Second Annual Report

Falconbridge Nickel Mines Limited

For the Period Ending
December 31st, 1930

Falconbridge Nickel Mines Limited

Falconbridge - Ontario

PRESIDENT

THAYER LINDSLEY

VICE-PRESIDENTS

HALSTEAD LINDSLEY J. GORDON HARDY

SECRETARY and TREASURER

NORMAN F. PARKINSON

DIRECTORS

THAYER LINDSLEY HALSTEAD LINDSLEY
J. GORDON HARDY W. S. MORLOCK
NORMAN F. PARKINSON

MINE SUPERINTENDENT

ERNEST CRAIG, Falconbridge, Ontario

CONSULTING METALLURGIST

ANTON GRONNINGSATER

TRANSFER AGENTS and REGISTRARS

NATIONAL TRUST CO., Toronto

AUDITORS

CLARKSON, GORDON, DILWORTH, GUILFOYLE & NASH
Toronto

FALCONBRIDGE NICKEL MINES, LIMITED

100 Adelaide Street West, Toronto,
February 18th, 1931.

To the Stockholders of
Falconbridge Nickel Mines Limited.

The past year saw your property come into production and commence distributing its products in the European market. Its nickel has already been recognised as being of high standard, and has won for itself repeat orders with consumers of the first rank. All that is now required is a revival in industry that will permit us to sell all our production. Until that time any statement of earnings is necessarily based on assumptions.

The financial position of your Company is naturally affected by present conditions. Contracts for financing have become delinquent to the extent of $278,000 and these were included in the amounts stated as available in my statement to you of December 9th, 1929. It is expected, however, that our resources will carry us well into this year of 1931, together with income from current sales, and an arrangement has been made to take care of further requirements for some time to come, with our stocks of refined nickel as collateral. The attached certified Balance Sheet shows you the financial position of your Company as of December 31st, 1930, and the reports herewith from your technical staff set forth the work accomplished.

The Directors take this opportunity of expressing their great appreciation of the work done by Mr. J. Gordon Hardy, the Consulting Engineer, and the entire staff, in bringing to a successful conclusion the highly complex operation of creating a new producer of refined nickel.

By order of the Board,
THAYER LINDSLEY,
President.

100 Adelaide St. West, Toronto,
February 16th, 1931.

Mr. Thayer Lindsley, President,
and
The Board of Directors,
Falconbridge Nickel Mines, Limited.

Dear Sirs,

I beg to report as follows on the operations of your Company for the fourteen months ending December 31st, 1930, supplementing the detailed statement of Mr. Ernest Craig, your mine superintendent, and the information given by Mr. Anton Gronningsater, your consulting metallurgist, both of which are attached.

MINE

ORE-RESERVES: Our actual mining operations on the 225, 350 and 1,000 foot levels satisfied us that the tonnage estimated within those limits in the 1929 Report was amply conservative. We are letting those figures stand, however, and on the same basis we have added to that tonnage, due to our 1930 development work and diamond drilling, the increase shown in detail in Mr. Craig's report. This brings the total Ore-Reserve indicated in this section of our property to over two million tons of sorted ore, or say many years' supply at our present capacity.

DEVELOPMENT: The development by diamond drilling beneath the 1,000 foot level was frankly disappointing. Down to 1,500 feet it was about normal to our experience on the above level, but from there downwards it showed a shattered condition of the rocks, plus scanty mineralization. As this situation can be best investigated further when we sink to, and open out, the 1,500 foot level, which obviously is not immediately contemplated, and also for reasons of economy, this drilling was brought to a close.

OTHER RESERVES: It must be remembered that the section of ground above dealt with, and containing the present estimated Ore-Reserves, is only part of your Company's property. From the most eastern end of the present workings there are in addition, still further to the east, over 7,000 feet of the ore-bearing contact within your ground and already investigated in a preliminary way by diamond drilling from surface. At the most easterly hole there was shown to be 27 feet width of commercial ore, while at 1,800 feet easterly from your present workings several holes have disclosed over 40 feet in width of fair grade ore. When demand warrants it, our second shaft will doubtless be located at the latter place.

