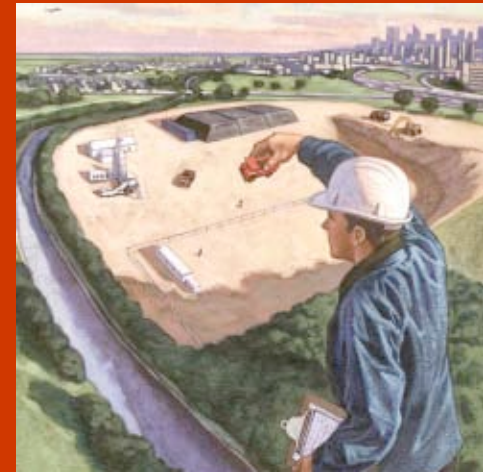


**Assess**

**Design**

**Implement**



**Federal Contaminated Sites  
National Workshop – 2008  
Vancouver, British Columbia**

**Site Remediation Solutions**



# Remediation of a Former Canadian Forces Base in Chatham, NB



Presented by:

Daniel Godbout (DND) and Guy Lavoie (Biogenie)

# Site History

- **The site is known as the former CFB Chatham**
- **Home of many flying squadrons**
- **The Base covers an area of 10 km<sup>2</sup>**
- **In operation from 1940 to 1995**
- **The Province of New Brunswick acquired the site through a transfer agreement**
- **They created "SkyPark Miramichi Inc."**
- **The site was renamed and is now divided in 3 main areas: a retirement community, a business Park and the municipal airport**



Aboveground Tank  
Sub Site 4  
Sub Site 2  
Sub Site 152

Building 64  
POL Compound  
Sub Site 10  
Sub Site 5

Sub Site 18  
Sub Site 19

Concrete Apron

Sub Site 9

Stockpiled Material

Sub Site 13

Sub Site 12



**Source:** New Brunswick Services  
Aerial Photographs  
  
N° DNR 83505-77;  
N° DNR 83508-104; and  
N° DNR 83508-105;  
  
