

SOUTH JACKSON AND CRUSHER - 1917

Work started at this pit overhauling cars, air pipes, etc., on April 23rd. As nothing had been done in the year 1916, considerable repairing was necessary. The announcement was made that mining would start as soon as men could be secured. Loading ore started on May 4th and continued throughout the season until November 10th. A product of 47,336 tons was mined. During the months of May and June practically all of the work was on the East side of the Railroad track which runs through the pit; seven breasts were worked but the product of the two most Northerly was so poor that these two had to be abandoned. On the West side the face of the ore was high - in places nearly 100 feet - and it was too dangerous to start work in that area until the frost was thoroughly out of the ground, as slabs fell off and it was impossible to trim the face. One contract started on this West side in June and others in July. The product improved in quality from that time. Throughout the season there was a scarcity of men, which was an unusual condition at this open pit as in previous years men could be secured here when there was a general shortage at the underground mines. These silicious ores were in demand and we could have sold a greater tonnage if it could have been mined.

Mining operations in this open pit have been conducted for a great many years. The formation is very much broken and contains seams of lean material. It has been the habit to throw this rock in piles in the bottom of the pit as mining advanced; as a consequence the whole bottom of the pit is covered with great piles containing thousands of tons of this lean ore and rock which is unmerchantable. I have stated above the breasts on the North ran into such lean ore that they had to be abandoned. In addition to this there was considerable over-burden encountered which had been dumped from open pits and early mining work. This had to be removed to get at the merchantable ore. At the end of the season on the East side operations had extended nearly to the Lucy line; to the South, we were cut off by dikes;

in the Southwest end some good material was found but the tonnage here is limited on account of dikes also. As there is still a large demand for this ore it became necessary to start exploring to develop the tonnage to be mined the next few years. This was done by means of churn and diamond drills which I will treat under the head of explorations.

EXPLORATIONS.

A churn drill was brought into the pit in June, the bottom of the pit tested thoroughly for a vertical distance of between 50 and 60 feet. On the East side of the pit, that is, Northeast of the loading track, sixteen holes were drilled. In all but four of these ore of the South Jackson guarantee was found. On the Southwest side eight churn drill holes were put down. In these only two found merchantable ore. The tonnage found from this drilling was 70,000 tons. After completing the churn drilling in the pit this drill was moved to the South of the pit on section 12 where holes 9 and 10 were drilled. Both of these were 135' in depth and although they were within 25 feet of the face of the pit no merchantable ore was found. Two churn drill holes were then drilled a little to the Southeast on the Lucy property. These were stopped at a depth of 130' but neither found merchantable ore; the manganese, however, averaging slightly better than 4%. Years ago at the North end of the pit some mining was done in a seam of manganese ore called the "The Manganese Pit". It was decided to test this area with the churn drill. Up to December 31st, holes 97 to 104 were drilled in this area. This is located about 200 feet due West of the Crusher building. The material found in practically all of the holes has been of merchantable grade. The ore developed here December 31st is 90,000 tons but explorations in this territory will be continued. This is covered with an averaged of 4' sand and 6' loose rock which was dumped there in former years.

In addition to the churn drill, a diamond drill was employed for exploratory purposes. Hole 93 was located in the South foot wall of the pit about 100' West of the loading track. It was a flat hole, dip -5° , and

was drilled in a Southerly direction; the first 45 feet were good, the balance of the hole contained lean material; it was stopped at 120' in caving ground.

Hole #96, 250' to the Northwest of 93 was also a flat hole drilled to the South. This stopped at 110' when it encountered old workings, the material throughout the whole length of this was merchantible.

Hole #8, section 12, was located near the end of the loading track against the South wall of the pit. This is about 200' to the Southeast of hole 93. The material encountered was lean.

The last hole drilled was in the Lucy pit in the North face. This was #100, section 6, 47-27, a flat hole at a dip of -5° and drilled about North 28° East; 100' were drilled most of the material being merchantible.

METHOD OF MINING.

The explorations conducted this summer show that the present method of open pit mining will soon have to be discontinued on account of the breasts running out. This means that some other method will have to be adopted. Two methods have occurred to me, one is placing a steam shovel in the bottom of the pit, the other is by a milling.

