KOPPERS

KOPPERS COMPANY, INC.

ENGINEERING AND CONSTRUCTION DIVISION

H. A. DENNY
VICE PRESIDENT AND GENERAL MANAGER

PITTSBURGH · 19 · PA.

TELEPHONE
EXPRESS 1-3300

February 23, 1962

Mr. John C. Doyle, President
Canadian Javelin, Ltd.
680 Fifth Avenue
New York 19, New York

Dear Mr. Doyle:

Our P-40-6

We have reviewed the report on "The Smelting of Julian Concentrates by the Strategic-Udy Process" dated March 6, 1961 by Strategic-Udy Processes, Inc. The results of their actual test program in the 100 KW furnace and their extrapolation of these results to establish the general range of power and material usages foreseen for a large plant check quite closely with our own calculated estimates as reported to you some time ago, and as repeated below. We concur in their recommendations and in their conclusions.

We have no reservations as to the technical practicality of a smelting and steelmaking plant for processing the Julian concentrates, using the Strategic-Udy smelting process and either the basic oxygen furnace or the electric arc furnace for steelmaking, the choice to be made after detailed study of the comparative economics at the plant site chosen.

Using unit costs of raw materials, labor, power, etc. received from you, assuming that these costs are sufficiently accurate for the present purpose without further checking, we have prepared a preliminary estimate of the cost of production of ingots or continuous cast billets from the Julian concentrates with the plant located at Julian Lake. Comments on several of the items are included:

Estimated Production Cost

A. Smelting

1. Ore Concentrates — Cost Per Net Ton

You have estimated that 64.5% Fe concentrates will be available at the plant site at $3.00 per ton. At

Estimated Production Cost (continued)

	Cost Per Net Ton
This grade, 1.56 tons of concentrates will be used per ton of hot metal, for an iron cost of 1.56 tons x $3.00 per ton =	$ 4.70
In an operation in which only part of the production of the concentrating plant will be processed in the smelting plant, with the balance being shipped as high-grade concentrates, it may improve the overall economics of the venture to accept as feed for the smelting plant some lower grade of concentrates such as 60.% Fe, reserving the higher grades for shipment. Technically, this practice is within the capabilities of the Strategic-Udy Process at slight if any increase in operating cost.	
2. You have estimated that coal of approximately 55.% fixed carbon can be delivered at the plant site at $13.50 per ton. At this grade, .73 tons of coal will be used per ton of hot metal, for a reductant cost of .73 tons x $13.50 per ton =	9.80
In view of the high proportion of the cost of coal which results from the transfer and freight charges, it may be well to consider using a coal of much higher fixed carbon. For example, a 78% fixed carbon Pocahontas coal would require a usage of only .52 tons, which would justify a price $5.30 per ton higher than the 55% fixed carbon coal. We would feel that this higher fixed carbon coal would be available at considerably less than this increase in price.	
3. Limestone	
No specific source of limestone has been located conveniently near the plant site. Anticosti Island limestone could probably be delivered at the plant for not more than $8.50 per ton, with considerable savings resulting	

	Cost Per Net Ton
if any suitable source can be developed along the railroad from Seven Islands. Usage will vary with the grade of concentrate smelted, about .35 tons being a reasonable average. Limestone cost - .35 T at $8.50 =	$ 3.00
4. Electrodes	
Soderberg type - 15 lbs. at .07 per lb. =	1.05
5. Power	
Estimated power for smelting only, at 64.5% Fe, is 1000 KWH per ton. Assume power rate is $.005 per KWH, 1000 KWH x $.005 = (At this usage, product cost will vary $1.00 per ton for each $.001 change in power rate.)	5.00
6. Labor	
Estimating 1.4 man hours per ton, and using labor cost per man hour from your estimate at $2.70, labor cost will be 1.4 Mh x $2.70 = As mentioned above, no allowance has been made for climate and weather conditions in this figure, nor for the cost of employee training which may result from unusually high turnover.	3.80
7. Other Materials and Services	
Estimated at	4.15
Total estimated operating cost for smelting, per net ton (per gross ton)	$31.50 (35.20)
B. Estimated operating cost for oxygen steelmaking and ingot casting or continuous billet casting per net ton	15.00

		Cost Per Net Ton
C. Total estimated operating cost for continuous cast steel billets or ingots	per net ton	$46.50

General layout and elevations of a typical smelting and steelmaking plant are shown on the drawings enclosed, numbers DR-1012 and DR-1013. These will no doubt require some modification for local conditions after more detailed study of the project, but may be taken as generally representing the plant proposed.

The plant will employ about 600 men within the plant area, and will require approximately 100,000 KVA if basic oxygen furnace steelmaking is used, or about 110,000 KVA if electric furnace steelmaking is used.

We would estimate the capital cost of the plant to be of the following order of magnitude:

Material Handling	$ 1,500,000
Smelting and Steelmaking	26,000,000
General Facilities	14,500,000
	$42,000,000

For the further development of the project, we offer our services for the preparation of a detailed feasibility study and report, suitable for presentation to directors, investors, and other financial interests. This should include plant specifications and a firm quotation for the installation, a study of operating costs, manpower requirements and a manning chart, reviews of raw material, market, and logistics studies, and such financial studies as are required to develop financing requirements, working capital, cash flow at various operating rates and sales prices, etc. We will be willing to furnish this service at our cost, probably in the range of $35,000 to $50,000.

After completing a detailed feasibility report, Koppers is prepared to guarantee up to the extent of its fees:

1. That the capital cost of the plant will not exceed the amount quoted in the feasibility report subject to customary provisions for escalation.

2. That the plant will be capable of producing at the rate specified.

3. That the plant will be capable of producing product of the quality described in the feasibility report from the raw materials defined in the feasibility report.

Koppers is also prepared to participate financially in the venture up to the extent of our fee for the engineering and construction of this facility. Koppers will also undertake to furnish management advisory services if desired, similar to those furnished over a period of years to several integrated steel plants in South America and Europe.

Enclosed is a copy of a brochure "The Engineering and Construction Experience of Koppers" published several years ago which describes generally the breadth of our background and experience in the metallurgical field. Perhaps this may be of some use in your presentation of this project to interested parties. If there is any further way in which we can assist, please let us know.

Very truly yours,

KOPPERS COMPANY, INC.
ENGINEERING & CONSTRUCTION DIVISION

H. A. Denny
Vice President

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Enclosures