

SOUTH JACKSON MINE - 1919.

The product from this property for the season 1919 was 56,840 tons. Practically all of this came from the open pit near the Lucy line with the exception of a small amount that was obtained from the drifts at the tunnel level.

OPEN PIT.

Operations started in the open pit the latter part of April. It had been determined to try loading by means of steam shovel, although it was a question whether a satisfactory mixture could be obtained, but as this method would be cheaper than any other, it was decided to make the experiment. A steam shovel was moved to the pit early in May and placed alongside of the cut which had been made through the pit to the Southeast into the Lucy Pit just North of the section corner. The result of the loading was satisfactory and the shovel was employed throughout the season. There were times the ore was slightly off grade, but by maintaining two breasts and arranging so that the shovel could be moved quickly from one to the other, the product was kept uniform. During the season about two and one-half cuts were made through the bottom of the pit, except North of the section corner where the banks are high. Here a cut and one-half was made. In the Lucy Pit it was necessary to employ the shovel for a short time in filling the bottom of the pit up to the track level, so that tail room could be obtained for the railroad cars.

During the last two or three years, the best product from the pit has come from the South end and the Southeast corner; that on the North side had been quite lean, but by combining with the South side ore, a satisfactory product had been maintained. It was expected in steam shovel loading, that the ore on the North side would be lean and would have to be mixed with the South side ore to "sweeten" it. We found, however, while the North side kept up to guarantee or well above, that a great deal of difficulty was had with the ore from the South side. Here an old incline shaft and drift were en-

countered filled with sand, also several dikes cut through the formation which did not show on surface. This material had to be separated, loaded and hauled away from the pit, but some of the good ore was contaminated by the sand and rock, and gave us considerable trouble in making our guarantee.

In order to facilitate the moving of the shovel from one breast to another, it was necessary to supply the pit with extra loading track, 900 feet of which was layed during the year. This was charged to the operations and included in the cost of production. Most of the loading was done by spotting the cars by hand, a down grade being maintained, however, there were times on account of little tail room, when it was necessary to employ a spotting engine to give us satisfactory car service. When spotting by hand, cars were furnished by the Railroad Company, who would give us two spots a day; refusing to come to the pit oftener than that, unless continuous service was demanded, at which time we were required to pay the hourly charge of \$7.50. This action by the Railroad Company was unreasonable at times, and made an expensive proposition for the mine, as nearly every day there was idle time when nothing could be done by the steam shovel crew. The Railroad Company's service at this pit has been anything but satisfactory and last year was no exception to the rule.

In addition to the steam shovel crew, four miners were engaged in drilling and blasting in front of the shovel, breaking up large chunks or in preparing the breast. In August a churn drill was brought to the pit. Eight holes were drilled in the high bank on the North side and five on the bank to the South. Those on the North averaged 48' in depth. On September 13th, the first four holes on the North side were blasted at one time, 2450 pounds of powder being used. This broke off the entire side of the cut for 25 feet which gave us ore from this side for the balance of the season; although some of the slabs were so large as to require extra drilling and blasting. The latter part of September a churn drill hole 63' deep near the section corner on the South side of the pit was blasted; 1350 pounds of powder was used here which shattered a very large volume, the full extent of which has not been

determined.

UNDERGROUND.

There remains above the level of the old pit about one season's product. When it is impossible to do further steam shovel loading, it will be necessary to mine by means of milling. The mill drifts have been started at the tunnel level which is about 60' below the collar of the shaft, or at an elevation of 1384.7. Last year a drift was extended to the West in the direction of the old manganese pit. It was continued this year and the breast at present is 250' to the West of the shaft. In the Southwest end of the pit, the drainage tunnel was extended 140' to permit milling to start in that territory. This drift in August holed into an old stope which was filled with water. The present breast is 40' beyond this stope and raises will be pushed through to the bottom of the pit during the coming season. The drift on the Southeast side of the shaft was extended 60' to the South. The underground drifting was greatly retarded during the past season on account of insufficient air pressure.

SHAFT.

