into a raise put up along the foot. From this time through the entire year, two contracts were employed on each shift mining the floor pillar and extending the stope to the East. In May a new raise was put up to the 1570' Level, 60 feet North of the first, allowing us to continue mining back the floor pillar and keeping a second contract stoping to the North-east. The North-east limit was reached in October and the ore remaining on the foot taken.

This stope furnished about 20,000 tons of the year's product. The ore has been cleaned out as fast as it is broken, so that we can expect only a very small tonnage from this level the coming year. The ore has been lean in spots, fine grained and close texture and towards the North-east, banded with Jasper with a Silica content, between 10% and 12%.

In July contract No. 11 started a winze in the foot-wall at the East end of the stope on the 1710', preparatory to mining the floor pillar below. We expected to sink this winze between 25 and 30 feet and hole through into the stope below. By the end of the year, the winze was down approximately 64 feet, incline distance, all in high grade ore, and had not holed into the stope, showing ore still remaining on the foot.

When operations were resumed on the upper levels of the Pascoe Shaft on December 8th, a new contract was started South-east of the winze, to locate and open up the 15 feet of ore shown in Diamond Drill Hole No. 495. While the area on the level is small, we hope it will open up and connect with the main stope to the West.

1850' LEVEL:-

No mining was done above this level until the latter part of June when No. 6 contract put up a raise from the stope above the 1950' Level, and followed a leader of ore to the North, which widened to about 10' to 12'. This contract followed this ore up 35 feet when they struck the rock on August 10th.

The main operations were tramming the broken ore from No. 1 Stope and the stope to the South-west of the shaft, just above the main stope from the 1950' Level. These two places were cleaned out early in August, the fillers only working intermittently after June 1st.

1950' LEVEL:-

Contracts Nos.: 3, 5 and 6, were employed on this level and the stope above for the most part of 1925. While only 17.7% of the product was trammed from this level with three gangs breaking ore, there was a considerable tonnage of broken ore left in the stope.

Contract No. 3 outlined the ore body that was shown up by Diamond Drill Hole No. 469 on the sill floor. It looked to be but a mere pocket about 40 feet long and 15 feet wide. We stoped out this ore to a height of 20 feet and put in timber to enable us to continue upwards. As the stope advanced, it was carried back under the main stope, the floor of the main stope being the back of No. 3's place. In June a raise was started and holed through to the main stope in July. This gave No. 3 a new entrance to their stope and they started to take the back, or floor of the main stope. The ore body shown in Diamond Drill Hole No. 469 is a part of the main stope. There is a wedged shaped horse of Jasper between the two, about 20 feet wide on the level and pinching out 35 feet up.

The ore in this stope was all mined by September except the floor pillar of the 1850' Level. No. 3 then started a drift East of the main stope, driving South-east to mine the ore located by Diamond Drill Hole No. 536. As this ore is some distance above the level, after advancing 35 feet, a 60° raise was started. By December 31st, the raise was up 58 feet and still in rock.

Contracts Nos. 5 and 6 were engaged mining the floor pillar above the 1950' Level and extending the main stope to the east and west over No. 3. By July they had holed to the 1850' Level, at the South end of the stope. The hanging of this stope is Soaprock and broke away and mixed badly with the ore. It was our intention to leave a shell of ore in the floor of the level to hold back the Soaprock above. We had left an arched pillar in the stope between the stope and No..3's place. This pillar collapsed and allowed the broken ore on which the miners were working to drop away and it was necessary to underhand stope the balance of the floor pillar from the 1850' Level. This was brought back to within 25 feet of the winze to the stope below and stopped, on account of the drill working at the top of the winze. On October 9th between shifts in the morning, the floor broke away back to the winze.

The drill was not disturbed but some of the drill rods went down the shaft.

2470' LEVEL:-

The small stope just West of the shaft plat was sealed off. The partition across the drift has a small door in it, the idea being to provide a refuge chamber for the men on the lower levels in the Pascoe Shaft in case of fire. Both water and air connections are carried behind the partition. As the mine becomes deeper, we will provide another such chamber, for the men to go into, on one of the levels lower down.

2570' LEVEL:-

Contract No. 8 drifted Northwesterly along the hanging towards No. 9 winze. We were encouraged from time to time by a leader ore ore varying from a foot to 2½ feet in width. This drift was only worked intermittently throughout the year, we we were forced to take the men out on account of the floor pillar on this level above the 2670' Level stope starting to work, and causing the sides and back of this drift in the proximity of the old stope slabbing off. This portion of the drift was timbered in July so there was no danger to the trammers. The men have worked steadily since November 10th and better progress is being made as we are tramming the rock for the miners, which gives them more time for rigging up and drilling.

2670' LEVEL:-

No mining was done from this level during the year. The ore in the stope West of the shaft was practically cleaned out by the first of February.

The floor pillar underneath the 2570' Level contains a large tonnage of high grade ore and has shown signs of working during the year. Some ore has fallen away and we are in hopes it will be gradual for a sudden drop would cause an air blast that might do considerable damage to the shaft. A timber bulkhead was built on each side of the shaft in the drift leading to the stope, in an attempt to break the blast and reduce its effect.

In August, No. 8 contract had to be taken out of the 2570' Level drift and were brought to this level to drive a drift back of the shaft to hole into the stope to the 2570' Level. This drift was advanced to within 6 feet of holing into the stope and stopped.

This drift will be used as a filling place when the floor pillar of the level above drops. When this happens the last cut will be blasted through to the stope.

Early in November during the period the mine was idle, the back of the 2770' stope or the floor pillar of the 2670' Level collapsed; the hanging of this stope is Quartzite and was continually breaking away the entire distance from the 2770' Level. As this stope holed about 50 feet from the shaft, in order to prevent the hanging from dropping away and working back towards the shaft, a timber crib was built across the stope in front of the shaft.

2770' LEVEL:-

We were greatly encouraged with the ore showing at this elevation, opening up an area on the level of 1.75 square inches, which represents a stope 150 feet long by an average width of 29 feet. The ore lying against the hanging was Magnetite, and that on the foot the Specular ore. Both the foot and hanging had flattened to about 45°, which brought the stope to a very small area on the 2670' Level, in order to keep a safe distance from the shaft.

A contract of five miners were engaged breaking ore in this stope up until October 16th, when the mine was shut down on account of the wreck to the Pascoe Shaft. During this time the back of this stope came down. We hoisted approximately 19,000 tons from this level during 1925 and estimate 8,000 tons on the stull.

From April until June, No. 11 contract put up a raise along the foot-wall from the 2770' Level to the 2670'. This raise gave a safe access to the stope and improved the ventilation.

2840' LEVEL:-

Sinking of the shaft was temporarily stopped early in July and the cutting out of the plat for a new level started at this elevation. The plat was advanced 25 feet before sinking the shaft for the skip-pit. The first few cuts were in Soaprock and a great deal of time was spent timbering the back. Specular ore was encountered 16 feet from the edge of the shaft in the left half of the breast, the other half was Jasper. At 25 feet the ore had pinched down to about 2 feet with the rest of the breast in rich Jasper. We were surprised to have struck the ore so close to the shaft and for this reason anticipated a

very large ore body.

The Diamond Drill was moved to this level as soon as the miners returned to shaft sinking, and four holes were drilled from the breast. Only one of the four holes struck ore, No. 570 passed into Magnetic ore at 74 feet and cut 29 feet averaging 70.66 Iron. As the angle between holes was not large, it does not look very encouraging for an ore body of any size.

As it takes approximately one year to sink the shaft for a new level and drift to the ore, we are continuing to sink the shaft. At the same time, we aredriving a drift North-west into the hanging. When this drift has been advanced 200 feet, a drill station will be cut and drilling started to determine the extension of the ore downward. This is part of our exploration programme.

COST COMPARISON.

SUPPLIES.

GENERAL:-

The total amount of General Supplies used was more than last year, in spite of the fact that we operated more days in 1924 than the current year. The two items showing the largest difference is Diamond loss and wire hoisting rope. The Diamond loss for 1925 was $2,635.57, compared with $1,865.04 for the previous year. A greater footage was drilled in 1925 and the ground harder. The amount charged for hoisting rope was $3,755.80 in 1925, compared with $1,251.53 in 1924. A new skip rope was put on the No. 8 Shaft skip in January when the old one burnt off at the time of the fire in the rope slide. When hoisting was started from the new 2840' Level, Pascoe Shaft, it was necessary to splice in two pieces, as the rope on the drum was not long enough to reach this distance.

IRON & STEEL:-

The amount of Iron and Steel used was about one-half that for the previous year. Our records show that during 1924 we made up $1,576.00 of 1-1/8" drill steel, compared with $584.76 for 1925. The same is true of steel rails. Very few rails were taken underground the past year compared with $780.00 for 1924.

OIL & GREASE:-

The consumption of Oil and Grease shows a decrease of approximately $300.00 from the previous year, due in part to the fact that we operated only 240 days in 1925, thereby using less Engine Distilate, which is one of the largest items. The consumption averages approximately 50 gallons per shift.

MACHINERY SUPPLIES:-

The total amount for Machinery Supplies shows a large decrease for 1925. In 1924, we purchased from the Spies Mine pipe and Compressor at $7,000.00. This Compressor is used at the Republic Mine as a Booster. Another item of expense in 1924 was 2 - 10 ft. sheave wheels for the No..9 Shaft House, at a cost of $835.00.

EXPLOSIVES.				
KIND	QUANTITY	AVERAGE PRICE	AMOUNT 1925	AMOUNT 1924
50% Powder	75,210	.152	11,461.45	14,872.50
Total Powder	75,210	.152	11,461.45	14,872.50
Fuse	96,000	6.343	608.96	712.80
Caps	25,050	10.413	260.85	246.97
Tamping Bags	11,890	2.131	25.33	21.06
Cap Crimpers,	2	1.00	2.00	3.00
Cap Sealer				
Fuse Lighters				44.96
Total Fuse, etc.,			897.14	1,028.79
Total Explosives,			12,358.59	15,901.29
Product			72,314	75,511
Pounds Powder per ton of ore			1.04	1.28
Cost per ton for powder			.1585	.1969
" " " " Fuse, caps, etc.,			.0124	.0136
" " " " all explosives			.1709	.2106
Average price per pound for powder			.152	.154

Republic Mine on 6 double shifts basis Jan. 1st to Jan. 31st, 1925.
" " " 5 " " " Feb. 1st to Oct. 15th, 1925.
" " idle from Oct. 16th to Nov. 9th, 1925.
" " on 6 double shifts basis Nov. 10th to Dec. 31st, 1925.

The decrease in pounds of powder per ton of ore is due to less rock drifting in 1925. Also more ore hoisted during 1925 from old stopes and the mining of floor pillars and ore above the 2770' Level required less powder.

LUMBER & TIMBER:-

The cost of Lumber and Timber used in 1925 was $7,022.16 compared with $8,460.05 for 1924. We would have shown a large decrease in the timber used the past year, as we only built one new stull, except for the repairs to the Pascoe Shaft, which was made necessary by the caving in of the top portion and tearing out of 800 feet of skip-road. Further, the new portion of the Pascoe Shaft below the 2770' Level was in Soaprock and therefore required the placing of the sets close together.

FUEL:-

The amount expended for fuel will show a decrease because less coal was burned to produce steam for the Central Plant Compressor, on account of fewer shifts worked. Also we had an over-run on our coal pile on May 1st, which we spread over the balance of the year. With the operation of the Booster Compressor, we can make sufficient air by running one Water Power Compressor, which conserves the water during the late spring and summer, and allows us to secure a larger proportion of compressed air from this source.

ELECTRIC POWER:-

There is very little difference between the Electric Power consumed the past two years. The power charge for 1925 was $13,501.20, compared with $13,082.40 for 1924. While we operated less days and produced a smaller tonnage, the operation of the Booster Compressor added to our current consumption.

DAYS & SHIFTS.			
1924		1925	
DAYS	SHIFTS	DAYS	SHIFTS
255	55,154	240	46,706

While we were operating on a 5 day week basis during 1925, compared with 4 days for a portion of 1924, the mine was idle more days in 1925, on account of accidents to equipment. The large decrease in the number of shifts worked is due to our employing fewer men during 1925. On account of the small production, it was necessary to cut off every man possible.

WAGES.					
1924			1925		
SURFACE	UNDERGROUND	TOTAL	SURFACE	UNDERGROUND	TOTAL
$4.64	$4.76	$4.73	$4.64	$4.83	$4.77

The same wage schedule was in effect during both 1924 and 1925, and approximately the same labor was employed on surface. The increase in wages for underground labor is explained by the men laid off from underground being the lower rate.

PRODUCTION.			
1924		1925	
TOTAL TONS	DAILY AVERAGE	TOTAL TONS	DAILY AVERAGE
75,511	296	72,314	301

While we show a decrease in production of 3,197 tons for 1925 over 1924, our daily average is slightly larger. The production for each year is below normal for the Republic Mine and is due to the small developed tonnage available.

NUMBER OF MEN AND WAGES.			
1924		1925	
NO. MEN	WAGES	NO. MEN	WAGES
210	$264,511.89	172	$225,238.66

The decrease in total wages for the past year is due to the smaller number of men employed.

TONS PER MAN PER DAY.	
1924	1925
1.35	1.54

The increased tons per man per day, with approximately the same daily average hoist is on account of a smaller working force.

COST OF PRODUCTION.			
1924		1925	
COST OF PRODUCTION	COST ON CARS	COST OF PRODUCTION	COST ON CARS
$4.844	$5.712	$4.335	$5.185

The 1925 costs are estimated, as the December Cost Sheet has not been received from the Central Office.

We show a decrease Cost of Production for 1925 of approximately.50¢ over 1924, even with a slightly smaller production. The items showing the largest decreases are: Development in Rock, Development in Ore, Stoping, Timbering and Tramming.

There was less development undertaken during 1925 in both rock and ore than in 1924.

The decrease against stoping is due to less explosives used breaking ore, as we were mining floor pillars above the 1710' and 1950' Levels; also, on account of the character of the ore in the 2770' Stope, which broke away from the hanging with the drilling and blasting of few holes.

Less timber was used as the stope on the 2770' Level was the only one developed during the year, requiring a stull.

The tramming cost shows a decrease for 1925, due to a smaller tonnage handled and less labor furnished the fillers after July.

REPUBLIC MINE

AVERAGE MINE ANALYSIS ON OUTPUT FOR YEAR 1925.

GRADE	IRON	PHOS.	SILICA
Republic Bessemer Lump,	63.82	.044	
Republic Bessemer Crushed,	61.58	.045	
Republic Basic, Run-of-Mine,	60.80	.044	10.69
Republic Basic Lump,	64.64	.049	
Republic Basic Crushed,	60.98	.048	
Republic Pascoe Lump,	(No Production)		
Republic Pascoe Crushed,	59.29	.040	

AVERAGE ANALYSIS ON STRAIGHT CARGOES FOR YEAR 1925.

GRADE	Mine IRON	Mine PHOS.	Mine SILICA	Lake Erie IRON	Lake Erie MOIST.
Republic Bessemer Lump,	(No Shipments)				
Republic Bessemer Crushed,	(All Mixed)				
Republic Basic, Run-of-Mine,	(No Shipments)				
Republic Basic Lump,	64.22	.051	6.76	63.55	.17
Republic Basic Crushed,	60.83	.050	10.47	62.51	1.68
Republic Pascoe Lump,	(No Shipments)				
Republic Pascoe Crushed,	(No Shipments)				

REPUBLIC MINE

ORE STATEMENT - DECEMBER 31ST, 1925.

	RUN-OF-MINE BESS.	BASIC	PASCOE	BESS. LUMP	BASIC LUMP	PASCOE LUMP	BESS. CRUSHED	BASIC CRUSHED	PASCOE CRUSHED	TOTAL	TOTAL LAST YEAR
On hand Jan. 1, 1925,	-	655	4,381	-	5,285	-	12,150	88,879	4,177	115,527	93,834
Output for Year,	-	214	-	-	43,068	-	-	27,049	1,003	71,334	75,511
Transferred,	-	-	-	-	-	-	8,352	8,352	-	-	-
Stockpile Overrun,	-	-	-	-	980	-	-	-	-	980	0
Total,	-	869	4,381	-	49,333	-	20,502	107,576	5,180	187,841	169,345
Shipments,	-	-	-	-	45,407	-	8,352	19,843	507	74,109	53,818
Balance on Hand,	-	869	4,381	-	3,926	-	12,150	87,733	4,673	113,732	115,527
Decrease in Output,										3,197	
Decrease in Ore on Hand,										1,795	

1925 -- 2-8 Hour Shifts, 6 days per week, Jan. 1st to Jan. 31st, 1925.
2-8 Hour Shifts, 5 days per week, Feb. 2nd to Dec. 31st, 1925.

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

REPUBLIC MINE

SHIPMENTS FOR YEAR-1925.

GRADE	POCKET	STOCKPILE	TOTAL	TOTAL LAST YEAR
Republic Bessemer Lump,	174	36	210	144
Republic Basic Lump,	22,467	22,730	45,197	49,100
Republic Pascoe Lump,	-	-	-	-
Republic Bessemer Crushed,	4,551	3,801	8,352	-
Republic Basic Crushed,	996	18,847	19,843	4,333
Republic Pascoe Crushed,	-	507	507	241
Total,	28,188	45,921	74,109	53,818
Total Last Year,			53,818	
Increase,			20,291	

REPUBLIC MINE

COMPARATIVE MINING COST FOR YEAR

	1925	1924	INCREASE	DECREASE
PRODUCT	72,314	75,511		3.197
Underground Costs	2.966	3.526		.560
Surface Costs	1.041	1.013	.028	
General Mine Accounts	.324	.305	.019	
Cost of Production	4.331	4.844		.513
Plant Account	.032	.032		
Construction	.010		.010	
Taxes	.308	.340		.032
Central Office	.242	.256		.014
Contingent Expense	.164	.161	.003	
Cost Adjustment	.029	.022	.007	
Cost on Stockpile	5.116	5.655		.539
Loading & Shipping	.070	.057	.013	
Total Cost on Cars	5.186	5.712		.526
No.Days Operating	247	258		11
No.Shifts & Hours	2-8	2-8		
Avg.Daily Product	293	293		
COST OF PRODUCTION				
Labor	3.168	3.538		.370
Supplies	1.163	1.306		.143
Total	4.331	4.844		.513

REPUBLIC MINE

COMPARATIVE WAGES AND PRODUXT

	1 9 2 5	1 9 2 4	INCREASE	DECREASE
PRODUCT	72,314	75,511		3,197
No.Shifts & Hours	2-8	2-8		
AVG.NO.MEN WORKING				
Surface	51	56		5
Underground	126	157		31
Total	177	213		36
AVG.WAGES PER DAY				
Surface	4.64	4.63	.01	
Underground	4.83	4.76	.07	
Total	4.77	4.73	.04	
WAGES PER NO. OF 25 DAYS				
Surface	116.00	115.75	.25	
Underground	120.75	119.00	1.75	
Total	119.25	118.25	1.00	
PRODUCT PER MAN PER DAY				
Surface	5.07	4.97	.10	
Underground	2.20	1.85	.35	
Total	1.53	1.35	.18	
LABOR COST PER TON				
Surface	.914	.933		.019
Underground	2.201	2.569		.368
Total	3.115	3.502		.387
AVG.PRODUCT BRK'G & TRM'G	5.40	4.51	.89	
" WAGES CONTRACT MINERS	4.96	4.85	.11	
" " " TRAMMERS	6.62	6.21	.41	
" " " LABOR	5.35	5.14	.21	
TOTAL NO.OF DAYS				
Surface	14251-3/4	15207-1/4		955-1/2
Underground	32929	40733-3/4		7805-3/4
Total	47179-3/4	55941		8761-1/4
AMOUNT FOR LABOR				
Surface	66109.76	70440.77		4331.01
Underground	159128.90	194071.12		34942.22
Total	225238.66	264511.89		39273.23

Proportion Surface to Underground Men:

1925 - 1 to 2.47
1924 - 1 to 2.8
1923 - 1 to 2.48
1922 - 1 to 2.30
1921 - 1 to 2.51
1920 - 1 to 2.67
1919 - 1 to 2.81

REPUBLIC MINE

STATEMENT OF EXPLOSIVES USED FOR BREAKING ORE

KIND	QUANTITY	AVERAGE PRICE	AMOUNT 1925	AMOUNT 1924
50% Powder	75,210	.152	11,461.45	14,872.50
Total Powder	75,210	.152	11,461.45	14,872.50
Fuse	96,000	6,343	608.96	712.80
Caps	25,050	10.413	260.85	246.97
Tamping Bags	11,890	2.131	25.33	21.06
Cap Crimpers	2	1.00	2.00	3.00
Fuse Lighters				44.96
Total Fuse, Etc.			897.14	1,028.79
Total Explosives			12,358.59	15,901.29
Product			72,314	75,511
Pounds Powder per Ton of Ore			1.04	1.28
Cost Per Ton for Powder			.1585	.1969
" Fuse, Caps,Etc.			.0124	.0136
" All Explosives			.1709	.2106
Avg. Price Per Pound for Powder			.152	.154

Republic Mine on 6 double shifts basis Jan.1st to Jan. 31st, 1925.
" 5 " " Feb.1st to Oct. 15th, "
" idle from Oct.16th to Nov. 9th, 1925.
" on 6 double shifts basis Nov.10th to Dec. 31st, 1925.

