WABUSH MINES

REVIEW OF SCULLY MINE RESERVES

for

DEPARTMENT OF NATURAL RESOURCES

GOVERNMENT OF NEWFOUNDLAND AND LABRADOR

Graham Farquharson, P.Eng.
Henrik Thalenhorst, P.Geo.
Strathcona Mineral Services Limited

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Department of Natural Resources
Government of Newfoundland and Labrador
P.O. Box 8700
50 Elizabeth Avenue
St. John's, Newfoundland A1B 4J6

Attention: Allister W. Taylor, Assistant Deputy Minister

Dear Sirs:

Wabush Mines

Enclosed is our review of the status of mineral reserves at the Scully Mine of Wabush Mines and the procedures that have been followed in estimating those reserves. The reserve estimates have been prepared in accordance with general mining industry standards**.**

The manganese content in the ore, which is a specific characteristic of the Scully Mine deposits, is the primary market limitation to exploiting more of the remaining resources than is currently planned and that are not included in the most recent reserve estimates.

Cleveland-Cliffs Inc., as the managers of the Wabush Mines joint venture, have been examining the possibility of installing a manganese reduction plant and if feasible this project could allow the current blend of pellet products to be produced through to 2021. Encouragement and support for this endeavour should be given by all stakeholders because of the significant benefits of extended mine life for the employees of Wabush Mines and the community of Wabush.

We apologize for the very late delivery of our comments on this important matter.

Yours sincerely,

Graham Farquharson

GF:jb

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Summary

Wabush Mines has had approximately 40 years of operating history at the Scully Mine producing up to 6 million long tons of iron ore pellets per year and has faced a number of technical and marketing challenges that have never allowed Wabush Mines to consistently achieve satisfactory levels of profitability during that period.

While initially in the mid-1960's the Scully Mine was developed as a captive source of iron ore for the joint venture partners at that time, the many changes that have occurred since in the steel industry, and particularly over the past ten years, have resulted in changes in specifications for iron ore products sold to the steel industry as well as fundamental changes in the structure of the iron ore and steel industries and therefore changes in the composition of the joint venture participants in Wabush Mines.

There are unique circumstances pertaining to the Scully Mine deposits that present obstacles to the production of quality pellets. A major challenge is the high manganese content in the lower units of the geological formation in the stratigraphic column at the Scully Mine. Specifications by the steel industry on the maximum permissible manganese content in pellets have restricted mining to ore units that have less than 2% manganese, which after concentrating results in a similar manganese content in the pellet product. As much as 60% of the production from Wabush Mines, with its high-manganese pellets, has recently been sold in China, as the traditional North American markets are no longer as receptive to this quality of product.

Cleveland-Cliffs Inc., as the manager of the Wabush joint venture, have been following generally accepted procedures in the mining industry for estimating mineral reserves at the Scully Mine. Because of the scale of the iron ore operations and the size of the resource, it has not been considered necessary to redo the reserve estimates each year starting from the original data base. Cleveland-Cliffs have had a policy of generally updating the reserve estimates through a detailed review every third year, and interim reserve estimates are based upon subtracting recent production following the most recent detailed review. Cleveland-Cliffs had estimated the Scully Mine reserves as of the end of 1996 to have a reserve base that could produce 270 million long tons of pellets over the life of the mine, and then subtracted production over the next five years to arrive at a new pellet reserve estimate of 244 million long tons at the end of 2001.

During the 2002 detailed review of the reserves, recognition was made for the first time of the adjustments that would be necessary because of the change in market specifications for manganese content in pellets and this eliminated a large tonnage that would not allow a life-of-mine blended grade of 1.4% manganese. The reserve estimate, therefore, at the end of 2002 decreased to 86 million long tons of pellets with a much reduced mine life. Cleveland-Cliffs may have been in a position to make the adjustments to reserves because of the manganese content before 2002, but that cannot be stated for certain without good knowledge of the history of developments affecting the marketing of Wabush pellets.

In 2003 there was a further reduction in the reserves because of experience with water inflow in the open pit at the west-end of the property, which contains perhaps the best quality ore now

available at the Scully Mine because of its low manganese content, with the water flow causing a change in the mine plan due to it being no longer feasible to mine as deep as originally planned. In addition, in 2003 the Canadian dollar commenced its strengthening vs. the U.S. dollar along with increased operating costs. All of these factors in 2003 resulted in a year-end pellet reserve estimate of 61 million tons or sufficient for 10 years of operation at full capacity.

Production in 2004 was affected by a labour strike and as of the beginning of 2005 there remained 57 million long tons of pellet reserves.

As a result of our review we can confirm that Cleveland-Cliffs have been following standard procedures in the application of technical and economic factors for determining mineral reserves and subsequent mine plans. There is no evidence to support any suggestion of “high-grading” as can often be done in a gold or base metal deposit. Changes in iron ore grades are not significant with regard to their iron content, and in the case of the Scully Mine the grade selection process, or grade control, is very much focused on ensuring that the manganese grade is such that only acceptable products are produced from mining the iron ore.

There remains at the Scully Mine substantial resources of high-manganese iron ore, primarily at depth below the existing operations, and the emphasis for Wabush Mines must now be to determine whether or not any of that resource can be incorporated in the long-term mine plans, while the mine and associated infrastructure are still in operation and operating at a scale to provide reasonable unit costs.

Cleveland-Cliffs have previously examined the possibility of installing a manganese reduction plant that would reduce the manganese content of ore processed to allow production of the current pellet products to continue, with their manganese content of either 1.2% or 2.0%, from ores that would contain up to 4.0% manganese. Those studies on manganese reduction in the past have provided some encouragement. The most recent report that we have reviewed was a memorandum prepared by Cleveland-Cliffs staff in June 2005 that suggested favourable economics for the installation of a manganese reduction plant with the economics becoming more favourable if the plant was operational as early as 2008. The capital cost of the manganese reduction plant would appear to result in an additional cost of less than $2 per ton of additional pellets produced over the extended life of the project. The incremental operating costs for the manganese reduction plant were also very modest, and not really significant with reference to the large additional tonnage of pellets produced. The cost factors therefore for the manganese reduction plant do not appear to be an impediment to proceeding with such a project.

We are not certain as to how confident Cleveland-Cliffs are on the technical process involved with the manganese reduction plant, but if more test work remains to be done then this should be expedited.

