63-3620

010

Some of the

MINING PROPERTIES

Of The

LAKE SUPERIOR CORPORATION

Report to the President,

By

John R. Hardman, S.B., Ma. E.

1910

SUMMARY.

The MAGPIE contains a probable tonnage in excess of 7,000,00; the Middle Section has, practically proved, over 4,000,000 tons. The quality of the ore is good excepting for its high contents of sulphur. One half of the tonnage given will probably prove low enough in sulphur to constitute a merchantable ore; the other one-half will contain so much sulphur that it will require to be roasted.

The feasibility and economy of doing this remains to be proved

Montreal, June 22nd, 1910.

Thos. J. Drummond, Esq.
President,
The Lake Superior Corporation,
M O N T R E A L, P.Q.

Sir:-

In the following pages I beg leave to submit to you my views upon those mineral deposits of the Lake Superior Corporation which you were kind enough to instruct me to examine in your letter of June 9th.

Your letter requests that I should give you my "general ideas" upon what I may call the "Helen Group" of properties, which comprises the first and original mine opened, the "Helen", which is a deposit of brown hematite; also the more recently discovered body of Bessemer ore which lies under the bed of Lake Boyer and is therefore called the "Boyer Lake" deposit, and finally the unique deposit of iron sulphides, or iron pyrites, lying under "Mount Hematite", and which has only been explored quite recently. In connection with these I also, as you request, give you my opinion as to the possibility and feasibility of exploring these bodies by the Diamond Drill.

Secondly I give you as full a report as is now possible upon the deposit of spathic ore, or Siderite, on which the corporation has an option, and on the "Alice" property which the corporation owns. In this connection you have asked me to specifically report upon the question of the quantity of ore in the "Magpie" deposit, upon the quality of the ore as shown by the drill cores and surface openings, and thirdly upon the question of an efficient treatment of this ore to make it commercially valuable as a supply for blast furnaces. I begin with my general views upon the Helen Group.

MAGPIE GROUP

With reference to the large bodies of Siderite, or carbonate of iron, occurring about 12 miles north - north-east of the Helen group, and within one mile of the Magpie River, they consist of the Magpie locations now under option to the Corporation, and of the Alice locations owned by it. I first made as thorough an examination as was possible of the deposit at the Magpie; the information being afforded by the cores of some 12 bore holes that have been put down, and one or two open cuts which, as yet, have not reached more than a shallow depth. The Alice locations have not been drilled and the only information that could be obtained was from the few open trenches which are now working, and in which a few blasts have been made.

On the Magpie some 12 holes have been finished, and two more (Nos. 11 and 14) are still going down. The deposit apparently begins on location J L 65, which contains 30¾ acres; it appears first on a sharp hill, or pinnacle, (called "Iron Mountain") which rises above the surface of Beaver Lake to a height of about 150 feet, then gradually dies out to the westward beneath the swamp. Its continuity is established on J L 65 for a length of 900 feet. The deposit re-appears on the eastern side of the road near the boundary between J L 65 and J L 66. This eastern end I may call, for the present, the "Eastern Section"; it has, proved and probable, a length of outcrop of about 1100 feet.

From the swamp, on the western end of the "Eastern Section" the outcrop has been traced to the westward and north-westward almost continuously to and through "Deposit E", a distance of 1500 feet along the outcrop; this I call the "Middle Section".

From Deposit E, northerly, disconnected trenches and open cuts extend to and beyond the north-eastern corner of location J L 62 into J L 68, a distance exceeding 1200 feet; this I call the "Western Section."

It will be noted therefore, that a total length of outcrop, aggregating 3800 feet, has been disclosed, which first runs west-north-west, then curves to a northerly course and ends with a north-westerly course.

EASTERN SECTION

The eastern section has not been so thoroughly trenched as the others, nor has it been pierced by a diamond drill hole, but the course is regular and there is no room to doubt a continuous outcrop. The width varies from 30 to 80 feet, and for calculation purposes I have assumed a width of 40 feet for the total length of 1100 feet.

MIDDLE SECTION

The middle section is by far the most important of the three, as it has been pretty thoroughly explored by drill holes and pits. The first drill hole (#7) is placed about 200 feet west of the swamp which divides the Eastern Section from the Middle Section. Here the deposit is about 70 feet wide; the hole is a vertical one and has a total depth of 312 feet, 206 feet of which are in ore and 160 in good ore. The core has been analyzed in 10 feet sections; the average of the analyses from this hole for 160 feet shows; 34.52% metallic iron, 4.875% silica, 1.19% sulphur and .010% phosphorus. Westerly from this hole the trenches are continuous to No. 1 bore hole; between #7 and #1 holes are two other holes #6 and #8, these holes and trenches cover what is described on Mr. Seelye's map as"Deposit D".

Just north of #1 hole there is a break in the continuity of the outcrop for about 100 feet. I do not regard this as of importance since the Siderite is picked up again, in regular line of strike, on Deposit C and runs continuously through it until another gap of about 100 feet is encountered. The first gap is probably caused by a covering of schist, not yet eroded off, which conceals a sharp flexure but this second gap is either due to a minor fault, or to another sharp flexure in the rocks at this point; however, the ore is immediately found again in Deposit E, but the outcrop line has been deflected over 100 feet to the eastward. There is no change in quality of ore or in width of outcrop.

Deposit C has three drill holes in it (Nos. 2, 3 and 4) but, unfourtunately, they were placed too far to the westward and being vertical passed out of the ore (which dips easterly) at the depths of 79 feet, 28 feet and 40 feet. I therefore suggested to the General Superintendent of Mines that two new holes should be put down to test this Deposit C, and that they should be started to the east and drilled at an angle of 45° so as to cut nearly perpendicular through Deposit C at a depth of about 300 feet; your General Manager approved of my suggestions and gave orders for the work to be done.

With the exception of the two gaps mentioned, the Middle Section has an uninterrupted line of outcrop 1500 feet in length. The depth of the ore in this section has been proved by hole #8 to 531 feet. This hole found no ore until a depth of 148½ feet was reached, after which it remained in ore for 383 feet, 20 feet of which however must be discarded. Analyses of the core from this hole showed a highest percentage of iron of 39.6% with 3.28 silica, 0.316 of sulphur and 0.010% phosphorus; the general average of the 37 analyses made of this core after rejecting the pyritous portions is 33.96% iron, 8.76% silica, 0.804% sulphur, .007% phosphorus. The seven other holes (averaging the analyses of their

cores) show a general composition as follows:- Iron 39.00%; silica 8.33%; sulphur 1,126%; phosphorus .010%. It is from the northern end of this Middle Section (on Deposit E) that a pit or quarry has been opened to obtain the 300 tons which are to be shipped to Detroit for a desulphurizing test.

Drill holes Nos. 9 and 10, bored at an angle of 45° from the eastward, cut the Middle Section (Deposit D) at 225 feet and 385 feet respectively; the widths of ore shown by these holes are 68 feet for #9 and 40 feet for #10; these widths substantially agree with those measured on the surface. The horizontal distance between the sections made by holes 9 and 10 is 510 feet.

I, therefore, regard the Middle Section as affording proof of an ore body of a general width of 50 feet and a length of 1500 feet, which has been proved by bore hole #8 to a depth of 531 feet.

$$\frac{50 \times 1500 \times 531}{9} = \frac{39,825,000}{9} = 4,425,000 \text{ tons}$$

or a tonnage of about 4½ millions for the "Middle Section".

WESTERN SECTION

The Western Section, like the Eastern, is not yet proved beyond surface trenches and the one bore hole #5. This hole, which has a depth of 203 feet was, like holes Nos. 2, 3 and 4, put down too near the western edge of the deposit and passed out of the ore at 99 feet; the core analysis shows iron contents of about 38% with sulphur and silica varying as in the other portions of the deposits. The width of this Western Section, judging from outdrops, will be less than in the Middle or Eastern Section, ranging from 15 to 60 feet. I have assumed a width of 30 feet, a length of 1200 feet and a probable depth of 300 feet; these figures will show a tonnage in excess of 1,000,000.

The probable tonnage of the Eastern Section, as the width (on surface) may be taken at 40 feet will be greater than that of the Western Section. If an equal depth of 300 feet, which was assumed for the Western Section, and which I regard as likely to be exceeded on exploitation, is taken the tonnage would be 1½ millions.

To recapitulate,

Tonnage in Eastern Section	1,500,000
in Middle Section	4,500,000
in Western Section	1,000,000
	7,000,000

At least one-half of this probable tonnage would be ore that could be used in the furnace once the carbonic acid was calcined off. The theoretical amount of carbonic acid in Siderite is 38%, and the driving off of this amount of gas would raise the general average iron contents (as shown by analyses of cores) from 39% to at least 52% iron and probably to 56% iron. The sorting of this ore would not be at all difficult, and the phosphorus is so low that it would be well within the Bessemer limit after roasting. The sulphur would have to be carefully sorted out unless ore carrying more than .5% sulphur were admissable.

QUALITY OF THE ORE AND ITS TREATMENT

I have availed myself of all the information to which I could get access in order to present an opinion upon the quality of this ore. It is a carbonate ore, or a Siderite, from which the CO_2 must be expelled before it is put into the furnace. Two or three decades ago, before pig iron furnaces were driven for such large outputs as they are today, carbonate ores were often fed to the furnace without calcining, the carbonate acid being gradually expelled as the ore approached the zone where temperatures of 500° and 600° centigrade obtained. Today this practice would not conduce to commercial success. It is therefore necessary to consider the quality of this ore, <u>after it has been calcined</u>, rather than in its native condition.

The average analysis of the raw ore, sufficiently low in sulphur to ship at once, is:-

Iron	39.00%	-	40.00%
Silica	9.00%	-	8.00%
Sulphur	.50%	-	.500%
Phosphorus	.008%	-	.011%

Such an ore, if the carbonic acid were completely driven off, would yield 54% of metallic iron, but the sulphur and the phosphorus contents would be increased in a corresponding ratio, so that the calcined ore might have an analysis like this: Iron 54%, Silica 11.50% Sulphur .70% and Phosphorus 0.014%; if the general run of the ore were taken (with sulphur contents of 1.126%) the sulphur in the calcined ore would increase to 1.50% to 1.60%. The matter of desulphurizing the ore therefore becomes the <u>only important</u> factor in the question of utilizing the full tonnage held by this deposit; Its contents otherwise, as I do not need to tell you, make a most desireable quality of Bessemer grade ore.

The laboratory experiments on desulphurizing made at the Soo are anything but satisfactory, and I do not regard them as of value to your problem. The sulphur that is in the ore is present as pyrite, or bissulphide of iron; it is a well known metallurgical fact, that one atom of the sulphur of this mineral is easily burned off

or gotten rid of, so that even a careless roast should show a diminution of one-half the original sulphur contents of the ore. As the percentage of sulphur in the calcined ore increases when the CO_2 is driven off, because the divisor is decreased through the loss of 38% (theoretical) of Carbonic acid, and since one-half the sulphur contents can be easily volatilized as sulphur, a rough calculation shows that the actual percentage of sulphur should be diminished, (under varying conditions) from 25% to 60%. In the analysis given this would reduce the sulphur from 1.126% in the ore to .5% to .8% in the roasted calcined mass, Only one experimment out of eleven made in the Laboratory at the Soo, shows this reduction, the other ten show an increase in sulphur contents.

The quality of the Magpie Ore, with this one exception of high sulphur, is admirable: the iron contents, when roasted, should be above 52% metallic iron for the whole mass, 55% metallic iron,or better, for fully one-half of the tonnage figured. The silica is low, and the phosphorous contents always below the Bessemer limit for standard grade.

In the matter of the first run of two hundred to three hundred tons od Magpie ore, to be made at the works of the Detroit Chemical Co. in order to establish some correct data as to roasting - I may say that I have been told the outlines of the process but details were unknown, and I therefore am in no position to express an opinion. As a general proposition I see no difficulties in the way of constructing a calcining and desulphurizing plant to handle 1000 tons a day, which should drive off all the CO_2 and at least one-half of the sulphur contents, and probably at a cost of 40 to 45 cents per ton: but to make a "sweet" roast, or completely eliminate the sulphur, is a very difficult,and, perhaps, expensive operation which would undoubtedly diminish capacity and equally undoubtedly increase costs. In consequence of Mr. Seelye's undoubted faith in the Detroit process I regard it as very worthy of a trial; if successful at a reasonable cost you will undoubtedly have a very large tonnage of A 1, Bessemer grade, ore.

ALICE

As to the Alice Mine I have already mentioned on page 5 that only surface trenches have been made upon this group of claims. The width as shown by these trenches ranges from 25 or 30 to 60 feet, and the quality of the ore appears to be identical with that of the Magpie; I was furnished with no analysis so am unable to state this definitely. There is nothing in the geology, or in the physical conditions, to indicate that the deposits on the Alice are different from those on the Magpie,but a considerable amount of work is necessary before one can speak with the same authority of the Alice

5016

R E P O R T

O N

M A G P I E P R O P E R T Y

Township 29 -O- Range XXVI

DISTRICT OF ALGOMA.

PROPERTY: This property consists of (19) mining claims, staked under the Mining Act of Ontario 1909. The Area will approximate (700) acres.

LOCATION: These claims all lie in Township (29) Range (XXVI) In the District of Algoma, within a radius of three miles of the Southeast corner of the Township. Fourteen of the lot comprise the Magpie group proper, while the other five a little distance to the South are spoken of as the Alice group.

The estimated length of a railway spur from Hall's Pit on the Michipicoten Division of the Algoma Central Railway to the property is 10.5 miles. At present the property is reached by following the old Grassett Tote road fr m the railway for about Eight miles and a new road Northwesterly from the Grassett road for about two miles.

HOW ACQUIRED: Six of the claims (S.S.M. 1038,1041,1042,1045, 1047 and 1048) were staked on behalf of Messrs A.B.Blackinton, Angus Gibson and Morton J. Burke, while the A.C.R. Land Grant Area was thrown open in April,May and June 1909, for the staking of discoveries made before the withdrawal of this area from exploration.

The remainder were staked in the fall of 1909 by individuals on behalf of the Algoma Central & Hudson Bay Ry.Co.

The first six mentioned claims were optioned to the Lake Superior Iron and Steel Company on July 19th,1909, for a period of six months, the Company to do the first (90) days assessment work required for each claim by the Mines Act on or before January 19th,1910. the Company may elect to take a (21) year lease of any or all of the claims, such lease to be renewable for further periods of (21) years. After mining operations are under way a royalty of Twenty Cents (20¢) per ton is to be paid on a yearly minimum output of 50,000 tons.

HISTORY OF OPERATIONS: At the end of August 1909 a gang of men were put at work getting a road to the claims in shape. The road was finished by September 2nd,1909, and the erection of camps and trenching on the ore deposits were then proceeded with.

The camps were erected about one and a quarter miles from the ore outcrops, because this was the nearest point at which both water and timber suitable for building purposes were available.

Trenching was carried on actively till about November 15th, with the exception of a couple of weeks, when there was a scarcity of men.

During October and November a gang of three men were kept busy putting down pop holes so that samples of fresh ore for analysis might be secured.

A Sullivan "C" drill was put in operation on Sept. 28th and has been kept running continuously since. For a month or more at the start this outfit was handicapped by a

lack of necessary boiler capacity. A Sullivan "H" drill was put into operation on December 6th. Up to December 31st 1909 the total footage drilled amounted to 1,180 feet.

During October and November a survey for patents of all the claims in the Magpie group proper was made by Mr. J. L. Lang, O.L.S. In addition surveys of all trenching done was made and plans of this on a scale of 30' to the inch prepared, these plans showing the boundaries of the ore deposits and the various kinds of rocks exposed adjacent to the ore bodies.

DESCRIPTION OF OPERATIONS: Thorough trenching was done on all the discoveries of ore made in the Magpie group proper, the work being confined to claims S.S.M. 1038 (J.L.66),1042(JL.62), 1045(J.L.63), 1048 (J.L.65),1228 (J.L.68), and J.L.74 and 76. On the claims in the Alice group trenching was started late, and owing to unfavorable conditions not much was done.

On S.S.M. 1228 (surveyed as J.L.68 and heretofore referred to as Macdonald #1 Claim) a deposit of ore was located near the middle of the South side of the claim. This is called Deposit "A", between 600' and 700' of trenching was done here, this work showing an ore body striking Northwest and Southeast for a length of about 200'. The Northwesterly 75' of this will average 15' in width, while the rest will probably average more, but the width of this Southeast part has not been determined because the stripping became too deep; for the same reason the Southeast end of the ore deposit was not reached.

To the North of this deposit about 100' there is a small exposure about 20' X 40' of extremely Pyritic Ore.

Greenstone and White Talcose Schist are both found in contact with the ore. In some places the Greenstone has a rusty capping simulating some of the ore in appearance. A sample from a test pit sunk in this ore - capped Greenstone gave Iron 11.05%, Silica 65.86%, Sulphur .061% and Phosphorus .038%.

A test pit in ore about 75' from the Southeast end of the larger deposit furnished a sample running Iron 42.48%, Silica 3.74%, Sulphur 1.23% and Phosphorus .009%.

Supt. McLaren writes that he suspects that part of what appears to be the larger deposit may be only an iron capping a few inches deep such as is encountered at other places in the neighborhood.

At the Northeast corner of claim S.S.M. 1042 (J.L.62) there is a deposit of ore known as Deposit "B". This and deposit "A" may really be one as they are in line and separated by only 85' of alder swamp in which the soil was too deep and wet to permit of trenching. Some 1500' of trenching has shown the main body to be about 200' long and with a width varying from 20' to 60'. The contact has been located on all sides, the inclosing rock being Greenstone. The contact is clean cut except at the Northwesterly end, where the ore merges into Greenstone with a capping of ore a few inches thick. Beyond this ore, capped Greenstone, which has a width of 40' to 50', there is an exposure 30' X 50' of good ore, whose Northerly and Westerly limits have not been

determined because of the alder swamp mentioned above, separating this deposit from Deposit "A".

About 200' Southwest of the North end of the deposit just described, there is an exposure of very good looking ore 15' wide X 60' long. On the sides there is a clean cut contact between the ore and Greenstone. The Easterly end dips into a swamp and the Westerly end has not yet been shown up because of a deep covering of drift.

Analyses of samples from three test pits on the largest deposit in group "B" show Iron to run a little better than 40%, Sulphur from .18% to 2.5% and Phosphorus .007% and lower.

A sample from a test pit in the ore capped Greenstone ran Iron 41.78%, Silica 11.56%, Sulphur .330%, Phosphorus .008%. This shows a much higher percentage of Iron than one would suspect from the appearance of the material.

Several of the test pits were sunk near the edge of the ore body to determine its dip, if any.

Drill Hole #5 on this deposit ran through ore, which carries patches and bands of Pyrites for 99'. The hole was continued in Greenstone to 203'. The averages of (10) analyses of samples representing the ore cut is Iron 37.80%, Silica 8.82%, Sulphur 2.139%, Phosphorus .010%. The average percentage of Iron for the first 30' in depth is 44.34%.

Near the Southeast corner of claim S.S.M. 1042 is located Deposit "C". This forms the crest of a fairly prominent little hill and it was one of the first outcrops of ore discovered. The main part of the deposit strikes about North

and South but at the Southerly end it takes a bend to the Southeast.

Between 800' and 900' of trenching on this hill has served to show pretty well the limits of the ore body. The ore body which is about 250' long has a pretty regular westerly boundary. The Easterly boundary winds about a good deal giving widths for the ore body varying from 30' to 50' or more.

