	1924	1923
January	826	970
February	836	1046
March	800	929
April	823	949
May	788	898
June	803	981
July	780	921
August	802	953
September	798	926
October	787	895
November	778	833
December	735	823
Average -	796	927

The average number of gallons pumped per minute over the past four year is as follows:-

1921 - 910 gals. per minute,
1922 - 943 Do.
1923 - 927 "
1924 - 796 "

SURFACE.

VENTILATING SYSTEM.

The Maas-Negaunee Ventilating System was authorized in October. Preparations were immediately started on the surface installation so that they would be well underway by the time cold weather set in. The location selected for the fan is 30 feet East of #2 shaft. The skip and cage compartments are to be used as the downcast. Work was started on the housings October 22nd, but had to be stopped in November.

The fan has been purchased from the Morgan-Gerrish Company. It is a No. 12 American Blower Company and has a capacity of 100,000 cu. ft. per minute. It will be driven by a 150 H.P., 2200 volt alternating current, squirrel cage motor, and is designed for two speeds.

The motor and fan foundations have been completed as well as the pulley bearing pier. The collar of #2 shaft has been concreted as well as the motor house floor and the air passageway floor, except a small space in the passageway in front of the reversing doors. All enclosures have been built and covered with metal lath ready for guniting.

The headframe has been enclosed with boards and covered with metal lath. The guniting will be done as soon as the weather permits in the spring.

The fan is on the ground and will be erected sometime this winter so as to be ready for operation in the spring.

HOIST HOUSE AND HOIST FOR #2 SHAFT.

The engine which was destroyed by fire on December 4th, 1922 was rebuilt in October and a new building was erected to enclose this hoist.

NO. 3 SHAFT HEADFRAME.

The guniting which was stopped a year ago last fall on account of the cold weather was completed in May of this year.

DRAINAGE DITCH.

A drainage ditch to the West of the timber yard was made in July.

SEWER.

An 8" sewer pipe was laid from the change house to connect with the new City sewer which was constructed on Maas Street during the summer. This connection was made in July.

SHOPS.

During the year an Arthur Power Hack Saw was added to the machine shop equipment.

A 15 H.P. 220 Volt motor was installed in the carpenter shop for operating the circular saw.

WOOD TRESTLE.

Eight wooden bents were erected at the East end of the steel trestle for Bessemer ore that will be stocked this coming season.

DELAYS - ELECTRICAL.

March 4th - 1/2 hour delay account of no current.

May 8th - 4 hours delay, current off from noon due to transmission pole line down account of sleet storm.

DELAYS - NON-ELECTRICAL.

July 24th - 1/2 hour delay account of motor car off track on tenth level.

ESTIMATE OF PROBABLE ORE IN NEGAUNEE MINE DECEMBER 31, 1924.

Above 9th level,
No. 1 Shaft Pillar 1,148,681 tons,
No. 2 Shaft Pillar 113,906 "
Total above 9th level - - - - - - 1,262,587 tons,

Total between 9th & 10th levels - - - 978,413 "

Total between 10th & 11th levels - - - 2,372,962 "

Total above 11th level - - - - - - 4,613,962 tons.

Percentage of Bessemer equals 11%.

GRADED AS FOLLOWS:

Bessemer Ore	Trade Name.	Tons
Developed	Negaunee-Bessemer	507,536
Non-Bessemer Ore		
Developed	Negaunee	4,106,426
Total Bessemer and Non-Bessemer,		4,613,962

ASSUMPTION:

12 cu. ft. equals one ton. 10% Deduction for Rock,
10% " " Loss in Mining.

ESTIMATED ANALYSIS.

	IRON	PHOS.	SILICA	ALUM.	MANG.	LIME	MAG.	SUL.	IGNI.	MOIST.
Negaunee:										
Dried 212°	59.10	.100	7.70	2.64	.324	.900	.306	.009	3.10	
Natural	52.00	.088	6.78	2.32	.285	.792	.269	.008	2.73	12.00
Negaunee-Bessemer:										
Dried 212°	60.00	.048	7.04	2.72	.237	.644	.307	.009	2.07	
Natural	52.80	.042	6.20	2.39	.209	.567	.270	.008	1.82	12.00

NEGAUNEE MINE

AVERAGE MINE ANALYSIS ON OUTPUT FOR YEAR 1924.

GRADE	IRON	PHOS.	SILICA
Negaunee Bessemer,	61.84	.047	6.85
Negaunee,	60.01	.088	7.81

AVERAGE ANALYSIS ON STRAIGHT CARGOES FOR YEAR 1924.

	Mine			Lake Erie		
GRADE	IRON	PHOS.	MOIST.	IRON	PHOS.	MOIST.
Negaunee Bessemer,	61.80	.046	11.60	61.87	.049	12.00
Negaunee,	59.83	.089	11.52	59.62	-	11.23

ORE STATEMENT - DECEMBER 31ST, 1924.

	NEGAUNEE BESSEMER	NEGAUNEE	TOTAL	TOTAL LAST YEAR
On hand January 1, 1924,	4,968	168,358	173,326	171,856
Output for Year,	54,533	268,590	323,123	381,118
Transferred,	7,283	7,283	-	-
Stockpile Overrun,	-	-	-	797
Total,	52,218	444,231	496,449	553,771
Shipments,	42,774	299,148	341,922	380,445
Balance on Hand,	9,444	145,083	154,527	173,326
Decrease in Output,			58,792	
Decrease in Ore on Hand,			18,799	

1924 -- 1-8 Hour Shift, 6 days per week, Jan. 1st to July 26th, 1924.
1-8 Hour Shift, 4 days per week, July 26th to Nov. 30th, 1924.
1-8 Hour Shift, 5 days per week, Dec. 1st to Dec. 31st, 1924.

1923 -- 1-8 Hour Shift, Jan. 1st to Dec. 31, 1923.

NEGAUNEE MINE

SHIPMENTS FOR YEAR-1924

GRADE	POCKET	STOCKPILE	TOTAL	TOTAL LAST YEAR
Negaunee Bessemer,	23,650	19,124	42,774	43,998
Negaunee,	150,956	148,191	299,147	336,447
Total,	174,606	167,315	341,921	380,445
Total Last Year,	193,718	186,727	380,445	
Decrease,			38,524	

NEGAUNEE MINE

COMPARATIVE MINING COST FOR YEAR

	1924	1923	INCREASE	DECREASE
PRODUCT	323,123	381,915		58,792
Underground Costs	1.177	1.151	.026	
Surface Costs	.147	.149		.002
General Mine Accounts	.105	.090	.015	
Cost of Production	1.429	1.390	.039	
Plant Account	.031	.030	.001	
Taxes	.563	.466	.097	
Central Office	.124	.063	.061	
Contingent Expense	.010	.008	.002	
Cost Adjustment	.001	.001		
Cost on Stockpile	2.156	1.956	.200	
Loading & Shipping	.032	.024	.008	
Misc.Debits & Credits	.004	.004		
Total Cost on Cars	2.184	1.976	.208	
No.Days Operating	261	297		36
No.Shifts & Hours	1-8	1-8		
Avg.Daily Product	1.238	1.286		48
COST OF PRODUCTION				
Labor	.910	.874	.036	
Supplies	.519	.516	.003	
Total	1.429	1.390	.039	

NEGAUNEE MINE.

NEGAUNEE MINE

COMPARATIVE WAGES AND PRODUCT

	1924	1923	INCREASE	DECREASE
PRODUCT	323,123	381,915		58,792
No.Shifts & Hours	1-8hr	1-8hr		
AVG.NO.MEN WORKING				
Surface	41	43		2
Underground	178	188		10
Total	219	231		12
AVG.WAGES PER DAY				
Surface	4.31	4.17	.14-3.35%	
Underground	5.12	4.91	.21-4.27%	
Total	4.96	4.76	.20-4.20%	
WAGES PER MO.OF 25 DAYS				
Surface	107.75	104.25	3.50	
Underground	128.00	122.75	5.25	
Total	124.00	119.00	5.00	
PRODUCT PER MAN PER DAY				
Surface	27.21	28.32		1.11
Underground	6.84	6.76	.08	
Total	5.47	5.46	.01	
LABOR COST PER TON				
Surface	.158	.147	.011	
Underground	.748	.725	.023	
Total	.906	.872	.034	
AVG.PRODUCT BRK'G & TRM'G	11.23	11.17	.06	
" WAGES CONTRACT MINERS	5.27	5.03	.24	
" " " LABOR	5.27	5.03	.24	
TOTAL NO.OF DAYS				
Surface	11874	13487		1613
Underground	47190-3/4	56462$\frac{1}{4}$		9271$\frac{1}{2}$
Total	59064-3/4	69949$\frac{1}{4}$		10884$\frac{1}{2}$
AMOUNT FOR LABOR				
Surface	51180.85	56234.24		5053.39
Underground	241818.38	277039.39		35221.01
Total	292999.23	333273.63		40274.40

Proportion Surface to Underground Men:

1924 - 1 to 4.34
1923 - 1 to 3.37
1922 - 1 to 5.11
1921 - 1 to 5.11
1920 - 1 to 5.15
1919 - 1 to 5.35

1924 - 1-8hr 4 days per wk.from July 30th to Dec.1st.
1-8hr 5 " December 1st.

NEGAUNEE MINE.

NEGAUNEE MINE

TIMBER STATEMENT FOR THE YEAR ENDING DECEMBER 31, 1924.

KIND	LINEAL FEET	AVG. PRICE PER FOOT	AMOUNT 1924	AMOUNT 1923
6" to 8" Timber	42,528	.041	1,746.29	4,673.35
8" to 10" "	67,676	.073	4,910.83	2,994.07
10" to 12" "	38,084	.099	3,769.69	7,789.84
12" to 14" "	15,364	.116	1,781.02	3,234.43
Total - 1924	163,652	.0746	12,207.83	
Total - 1923	269,043	.0695		18,691.69
	LINEAL FEET	PER 100'		
7' Lagging	828,013	.756	6,259.43	7,822.29
Poles 10'	434,487	1.29	5,604.74	4,599.09
Cover Boards 1" Sq.Ft.	70,290	16.43	1,154.86	1,394.34
Total - 1924			13,019.03	
Total - 1923				13,815.72
Grand Total - 1924			25,226.86	
Grand Total - 1923				32,507.41

Product	323,123	381,915
Feet of Timber per ton of ore,	.5065	.7045
Feet of Lagging per ton of ore,	2.5625	2.6762
Feet of Lagging per foot of timber,	5.0596	3.7989
Cost per ton for Timber,	.0378	.0489
" Lagging,	.0194	.0205
" Poles,	.0173	.0120
" Cover Boards,	.0036	.0037
" Timber, Lagging, Poles & Boards,	.0781	.0851
Equivalent of stull timber to bd. measure,	300,469	497,603
Feet of bd. measure per ton of ore	.930	1,303

Total cost for timber, lagging, poles & boards, and cost per ton,

1924	$25,226.86	$.0781
1923	32,507.41	.0851
1922	24,766.16	.08282
1921	27,285.61	.10627
1920	37,934.19	.0666
1919	35,620.73	.07151
1918	21,403.96	.0415
1917	22,137.51	.0407
1916	21,510.67	.04

NEGAUNEE MINE

STATEMENT OF EXPLOSIVES USED FOR STOPING AND DEVELOPING IN ORE
-1924-

KIND	QUANTITY	AVERAGE PRICE	AMOUNT 1924	AMOUNT 1923
40% Powder	9,800	.1419	1,390.51	839.40
50% "	93,050	.1550	14,422.75	18,410.24
60% "	22,150	.1675 ~~.1810~~	3,710.14	6,727.65
Total Powder - 1924	125,000	.1562	19,523.40	
Total Powder - 1923	163,350	.1590		25,977.29
Fuse	327,700	.6364c	2,085.59	2,656.88
Caps #6	56,400	1.091c	615.41	842.31
Caps #8	1,300	1.974c	25.66	
Cap Crimpers	24	1.00 ea.	24.00	48.00
Tamping Bags	21,200	2.15M	45.58	69.82
Connecting Wire	28	.446 lb.	12.38	14.59
Electric Exploders	74	5.70c	4.22	4.92
Delay Igniters	45	8.69c	3.91	60.88
Leading Wire				.45
Total Fuse, etc. - 1924			2,816.75	
Total Fuse, etc. - 1923				3,697.85
Total All Explosives - 1924			22,340.15	
Total All Explosives - 1923				29,675.14
Product			323,123	381,915
Pounds of Powder per ton of ore,			.3868	.4277
Cost per ton for powder,			.0604	.0680
" " fuse, caps, etc.,			.0087	.0097
" " all explosives,			.0691	.0777
Average price per Lb. for Powder,			.1562	.1590

G.M.S.

MAAS MINE - 1924.

The product for the year by grades was as follows:-

Bessemer,	5,109	tons,
Maas,	221,058	"
Total,	226,167	"
Rock,	956	"

The product is less than our normal output due to curtailment. The amount of ore in stock increased during the year and on December 31st was 582,014 tons, of which 59,483 tons is Bessemer and 522,531 tons Maas. This is exclusive of possible overrun.

The mine started the year on its regular schedule of six eight-hour shifts per week. It curtailed to four shifts from July 29th to December 1st and five from then until the first of the year.

Practically all of the ore came from the territory adjacent to the Negaunee Mine; on the foot side between the first and second levels; from foot to hanging between the second and third levels at a point from 400' to 800' West of the Negaunee boundary, and on the hanging side below the third level near the Negaunee boundary. In the Railroad pillar adjoining the Negaunee Mine the operations were above the fourth level and extended under the hanging across the formation. The amount of Bessemer was small and at present no ore of this grade is being mined.

The work on the various levels and sub levels in detail is as follows:-

UNDERGROUND.

SUBS ABOVE THE SECOND LEVEL.

618' SUB LEVEL.

Work on this sub level, which is located in the Eastern end of the mine, was principally in the Roman Catholic Cemetery track and Railroad pillar. Work was in progress here last year and the sub level finished in October.

PRODUCTION.

Month	Bessemer	Negaunee	Total	Rock
January	5,428	27,441	32,869	
February	4,136	24,277	28,413	12
March	5,516	22,189	27,705	
April	2,900	27,900	30,800	168
May	3,312	28,325	31,637	96
June	5,842	23,436	29,278	576
July	6,504	23,520	30,024	400
August	4,675	16,829	21,504	336
September	4,595	17,873	22,468	256
October	3,721	18,931	22,652	396
November	3,192	15,786	18,978	172
December	4,712	22,083	26,795	764
Total	54,533	268,590	323,123	3,176
Transferred from	7,283 to	7,283		
Total	47,250	275,873	323,123	3,176

	1924	1923
Bessemer Ore Shipped	42,774 tons,	43,998 tons,
Negaunee " "	299,148 "	336,447 "
Total ore shipped -	341,922 tons.	380,445 tons.
Bessemer Ore on Hand Dec. 31st,	9,444 tons,	4,968 tons,
Negaunee " " " "	145,083 "	168,358 "
Total ore on hand -	154,527 tons.	173,326 tons.

NEGAUNEE MINE

ANALYSIS OF PRODUCTION AND COSTS.

