



Northgate Minerals Corporation – Kemess South Mine

Reclamation & Closure Preparation

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



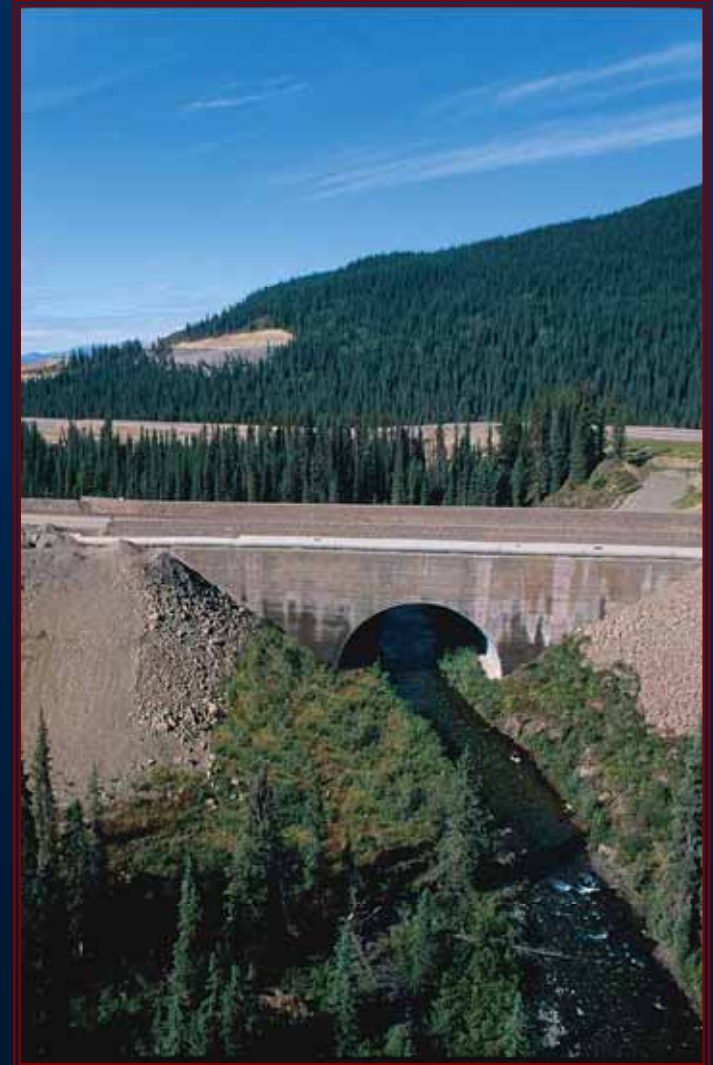
Harold Bent, P. Geo
Environmental Manager





