced 15% on May 16th, 1932, following the 10% reduction on Oct. 1st, 1931.

(3) Comparison of Production:

Production - 1933	3,405 tons
Production - 1932	24,769 "
Decrease	21,364

(4) Comparison of Number of Men and Wages:

<u>Year</u>	<u>No. Men</u>	<u>No. Days</u>	<u>Amount</u>	<u>Rate per Day</u>
1933	61	2,518	9,458.97	3.76
1932	78	5,596½	23,489.23	4.19
Decrease	17	3,078½	14,030.26	.43

(5) Tons per Man per Day:

The tons of ore from sinking shaft operation per man per day were as follows:

	<u>1933</u>	<u>1932</u>	<u>Decrease</u>
Surface	2.45	15.94	13.49
Underground	3.02	6.12	3.10
Total	1.35	4.43	3.08

1933 - Shaft Sinking

1932 - Mining to June 1st, shaft sinking 7 months.

(6) Cost of Production:

1933	\$ 24,007.92	Cost per ton \$ 7.051
1932	63,409.71	" " " 2.560
Decrease	39,401.79	Increase 4.491

	<u>Total Cost</u>				<u>Cost per Ton</u>		
	<u>Labor</u>	<u>%</u>	<u>Supplies</u>	<u>%</u>	<u>Labor</u>	<u>Supplies</u>	<u>Total</u>
1933	10,718.13	40	16,002.67	60	3.147	4.701	7.848
1932	30,648.85	44	38,730.33	56	1.238	1.563	2.801
Incr.				4	1.909	3.138	5.047
Decr.	19,930.72	4	22,727.66				

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8. COST OF OPERATING: (Cont)

b. Detailed Cost Comparison:

b. Details: Comparison Supply Balance Jan. 1st, 1934 with Balance Jan. 1st, 1933:

	<u>Jan.1st,1934</u>	<u>Jan.1st,1933</u>	<u>Increase</u>	<u>Decrease</u>
1. General Supplies	1778.76	1824.53		45.77
2. Iron and Steel	187.64	193.89		6.25
3. Oil & Grease	183.88	190.12		6.24
4. Machinery Supplies	3119.85	3237.45		117.60
5. Explosives	172.81	104.62	(1) 68.19	
6. Lumber and Timber	442.00	1828.36		1386.36
7. Fuel	78.51	660.41		581.90
9. Sundries		5.69		5.69
<b>Total</b>	<b>5963.45</b>	<b>8045.07</b>		<b>2081.62</b>

(1) Powder stored underground and not charged out.

Comparison Supplies Used & Cost per Ton - 1933 with 1932:

	<u>1933</u>		<u>1932</u>		<u>Increase</u>		<u>Decrease</u>	
	<u>Amount</u>	<u>Per Ton</u>	<u>Amount</u>	<u>Per Ton</u>	<u>Amount</u>	<u>Per Ton</u>	<u>Amount</u>	<u>Per Ton</u>
1. General Supplies	524.46	.154	1060.73	.043	.111	536.27		
2. Iron & Steel	33.05	.010	224.12	.009	.001	191.07		
3. Oil & Grease	237.09	.070	387.65	.016	.054	150.56		
4. Machinery Supplies	359.89	.106	610.34	.025	.081	250.45		
5. Explosives			2265.48	.092		2265.48	.092	
6. Lumber & Timber	22.93	.006	606.76	.025		583.83	.019	
7. Fuel	242.75	.072	550.17	.022	.050	307.42		
8. Electric Power	6371.88	1.872	13686.33	.552	1.320	7314.45		
9. Sundries	423.58	.124	759.38	.031	.093	335.80		
10. Other Mines & Accts	505.56	.149	725.13	.030	.119	219.57		
<b>Total</b>	<b>7710.07</b>	<b>2.265</b>	<b>19425.83</b>	<b>.785</b>	<b>1.480</b>	<b>11715.76</b>		

Large decrease in all supplies due to mine being idle from April 8th, 1933 to November 9th, 1933, when bailing water from auxiliary shaft was commenced, which took until November 28th to finish, when shaft sinking was resumed. This work was still in progress on December 31, 1933.

The shaft was sunk 273 feet during the year 1933.

7. Detail of Accounts:

	<u>1933</u>	<u>1932</u>	<u>Increase</u>	<u>Decrease</u>
Analysis and Grading	695.37	742.62		47.25
Personal Injury	588.95	900.86		311.91
Safety Department	97.83	618.22		520.39
Tel. & Safe	49.29	169.96		120.67
Local & Ge	386.52	981.98		595.46
Spec. Exp. P	333.73	996.62		662.89
Ishpeming	546	595.64		49.64
Mine Office	650	195.12		454.88
<b>Total Gen. Mine Accts.</b>	<b>8,190.83</b>	<b>17,680.45</b>		<b>9,489.62</b>
<b>COST OF PRODUCTION</b>	<b>24,007.92</b>	<b>7,051</b>	<b>63,409.71</b>	<b>2,560</b>
Taxes	2,732.76	803	5,994.82	242
<b>TOTAL COST</b>	<b>26,740.68</b>	<b>7,854</b>	<b>69,404.52</b>	<b>2,802</b>
Less Adj. Supply Invent.	19.88	.006	25.35	.001
<b>GRAND TOTAL COST</b>	<b>26,720.80</b>	<b>7,848</b>	<b>69,379.18</b>	<b>2,801</b>

The above figures include for 1933 the Operating Expense, Idle Expense and Sinking Expense as compared with the Operating and Idle Expense of 1932. An analysis of cost sheets for 1932 and 1932 would be of no value, due to shaft sinking being the only operation in 1932. In 1932 some ore was mined during the early months of the year.

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8. COST OF OPERATING

b. Detailed Cost Comparison (Cont.)

7. Detail of Accounts:

<u>Underground Costs</u>	<u>1933</u>		<u>1932</u>		<u>Increase</u>		<u>Decrease</u>		
	<u>Amount</u>	<u>Per Ton</u>	<u>Amount</u>	<u>Per Ton</u>	<u>Amount</u>	<u>Per Ton</u>	<u>Amount</u>	<u>Per Ton</u>	
1. Exploring in Mine	78.15	.023	68.95	.003	9.20	.020			
4. Development in Ore			4,006.33	.162			4,006.33	.162	
5. Stopping			8,812.35	.356			8,812.35	.356	
6. Timbering	96.97	.028	3,033.83	.123			2,936.86	.095	
7. Trammig	276.53	.082	4,294.66	.174			4,018.13	.092	
8. Bailing Water	818.22	.240			818.22	.240			
9. Pumping	7,163.93	2.102	10,801.69	.436		1.666	3,637.76		
10. Compressors & Air Pipes	15.05	.005	2,551.40	.103			2,536.35	.098	
11. Reopening Expense	14.00	.005			14.00	.005			
12. Underground Superintend.	1,366.74	.402	2,252.77	.090		.312	886.03		
13. Closing Expense	450.32	.132	156.82	.006	293.50	.126			
16. Electric Tram Equipt.	88.52	.026	603.09	.024		.002	514.57		
17. Pumping Machinery	40.09	.012	238.17	.010		.002	198.08		
Total Underground Costs	10,408.52	3.057	36,820.06	1.487		1.570	26,411.54		
<u>Surface Costs</u>									
18. Hoisting	2,653.45	.779	4,774.64	.193		.586	2,121.19		
19. Stocking Ore	255.23	.075	935.71	.038		.037	680.48		
21. Dry House	156.03	.046	1,077.22	.044		.002	921.19		
22. Gen. Surface Expense	1,006.06	.296	1,026.30	.040		.256	20.24		
23. Maint; Hoist, Equipt.	532.15	.156	656.05	.026		.130	123.90		
24. " Shaft	240.13	.071	102.72	.004	137.41	.067			
25. Top Tram Equipt.	149.70	.044	236.13	.010		.034	86.43		
26. Dks. Trest. & Pkts.	410.66	.120	39.13	.002	371.53	.118			
27. Mine Buildings	5.16	.001	61.29	.003			56.13	.002	
Total Surface Costs	5,408.57	1.588	8,909.19	.360		1.228	3,500.62		
<u>General Mine Accounts</u>									
28. Insurance	594.17	.183	665.94	.027		.156	71.77		
29. Mining Engineering	204.55	.060	499.26	.020		.040	294.71		
30. Mech. & Elec. Engr.	260.94	.076	314.24	.013		.063	53.30		
31. Analysis and Grading	695.37	.203	742.62	.030		.173	47.25		
32. Personal Injury	588.95	.174	900.86	.037		.137	311.91		
33. Safety Department	97.83	.027	618.22	.025		.002	520.39		
34. Tel. & Safety Devices	49.39	.014	169.96	.007		.007	120.57		
35. Local & Gen. Welfare	386.52	.113	981.98	.039		.074	595.46		
36. Spec. Exp. Pens. & Allows.	1,233.73	.360	4,996.62	.201		.159	3,761.89		
37. Ishpeming Office	1,864.00	.546	4,595.64	.185		.361	2,731.64		
39. Mine Office	2,215.38	.650	3,196.12	.129		.521	980.74		
Total Gen. Mine Accts.	8,190.83	2.406	17,680.46	.713		1.693	9,489.63		
COST OF PRODUCTION	24,007.92	7.051	63,409.71	2.560		4.491	39,401.79		
Taxes	2,732.76	.803	5,994.82	.242		.561	3,262.06		
TOTAL COST	26,740.68	7.854	69,404.53	2.802		5.052	42,663.85		
Less Adj. Supply Invent.	19.88	.006	25.35	.001		.005	5.47		
GRAND TOTAL COST	26,720.80	7.848	69,379.18	2.801		5.047	42,658.38		

The above figures include for 1933 the Operating Expense, Idle Expense and Reopening Expense as compared with the Operating and Idle Expense of 1932. An analysis of cost sheets for 1933 and 1932 would be of no value, due to shaft sinking being the only operation in 1933, while in 1932 some ore was mined during the early months of the year.

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9. EXPLORATIONS  
AND FUTURE  
EXPLORATIONS

There was no diamond drilling in 1933.

10. TAXES

	<u>1933</u>		<u>1932</u>	
	<u>Valuation</u>	<u>Taxes</u>	<u>Valuation</u>	<u>Taxes</u>
<u>GARDNER MINE C. &amp; N.W. LEASE</u>				
SE $\frac{1}{4}$ of SE $\frac{1}{4}$ Sec. 35, 45-25.....	5,000	81.96	5,000	160.35
NW $\frac{1}{4}$ of NE $\frac{1}{4}$ " 2-44-25.....	80	1.34	80	2.57
Personal Property.....	150,000	2,458.50	170,000	5,451.84
Total.....	155,080	2,541.80	175,080	5,614.76
Collection Fees.....		25.42		56.15
TOTAL TAXES.....		2,567.22		5,670.91
<u>MACKINAW MINE (D.M. &amp; M. LEASE)</u>				
N $\frac{1}{2}$ of SE $\frac{1}{4}$ & SW $\frac{1}{4}$ Sec. 35, 45-25..	10,000	163.90	10,000	320.70
Collection Fees.....		1.64		3.21
Total Taxes.....		165.54		323.91

The lower rate for Forsyth Township, due to the 15 mill limitation on general property, made a considerable reduction in the taxes of the Gardner Mackinaw Mine.

11. ACCIDENTS  
AND  
PERSONAL  
INJURY

There were no accidents during the year 1933 to mar the fine record at this mine. This gives a record of nearly four years underground without a lost time accident and a surface record of five years and two months without a lost time accident.

12. NEW  
CONSTRUCTION  
AND  
PROPOSED NEW  
CONSTRUCTION

The only work under new construction was the continued sinking of the Mackinaw incline shaft from the 5th Level.

E&A #566 - Sinking Mackinaw Shaft.	
Original Estimate.....	\$ 82,280.00
Total Expended to Dec. 31, 1932.....	<u>56,175.52</u>
Unexpended balance Dec. 31, 1932.....	\$ 26,104.48

All E&A's were considered closed as of Dec. 31, 1932 and E&A #632 was prepared in 1933 to complete the unfinished work of E&A #566.