Production of	1923	381,915 tons,
"	1924	323,123 "
Decrease	1924	58,792 tons.

Cost of production	1924	$461,830.51	- Cost per ton	$1.429
" " "	1923	530,942.54		1.39
Decrease		$ 69,112.03	Increase	$ .039

DETAIL OF COST OF PRODUCTION.

	TOTAL COST				COST PER TON		
	LABOR	%	SUPPLIES	%	LABOR	SUPPLIES	TOTAL
1924 -	$294,014.53	63.3	$167,815.98	36.7	$.905	$.524	$1.429
1923 -	333,988.69	62.9	196,953.85	37.1	.874	.516	1.39
	$ 39,974.16 Decr.		$ 29,137.87 Decr.		$.031 Incr.	$.008 Incr.	$ .039 Incr.

The mine operated on curtailed production in 1924. Full time in 1923. Schedule for 1924:- Full time from January 1st to July 29th; four days per week from July 29th to December 1st; and five days a week from December 1st for the balance of the year.

The increased cost for labor was due to a higher average wage scale in 1924. The increase in wages of 10% May 1st, 1923 was effective eight months in 1923 and twelve months in 1924. The overhead during the part time period in 1924 also increased labor costs.

The increase in cost per ton for supplies was due to general overhead during part time periods, such as electric power to pumps, fuel to boiler house, etc.

There were no increases or decreases in wages during 1924.

During the year 1924 the mine worked one eight-hour shift for 261 days. The average number of men employed during the year was 219, for a total of 59,065 days. In 1923 the average was 228 for a total of 69,949 days. A decrease in 1924 of 9 men and 10,884 days.

NEGAUNEE MINE

The average tons per man per day underground in 1924 was 6.84, an increase of .08 tons per man over 1923 which was 6.76. The total tons per man per day in 1924 was 5.47, an increase of .01 tons per man over 1923, which was 5.46.

UNDERGROUND COSTS:

Sinking Shaft,

1924 Amount	$ 7,922.26	- Cost per ton $.024
1923	13,716.28	.036
Decrease	$ 5,794.02	$.012

Resumed shaft work in #3 shaft on June 1st. Completed shaft to 13th level and cut out 12th level plat and started excavation for 12th level.pocket.

Development in Rock,

1924 Amount	$1,748.38	- Cost per ton $.005
1923	2,339.23	.006
Decrease	$ 590.95	$.001

		Drftg.	Raising
No. feet of rock work 1924,	448'	418'	30'
" " " " " 1923,	527'	333'	194'
Decrease,	79'	85'	164'

Decrease cost per ton due to less rock work in 1924.

Development in Ore,

1924 Amount	$ 266.21	- Cost per ton $.001
1923	4,130.27	.011
Decrease	$3,864.06	$.01

		Drftg.	Raising
No. feet Ore Dev. in 1924,	87'		87'
" " " " " 1923,	979'	196'	783'
Decrease,	892'	196'	696'

Decrease cost per ton due to less Ore Development in 1924.

Stoping,

1924 Amount $170,369.35 - Cost per ton $.527

1923 192,304.85 .504

Decrease $ 21,935.50 $.023

Detail.

	Labor		Supplies	
1924	$139,365.84	81.8%	$31,003.51	18.2%
1923	155,237.77	80.9%	37,068.08	19.8%

	Cost per ton		
	Labor	Supplies	Total
1924	$.431	$.096	$.527
1923	.408	.096	.504
Incr.	$.023		$.023

Increase cost per ton due to 10% increase in wages effective May 1st, 1923.

Explosives.

	1924	1923
Total lbs. Powder	125,000	163,350
Average price per pound	.1562	.1590
Total amount	19,523.40	25,977.29
Fuse, Caps, Etc.	2,816.75	3,697.85
Grand Total	22,340.15	29,675.14
Lbs. powder per ton of ore	.3868	.4277
Cost per ton for powder	.0604	.0680
" " " all explosives	.0691	.0777

Timbering,

1924 Amount $ 83,057.05 - Cost per ton $.257

1923 102,469.09 .268

Decrease $ 19,412.04 $.011

	1924	1923
Timber Cost,	12,207.83	18,691.69
Lagg. Poles & Cover Bds.	13,019.03	13,815.72
Total,	25,226.86	32,507.41
Ft. of Tbr. per ton of ore	.5065	.7045
Ft. of Lagg. "	2.5625	2.6762

	1924	1923
Cost per ft. for timber,	.0746	.0695
Cost per ton for Timber,	.0378	.0489
" " " " Lagging,	.0194	.0205
" " " " Poles,	.0173	.0120
" " " " Cover Bds.,	.0036	.0037
" " " " Tbr., Lagg., Poles & Cover Boards,	.0781	.0851
Equivalent of stull timber to board measure,	300,469	497,603

The decrease cost per ton is due to less timber used in 1924 on account of timber adjustment 1923, and more of the smaller timber used in 1924.

Tramming,

1924 Amount	$25,491.38	- Cost per ton	$.079
1923	29,055.45		.076
Decrease	$ 3,564.07	Increase	$.003

Increase cost per ton is due to 10% increase in wages on May 1st, 1923.

Ventilation,

1924 Amount	$524.49	- Cost per ton	$.002
1923	6.37		.000
Increase	$518.12		$.002

New ventube charged out in 1924, also fan motor repaired.

Pumping,

1924 Amount	$33,458.17	- Cost per ton	$.103
1923	36,680.70		.096
Decrease	$ 3,222.53	Increase	$.007

	1924	1923
Total Gals. water pumped	419,625,640	488,963,860
Gals. pumped per minute	796	932

A decrease of 69,338,220 gallons of water

pumped and 136 gallons per minute.

Increase cost per ton due to the mine operating four days a week for four months and five days a week for one month during 1924, as compared with full time for all of 1923.

Compressor & Air Pipes,

1924 Amount $23,811.79 - Cost per ton $.074

1923 25,684.21 .067

Decrease $ 1,872.42 Increase $.007

	Compressor	Air Pipes
1924	$19,793.79	$4,018.00
1923	21,290.63	4,393.58
Decr.	$ 1,496.84	$ 375.58

Total Cu.Ft. air used 1924 - 559,980,000
Do. 1923 - 655,695,000
Decrease - 95,715,000

Increase cost per ton here is due to 10% increase in wages effective May 1st, 1923.

Back Filling,

1924 Amount $2,269.17 - Cost per ton $.007

1923 3,333.93 .009

Decrease $1,064.76 $.002

Less filling.

Underground Superintendence,

1924 Amount $12,781.94 - Cost per ton $.040

1923 13,209.55 .035

Decrease $ 427.61 Increase $.005

Increase in cost per ton due to 10% increase in wages effective May 1st, 1923.

Cave-In,

1924 Amount $ 9.71 - Cost per ton $.000

1923 178.80 .000

Less repairing to fences around caves.

MAINTENANCE ACCOUNTS:

Compressor & Power Drills,

1924 Amount $525.79 - Cost per ton $.002

1923 344.24 .001

Increase $181.55 $.001

No power drills purchased. Increase due to more repairs to compressor.

Hand Tramming Equipment,

1924 Amount $4,130.44 - Cost per ton $.013

1923 3,506.42 .009

Increase $ 624.02 $.004

More rail used and more repairs to and building of new buggies.

Electric Tram Equipment,

1924 Amount $10,541.71 - Cost per ton $.033

1923 10,468.47 .027

Increase $ 73.24 $.006

	Sub Division.		
	Gen. & Motor	Locomotives	Wiring
1924	115.72	2,633.25	788.12
1923	210.89	2,409.75	1,230.41
Decr.	95.17	Incr. 223.50	Decr. 442.29

	M. L. Tracks	M. L. Cars
1924	3,047.94	3,956.68
1923	3,381.07	3,336.85
Decr.	233.13	Incr. 619.83

Generator & Motor: Decrease due to less repairs.

Locomotives: Increase due to more repairs to locomotives.

Wiring: Decrease due to more wiring and more lights used in 1923.

M. L. Tracks: Less repairs and less rail used.

M. L. Cars: More repairs to motor cars.

Pumping Machinery,

1924 Amount $3,249.48 - Cost per ton $.010

1923 2,169.33 .006

Increase $1,080.15 $.004

Increase cost per ton due to charging out four 8" valves and more pump repairs.

Total Underground Costs,

1924 Amount $381,157.32 - Cost per ton $1.177

1923 439,597.19 1.151

Decrease $ 58,439.87 Increase $ .026

SURFACE COSTS:

Hoisting,

1924 Amount $19,479.67 - Cost per ton $.060

1923 22,060.63 .058

Decrease $ 2,580.96 Increase $.002

Electric Power 1924, $13,941.63
" " 1923, 15,616.50

Increase due to 10% increase in wages effective May 1st, 1923.

Stocking Ore,

1924 Amount $4,082.31 - Cost per ton $.013

1923 5,334.07 .014

Decrease $1,251.76 $.001

Erected portable Bessemer trestle in both years, also more ore stocked in 1923.

Dry House,

1924 Amount $8,444.44 - Cost per ton $.026

1923 9,668.42 .025

Decrease $1,223.98 Increase $.001

Coal to Boiler House -	Tons	Cost
1924	1156	7,078.92
1923	998	9,155.35

This account is high in both years. In 1923 one of the boilers in #3 Boiler House was replaced by an Imperial Mine boiler. In 1924 part cost of the Imperial boiler was charged and a new sewer line was extended to the dry, also curtailment in 1924 as compared with 1923, the boiler house operating full time during part time period.

NEGAUNEE MINE

General Surface Expense,

1924 Amount $5,831.04 - Cost per ton $.018

1923 5,295.15 .014

Increase $ 535.89 $.004

Increase cost per ton due to 10% increase in wages also less product in 1924.

MAINTENANCE ACCOUNTS:

Hoisting Equipment,

1924 Amount $3,765.34 - Cost per ton $.012

1923 7,922.77 .021

Decrease $4,157.43 $.009

	Sub Division.		
	Wire Rope	Machinery Parts	Skips & Skip Roads
1924	102.88	1,826.33	1,836.13
1923	1,492.30	4,050.32	2,380.15
Decr.	1,389.42	2,223.99	544.02

Wire Rope: Decrease due to no new ropes put on in 1924 as compared with three new ropes put on in 1923. One each on South and North skip roads and one on cage road.

Machinery Parts: Decrease due to 1923 charge on final payment E&A 426, new armature $2,062.00.

Skips & Skip Roads: Less repairs to skips and skip roads.

Shaft,

1924 Amount $1,961.19 - Cost per ton $.006

1923 1,239.41 .003

Increase $ 721.78 $.003

Increase cost per ton is due to replacing much of the casing between skip and cage roads, and more repairs to shaft pockets.

Top Tram Equipment,

1924 Amount $2,498.52 - Cost per ton $.008

1923 1,706.85 .005

Increase $ 791.67 $.003

	Sub Division. General Repairs		Wire Rope
1924	2,496.02		2.50
1923	1,173.01		533.84
Increase	1,323.01	Decr.	531.34

Increase cost per ton "General Repairs" due to replacing broken top tram gear and pinion and six hundred new rollers, also more repairs.

Decrease in "Wire Rope" due to replacing 5,800' of 5/8" wire rope on South side in 1923 and no replacements in 1924.

Docks, Trestles & Pockets,

1924 Amount	$ 470.45 - Cost per ton	$.001
1923	1,286.87	.003
Decrease	$ 816.42	$.002

Decrease cost per ton due to 1923 grading for new Bessemer stocking trestle, extending rock trestle, and some trestle painting, none of which was done in 1924.

Mine Buildings,

1924 Amount	$1,005.25 - Cost per ton	$.003
1923	2,401.22	.006
Decrease	$1,395.97	$.003

Decrease cost per ton due to 1923 cost completing new roof on office building, guniting shaft head frame, and erecting surface dry house, as compared with 1924 cost of a little shaft house guniting and completing surface men's dry house.

Total Surface Costs:

1924 Amount	$47,538.21 - Cost per ton	$.147
1923	56,915.39	.149
Decrease	$ 9,377.18	$.002

GENERAL MINE ACCOUNTS:

Insurance,

1924 Amount $189.82 - Cost per ton $.001
1923 180.48 .000
Increase $ 9.34 $.001

Increase cost per ton due to less product in 1924.

Engineering,

1924 Amount $2,312.73 - Cost per ton $.007
1923 2,947.76 .008
Decrease $ 635.03 $.001

Decrease cost per ton due to less engineering time.

Analysis,

1924 Amount $11,983.63 - Cost per ton $.037
1923 12,272.04 .032
Decrease $ 288.41 Increase $.005

This account includes proportion of district laboratory and sampling. The total cost for the laboratory in 1924 was $16,189.83 and the total determinations 95,702. In 1923 the cost was $16,373.50 and the total determinations were 106,150. A decrease in cost of $183.67 and a decrease of 11,054 determinations.

Cost per determination 1924, $.169169
" " " 1923, .154234
Increase - $.014935

Increase cost per determination due to laboratory force on salary, making labor cost same as when mine was on full time schedule.

Personal Injury Expense,

1924 Amount $4,855.17 - Cost per ton $.015

1923 4,139.80 .011

Increase $ 715.37 $.004

Increase cost per ton in 1924 due to more injury expense. No fatal accidents in 1924.

Safety Department Expense,

1924 Amount $ 86.71 - Cost per ton $.000

1923 145.63 .000

Decrease $ 58.92

Less expense.

Telephones & Safety Devices,

1924 Amount $2,304.66 - Cost per ton $.007

1923 1,964.70 .005

Increase $ 439.96 $.002

This account high in both years due to E&A 445 Fire Equipment for underground. More charges in 1924.

Local General Welfare,

1924 Amount $1,598.10 - Cost per ton $.005

1923 1,755.56 .005

Decrease $ 157.46 $.000

Less welfare work done in 1924.

Special Expense,

1924 Amount $10.00 - Cost per ton $.000

1923 none

Increase $10.00

Mine Office,

1924 Amount $10,794.16 - Cost per ton $.033

1923 11,023.99 .029

Decrease $ 229.83 Increase $.004

	Sub Division	
	Direct Charges	Mine Office
1924	$2,951.98	$7,842.18
1923	3,803.72	7,420.27
Decrease	$ 851.74	Increase $ 421.91

Decrease direct charges due to less General Office charge.

Increase Mine Office due to 10% increase in wages effective May 1st, 1923.

Increase cost per ton due to less product in 1924.

600' SUB LEVEL.

This was located directly below the 618' sub level and work was started in September 1923. Mining is still in progress on both sides of the dike which cuts through the formation parallel to the foot wall.

In December six contracts stoped in the Cemetery Tract, five on the foot side and one to the South of the dike. Two contracts were employed in the Cleveland-Cliffs strip and one in the American Mining Company strip on the foot side.

SUBS BETWEEN SECOND AND THIRD LEVELS.

325' SUB LEVEL.

WEST SIDE.

Work started here in 1923 and was continued on the West end of the sub level near the winze and on the foot side near raises nos. 1, 2, 3 and 4. The sub level was completed in October.

In December drifts were started East from raises #3 and #4 to tap the water.

THIRD LEVEL.