REPUBLIC MINE.

REPUBLIC MINE.

ANALYSIS OF COST SHEETS FOR THE YEARS 1924 & 1925.

UNDERGROUND COSTS

EXPLORING IN MINE

Year	1924	$8,154.25
"	1925,	11,218.35
Increase for 1925,		3,064.10

This increase is due to the operation of one drill on a double shift from September 1st for the balance of the year, and putting a second drill to work November 30th, also on two shifts, compared with a single shift operation for one drill during 1924.

The cost per foot for 1925 also shows a slight increase due to a greater carbon loss, as the ground drilled was harder. The cost per foot for 1925 was $3.103 compared with $3.066 for 1924.

SHAFT SINKING

Year	1924,	$21,262.78
"	1925,	21,374.10
Increase for 1925,		111.32

The total cost shows an increase, but the unit cost per foot sunk was about the same each year, being $160.70 in 1925 and $161.10 in 1924.

Almost the entire distance sunk during the past year was in Soaprock and while the drilling time and powder costs were less, this was off-set by more timber used and time installing it.

ROCK DRIFTING

Year	1924,	$25,247.63
"	1925,	14,480.10
Decrease for 1925,		10,767.53

Although the expense for rock drifting is considerably less for the past year, the cost per foot shows an increase, being $23.76 for 1925 and $21.75 in 1924. We did only about half as much rock work during the past year as was done the year before, the footage being 610 feet for 1925, compared with 1,161 feet for 1924.

Further, the cost of drifting on the 2570' Level showed an increase, on account of the length of tram and intermittent operation. It was necessary to stop work on this level from time to time on account of the floor pillar of the stope in the vicinity of the shaft working.

DEVELOPMENT IN ORE

Year 1924,	$18,937.38
" 1925,	13,032.49
Decrease for 1925,	5,904.89

This account shows a decrease for the past year, due to the fact that new ore was not found and opened up at the same rate as the year previous. We had as a result fewer feet of ore drifting and raising. The total footage driven in ore in 1924 amounted to 698 feet of drifts and 256 feet of raises, whereas, in 1925, we had only 338 feet of drifts and 331 feet of raises.

STOPING

Year 1924,	$95,074.21
" 1925,	70,264.68
Decrease for 1925,	24,809.53

Fewer new stopes were developed during the past year and in order to keep up a uniform production, it was necessary to pull heavily on some of the old places. As a result of our 1925 operations, we hoisted a larger tonnage of ore than was broken during the year in the stopes. The small tonnage mined required less labor and supplies, which explains the large decrease in the stoping charge.

TIMBERING

Year 1924,	$15,422.07
" 1925,	11,597.61
Decrease for 1925,	3,824.46

Although only one new stull was built on the 2770' Level during the past year, extensive repairs were made to old stulls on the 1850' and 1950' Levels, and also to the Pascoe and No. 9 Shafts. This repair work added materially to the timbering costs. During 1924, the greater portion of the expense of timbering was for construction of new stulls.

TRAMMING

Year 1924,	$44,125.09
" 1925,	40,799.17
Decrease for 1925,	3,325.92

Decrease due to smaller product handled by contract trammers and less labor furnished them. The unit cost shows a decrease of $0.02 per ton, due to lower rate paid the contract trammers.

PUMPING

Year 1924,	$6,874.81
" 1925,	6,263.32
Decrease for 1925,	611.49

This decrease is due to less consumption of electric power from the McClure Plants. During our several shut-downs during 1925, all current for pumping was generated at our own plant at a very low cost.

COMPRESSOR & AIR PIPE

Year 1924,	$14,286.60
" 1925,	12,746.11
Decrease for 1925,	1,540.49

On account of fewer drilling machines being operated, in 1925, less air was consumed, taking less steam. We burned 770 tons of coal during the past year for the Steam Compressor, compared with 881 tons in 1924.

UNDERGROUND SUPERINTENDENTS

Year 1924,	$ 6,056.59
" 1925,	5,873.17
Decrease for 1925,	183.42

Decrease due to fewer shifts operated in 1925 compared with 1924.

MAINTENANCE ACCOUNTS

COMPRESSORS & POWER DRILLS

Year 1924,	$ 2,054.41
" 1925,	1,018.41
Decrease for 1925,	1,036.00

In 1924, a new piston was purchased for one of the low pressure cylinders on the compressors at the Water Power Plant. Further, less rock drifting was done during the past year, reducing the repairs to drilling machines, explaining this large decrease against this account.

HAND TRAMMING EQUIPMENT

Year 1924,	$5,333.02
" 1925,	2,724.71
Decrease for 1925,	2,608.31

On account of the little development work during the past year, only a small amount of new track was laid, and then no new material was used. In the previous year, new car wheels were put on all the cars on the 2070' Level and 160 new 20 ft. rail sent underground, making the cost high for that year.

ELECTRIC TRAM EQUIPMENT

Year 1924,	$2,427.32
" 1925,	2,081.50
Decrease for 1925,	345.82

The expense against this caption was high each year, as a new storage battery was purchased for the underground haulage locomotive in both 1924 and 1925. The small decrease for the past year is due to less minor repairs made to this equipment.

PUMPING MACHINERY

Year 1924,	$1,048.86
" 1925,	1,048.39
Decrease for 1925,	.47

The only unusual item of expense in the past year was a new gear on the pump at the bottom of No. 9 Shaft; this was off-set by the cost of re-winding the main Pascoe Shaft pump motor in 1924.

SURFACE COSTS

HOISTING

Year 1924,	$32,756.99
" 1925,	29,615.71
Decrease for 1925,	3,141.28

The operating expense for hoisting shows a large decrease for the past year, due to smaller production.

The labor cost for the two years shows a slight decrease for 1925, being $11,688.06 compared with $12,107.65 for 1924. This was due to not employing an extra hoisting engineer for several months after Hooper was killed. The proportion of Boiler House expense charged to hoisting decreased from $11,324.07 to $9,730.36 in 1925, and is due to a smaller part of the product coming from the upper levels of the Pascoe Shaft.

The electric power consumed shows a decrease for 1925 from $8321.40 to $7871.70, on account of the smaller tonnage hoisted through the No. 9 Shaft.

STOCKING ORE

Year 1924,	$ 9,369.79
" 1925,	8,286.60
Decrease for 1925,	1,083.19

In 1924, the Crushed ore was stockpiled the entire season, while during the past year we shipped from pocket for a month and a half. Continuous stocking of the fine ore required more trestle.

SCREENING & CRUSHING AT MINE.

Year 1924,	$ 2,448.72
" 1925,	2,414.83
Decrease for 1925,	33.89

Very little difference between the two years, as this is mostly a supply charge, and the operation for 1924 and 1925 was about the same.

DRY HOUSE

Year 1924,	$1,935.05
" 1925,	1,754.04
Decrease for 1925,	181.01

The decrease is due to less fuel burned to keep the Dry warm.

GENERAL SURFACE EXPENSE

Year 1924,	$5,218.55
" 1925,	5,555.01
Increase for 1925,	336.46

The bulk of the general surface expense consists of the wages of Surface Foreman, Mine Policeman and Watchman. The reason of this increase for 1925 is the work done to construct a new road to the West of the Company barn, to allow more stocking room for the Crushed ore.

MAINTENANCE ACCOUNTS

HOISTING EQUIPMENT

Year 1924,	$9,896.24
" 1925,	9,408.23
Decrease for 1925,	488.01

This decrease for 1925 is due to several extraordinary charges in 1924. The storage pockets on the motor haulage level were rebuilt; two new 10 ft. head sheaves for No. 9 Shaft House were installed and new wires for bell signals system put in the Pascoe Shaft from surface to the Motor Haulage Level during 1924.

SHAFT

Year 1924,	$8,515.03
" 1925,	14,196.09
Increase for 1925,	5,681.06

Although there is a large increase against the Shafts for 1925, the 1924 expense was heavy, due to re-timbering No. 9 Shaft in the so-called "Wide Shaft". Approximately $8,300.00 of the past year's charges is due to the repairs to the Pascoe Shaft, on account of the upper portion near surface caving in.

TOP TRAM EQUIPMENT

Year 1924,	$2,257.83
" 1925,	1,584.07
Decrease for 1925,	673.76

More rope was charged to the top tram in 1924 than 1925, explaining the decrease.

DOCKS, TRESTLES & POCKETS

Year, 1924,	$1,135.66
" 1925,	1,183.05
Increase for 1925,	47.39

This account shows but little change for the two years.

MINE BUILDINGS

Year 1924,	$2,879.97
" 1925,	1,262.40
Decrease for 1925,	1,617.57

The year 1924 showed heavy expenditures due to completion of rebuilding No..9 Dry; during 1925, repairs were made to the Central Plant Coal Dock.

GENERAL MINE ACCOUNTS

INSURANCE

Year 1924,	$1,156.59
" 1925,	1,001.52
Decrease for 1925,	155.07

Decrease due to smaller premiums charged against the Republic Mine.

ENGINEERING

Year 1924,	$1,570.67
" 1925,	1,483.80
Decrease for 1925,	86.87

Small decrease account of less time spent by the engineers at the Republic Mine.

REPUBLIC MINE.

SPIES-VIRGIL MINE.

The production for the year 1925 was 62,098 tons, of which 45,051 tons was Spies and 17,047 tons Virgil. This compares with 27,159 tons for the year 1924, all of which came from the Spies, as the Virgil drifts were just being driven. Further, there was no production from the Spies either for the months of January and February, 1924, as the shaft was being sunk and in June hoisting was suspended, as the grade of Spies ore was low and it was necessary to open up new territory.

The Virgil Mine was put on an operating basis April 1st, 1925, but no actual mining was started during the year. The ore hoisted was that encountered in the course of driving development drifts and raises, and for this reason was small and varied from month to month. The Spies output was uniform throughout the year until November 20th when shipments were completed. On account of the small tonnage remaining in the property, it was decided to hoist only the ore necessary to make room in the stopes and raises for ore broken in development work, and tram again when shipping starts in 1926.

The tonnage produced by grades for the year was as follows:-

GRADE	TONS
Spies Crushed,	45,051
Virgil Crushed,	17,047
Total Spies-Virgil,	62,098

SHIPMENTS.

We shipped a total of 64,294 tons to the Escanaba Docks. Part of this tonnage was forwarded via: The Chicago & Northwestern Railroad and part via: The Chicago, Milwaukee & St. Paul Railroad. Pocket shipments were not started until June 12th and were discontinued again on the 17th, and then resumed on June 20th, after which they were continued throughout the season until November 20th, when our season's requirements were filled.

A Steam Shovel was rented from the Zimmerman Mine of the M. A. Hanna Company for stockpile loading. On October the 27th, we had to release this Shovel and return it to the Zimmerman Mine at Stambaugh.

ANALYSIS

Year 1924,	$2,606.88
" 1925,	2,375.91
Decrease for 1925,	230.97

In charging out the Republic Mine Chemist's labor, a division is made, Laboratory and Shipping Expense. As we shipped more ore in 1925, less time was charged against Laboratory expense, explaining this decrease.

PERSONAL INJURY EXPENSE

Year 1924,	$2,899.18
" 1925,	3,787.90
Increase for 1925,	888.72

Although we had less accidents during the past year, the cost shows an increase because of the greater severity of them. There were thirty-two accidents in 1925, compared with forty-nine for 1924.

SAFETY DEPARTMENT EXPENSE

Year 1924,	$193.60
" 1925,	158.27
Decrease for 1925,	35.33

There was a small decrease for 1925, due to a less number of training periods during the year.

TELEPHONE & SAFETY DEVICES

Year 1924,	$891.43
" 1925,	880.90
Decrease for 1925,	10.53

This account shows but little change for the two years.

MINE OFFICE

Year 1924,	$13,703.72
" 1925,	13,773.49
Increase for 1925,	69.77

This increase is due in part to the purchase of a new typewriter for the Mine Office.

When we started to load again in November, we borrowed the Bates Mine Shovel. This Shovel was stored some 900 feet from the railroad track and had to be moved this distance on sections, which took two days. We were able to keep this Shovel until we had completed the season's requirements, when it was returned.

The initial tonnage was loaded from the Spies Stockpile on July 1st and was intermittent during the balance of the season. We also loaded from the Virgil pile on November 13th and 14th. Shipments from stockpile were completed on November 18th and from pocket on November 20th when stockpiling was resumed.

The total shipments from pocket and stockpiles from the Spies and Virgil properties for the year 1925 follow:-

GRADE OF ORE	POCKET TONS	STOCKPILE TONS	TOTAL TONS
Spies Crushed,	22,454	32,246	54,698
Virgil Crushed,	6,818	2,778	9,596
Spies-Virgil Total,	29,272	35,024	64,294

The Spies-Virgil ore was shipped as Spies Grade. The following table shows the cargoes for the season abd a comparison between the Mine and Lower Lake analysis:-

	MINE ANALYSIS				LOWER LAKE ANALYSIS		
STEAMER	TONS	IRON	PHOS.	SILICA	IRON	MOIST.	IRON NATURAL
Uranus	1279	57.03	.468	5.16	56.50	6.86	52.624
Munising	5877	56.09	.480	6.76	55.85	5.89	52.560
Angeline	4061	55.64	.492	8.22	55.55	6.41	51,989
Central West	4132	56.05	.482	6.71	55.36	6.46	51.784
Paisley	4468	55.45	.536	7.27)	55.60	6.12	52.197
Paisley	803	56.77	.573	4.58)			
Panay	5263	55.31	.493	7.64	56.20	6.24	52.693
Paisley	5264	55.39	.490	7.88	54.56	6.11	51.226
Cadillac	5358	54.70	.495	7.55	54.05	5.90	50.861
Central West	4536	55.46	.446	7.52	55.22	5.80	52.017
Paisley	2701	55.17	.466	7.85	54.76	5.60	51.693
Munising	5687	55.09	.503	8.47	55.00	6.28	51.546
Negaunee	5536	55.86	.458	7.08	55.50	6.08	52.126
Munising	5628	57.22	.423	5.57	56.95	8.00	52.394
Pioneer	5625	55.53	.474	6.95	55.72	5.90	52.433

It will be noted that in each case, except the Steamers Panay's and Pioneer's cargoes, the Lower Lake Chemists report a lower Iron than shown by the Mine analysis, and the Iron Natural is lower than the guarantee for the entire season. The Spies ore hoisted the latter part of the shipping season was below the average analysis, as we were cleaning out the old stope and

there was some lean material mixed with the ore; further, the high moisture in the Virgil ore which ran about 12.50%, brought down the Iron Natural below our years's guarantee.

The following is a complete analysis of the shipments of Spies and Virgil ore for the season 1925:-

	SPIES	VIRGIL
TONS	54,698	9,596
Iron	55.30	58.20
Phosphorus	.545	.448
Silica	7.75	5.35
Manganese	.14	.16
Alumina	2.97	2.76
Lime	.30	.70
Magnesia	.40	.36
Sulphur	.50	.093
Loss by Ignition	8.70	6.60

STOCKPILE BALANCES.

The following is the tonnage of Spies and Virgil ore in stock on December 31st, 1925:-

GRADE	TONS IN STOCK
Spies Crushed	147
Virgil Crushed (High Sulphur)	1,445
" " (Low Sulphur)	6,988
Total,	8,580

We show an over-run shipment from the Spies stockpile of 637 tons and estimate 5,000 tons more in the pile when stocking was resumed, so that our book figures of 147 tons only represents the tonnage dumped from November 20th to the end of the year.

The high Sulphur Virgil ore shown in stockpile is the dirt hoisted from the Fifth Level development drift and averages .451 Sulphur. This ore is not merchantable and should be considered a waste pile.

DIVISION OF PRODUCT BY LEVELS.

The tonnage trammed from the various levels during 1925 is as follows:-

LEVEL	PROPERTY	TONNAGE	PER CENT OF PRODUCT
First Level	Spies	15,795	25.4
Second "	"	13,767	22.2
Third "	"	15,489	24.9
Fourth "	Virgil	15,602	25.2
Fifth "	"	1,445	2.3
Total		62,098	100.0%

We show a very small reserve tonnage in the Spies and we feel that during 1926, the percentage of product will be reversed, i.e., about 20% from the Spies and 80% from the Virgil.

PRODUCTION BY MONTHS.

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

MONTH	ROCK	SPIES	VIRGIL	TOTAL	NO. DAYS OPERATED	AVE. DAILY PRODUCT	TONS PER MAN PER DAY
Jan.,	2332	3890		3890	26	150	3.73
Feb.,	1546	3373	1104	4477	24	228	2.50
Mar.,	1706	3896	1175	5071	26	195	2.12
Apr.,	514	4228	1498	5726	26	220	2.78
May,	150	4180	1923	6103	25	244	2.81
Jun.,	508	4638	2286	6924	25	259	2.69
Jul.,	850	4983	1206	6189	26	215	2.37
Aug.,	1484	4681	852	5533	26	198	2.21
Sep.,	1216	4149	1546	5695	25	228	2.49
Oct.,	1094	3701	1056	4757	20½	232	2.05
Nov.,	952	2653	1657	4310	24	180	2.00
Dec.,	828	42	2744	2786	23½	119	1.19
Total	13180	44414	17047	61461	297	207	2.37
Over-run		637					
Grand Total	13180	45051	17047	62098	297	209	2.39

On January 1st, 1925, we only showed 24,748 tons of Spies ore, developed and available for mining. During the year we develpped additional ore above the Third Level, West lens, which allowed us to keep up a steady production until November 20th, when shipments were stopped. While we are continuing to develop and do some mining on the Spies property, we are only hoisting what is necessary to make room for the ore broken.

The Virgil product is that secured in driving development drifts and raises and varies from month to month. The ore body on the Virgil is showing up so large that it is taking longer to develop than we anticipated, and it will probably be well into 1926 before actual mining can be started.