ORE GRADE: Our expectations as to grade of ore, based on 1929 sampling and sorting tests, did not altogether materialize in the actualities of mining in 1930. This was partly due to stoping dilution and inclusion of low grade ore from development work, but largely to the sampling system in use in the district not being applicable to our occurrence. Hence we have considered that the bulk-sampling of actual mining in 1930 is much more representative, especially as such mining was carried out at the three horizons of the 225, 350 and 1,000 foot levels. The difference is a decrease of .5% of nickel per ton of sorted ore, making same 2.47%, and this is accompanied by a slight increase in copper to 1.08%. These figures we are now taking as the average grade of ore.

PRECIOUS METALS: Similarly, the anticipated grade of precious metals, based on analyses of ore, was found in practice with smelter and refinery products to be too high. As yet no precious metals have arrived at the marketing stage, but sufficient concentration of them has been effected to make analyses of such products more reliable than those carried out on the original ore. Both in the case of copper contents and of precious metals there has been a drastic revision downwards of market value, as you know.

GENERAL: No trouble has been experienced in mining our ore, thanks to Mr. Craig and his staff and, as said before, the ore supply question does not constitute one of our worries. The accompanying map shows the present extent of the mine workings and the ore areas estimated.

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SMELTER

The salient features of 1930 smelting operations are given in Mr. Craig's report, and I would simply add that a minimum of trouble has been met with in this department. Such was its output that it overran what was expected of it, and when at the same time the Refinery was tardy in getting into its stride, the necessary result was a shutdown of the Smelter in November-December to permit the Refinery to catch up. During this shutdown extensions to smelting equipment were made, so that on short notice the capacity can be increased to 450 tons per day instead of the present 300. Here again the personnel, under Mr. Richard Gill, smelter superintendent, have accomplished exceedingly meritorious work.

REFINERY

Smelter output in the shape of matte carrying around 82% of combined nickel-copper metals is shipped from Canada to our Refinery in Norway. Here we have modernized and extended an existing plant to an annual capacity of 3,000 short tons of refined nickel, and have there taken advantage of the benefits of low power costs, skilled personnel and preferential European markets. Of the capacity mentioned there is earmarked about 750 short tons of nickel annually for Norwegian producers, and it must be remembered that in 1930 we were burdened by having to take care of this obligation during a construction period when our costs bore no relation to normal and were, therefore, greater than the tolls we could charge under contract. This condition no longer exists since capacity production was reached by the end of the year, and consequently the toll business now becomes an asset instead of a liability. In stating that Refinery capacity output was not reached until the end of the year, it must be borne in mind that about one-quarter of a year's production is tied up in "metals in process" and that this tie-up had to be satisfied before actual capacity output could be achieved. At the present time Refinery capacity is closely geared to Smelter output at the rate of 300 tons of ore daily. A number of the Refinery units, however, are competent to handle the increase to 450 tons of ore daily, for which the Smelter has been prepared, and complete ability of the Refinery to take care of this increase—say to a total of 4,000 short tons of nickel annually—can be achieved at a moderate cost, though with several months' delay in time. Since quality of output is of prime importance in marketing our metals, it has been gratifying to find that our product has been fully satisfactory in this respect. It reflects great credit on the Refinery personnel, headed by Mr. Anton Gronningsater and Mr. S. B. Steen, the Refinery Manager.

MARKETING

No one need be told of the difficulties met with in making sales in these depressed times. Notwithstanding, and thanks to the connections and energy of our sales agents, Messrs. Brandeis, Goldschmidt & Company, of London, we have got a fair share of such business as was available. Throughout 1930 we produced 1,187.5 short tons of refined nickel for our toll customers and for our own account, and of that amount 677.9 short tons moved into consumption. That meant a disposal of 57% of our production. To these sales, however, Falconbridge merely contributed 90 short tons, only coming into production as it did in October, with a total of 468.5 short tons of refined nickel for the year. It must be understood that sales are apportioned on a quota basis monthly between our toll customers and ourselves according to the relative contribution to production by each. Hence our toll customers had the market to themselves for most of the year, and our proportion of sales for the year was only 13%. By the end of the year, however, our rapidly mounting output had changed our ratio to 70% of the sales effected.

