Case Study

Award Winning Closure Vision

Vale

Whistle Mine, Sudbury ON, Canada

>Before

Whistle Mine was a satellite nickel orebody that was developed by Inco Ltd. (now CVRD Inco Ltd.) between 1988 and 1998. Approximately 6.4 Mt of waste rock was stockpiled on the surface during the life of the open pit mine. Due to its acid-generating potential and proximity to local surface water receptors, all waste rock was relocated to the open pit between 2000 and 2001.

Okane was engaged to assist with detailed design of a full-scale dry cover system for the open pit (backfilled with acid-generated waste rock).

>Approach

Design objectives for the cover system were to reduce the ingress of atmospheric oxygen to the underlying waste material, reduce the entry of meteoric water to the underlying waste material, and provide a medium for sustainable vegetation cover. Detailed design called upon data gathered from an Okane designed and instrumented field cover trial which ran over the two previous climate cycles.

Okane completed the following key aspects of the design process:

1. *Development of a full-scale construction cost estimate to allow informed selection of the most appropriate cover solution;*
2. *Material characterisation of potential borrow source material for use in the cover's barrier layer and of growth medium materials;*
3. *Complete detailed soil-atmosphere numerical modelling (VADOSE/W 2D model) calibrated to results from test cover plot monitoring, to confirm the selected cover system design would satisfy cover system objectives;*

Before:
Open pit covered with acid-generating rock.

4. *Design of a cover system performance monitoring program;*
5. *Slope stability analyses of the preferred pit cover system;*
6. *Design of the landform's surface water management system using landform evolution and erosion numerical modelling;*
7. *Development of a revegetation plan for the pit cover system; and*
8. *Design of earthworks for integration of the cover system into the surrounding terrain.*

>After

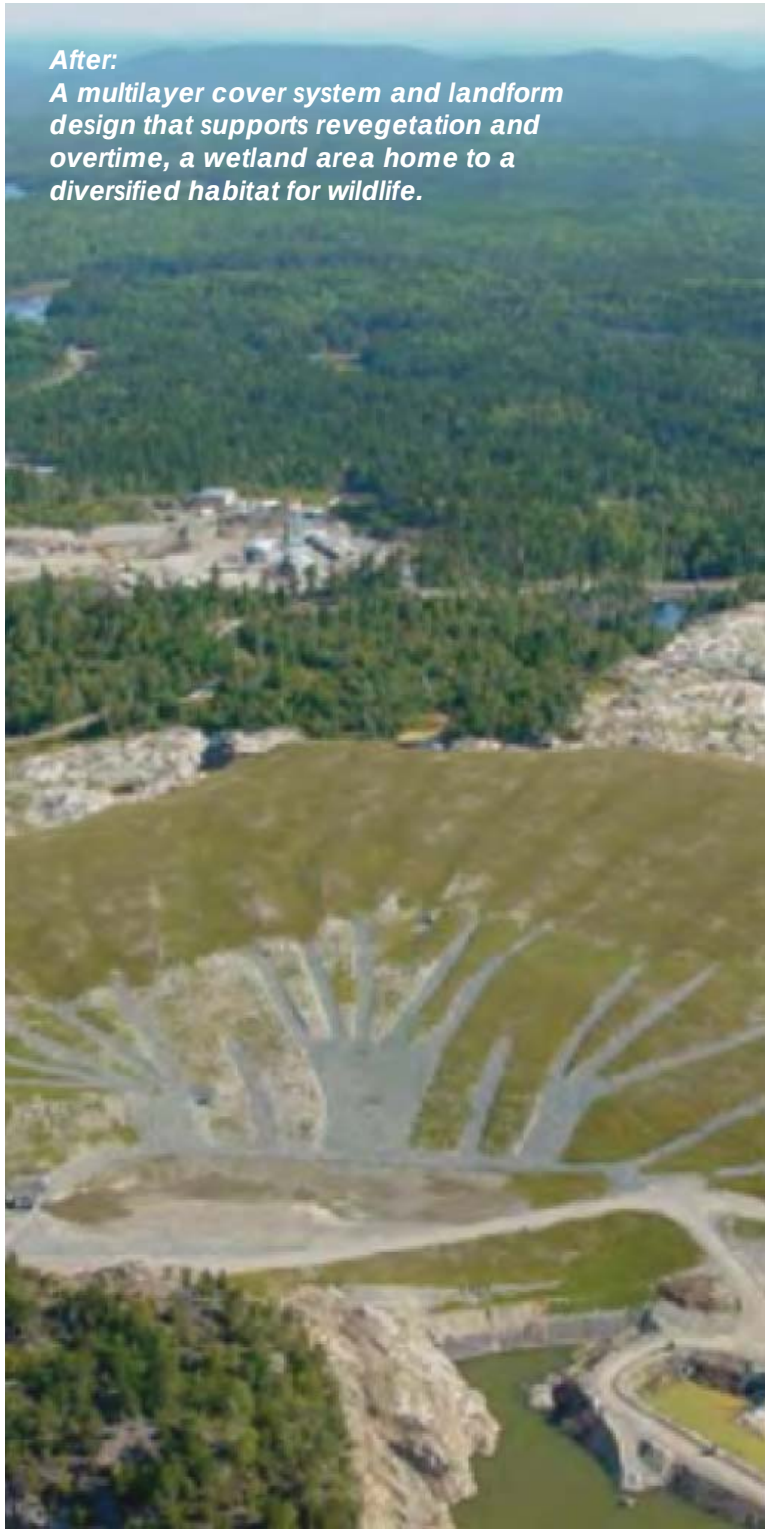
A multilayer cover system and landform design that supports revegetation and overtime, a wetland area home to a diversified habitat for wildlife.

The reclamation works at Whistle Mine were awarded the Tom Peters Memorial Mine Reclamation Award at the second annual Ontario Land Reclamation Symposium hosted by the Canadian Land Reclamation Association (CLRA) and Ontario Mining Association (OMA) in 2009.

> ***A multilayer cover system and landform to support revegetation and a biodiverse habitat.***

Integrated Mine Closure and Relinquishment Solutions

okane 25 YEARS



After:
A multilayer cover system and landform design that supports revegetation and overtime, a wetland area home to a diversified habitat for wildlife.