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12. NEW  
CONSTRUCTION  
AND  
PROPOSED NEW  
CONSTRUCTION

E&A #632 - Sinking Mackinaw shaft		
Original Estimate.....		\$ 21,983.04
Expended in 1933.....		<u>11,477.55</u>
Unexpended balance Dec.31,1933.....		\$ 10,405.49

Summary of work in 1933:

	<u>Cost</u>	<u>Per Foot</u>
Stripping & Timbering 97' to 8th Level	\$ 2,467.09	\$ 25.43
Sinking & Timbering 179' 8th Level to bottom	9,010.46	50.33

GARDNER-MACKINAW MINE  
ANNUAL REPORT  
YEAR 1933

13. EQUIPMENT  
AND  
PROPOSED  
EQUIPMENT:

a. Steam Shovels:

No repairs were made to steam shovels during the winter of 1932-1933. The shovels were not used in 1932 as no ore was shipped. This year they had considerable service and repairs must be made before shipping season of 1934.

b. Stockpile Trestles:

Nine trestle bents were erected late in 1933 for stocking ore. On account of shipments all stocking trestles were dismantled and good material salvaged.

c. Scraper Hoists:

The equipment at this mine is as follows:

	<u>On Hand</u> <u>1/1/1933</u>	<u>Purchased</u> <u>in 1933</u>
Ingersoll-Rand Air	6	-
Sullivan Air	3	-
Sullivan 10 H. P. Electric	3	-
Sullivan 20 H. P. Electric	<u>1</u>	-
Total	<u>11</u>	-

The Sullivan air hoists should be scrapped, ~~xxxxxx~~ if the necessity ~~every~~ arises for additional scraper equipment, more electric units will have to be purchased.

d. Pumping Equipment:

With the opening of the 8th and 9th levels it will soon be necessary to obtain another centrifugal pump to handle the water from the bottom level to the 6th or 5th level. Very little water comes in on the 7th level and even less is anticipated on the 8th and 9th levels, so the pump required will be of small capacity. A pump capable of handling 50 gallons per minute against a head of 600 feet will fill the requirements for the 8th and 9th levels. This pump should have an automatic starting and stopping device to reduce labor expense. The question of another pump for this mine has already been submitted to the Mechanical Department and they are endeavoring to find one in the idle equipment.

14. MAINTENANCE  
AND REPAIRS:

The breakdown of the auxiliary hoist motor on the 5th level in December 1933 made it necessary to install the motor formerly used on the Austin hoist. The mine was idle (no sinking done) from December 23rd to 31st while this work was in progress.

There was no other repair expense in 1933.



GARDNER-MACKINAW MINE  
ANNUAL REPORT  
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15. POWER:

Electric power was furnished by the Cliffs Power & Light Co., a subsidiary of The Cleveland-Cliffs Iron Co. The charge of  $1\frac{1}{2}$ ¢ per kilowatt hour was the same as in previous years, except since July 1st, 1933, there has been added a Michigan sales tax of 3%.

The following statement gives a detail of the power used in 1933 and 1932:

	K.W.H. Used		Increase	Decrease	Remarks
	1933	1932			
Mackinaw Hoist & Lighting	29,904	81,950		52,046	Mine idle 7 months
Compressors	114,210	287,730		173,520	" " " "
Safety Department	0	13,488		13,488	" " " "
Electric Haulage	15,500	40,036		24,536	" " " "
E. & A. - Winze	1,200	35,416		34,216	Very little work at winze
Shops	668	1,274		606	Mine idle 7 months
Top Tram - Mackinaw	74	440		366	" " " "
Underground Hoist	34,546	18,550	15,996		U.G. hoist kept heated by electricity during idle period and bailing acct. of water and shaft sinking in November, and December.
Pumping & Lighting	352,474	472,792		120,318	Less pumps operated in idle period.
Analysis - Crusher	20	28		8	Mine idle 7 months
" - Drier	0	5,486		5,486	" " " "
Flood Lights - Mackinaw	114	22	92		Flood lights acct. sinking
Heating Plant	0	610		610	Heat. Plant idle in 1933.
Dry House	2,044	2,604		560	Only part of dry used
Office	0	206		206	No current charged in 1933
Timbering	0	702		702	Mine idle 7 months and no timbering in mine.
Total	550,754	961,334		410,580	
In Cash	\$8261.31	\$14420.01		\$6158.70	

17. CONDITION  
OF  
PREMISES:

No improvements made in 1933. The premises were kept clean.

GARDNER-MACKINAW MINE  
ANNUAL REPORT  
YEAR 1933

18. NATIONALITY  
OF  
EMPLOYEES:

This report compares month of December 1933 with same month 1932. It has been prepared under two statements. The first shows the nationality of the employees as to parentage. The second statement separates the nationalities into "Foreign born" and "American born".

<u>As to Parentage</u>	<u>1933</u>	<u>%</u>	<u>1932</u>	<u>%</u>
English	5	8.3	5	7.2
Finnish	11	18.1	15	21.8
Italian	9	14.9	10	14.5
Swedish	17	27.9	18	26.1
French Canadian	13	21.4	13	18.8
Germans	2	3.1	2	2.9
Norwegians	2	3.1	4	5.9
Irish	-	-	1	1.4
Scotch	1	1.6	-	-
Hungarian	1	1.6	1	1.4
Total	61	100.0	69	100.0

<u>As to Birth</u>	<u>American Born</u>		<u>Foreign Born</u>	
	<u>1933</u>	<u>1932</u>	<u>1933</u>	<u>1932</u>
English	4	4	1	1
Finnish	3	6	8	9
Italian	1	2	8	8
Swedish	10	11	7	7
French Canadian	7	9	6	4
Germans	2	2	-	-
Norwegians	1	2	1	2
Irish	-	1	-	-
Scotch	1	-	-	-
Hungarian	-	-	1	1
Total	29	37	32	32
Percentage	48%	54%	52%	46%

FRANCIS MINE  
ANNUAL REPORT  
YEAR 1933

1. GENERAL:

The steel headframe is the only structure remaining on this property, on which the lease was surrendered several years ago. The ore in stock is on an adjoining forty owned by The C. C. I. Co.

2. PRODUCTION,  
SHIPMENTS &  
INVENTORIES:b. Shipments:

	<u>1933</u>	<u>1932</u>
Franport	11,262	0

c. Stockpile Inventories:

	<u>1933</u>	<u>1932</u>	<u>Decrease</u>
Franport	186,414	197,676	11,262

Shipments this year were made at first from the old North and South stockpile, the greater portion of which had been shipped prior to 1933. Part of the ore loaded ran as expected from average analysis of ore in stock, then a cargo ran too high in phos. The balance of loading was from the East-West stockpile where ore of better grade was stocked. The phosphorous was satisfactory in cargo loaded from this pile. It is recommended that ore shipped in the future be loaded from the East-West stockpile until it is exhausted. This will leave the ore in the North-South stockpile, possibly 40,000 tons, to be slowly worked off later in mixed cargoes.

8. COST OF  
OPERATING:

	<u>1933</u>	<u>1932</u>	<u>Increase</u>	<u>Decrease</u>
General Mine Expense	36.13	0	36.13	
Loading & Shipping	488.26	0	488.26	
Taxes	<u>2,656.93</u>	<u>5,687.58</u>		<u>3,030.65</u>
Total Cost at Mine	<u>3,181.32</u>	<u>5,687.58</u>		<u>2,506.26</u>

General Mine Expense increased due to shipping 11,262 tons of ore. Loading & Shipping increased due to shipping 11,262 tons of ore; none in previous year.

Taxes decreased 53% on account of lower valuation and tax rate.

10. TAXES:

	<u>1 9 3 3</u>		<u>1 9 3 2</u>	
	Valuation	Taxes	Valuation	Taxes
SW $\frac{1}{4}$ of NW $\frac{1}{4}$ Sec. 27-45-25 - 40 Acres				3.04
SW $\frac{1}{4}$ (Except R of W) " 153.56 Acres	500	8.22	500	16.03
Personal Property	<u>160,000</u>	<u>2,622.40</u>	<u>175,000</u>	<u>5,612.20</u>
Total	<u>160,500</u>	<u>2,630.62</u>	<u>175,500</u>	<u>5,631.27</u>
Collection Fees		26.31		56.28
Total Taxes		<u>2,656.93</u>		<u>5,687.55</u>

Tax Rate per \$100.00

1.639

3.207

Taxes decreased 53% due to decrease of \$20,000, or 11%, in valuation and \$1.568, or 48%, in tax rate.

REPUBLIC MINE  
ANNUAL REPORT  
YEAR 1933

1. GENERAL

Nothing of importance transpired at this property during 1933. Three more of the Location Houses were sold and negotiations started by the Michigan State Highway Department for the purchase of a right-of-way for relocating Highway M-45 through Republic, which crosses land owned by The Cleveland-Cliffs Iron Company and the Cliffs Power & Light Company. This new alignment follows Mine Street and will require their purchasing and moving eight of our Location houses and the old Company barn.

the Location houses sold were as follows:

<u>House No.</u>	<u>Purchaser</u>	<u>Sale Price</u>
No. 19	Milo Martell	\$ 200.00
No. 49	Arthur Kandala	300.00
No. 44	Percy Mills	250.00

The above sales are covered by contracts and are being paid for on a monthly payment plan. None of these houses would have been affected by the new Highway as they are located on different streets.

The Company still owns ten single and four double houses of which eight single houses and five halves of the double houses were occupied on December 31st, 1933. The highway purchase will include six single and two double dwellings; leaving four single and two double dwellings still to be disposed of; of which all but one half of one of the double houses are occupied. While we are not able to collect rent on most of these houses, still we feel it is better to have them occupied than remain vacant at an isolated location where there is no watchman.

10. TAXES

<u>Description</u>	<u>1933</u>		<u>1932</u>	
	<u>Valuation</u>	<u>Taxes</u>	<u>Valuation</u>	<u>Taxes</u>
<u>Republic Township</u>				
Realty as described on Tax Receipt..	\$ 10,000	381.63	\$ 10,000	455.80
Personal Property.....	10,000	381.63	10,000	455.80
Lots 71,72,86,108 and 126.....	95	3.68	95	4.51
Total.....	20,095	766.94	20,095	916.11
Collection Fees.....		7.67		9.16
Total Opt. Republic Mine ..		774.61		925.27
Republic Mine Dwellings -Incl. Fees..	6,750	260.42	6,950	320.31
Total Republic Twp. (inc. Fee)	26,845	1,035.03	27,045	1,245.58
Rate.....		3.83		4.588

REPUBLIC MINE  
ANNUAL REPORT  
YEAR 1933

There has been no change in valuation of the Realty or Personal property but the rate for 1933 is lower because of the new State law limiting the rate to \$1.50 per \$100.00 valuation plus debt service.

SPIES VIRGIL MINE  
ANNUAL REPORT  
YEAR 1933

1. GENERAL

The Spies Virgil Mine operated four months during 1933 on a four day week schedule with two crews each working alternate weeks from January 1st to May 1st. This arrangement gave each man an average of eight to nine days employment per month. It was the intention to close the mine about March 1st and allow it to flood for an indefinite period. When the Republic Steel Corporation became acquainted with this fact they decided to do some additional exploration work on their Sherwood property, before the mine was allowed to flood.

An extensive exploration program was carried on for the Republic Company from March first until August 31st. The Cleveland-Cliffs agreed to continue their operations to May 1st only, as the Sherwood operations were very indefinite as to how much would be done and the time it would take. From May 1st to October 1st the entire expense, except for a small proportion of Mine Office and Superintendence, was carried by the Republic Company. They also carried one half of the pumping cost from October 1st to November 15th.

The Sherwood operations were carried on two eight hour shifts, six days per week, which permitted the transferring of the majority of the Virgil crew at once, as the same working schedule of two days per week was continued. All development work was discontinued on the Virgil. The few gangs employed on the Virgil side were engaged in breaking ore and even this plan reduced the production to a small tonnage. The idea of the joint operation was to reduce the cash expenditure on the Virgil to a minimum.

Since September, the mine has been idle except for pumping, awaiting a decision from the Republic Company whether or not they intend to do any mining. The pumping is done on one shift, with the clerk acting as hoisting engineer and the Captain as one of the two pumpmen for six days of each week. The idle expense is not large, amounting to about \$1200.00 per month, exclusive of taxes.

2. PRODUCTION  
SHIPMENTS &  
INVENTORIES

a. Production by Grades

<u>Grades</u>	<u>Tons</u>
Virgil Crushed	11,950
Virgil High Sulphur	
Total Virgil	11,950
Sherwood Ore	1,578
Rock	4,555

SPIES VIRGIL MINE  
ANNUAL REPORT  
YEAR 1933

2. PRODUCTION  
SHIPMENTS &  
INVENTORIES

a. Production by Grades (continued)

The production of 11,950 tons for 1933 compares with 13,601 tons in 1932, a decrease of 1,651 tons. Although the production for each year is for four months and on a four day week schedule, during 1933, starting in March our operation on the Virgil was very limited due to the work carried on for the Republic Steel Corporation on their Sherwood property.