Mining was in progress between the old rooms to the North of #3-E raise in October 1923 and continued until October 1924. The only other work on this level was that of repairing the foot wall drift near the Negaunee boundary. The mining of the main third level area between the old rooms is now in progress from the 300' sub level.

SUBS BETWEEN THIRD AND FOURTH LEVELS.

300' SUB LEVEL.

WEST END.

Work was started here in June 1923 and is still in progress.

In December there were six contracts between raises #3-W and #6-W and two in the trench stope at the East end of this section of the sub level.

EAST END.

Mining started in June 1923 and is still in progress.

In December there were five contracts on the foot side and four on the hanging.

280' SUB LEVEL.

Work on this sub level started in 1918 and most of the ore under the hanging mined before the present year. In 1924 the work was entirely in the Northeast end at the trench stope located to the Southeast of #21-S raise and in the territory adjoining this stope.

In December one contract worked to the Southwest of #21-S raise stoping and one cutting out at #5-E raise, to the Northeast, in the Railroad pillar.

270' SUB LEVEL.

This sub level was started in 1917 when a drift was driven from the North foot wall due South to the Railroad pillar for exploratory purposes. Active mining started in 1923. During the past year the pillars North and South of #705 raise were taken. The work in that vicinity being finished in October.

Since July one contract has mined at the trench stope to the Southeast of #21-S raise.

In December the last slice to the West on the North side of the trench stope was being taken.

260' SUB LEVEL.

This sub level was opened in the vicinity of #425 and #705 raises in 1922. Mining here has been continuous since that time.

In December one contract was stoping to the North of #705 raise and two to the South of #706 raise.

245' SUB LEVEL - TRAMMING SUB.

The work during the year has been in three separate territories.

The territory South of #705 raise was opened in July. In December one contract drifted Southwest from the raise to connect with an old drift which had previously been driven on this sub level. This connection was made for a traveling road. Three contracts are mining in the Railroad pillar, and one contract drifting West from #425 raise.

The second territory was in the Northeast end in the Railroad pillar where a drift is being projected into the foot wall. This will be driven 150' and a raise put up from the end for ventilation purposes. Through it will be the main air course to the fourth level.

The third section was the trench stope. This was started in January at a point near the foot North of #224 raise. The main level trench drift has been driven West 280'. To the left of this drift starting at the back of the level set is a stope which is five sets high. This trench has a length at present of 140' but eventually will be the full length of the stope. In December the third tier of the stope was advanced six sets to the West and the sill floor four sets to the West. As I have mentioned above, mining is in progress at this trench stope on the 300' elevation.

FOURTH LEVEL.

To the East of the shaft at the fourth level plat, an excavation was started early in the spring to make room for a Gould pump to replace the 200-gallon Aldrich. A small sump was also cut.

UNDERGROUND IN GENERAL.

There was practically no development at the Maas Mine during the year.

The territory between the first and second levels is crossed with dikes which run longitudinally and which are making the mining there much more difficult. Below the second level near the Negaunee boundary, a large pillar has been left on the foot wall to protect the mining which is now in progress between the first and second levels. Between the third and fourth levels practically all of the mining is to the East of the pillars left to support the hanging.

It is well that arrangements are being made so that the pillars which have been left to support the surface can be mined. This will permit the opening of the large ore body between the third and fourth levels, so that it can be mined in a regular way.

In order to get the best results at the Maas Mine, the shaft should

be made standard, the headframe altered to fit the shaft and steel trestles built.

VENTILATION.

There was no trouble with the underground ventilation until warm weather, when suddenly it became bad on the fourth level and the sub levels beneath the third level. In August doors were installed in the Negaunee Mine so that a portion of the Negaunee Mine air was shunted through the Maas second level. A 4,000' fan was installed at the top of the raise leading from the second to the third level at the Negaunee boundary. This forced air to the third level and improved conditions slightly. It was impossible to get enough circulation to force the impure air out of the mine, and as a natural consequence, it got worse from day to day until colder weather set in. During the winter the circulation is better and the air is good.

During the coming season we hope that our ventilation trouble will be past as the new fan, which has been bought for supplying air to the Maas and Negaunee Mines, should be in operation early in the spring. I have mentioned above that a drift is being driven on the 425' sub level into the foot wall, from the end of which a connecting raise will be put through to the third level.

PUMP STATION - FOURTH LEVEL.

As soon as the new pump station to the East of the shaft was completed, a Gould vertical pump, purchased from the Chase Mine, was installed. This went into operation July 17th.

This pump has a capacity of 400 gallons per minute against a 300' head. It is pumping to the main pump station on the third level, a height of 200 feet.

WATER.

The number of gallons of water pumped per minute in 1924 as compared with 1923 is shown in the following table:-

	1924	1923
January	988	966
February	963	930
March	996	929
April	1042	930
May	961	979
June	1005	1012
July	929	990
August	1001	962
September	1008	1009
October	981	975
November	1031	960
December	981	950
Average -	990	966

It will be noticed that there has been a slight increase during the past year.

FIRE DOORS.

Fire door frames were installed and gunited on the second, third and fourth levels in April and the metal fire doors installed in May. In each instance these are located near the shaft plat.

SURFACE.

CAVE.

On July 9th a cave broke through to surface making a hole about 200' in diameter. It is located 400' West and 175' South of section corner 31|32 / 6|5. This is the second cave to break through - the first occurring March 1st, 1918. No effect of this cave was felt underground.

STOCKING TRESTLE.

Very little ore was shipped from the Maas Mine pocket during the past season. It was necessary during the summer to provide extra stocking room. In August eleven double track bents were erected. To provide room for the winter stocking, thirteen bents were erected in November and twelve bents in December.

BOILER HOUSE.

The heating boiler installed a few years ago at the East end of the dry was found inadequate to supply the steam necessary. During the summer it was decided to dismantle this and install one of the boilers from the Imperial

Mine which had been in the temporary boiler plant at the Maas since the war. This boiler of 125 H.P. locomotive type, was moved to the site in September and the installation was completed in October.

STEAM TURBINE.

The steam turbine, which was shut down the first of the year, was started again February 13th and operated until April 7th. It has not been in operation this fall.

TEMPORARY BOILER HOUSE.

The temporary boiler house which was erected during the war was dismantled during November.

MAAS CRUSHER.

Operations at the Crusher were started on April 28th and was shut down on November 21st.

The product of the Crusher by grades is as follows:-

Morris-Lloyd,	153,142 tons,
Athens,	28,084 "
South Jackson,	33,262 "
Total -	214,488 tons.

This is the largest tonnage handled at this plant since it has been in operation.

DELAYS - ELECTRICAL.

March 4th - 1/2 hour delay account of no current.

DELAYS - NON-ELECTRICAL.

March 4th - 1/2 hour delay account of top tram rope broke.

March 21st - 1 1/2 hours delay account of skip off track.

May 7th - Production low due to motor off track in Transfer sub.

July 31st - 1 hour delay account of broken axle on fourth level.

Oct. 30th - 2 1/2 hours delay account of breaking rail in skip dump.

Nov. 25th - 2 hours delay account of car broke on landing.

Dec. 10th - 2 1/2 hours delay account of top tram car over dump.

ESTIMATE OF ORE RESERVES IN MAAS MINE DECEMBER 31, 1924.

Assumption 12 cu. ft. equals one ton.

10% deduction for rock.

10% deduction for loss in mining.

AVAILABLE ORE

Ore reserve between 1st and 2nd levels - - - -	279,340 tons,
Ore reserve between 2nd and 3rd levels - - - -	1,290,350 "
Ore reserve between 3rd and 4th levels - - - -	1,960,875 "
Total available - - - - - - - -	3,530,563 tons.

NON-AVAILABLE ORE

Between 3rd and 4th levels - - - - - - - -	1,434,608 tons.
Total All Ore - - - - - - - -	4,965,171 tons.
Percentage of Bessemer equals 10% - - - -	496,721 tons.

BESSEMER ORE	TRADE NAME	TONS
Developed	Maas-Bessemer	353,056
NON-BESSEMER ORE		
Developed	Maas	3,177,507
Total Bessemer and Non-Bessemer - -		3,530,563

ESTIMATED ANALYSIS.

	IRON	PHOS.	SILICA	ALUM.	MANG.	LIME	MAG.	SUL.	IGNI.	MOIST.
Dried 212°	61.00									
Maas-Bessemer	61.00	.044	7.50	1.79	.206	.510	.218	.007	1.50	
Natural	53.39	.039	6.56	1.57	.181	.446	.191	.006	1.31	12.50
Dried 212°										
Maas	59.90	.116	7.60	2.34	.280	.820	.256	.009	2.80	
Natural	52.25	.101	6.63	2.04	.244	.715	.224	.008	2.44	12.75

MAAS MINE

AVERAGE MINE ANALYSIS ON OUTPUT FOR YEAR 1924.

GRADES	IRON	PHOS.	SILICA
Maas Bessemer,	61.47	.049	7.99
Maas,	59.46	.098	8.85

AVERAGE ANALYSIS ON STRAIGHT CARGOES FOR YEAR 1924.

	Mine		Lake Erie	
GRADES	IRON	PHOS.	IRON	MOIST.
Maas Bessemer,	(All Mixed)			
Maas,	(All Mixed)			

ORE STATEMENT - DECEMBER 31ST, 1924.

	MAAS BESSEMER	MAAS	TOTAL	TOTAL LAST YEAR
On Hand January 1, 1924,	100,934	389,741	490,675	450,207
Output for Year,	6,770	219,397	226,167	227,792
Transferred,	1,661	1,661	-	-
Total,	106,043	610,799	716,842	677,999
Shipments,	46,560	88,268	134,828	187,324
Balance on Hand,	59,483	522,531	582,014	490,675
Decrease in Output,			1,625	
Increase in Ore on Hand,			91,339	

1924 -- 1-8 Hour Shift, 6 days per week, Jan. 1st to July 26th, 1924.
1-8 Hour Shift, 4 days per week, July 26th to Nov. 30th, 1924.
1-8 Hour Shift, 5 days per week, Dec. 1st to Ded. 31st, 1924.

1923 -- 1-8 Hour Shift, Jan. 1st to Dec. 31st, 1923.

MAAS MINE

SHIPMENTS FOR YEAR-1924.

GRADE	POCKET	STOCKPILE	TOTAL	TOTAL LAST YEAR
Maas Bessemer,	885	45,675	46,560	42,545
Maas,	63,478	24,790	88,268	144,779
Total,	64,363	70,465	134,828	187,324
Total Last Year,	77,952	109,372	187,324	
Decrease,			52,496	

MAAS MINE

COMPARATIVE MINING COST FOR YEAR

	1924	1923	INCREASE	DECREASE
PRODUCT	226,167	227,792		1,625
Underground Costs	1.413	1.410	,003	
Surface Costs	.189	.214		.025
General Mine Accounts	.118	.132		.014
Cost of Production	1.720	1.756		.036
Original Cost	.073	.076		.003
Plant Account	.186	.251		.065
Taxes	.365	.340	.025	
Central Office	.091	.077	.014	
Contingent Expense	.012	.009	.003	
Cost Adjustment	.016	.014	.002	
Cost on Stockpile	2.463	2.523		.060
Loading & Shipping	.022	.037		.015
Total Cost on Cars	2.485	2.500		.075
No.Days Operating	261	300		39
No.Shifts & Hours	1-8	1-8		
Avg.Daily Product	866	759	107	
COST OF PRODUCTION				
Labor	1.092	1.100		.008
Supplies	.628	.656		.028
Total	1.720	1.756		.036

MAAS MINE

COMPARATIVE WAGES AND PRODUCT

	1 9 2 4	1 9 2 3	INCREASE	DECREASE
PRODUCT	226,167	227,792		1,625
No.Shifts & Hours	1-8hr	1-8hr		
AVG.NO.MEN WORKING				
Surface	36	38		2
Underground	150	141	9	
Total	186	179	7	
AVG.WAGES PER DAY				
Surface	4.37	4.15	.22-5.27%	
Underground	4.97	4.71	.26-5.52%	
Total	4.84	4.59	.25-5.44%	
WAGES PER MO.OF 25 DAYS				
Surface	109.25	103.75	5.50	
Underground	124.25	117.75	6.50	
Total	121.00	114.75	6.25	
PRODUCT PER MAN PER DAY				
Surface	21.80	19.65	2.15	
Underground	5.69	5.43	.26	
Total	4.51	4.23	.28	
LABOR COST PER TON				
Surface	.201	.211		.010
Underground	.872	.874		.002
Total	1.073	1.085		.012
AVG.PRODUCT BRK'G & TRM'G	9.36	8.62	.74	
" WAGES CONTRACT MINERS	5.18	4.86	.32	
" " " LABOR	5.18	4.86	.32	
TOTAL NO.OF DAYS				
Surface	10,377	11593		1,216
Underground	39,722	42212½		2,490½
Total	50,099	53805½		3,706½
AMOUNT FOR LABOR				
Surface	45360.19	48140.12		2779.93
Underground	197257.75	198972.36		1714.61
Total	242617.94	247112.48		4494.54

Proportion Surface to Underground Men:
1924 - 1 to 4.16
1923 - 1 to 3.71
1922 - 1 to 4.34
1921 - 1 to 4.58
1920 1 to 4.56
1919 - 1 to 4.23

1924 - 1-8hr 4 days per wk,from July 30th to Dec.st.
1-8hr 5 " " Dec.1st.

MAAS MINE

TIMBER STATEMENT FOR THE YEAR ENDING DECEMBER 31, 1924.

KIND	LINEAL FEET	AVG. PRICE PER FOOT	AMOUNT 1924	AMOUNT 1923
6" to 8" Timber	41,805	.0435	1,820.00	1,571.04
8" to 10" "	53,412	.0763	4,076.88	4,048.07
10" to 12" "	18,431	.0951	1,753.28	2,314.31
12" to 14" "	9,974	.1124	1,120.85	1,628.79
Total - 1924	123,622	.071	8,771.01	
Total - 1923	131,108	.0729		9,562.21
	LINEAL FEET	PER 100'		
7' Lagging	742,009	.749	5,557.96	6,271.57
Poles	148,572	1.21	1,801.10	1,186.10
Total - 1924	890,581	.826	7,359.06	
Total - 1923	967,065	.771		7,457.67
Covering Boards - 1924	59,700	1.79	1,069.60	
Covering Boards - 1923	80,950	1.397		1,130.76
Total Timber			17,199.67	18,150.64

Product,	226,167	227,792
Feet of Timber per ton of ore,	.5469	.5755
Feet of Lagging per ton of ore,	3.285	3.82
Feet of Lagging per foot of timber,	6.00	6.63
Cost per ton for Timber,	.0388	.042
" Lagging,	.0246	.0275
" Covering Boards,	.0047	.0049
" Poles,	.0079	.0052
" All Timber,	.0760	.0796
Equivalent of stull timber to bd. measure,	213,061	240,498
Feet of bd. measure per ton of ore,	.942	1.06

Total cost for timber, lagging, poles & boards, and cost per ton,

1924	$17,199.67	$.0760
1923	18,150.64	.0796
1922	15,277.59	.0705
1921	25,610.04	.1230
1920	25,103.12	.0749

MAAS MINE

STATEMENT OF EXPLOSIVES USED FOR STOPING AND DEVELOPING IN ORE
-1924-

KIND	QUANTITY	AVERAGE PRICE	AMOUNT 1924	AMOUNT 1923
40% Powder	26,550	.1418	3,764.29	2,175.30
60% "	56,400	.1684	9,497.27	11,104.29
Total Powder - 1924	82,950	.1599	13,261.56	
Total Powder - 1923	81,700	.1625		13,279.59
Fuse	263,450	.6398c	1,685.38	1,685.52
Blasting Caps	54,000	1.291c	697.43	589.51
Cap Crimpers	18	1.00 ea.	18.00	30.00
Battery Wire				4.00
Igniters				2.28
Total Fuse, Caps, etc.,			2,400.81	2,311.31
Total All Explosives,			15,662.37	15,590.90
Product,			226,167	227,792
Pounds of Powder per ton of ore,			.3668	.3587
Cost per ton for powder,			.0586	.0583
" " Fuse, Caps, etc.,			.0106	.0101
" " All Explosives,			.0692	.0684
Average price per Lb. for Powder,			.1599	.1625

PRODUCTION.