From our discussions with management at Cleveland-Cliffs it would appear that the biggest concern about such an investment is whether or not the market will be prepared to take pellets for a number of years into the future that will always have a higher manganese content than normally

sold in the iron ore pellet market. The current relatively buoyant iron ore markets would appear to offer as good an opportunity as can ever be anticipated for the participants in the Wabush Mines joint venture to move ahead with whatever is required to determine the feasibility of constructing the manganese reduction plant at the Scully Mine.

If the decision on such a process is positive, then it would appear that the possibility of extending the life of the Wabush Mines operations from 2013 to perhaps 2021 may be attainable, and this prospect would help to alleviate the concerns from other stakeholders, such as the Wabush Mines employees and the Government of Newfoundland and Labrador, that Wabush Mines is headed for closure as early as 2013.

Introduction

Wabush Mines has conducted iron ore mining operations at Wabush, Labrador since 1965 with the mining and concentrating at Wabush and the subsequent stage of pelletizing being done at a plant at Pointe Noire on the St Lawrence River near Sept-Isles, Québec. Since 1967 annual capacity of the Wabush operation has been approximately six million long tons of pellets.

Wabush Mines is an unincorporated joint venture with the following current participants in the joint venture:

Stelco Inc.	-	44.6%
Dofasco Inc.	-	28.6%
Cleveland-Cliffs Inc.	-	26.8%

Wabush Mines is managed on behalf of the joint venture by Cliffs Mining Co., a subsidiary of Cleveland-Cliffs Inc.

Three large iron ore operations are located in close proximity to each other, very near the border between Québec and Labrador, with the largest community in the area being Labrador City which serves as the base for the Iron Ore Company of Canada (IOC) and adjoins the community of Wabush. Québec Cartier Mining Company is the third producer in the area and is associated with the community of Fermont located on the Québec side of the border. Québec Cartier Mining has its own rail link to the St. Lawrence River, whereas IOC and Wabush use the railroad owned and operated by IOC which leads to Sept-Isles, with a short extension to Pointe Noire owned by Wabush Mines. Wabush Mines is the smallest of the three operations and has always been considered to have less favourable economics because of lower production rate, quality issues because of the manganese content in the ore, large de-watering requirements in the mining operations, the use of a competitor's railroad, and finally the diverse ownership that Wabush Mines has had since the formation of the original joint venture.

Over the past 25 years iron ore markets have generally been very stable with there always being adequate supply to meet demand. As a result there has been very little price change for iron ore products and any changes that have occurred have been due to temporary changes in economic conditions affecting the steel industry as the almost exclusive market for the iron ore products.

However, in 2003 global demand for iron ore began to increase and accelerated further in 2004 and 2005, primarily as a result of very strong demand from China. This led to significant increases in pricing for iron ore products in 2004 and 2005 with a further increase expected in 2006. The price increases have also been related to the very strong position for the principal iron ore suppliers as the consequence of three of those suppliers now being responsible for more than 70% of iron ore production sold to non-integrated steel producers.

Prior to the relatively recent strong demand for iron ore the steel producers had been increasing the tightness for specifications for iron ore products such as the pellets produced by Wabush Mines. Manganese is the main non-iron element affecting the quality of the Wabush pellets with all other elements generally meeting typical market specifications for pellets.

In general we understand that steel producers require the production of hot metal containing less than 0.4% manganese, and any manganese that is retained in the slag is considered to be deleterious and undesirable. As a consequence pellets from Wabush Mines with a manganese content of 1.2 to 2.0% have to be blended in with low-manganese iron ore in order to meet the specifications generally established by the steel producers. Maintaining a satisfactory manganese content is therefore the major technical challenge facing Wabush Mines in terms of product quality, which is a challenge not faced by the neighbouring operations at IOC where mining occurs higher up the stratigraphic column where the manganese content is much lower. The challenge of marketing the Wabush pellets is illustrated by the fact that the joint venture participants in Wabush Mines do not take a share of production in proportion to their interest in the joint venture, which at one time in the early years of the joint venture we understand they did.

Until 2002 Wabush Mines included in their mineral reserves material that graded up to 4% manganese which resulted in a reserve base sufficient for the production of about 250 million long tons of pellets, which would have been sufficient for about 40 years of mine operations. In 2002 it was belatedly recognized that the mine could no longer mine and produce pellets for sale into the global market starting with material that had such a high manganese content. As a consequence, the mineral reserves were reduced in 2002 to an amount required to produce less than 90 million long tons of pellets with a manganese content of 1.2 to 2.0%, and which would have been sufficient to keep the Wabush operations going until 2016.

In 2003 difficulties with handling water inflow into the mining operations on the western part of the property restricted the depth to which mining could be planned in that area, and together with the strengthening of the Canadian dollar with respect to the U.S. dollar and a continuing increase in operating costs, resulted in a further reduction in the reserve estimate of marketable Wabush pellets to about 60 million long tons and the mine life would extend to 2013.

In early 2005 officials of the United Steel Workers of America, representing employees of Wabush Mines, contacted the Minister of Natural Resources of the Government of Newfoundland and Labrador to express concern about the diminishing projected life for Wabush Mines and therefore for the community of Wabush. There are slightly more than 400 employees of Wabush Mines located at Wabush, and more than 300 employees working at the Pointe Noire location. As a consequence, the Minister of Natural Resources, through the Assistant Deputy Minister, Allister Taylor, engaged Strathcona Mineral Services Limited to review information provided by Cleveland-Cliffs on the Wabush operations including mineral reserve statements to determine if the most recent public statements of mineral reserves are reasonable and reflect good mining practice consistent with maintaining an economic mining operation for as long as possible and thus providing the economic foundation for the community at Wabush and the employees located at Wabush and Pointe Noire.

