Eagle is landing

Kennecott's Eagle project, situated in the Upper Peninsula of Michigan, US, holds a high grade magmatic sulfide deposit containing nickel and copper. Dan England headed for the land of the Yoopers to discover Eagle's story.

The land now known as the Upper Peninsula of Michigan was, in the 1830s, a place that no one really wanted, not even Michigan. It was described in a federal report of the time as "a sterile region on the shores of Lake Superior destined by soil and climate to remain forever a wilderness." It's even cut off from the rest of Michigan, linked only by the soaring Mackinac Bridge, across the merging waters of Lake Michigan and Lake Huron.

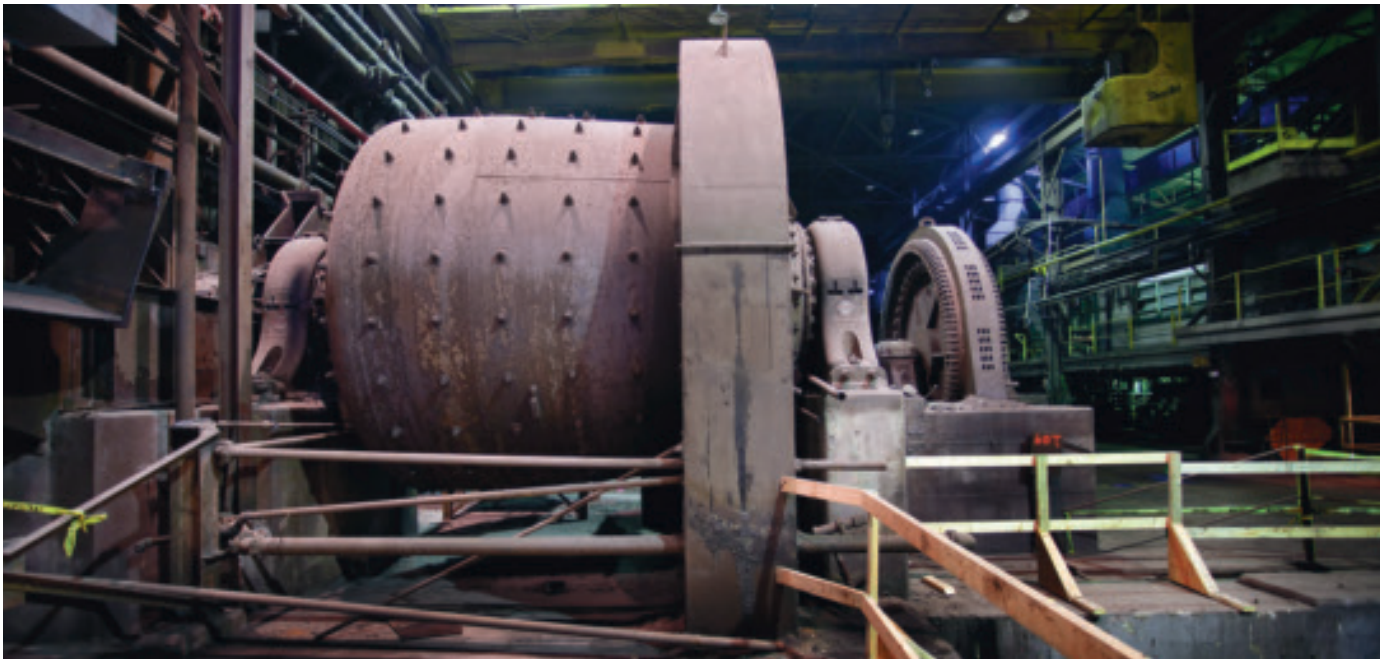
Its isolation might have been perpetual, but for what was found beneath all that soil and snow: rich deposits of copper and iron ore that steadily fuelled the new nation for more than a century.