Month	Bessemer	Maas	Total	Rock
January	92	21,128	21,220	24
February	1,328	17,672	19,000	
March	2,444	15,560	18,004	68
April	360	21,358	21,718	188
May	469	23,236	23,705	
June	29	23,815	23,844	
July	2,048	18,289	20,337	132
August		13,632	13,632	104
September		14,776	14,776	
October		15,893	15,893	16
November		13,554	13,554	128
December		20,484	20,484	296
Total -	6,770	219,397	226,167	956
Transferred from	1,661 to	1,661		
Total -	5,109	221,058	226,167	956

	1924	1923
Bessemer Ore Shipped	46,560 tons,	42,545 tons,
Maas " "	88,268 "	144,779 "
Total ore shipped -	134,828 tons.	187,324 tons.
Bessemer Ore on Hand Dec. 31st,	59,483 tons,	100,934 tons,
Maas " " " "	522,531 "	389,741 "
Total ore on hand -	582,014 tons.	490,675 tons.

MAAS MINE

ANALYSIS OF PRODUCTION AND COSTS.

Production of	1924	226,167 tons,	
"	1923	227,792 "	
Decrease	1924	1,625 tons.	
Cost of production	1924	$389,005.61 - Cost per ton	$1.720
" " "	1923	399,895.25	1.756
Decrease	1924	$ 10,889.64	$ .036

DETAIL OF COST OF PRODUCTION.

	TOTAL COST				COST PER TON		
	LABOR	%	SUPPLIES	%	LABOR	SUPPLIES	TOTAL
1924 -	$246,893.28	63.5	$142,112.33	36.5	$1.09	$.63	$1.720
1923 -	250,450.23	62.6	149,445.02	37.4	1.10	.656	1.756
Decr.	$ 3,556.95		$ 7,332.69		$ .01	$.026	$ .036

The mine operated on a full time schedule of six days per week to July 29th, on four days per week from July 29th to December 1st, and five days per week for December. In 1923 the mine operated on one eight-hour per day basis six days per week throughout the year.

The average number of men employed during the year was 192 for a total of 50,099 days. In 1923 an average of 180 men were employed for a total of 53,805 days; an increase of 12 men and a decrease of 3,706 days.

The average tons per man per day underground in 1924 was 5.69, an increase of .29 tons per man per day compared with 1923, when the average tons per man was 5.40.

There was no change in wages during 1924. In 1923 a 10% increase was effective from May 1st which made an increase for 1924 of $.25 per day over average 1923 labor costs or 5%.

The actual increase in wages during the year amounts to $12,524.75, which based on the production mined equals $.055 per ton.

In 1924 the total supply cost was $142,112.33 or 36.5% of the cost of

production, which is 9% less than the supplies in 1923 when the supply dost was $149,445.02 or 37.4% of the cost of production.

The decrease of $.036 per ton in the cost of production in 1924 is due to the increased daily production.

UNDERGROUND COSTS:

Development in Rock,

1924 Amount	$283.46 - Cost per ton	$.001
1923	622.54	.003
Decrease	$339.08	$.002

There was 79' of rock work in 1924 at $3.59 per foot; and 141' in 1923 at $4.41 per foot, a decrease of 62 feet.

Development in Ore,

1924 Amount	$3,740.77 - Cost per ton	$.016
1923	1,720.38	.007
Increase	$2,019.39	$.009

More development work in 1924 than 1923.

Stoping,

1924 Amount	$127,721.55 - Cost per ton	$.565
1923	130,382.30	.572
Decrease	$ 2,660.75	$.007

Detail.

	Labor		Supplies	
1924	$106,327.89	83.3%	$21,393.66	16.7%
1923	107,918.19	82.8%	22,464.11	17.2%
Decr.	$ 1,590.30		$ 1,070.45	

	Cost per ton		
	Labor	Supplies	Total
1924	$.470	$.095	$.565
1923	.474	.098	.572
Decr.	$.004	$.003	$.007

Three Mayne Loaders charged in 1923 at a cost of $1,650.00. Two Double Drum Slushers charged in 1924 at a cost of $1,291.00.

Explosives.

	1924	1923
Total lbs. of Powder	82,950	81,700
Average price per lb.	$.1599	$.1625
Total Amount	$13,261.56	$13,279.59
Fuse, Caps, etc.	2,400.81	2,311.31
Grand Total	$15,662.37	$15,590.90
Lbs. Powder per ton of ore	.3668	.3587
Cost per ton for powder	.0586	.0583
" " " All Explosives	.0692	.0683

Timbering,

1924 Amount $66,252.29 - Cost per ton $.293

1923 69,446.18 .305

Decrease $ 3,193.89 $.012

	1924	1923
Timber Cost	8,771.01	9,562.21
Lagging, Poles, etc.	8,428.66	8,588.43
Total	17,199.67	18,150.64
Ft. timber per ton of ore	.5469	.5755
Cost per ton, all timber	.0760	.0796
Avg. price per ft.all tbr.	.071	.0729

Tramming,

1924 Amount $25,622.95 - Cost per ton $.113

1923 27,484.16 .121

Decrease $ 1,861.21 $.008

Ventilation,

1924 Amount $1,296.76 - Cost per ton $.006

1923 670.08 .003

Increase $ 626.68 $.003

Increase due to charges against E&A 467

Ventilation, transferred to this account in 1924.

MAAS MINE

Pumping,

1924 Amount $41,791.00 - Cost per ton $.185

1923 40,130.94 .176

Increase $ 1,660.06 $.009

Gallons of water pumped 1924 - 522,683,088

" " " " 1923 - 509,330,141

Gallons of water pumped per minute 1924 - 992

" " " " " " 1923 - 966

Compressors & Air Pipes,

1924 Amount $20,824.93 - Cost per ton $.092

1923 20,651.21 .091

Decrease $ 173.72 $.001

Cu. Ft. of air made by Maas compressors,
1924 - 470,880,000 cu.ft.
1923 - 482,220,000 "
Decr. 11,340,000 cu.ft.

Back Filling,

1924 Amount $ 18.40 - Cost per ton $.000

1923 128.40 .001

Decrease $110.00 $.001

Underground Superintendence,

1924 Amount $11,643.53 - Cost per ton $.052

1923 11,652.33 .051

Decrease $ 8.80 Increase $.001

MAINTENANCE ACCOUNTS:

Compressors & Power Drills,

1924 Amount $1,168.42 - Cost per ton $.005

1923 539.06 .002

Increase $ 629.36 $.003

A larger circulating pump for the compressor was charged in 1924 at a cost of $570.00.

Hand Tramming Equipment,

1924 Amount $1,491.53 - Cost per ton $.007

1923 1,560.83 .007

Decrease $ 69.30 $.000

Electric Tram Equipment,

1924 Amount $12,162.19 - Cost per ton $.054

1923 11,847.60 .052

Increase $ 314.59 $.002

	Sub Division.		
	Gen.&Motor	Locomotives	Wiring
1924	113.11	1,938.26	1,522.24
1923	208.96	2,862.22	1,049.00
	Decr. 95.85	Decr. 923.96	Incr. 473.24

	M. L. Tracks	M. L. Cars
1924	2,950.19	5,638.39
1923	2,213.61	5,513.81
	Incr. 736.58	Incr. 124.58

Decrease in Generator & Motor due to less labor on haulage generator in 1924.

1923 charge against Locomotives high due to four sets of wheels and one new controller charged amounting to $600.00.

Increase in Wiring due to 503 ft. of simplex cable used in 1924, amounting to $360.00.

Increase in Main Line Tracks due to more labor maintaining tracks in 1924.

Pumping Machinery,

1924 Amount $12,162.19 - Cost per ton $.054

1923 11,847.60 .052

Increase $ 314.59 $.002

Increase due to one 300-gallon per minute Gould pump installed on 4th level in 1924.

Total Underground Costs,

1924 Amount $319,541.27 - Cost per ton $1.413

1923 321,161.60 1.410

Decrease $ 1,620.33 Increase $ .003

SURFACE COSTS:

Hoisting,

1924 Amount $15,229.14 - Cost per ton $.067

1923 14,195.91 .062

Increase $ 1,033.83 $.005

Stocking Ore,

1924 Amount $ 7,504.64 - Cost per ton $.033

1923 11,834.88 .052

Decrease $ 4,330.24 $.019

The 1923 charge included the cost of a 36 bent trestle. The 1924 production that was stocked was put on this trestle until August 1924. Eleven bents were added to this trestle in August and took care of the stocking until December 1924.

Dry House,

1924 Amount $7,422.85 - Cost per ton $.033

1923 8,335.31 .037

Decrease $ 912.46 $.004

General Surface Expense,

1924 Amount $4,301.64 - Cost per ton $.019

1923 4,698.33 .021

Decrease $ 396.69 $.002

MAINTENANCE ACCOUNTS:

Hoisting Equipment,

1924 Amount $4,154.28 - Cost per ton $.019

1923 4,301.30 .019

Decrease $ 147.02 $.000

Sub Division.

	1924	1923	
Electric Hoists	732.34	823.88	91.54 Decr.
Wire Rope	1315.76	1435.14	119.38 Decr.
Skips, Cages & Roads	2106.18	2042.28	63.90 Incr.

Shaft,

1924 Amount $478.46 - Cost per ton $.002

1923 119.68 .000

Increase $358.78 $.002

Increase due to repairing shaft timber in 1924.

Top Tram Equipment,

1924 Amount $2,208.12 - Cost per ton $.010

1923 1,794.95 .008

Increase $ 413.17 $.002

Sub Division.	1924	1923
Engine and Motors	27.87	
Tracks and Cars	1620.70	1310.91
Wire Rope	315.47	401.93
Sheaves, rollers, etc.	244.08	82.11

Docks, Trestles & Pockets,

1924 Amount $ 12.45 - Cost per ton $.000

1923 404.88 .002

Decrease $392.43 $.002

The 1923 charge included repairs made to permanent trestle.

Mine Buildings,

1924 Amount $1,343.72 - Cost per ton $.006

1923 3,034.40 .013

Decrease $1,690.68 $.007

The 1923 charge included cost of repairing shop building destroyed by fire in December 1922.

The charges against E&A 394 in 1924, for small addition to dry building and installation of larger boiler in heating plant was transferred to this account.

GENERAL MINE ACCOUNTS:

Insurance,

1924 Amount $249.12 - Cost per ton $.001

1923 249.15 .001

Decrease $ .03 $.000

Engineering,

1924 Amount $2,309.29 - Cost per ton $.010

1923 2,674.79 .012

Decrease $ 365.50 $.002

Analysis,

1924 Amount	$8,073.08 - Cost per ton	$.036
1923	9,308.13	.041
Decrease	$1,235.05	$.005

This account includes the operating laboratory charge.

	No. of Dets.	Cost per Det.	Total
1924	28,181	$.16838	$4,745.01
1923	36,366	.15381	5,593.51
Decr.	8,185	Incr. $.01457	Decr. $ 848.50

Personal Injury Expense,

1924 Amount	$4,616.00 - Cost per ton	$.020
1923	6,354.73	.028
Decrease	$1,738.73	$.008

The 1923 charge included weekly payments to John Heiskonen, arm injury, who is still receiving compensation; also settlement to Domenic Francisco $504.00, and settlement to Herman Granlund $2,556.32.

The 1924 charge included final settlement with Herman Granlund $826.32. Medical expense for Peter Haikkonen, report #343, and back payments to Domenic Francisco, report #320.

Safety Department Expense,

1924 Amount	$119.21 - Cost per ton	$.000
1923	99.55	.000
Increase	$ 19.66	$.000

Telephones & Safety Devices,

1924 Amount	$611.40 - Cost per ton	$.003
1923	698.83	.003
Decrease	$ 87.43	$.000

Local General Welfare,

1924 Amount	$1,330.48 - Cost per ton	$.006
1923	1,338.44	.006
Decrease	$ 7.96	$.000

Special Expenses,

1924 Amount	$138.75 - Cost per ton	$.001
1923	0.00	.000
Increase	$138.75	$.001

The charge in 1924 is for cost of cement sidewalk on Mitchell Avenue, Anthony field plat.

Mine Office,

1924 Amount	$9,361.71 - Cost per ton	$.041
1923	9,290.39	.041
Increase	$ 71.32	$.000

Total General Expense,

1924 Amount	$26,809.04 - Cost per ton	$.118
1923	30,014.01	.132
Decrease	$ 3,204.97	$.014

ATHENS MINE - 1924.

The product for the year was as follows:-

Athens Ore,	244,969	tons,
Mitchell Lease,	2,900	"
Total,	247,869	"
Rock,	1,667	"

The product came from the following areas:- Above the fourth level on the South foot; above the sixth level on the North and South sides of the main Northeast-Southwest dike; above the seventh level through raises to the eighth level, on the continuation of the mining started above the sixth level West end, and above the ninth level at the West end adjoining the Bunker Hill line. At present about one-half of the ore from this latter territory is being handled through raises from the tenth level.

No ore was mined on the Corbit Lease during the year.

Early in the year when men became more plentiful, the underground force was gradually increased and on March 25th a night shift was started, which continued until July 29th. The product at this time averaging in the neighborhood of 1100 tons a day. On July 29th, curtailment went into effect which reduced the operating days to four shifts per week and our output to practically 800 tons per day. This reduced the monthly output to 15,000 tons. On December 1st the operations were extended to five days a week and the mine is now operating on that basis.

Labor conditions are favorable at present as few men are leaving the district since the five-day schedule went into effect. There are now employed 132 men underground, 38 men on surface, or a total of 170 men.

The work for the year on the various levels and sub levels is as follows:-

UNDERGROUND.

SUBS ABOVE THE FOURTH LEVEL - SOUTH FOOT.

355' SUB LEVEL.

Work was in progress here on the first of the year and the sub level was completed in May by taking the pillars at #431 raise.

365' SUB LEVEL.

Work was started in January and continued throughout the year.

In December three contracts were stoping at #431 raise. This sub level is practically completed.

375' SUB LEVEL.

Work here was started in July.

In December one contract was stoping East of #434 raise; one contract stoping West of #433 raise; one contract stoping West of #432 raise; the latter two contracts using scrapers.