Initial meetings with representatives of Cleveland-Cliffs were followed by a visit to Wabush during the period July 12-15, 2005 with the participants in that visit being John Davis of the Department of Natural Resources, and Graham Farquharson and Henrik Thalenhorst of Strathcona. Our principal contacts with Cleveland-Cliffs, and Wabush Mines during our site visit, for providing information and background on the Wabush operation were as follows:

Richard Fink	-	management and project issues
Dianne Darch Ron Graber	-	geology and mineral reserves
William Bell	-	mining operations

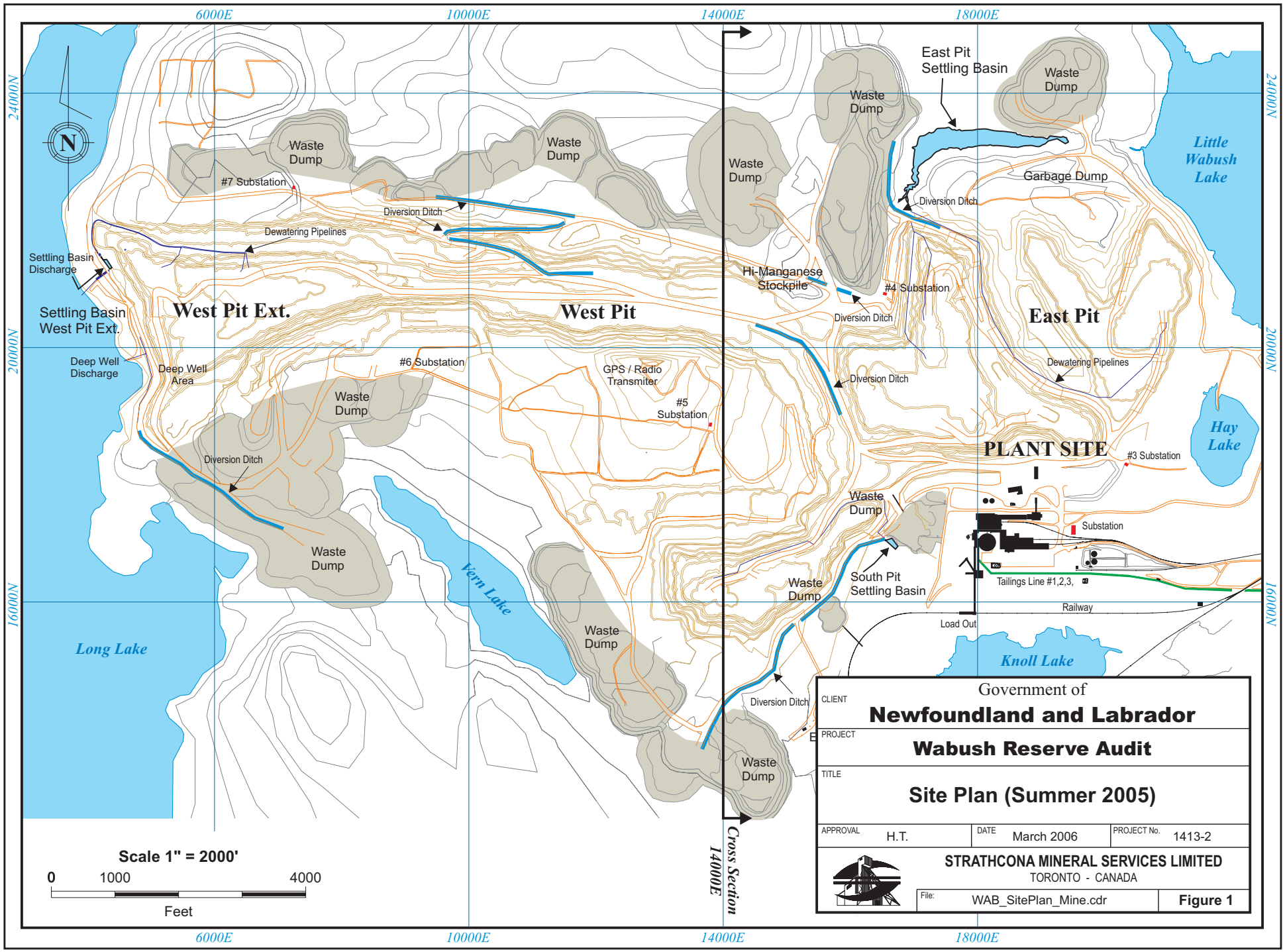
Our report, with our observations on the historical development of the mineral reserves for Wabush Mines and the reasons for changes that have occurred, has been substantially delayed solely because of circumstances preventing Graham Farquharson from being able to complete the assignment in a reasonable time period and we apologize for the resulting inconvenience to the interested parties.

Scully Reserve and Operating Nomenclature

The North American iron ore sector uses terms and some measures that are particular to iron ore and that would not necessarily be found in other sectors of the mining industry. The following list defines or explains some of these terms that are in effect at the Scully Mine:

Long ton	All mass measurements are in long tons (ore and waste, concentrate, pellets). One long ton is 2240 pounds or 1016 kilograms and is thus very similar to one metric tonne of 1000 kilograms.

Crude Ore	Iron ore in the ground with in-situ assays for iron, manganese and other elements of interest in the determination of the quality of the iron ore.
Strip Ratio	Ratio of mined waste plus overburden to crude ore. The ratio at Scully has historically ranged from 0.12 to 0.67, averaging about 0.6 since 1996.
All Material Ratio	The ratio of total long tons mined (ore plus waste) to long tons of pellets produced. This ratio at Scully is historically around 4.0, but has averaged closer to 4.5 since 1996.
Weight Recovery	Ratio of mass of pellets recovered from a unit of crude ore in the ground. At Scully, the weight recovery has ranged from 32 to 37% (nearly three long tons of crude ore are required to produce one long ton of pellets). The weight recovery ratio reflects the iron grade of the crude ore, the dilution experienced during mining, the iron grade of the pellets (typically 64% Fe), the recovery in the concentrator, any losses during transportation and pelletizing, and any substances added during pelletizing. The weight recovery is an important economic factor to be considered during grade control and reserve estimation.
Manganese Blend	The Scully operation produces two types of pellets, one with 1.2% Mn and one with 2% Mn. The manganese blend is the ratio of the two products. The current ratio of 60/40 translates into an average pellet content of 1.5% Mn. The former ratio of 75/25 translated into an average pellet content of 1.4% Mn. The manganese blend is an important economic and marketing factor to be considered during reserve estimation.



Government of

CLIENT **Newfoundland and Labrador**

PROJECT **Wabush Reserve Audit**

TITLE **Site Plan (Summer 2005)**

APPROVAL	DATE	PROJECT No.
H.T.	March 2006	1413-2

STRATHCONA MINERAL SERVICES LIMITED
TORONTO - CANADA

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Figure 1

Geological Background

The Scully operation recovers iron ore from an ancient sedimentary package, referred to as the Wabush Iron-Formation by Gross (1972), that is equivalent to the Sokoman Formation farther north in the Labrador Trough at Schefferville. While the Sokoman Formation has recorded one episode of folding and metamorphism (the Hudsonian orogeny 1.8 billion years ago), the equivalent to the south has experienced an additional younger episode of folding and metamorphism during the Grenvillian orogeny 1.0 billion years ago. As a result, the metamorphic grade in the Wabush area is higher than in Schefferville, which has resulted in an increased grain size, making beneficiation easier. However, the additional episode of folding has complicated the structural pattern in the Wabush area. Small-scale structures on the scale of the bench height (10 to 15 metres) are still being defined by detailed geological mapping as part of the daily grade-control activities.