The 1930 sale of 57% of production was a creditable performance, but was largely due to the small tonnage involved. When our full tonnage came on the market at the end of the year, this percentage naturally fell off and is now running at about one-third of our nickel output. At the end of the year we had in stock for Falconbridge account 378.6 short tons of nickel, of which 198 tons had been sold for future delivery and 180.6 tons remained unsold. Copper sales have presented no difficulty, due to the relatively small tonnage produced.

EARNINGS

It will readily be seen that, with sales actually paid for of only 90 short tons out of the total 1,469.3 short tons of nickel to be accounted for from our Canadian matte shipments, no representative picture of our earning possibilities can be made by this year's accounts. Of the nickel returnable from our matte shipments 26% was still in untouched matte stock, 42% was tied up in metals in process in the Refinery, 26% was in refined metal stocks on hand and 6% had been sold and paid for. To inform our shareholders, however, as to what we have actually done and could have shown if we had not been in the very initial stages of production, the attached Earnings Statement has been prepared on the assumptions noted thereon. Actually, by the end of the year our operations and costs had so stabilized that we had come within striking distance of the costs estimated in our 1929 Report, in spite of decreased ore grade, and even with present low metal prices we were producing nickel for two-thirds of the price at which we were selling it, after due credits for copper and precious metals, but before write-offs.

OUTLOOK

The above descriptions should convey a fairly full picture of the present Falconbridge status. It has been demonstrated to the satisfaction of the operating staff that Falconbridge can produce the earnings heretofore estimated at such time as it can sell its product, and that ability to make this volume of sales only awaits normal business times. Coming into production more or less as estimated, but at a time of world-wide depression and with remaining working capital less than anticipated due to part of our contracted financing having become delinquent, it is evident that care is required to maintain the Company's position until such time as business revives. Stocks of refined metal are building up and on this collateral temporary financing has been arranged, if and when needed. Your fixed assets comprise a mine, with many years' supply of payable ore developed, which for purchase, equipment and development has cost over three million three hundred thousand dollars; housing costing almost ninety thousand dollars; an efficient Smelter costing over six hundred thousand dollars; and a successful Refinery costing over one million dollars. This expenditure of over five million dollars has brought into existence a rounded-out nickel-producing enterprise, that has shown its ability to take its modest place in the industry.

Yours very truly,
J. GORDON HARDY,
Consulting Engineer.

FALCONBRIDGE NICKEL MINES, LIMITED

Balance Sheet, 31st December, 1930

ASSETS

Cash on Hand and in Banks		$ 8,266.69	
Accounts Receivable—Trade	$ 41,957.15		
Sundry	2,958.11		
		44,915.26	
Securities		157,629.99	
			$ 210,811.94
Amount Receivable on Investments Sold (in suit)			30,000.00
Inventory—Refined Metals		$ 187,539.50	
Matte on Hand and in Process		495,450.45	
Mining Supplies		65,222.99	
			748,212.94
Mine and Smelter Buildings, Machinery and Equipment	$1,108,180.89		
Less: Reserve for Depreciation	102,658.14		
		$1,005,522.75	
Mining Properties and Claims		2,555,985.53	
			3,561,508.28
Deferred Development—			
Expenditures to 1st February, 1930	$ 346,456.31		
Less: Written off to Mining Operations	21,268.11		
	$ 325,188.20		
Later Development of Additional Ore Bodies	45,893.56		
	$ 371,081.76		
Broken Ore in Stopes	33,615.27		
		$ 404,697.03	
Incorporation Expenses		2,270.00	
Prepaid Insurance		4,048.15	
Commission on Shares Sold		175,000.00	
			586,015.18
Raffineringsverket Aktieselskap—			
Special advance recoverable as a tonnage charge on custom metals as and when refined, less repayments		$ 215,995.85	
Falconbridge Nikkelverk Aktieselskap—			
Investment in and advances to		1,131,477.58	
			1,347,473.43
Deficit			263,172.61
			$6,747,194.38