FOURTH LEVEL.

Main level crosscut #420 was started the latter part of August and has been driven South 150'. The last 50' has been in mixed ore and paint rock.

The first half of December the drift was advanced 30', the breast being in dike which came in from the East.

SUBS ABOVE THE SIXTH LEVEL.

495' SUB LEVEL.

SOUTH SIDE OF DIKE.

Work was in progress here the first of the year and was completed in February. The last pillars taken were at #635 raise.

505' SUB LEVEL.

NORTH SIDE OF DIKE.

Work was in progress here on the first of the year and was completed in January at #655 raise.

SOUTH SIDE OF DIKE.

The ore at this elevation was taken from the 515' sub level. Exploratory drifts on the 515' sub, driven several years ago, had caved so that it was

impossible to mine this small area at the 505' elevation.

515' SUB LEVEL.

NORTH SIDE OF DIKE.

This was opened as an exploratory sub level in 1919. Active mining started in 1923 and was completed in June 1924 by taking the pillars at #655 raise.

SOUTH SIDE OF DIKE.

Two exploratory drifts were driven in 1919. Mining was started in January 1924. The sub level was completed in June.

530' SUB LEVEL.

NORTH SIDE OF DIKE.

Work was started in January and the sub level completed in October.

SOUTH SIDE OF DIKE.

Work here was started in July and completed in December - the last pillars being taken at #635 raise.

540' SUB LEVEL.

NORTH SIDE OF DIKE.

Work started in May and has continued since then.

In December one contract was stoping South of #646 raise along the dike.

SOUTH SIDE OF DIKE.

Work started here in August and is still in progress.

In December two contracts were stoping North of #635 raise.

550' SUB LEVEL.

NORTH SIDE OF DIKE.

Work started here in September.

In December one contract was developing Northeast of #655 raise along the limit of mining.

One was stoping South of #655 raise using scraper.

One was developing South of #655-A raise using scraper.

One was developing South of #656 raise using scraper.

One was developing East of #656-B raise using scraper.

One was stoping North of #647-B raise using scraper.

One was stoping South of #648 raise.

One was stoping North of #648-A raise.

One was stoping to the Southwest of #648-B raise using scraper.

SIXTH LEVEL.

In March a drift was started from #814 raise to the North and in June holed to #4 crosscut, 40' East of #644 raise. This drift is for ventilating purposes.

Ventilation raise #660-1 from the 660' sub level reached the elevation of the sixth level in May. From the top of this raise a drift was driven South through the dike and then East in ore and holed to the connecting drift between #3 and #4 crosscuts. This work was finished in July.

SUBS ABOVE THE EIGHTH LEVEL.

615' SUB LEVEL.

This sub level was at the extreme Western end of the sixth level. Work was started here in November 1923 and completed in July 1924. The last work being at #852 raise.

630' SUB LEVEL.

Work was started in May.

In December two contracts were stoping, one West and the other Northwest of #852 raise.

660' SUB LEVEL.

A ventilation raise to the sixth level, located 60' East of #853 raise, was started in April and reached the elevation of the sixth level in May.

EIGHTH LEVEL.

No. 830 crosscut, located midway between #810 and #850 crosscuts, was started in October. During the first half of December the drift was advanced 35'. In the breast a small dike 3" thick was encountered crossing

the drift to the Northeast and Southwest. The material from the main cross-cut to this point has been ore.

RAISES.

No. 855 raise, two compartment, was started in October and reached the elevation of the 660' sub level the middle of December. Material, ore 135' from the floor of the eighth level. Angle of raise 70°.

No. 856 raise, started November 1st, was 75' above the rail of the eighth level on December 15th. Material 0' to 10' open drift; 10' to 13' slate; 13' to 32' mixed ore and dike; 32' to 75' ore. Dike came in on the foot and out in the hanging. Angle of raise 70°.

No. 851 raise was started on December 15th.

SUBS ABOVE THE NINTH LEVEL.

855' SUB LEVEL.

Work was in progress here on the first of the year and was completed in July at #926 raise.

865' SUB LEVEL.

Work started in December 1923 and was continued throughout 1924.

In December one contract was stoping South of #926 raise using scraper.

One contract was stoping South of #928 raise.

One contract was stoping West of #928 raise.

One contract was stoping North of #928 raise.

875' SUB LEVEL.

Work here was started in July.

In December one contract was developing West from #1023 raise toward #1024. One contract was developing North from #1026 and one developing West from #1026 has just reached the Bunker Hill line. This last contract is using tugger hoist and scraper.

NINTH LEVEL.

A raise from the 930' sub level East of #1023 raise reached the elevation of the ninth level in June. From the top of this raise a drift was driven

South, holing to the South main crosscut on the ninth level opposite #913 raise. This was for ventilating purposes.

Raises #1024, #1025 and #1026 from the tenth level were connected to the South main crosscut of the ninth level during the year.

SUBS BETWEEN NINTH AND TENTH LEVELS.

930' SUB LEVEL.

In April a drift was started East from #1023 raise and was driven a distance of 70' being finished in May. In the East end a raise was put up to the ninth level elevation. This raise and drift with the lower part of #1023 raise will provide an air course from the ninth to the tenth levels outside of the limit of mining. The top of #1023 raise at the ninth level elevation will be crushed by mining operations.

TENTH LEVEL.

Raise #1024, two compartment, located 40' West of #1023 raise, was started in March and was completed to the elevation of the 875' sub level above the ninth level in May. Material 0' to 70' ore; 70' to 90' dike; 90' to 120' ore.

Raise #1025, two compartment, located 35' West of #1024 raise, was started in May and completed to the 875' sub level in June. Material 0' to 44' ore; 44' to 65' dike; 65' to 120' ore.

Raise #1026, two compartment, located 35' West of #1025, was started July 1st and reached the elevation of the 875' sub level the last of September. Material 10' to 45' dike; 45' to 90' mixed ore and dike; 90' to 120' ore.

It is evidently the same dike that was encountered in all of these raises. It stands vertical, coming in on the foot and going out on the hanging in each instance.

UNDERGROUND IN GENERAL.

Mining conditions during the year were favorable but it is unfortunate that it was necessary to curtail production just when the mine was about to enter its 400,000 tons per year schedule.

The ground is extremely heavy. The capping breaks readily and on account of the flat formation, the pressure is unusually high. Every effort is made to get the ore out of the sub levels as quickly as possible after they are opened. It is a decided advantage to have the raise interval not over 45 feet whereever practical.

Tugger hoists and scrapers are employed where they can be used to advantage, twelve new outfits were installed and charged out during the year, meaning a cost of 3.5 cents per ton on the year's output. The coming years should reap the benefit as mining by scraper is considerably cheaper than hand shoveling.

Retimbering costs have been high and we are not yet over the effect of the poor ventilation. The timber treated with zinc chloride, which we are using in our main levels, is holding up well, however, it has not been long enough underground to give us a definite idea what the life will be. From our experience to date the increased life is at least 100% as that has been proved. How much greater this will be time will tell.

The mining above the sixth level in the West end is beginning to show its effect on the level and preparations are being made to get raises into this territory from the eighth level. These are being put up to the 660' sub level and from this point will be pushed through above the sixth level whenever it is necessary.

The territory being worked on the South side of the fourth level at #430 crosscut is nearly completed and it has been decided to take another section 120' wide immediately to the East. For this purpose #820 crosscut is now being driven.

VENTILATION.

We have had very little trouble with the ventilation during the past year. The plan worked out has given good results. It is necessary, however, to keep the auxilliary blowers working continually when the mine is in operation to provide fresh air in the sub levels from the main level drifts. During the

winter season the fan is reversed at times at night or weekends to prevent ice forming in the cage compartment which is downcast. The ice has given us some trouble but by reversing the fan it has helped conditions.

A No. 2½ Sirocco fan was placed on the South side of the fourth level to act as a booster for the Buffalo fan near the shaft. The rock obstruction in front of the large fan on the tenth level was removed and an evassee built for the fan.

FIRE DOORS.

During the year fire doors and gunited frames were installed on the sixth, eighth, ninth and tenth levels and latch cylinders connected to an air line in the shaft. These doors can be closed by opening the valve at any plat or from surface.

Red and green safety lights and safety catches were put on all ventilation doors.

In April all wood doors on all levels were covered with Toncon Metal which is a non-corrosive metal.

EIGHTH LEVEL PLAT.

A concrete bulkhead was built with the cement gun at this plat in front of the South raise to the sixth level.

WATER.

The average number of gallons of water pumped per minute as compared with 1923 is as follows:-

	1924	1923
January	209	186
February	208	185
March	211	188
April	214	190
May	218	194
June	218	193
July	222	198
August	222	199
September	225	203
October	227	203
November	229	204
December	232	205
Average -	218	195

This shows that there has been a gradual increase in the number of

gallons pumped per minute.

SCRAPERS.

During the year twelve double drum Ingersoll-Rand tugger hoists were purchased. These are used chiefly in connection with stoping. The results obtained have been very satisfactory and it is possible a few more may be used. The cost of these, together with the turn table mountings and slusher, were charged out during the year against the cost of mining. These have been used not only for scraping ore into chutes in the sub levels, but also on main levels for main level drifting. In the latter case, a slide is used and the ore loaded directly into the motor cars. The method used in sub levels has principally been what we term "fanning". The original drift is driven directly opposite the raise, after which side slices are taken, no sheave being used except the one in the breast.

FATAL ACCIDENTS.

William Prout.

On Monday afternoon, February 18th, William Prout, a timberman who was repairing #852 raise at a point just below the 660' sub level, fell down the raise to the eighth level, a distance of something over 100'. He died while being taken from the mine to surface. It is not known exactly how the accident occurred, whether he was standing on the staging which broke, or whether he was removing the staging plank and fell with it to the bottom of the raise. Prout was an experienced miner and had done more raise work than any other miner at the Athens. He had been employed by our company about twelve years. He was a married man and left a wife and four children.

William Remillard.

On May 23rd at 11:40 A.M., William Remillard, a timberman, was instantly killed at #656 raise on the sixth level by being crushed between a motor train and one of the upright supports of the raise.

Remillard had just come down the raise from the 525' sub level. Without notifying the motorman or trainmen, he attempted to pass from one side

of the drift to the other by crossing between the cars of the train. The train started to move toward the shaft and in attempting to get out from between the cars, he was caught between the car and the chute support.

When the train started, Remillard was seen by Shiftboss Dixon, who was standing a few feet from the chute. Dixon attempted to stop the train by signalling and calling to the motorman. The train stopped after moving a few feet but it was too late to prevent the accident.

Remillard was a married man and left a wife and three children. He had been employed at the Athens about two years.

SURFACE.

TREATING PLANT.

The plant installed a little over a year ago for treating our main level timbers with zinc chloride operated throughout the summer months, being shut down in October. During the year 2,516 pieces of 8' timber were treated, of which a large supply still remains on the ground. This is expected to supply our wants until treating starts again during the coming summer. The results obtained are apparently quite satisfactory. Timber treated a year ago - which was green and which showed very little penetration - after being in the mine a year, is apparently in nearly as good shape as when it went underground. During the past year the timber was given a better chance for seasoning and as a result we have had better penetration. It is necessary in a plant of this kind to purchase the timber a year ahead in order that it may be peeled and seasoned before treatment.

The cost of treatment for our 12" to 14" diameter timber is as follows:-

	COST PER 8' PC.	COST PER FOOT
Peeling,	$ .251	$ .031
Labor for treating,	.344	.043
Zinc Chloride,	.247	.031
Tools, etc.,	.019	.002
Charge for Heat, Water & Air,	.060	.008
Total -	$ .921	$ .115

ROCK TRAM ENGINE.

An electric driven engine with a 6' rubber lined sheave was installed in March for tramming rock from the headframe to the rock pile. This was purchased from the Lake Shore Engine Works.

DRAINAGE FOR TIMBER TUNNEL.

Considerable trouble has been had during the summer season with the flooding of the tunnel after heavy showers. The water ran down the cage compartment of the shaft, making it extremely bad. In September a catch basin connecting with the surface sewer was constructed near the mouth of the tunnel.

STOCKING TRESTLE.

On account of the small shipments during the summer, a large amount of ore was left in stock at the close of the season. With this surplus ore, the capacity of the steel stocking trestles is not sufficient to take care of our stocking requirements during the present winter season. Twelve wooden bents have been added to the Southeast track of the Southeast trestle to provide the needed space.

HEAD SHEAVE.

A new cast iron sheave with steel liners was installed over the North skip compartment on November 15th. This sheave was purchased from Robert Holmes and Brothers, Danville, Illinois.

DELAYS - ELECTRICAL.

March 4th - 1/2 hour delay account of no current.

DELAYS - NON-ELECTRICAL.

Jan. 9th - No hoisting on North side from 3 to 5 o'clock account of skip rope giving out at splice.

ESTIMATE OF ORE RESERVES IN ATHENS MINE DECEMBER 31, 1924.

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

Percentage of Bessemer equals 0.

DEVELOPED ORE.

Fourth level and above - - - - -	1,136,752 tons,
Fourth level to sixth level, North side of dike - - - - - - - - - -	525,612 "
Sixth level to 660' sub level, North side of dike - - - - - - - - - -	512,060 "
660' sub level to eighth level - - -	1,166,737 "
Eighth level to ninth level - - -	513,425 "
Ninth level to tenth level - - - -	441,558 "
Below tenth level - - - - - -	61,129 "
Total developed ore - - - -	4,357,273 tons.

PROSPECTIVE ORE.

Fourth level to sixth level, South side of dike - - - - - - - - - -	1,933,175 tons,
Sixth level to 660' sub level, South side of dike - - - - - - - - - -	441,176 "
Total prospective ore - - - -	2,374,351 tons.
Total All Ore - - - - - -	6,731,624 tons.

ESTIMATED ANALYSIS

	IRON	PHOS.	SILICA	ALUM.	MANG.	LIME.	MAG.	SUL.	IGNI.	MOIST.
Dried 212°	59.80	.140	8.45	2.64	.530	.430	.480	.012	1.15	
Natural	52.03	.121	7.35	2.30	.461	.374	.418	.010	1.00	13.00

ATHENS MINE

AVERAGE MINE ANALYSIS ON OUTPUT FOR YEAR 1924.

GRADE	IRON	PHOS.	SILICA
Athens,	60.46	.124	7.08
Mitchell Lease,	58.45	.149	6.89
Corbett Lease,	(No Production)		

AVERAGE ANALYSIS ON STRAIGHT CARGOES FOR YEAR 1924.

GRADE	Mine IRON	Mine PHOS.	Lake Erie IRON	Lake Erie MOIST.
Athens,	59.32	.128	59.66	13.02
Mitchell Lease,	(No Shipments)			
Corbett Lease,	(No Shipments)			

ORE STATEMENT - DECEMBER 31ST, 1924.