The Wabush Iron-Formation comprises five members (**Table 1**) totalling more than 300 metres in thickness, and is illustrated in **Figure 2** along a north-south section, 14000E, through the centre of the Scully property. Two of the members have no iron content of economic interest, being the Middle Quartzite used as a marker bed, and the Basal Silicates at the bottom of the Wabush Iron-Formation where the iron content is contained within silicates that are not valued as iron ore. The iron in the Upper, Middle and Lower Members, in contrast, is mostly in its oxide form, mainly as hematite (Fe_2O_3) – also called specularite in its coarse-grained form – and to a lesser extent as magnetite (Fe_3O_4). Small amounts of iron are in silicates such as amphiboles (grunerite) and in carbonates such as ankerite ($Ca[Fe,Mg,Mn][CO_3]_2$) but are not recovered into the final concentrates. The main gangue mineral in the Wabush Iron-Formation is quartz or silica (SiO_2) that would constitute about 50% of the ore, and the ore beds have been thus been called quartz-specularite schists.

The individual sedimentary units within the Wabush Iron-Formation are correlatable over the area of the Scully mine operations despite being folded and faulted, and have relatively consistent contents of iron, manganese and other elements affecting processing and marketing.

Table 1

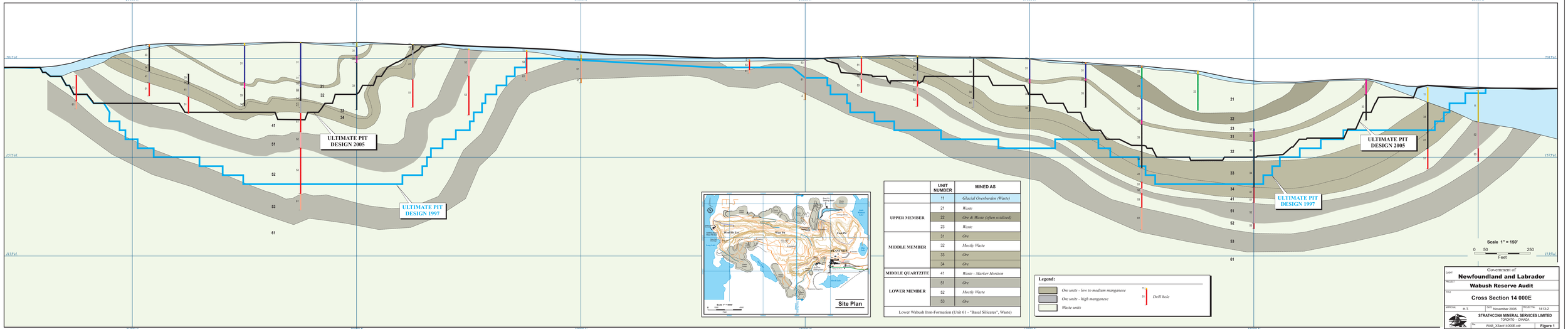
Upper Wabush Iron-Formation – Stratigraphic Column

Member	Metres (m)	Unit No.	Mined as	Weight Recovery	Mn Content in Concentrate (%)
Glacial Overburden (Waste)					
Upper Member	135	21	Waste		
		22	Ore & Waste (often oxidized)	Low	0.8
		23	Waste		
Middle Member	120	31	Ore	High	1.3
		32	Mostly Waste		
		33	Ore	High	1.5
		34	Ore	Variable	1.6
Middle Quartzite	12	41	Waste - Marker Horizon		
Lower Member	70	51	Ore	High	2.7
		52	Mostly Waste		
		53	Ore	High	2.7
Lower Wabush Iron-Formation (Unit 61 - “Basal Silicates”, Waste)					

The weight recoveries in those units from which ore is being recovered are always variable, i.e., not the entire horizon labelled “Ore” in **Table 1** will be mined as such, since some part of the unit will fall below the cut-off grade of 25% weight recovery. However, in the units with “high” weight recovery the proportion below the cut-off grade will be smaller than in those units with a “low” weight recovery.

Unlike the neighbouring deposits being worked by the Iron Ore Company (IOC), the Scully deposit area has been subjected to deep weathering and oxidation that reaches depths in excess of the final pit outline in many areas. This has led to the local transformation of what would otherwise be ore into waste, since the products of the weathering, chiefly geothite (FeO[OH]), cannot be tolerated in the concentrate. Large amounts of heavily oxidized material are found in the Upper Member (Unit 22 - Table 1) and are usually classified as waste in mining.

The Middle Member has the best quality ore on the Scully property with the highest iron content and therefore the best weight recovery, and the lowest manganese content. The ore units in the Lower Member have lower iron content than in the Middle Member, but more importantly have a high manganese level thus necessitating blending with ore from the Middle Member to result in a concentrate meeting market specifications.



	UNIT NUMBER	MINED AS
	11	*Glacial Overburden (Waste)*
UPPER MEMBER	21	*Waste*
	22	*Ore & Waste (often oxidized)*
	23	*Waste*
MIDDLE MEMBER	31	*Ore*
	32	*Mostly Waste*
	33	*Ore*
	34	*Ore*
MIDDLE QUARTZITE	41	*Waste - Marker Horizon*
LOWER MEMBER	51	*Ore*
	52	*Mostly Waste*
	53	*Ore*

Lower Wabush Iron-Formation (Unit 61 - "Basal Silicates", Waste)

Legend:

- *Ore units - low to medium manganese*
- *Ore units - high manganese*
- *Waste units*
- *Drill hole*

