Former Tipple Mine Site Remediation and Reclamation Program

Environmental Services Association of Alberta

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Presented by:

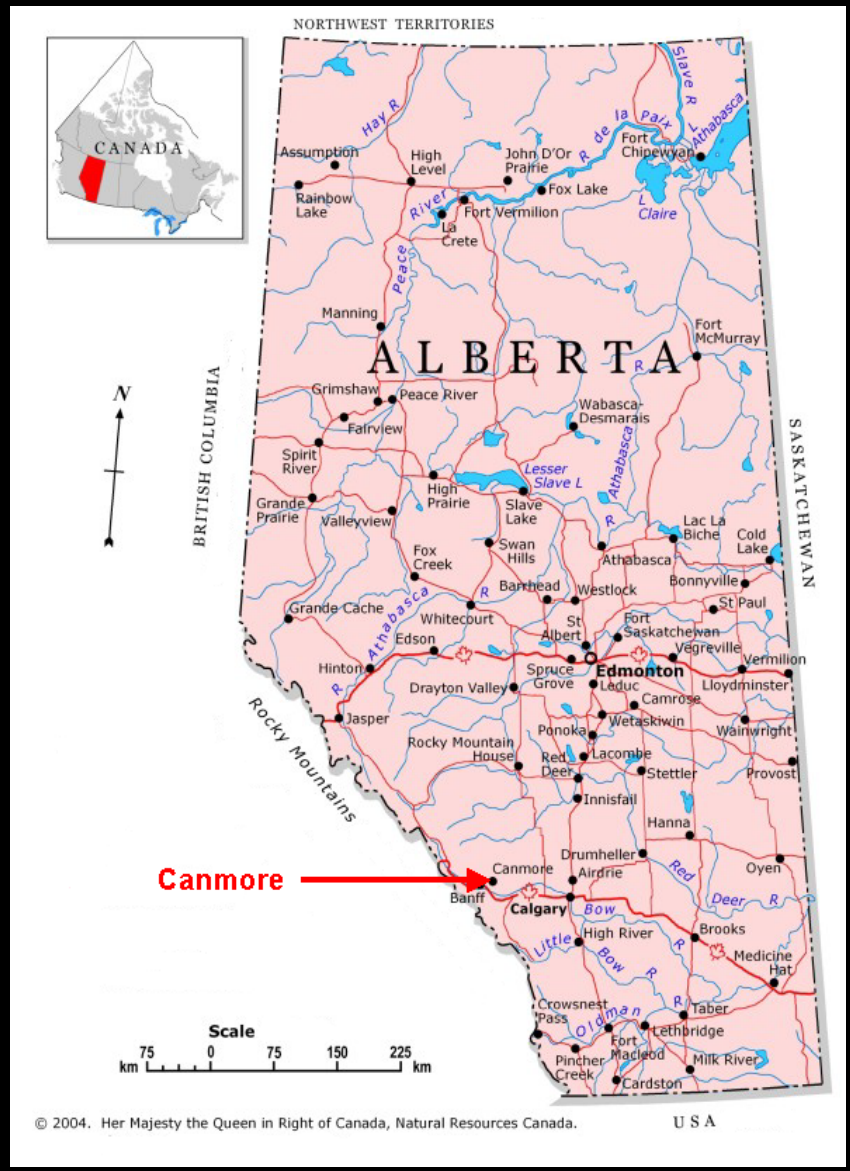
AMEC Earth & Environmental

Brian Geddes, P. Eng.

Presentation Overview

- Site Background & History
- Project History & Development
- Remediation & Reclamation Plans
- Public Consultation Activity
- Photos
- Project Outcomes

Site Location



Site History

- Tipple for underground coal mine from ’40s until late ’70s.
- Physical separation process; product coal separated from waste rock.
- Produced coke and briquettes as a sideline in the ’60s.

- Coal tar from coking operation disposed to pits.
- Site dismantled and surface re-contoured (including dispersal of pits) in 1979.
- Area re-developed to high end residential from late ’80s to current.

Operating Site - 1967

Project History and Development

- Coal tars discovered at depth during a sewer line installation in 1998.
- A series of eight intrusive investigations and assessments were completed between 1998 and 2005, all undertaken in consultation with Alberta Environment.
- AMEC contracted by McDermott International, the company that holds responsibility for some of the legacies at the site.