	ATHENS	MITCHELL LEASE	CORBETT LEASE	TOTAL	TOTAL LAST YEAR
On hand January 1, 1924,	197,360	9,686	383	207,429	149,829
Output for Year,	244,969	2,900	-	247,869	245,545
Transferred,	127	-	127	-	-
Total,	442,456	12,586	256	455,298	395,374
Shipments,	127,818	1,140	-	128,958	187,945
Balance on Hand,	314,638	11,446	256	326,340	207,429
Increase in Output,				2,324	
Increase in Ore on Hand,				118,911	

1924 -- 1-8 Hour Shift, 6 days per week, Jan. 1st to March 24th, 1924.
2-8 Hour Shifts, 6 days per week, Mar. 24th to July 26th, 1924.
1-8 Hour Shift, 4 days per week, July 26th to Nov. 30th, 1924.
1-8 Hour Shift, 5 days per week, Dec. 1st to Dec. 31st, 1924.

1923 -- 2-8 Hour Shifts, Jan. 1st to Apr. 29th, 1923.
1-8 Hour Shift, Apr. 30th to Dec. 31st, 1923.

ATHENS MINE

SHIPMENTS FOR YEAR-1924.

GRADE	POCKET	STOCKPILE	TOTAL	TOTAL LAST YEAR
Athens,	14,928	112,890	127,818	187,945
Mitchell Lease,	1,140	-	1,140	-
Corbett Lease,	-	-	-	-
Total,	16,068	112,890	128,958	187,945
Total Last Year,	61,397	126,548	187,945	
Decrease,			58,987	

ATHENS MINE

COMPARATIVE MINING COST FOR YEAR

	1924	1923	INCREASE	DECREASE
PRODUCT	247,869	245,545	2.324	
Underground Costs	1.370	1.341	.029	
Surface Costs	.258	.221	.037	
General Mine Accounts	.109	.098	.011	
Cost of Production	1.737	1.660	.077	
Plant Account	.210	.210		
Taxes	.363	.322	.041	
Central Office	.079	.080		.001
Contingent Expense	.004	.004		
Cost Adjustment	.001	.001	.002	
Cost on Stockpile	2.394	2.275	.119	
Loading & Shipping	.021	.026		.005
Misc.Debits & Credits	.002	.015	.013	
Total Cost on Cars	2.413	2.286	.127	
No.Days Operating	261	300		39
No.Shifts & Hours	2-8-~~95~~ 1-8-166	1-8		
Avg.Daily Product	950	818	132	
COST OF PRODUCTION				
Labor	1.064	1.032	.032	
Supplies	.673	.628	.045	
Total	1.737	1.660	.077	

ATHENS MINE

COMPARATIVE WAGES AND PRODUCT

	1924	1923	INCREASE	DECREASE
PRODUCT	247,869	245,545	2,324	
No.Shifts & Hours	1-8hr	1-8hr		
AVG.NO.MEN WORKING				
Surface	40	41		1
Underground	159	141	18	
Total	199	182	17	
AVG.WAGES PER DAY				
Surface	4.44	4.24	.20-4.71%	
Underground	4.96	4.75	.21-4.42%	
Total	4.86	4.64	.22-4.74%	
WAGES PER MO.OF 25 DAYS				
Surface	111.00	106.00	5.00	
Underground	124.00	118.75	5.25	
Total	121.50	116.00	5.50	
PRODUCT PER MAN PER DAY				
Surface	22.49	20.56	1.93	
Underground	5.78	5.82		.04
Total	4.60	4.54	.06	
LABOR COST PER TON				
Surface	.198	.206		.008
Underground	.859	.816	.043	
Total	1.057	1.022	.035	
AVG.PRODUCT BRK'G & TRM'G	1.006	9.58	.48	
" WAGES CONTRACT MINERS	5.41	5.09	.32	
" " " TRAMMERS	5.41	5.09	.32	
" " " LABOR	5.41	5.09	.32	
TOTAL NO.OF DAYS				
Surface	11022½	11940		917½
Underground	42904½	42171-3/4	732-3/4	
Total	53927	54111-3/4		184-3/4
AMOUNT FOR LABOR				
Surface	48991.52	50612.84		1621.32
Underground	212924.32	200444.81	12479.51	
Total	261915.84	251057.65	10858.19	

Mine started on operating basis Jan.1,1919.
Proportion Surface to Underground Men:
1924 - 1 to 3.99
1923 - 1 to 3.44
1922 - 1 to 3.75
1921 - 1 to 3.88
1920 - 1 to 3.83
1919 - 1 to 3.

1924 - 1-8hr shift 4 days per wk.from July 31th th Dec.1st;
1-8hr " 5 " " De c.1st.

ATHENS MINE.

ATHENS MINE

TIMBER STATEMENT FOR THE YEAR ENDING DECEMBER 31, 1924.

KIND	LINEAL FEET	AVG. PRICE PER FOOT	AMOUNT 1924	AMOUNT 1923
6" to 8" Timber	73,920	.0406	2,999.55	2,882.76
8" to 10" "	87,383	.0682	5,956.62	6,514.04
10" to 12" "	33,501	.0926	3,103.65	2,888.77
12" to 14" "	11,590	.1578	1,828.50	1,287.96
Total - 1924	206,394	.0673	13,888.32	
Total - 1923	200,223	.0677		13,573.53
	LINEAL FEET	PER 100'		
7' Lagging	728,776	.8376	6,104.24	6,092.08
Poles	262,750	1.18	3,098.45	2,333.42
Total - 1924	991,526	.928	9,202.69	
Total - 1923	965,634	.872		8,425.50
1" Covering Boards Sq.Ft.	79,050	16.60	1,311.99	1,357.12

Product	247,869	245,545
Feet of Timber per ton of ore	.833	.815
Feet of Lagging per ton of ore	2.940	3.118
Feet of Lagging per foot of timber	3.531	3.823
Cost per ton for timber	.0560	.0553
Cost per ton for Lagging	.0246	.0248
Cost per ton for covering boards	.0053	.0055
Cost per ton for poles	.0125	.0095
Cost per ton for timber, lagging, poles & boards,	.0984	.0951
Equivalent of stull timber to bd. measure,	337,969	328,170

Total cost for timber, lagging, poles & boards, and cost per ton,

1924	$24,403.00	$.0984
1923	23,356.15	.0951
1922	16,566.21	.0857
1921	23,169.19	.1316
1920	22,622.15	.1146

ATHENS MINE

STATEMENT OF EXPLOSIVES USED FOR STOPING AND DEVELOPING IN ORE
-1924-

KIND	QUANTITY	AVERAGE PRICE	AMOUNT 1924	AMOUNT 1923
40% Powder	8,400	.1350	1,134.00	7,039.76
50% "	48,950	.1550	7,587.25	
60% "	21,475	.1675	3,597.09	5,097.75
Total Powder - 1924	78,825	.1563	12,318.34	12,137.51
Total Powder - 1923	82,600	.1469		12,137.51
Fuse	298,800	.6866c	2,051.57	2,079.08
Caps	49,350	1.2404c	612.15	657.19
Cap Crimpers	45	.805 ea.	34.24	26.83
Electric Exploders	350	6.674c	23.36	12.83
Connecting Wire	64	.362 lb.	23.19	
Total Fuse, Caps, Etc.,			2,744.51	2,775.93
Total All Explosives			15,062.85	14,913.44
Product			247,869	245,545
Pounds of Powder per ton of ore,			.3180	.3364
Cost per ton for powder,			.0497	.0494
" " fuse, caps, etc.,			.0111	.0113
" " all explosives			.0608	.0607
Average price per lb. for powder,			.1563	.1469

PRODUCTION.

Month	Athens	Mitchell	Total	Rock
January	24,131		24,131	
February	21,161		21,161	
March	20,073		20,073	
April	25,255		25,255	188
May	27,833		27,833	37
June	26,216		26,216	79
July	25,191		25,191	203
August	15,104	189	15,293	200
September	15,113	216	15,329	256
October	14,174	531	14,705	83
November	12,025	1,049	13,074	116
December	18,693	915	19,608	505
Total -	244,969	2,900	247,869	1,667

	1924	1923
Mitchell Lease Ore Shipped,	1,140 tons,	
Athens " "	127,818 "	187,945 tons,
Total ore shipped -	128,958 tons.	187,945 tons.
Mitchell Lease Ore on Hand Dec. 31st,	11,446 tons,	9,686 tons,
Corbit " " " " "	256 "	383 "
Athens " " " "	314,638 "	197,360 "
Total ore on hand -	326,340 tons.	207,420 tons.

ATHENS MINE

ANALYSIS OF PRODUCTION AND COSTS.

Production of 1923 245,545 tons,

" 1924 247,869 "

Increase 1924 2,324 tons.

Cost of production 1923 $407,613.22 - Cost per ton $1.660

" " " 1924 430,432.64 1.737

Increase 1924 $ 22,819.42 Increase $ .077

DETAIL OF COST OF PRODUCTION.

	TOTAL COST				COST PER TON		
	LABOR	%	SUPPLIES	%	LABOR	SUPPLIES	TOTAL
1923 -	$253,329.93	62.1	$154,283.29	37.9	$1.032	$.628	$1.660
1924	263,677.62	61.3	166,755.02	38.7	1.064	.673	1.737
Incr.	$ 10,347.69		$ 12,471.73		$ .032	$.045	$..077

From January 1st to March 25th, the mine operated on one eight-hour shift; from March 25th to July 28th, two eight-hour shifts; from July 28th to December 3rd, one eight-hour shift four days per week; from December 3rd to 31st, one eight-hour shift five days per week.

The average number of men employed during the year was 199, for a total of 53,927 days or 271 days per man as compared with 1923 of 182 men employed for a total of 54,112 days or 297 days per man, an increase in 1924 of 17 men, a decrease of 185 days, and a decrease of 26 days per man.

The average tons per man underground in 1924 was 5.78 or a decrease of .04 tons per man per day as compared with 1923 when the average tons per man was 5.82. The total tons per man per day in 1924 was 4.60, while in 1923 the total tons per man was 4.54; an increase of .06 tons per man per day.

There has been no change in the wage schedule since May 1st, 1923.

UNDERGROUND COSTS:

Development in Rock,

1924 Amount $ 946.17 - Cost per ton $.004

1923 1,057.13 .004

Decrease $ 110.96 $.000

	Sub Division.				
	Drifting	Per Ft.		Raising	Per Ft.
1924	64'	4.90		86'	4.75
1923	81'	6.80		40'	4.90
Decr.	17'	1.90	Incr.	46'	Decr. .15

Development in Ore,

1924 Amount $7,058.97 - Cost per ton $.029

1923 5,765.61 .024

Increase $1,293.36 $.005

In 1924, 9,316 tons of ore were mined in development work at an average of 8.75 tons per man per day, while in 1923, 6,002 tons were mined at an average of 6.39 tons per man per day, or an increase in 1924 of 3,314 tons and 2.36 tons per man per day.

Stoping,

1924 Amount $133,159.95 - Cost per ton $.537

1923 124,172.69 .506

Increase $ 8,987.26 $.031

	Detail.			
	Labor		Supplies	
1924	$104,310.24	78.3%	$28,849.71	21.7%
1923	103,170.93	83.1%	21,001.76	16.9%
Increase	$ 1,139.31		$ 7,847.95	

	Cost per ton		
	Labor	Supplies	Total
1924	$.421	$.116	$.537
1923	.420	.086	.506
Increase	$.001	$.030	$.031

During the year 12 new double drum Ingersoll-Rand tugger hoists were purchased for use on the scraper method of mining at a cost of $667.00 each or $8,004.00 This item increased the cost

per ton $.032.

Explosives.

	1924	1923
Total lbs. Powder	78,825	82,600
Avg. price per lb.	.1563	.1469
Total Amount	12,318.34	12,137.51
Fuse, Caps, etc.	2,744.51	2,775.93
Grand Total	15,062.85	14,913.44
Lbs. powder per ton of ore	.3180	.3364
Cost per ton for powder	.0497	.0494
Cost per ton all explosives	.0608	.0607

Increase 1924 $.001 per ton.

Timbering,

1924 Amount $87,004.80 - Cost per ton $.351

1923 82,082.87 .334

Increase $ 4,921.93 $.017

Detail Cost of Timber.

	1924	1923
Cost of stull timber	13,888.32	13,573.53
Cost of Lagging & Poles	10,514.68	9,782.62
Total Cost	24,403.00	23,356.15
Ft. tbr. per ton of ore	.833	.815
Cost per ton for Timber, Lagging & Poles	.0984	.0951

Increase 1924 $.0033 per ton.

All timber used on main levels was peeled and treated with chloride of zinc.

Tramming,

1924 Amount $35,255.41 - Cost per ton $.142

1923 33,218.30 .135

Increase $ 2,037.11 $.007

	Sub Division 1924	1923
Tramming	28,896.08	27,005.93
Skip Tenders & Bellmen	4,099.02	3,860.71
Cleaning Skip Pit	2,260.31	2,351.66

Ventilation,

1924 Amount $6,133.46 - Cost per ton $.025

1923 12,765.69 .052

Decrease $6,632.23 $.027

During the year we purchased three size 2½ Anaconda type mine ventilating fans with 5 H.P. motors from Morgan-Gerrish Company, cost $1176.00. We also purchased one #125 Coppus Vaino Electric Blower from Coppus Engineering Corporation costing $78.00. The increase for 1923 was due to guniting between the cage and skip roads, and also installing four new ventilating fans together with considerable new ventube.

Pumping,

1924 Amount $19,626.52 - Cost per ton $.079

1923 18,509.86 .075

Increase $ 1,116.66 $.004

1924 - Gals. of water pumped 116,161,813; gallons per minute 225.

1923 - Gals. of water pumped 103,329,158; gallons per minute 197.

Increase 1924 of 12,832,655 gallons and 28 gallons per minute.

Compressors & Air Pipes,

1924 Amount $28,487.28 - Cost per ton $.115

1923 30,917.41 .126

Decrease $ 2,430.13 $.011

Sub Division.	1924	1923
Compressor	24,802.16	27,108.88
Air Pipes	3,685.12	3,808.53

Cu. ft. air compressed in 1924 was 581,130,000 @ $.0427 per M cu.ft.

Cu. ft. air compressed in 1923 was 635,535,000 @ $.0426 per M cu.ft.; a decrease of 54,405,000 cu. ft. and an increase of $.0001 per M cu.ft.

Underground Superintendence,

1924 Amount $10,277.95 - Cost per ton $.042

1923 8,546.35 .035

Increase $ 1,731.60 $.007

On August 1st an Underground Foreman was put on. There were three shift bosses to March 25th. From then on four shift bosses were employed.

MAINTENANCE ACCOUNTS:
Compressors & Power Drills,

1924 Amount $ 784.72 - Cost per ton $.003

1923 1,939.05 .008

Decrease $1,154.33 $.005

Sub Division.	Repairs to compressors	Power Drills
1924	274.72	510.00
1923	919.05	1,020.00
Decrease	644.33	510.00

In 1923 repairs to compressor charged with building spray pond for cooling circulating water, also repairs to compressor. Only small repairs in 1924.

In 1924 three Cleveland Auger Drills were purchased from the Cleveland Rock Drill Company, while in 1923 six of the same type were purchased.

Hand Tramming Equipment,

1924 Amount $1,763.64 - Cost per ton $.007

1923 1,912.55 .008

Decrease $ 148.91 $.001

Sub Division.