	Virgil Ore Tons	Virgil Hi-Sul. Tons	Total Tons
Production to Jan. 1, 1933	825,694	8,879	834,573
Production for 1933	11,950		11,950
Total production from Virgil Mine to Jan. 1, 1934	837,644	8,879	846,523

b. Shipments

<u>Grade of Ore</u>	<u>Pocket Tons</u>	<u>Stockpile Tons</u>	<u>Total Tons</u>	<u>Last Year Tons</u>
Virgil Crushed		48,889	48,889	4,551
<b>Total</b>		48,889	48,889	4,551
<b>Total Last Year</b>		4,551	4,551	
<b>Increase</b>		44,338	44,338	
<b>Total Shipments to Jan. 1, 1933</b>			497,008 tons	
<b>Shipments during 1933</b>			48,889 "	
<b>Total shipments from Mine to Jan. 1, 1934</b>			545,897 tons	

The shipment of Virgil ore for 1933 was all made from the north stockpile. The first loading was started on June 2nd and continued throughout the month and into July, loading a total of 46,862 tons. The next shipment was not made until November when 21,027 tons were loaded from the North pile, after which the shovel was drained and tied up for the winter.

Due to taking full cuts from the North pile when loading Virgil ore during June and July, it was necessary to dismantle the approach to the Sherwood stockpile trestle. At that time it was not anticipated that any more Sherwood ore would be hoisted during the year.

SPIES VIRGIL MINE  
ANNUAL REPORT  
YEAR 1933

2. PRODUCTION  
SHIPMENTS &  
INVENTORIES

b. Shipments (Continued)

The Sherwood ore hoisted during July and August amounting to 398 tons was loaded into seven railroad cars and held at the mine until October, when it was shipped to Escanaba for the Republic Steel Corporation's Account.

Prior to starting loading operations in June, the steam shovel was overhauled and minor repairs made. In July the boiler was cleaned and repairs made by the boilermaker. In October a number of new tubes were installed.

c. Stockpile Inventories

<u>Grade</u>	<u>Tons in Stock</u>
Virgil Crushed	291,745
Virgil Crushed (High Sulphur)	<u>8,879</u>
Total	300,624

d. Division of Product by Levels

<u>Level</u>	<u>Tons</u>	<u>Percent of Product</u>
Sixth	4,553	38.00
Eighth	<u>7,397</u>	<u>62.00</u>
TOTAL	11,950	100.00

e. Production by Months

The product by months, days operated, average daily product and tons per man per day are shown in the table below

<u>Month</u>	<u>Rock Tons</u>	<u>Hi-Sul. Ore Tons</u>	<u>Virgil Ore Tons</u>	<u>Total Ore Tons</u>	<u>No. Days Opt.</u>	<u>Average Daily Product</u>	<u>Tons Per Man Per Day</u>
January			4,388	4,388	18	244	6.00
February			4,259	4,259	16	266	6.33
March			1,866	1,866	18	104	5.33
April			1,437	1,437	16	90	5.23
May							
June							
July							
August							
Sept.							
Oct.							
Nov.							
Dec.							
YEAR			11,950	11,950	68	176	

The mine was idle from May 1st, except for Sherwood development and pumping.



SPIES VIRGIL MINE  
ANNUAL REPORT  
YEAR 1933

**2. PRODUCTION**  
**SHIPMENTS &**  
**INVENTORIES**

*Analysis on Straight Cargoes*

**f. Ore Statement**

Grade	Tons	Virgil Ore	Virgil Hi-Sul.	Total	Total Iron Nat. Last Year
Virgil Crushed	48,889	57.41	0.94		3.42
On hand Jan. 1, 1933		328,684	8,879	337,563	328,513
Output for year 1933		11,950		11,950	13,601
Total		340,634	8,879	349,513	342,114
Shipments		48,889	0	48,889	4,551
Balance on hand 12-31-33		291,745	8,879	300,624	337,563
Decrease in Output	48,889	57.55	.427	7.09	1,651

**1933** 1-8 hour Shift 4 days per week - 2 crews working alternate weeks. Jan. 1st to May 1st.  
 Idle except pumping & Sherwood development May 1st to Sept. 1.  
 Idle except pumping from Sept. 1st to Dec. 31st.

**1932** 1-8 hour Shift 4 days per week - 2 crews working alternate weeks Jan. 1st to March 1st.  
 Idle except for pumping from March 1st to Nov. 1st.  
 1-8 hour Shift 4 days per week - 2 crews working alternate weeks Nov. 1st to Dec. 31st.

**g. Delays**

Grade	Tons	Iron	Phos.	Sil.	Sulph.
Virgil Hi-Sulphur	8,879	57.41	.424	4.09	.389
Natural		53.10	.392	3.78	.341
There was only one delay during the year, which occurred on July 10th when the pump cable burnt through on surface. The mine was idle the entire shift.	1,180	58.00	.561	3.30	.186
Natural		53.94	.512	3.17	.173

**h. Delays from Lack of Current**

There were no delays during the entire year due to lack of current.

**3. ANALYSIS**

**a. Average Analysis on Output**

Grade	ft. equal	Tons	Iron	Phos.	Sil.	Sulph.
Virgil Crushed	10% deduction for rock	11,950	60.24	.387	3.78	.061

SPIES VIRGIL MINE  
ANNUAL REPORT  
YEAR 1933

4. ESTIMATE  
OF ORE  
RESERVES

3. ANALYSIS

b. Average Analysis on Straight Cargoes

Due to caving of the slope above the Sixth Level, the available ore has been reduced, as it will be necessary to leave a MINE LAKE ERIE between the ore Tons the Iron Phos. Sil. Sul. Iron Moist. Iron Nat.

Virgil Crushed	48,889	57.55	.427	7.09	.074	57.47	7.05	53.42
----------------	--------	-------	------	------	------	-------	------	-------

c. High Sulphur Ore

No high sulphur ore was mined or encountered in development during 1933.

d. Average Analysis on Total Shipments

Grade	Available		Unavailable		Total	
	Tons		Tons		Tons	
Virgil Crushed	48,889	57.55	7,397	7.09	56,286	7.00
Sherwood Crushed	378,932	56.48	270,427	5.26	649,359	5.26
1933 Production						
			7,397	7.09	7,397	7.00
<hr/>						
			167,318	95,712	263,030	

e. Average Analysis of Ore in Stockpile

Grade	Tons	Iron	Phos.	Sil.	Mn.	Al.	Lime	Mag.	Sul.	Loss	Moist.
Virgil Crushed	48,889	57.55	.427	7.09	.074						
Dried 212° F.	291,745	57.64	.401	7.00	.19	1.84	.60	.21	.078	6.50	
Natural		53.60	.372	6.51	.18	1.70	.56	.19	.072	6.05	7.00
Virgil Hi-Sulphur											
Dried 212° F.	8,879	57.41	.424	4.09					.369		
Natural		53.10	.392	3.78	.151				.341		7.50
<hr/>											
Total all ore Dec. 31, 1933				617,477		882,185		1,499,662			
Sherwood Dried	1,180	58.00	.561	3.30					.186		
Natural		53.94	.512	3.17	.38				.173		7.00

of the ore above the Sixth Level tied up in pillars and shown unavailable.

4. ESTIMATE  
OF ORE  
RESERVES

a. Developed Ore

Grade	Tons	Iron	Phos.	Sil.	Mn.	Al.	Lime	Mag.	Sul.	Loss	Moist.
Virgil Crushed	65,000	58.50	.365	6.00	.19	1.85	.60	.22	.078	6.50	7.00

Assumption: 12 cu. ft. equals one ton.  
10% deduction for rock.

The following is an expected analysis of the 1934 production from the Virgil Mine. This estimate is based on resumption of operations before January 1st, 1934, so as to start production on that date and working six single shifts per week with two crews, each working three days from January 1st to December 31st, 1934.

Grade	Tons	Iron	Phos.	Sil.	Mn.	Al.	Lime	Mag.	Sul.	Loss	Moist.
Virgil Crushed	65,000	58.50	.365	6.00	.19	1.85	.60	.22	.078	6.50	7.00

SPIES VIRGIL MINE  
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4. ESTIMATE  
OF ORE  
RESERVES

Due to caving of the stope above the Sixth Level, the available ore has been reduced, as it will be necessary to leave a shell of ore between the ore to the East and the old stope to prevent any rock that has caved from the hanging wall mixing and contaminating the ore to be mined. A new estimate of this area was made. There was practically no development on the sub-levels above the 8th Level and no change in tonnage other than that mined.

Virgil Ore	Available Tons	Unavailable Tons	Total Tons
Revised Estimate developed ore above 6th Level, Dec.31,1933	41,008	507,718	548,726
Estimate of Developed Ore between 6th & 8th Levels Dec.31,1932	174,715	95,712	270,427
1933 Production	7,397		7,397
Balance of Dec. 31, 1933 between 6th & 8th Levels.	167,318	95,712	263,030
<b>Total Developed Ore Dec.31,1933</b>	<b>208,326</b>	<b>603,430</b>	<b>811,756</b>

b. Prospective Ore

Surface	Available Tons	Unavailable Tons	Total Tons
Between 6th & 8th Levels	409,151	278,755	687,906
<b>Total all ore Dec.31,1933</b>	<b>617,477</b>	<b>882,185</b>	<b>1,499,762</b>

We estimate we will recover between 25% and 33% in our last mining operations, of the ore above the Sixth Level tied up in pillars and shown unavailable.

c. Estimated Reserve Analysis

Surface	Iron	Phos.	Sil.	Mng.	Alum.	Lime	Mag.	Sul.	Loss	Moist.
Dried	57.50	.425	7.00	.16	1.64	.60	.30	.119	7.35	
Natural	51.75	.382	6.30	.15	1.48	.55	.26	.107	6.60	10.00

d. Estimated Production

The following is the estimated tonnage and expected analysis of the 1934 production from the Virgil Mine. This estimate is based on resumption of operations before January 1st, 1934, so as to start production on that date and working six single shifts per week with two crews, each working three days from January 1st to December 31st, 1934.

Grade	Tons	Iron	Phos.	Sil.	Mn.	Al.	Lime	Mag.	Sul.	Loss	Moist.
Virgil Crushed	65,000	58.50	.365	6.00	.19	1.85	.60	.22	.078	6.50	7.00

SPIES VIRGIL MINE  
ANNUAL REPORT  
YEAR 1933

5. LABOR  
AND  
WAGES

a. Comments

The normal force of 68 to 70 men were employed between the Virgil and Sherwood operations on a two day week basis for eight months to September 1st. During the idle period a crew of ten men, including the Captain and Clerk, were employed on a staggered schedule.

Wages were increased on July 16, 1933. Surface wages were increased 10% and working hours reduced from nine hours to eight hours per shift, while underground wages were increased 15%. General surface labor \$3.20 and company account miners \$4.04.

b. Comparative Statement of Wages and Product

	<u>1933</u>	<u>1932</u>	<u>INCREASE</u>	<u>DECREASE</u>
PRODUCT	11,950	13,601		1,651
NO. SHIFTS & HOURS	1-8	1-8		
<u>Avg. No. of Men Working</u>				
Surface	8	18		10
Underground	23	48		25
Total	31	66		35
<u>Avg. Wages Per Day</u>				
Surface	3.29	3.71		.42
Underground	3.91	4.23		.42
Total	3.72	4.14		.42
<u>Wages per Month of 8 Days</u>				
Surface	26.32	29.68		3.36
Underground	31.28	34.64		3.36
Total	29.76	33.12		3.36
<u>Production per Man per Day</u>				
Surface	18.36	15.77	2.59	
Underground	8.47	7.06	1.41	
Total	5.80	4.88	.92	
<u>Production per Man 8 days</u>				
Surface	18.36	15.77	2.59	
Underground	8.47	7.06	1.41	
Total	5.80	4.88	.92	
<u>Labor Cost per Ton</u>				
Surface	.1790	.2355		.0565
Underground	.4621	.6129		.1508
Total	.6411	.8484		.2073

6. SURFACE

SPIES VIRGIL MINE  
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5. LABOR  
AND  
WAGES

a. Building Repairs (Continued)  
b. Comparative Statement of Wages and Product (Cont.)

What repairs were made to the location houses were done by the tenants, any supplies necessary furnished, was reduced by the tenants.