Government of
Newfoundland and Labrador

PROJECT
Wabush Reserve Audit

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Cross Section 14 000E

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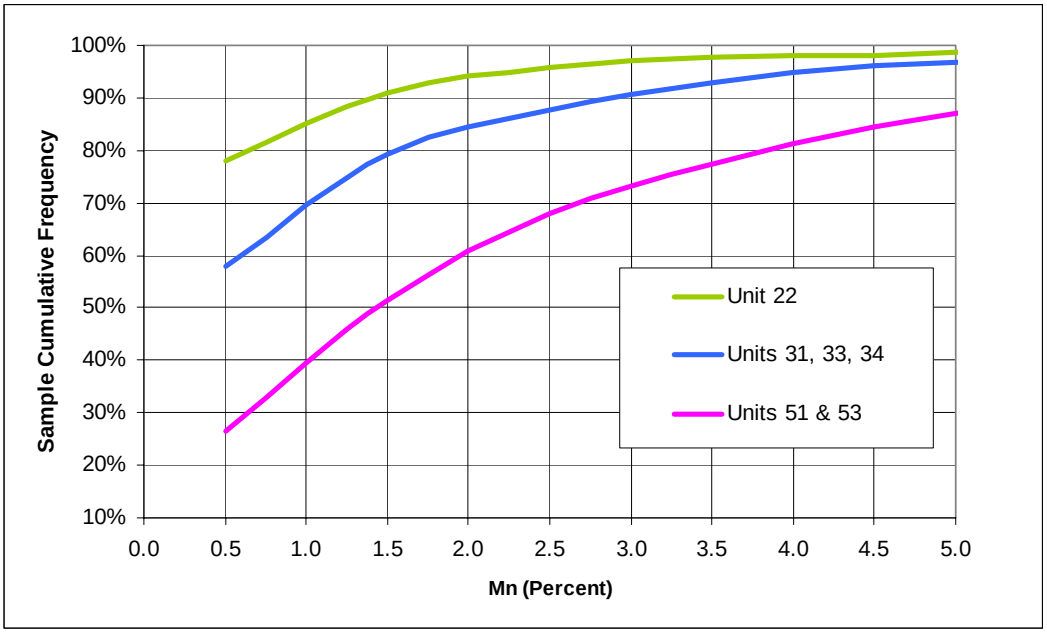
Figure 1

As O'Leary (1979) has shown, the manganese grade in the final concentrate closely matches the manganese grade in the crude ore, indicating that on average about two-thirds of the manganese is being rejected in the concentration process. The overall manganese distribution in the Upper Wabush Iron-Formation is controlled by the stratigraphy, with higher manganese concentrations found in the lower, older units, and the lowest concentrations in the youngest, as indicated in **Table 1**. It appears that the deep weathering has re-distributed the manganese within each stratigraphic unit, but has not added or subtracted manganese to any large extent. As a result of the re-distribution, the manganese concentration within one particular unit can vary dramatically over short distances, which must be contended with during grade control.

Figure 3 shows the cumulative frequency distribution of manganese of all drill hole sample intervals within the Lower, Middle and Upper Member units from which ore is being mined at Scully:

Figure 3
Cumulative Mn Frequency for Samples by Stratigraphic Unit



The three curves in **Figure 3** illustrate as an example that, at a cut-off grade of 1.5% manganese, some 90% of the samples of unit 22 have manganese values below that cut-off grade. For the Middle Member units 31, 33 and 34, the number of samples below the cut-off of 1.5% is reduced to 80%, while for units 51 and 53 of the Lower Member this figure is only 50%. Given the stringent limits on the manganese content of the concentrate produced at Scully, the mine has to practice "low-grading" with respect to manganese from the natural endowment, and mineralized material with otherwise sufficiently high crude iron values becomes waste if the manganese content is too

high. Manganese grade control in the Middle Member units has to receive particular attention given that those units represent the greatest proportion of the tonnage to be mined in the current long-term plan.

Scully Operations

Mining is by conventional open-pit methods on 40-foot (twelve-metre) benches at a nominal rate of 40 000 long tons per day. A total of four individual pits are in operation (East Pit, South Pit, West Pit and West Pit Extension), as shown in **Figure 1**. In 2004 the West Pit and West Pit Extension together produced about two-thirds of the ore, being favoured because of their lower manganese content. Total mining in 2004 was 11.4 million long tons of ore with a head grade of 34.2% Fe, plus 5.8 million long tons of waste and overburden for a strip ratio of 0.51. About three months of production were lost in 2004 due to a labour strike.

After crushing and grinding, the ore is beneficiated on spirals to a product grading 60 to 61% Fe and 5% silica (SiO_2). The spiral concentrate is upgraded by hydrosizing and high-tension electrostatic separators to the final concentrate that in 2004 amounted to 3.8 million tonnes and assayed 64% Fe, 3% SiO_2 and 1.7% Mn. The concentrator plant does not have a good performance with ore that is high in magnetite, and a head grade with less than 15% of this mineral is required.

The concentrate produced in the Scully concentrator is shipped to the pellet plant in Pointe-Noire (five to six million long tons annually, depending on markets). While the project owners have traditionally taken the entire output of the operation, much of the pellet production is now being sold to China.

Water Problems

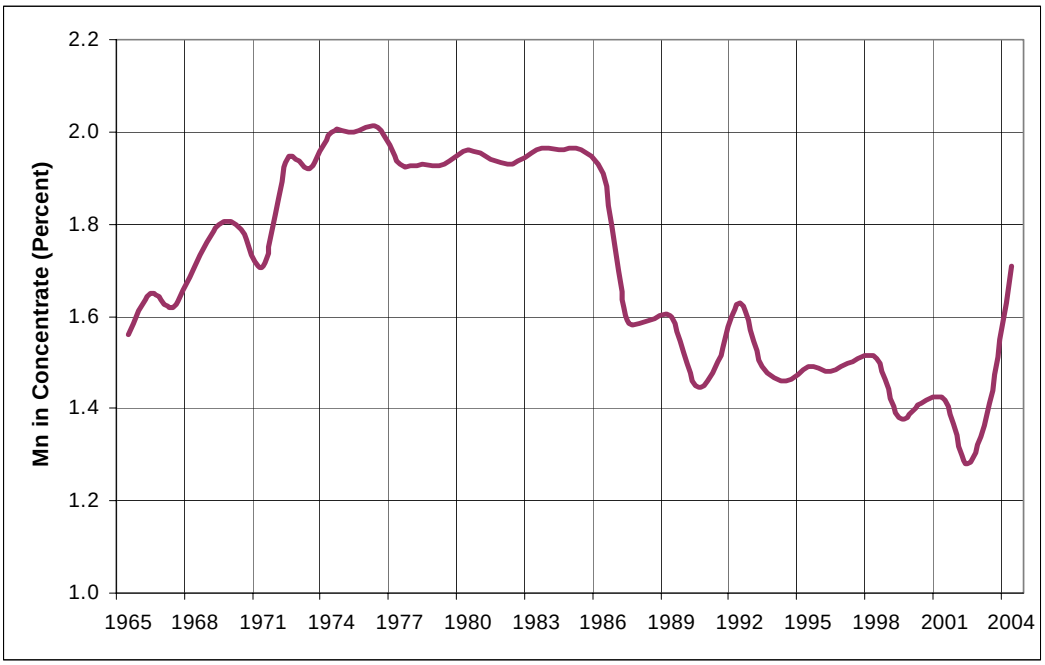
All of the pit floors of the Scully operation are below the water level in the surrounding lakes, and seepage from the lakes adjacent to the West Pit Extension and the East Pit have led to operational difficulties through ice build-up in the winter. Of considerable concern are two sink holes that have formed in Long Lake just to the west of the pit, and water is being drawn into the pit. It appears that at least one of the sink holes formed around a diamond drill hole drilled from the lake ice. At the time of our visit in July 2005 a battery of pumping wells on the western pit wall did not prevent a substantial amount of lake water entering the northwestern part of the West Pit Extension, where more pumping is required.