	Cars	Tracks
1924	998.68	764.96
1923	1,729.32	183.23
Decr.	730.64	Incr. 581.73

Decrease in 1924 to sub level cars due to large charge in 1923 for making 10 new cars and equipping them with new roller bearing trucks.

Increase in 1924 to sub level tracks due to more rail for tracks.

Electric Tram Equipment,

1924 Amount $7,172.12 - Cost per ton $.029

1923 7,184.19 .029

Decrease $ 12.07 $.000

Sub Division.

	Gen. & Motor	Locomotives	Wiring
1924	98.81	2,184.27	713.63
1923	98.40	2,444.44	699.51
Incr.	.41	Decr. 260.17	Incr 14.12

	M. L. Tracks	M. L. Cars
1924	732.30	3443.11
1923	719.82	3222.02
Incr.	12.48	221.09

Decrease in Locomotives 1924 due to overhauling two of locomotives in 1923. In 1924 a locomotive from the Francis Mine had to be overhauled before being sent underground. The repairs to this locomotive will be deducted from the rental charge.

Increase in Wiring due to extending trolley lines.

Increase in M. L. Tracks due to extending tracks.

Increase in Main Line Cars due to overhauling two of four cars bought from Francis Mine. Cars to be charged out next year.

Pumping Machinery,

1924 Amount	$1,807.44 - Cost per ton	$.007
1923	1,152.18	.005
Increase	$ 655.26	$.002

Increase due to repairs to pumps. Two new cylinders costing $300.00 each were bought from Prescott Pump Company to replace two which were cracked.

SURFACE COSTS:

Hoisting,

1924 Amount	$24,146.61 - Cost per ton	$.097
1923	25,324.70	.103
Decrease	$ 1,178.09	$.006

In 1924 the tons of ore and rock hoisted were 249,536 tons at an average depth of 2,156 feet. In 1923, 245,636 tons at an average depth of 2,186 feet, or an increase in 1924 of 3,900 tons and a decreasd depth of 30 feet.

Stocking Ore,

1924 Amount	$6,445.58 - Cost per ton	$.026
1923	4,122.83	.017
Increase	$2,322.75	$.009

In 1924, 231,804 tons were placed on stockpile while in 1923 only 184,148 tons were stocked. On account of the small tonnage shipped from stockpile during shipping season, it was necessary to erect additional trestle to take care of the product during winter months. There was also extra labor employed to scrape down sides of stockpile

ATHENS MINE

in order to make more room for ore.

Dry house,

1924 Amount $5,331.54 - Cost per ton $.022

1923 7,129.19 .029

Decrease $1,797.65 $.007

The heating charge to Dry House in 1924 was $3,806.24; in 1923, $5,229.02; decrease 1924 $1,422.78. Decrease 1924 due to coal shortage charged out in 1923.

General Surface Expense,

1924 Amount $6,199.66 - Cost per ton $.025

1923 6,412.81 .026

Decrease $ 213.15 $.001

In 1924 the charges to improvement and care of grounds were $706.11, while in 1923 the charges were $1,053.67; decrease $347.56. The difference is due to general surface work cleaning surface.

MAINTENANCE ACCOUNTS:

Hoisting Equipment,

1924 Amount $12,585.79 - Cost per ton $.051

1923 7,296.44 .030

Increase $ 5,289.35 $.021

	Sub Division.		
	Wire Rope	Machinery Parts	Skips & Skip Roads
1924	6,708.91	3,634.56	2,242.32
1923	3,296.98	1,778.60	2,220.86
Incr.	3,411.93	1,855.96	21.46

In 1924 there were three 8-foot cast iron sheaves at a cost of $672.60 and one steel lined sheave costing $497.40 charged, while in 1923 there were no sheaves charged.

In 1924 four 1 3/8" hoisting ropes at a cost of $5,534.89 and one 1 1/4" rope at a cost of $1,174.02 were used, while in 1923 only two

1 3/8" ropes at a cost of $2,358.70 and one 1 1/4" rope at a cost of $993.88 were used. Two new hoisting ropes and two new sheaves were put in use the latter part of the year.

Shaft,

1924 Amount	$1,459.71 - Cost per ton	$.006
1923	860.45	.004
Increase	$ 599.26	$.002

Increase due to repairs to underground pockets.

Top Tram Equipment,

1924 Amount	$6,824.12 - Cost per ton	$.028
1923	1,053.13	.004
Increase	$5,770.99	$.024

Increase in 1924 was due to new rock tram plant erected and new top tram car built. There was also an increase of $532.33 in top tram rope.

Docks, Trestles & Pockets,

1924 Amount	$269.05 - Cost per ton	$.001
1923	226.86	.001
Increase	$ 42.19	$.000

The charges for 1924 were for new plates in shaft house pockets.

Mine Buildings,

1924 Amount	$ 609.03 - Cost per ton	$.002
1923	1,817.51	.007
Decrease	$1,208.48	$.005

Detail of Mine Buildings.

	1924	1923
Office	25.10	15.68
Warehouse	8.28	
Shops	5.75	2.48

Shaft House	5.40	804.78
Engine House	28.06	57.88
Boiler House	2.58	3.80
Dry House	308.90	79.61
Miscellaneous	224.96	853.28

The charges to office were for repairing floor in wash room.

Charges to Engine House were for repairing roof and painting floors.

Charges to Dry House were for painting interior of Dry House.

Charges to Miscellaneous Buildings were for painting timber tunnel and building an extension to storage shed in storage yard. Large charge to this account in 1923 due to guniting crusher house and erecting rock tram building.

GENERAL MINE ACCOUNTS:

Insurance,

1924 Amount $17.28 - Cost per ton $.000

1923 $17.28 .000

Engineering,

1924 Amount $2,671.59 - Cost per ton $.011

1923 3,715.44 .015

Decrease $1,043.85 $.004

Analysis,

1924 Amount $3,709.29 - Cost per ton $.015

1923 3,551.29 .014

Increase $ 158.00 $.001

The Athens samples are worked at the Negaunee Mine laboratory.

ATHENS MINE

1924 - 14,960 determinations @ $.16945 per determ.

1923 - 15,290 " " .15485 " "

Decr. 330 " Incr $.01460 " "

Personal Injury Expense,

1924 Amount $12,164.80 - Cost per ton $.049

1923 8,692.82 .035

Increase $ 3,471.98 $.014

During 1924 there were two fatal accidents, that of William Prout, Accident Report #194, February 18th and that of William Remillard, Accident Report #206, May 23rd.

One fatal accident in 1923.

Safety Department Expense,

1924 Amount $169.86 - Cost per ton $.001

1923 154.07 .001

Increase $ 15.79 $.000

Telephones & Safety Devices,

1924 Amount $1,526.24 - Cost per ton $.006

1923 1,450.61 .006

Increase $ 75.63 $.000

Sub Division.

Lighting for shaft & levels,	1924	$493.92
	1923	667.49
	Decr.	$173.57
Mine Telephones,	1924	$238.60
	1923	139.29
	Incr.	$ 99.31
Safety Gates & U.G.Impr,,	1924	$ 55.40
	1923	247.54
	Decr.	$192.14
Sign Boards, Signals, etc.,	1924	$ 65.90
	1923	56.91
	Incr.	$ 8.99
Fire Equipment & Protection,	1924	$664.54
	1923	333.50
	Incr.	$331.04

Safety Devices, Engine House, 1924 $7.88. Making cases for extinguishers.

Mine Office,

1924 Amount $6,824.06 - Cost per ton $.027

1923 6,563.91 .027

Increase $ 260.15 $.000

Sub Division.

	Direct Charges		Central Office
1924	876.27		5,947.79
1923	1,058.45		5,505.46
Decrease	182.18	Increase	442.33

SOUTH JACKSON MINE - 1924.

The product for the year was 33,262 tons.

Operations started at the pit on April 18th. The first loading was along the North edge. Here the analyses ran low and this section of the pit was abandoned and the shovel moved to the West side where loading continued until the pit was shut down on June 16th. On August 30th, loading was again started and continued until September 28th. This ore also came from the West side of the pit.

A dinky engine for spotting cars was rented for the season from the Republic Iron & Steel Company as the regular South Jackson engine was in use at the new hoist dam.

When mining operations closed down the last of September, the shovel crew and drillers spent the first week in October lowering the approach to the pit.

TUNNEL LEVEL.

Four years ago, a drift was driven on the tunnel level from the shaft to the South and East toward the Lucy workings. During the past summer a branch was driven 80' South from this drift and a raise 56' high put through to surface. This will drain the bottom of the pit and permit loading early in the season if it is necessary.

During the past few years the tonnage mined has been very small which increases the cost per ton as there is always a certain amount of dead work in opening and closing an operation - even an open pit. My estimates of the season's output for the past several years has been placed at 70,000 tons. If a larger product is desired, it could be mined, but additional equipment would be required. A revolving type, electric operated, caterpillar tread shovel would be ideal in this pit and would cut down the loading cost very materially.

DELAYS.

On April 28th, a rail turned over derailing four railroad cars. Two days were spent in cleaning up the wreck and repairing the track.

ESTIMATE OF ORE RESERVES OF DECEMBER 31, 1924.

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 - - - - - -	3,000 "
Total -	43,000 tons.

Below present pit and above drainage tunnel available by milling:

West of Crusher - - - - - - - - - - - -	186,000 tons
Area below bottom of present pit shown by churn drilling - - - - - - - - - - - - - -	105,226 "
Total -	291,226 tons.
GRAND TOTAL -	334,226 tons.

ANALYSIS

	IRON	PHOS.	SILICA	MANG.	ALUM.	LIME	MAG.	SUL.	IGNI.	MOIST.
Natural	34.55	.066	36.00	2.00	1.42	.435	.175	.010	2.00	7.00

SOUTH JACKSON MINE

AVERAGE MINE ANALYSIS ON OUTPUT FOR YEAR 1924.

GRADE	IRON	PHOS.	SILICA	MANG.
South Jackson	36.47	.046	40.69	1.95

AVERAGE ANALYSIS ON STRAIGHT CARGOES FOR YEAR 1924.

	Mine				Lake Erie		
GRADE	IRON	PHOS.	SILICA	MANG.	IRON	MOIST.	MANG.
South Jackson	37.16	.056	39.67	1.86	37.17	6.85	2.44

ORE STATEMENT AND SHIPMENTS FOR YEAR 1924.

	YEAR	LAST YEAR
Output for Year,	33,262	12,812
Shipments,	33,262	12,812
Balance on Hand,	-	-
Increase in Output,	20,450	
Increase in Shipments,	20,450	

1924 -- Mine Idle Jan. 1st to Apr. 24th, 1924.
1-9 Hour Shift, Apr. 24th to June 16th, 1924.
Mine Idle June 16th to Aug. 30th, 1924.
1-9 Hour Shift, Sept. 1st to Sept. 26th, 1924.
Mine Idle Sept. 27th, to Dec. 31st, 1924.

1923 -- Mine Idle Jan. 1st to May 28th, 1923.
1-8 Hour Shift, May 29th to July 2nd, 1923.
Mine Idle July 3rd to Dec. 31st, 1923.

SOUTH JACKSON MINE

COMPARATIVE MINING COST FOR YEAR

	1924	1923	INCREASE	DECREASE
PRODUCT	33,262	12,812	20,450	
Open Pit Costs	.418	.521		.103
General Mine Accounts	.022	.034		.012
Cost of Production	.440	.555		.115
Original Cost	.803	.803		
Taxes	.160	.354		.194
Central Office	.014	.013	.001	
Contingent Expense	.002	.002		
Cost Adjustment	.011	.033		.022
Winter Expense	.047	.163		.116
Total Cost on Cars	1.477	1.923		.446
No.Days Operating	64	28	36	
No.Hours & Shifts	1-9	1-10		
Avg.Daily Product	520	548		28
COST OF PRODUCTION				
Labor	.213	.265		.052
Supplies	.227	.290		.063
Total	.440	.555		.115

SOUTH JACKSON MINE

COMPARATIVE WAGES AND PRODUCT

	1924	1923	INCREASE	DECREASE
PRODUCT	32,262	12,812	20,450	
No.Shifts & Hours	1-9hr	1-10hr		
AVG.NO.MEN WORKING				
Surface	0	1½		1½
Underground (Pit)	4	8½		4½
Total	4	10		6
AVG.WAGES PER DAY				
Surface	4.51	4.91		.40-8.14%
Underground	5.02	4.93	.09-1.82%	
Total	4.98	4.93	.05-1.01%	
WAGES PER MO.OF 25 DAYS				
Surface	112.75	122.75		10.00
Underground	125.50	123.25	2.25	
Total	124.50	123.25	1.25	
PRODUCT PER MAN PER DAY				
Surface	378.00	453.54		75.54
Underground	31.57	26.50	5.07	
Total	29.13	25.03	4.10	
LABOR COST PER TON				
Surface	.012	.011	.001	
Underground	.159	.186		.027
Total	.171	.197		.026
TOTAL NO.OF DAYS				
Surface	88	28-1/4	59-3/4	
Underground	1053-3/4	483-1/2	570-1/4	
Total	1141-3/4	511-3/4	630	
AMOUNT FOR LABOR				
Surface	397.31	138.80	258.51	
Underground	5289.98	2385.58	2904.40	
Total	5687.29	2524.38	3162.91	

1923 - Mine only operated 28 days;from May 29th to July 2nd.
1924 - " " April 24th to Sept.30th.

NORTH JACKSON MINE - 1924.

During the summer the old Jackson office was painted. This building is being used as a barracks for the Michigan State Police.

During the year fences were repaired around the open pits.

NORTH LAKE DISTRICT

MORRIS LLOYD MINES

GENERAL

The year 1924 has been a very slow one as far as operations were concerned. These mines operated on day shift only until July 30th, 1924, when work was curtailed to four days per week on day shift only. Since December first, the mines have been working five days per week on day shift.

The mines were closed on one day in February and four days during March month on account of low water at the power plants.

Notwithstanding all these things, we show the largest tons per man per day in the history of the properties, viz:- 4.80 compared with 4.29 for best previous year.

Very little new work was undertaken on surface during the year and operations here were confined to the regular duties of caring for the product as hoisted, receiving of mine timber, shipping, and maintenance of equipment.

We have prosecuted our development during the year and have further increased our ore reserves. The figures are shown in a statement in the body of this report.

During the year we have added nine scraper hoists to our underground equipment and have thereby increased the average of the tons per miner secured.

A new 2500 Cu. foot Ingersoll-Rand Air Compressor was purchased and installed during the early summer and an addition to our present engine house erected to house it. The total cost of this, including building, was $21,165.10.

Work has been continued on the programme of equipping all mines for fire protection and some mine doors have been installed. This work will go forward until completed.

The connection between the Morris and Barnes-Hecker Mines is being maintained and adds greatly to the security and ventilation of both properties.

Five additional bents were erected to the Morris rock trestle in February month and ample space for storing waste material is available for the coming year.

GENERAL
(CONTINUED)

A new cage was placed in work in the Morris mine in October month.

A new gear and pinion were placed on our main #1 Prescott Pump on the fourth level in November month.

During the year we mined ore from the Chase Leases in excess of Royalty Requirements. Total of all minimums are 77,500 tons and the tonnage mined was 93,814 tons. The product from the different leases appear in a statement in the body of this report.