The contacts are generally clean cut. Greenstone or Greenstone Schist is the rock most commonly in contact with the ore; occasionally though a White Talcose Schist or Mica dike forms the wall. Eight test pits have been sunk in this ore. Samples from seven of these show analysis with the following range; Iron 36% - 48.8%, Sulphur .039 to 1.00%, Phosphorus .007% - .003%. The average percentage of Iron for the seven analysis is 42.95%.

Three vertical diamond drill holes have been put down about on the centre line of the deposit. Hole #2 is about 50' from the North end of the deposit, hole #3 , 35' farther South and hole #4, 55' south of #3. Hole #2 ran out of ore at 79'; it was continued to 107' through Greenstone and Quartzite. Hole #3 ran out of ore at 28'; it was continued through Greenstone and Quartzite in alternation to 139'. Hole #4 showed ore to 41' and again from 65' to 72'; it was continued through Greenstone to 166'.

The average of 16 analyses of samples representing 10' sections of ore drilled through in holes #2,3 and 4, is Iron 39.77%, Silica 8.06%, Sulphur 1.111%, Phosphorus .010%.

To the North of Deposit "C" about 80' and across a small

depression there is another deposit of ore (Deposit "E") consisting of two kidney shaped parts connected by a narrow band. The strike of the whole is about Northwest and Southeast. The length over all is 260' and the average widths of the East and West lobes about 40' and 50' respectively. Between 600' and 700' of trenching has served to show up the limits of the ore body pretty well. Both Greenstone and White Talcose Schist occur in contact with the ore. The ore here exposed appears more Pyritic than that seen elsewhere.

Samples from (6) test pits on deposit "E" show iron ranging from 28% to 52%. The average of the six analysis is as follows; Iron 41.30%, Silica 13.76%, Sulphur 1.265%, Phosphorus .009%.

The Southeast end of deposit "C" is succeeded by a Northeast-southwest depression 100' wide. Across this depression from "C" is a small hill of ore, which is the north west end of a band of ore stretching away to the Southeast for a distance of 870'. The proven width in some places exceeds 80' and it is pretty safe to say the average width exceeds 50'. This is called deposit "D".

This ore body stretches from claim S.S.M.1042 across S.S.M.1045, a fraction claim surveyed as J.L.74, into S.S.M. 1038. 1,800' of more of trenching shows the boundaries pretty clearly except for an interval of 300' along the South side where the drift becomes too deep. As the trenches are carried down to the foot of the hill, along the face of which the ore is located. The ore in sight in part of this deposit is siderite but drill hole #6 has shown the siderite to merge

into Magnetite.

Greenstone is usually the adjoining country rock; a little white Talcose Schist forms the South wall near the East end of the ore body. At many points in the Westerly part of the ore body Mica dikes cut the ore; some of these dikes have a width of 30'.

One drill hole, No.1, put down about 35' from the Northwest end of the ore body, passed through ore for 210'; in this distance there were a few narrow bands of Greenstone and Mica dike. The hole was continued 35' in greenstone. The average of 18 analyses of samples representing 10' intervals of ore encountered in this hole to 180' in depth, is Iron 40.98%, Silica 14.07%, Sulphur .695%, Phosphorus .011%. A sample made up of a portion of each sample representing a 10' interval, on analysis gave Iron 42.30%, Silica 12.94%, Sulphur .995%, Phosphorus .010%, Alumina .90%, Lime 7.90%, Magnesia 5.95%, Manganese 2.05%, Loss on ignition 8.48%.

Drill hole No.6 was put down in ore about 200' Southeast of #1 and 20' from the North wall. This encountered ore for 104'; lean ore to 153'. Below 153' the quality improves. The average of (11) analyses covering to 110' in depth is as follows; Iron 37.42%, Silica 5.49%, Sulphur .443%, Phosphorus .009%.

Hole No.7 has been started near the Southeast end of the deposit. 120' East of the Southeast end of the ore body just described and across a small swamp, a North and South trench shows a body of ore 36' wide and in line with the deposit to the West. The next trench is about 150' farther

East and from here Eastward across claim S.S.M.1048 (J.L.65) enough trenching has been done to show a band of iron formation continuous for 900' or more. The width of the band varies from 15' to 40', except at the East end where it spreads out in fanlike shape with a diameter of 80'. This Easterly expansion of the band forms a knob like hill which rises rather steeply for 150' and forms a distinctive feature in the topography. In all about 950' of trenching has been done on this band. The band appears to be composed of ore of such inferior quality that no pop-holing has yet been done on it. The Westerly half of the band will likely run the higher in Iron; but it is extremely Pyritic. The Easterly half is decidedly lean looking.

Close to the Southeast corner of the same claim (S.S. M. 1048) there is a band of iron formation extending Southeastward into Claim J.L.76. Some 300' of trenching has shown up a body 50' X 180' with the boundaries nowhere yet in sight, owing to a thick covering of drift as the trenches go down the slope of the knoll. Two picked specimens taken from natural exposures before any stripping was done gave results as follows;

	No.1	No.2
Iron	48.97	44.07
Silica	35.70	27.72
Sulphur	.082	.307
Phosphorus	.010	Trace

On Claim J.L.71, the extreme Northwesterly claim, there is a small shaft in Pyritic Iron formation sunk several years ago, and also a pit in what appears to be Bog Ore. Two samples taken from this locality lately gave results as

follows;

	No.1	No.2
Iron	38.32	46.74
Silica	27.82	8.28
Sulphur	2.39	1.51
Phosphorus	.028	.052

No discoveries of Iron have yet been made on claims S.S.M. 1041 (J.L.64) S.S.M.1047(J.L.67)S.S.M.1229 (J.L.69), S.S.M. 1230(J.L.70) 72 and 73.

On claim S.S.M.1223 (the G.H.Burke claim in the Alice group) there were some exposures of good sized blocks of ore,samples, from which ran as high as 55% in Iron. Not much trenching has been done here as the work was rendered difficult by deep drift, large boulders and water. The presence of ore "in place" was proven; but it is very Pyritic.

On claim S.S.M. 1226 (the Bolton No.1) and claim S.S.M. 1227(Alsip No.3) about 500' of trenching was done. This showed Iron formation all along the ridge crossing these two claims, with one block of 53% ore, 10' to 15' wide, and 30' long, which merges into poorer ore.

CHARACTER OF THE ORE,ANALYSES:- All of the ore so far discovered appears to be, or have been originally an Iron carbonate,for all the samples, when dissolved in Acid, show brisk effervesence. The ore is usually dense and fine grained and often has an argillaceous looking appearance. Scattered through a good deal of the ore are small greenish black lath-like crystals, possibly Hornblende. Specimens may be secured at different places running from 48% to 55% in Iron but an average of the ore exposed will probably be between 40% and 42%. The ore with highest percentage of Iron, is in some

places found in contact with dikes; this suggests that the heat given out by the intruding dike may have caused the evolution of carbon dioxide from the adjacent carbonate ore, thus raising the percentage of Iron. Not enough instances of this have been seen to prove this theory true. Occasionally a light colored granular Siderite ore occurs with the heavier black ore. The Siderite ore runs about 37% in Iron and is non-magnetic.

The ore is in some places decidedly Pyritic, the Pyrite occurring in grains, patches and streaks. Sometimes the grains of Pyrite are so small as to escape detection except with a lense. The percentage of Sulphur in some samples has run as high as 2.5%. Phosphorus is invariably low, never exceeding .020%, in what appears to be merchantable ore.

WATER SUPPLY: The supply of water for present purposes is secured from a small pond at the Southeast corner of Claim S.S.M.1045. If mining operations are later carried on there are a couple of ponds within 1000' of the best ore deposits, which will furnish all the water necessary.

TIMBER: There is very little timber of any account on the Fourteen claims in the Magpie group proper. All but the swampy parts of the area embraced in the group have been burned over, with the result that there is a dense growth of small birch, poplar, alders, etc.

In the swampy areas the dry wood is rapidly being cleaned out for firing the boilers in the drill outfit. In these areas there is a little green spruce.

About a mile and a half from the ore deposits there is

an area of flat clay land of considerable size supporting a plentiful supply of good sized spruce.

CAMPS: These are located about a mile and a quarter Southeast from Deposit "C" and about three-fifths of a mile from the Grassett tote road. The buildings are all built of logs, and board roofed, pole floored (with exception of setters shack and office which have board floors) and plastered. A list of the buildings comprising the group follows;

Office	15'	X	17.5'
Sleep Camp	16.5'	X	18'
Setter's Office	12'	X	14'
Sleep Camp	17'	X	20'
Cook Camp	18'	X	25'
Store House	14'	X	16'
Root House	10'	X	10'
Stable	20'	X	26'

Compiled from reports and letters on file and brought up to January 1st,1910.

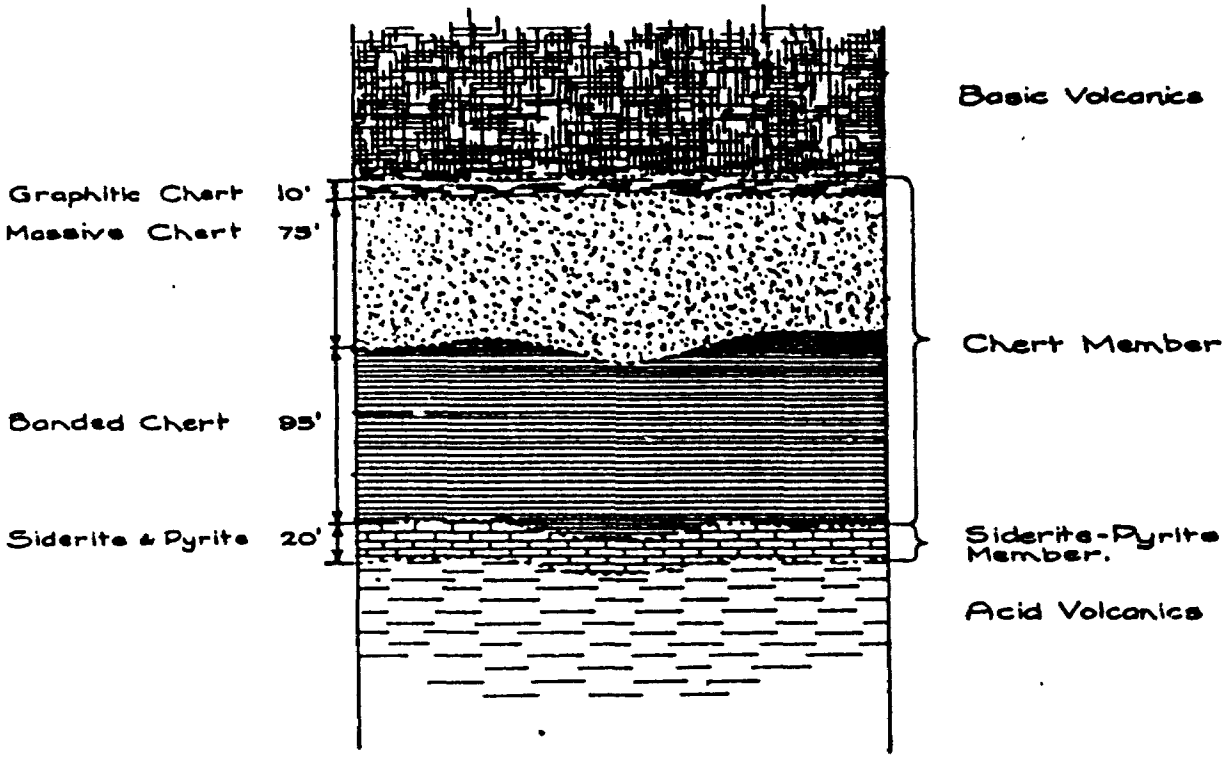
COST: The cost of operations from August 1st to December 31st 1909 was $16,368.96.

ANONYMOUS

Sault Ste Marie,Ont.

January 5th,1910.

~~ANON, 1910~~



DIAGRAMMATIC CROSS SECTION

UPPER MAGPIE IRON FORMATION

--ANNUAL REPORT--

of

Magpie Mine for 1911.

Township 29 -- Range 26.

District of Algoma.

Situation at Close of 1910

At the close of 1910 a shaft was being sunk on the north, or hangimg wall side of a deposit known as "Deposit D", about 70 feet away from the ore body, and about 500 feet from the North West end of the surface showing of this deposit. This shaft, size 25'x 9', had reached a depth of 80 feet through greenstone the entire distance.

Equipment

Two small vertical boilers and a small hoist had been set up and roughly housed at a point 150 feet north of the shaft. Two steam drills were used in sinking and the rock, which was hoisted by means of a derrick, was dumped into a car and trammed to the dump 50 feet away.

Buildings

The buildings at the mine consisted of a small temporary dry between the boiler house and the shaft, size 14'x 16'. of frame structure covered with corrugated iron; a two-story material store, a frame structure, size 18'x 22', situated about 75 feet west of the boiler house; a blacksmith shop of rough boards covered with tar paper, situated 400 feet northwest of the shaft.

Camps

The men employed at Magpie were living in log camps, situated about a mile and a quarter southeast of the mine, at a point between the mine and the end of the steel on the Magpie Spur of the A.C.R., which was then completed to within $3\frac{1}{2}$ miles of Magpie Mine.

Village Site

Stripping had been completed to rock for the water main from Alice Lake, about three-quarters of a mile south of the shaft, to the top of the hill 90 feet above the shaft, the proposed location of the water supply tank, and from the top of this hill in a north westerly direction to the village site, about 1000 feet northwest of the shaft. Altogether about 3350 lineal feet and approximately 1700 cubic yards of excavation had been done.

At the village site, a flat piece of ground situated northwest of the shaft, and a very favorable location for a town site, excavation had been made for 16 Miners Cottages, 4 Sleep Camps, a Cook Camp, and a Hospital.

Railway

Rails had been laid on the Magpie Spur to the Magpie River, a distance of 5½ miles from Magpie Junction and 3½ miles from Magpie Mine, and the supplies and materials for construction were being hauled on sleighs from the end of the steel over the Grassett tote-road and a road built from the camps to the mine.

Operations During 1911

The shaft is 207 feet deep, with the next round drilled. At the end of 1910 the shaft was down 80 feet, but no timbering was done. The sinking during the year, therefore, amounts to 127 feet in greenstone. Bearers were put in in good ground as follows:- 50 feet below the first level, at the first level, 25 feet above and 75 feet above, and the shaft has been timbered for a distance of 175½ feet.

First Level

Station was started at 100 feet and a 6½ -foot round was blasted and 12 holes drilled for a second round, when word was received to start station 25' lower down. The station, therefore, was cut at

125 feet. Its height is 14 feet at shaft, and 9 feet at 18 feet from the shaft. At 39 feet from shaft it is 16'x 9'. At 45 feet it is 14'x 8'. The station was driven across the ore body at the latter dimensions to a distance of 136 feet. The contacts of the ore body in the station crosscut are at 71 and 133 feet from the shaft, making the ore body 62 feet wide at that point. The average of six samples taken along the crosscut gives:-

Fe	Silica	S.	P.	Loss on Ignition	Fe after Ignition
35.51	3.23	0.394	0.014	35.12	54.95

This ore was from white to yellow in color on the freshly fractured surface. After about ten days exposure to the atmosphere, the surface changes to a brown tint.

In taking these samples, and also in all the other workings driven through ore in the mine, samples are taken every ten feet. In the crosscuts both walls and back are sampled. In the drifts the samples are taken only from the side next the ore body.

Sump

Half way between the shaft and the ore body a sump, 30'x 16' x 12', was sunk, but only props were put in to support floors and tracks. Hitches will have to be cut and heavy timbers put in, instead of these.

Drift No.1 is the name given to the drift running west along the south wall in siderite. It has advanced 401 feet from centre of Station Crosscut. Up to crosscut 1-2, the ore consists of light colored siderite, but near this point dark streaks begin to come in and gradually increase in going westward. From crosscut 1-3 to the face, the ore is all of a black color, and frequently shows small black lathlike crystals.

The average of 30 samples taken along 310 feet of the drift is as follows:-

Fe	Silica	S.	P.	Loss on Ignition	Fe after Ignition
36.42	32.18	0.467	0.009	32.84	54.22

The intensely black ore, as contrasted with the light colored runs from 10 to 14% lower in volatile, and from 1 to 3% lower in iron after ignition.

The wall in this drift varies in nature. It might be described as greenstone or green schist in some parts, while in others it is lighter in color. The latter phase probably represents one of the Keewatin volcanic rocks. From chainage 335 to the present face a number of tongues and irregular masses of micaceous material have been encountered. These resemble altered dykes, and their action on the siderite would account for the dark color of the ore in the vicinity, and the lower percentage of volatile matter.

Drift No.2 is the drift running east along the south wall. It is 368 feet from centre of Station Crosscut. From chainage 200 to 210 the wall is not clearly defined. This portion of the contact is characterized by a greenstone high in pyrite and pyrrhotite, sometimes with a tendency to banding parallel to the strike of the orebody. This ground is hard and difficult to break.

The ore in this drift up to chainage 250 is light colored siderite. From the latter point to the face dark ore predominates. The present face shows mica-dyke rock similar to that in No.1 Drift.

The Assay returns from 28 samples taken in No.2 drift, when averaged give the following:-

Fe	Silica	S.	P.	Loss on Ignition	Fe after Ignition
35.21	4.72	0.866	0.011	33.28	52.81

Crosscutting

The following crosscuts have been driven from the above mentioned drifts to cross the ore body.-

Crosscut 1-1 running north from Drift No.1 at 100 feet from centre of station crosscut was driven ahead 53 feet from No.1 Drift, when the wall was encountered and drifting discontinued. The ore in this crosscut is all light colored, and the averaging of five samples gives:-

Fe	Silica	S.	P.	Loss on Ignition	Fe after Ignition
35.66	3.70	0.964	0.010	32.88	53.16

Crosscut 1-2, running north from Drift No.1 at 200 feet from centre of station crosscut, was driven ahead 55 feet from centre of Drift 1. Contact has not yet been struck. The ore is darker in color than in the preceding crosscut.

Crosscut 1-3 has been started at 300 feet from centre of station crosscut, and is 38 feet from centre of No.1 Drift. This work has been in black siderite throughout.

Crosscut 2-1- At 125 feet from Main Crosscut this crosscut was started. The north wall of the ore body was encountered 42 feet from centre of Drift No.2. The ore is all of the light-colored variety, except near the north wall, where it is mixed with some dark-colored material.

Crosscut 2-2- started at 250 feet from Main Crosscut, is 46 feet from centre of Drift No.2. At this distance the wall was reached. The first fifteen ft. of the crosscut shows a mixture of light and dark ore- the remainder is light colored.

Crosscut for Raise.- Owing to the loss of time from powder smoke, a crosscut has been started south from Drift No.2 at chainage 311. It has been driven 15 feet to the wall of the ore body, and a vertical

raise will be run to the surface.

Total advance for the Year 1st. Level.

Station Crosscut-- 136 feet; and Sump

Main Drifts -- 754 "

Crosscuts(Exclusive of Station)-- 234 feet.

Average of Assays 1st Level.

The average of all assays received to date of samples taken on the 1st. Level--75 in number- is as follows:-

Fe	Silica	S.	P.	Loss on Ignition	Fe after Ignition
35.79	3.81	0.646	0.011	33.20	53.62

2nd. Level

Station was started at 205½ feet from the surface. The present height near the shaft is 14½ feet, and is 14 feet high 10 feet from the shaft. Holes have been drilled at the latter point, but not yet blasted, to taper the back down to 7 or 8 feet, at which height the rest of the station was driven. The width narrows gradually from the shaft to 13 feet at 80 feet from the shaft. This crosscut was driven a total distance of 125 feet from the shaft. The contacts occur at 73 feet and 124 feet.