The steam shovel proposition, if it could be worked out, would probably be the cheaper method. However, I am afraid that the shovel might encounter lean streaks which would bring the product below the guarantee, which would get us into serious trouble. Another obstacle in the way of the steam shovel method is the quantity of lean material that has been left in the pit and the possibilities of running into more refuse in the workings that were conducted underground which were afterwards filled from surface. If enough breasts stopes of good quality ore could be maintained it is possible that we might be able to "sweeten" the steam shovel product to such a degree as to make it merchantible, however, it would be impractical to take out more than one cut in depth if loaded directly into railroad cars on account of railroad operating condition. Further cuts would require an expensive approach and heavy grades.

By milling method a mixture from several different mills might give a merchantible grade even if one mill should happen to run lean. It

happens too that the pit lends itself admirably to this scheme without any great expense. Several years ago a drainage tunnel was constructed which runs from under the pit north beneath the County road and discharges into the open field. The shaft located in front of the crusher extends to this drainage tunnel; the elevation of the shaft plat at this tunnel is 1381.4 ft. while the top of the ore where most of the drilling was done averaged between 1455' and 1465'. This means that if a drift were driven from the shaft under the pit most of the ore found by the churn drill could be mined. The ore body to the west of the crusher would give practically the same amount of ore vertically. After the main drifts were driven, raises put through to surface and stripping completed, I do not think the cost of mining by milling would be a great deal in excess of the present cost. It is my idea to start exploratory work by means of drifts in the direction of these ore bodies early in the spring. In anticipation of this, a couple of sets were put in the bottom of the shaft, and the skip pit sunk a distance of 5 or 6 feet so that ore can be dumped directly into the skips from the tram cars. The tunnel timbering was repaired so that work underground can start as soon as the pit is opened for the summer.

The ore hoisted from the drifts will be dumped at the top of the Crusher building and can be crushed directly or loaded into cars and sent to the Maas crusher.

NEW STEAM SHOVEL TRACK.

Throughout the whole summer we were handicapped considerably on account of lack of track room in the pit. Most of the work in the East end was near the section corner and adjoined the open pit of the Lucy Mine. The tram to the present track was long. It was seen that if another loading track could be provided which would lead into the Lucy pit that the tramping distance would be shortened greatly and two tracks could be used in the pit instead of one. One December 1st a steam shovel was taken to the Jackson pit and a new cut was started on the Northeast side of the present one, the idea being to make a cut through the pit as deep as possible with the steam shovel wasting the dirt on either side. This necessitated

a cut of approximately 25 feet in width. They were able to maintain this width and carry the breast from seven to nine feet high. Horizontal holes were drilled in the breast, these holes being made as deep as possible to drill them. Enough powder was put in the holes to shake the ground thoroughly after which it was excavated by the steam shovel. An average of about two cuts were made per day - some days the breast of the cut advancing 20 to 25 feet. This work continued until the shovel reached a point where it could not waste the material on either side so this work had to be abandoned. This was on January 4th. There is still about 120 feet of cut to be made before the track can be laid into the Lucy pit. This can be taken by means of a breast stope this summer. The ore excavated by the shovel in places looked very good and I hope a few cars can be loaded by means of the steam shovel during the coming season to see how the product will run. If it is satisfactory a considerable quantity can be taken by this means.

STRIPPING.

Immediately after work of loading the ore stopped in the pit, the men were transferred to stripping. This was conducted in three places, North of the Lucy pit, near the Southeast corner of the South Jackson pit, near the section corner $\frac{1}{12} \frac{6}{7}$; and the Southwest edge of the pit over the vertical face.

To the North of the Lucy pit an area about 50' wide was cleaned.

At the section corner, the quantity to be removed was considerable. In order to reach this a bridge had to be built over some of the Lucy pit workings. The material at this section corner was principally sand that had accumulated there by stripping conducted for years. Work had to be abandoned there in January without being completed. This is unfortunate as it is dangerous to strip in that particular location in the summer where the face is vertical and liable to slab off.

At the Southwest end stripping was done along the edge of the vertical wall to prevent its mixing with the ore that will be taken from there during the coming season.

JACKSON CRUSHER.

Overhauling of the crusher was started on the 10th of April. Crush-

ing started on the day shift of the 18th, a night shift crew was put on the 20th. A great deal of trouble was had on account of frozen and sticky ore, most of the ore received was from stock pile loading. It was necessary to start the boilers to get steam to thaw out the cars. Trouble with the frozen and sticky ore continued through most of the month of May when conditions improved. The crusher operated on a day and night shift until July 15th when one of the crews was taken to start operating the new Maas Crusher. The Jackson was operated for the next two days by a day shift only and on the 17th the crushing was stopped. A crew started cleaning up around the buildings and crusher but it was necessary to operate here again on the 24th and 25th of July on account of an accident to the rubber conveying belt at the Maas Crusher. From that time to the end of the season this crusher was idle, however, it is in condition to operate at any time it may be necessary.