Project Objectives

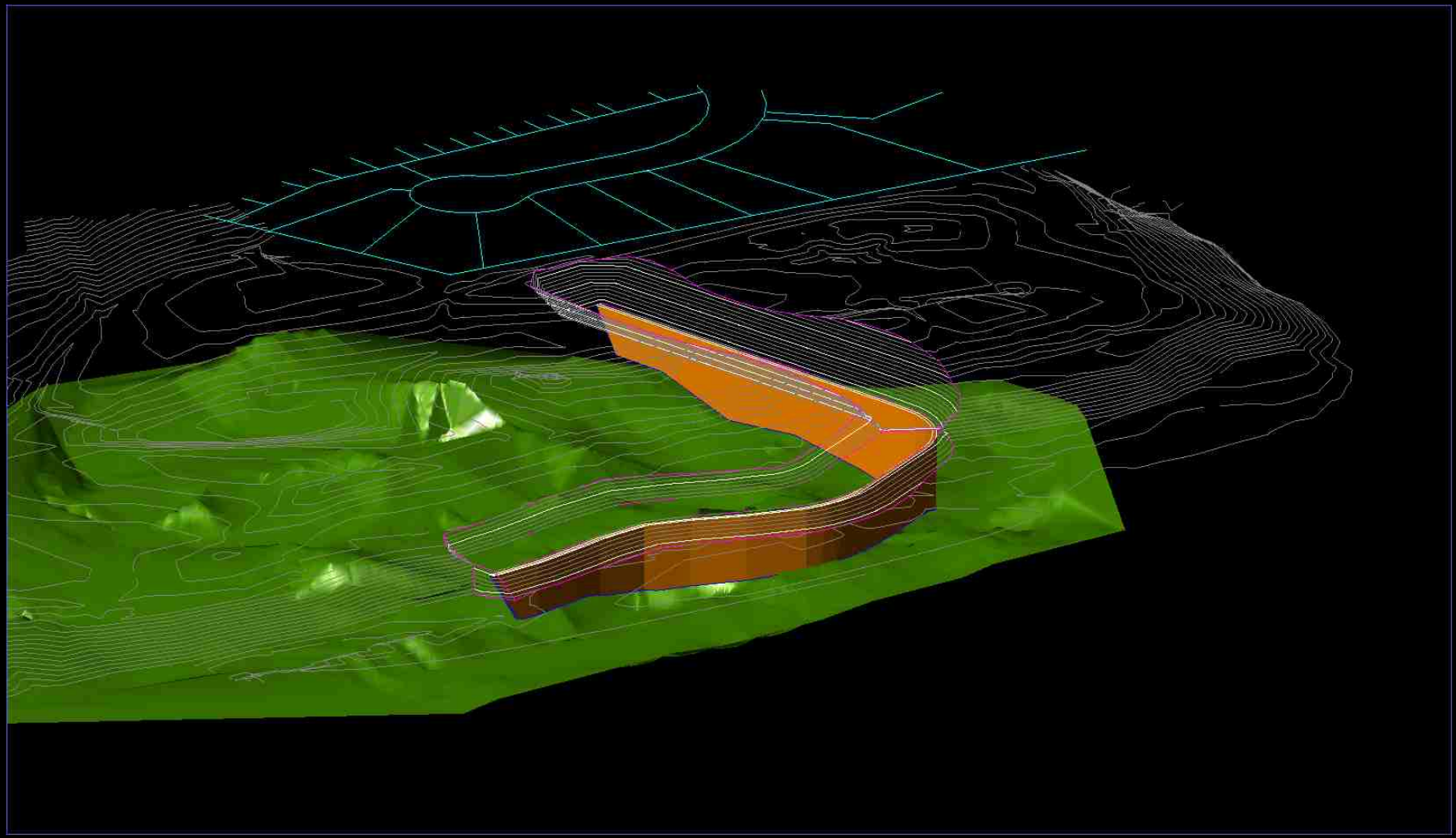
- Address the materials on-site that were a legacy of the former processing operations.
- Re-establish a vegetative cover consistent with the site's use as a wildlife corridor.

