10 Years of Planning, Design and Reclamation: Cape Breton Development Corporation Mine Site Closure Program

RPIC Presentation
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Presentation Outline

• History
• Program Background
• Challenges
• Approach
• Project Examples
• Conclusions
History

• Sydney Coal Field is located on Cape Breton Island, Nova Scotia
• The first commercial coal mines in Canada opened at Port Morien in 1798.
• Several companies operated coal mines over the years. The last company felt there was no future in coal.
• Royal commission recommended the formation of a crown corporation.
• On July 7, 1967 Cape Breton Development Corporation was formed to phase out coal and develop new economic opportunities.
History

• 1970s Oil embargo – federal government invested in coal mining!
• Drop in coal prices made it difficult to be profitable.
• Last mine closed in 2001. Hundreds of hectares of impacted lands as a result of the industrial activity - over 100 former mine sites.
• In 2002 CBDC engaged PWGSC to develop and implement a Mine Site Closure Program.
• January 1, 2010 CBDC was dissolved as a corporation with the assets and liabilities transferred to Enterprise Cape Breton Corporation (ECBC).
Program Background

• Over 700 properties scattered among 35 communities in the CBRM (wood lots, commercial/industrial, rail, residential)

• Some hosted industrial activity as far back as the 1700’s.

• Sites remediated to deal with environmental and health and safety issues:
  – Environmental - Acidic conditions, metals, TPH/BTEX and PAH impacts associated with waste rock, coal and industrial activity - impacted soil, sediment, groundwater and surface water.
  – Health and Safety - Mine workings, sinkholes, erosion
Program Background
Program Background

- Over $140 Million has been spent since 2001 on program management, planning, assessment, design, demolition, construction and environmental effects monitoring - the majority of which has gone into the local Cape Breton economy.
- Final year of 10 year program.
- All major construction activities are complete.
- Closure Reporting/Information Transfer to ECBC by March 31, 2013
- Office Closure anticipated for March 31, 2013
Program Background

Program Objectives

• Leave each site in a stable, safe condition
• Mitigate Human Health and Ecological Risk
• Return to former land use / acceptable alternative
• Emphasize reuse and recycling where possible
• Remediation measures must be economically practical, proven and involve more passive approaches where applicable
• Ensure all bylaws with respect to health, safety, noise, traffic control and roads are followed
Challenge

• How to deliver a multi-site program in the time frame specified by the ECBC Board of Directors (10 years). Initial estimates was 20 years.

• This question highlighted the need to develop approaches and tools that identified efficiencies and leveraged both the consulting and construction industries.
Approach

• Pre-Screening of 700+ CBDC Properties
• Establish Committees/Working Groups
  – Regulators, Stakeholders, Technical
• Governance
  – Roles and Responsibilities Workshop
  – Reporting Structure
  – Audits
• Mine Reclamation/Remediation SOA
• GIS Web Site and Share Point
• Site Groupings Report
• Schedule Development - Consistent approach for all projects (33 tasks)
Approach

• Industry Capacity Study
• Liability Estimates
• Communications
• Mine Workings Data Base
• Remedial Objectives Advisory Committee (ROAC):
  • Sub-Committees
• Closure Reporting Approach
Approach

Communications

- Brochures
- Open Houses
- Letters to residents
- Stakeholder meetings (elected officials, community groups)
- Contact Cards
- Media updates
- Celebrations
Communications

No. 21 Birch Grove community park

September 11, 2010

No. 4 Glace Bay recreational park.

September 18, 2010
Approach

Remedial Objectives Advisory Committee (ROAC)

• This would streamline the consulting process and promote a consistent approach to the remediation of CBDC sites
• Main goal was to establish a consensus on remediation objectives and closure standards
• Made-up of senior representatives from SOA consultants, PWGSC, CBDC
• 1. RA/Regulatory Framework; 2. Long-Term Maintenance and Monitoring; 3. Land Use / Encroachment; 4. Health & Safety/Mine Workings
Approach

RA/Regulatory Framework (RARFC) sub-committee

- HH&ERA framework and standard TOR
- Screening criteria for water, sediment, soil
- CRA for small sites (no water bodies)
- Fish habitat and wetland assessment methodology
- Consensus on compliance point, toxicity testing
- Regulator interaction/engagement flow chart
Approach

Long-Term Maintenance, Monitoring / Design Criteria (LTMMC) sub-committee

• Define classes of sites
• Develop ‘guiding principles' re. long term monitoring, care and maintenance for each class of site

Land Use / Encroachment sub-committee (LUEC)

• Probable land use plan
Approach

Health & Safety/Mine Workings

• Develop a comprehensive knowledge of ground and subsurface conditions.

• Repository of mine workings including mapping of workings, locations of openings and outcrops (MW GIS Data Base)

• Focus on environmental and health and safety - mine drainage, ground stability, bootleg workings, gas emission, mine openings, water quality of flooded workings etc.
Approach

Health & Safety/Mine Workings

- Short-term goal - ensure stable ground conditions for construction
- Long-term goal - land use restriction and identification
- Report preparation
- Explore use of innovative approaches such as Lidar digital elevation technology.
- Mine Workings Protocols
- Site Management Plan for monitoring and maintenance of sites with subsidence issues.
Approach
Approach

Closure Reporting

• Closure Reporting
  – Umbrella Document (1)
  – Site Closure Report/Records of Site Condition (ROSC) (approx. 150)
    • All sites where contaminant and/or mine health and safety impacts identified
  – Closure Letters (approx. 300)
    • Developed for non-impacted sites where no further action required
• Site Management Plans (SMP)
  – Site Monitoring and Maintenance requirements (approx 20)
Princess Colliery

April 2007

October 2010
Gowrie

October 2006

October 2010
Broughton

November 2005

October 2011
Dominion No. 4

September 2006

October 2010
Gardiner No. 25
Victoria Junction

July 2004

September 2009
Conclusions

- Strong Governance
- Communications
- Leverage Consulting Industry
- Develop Consistent Approach
- Lessons Learned
- Skills Development
Questions?