DELAYS.

There were many minor delays during the year from various causes. On account of the small product we handled and short duration of the delays, we were able to secure our usual hoist and suffered no loss of product.

The following is the list of delays of a more serious nature:-

DATE	DURATION	CAUSE	TONNAGE LOST
Oct. 13) Oct. 19)	4½ days	Crank shaft on 2nd Pump in 5th Level Pump House broke	975
Oct. 19	1 shift	Lack of current account of snow storm	125
Nov. 4	4 hours	2" pipe being hoisted on cage caught in Shaft	25
Dec. 28) Dec. 29)	2½ shifts	Skip caught in Shaft and rope broke	155

On September 8th, the crank shaft on one of the Prescott Pumps in the Fifth Level Pump House broke. A new one was ordered immediately by wire. As the water had decreased materially during the past few months from the Virgil development, we felt perfectly safe with the other pump, as it was only operating about two-thirds of the time. On October 13th at 3:15 A.M., the crank shaft of the second pump broke in exactly the same place. As the new crank shaft for the first pump had not been received, emergency measures had to be taken to handle the water below the Third Level.

Immediate steps were taken to plug all the deep drill holes on the 90' Sub-Level and also build a dam on this Sub to hold back the water.

The flow was reduced from about 250 gallons per minute to a little more than 100 gallons per minute. The main sump was about empty when the pump broke and with the reduced flow held the water until five o'clock on the afternoon of October 13th. In the mean time, a timber dam was built in the Fifth Level drift, and when the main sump was filled, the water was diverted behind this dam.

We had an Aldrich Pump on surface that had been located on the Fourth Level and used until the Fifth Level Pumps were put into commission. This pump was again installed on the Fourth Level, and at the same time, the second pump with the broken crank shaft was fixed so as to work with one pole. The Aldrich pump was ready for operation on the 16th and handled the water from the Fourth to the Third Level.

A centrifugal pump of 300 gal: capacity for a 1400 foot head was shipped by trucks from Ishpeming. Installation of this pump was started on the 16th, and as the cage was needed for taking the pump underground, operations were not re-

sumed until Monday, October 19th. On account of the large amount of piping and connections into the discharge line, the pump was not ready to operate when the crank shaft for the first pump arrived. This new crank shaft was installed and pump ready to operate on October 30th.

The crank shafts on the pumps as originally designed were cast steel. The new ones are drop forgings and much stronger in construction.

On October 19th, underground operations were resumed, but were compelled to send the men home again, as there was a lack of current, due to a severe snow storm the day previous. We were only allowed to run our pump, but unable to hoist or run the compressor.

There was a delay of a half shift in hoisting operations on November 4th. A 2" pipe line was installed at the time of the pump trouble in October, to cerry the Fourth Level water back of the dam on the Fifth Level. This pipe was new material and had been dismantled. A cage load of the pipe was being hoisted to surface, when the rope with which it was lashed to the hoisting cable became loose and some of the pipes caught in the shaft timber. No damage was done to the shaft or other equipment, but it took considerable time to cut the pipes that had embedded themselves in the timber. We were able to make up part of the loss of product.

A new skip was put on between shifts on the evening of December 28th, The skip was lowered through the shaft to make sure that it would go down without trouble. After it had reached the bottom of the shaft, as our cage and skip are in balance, it was hoisted just far enough to allow the cage to be out of the cold air. At seven o'clock, when the pumpman went down, the cage was hoisted to surface and then lowered to the Fifth Level. It happened that the Electrician was going to do some work on the motor underground and went down with the pumpman. When the skip reached a point about 100 feet below the Third Level, it partly dumped and caught under one of the shaft timbers. The hoisting Engineer did not know anything had happened until he noticed the skip rope getting slack on the drum. He turned off his power and set his brakes. The men on the cage stated that the only unusual thing they noticed was that the cage seemed to drop faster and then slow up as if they were going in the opposite direction. They heard the skip go bye but it was not making any unusual sound.

An inspection was made of the cage road before the cage was lowered and it was found that the lag screws with which the cage runners are fastened were knocked loose, and some were extending out into the cage compartment and one divider broken just above the Fifth Level.

The skip that had been taken off for repairs was put back. The rope broke about 25 feet from the end attached to the skip. Before the rope was put on the skip, a piece about 4 feet long was cut off from the broken end. This piece was in the shop and after the ice was melted off, it was examined and found to be very brittle and many of the wires broken and pitted from the action of the water. Althougn the skip was attached to the rope, the Captain would not allow the timbermen to ride the skip for inspecting the cage road. The rope was changed end for end the next day. An inspection of the skip-road showed only slight damage to a number of runners, which were temporarily repaired and changed later. Hoisting was resumed after mid-night of December 29th.

We are at a loss to know what caused the skip to dump. Our only theory is that as the skip passed the new Fourth Level, which is being opened up 180 feet below the Third Level, a piece of the rock that might have been on the shaft timber, wedged itself between the skip and casing plank and finally forced the skip to dump. In starting this new level, the skip is spotted here and the rock shoveled direct into the skip, and it is possible that some may have lodged on the timber.

The skip was hoisted to surface on Sunday, January 3rd, and did not appear to be badly damaged. The skip rope was new on February 8th, 1925.

ORE ESTIMATE.

ESTIMATE OF ORE IN SIGHT IN THE SPIES PROPERTY ON DECEMBER 31ST, 1925, IS AS FOLLOWS:-

LEVEL	TONS DEVELOPED	TONS PROSPECTIVE	TONS AVAILABLE	TONS UNAVAILABLE
Second Level North Lens Back Pillar	2,480		2,480	
Second Level North Lens-Floor Pillar	3,200		3,200	
Third Level North Lens Back Pillar	2,150		2.150	
Third Level North Lens-Ore below Level		5,530		5,530
Third Level Main Stope Back Pillar	5,000		5,000	
Ore shown by D.D.#6,		19,962		19,962
Totals	12,830	25,492	12,830	25,830
Grand Total,	38,328		38,660	

ESTIMATE OF ORE IN SIGHT IN THE VIRGIL PROPERTY ON DECEMBER 31ST, 1925, IS AS FOLLOWS:-				
LEVEL	TONS DEVELOPED	TONS PROSPECTIVE	TONS AVAILABLE	TONS UNAVAILABLE
Ore above 4th Level to 245 ft.Sub-Level (New 5th Level)	646,557		646,557	
Ore above 245' Sub-Level(New 5th Level)	157,335		157,335	
Ore below 4th Level (New Sixth)		708,294		708,294
Total	803,892	708,294	803,892	708,294
Grand Total	1,512,186		1,512,186	

The ore reserves including prospective ore, Sub-divided in grades, between Spies and Virgil, are as follows:-

GRADE	AVAILABLE	UNAVAILABLE	TOTAL
Non-Bessemer Spies Ore Developed	12,830		12,830
" " " " Prospective		25,492	25,492
Non-Bessemer Virgil " Developed	803,892		803,892
" " " " Prospective		708,294	708,294
Total Spies-Virgil Ore	816,722	733,786	1,550,508

On January 1st, 1925, our estimate of ore reserves on the Spies showed 24,748 tons of ore available. During the year, we mined 45,051 tons and have 12,830 tons available January 1st, 1926, showing a development of 34,000 tons. At the present time we can see little hope of developing any large tonnage, except that located by Diamond Drill Hole No. 6.

We feel that our estimate of Virgil ore of 1,500,000 tons is most conservative and that as development progresses, this tonnage will be at least doubled.

We have not taken into account any tonnage as developed by the Fifth Level drift, as this is so high in Sulphur that it is not merchantable and therefore not classed as ore.

The following is the estimated tonnage and expected analysis of the 1926 production from the Spies and Virgil Mines:-

GRADE	TONS	IRON	PHOS.	SILICA	SUL.	MOIST.	IRON NATURAL
Spies Crushed,	12,000	55.00	.500	7.50	.135	5.50	51.98
Virgil Crushed,	76,000	58.00	.490	4.50	.090	10.50	51.91
Total,	88,000	57.59	.491	4.91	.096	9.82	51.92

GENERAL.

LABOR:-

The labor situation in the Iron River District was very good during the entire year and as far as the Spies-Virgil operations were concerned, we were able to maintain full crews up until November. Early in the Spring we lost a number of miners because we were unable to give them houses in our location. This situation improved almost immediately as the Rogers Mine closed down and the Homer and Davidson Mines reduced their underground forces. Our greatest difficulty was securing miners experienced in putting up cribbed raises.

In November when some of the mines in the district increased their crews, we suffered as a result. Also, we have a number of miners working for us, who were formerly employed at the Rogers Mine, that will probably return there when the mine is started up January 4th. There are very few men looking for work now.

As we develop the Virgil property and employ more men, it is very necessary that we build more houses in order to maintain a steady class of miners.

ENGINE HOUSE:-

The floor in the new Power House was finally finished by Contractor Proksch of Iron River. The area back of the new air Compressor was filled in with flooring and the gutter that carries the steam and water pipes below the floor line on the North, South and West sides of the building was covered over.

The floor man in the Power House spent all his spare time chopping out the concrete foundation of the old Compressor, which stood in the South-West corner. This was very slow work as it was impossible to do any blasting and on account of the large amount of re-enforcing material used. This was started in April and completed in June. The floor was patched and the entire surface given several coats of grey concrete floor paint. Strips of rubber matting were placed around the machinery and where most of the walking is done.

The engineers and floor man take a great deal of pride in the appearance of the building and have plants and vines around the place on neat stands.

We feel we have the best looking Power House of any of the Company Mines.

EXPLORATION:-

The exploration work was partly in the nature of development and done with a Deep Hole Machine, Model 34 Waugh Turbro Drifter, manufactured by the Denver Rock Drill Company. The bit is shaped the same as the ordinary rock drill and varies in guage from 3¼" to 2-3/8" with 1/8" difference in each change. The rods vary in length from 2 to 9 feet and are connected with threaded couplings. The water is supplied under pressure through a water swivel.

In order to secure the best results, we found that it is absolutely essential to get the first two bits in as far as possible. If we can get the starter and the next change in 50 feet each, we can drill a fairly deep hole. It requires a water pressure of approximately 250 lbs. per suare inch if it is desired to drill beyond a depth of 75 or 100 feet.

The vertical angle of the hole, above the horizontal, is a very important factor bearing on the speed and depth of drilling. We found that fifteen degrees was most satisfactory. With this inclination the sludge can be quite readily cleaned from the hole by the water supplied through the drill rods; whereas, if the hole is much flatter, say ten degrees, it is necessary to withdraw the rods and wash out the sludge by means of an auxiliary ¾ inch pipe. Further, with a flat hole, the rods cause more friction and there is a loss of power and reduces the depth that can be drilled.

We drilled twenty-five holes having a total depth of 2717 feet, at a cost of $3208.65, or a cost per foot of $1.18.

The following table shows the location and depth of hoes drilled:-

HOLE NO.	LOCATION	DEPTH OF HOLE	FOOTAGE OF ORE
17	Fourth Level	99'	20'
18	"	240'	None
19	Fifth Level	183'	"
20	Fourth Level	108'	25'
21	90'Sub-Level	120'	50'
22	"	106'	106'
23	"	38'	38'
24	"	116'	115'
25	"	125'	95'
26	"	102'	50'
27	"	55'	35'
28	"	55'	5'
29	"	56'	10'
30	"	36'	25'
31	"	78'	45'
32	"	308'	308'
33	"	140'	55'
34	"	195'	130'
35	"	197'	197'
36	"	37'	5'
37	"	50'	None
38	"	36'	"
39	"	92'	92'
39A	"	123'	100'
40	Fourth Level	22'	None

While we drilled our second hole 240 feet, just 10 feet short of the record with this machine made by the Chief Consolidated, we later broke the record in Hole No. 32, when we reached a depth of 308 feet. This hole was stopped as it was up to our West boundary. There is no doubt that we could have drilled deeper, as the rods were turning freely and the sludge was coming back without difficulty.

The water returned from the hole is run into a standard sludge box and samples taken every 5 feet. As the Virgil ore does not cave readily, we feel our samples are fairly accurate. Experience, however, taught us that this machine is not satisfactory in hard cherty ground. The bits lose their gauge quickly and it is impossible to drill to any great depth.

For the purpose we used the drill to locate the rock walls from a main cross-cut in the ore, it is most satisfactory and is a quick and cheap way to get this information. We expect to use this drill to out-line the ore body on the 245' Sub-Level, which will be the new Fifth Level.

SURFACE.

GENERAL:-

The mine and location premises were cleaned up of the winter's accumulation of dirt and rubbish in April and kept in a neat condition the balance of the summer. The fence started last year was completed around the mine building and gates installed, so as to keep the cattle out. As the team was available, rock and cinders were spread on the roads which improved the roadways about the mine. A road was constructed around the new Engine House and then the ground inside the road leveled off and grass seed planted. Dirt was hauled and planting spaces made on the North side of the Shops building, and also to the West of the Office. The edge of these plats were lined with large boulders and whitewashed, which set the grounds off and made things look very neat.

A space was leveled off West of the Coal Dock so that the men driving to work could park their cars in an orderly way. A place was brushed out on the Virgil property just West of the Dry and benches built among the trees for the men to eat their lunch during the hot weather; previously, they were without shade.

The location cess-pool was cleaned out in August and the over-flow ditch deepened to carry away the excess of water. On account of the clay soil, there is very little absorption and the cess-pool is a continual source of trouble.

COAL DOCK:-

A contract was let to A. H. Procksch of Iron River for the construction of a new Coal Trestle. The original one built in 1916 was in very bad condition, all the timbers being rotted out. Work of wrecking the old dock was started the last of July. As we had quite a stock of coal on hand, this had to be moved to one side to permit the setting of the new bents.. The new dock is only eight bents long which is large enough for our supply use for the Dry and heating the mine buildings. The dock was completed the middle of August and our winter's supply of coal dumped during September.

SHOP BUILDING:-

The old Engine House which was converted into a Blacksmith Shop last year, was lined with Toncan Metal, in order to cover the interior wood work and make the building more fire resisting. All of the wiring was changed and put into conduits. It was originally planned to gunite the interior of this building, but experience at the Republic Mine Dry proved this to be impractical and much damage would result to all of the equipment in this new shop building, unless the latter was securely covered with a tarpaulin.

We also found that the expense of sheathing the wall with Toncan Metal was only approximately half of the cost of guniting.

The doors and window frames were painted and the floor, which was quite rough due to the removal of the old hoist and Compressor foundations, was evened up. It is our intentions to put a concrete floor in this building.

OIL HOUSE:-

A concrete floor was put in the Oil House and foundation footing placed under the sills. Steam was put into the building early in the fall.

IRON & STEEL RACK:-

An iron and steel rack was built to the South of the Shop building. Old pipe set in concrete piers were used as uprights. Before setting the pipe, They were flattened at two foot intervals and rail riveted to them for cross girts, to hold the iron and steel. It was covered with a plank roof with asbestos roofing paper. The use of this rack will keep the outside of the Shop building in a neater condition.

TRESTLES:-

The two bents of the permanent trestle on either side of the railroad track, due to the dumping of the ore at the end, had been pulled out of line, and the top sollar was badly decayed. These bents were straightened and the entire sollar renewed with 4" plank.

In November, contractor Proksch erected a new temporary trestle. Ten bents were added to the end of the Spies permanent trestle and a branch of five bents taken off of the second temporary bent. The main trestle will be used for stocking Virgil ore and branch for Spies.

In past years we stocked our ore without a trestle, using an end dump car and building out as the ore was stocked. With this method, it is necessary for the men to ride out on the car to swing and dump it. As we had several accidents to men being thrown off the car, it was decided to use a self dumping car from a trestle.

Fire broke out in the rock pile early in November and it will be necessary to start scraping and spreading it. We did not anticipate any trouble as the rock dumped the last year carried less Sulphur and there was considerable Iron formation rock mixed with the Black and Grey Slates. In order to prevent fire from starting in this rock, it is absolutely necessary to keep the pile as low as possible,

After Contractor Proksch completed the temporary ore trestle, We had him put up four bents, branching off the old Virgil trestle near the old Shop building, and we are stocking the rock on the high ground to the Northeast. This will allow us to keep the height of the pile down to about 14 feet and for some time to come the tram will be shorter. Arrangements are being made to spread the part of the pile that is now on fire.

SHAFT HOUSE:-

The Spies Shaft House was constructed to handle but one grade of ore. In order to be able to ship both Spies and Virgil ore from pocket, the loading pocket was divided into two compartments. The partition was placed so that one compartment would hold a railroad car of either grade and the other could be dumped through the smaller one direct into the railroad car. A deflector was installed in the chute from the Crusher, so as to divert each grade into their respective compartment in the loading pocket.

We have had more or less trouble during the winter months at the Spies Mine, with the ore freezing on the dump lip and also in the Crusher and chutes. This condition existed in spite of the Spies ore being comparatively dry. Now that we are hoisting Virgil ore, which is saturated with water, this condition will be worse than in the past.

In order to improve this condition we have enclosed the skip and cage compartments from surface to the dump with No. 24 gauge galvanized, corrugated sheet iron, and will install two stoves at different places so the heat will

strike the parts where the ore freezes. The enclosing of the shaft house was done by Contractor Proksch. This work was done in December. Two by four nailing strips were bolted to the shaft house members and the galvanized iron sheets nailed to the strips with zinc strips. The sides where the sheets over-laped were riveted with copper rivets. On account of the Sulphur in our mine water and fumes from the rock-pile, we used zinc nails and copper rivets in doing this work.

STOCK - PILES:-

We started stocking Virgil ore the latter part of January, when we encountered it in the Fifth Level drift. This ore proved to be very high in Sulphur. The ore on the Fourth Level was struck on March 10th. Just as soon as it became apparent that the ore on the Fourth Level was low in Sulphur, we made arrangements to stock this ore separately from the Fifth Level ore. We added three bents to the Virgil trestle and the Fourth Level ore was dumped from the end of the trestle and in this way kept separate.

The Spies pile was cleaned up during the past season except for approximately 5,000 tons, which was left to the West of the stocking ground, close to the Coal Dock approach. As we expect to hoist a very small tonnage of Spies ore until shipping is started, the Virgil ore is being dumped from a trestle along the center part of the old Spies ground, and the Spies ore from a branch trestle leading to the pile of Spies ore left from last season.

Both grades are being stocked on the West side of the railroad track.

UNDERGROUND.

SPIES DEVELOPMENT:-

No Diamond Drilling was done underground and the only new ore developed in the Spies Mine proper, was a new stope being opened up above the main West Third Level drift, going over towards the Virgil property. This territory was developed by raising and drifting, opening up a stope 75 feet long by 40 feet wide. This ore connected with the main stope on the 642' and 662' Sub-Levels, but on the upper Sub-Level it was cut off by the hanging. We are still developing and following this ore to the West and have crossed the line between the Spies and Virgil.

At this point the ore is only about 15 feet wide and mixed with seams of yellow ochre which lowers the Iron content. We do not anticipate opening up much of a stope, as we work West, and the mining will be in the nature of a scram.

VIRGIL DEVELOPMENT:-

Development drifting was continued on the Fourth and Fifth Levels during the early months of the year and then extended to raising and drifting on Sub-levels above the Fourth Level.