	<u>1933</u>	<u>1932</u>	<u>INCREASE</u>	<u>DECREASE</u>
<u>Labor Cost per Ton 8 Days</u>				
Surface	.1790	.2355		.0565
Underground	.4621	.6129		.1508
Total	.6411	.8484		.2073
<u>Avg. Product Br'k. &amp; Tram'g.</u>	35.87	35.46	.41	
<u>Avg. Product Br'k. &amp; Tram'g. 8 days</u>	35.87	35.46	.41	
<u>Avg. Wage Contract Miners</u>	4.21	4.845		.635
<u>Total Number of Days</u>				
Surface	651	862½		211½
Underground	1,411	1,927		516
Total	2,062	2,789½		727½

b. Stockpiles

<u>Amount for Labor</u>	<u>1933</u>	<u>1932</u>	<u>1931</u>
Surface	2,139.82	3,203.07	1,063.25
Underground	5,522.01	8,336.34	2,814.33
Total	7,661.83	11,539.41	3,877.58

Proportion Surface to Underground Men

7. UNDERGROUND

1933	1	to	2.15
1932	1	to	2.23
1931	1	to	2.28
1930	1	to	2.43
1929	1	to	2.74
1928	1	to	2.64
1927	1	to	3.08
1926	1	to	3.00

6. SURFACE

a. Building Repairs.  
1. Buildings - Mine  
Only the most necessary repairs were made the past year and most of them were of a minor nature. During August some of the sheet iron enclosing the Shaft House, which was loose, was renailed and the Shaft House ore pocket was cleaned out in anticipation of the mine closing down.

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**6. SURFACE**

**a. Building Repairs (Continued)**

**2. Buildings - Location**

What repairs were made to the location houses were done by the tenants, any supplies necessary being furnished by the Company. The usual kalsomining and painting which is done by the tenants, with material furnished, was reduced to a minimum.

Early in the spring, there was some thought of allowing the mine to flood for an indefinite period, when it was closed. In order to have lights for the location houses, mine buildings and location street lighting, arrangements were made with the Iron Range Light & Power Company, the local company, to extend their lines and connect into our distribution system. As we only have a small location, in order to make it attractive to them, we had to agree to turn over to them, by means of a bill of sale, our distribution system. As it would have very little salvage value, we agreed to their terms. The agreement allows the Mining Company to furnish current for street lights as long as the mine is operating or pumping.

**b. Stockpiles**

The ore hoisted and stockpiled during the winter of 1932-1933 was all placed on the main pile northeast of the shaft. In order to make room 5 bents were added to the trestle, two in January and three in February.

There was no new development on the Eighth Level.

**7. UNDERGROUND**

**b. Development**

**Fourth Level**

There was no new development on the Fourth Level during 1933. The stope above the 6th Level had been worked to an elevation of 385' or 40' below the Level. During the latter part of April, a cave occurred in the stope and worked through to the Fourth Level and above. This cave has cut off the traveling raise between the 6th and 4th Levels and when the mine is operated on a normal basis again a new raise nearer the Shaft will have to be put up.

**Sixth Level.**

There was no new development on the Virgil side of the Sixth Level.

When the Republic Steel Corporation was notified that the Virgil Mine was to be closed about March 1st and allowed to flood, they made immediate plans to do additional exploration work on their Sherwood property.

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7. UNDERGROUND

b. Development (Continued)

Sixth Level (Continued)

No. 1 Cross-cut, which was started last year to reach the ore in the vicinity of Diamond Drill Hole #9, was extended 460' to the south wall, cutting about 160' of ore averaging about 58.75 iron, .542 phos. and .200 sulphur. When this drift was well advanced and the results discouraging, plans were made to put down several Diamond Drill Holes. For this reason the footwall drift was advanced to the southwest in rock 250' where two drill stations were cut.

The outline of ore to be cut in No. 1 Cross-cut, as drawn by the Republic Company, showed 375' of ore compared with 160' actually drifted through. Then the grade was high in both phosphorus and sulphur.

The extension of the Virgil drift onto the Sherwood was in ore for 109'. During July two single compartment raises were put up to the north at 80' and 100' southwest of the Virgil-Sherwood line. These raises and sub-level drift 21' above the main level showed ore averaging about 60.36 iron, .500 phos. and .050 sulphur.

The results of the drilling are discussed under heading No. 9 - Explorations.

Eighth Level

There was no new development on the Eighth Level.

Subs Above Eighth Level

The highest elevation reached during 1932 was the + 25 foot sub-level at the west end of the Northwest orebody. During 1933 development was carried on from this elevation and proved that this is the top of the ore. The formation flattened out and the development at this elevation was all in rock.

Total Lagging

c. Stopping

Sixth Level

The ore hoisted the past year from the Sixth Level has all been secured from stopping operations. One gang has been engaged in stopping during the four operating months on the 185 and 230 foot sub-levels, in the area east of the main pillar. This ore breaks in large chunks and the miners spend considerable time blasting on the lower subs and chutes.

This stope is well filled with ore caved from the pillars and south side of stope. Mining in the future in this stope will be limited as the available tonnage is small.

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7. UNDERGROUNDc. Stoping (Continued)Eighth Level

The larger part of the 1933 tonnage was secured from the west stope. A small tonnage was broken from the lower subs in the East stope.

Mining in the West stope was conducted on the -50', -25' and 000' sub-levels. The ore in this stope runs higher in iron and lower in silica than the average of the mine. The phosphorus and sulphur are both lower. The ore is of a good structure but hard to break

d. Timbering

The timbering during the past year has all been in the nature of repairs to the main level drifts. After the cave in the stope above the Sixth Level, props were put in the cross-cuts leading off the drift into the Sherwood and also in the Virgil drift along the boundary. The total cost for timber was very small both in 1933 and 1932. No new timber was purchased.

Statement of Timber Used

<u>KIND</u>	<u>LINEAL FEET</u>	<u>AVG. PRICE PER FOOT</u>	<u>AMOUNT 1933</u>	<u>AMOUNT 1932</u>
6" to 8"	1,108	.04444	49.24	45.69
8" to 10"				3.22
10" to 12"	41	.09038	3.70	33.05
Total Timber 1933	1,149	.04607	52.94	
Total Timber 1932	1,442	.05684		81.96
		<u>PER 100 FEET</u>		
6' Lagging				13.92
Total Lagging				13.92
Poles	285	1.3877	3.95	1.16
Total Lagging & Poles, 1933	285	1.3877	3.95	
Total Lagging & Poles, 1932	2,228	1.047		15.08
Product			11,950	13,601
Feet of Timber per Ton of Ore			.0961	.1060
Feet of Lagging per Ton of Ore				.1576
Feet of Lagging per Foot of Timber				1.4868
Cost per Ton for Timber			.00443	.00603
Cost per Ton for Lagging				.00102
Cap. Crimpers				1.92
Powder Bags				2.89
Tamping Bags	2,000	2.35	4.70	9.40
Safety Fuse Lighters	550	.7236	3.98	4.48
Total Fuse, Caps, etc.			183.70	314.30
Total All Explosives			1,165.70	1,523.39



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7. UNDERGROUNDd. Timbering (Continued) and Blasting (Cont.)Statement of Timber Used (Cont.)

	Amount 1933	Amount 1932
Production	37,850	13,601
Cost per Ton for Poles	.00033	.00008
Cost per Ton for Timber, Lagging & Poles	.00476	.00713
Equivalent of Stull Timber to Board Measure	1,524	2,141
Feet of Board Measure per Ton of Ore	.1276	.1574
Cost of Timber, Lagging & Poles,	\$56.89	\$ 97.04

e. Drifting and Raising

The following is a comparison of the drifting and raising done in the years 1933 and 1932:

YEAR	DRIFTING		RAISING	
	ORE	ROCK	ORE	ROCK
1933	503	22	59	12
1932	1054	34	24	11

h. Ventilation

The natural ventilation in the mine is usually good during the winter months, especially while tramping and hoisting is carried on. The All development work was discontinued March 1st when Sherwood operations were started.

f. Explosives, Drilling and Blasting

The following statement of explosives used shows a decrease in powder used per ton and cost per ton for powder. The decrease in powder used per ton is due to securing part of the tonnage from caved ore in the stope above the Sixth Level while the decrease in cost per ton for powder is explained by the use of a larger percentage of Gelamite No. 2. The decrease in amount of powder used is due to the smaller production.

Both the 3rd and 8th Level pumps were operated throughout the year on

Statement of Explosives Used

	Quantity	Average Price	Amount 1933	Amount 1932
Ore Development & Stopping				
40% Gelatine Powder	1,503	.1125	169.10	385.63
No. 2 Gelamite Powder	6,500	.1250	812.50	823.46
Total Powder Lbs.	8,003	.12265	981.60	1,209.09
Fuse	24,200	5.39	130.39	226.27
No. 6 Caps	3,800	11.585	44.03	68.36
Fuse & Cap. Seal	1 Pt.	.60	.60	1.20
Cap. Crimpers				1.92
Powder Bags				2.69
Tamping Bags	2,000	2.35	4.70	9.40
Safety Fuse Lighters	550	.7236	3.98	4.46
Total Fuse, Caps, etc.			183.70	314.30
Total All Explosives			1,165.30	1,523.39

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3. COST OF  
7. UNDERGROUND

a. f. Explosives, Drilling and Blasting (Cont.)

<u>Statement of Explosives Used (Cont.)</u>		1932	1933	Increase	Decrease
		Amount	Amount		
Ore Produced, Tons	11,950				1,651
Average Daily Product	176				24
Production per Day	5.89	11,950	13,601		
Pounds Powder per Ton of Ore	68	.6697	.73149		
Cost per Ton for Powder	1-8	.08214	.09425		
Cost per Ton for all Explosives	22,000	.09751	.1120		
Budget Estimated Cost at Mine	\$3,144	\$2,519			
<u>Sinking, Rock Development, Etc.</u>					
Co Powder		-	-		
Fuse and Costs	\$ .862	\$1-187	-		.325
Co Caps Costs	.309	.348	-		.039
General Mine Accounts	.371	.419			.078
Co Total Explosives Used in Mine	1,542	1,165.30	1,523.39		.442
Co Cost of Loading & Shipping	.128	.333	.025		.205
Co Average Price per Pound for Powder	.670	.12265	.1215		.347

h. Ventilation

Plant & Equipment .038 .033

The natural ventilation in the mine is usually good during the winter months, especially while tramming and hoisting is carried on. The warm weather creates a balance in the air current between the two shafts and it is necessary to operate the 5 H.P. No. 2½ B. Anaconda Type Fan. at This fan was installed on surface and air blown down the skip compartment in addition to a water spray. The fan was finally moved to the Sixth Level where the Sherwood drilling was going on which improved the air more than when located on surface. After the mine was closed entirely except for pumping, it was moved to the Eighth Level near the Pump House.

i. Pumping

Both the 3rd and 8th Level pumps were operated throughout the year on one eight hour shift. The Sherwood drilling increased the water pumped from 150 gallons per minute to 180 gallons. Toward the end of the year it began to show a decrease from the Sherwood drill holes. The water pumped for the year amounted to 84,468,275 gallons.

The Wisconsin-Michigan Power Company has notified us that the minimum established in 1932 for idle mines and which was to expire Jan. 1, 1934, has been extended indefinitely. Under this minimum and our pumping schedule, we only pay for the current actually used.