LIABILITIES

Capital—Authorized 5,000,000 Shares No Par Value			
Allotted as at 31st October, 1929	3,213,305 Shares		
Allotted and Issued in 1930	2,000 Shares		
	3,215,305 Shares		
Allotments cancelled during 1930	15,750 Shares		
	3,199,555 Shares		$6,724,281.64
Less: Subscriptions Overdue	4,500 Shares		54,000.00
Issued at 31st December, 1930	3,195,055 Shares		$6,670,281.64
Options Outstanding	581,000 Shares		
Accounts and Wages Payable		$20,338,97	
Commission Payable re Overdue Subscriptions		30,000.00	
Reserve for British Government Income Tax		1,475.00	
			51,813.97
Interest not taken into Revenue			25,098.77
Contingent Liability—			
Balance of Contracts for completion of Capital Expenditures at Nikkelverk Refinery (Kr. 59,700)		$15,999.60	
			$6,747,194.38

AUDITORS' CERTIFICATE

We have audited the accounts of Falconbridge Nickel Mines Limited for the fourteen months ended 31st December, 1930, and we certify that the above Balance Sheet correctly sets forth the position of the Company at that date, according to the best of our information and the explanations given us and as shown by the books.

CLARKSON, GORDON, DILWORTH, GUILFOYLE & NASH,
Chartered Accountants.

Toronto, 9th March, 1931.

FALCONBRIDGE NICKEL MINES, LIMITED

and its wholly-owned Subsidiary

FALCONBRIDGE NIKKELVERK AKTIESELSKAP

Consolidated Balance Sheet, 31st December, 1930

ASSETS

Cash on Hand and in Banks		$ 18,019.60	
Accounts Receivable—Trade	$ 47,317.15		
Sundry	5,713.76	53,030.91	
Securities		157,629.99	
			$ 228,680.50
Amount Receivable on Investments Sold (In Suit)			30,000.00
Inventory—Refined Metals		$ 187,539.50	
Matte on Hand and in Process		495,450.45	
Mining and Refinery Supplies, etc.		107,621.14	
			790,611.09
Mine, Smelter and Refinery Buildings, Machinery and Equipment	$2,138,545..74		
Less: Reserve for Depreciation	115,934.74	2,022,611.00	
Mining Properties and Claims		2,555,985.53	
			4,578,596.53
Deferred Mine Development—			
Expenditures to 1st February, 1930	$ 346,456.31		
Less: Written off to Mining Operations	21,268.11		
	$ 325,188.20		
Later Development of Additional Ore Bodies	45,893.56		
	$ 371,081.76		
Broken Ore in Stopes	33,615.27		
Deferred Refinery Expenses	85,380.95		
		$ 490,077.98	
Incorporation Expenses		2,270.00	
Prepaid Insurance		4,048.15	
Commission on Shares Sold		175,000.00	
			671,396.13
Raffineringsverket Aktieselskap—			
Special advance recoverable as a tonnage charge on customs metal as and when refined, less repayments			215,995.85
Deficit			263,172.61
			6,778,452.71

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Issued at 31st December, 1930	3,195,055 Shares		$6,670,281.64
Options Outstanding	581,000 Shares		
Accounts and Wages Payable, etc.		$51,597.30	
Commission Payable re Overdue Subscriptions		30,000.00	
Reserve for British Government Income Tax		1,475.00	
			83,072.30
Interest not taken into Revenue			25,098.77
Contingent Liability—			
Balance of Contracts for completion of Capital Expenditures at Nikkelverk Refinery (Kr. 59,700)	$15,999.60		
			$6,778,452.71

AUDITORS' CERTIFICATE

We have audited the accounts of Falconbridge Nickel Mines Limited for the fourteen months ended 31st December, 1930, and have accepted the certificate of A. Lyng, the Norwegian auditor, as to the accounts of Falconbridge Nikkelverk Aktieselskap to the same date, subject to which we certify that the above Consolidated Balance Sheet correctly sets forth the combined position of the companies at 31st December, 1930, according to the best of our information and the explanations given us and as shown by the books.