Sump has been started 35 feet from the shaft, and now measures 16'x 20'x 5', with the hitches cut for the timbers.

Drifts have been started to run east and west along the south wall. The East drift is now advanced 17 feet: the West 15 feet.

Total Advance for Year 2nd. Level.

Station Crosscut-- 125 feet

Sump -- Partly completed

Drifts -- 32 feet.

Pumps,- No excessive amount of water has been met with in the underground work. The largest flow was encountered in the shaft at a depth of about 160 feet. Cement was used to trap the water here and lead it into a barrel, from which a Pulsometer pumps it into the 1st. level Sump.

On the first level two pumps have been placed to keep the Sump empty- one to act as a reserve. These are a 16"x 16"x 18" Cameron, and a No.8 discharging into an 8-inch Main.

Drills,- Six Little Giant Rand Drills- Nos. 43 and 43½B,- are being worked on the Day Shift, and five on the Night at the present time. Seven Cleveland Stope Drills have been received.

Water Mains

The work of drilling and blasting out the ditch for the water main from Alice Lake to the village site was continued through the winter and spring months, and a 4-inch cast iron pipe laid from Alice Lake to the site of the storage tank, a distance of 900 feet, and at an elevation of 267 feet from the lake. At this point a 20'x 30' wooden water tank has been erected on a 30-foot, twelve-post Steel structure. The tank has a capacity of 100,000 gallons. It is elevated 120 feet above the townsite, giving a pressure of 50 lbs. on the water main.

Leaving the water tank the pipe is increased to 6 inches, and carried at this size to the end of the main, between the foundations excavated for the Cook Camp and Camp No.1 , on the townsite. About 200 feet from the end of the line, directly opposite the Retail Store foundation, a 4 inch branch was taken off, running in a northwesterly direction for 300 feet, to supply the cottages. Another 4-inch branch was taken off 50 feet west of the shaft, to supply the boilers.

Six hydrants have been installed for fire protection. These are distributed along the water main from the shaft to the end of the main in the village, so as to be within easy reach of the buildings.

The pumping station at the lake consists of a 50H.P. return tubular boiler, 72" diameter by 16' long, and a No.10 Cameron Pump. The building is a frame structure, 32'x 16', roofed with tar paper.

Sewer

A main 10-inch sewer pipe has been laid through the main street between the camps, hospital and root-house on the east, and the warehouse, store, office and cook camp on the west. It has been extended north for a distance of 1000 feet into a swamp,- thence into a small creek, which flows through the swamp into the Magpie River.

A branch sewer running along Cottage Ave. connects with the main sewer and connects all the cottages.

Camps

When rails had been laid on the Magpie Spur as far as the beginning of Alice Trestle, about three-quarters of a mile south of the mine, gravel, cement and lumber was hauled from the end of the steel to the townsite over a road, which was cut through the bush a distance of about one mile . Work was then commenced on the Camps, and has been carried on to the end of the year with only an occasional interruption, such as when, in case of a shortage of men, they were taken off the camp work and placed on the plant construction. The following camps have been completed during the year.

Cook Camp-- A two-story frame building, 30'x 84', with a one-story frame kitchen, 16'x 84', attached. This is built on a solid concrete foundation, with a sufficient space provided for a furnace. The building is lighted by electricity, heated by steam, and is equipped with fire extinguishers.

The first story contains kitchen, bakery, store-room, three dining halls, and vestibule-all with hardwood floors and wainscoting, and with plastered ceilings and walls. The second story contains thirteen bed-rooms and two bath-rooms, all with hardwood floors, and ceiling and walls plastered throughout. The bakery is equipped with a Hubbard bake-oven; the kitchen with a Gurney John-Bull Steel range, two hot-water tanks, sinks, and tables for feeding 230 men at one sitting.

No.1 Sleep Camp is a two-story frame building, 26'x 64', built on a concrete foundation. It has 20 sleeping rooms, and one large sitting-room and a bath-room,- all with hardwood floors and plastered ceilings and walls. The building is lighted by electricity and heated by hot water, with furnace located in the basement.

Camps Nos.2,3,4,- are all of the same size, 26'x 85', two-story frame buildings, each containing 28 sleeping rooms, and a sitting-room and bath-room, all with hardwood floors, and plastered ceilings and walls. These buildings also are lighted by electricity a and heated by steam.

Camp Equipment,- In the cook camp, all the sleeping rooms are equipped with an iron bed spring and mattress, three pair of blankets, sheets and pillows, a washstand, dresser, and two chairs. In Sleep Camps 1,2,3,4, the rooms are equipped with an iron bed, mattress and three pairs of blankets. All the sleep camps are equipped with fire extinguishers.

The Office is a two-story concrete block building, the blocks having stone-effect face. The roof is framework, covered with Brantford roofing. The walls and ceiling are lathed with metal lathing, which has received two coats of plaster. A third or finishing coat will be given, and the floor laid of hardwood. The building will be

lighted by electricity and heated by steam. The heating system is partly installed.

One of the dining rooms is being used as a temporary office until the general office is completed.

The Retail Store is a two-story frame building, size 62'x 25', with an addition on one side, 18½'x 19½', to be used as a butcher shop. The store has been completed on the outside, with the exception of painting. The second story, which is to be used as a store-room, has been sheeted on the walls and ceiling. The first floor is divided into the main store, and a back room to be used as an office. The ceiling has been ceiled and the walls plastered. The counters, shelving, etc., have yet to be built. The store will be heated by means of coal stoves and lighted by electricity.

Hospital,- This building has been commenced and part of the frame work erected. It will be a two-story frame building.

Root House,- This is a one-story frame building, 30'x 60', with three walls separated by air spaces. The two inner walls are each built of two layers of surfaced lumber, with tar paper intervening. The outer wall consists of rough boards, tar paper, and shiplap. The roof, built in the same manner as the walls, is covered with Brantford roofing.

This building is being used for the storage of all freezable goods.

Ware House,- This is a one-story frame building, 30'x 120', set on concrete piers, the floor being on the level with the railway car floor. The walls are built of rough boards, tar paper, and siding, while the roof is of rough lumber, covered with Brantford roofing. This building is filled with material for stocking the general store, when the latter is completed.

Adjoining this building an extension has been built to be used as an ice-house. It is a frame structure, 30'x 30', double-sided with shiplap, and roofed with Brantford roofing. At present it is filled with machinery.

Another temporary warehouse, 18'x 63', has been built of double boards with tar paper between, and roofed with Brantford roofing. This building is used for storing cement.

Cottages,- Concrete foundations have been put in for fourteen miners cottages, all of the same size.

No.1 Cottage has been completed. It is a one-story frame building, roofed with Brantford roofing. It has five rooms with hardwood floors,- kitchen, dining-room, sitting-room, and two bed-rooms and bath, all lathed and plastered, lighted by electricity and heated with coal stoves. This cottage is being occupied by the General Superintendent and staff until the general office is completed

Hosehouses,- Three hosehouses, 4'x 6'x 7' high, have been built of faced lumber and roofed with Brantford roofing. Two have been located on the town site, and one centrally among the plant buildings near the mine. Each hose house is equipped with 400 feet of three-inch hose, four nozzles, fittings, two pails, and two axes.

Material received

After the railroad had been completed and rails laid into the village, material began to arrive, such as gravel, cement, brick, lumber, merchandise and machinery. The gravel, arriving during the year, was unloaded and hauled by teams to the foundation work. The cement was stored in the ware house, whence it is drawn to the various points of construction. The brick was unloaded, and piled up near the track, and covered with boards. The merchandise was unloaded into the ware house. A large quantity of lumber was received during the

summer; this was piled beside the track on both sides of the village spur, which runs to about the middle of the village, or town site. Considerable heavy and bulky material was received, such as roaster sections, gears, and foundation plates, crushers, gas producer parts, ore bridge parts, roof trusses, mine hoist, and machine shop appliances.

In order to prevent tying up cars, it was necessary that the material be unloaded as rapidly as possible. It was, therefore, unloaded along the track wherever convenient. Considerable of this freight is still lying beside the track, but the greater portion has been moved to the points of erection.

Two cargoes of bituminous coal was received and dumped at the temporary trestle, on the main line, south of the mine--total 6406 tons.

A car of 60 small pigs was received, and a suitable piggery has been built north of the townsite, sufficiently far away to prevent odors reaching the camps. It also has a good drainage away from the town site. The stock of 28 pigs, at the lower camps, were condemned by the Government Inspector, being infected; they were all shot and consumed by fire, together with the piggery.

Plant Construction

During the latter part of 1910 about 300 tons of siderite from the surface of the deposit known as "Deposit D" was shipped to Detroit, Mich., where a number of experiments were conducted on a commercial scale. The object of the experiments was to ascertain the feasibility of removing the sulphur and volatile constituents from the ore. Separate experiments were conducted in a rotary cement kiln, 70 feet long and 7 feet in diameter, fired by pulverized coal and producer gas, and were under the direction of experts in

ore roasting. The results obtained clearly showed, that with a kiln of sufficient length to thoroughly utilize the heat, and fired with a fuel capable of careful regulation, the desulphurizing and concentrating could be carried on at expenditure that would leave ample margin for profit. Based upon the results obtained at Detroit, a plan was designed and construction proceeded with at Magpie.

Briefly the process is as follows:-

The ore hoisted from the mine will be discharged into a No.8 Austin crusher, elevated sufficiently high to empty into a rotary trommel,- the oversize dividing equally into two No.5 Austin crushers, the product of which will discharge, together with the finished product, passing through the trommel, on to a 24-inch belt conveyor, and be elevated to the storage bin above the dust-chamber at the outlet of the calciner. From the ore-bin the ore will be fed automatically into the calciner, which discharges by gravity into each of ~~the~~ two roasters equally. These in turn empty into the coolers from which the finished product is finally discharged into the stock yard, to be distributed by an electric crane, or ore bridge. This ore bridge will have a span of 148 feet, and is to distribute the ore over the stock yard, and also reclaim it and load it into cars for shipment.

The roasting plant will consist of several units. Each unit being composed of :-

1. A rotary kiln, known as the "Calciner",125 feet long by 8 feet in diameter, lined with 9 inch-kiln blocks,
2. Two rotary kilns, known as the "Roasters", each 60 feet long by 8 feet diameter, lined with 9-inch kiln blocks.

3. Two rotary tubes, 28 feet long by 3 feet in diameter, lined with cast iron plates. These act as coolers, and at the same time serve to convey the hot ore into the stock-yard.

The kilns are to be fired with producer-gas, generated in mechanically operated gas-producers, capable of careful regulation, and are to have a pitch of one-half inch to the foot.

Contracts

Contracts have been closed for the rotary-kilns, gas-producers, ore-bridge, chimneys, coal and ore-handling conveyors, and crushers. Three units of kilns, gas producers and chimney have been contracted for, the capacity of each unit to be 250 tons per day. The ore-bridge, crushers, hoist, and conveying machinery have been designed with a view to handling 2000 tons per day, and ample provision has been made for future extension. The machinery and kilns for the first unit have arrived at Magpie, with the exception of a few minor parts, and the bulk of the fire brick.

The contract for the ore-bridge was given to the Brown Hoisting Co. of Cleveland, Ohio, with the stipulation that they proceed with the erection upon the arrival of the bridge material. In order that they might erect the bridge a 100-foot section of concrete wall has been put in on both sides of the gully running north and south about 200 feet east of the shaft. This gully has been selected as the most suitable location for a stock yard. The sections of the wall have been built in line with the first unit, which will be the first to be installed. Both walls are built upon solid rock. Owing to the abrupt drop in the surface of the rock at the location of both east and west walls, it was necessary to blast out ledges in order to get a suitable bearing for the

walls. Approximately 50 yds. of rock was removed altogether. The top of the west wall is 10 feet higher than the east wall, the difference in height being taken up by a difference in the lengths of the legs of the bridge. This was done to take advantage of the difference in elevation of the ground. The east wall contains 485 cu.yds., and the west wall 479 cu.yds.of concrete. The west wall has six 4-foot circular openings running through it two feet from the top. These permit the coolers to extend through the wall into the stock yard.

The Brown Hoist erecting crew(23 in number) arrived on Nov.26th., and were given the entire upper floor in Camp No.3, and a separate table in the dining room. They at once proceeded to build a rough board building covered with tar paper. It is located about 50 feet north of the west ore bridge wall, and runs east and west. The east end is used as an office; the central part as a storage room for their tools and rigging; while the west part serves as a black-smith shop. According to contract,we hauled their hoists, derricks, etc., to the bridge wall. They have set up two hoists on the knoll east of the east wall, and housed them in roughly with boards covered with tar paper. They also set up an 85-foot steel derrick east of the east wall, and with it they have erected their false-work - a skeleton frame structure, 76 feet high and 15 feet wide, built of 8"x8" timber, cross-braced with 3"x 10"s and 2"x 6"s. They have also set up a portion of the pier leg on the east wall. We have furnished and hauled to the site, all the lumber in the false work, and have had a number of men and a team hauling bridge material to them from the village spur, where it was unloaded.

Roaster Foundation

The foundations for the coolers and the roasters have been completed- in all 193 cu.yds. of concrete. Excavation to rock has been completed for the foundations for the two gas producers, and for the calcining tubes; also the dust chamber and chimney. Considerable blasting was necessary for the main gas flue from the gas producer: also for the gas producer foundation- the rock being too high at these points. Approximately 40 yds. were taken out.

Chimney

The contract for the erection of the concrete chimney, 105 feet high by 7 feet in diameter, was given to the Weber Chimney Co., of Chicago, Ill., and was signed on Sept.23rd. It stipulates that "the material will be shipped in five days from receipt of order to ship, and about 35 working days are required for completion of the work". These people have entirely disregarded their contract, as they failed to ship tools, and none of the round steel to be used in the horizontal reinforcing rings has reached here to date. The wooden forms arrived here in October, and, finally, after considerable correspondence, their man reached Magpie Dec.8th.- 76 days after signing contract. He arrived without any instructions whatsoever. After spending one week telegraphing his people, he received instructions to borrow tools and proceed with the work. He was given men and tools, which were charged to the Chimney Co., and proceeded with the chimney foundation, which consists of a slab 14 feet in diameter and 3 feet deep. This completed, he decided the weather was too cold to go on with the work, and left the Magpie.

Crusher Foundation

Excavation has been completed to rock for the No.8 crusher, close to the shaft on the north side. The concrete mixer has been placed

along side the foundation, and a mast rigged for hoisting the concrete into the form, which will rise 28 feet above the collar of the shaft.

Head Frame

A Steel head frame, 74 feet high, has been designed, and drawings sent to the Algoma Iron Works for construction.

Skips

Two Kimberly skips, which were designed at Magpie, and made by the Algoma Iron Works, have been received.

Present Compressor and Hoist Room

This building is 37'x 20', with a wing 10'x 19'. It is built of rough lumber, tar paper covered, and contains a small hoist and two Ingersoll-Sergeant compressors. The one, which has been used up to the present time, was not large enough to furnish power for development until the power arrives next spring for the electrical driven compressor. A larger compressor was, therefore, obtained from Helen Mine, and this is being connected up.

New Machine Shop, Blacksmith Shop, and Compressor Room.

One building, 150'x 30', of concrete blocks will contain these three departments. The blacksmith shop, 25'x 30', will occupy the west end of the building, the machine shop the centre, and the compressor plant the east end. Each of the two latter rooms will be 62½'x 30'. Excavating for the foundation of this building is completed.

The blacksmith shop is to contain,-A Lake Shore Drill Sharpening machine, already on hand, and two forges.

The machine shop will contain.-

1- McCabe double spindle lathe, 26"-48" swing, 22 ft. bed.

1- Leblond 18"x 12' Compound quick change engine lathe.

1- #2 Apex Merrill Pipe threading, and cutting off machine, capacity 1" to 4"

1- Long and Allstatter Single Head combined punch and shear, 30" throat, capacity 1" through 1"

1- 5-foot American Tool Works Full Universal Drilling Machine, with core drive.

1- #16 Valley City Grinding Machine.

1- Racine High Speed metal cutting saw- capacity 6 inches.

1- 24 inch Steptoe Shaper.

1- Bolt cutting machine.

The compressor room will contain one 22 and 13x24- class RP2 Rand Air Compressor, and a 280 H.P. induction motor to drive it, Both of these machines have arrived here, and the compressor has been placed on a concrete founfation containing 50 cu.yds. The excavation for the motor foundation is completed.

This room also will contain a 450 H.P motor generator set, and a 6-Panel Vermont marble switchboard. The motor generator set will convert a 3-phase 550-volt alternating current into a 230-volt direct current, which is to be used for the ore bridge and kilns.

Present Electric Light Plant

This is housed in a frame tar paper-covered building, 24'x 26'. It contains a slow-speed steam-engine, and a 17½ K.W.D.C. Westinghouse generator, 110 volts. Poles have been set up through the town site, and all the wires are strung. This building is also being used temporarily as a machine shop. The Leblonde lathe, pipe cutting and machine, emery wheel have been set up here.

Transformer House will be located north of the compressor plant, and is to be 23'x 23' inside, of concrete blocks. It will contain three

Pittsburg Transformers- to transform from 20,000 to 550 volts, with lightning arresters. This equipment will be put in by the Lake Superior Power Co.

Hoist House

This building will be, 58'x 25', built of concrete blocks. This will contain two hoisting engines- one with a double conical drum, geared to 150 H.P., slip-ring induction motor. This hoist, which will operate the skips, has been received. The drum of the cage hoist will be driven from one end by a similar motor, and the other end is operated by steam. The cage drum is also equipped with an automatic emergency brake, operated by fly-balls when the speed exceeds a certain limit. The distance from the shaft to the centre-line of the hoists will be 275 feet. Excavation has been made for the foundation of this building.

New Boiler House

The New boiler house is to be 62'x 36'8" inside. It is to be built of concrete blocks, and will contain a battery of five-125 H.P. Waterous Return Tubular Boilers, and the old 125 H.P. Kewanee Return Tubular Boiler, which came from the Helen Mine.

A tempoary building of rough boards, 48'x 35', houses the five Waterous Boilers, which have been set up, and almost all the brick work for setting of same is complete. Two of these boilers are in operation. The Kewanee boiler is blocked up in place at the south end of the Waterous boilers, but has not yet been housed. It furnished power until the new boilers were put in commission, when it was moved from its former place, beside the compressor, to its present position.

Transmission Line

A power plant is being put in at Steep Hill Falls on the Magpie River, and the right-of-way for the transmission line has been cleared from the Falls to Magpie Mine. The poles are now being raised between Helen Mine and Steep Hill Falls.

Trestle

In order to connect up our stock yard with the railway, it is necessary to build a trestle from the Magpie Brach of the Railway to the south end of the stock yard. This trestle will be 305 feet long, and 31 feet high at the deepest point. It will contain 122,776 feet, board measure, of timber. The footing for the sills has been blasted out, and the sills placed in position.

Superintendents

There were three changes in the superintendenoy of Magpie Mine in 1911. A. Scott was in charge until July 10th. A.A. Alsip from July 10th to Oct. 16th., and W. Melville from Oct. 16th. to the end of the year.

Assessment Work- 123¾ days' work, 8 hrs each, was performed on Claims 1228 and 1229 for year ending Mar. 17th. 1911. No further assessment work was performed during 1911.

