Minerals Recovery of Copper Mine Tailings on Lake Superior Coastline for Use as Raw Material in the Mfg. of Roofing Shingles

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Problem Statement

Copper was mined in the Keweenaw Peninsula for over 100 years. The copper was freed from the rock by stamp mills on the shores of Lake Superior and adjacent waterways. Upwards of 500 million tons of stamp sand waste were deposited in the waterways.

Problems that have resulted are:

• Deposits in confined waterways have a negative effect on the aquatic system.

• Large deposits on the shores of Lake Superior continue to erode into the lake and the effects on the ecosystem is unknown.

• Deposits have depressed lakeshore property values.

• In an area dependant on tourism, deposits are unsightly and unappealing.

Technology Description

The stamp sands are a viable new source of raw materials. The roofing industry currently has to mine and process rock for its needs. Stamp sands require minimal processing.

The technology issues and barriers to enable us to make this a viable solution are:

• Use physical and chemical characterization and product testing to confirm the use of G-Sand™ for roofing granules.

• Determine ways to utilize the by-product.

• Explore new processing techniques to lower costs.

• Explore copper leaching techniques to add value to the processing.

• Explore ways to lower transportation costs.

Expected Results

The results from our investigation will guide us in transforming this research project into a viable business enterprise.

We feel strongly our findings will lead us to the following:

• A deep understanding of the physical and chemical properties of the stamp sands of the Keweenaw and their commercial applications.

• New uses will be explored for the stamp sands such as algae and bacterial deterrents.

• New knowledge will be gained in material processing and copper leaching techniques.

Potential Environmental Benefits

Removal of the stamp sands has always been the ultimate solution but the least practical. By utilizing the stamp sands we are removing potential environmental harm.

Potential benefits include:

• Improvement of the fish and aquatic systems of the area.

• Removal of the source of dust from the stamp sand wastelands.

• Stop the continued erosion of stamp sand banks into the waterways.

• Remove the source of migrating sand that plugs harbors and channels.

Fig. 1 Stamp sands erosion into Lake Superior.

Fig. 2 West end of Torch Lake showing stamp sand filling half the lake. Stamp mill stack in background.

Fig. 3 A pond at Point Mills. The pond has existed for 50 years and has no algae growing in it.

Fig. 4 Setting sun on Lake Superior, North Entry, lighthouse on left.

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