CLARKSON, GORDON, DILWORTH, GUILFOYLE & NASH,
Chartered Accountants.

Toronto, 9th March, 1931.

FALCONBRIDGE NICKEL MINES, LIMITED

1930

Based on assumption that metals in process and in matte stock, were liquidated on costs of December and on average net sales price of last quarter of year, the following Earnings Statement would be shown.

Nickel Sales	net	$ 58,642.28	
Nickel Stock—Consignment	"	4,778.66	
Nickel Stock—At Refinery	"	241,639.06	
			$305,060.00
Copper Sales	"	20,803.28	
Copper Stock—At Refinery	"	5,702.62	
			26,505.90
Total Finished Metals			$331,565.90
Unfinished Nickel—Matte Stock	"	186,927.15	
Unfinished Nickel—In Process	"	347,107.50	
Unfinished Copper—Matte Stock	"	34,088.60	
Unfinished Copper—In Process	"	67,272.60	
			635,395.85
Total Metal Values (Ni. and Cu. only)	"		$966,961.75
Add: Credit for Precious Metals	"		25,000.00
Total Metal Values (Prec. Metals incl.)	"		$991,961.75
COSTS:			
Mining and Smelting		564,973.19	
Transportation to Refinery		45,368.95	
Refining Costs		173,364.78	
Miscellaneous Advertising Expense		98.18	
			783,805.10
GAIN			$208,256.65

No provision made herein for depreciation at mine, smelter or refinery, nor for deferred development at mine and smelter. No credit taken for non-operating revenue.

FALCONBRIDGE NICKEL MINES, LIMITED

SECOND ANNUAL REPORT
PERIOD NOVEMBER 1st, 1929, TO DECEMBER 31st, 1930

Falconbridge, Ontario,
January 15th, 1931.

Mr. Thayer Lindsley, President,
and Directors,
Falconbridge Nickel Mines, Limited,
100 Adelaide Street West,
Toronto, Ontario.

Dear Sirs,

In submitting the following report for the fiscal period ending December 31st, 1930, I wish to respectfully point out that, of the fourteen months under review, the first three months, viz., November, 1929, to January, 1930, inclusive, were confined entirely to completing the mine and smelter plants preparatory to production. This result was definitely attained by the end of January, 1930, and the smelter successfully blown in on February 4th, 1930.

I would further point out that upon instructions from Mr. Hardy, production was temporarily suspended during November and December, 1930, thereby reducing the operating time covered by this report to a period of nine months.

MINE DEVELOPMENT

Combined development footages completed on all levels during the period under review are distributed as follows:

Drifting and Cross-Cutting, including Slashing	3,918 feet
Raising	306 feet
Raise Slashing	190 feet
Box Holes Completed	75 only
Station Cutting	13,596 cu. ft.
Pump Chambers	14,200 cu. ft.

Of the total 3,918 feet of drifting and cross-cutting recorded, 2,200 feet was driven East and West along the ore zone, being distributed on three levels for the purpose of proving and increasing ore reserves. (See mine plan attached.)

During the period of smelter shut-down in November and December, opportunity was taken to cut two stations in the shaft at 500 and 740 feet respectively, these having been passed up in the hurry to reach the 1,000 foot horizon in the original sinking.

DIAMOND DRILLING

The total diamond drilling footage amounted to 8,889 feet, of which 7,252 feet was underground and 1,637 feet surface drilling.

While the surface drilling gave information as to the Eastern extension of our main ore body, it was particularly spotted to delimit ore backs above the stopes and under drift covering. The underground drilling was all carried out beneath the 1,000 foot (bottom) level in an endeavor to ascertain the prospects of downward ore extensions.

The results are set forth on the accompanying longitudinal section of our workings, and show that beneath the 1,800 foot horizon a disturbed condition exists. This can best be investigated further when the shaft has been deepened to 1,500 feet, since the angle at which our deepest holes were drilled was not really conducive to reliable results. Nevertheless, the drilling certainly enabled us to indicate considerable reserves.