During the year two cuts were made in the bottom of the shaft to provide a small skip pit and a chute, so that the ore could be loaded into the skips more readily.

COMPRESSOR.

Before work starts the coming season a larger air compressor should be provided for this mine. The present compressor has a capacity of 300 cubic feet per minute and is not large enough to supply the air for the underground drilling and for the two machines which have to run almost continually in the pit. If greater progress cannot be made with the underground drifting, it will be impossible to obtain the season's product by milling in the year 1921, as sufficient territory cannot be developed for milling operations.

ENGINE SERVICE.

As mentioned above the Jackson Pit has received extremely poor engine service and a great deal of time has been lost on this account. The

yard foreman at Ishpeming is extremely arbitrary and last year there was a continuous wrangle with his office in order to get service. To do cheap mining in this pit, there should be as little loss of time on the part of the shovel crew as possible. In order to help the situation, I would recommend that a Company spotting engine be employed at this pit. The Company owns an engine which was used for removing the rock pile at the old Moro. I understand this is of sufficient size to spot one or two loaded cars. If such is the case, I believe it would be to our advantage to use it at this pit. I would recommend that it be overhauled, if necessary, and tried out here during the coming season.

MINING METHOD.

The steam shovel method will be employed during the coming season if a proper mixture can be maintained, if not, the only other possible method will be milling. The latter method, while it might give a more uniform product, will be more expensive as all of the ore will have to be trammed underground, therefore, it is to our advantage to employ the steam shovel as long as possible. If the Company locomotive proposition works out satisfactorily, it is possible that steam shovel mining can be done beyond the present season, if the locomotive is able to haul loaded cars up grade. Milling drifts will be extended as rapidly as possible in order that they may be available in case it is necessary to use them to regulate the grading.

EXPLORATIONS.

The churn drill holes in the Southeast end of the pit were recorded by the Geological Department as regular exploration holes in order that a proper record might be kept, however, these were drilled wholly to be used in breaking the bank. The analyses were kept in order to show the grade of ore. In one or two of the holes on the North side a few runs of high manganese ore was found.

Hole #119. Location Negaunee Coordinates, South 4055 West 7700; dip 90°; elevation of collar 1453; depth December 31, 1918 1245 ft. Material

reported last year in this hole was 0 to 510 ' soft ore jasper with runs of lean ore.

FROM	TO	MATERIAL
510	1245	Soft ore jasper.
1245	1252	Lean ore.
1252	1385	Soft ore jasper.
1385	1451	Dike.
1451	1483	Soft ore jasper, dike and quartz.
1483	1545	Soft ore jasper.
1545	1570	Dike, jasper and dike.
1570	1647	Soft ore jasper.
1647	1744	Greenstone.

Hole finished May 5th, 1919.

STRIPPING.

In the Southeast end of the Jackson Pit on both the North and South side areas were stripped during the year. On the North side the stripping was about 50' in width and 250' in length, while on the South side the area around the section corner and to the East was cleaned back as far as the East edge of the old Lucy Pit. On both sides stripping from former years had to be rehandled. To the West of the crusher building a territory about 400' long and 200' in width was stripped in the territory known as the manganese strip. Most of this was removed by scraper although a considerable quantity will have to be handled by hand before the actual mining starts.

SOUTH JACKSON ESTIMATE DECEMBER 31, 1919.

Above present pit available by present system of mining:

On Southwest side - - - - - 35,000 tons,
 North of Lucy Pit - - - - - 25,000 "
 South and Southwest of Lucy Pit - - - 25,000 "

TOTAL - 85,000 tons.

Below present pit and above drainage tunnel
 available by milling:

West of Crusher - - - - - 186,967 tons,
 Area A below bottom present pit by
 churn drilling - - - - - 110,000 "
 Probable extension of Area A East
 onto Lucy Pit - - - - - 90,000 tons,

TOTAL - 386,967 tons,

GRAND TOTAL - 471,967 tons.

Mined during the year - 56,840 tons,

Balance December 31st, 1919 - 415,127 tons.