Hydrological studies were being undertaken, and it was hoped that an engineering solution could be found to stop the influx of the water since there is an engineering and economic limit to the quantity of water that can be pumped. The western part of the open-pit operation at Scully with its low-manganese ore may be in jeopardy, but we have no further information since our visit to the Wabush property.

Manganese Blend History

The manganese blend produced by the Scully mine has changed over time, from generally higher levels in the past to lower levels more recently. This is shown in **Figure 4,** the data for which were contained in a poorly-legible print of a spreadsheet, so that a few of the individual figures may not be entirely correct.

Figure 4
Average Mn Grade of Pellets, 1965 to 2004



We are advised by Cleveland-Cliffs that the sharp drop in the manganese grade of the pellets from 1986 to 1987 was entirely due to the Wabush owners and customers declining to purchase high-manganese pellets during the period of reduced economic activity in the steel industry that commenced in 1987. The very restricted outlets for much of the Wabush pellet production because of the manganese content continued in effect until 2004 when strong iron ore demand allowed more Wabush pellets to be sold.

Reserve Reporting Terminology

The Scully Mine reserves are determined by Cleveland-Cliffs, the project operator, in accordance with guidelines of the Securities and Exchange Commission (SEC) which do not recognize the term “mineral resources” or its equivalent as defined by the codes of the Canadian Institute of Mining and Metallurgy, (CIM) and the U.S. Society of Mining Engineers (SME). Thus only that part of a mineral deposit that can be economically and legally extracted or produced can be identified and reported as an ore reserve.

In the case of the Scully Mine, the distinction between the CIM reserve definitions as required by National Instrument 43-101 for Canadian public companies, and the SEC rules, would be of minor importance for reserve reporting, since the process of reserve estimation as prescribed internally by Cleveland-Cliffs complies with general industry standards without reference to specific reporting requirements and rules. Following the CIM guidelines, the additional tonnages that would become available if a manganese reduction plant was to be built (see below), would qualify as “additional mineral resources”.

Recent Reserve History

The mineral reserves at the Scully mine have been quoted both as long tons of crude ore and as long tons of final product (pellets). In many cases, after a new complete reserve estimation had been completed, the reserves in the following years were simply calculated by subtracting the subsequent cumulative production from the earlier reserve estimate. An example was the period 1997-2002. If there are changes in market conditions or operating costs during a period, then the process of subtracting production tonnages from an earlier detailed reserve estimate can result in published reserve estimates that do not reflect current market and economic conditions. **Table 2** summarizes the recent Scully mine reserve history, expressed in terms of pellets rather than crude ore, and presents available reserve data for a few selected earlier years:

Table 2
Scully Mine Reserves, 1997 to 2005
– million long tons of pellets –

December 31	Original Estimate	By Subtraction	Manganese Cut-Off
1965	204		Unknown
1986	341		Unknown
1988	319		Unknown
1993	284		Unknown
1994		279	Unknown
1995	312		Unknown
1996	270		4%
1997		265	4%
1998		260	4%
1999		255	4%
2000		248	4%
2001		244	4%
2002	86		1.4% (75/25 blend)
2003	61		1.44% (70/30 blend)
2004		57	1.44% (70/30 blend)

After a review of the SEC 10-K reports filed by Cleveland-Cliffs for the years 1993 to 2004, and with particular note of the references to the reserves of the Scully mine, and taking into account the information provided by Graber (2005), the following observations and conclusions can be made:

1. The public mineral reserve reporting by Cleveland-Cliffs as reflected in the 10-K reports was presented without much supporting detail in the 1990s but changed to somewhat more detail starting with the annual report for 2003. There is still very little real information even in the most recent 10-K reports that would allow a knowledgeable person to critically assess the reserve estimates. This practice appears to reflect the corporate philosophy that "*Ore reserve estimates are highly confidential and information should only be shared with authorized personnel.*" (Cleveland-Cliffs Inc, 1999, page 3).

2. The subtraction of production tonnage from previous estimates of reserve tonnage over an extended period of time, such as happened for the years 1997 to 2001, disregards any changes in economic parameters, particularly the increase in operating costs that took

place in those years (**Figure 5** below). A corporate policy manual on ore reserve estimation (Cleveland-Cliffs Inc, 1999) requires “updating” of reserves at least every three years.

3. The original 1996 reserve estimate was based on the expectation that long-term marketable product could be produced from all material below a 4% manganese cut-off grade. However, as was shown in **Figure 4**, there was a major change in 1987 as to what the market would accept for manganese content in Wabush pellets. This important market factor was not reflected in the Wabush reserve estimates reported by Cleveland-Cliffs until 2003.

4. Material with a magnetite content of greater than 15% magnetite was included in the reserves that was later proven not to be viable concentrator feed. Treating such material would require capital expenditures for grinding and magnetic separation, and Cleveland-Cliffs advise that the tonnage of such high-magnetite material is not sufficient to justify the capital expenditure.

5. There was no engineered pit design incorporated into the reserves before 2003, so that ore reported as reserves was tied up by the ramp system. However, this item would be expected to be of comparatively smaller impact.

6. The basic drill hole coverage of the Scully deposit at 75 metres (250 feet) is too open to resolve the small-scale fold structures within the deposit. In-fill and definition drilling is continuing. While the additional drilling helps grade control, it is not obvious that the evolving better geological understanding of the deposit has affected the reserve estimate.