ORE RESERVES

Indicated ore reserves as at October 31st, 1929, were estimated at 1,367,000 tons, and during the period we have added an estimated tonnage of 984,480, indicating a total to date of 2,279,453 tons after sorting. The added tonnage has been arrived at through estimates based on development above the 1,000 foot horizon, while below this level the tonnage is calculated entirely upon diamond drilling results. The figures would tabulate as follows:

As of		Tons Sorted Ore
October 31, 1929		1,367,000
LESS: Hoisted during 1930		72,027
REVISED: Balance December 31, 1930		1,294,973
New ore 1930		
Above 1,000 feet	314,770	
Below 1000 feet	669,710	
		984,480
Total, December 31, 1930		2,279,453

ORE GRADE

While the grade of our last year's ore reserve was calculated at 2.97% nickel, and .97% copper, it will be noted that our smelter feed average for 1930 was 2.47% nickel and 1.08% copper. In view of this, and the fact that the results obtained in sampling during the current year almost invariably check with last year's figure, we feel that we are conservative in estimating our total ore reserves on the basis of smelter feed. The reason for our preference in taking smelter figures is that the tonnage above stated is that of sorted ore; the variations in sorting being such as to render it more desirable to take actual 1930 results.

MINING

Breaking ore for production commenced January 15th, 1930, a total of 148,005 tons being broken, from which 83,931 tons was hoisted, thus leaving a broken reserve of 64,074 tons. As will be seen on the accompanying map, this tonnage was mostly taken from above the 225 foot level. No stoping was done in November and December, 1930, owing to the smelter being shut down and there being an ample supply of broken ore.

CRUSHING AND TRANSPORTATION

From the 83, 931 tons hoisted to the crushing plant, 11,904 tons of waste, or approximately 14%, was eliminated by sorting during the various stages of crushing. The remaining 72,027 tons, of an average grade of 2.47% nickel and 1.08% copper, was delivered via the aerial tramway to the smelter bins.

SMELTING

As previously intimated, the smelter was blown in on February 4th, 1930. However, due to the necessary adjustments and metal absorption throughout the plant, production for this month was naturally low. During the actual productive period, the smelter plant was in operation a total of 252 days, all lost time being accounted for by uncontrollable power

interruptions necessitating the suspension of production. The most protracted interruption was from June 27th to July 15th, inclusive, same being caused by unavoidable floods at the power company's Wahnapitae plant.

Due to smelter production having so far exceeded refinery capacity in Norway as to cause an unmanageable accumulation of matte at the latter point, the smelter was shut down on October 31st, 1930, and so remained until January 1st, 1931, when it was again blown in.

Including all losses of absorption and in the smoothing out of operations at the start, the smelting results tabulate as follows:

Tons Smelted	71,626
Metals per Ton in Ore	49.4 lbs. Ni.—21.6 lbs. Cu.
Metals Recovered per Ton Ore	42.3 lbs. Ni.—18.3 lbs. Cu.
Metals in Process per Ton Ore	1.5 lbs. Ni.— .6 lbs. Cu.
Metallurgical and Flue Losses	5.6 lbs. Ni.— 2.7 lbs. Cu.

PRODUCTION

From the 71,626 tons of ore smelted during the year, 2,630 tons of matte was produced and shipped to the refinery in Norway. This contained 1,514.75 short tons of nickel; 655.97 short tons of copper, and an indeterminate amount of precious metals. Deducting metallurgical losses at the Refinery, this production in matte would call for 1,469.3 short tons of marketable nickel and 636.3 short tons of marketable copper. Our costs are, of course, based on the marketable quantities.

CONSTRUCTION

Aside from completing the mine and smelter plants to their productive stages, a number of improvements and additions were effected during the year. The installation of the second converter was completed and a pan conveyor installed to handle slag. Construction work in connection with the extension to the blast furnace and converter building was started May 1st, all excavations having been completed and the putting in of foundations well advanced. The extension of the charge floor was also completed in order to provide additional space to facilitate the handling of materials to the furnace. These extensions to foundations cover the plans for the addition of one more blast furnace and one more converter.

In order to take advantage of the period during which operations were suspended, viz., November and December, 1930, and at the same time provide employment for the married men living on the property, a five foot extension was made to the present blast furnace. This work was successfully carried out in ample time to allow the resumption of operations on January 1st, 1931, and place us in a position to increase production approximately 40% with a minimum of delay.