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8. COST OF  
OPERATING

a. Comparative Mining Costs

			1932	1933	Increase	Decrease	
	Per Ton		Per Ton	Per Ton			Per Ton
<u>Production</u>							
Ore Produced, Tons			11,950	13,501		1,651	
Average Daily Product			176	200		24	
Tons per Man per Day	.010		5.89	3.38	2.51		
Number days Operating			68	68			
Number Days & Hours - 4 months			1-8	1-8			
Budget Estimated Production			22,000	50,000		1,699.34	.107
Budget Estimated Cost at Mine			\$3.144	\$2.519		116.44	
<u>Costs</u>							
<u>Underground Costs</u>							
Underground Costs	.041		\$ .862	\$1.187		.325	.023
Surface Costs			.309	.348		.039	
General Mine Accounts	.062		.371	.449		.078	.038
Cost of Production			1.542	1.984		.442	
Cost of Loading & Shipping			.128	.033	.095		.001
Cost at Mine per Cost Sheet			1.670	2.017		.347	
<u>Depreciation</u>							
Plant & Equipment			.038	.038			
Development	.107		.219	.219			.032
Movable Equipment							
Taxes			.368	.288	.080		
Supply Inventory	.044		.002	.000	.002		.027
Total Cost at Mine			2.297	2.562		.265	
Idle Expense for 8 months			.920	1.983		1.063	
Total Cost at Mine including Idle Expense			\$3.217	\$4.545		\$ 1.328	
<u>Equipment</u>							
Equipment	.002		1,121.12			865.85	.081
<u>Pumping Machinery</u>							
Machinery	.015		817.85			142.68	.006
<u>Total Underground Costs</u>							
Costs	.862		16,146.50	1.187		5,047.47	.325
<u>Hoisting</u>							
Hoisting	.078		1,285.48			348.25	.018
<u>Stocking Ore</u>							
Ore	.047		535.69	.039	22.01		.008
<u>Screening - Crushing at Mine</u>							
Screening - Crushing at Mine	.026		345.91	.025	.001	36.60	
<u>Dry House</u>							
Dry House	.070		860.56	.064	.006	25.37	
<u>General Surface Expense</u>							
General Surface Expense	.043		647.48	.047		129.44	.004

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8. COST OF  
OPERATING

b. Detailed Cost Comparison

	1933		1932		Increase		Decrease	
	Amount	Per Ton	Amount	Per Ton	Amount	Per Ton	Amount	Per Ton
1. Exploring in Mine	121.86	.010	117.51	.008	4.35	.002		
4. Development in Ore	1,704.13	.143	3,403.47	.250			1,699.34	.107
5. Stopping	2,679.61	.225	2,796.05	.206		.019	116.44	
6. Timbering	487.57	.041	948.18	.070			460.61	.029
7. Trammig	740.48	.062	1,355.01	.100			614.53	.038
8. Ventilation			20.20	.001			20.20	.001
9. Pumping	2,301.35	.192	2,824.19	.208			522.84	.016
10. Compressors & Air Pipes	1,281.38	.107	2,163.53	.159			882.15	.052
12. Undg. Superintendence	531.27	.044	958.74	.071			427.47	.027
14. Compressors & Power Drills	10.74	.001	110.65	.008			99.91	.007
16. Elec. Tram Equipment	265.47	.002	1,131.12	.083			865.65	.081
17. Pumping Machinery	175.17	.015	317.85	.023			142.68	.008
Total Underground Costs	10,299.03	.862	16,146.50	1.187			5,847.47	.325
18. Hoisting	937.23	.078	1,285.48	.096			348.25	.018
19. Stocking Ore	558.70	.047	535.69	.039	23.01	.008		
20. Screening - Crushing at Mine	309.31	.026	345.91	.025		.001	36.60	
21. Dry House	837.19	.070	860.56	.064		.006	23.37	
22. General Surface Expense	518.02	.043	647.46	.047			129.44	.004

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8. COST OF OPERATING

b. Detailed Cost Comparison (Continued)

	<u>1933</u>		<u>1932</u>		<u>Increase</u>		<u>Decrease</u>	
	<u>Amount</u>	<u>Per Ton</u>	<u>Amount</u>	<u>Per Ton</u>	<u>Amount</u>	<u>Per Ton</u>	<u>Amount</u>	<u>Per Ton</u>
23. Hoisting Equipment	269.58	.023	786.63	.058			517.05	.035
24. Shaft	15.97	.001	6.38	.000	9.49	.001	1,887.11	.078
25. Top Tram Equipment	247.78	.021	72.83	.005	174.95	.016	8,555.51	.442
26. Docks, Trestles & Pockets	4,400.00	.368	192.76	.014	4,478.51	.080	192.76	.014
27. Mine Buildings	3.85	.000	4.46	.000			.61	
TOTAL SURFACE COSTS	3,697.23	.309	4,738.16	.348			1,040.93	.039
28. Insurance	91.40	.008	51.27	.004	40.13	.004		
29. Mining Engineering	31.50	.003	221.02	.016			199.52	.013
30. Mech. & Elec. Engineering	104.08	.009	118.23	.009			14.15	
31. Analysis & Grading	324.56	.027	383.78	.028			59.22	.001
32. Personal Injury	286.77	.024	389.90	.029			103.13	.005
33. Safety Department	27.77	.002	97.56	.007			69.79	.005
34. Telephones & Safety Devices	126.07	.010	153.35	.011			27.28	.001
35. Local & General Welfare	259.56	.022	388.55	.029			128.99	.007
36. Special Exp. Pensions & Allowances	943.51	.079	1,061.84	.078			118.33	
37. Ishpeming Office	1,096.08	.092	1,652.43	.122			556.35	.030

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8. COST OF OPERATING

b. Detailed Cost Comparison (Continued)

	<u>1933</u>		<u>1932</u>		<u>Increase</u>		<u>Decrease</u>	
	<u>Amount</u>	<u>Per Ton</u>	<u>Amount</u>	<u>Per Ton</u>	<u>Amount</u>	<u>Per Ton</u>	<u>Amount</u>	<u>Per Ton</u>
39. Mine Office	1,134.46	.095	1,524.94	.116			390.48	.021
Total General Mine Expenses	4,425.76	.371	6,092.87	.449			1,667.11	.078
COST OF PRODUCTION	18,422.02	1.542	26,977.53	1.984	478.51	.080	8,555.51	.442
40. Taxes	4,400.00	.368	3,921.49	.288	478.51	.080		
TOTAL COST	22,822.02	1.910	30,899.02	2.272			8,077.00	.362
Idle Expense	11,000.94	.920	26,974.86	1.983			15,973.92	1.063

Operating Schedule

<u>1933</u>	<u>1932</u>
Jan.1 - May 1, 4 single shifts per week	Jan.1 - Feb.29, 4 single shifts per week
May 1 - Sept.1, Virgil Mine Idle - Sherwood operating 6 double shifts per week	Mar.1 - Oct.31, Mine idle except for pumping.
Sept.1 - Dec.31, Idle except for pumping.	Nov.1 - Dec.31, 4 single shifts per week

General

The total amount shows a decrease in nearly every item due to the joint operation, Virgil-Sherwood, and dividing the overhead expense which is constant regardless of production.

1. Exploring in Mine

Both the 1933 and 1932 charge is a proportion of the Geological Department expense charged to the Spies Virgil Mine. No exploration work was undertaken in either year.

4. Development in Ore

The ore development was discontinued during February and was only half what it was in 1932.

5. Stoning

This increase in cost per ton is explained by the fact that a larger percentage of the tonnage was secured from the 8th Level stope which is small and powder costs higher.

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8. COST OF OPERATING

b. Detailed Cost Comparison (Continued)

6. Timbering

The timbering cost in 1933 is for repairs only as no new chutes were built and then a part was charged against idle expense.

7. Tramming

This large decrease is due to dividing the expense between Virgil and Sherwood for two months, and the reduced tonnage.

9. Pumping

A proportion of pumping was charged to Republic during two months of 1933.

10. Compressor & Air Pipes

The larger part of the joint operation was on the Sherwood property during March and April of 1933, explaining the large decrease in total amount and cost per ton.

12. Underground Superintendence

Part of the Captain's and Shift Bosses' time was charged to Sherwood explaining the decrease.

14. Compressor & Power Drills

Only minor repairs to the compressor in 1933. In 1932 the exciter burnt out and had to be rewound.

16. Electric Tram Equipment

Less repairs made to electric tram equipment the past year and during 1932 a new armature for the underground locomotive was charged out.

17. Pumping Machinery

The repairs made to the pumps are about the same each year. The decrease for 1933 is almost the amount, \$142.50, paid the City of Iron River for making a change in the drainage ditch through the Burns Addition.

18. Hoisting

Sherwood development was resumed in March and a part of the hoisting expense (labor) was charged to Sherwood on a tonnage basis.

19. Stocking Ore

More bents were added to the trestle in 1933 than 1932 explaining the increased cost.

20. Screening & Crushing

A smaller tonnage was handled in 1933 and then the expense for March and April was distributed on a tonnage basis between Virgil and Sherwood.

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8. COST OF OPERATING

b. Detailed Cost Comparison (Continued)

21. Dry House ) All these captions show  
Heavy repairs to the heating plant boiler were more than offset by amount  
the charges against Sherwood during March and April. at per ton, due to

22. General Surface Expense ) lower salaries and reduced force  
General Surface work was reduced to a minimum. The decrease is employed, also economies made in  
explained by not having a night watchman on during March and April  
except Sunday, as Sherwood operated nights.

23. Hoisting Equipment ) The amount of taxes is greatly reduced due to the law limiting the  
A new skip rope was put on during 1932, explaining the large decrease thousand dollars of valuation, plus debt service.  
for 1933. tition charged to operating and idle expense.

24. Shaft )  
Only minor repairs made each year. months in 1933 compared with eight  
months in 1932. Further, the Republic Company paid half the pumping

25. Top Tram Equipment )  
The large increase is for repairs made to larry car which went over list to November 15th, 1932.  
the end of the trestle in December, 1932.

9. EXPLORATIONS

26. Docks, Trestles & Pockets  
No charge made to this account the past year.

27. Mine Buildings  
Small maintenance charge each year.  
No exploration work of any kind was done during the past year.

28. Insurance  
Mine buildings and contents covered by new policy with increased rates.  
Five Diamond Drill holes were drilled from the Sixth Level. Their location

29. Mining Engineering ) hole, vertical depth below level and feet of ore  
The decrease is due to reduced engineering force and salaries and not as much time required as no development work.

30. Mechanical & Electrical Engineering )  
Monthly charge about the same for 1933 and 1932. Decrease small

Hole	Co-ordinates	Length of Hole-Feet	Vertical Depth Below Sixth	Ore Feet
13	2364 223 W. -17°	1085'	365'	415'
	South	700'	234'	190'
			203'	230'
	204 W. -60°	538'	484'	330'
	North			60'

31. Analysis & Grading  
Smaller proportion of Shipping Department on account of tonnage shipped from other properties. This more than offset increased number of determinations.

32. Personal Injury  
Reduction due to charge of 2% of payroll which was smaller account transferring a large part of the crew to Sherwood  
No. 3 and 4 about the middle of the ore in these holes. As the ore cut showed high phosphorus and sulphur, it was decided to start a second drill. No. 14 was planned from a station in the main footwall drift to the south to cut the ore at depth that was encountered in No. 1 Cross-cut. The reason for starting so far north was to see if the ore was



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8. COST OF OPERATING

b. Detailed Cost Comparison (Continued)

- 33. Safety Department ) All these captions show
- 35. Local General Welfare ) a decrease in total amount
- 36. Special Expense, Pensions & Allowances ) and cost per ton, due to
- 37. Ishpeming Office ) lower salaries and reduced force
- 39. Mine Office ) employed, also economies made in many cases.

40. Taxes

The amount for taxes is greatly reduced due to the law limiting the rate to \$15.00 per thousand dollars of valuation, plus debt service. The increased cost per ton is due to smaller tonnage and difference in proportion charged to operating and idle expense.

Idle Expense

The mine was only idle for four months in 1933 compared with eight months in 1932. Further, the Republic Company paid half the pumping expense from October 1st to November 15th, 1933.

9. EXPLORATIONS AND FUTURE EXPLORATIONS

1. Spies Virgil

No exploration work of any kind was done during the past year.

2. Sherwood

Five Diamond Drill holes were drilled from the Sixth Level. Their location dip, course, length of hole, vertical depth below Level and feet of ore cut in hole are shown in the following tabulation.

Hole No.	Co-ordinates of Collar	Dip	Course	Length of Hole-Feet	Vertical Depth Below Sixth	Ore Feet
13	N.364 223 W.	-17°	S.43°30'W.	1085'	365'	415'
14	N.490 194 W.	-20°	South	700'	234'	190'
15	N.273 600 W.	-30°	S. 2°00'E.	600'	303'	230'
16	N.285' 625 W.	-30°	S.49°00'W.	730'	421'	330' #
17	N.388 204 W.	-60°	North	538'	484'	60'

# Hole #16 was still in ore when it was stopped on August 31st.

No. 13, the first hole, was started on April 1st and was laid out to cut Nos. 3 and 6 about the middle of the ore in these holes. As the ore cut showed high phosphorus and sulphur, it was decided to start a second drill. No. 14 was planned from a station in the main footwall drift to the south to cut the ore at depth that was encountered in No. 1 Cross-cut. The reason for starting so far north was to see if the ore en-

SPIES VIRGIL MINE  
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9. EXPLORATIONS  
AND FUTURE  
EXPLORATIONS

2. Sherwood (Continued)

countered in the drift just across the Virgil line extended to the southwest below the Level. Hole No. 14 went over the top but it was found by Hole No.17.

The extension of the footwall drift was started on May 1st and extended 250' or to the 600' W. Co-ordinate, so as to have a hole to the south 400' west of Cross-cut No. 1 and Hole No. 14. Hole No. 15 was planned to intersect Holes No. 3 and No.13.

Hole No. 16 drilled from the west end of the footwall drift, was planned to determine the western limit of the ore body. This hole was stopped in ore.

Detail of tonnage estimates and analysis of the ore encountered in these holes will be given in the Geological Department Report.