We struck ore on the Fifth Level the latter part of January, which at first was very encouraging, as we did not anticipate getting any ore in the main motor level haulage drift, until we reached a point about 400 feet farther West. We drifted through 169 feet of ore running fairly uniformly high in Iron content; some of the samples averaging as high as 65% in Iron. Unfortunately, though, the Sulphur also was exceedingly high, as there is considerable Gypsum in the ore. The ore is soft and entirely different from the regular Spies Mine ore, and looks more like the Hematite ore on the Marquette Range. There is a possibility that this is the same ore that we encountered in the Fourth Level drift, 250 feet above and 200 feet nearer the shaft. In October, 1924, we cut through 30 or 40 feet of low grade ore in the Fourth Level drift which came in the bottom of the drift on the South side, and then gradually disappeared again, dipping towards the West.

On account of the high Sulphur in the Fifth Level ore, all development work was stopped early in March and nothing more done for the year.

The following is the tonnage produced from the Fifth Level drift and average analysis of same:-

TONS	IRON	PHOS.	SILICA	SULPHUR
1445	59.56	.358	3.48	.451

The main drift on the Fourth Level encountered ore on March 10th and we were greatly encouraged after the disappointment on the Fifth Level, to find the ore running low in Sulphur. This was watched very closely and the 210 feet of ore cut in the main drift averaged .090 Sulphur, which is less than the average in the Spies Mine ore.

This drift was headed for Diamond Drill Hole No. 50, and planned to strike the ore in about the center of the ore body found.in the drill hole. This was the first hole drilled by our Company on the Virgil lease, encountering 170 feet of ore, from a point 890 feet below surface to a depth of 1060 feet. The drill hole shows an average of 58.47 Iron and .447 Phosphorus. No Sulphur determinations were made while this hole was being drilled. Diamond Drill Hole No. 8 drilled by the former operators, is located 120 feet South of Hole No. 50 and shows 120 feet of ore from 990' to 1110'.. The ore in drill hole No. 18 ran 56% Iron. The average Iron of the first 130 feet of ore in the Fourth Level drift was better than 60%. The development on the 90' Sub-Level and in No. 404 raise have proved conclusively that the Fourth Level ore body is low in Sulphur, which is very encouraging, as the possibilities of a very large ore body above and below this elevation is assured.

As soon as we had drifted 50 feet through the ore on the main level, No. 410 raise was put up and the 90' Sub-Level developed 26 feet above. A drift was driven both North and South from this raise and showed up a total of 450 feet of ore, which is the length of the ore body at this elevation. Further, development to determine the width was done with Deep Hole Drill machines. Nineteen holes were drilled to locate the foot and hanging rock and the outline of the ore at this elevation is well defined. The area on the 90' Sub-Level is approximately 87,000 square feet or 7,250 tons per foot of height. While we have only estimated 1,512,000 tons of ore in sight on the Virgil property as of December 31st, 1925, we are optimistic enough to feel that further development will double this tonnage.

The analysis of the ore is also very encouraging. The following tabulation shows a comparison of the analysis of the ore in Diamond Drill Holes Nos.: 50, 51 and 52; of the development drifts on the 90' Sub-Level and the Deep Drill holes on the same Sub-Level:-

	IRON	PHOS.	SILICA	SULPHUR	MOIST.	IRON NATURAL
Diamond Drill Holes Nos.:50, 51 & 52,	57.91	.488	7.30	.141	10.50	51.83
Deep Drill Holes,	59.70	.490	5.55	.099	10.50	53.43
Development drifts,	59.65	.490	5.50	.082	10.50	53.39

Raise No. 410 was extended to the 165 foot elevation and a drift driven as far North as the one on the 90 foot Sub-Level. This drift was all in Iron formation, except about 60 feet of ore, showing this drift to be in the hanging and that the ore cut corresponds to the finger of ore located by Drill Hole No. 32 on the 90' Sub-Level.

Diamond Drill Hole No. 51 shows ore at the highest elevation. Raise No. 404 was put up to follow this up. This raise was started in black slate, striking ore 63 feet above the Fourth Level, while according to the information of Hole No. 51, we did not expect to strike ore until the raise was up 88 feet, or 25 feet higher. This raise was extended to the 245' Sub-Level and then pushed up 57 feet further to the rock. The back of the raise is to the North of Hole No. 51, bringing out the fact that this hole struck the ore at the highest point and that the hanging dips both to the North and South, as shown by this raise and Diamond Drill Hole No. 53 to the South.

As we have developed ore in raise No. 404 to a height of 237 feet above the level and Diamond Drill Hole No. 51 shows it 341 feet above, we have decided to develop two intermediate levels, 180 feet apart. The new Fourth Level has been started from the shaft approximately 185 feet below the Third Level and the new Fifth Level is being developed from No. 404 Raise on the 245' Sub-Level. As soon as the plat on the new Fourth Level has a good start, the new Fifth Level will be started from the shaft and developed from both ends. The old Fourth Level will become the Sixth, and the old Fifth, the Eighth, allowing for an intermediate level between the old Fourth and Fifth, which are 250 feet apart.

PUMP HOUSE AND SUMP:-

The sump was entirely finished in January including the raise which connects the bottom of the sump with the "clean out" drift, 50 feet below the Fifth Level, to the bottom of the main shaft. A dam 10 feet thick was also put in this raise, through which is inserted an eight-inch pipe, together with a shear valve, which can be closed quickly when cleaning out the mud.

During March we white-washed the walls of the Pump House, not only to make the interior look more attractive, but also to prevent the sluffing off of the softer seams of slate.

All the machines, frames, pipe and conduits were painted with a black acid resisting paint and the Pump House looks very neat and clean.

We have had considerable trouble with the Prescott Pumps. First, we had trouble with the valves and it was necessary to make new valve seats for all the chambers. Then on September 8th, the crank shaft on No. 1 Pump broke, before this pump was repaired, the crank shaft on No. 2 Pump broke in the same place,leaving us without any equipment to handle the water below the Third Level. Emergency measures were taken, by plugging all drill holes, building dams on the Fourth and Fifth Levels to hold back the water and installing other pumps.

The crank shafts on the pumps were cast steel, but were replaced with forged ones. There is an over hanging bracket carrying one of the bearings of the gear. This bracket is bolted to the main frame of the pump but vibrates up and down to a considerable extent. It is our opinion that on account of the movement of this end bearing of the shaft, there was a bending movement near No. 3 Pole, causing it to crystalize and finally break. Both shafts broke in the same place. We are going to build a concrete pier under these brackets and try to eliminate the movement.

During December we discovered a sand hole in the casting of the pump between two of the discharge chambers. This caused a knock in the pump. This part of the pump has been sent to the General Shops at Ishpeming for repairs.

We did intend to put in a water tight door at the entrance of the Pump House, but on account of the broken up condition of the slate and the impossibility of making a water tight job without going to considerable expense, it was decided not to go ahead with it.

TRACKS:-

The rail on both the Fourth and Fifth Levels were bonded with the electric welding outfit. This work was completed in February.

All switches in the Fourth Level track are equipped with safety signal lights. Electrical connections are made so that when the switch is thrown for the main line, a green light shows and for a turn-out or cross-cut, a red light. These work automatically with the throwing of the track switch lever.

UNDERGROUND SPIES MINE.

From three to four gangs were employed on the Spies property throughout the year. The stoping was confined to the Sub-levels above the First Level North lens, and the Third Level, West Stope. Also the floor pillar on the First Level, North lens, was taken. During December mining of the floor pillar North lens on the Second Level was started.

900' SUB-LEVEL:-

No. 1 contract cleaned out the ore during January that remained at this elevation in the North Stope of the North lens. They then moved to the South stope and found the ore extending further to the North and East than we had anticipated, and were engaged here until July. We thought this ore would connect up with the stope to the North, but found that there was a horse of rock at this point, about 15 feet thick.

875'-845 '-825' SUB-LEVELS:-

Contract No. 2 took the pillars left between the main stope and North lens. These pillars had been left to hold the hanging up and prevent the leaner material from mixing with the clean ore. We completed removing these pillars in October.

FIRST LEVEL:-

Contract No. 2 was employed on the Subs above removing the pillars left between the stopes and this level until November. We started mining the First Level floor and back pillar of the North Lens in March. We first coned out and enlarged the raise leading to the First Level from the back of the shrinkage stope above the Second Level, and then put down deep holes blasting down the floor. The North end of the pillar was only about 25 feet wide but increased in width to the South. A pillar was left at the narrow part to hold up the hanging. Work was discontinued here during June until the gang on the 900' Sub had completed at the North end of their stope. Mining of the floor pillar was resumed in July and completed in August back to within 25 feet of the travelling raise to the 825' Sub-Level. The balance of the ore back to the turn-off of the main drift is lean and it is doubtful if this can be taken on account of the grade.

682'-662'-642' SUB-LEVELS:-

From two to three gangs were employed for, the most part of the year up to November 18th, developing and mining the ore to the West of the South end of the main stope. The mining in this territory was in the nature of a scram operation following leaders of ore. The ore on the main level was only about a drift wide and the raises put up to the 642' Sub-Level were in lean material. But at the 642' elevation, the hanging falls back so that you find an area of 30' to 40' wide of 55% Iron, the grade improving somewhat with height.

There was no connection between the main stope and the ore on the 682' Sub-Level. We did not encounter ore at this elevation until we began mining in the vicinity of No. 25 Diamond Drill Hole.. A stope was opened up to the West 60 feet long and 25 to 30 feet wide.

On the 662' Sub-Level the Westerly limit of the main stope was extended 40 feet West of Diamond Drill Hole No. 25. The area opened up at this elevation was very encouraging and made a profitable operation. The ore was mixed with seams of lean material, but on account of the grade of the Virgil ore, we were hoisting at the same time, we were able to handle it. The stope at this elevation was 80 feet long by 50 feet wide. The ore in this stope at the 642' elevation proved also to be an extension of the Main Stope. The ore has been followed to the Spies-Virgil line, and it looks promising for an extension over on the Virgil property. This Sub-Level was about 100 feet long by 30 feet wide with a small leader to the North in the vicinity of the old winze.

About one-third of the Spies product came from this territory, to the West, in the vicinity of No. 25 Drill Hole. Since November 18th when shipments were completed, we have been confining our operations to development drifting and raising, so as to have some ore to work on at the opening of navigation 1926.

THIRD LEVEL:-

The operations on the main level were the putting up of raises for the mining of the ore above as the stope was extended Westward. The drift past the winze was pushed ahead about 20 feet to make room for another raise inside.

UNDERGROUND VIRGIL MINE.

Development of the Virgil Mine was carried on with two contracts up until April when a third was added. As more ground was opened up, additional gangs were employed, until at the end of the year, six contracts were engaged in development drifting and raising.

Development on the Fourth and Fifth Levels were delayed considerably early in the year due to trouble with the Shovel-loaders. We had great difficulty training runners, as the men in the Iron River District do not seem fitted for that kind of an occupation. The water conditions in the Fourth Level drift was also responsible for the progress, and as the formation became softer, it was necessary to timber the drifts.

The development to date indicates that the Virgil ore is not as hard as the Spies, and it is necessary to timber it after it has been opened for a time. If the hanging rock is soft and slabby, we are apprehensive of its holding up, so that the ore can be mined by the sub-level stope method.

NEW FOURTH LEVEL:-

Cutting out from the shaft for the new Fourth Level was started early in December. The first cut was drilled off the ladder and pipe way. Great care had to be exercised when blasting, so as not to damage the shaft timbering or piping. Short cuts were drilled with the holes close together and the ground for several cuts practically burnt out. A great deal of over-time was spent by the miners, mucking the rock as it has to be handled directly into the skip. In order not to delay the hoisting from the other levels, mucking is done between shifts and lunch time. In spite of the many difficulties good progress was made in the hard cherty slate. A drift 13 feet wide by 37 feet long and 9 feet high was excavated along the West side of the shaft, besides cutting in towards the cage-way, a room 10' x 10'. Two gangs will be employed here in order to rush the development of this level as much as possible. One gang will drive straight ahead to the Southwest and the second crew will drive the tail drift and open up the plat. We have in the neighborhood of 600 feet to reach the ore on the Spies property, shown up by Diamond Drill Hole No. 6. We hope to be able to develop this ore and start mining operations during the coming summer.

FOURTH LEVEL:-

The Fourth Level drift was advanced 237 feet in January and 115 feet in February and encountered ore on March 10th. Progress was slow in February as this same contract cut two Diamond Drill stations, 24 feet long, near the 400 East Co-ordinate line, and also spent considerable time timbering the main drift. The ground was soft and slabbed off the back, and we had to keep the timber close to the breast.

When we first struck the ore, we also ran into a water vug, about 1½ feet wide; for a few hours the flow of water taxed the capacity of not only our main pump, but also the spare pump on the 5th Level and the emergency pump that was installed on the 4th Level, when shaft sinking was in progress. These three pumps have a capacity of 1,000 gallons per minute. The flow had decreased to approximately 300 gallons per minute after several days.

This drift was extended 166 feet in March and 55 feet during the month of April and stopped 110 feet from the Virgil-Sherwood line. The last 25 feet was mixed material. A Deep Hole was drilled from this breast and showed 30 feet of ore ahead. The drift was then extended 40 feet into lean material and again stopped. The entire drift in ore had to be timbered and was completed early in June, then contract No. 14 was moved to the shaft and drove the tail drift and cut a motor barn in the end. This tail drift was in hard cherty slate and progress was slow and work was not completed here until in August.

Contract No. 14 about August 10th moved back to the main Virgil drift and started Raise No. 408. This raise was put up in ore and double cribbed 100 feet above the rail of the Fourth Level, when they cut out for an off-set before extending it higher and drifting on the Sub-level.

Contract No. 10 was transferred from the 90' Sub-level to the Fourth Level on July 14th. They have been engaged during the rest of the year driving the drift to the Northwest and cross-cuts Nos. 1 and 2 to the Southwest parallel to the main drift. These cross-cuts are being driven at 100 ft. centers. The drift to the Northwest was started 135 feet Northeast of No. 404 Raise, the curve being 75' radius. The curves from this drift are 50' radius. We struck ore 125 feet from the Northwest drift in cross-cut No. 1 and had drifted through 130 feet by the end of December. In cross-cut No. 2, the ore was encountered

25 feet further East than in No. 1 and had drifted through 55 feet by the end of the year.

Contract No. 11 was transferred to the Main Level in July and put up Raises Nos. 412, 414 and 406. Raise No. 412 was put up to a height of 40 feet above the rail, 16 feet in ore and the balance in black slate. The rock was very treacherous and the cribbing had to be kept close to the back. This raise was stopped and No. 414 put up 46 feet, all in balck slate. They then moved to Raise No. 406. Although No. 404 Raise, 60 feet to the Northeast had rock up to a height of 63 feet, this raise had ore from the start up to 92 feet above the rail, when they ran into lean Iron formation. They cut out 100 feet above the level drifted to the North 15 feet for an off-set in their raise and extended it 43 feet, the first 5 feet in ore and the balance in rock. This raise was stopped. They then moved to #1 cross-cut on the Main Level and started No. 422 Raise; this raise was up 25 feet the end of December, all in mixed seams of ore and black slate. They also extended No. 420 Raise 20 feet in ore to a height of 83 feet above the Main Level.

Contract No. 12 started No. 404 Raise the first of April and was planned to strike the bottom of the ore as shown in Diamond Drill Hole No. 51 at an elevation of about 88 feet above the level. Ore was encountered at 63 feet or 25 feet lower than we anticipated. We cut out at 100 feet above the Main Level for an off-set in the raise and again at 180 feet above the level. The raise was extended 57 feet above the 245' Sub-Level when it struck the hanging. They cut in on the foot side of the raise for 15 feet to make sure we were in the hanging and not in a lean area. They then came down to the 245' Sub-Level and started drifting.

The ore in this raise was all high grade material and ran uniformly so. The sulphur content also was satisfactory, averaging under .100. Later on as the new Fourth Level is developed, we may extend No. 404 Raise through even though we will have to raise in rock.

Contract No. 13 started the middle of May and extended No. 410 Raise from the 90' Sub-Level to the 165' Sub-Level. From a point 93 feet above the level to the back of the raise, the ore was mixed with seams of ferruginous and black slate.

The ore goes up higher than we were lead to believe from the drill holes, all of which makes us optimistic as to the size of the ore body.

245' SUB-LEVEL - NEW FIFTH LEVEL - NO. 404 RAISE:-

Contract No. 13 was transferred to this elevation early in November from the 165' Sub-Level. They drifted Southeast from the top of No. 404 Raise, 119 feet, 109 feet in ore and the last 10 feet in rock. They then came back to the top of their raise on December 6th and drifted Northeast, parallel to the old Fourth Level drift. This drift is to connect with a heading from the shaft and be the New Fifth Level. It is being driven small and the back arched so that it will be unnecessary to timber, which will mean better progress, as the hoisting of timber to this elevation would take a great deal of time. On December 31st, the breast was 108 feet from the raise. The drift cut 83 feet of ore, then 25 feet of chert and had ore in the breast.

165' SUB-LEVEL - NO. 410 RAISE:-

Contract No. 13 completed No. 410 Raise to this elevation early in June and cut out and started drifting to the North. The drift was advanced 34 feet in lean ore to a breast of black slate. They came back to within 20 feet of the raise and followed the ore to the Northeast, keeping the rock on their left. After they had gone ahead about 80 feet, the rock turned back to the Northwest. The turn was so sharp, that we decided to come back to the cross-cut to the North and push it ahead. We thought that we would pass through the black slate into ore ahead. At a point 85 feet North of No. 410 Raise, the drift passed into chert and continued in this formation of chert and Jasper 85 feet further, when they struck ore. Contract No. 13 cut 50 feet of ore, averaging 60% Iron and .060 Sulphur and then passed into chert with ore seams. This formation remained the same for the next 110 feet when the drift was stopped 330 feet North of the raise. Two cross-cuts were driven to the West; one 100 feet and the other 170 feet North of the raise. The first one was started in a seam of ore but pinched out in a few feet, the rest of the formation was chert and Jasper. The second cross-cut followed the ore encountered in the Main drift for 20 feet and then cut into lean formation.

155' SUB-LEVEL:-

Contract No.14 cut out from No. 408 raise the latter part of September and drifted to the Southwest 12 feet, and then put up a small hole to No. 13's drift, off of No. 410 raise for ventilation. They then drifted Northwest from 408 Raise 60 feet in rock. As No. 406 raise had not reached this elevation, they moved to the No. 404 Raise at this elevation and drove through ore connecting Nos. 404 and 406 Raises at this elevation; also drifted 23 feet Northwest from the top of No. 404 Raise to the rock, a distance of 33 feet.

120' SUB-LEVEL:-

Contract No. 12, who were putting up No. 404 Raise, began having trouble with drills sticking in the ore. As we did not have any auger steel on hand, it was decided to drop down to the contact of the rock and ore and open up a Sub-level until we could get some of this drill steel. This gang drifted Southeast from the raise 51 feet, when they struck black slate and then followed it Westerly 65 feet. The rock twisted back and forth and was so full of local folds, it was difficult to follow. Contract No. 12 resumed operations in their raise on June 23rd.

90' SUB-LEVEL - NO. 410 RAISE:-

Contracts Nos. 10 and 11 developed this Sub-Level starting early in April. No. 10 worked on the North side of the Raise and No. 11 on the South side.

The ore to the South was harder and No. 11 did not make the progress that No. 10 did. Further, a water vug was cut 125 feet South of the raise which slowed up the work for several shifts. They struck the rock 150 feet from the raise and followed it for a distance to the East. As the rock folded and twisted back on itself, work was stopped to further explore this territory with the Deep Hole Machine.

No. 10 extended their drift on the North side of the raise 305 feet in ore and were moved to the Main Level on July 14th.