In view of the fact that housing facilities for permanent employees were very limited, the erection of ten standard five-room cottages was authorized and completed. Three small three-room cottages and a superintendent's residence were added later in the year.

In conclusion, I wish to take this opportunity of expressing my pleasure in recording the loyal and efficient co-operation of the staff and employees.

Respectfully submitted,

E. CRAIG,

Superintendent.

Mr. Thayer Lindsley, President,
Falconbridge Nickel Mines, Limited,
100 Adelaide Street West,
Toronto, Ontario.

February 2nd, 1931.

Dear Sir,

I beg to submit the following report for the fiscal year ending December 31st, 1930.

SMELTER

The rock house started in February, 1930. The ore is crushed in stages to a maximum of 3½", screened, and the coarse material hand-sorted on picking belts. The equipment gave no trouble in starting, and the layout is believed to be well suited for the treatment of the ore on our scale of operations.

The smelter, which was blown in February 4th, consists of a blast furnace and two converters. The ore is smelted without previous roasting. The start took place with a minimum of trouble, and the plant has in every respect fulfilled our expectations. It is to be noticed that the operations as directed permit a very high metal recovery.

REFINERY

As mentioned in the Annual Report for 1929, preliminary operations started at the end of October, 1929, on custom matte from Norway, preparing the solutions, anodes, etc., necessary for the nickel deposition, at the same time as the new equipment for the extension of different departments was being installed. Due to the equipment already on hand from the plant taken over, we were able to start nickel deposition on a small scale on January 30th, 1930. Matte from Canada was received April 6th. As the new equipment was installed, started up, and brought into working order, the production was gradually increased, and by the end of the year the estimated capacity of the plant was exceeded, to a total of 2,800 metric tons of nickel yearly. There was some delay in delivery of equipment and, as usual, a certain amount of mechanical troubles in starting up of the same, but nothing out of the ordinary. Chemically, very little trouble was met with, and nickel of very high purity was obtained at once.