Remediation Plan

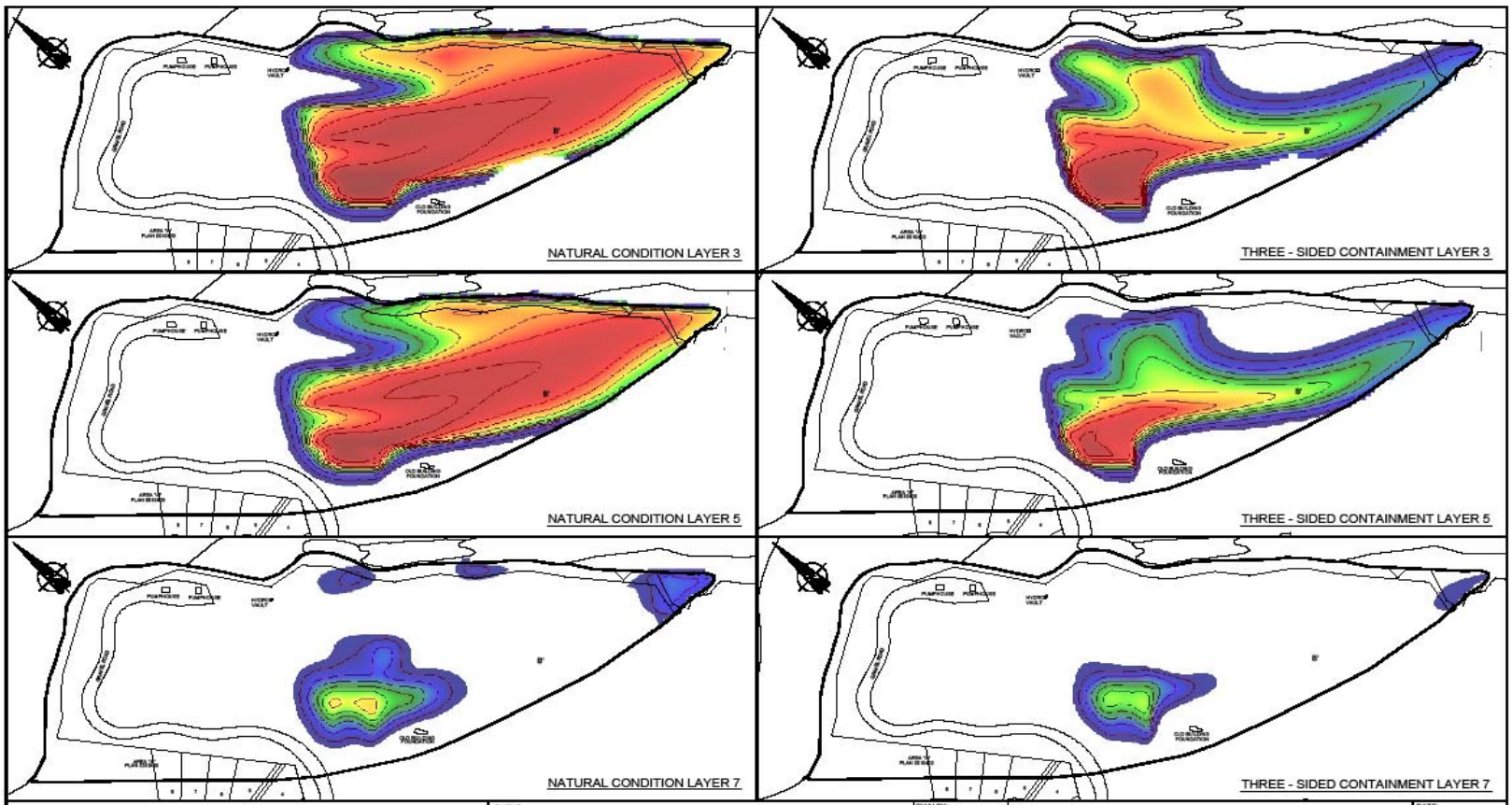
The remediation plan involved managing the coal tars by:

- Removing contaminated sediments that were present in the Bow River channel immediately adjacent the site;
- Constructing a subsurface barrier that would separate the on-shore tars from the local river ecosystem;
- Placing bank erosion protection works over the portion of the barrier running along the river's edge; and
- Installing a groundwater testing system that would monitor the performance of the subsurface barrier.

Subsurface Barrier



Groundwater Modeling Outputs



Soil Bentonite Slurry Wall

- Max depth below working bench – 13m.
- Max depth below final grade – approx 20m.
- Specified mix utilized river gravels, imported granular materials and imported fines.
- Minimum bentonite content – 1.5%.
- Minimum fines content – 15%.
- As-built permeability - 1x10-6 cm/sec w/ FoS of 10.

Reclamation Plan

Guided by the requirements of a Conservation Easement that applies to the property. The reclamation plan involved:

- Importing the subsoil and topsoil required to support a vegetative cover on the property;
- Re-vegetating the surface with spruce and aspen seedlings and native grass species.

Revegetation Plan

General Site Perspective Following Reclamation

Consultation Activity

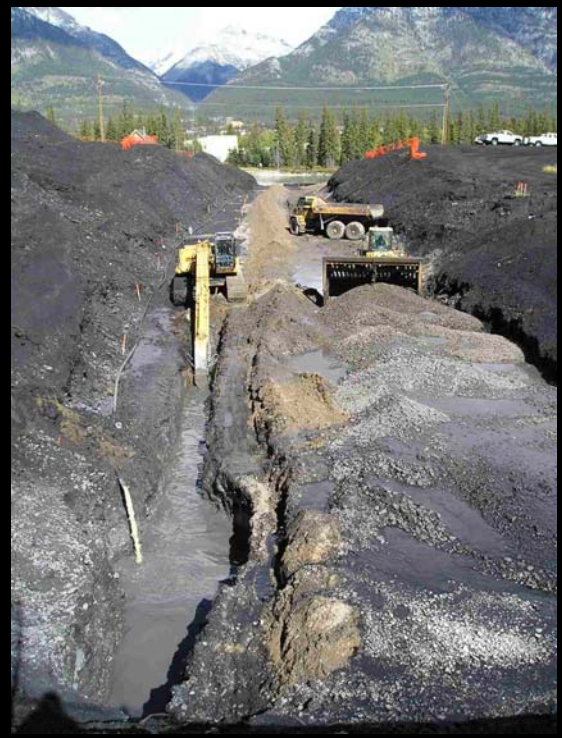
- Meetings with institutional stakeholders.
- Information packages sent to property owners.
- Inquiries and concerns from residents addressed via personal visits, telephone and/or email responses.
- Project website established with a feedback mechanism (i.e. on-line survey).
- Presentation made to the Canmore Town Council.
- Public Open House; and
- Public input during construction via website, toll-free number and email.

