Ottawa, Ont.

March 31, 1923

REPORT

of the

ORE DRESSING AND METALLURGICAL LABORATORIES

The elimination of the impurities from Malagash Rock Salt - by R. K. Carnochan.

Test No.162

Samples of rock salt from Malagash, N.S. were received at the Ore Dressing Laboratories upon the following dates:

May 8, 1922	Sample No. 1	5.5 pounds net.
May 22 1922	Sample No. 2	9.5 " "
"	Sample No. 3	2.5 " "
"	Sample No. 4	5.0 " "
"	Sample No. 5	5.5 " "
June 26, 1922	Sample No. 6	871.0 " "

The rock salt was sent in by Messrs. Chambers and McKay, New Glasgow, N.S., and was discoloured. Tests were desired on this material to see if a process could be devised to remove the colour and produce a clean white salt.

The discolouration in the salt occurs in different ways. Some pieces are very dark and must contain a large amount of the discolouring matter, while others show just a faint even tint, and can only have a very small percentage of the impurity.

Analytical work by the chemists of the laboratories shows the colouring to be due to iron and organic matter. The salt as received ran about 7% water insoluble, of which 1.8% was Fe_2O_3 and 0.7% organic matter. This shows that the percentage of colouring in the salt is very small.

The discolouration is the chief objection to the salt, but the insoluble is also undesirable for when used to pack fish, it remains on them as a slime.

162

The following methods of treatment were tried:

1. Dissolving in water, filtering, and evaporating the filtrate. This gives a pure clean white salt. Before considering the installation of such a process, it was desired that experimental work be conducted to determine if the impurities could be removed by other methods involving a less costly installation.
2. The rock salt was sized and each size fed to a revolving furnace, temperature about 1100 F. the furnace discharge was sized. It was expected that either the salt or the dirt might decrepitate and go into the fines when the furnace discharge was screened. It was found that the salt and the dirt decrepitated about the same amount, for when screening no separation was evident.
3. Tabling the salt in a saturated salt solution on a small Wilfley table. This gives no concentration whatever as the dirt seems to be of the same specific gravity as the salt.
4. Dry magnetic separation in the Ullrich machine. This process removes only the very dirty pieces of salt. If the sample which is fed to the machines is quite dirty, it makes some difference, but when the sample is only slightly discoloured it does not remove anything.
5. The salt was sized and each size ground in a small pebble mill. The mill discharge was screened. It was thought that the dirt would not grind as fast as the salt, and upon screening the mill product it would be found in the coarse product. It was found that this method would not work as the dirt grinds almost as easily as the salt.
6. Washing the salt -80 mesh in a log washer using a concentrated salt solution as a wash. The washed salt was no cleaner than the feed to the machine.
7. Melting the salt and allowing the dirt to settle, while the salt is molten. This gives some separation - a lot of the dirt settles, but the salt produced is still discoloured.

CONCLUSIONS

None of the methods investigated would be suitable for the

treatment of the salt for the elimination of the impurities except that of dissolving and evaporating, the common practice with the majority of producers.

If this method is not adopted, closer selection of clean faces underground, closer sorting on the surface with the rejection of the discoloured material will be necessary to produce a clean salt in the various sizes required by the trade.

Chief, Division of Ore
Dressing and Metallurgy.