Northgate Minerals Corporation – Kemess South Mine

Reclamation & Closure Preparation

Minerals North Conference 2009, Fort St. James, B.C.

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Environmental Manager
Presentation Outline

- Kemess Operational History
- Reclamation Closure Plan document & Strategy
- 2008 – 2011 Reclamation Programs
- Closure Monitoring
Kemess Overview

- **Cu – Au Open Pit Mine**
  - Spring 1998 to Q3 2011

- **Work Force**
  - ~350 Full time Kemess Employees
  - ~125 Full time Contractor positions

- **Mining & Milling Average Daily Rates**
  - 146,000 tonnes / day (waste + ore)
  - 52,300 tonnes / day (ore)

- **Average Annual Production**, 
  - 250 - 300,000 ounces of gold
  - 65 - 75 million lbs copper
Reclamation Closure Plan Document

Submitted to BC MEMPR on August 20, 2007

Copies have been provided to the following:

- BC MEMPR and BC MoE,
- TSF - Geotechnical Review Panel,
- Takla First Nation,
- Tsay Keh Dene First Nation,
- Kwadacha First Nation,
RCP Preparation

Reclamation Prescriptions, Volume I
- AMEC Earth & Environmental
- Kemess Environment Department

Water Quality Modeling & Prediction, Volume II
- Klohn Crippen Berger
- Marsland Environmental Associates
- EcoMetrix Incorporated
Reclamation & Closure Prescriptions

Prescriptions for key areas:
- Open Pit
- Waste rock dumps
- Tailings storage facility
- Plant facilities
- Water collection and diversion structures
- Ore stockpiles
- Construction borrow areas
- Reclamation media storage areas
- Airstrip
- Minesite access roads, including a small portion of the ORAR
- Minesite power distribution system
Reclamation Strategy

- End Land Use Objective is Wildlife Habitat
  - Vegetative mosaic of open spaces & treed areas

- Successional Reclamation
  - Prepare surfaces to promote ingress of native vegetation
  - Plant key pioneering species
  - Use native seeds and plants to greatest extent possible

- Total disturbed area to be reclaimed ~ 600 ha
Reclamation Programs & Schedule

- 2000 Annual progressive reclamation was initiated and ongoing
  - Surface preparation
  - Hydro seeding & Hand seeding
  - Willow whips and tree seedling

- 2008 – 2010 use existing mine fleet for heavy earth works over next 3 years

- 2008 Initiated collection of native seed and cones for propagation;

- 2013 All reclamation prescription work to be completed
Annual Reclamation

Hydroseeding

Sediment Control
Progressive Reclamation
2008 Native Seed Collection Program
Reclamation Program 2008

- Reclamation of the Tailings Dam Buttresses
  - ~ 60 ha reclaimed
  - Placement of growth media & Surface Preparation
  - Planting of trees (pine and spruce) and pioneer species (willow, lupine)

- Collection of native seed and cones for propagation
  - Lodgepole Pine (60,000 seeds); Arctic Lupine (40,000 seeds), Fireweed and Northern Rough Fescue

- Ongoing reclamation of Borrow areas adjacent to Dam
  - Recontouring; fertilizing; seeding
Placement of Growth Media
Growth Media – Placement and Preparation
Planting
Tailings Dam September 2008
Reclamation Program 2009

- PAG Waste Rock Re-handle to the West Pit ~5.3M tonnes

- Waste Dump
  - Resloping utilizing mine equipment
  - Surface Preparation

- Ongoing reclamation of Borrow areas adjacent to Dam
PAG Waste Rock Re-Location
Waste Dump Test Plots & Contouring
Reclamation Program 2010 & 2011

- Complete PAG Waste Rock Re-handle to West Pit
- Continue Waste Dump Reclamation
  - Contouring, Overburden Placement & Re-vegetation
- TSF Spillway Construction
- Final reclamation activities in Borrow areas
**Reclamation Program 2012**

- Removal of plant and camp infrastructure
- Decommissioning of ponds and diversion structures
- Construction of closure drainage features
- Final surface preparation & planting
- Reclamation success assessments (annual)
- Water quality monitoring; TSF monitoring
Closure Monitoring

- Vegetation
- Water Quality
- Geo-technical
  - Tailings Dam & Pit
  - Site inspections & remote automated monitoring
- Closure Monitoring will be initiated in 2012
THANK YOU!