Managing Program and Project Requirements during Sediment Stabilization at the Sydney Tar Ponds

Jerome MacNeil, Sydney Tar Ponds Agency
Diane Ingraham, Sydney Tar Ponds Agency
Shouvik Gangopadhyay, Nordlys LLP
Vincent Van Zutphen, Nordlys LLP

RPIC Toronto
May 1, 2012
Clean-up of contamination stemming from 100 years of steel and coke production that spread to four areas around the former steel mill:

- North and South Tar Ponds
- Former Coke Ovens property
- An old landfill uphill from the Coke Ovens
- The Coke Oven Brook that carried contaminants from the Coke Ovens to the Tar Ponds
Overview (cont.)

17 Tenders issued to date - 9 Coke Oven; 7 Tar Ponds; 1 Future Land Use

Tar Pond Tenders:
- TP2: Material Processing Facility
- TP2 Ops: Operation of Facility
- TP6A: Flow Diversion
- TP6B: Solidification/Stabilization & Channel Construction
- TP6C: Ferry Street Bridge
- TP6D: Construction of Access Roads
- TP7: Tar Ponds Cap

Focus of this presentation:

Management/Coordination of simultaneous site activity by TP2 Ops, TP6A, TP6B, TP6C and TP7 contractors to ensure seamless performance
Scope of Tenders

- **TP2 Ops:** Control traffic onto and off site; provide personnel/vehicle decontamination; manage debris generated from construction activities. (Mikjikj Enterprises/Harbour Tech Services)
- **TP6A:** Flow Diversion system to re-direct two brooks around north and south ponds to create water-controlled areas for solidification and stabilization work (MB JV)
- **TP6B:** Solidification and stabilization of contaminated sediments; Construction of channel within stabilized monolith to connect the two brooks to Sydney Harbour (Nordlys)
- **TP6 C:** Construct a new bridge structure to maintain traffic access along Ferry Street to the city core (Joneljim)
- **TP7:** Construction of a Cap over the treated sediments for protection and to divert surface flow away from the treated material (Hazco)
Tar Ponds Overview

[Map of Tar Ponds area with labels for Battery Point, C.B.R.M. Sewage Treatment Plant, North Tar Pond, South Tar Pond, Sydney Harbour, South Arm, Ferry Street, Dorchester Street, High Street, Prince Street, Weymouth Road, Weymouth Brook, Sydney Tar Ponds Agency, Coke Ovens Brook Connector, and Victoria Road.]
TP6A / TP6B

- TP6A responsible for “Finish Dates” to ensure water free areas (in Phases) for timely start of solidification
  - Infrastructure to be established in place
  - Water from corresponding phase to be pumped dry
  - Water from previous phase being pumped to new discharge point

- TP6B establishes “Finish Dates” for Channel Construction (in Phases) to ensure availability of flow path and real estate for flow diversion activity for next phase.
  - Channel construction complete in accordance with specifications
  - Water flow in progress from current discharge point to end of next phase
Schedule slippage could have major impact on other Contractor Performance (weather – related)

Infrastructure overlaps each others work areas
- Pipes for pump around placed on areas that require stabilization
- Pumping Station to be established in areas that will be stabilized

Access Roads and Zones maintenance within site (TP6B) will affect TP6A performance
- Clean/Dirty road access to site affects productivity (also ties in to TP2)

Inability to manage storm event (TP6A) will affect TP6B performance
- Flooding of channel affects schedule
- Flooding of areas to be stabilized requires water management prior to treatment
- TP6B responsible for “Declarations” to provide areas available for cover
  - Areas with stabilized material must be certified to have met treatment and grading requirements so that at a minimum, a protective cover can be placed
- TP7 responsible for grade adjustments in specific areas to allow TP6B to place displaced stabilized material
  - In areas that are below the “Blue Line”, the grade must be brought up with non-stabilized material so that S/S material can be placed
Schedule slippage for above tasks could have major impact on other Contractor Performance (weather – related)
  - Protection to be in place prior to inclement weather
  - Difficult to place and compact stabilized material in inclement weather
Work activity schedule of TP6B and TP7 affects TP2 Ops process
  - Cumulative traffic may create a log jam for decontamination and disrupt productivity
Access Roads and Zones maintenance within site (TP6B) will affect TP7 performance
  - Clean/Dirty road access to site affects productivity (also ties in to TP2)
TP6B / TP6C