Today, it is still a pretty rough hewn place, populated by people best described as "independent thinkers" who meet change with scepticism. They are there because they like being left alone with fish and wildlife and trees and the Upper Peninsula's particular kind of culture and beauty. (Make no mistake, its wild beauty is a thing to behold, especially during the several weeks of summer). And while mining is a huge part of the heritage of the Upper Peninsula (UP as it is referred to there), so were mining operations that were careless of the environment. For Yoopers (as they affectionately call themselves) the environment is not some sort of celebrity cause but a serious part of who they are and how they live.

Andrew Ware, a geologist for Kennecott (a wholly owned subsidiary of Rio Tinto) recalls that before finding Eagle, there was a long period of determining "a whole lot of places in the UP where deposits were

The rocky outcrop in Michigan's Upper Peninsula (left) where the Eagle nickel-copper deposit was discovered.

Mining heritage. Interior of the Humboldt mill, which will be refurbished to process ore from the Eagle mine. Below, miners' cottages from a previous era.



not." Then, in 2002 an exploration team came upon a six acre magmatic sulfide deposit, the kind that nickel and copper find irresistible. This was not a minor deposit of minerals but one with copper content of more than four per cent (compare Kennecott's operation in Utah where the copper level is 0.54 per cent). And the nickel is even richer, at 6.24 per cent (Cu Equivalent). Moreover, the site will be the only primary nickel mine in the US and when fully operational it is expected to yield 300 million pounds of nickel and 250 million pounds of copper over the life of the mine.

For Rio Tinto, adding nickel to the portfolio is desirable and for Michigan's UP, with its struggling county and local governments, hard hit by the recession and high unemployment, it seemed to be a find of enormous promise.

The mine site is part of a 1,600 acre parcel, but the land used for the project will be less than 120 acres. The mining will be carried out entirely underground. An office building, truck wash and small area for temporary storage of development rock will occupy the site, as will a state of the art water treatment plant.

Vicky Peacey is the Health, Safety and Environment manager for the project. "This water treatment plant uses a reverse osmosis system that makes the water so clean that minerals would need to be added to make it drinkable." Then she says with some passion: "This entire mine project is designed around environmental protection."

Happily, processing of the nickel and copper can take place in Humboldt, around 30 kilometres away, at a previously abandoned iron ore plant.

This brownfield project will mean remediation of the contaminated land, structural improvements to the building and equipment and an environmentally sound way of disposing of the sulfides. It will also mean about 500 construction jobs and some 200 permanent jobs.

But memories are long in the UP and no one, not even those associated with mining for years, was willing to trade good water for nickel. In fact, so insistent was the populace that this mine project be done right or not at

all that the Michigan Department of Natural Resources and the Environment sought new mining legislation – what became known as Part 632 – that would be more stringent than any in the US. Rio Tinto welcomed the move, and sat at the table with environmentalists, residents and politicians to hammer out words that would translate into operations that would provide real protection to the environment and satisfy the public.

One of the sponsors of the legislation, State senator Mike Prusi, whose district covers much of the UP, was an early supporter of both the mine and the new rules for mining. "You can't weave a computer or knit a Prius. We need minerals and metals to sustain society and the community needs the benefits from the revenue.

I believe what we came up with in terms of laws and administrative rules is very strong."