An estimate was made during September as to the tonnage that could be mined above the Sixth Level as follows:

Ore Body	Tonnage	Iron	Phos.	Sil.	Sul.	Moist.	Iron Natl.
North	18,000	58.61	.635	3.00	.056	6.48	54.81
South	161,000	58.75	.541	2.91	.198	6.80	54.76
Total	179,000	58.74	.550	2.92	.184	6.77	54.76

The approximate average of the expected analysis from the entire property from the latest information is as follows:

Iron	Phos.	Silica	Sulphur	Moisture	Iron Natl.
57.15	.500	3.00	.150-.200	7.25	53.00

10. TAXES

The following tabulation is a comparative statement of taxes paid in Iron County for the year 1933 and 1932.

Erickson Lease SW $\frac{1}{4}$ of Sec. 21, 43-34	187,500	6,587.34
Collection Fees.....		65.31
Total Bates Township.....		6,652.65
Rate,,,:.....		3.546

SPIES VIRGIL MINE  
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10. TAXES

<u>Description</u>	<u>1933</u>		<u>1932</u>	
	<u>Valuation</u>	<u>Taxes</u>	<u>Valuation</u>	<u>Taxes</u>
<u>Iron River Township</u>				
NE $\frac{1}{4}$ of NW $\frac{1}{4}$ , Sec.24,43-35 40 acres				
SE $\frac{1}{4}$ of NW $\frac{1}{4}$ , " 24, " 40 "				
Spies Dwellings.....	5,000	101.40	4,500	126.04
<u>Spies Virgil (a)</u>				
E $\frac{1}{2}$ of NW $\frac{1}{4}$ , Sec.24-43-35 Spies)				
SE $\frac{1}{4}$ of NW $\frac{1}{4}$ , " 24 " Virgil).	80,000	1,622.40	90,000	2,520.80
Stockpile,Supplies & Equipment....	390,000	7,909.20	485,000	13,584.27
Total Spies Virgil.....	470,000	9,531.60	575,000	16,105.07
(a) Total Iron River Township.....	475,000	9,633.00	579,500	16,231.11
Rate.....		2.028		2.8008
<u>Village of Mineral Hills</u>				
<u>Spies Lease</u>				
SE $\frac{1}{4}$ of NW $\frac{1}{4}$ , Sec.24-43-35.....)				
NW $\frac{1}{4}$ of NW $\frac{1}{4}$ , " 24 " .....				
Dwellings.....	4,500	4.83	4,500	4.04
<u>Virgil Mine Lease</u>				
(a) SW $\frac{1}{4}$ of NW $\frac{1}{4}$ of Sec.24-43-25.....	80,000	85.92	90,000	80.83
Stockpile,Supplies & Equipment....	390,500	419.40	485,000	435.59
Total Opt.Spies-Virgil.....	470,500	505.32	575,000	516.42
Total Mineral Hills.....	475,000	510.15	579,500	520.46
Rate.....		.1074		.0898

(a) The mineral valuation is not divided between the Spies and Virgil. The valuation of \$80,000 includes both the Spies and Virgil descriptions noted above for the year 1933. Not divided by Tax Appraiser and any division would be arbitrary.

Fees not required in Iron River Township in accordance with a ruling of the Auditor General Dec. 21, 1931 and advice by Iron County Taxpayers' Assn. Dec.23,1931.

The Village of Mineral Hills is in Iron River Township. The valuation as shown here are the same valuations shown by Iron River Township, and are omitted in the recapitulation and distribution. Above taxes paid in August 1933.

<u>Bates Township</u>	
Erickson Lease SW $\frac{1}{4}$ of Sec. 21,43-34	193,000
Collection Fees.....	66.58
Total Bates Township.....	6,724.12
Rate,,,	3.446

SPIES VIRGIL MINE  
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YEAR 1933

10. TAXES

<u>PERSONAL INJURY</u>	<u>Description</u>	<u>Valuation</u>	<u>1933</u> <u>Taxes</u>
	<u>City of Crystal Falls</u>		
	<u>Ravenna-Prickett</u>		
	W $\frac{1}{2}$ of SE $\frac{1}{4}$ , Sec.19,43-32.....	10,500	280.39
	Rate per \$100.00.....		2.671
	<u>Crystal Falls Township</u>		
	<u>Ravenna-Prickett</u>		
	SW $\frac{1}{4}$ of Sec.19,43-32.....)	72,000	1,458.72
	NE $\frac{1}{4}$ of SE $\frac{1}{4}$ , " 24,43-33.....)		
	SW $\frac{1}{4}$ of NE $\frac{1}{4}$ " 19,43-32.....	200	4.06
	SE $\frac{1}{4}$ of NE $\frac{1}{4}$ " 19, " .....	200	4.06
	SW $\frac{1}{4}$ of NW $\frac{1}{4}$ " 19, " .....	200	4.06
	SE $\frac{1}{4}$ of NW $\frac{1}{4}$ " 19, " .....	200	4.06
	SE $\frac{1}{4}$ of NE $\frac{1}{4}$ " 24,43-33.....	200	4.06
	Total.....	73,000	1,479.02
	Rate per \$100.00.....		2.026
	<u>Total Ravenna-Prickett.....</u>	<u>83,500</u>	<u>1,759.41</u>
	<u>Distribution of Charges</u>		
	C.G.I. Proportion.....	65,300	1,390.67
	Michigan Mineral Land Co.....	18,200	368.74

A trade was made with the M.A.Hanna Company of the Erickson Lease for their Ravenna-Prickett Lease. The Prickett is owned by the Michigan Mineral Land Company.

11. ACCIDENTS

AND  
PERSONAL  
INJURY

a. Accidents

There were two lost time accidents at the Spies Virgil Mine during 1933, both occurring on surface and being in connection with stockpile loading. This record compares with no lost time accidents in 1932, two in 1931 and three in 1930.

The first accident occurred on June 14th at 3:00 P.M.

Contardi, a miner, was working as a pitman with the steam shovel crew. A trestle stringer had caved from the top of the ore pile and the pit crew was removing it. Contardi, who was in front of the timber, had his foot caught while it was being moved, between it and a piece of ore. He finished the shift, but it became swollen during the evening and Contardi lost two weeks time, receiving \$23.20 compensation.

SPIES VIRGIL MINE  
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11. ACCIDENTS  
AND  
PERSONAL  
INJURY

Shafts (Continued)

a. Accidents (Continued)

The second accident occurred on June 22nd at 10:00 A.M.

Wales, the sampler, of the railroad cars when loading from stockpile, had just finished sampling a car and was going to cross over to the next car when he fell to the ground, landing in a sitting position, causing severe contusions of muscles of back and loins.

Wales claims he still suffers a great deal of pain in his back and is unable to work. He has been examined by doctors from the Ishpeming Hospital in addition to Dr. Libby of Iron River. X-ray pictures do not show anything that assists them in treatment of the case.

To December 31st 1933 Wales was paid a total of \$290.00 compensation in addition to \$5.60, the cost of the Mayo Sacro-iliac Belt, which was purchased for him. He is still receiving compensation.

b. Safety Work

Training in Rescue and First Aid was discontinued on account of the curtailed operation. Attention to safety was stressed at all times and all standards enforced and strictest discipline maintained.

12. NEW CONSTRUCTION  
AND PROPOSED  
NEW CONSTRUCTION

No new construction was undertaken during 1933 and none anticipated for 1934.

14. MAINTENANCE  
AND REPAIRS

a. Shafts

1. Spies Shaft

A thorough examination was made each month during the operation period and the building paper covering on the pipes renewed in places, also a number of pipe hangers replaced where eaten away by the acid water.

	Percent	Percentage
1	.03	Dane
2	.07	French Canadian
1	.03	Swede
1	.03	German
3	.10	Finn
1	.03	Polish
2	.07	Irish

SPIESVIRGIL MINE  
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14. MAINTENANCE  
AND REPAIRS

18. NATIONALITY  
OF  
EMPLOYEES

a. Shafts (Continued)

2. Virgil Shaft

A monthly inspection was made of the Virgil Shaft, the second outlet. The water in the old stopes dropped a total of about 7 or 8 feet during the year.

b. Hoisting Equipment

Only minor repairs were made during 1933.

c. Pumps

The pumps gave very little trouble this year. The valves and valve seats in the 8th Level pumps were renewed several times during the year. The same oiling system was installed on No. 1 Prescott Pump eighth Level as was put on No. 2 last year. The new system insures good lubrication and a saving in oil consumption

17. CONDITION  
OF  
PREMISES

When the mine was closed in September, all equipment was stored in buildings. The village cleans the streets and alley at the location. The dwellings are badly in need of paint. The sheds and fences are in poor state of repair and detract from the appearance of the location.

All the men living in the location had gardens as well as a number living in Iron River were provided with lots for planting potatoes. The crops were not so good this year on account of the very dry season.

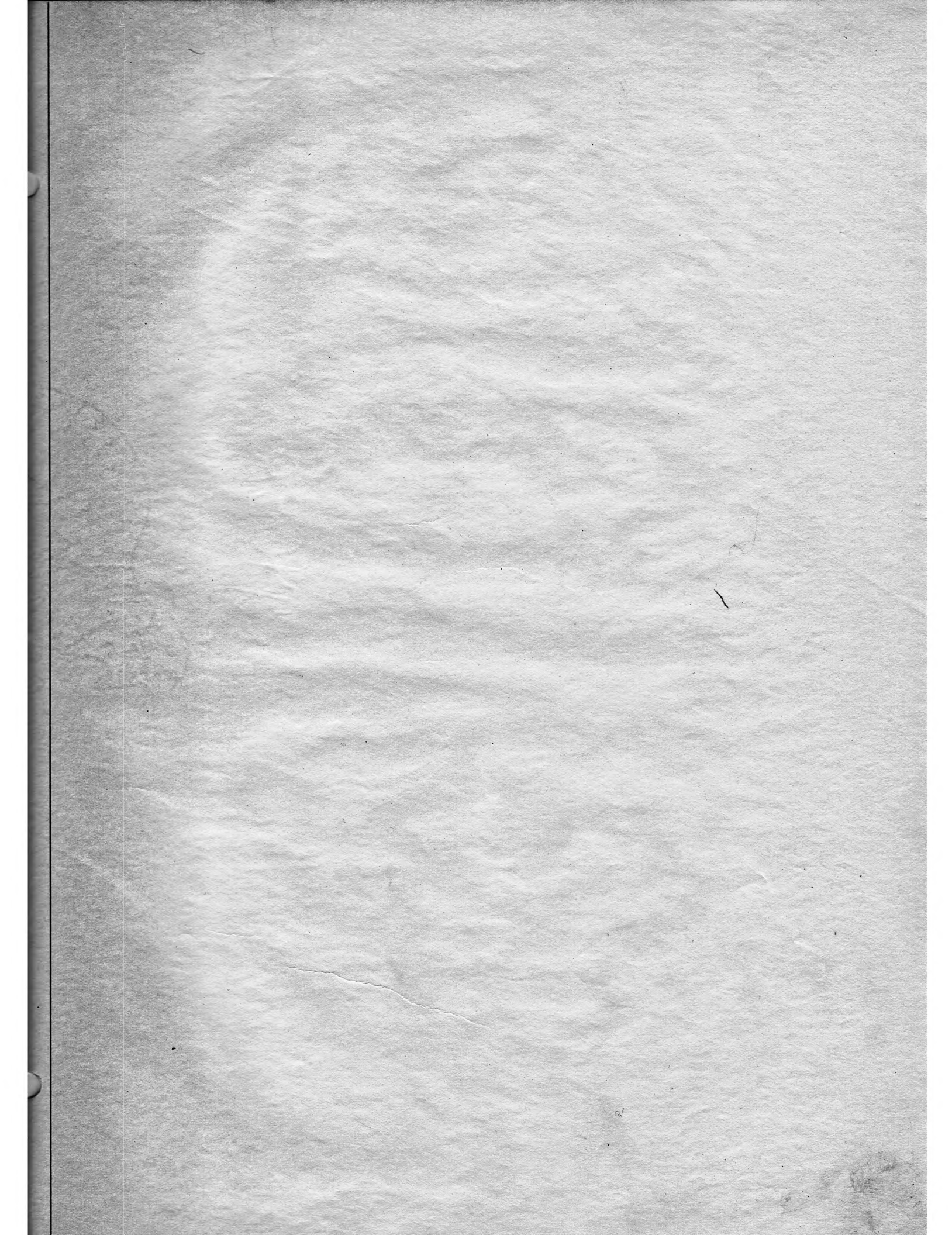
18. NATIONALITY  
OF  
EMPLOYEES

	<u>Percent</u>	<u>Parentage</u>
<u>Americans</u>		
2	.07	Americans
4	.13	English
1	.03	Dane
2	.07	French Canadian
1	.03	Swede
1	.03	German
3	.10	Finn
1	.03	Polish
2	.07	Irish

SPIES VIRGIL MINE  
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YEAR 1933

18. NATIONALITY  
OF  
EMPLOYEES

<u>Foreign Born</u>	<u>Percent</u>	<u>Parentage</u>
6	.19	English
1	.03	Croatian
1	.03	Swede
1	.03	German
3	.10	Finn
1	.03	Polish
1	.03	Italian
31	100%	





DREW MINE  
ANNUAL REPORT  
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1. GENERAL:

Orders were received in July to put the Drew Mine in shape for operation. A force of men was put to work, overhauling the washing plant, repairing equipment and making the necessary preparations in the pit, including pumping out the water, cleaning material that had washed into the pit and the necessary track work.

