



# United States Department of the Interior

BUREAU OF MINES  
WASHINGTON, D.C. 20240

In Reply Refer To:  
EBM-MRED-MS-FM

December 6, 1973

AIRMAIL

Mr. Benjamin Alvarado  
Calle 64 No. 7-18 Apt. 1002  
Bogotá D.E., Colombia

Dear Ben:

It was nice to get your letter of November 28 and hear that you are still interested in iron ore. I think of you often and remember the pleasant times we had working together on the U.N. project.

I have not been concerned with iron ore for the last few years so took the liberty of discussing your letter with Fred Klinger, currently the Bureau's iron ore specialist, Francis Brantley, the iron and steel specialist, and Carl Rampacek, Assistant Director, Metallurgy. The following stemmed from our discussions.

We believe you are well advised to consult the Mineral Research Center of the University of Minnesota. Dr. Lawver, the director, has done a lot of work on concentrating iron ores by high-intensity magnetic separation, a relatively new process which may be applicable to Colombian ores.

French metallurgists have probably done as much as anybody else in the world to investigate means of beneficiating the Minette type ores. If you wish to consult with them I suggest you write to Jacques Astier, Director, Station d'Essais IRSID, Maizières-les-Metz, France. Jacques is well known to our mutual friend Andre Morelle.

Most of the work on the Minette ores of the United States has been on the Clinton formation ores of the Birmingham District, Alabama. Bureau metallurgists at the Tuscaloosa Metallurgy Research Laboratory worked on the problem from 1914 until about 5 years ago and published many reports on the subject. The latest work was under the supervision of Ignatz L. Feld, who is still at the laboratory. If you wish to consult him informally the address is Tuscaloosa Metallurgy Research Laboratory, P.O. Box L, University, Alabama 35486. I am sending him a copy of this letter.

The now defunct RN Corporation tested the Clinton formation ores for amenability to partial reduction in a rotary kiln pilot plant at Birmingham, Alabama, about 10 years ago. The RN Corporation was merged with divisions of the Steel Company of Canada, and Lurgi-Gesellschaft of West Germany to form a new company which currently is promoting the kiln process and equipment, now known as the SL/RN process, around the world. Lurgi is the operating company. The address is Lurgi-Gesellschaft, 6 Frankfurt (M), Federal Republic of Germany.

Ltr. to Benjamin Alvarado, Bogota D.E., Colombia  
Subj: Iron ore

The Bureau of Mines does not conduct metallurgical investigations on a commercial fees basis. However, it does make investigations for development of foreign mineral resources by arrangement between governments. Carl tells me that Bureau of Mines metallurgists would be glad to examine a sample of Paz del Rio ore to see if such a project might be fruitful and possibly advise you on the best approach to take. Practically all Bureau research on beneficiating iron ore the last few years has been done in Minnesota. The researchers there have had outstanding success, particularly with flotation. If you wish their opinion send a 10 pound sample, identified with our correspondence, to William M. McKewan, Director of Research, Twin Cities Metallurgy Research Center, P.O. Box 1660, Twin Cities Airport, Twin Cities, Minnesota, 55111.

If you decide to pursue a Bureau of Mines metallurgical investigation, it is best to start with your own government. Your officials can work through the U.S. embassy. Once the protocol is taken care of, the details are easily worked out directly.

Please let me know if I can be of further help. Good luck and have a Merry Christmas and a Happy New Year.

Sincerely yours,



Horace T. Reno,  
Supervisory Physical Scientist  
Division of Ferrous Metals