ANALYSES

	<u>IRON</u>	<u>PHOS.</u>	<u>SUL.</u>	<u>MANG.</u>	<u>MOIST.</u>	<u>SIL.</u>
Natural	36.83	.066	.010	2.00	7.00	31.56

SOUTH JACKSON MINE

AVERAGE MINE ANALYSIS ON OUTPUT FOR YEAR 1919.

GRADE	IRON	PHOS.	SILICA	MANG.
South Jackson,	37.73	.058	36.49	2.54

AVERAGE ANALYSIS ON STRAIGHT CARGOES FOR YEAR 1919.

GRADE	IRON	Mine			Lake Erie		
		PHOS.	SIL.	MANG.	IRON	MANG.	MOIST.
South Jackson,	37.56	.058	36.51	2.68	39.28	3.03	7.42

ORE STATEMENT AND SHIPMENTS FOR YEAR 1919.

	YEAR	LAST YEAR
Output for Year,	56,840	15,879
Shipments,	56,840	15,879
Balance on hand,	0	0

1919 - 1-10 Hour Shift - May 10th to October 6th

1918 - 1-10 Hour Shift - May 28th to November 13th.

SOUTH JACKSON MINE.

SOUTH JACKSON MINE.

COMPARATIVE MINING COST FOR YEAR.

	1 9 1 9.	1 9 1 8.	INCREASE.	DECREASE.,
PRODUCT	56,840	15,879	40,961	
General Expense	.036	.073		.037
Maintenance	.007	.282		.275
Mining Expense	.436	.712		.276
Crushing	.125	-	.125	
Stripping	.018	.529		.511
Cost of Production	.622	1.596		.974
Exploratory	-	.607		.607
DEPRECIATION.				
Original Purchase	.803	.803	-	
Total Depreciation	.803	.803	-	
Taxes	.037	.115		.078
Idle Expense	.017	.054		.037
Central Office	.013	.059		.046
Miscellaneous	.008			.008
Supply Inventory	-	.001		.001
Sundry Expense	.007	.006	.001	
Cost on Stockpile	1.491	3.241		1.750
Loading & Shipping	.008	.136		.128
Total Cost on Cars	1.499	3.377		1.878
No. Days Operating	100	83	17	
No. Shifts and Hours	1-10hr	1-10hr		
Avg. Daily Product	568	103	465	
COST OF PRODUCTION.				
Labor	.325			
Supplies	.297			
Total	.622			

SOUTH JACKSON MINE.

COMPARATIVE WAGES AND PRODUCT.

	1919.	1918.	INCREASE.	DECREASE.
PRODUCT	56,840	15,879	40,961	
No.Shifts and Hours	1-10hr	1-10hr		
AVERAGE NUMBER MEN WORKING				
Surface	7½	4	3½	
Underground	4½	7		2½
Total	12	11	1	
AVERAGE WAGES PER DAY				
Surface	5.32	4.76	.56-12%	
Underground	5.92	4.36	1.56-36%	
Total	5.51	4.58	.93-20%	
WAGES PER MONTH OF 25 DAYS				
Surface	133.00	119.00	14.00	
Underground	148.00	109.00	39.00	
Total	137.75	114.50	23.25	
PRODUCT PER MAN PER DAY				
Surface	25.90	11.83	14.07	
Underground	53.38	7.90	45.48	
Total	17.44	4.74	12.70	
LABOR COST PER TON				
Surface	.205	.416		.211
Underground	.111	.551		.440
Total	.316	.967		.651
TOTAL NUMBER OF DAYS				
Surface	2,194½	1,342	852½	
Underground	1,065	2,008		943
Total	3,259½	3,350		90½
AMOUNT FOR LABOR				
Surface	11,676.19	6,608.21	5,067.98	
Underground	6,303.37	8,751.39		2,448.02
Total	17,979.56	15,359.60	2,619.96	

PROPORTION Surface to Underground Men:

1919 - 1 to .6
 1918 - 1 to 1.75
 1917 - 1 to 6.5
 1915 - 1 to 5.
 1914 - 1 to 13.