Pre - Construction (2007)

Construction (Aug 2007)

Construction (Sept 2007)

Construction (Sept 2007)



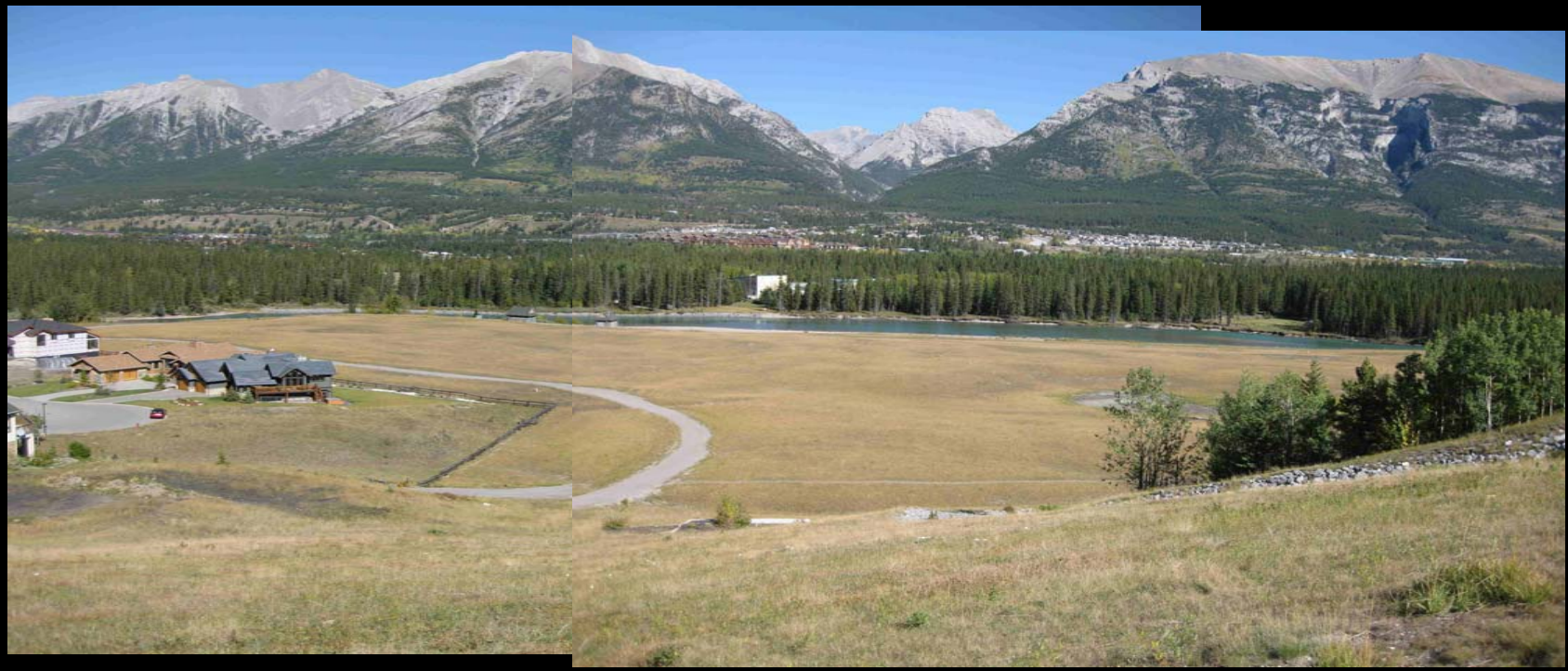
Construction (Sept 2007)

Construction (Sept 2007)

Construction (Sept 2007)

Habitat Replacement

Post - Construction (Sept 2009)



Post - Construction (Sept 2009)

Project Outcomes

- Risks mitigated without intrusive & costly removal exercise.
- Passive, low maintenance structure with no operating costs (beyond performance monitoring).
- Land use not compromised.
- Adjacent property values maintained.
- Satisfied regulators.
- Satisfied public.

Questions?