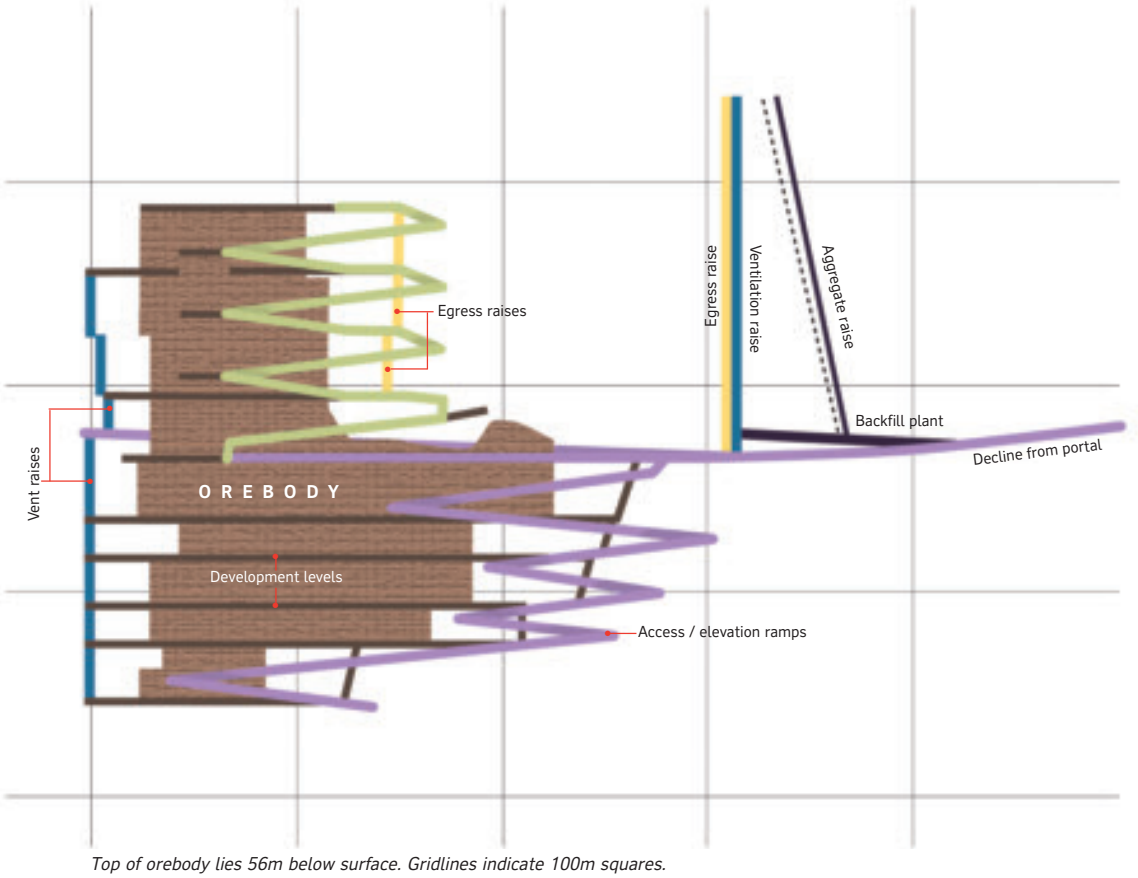
Jon Cherry, the general manager of the Eagle project, reflected: "We welcome the law. It provided a forum for dialogue with all the stakeholders concerned and it makes excellent environmental sense."

The permitting process for the project has been painstakingly thorough. Jon Cherry again: "The key to it all is not just to follow the rules but to exceed the rules. We present our case with meticulous attention to the facts, the technical design and the science. If you are patient and allow the process to work, you'll be successful. For Rio Tinto, this success in our first greenfield US project means that other good projects can follow."

As important as the development of the operational plan for the mine itself has been, Rio Tinto recognised early on that interaction with the community was also critical.

At the beginning of the project, Kennecott reached out to the Lake Superior Community Partnership for support and Northern Michigan University to host public hearings. The president of the University, Dr Les Wong, saw a role for the university in the process and not just because they had ideal meeting space.

"I wanted the right questions to be asked," he said. "That's part of a



Top of orebody lies 56m below surface. Gridlines indicate 100m squares.

The underground mine has several openings to the surface: a main decline tunnel, a primary ventilation system, an aggregate rock system to take clean aggregate to the Cemented Rock Fill Plant and an emergency route to the surface. The mine levels are accessed from the decline tunnel which also serves as the mucking access for development of the "steps" that contain the actual ore and are mined in vertical sections. Every other step is mined and then filled with either cemented rockfill generated at the backfill plant or development waste. Ore is drilled and blasted from the upper area of each step and dug out from the lower level by loaders that in turn load trucks that take the ore to the surface.