The out-line of the ore on this Sub-Level was determined with the Deep Hole Machine with good results. On account of the irregularity of the foot and hanging rock, we obtained the desired information quicker and without cutting up the ore body with a lot of cross-cuts.

The area of the ore on this Sub-Level is approximately 87,000 sq.ft.

FIFTH LEVEL:-

When drifting was resumed on the Fifth Level the latter part of January after a few blasts, we encountered ore. We did not anticipate cutting the ore until we had reached a point 400 feet farther West. During February and early part of March, we drifted through 169 feet of ore running high in both Iron and Sulphur. After passing through the ore, it was driven about 30 feet in mixed ore and slate and stopped. A hole was drilled from a point 15 feet back from the breast, South 7° and 40" West, with the No. 34 Turbro Deep Drill Machine. This hole passed through 17 feet of mixed ore and black slate, then black slate and cherty black slate and bottomed at 183 feet.

During April about 30 or 40 feet of the end of the drift, which was driven through mixed seams of ore and slate showed signs of weight, and it was necessary to put in a number of lining sets. No further work was done on this level during the balance of the year.

COST COMPARISONS.

DAYS AND SHIFTS.			
1924		1925	
DAYS	SHIFTS	DAYS	SHIFTS
188	9411½	297	23766½

The Virgil Mine was put on an operating basis and combined with the Spies on April 1st, 1925, which explains the large difference in shifts worked between 1925 and 1924. During 1924 the Spies Mine was only operated nine months, compared with the entire year in 1925, together with nine months for the Virgil.

WAGES.					
1924			1925		
SURF.	UNDERGD.	TOTAL	SURF.	UNDERGD.	TOTAL
4.07	4.77	4.50	4.19	4.89	4.67

The same wage schedule was in effect during both 1924 and 1925 and approximately the same labor was employed on surface. The reason for the increase in the rate for 1925, is that it represents the combined operation of the Spies-Virgil , while in 1924, nearly all of the skilled labor's time was

spent on new construction and charged to the E. & A. for Opening & Equipping the Virgil Mine. This same explanation holds true of the increase in wage rate for underground.

PRODUCTION.			
1924		1925	
TOTAL TONS	DAILY AVERAGE	TOTAL TONS	DAILY AVERAGE
27159	144	62098	209

The increase in production is on account of the 1925 tonnage being the combined hoist of the Spies and Virgil properties, while in 1924, the Spies only was producing, and then only for nine months.

NUMBER OF MEN AND WAGES.			
1924		1925	
NO. MEN	WAGES	NO. MEN	WAGES
31	$42,323.35	76	$111,085.41

The increase in number of men employed and wages paid is due to putting the Virgil Mine on an operating basis April 1st, 1925, and combining the cost sheet with the Spies. During 1924, all labor engaged in opening the Virgil was charged to the E. & A.

TONS PER MAN PER DAY.	
1924	1925
2.88	2.61

The decrease in tons per man per day is due to the small production from the Virgil for the number of men working. The tons per man per day for 1924 for opening the Spies alone is very low for this property and due to starting up after several years of idleness. The average for the Spies is about 4.50 tons per man per day.

COST OF PRODUCTION.				
	1924	1925	DECREASE	INCREASE
Cost of Production,	2.178	2.860		.682
Cost on cars,	2.709	3.355		.646
Grand Total Cost,	3.059	3.705		.646

The Cost of Production for 1924 covers Spies-Mine operations only, while that for 1925, includes the Virgil from April 1st on. For the first three months of 1925, when the Spies Mine was operating alone, the average cost was $1.805 per ton, and as the production was larger the following months, the cost would have been even lower. As the Virgil was still in the progress of development and no mining was being done, the cost naturally increased when the costs for the two properties were combined. The costs for the last six months of the year are exceptionally high as we did a lot of new construction work on surface, such as New Coal Dock, repairs to Permanent Trestle, construction for the first time of temporary trestles for stocking Spies and Virgil ore, changing Loading Pocket in Shaft House for handling two grades of ore and enclosing of Shaft House with corrugated, galvanized iron sheets; all of which was charged to operating. Further, the breaking of the crank shafts on both Fifth Level Pumps in October added materially to our costs.

The reason for the difference in increase between Cost of Production and Cost on Cars is explained by the fact that there is no charge against Idle Expense for the year 1925.

COST COMPARISONS.

The Virgil Mine was put on an operating basis with the Spies Mine on April 1st, 1925, and all but a few construction accounts closed on that date. The E. & A. was completed June 30th.

The following facts explain in part why the E. & A. #429, covering the Opening and Equipping the Virgil Mine over-ran the estimate:-

On September 9th, 1922, an estimate of the cost of Opening and Equipping the Virgil Mine was made. As the figures in the Superintendent's Division of the E. & A. are practically the same as those in the original estimate, the following explanation is given as to how these costs were arrived at and why the expenditures were in excess of the estimate.

In the first place, we had but little information as to the character of the ground the shaft would be sunk in, or the material that would be encountered between the shaft and the ore bodies.

The drill holes near the shaft were all shallow, the only deep holes being two in number, a half mile to the East and the five holes on the West side of the Virgil fprty, 1500' to 2000' away to the Southwest. The shaft itself was bottomed 54 feet below the Third level of the Spies Mine, in black slate, and as all of the foot-wall material in the Spies Mine was either Black or Gray slate, we assumed that we would encounter the same material in the shaft and rock drifts. Much to our surprise, we encountered first gray-slate and then cherty slate on the 28th cut, or 125 feet below the bottom of the old shaft. From that time on, our sinking speed was materially decreased.

Both the 4th and 5th level plats, the pump-house and sump were cut out in cherty gray slate. This hard cherty material extended also for 600 feet away from the shaft on the 4th level and just as far, if not further on the 5th level.

The only guide we could follow in making out this E. & A. was the experience gained from the opening up of the Spies property, and we based our shaft sinking and rock drifting figures on E. & A. #274, making the necessary alterations for the difference in wage scale prevailing in 1916 and September, 1922. The change from soft black slate to the cherty gray slate upset both

the time schedule and the monthly footage figures.

To further complicate matters, the wage schedule changed before we actually started sinking operations and after the figures for the E. & A. were prepared, wages increased approximately 25%. Company account miners for instance, were increased from $3.70 to $4.60 or 24.4%. This item alone has had a large bearing on the increased labor charges.

When shaft sinking started in October, 1922, labor was quite plentiful, as we had not quite recovered from the drastic decline in the steel business in 1921. In less than six months, we lost practically our entire shaft sinking crew, and for three or four months, work was practically at a standstill until we recruited an entire new crew from Dagett, Michigan. Most of these men were farmers and had never worked in a mine and sinking was delayed considerably until they were broken in.

Early in the year, 1924, as we were cutting the plats on the 4th and 5th levels, we received instructions to operate the Spies Mine and produce at least our minimum tonnage of 17,500 tons. That immediately complicated matters because due to the cherty nature of the ground in the plats, we bought and put in operation #248 Ingersoll-Rand drilling machines to speed up the drifting, and the small Imperial Type 10 compressor in operation, wss only able to furnish air for six of these machines. Hitherfore, all the drifting and drilling in the Spies Mine and in the shaft sinking operations was done with Jackhammers, and while the Type 10 compressor would take care of fifteen to eighteen of these small machines, we found it impossible to keep the air pressure up when drilling on both the 4th and 5th level plats, and at the same time, keep the air pump at the bottom of the shaft in operation. The latter was only a temporary installation to keep the sump pumped out, pending the installation of the permanent electric pumps.

We tried to keep six Jack-hammers in operations in the stopes and did our pumping between shifts and when mucking rock, but development work was considerably retarded due to low air pressure.

The fact that we might have to operate both the Spies Mine and do development work on the Virgil lease, silmultaneously, was not taken into consideration, and as a result, we made no provision for a new air compressor in the E. & A. As we finished the plats and started drifting, it was apparent that better speed could be made if we had mechanical mucking machines, and again we were faced with the shortage of air to operate these loaders.

Just about this time the Company decided to abandon the Francis Mine, and arrangements were made to move the 2450 cu.ft. P.R.E.#2 Compressor from that property to Iron River, and this compressor was installed and went into operation in August, 1924, but from February until August, 1924, drifting on both 4th and 5th levels was delayed and the time schedule again increased due to low air pressure.

Another unlooked for factor delaying our progress was the timbering of both the 4th and 5th levels, just as soon as they entered the black slates and Iron formation. We never found any timber necessary on any of the main levels in the Spies Mine. The black slates on the upper levels hold well, and in the Iron formation, particularly, no timber is needed. The only timber sets put up in the Spies Mine are placed at the bottom of each raise and form the frame work to which to attach the chutes. The last 1,000 ft. in the 4th level drift was all timbered, and this together with the water coming in the back of the drift, has slowed our progress at least 50%.

The above general facts together with the large labor turn-over, worked adversely against us and by delaying the progress, advanced the date on which the Virgil property was put on an operating basis. The Virgil was put on an operating basis April 1st, 1925, instead of March 1st, 1924.

The following is an analysis of each item on the Superintendent's division of the E. & A. #429:-

GENERAL EXPENSE:-

The estimate totalled $25,860.00 and the expenditures to date total $53,597.31. Our estimate included general expense for eighteen months, as that was the time we figured it would take to reach the ore on the 4th level. We set the day on which we would reach the ore for March 1st, 1924. The E. & A.

shows that our expenditures up to the end of February, 1924, had totalled $29,397.02, compared with the estimated figure of $25,860.00. The increase is practically all in the taxes, as we estimated $8,000.00 for these, while actually up to March 1st, 1924, they amounted to $12,421.47. We had to guess at the taxes as we did not know what valuation the State Tax Commission would place on the Virgil property.

The general expense was carried on the E. & A. for thirty-two months, the mine being put on an operating basis on April 1st, 1925.

The question arises as to why it took us practically a year longer than we originally figured to reach the ore. In the first place, we lost practically four months in the Spring and early Summer of 1923, when we lost 80% of our miners. Then due to the cherty nature of the ground, the shaft was sunk through, we dropped from an average of 92 feet monthly to 60 feet per month; whereas, with favorable ground, we could have sunk the required distance in eight months, it actually took us twelve months. Cutting the plats required two and one-half months instead of the estimated one month, and the rest of the delay can be attributed to the poor air pressure for a period of six months, while operating the Spies in conjunction with the development work on the Virgil.

MAINTENANCE:-

This account totals $3,750.00 compared with an estimate of $700.00. The over expenditure is practically all in the item, Hoisting Machinery. This includes the cost of a new skip rope and new skip. The skip that was used for a counter-balance while sinking, dropped one Sunday morning as the men were hoisting it up, preparatory to putting on a new rope. The pentice was partially demolished and the expense of the new skip, new rope and repairing the shaft, accounts for most of the increase. Furthermore, before we started sinking we found it necessary to re-timber most of the shaft from the 3rd level to the bottom, and re-place all the cage guides from surface to the bottom.

All of the ore from the Spies has been hoisted with a single skip in balance with the cage, and we thought it a good plan to so arrange our piping and cables in the shaft below the 3rd level to make room for a second skip.

The cage compartment was therefore cut down in size, and that made it necessary to move the old cage guides. These were found in such poor shape that it was deemed wise to replace them. All of this work was charged to the Maintenance Account.

SHAFT SINKING:-

The total amount provided for this account was $64,000.00. We actually spent $98,348.95. The cost was estimated at $80.00 per foot and the shaft sinking speed at 100 feet per month.

Shaft sinking was started in October, 1922, and it took us two weeks to get the shaft crew organized. In November, we sank 91 feet at a total cost of $7,961.24 or $87.55 per foot, and of this footage, two-thirds was sunk the first fifteen days, the balance in the remaining ten days. On November 18th, we encountered the cherty slate, and it is safe to assume that if we had not struck this hard material in the shaft, that our footage for November would have been from 100 to 105 feet instead of 91. As near as can be calculated, the actual cost of the first 61 feet sunk in November, in the black slates, was $82.25 per foot, or less than 3% over the estimate.

Before encountering the cherty slate, the complete round of holes in the shaft was drilled in 7.56 hours. After the middle of November, 1922, it took an average of 12.6 hours per round. Another factor that increased the cost per foot was that in the hard ground, the average depth of each cut was less than that in the softer slate. In favorable ground, we averaged 5.4 ft. per cut, which dropped to 3.86 ft. in the hard cherty slate. In other words, the depth of the cuts blasted increased 40% in the more favorable ground.

In March, 1923, we began to be troubled with a shortage of labor, and our records show that we were full handed only nineteen shifts out of a total of seventy-nine. In April conditions rapidly grew worse, due to the re-opening of the other mines in the Mineral Hills District, and we were full handed only one shift our of seventy-seven.

For over half the month we were sinking with only four men and a boss on each shift, which was only two-thirds of a regular crew. In May we got down to only one-third a normal crew, and shaft sinking was temporarily abandoned

and the few men left put to work cutting the 4th level plat. Shaft sinking was not resumed until the middle of July and we found it necessary to break in a green crew again. There is no question but that our time schedule was lengthened at least three months by the labor shortage.

From the facts shown above, we believe it has been made clear that we could have sunk the shaft and kept within the estimate if the character of the ground had continued the same as we cut through in October and part of November. The shortage of labor would have delayed the sinking operations any way, but we would have had the shaft pretty well down to the 5th level by May, 1923, in which case it would have been easier to keep men employed by putting them to work on both the 4th and 5th level plats, simultaneously, because the shaft was pretty wet, making disagreeable working conditions for the men.

DRIFTING:-

We estimated 3700 feet of drifting necessary on the 4th and 5th levels to reach the ore, and to April 1st, we had driven 3800 feet. Approximately 275 feet of the latter is in ore. We estimated that we would drive at least 200 ft. monthly on both the 4th and 5th levels, so that the over-head expense could be divided and the cost per foot reduced.

The course of the 4th level drift carried it through 400 feet of hard cherty slate, and as a result, the monthly footage for the first three months drifting were: 91, 100 and 143 feet, respectively. The average for July, August and September, 1924, was 202 feet per month. In October, due to striking water and timbering the drift, the footage dropped back to 153 feet.

On the 5th level we had the same trouble with the cherty slate, the monthly footages running 91, 88 and 128 feet, respectively, for April, May and June, 1924, and then increasing to 208, 247 and 360 feet in July, August and September.

The small footage for the months of April, May and June, on both the 4th and 5th levels, was also due to low air pressure, which materially decreased the drilling speed of the machines.

After the Francis Mine compressor was installed and Armstrong loaders used for mucking, the footage driven was materially increased from less than 100 feet to 360 feet per month.

We had hopes of bettering even the latter, as we drifted 115 feet in seven days, or at the rate of 420 feet per month just before we found it necessary to timber the 5th level drift.

Our estimate was thrown out of line by the character of the ground in the drifts which was too hard in the beginning to allow us to make good progress, and which then changed and became so soft that timber was necessary. Neither of these conditions were looked for, as the three upper levels in the Spies Mine were driven through slates easy to drill and still firm enough to stand without timbering.

PLATS & POCKETS:-

There were three unforeseen factors that increased the cost of cutting the plats over the estimate.

First, we assumed the ground to be similar in character to the 1st, 2nd and 3rd level plats. Instead, we ran into the hardest kind of ground. On the 5th level plat, particularly, it required two shifts to drill the round of holes, whereas, in favorable ground, we should have drilled and blasted twice a shift. The low air pressure due to the operation of the machines in the Spies Mine stopes, was a great handicap in drilling the cherty slate. The cherty bands were equal in hardness to Republic Mine Jasper.

Secondly, when the estimate was made out, we assumed the plats could be double tracked for 100 feet Southwest of the shaft, which would permit us to operate a motor and six-4 ton standard saddle back motor cars. In 1923, the Lake Shore Engine Works developed a new type Rocker Dump 2 ton car, and it was decided to equip the Virgil with the new cars. By that change, we doubled the length of our motor trains and consequently the length of the plat had to be increased correspondingly. As we have but one skip in the shaft and no storage pockets, it is necessary to avoid all possible delays in hoisting by having loaded cars spotted at the shaft throughout the shift.

Third, we assumed the shaft would be bottomed below the 5th level before cutting the 4th and 5th level plats. That would enable us to work on both levels at the same time. A start would be made on the 4th level plat and then sinking resumed.

Instead of that, we were forced to put in two and one-half months on the 4th level alone, when we were short of labor in the Spring and Summer of 1923. We could make no headway in the shaft with six men and rather than lose them, we started excavating the 4th level plat. Progress was slow with the small crew and all the over-head had to be borne by the one plat operation.

The labor shortage, increased length of plat and hard ground increased the expenditures over the estimate.

PERMANENT EQUIPMENT:-

There was no provision made for new air drills, as we contemplated driving the drifts with the Jack-hammer machines on hand. When the hard cherty slate was encountered, we were making such poor progress that new drills of a heavier type were absolutely necessary.

The estimate for the pump-house and sump was too low. We based our figures on the cost of the 3rd level pump-house, which was finished in 1917 at a cost of $1861.52. Allowing for difference in wages, we assumed $2500.00 to be ample. From information furnished by the former operators of the Virgil property, we were led to believe that the in-flow of water would run between 200 and 250 gallons per minute. We therefore planned but a small sump. The flow of water struck in the 4th level drift in October, 1924, was much heavier than that and we therefore deemed it advisable to cut a large sump underneath the 5th level, similar to those in use in the Negaunee and North Lake Districts.

In order to complete the plan, a clean out drift and raise at the bottom of the shaft leading to the bottom of the sump was necessary. We also put in two concrete dams and made provision for a water tight bulkhead at the entrance to the pump-house. A raise from the back of the pump-house leading to the ladder compartment in the shaft, 30 feet above the level, was finished.

The expense involved in the cutting out the large sump, the construction of the concrete dams, the cost of the clean-out drift and raise, the cost of the raise connecting the shaft and the back of the pump-house; all contributed to the total expended over and above the estimate.

MASTER CARPENTER'S DIVISION.

All of these figures were prepared with the Master Carpenter, and his estimate for the new power house was ample to cover all the work done to date.

No provision was made for a new top tram engine house in the E. & A., but the old frame structure was considered a fire hazard by the Committee on Fire Prevention, and a new fire proof building was constructed to meet their recommendations. This building was built of concrete and expanded metal lath at a cost of $673.61

The boiler room for the change house was estimated at $1,000.00 and cost $1249.33. The increase was due to lining the addition with fire proof material and guniting the exterior.

The cost of moving the old pulley stands from the Lake Mine and re-erecting them at the Spies-Virgil property, was estimated at $2,000.00, and it actually cost $3,646.47. The cost was estimated on the basis of a bid received by the Mechanical Department which proved to be worthless, as the work could not be done at that figure, and the Worden-Allen Company finally did the work on a cost plus plan.

One of the steel pulley stands had to be placed on the site of the water tank, and the latter was moved to a new location back of the Dry. There was no provision made for this work in the E. & A.

CHIEF MECHANICAL ENGINEER'S DIVISION.

The account under this heading include the hoist, compressor, top tram, pumps, electric haulage, etc. We will merely take up the large items:-

COMPRESSOR PLANT:-

We never planned installing a new air compressor until the needs of the Virgil property demanded it. As mentioned before, the fact that the Francis Mine compressor was available at the time our air pressure was low, due to operating both the Spies Mine and doing the development work on the Virgil forty, and also due to the hard rock encountered, made it imperative that a larger compressor be installed.

The estimate merely provided for moving the old compressor from the old to the new Engine House.

SHOP EQUIPMENT:-

The old Spies Mine shops had only a small drill press, and on account of the expense of having our shop work done at other mines, it was decided to move the old Lake Mine drill press, lathes and pipe threading machine, to the Iron River District, enabling us to work to better advantage.

