Rock Bay Remediation
Stage 3

Design and Construction of Rock Bay Stage 3

Stephen Pinto
Project Background

• Rock Bay Property: Victoria Harbour, BC
  • 1.73 ha uplands (fill) & 2.02 ha sediments (harbour floor)
  • 1862 – 1952: Manufactured Gas Plant; other industries
    • Caused significant contamination to soil, groundwater & sediments:
      • Coal tar (PAHs)
      • Hydrocarbons
      • Metals
      • Cyanide
  • 1996: EC and BC MoE warning letters requiring action
  • 2003: Recommended Remedial Strategy
Project Background

• 2004-2006: TC & BC Hydro combined remediation project (Stages 1 & 2)
  • 200,000+ tonnes removed
• 2014-2016: TC Only (Stage 3)
  • Cofferdam & shoring installation
  • Wastewater management
  • Stormwater outfall bypass
  • Excavation of 91,000+ tonnes
  • Treatment of 53,000+ tonnes
Request for Proposal

- Request for Proposal (RFP) – Design / Build
- Consisting of:
  - 110 RFP Pages
  - 222 Specification Pages
  - 37 Drawings
  - 1,669 pages of Reference Documents
  - 60 Pages of Addendums
RFP Scoring

• **100 TOTAL POINTS**
  - Envelope 1
    - 40 Points for Technical Write Up
    - Minimum Requirement of 60%
  - Envelope 2
    - Bonding
    - Insurance
    - Unit Price Table
Stage 3 Requirements

- Transport Canada required that:
  - Work as Per DFO Authorization
  - All excavation to be conducted in the dry; eliminate risk of mobilization and residual contamination
  - Excavation of contaminated soils up to upland property lines.
  - Excavation of the sand seam within the clay along the south property line and installation of a sand seam seal plug \((1 \times 10^{-8} \text{m/sec})\)
  - Treatment and/or destruction of waste and hazardous waste material
  - No intrusion on neighboring properties
  - Backfilling and shoreline restoration
Site Contamination

- **Soil and Sediments:**
  - PAHs > CSR CL and Hazardous Waste (HW)
  - Metals and hydrocarbons > CSR CL.
Regulatory Involvement

• 1996 – Transport Canada and BC Hydro notified of a potential order to remediate contamination identified on site.

• 2003 Revised Recommended Remedial Strategy accepted by BC MOE, DFO and Environment Canada
  • Uplands: remove soil > CL
  • Marine: remove sediment > hazardous waste
Overall Organizational Chart
QM TEAM
Construction Plan

- Site preparation
- Cofferdam to seal off the bay
- Bypasses for the 626 and 627 storm sewers
- Shoring along upland property lines
- Draining of the bay
- Excavation and transport of an estimated 90,000 tonnes of material
- Treatment and disposal of contaminated soils
- Backfilling and shoreline restoration
- Construction Submittals
Project Schedule

• Start April 2014

• Site works complete by January, 2016

• All treatment by January 30, 2016

• Closeout Submissions Due – February 15, 2016
Project Schedule
Site Preparation

- June 2014 – Mobilization
- June to July 2014
  - Clearing & Grubbing
  - Paving and Stockpile / Storage Areas
- Services and Facilities
- Security
- Trailers
Site Preparation

• Truck Washes
• Scales
• Grading and Catch Basins
• Water Services
Shoring on Property Line

- Aug to Dec 2014 – shoring along south property line
- Sept 2014 to Feb 2015 – 626 storm sewer bypass construction
- Dec 2014 - excavation and backfilling in SCD1
Shoring on Property Line
Cofferdam Construction
Cofferdam Construction
Cofferdam Construction
Cofferdam Construction

- Aug to Nov 2014 – main cofferdam construction
- Nov 2014 to Feb 2015 – northern cut-off wall
Outfall Bypass
Outfall Bypass
Outfall Bypass
Outfall Bypass
Outfall Bypass and Shoring
Closing Off The Bay

• February 2015
Fish Removal

- Approximately 3,600 fish removed
- Stickleback, surf smelt, sculpin and halibut
Dewatering
Coal Tar
Bulk Excavation

- March 2015 – Bulk Excavation Begins
- Coal Tar seeping out of geoduck hole
Bulk Excavation
Bulk Excavation
Debris
Excavation & Backfill
Backfill
Backfill
Backfill
Backfill & Stockpile
Backfill & Restoration
Transportation

- 25 Barges
- 7,200 Trucks
Treatment & Disposal
Documentation

- Pre-construction Submittals – 17
- On-Site Notification – 398
- On Site Instructions – 307
- Schedule Updates – 46
- Progress Meetings – 68
- QM Work Hours – 50,000
Demobilization
Final Product
Special Thanks

- PWGSC
- Transport Canada
- Isherwood Engineering
- WSP Engineering
- Envirogreen Technologies
- Volk Transport
- Thurber Engineering
- To All the Rock Bay Staff