From these observations we conclude that the 1996 mineral reserve estimate for the Scully mine was flawed and biased high in tonnage, mainly due to the high manganese cut-off grade and the inclusion of the high-magnetite ore. By the end of 2001, operating cost increases since 1997, without corresponding iron ore price increases, had rendered the reserve statement as of December 31, 2001 invalid with respect to current economics, and similarly the projected mine life of about 40 years. The mineral reserve estimate as of December 31, 2002 reflected many of the foregoing observations, most of which were acknowledged by Cleveland-Cliffs in their internal communications, and consequently the year-end 2002 reserve estimate was a much more realistic assessment of the economic reserve base at the Scully mine.

Additional items that affected the further reserve tonnage reduction at the end of 2003 compared to 2002 are:

7. The ultimate mining depth in the West Pit, that contains most of the low-manganese ore, had to be limited due to the water inflow from Long Lake as described above. This is significant beyond the tonnage lost in the West Pit, as the loss further limits the blending possibilities for the overall reserves and the ability to blend in high-manganese ore.

8. Adverse changes in economic parameters including increased unit operating costs and the change in the Canadian dollar in 2003 from 1.54 to 1.31 to the U.S. dollar.

Figure 2 is a somewhat simplified cross section through the Scully deposit on line 14 000 E that shows the basic folded stratigraphy as discussed above, and the 1997 ultimate pit in comparison with the current ultimate pit. As illustrated, the reduction in mineable ore is restricted to the stratigraphically and structurally lower parts of the deposit, avoiding much of the high-manganese mineralization in units 51 and 53 (the stratigraphic effect) and excessive waste mining (the topographic effect).

Current Reserves and Mine Plan

The January 1, 2005 mineral reserves (or December 31, 2004) as estimated by Cleveland-Cliffs are summarized and compared to the year-earlier reserves in **Table 3** (source: Wabush Mines, 2005):

Table 3
Scully Mine Reserves January 1, 2004 and 2005
– thousands of long tons –

		January 1, 2004	**January 1, 2005**
Crude Ore	Long Tons	165 373	**154 000**
	Crude Fe	35.8%	**No Data**
	Crude Magnetite	3.6%	**No Data**
	Weight Recovery	36.9%	**37.1%**
Waste	Long Tons	111 905	**106 100**
	Strip Ratio	0.68	**0.69**
Concentrate	Long Tons	61 017	**57 200**
& Pellets	Fe	65.8%	**No Data**
	Mn	1.52%	**No Data**
	SiO_2	3.24%	**No Data**

Mine production in 2004 was 11.4 million long tons of ore, and 5.8 million long tons of waste and overburden, with the stripping ratio being 0.51, or less than the average of 0.68 required to maintain the balance between waste and ore over the remaining life of the mine. Pellet production of 3.8 million long tons in 2004 was less than the planned production of 6.0 million long tons because of a labour strike. The items in **Table 3** for which no data was available for the January 1, 2005 reserve estimate can be assumed to be very close to the data values for the previous year

when a reserve estimate was done in the normal detail by Cleveland-Cliffs, whereas the reserve data for January 1, 2005 resulted from the subtraction of 2004 production tonnages from the prior detailed estimate.

A report prepared by AMEC Earth & Environmental of St. John's for Wabush Mines on the long-term mine development plan for submission to the Department of Natural Resources in 2004 makes reference to a mine plan that was developed based on the January 1, 2004 reserves and that is informally known as the 10-K Plan. The Scully mine reserves would be exhausted at the end of 2013 according to this mine plan under the assumption of nearly full plant output. Changes in key economic parameters could affect the forecast date of reserve exhaustion because there remains a large tonnage of iron mineralization excluded from the 10-K Plan because of either high manganese content, or high magnetite content, or because the stripping ratio is too high to be economic at the pellet prices and production costs used in developing the 10-K Plan.

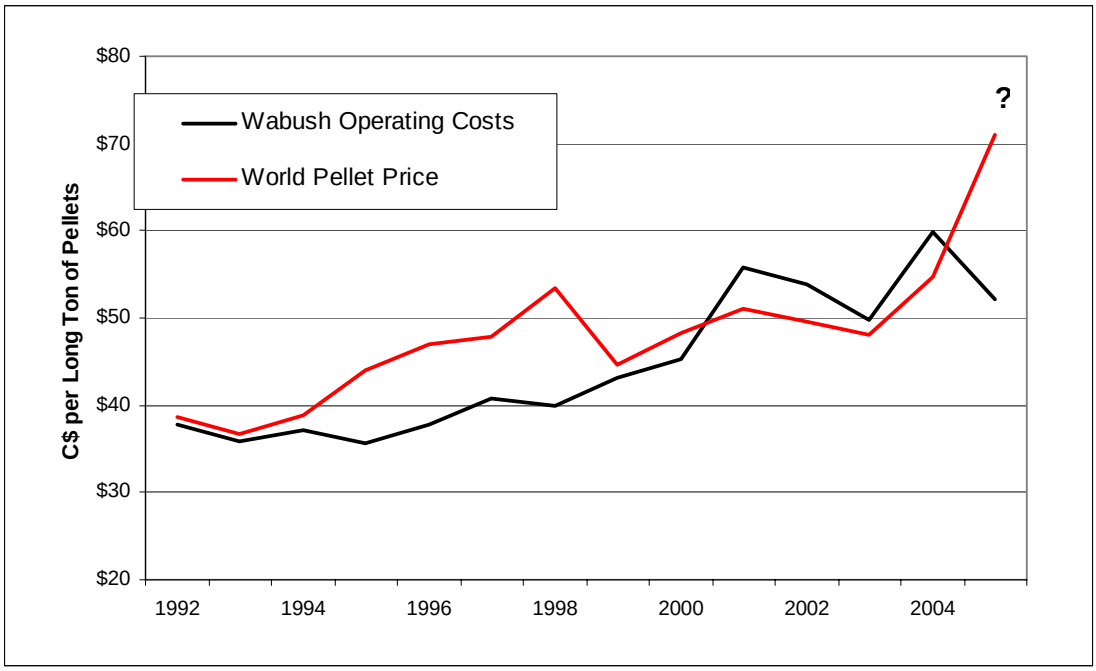
The mineral reserve estimate produced at the beginning of 2005 is again derived by subtraction from the estimate prepared a year earlier. A new estimate from first principles was being prepared at the time of our visit to the Wabush site in July 2005 and was expected to be completed by the end of the third quarter of 2005. It was to take into account the additional geological and hydrological information developed in 2004 and 2005, and to update the economic parameters, including pellet prices, exchange rate and unit operating costs. Expectations were that the positive and negative influences of those various parameters would more or less offset each other, and that the overall remaining production life of the mine would not change by more than one or at most two years from the 2004 mine plan.