Yours truly,

W Melville

Superintendent.

MAGPIE MINE, ONT.

[illegible] May 23rd., 1916 [illegible]

MAGPIE TONNAGE

[illegible] Mr. J. Frater Taylor, [illegible]

President

[illegible]

Dear Sir,-

At the time the original drilling was done at Magpie Mine, only low grade ore was encountered. This ore ranged in iron in its natural state from 34 to 42%. The exact characteristics of this ore were not well understood at the time and various concentrating propositions were talked of. Mr. Seelye in his original estimates on the tonnage at the Magpie considered the ore body roughly 4000 feet long, 60 feet wide and 800 to 1000 feet deep. The drilling done at the Magpie did not warrant any such assumption and these figures were purely invention. At the time Mr. Hardman visited the property, that is in 1910, no experiments had been performed on the Magpie ore and no definite plan had been decided upon as to how this ore could be treated. Mr. Hardman became somewhat imbued with Mr. Seelye's optimism and was led to estimate the tonnage in the middle section at the Magpie at 7,000,000. At this time the mine had not been opened up and all the information obtainable was from the drill records. Evidently Mr. Hardman included in his figures the large diabase dyke cross-cutting the ore and the lean ore on either side of this dyke. He also must have included the large body of ore west of our present workings.

When the Mine was opened up, work was done on the 1st and 2nd levels simultaneously and the surface area of these two levels fully exposed. The surface area on these two levels, that is the total length and the total width proved to be practically the same and the same as the surface area on surface, so that this led us to assume that the body would carry with depth, that is, that it would hold its dimensions.

On February the 14th., I reported at the Magpie about 5,000,000 tons of iron ranging from 42 to 54% after ignition. This included the body West of our present workings, which was tapped by two drill holes, one at a vertical depth of 613 feet and the other at a vertical depth of 686 feet. The surface dimensions of this body are 700 feet long by an average of 45 feet to 50 feet wide. The ore as exposed in the hole shows an average width of 42 feet. At the time I considered this ore treatable, but from later experiments it was proven that the volatile in this body was very low so that it could not be roasted, and I now consider that this body is useless as a commercial proposition. This ore is so extremely hard that mining would be expensive, and, as roasting will not benefit the ore sufficiently to make it a merchantable product, some other method of concentration will have to be devised. Methods so far tried in treating this grade of ore in Ontario have proved to be failures and I do not consider it worth while to experiment with this ore at all.

When our shaft was sunk to the third level and the ore crosscut on this level, it was found that the width opposite the shaft had pinched from 60 feet to 6 feet. Drifts were run along

the body. The one on the East showed the ore gradually increasing in width until it obtained nearly its normal width 300 feet from the shaft. The drift to the West showed an increasing width of ore to 95 feet from the shaft, where the ore was suddenly pinched out altogether by a rock intrusion. This intrusion continued for 100 feet after which the ore was again encountered and continued to the dyke but was found to be narrower than on the 2nd level. West of the dyke no work has been done as yet, the drift here being just into the ore. As the ore body on this level looked too narrow to mine commercially below the level, it was decided to drill for the 4th level. Five drill holes were put down from the 3rd level to the proposed location of the 4th level. These drill holes showed that to the East of the shaft the ore is again widening with depth, but West of the shaft the rock intrusion becomes much wider than on the 3rd level and practically cuts out of all the ore between the shaft and the diabase dyke. The only ore proven up here is a small narrow body, too narrow to mine commercially.

My original estimate of 5,000,000 tons was made up as follows: 2,000,000 ton in the block West of our present workings and 3,000,000 tons in the ore which we are mining at present. The block of ore West of our present workings I considered 700 feet long, 40 feet wide and 700 feet deep, as we had drill holes tapping it at this depth. The block which we are now working I considered 1200 feet long, 50 feet wide by 500 feet in depth. As this width held from the surface down to the 2nd level, and

as we had one drill hole tapping the ore to a depth of 531 feet, I considered these estimates conservative, but it now develops that the ore pinches very rapidly from the 2nd to the 3rd level, so that these previous estimates are of no value.

On the third level and on the fourth level the same amount of development work is necessary per foot in length of the ore body as on the upper levels, but on the third level the tonnage developed per foot in length is only about a quarter of that developed on the upper levels and considerable of this development work will have to be in rock, so that, instead of obtaining ore from this work, which can be hoisted direct to the kilns, we obtain only rock which has to be handled in small cars to the surface and trammed to our waste dump. This rock work is therefore very much more expensive than development work in ore. Also in order to keep ore developed ahead it is necessary to do practically four times the amount of work on the third level as was necessary on the second. This of course makes our total mining much more expensive than previously and this mining cost will eventually reach a figure where it is prohibitive. When such figure is reached there is only one thing we can do from the present outlook and that is to stop development work altogether and mine out such ore as has been developed, in other words clean up the mine.

Should further drilling prove that the rock intrusion on the third and fourth level is local and that there is still a good width of merchantable ore below this, it would still be necessary to stop mining operations for sometime to catch up on our development work, as we would have to sink the shaft a

matter of 300 feet at least to develop this ore in our lower workings. Personally I do not think there is any chance of the ore again widening out but believe it will be cut off more and more by rock intrusions. I think however that more drilling should be done from the fourth level before it is definitely decided to abandon the mine.

Commencing July it is our intention to roast high sulphur Helen Ore together with the Magpie. While this Helen Ore continues it will be possible to keep ahead somewhat with our development work, because it will not be necessary to break the same quantity of Magpie to keep our kilns supplied to their maximum capacity.

This will prolong the life of both the Helen and the Magpie, because if the Helen can break even on their ore it will allow them to finish concentrating the pocket of pyrites at the East end of the mine at a profit and it will allow the Magpie to gain somewhat on the development work, so that after the Helen ore is finished more gangs can be put on breaking ore.

I am sending you two sketches to accompany this report, one showing the plan of the different levels. This shows how the ore body narrows up on the third and on the fourth level and how the bulk of it between the shaft and the diabase dyke is cut off by rock intrusion. The other sketch shows cross section of the ore body and shows the ore already mined, that which we are at present mining and the intrusion of rock on the third and fourth levels. You will see from this sketch that the rock is widening out rapidly with depth.

Yours truly,
"A. Hasselbring"
General Superintendent.

Records in this file donated by Algoma Ore Properties 1979-1981

COPY

MAGPIE MINE. July 25, 1916.

Algoma Steel Corporation, Ltd.,

Sault Ste. Marie,

Ontario.

Gentlemen:-

Attention of J. Frater Taylor, President.

Results of my examination of the Magpie property are submitted herewith. At the outset I may acknowledge my indebtedness to the men on your staff for their cordial co-operation. I include only such descriptive detail as bears directly on the questions before me, namely, the tonnage of ore now available, the possibilities of extension of the ore body with depth, the manner of exploration and development. The essential conditions are summarized on the accompanying map, showing plan and sections of the property.

General description of carbonate belt. The Magpie carbonate ore stands in a nearly vertical bed striking generally in a direction north of west and south of east. The thickness ranges up to 48 feet. The belt is broken by folding and faulting at several points as shown on the general map. At the southeast end the belt takes a sharp turn to the

southeast and connects with the Alice belt. On the northwest the belt makes a very sharp bend, accompanied by faulting, and probably connects with the belt to the northwest of the Magpie location.

The faulting and folding of this belt as a whole have taken place along an axis striking approximately east and west and marked by a slaty cleavage in the wall rocks. On the accompanying map the outcrops of these rocks, with the direction of their cleavage, are platted. It will be noted that while the cleavage keeps a uniform direction, marking the attitude of the axial plane of folding and faulting, the carbonate belt is in places parallel to the cleavage and in places cuts across it. The faulting you will also note follows approximately the direction of the cleavage. This is a normal relationship common to structures of this kind. The diabase dike crossing the lands was introduced later than the development of the cleavage and takes no part in the folding which developed the cleavage.

The carbonate deposit as a whole is a sedimentary bed lying between a series of acid and basic flows and tuffs of surface volcanic origin. The wall rock on the south is mainly a talcose and sericitic schist representing a sheared porphyry or felsite, more or less tuffaceous in places. The north wall is mainly a chloritic green schist represent-

ing an ellipsoidal basalt and associated tuffs. The distribution of the outcrops is shown on the map. In other words the carbonate was deposited by sedimentation over a nearly horizontal surface of volcanic flows and tuffs and immediately covered by further flows. Subsequently the entire mass was tilted to its present position. This manner of origin favors the view that the carbonate belt has a considerable downward extension.

It has been suggested that the carbonate belt was perhaps a vein deposit, in which case it would be difficult to predict its extent. Evidence against this mode of origin is: (1) The considerable horizontal extent of this narrow belt through the Magpie property, connecting with the "Alice" deposit. (2) The fact that the carbonate bed lies uniformly between layers of felsite and basalt which were originally volcanic flows, and does not seem to cross these flows except by faulting. (3) The similarity of Magpie carbonate, in its general characters and associations, to the Helen siderite which is directly continuous with banded jasper formation, the sedimentary origin of which has never been doubted. (4) The common occurrence of carbonate in the bedded iron formations of the Lake Superior iron ranges, and the common occurrence of both the carbonate and banded iron formation in many iron formation belts associated with volcanics east

of Lake Superior.

Part of carbonate ore available for mining. Only the central portion of the carbonate belt seems to be of commercial grade and thickness. The northwest end of the belt is highly magnetic and while it shows a good percentage of iron in the raw state, it contains so little volatile matter, in other words the iron is so largely in the oxide rather than the carbonate form, that roasting does not raise it to the desired grade. Toward the east also the belt becomes magnetic and high in sulphur and in section K-K is also too thin to work. The part of the belt now opened up for mining is interrupted by a diabase dike, which cuts out the ore for a distance of 90 to 105 feet, and which further renders the formation magnetic and low grade for a distance of approximately 25 feet from its contact with the diabase.

The mine levels and the drilling together have shown that the maximum longitudinal length of the ore available for mining is 1,250 feet and the average thickness is 38 feet. The ore has been developed to the third level of the mine at a depth of 275 feet. Drilling below this depth has shown the ore to extend to at least 660 feet.

The third level shows, west of the shaft, an introduction of a rock locally called "mica dike" and a diminution of total area of ore of 36½% as compared with the second level.

Drilling below the third level seems to indicate a widening of this dike and corresponding reduction in area of the ore body. As estimated from the insufficient data available, the fourth level will show 39% less ore area than the second level, or about 3% less than the area of the third. The possibility of the continuation of the ore below the third level in sufficient dimensions to make it commercially available is one of the principal questions before us. Conditions of origin outlined above favor the view that the ore may extend to considerable depth.

Magnetic survey. A magnetic survey of the Magpie belt was made with dip needle to see whether the dip needle readings would not register the alterations of carbonate to magnetite and therefore indicate poorer parts of the carbonate belt. It was also in mind that this could show whether magnetic observations might not help in the study of Siderite Hill at the Helen. The results are interesting, in that they indicate the entire carbonate formation to be magnetic, and that the magnetism increases in intensity toward the east and west ends of the belt and in approaching the diabase dike from either direction. These observations check with the known facts ascertained from analyses, namely, that the carbonate actually does contain more magnetite and therefore is less susceptible

to treatment by roasting at the points where the needle registered high magnetism. Further to check these results, samples were collected from various parts of the belt, crushed in the laboratory and the magnetite drawn off with a magnet. The proportion of magnetite drawn out corresponds closely with the inferences obtained from the dip needle as to the distribution of magnetism.

The detailed readings are not shown on the map, but above the longitudinal section on the accompanying map averages of the readings crossing the belt have been platted in order that the general increase of magnetism at certain points may be easily read by the rise in the line above the horizontal.

Grade. The ore consists of light crystalline carbonate with texture of marble, of dark granular siderite, and of fine-grained, dark, dense siderite of the appearance of magnetite ore, the last named phases being characteristic of the contact with the diabase. At the surface the carbonate has been oxidized from a few inches to a few feet to a dark brown and black hematite, carrying some magnetite.

The average grade of ore in a raw state, as determined by averaging analyses on level maps, is as follows:

Fe	36.69
Phos.	.011
SiO_2	5.48
Sul.	1.02
Loss on Ig. ...	27.32

After roasting the grade, according to guarantee for 1916, is:

Fe.	50.00
Phos.	.013
SiO_2	9.60
Mn.	2.75
Al_2O_3	1.24
CaO	7.69
MgO	7.75
S.	.196
Moisture	1.28
Loss on Ignition	Nil

In roasting the ore there is on an average about a 30% loss; in other words, one ton of roasted ore requires 1.43 tons of raw ore.

The average analyses of raw ore above given does not include analyses of magnetic and high sulphur parts of the deposits, particularly in the east and west ends of the belt which have not been mined. The distribution of sulphur in the carbonate belt as a whole may be summarized as follows:

The only place on the level maps where high sulphur is found for more than one or two analyses is on the first level, where from a point 450 feet east of the shaft (and east of the part stoped out) to the end of the drift sulphur runs from about 4 to 12%. This high sulphur belt seems to extend eastward, the ore found in the two holes through the east block of ore (43 feet in the No. 14 and 7 feet in No. 15) averaging 10% S. The surface exposures of this block of ore at the Iron Knob showed considerable pyrite.

In the main part of the mine several of the drill holes struck high sulphur ore; No. 7 for 36 feet running from 12 to 16%, near the second level, No. 11 for 26 feet running about 12% near the third level, No. 10 for 24 feet running from 4 to

9½% near the third level. In all these cases it seems that the high sulphur belts were only small in extent, since analyses from the levels at corresponding points showed only the ordinary low percentage.

Below the third level, No. 8 struck ore running from 2½ to 8%, and chiefly over 4%, for 80 feet. None of the other holes struck high sulphur.

In the block of ore west of the mine (the magnetic portion) No. 16 passed through 42 feet averaging under 2%; No. 17 passed through 23 feet under 2% and 30 feet running from 6½ to 15%. In the belt to the northwest No. 5 encountered 50 feet low sulphur ore and 49 feet running from 4 to 6%. The highest sulphur content which it has been found feasible to use in the roasting kilns at the Magpie is about 2%.

Tonnage estimate. While on the ground Mr. Hasselbring and I made a joint estimate of available ore on the property, with the following results:

Total tonnage originally in the mine.

	Av. width (feet)	Length (feet)	Area (sq. ft.)	Height (feet)	Tonnage.
Above 1st level	48	1,155	55,440	92	255,000 (a)
" 2nd "	47	1,250	47,000	80	433,000 (b)
" 3rd " E. of dike	23	875	20,125	103	455,000 (c)
" 3rd level W. of dike	30	325	9,750	103	
" 4th level E. of dike	40	475	19,000	100	293,000 (d)
" 4th level W. of dike			9,750	100	
Total -					1,451,000 (e)

(a) Only 50% of the original ore volume is here included as ore, the remainder being left to allow for rock near the west end, for pillars under buildings, and around shaft, for lean ore next to dike, etc.

(b) 8,000 tons have been deducted for lean ore next to the dike.

(c) No deduction has been made for ore next to the dike on this level. Said to be of somewhat better grade. Probably some deduction should be made.

(d) This does not include about 63,000 tons, as estimated by Parrish, of ore just east of the dike in the thin portion of the formation where it may not be possible to extract it profitably.

(e) To this total some addition should be made for the ore out in holes 8 and 151, respectively, 125 and 135 feet below the fourth level, but data are insufficient for an estimate.

About 90% of the ore is extracted by the method of mining used. Therefore the total available tonnage originally in the mine was 1,305,900 tons above the fourth level, or 1,037,200 above the third level.

Mined to June 1, 1916, 521,000 tons. Left in mine at that date 784,900 tons above the fourth level, or 516,200 above the third level.

Rate of extraction of ore. Mr. Hasselbring estimates that from June 1st (date of estimate) to the first of January, 1917, 150,000 tons will be taken from the mine. This would leave a total above the fourth level at that date of 634,900 tons, of which 366,200 tons would be above the third level. The amount of ore taken out of the mine during the year ending

July 1st has been somewhat more than 300,000 tons. At this rate of mining it is estimated that ore above the third level will last at least until the end of the year 1917. The narrowing of the ore body between the third and fourth levels makes it doubtful whether this ore can be extracted at a profit. However, the area of ore as estimated for the fourth level is only 39% less than the area of the second level and there may be no loss in mining this ore. In any event it seems desirable to develop it in order to prove whether it can be mined at a profit and to test possibilities of widening of the ore body below the fourth level. The amount of ore estimated between the third and fourth levels should keep the operation going for nearly a year longer.

There is a good chance that the ore body extends below the fourth level in such condition as to be commercially available; and thus to materially lengthen the life of the mine.

This situation seems to call for the following procedure:

Plan of development. (1) The shaft is now about thirty-five feet below the third level and has been going down slowly on account of limitation of compression and drill capacity. The shaft should be sunk to the fourth level as soon as possible and the fourth level opened up, so it may be ready

for mining by the time the ore body has been extracted above the third level, and in order that the fourth level may be used as a starting point for exploration below. There has been much difficulty in crowding this work on account of the limitation of men and equipment. It would seem desirable to speed up this work in the hope that the fourth level could be completely developed by the end of 1917. If this can be done, the mining of the ore, which until that time will be above the third level, can be continued with little, if any interruption between the third and fourth levels.

(2) From a point west of the dike on the third level, a crosscut should be run to the north, and from the end of this crosscut a drill hole should be sent down at an angle to cross the ore body on the fourth level, to determine the thickness of the ore west of the dike on the fourth level, and thus to determine whether it is worth while to run the fourth level drift west of the shaft through the narrowing of the ore body to reach ore west of the dike.

(3) After the fourth level is opened, drilling should be started at once to determine whether or not it is worth while to attempt to open up another level. This exploration might be accomplished by deep drilling from the surface, but calculation of the cost of crosscutting necessary to get a starting point for the drill shows that it will be cheaper to

drill underground. The only advantage of surface drilling is that it need not be postponed to the completion of the fourth level, and it may therefore be desirable to resort to surface drilling if the other method does not progress fast enough to keep development ahead of mining.

General considerations bearing on above recommendations. The geologic conditions on the property seem to me to warrant the opening up of the fourth level and exploration below this level as a means of determining whether the ore body is continuing down with sufficient dimensions to be mined at a profit. The work is further warranted by your large capital investment in plant, which would seem to require that possibilities below the third level be fully tested, merely as a matter of insurance against leaving any profitable ore in the property. If this work is left until the ore above the third level is largely extracted, it will mean a period of interruption in output, during which overhead charges will run and make the work much more expensive, as well as interrupting your use of the ore. I fully appreciate the difficulties in fully meeting this recommendation, but believe it should be possible to do the work in approximately the time indicated.

In general my view of the property coincides with that of Mr. Hasselbring, in that the property does not look so good as it did and previous estimates of tonnage have prov-

ed to be much too large. On the other hand, the situation seems to have sufficient possibilities to warrant an aggressive campaign to settle at the earliest possible date the question whether the property is or is not to be abandoned.

Maps. Accompanying this report is a whiteprint showing plan, longitudinal section and cross sections.

Note. I find it necessary to leave town before I have had a chance to check fully the maps used in this report. While I believe them to be substantially correct, I will go over them immediately on my return and if there are changes will submit revised copies.

Very truly yours,

C. K. LEITH.

CKL:M

MINES DEPARTMENT
YEARLY REPORT
1919

ANNUAL REPORT

MAGPIE MINE

1919

EXPLORATION

During January three diamond drill holes were drilled from 1-10 Xcut, 4th. level, to prove the existance or non-existance of ore between the Mica and Diabase dykes, below this level.