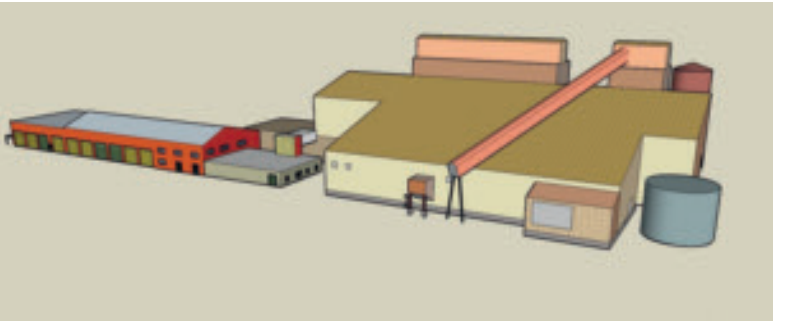
university's job. So we encouraged students and faculty to become involved. They, along with members of the community, showed a lot of interest and turned out to the meetings. A lot of good, hard questions were asked. And the company approach of honestly answering those questions worked."

Joe Cram, who runs the Hungry Hollow café and general store in an end-of-the-road town named Big Bay, is a community leader; he was an early sceptic, but now supports the project because he believes that Rio Tinto will do right by neighbouring communities to the mine and the related mill. "Three years ago," he tells me, "you would be hard pressed to find anyone who would voice support for the project. But now, I have to say, they're coming around."

Chantae Lessard and Matt Johnson, who, respectively, handle community and government relations locally, have been instrumental in building trust, holding community discussions and meeting regularly with key members of the community like Joe Cram.

Chantae explained: "People were concerned, for example, that trucks from the mine were going to be using the main road to Big Bay and that the trip between the mine and the mill would put the trucks on public roads." The proposed solution is a new road, called Woodland Road, which will mean mining, logging, and other aggregate trucks will no longer use the main road. It's a road that can be used by the public as well. Another infrastructure improvement is the upgrading of power lines to Big Bay so as to provide a more consistent electricity feed.

Chantae and Matt also talk with local politicians. John Olson, supervisor for Michigamme Township, is one of them and he's enthusiastic. "This project is going to make a huge difference to us. When the taxes start coming in, our budget will go from around US$300,000 to something like US$2,000,000."



Computer graphic of the concentrator which will process ore. Left, drill core from the exploration phase, showing the presence of nickel.

Vicki Lempinen, superintendent of Schools for Republic and Michigamme townships, explains that it will mean full funding for the 160 kids and 13 teachers, not to mention upgrades to the school infrastructure. "The revenue will make all the difference to the school. We're just trying to hang on until the mine comes on line," she said. "The project is exciting because it means more opportunity for the kids who want to stay here."

At times, there have been so many moving parts that had to be fitted into place – operational, legal, technical, environmental and social – that some wondered whether it all would come together. But now, on the verge of some actual mining taking place, it seems that it has. Says Jon Cherry with a smile, "I've invested seven years of my life here. I look forward to finally seeing some nickel."

Read more about Kennecott Eagle at www.eagle-project.com

Dan England is a writer and journalist, based in Fairfield, Connecticut.

A taste of Upper Michigan

"First, I popped into a knapsack a bag of one of Upper Michigan's best kept secrets – *korppu*, the flavoursome hard cinammon toast Finnish loggers once carried into the woods for their midmorning coffee breaks. The most sought after *korppu* is also called 'Trenary Toast' for a celebrated bakery at Trenary, a tiny town in the waist of Upper Michigan between Marquette and Escanaba. Every day the toast is baked fresh and shipped to cafés and supermarkets all over the Upper Peninsula and to mail order customers, most of them exiled Yoopers, in every state of the nation . . . a little *korppu* slathered with butter and softened by hot coffee gives a jolt of energy that easily lasts until lunch . . ." – *From "A Venture into Murder", a thriller by Henry Kisor set amongst the ancient mine workings of the area. To sample* korppu*, visit www.trenarytoast.us*