PUMPING PLANT:-

This account over-ran due to purchasing new and larger pumps than first thought necessary. The data secured from the Wickwire Steel interests led us to believe that one of the 350 gallon pumps purchased for the Gwinn District, would be suitable and ample for our needs. Further information made this doubtful, and two new pumps good for 1250' head were installed. The spare pump from the Gwinn District was also placed on the 4th Level, and as mentioned before, all three pumps were kept busy for a time after a large water course was struck on the 4th Level, early in March, 1925.

HEATING SYSTEM:-

The original plan relative to the heating system was to move a 25 or 35 H.P. second hand boiler from one of the other mines to the Iron River District, to take the place of the old 125 H.P. boilers. We found no boiler available on the Marquette Range and had to purchase one from the Mesaba-Cliffs Iron Mining Company. The Hartford Steam Boiler inspector then recommended that only 15 lbs. steam pressure be carried, and we found it impossible to keep the boiler feed pump operating satisfactorily with that low pressure, and finally had to purchase a new electric driven triplex pump.

FIRE PROTECTION:-

This covered purchase of new fire hose, the old hose being condemned by the Fire Prevention Committee.

SUB-STATION & POLE LINE:-

This expense was made necessary at the request of the Peninsula Power Company. They offered to build a new line with a double circuit to prevent delays if we would provide a new switch house. As we had had trouble with the old pole line and as it ran between the two stockpile grounds, making it necessary to shut off the power when moving the shovel, we decided to accept their proposition, as it was to our advantage.

FIGHTING FIRE - ROCK PILE:-

The fact that the sulphur in the rock pile might catch afire was over-looked and no funds were asked for spreading the pile. We found it necessary to install the old electric skip hoist in a temporary building and scrape and spread the pile to put out the fire.

SPIES-VIRGIL MINE

AVERAGE MINE ANALYSIS ON OUTPUT FOR YEAR 1925.

GRADE	IRON	PHOS.	SILICA
Spies,	55.21	.538	7.78
Virgil,	58.19	.449	5.16

AVERAGE ANALYSIS ON STRAIGHT CARGOES FOR YEAR 1925

GRADE	IRON	Mine PHOS.	SILICA	Lake Erie IRON	MOIST.
Spies,		(All Mixed)			
Virgil,		(All Mixed)			

ORE STATEMENT - DECEMBER 31ST, 1925.

	SPIES	VIRGIL	TOTAL	TOTAL LAST YEAR
On hand January 1, 1925,	9,794	835	10,629	3,137
Output for Year,	44,414	17,047	61,461	27,159
Stockpile Overrun,	637	-	637	-
Total,	54,845	17,882	72,727	30,296
Shipments,	54,698	9,596	64,294	19,667
Balance on Hand,	147	8,286	8,433	10,629
Increase in Output,			34,939	
Decrease in Ore on Hand,			2,196	

1925 -- 2-8 Hour Shifts, 6 days per week, Jan. 1st to Dec. 31st, 1925.

1924 -- 2-8 Hour Shifts, 6 days per week, Jan. 1st to Dec. 31st, 1924.

SPIES-VIRGIL MINE

SHIPMENTS FOR YEAR-1925.

GRADE	POCKET	STOCKPILE	TOTAL	TOTAL LAST YEAR
Spies,	22,452	32,246	54,698	19,667
Virgil,	6,818	2,778	9,596	-
Total,	29,270	35,024	64,294	19,667
Total Last Year,			19,667	
Increase,			44,627	

SPIES - VIRGIL MINE

COMPARATIVE WAGES AND PRODUCT

	1 9 2 5	1 9 2 4	INCREASE	DECREASE
PRODUCT	62,098	27,150	34,939	
No. Shifts & Hours	2-8	1-8;2-8		
AVG. NO. MEN WORKING				
Surface	23	11	12	
Underground	53	20	33	
Total	76	31	45	
AVG. WAGES PER DAY				
Surface	4.19	4.07	.12	
Underground	4.89	4.75	.14	
Total	4.67	4.50	.17	
WAGES PER MO. OF 25 DAYS				
Surface	107.75	101.75	6.00	
Underground	122.25	118.75	3.50	
Total	116.75	112.50	4.25	
PRODUCT PER MAN PER DAY				
Surface	8.54	7.67	.87	
Underground	3.76	4.63		.87
Total	2.61	2.88		.27
LABOR COST PER TON				
Surface	.490	.530		.40
Underground	1.299	1.028	.271	
Total	1.789	1.558	.231	
AVG. PRODUCT BRK'G & TRM'G	10.86	6.38	4.48	
" WAGES CONTRACT MINERS				
" " " TRAMMERS	5.62			
TOTAL NO. OF DAYS				
Surface	7267-3/4	3539½	3728-1/4	
Underground	16498-3/4	5873	10625-3/4	
Total	23766-1/2	9412½	14354	
AMOUNT FOR LABOR				
Surface	30431.97	14411.19	16020.78	
Underground	80653.44	27912.16	52741.28	
Total	111085.41	42323.35	68762.06	

Proportion Surface to Underground Men:

1925 - 1 to 2.3
1924 - 1 to 1.82
1923 - 1 to 3
1922 - 1 to 2.8
1920 - 1 to 3.1
1919 - 1 to 2.91
1918 - 1 to 2.86

1924 - Operating from March 17th;
1 8-hr to March 24th; then 2-8hr shifts.

Virgil Mine was combined with Spies operating, beginning with 1925.

SPIES-VIRGIL MINE

STATEMENT OF EXPLOSIVES USED FOR BREAKING ORE

KIND	QUANTITY	AVERAGE PRICE	AMOUNT 1925	AMOUNT 1924
40% Powder	40,370	.1350	5,449.95	4,428.00
60% "	200	.1675	33.50	
Total Powder	40,570	.1352	5,483.45	4,428.00
Fuse	89,600	.6484	581.25	400.57
Caps	12,555	.1065	133.71	97.45
Cap Crimpers				4.00
Tamping Bags	1,140	2.59M	2.96	
Total Fuse,Etc.			717.92	502.02
Total Explosives			6,201.37	4,930.02
Product			45,051	27,159
Pounds Powder per Ton of Ore			1.14	1.204
Cost per ton for Powder			.1351	.163
" Fuse,Etc.			.0177	.018
" All Explosives			.1528	.181
Avg.Price per Pound for Powder			.1352	.135

SPIES-VIRGIL MINE.

ANALYSIS OF COST SHEETS FOR THE YEARS 1924 AND 1925.

UNDERGROUND COSTS.

EXPLORING IN MINE

Year	1924,	$
"	1925,	3,254.40
Increase for 1925,		3,254.40

The charge against this account represents the cost of operation of the Model 34 Waugh Turbro Drifter, which was used to drill deep holes and develop the ore body. No work of this nature was done during 1924. We drilled twenty-five holes having a total depth of 2,717 feet at a cost of $1.20 per foot.

DEVELOPMENT IN ROCK

Year	1924,	$
"	1925,	18,233.80
Increase for 1925,		18,233.80

During 1924 all development in Rock on the Virgil property was charged to E. & A. #429, Opening & Equipping the Virgil Mine. The Virgil was put on an operating basis on April 1st, 1925, and the Cost Sheet combined with the Spies. No work of this nature was undertaken on the Spies in 1924, explaining the large increase.

DEVELOPMENT IN ORE

Year	1924,	$
"	1925,	28,316.31
Increase for 1925,		28,316.31

The same explanation given for Development in Rock applies to this caption.

STOPING

Year	1924,	$21,894.42
"	1925,	26,388.08
Increase for 1925,		4,493.66

This item represents the cost of breaking the ore mined from the Spies property and the increase is due to the larger production in 1925.

The tonnage mined during 1925 was 45,051 tons compared with 27,159 tons in 1924. The unit cost, however, shows a decrease of $0.221 per ton, account of the larger out-put.

TIMBERING

Year 1924,	$ 961.60
" 1925,	11,430.06
Increase for 1925,	10,468.46

The 1924 cost is for the Spies Mine only, and practically no timber is used in mining this ore body. The 1925 cost is the combined Spies-Virgil and all the main drifts of the Virgil require timbering, besides a large number of cribbed raises were put up the past year in the course of development on the Virgil.

TRAMMING

Year 1924,	$ 8,142.41
" 1925,	11,572.15
Increase for 1925,	3,429.74

This tramming expense is the cost of handling the Spies tonnage only, as the tramming of the Virgil ore is included in the items, Development in Rock & Ore, no mining being done on the Virgil during either year. The increase is due to tramming a larger tonnage. The unit cost, using the tonnage of Spies ore handled, was less for the past year than the one previous, being $0.257 per ton in 1925, compared with $0.300 for 1924.

PUMPING

Year 1924,	$ 4,076.65
" 1925,	11,310.64
Increase for 1925,	7,233.99

This large increase is explained by the fact that during 1924 only the cost of operating the Third Level Spies pumps, was charged to this item, the balance of the pumping expense was charged to E. & A. # 429. After April, 1925, when the Virgil Mine was placed on an operating basis, the entire pump cost of both the Spies and Virgil went in on this cost sheet.

COMPRESSOR & AIR PIPES

Year 1924,	$ 4,251.54
" 1925,	14,513.41
Increase for 1925,	10,261.87

During 1924 the expense of operating the Compressor was divided between the Spies and Virgil, the Virgil being on an E. & A. #429. There was very little charge account of piping in connection with the Spies. The 1925 costs are the combined Spies-Virgil, or total cost of running the Compressor, and extensive piping had to be done as development on the Virgil progressed.

UNDERGROUND SUPERINTENDENCE

Year 1924,	$2,724.13
" 1925,	5,365.04
Increase for 1925,	2,640.91

The Captain's and Shift Bosses' time was proportioned between the Spies and Virgil in 1924, about half charged to each operation. The 1925 cost is for a combined operation, and is approximately double that of the year previous.

MAINTENANCE ACCOUNTS

COMPRESSOR & POWER DRILLS

Year 1924,	$
" 1925,	1,503.58
Increase for 1925,	1,503.58

This item represents the cost of auger drill machines purchased during 1925, used in connection with the Virgil development. The Virgil ore is soft and the same drills as used in the Spies ore were not satisfactory.

HAND TRAM EQUIPMENT

Year 1924,	$185.40
" 1925,	441.65
Increase for 1925,	256.25

The 1924 expense represents the cost of repairs to the cars used on the Spies Levels. The 1925 charge includes three sub-level cars built to be used in developing the Virgil ore body.

ELECTRIC TRAM EQUIPMENT

Year 1924,	$
" 1925,	3,329.49
Increase for 1925,	3,329.49

Electric tramming is used only on the Virgil levels and during 1924, the Virgil was carried on an E. & A., being put on an operating basis April 1st, 1925.

PUMPING MACHINERY

Year 1924,	$ 109.55
" 1925,	2,934.27
Increase for 1925,	2,824.72

Only minor repairs were necessary for the Spies Third Level pumps in 1924. During the past year we had a great deal of trouble with the new Prescott Pumps on the bottom level. The crank shafts on both pumps broke and had to be replaced. The one on the second pump broke before the first pump was repaired and we were without any pumping equipment below the Third Level. Emergency measures of building dams and installing additional pumps had to be taken, which was a heavy expense.

SURFACE COSTS

HOISTING

Year 1924,	$2,299.71
" 1925,	5,041.96
Increase for 1925,	2,742.25

The increase for 1925 is due to the larger tonnage hoisted, being 62,098 tons compared with 27,159 tons the previous year. The unit cost was slightly less for 1925.

STOCKING ORE

Year 1924,	$1,853.99
" 1925,	4,038.43
Increase for 1925,	2,184.44

A larger tonnage was stockpiled in 1925 than 1924, explaining the increase.

SCREENING & CRUSHING AT MINE

Year 1924,	$1,995.01
" 1925,	2,825.38
Increase for 1925,	830.37

The increase for 1925 represents the extra power consumed crushing the larger tonnage, the same labor being required.

DRY HOUSE

Year 1924,	$1,286.86
" 1925,	2,840.79
Increase for 1925,	1,553.93

In 1924 the Dry House expense was divided between operating Spies and Virgil E. & A. #429 , while in 1925, it all went into one Cost Sheet.

GENERAL SURFACE EXPENSE

Year 1924,	$2,653.47
" 1925,	2,769.62
Increase for 1925,	116.15

Small increase over previous year.

MAINTENANCE ACCOUNTS

HOISTING EQUIPMENT

Year 1924,	$ 604.60
" 1925,	1,997.31
Increase for 1925,	1,392.71

This large increase is due to dividing the expense in 1924 between operating Spies and Virgil development. Further, in 1925, heavy repairs were made to Skip & Cages and a new copper pull-bell was put down the Shaft.

SHAFT

Year 1924,	$ 93.44
" 1925,	259.02
Increase for 1925,	165.58

On account of handling more material through the shaft the past year, more repairs were necessary, explaining the increase against this account.

TOP TRAM EQUIPMENT

Year 1924,	$112.65
" 1925,	249.38
Increase for 1925,	136.73

The increase for 1925 is due to dividing the expense between the Spies and Virgil during 1924, while the past year, the operations were combined. The unit cost is the same for each year.

DOCKS, TRESTLES & POCKETS

Year 1924,	$ 98.74
" 1925,	2172.61
Increase for 1925,	2073.87

Only minor repairs were made to Docks, Trestles & Pockets in 1924. During 1925, the loading pocket in the Shaft House was divided so that both Spies and Virgil grades could be shipped at the same time; several bents on the Spies permanent trestle were straightened and an entire top sollar renewed; and a temporary trestle for stocking ore erected for the first time.

Previously, we have been stocking with an end dump-car and building out the pile.

MINE BUILDINGS

Year 1924,	$1,955.84
" 1925,	4,879.97
Increase for 1925,	2,924.13

The charges were high each year. In 1924, the Dry, Shop and Office buildings were gunited. In 1925, it was necessary to erect an entire new coal dock, as the old one was badly decayed and also the Shaft House was enclosed with corrugated, galvanized sheet iron. The cost of the latter was in the neighborhood of two thousand dollars.

GENERAL MINE ACCOUNTS

INSURANCE

Year 1924,	$130.88
" 1925,	158.40
Increase for 1925,	27.52

The Spies was only operated ten months of 1924, compared with a full year in 1925; two months' insurance in 1924 was charged to idle expense.

ENGINEERING

Year 1924,	$277.63
" 1925,	1627.20
Increase for 1925,	1349.57

The Engineers spent most of their time on Virgil development, which during 1924, was charged to the E. & A.

ANALYSIS

Year 1924,	$595.28
" 1925,	2288.05
Increase for 1925,	1692.77

This large increase for 1925 against analysis is due to a larger production, more shipments and sampling of development drifts for analysis maps.

SAFETY DEPARTMENT EXPENSE

Year 1924,	$4.75
" 1925,	113.93
Increase for 1925,	109.18

In the Spring of 1925, training of First Aid Crews was started; nothing of this nature was done the previous year.

PERSONAL INJURY

Year 1924,	$747.88
" 1925,	1396.63
Increase for 1925,	648.75

TELEPHONE & SAFETY DEVICES

Year 1924,	$417.08
" 1925,	1401.09
Increase for 1925,	984.01

LOCAL GENERAL WELFARE

Year 1924,	$15.50
" 1925,	74.84
Increase for 1925,	59.31

MINE OFFICE

Year 1924,	$1,618.48
" 1925,	4,533.75
Increase for 1925,	2,915.27

The same explanation applies to the above five accounts. The increase for 1925 is due to the 1924 expense being divided between operating Spies and Virgil development, which was charged against E. & A. #429. The past year was a combined operation.

HILL-TRUMBULL MINE

ANNUAL REPORT FOR 1925

Ore operations at the Hill-Trumbull Mine were begun on April 24th and shipments for the season were concluded on October 6th. The 1924 season opened on the same date, but closed almost a month earlier. The property produced 648,270 tons of wash ore, which yielded 406,094 tons of concentrates, and 98,893 tons of direct ore were shipped, making a total output for the season of 504,987 tons (shipping grade).

Operations at the Hill-Trumbull Mine during 1925 were conducted entirely on day shift, the pit and washing plant working on a 12-hour shift for the most part.

The analysis of the crude ore mined from the Hill-Trumbull properties during 1925 was as follows:

	TONS.	FE.	PHOS	SIL.
Hill Crude----------	124,845	40.91	.043	35.81
Trumbull Crude---------	523,425	41.75	.049	33.45
TOTAL & AVERAGES-------	648,270	41.59	.048	33.90

The average iron content of the crude ore secured during 1925 was two points lower than that handled during 1924.

The following table shows the tonnage and analysis of the concentrates secured from the Hill-Trumbull property during 1925:

	TONS.	FE.	PHOS	SIL.	MOIS.	FE.NAT.
Hill Concentrates-------	79,377	58.70	.055	9.85	5.50	55.47
Trumbull Concentrates---	326,717	58.55	.063	8.12	8.11	53.80
TOTAL AND AVERAGES------	406,094	58.58	.061	8.46	7.60	54.12

The average iron content of the 1925 concentrates was 1.17% under that for the previous year. These results were not unsatisfactory, when consideration is given to the fact that the crude ore was two points lower in iron.

The analysis of the direct ore shipped from the Hill-Trumbull property during the past season was as follows:

	TONS.	FE.	PHOS	SIL.	MOIS.	FE.NAT.
Hill Direct Ore---------	98,893	53.93	.057	9.38	7.28	54.64

While the average iron content of this ore was slightly lower than for the previous season, it was higher than our expectations and considering the

HILL-TRUMBULL MINE.

comparatively large tonnage handled, the maintenance of this grade was quite satisfactory.

The following table shows our estimate of production for 1926, as divided between the Hill and Trumbull properties, also the analysis of same:

GRADE:	TONS	FE.	PHOS	SIL.	MOIS.	FE.NAT.
Hill Non-Bessemer Direct----------	85,000	59.65	.055	10.83	7.28	55.31
Hill Bessemer Direct----------	30,000	61.07	.044	9.27	7.28	56.64
Hill Non-Bessemer Concentrates------	35,000	58.69	.062	9.50	8.00	54.00
Trumbull Non-Bess. Concentrates-----	350,000	58.18	.063	9.20	8.11	53.46
TOTAL AND AVERAGES----------	500,000	58.75	.060	9.50	7.91	54.12

The 350,000 tons of Trumbull ore is to be secured from top cuts extending across the westerly part of the Trumbull pit. It is advisable to conduct our operations in this manner, rather than to attack the bottom ore next season, as we wish to outline the lean ore tonnage, which we will have to remove from the second bench. According to this program, there will be no extensive lean ore operations at the conclusion of the next shipping season, but the ore cuts contemplated in 1927 will outline this lean material on the second bench and we will handle such non-washable ore as is developed at the conclusion of the 1927 shipping season.

In order to secure 150,000 tons of Hill ore for shipment next season under the most favorable operating conditions, the above schedule would have to be carried out. The Hill ore available for next season is located in the direct ore area, the wash ore immediately west of this deposit, the Hill ore in the approach to the Trumbull pit and scattered bodies in the bottom of the old Hill pit and along the north shore line. In order to mine any of the ore in the bottom of the old Hill pit would entail considerable new track work and we feel that it would be inadvisable to start operating here until the water has entirely drained from the pit and an opportunity is afforded for a detailed examination of the conditions, so that track and operating layouts can be decided upon. We do not wish to cut down in the Hill ore leading into the west Trumbull pit on account of complicating the Trumbull operations and resulting in too steep hauling grades.