Presentation Outline

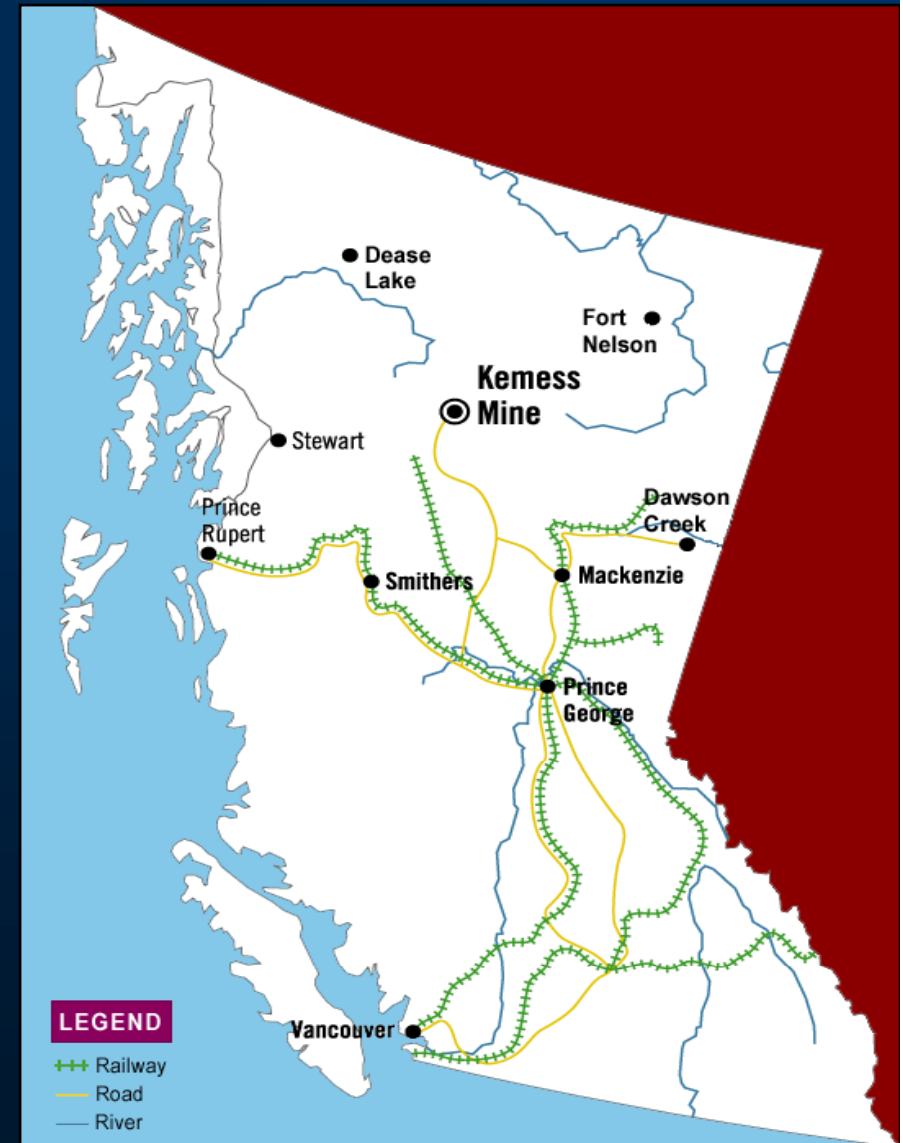
- Kemess Operational History
- Reclamation Closure Plan document & Strategy
- 2008 – 2011 Reclamation Programs
- Closure Monitoring