Hole No. 162 was drilled to cut the ore at the 6th. level at a point approximately 150 feet West of the shaft. This hole, after leaving the greenstone, which forms the Northern boundary of the ore body, passed through mica dyke until it reached the talcose schist which forms the Southern boundary of the ore. Only a narrow stringer of siderite, 3 feet in width, was encountered, aboutthe centre of the mica dyke.

Hole No. 163 cut the 6th. level between the mica and diabase dykes and only passed through 7 feet of siderite. The remainder of the distance between the greenstone and talcose schist consisted of iron formation.

Hole No. 164 was drilled for the purpose of ascertaining whether the siderite came in again with depth. It cut at a point 400 feet below the 4th. level directly under 10-Xcut and the mica dyke. It only met with alternate bands of iron formation and mica dyke and siderite was entirely absent.

The result of these holes show that no ore can be expected on the lower levels between these two dykes, that is under 10 stope feet of the 4th. level.

YEARLY REPORT
OF

GENERAL SUPT. OF MINES DEPARTMENT

MAGPIE MINE

JAN. 1ST.
1919
to
1920

PRESENTED UNDER FOLLOWING HEADINGS.

MAGPIE MINE
HOLDSWORTH PROPERTY
GOUDREAU MINE

MAGPIE MINE
Exploration
Mining
- Development
- Stoping & Ore production

Underground machinery & equipment
Surface
- Hoisting
- Crushers
- Conveyors

Roast Plant
- Kilns
- Coolers
- Coal Mill

Ore Bridge
Camps & Cottages
Electric Power
Labor

HOLDSWORTH PROPERTY

GOUDREAU MINE

No further drilling was done during the year, as the remaining blocks of ore had been previously proven to the 5th. level.

M I N I N G

DEVELOPMENT

The small amount of development work done during 1919, as compared with previous years, is accounted for in several ways.

Labor, while more plentiful than the preceding year, was still short of requirements. The class of labor obtained was very much below the average of former years.

During the month of April and again in November work was entirely suspended, due to storms destroying sections of the transmission line, from the power plant at Steep Hill Falls to the Mine. While this damage was repaired in a couple of days, it allowed the water in the Mine to rise enough to flood the pumps on the lower level. It was necessary then to bale this water out by means of the skips and such auxiliary pumps as were available. These latter were of small capacity and the work of dewatering the mine in each case extended over a month. During these periods no development work whatever was done, although stoping was continued part of the time.

Up until June, the policy of the Company was to do no further development on levels lower than the 4th. As this work was completed early in the year, no development was carried on until Summer, when the Company changed their program and decided to sink the shaft to and develop the 5th. level.

The shaft was already down 71.5 feet but, as no work had been done in it for a year, it was full of water and a large amount of fine ore had settled at the bottom. This

had all to be removed and actual sinking did not start until the end of August. Practically all of the remainder of the year was occupied in the shaft. No work of course could be started on the 5th. level until the shaft was down.

During the year, 1314 feet of development was done. The attached statement shows in detail what this footage consists of, when and where the work was done. Development on the third level was completed, during the year.

On the 4th. level the development of No. 9 stope and 10 stope East was finished.

The main drift on the West ore body was driven through the diabase dyke and about 50 feet into No. 11 stope, which lies West of this dyke and directly under No. 8 stope.

The remainder of the work on the 4th. level was confined to the development of 10 stope West. About 100 feet of X-cutting and an equal amount of raising was done in this stope.

The shaft was sunk from its depth of 71.5 feet to a depth of 200 feet below the 4th. level. 103 feet of this sinking was done on contract by Longyear and Co. The station X-cut and puffer station on the new level were each driven in 12 feet.

A 43 foot pillar will be left on the floor of the 4th. level, to protect the lower levels from the caving on the walk on the levels above. This will leave a depth of ore of 107 feet to be mined on the 5th. level. This is a larger available footage than on any previous level.

M A G P I E M I N E

DEVELOPMENT STATEMENT FOR YEAR ENDING DECEMBER 31ST. 1919

MONTH	3RD. LEVEL.			4TH. LEVEL			SHAFT & 5TH. LEVEL			TOTAL FOR MONTH
	DRIFTING	XCUT	RAISE	DRIFTING	XCUT	RAISE	SHAFT	STA XCUT	SUPPLY STA	
January					77.5	38.0				115.5
February					73.0	45.5				118.5
March						40.0				40.0
April					77.5	83.0				160.5
May					35.5	71.5				107.0
June				30.0		20.0				50.0
July				42.0						42.0
August			40.0	70.0		30.0	21.5			161.5
September				66.0	30.0	35.0	40.0			171.0
October				68.0	29.0	25.0	41.0			163.0
November				25.0	10.0	12.0	16.0			63.0
December				40.0	32.0	16.0	10.0	12.0	12.0	122.0
TOTALS			40.0	341.0	364.5	416.0	128.5	12.0	12.0	1314.0 FEET

Summary

DRIFTING	341.0
XCutting (including Sumps)	368.5
RAISING & SINKING	604.5
TOTAL	1314.0 Feet

STOPING & ORE PRODUCTION

3RD. LEVEL

Stoping on the 3rd. level was carried on from Nos. 6, 7 and 8 stopes.

No. 6 stope was finished early in the year.

No. 7 stope between the mica dyke and shaft pillars was completed. A large quantity of ore still remains, however, in the shaft pillar East of this stope which will be mined when the 3rd. level is completed. No. 7 stope West of the mica dyke was carried back as far West as 15 X-cut on the 2nd. level and 16 X-cut on the 3rd. level.

No. 8 stope was practically finished during the year and nearly all the Helen Hematite which lay above this stope was also withdrawn. There still remains about 7000 tons of siderite and 1000 tons of hematite to finish the work here.

No. 9 stope Production from this stope continued throughout the whole year. It was opened up from 5 raise, but, due to a heavy fall of rock from the walk of the upper levels, all the work East of 8 X-cut had to be abandoned. The stope was then opened up from its Eastern extremity and stoped West as far as 10 X-cut on the 3rd. level and 9 X-cut 4th. level. Practically all the ore in this stope will be recovered in spite of the rock fall, except a small portion on the West side.

However, the block of 40,000 tons of ore above No. 3 stope, will have to be left. This block, as will be seen from the attached section of the mine, lies over 9 stope also and, if it was mined, it would fall upon the rock in No. 9 stope

above mentioned and could not be drawn from the chutes below until the rock was first taken out. The impractability of removing this rock will be understood from the huge amount of it. It is estimated that not less than 30,000 tons came down and filled not only the entire Western end of 9 stope, but also 6 stope above, the entire height of the broken rock being nearly 200 feet.

As the present program of the Compant calls for several years further operation, it is doubtful if this block would have been mined, at any rate, until the mine was finished. The Roast plant is situated directly over this block and might be endangered if it were removed. The attached section of the mine shows this condition clearly. It also shows the location of the various stopes and the work done.

The attached table shows the production during 1919, also the condition of the ore reserve.

ANONYMOUS
1919

Report on Condition of Eagle Mine, March, 1921.

No. 11 Stope.

The first section of the stope from the diabase dyke to 25 cross-cut has been stoped out and the back to the third level blasted down. A small amount of ore still remains broken in the stope to be trammed out.

In the second section of the stope, the main drift has been completed to 32 cross-cut which is the end of the ore body, and all the development work on the level completed with the exception of 30 cross-cut and 30 and 31 raises. All chutes are timbered except in the above raises and 28B-1&2, 27B-2, and 25B-2 raises. The bottom sub has been completed and the manway raise which is 32 raise has reached the second sub. To complete the development in this stope there remains 350 feet of subbing and 80 feet of raising. This is black ore and the price paid for contract work in black ore at the present time is $9 per foot for either raising or drifting. This figure is for labor alone. Dynamite - labor same to all extra.

No. 12 Stope.

This stope is divided at 8A cross-cut. All development work on the section between 8A cross-cut and the shaft has been completed with the exception of the fourth sub which has still to be driven 30 feet. This stope has been opened up at 8A raise. At the bottom sub it is opened up from wall to wall and carried about twenty feet ahead of 8 raise and back to 7 cut. On the second sub the stope has been opened up to the left hand wall but the right hand wall has not yet been reached.

Magpie Stopes.

It is opened up for a length of about thirty feet. On the third sub the stope has an opening of about twenty feet square. Neither wall has been reached.

In the east section of 12 stope the main drift is completed to the end of the ore body which is 11A cross-cut. The reason for the unequal size of the two parts of this stope is the fact that the ore body is eighty feet shorter than was expected although we had figured the stope would be shorter than the one on the fourth level above. 10A cross-cut has still to be driven about six feet and 10 A and 11A raises have not yet been driven. These raises of course are only to be driven to the bottom sub. To finish the development of this stope will require 300 feet of subbing and110 feet of drifting raising. This is all in white ore and the price paid for contract work is $7 for raising and $6.40 for drifting and subbing.

No. 14 Stope.

All the development work in this stope between the shaft and the mica dyke has been completed. The first and second subs have been stoped out. On the third sub it has been drawn back to about twenty feet from 13 raise. Difficulty was encountered by benches falling down before the walls were reached and the outline of the stope at this point has the form of a horse [illegible]. The [illegible] has just been cut through into the stope [illegible] to be opened up.

MAGPIE STOPES.

14 Stope - Western Extension.

The extent of this stope is as yet unknown. When the mine closed three machines were engaged in developing it on the level and one in driving the first sub. The main drift has been driven to a total distance of 334 feet of which the first 165 feet underlies that part of 14 stope which has been developed and partly stoped out. The remaining section of the stope shows a width of ore varying from 20 feet in width at 6A cross-cut to over 50 feet at 10 crosscut. One raise put up in 10 crosscut, near the main drift, encountered mica dyke, while the inside raise went up all in ore. We think but have not got done enough development to prove that the mica dike is bottomed close to the back of the main drift. The main drift encountered a sharp bulge in the south wallat 14 crosscut and it will be necessary to turn the drift at this point. Instead of proceeding with the drift when we encountered the rock we started to run 14 crosscut to see how much ore we had at this point. This cross cut is in 22 feet in ore and a seven foot hole driven beyond showed all ore. Crosscuts 6A, 7A, and 8 with their raises have been completed and the first sub from 6A has been driven back and holed into 14 stope proper, and has been driven west as far as 7A raise. As this part of the ore body is only 20 feet wide it was intended to backstope the ore. It is very probable that [illegible] the [illegible] level, as we have no cross cut across the dike

MAGPIE STOPES.

on the fourth level to prove whether ore exists beside the dike or not. 11B and 12B cross cuts have been started but are not completed. 10B crosscut shows 50 feet of ore but the dike is probably just above this crosscut. The amount of ore lying in this section of the mine is unknown but we expect a stope of ore from about 10B to the diabase dike.

The footage obtained by contractors in white ore varied from 130 to 163 feet with an average of about 140 feet, while in black ore the average was about 115 feet. The average when done on company account in white ore was under 100 feet and in black ore about 75 feet. The diabase dike, when encountered is extremely hard and the contract price may have to be $10 per foot. We had arranged to have the present men do this at $9 as they had been contracting the drift to its present stage but a new contract probably would not drive it for the same money.

All the mine plans and sections have been brought up to date and show the conditions noted above. The colored plan shows where the machines were working when the mine shut down. Special efforts were being put forth to speed up the development leading to 15 stope that in case the shaft should not be sunk to the 6th level the ore in 15 stope would be available before the ore in 12 stope was finished. All development work to date has been sampled and the analysis is shown on the assay plans.

TONNAGE.

The following tonnage is in the mine either developed or partly developed according to our estimate:

11 stope	55,000 tons.
12 "	200,000 "
14 "	15,000 "
Shaft pillar	30,000 "
Total	300,000 " = 1 years Supply.

In addition to this is the tonnage available from the backstoping in 14 stope, and the ore that will be produced from 14 stope between the end of the mica dyke and the start of the diabase dyke. Not enough development has been done to make an estimate on this ore but the outlook is decidedly promising.

ANONYMOUS, 1921

Memo on the Magpie Mine

The following summarizes the facts gleaned from a days perusal of plans, sections and correspondence relating to the Magpie Mine:

Claims:

The claim holdings consist of a block of nine patented claims - J.L.62 to J.L.69 inclusive and J.L.74 - totalling about 290 acres in extent. The claims adjoining to the west and north numbered T.L.70 - 75 and J.L.132 to 139 have reverted to the Crown.

Location:

Eight miles north of Magpie Junction.

Transportation:

Steel has been removed from the old railway grade and the bridges are passable for motor vehicles only. The old grade follows a route approximately ten miles in length from Magpie Junction to the mine workings.

Buildings:

A few of the original buildings are believed to be still habitable.

Geology:

The range has a total length of about 2,000 feet dislocated by minor faults into four segments. It is composed of siderite with minor amounts of magnetite which become more predominant in the north-west portion.

The strike is roughly north-west and dips are vertical or almost so.

The banded chert member is absent except for a thin band in the north-western part of the range. The relations between acid and basic volcanics are reversed, acid tuffs overlying and basic lavas underlying the siderite. Tops are believed to be west.

Underground Workings:

A shaft was sunk to a total depth of 600 feet and approximately 1,500,000 tons of siderite mined between 1909 and 1921 from the upper four levels. The fifth level, 200 feet vertically beneath the fourth level, was driven 250 south-east of the shaft and 300 feet north-west of the shaft developing some 350,000 tons of ore of which less than one-fourth was removed before suspension of operations.

On the third level north-west of the shaft, the top of a mica-rich mass, probably an inclusion, was encountered. This increased in dimensions downward until reaching a length of 150 feet on the fourth level. On driving north-west on the fifth level the micaceous mass was not encountered but was found some 30 feet above the level.

On the fifth level the mine workings are terminated some 250 feet south-east of the shaft by a fault which apparently thins the ore and throws the east side about 100 feet to the north. To the north-west, some 750 feet from the shaft on the fourth level, the mine workings stop where the siderite has been thinned to non-commercial widths apparently by folding.

On the lower levels the present shaft was found to be so close to the ore body that a shaft pillar was required.

Judging by the underground workings the south-east extremity of the ore body rakes to the west at about 75 degrees. No corresponding rake was noted to the north-west, the workings terminating in a vertical line when viewed in longitudinal section.

Grades:

The assay plans of the first, third and fifth levels are the basis for the following grades:

	North-West of Diabase			South-East of Diabase		
	Fe.	S_1O_2	Loss	Fe.	S_1O_2	Loss
First Level	35.9	6.3	27.5	36.5	5.3	29.1
Third Level	36.9	6.9	25.8	37.5	4.8	24.7
Fifth Level				36.9	4.8	29.7

Old Drilling:

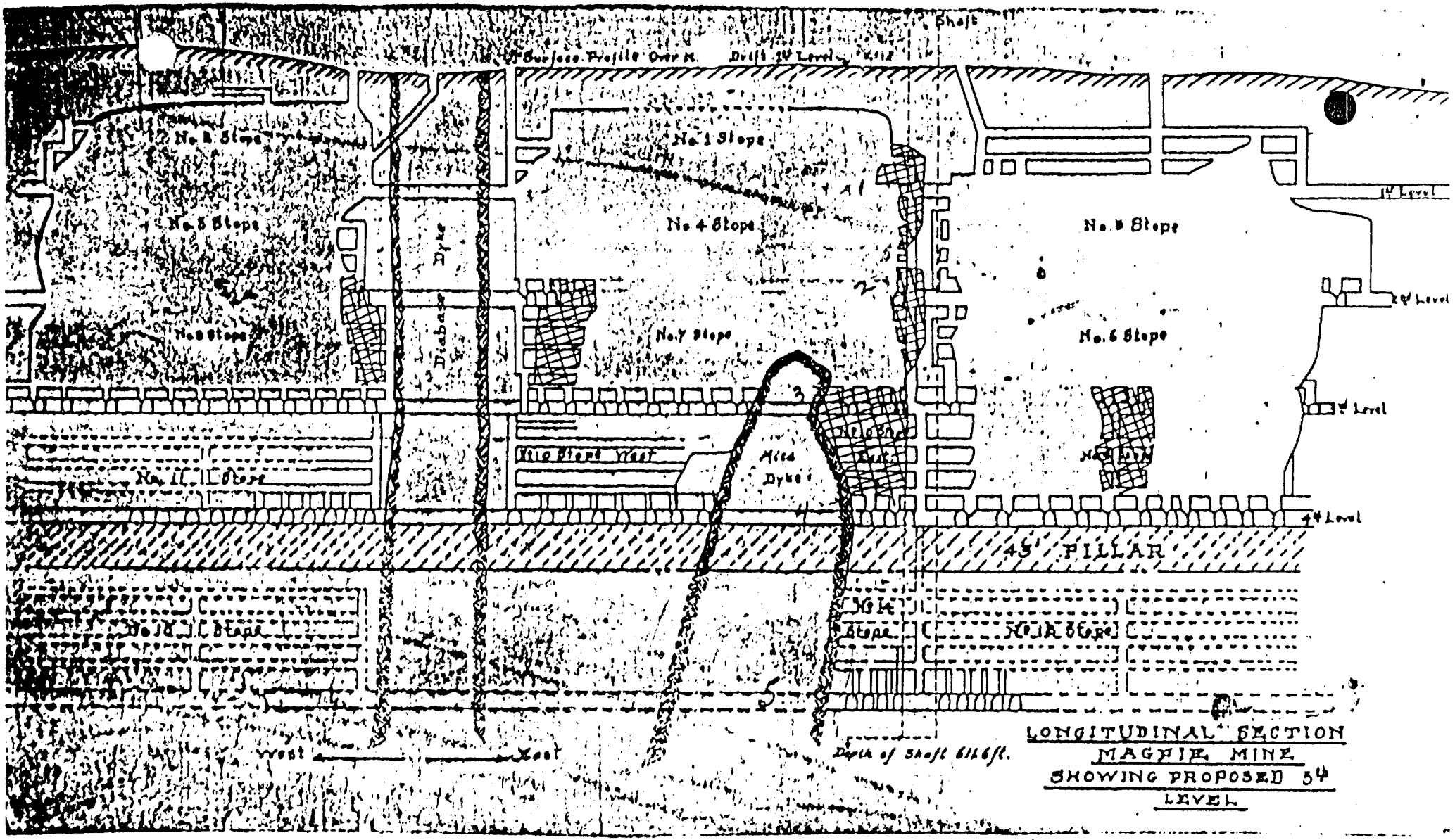
Seventeen holes were put down from surface in the years 1909 and 1910. Of these only five intersected ground that was not later penetrated by underground workings.

Holes 16 and 17 cut the west extension of the siderite ore body some 700 feet and 1110 feet respectively west of the shaft at vertical depths of about 650 feet. Here the ore was found to be somewhat higher in silica than the ore body proper, averaging 41 per cent Fe. and 12.2 per cent S_1O_2 across an average true width of 33 feet.

Holes 14 and 15 intersected the south-eastern extension of the ore zone some 1000 feet and 1300 feet respectively east of the shaft. In D.D.H.14, at 200 feet vertical, a true width of 35 feet of siderite was found to average 41.6 per cent Fe. and 11.8 per cent S_1O_2. D.D.H.15 approximately 400 feet east of H.14, cut only 3 feet of pyritic siderite.

D.D.H.5, a vertical hole, was put down on a siderite lense which occurs on the claim line between claims J.L.62 and J.L.68. It was collared in ore and encountered good grade low-silica siderite for the first 90 feet. Judging by the surface maps, the siderite body is not large. No further drilling was done on this lense.

