FOX-C Ekalugad Fjord
Intermediate DEW Line Site
Mid-Station Dump Lobe B “Excavation”
Project Location
Introduction

- Intermediate DEW Line Site built in 1957 and closed in 1963
- Buildings and equipment were abandoned
- Throughout the 1980s & 1990s site assessments were completed to identify the contaminants
- In 2003 the site was identified as a priority by the Federal Contaminated Sites Accelerated Action Plan
- In 2004 INAC completed the final assessment phase
Introduction (continued)

- In June 2005 the camp & remediation contracts were awarded to Qikiqtaaluk Corporation
- In September 2005 equipment was mobilized to site via sealift
- Remediation was completed over 3 field seasons
- In September 2008 the project was completed and equipment and hazmat were demobilized via sealift
Work Completed

- Community Consultations
- Road repair & construction
- Drum testing, cleaning & disposal
- Removal of hazardous materials from buildings (PCBs & Asbestos)
- Building Demolition
- Construction of non-hazardous waste landfill (NHWL)
- Debris collection and disposal
Work Completed (continued)

- Excavation of contaminated soil
- Landfarm operation
- In-situ landfarm operation (Water Lake)
- **Mid-Station Dump Excavation (Lobe B)**
- Regrading
- Hazmat shipping/disposal
Lobe B Characteristics

- North facing slope
- Elevation of 650-663 metres
- Estimated to be 0.2-3 metres deep (~3400 m³)
- Contents unknown (mostly non-hazardous debris)
Lobe B Characteristics (continued)
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Lobe B Original Methodology

- Excavate using heavy equipment
  - This was to be completed in steps by removing the surface materials and scraping down to the frozen area, allowing it to thaw, and then repeating the process.
- Once removed the material was to be taken to the Material Processing Area (MPA) sorted, sampled and handled as follows:
  - Non-hazardous debris – placed in the non-hazardous waste landfill (NHWL)
  - Tier I soil – placed in the NHWL (as intermediate fill)
  - Tier II soil – packaged and shipped off site for disposal
  - Hazardous materials – depending on the item it may be treated on site or packaged and shipped off site for disposal
Lobe B Original Methodology (continued)
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- **Results**
  - Very slow process
    - Material frozen (north slope, 2-3 weeks snow free)
  - Based on the progress made in 2007 projections were made on how long it would take to complete the work remaining at Lobe B
    - It was estimated at around 90 days
    - The typical field season at FOX-C is around 70-75 days

- An alternative approach would be required if we wanted to complete the project in 2008
Lobe B Alternatives

- Alternative approaches considered:
  - Using additional heavy equipment
  - Snow removal early in the season
  - Heating
    - piping system
    - hot air
    - black tarps
  - Addition of salt water
  - Loosening the material with explosives

- These options were reviewed and discussed amongst the project team (INAC, PWGSC, UMA, QC)
Lobe B Alternatives

- Consideration given to:
  - Limited access (Helicopter or Sealift)
  - Available equipment (on-site)
  - Cost
  - Permitting
  - Scheduling

- Upon completing the review it was decided that the use of explosives to loosen the material would give us the best opportunity to complete the project in 2008

  ✓ Loosening the material with explosives
Lobe B Alternative Methodology

- Procedure was to have a qualified explosives contractor:
  - Drill boreholes at least 1 m deeper than the depth of the material to be loosened (minimum of 1.2 m deep)
  - The quantity of dynamite to be used for each blast was to be adjusted on-site but a general rule of thumb was to use 0.5 kg of dynamite per cubic metre of material
- Once loosened the material was to be excavated and sorted
  - Non-hazardous debris to go directly to the NHWL
  - Soil trucked to a Material Processing Area (MPA)
    - Thawed, sorted & sampled
  - Any hazardous materials identified were to be packaged and disposed of as per proper procedures
- Disposal procedures were the same as originally planned
Lobe B Alternative Methodology (continued)
Lobe B “Blasting Plan”

- Comprehensive “Blasting Plan” was developed. It included information and procedures for:
  - Transportation of dynamite (1,700 kg) & blasting caps (50 kg)
    - Dewar Lakes then to FOX-C (plane/helicopter)
  - Storage of dynamite & blasting caps at site
    - Two empty barge containers lined with wood (one for dynamite & one for blasting caps) placed at least 15 m apart, marked with all required warning panels
    - Located near the lake, over 2 km from the camp (regulations require storage at least 1,600 m from camp)
  - Locked at all times
Lobe B “Blasting Plan” (continued)

- Work method
- Handling of unused explosives
- Identification of risks and mitigative measures
  - Special precautions for drilling
  - Spill response team & spill kits
    - Booms, absorbent, pump, empty drums
  - Spill containment area set up below the work area
    - Monitored during drilling operations & for 1 hour following all blasts
- Spill team, kits, and containment area were designed to be able to deal with most likely worst case scenario:
  - Instantaneous release of 5 full drums of hazardous materials
Permits and Licences

- Blasting Permits (including storage, transportation & handling) were held by Kudlik Construction
- Land Use Permit
  - Amendment application submitted
  - Nunavut Impact Review Board (NIRB) distributed the request to interested parties and communities for review & comment
  - Approval received
    - Terms & conditions of the original licence still applicable
    - New requirement added regarding the Transportation of Dangerous Goods (TDG)
Results

- **Schedule**
  - Blasting & excavating (~16 days)
  - Sampling including confirmatory (~8 days)
  - Sorting & packaging (~24 days)
  - Landfilling (~40 days)
  - Regrading & reshaping (~6 days)
  - Total ~50 days
Results (continued)

- Blasting Process & Information
  - Started at top centre of area, then worked around the edges & down the slope
  - 4 blast events were completed
    - Each followed by 2-3 days of excavation
  - ~800 kg of explosives used
  - No spills or incidents
Results (continued)

- Total volume of material removed was ~2,200 m³
  - Most non-hazardous debris went directly to NHWL
  - 51 piles of soil created in the MPAs
    - Non-hazardous = ~900 m³
    - Tier I = ~200 m³
    - Tier II = ~500 m³
    - Hazmat = ~20 m³
Lobe B Before & After Pictures
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