Mining and washing activities were started on August 26th and continued until October 27th.

Some stripping work was done prior to the start of ore operations and was continued by a contractor until the latter part of October. When ore operations were finished, the Drew Mine electric shovel was utilized in stripping work at the South end of the pit until November 26th, when weather conditions became so severe that further work was impractical.

2. PRODUCTION,  
SHIPMENTS &  
INVENTORIES:

a. Production by Grades:

Drew Crude Ore, -----	54,368 tons.
Syme Crude Ore, -----	9,284 "
Total Crude Ore, -----	<u>63,652 "</u>
Drew Concentrates, -----	44,545 "
Syme Concentrates, -----	7,502 "
Total Concentrates, -----	<u>52,047 "</u>

b. Shipments:

The shipments from the Drew Mine during 1933 were the same tonnages as shown under the production statement, as all ore mined was forwarded to Lower Lake ports.

c. Stockpile Inventories:

No merchantable ore, either concentrates or direct shipping, was stocked at the Drew property during 1933.

e. Production by Months:

(1) Crude Ore:

<u>MONTH</u>	<u>DREW</u>	<u>SYME</u>	<u>TOTAL</u>
August, -----	5,830	-	5,830
September, -----	25,194	6,282	31,476
October, -----	<u>23,344</u>	<u>3,002</u>	<u>26,346</u>
Total - 1933, -----	54,368	9,284	63,652



DREW MINE  
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4. ESTIMATE OF  
ORE RESERVES:  
(Continued)

a. Developed Ore: (Continued)

	<u>OPEN PIT</u>	<u>UNDERGROUND</u>	<u>TOTAL</u>
Drew, -----	84,000	4,560	88,560
Syme, -----	11,040	40,950	51,990
Total, -----	95,040	45,510	140,550

The ore estimate of January 1st, 1934, is based on the results of structure drilling and mining operations undertaken during the year 1933.

The last previous estimate made on the Drew Mine showed the following tonnages (Concentrated basis):-

Drew,	227,000 tons
Syme,	<u>80,800 "</u>
Total,	307,800

Deducting the 44,545 tons of Drew concentrates and 7,502 tons of Syme concentrates shipped during the year 1933, would leave, from the estimated figures of August, 1932, as noted above - 182,455 tons in the Drew and 73,298 tons in the Syme.

Comparing these figures with those of our estimate of January 1st, 1934, a reduction of 93,895 tons is made in the Drew estimate and - 21,308 tons in the Syme. The reasons for this drastic reduction are: first - the rock deduction assumed in previous estimates for the Drew-Syme ore body was 10%, whereas during the season of 1933 this deduction amounted to at least 30% in the ore mined - and - second; the results of the structure drilling, some of which was in the nature of check work, showing a very much restricted ore body and the fact that some of the material, which had been considered as ore, was of such character that it could not be treated to advantage so as to make it of merchantable grade. Further than this, some of the ore which had previously been considered as minable by open pit methods is now considered as underground and will have to be mined by tram-to-pit methods.

b. Prospective Ore:

The Mining and exploratory work undertaken on the Drew forty during 1933 has proved conclusively that there is small chance of developing any further ore in that property. The Syme ore extends to the Southward and while it is doubtful whether an open pit deposit can be developed between the Southerly explorations to date and the South boundary line, a distance of approximately 900 feet, the question of doing the necessary exploratory work to determine this will have to

DREW MINE  
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4. ESTIMATE OF ORE RESERVES:

b. Prospective Ore: (Continued)

be decided by the spring of 1934. We feel sure that the ore extends to the Southward, but from present data, it would have to be mined by underground methods, which would be prohibitive from the cost standpoint for an ore of this character, requiring beneficiation.

c. Estimated Analyses:

Test-pits are being put down in the unmined open pit area to determine the grade of the ore remaining. This work has not been completed. Hand-wash tests have been made from the structure drill samples and the test-pitting work completed thus far and indicates that the analyses of the ore reserves will approximate that of the shipments during 1933. A report on the expected analyses of the Drew-Syme ore reserves will be made shortly.

5. LABOR & WAGES:

a. Comments:

(1) Labor:

Labor, both skilled and common, was plentiful for the Drew Mine operation during the year 1933, in spite of the fact that the Code became effective before work was started at this property.

6. SURFACE:

a. Buildings, Repairs:

Only such repair work as was necessary to the small mine buildings and frame washing plant was undertaken during 1933. Only minor repairs are contemplated during 1934, when the mine should be exhausted, if the ore can be disposed of.

c. Tracks, Roads, Transmission Lines:

The Drew Mine had been idle several years and it was necessary to put the mine tracks in shape for service. This work consisted in replacing ties and in lining and ballasting the tracks.

No work was necessary on the roads or transmission lines.

7. OPEN PIT:

a. Stripping:

Stripping and clean-up work was begun the middle of July and were carried forward with our equipment until ore activities started on August 26th.

A contractor, operating a small gasoline shovel, was engaged from September 18th to the end of October in removing an old track grade at the North end of the pit; removing the overburden and taconite from the top of the ore in this vicinity; widening the pit along the West side and pushing the stripping cuts to the South end of the ore body.

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7. OPEN PIT:  
(Continued)

a. Stripping: (Continued)

Following the suspension of ore operations, the Drew electric shovel was engaged in removing taconite along the West side of the approach track and in loading out the surface material to the top of the ore at the South end of the pit. This work was completed November 24th and the equipment laid up for the season.

A total of 59,740 yards of stripping were handled during the year. An appropriation of \$29,067.00 was made for stripping, but only - \$21,763.98 was expended, leaving a balance of \$7,303.02. The estimated cost per yard was figured at \$.30, whereas the actual cost was \$.364/. The reason for this over-run in the estimate was due to the very congested conditions under which the work was conducted and the fact that a larger part of the material than anticipated was a hard taconite.

The following stripping work remains to make the open pit ore, set up in the estimate of January 1st, 1934, available:

	<u>SURFACE</u>	<u>ROCK</u>	<u>TOTAL</u>
Drew,	2,490	2,014	4,504
Syme,	<u>1,900</u>	<u>3,793</u>	<u>5,693</u>
Total,	4,390	5,807	10,197

g. Open Pit Mining & Loading:  
Wash Ore:

Open pit mining operations were conducted from August 26th to October 27th. The ore was all loaded into 20-yard cars and hauled to the skip pocket.

It was very apparent from a study of the situation, that the former method of operating the Drew pit would have to be changed. The early clean-up work and blasting in ore showed that there was considerably more rock mixed with the ore and it was necessary to provide a method of handling this rock from the pit, other than hoisting it to the washing plant, sorting it out on the grizzly and dumping it along side of the plant. With this end in view an approach track was maintained leading in to the pit and all the rock possible was sorted out in the mining operation, hauled from the pit by locomotive and placed on the waste dump.

Mining activities at the beginning of the season were conducted to the North of the pocket. Rock conditions here became so bad that it was necessary to shift mining activities to the South and drill and blast the West bank at the North end of the pit. The electric shovel moved back and forth between the North and South ends of the pit several times during the season.

DREW MINE  
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7. OPEN PIT:  
(Continued)

g. Open Pit Mining & Loading:

Wash Ore; (Continued)

The bad rock conditions slowed up operations to a considerable extent. The skip hoist and washing plant could have easily handled 50% more ore during the operating period and there was almost a constant delay in providing sufficient ore to the plant. The pit is very small and the work was so congested that it was impossible to carry on an operation with more than one shovel.

Generally speaking, operations should be somewhat better in 1934, as there will be more room and it will be possible to sort and dump some rock in the pit.

k. Water in the Pit:

Some delays were occasioned by heavy rains washing surface material into the pit and skip pocket. Our pumping facilities were limited and upon several occasions it was necessary to shut down ore operations from one to two shifts in order to free the pit of water and clean up the material washed into it.

8. COST OF  
OPERATION:

a. Comparative Mining Cost:

(1) Product:

	<u>PRODUCTION</u> <u>YEAR 1933</u>	<u>BUDGET</u> <u>ESTIMATE</u>
Concentrates shipped,	52,047 tons	60,000 tons.
Avg. Daily Product, -----	1,010	
Tons Per Man Per Day, -----	15.14	
Days Operated, -----	63	
Days Idle, -----	64	

COST:

<u>Total Cost at Mine:</u>	<u>1933 COST</u>	<u>BUDGET</u> <u>ESTIMATE</u>
Production Grude Ore,	\$ .269	\$ .200
General Pit Expense,	.085	.100
Concentrating,	.238	.250
General Mine Expense,	.136	.050
Totals,	\$ .728	\$ .600

d. Detailed Cost Comparison:

(1) Product:

The production for the year was 7,953 tons under the estimate. This was due entirely to the large amount of rock encountered in mining the ore. Where an estimate of 10% for rock had been anticipated, it actually amounted to over 30%.

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8. COST OF  
OPERATION:  
(Continued)

d. Detailed Cost Comparison: (Continued)

(2) Crude Ore Costs:

There was an increase of \$.069 in the production of crude ore as compared with the budget estimate. This is explained by the fact that there was very much more rock encountered in mining the ore than had been anticipated.

(3) General Pit Expense:

The cost under this caption was \$.015 under the estimate. The items "Open Pit Superintendence", "Pumping & Drainage" and "Test-Pitting" were lower than figured on and explain the decrease.

(4) Concentrating:

The actual cost realized here was \$.012 under the estimate. The large quantity of rock encountered in mining was handled in the pit and removed therefrom by locomotive trains. The cost of handling the rock did not go against concentrating and the ore dumped into the pit pocket and hoisted and later washed, was comparatively clean, which explains this decrease.

(5) General Mine Expense:

The increase of \$.086 in this account is largely explained by the items "Analysis & Grading", "Personal Injury" and "District Office" - running higher than we had anticipated.

All of the above cost items were effected by the fact that the production was almost 8,000 tons less than had been anticipated at the time of making the budget estimate and the idle expense costs were somewhat higher than had been anticipated and were charged against the smaller tonnage.

9. EXPLORATIONS  
AND FUTURE  
EXPLORATIONS:

A number of shallow test-pits were put down in the pit during the ore season, as a guide to the shovel cuts. Upon the completion of ore activities, four test-pits, averaging 40 feet in depth, were put down in the pit. About six additional pits, varying from 20 to 40 feet in depth, will be sunk in the pit in order to determine more accurately the quality and extent of the pit ore body. This work should be completed prior to the 20th of January, 1934.

Contractor Schultze moved two structure drill outfits to the Drew Mine on September 18th and was engaged until the middle of December in putting down fifteen holes, with a total footage of 1,162'10". The result of this drilling was quite disappointing and restricted considerably the pit limits, which had previously been considered as fairly definitely determined.





DREW MINE  
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11. ACCIDENTS  
AND  
PERSONAL  
INJURY:  
(Continued)

NAME: Matt Bukovich  
(Continued)

DATE: October 21st.

NATURE: Laceration on forehead 1" long. Multiple slight abrasions and contusions to forehead and nose, with slight fracture of nose - bleeding from nostrils. Marked tenderness and slight abrasions over the right hip. Not involving the bone, but thick muscles of back.

TIME LOST: Bukovich had not returned to work at the close of the ore season.

12. NEW CONSTRUCTION  
AND PROPOSED  
NEW CONSTRUCTION:

No new construction was undertaken during the year 1933 and none is anticipated for the future.

13. EQUIPMENT AND  
PROPOSED  
EQUIPMENT:

No new equipment was purchased during 1933, but four 20-yard cars were transferred to the Drew Mine from the Hill-Trumbull and were utilized and rental paid when they were in service. It is not expected that any new equipment will be purchased for this property, although some machinery may be rented.

14. MAINTENANCE  
AND REPAIRS:

Only the usual maintenance work was done on the equipment incident to the usual operation and the repair work was held at the very minimum. No repairs were undertaken at the conclusion of the season's operations, and it is only anticipated making such minor repairs as will be absolutely necessary to put the equipment in shape for the 1934 activities.

