

NRRI researches taconite rock

Taconite rock, found in overabundance on Minnesota's Iron Range, makes an extremely durable and high-performing aggregate, according to research at the University of Minnesota Duluth's Natural Resources Research Institute (NRRI).

It has been used extensively in the Northland, but this week it will be transported from Duluth to Chicago via the Great Lakes, testing its "shipability" and potential as a new, readily available aggregate product for other areas.

Chicago's local aggregate sources are primarily limestone-based, a softer rock than taconite. Iron Range aggregate could meet their needs for a tougher surface treatment on roads. That could mean longer lasting roads for the greater Chicago area, less road construction and less overall cost.

NRRI's research also shows that hard taconite rock has excellent friction characteristics for safer driving conditions when applied to the road surface.

Some of the shipment will also go to a Chicago area cement and concrete manufacturer because the silica and iron ore in taconite are major ingredients in the manufacturing of Portland cement.

Millions of tons of Iron Range taconite rock are available in northern Minnesota, without the need to create or expand gravel

quarries in busy urban areas where aggregate is needed.

"The logistics of moving the aggregate in a cost-effective way has been the tough part," said NRRI geologist Larry Zanko, principal investigator on the project. "But the tug and barge system offers promise for efficient transportation."

The vintage barge Pere Marquette 41 and tug Undaunted have been in operation on the Great Lakes since 1997, but this is her first trip on Lake Superior.

The barge can carry 5,000 net tons of dry bulk or 240,000 cubic feet of cargo.

Depending on weather, it will take four to five days to move the 5,000 tons of aggregate rock to Chicago.

"Not a single taconite pellet is being produced right now on the Iron Range," said Zanko. "This highlights the importance of tapping into taconite rock as a more durable, more sustainable, and more energy-efficient alternative to lesser-quality crushed stone, especially as the nation's transportation infrastructure needs serious upgrading."

Many port businesses are excited about the possibilities in a new product from the Iron Range. Hallett Dock Company hopes to attract customers that can take advantage of the movement by bringing their bulk products to Duluth on the up-bound trip, according to Hallett Dock President Mike McCoshen.

"We're unique because

we're not product-specific like the coal docks, ore docks or grain elevators," said McCoshen. "We're more of a bulk commodities boutique, and can ship 500,000 tons to 5,000 tons, like this project. We hope there is potential for the long-term on this one."

The Duluth Seaway Port Authority anticipates that, if demand for taconite aggregate grows, it could eventually be carried on larger vessels at an even lower cost per ton.

"This shipment of taconite aggregate is a great example of how the cost and fuel efficiencies of waterborne transportation can open up new, niche markets around the Great Lakes," noted Ron Johnson, the Port Authorities' trade development director.

Earlier this month, the Lake Carriers' Association reported that Great Lakes iron ore shipments are down 70 percent from last year at this time because of the economic downturn. A new potential product from the Iron Range is a welcome bit of good news.

"For those of us in the shipping business, this is a ray of sunshine in a cloudy sky," said Pere Marquette Operations Manager Chuck Leonard.

Laurentian Aggregate of Duluth worked closely with NRRI and was instrumental in facilitating this shipment. Funding for NRRI's aggregate research is provided by the U.S. Department of



Commerce (Economic Development Administration), Iron Range Resources, Blandin Foundation, Minnesota Power, Minnesota Technology, Inc., and the University of Minnesota Permanent Trust Fund. The mission of **NRRI** is to foster the economic development of Minnesota's natural resources in an environmentally sound manner to promote private sector employment.