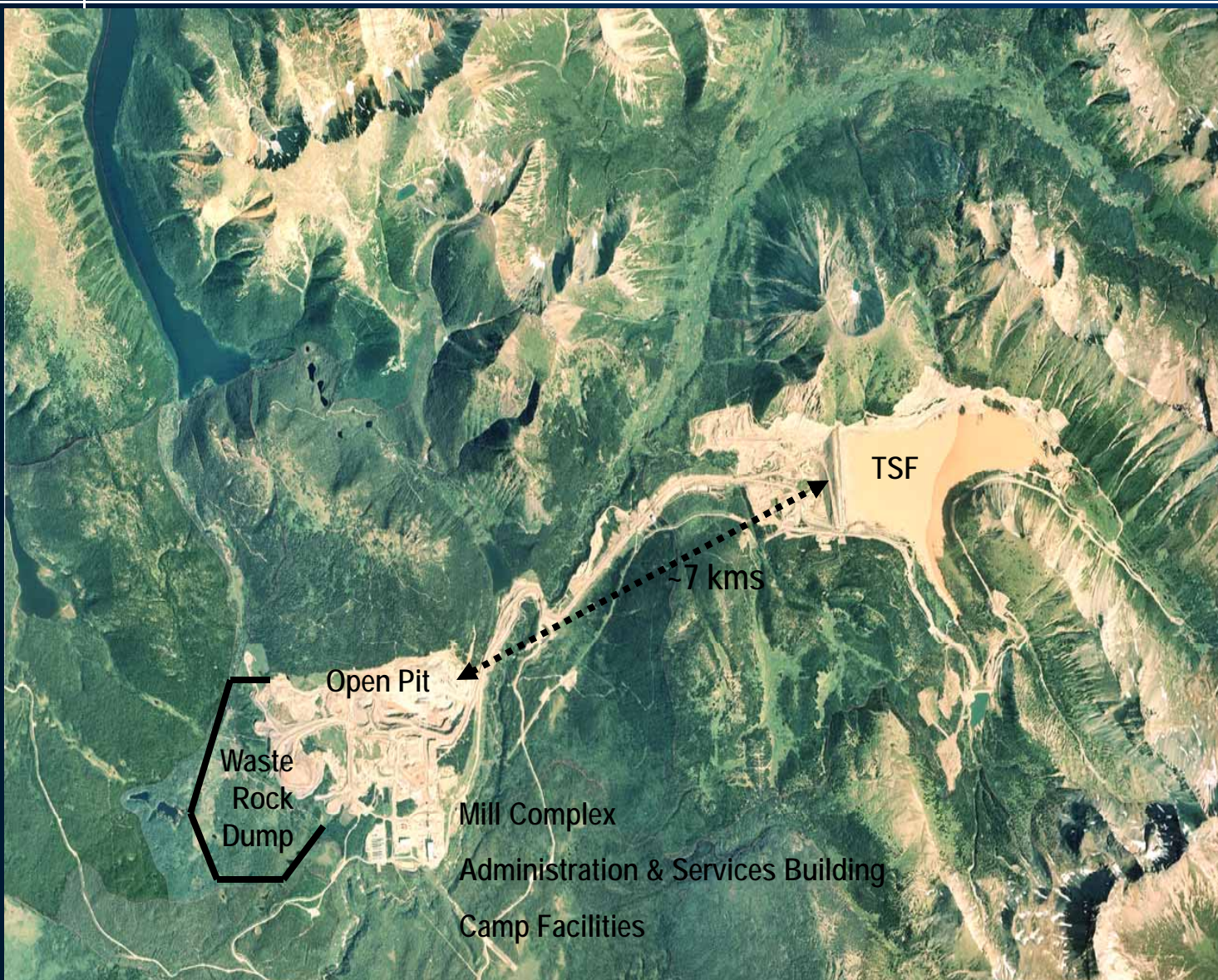


Kemess Overview

- **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



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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,