18. NATIONALITY  
OF  
EMPLOYEES:

American, -----	29
Scandinavian -----	10
Italians, -----	17
Austrians, -----	36
Montenegrins, -----	1
Finnish, -----	20
Total -----	113

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19. WASHING PLANT  
OPERATIONS:

The washing plant operations were conducted from August 26th, to October 27th. The crew worked on three 8-hour shifts, five days per week as soon as the mill was tuned up and a continuous operation possible.

Very little difficulty was experienced with the plant and, everything considered, results here were quite satisfactory. The conveyor belt, leading from the plant to the loading pocket, gave some trouble the fore part of the season. The ore fed on to the conveyor belt was very wet and when the load was heavy there was some slippage.

The weight recovery amounted to 81.76% and the Iron Unit Recovery 96.95%. These recoveries were quite satisfactory, but their accuracy is questionable, as the crude ore could not be weighed and was estimated on a skip tally basis.



HILL-TRUMBULL MINE  
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1. GENERAL:

From January 1st until the middle of July, three full-time watchmen were employed in policing the mine premises and two half-time watchmen were engaged at the washing plant. From July 17th until the end of the year, four regular watchmen were employed at the mine and one man at the washing plant. The increase in watchmen was due to the Mining Code requirements. As the washing plant watchman lives with his family on the premises, ample protection is afforded here.

Several brush fires started in the vicinity of the mine buildings but the watchmen were able to control them and no property damage resulted.

There were several very heavy rain storms during the summer and the water accumulated in both the Hill and Trumbull pits. The Hill-Annex pumping, however, drained the water from the Hill pit and that in the Trumbull seeped away. The pits were entirely dry at the end of the year.

In order to afford a safe-guard against sand storms from our washing plant tailings basin, we entered into a short-time contract with the Minnesota Power & Light Company. Our old power contract expired on May 4th and the new contract entered into ran from that date until October 1st, when it was automatically cancelled.

In order to reduce our load factor, a 1000-gal. pump was installed, to replace the former 2000-gal. pump and an 85 H.P. motor was hooked up to the new pump.

The sweet clover in the tailings basin attained sufficient growth and afforded ample protection, except in a few instances when there was an extremely heavy wind and some dust rose from the dikes themselves and from a few bare places in the basin. We feel that the sweet clover growth is sufficient to protect the basin from sandstorms until such time as we resume washing operations and build up the tailings pond.

4. ESTIMATE OF  
ORE RESERVES:

a. Developed Ore:

Assumption: 13 Cu. ft. per ton for Direct Ore.

17 Cu. ft. per ton for Wash Ore.

A rock deduction of 10% was made in the case of the

Direct Ore and Wash Ore and 35% for the Rocky Wash.

Concentrates are figured on 65 per cent gross recovery.

No exploratory or development activities were undertaken during the year 1933 and the reserve estimates are the same as reported a year ago:

HILL-TRUMBULL MINE  
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4. ESTIMATE OF  
ORE RESERVES:  
(Continued)

a. Developed Ore: (Continued)

Hill Bessemer Direct Shipping, -----	632,449 tons.
Hill Non-Bessemer Direct Shipping, -----	1,132,200 "
Hill Bessemer Concentrates, -----	291,226 "
Hill Non-Bessemer Concentrates, -----	<u>389,323 "</u>
 TOTAL HILL ORE, -----	 2,445,198 "
 Trumbull Bessemer Direct Shipping, -----	 85,000 "
Trumbull Non-Bessemer Direct Shipping, -----	200,560 "
Trumbull Bessemer Concentrates, -----	2,255,539 "
Trumbull Non-Bessemer Concentrates, -----	<u>645,992 "</u>
 TOTAL TRUMBULL ORE, -----	 3,187,091 "
 GRAND TOTAL HILL AND TRUMBULL ORE, -----	 5,632,289 "

The ore estimate of January 1st, 1934 is the same as that reported a year ago, as no drilling or test-pitting was done during 1933 and there is no reason to make any changes in the tonnage or the grade.

b. Prospective Ore:

The drilling of the land to the North of the Hill pit in the vicinity of the taconite island, will no doubt show up an additional tonnage of concentrating ore. Test-pits put down along the ore limits of the pit in 1925 indicated that the ore makes back beyond the stripping banks and a few old scattered drill holes confirm this. From the standpoint of taxes it has not been advisable to conduct any drilling in this locality, but when ore conditions become normal and the mine resumes operations, it would be advisable to investigate this matter and decide on what drilling should be done. According to our lease we are required to re-estimate, with the Great Northern engineers, the tonnage of ore in sight in the Hill-Trumbull Mines as of December 31st, 1933, so as to fix the minimum tonnage requirements during the last fifteen years of the lease. In connection with this estimate the lease provides that the Great Northern engineers will furnish us plans, showing what exploring they consider it would be necessary to do to determine the existence of ore bodies other than those upon which our estimates have been based during the first fifteen years of the lease. This estimating and exploratory work has been postponed until normal conditions prevail in the iron ore market.

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4. ESTIMATE OF  
ORE RESERVES:  
(Continued)

c. Estimated Analysis:

<u>Hill Mine:</u>	<u>Tons</u>	<u>Iron</u>	<u>Phos.</u>	<u>Sil.</u>	<u>Fe.Nat.</u>
Bessemer Direct Shipping,	632,449	58.00	.045	13.00	53.36
Non-Bess. Direct Shipping,	1,132,200	58.00	.055	13.00	53.36
Bessemer Concentrates,	291,226	59.50	.045	8.50	55.04
Non-Bessemer Concentrates,	389,323	60.00	.059	7.50	55.50
<b>TOTAL HILL ORE, -----</b>	<b>2,445,198</b>	<b>58.57</b>	<b>.052</b>	<b>11.38</b>	<b>54.87</b>
 <u>Trumbull Mine:</u>					
Bessemer Direct Shipping,	85,000	56.40	.040	12.79	51.32
Non-Bess. Direct Shipping,	200,560	58.04	.060	9.85	52.82
Bessemer Concentrates,	2,255,539	59.00	.043	9.00	54.57
Non-Bessemer Concentrates,	645,992	59.00	.080	9.00	54.57
<b>TOTAL TRUMBULL ORE, -----</b>	<b>3,187,091</b>	<b>58.88</b>	<b>.054</b>	<b>9.14</b>	<b>54.38</b>
<b>GRAND TOTAL HILL-TRUMBULL,</b>	<b>5,632,289</b>	<b>58.74</b>	<b>.053</b>	<b>10.11</b>	<b>54.59</b>

6. SURFACE:

a. Buildings, Repairs:

No repairs or construction work was undertaken during the year.

7. OPEN PIT:

There was no activity in the Hill and Trumbull open pits during the year 1933.

9. EXPLORATIONS  
AND  
FUTURE  
EXPLORATIONS:

No exploratory work was undertaken during the year 1933, and none is contemplated for 1934, unless a comprehensive ore operation is to be undertaken, in which event some structure drilling will be necessary in the bottom of the Trumbull pit during the spring and further explorations should be done in the fall to govern the 1935 ore program.

10. TAXES:

The following statement shows the taxes and average rate at the Hill-Trumbull Mine for the years 1932 and 1933:

HILL-TRUMBULL MINE  
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10. TAXES:  
(Continued)

Statement of Taxes:

	<u>1933</u>	<u>1932</u>	<u>Increase</u>	<u>Decrease</u>
Hill Mine, -----	34,224.68	34,343.37		118.69
Trumbull Mine, -----	42,773.61	42,921.94		148.33
Hill-Trumbull Shops, ---	902.50	905.63		3.13
Hill-Trumbull W.P.Lands-	2,997.79	2,936.80	60.99	
Personal Property, -----	1,878.81	2,092.73		213.92
TOTAL, -----	82,777.39	83,200.47		423.08
Village Lots, -----	538.61	540.48		1.87
GRAND TOTAL, -----	83,316.00	83,740.95		424.95
Average Rate, -----	.728	.729		.001





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1. GENERAL.

A force of two regular full-time watchmen at the mine and two men, working half time policing at the washing plant, were employed from the first of January until the middle of July. From July 17th to the end of the year, four regular mine watchmen were employed and one resident watchman at the washing plant, in order to come within the requirements of the Mining Code. It is only necessary to employ one man at the washing plant, as he lives on the premises with his family and someone is always there.

The watchmen reported several brush fires during the past summer and it was necessary for them to take steps to keep them from spreading. No damage resulted from the fires.

The watchmen did not report any deprecations of any consequence during the year.

The water in the Holman pit rose to within 15 feet of the approach, leading in to the Brown No. 1 pit. This water stage is now about 20 feet lower than it was when we started pumping operations at the property in the fall of 1928.

4. ESTIMATE OF ORE RESERVES:

a. Developed Ore:

Assumption: 16 Cubic feet per ton for Wash Ore.

A rock deduction of 10% was made generally and in estimating a part of the deposit the deduction was increased to 20%, due to the exceptionally rocky condition of this ore.

No exploratory work was undertaken at the Holman-Cliffs Group of properties during the past year and there was, therefore, no occasion for making any re-estimates.

The tonnage listed below is on a concentrated basis and is figured on a 60% gross recovery:

<u>Brown No. 1:</u>	
Non-Bess. Concentrates, -----	1,126,196 tons.
<u>Holman:</u>	
Non-Bessemer Concentrates, -----	2,798,873 "
<u>Brown #2:</u>	
Non-Bessemer Concentrates, -----	<u>1,891,533</u> "
TOTAL HOLMAN-BROWN, -----	5,816,602 "
 <u>North Star:</u>	
Non-Bess. Direct, -----	80,103 "
Bessemer Concentrates, -----	538,083 "
Non-Bess. Concentrates, -----	<u>101,891</u> "
TOTAL NORTH STAR, -----	720,077 "

HOLMAN-CLIFFS MINE  
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4. ESTIMATE OF ORE RESERVES:  
(Continued)

a. Developed Ore: (Continued)

Bingham:

Bessemer Direct, -----	269,664 tons.
Non.-Bess. Direct, -----	329,590 "
Bessemer Concentrates, -----	1,198,361 "
Non-Bess. Concentrates, -----	<u>590,238 "</u>
 TOTAL BINGHAM, -----	 2,387,853 "
 TOTAL BINGHAM-NORTH STAR, -----	 3,107,930 "
 GRAND TOTAL HOLMAN-CLIFFS MINE, -----	 8,924,532 "

6. SURFACE:

a. Buildings, Repairs:

The following tabulation shows a list of the house occupants and repairs made during the year 1933. The very minimum of repair work was undertaken during the year:

<u>House No.</u>	<u>Occupant</u>	<u>Description of work</u>
1	Andy Nelson,	Repair windows
14	George Dunstan,	Repair sink
15	W. E. Gustason,	Repair doors
18	Don Franks,	Repair toilet
37	George Sullivan,	Install register.
41	A. L. Sundquist,	Repair foundation & skirting.
82-104	(Vacant)	Cut and drain pipes
106	M. Youngberg,	Repair plumbing.
157	J. W. Mattson,	Repair water tank

Note: The occupants of the houses were charged a rental of \$6,103.00 during 1933 and collections amounted to \$4,373.50.

10. TAXES:

The following statement shows the taxes and average rate for the Holman-Brown, Bingham and North Star Mines, together with the Holman-Cliffs auxiliary lands, Bingham-North Star washing plant lands, Holman-Brown lands, Holman-Cliffs shops and Holman-Cliffs personal property for the years 1932 and 1933:

HOLMAN-CLIFFS MINE  
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10. TAXES:  
(Continued)

Statement of Taxes:

	<u>1933</u>	<u>1932</u>	<u>Increase</u>	<u>Decrease</u>
Holman-Brown Mine,	49,752.48	49,711.50	40.98	
Bingham Mine,	13,161.81	13,150.97	10.84	
North Star Mine,	10,256.92	10,248.47	8.45	
Holman-Cliffs Aux.Lands	2,149.71	2,626.50		476.79
Bingham-North Star W.P.Lands,	33.70	41.36		7.66
Holman-Brown Lands,	15.68	19.24		3.56
Holman-Cliffs Shops,	279.13	279.87		.74
Holman-Cliffs Personal Property,	<u>2,260.90</u>	<u>3,396.06</u>		<u>1,135.16</u>
 TOTAL,	 \$ 77,910.33	 \$ 79,473.97		 1,563.64
 Rented Buildings,	 <u>1,393.64</u>	 <u>1,392.69</u>	 <u>.95</u>	
 GRAND TOTAL,	 \$ 79,303.97	 \$ 80,866.66		 1,562.69
 Average Tax Rate,	 .726	 .728		 .002