The average silica as estimated above, is rather high and undoubtedly will be disappointing to the Sales Department. We feel that our estimate is very

conservative and we are in hopes of securing a lower silica than shown. We feel, however, that this silica should be given in our estimate, as it is the result of very careful investigation. The highest silica is the Non-Bessemer direct. As this ore lies on top, it is necessary to mine it in our next season's operations.

HILL-TRUMBULL ORE ESTIMATE OF JANUARY 1ST. 1926

Following is an estimate of the ore in sight at the Hill-Trumbull properties on January 1st., 1925, the tonnage mined during that year and the estimate of January 1st., 1926.

A factor of 14 cu. ft. per ton was used in the case of the direct shipping ore and 18 cu. ft. per ton for the wash ore.

ORE ESTIMATE OF JANUARY 1ST.1925

	TONS.
Hill Bessemer Direct Shipping Ore----------	642,000
Hill Non-Bessemer Direct Shipping Ore----------	1,420,000
Hill Bessemer Concentrates----------	1,408,000
Hill Non-Bessemer Concentrates----------	743,000
TOTAL HILL ORE IN SIGHT JANUARY 1ST., 1925----------	4,213,000
Trumbull Bessemer Direct Shipping Ore----------	85,000
Trumbull Non-Bessemer Direct Shipping Ore----------	310,000
Trumbull Bessemer Concentrates----------	2,396,000
Trumbull Non-Bessemer Concentrates----------	1,347,000
TOTAL TRUMBULL ORE IN SIGHT JANUARY 1ST., 1925----------	4,138,000
GRAND TOTAL HILL AND TRUMBULL ORE IN SIGHT JANUARY 1ST., 1925----	8,351,000

ORE MINED DURING 1925

Hill Non-Bessemer Direct Shipping Ore----------	98,893
Hill Non-Bessemer Concentrates----------	79,377
TOTAL HILL ORE MINED DURING 1925----------	178,270
Trumbull Non-Bessemer Concentrates----------	326,717
GRAND TOTAL HILL AND TRUMBULL ORE MINED DURING 1925----------	504,987

ORE ESTIMATE OF JANUARY 1ST., 1926

Hill Bessemer Direct Shipping Ore----------	642,000
Hill Non-Bessemer Direct Shipping Ore----------	1,321,000
Hill Bessemer Concentrates----------	1,408,000
Hill Non-Bessemer Concentrates----------	664,000
TOTAL HILL ORE IN SIGHT JANUARY 1ST., 1926----------	4,035,000
Trumbull Bessemer Direct Shipping Ore----------	85,000
Trumbull Non-Bessemer Direct Shipping Ore----------	310,000
Trumbull Bessemer Concentrates----------	2,396,000
Trumbull Non-Bessemer Concentrates----------	1,020,000
TOTAL TRUMBULL ORE IN SIGHT JANUARY 1ST., 1926----------	3,811,000
GRAND TOTAL HILL AND TRUMBULL ORE IN SIGHT JANUARY 1ST., 1926----	7,846,000

From our ore operations during the past season, there have been no developments which would warrant a change in our estimate of the previous year. We have, therefore, deducted shipments from the several areas in determining our estimate of January 1st., 1926.

We have always considered the deposit to the north of our present Hill stripping limits, and also the easterly part of the Trumbull stripping limits, as somewhat questionable and until some check drilling is done here, we do not feel justified in doing any further stripping, or including any more ore in our estimate than we have already done.

We put down a number of test-pits over the Trumbull area to be mined next year, in the bottom of old Area A, which is immediately east of the main approach, and the direct ore deposit. These test-pits have proven the ore to run about as we expected, if anything, the grade proven up has been slightly higher than was indicated by drill holes.

At the time of writing the annual report a year ago, it looked as though the tonnage to the north of our present pit limits might be increased. While we feel quite sure that there is more ore to the north of the pit, than we have estimated, we do not feel justified in increasing the tonnage at this time.

The average analysis of the ore in the Hill and Trumbull properties on January 1st., 1926 is as follows:

HILL MINE

	TONS.	FE.	PHOS	SIL.	FE.NAT.
Bessemer Direct Shipping----------	642,000	58.00	.045	13.00	53.36
Non-Bessemer Direct Shipping---------	1,321,000	58.00	.055	13.00	53.36
Bessemer Concentrates----------	1,408,000	59.50	.045	8.50	55.04
Non-Bessemer Concentrates----------	664,000	60.00	.059	7.50	55.50
TOTAL AND AVERAGES----------	4,035,000	58.85	.050	10.53	54.30

TRUMBULL MINE

	TONS.	FE.	PHOS	SIL.	FE.NAT.
Bessemer Direct Shipping----------	85,000	56.40	.040	12.79	51.32
Non-Bessemer Direct Shipping---------	310,000	58.04	.060	9.85	52.82
Bessemer Concentrates----------	2,396,000	59.00	.043	9.00	54.57
Non-Bessemer Concentrates----------	1,020,000	59.00	.080	9.00	54.57
TOTAL AND AVERAGES----------	3,811,000	58.86	.054	9.15	54.35

Based on our past experience and more particularly the results obtained

during the past season, we feel that our estimate of the reserve, to be washed, will produce somewhat lower grade concentrates than we have previously estimated, and as compared with the analysis shown for concentrates from the Hill and Trumbull properties on January 1st., 1925, the iron dried has been reduced one point.

STRIPPING

The A. Guthrie Company stripped 1,170,920 cubic yards of overburden during the year 1925. This brings the grand total stripping, which has been done by the A. Guthrie Company during the past five years to 5,127,230 cubic yards. The total figure is 127,230 cubic yards in excess of our original estimate before the contractor started operations. The reason for this excess yardage is due to the fact that the outside cuts produced steeper slopes than we had figured on. The Trumbull stripping bank especially has stood up much steeper than anticipated. While this yardage is larger than our original expectations, the test-pits around the edge of the pit have disclosed the fact that the ore, of good washable grade, extends to the toe of the stripping and the tonnage of ore to be secured will more than offset for the overrun of stripping.

There was also a very heavy slough of the stripping bank along the north cut in the vicinity of the Hill-Trumbull boundary. This was occasioned by the existence of an old creek bed and some seepage, which could not be entirely cut off by dams. The slough handled here in clean-up operations helped to increase the overrun in the Contractor's stripping figures.

The Contractor started preparing equipment for 1925 stripping operations the latter part of March. Stripping work started April 6th and aside from the job of cleaning up the loading benches, was finished October 25th. The clean-up work was not completed until November 30th.

The A. Guthrie Company purchased six new 30-yd. Koppel cars, which were added to the Hill-Trumbull stripping job equipment for the season of 1925.

During the greater part of the season, the stripping bank was blasted down ahead of the shovel cuts, but toward the end of the operation, the bank was so low that it was not necessary to shake it in order to effect good digging conditions.

The Contractor experienced considerable delay during the months of September and October, due to the fact that the heavy rains softened the dump.

Stripping operations during 1925 were confined to the westerly part of the Trumbull pit. The Contractor's 350-ton shovel took a number of cuts across

the pit, the length of which diminished as they progressed westward. The height of the stripping bank at the beginning of the season averaged around 70' and the last cut was only in a 35' bank.

Upon the completion of stripping operations, the Contractor stored the 350-ton shovel in the west end of the Trumbull pit. This machine will be dismantled and taken from the pit early next spring. It will in no way inconvenience our operations, even if it were not removed from the pit until some time after we started ore loading. The locomotives and track shifter were taken to the Contractor's shops at the Hill-Annex Mine and the dump cars were stored in our yards.

The following table shows the monthly yardage handled by the A. Guthrie Company, also the cost per yard and the total amount billed us:

MONTH:	CUBIC YARDS	COST PER YARD	TOTAL COST
April----------	151,526	$ .3159	$ 47,873.77
May----------	197,152	.3127	61,646.19
June----------	166,905	.3256	54,347.76
July----------	179,173	.3253	58,286.53
August---------	184,883	.3212	59,391.32
September------	158,053	.3235	51,136.00
October--------	112,186	.3231	36,245.65
November-------	21,042	.3272	6,884.79
TOTAL----------	1,170,920	$.3209	$375,812.01
1924----------	1,041,433	$.3205	$333,810.64

The average cost of $.3209 for 1925 compares with $.3205 for the previous year and $.3350 for the entire operation to the beginning of 1925.

TRACKS

A track crew of 14 men was put to work on April 6th. This gang extended and threw over the loading tracks leading into the Hill rocky area to the east of the approach and they straightened and repaired the west main approach track. It was not necessary to do any extensive repair work on the main line or in the yards during the past year.

The large part of the track work during 1925 consisted in throwing tracks in the pit for shovel loading. Due to the short cuts in the direct ore area and during the latter part of the season in the Trumbull wash ore, the amount of track work was quite excessive for the tonnage secured.

During October a new waste dump track was laid, approximately one-half mile in length. This track was placed on the high dump built up by A. Guthrie Company's stripping operations.

The A. Guthrie Company have made us a proposition covering the sale to us of over 12,000' of their track and we are at the present time considering the purchase of same. When the Contractor started work at the Hill-Trumbull Mine, it was necessary to provide a double track system from the bottom of the approach out onto the dumps, in order to relieve the congestion that would have occurred with run-around tracks. It is very advisable that we purchase all of the double line system, as well as one track leading onto the dump and the Contractor's stripping track, which follows the toe of the stripping around to the west end of the Trumbull property.

Before next season's ore operations, it will be necessary for us to replace a considerable number of ties on the main line, as well as to do some relining and reballasting. The yard tracks are getting in bad shape and a number of tie replacements will be necessary here. The rails for the most part are standing up very well under the service and it will only be necessary to replace a few of them next season.

REPAIR WORK

The repair crew in the shops returned to work on January 5th, following the holiday lay-off. Repairs on shovel No. 27, which had begun in November, 1924, and on shovel No. 26, which were started in December, were continued during the month of January. Both of these machines were given a thorough overhauling and they stood up very well under the heavy service to which they were subjected during the year.

Locomotives Nos. 101, 102 and 103 were taken into the shop the latter part of January and the work of repairing was carried on somewhat intermittently until the middle of March, when the job was completed. The lower 100 flues were taken out of each of the locomotives, so that the boilers could be thoroughly cleaned. New hub liners were put in, the side rods were taken down and the cylinders opened for the necessary repairs.

Work on the 20-yard cars was started in January and completed the latter part of February. The cars were thoroughly repaired and repainted.

The locomotive crane was given a thorough overhauling during the month of March and was painted.

The necessary repairs on the Keystone drill were made during March.

Repairs on the 12-yard cars were begun in March and completed before the end of April.

Locomotives Nos. 2 and 19 were taken into the shop for repairs in March. These machines were overhauled quite thoroughly, the job being finished in April.

The two 50-ton steel ore cars, which are used handling coal to the dock, were repaired in April. The work of cleaning the intake channel for our washing plant pump, which was begun in December, was resumed January 5th. The old fish screen was removed and an excavation made for concrete dam. The concrete for the foundations of the dam were poured, but the work had to be discontinued on account of very severe weather. The gravel for the concrete work was hauled and the men then transferred to the washing plant to do some overhauling there. The remainder of the work on the dam was done in March and a sand pump was installed to handle the mud that had accumulated in the channel. This job was completed March 7th

and the crew, with the exception of two men, was laid off.

During the forepart of April, two breaks in the storage basin dyke were repaired and during the latter part of that month the washing plant crew put the finishing touches on the mill for the season's operations.

At the conclusion of the wash ore operations last season, the Model 27 shovel was taken into the shops for overhauling.

The usual fall work was done at the washing plant and the storage basin dyke was built up several feet in order to safeguard the start of our 1926 washing operations.

The washing plant crew disconnected the pipes in the mill and took down the machinery, besides doing considerable repair work on the 8' pan conveyors.

ORE OPERATIONS

Ore operations for the 1925 season were begun on April 24th and completed October 6th. Direct ore operations were started April 29th.

Shovel No. 27 was cut into the top bench of Trumbull ore on the west side of the approach at the beginning of the season and worked here throughout the year. Frost conditions caused quite a little trouble during the months of April and May.

The south end of the shovel No. 27 cuts encountered lean material, which could not be washed to advantage. These ore cuts outlined the non-washable area and this material was removed subsequent to the ore season. When the shovel encountered the lean material there was a delay. A part of the cut would be wash material and a part non-concentrating, until we had progressed some little distance. We usually operated a nigh shift here to carry the cut far enough along to provide suitable track facilities for the following cut.

The ore cuts developed a larger lean ore area than we had anticipated and for this reason it was necessary for us to take some ore from the bottom of the Trumbull pit to the northeast. Shovel No. 26 operated in this pit bottom and in the Hill rocky area, being moved back and forth as conditions necessitated. Shovel No. 26 worked the forepart of the season in the high grade Hill deposit to the west of the approach.

The high grade Hill area was exhausted in July, work in the rocky area completed the middle of August, and No. 26 shovel spent the balance of the season in the bottom of the Trumbull pit.

The tonnage and analysis of the wash ore produced during 1925 follows:

	TONS	FE.	PHOS	SIL.
Hill Wash Ore----------	124,845	40.91	.043	35.81
Trumbull Wash Ore-------	523,425	41.75	.049	33.45
TOTAL & AVERAGES--------	648,270	41.59	.048	33.90

The Model 36 revolving shovel was moved into the direct ore area at the east end of the Hill pit the forepart of the season. The machine loaded here from time to time, as the average grade of our shipments warranted.

Operations in the direct ore area were conducted in such a manner that the cuts extended clear through to the Hill-Annex line and the floor of the deposit is now comparatively level. The operations on the Hill-Annex side had been carried down some distance below us and it was advisable to carry our cuts down so as to avoid the likelihood of sloughing, which would result from further operations by the Hill-Annex Mine.

A horse of taconite was developed at the end of the season's operations, extending from the Hill-Annex side to about the center of our direct ore area.

The analysis of the direct ore produced during 1925 follows:

	TONS	FE.	PHOS.	SIL.	MOIS.	FE.NAT.
Hill Direct Ore----------	98,893	58.93	.057	9.38	7.28	54.64

Both the direct ore area and the wash ore areas to be attacked during 1926 were thoroughly test-pitted. This work started in August and was completed December 10th. In the case of the wash ore test-pits, the samples were hand washed, so as to determine what we may expect from the concentrating of this material next season.

LEAN AND WASTE ORES

Upon the conclusion of the season's ore operations, the track gang laid a new line along the A. Guthrie dump and shovel No. 27 started digging the lean waste material at the south end of the Trumbull pit on October 13th.

Three trains were used to serve this shovel in the lean ore operation. Seven cuts were taken across this area and a total of 138,510 tons of material was handled.

Our estimated cost per yard for doing this work was placed at $.37 and the actual cost realized was $.316.

The tonnages of lean and waste ores handled by years since we started operating at the Hill-Trumbull Mine, and the analysis of same, follows:

Coarse Non-Concentrating Material Above 40%:	YEAR	TONS	FE.	PHOS	SIL.	
Hill Mine----------	1920	7,245	32.90	.028	42.65	(2)
Hill Mine----------	1921	70	41.53	.039	32.67	(1)
Hill Mine----------	1923	212	41.91	.032	36.62	(1)
TOTAL AND AVERAGES----------		7,527	33.23	.028	42.38	

(1) 1921 and 1923 tonnages stocked in No. 1 stockpile.
(2) 1920 tonnage stocked in No. 2 stockpile.

Concentrating Material Above 25%:	YEAR	TONS	FE.	PHOS	SIL.
Hill Mine----------	1923	10,028	27.16	.035	50.47
Trumbull Mine----------	1923	22,980	27.95	.029	53.59
Trumbull Mine----------	1924	17,331	26.62	.038	55.43
Trumbull Mine----------	1925	28,470	26.82	.035	54.70
Hill Mine----------	1925	60	30.70	.029	52.23
TOTAL & AVERAGES----------		78,869	27.15	.034	54.00

Waste Ore - Placed on Stripping Dump:

Hill Mine----------	1923	3,192	29.58
Trumbull Mine----------	1923	52,007	19.49
Trumbull Mine----------	1924	81,180	20.62
Trumbull Mine----------	1925	123,510	20.81
TOTAL AND AVERAGES----------		259,889	20.59

WASHING PLANT

Washing operations were begun on April 24th and were concluded October 6th.

The frost in the ore handled during April and May was very trying. There were many frost chunks to be handled in the mill and it was impossible to wash them to good effect. The mill feed was slowed down when we were handling the frost material.

While there were no unusual delays during the past season, the very low grade ore that was handled at times, as well as rocky materialy, necessitated a slowing down in the mill operations.

As the result of an investigation of our method of sampling, it was considered advisable to put in chutes so as to mix the screen product with that of the logs. As a result of mixing the product from the machines in this manner, we obtained much more satisfactory samples and we checked somewhat better with the Lower Lake chemists.

The old conveyor belt, which had been in service since 1923, became so badly worn and breaks were occurring so constantly, that a new belt was put in service during August. We are in hopes that the new belt will carry us for the next two years and unless some bad accidents occur, this should be realized.

An electric car puller was installed in May. This equipment has worked very satisfactorily and we have been able to handle our operations at the washing plant with two less men than would have been the case if we had continued lowering and spotting the cars by hand, as was done in the past.

While the washing plant crew shows about the same number of men as in previous years, the extra labor on the dyke is responsible for this. Heretofore we have built up our dykes at the conclusion of the ore operations, whereas during the past season we kept men continually on the dykes and thus the winter work is lessened appreciably.

We made tests of the Hill-Trumbull ore at both the Crosby and Hawkins washing plants, where Dorr classifiers are installed to take the place of turbos

and tables. The test made at the Crosby plant was quite unsatisfactory, but that at the Hawkins mill demonstrated the adaptability of the Dorr classifier for handling our Hill-Trumbull ore. The test at the Hawkins plant showed the following results, as compared with running the same ore through our Hill-Trumbull washer:

	RESULTS OBTAINED BY WASHING 1,398,880 LBS. OF HILL-TRUMBULL ORE IN HILL-TRUMBULL WASHING PLANT.		RESULTS OBTAINED BY WASHING 1,435,100 LBS. OF HILL-TRUMBULL ORE IN HAWKINS WASHING PLANT.	
	IRON.	SILICA.	IRON.	SILICA.
Crude Ore----------	44.14	31.48	45.16	30.18
Trommel Product----------	59.44	8.12	59.63	7.30
Log Product----------	59.08	9.50	60.66	6.98
Log Overflow----------	24.78	60.84	34.76	47.83
Turbo Product----------	53.87	18.76	---	---
Bowl Classifier Product---------	---	---	54.22	18.70
Total Concentrates Secured------	931,700 LBS.		956,400 LBS.	
Analysis of Concentrates--------	60.06	8.47	60.44	7.40

The crude ore, which was used in these tests was secured from the same part of the Trumbull pit. Several cars to be washed at the Hill-Trumbull plant were loaded and then several cars for the Hawkins test, in this way securing the same grade to be tested at the plants.

The gross recovery secured at the Hill-Trumbull plant amounted to 66.60% and at the Hawkins plant 66.64%, or an increase of .04% at the Hawkins. The concentrate fines were the product of the turbos at the Hill-Trumbull plant and were secured from Dorr bowl classifiers at the Hawkins. There was very little difference in the gross recovery, the iron content of the concentrates, however, was .38% higher at the Hawkins mill.