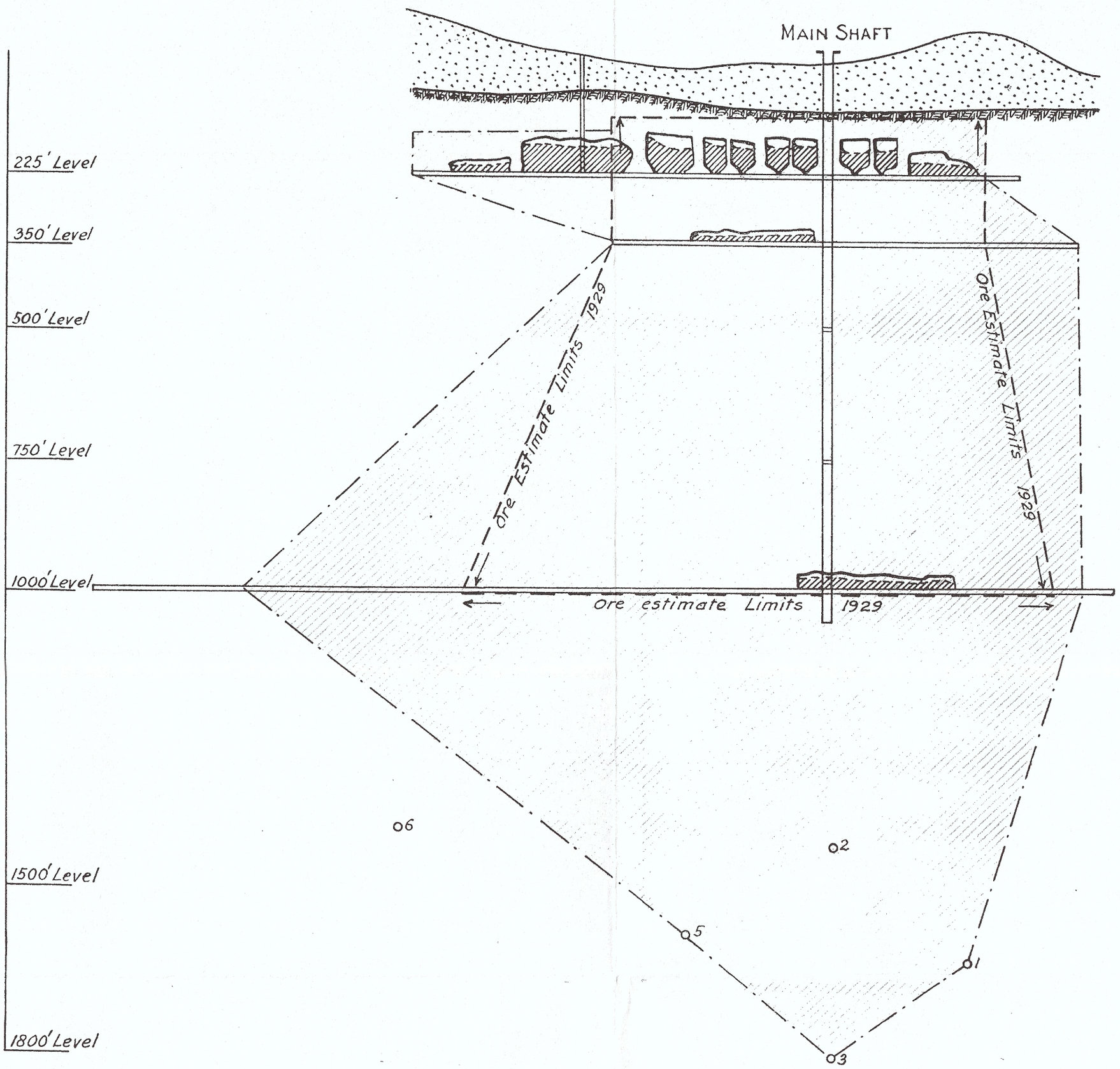
The matte, as received from the smelter in about 1" lumps, is crushed fine, roasted to remove sulphur, leached to remove part of the copper, the dissolved copper deposited electrolytically, and the copper cathodes sold as such, without re-melting. The leached material is smelted to anodes in an electric furnace and the anodes electrolyzed for nickel production in conjunction with departments for purification of the electrolyte. The precious metals are recovered as slimes in the nickel deposition tanks. The nickel cathodes are cut up and shipped as such, without re-melting.

For the year 1930 the amount of matte received from the smelter, the Refinery production, the metals in process, and the matte on hand at the end of the year is set out in the following table:

	Short Tons	Contents Ni. lbs.	Contents Cu. lbs.
Falconbridge Matte Received (Smelter weights and contents less 3%)	2,630	2,938,604	1,272,579
Produced in Marketable Form to end of year		937,133	258,967
Metals in Process		1,224,979	672,726
Metals in Matte on Hand (620.785 met. tons)	684	776,492	340,886

Certain new features tried out in the refining process were successful, and I feel it is safe to say the refining process as now practised is thoroughly modern and up-to-date, allowing both low operating costs and high quality of the metals.

Respectfully submitted,
ANTON GRONNINGSATER,
Consulting Metallurgist.



INTERSECTION LEGEND

	ORE WIDTH	% Ni AFTER WASTE	% Cu. REJECTION	% WASTE
1	5'- 6"	3·00	0·85	9
2	40'- 0"	2·58	1·38	44
3	25'- 0"	2·59	0·85	35
4	2'- 6"	1·83	2·02	21
5	10'- 0"	1·86	0·96	39
6	2'- 0"	2·25	0·20	Nil.
7	6'- 0"	1·07	0·87	Nil.

LEGEND

ORE ESTIMATE LIMITS 1930

BROKEN ORE

SCALE

Ft. 100 50 0 100 200 300 400 Ft.

THE MAP SPECIALTY Co 79 E. ADELAIDE ST. TORONTO

FALCONBRIDGE NICKEL MINES LIMITED

LONGITUDINAL SECTION SHOWING UNDERGROUND WORKINGS AND ORE ESTIMATE LIMITS