J.R.Booth
Sept.19/52/sl



LONGITUDINAL SECTION
MAGPIE MINE
SHOWING PROPOSED 5th
LEVEL

MAGNE DIAMOND
DRILLING
NOV. '52 - Feb. '53

ALGOMA ORE PROPERTIES, LIMITED

Log of Diamond Drill Hole No. M 1 at MAGPIE MINE

ELEVATION | STRIKE 215° 36' ANGLE 68° | DEPTH 1600' | STARTED Oct. 22, 1952.

SECTION | PLAN | LAT. | DEPT. | FINISHED Nov. 22, 1952.

ANALYSIS

FOOTAGE	DESCRIPTION	NO.	FE	S			
0 - 8	Casing						
8 - 68	Felsite - considerable ropy structure, fine grained, dark grey green, fairly hard. Numerous fractures filled with calcite. Considerable carbonate throughout. 75° polished slip, slightly weathered, at 11 ft. Vuggy crushed zone at 23 ft. 3" green chloritized fracture zone at 29.5 ft. 45° polished slip at 30 Ft. Weathered slip zone parallel to hole from 49 ft. to 51 ft. Vuggy sections at 56.5 ft. and 64 ft.						
68 - 70.6	Syenite intrusive - upper contact sharp at 50°. Lower contact gradational over 8 ins. Two well polished slips at lower contact.						
70.6- 74	Felsite - as above.						
74 - 75.7	Syenite intrusive - sharp upper contact on well polished slip at 50°. Lower contact gradational over 6 ins.						
75.7- 98	Felsite as above. Numerous red syenite stringers. Vuggy zone at 85 ft.						
98 - 111	Felsite - same as section from 8' to 68'. Polished 60° slip at 104 ft. Vuggy zone at 108 ft.						
111 - 146	Felsite - as above. Numerous slips and fractures.						
146 - 149	Felsite - vuggy - some fine pyrite and chalcopyrite.						
149 - 176	Felsite - large vug at 160' filled with calcite and quarts. Numerous stringers - quartz center with calcite edges.						
176 - 177	Felsite - flow breccia with a little pyrite and chalcopyrite.						
177 - 179	Felsite - gray green color, carbonatized, with several calcite stringers.						

Log of Diamond Drill Hole No. M 1 at MAGPIE MINE

(CONTINUED)

FOOTAGE	DESCRIPTION	ANALYSIS NO.	Fe	S			
[illegible] - 209	Flow breccia - spotty mineralisation, mainly fine pyrite and chalcopyrite. Some short unbrecciated sections.						
209 - 237	Felsite - gray green color - carbonatized throughout. Numerous quartz filled fractures. Quartz filled vug at 216 ft. Calcite stringers at 225.7', 228.6', 230.8' & 232.9'. Some hydrothermal alteration of wall rock on both sides of the calcite stringers. Alteration product hard, and buff in color.						
237 - 261	Felsite as above. Numerous siliceous metacrysts.						
261 - 297	Felsite as above. Numerous quartz and calcite filled fractures. Occasional flecks of chalcopyrite.						
297 - 303	Felsite as above. Stringers and blobs of fine magnetite in calcite.						
303 - 327	Felsite as above. Numerous quartz and calcite filled fractures.						
327 - 342	Felsite-syenite contact zone - 3 ft. of altered felsite, followed by 12 ft. of quartz-rich intrusive which grades into true syenite. A little pyrite and chalcopyrite.						
342 - 357	Syenite with some quartz stringers. Hornblende is principle accessory mineral.						
357 - 364	Metamorphosed felsite - lower contact zone. Some shearing and fracturing which has provided channels for solutions from syenite intrusive.						
364 - 598	Felsite - gray green color - carbonatized throughout - considerable minor shearing - numerous quartz and calcite stringers, mostly offset by later shearing. A few flecks of pyrite and chalcopyrite throughout. 8" zone of magnetite stringers at 395 ft. Calcite filled 25° slip at 414 ft. Vug, partially filled with calcite, at 461.5 ft. Ropy structure from 511 ft. to 513 ft. Fine syenite stringer at 551 ft. 3" of good amygdaloidal flow structure from 575 ft. to 578 ft.						

Log of Diamond Drill Hole No. M 1 at MAGPIE MINE

(CONTINUED)

ANALYSIS

FOOTAGE	DESCRIPTION	NO.	FE	S			
[illegible] - 605.5	Metadiorite - medium grained, dark green color - gradational contacts.						
605.5- 916.5	Felsite as above. Quarts stringers at 611 ft and 618 ft. Calcite filled 50° slip at 621 ft. Quarts-calcite stringer with pyrite at 695 ft. Fine syenite stringer parallel to core at 701 ft. Polished slip at 748 ft. Small shear zone at 778 ft. Quarts stringer at 802 ft. Good pyritised flow structure from 820 ft to 825 ft. 2" granular quarts with a little pyrite at at 884 ft.						
916.5- 928	Upper contact zone of hornblende granite intrusive.						
928 - 942.5	Hornblende granite intrusive. Quarts stringers almost parallel to core.						
942.5- 962.5	Lower contact zone - felsite highly silicified.						
962.5-1003	Felsite - in part highly silicified. A few good slips at about 45°. Lower part highly brecciated.						
1003 -1080	Felsite - gray green color, carbonatized. 4" flow structure at 1014 ft. 6" silicified band at 1044 ft. Good chloritised 45° slip at 1054 ft.						
1080 - 1123	Felsite - highly silicified.						
1123 -1137	Basic tuff - carbonatized. Pink calcite stringers at 1127' & 1134'. Fault gouge at 1133.9 ft. - highly chloritized.						
1137 -1210.5	Felsite - gray green color. Mainly highly silicified, but some carbonatization. 1 ft. breccia at 1186 ft. Numerous chlorite slips.						
1210.5-1220.7	Mica dike. Grey brown color, very soft - carbonatized chlorite-talc schist with fine biotite mica throughout. 1" fault gouge at 1214.3 ft.						
1220.7-1222.2	Breccia zone - mainly magnetite with a little pyrite and pyrrhotite, some chlorite; carbonatized.						
1222.2-1227	Mica dike.						

Log of Diamond Drill Hole No. M 1 at MAGPIE MINE

(CONTINUED)

FOOTAGE	DESCRIPTION	ANALYSIS NO.	Fe	S	SiO_2
[illegible] - 1228.6	Agglomerate - some magnetite, pyrite and pyrrhotite.	29241	30.9	5.5	27.4
1228.6-1230.2	Mica dike.				
1230.2-1232	Acid agglomerate - dark grey color, fairly hard. A few flecks of pyrite.				
1232 -1234.8	Mica dike.				
1234.8-1241.5	Acid agglomerate.				
1241.5-1244	Mica dike.				
1244 -1274.5	Acid agglomerate - silicified and sericitized from 1250' on.				
1274.5-1280	Chlorite schist with small bands of acid agglomerate.				
1280 -1291.5	Mica dike.				
1291.5-1327	Acid agglomerate - as above. 1 ft. mica dike at 1302 ft. 1 ft. chlorite schist at 1319 ft. 6" agglomeratic tuff at 1325 ft.				
1327 -1331	Mica dike.				
1331 -1336	Basic flow - chloritic, schisted.				
1336 - 1355	Acid agglomerate.				
1355 - 1374	Acid tuff - dark gray color, numerous quartz-carbonate filled slips.				
1374 - 1386	Acid agglomerate - granite contact zone.				
1386 - 1390	Granite - fine pyrite throughout.				
1390 - 1437	Acid agglomerate intruded by granite.				
1437 - 1470	Acid agglomerate - sericitized.				
1470 - 1479	Tuff - altered by granitic intrusive. Sharp 30° contact at 1470 ft.				
1479 - 1491	Acid agglomerate - altered by granitic intrusive.				
1491 -1492.5	Chloritic schist with fault gouge.				
1492.5-1504	Old granite intrusive - highly sheared - some kaolin developed. Fault zone.				
1504 - 1505	Talc-chlorite schist.				
1505 - 1540	Felsite - grey blue color - silicified, some sericite.				

ALGOMA ORE PROPERTIES, LIMITED

Log of Diamond Drill Hole No. X 1 at MAGPIE MINE

(CONTINUED)

FOOTAGE	DESCRIPTION	NO.	ANALYSIS FE	S			
1548 - 1549	Micaceous fault zone at 40°.						
1549 - 1600	Felsite as above.						
End of hole.							

Algoma Ore Properties, Limited

AO 488
MACPIE

DIAMOND DRILL HOLE DATA

D.D.H. No. M 1

Depth	Corrected Acid Dip	Tro-Pari Dip	Bearing Magnetic	Azimuth Magnetic	Azimuth Corrected	Magnetic Susceptibility
100	64°					
200	63				206° 19½'	
300	60					
400	59				199 S	
500	55					
600	51				191 46½	
700	49					
800	49	48	S 13° 30' W	193° 30'	184 30	
900	45					
1000	44	44	S 7° 30' W	187 30	180 00	
1100	39					
1200	38	39	S 1 W	181 00	174 00	
1300	36					
1400	36	35	S 12 W	192 00	169 45	
1500	31					
1600	29				165 30	

ALGOMA ORE PROPERTIES, LIMITED

Log of Diamond Drill Hole No. M 2 at MACPLE

ELEVATION 1015.39 STRIKE N14°30'W ANGLE 65° DEPTH STARTED Nov. 29, 1952.

SECTION PLAN LAT. DEPT. FINISHED

ANALYSIS

FOOTAGE	DESCRIPTION	NO.	FE	S
0 - 12	Casing			
12 - 92	Brecciated acid tuff - color green, Hardness 5-6, highly chloritized and carbonatized. Weathered slip filled with sulphides largely altered to limonite, at 25 ft. at 25° to core. Numerous quartz & calcite filled fractures at varying angles to core.			
92 - 168	Acid agglomerate - color grey fragments in a green matrix. H 6-7. Several short siliceous sections. Carbonatized & chloritized throughout. Upper contact at a well polished slip at 35° to core. Spotty cubic pyrite.			
168 - 230	Acid agglomerate as above, slightly altered by felsitic granite intrusive.			
230 - 245	Acid agglomerate as above - unaltered.			
245 - 261	Acid agglomerate as above, altered by felsitic granite intrusive. Fault zone with numerous calcite filled slips from 253 to 261 ft.			
261 - 265	Metadiorite - slightly carbonatized.			
265 - 286	Acid agglomerate as above, altered by felsitic granite intrusive.			
286 - 301	Acid agglomerate as above - unaltered.			
301 - 337	Acid agglomerate as above - altered by felsitic granite intrusive. Polished slip at 45° at 336 ft.			
337 - 396	Acid agglomerate as above - highly sheared - near granite intrusive. Polished slip at 25° at 342.5 ft. 14 polished slips at 25° to 35° from 350 to 364 ft. Numerous slips at 30° from 379 to 395 ft. 30° slip at 395 ft. shows movement at 45° to core across the slip.			

Log of Diamond Drill Hole No. M 2 at MAGPIE

(CONTINUED)

FOOTAGE	DESCRIPTION	NO.	FT	%	ANALYSIS		
[illegible] - 460	Chloritized carbonatized acid flow - minor calcite filled fractures.						
460 - 689	Acid tuff - fine to medium grained, chloritized, slightly carbonatized. Highly sheared from 478 to 481 ft. Sheared & silicified from 574 to 577 ft., 592 to 607 ft., & from 651 to 659 ft.						
689 - 691	Metadiorite - slightly sheared - fine to medium grained, color olive green, H 4-5. Highly chloritized & carbonatized - altered to talc-chlorite schist.						
691 -713.5	Acid tuff as above - 4" stringer, mainly calcite with a little quartz at 703 ft.						
713.5- 721	Metadiorite as above.						
721 - 806	Acid tuff as above - 6" highly chloritized at 791 ft. Brecciated & pyritized from 792 to 801 ft. Silicified from 801 - 806 ft.						
806 - 825	Metadiorite as above - highly sheared - sharp contact at 25°.						
825 - 846	Acid tuff - silicified, chloritized & carbonatized.						
846 - 881	Sheared acid agglomerate - silicified, chloritized & carbonatized.						
881 - 907	Ditto. Appears to be near granitic intrusive. Calcite filled fault (?) at 903 ft.						
907 - 935	Sheared acid agglomerate - silicified, chloritized & carbonatized.						
935 - 1041	Ditto. Numerous quartz stringers up to 15" wide, with a little calcite. Appears to be near granitic intrusive. Well polished, chloritized 30° slip at 940 ft. Well polished 50° slip at agglomerate-quartz contact at 982 ft.						
1041 - 1050	Metadiorite as above.						
1050 - 1080	Sheared acid agglomerate - silicified, chloritized & carbonatized.						
1080 - 1084	Metadiorite as above.						
1084 - 1097	Sheared acid agglomerate as above.						

ALGOMA ORE PROPERTIES, LIMITED

Log of Diamond Drill Hole No. M 2 at MACPIE

(CONTINUED)

FOOTAGE	DESCRIPTION	ANALYSIS NO.	Fe	S	SiO_2	Mn	P
1097 - 1117	Metadiorite as above.						
1117 - 1155	Sheared acid agglomerate as above.						
1155 - 1156.5	Magnetite with 20% sulphides.	29250	46.9	11.8	17.30		
1156.5-1157.3	Metadiorite as above.						
1157.3-1159	Magnetite with 5% sulphides.	29251	42.1	2.92	10.14		
1159 - 1164	" " 40% "	29252	45.7	22.8	7.54		
1164 - 1175	Metadiorite as above.						
1175 - 1180	Magnetite with 30% sulphides.	29242	44.8	14.8	14.12	1.37	
1180 - 1185	" " 15% "	29243	43.8	7.4	18.52		
1185 - 1190	" " 20% "	29244	43.0	9.60	15.48	1.59	
1190 - 1192	" " 8% "	29245	40.4	3.12	16.14		
1192 - 1195	Metadiorite as above.						
1195 - 1200	" " "	29246	23.9		40.04		
1200 - 1201	Magnetite with 15% sulphides.						
1201 - 1202	Metadiorite.						
1202 - 1202.7	Magnetite with 10% "	29247	17.7	3.5	35.88		
1202.7-1203.7	Metadiorite.						
1203.7-1205	Magnetite with 10% "						
1205 - 1207	Magnetite with 20% sulphides.	29248	35.2	11.9	6.00		
1207 - 1217	Metadiorite as above.						
1217 - 1219	Magnetite with 40% sulphides.	29249	43.4	20.7	18.00		
1219 - 1235	Metadiorite as above.						
1235 - 1277	Felsite - color grey to grey green - H 6. Some calcite filled slips. Some Chloritization.						
1277 - 1284	Metadiorite as above - highly sheared.						
1284 - 1406	Felsite as above. Silicified from 1332 - 1335 ft. Sericitized from 1345 - 1348 ft. & from 1590 - 1393 ft.						
End of Hole.							

ALGOMA ORE PROPERTIES, LIMITED

SAULT STE. MARIE

ONTARIO

IN YOUR REPLY PLEASE QUOTE
ATTENTION OF

Assay Calculations for Magpie D.D.H. 2

	L	Fe	LFe	S	LS	SiO_2	$LSiO_2$
	1.5	46.9	70.35	11.8	17.70	17.3	25.95
	0.8	0	0	0	0	40.0	32.00
	1.7	42.1	71.57	2.92	4.96	10.14	17.24
	5.0	43.7	218.50	22.8	114.00	7.54	37.70
Sub-Tot	9.0		360.42		136.66		112.89
Avg.		40.47		15.18		12.54	
	11.0	0.0	0.0	0.0	0.0	40.0	440.00
	5.0	44.8	224.00	14.6	73.00	14.12	70.60
	5.0	43.5	217.50	7.4	37.00	18.52	92.60
	5.0	43.0	215.00	9.6	48.00	15.48	77.40
	2.0	40.4	80.80	3.12	6.24	16.14	32.28
Sub-Tot	17.0		737.30		164.24		272.88
Avg.		43.37		9.66		16.05	
	8.0	0.0	0.0	0.0	0.0	40.0	320.00
	5.0	17.7	88.50	3.5	17.50	35.88	179.40
	2.0	35.2	70.40	11.9	23.80	6.0	12.00
	10.0	0.0	0.0	0.0	0.0	40.0	400.00
	2.0	43.4	86.80	20.7	41.40	18.0	36.00
Grand Total	64.0		1343.42		383.60		1773.17
Avg.		20.99		5.99		27.71	

Waste 29.8 ft. - 46.56%
Marginal 34.2 ft. - 53.44%

Note: Fe content of metadiorite taken as 0, since this Fe is not available for the product, and would be removed either during mining or by sink-float.

Algoma Ore Properties, Limited AO 488

DIAMOND DRILL HOLE DATA D.D.H. No. M 2.....

Depth	Corrected Acid Dip	Tre-Pari Dip	Bearing Magnetic	Azimuth Magnetic	Azimuth Corrected	Magnetic Susceptibility
100	66					
200	61	60	N 16 W	344	339	
300	57					
400	55	53	N 9 W	351	346	
500	53					
600	49	49	N 17 W	343	338	
700	46					
800	41	41	N 11 W	349	344	
900	39					
1000	36½	36	N20½ W	339½	335	
1100	33					
1200	31	30	S74½E	Hole passes thro' Magnetite	343	
1300	29			here.		
1400	27	27	N 4 W	356	351	

ALGOMA ORE PROPERTIES, LIMITED

Log of Diamond Drill Hole No. M 3 at Old Magpie Mine.

ELEVATION 1001.15' STRIKE N 50° E ANGLE 65° DEPTH 1005' STARTED Jan. 15, 1953.

SECTION PLAN LAT. DEPT. FINISHED Jan. 28, 1953.

ANALYSIS

FOOTAGE	DESCRIPTION	NO.	FE	S			
0 - 8	Casing.						
8 - 8.5	Brecciated acid tuff - color grey green, cementing material pink, H 7, felsitic. Probably granitised. Sharp lower contact, well weathered 1/8" wide, intersects core at 30°.						
8.5 - 28	Metadiorite (cf. D.D.H. M2). Color olive green, H 4, medium grained. Biotite is an important accessory mineral. This may be the biotite-picrite of Thomson (see G.S.C. Memoir 147 by Collins, Quirke & Thomson.)						
28 - 106	Acid tuff and agglomerate - dark green grading to grey, with pink tones, H 7, mainly felsitic. Fine cubic pyrite (possibly 2%) throughout. Considerably sheared with a little coarse cubic pyrite in zones of greatest shearing. Granitised. 1' brecciated sericitised zone at 57'. Highly silicified from 72' on.						
106 - 122	Metadiorite - color grey green, H 5½, fine grained edges to medium in centre. Minor calcite filled shearing.						
122 - 233	Acid tuff and agglomerate as above - H 7, highly sheared, silicified and sericitized with occasional pyrite in shears.						
233 - 245	Metadiorite - color grey, fine to medium grained, H 5½. Upper contact in shear zone at 20° to core. Well chloritized and carbonatized. Minor shearing at 30° throughout.						
245 - 254	Acid tuff & agglomerate - H 7, color grey, felsitic. Considerable shearing & carbonatization, some sericitization, a little silification. Minor pyritization (0.1%).						
254 - 263	Intermediate flow - H 6, color dark grey green, fragmental. Fair flow structure. Moderately carbonatized.						