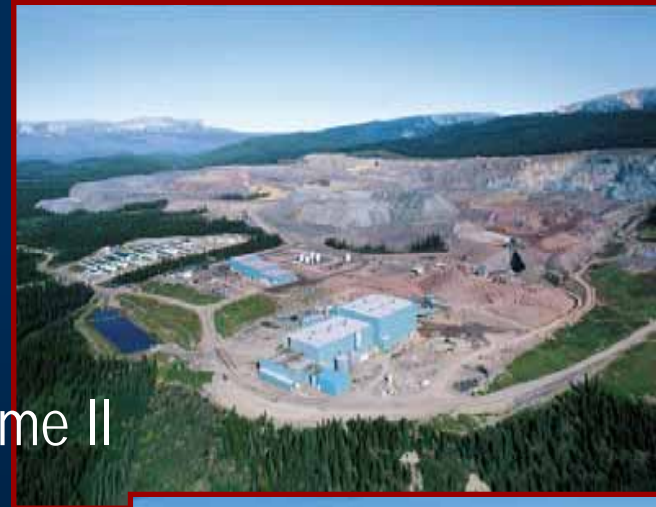
RCP Preparation

Reclamation Prescriptions, Volume I

- AMEC Earth & Environmental
- Kemess Environment Department

Water Quality Modeling & Prediction, Volume II

- Kohn 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



Tailings Dam June 2006





Placement of Growth Media





Growth Media – Placement and Preparation



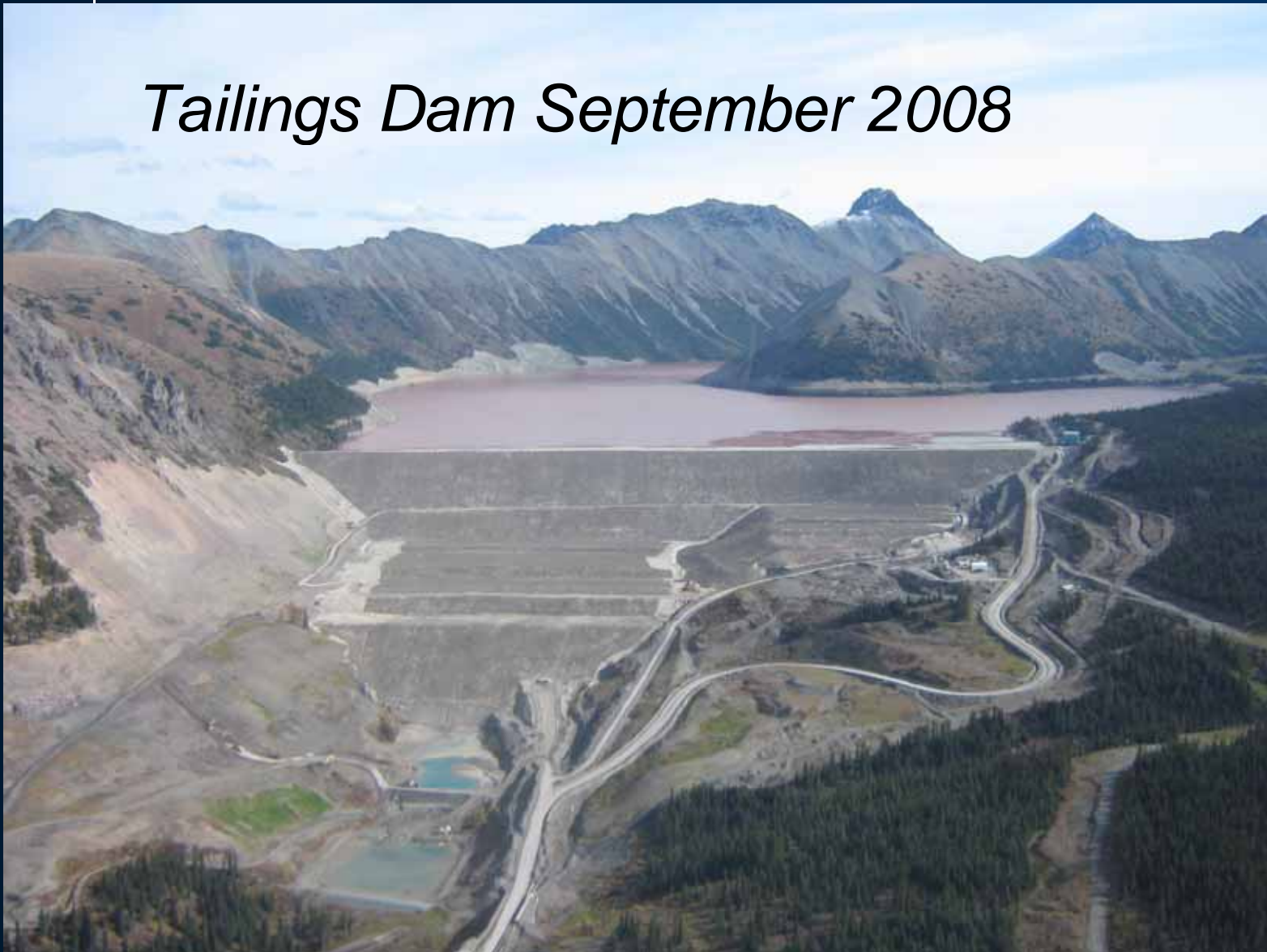


Planting





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!

