

MACKINAW MINE.

The work of re-opening the Mackinaw Mine was started in September 1916. By the close of the year supplies had been received and the work of assembling the equipment necessary for unwatering the shaft was completed. The actual work of unwatering was started on January 2nd, 1917, and by the evening of the 4th the water had been removed to a point 30 feet above the bottom of the shaft. The water was taken out by one large bailer, operating in the cage compartment. During the next few days an electric pump was installed in the small pump house 300 feet below surface, which started to operate on Sunday, January 7th. On January 8th a No. 9 pump was taken to the bottom of the shaft and connected up, and the 30- feet of water in the bottom pumped out. Sinking was started on Wednesday, January 10th.

The work for the year was confined to sinking the shaft, cutting plats on four levels, and to drifting on the 4th level and on the sump level twelve feet below the 4th.

SHAFT SINKING.

When work was stopped at the Mackinaw Mine in 1915, the bottom of the shaft was 401 feet below the top of the concrete collar at surface. Actual sinking was started January 10th and continued through the year up to August 1st, at which time the bottom of the shaft had reached a depth of 947 feet below the collar. The following table gives the monthly progress of sinking and cost per foot:

<u>MONTH:</u>	<u>FEET SUNK.</u>	<u>COST PER FOOT:</u>
January,	34-1/2	\$158.37
February,	90	75.62
March,	94	82.47
April,	80	74.44
May,	115-1/2	65.00
June,	59	75.03
July,	72	81.10
Sunk in 1917,	545	

Average cost per foot - \$80.32

The summary of the work in the shaft for the year was: 546 feet of sinking, 89 sets of timber and 5 sets of bearing pieces installed. The first

six feet of sinking was through lean ore, averaging about 52% Iron, below which hard black jasper was encountered. Slow progress was made in sinking throughout January due to the very hard ground, also to the fact that a new type of sinking drill was in use and it required some time for the men to learn to handle it.

In February better ground was encountered, but there were some delays during this month due to trouble in blasting. When sinking was started a blastering battery was used for firing charges, delay action fuzes being used, but trouble developed in blasting. The last of February new wires were put down the shaft, after which the blasting was done directly by electric current, which eliminated all trouble.

In March the 1st level was reached and a drift was driven in a distance of 35 feet, to be used as a temporary sump. The shaft was sunk 94 feet for the month in addition to the 35 feet of drifting. About 11:30 A. M., March 31st, there was an accident to the compressor, and no work was done at the mine for the balance of the day on the 31st; also on April 1st, 2nd, 3rd and 4th, by which time new parts had been received from the factory and the compressor was repaired.

There were only twenty days work in the shaft in the month of April. During this month the 2nd level plat was cut out for a distance of 11 feet to the East of the shaft; in April the shaft passed through the slate and at the end of the month was in arkose.

In May the best footage was made, the shaft being sunk 115-1/2 feet and 19 sets of timber installed. A portion of the plat was also cut on the 3rd level, a drift being driven 14 feet to the East of the shaft.

In June the shaft reached the elevation of the 4th or 850-ft. level. Considerable drifting was also done in this month, the plat being cut on the West and North sides of the shaft.

Sinking was temporarily stopped the latter part of July until after the Gardner shaft had been sunk. During this month the ground was excavated

for a loading pocket on the 4th level and a drift started 12 feet below the 4th for tramming the rock which came from the sump drift. At a point 45 feet below the 4th level a drift was driven a distance of eleven feet back of the skip compartment from which a raise will later be put to tap the settling basin of the sump.

In August a drift was driven near the bottom of the shaft for handling the dirt which would spill from the skip pit pocket. The following is a record of the work done on the various levels:

FIRST LEVEL:

The 1st level is located 563 feet below the collar of the shaft. When sinking had reached this point a plat was cut on the South side of the shaft and a drift extended to a point 35 feet South of the shaft. A concrete dam was built across this drift at a point about 14 feet South of the shaft, and the drift beyond the dam has been used for a sump.