SOUTH JACKSON MINE

AVERAGE MINE ANALYSIS ON OUTPUT FOR THE YEAR - 1917.

GRADE	IRON	PHOS.	SILICA	MANG.
South Jackson,	36.98	.055	37.91	2.68

AVERAGE ANALYSIS ON STRAIGHT CARGOES FOR THE YEAR-1917.

GRADE	Mine				Lake Erie		
	IRON	PHOS.	SIL.	MANG.	IRON	MANG.	MOIST.
South Jackson,	36.95	.055	38.03	2.65	38.23	2.79	7.44

ORE STATEMENT AND SHIPMENTS FOR YEAR-1917.

	<u>SOUTH JACKSON</u>
Output for Year,	47,836
Shipments,	47,836
Balance on Hand,	0

Mine operated 1-10 Hr. Shift April 27th to November 10th
Mine idle in 1916.

SOUTH JACKSON MINE

SOUTH JACKSON MINE.

COMPARATIVE MINING COST FOR YEAR.

	1 9 1 7.	1 9 1 5.	INCREASE.	DECREASE.
<u>PRODUCT</u>	47,836	56,026		8,190
General Expense	.027	.020	.007	
Maintenance	0	.010		.010
Mining Expense	.538	.363	.175	
Cost of Production	.565	.393	.172	
Exploratory	.121		.121	
<u>DEPRECIATION.</u>				
Original Purchase	.803	.200	.603	
Equipment		.006		.006
Total Depreciation	.803	.206	.597	
Taxes	.038	.029	.009	
Central Office	.031	.018	.013	
Sundry Expense	.005	.065		.060
<u>COST ON STOCKPILE</u>	1.563	.711	.852	
Loading & Shipping	.114		.114	
Total Cost on Cars	1.677	.711	.966	
No. Days Operating	158	112		
No. Shifts and Hours	1-10hr	1-10		
Avg. Daily Product	303	500		
<u>COST OF PRODUCTION</u>				
Labor	.461	.270		
Supplies	.104	.123		
Total	.565	.393		

Idle 1916; 1915 used for comparison.

SOUTH JACKSON MINE.

SOUTH JACKSON MINE.

COMPARATIVE WAGES AND PRODUCT.

	1 9 1 7.	1 9 1 6.	INCREASE.	DECREASE.
PRODUCT	47,836	56,026		8,190
No. Shifts and Hours	1-10hr	1-10hr		
<u>AVERAGE NUMBER MEN WORKING</u>				
Surface	4	7		m 3
Underground	22	35		13
Total	26	42		16
<u>AVERAGE WAGES PER DAY</u>				
Surface	3.86	2.08	1.78-85%	
Underground	3.24	2.14	1.10-51%	
Total	3.34	2.14	1.20-56%	
<u>WAGES PER MONTH OF 25 DAYS</u>				
Surface	96.50	52.00	44.50	
Underground	81.00	53.50	27.50	
Total	83.50	53.50	30.00	
<u>PRODUCT PER MAN PER DAY</u>				
Surface	36.71	75.84		39.13
Underground	7.61	9.12		1.51
Total	6.30	8.14		1.84
<u>LABOR COST PER TON</u>				
Surface	.105	.027	.078	
Underground	.425	.235	.190	
Total	.530	.262	.268	
<u>TOTAL NUMBER OF DAYS</u>				
Surface	1,303	738 $\frac{1}{2}$	564 $\frac{1}{2}$	
Underground	6,266 $\frac{3}{4}$	6,145 $\frac{1}{2}$	121 $\frac{1}{2}$	
Total	7,569 $\frac{1}{4}$	6,884 $\frac{1}{2}$	685 $\frac{1}{2}$	
<u>AMOUNT FOR LABOR</u>				
Surface	5,032.24	1,534.44	3,497.80	
Underground	20,308.80	13,164.65	7,144.15	
Total	25,341.04	14,699.09	10,641.95	

Proportion Surface to Underground Men:

1917 - 1 to 6.5
 1915 - 1 to 5.
 1914 - 1 to 13.

Idle 1916; 1915 used for Comparison.