ALGOMA ORE PROPERTIES, LIMITED

HOLE NO. M 5 at Old Magpie Mine. SHEET NO. 2

DEPTH FROM	DEPTH TO	DESCRIPTION	ANALYSIS NO.	FE	S	SiO2	Mn	P
263	344	Acid tuff - H 7, color grey green, felsitic. Minor shearing, silification & carbonatization. Intense shearing almost parallel to core from 335 to 343', shears granitized.						
344	348	Intermediate flow. H 5½, color green. Indicates tops north. Highly sheared & carbonatized, indicating that it is contemporaneous with the above tuffs.						
348	365	Acid tuff - H 7, color grey green, felsitic. Highly sheared & granitized - much orthoclase feldspar.						
365	370	Metadiorite - H 5½, color green, medium grained. Upper contact sharp at 30°. Lower contact also sharp, but obscured by broken core. Highly carbonatized. Shearing does not extend into this metadiorite, therefore this is a later intrusive.						
370	428	Acid tuff - H 7, felsitic, intensely sheared and granitized.						
428	433	Metadiorite - H 5½, medium grained centre, fine grained chilled edges. Lower contact sharp at 60°. 3" quartz carbonate stringer just above lower contact. No shearing, so this is a later intrusive contemporaneous with 365 to 370'.						
433	977	Acid tuff as above. Shearing and granitization decreasing from 458' and quartz-calcite stringers, indicating two sets of shearing, become fairly numerous. Both sets at approx. 45° to core, but oriented at approx. 90° to each other. From 631' to 683' shearing and granitization increase. From 683 on, practically no granitization, all slips being filled with quartz-calcite stringers.						
977	1003	Diabase - felsitic edge grading to medium grained at end of hole. Appears to be very fresh - is probably younger diabase. Contact sharp at 10°.						
End of Hole.								

Algoma Ore Properties, Limited

AO 488

DIAMOND DRILL HOLE DATA

D.D.H. No. ..M.S....

Depth	Corrected Acid Dip	Tre-Pari Dip	Bearing Magnetic	Azimuth Magnetic	Azimuth Corrected	Magnetic Susceptibility
100	62½					
200	63½	63	N 60 E	60	58	
300	65					
400	65	64	N 64 E	64	63½	
500	64					
600	65	64	N59 E	59	59½	
700	64					
800	64	65	N 63½ E	63½	65	
900	Not taken					
1000	Not taken					

A.O. 477

ALGOMA ORE PROPERTIES, LIMITED

Diamond Drill Report

HOLE No. M 4 at Old Magpie Mine — PLAN No.

STRIKE N 30° 42' E — STARTED Feb. 1, 1953. — SECTION No.

ANGLE 60° — FINISHED Feb. 28, 1953. — LAT. — DEPT.

DEPTH 1503' RX core to 883', then AX. — ELEVATION 1001.13

DEPTH FROM	DEPTH TO	DESCRIPTION	ANALYSIS NO.	FE	S	INSOL.
0	10	Casing				
10	23	Metadiorite - color grey green, H 3½, fine grained. Sheared at approximately 15° to core. Fine cubic pyrite throughout (1%). Granitized from 12' to 16', at 18', and at 20'.				
23	317	Granitized Acid Tuff - dark green to pinkish, H 7, felsitic. Highly sheared, with cubic pyrite in fractures. Some sericitization and carbonatization.		Hard ground from 23' to 123'.		
317	321	Metadiorite - color olive green, H 5, fine grained. Sharp contacts at 40° to core. Minor carbonatization.				
321	414	Acid agglomerate - minor granitization and carbonatization. Color grey green, H 5½, fragmental.				
414	426	Metadiorite - color grey green, H 5½, medium grained. 1" brown carbonate (probably ankerrite) at 417'. Minor calcite filled slips at 60° to core.				
426	624	Acid agglomerate as above, H 6. Highly sheared, mainly at about 10° to core. Moderate granitization for 5' from contact, then decreasing rapidly. At 442', shearing has swung to 30° to core. Some sericitization. 2" quartz-tourmaline vein at 45° to core at 526'. Numerous quartz-tourmaline veins from 550' to 560'. Highly granitized and sericitized from 480' to 583', then minor to 618', moderate from 618' to 624'. 3" Metadiorite at 573'. Trace of magnetite at 574'. 1.5' metadiorite from 576.5' to 578'.		Hard ground from 480' to 583'.		
624	690	Acid Tuff - grey, H 5, felsitic. Numerous calcite stringers. At 665', calcite stringers at 75° to core are cut by later shearing at 35° to core. (continued)				

ALGOMA ORE PROPERTIES, LIMITED

HOLE NO. M 4 at Old Magpie Mine — SHEET NO. 2

DEPTH FROM	DEPTH TO		DESCRIPTION	ANALYSIS NO.	FE	S	SiO_2	Mn	P
624	690		(continued) Quartz-calcite stringers begin to appear at 675'. There are a few minor blebs of magnetite from 674.5' to 675'. From 674' to 677' the rock is brecciated and silicified. From 677' to 689', shearing has been intense at 45° to core, and fragments have been greatly flattened and elongated.						
690	864		Acid Agglomerate, brecciated and granitized, moderately carbonatized. Color green with pink tones, H 6½-7, fragmental. A few calcite stringers. 6" with pyrite and magnetite at 744'.		Hard ground from 690' to 700'				
864	871		Metadiorite - green, H 5, medium to fine grained. Sharp contacts at 45° to core.						
871	915		Acid agglomerate as above-brecciated, minor granitization and carbonatization. 3" pyritized at 883'.						
915	920		Metadiorite - green, H 5, medium to fine grained, felsitic edges. Sharp contacts at 45° to core.						
920	1070		Acid agglomerate as above - brecciated, carbonatized. A few calcite stringers. Minor pyritization from 1017' to 1025'. A little chloritization throughout. 3" with a little magnetite at 1070'.						
1070	1080		Metadiorite (Biotite Picrite?) Color olive green, H 3½, medium grained. Sharp intrusive contacts at 45° to core.						
1080	1105.5		Acid agglomerate as above.						
1105.5	1110.5		Magnetite with 30% sulphides.	29255	39.9	1.8	9.6		
1105.5	1116		Metadiorite (Biotite Picrite?) as above.						
1116	1135		Felsite - dark grey green, H 4½-5½. Probably intermediate flow. Patchy minor pyritization along fractures.						
1135	1156		Metadiorite (Biotite Picrite?) as above.						
1156	1157		Magnetite with 8% pyrite.						
1157	1163		Felsite as above, with patches of magnetite. Well polished hornblende slip parallel to core from 1157' to 1159'.						

ALGOMA ORE PROPERTIES, LIMITED

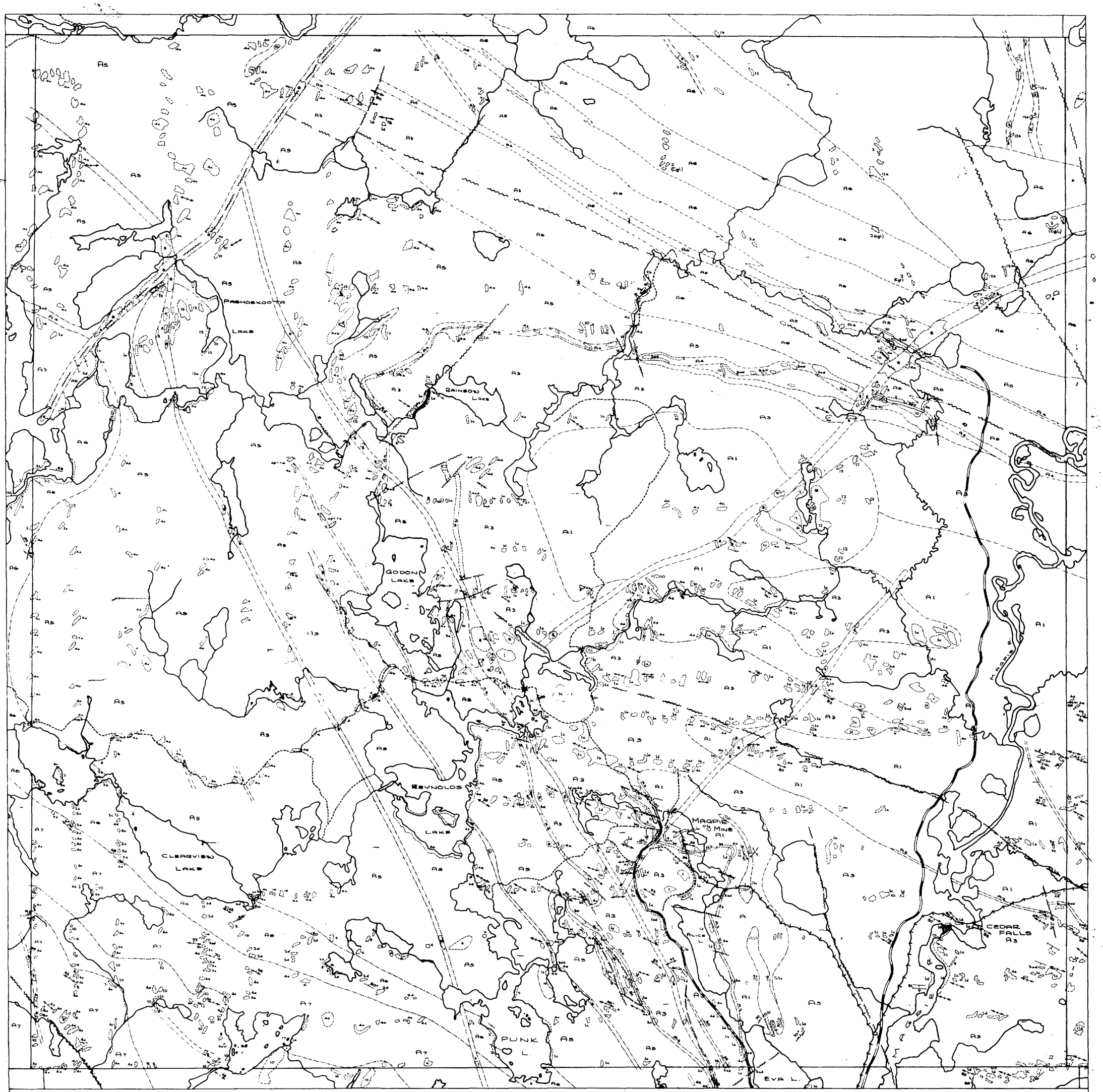
HOLE NO. M 4 at Old Magpie Mine. SHEET NO. 5

DEPTH FROM	DEPTH TO	DESCRIPTION	ANALYSIS NO.	FE	S	SiO2	Mn	P
1163	1226	Felsite as above, magnetite patches much less frequent. Some brecciation.						
1226	1232	Magnetite with 20% pyrite	29256	36.	9.8	11.66		
1232	1238	Magnetite and siderite in brecciated greenstone	29257	34.4	1.7	14.9		
1238	1251	Felsite as above with patches of magnetite.						
1251	1260	Felsite - sericitized and brecciated.						
1260	1273	Metadiorite (Biotite Picrite?) as above.						
1273	1307	Felsite - probably intermediate flow. Color medium grey, H 6, carbonatized throughout. Considerable shearing, fractures filled with calcite, and in places with calcite and cubic pyrite. Small brecciated patches.						
1307	1311	Metadiorite - sharp contacts with chilled edges. H 4. Moderate carbonatization. NOT micaceous.						
1311	1370	Acid Agglomerate - light greenish grey, H 6, fine fragmental. Sheared throughout, fractures filled with calcite. Moderately carbonatized throughout.						
1370	1405	Acid tuff as above, granitized. Color grey buff, H 7, medium texture. This rock is almost a granite, but appears to have been a highly porous rock which has been permeated with granite solutions rich in silica and orthoclase. These solutions have almost completely replaced and obliterated the host rock. Contacts are gradational over 5 ft.		Hard ground from 1370' to 1396'.				
1405	1450	Acid Agglomerate - grey green H 6, fine fragmental. Considerable shearing, calcite filled fractures. Slightly carbonatized throughout.						
1450	1478	Acid tuff as above - shearing at 60° to core greatly intensified.						
1478	1503	Acid tuff as above - minor shearing, calcite filled fractures.						
End of Hole.								

Algoma Ore Properties, Limited — AO 488

DIAMOND DRILL HOLE DATA — D.D.H. No. M.4.....

Depth	Corrected Acid Dip	Tro-Pari Dip	Bearing Magnetic	Azimuth Magnetic	Azimuth Corrected	Magnetic Susceptibility
0	60° Initial Dip				30°42' Initial	
100	57					
200	56	56	N 41½ E	41½	43½	
300	55					
400	53	52	N 23 E	23	22½	
500	50					
600	47	47	N 19½ E	19½	19	
700	44					
800	39	39	N 59 E	59	43½	Magnetite in core-allowed extra 10° E decl.
900	36					
1000	34	33	N 43½ E	43½	34½	
1100	32					
1200	29	Patchy magnetite in core - no test.			26 (interpolated)	
1300	27					
1400	28	28	N 10½ E	10½	17	



LEGEND

RECENT & PLEISTOCENE

Sand, Gravel, Boulder drift

Major Unconformity

PRECAMBRIAN

Diabase

Granite , Gneiss , Aplite , Quartz Porphyry

Lamprophyre · Mica · Dyke

Diorite

Intrusive Contact

A7 Maguire Lake Basic Volcanics - Massive (4a), Pillow (4b), Amygdaloidal (4c), Fragmental (4d), Chlorite Schist (4e).

A6 Dore Formation - Quartzite (2a), Graphitic shale (2b), Greywacke (2c), Argillite (2d).

Local Unconformity

A5 Godon lake Basic Volcanics - Massive (4a), Pillow (4b), Amygdaloidal (4c), Fragmental (4d), Chlorite Schist (4e).

A4 Upper Magpie Iron Formation - Chert (3a), Siderite (3b), Pyrite (3c), Magnetite (3d).

A3 Acid Volcanics - Massive (1a), Pillow (1b), Tuff (1c), Agglomerate (1d), Ostrelite Schist (1e), Quartz eye (1f), Undifferentiated (1g).

A2 Lower Magpie Iron Formation - Chert (3a), Siderite (3b), Pyrite (3c), Magnetite (3d).

A1 Basic Volcanics - Massive (4a), Pillow (4b), Amygdaloidal (4c), Fragmental (4d), Chlorite Schist (4e).

GEOLOGICAL MAP

TOWNSHIP 29 RANGE 26

MAGPIE AREA

DISTRICT OF ALGOMA

SCALE – 1" = 1/4 MILE

OCT. 1953

GEOLOGY BY DR. A.M. GOODWIN
TRACED BY W.T. LOVE

"C"

SYMBOLS

- Main Roads.
- Trails, old roads.
- Power line.
- Outcrop Boundary.
- Defined Contact.
- Assumed Contact.
- Indicated Fault.
- Strike and Dip of Bedding.
- Strike and Dip of Schistosity or Shearing
- Strike and Dip of Cleavage or Jointing.
- Strike and Dip of Gneissosity.
- Direction of Glacial Striae.
- Direction of Top of Bed from Flow Gradation or Pillows.
- cgl. Conglomerate.
- bnd. Banded.
- bx. Brecciated.
- fd. Folded.
- ank. Ankeritic.
- Direction of Top of Bed from Fracture Cleavage or Drag Folding.

8

SKETCH OF PLAN & SECTIONS OF MAGPIE ORE-BODY

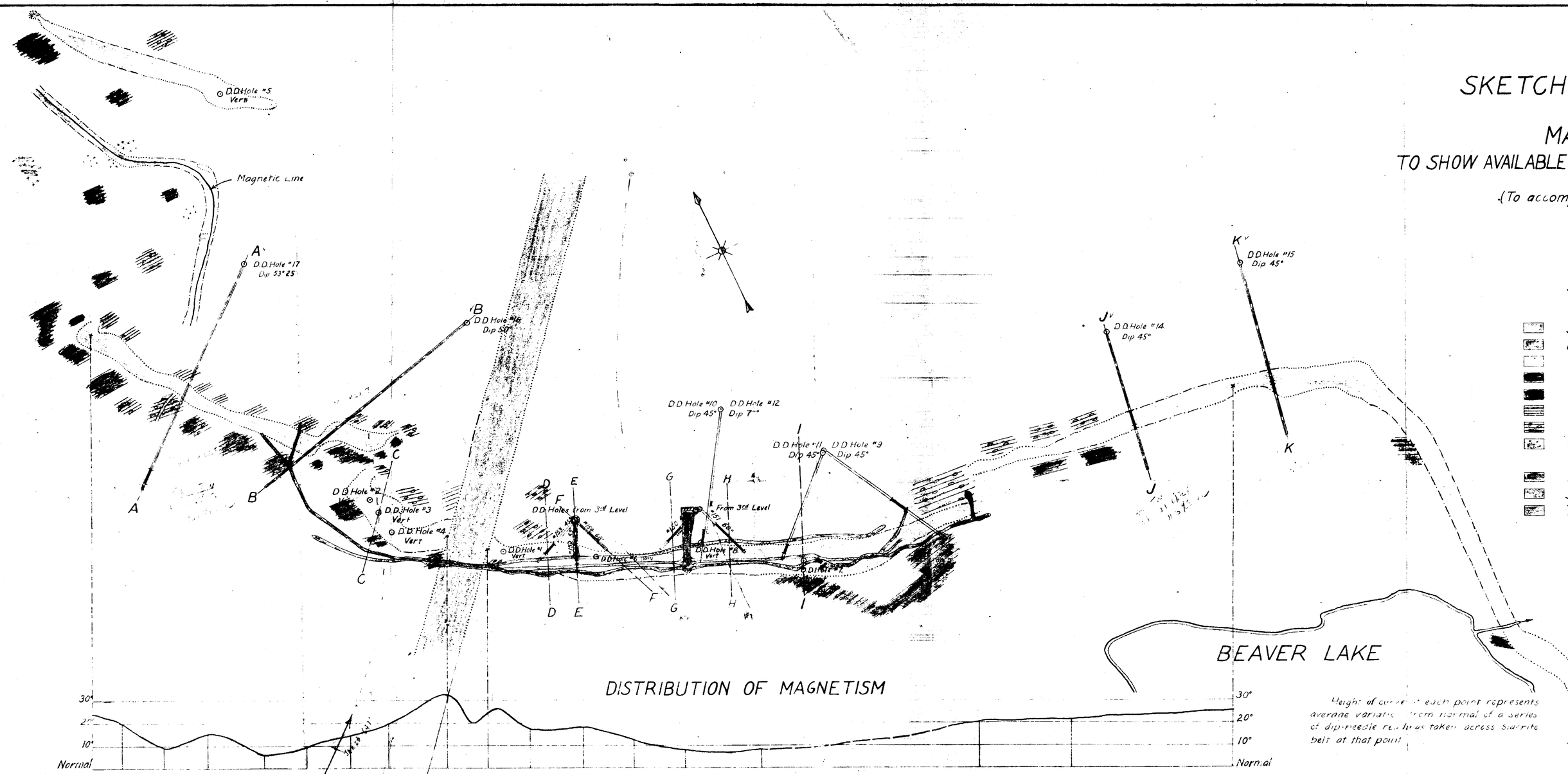
TO SHOW AVAILABLE INFORMATION BEARING ON STRUCTURE

(To accompany report of C.K.Leith, July 25, 1916)

(2)