Ore was hoisted on 262 days at the rate of 940 tons per day making a total production of 246,356 tons. This figure includes 19,186 tons over-run from stockpiles.

This compares with a product of 260,335 tons in 1923.

LABOR

On account of the part time our mines have been working, it has been difficult to hold our best men and a number have left us to secure employment where they can work full time. Some men have gone to the Ford properties at L'Anse, Michigamme and Iron Mountain.

There have been no increases or decreases in wages during the past year, but due to part time work our rate per day on surface shows a small increase due to our principal mens larger rate being spread over a smaller number of man days. The underground rate shows an increase due to larger earnings of our contract miners.

The contract rate for miners in 1924 was $5.37 per day compared with $4.88 in 1923.

It will be noted that nothwithstanding the increased earnings of our miners, we show the lowest underground labor cost in 1924 than for any other year in the history of these mines.

The following statement shows the number of men employed each month on surface and underground during the year with previous years for comparison. Viz:

MORRIS LLOYD MINES

LABOR
(CONTINUED)

MEN EMPLOYED

SURFACE MEN

	1911	1912	1913	1914	1915	1916	1917	1918	1919	1920	1921	1922	1923	1924
JAN.		32	23	59	54	75	54	56	51.2	52.2	57.5	53.2	47	48
FEB.		29	22	52	56	70	55	53	50.5	51.2	61	52	49	48
MAR.		27	25	55	59	72	59	52	49	47	60.2	50	50	51
APR.	18	24	22	53	55	78	61	50	51	49	53	47	50.5	53
MAY.	20	22	42	60	61	81	60	54	55	63	56.2	53	58	60
JUN.	19	20	52	58	63	79	63	54	52.2	56.7	54	52.2	60.2	60
JUL.	19	22	56	57	73	90	63	64	55	57	51.5	57	55.5	56
AUG.	25	22	61	58	83	84	57	58	53.2	55.2	52.2	58.5	57	60.5
SEP.	20	22	56	60	86	83	61	55	53.2	50.2	62	59.5	55	58
OCT.	23	21	61	60	82	75	58.2	60	54	55	61.2	54.2	56	54
NOV.	23	20	54	49	75	69	65	54.2	56	50.2	47.2	50	58	55
DEC.	25	21	54	52	70	56	51	50	54.75	52.2	49.2	51	52.5	51
AVG.	21	23.5	50	56	67	66	59	55	53	53.2	54.6	54	54	54.5

UNDERGROUND MEN

	1911	1912	1913	1914	1915	1916	1917	1918	1919	1920	1921	1922	1923	1924
JAN.		104	106	215	203	242	240	208	206.2	232	280	188.2	165	149
FEB.		104	93	197	200	245	230	194	206	214	271	193	168	140
MAR.		109	93	222	214	253	230	201	217	210	300.2	189	173	143
APR.	62	97	88	195	188	247	229	184	213	198.2	279	198	179	143
MAY.	82	107	159	207	216	240	220	198	214	174	272.2	196	156	138
JUN.	71	103	142	213	201	237	216	202	231.2	186	186	164	148	149
JUL.	73	113	154	190	194	232	207	201	214	189	198	153	142	149
AUG.	100	109	180	189	197	225	187	195	216	186	209	157	157	147
SEP.	87	104	182	197	210	210	177	186	201	189.2	186	159	153	143
OCT.	104	117	190	203	206	219	181	182	205	193	194	157	147	146
NOV.	106	103	168	172	217	216	174	164.2	201	199	194	163	144	140
DEC.	106	101	193	186	234	222	176	174	212.4	246	187.2	166	143	140
AVG.	88	106	146	199	207	232	206	191	214	201	203	174	157	144

TOTAL MEN

	1911	1912	1913	1914	1915	1916	1917	1918	1919	1920	1921	1922	1923	1924
JAN.		136	129	274	257	317	294	264	258	284.2	337.2	242	212	197
FEB.		133	115	249	256	315	285	247	256.5	265.2	332	245	217	188
MAR.		136	118	277	273	325	289	253	266	257	361	239	223	194
APR.	80	121	110	248	243	325	290	234	264	247.2	332	245	229.5	196
MAY.	102	129	201	267	277	321	280	252	269	237	328.2	249	214	198
JUN.	90	123	194	271	264	316	279	256	284	242.75	240	216.2	208.2	209
JUL.	92	135	210	237	267	322	270	265	269	246	249.5	210	197.5	205
AUG.	125	131	241	247	280	309	244	253	269.2	241.25	261.2	215.2	213	207
SEP.	107	126	238	257	296	293	238	241	254.2	240	248	218.5	208	201
OCT.	127	138	251	263	288	294	239.2	242	259	248	255.2	211.2	203	200
NOV.	129	123	222	221	292	285	239	219	257	249.2	241.2	213	202	195
DEC.	131	122	247	238	304	278	227	224	267	298.2	237	217	195.5	191
AVG.	109	129	196	255	274	308	265	246	267	254.2	257.6	216	210.07	198.5

MORRIS LLOYD MINES.

LABOR
(CONTINUED)

The average wage rates for each month and year are shown on the following statement with previous years for comparison, viz:

AVERAGE WAGE RATES

SURFACE

YEAR	1913	1914	1915	1916	1917	1918	1919	1920	1921	1922	1923	1924
JAN.		2.47	2.25	2.48	3.19	3.86	5.15	5.10	5.73	3.87	3.94	4.26
FEB.		2.44	2.23	2.69	3.21	3.89	5.20	5.60	4.82	3.89	3.97	4.29
MAR.		2.43	2.23	2.70	3.16	3.85	5.23	5.55	4.82	3.84	3.93	4.26
APR.		2.40	2.22	2.74	3.10	4.02	5.16	5.60	4.84	3.93	3.93	4.28
MAY.	2.48	2.31	2.23	2.91	3.40	4.22	5.19	5.55	4.79	3.89	4.30	4.28
JUN.	2.38	2.49	2.28	2.91	3.42	4.21	5.16	5.47	4.83	3.61	4.32	4.30
JUL.	2.54	2.47	2.20	2.90	3.39	4.23	5.21	5.32	4.85	3.50	4.30	4.29
AUG.	2.54	2.48	2.51	2.89	3.43	4.70	5.17	5.50	4.32	3.46	4.35	4.34
SEP.	2.51	2.51	2.46	2.88	3.44	4.82	5.20	5.61	4.37	3.93	4.27	4.43
OCT.	2.49	2.21	2.38	2.91	3.86	5.32	5.19	5.65	3.96	3.95	4.36	4.38
NOV.	2.54	2.21	2.47	2.91	3.83	5.38	5.21	5.70	3.92	3.96	4.29	4.40
DEC.	2.50	2.22	2.45	3.04	3.88	5.23	5.18	5.69	3.89	3.93	4.26	4.35
AVG.	2.48	2.39	2.33	2.83	3.44	4.48	5.18	5.46	4.54	3.72	4.12	4.34

UNDERGROUND

YEAR	1913	1914	1915	1916	1917	1918	1919	1920	1921	1922	1923	1924
JAN.		2.97	2.65	2.99	3.51	4.36	5.83	5.82	6.31	4.29	4.32	4.83
FEB.		2.96	2.61	3.15	3.52	4.36	5.95	6.42	5.30	4.24	4.37	4.88
MAR.		2.95	2.66	3.12	3.53	4.41	6.01	6.49	5.35	4.24	4.36	4.89
APR.		2.92	2.70	3.05	3.53	4.64	6.01	6.40	5.16	4.22	4.30	4.91
MAY.	2.89	2.92	2.63	3.16	3.88	4.86	6.02	6.57	5.26	4.23	4.85	4.89
JUN.	2.91	2.88	2.74	3.20	3.90	4.91	6.13	6.62	5.55	3.90	4.83	4.95
JUL.	2.94	2.89	2.69	3.17	3.98	4.98	6.17	6.46	5.55	3.81	4.83	4.95
AUG.	2.95	2.81	2.98	3.18	4.05	5.52	6.03	6.64	4.93	3.84	4.82	5.03
SEP.	2.90	2.63	3.03	3.17	4.16	5.53	6.10	6.47	4.87	4.34	4.79	5.01
OCT.	2.95	2.68	3.03	3.19	4.42	6.11	6.00	6.71	4.44	4.47	4.83	5.07
NOV.	2.96	2.68	3.07	3.23	4.37	6.04	5.86	6.36	4.28	4.39	4.85	5.06
DEC.	2.95	2.70	2.97	3.37	4.34	5.94	5.83	6.26	4.34	4.43	4.88	4.96
AVG.	2.90	2.85	2.83	3.17	3.93	5.14	6.00	6.42	5.26	4.19	4.65	4.94

TOTAL

YEAR	1913	1914	1915	1916	1917	1918	1919	1920	1921	1922	1923	1924
JAN.		2.88	2.57	2.89	3.45	4.26	5.70	5.69	6.18	4.17	4.24	4.70
FEB.		2.86	2.53	3.06	3.46	4.26	5.81	6.24	5.20	4.15	4.29	4.74
MAR.		2.87	2.57	3.03	3.47	4.30	5.87	6.31	5.24	4.14	4.26	4.74
APR.		2.83	2.61	2.98	3.44	4.52	5.85	6.24	5.07	4.16	4.20	4.74
MAY.	2.81	2.81	2.64	3.12	3.80	4.74	5.84	6.33	5.16	4.13	4.67	4.74
JUN.	2.80	2.81	2.65	3.14	3.81	4.78	5.94	6.38	5.39	3.82	4.68	4.78
JUL.	2.87	2.81	2.58	3.09	3.87	4.89	5.97	6.23	5.40	3.72	4.69	4.77
AUG.	2.87	2.75	2.87	3.11	3.93	5.36	5.86	6.38	4.79	3.71	4.70	4.81
SEP.	2.83	2.76	2.91	3.12	4.00	5.39	5.92	6.28	4.73	4.20	4.66	4.84
OCT.	2.85	2.55	2.89	3.14	4.29	5.97	5.85	6.46	4.30	4.33	4.69	4.89
NOV.	2.87	2.60	2.94	3.16	4.28	5.89	5.70	6.20	4.17	4.29	4.68	4.89
DEC.	2.86	2.61	2.87	3.31	4.25	5.79	5.70	6.14	4.21	4.33	4.71	4.79
AVG.	2.82	2.77	2.72	3.10	3.84	5.01	5.84	6.23	5.13	4.08	4.53	4.78

MORRIS LLOYD MINES

LABOR
(CONTINUED)

The cost per ton for labor, surface, underground and total are shown on the following statement with previous years for comparison, viz:

COST PER TON FOR LABOR

SURFACE

	1913	1914	1915	1916	1917	1918	1919	1920	1921	1922	1923	1924
JAN.		.167	.205	.228	.189	.225	.294	.275	.242	.265	.208	.237
FEB.		.159	.211	.219	.178	.237	.279	.319	.211	.247	.217	.251
MAR.		.157	.175	.175	.173	.193	.267	.284	.196	.232	.202	.274
APR.		.172	.181	.189	.172	.205	.310	.346	.209	.280	.205	.251
MAY.	.208	.159	.16	.180	.159	.202	.290	.397	.200	.235	.247	.209
JUN.	.1756	.159	.169	.161	.176	.166	.251	.327	.369	.183	.188	.203
JUL.	.159	.234	.151	.180	.166	.181	.293	.333	.318	.183	.225	.219
AUG.	.173	.188	.20	.161	.170	.212	.276	.288	.314	.175	.214	.298
SEP.	.155	.203	.163	.182	.198	.212	.280	.287	.347	.212	.243	.260
OCT.	.182	.168	.164	.174	.229	.213	.258	.281	.254	.213	.225	.233
NOV.	.195	.160	.163	.187	.232	.354	.307	.338	.225	.210	.231	.250
DEC.	.166	.167	.173	.173	.254	.333	.300	.271	.239	.219	.289	.277
AVG.	.164	.172	.174	.184	.190	.229	.284	.309	.242	.214	.223	.225

UNDERGROUND

	1913	1914	1915	1916	1917	1918	1919	1920	1921	1922	1923	1924
JAN.		.868	1.027	1.043	.946	1.036	1.363	1.389	1.560	.911	.801	.873
FEB.		.868	1.003	1.072	.888	1.017	1.347	1.514	1.274	.891	.873	.872
MAR.		.957	.844	.831	.853	.952	1.394	1.465	1.304	.828	.812	.935
APR.		.971	.878	.836	.876	.985	1.545	1.589	1.262	.970	.871	.885
MAY.	.907	.873	.856	.757	.897	.927	1.320	1.499	1.125	.852	.904	.800
JUN.	.812	.842	.755	.702	.960	.907	1.320	1.505	1.556	.723	.740	.812
JUL.	.765	1.183	.673	.722	.907	.904	1.374	1.554	1.335	.648	.778	.734
AUG.	.828	.937	.753	.671	.851	.992	1.374	1.420	1.255	.650	.806	.837
SEP.	.826	.996	.746	.700	.869	.985	1.267	1.406	1.194	.752	.869	.854
OCT.	.854	.891	.74	.735	.954	.980	1.217	1.376	.946	.810	.816	.826
NOV.	.851	.878	.772	.798	.977	1.335	1.389	1.538	.952	.790	.861	.775
DEC.	.818	.873	.853	.840	1.075	1.311	1.333	1.586	.961	.872	.919	.850
AVG.	.781	.92	.811	.809	.921	1.028	1.354	1.482	1.248	.786	.834	.770

TOTAL

	1913	1914	1915	1916	1917	1918	1919	1920	1921	1922	1923	1924
JAN.		1.035	1.232	1.271	1.126	1.261	1.657	1.664	1.802	1.176	1.009	1.110
FEB.		1.027	1.214	1.291	1.066	1.254	1.626	1.833	1.485	1.138	1.090	1.123
MAR.		1.114	1.019	1.006	1.026	1.145	1.661	1.749	1.500	1.060	1.014	1.209
APR.		1.143	1.059	1.025	1.048	1.190	1.855	1.935	1.471	1.250	1.076	1.136
MAY.	1.115	1.032	1.016	.937	1.056	1.129	1.610	1.896	1.325	1.183	1.151	1.009
JUN.	.987	1.001	.924	.863	1.136	1.073	1.571	1.832	1.925	.906	.928	1.015
JUL.	.924	1.417	.824	.902	1.073	1.085	1.667	1.887	1.653	.831	1.003	.953
AUG.	1.001	1.125	.953	.832	1.021	1.204	1.650	1.708	1.569	.825	1.020	1.135
SEP.	.981	1.199	.909	.882	1.067	1.197	1.547	1.693	1.491	.964	1.112	1.114
OCT.	1.036	1.059	.904	.909	1.183	1.193	1.475	1.657	1.200	1.023	1.041	1.059
NOV.	1.046	1.038	.935	.985	1.209	1.689	1.696	1.876	1.177	1.000	1.092	1.025
DEC.	.984	1.040	1.026	1.013	1.379	1.644	1.633	1.857	1.200	1.091	1.208	1.127
AVG.	.945	1.092	.985	.993	1.112	1.256	1.638	1.791	1.490	1.000	1.057	.995

MORRIS LLOYD MINES.