- TP6B responsible for completion of bridge abutments adjacent to newly constructed channel
  - Pouring abutments
  - Backfill around abutments
  - Attachment of channel liner to abutments

- TP6C to coordinate their site preparation process to avoid impacting channel construction work done by TP6B
- Coordination required between TP6C finish work and the TP7 final grades
- TP6B will require minor site works to complete isolated areas that were previously inaccessible due to TP6A infrastructure
Programmatic management to ensure seamless coordination and avoid any of the negative impacts listed previously.

At the same time, ensure that project quality requirements, specifications and very specific performance criteria are being met.

Finally, ensure that work is done in accordance with schedule and budget.
- Built for decontamination of personnel and equipment leaving site
- allows for separation of large sized material removed from during stabilization into recycle, removal and size reduction for incorporation into cells as appropriate
TP6A designed to divert streamflows during stabilization and channel construction
Must handle 1 in 5 year storm flows; Max Design = 112,599 US gpm
Stop logs have duckbill or backflow preventer valves; can be raised if higher flows are anticipated
Diesel and electric pumps are used
• Phase I - S/S first then excavate channel; Phase II - Build Channel and S/S; Phase III - Build channel first and S/S
• Lessons learned from Phase I - modify odour control; rethink ways/means of channel construction; improve efficiency and improve performance (2.6% reworks out of 1331 cells)
• Phase II - Odour controls reduce exceedances; performance improves to 1.6% reworks of 791 cells)
• Treated 424,977 cubic meters of sediments in first two phases

• Overall lengths of channel elements is approximately 1,300 meters;

• In-field conditions (plastic silts) dictated material handling and final channel alignment;

• slopes and widths along with meanders enhance future enjoyment of the remediated area.
• Phase III - tidal influences more crucial as this phase of the work is nearest the harbour
• All waste material recycled on site
• New Ferry Street Bridge will be constructed to tie into the downtown improvements underway by Cape Breton Regional Municipality (CBRM)
• Intend to boost tourism as an attractive access way to and from downtown as well as to the completed site's walking trails, sports and cultural areas...
Engineered cap is built up as a series of layers designed to divert infiltrated water from reaching the monolith and to protect it, and to contain residual contaminants.

Superior hydraulic conductivity performance of impermeable clay layer led to re-design of the GCL and savings of $2M realized. (10-7 cm/s spec'd, 10-8 cm/s achieved)
Schedule compliance is ensured through:

- Established milestone dates (per phase) in contracts tied to liquidated damages
- Bi-weekly schedule update and review to ensure on-going compliance and look-aheads
- Bi-weekly progress meetings to discuss potential issues and devise solutions

Project Quality is monitored via:

- On-going QC submittals which are reviewed for deficiencies; corrective actions requested and implementation of the corrective action monitored
- Any “sticking points” are discussed at bi-weekly meetings; stakeholders work collaboratively on alternate solutions if existing processes do not suffice
Coordination is achieved through:

- Weekly contractor meetings (attended by all contractors) to mitigate/plan around potential conflicts
- Activities across different tenders sequenced for maximizing efficiency
- Additional planning enforced prior to inclement weather to ensure that storm damage avoidance/mitigation plans are in place.
- Frequent (multiple times daily) review of work exclusion zones to ensure that access is well-planned and allowed for efficient execution of upcoming activities
- Bonhomie among contractors (site supervisors, laborers, operators) who ensure on-site coordination to minimize/avoid impacts to each other
Phase I and II of the Tar Ponds Project have been substantially completed (98% +)
The work has been done in accordance with schedule milestones (ahead on schedule)
Work has been executed within program budget
Quality of the project has been exemplary (various contractors above 95% on multiple quality indicators)
Phase III has already started on track
Thank You!
Questions ?