Scale: 1 inch = 100 feet

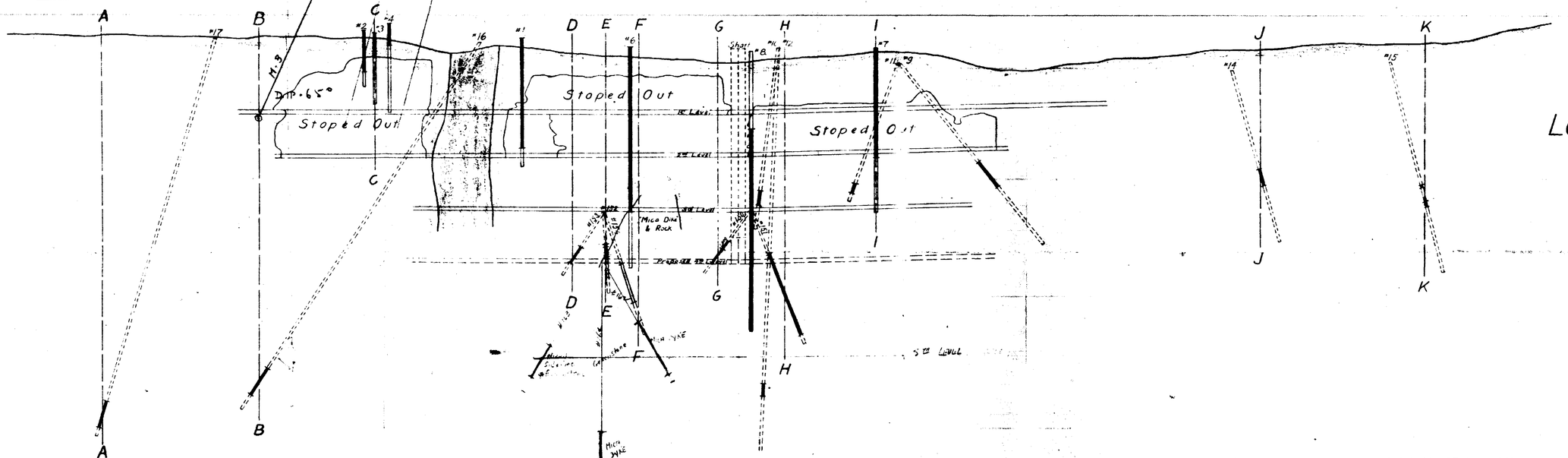
- Siderite, magnetite, & iron formation.
- Diabase dike
- "Mica dike"
- Felsitic Schist [with direction of schistosity]
- " " (tuffaceous)
- Green Schist [with direction of schistosity]
- " (ellipsoidal)
- Greenstone (massive)
- First Level - Main drifts
- Second " - - "
- Third " - - "



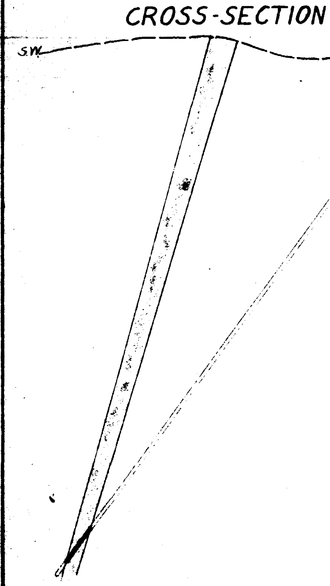
DISTRIBUTION OF MAGNETISM

Height of curve at each point represents average variation from normal of a series of dip-needle readings taken across Siderite belt at that point.

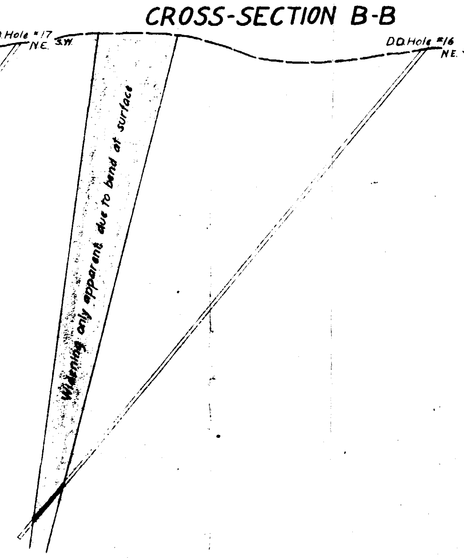
LONGITUDINAL SECTION THROUGH ORE-BODY



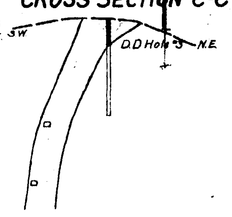
CROSS-SECTION A-A



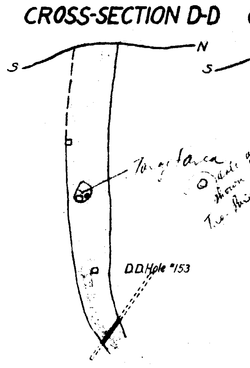
CROSS-SECTION B-B



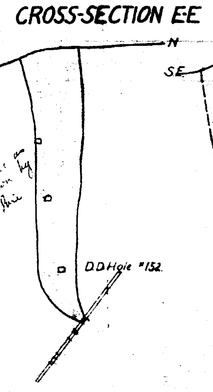
CROSS-SECTION C-C



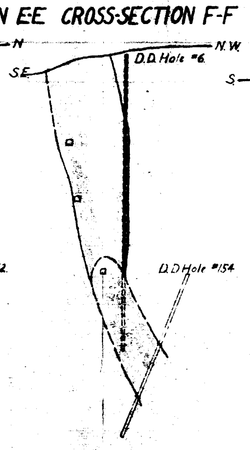
CROSS-SECTION D-D



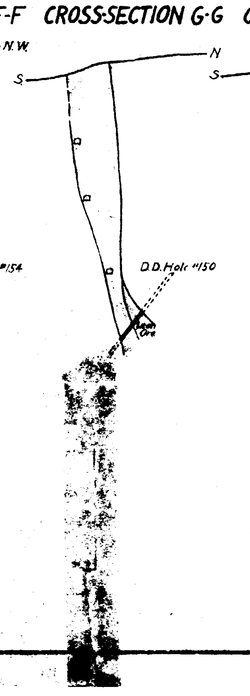
CROSS-SECTION E-E



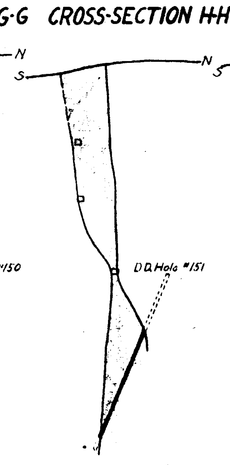
CROSS-SECTION F-F



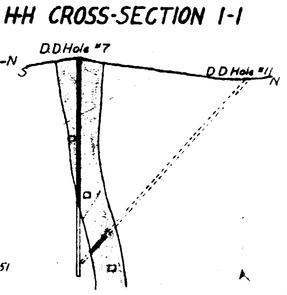
CROSS-SECTION G-G



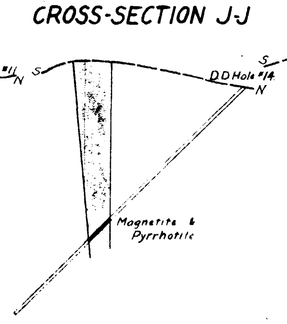
CROSS-SECTION H-H



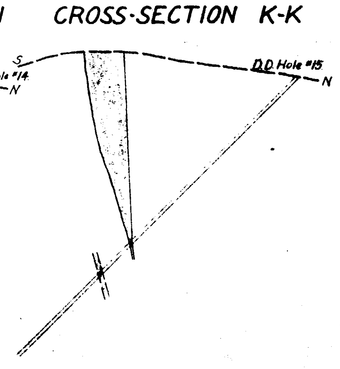
CROSS-SECTION I-I

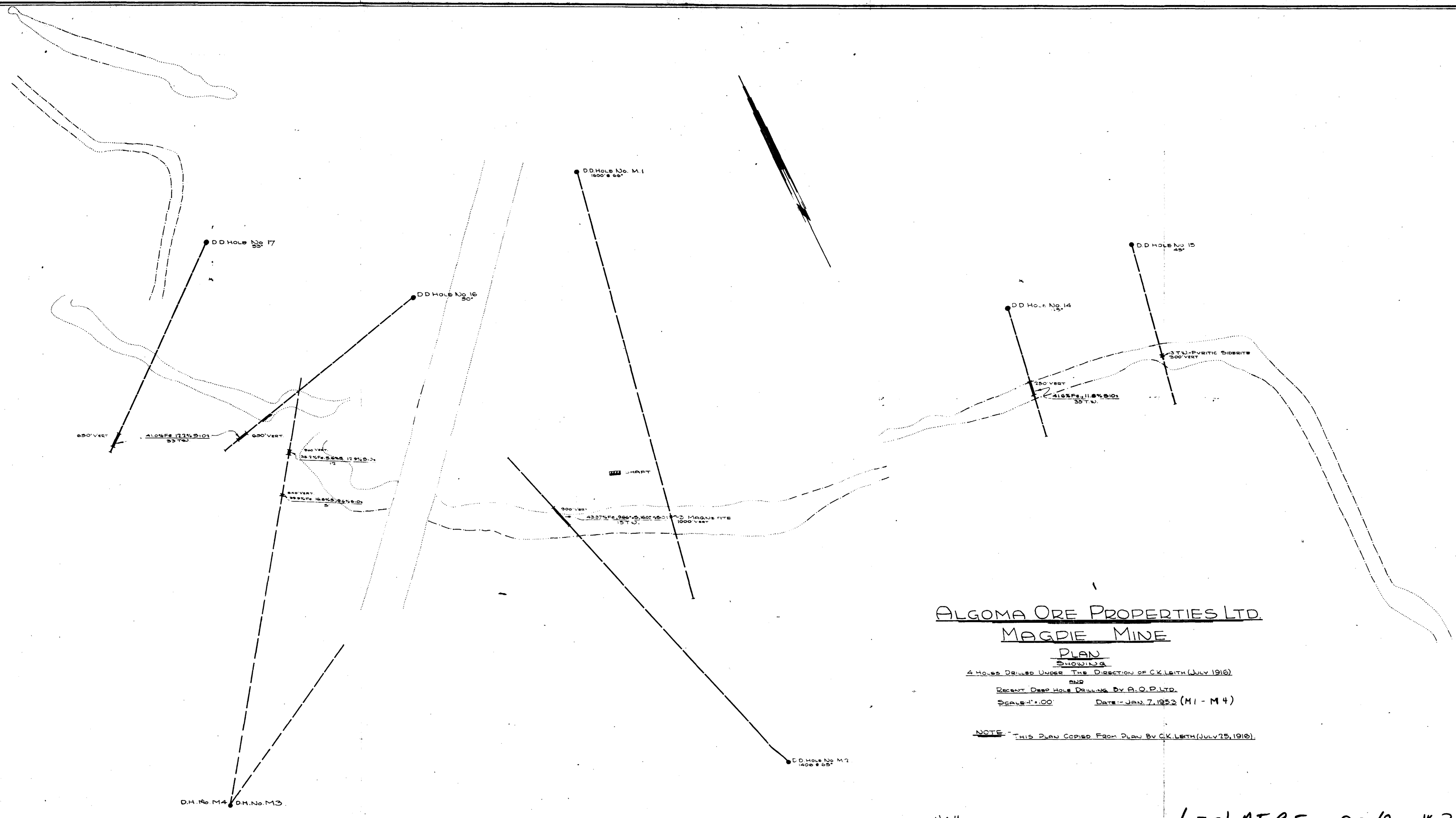


CROSS-SECTION J-J



CROSS-SECTION K-K





ALGOMA ORE PROPERTIES LTD.

MAGPIE MINE

PLAN
SHOWING

4 HOLES DRILLED UNDER THE DIRECTION OF C.K. LEITH (JULY 1916)
AND
RECENT DEEP HOLE DRILLING BY A.O.P. LTD.

SCALE 1" = 100' DATE:- JAN. 7, 1953 (M1 - M4)

NOTE - THIS PLAN COPIED FROM PLAN BY C.K. LEITH (JULY 25, 1918).

"A"

LECLAIRE-0013 #3

M-M-10
N.V. Lake

Anchor positive
LECLAIRE-0013 4 Y

D.H.17

650 VERT

41.0% Fe, 17.2% SiO2
35 FT.

D.H.16
50°

650 VERT

Old D.D.H.3

D.D.H. 10

ss6+
ss5+
ss4+
ss3+
ss2+
ss16+
ss15+
ss17+
ss14+
ss1+
ss18+
ss19+
+ss7
ss20+
ss21+
ss8+
ss9+
ss10+
ss11+
+ss12
+ss13

D.D.H.4
D.D.H.3.
D.D.H.2

D.H.14

D.H.15

480 VERT

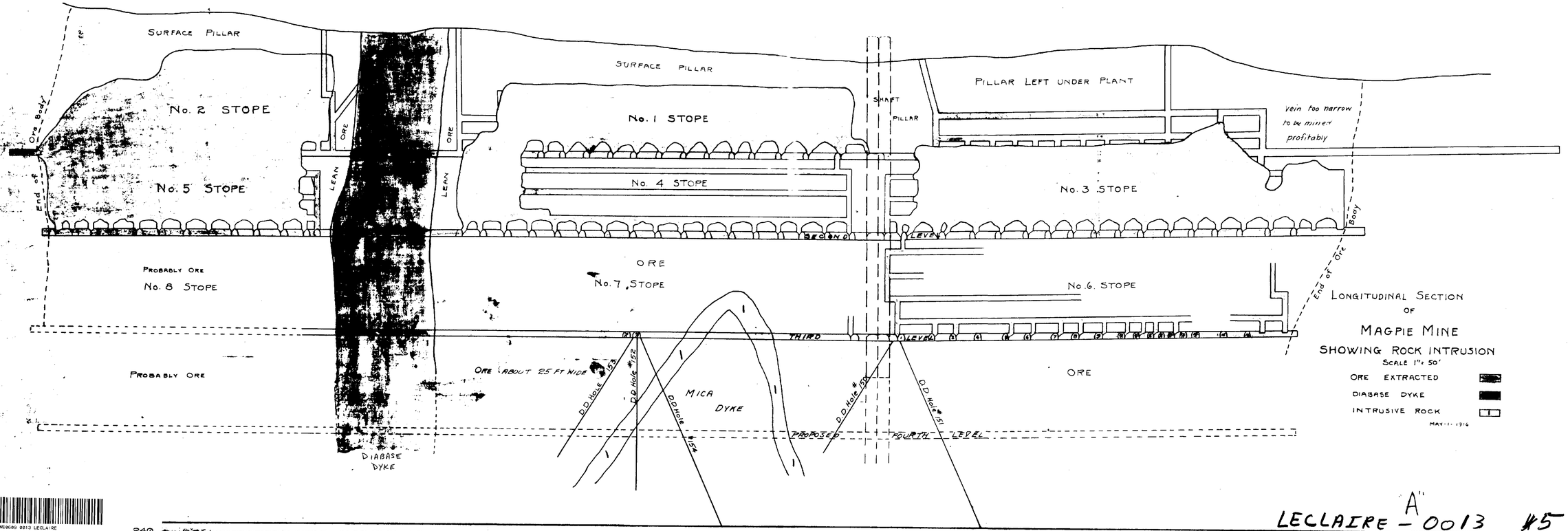
41.8% Fe 11.8% SiO2
38 FT.

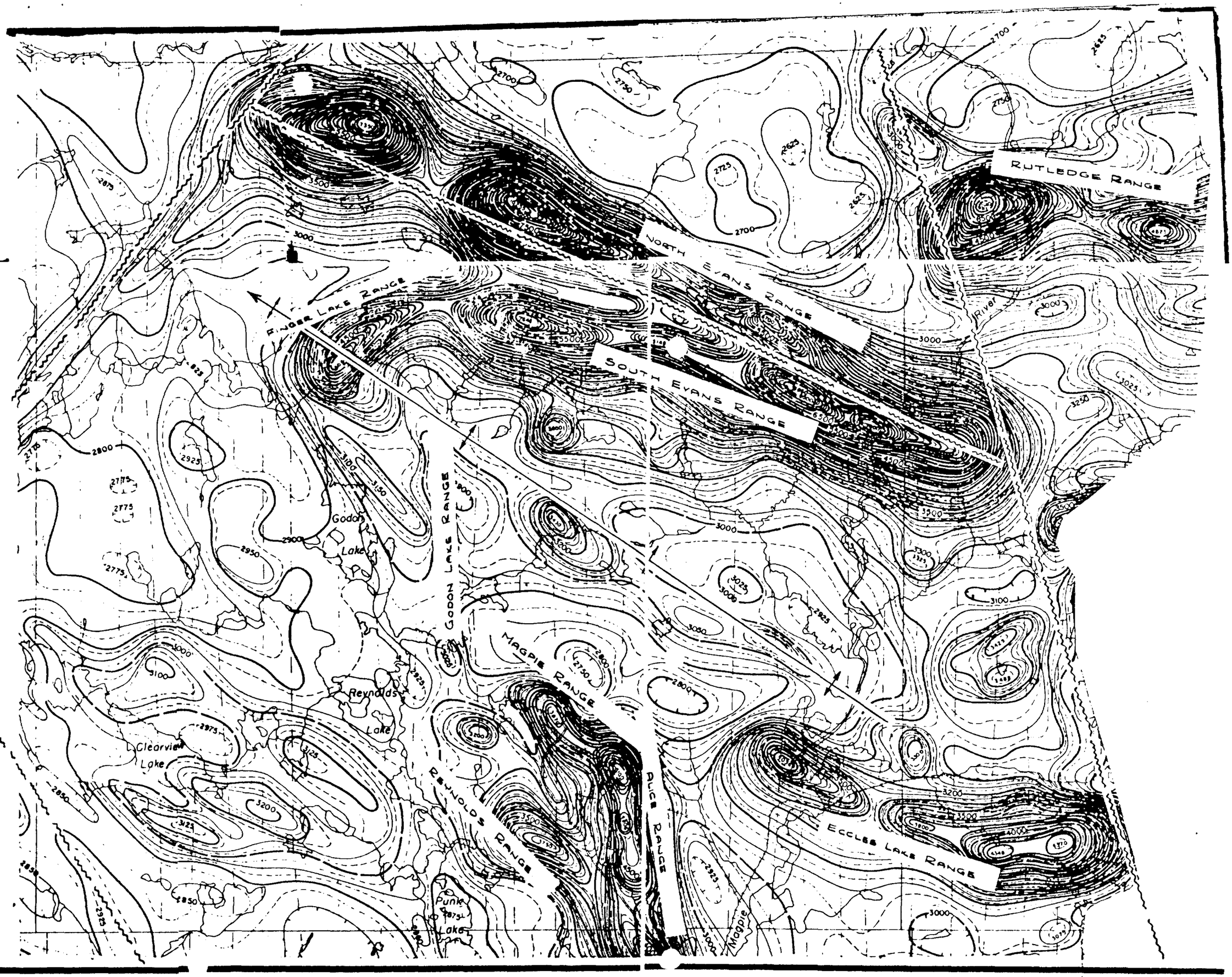
650 VERT

BEAVER LAKE

DRAWN H.S.K.M.	ALGOMA ORE PROPERTIES LIMITED HELEN MINE ONTARIO	MAGPIE DRILLING PLAN, HORIZONTAL PROJECTIONS	SCALE 1"=100'
TRACED			DATE Nov 20/52
CHECKED			Dec. 24, 1952. Mar. 12, 1953.
APPROVED			M.M.-5

"A"





AEROMAGNETIC MAP LECLAIRE-0013 #6