SECOND LEVEL:

The 2nd level is located 663 feet below the collar of the shaft; at this point a drift has been extended 11 feet to the South of the shaft.

THIRD LEVEL:

The 3rd level is 763 feet below the collar of the shaft; at this point a drift was driven 14 feet South of the shaft.

FOURTH LEVEL:

The 4th level is located 863 feet below the collar of the shaft. The work of cutting a plat and pocket was started in June, but was then stopped until the shaft had been sunk 84 feet below the level, or to a depth of 947 feet. After completing the sinking, the plat was cut, after which the pocket was installed. The main haulage drift was then extended 122 feet to the South, at which point the drift branches; one drift going to the south-west towards the ore body and the other to the south-east towards the Gardner shaft. The drift towards the ore was only carried in a short distance, so that work could later be resumed here without injury to the main air lines. The main work done on this level has been confined to the drift to the Gardner. On December 31st this drift had reached a point

867 feet from the Mackinaw shaft, or 143 feet from the Gardner shaft. It is intended to start raising as soon as the Gardner shaft is reached, in order to hasten the work of sinking the Gardner shaft. In December more miners and trammers were taken on in order to provide work for some of the men thrown out of employment at the Stephenson and Austin. They have started a drift to the south-west towards the ore body, which, by the end of the year, had advanced 60 feet from the forks of the main haulage drift. The drift to the Gardner will improve the ventilation in both mines, and will also provide a second outlet. It is, therefore, planned that one-half the cost of this drift should be taken up by the Mackinaw and one-half by the Gardner.

SUMP LEVEL:

When the shaft was being sunk, a drift was driven in a short distance twelve feet below the 4th level. Work was resumed on this drift in September - it being driven 20 feet due North; it was then turned to the North-East at right angles to the formation and was extended 157 feet. The drift was in soft decomposed arkose near the shaft, and it was hoped that by crossing the formation, firmer ground would be encountered which would permit of driving a large drift, but as there was no change of ground in 157 feet, it was decided to stop. A drift has since been driven on a curve around the East side of the shaft to a point about eighty feet South of the shaft. This drift will later be connected with the permanent pump house. For the year there have been a total of 428 feet of drifting on the sump level, which has provided a capacity of 160,500 gallons. A large amount of work remains to be done before completing the sump, as it is desired to have a sump capacity of at least 350,000 gallons. The drifts on sump level are about 7 ft. x 7 ft. in size, this being as large as they can be made without timber, owing to the soft ground.

GENERAL REMARKS:

The Mackinaw shaft will be sunk to a depth of about 1,340 feet, or approximately 400 feet deeper. The bottom level will be 1,263 feet below

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surface which is below the lowest ore shown up by diamond drilling on this property. If a large body of ore is proved up at this depth it will be necessary to sink the shaft again as it is planned to start mining on the bottom of the deposit. Sinking will probably be completed in 1918, and some ore may be obtained from development work before the end of the year.

MACKINAW SURFACE:

Early in the summer the work of clearing and leveling off the timber yard and stockpile grounds near the shaft was started. Labor was scarce and this work was continued with a small crew all through the Summer. The timber yard has practically been completed, but a large amount of work remains to be done on the stockpile grounds.

A standard brick oil house was erected in the fall, the equipment was installed in November, since which time the oil house has been used.

A contract was let for a brick heating plant in December and work on foundations was started. The heating plant will be built on the end of the dry, so that the boiler can be cared for by the regular dry man. Additional heating capacity is badly needed, as well as increased dry room.

The M. M. & S. E. Railway have started the construction of tracks into the mine from the main line and expect to complete construction work during the winter.

Foundations for a water tank were installed late in the fall. The tank will be set up 30 feet above the ground and will provide a water supply for the mine buildings. A fire pump will be kept installed to increase the pressure in case of a bad fire.