While the Dorr classifier showed a little larger tonnage recovery and also raised the grade somewhat, it was not considered a sufficient betterment to warrant the expenditure necessary for the installation of two Dorr bowl classifiers at our Hill-Trumbull washer for next season's operations. It is quite likely that we will encounter ores that will be benefitted to a greater extent than those tested last season and no doubt we will install some machinery to surplant the turbos and tables before our operations are concluded in the Marble district.

Aside from the men, it was necessary to place several teams at work on

the storage basin dyke last summer, to repair breaks and to build up the dyke itself. All work on the dyke was completed October 31st. and we have sufficient height to take care of at least the first half of next season. We find that it is advisable, however, to always keep at least one, if not two, men patrolling the dyke and placing 1/2" boards along places where any wash occurs from water currents or waves.

Following is the tonnage and analysis of the crude ore treated and the concentrates produced during the seasons of 1924 and 1925, also the ratio of tonnage recovery and the recovery of iron units for these years:

	TONS.	FE.	PHOS	SIL.
Crude Ore Treated During 1925----------	648,270	41.59	.048	33.90
Crude Ore Treated During 1924----------	451,724	43.59	.050	30.67
Concentrates Produced During 1925----------	406,094	58.58	.061	8.46
Concentrates Produced During 1924----------	287,146	59.75	.063	7.40

Ratio of Recovery for 1925---------- 62.64%.
Ratio of Recovery for 1924---------- 63.57%.

Recovery of Iron Units for 1925---------- 88.23%.
Recovery of Iron Units for 1924---------- 87.06%.

Considering the fact that the crude ore treated in 1925 was two points lower in iron, the iron in the concentrates is quite satisfactory, as is also the gross and iron unit recovery. The physical structure of the material handled during 1925 was much the same as that for the previous year.

The average analysis of the product from the several machines during the years 1924 and 1925 follows:

----------1-9-2-5----------

	FE.	PHOS	SIL.
Screen----------	57.92	.053	8.80
Logs----------	58.41	.053	8.35
Turbos----------	51.79	.046	18.54
Tailings---------	11.36	-	-

----------1-9-2-4----------

	FE.	PHOS	SIL.
Screen----------	60.00	.063	7.25
Logs----------	58.87	.061	9.20
Turbos----------	52.57	.056	19.17
Tailings--------	14.83	-	-

The iron content of the product from all of the machines was somewhat lower in 1925 than during the previous year and the iron in the tailings was considerably lower. During 1925 the turbo product was comparatively small and the log output was relatively heavy.

Due to the very inferior character of the fine material handled during 1925, the turbo product was most unsatisfactory and we did not operate the tables at all, other than to show the fee owners from time to time that no recovery could be made from them.

The tonnage of rock rejects from the mill and the analysis of same follows:

	TONS	FE.	PHOS	SIL.
Plant Rejects----------	10,940	24.64	.079	59.31

WATER LEVEL IN PIT:

As a result of the Hill-Annex Mine pumping, the water level in the Hill pit was lowered from an elevation of 1284' to 1254', or by 40'. The area now covered by water is much less than a year ago and the remaining 18' of water in the pit, measured to the deepest point, should be drained by the middle of the summer. While it would appear that the elevation of the water would drop faster with the smaller volume from the pit, the saturated underground area is larger at lower elevations and the water is being lowered a smaller amount per month than was the case a year ago.

ACCIDENTS

Only two accidents, listed below, occurred at the Hill-Trumbull Mine during 1925 of a nature serious enough to require the payment of compensation:

DAN MARKOVICH

Injured---------- April 28th, 1925.
Occupation---------- Pitman.
Nationality---------- Austrian.
Time Lost---------- 68 Days.
Compensation Paid----------$196.67.

Remarks: The hoisting chain on the steam shovel drum was being cleaned and Markovich was standing very close to the drum. A "U" bolt caught Markovich's foot and crushed it against the flooring.

OSTOYA MARYANOVICH

Injured---------- October 23rd., 1925.
Occupation---------- Test-pitter.
Nationality---------- Jugo-Slav.
Time Lost---------- 12 Days.
Compensation Paid---------- $10.00.

Remarks: Maryanovich was going to work in the pit and had walked down a stairway leading down from the west side of the approach. The ground slopes away from this stairway and on account of the icy condition, Maryanovich slipped and fell, striking the ground so hard that he injured his back.

SHIPMENTS

Following are the cargoes of Hill-Trumbull ore shipped during the past season and the analysis of same as obtained at the Mine and by the Lower Lake Chemists:

PETER WHITE	4/30/25					3,454 Tons.
	FE.	PHOS	SIL.	MOIS.	FE.NAT.	
Mine	58.77	.056	7.31	10.73	-----	
Oscar Textor	57.55	---	----	7.69	53.12	
MARQUETTE	5/6/25					6,558 Tons.
Mine	58.42	.049	8.94	10.62	-----	
Cremer & Case	57.30	---	----	9.12	52.07	
MICHIGAN	5/6/25					5,913 Tons.
Mine	58.37	.044	10.00	10.81	-----	
Crowell & Murray	57.93	---	-----	10.80	51.67	
BENSON FORD	5/8/25					6,374 Tons.
Mine	58.32	.039	10.31	11.38	-----	
Crowell & Murray	56.95	---	12.57	11.05	50.66	
Hughes-Guentzler	56.73	---	-----	11.39	50.27	
F. A. BAILEY	5/12/25					9,504 Tons.
Mine	58.66	.055	7.92	8.93	-----	
Hughes-Guentzler	57.15	---	----	8.40	52.35	
PETER WHITE	5/16/25					8,711 Tons.
Mine	58.28	.056	8.58	6.65	-----	
Crowell & Murray	57.65	---	----	7.58	53.28	
MICHIGAN	5/19/25					9,610 Tons.
Mine	58.32	.059	7.98	6.92	-----	
Cremer & Case	57.00	---	----	7.58	52.68	
COLONEL	5/24/25					5,546 Tons.
Mine	59.17	.052	8.62	8.35	-----	
Hughes-Guentzler	58.83	---	----	7.70	54.30	
THOS. BRITT	5/26/25					5,875 Tons.
Mine	59.30	.059	6.65	6.04	-----	
Crmer & Case	58.40	---	----	6.21	54.77	
SAMUEL SQUIRE	5/28/25					6,452 Tons.
Mine	59.23	.058	6.44	5.53	-----	
Oscar Textor	57.22	---	----	6.93	53.25	
PANAY	5/30/25					5,351 Tons.
Mine	58.85	.055	8.03	9.62	-----	
Crowell & Murray	57.70	---	----	11.47	51.08	

PETER WHITE- - - - - - - - - - - - - - - 6/1/25 - - - - - - - - - - - 8,519 Tons.

	FE.	PHOS	SIL.	MOIS.	FE.NAT.
Mine	59.02	.062	6.35	7.14	-----
Hughes-Guentzler	56.97	---	----	7.95	52.44

HENRY FORD 11- - - - - - - - - - - - - - 6/4/25 - - - - - - - - - - - 3,863 Tons.

Mine	60.46	.063	4.99	6.78	-----
Hughes-Guentzler	59.10	---	----	6.22	55.42
Crowell & Murray	58.83	---	7.36	7.36	54.50

PANAY- - - - - - - - - - - - - - - - - - - 6/6/25 - - - - - - - - - - - 5,235 Tons.

Mine	59.62	.060	8.23	8.82	-----
Cremer & Case	57.60	---	----	7.46	53.30

F. A. BAILEY- - - - - - - - - - - - - - - 6/6/25 - - - - - - - - - - -9,424 Tons.

Mine	59.28	.063	7.98	8.44	-----
Crowell & Murray	59.30	---	----	8.70	54.14

CLETUS SCHNEIDER- - - - - - - - - - - - - 6/13/25 - - - - - - - - - - 4,025 Tons.

Mine	59.34	.055	6.62	10.61	-----
Cremer & Case	57.00	---	----	8.04	52.42

COLONEL- - - - - - - - - - - - - - - - - - 6/13/25 - - - - - - - - - -5,582 Tons.

Mine	58.74	.064	8.46	10.86	-----
Crowell & Murray	58.30	---	----	9.35	52.85

H. SHEADLE- - - - - - - - - - - - - - - - -6/13/25 - - - - - - - - - 9,322 Tons.

Mine	59.35	.060	9.11	8.28	-----
Oscar Textor	58.93	---	----	7.24	54.66

FRONTENAC- - - - - - - - - - - - - - - - - 6/19/25 - - - - - - - - - 10,737 Tons.

Mine	58.63	.059	8.54	8.61	------
Oscar Textor	57.45	---	----	7.57	53.10
Crowell & Murray	57.75	---	----	7.00	53.71

F. A. BAILEY- - - - - - - - - - - - - - - 6/20/25 - - - - - - - - - 9,349 Tons.

Mine	58.78	.054	9.07	7.73	-----
Crowell & Murray	58.25	---	----	7.86	53.67

Q. A. SHAW- - - - - - - - - - - - - - - - - 6/20/25 - - - - - - - - - 2,228 Tons.

Mine	59.96	.059	8.83	5.30	-----
Oscar Textor	58.50	----	----	6.49	54.70

J. H. SHEADLE- - - - - - - - - - - - - - -6/21/25 - - - - - - - - - - 9,542 Tons.

Mine	58.55	.056	8.15	7.62	-----
Oscar Textor	57.36	---	----	7.94	52.80

W. P. SNYDER, JR.- - - - - - - - - - - - -6/23/25 - - - - - - - - - 7,266 Tons.

Mine	58.67	.057	8.93	6.41	-----
Hughes-Guentzler	58.65	---	----	6.56	54.80

COLONEL- - - - - - - - - - - - - - - - - -6/24/25 - - - - - - - - - 5,593 Tons.

Mine	59.68	.061	5.57	5.99	-----
Crowell & Murray	60.05	---	----	6.95	55.88

HILL-TRUMBULL MINE.

FRONTENAC- - - - - - - - - - - - - - - - 6/26/25 - - - - - - - - - - - 10,737 Tons.

	FE.	PHOS	SIL.	MOIS.	FE.NAT.
Mine----------	59.41	.058	8.15	7.68	-----
Crowell & Murray---------	59.60	---	----	7.40	55.19

PONTIAC- - - - - - - - - - - - - - - - - 7/2/25 - - - - - - - - - - - 10,431 Tons.

Mine----------	58.94	.061	8.27	8.99	-----
Crmer & Case----------	58.20	---	----	9.21	52.84

ISHPEMING- - - - - - - - - - - - - - - - 7/5/25- - - - - - - - - - - - 9,571 Tons.

Mine----------	59.20	.061	9.41	7.30	-----
Cremer & Case----------	57.70	---	----	6.53	53.93

GRAND ISLAND- - - - - - - - - - - - - - - 7/6/25- - - - - - - - - - - - 7,792 Tons.

Mine----------58.45		.056	10.06	5.75	-----
Hughes-Guentzler---------58.83		---	-----	5.97	55.32

PONTIAC- - - - - - - - - - - - - - - - - -7/10/25- - - - - - - - - - - 10,495 Tons.

Mine----------	58.85	.063	9.79	5.29	-----
Oscar Textor----------	59.10	---	----	4.78	56.27

YOSEMITE- - - - - - - - - - - - - - - - - 7/15/25- - - - - - - - - - - 5,349 Tons.

Mine----------	58.44	.065	8.32	7.35	-----
Oscar Textor----------	59.00	---	----	7.29	54.70

FRONTENAC- - - - - - - - - - - - - - - - -7/16/25- - - - - - - - - - - 10,761 Tons.

Mine----------	58.22	.064	9.28	7.75	-----
Crowell & Murray---------	58.67	---	----	6.98	54.57

J. H. SHEADLE- - - - - - - - - - - - - - -7/20/25- - - - - - - - - - - 9,409 Tons.

Mine----------	57.61	.065	11.01	7.29	-----
Crowell & Murray---------	58.61	---	-----	6.91	54.56

HENRY FORD 11- - - - - - - - - - - - - - -7/24/25- - - - - - - - - - - 11,121 Tons.

Mine----------	59.02	.055	7.16	5.13	-----
Hughes-Guentzler---------	58.35	---	----	5.83	54.95
Crowell & Murray---------	58.76	---	----	5.40	55.59

FRONTENAC- - - - - - - - - - - - - - - - -7/25/25- - - - - - - - - - - 10,543 Tons.

Mine----------	58.11	.053	8.82	7.20	-----
Hughes-Guentzler---------	58.00	---	----	6.75	54.08

FRONTENAC- - - - - - - - - - - - - - - - -8/1/25- - - - - - - - - - - 10,874 Tons.

Mine----------	58.03	.058	9.11	6.90	-----
Hughes-Guentzler---------	58.40	---	----	6.47	54.62

ISHPEMING- - - - - - - - - - - - - - - - -8/3/25- - - - - - - - - - - 9,449 Tons.

Mine----------	57.01	.059	10.66	6.89	-----
Cremer & Case----------	58.20	---	-----	6.72	54.29

GRAND ISLAND- - - - - - - - - - - - - - -8/4/25 - - - - - - - - - - - 8,955 Tons.

Mine----------	57.79	.066	9.28	7.66	-----
Cremer & Case----------	57.45	---	----	6.43	53.76

HILL-TRUMBULL MINE.

	FE.	PHOS	SIL.	MOIS.	FE.NAT.	
W. G. MATHER- - - - - - - - - - - - - - - - -8/10/25- - - - - - - - -						11,334 Tons.
Mine----------	58.13	.073	8.95	7.31	-----	
Oscar Textor----------	58.10	---	----	7.87	53.54	
MARQUETTE- - - - - - - - - - - - - - - - - - 8/10/25- - - - - - - - -						6,625 Tons.
Mine----------	58.59	.066	8.16	7.49	-----	
Hughes-Guentzler----------	58.28	---	----	8.44	53.36	
PENOBSCOT- - - - - - - - - - - - - - - - - - 8/15/25- - - - - - - - -						6,342 Tons.
Mine----------	57.70	.066	9.32	6.92	-----	
Crowell & Murray----------	58.65	---	----	6.00	55.13	
THOS. BRITT- - - - - - - - - - - - - - - - - 8/16/25- - - - - - - - -						5,899 Tons.
Mine----------	58.06	.070	8.93	8.28	-----	
Oscar Textor----------	58.80	---	----	6.07	55.23	
W. G. MATHER- - - - - - - - - - - - - - - - -8/19/25- - - - - - - - -						11,430 Tons.
Mine----------	57.73	.068	9.63	8.51	-----	
Crowell & Murray----------	58.10	---	----	6.73	54.19	
ISHPEMING- - - - - - - - - - - - - - - - - - 8/24/25- - - - - - - - -						9,484 Tons.
Mine----------	58.42	.071	9.38	6.89	-----	
Cremer & Case----------	58.75	---	----	5.03	55.79	
HENRY FORD 11- - - - - - - - - - - - - - - - 8/24/25- - - - - - - - -						10,963 Tons.
Mine----------	59.10	.065	8.34	6.76	-----	
Crowell & Murray----------	58.80	---	----	6.50	54.98	
Hughes-Guentzler----------	58.80	---	----	6.67	54.88	
A. E. R. SCHNEIDER- - - - - - - - - - - - 8/25/25- - - - - - - - -						7,642 Tons.
Mine----------	58.14	.067	9.55	7.40	-----	
Cremer & Case----------	58.00	---	----	6.45	54.26	
W. G. MATHER- - - - - - - - - - - - - - - - 8/30/25- - - - - - - - -						11,351 Tons.
Mine----------	58.15	.070	9.87	5.89	-----	
Crowell & Murray----------	58.65	---	----	6.78	54.67	
YOSEMITE- - - - - - - - - - - - - - - - - -9/1/25 - - - - - - - - -						5,351 Tons.
Mine----------	58.43	.078	9.13	7.61	-----	
Oscar Textor----------	58.00	---	----	7.95	53.39	
PENOBSCOT- - - - - - - - - - - - - - - - - -9/3/25- - - - - - - - -						6,196 Tons.
Mine----------	58.73	.064	9.69	7.18	-----	
Cremer & Case----------	58.70	---	----	6.03	55.16	
W. G. MATHER- - - - - - - - - - - - - - - - 9/6/25- - - - - - - - -						11,403 Tons.
Mine----------	58.41	.076	9.41	6.07	-----	
Oscar Textor----------	59.15	----	----	5.79	55.72	
BENSON FORD- - - - - - - - - - - - - - - - -9/8/25- - - - - - - - -						10,830 Tons.
Mine----------	59.44	.066	7.34	6.11	-----	
Crowell & Murray----------	59.05	---	----	7.40	54.68	
Hughes-Guentzler----------	59.00	---	----	7.52	54.56	

ANGELINE- - - - - - - - - - - - - - - - 9/9/25 - - - - - - - - - - 6,275 Tons.

	FE.	PHOS	SIL.	MOIS.	Fe.NAT.
Mine	59.06	.075	8.14	6.46	-----
Hughes-Guentzler	58.57	---	----	8.01	53.88

W. E. FITZGERALD- - - - - - - - - - - 9/10/25- - - - - - - - - - 6,862 Tons.

Mine	58.03	.066	10.19	8.90	-----
Crowell & Murray	59.10	---	-----	6.00	55.55

FRONTENAC- - - - - - - - - - - - - - - -9/13/25- - - - - - - - - -10,878 Tons.

Mine	59.39	.054	7.61	6.37	-----
Hughes-Guentzler	60.15	---	----	6.05	56.51

W. G. MATHER- - - - - - - - - - - - - - 9/20/25- - - - - - - - - - 4,475 Tons.

Mine	58.59	.042	8.81	10.52	-----
Crowell & Murray	59.00	---	----	9.81	53.21

COLONEL--- - - - - - - - - - - - - - - 9/24/25- - - - - - - - - - 5,490 Tons.

Mine	58.86	.052	8.52	6.43	-----
Oscar Textor	58.30	---	----	7.65	53.84

PONTIAC- - - - - - - - - - - - - - - - -9/25/25- - - - - - - - - -10,606 Tons.

Mine	58.45	.055	8.12	6.77	-----
Hughes-Guentzler	58.70	---	----	6.39	54.95

PETER WHITE- - - - - - - - - - - - - - -9/26/25- - - - - - - - - - 8,647 Tons.

Mine	58.36	.051	9.22	6.97	-----
Cremer & Case	57.90	---	----	7.12	53.78

HENRY FORD 11- - - - - - - - - - - - - -9/30/25- - - - - - - - - -10,963 Tons.

Mine	59.29	.057	6.70	7.93	-----
Crowell & Murray	58.70	---	----	8.60	53.65
Hughes-Guentzler	58.18	---	----	8.96	52.97

MARQUETTE- - - - - - - - - - - - - - - -10/2/25- - - - - - - - - - 4,259 Tons.

Mine	58.82	.058	7.21	7.18	-----
Crowell & Murray	58.80	---	----	7.34	54.48

MARQUETTE- - - - - - - - - - - - - - - -10/10/25- - - - - - - - - 6,746 Tons.

Mine	59.00	.051	9.02	7.10	-----
Oscar Textor	60.20	---	----	7.97	55.40

D. TROXEL- - - - - - - - - - - - - - - -10/13/25- - - - - - - - - 6,611 Tons.

Mine	58.86	.053	7.79	7.97	-----
Hughes-Guentzler	59.40	---	----	7.97	54.66

ISHPEMING- - - - - - - - - - - - - - - -10/14/25- - - - - - - - - 9,390 Tons.

Mine	59.02	.051	7.38	9.27	------
Oscar Textor	59.25	---	----	10.32	53.13

In addition to the above cargoes 10,415 tons of Hill Direct ore was shipped with the Boeing grade.