Substantial changes in key parameters from those that were incorporated in the 2004 life-of-mine plan would have an impact on the projected mine life. Those sensitive key parameters would include an escalation of the water control challenges in the West Extension Pit, an increase in production costs, and on the positive side, the continuation of the strong global demand for iron ore that commenced in 2004 with the consequent effect on pellet prices.

The Influence of a Higher Pellet Price

The reserve estimate of 57 million long tons of pellets as of January 1, 2005, and the 10-K Plan, were originally developed in late 2003 and were based on a set of economic parameters that have now changed. Despite a noticeable further strengthening of the Canadian dollar with respect to the U.S. dollar in 2005 (which adversely affects the cost of a product sold in U.S. dollars), and continuing pressure on the unit operating costs, pellet prices (in Canadian dollars) have increased to a greater extent than the two cost items, providing for a positive operating margin which has not always occurred with the Wabush operations. (**Figure 5**).

Figure 5
Wabush Operating Costs and World Pellet Price, 1992 to 2005[1]



In 2004 and 2005 global iron ore prices increased as a result of strong demand with China responsible for much of that demand. Pellets from Canadian iron ore producers were reported by Natural Resources Canada to have increased in price by 21% in 2004 and by 86% in 2005. The impact of those price increases on sales revenue for Wabush Mines was not provided in the data made available for this review but in a press release of April 17, 2005, Cleveland-Cliffs reported that the 2005 increases in international pellet pricing would result in an increase of US$7.74 per ton of pellets sold from their six mining operations above the average 2004 realization of US$44.19 per ton.

If there was a continued positive trend in iron ore pricing, and thus far in 2006 there is the expectation that price increases will continue in the near term although not at the same rate as in 2004-2005, then one would think there would be the potential to extend the Scully operations to depth subject to limitations due to increased mining costs and maintaining a blend of manganese grades in the Wabush pellet products that meet market requirements. With reference to **Figure 2** (Section 14000E through the Scully mine), the substantial difference between the depth of the ultimate pit as designed in 2005 versus that which was planned in 1997 is notable. First and

[1] The data for **Figure 5** have been derived from a presentation to the Minister of Natural Resources on February 16, 2005 by Wabush Mines plus budget data for 2005.

foremost in assessing whether an increase in depth beyond that planned in 2005 is feasible will be the determination of whether the blend of manganese grades in the iron ore pellets would be as marketable as those being delivered at present. If that prospect was encouraging then a new mine design could be considered with the new pellet prices and expected mining costs being the primary determinants of what stripping ratio can be tolerated to allow economic extraction of additional reserves.

In a review of long-term mine planning options by Cleveland-Cliffs and as summarized in a report dated June 30, 2005 by S.J. Shoemaker, the Cleveland-Cliffs engineering group that evaluated the influence of the higher pellet price concluded that "*...this plan is not considered viable due to the very high material movement requirements in a very small mining footprint... requiring long lead times before ore is available for processing...*" (Shoemaker, 2005, page 9). This indicates that the current pit configuration creates physical constraints toward such an expansion that would require funding a substantial pre-stripping campaign. The study reported that the life-of-mine stripping ratio would increase to 1.12 from the current 0.68 and would require moving about 120 million tons of waste to get access to about 50 million tons more of ore. The mine life would be extended to 2016 from the 2013 anticipated in the 10-K Plan.

The Effect of a Manganese Reduction Plant

Cleveland-Cliffs has also evaluated the effect that the installation of a manganese reduction plant would have on the Scully reserves as reported by Shoemaker (2005). The plant, studies for which have been undertaken in the past, is assumed to reduce the manganese in the concentrate by 40% at a modest cost per long ton of pellets, without a reduction in weight recovery. The process is based on rejection of high-manganese non-magnetic material through one stage of low-intensity magnetic separation followed by two stages of high-intensity magnetic separation using rare-earth magnets. The pellet products would continue to have a manganese content of 1.2% to 2.0% and a lower-grade manganese pellet would not be produced. The main function of the manganese reduction plant would be to allow the mining of high-manganese ore, that is now considered waste, and thereby extend the life of the mine. Total cost of the manganese reduction plan was estimated in 2005 at about $40 million.

Shoemaker (2005) presents three scenarios that are distinguished by the different dates at which the manganese reduction plant becomes operational, and compares those scenarios to the current 10-K Plan, and the pit expansion plan based on higher pellet prices and current operating costs discussed in the previous section. The following is a summary:

Table 4
Summary of Manganese Reduction Plant Impact
– thousands of long tons –

	Current 10-K Plan	Pit Expansion Plan	Manganese Reduction Plant Operational in		
			2008	2010	2012
Crude ore mined (long tons)	148 901	196 922	281 788	230 444	179 410
Strip ratio	0.68	1.12	0.58	0.62	0.64
Pellet produced (long tons)	53 662	71 662	101 662	83 662	65 662
All material ratio	4.7	5.8	4.4	4.5	4.5
Mn in Concentrate without reduction	1.5%	1.5%	2.4%	2.2%	1.9%
with reduction	N/A	N/A	1.5%	1.5%	1.5%
Last Production Year	2013	2016	2021	2018	2015

The effect on the reserves of a manganese reduction plant would be quite significant, adding from two to eight years of production and reserves to the Scully operation depending on the year in which the reduction plant starts to operate. The approximate capital costs for the plant are substantial in absolute terms, but quite modest when related to each long ton of pellets added to the reserves. Under the assumptions of the Cleveland-Cliffs study, the net present value of the mine plan increases for the longer-life scenarios using the manganese reduction plant as compared to the 10-K Plan or the pit expansion plan. A key result of this study is that the strip ratio would actually be slightly reduced compared to the 10-K Plan, making it more practical from a mining point of view than the higher strip ratio for the pit extension plan that was primarily based on the continuity of an increased pellet price as discussed in the previous section.

The calculations and projections for the manganese reduction plan are based on a preliminary feasibility study that was undertaken several years ago and is in need of an update, which we understood Cleveland-Cliffs was intending to do. In our discussions with Cleveland-Cliffs management they have quite correctly emphasized that the success of a manganese reduction plant would very much depend on there being a continuing market for the current quality of Wabush pellets with their higher manganese content than is acceptable to much of the steel industry. It is not known whether the current owners of Wabush Mines, or other customers now buying the Wabush pellets, would be prepared to make a long-term commitment to purchase the Wabush pellets that would support an investment in the manganese reduction plant.

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