**Scale:** 1:15 000

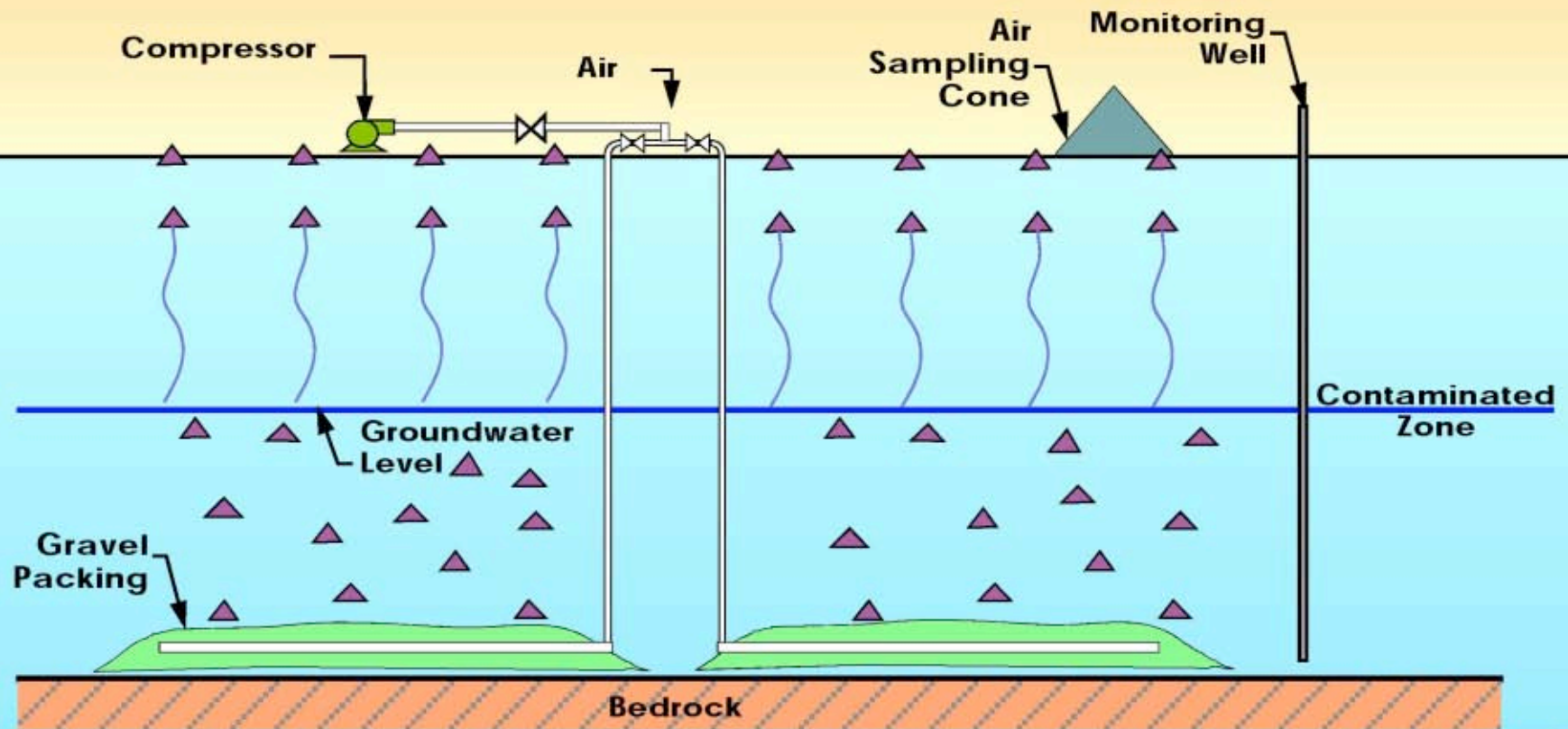
# Mandate and Objectives

- **Request for Abbreviated Proposal (RFAP) in 1998**
- **Remediate soil from 11 different areas on the former Base**
- **All impacts had to be removed by September 2004**
- **DND and DCC were opened to different remediation approaches**
- **“Pay-for-Performance” type contract**
- **Obtain Record of Site Condition from the NBD OE**

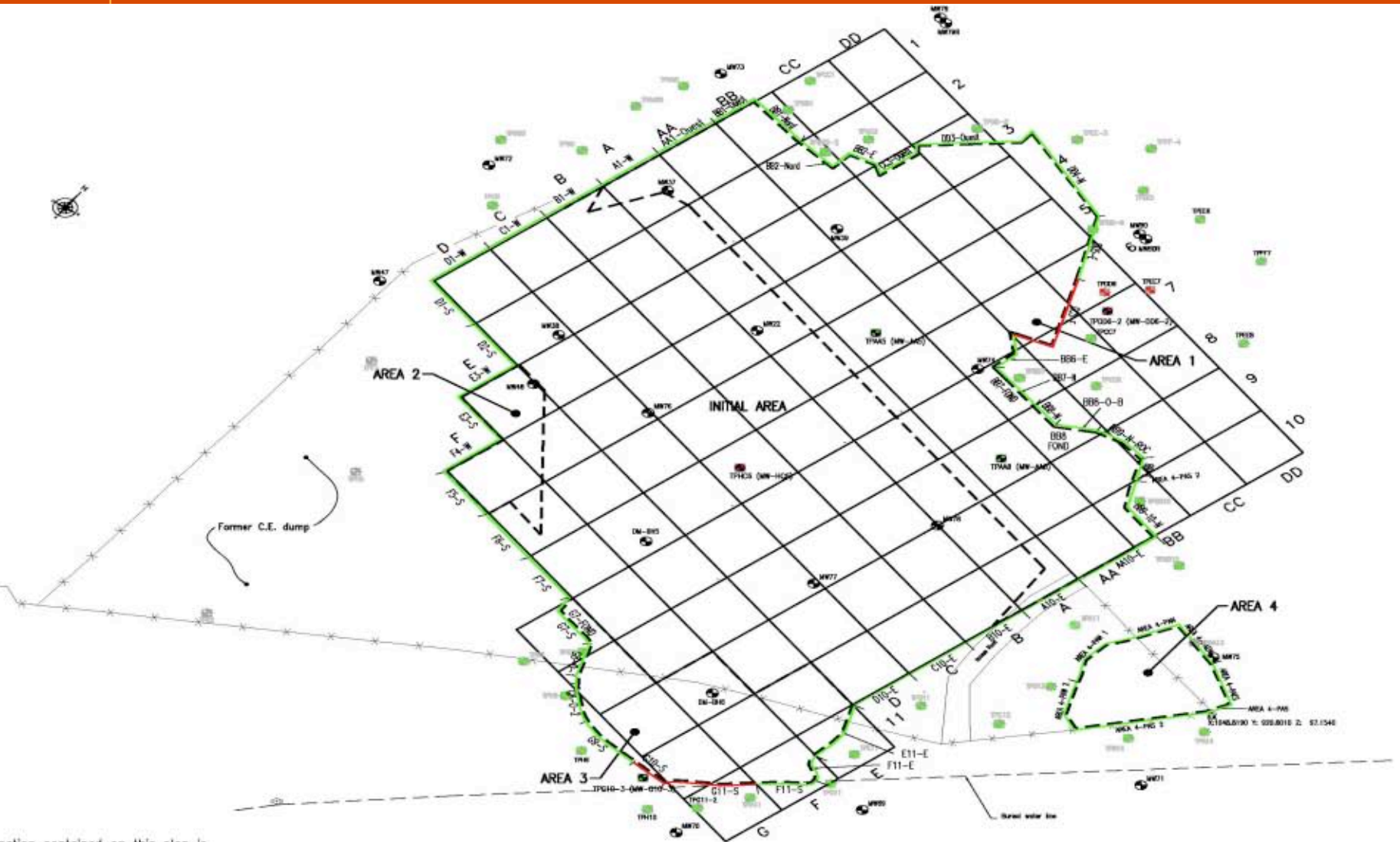
# Remedial Action Plan

- **Transport all impacted soil on the largest impacted site (Site 18)**
- **Inverted Biopile system was utilized to biotreat impacted soil**
- **Soil was also stockpiled and treated above the ground surface to deal with the additional volume**
- **Disposed of non biotreatable soil at an approved facility**

# Inverted Biopile Process



# Site 18



# Challenges

- **A part of the soil located on Site 18 was partly remediated using Low Thermal Desorption**
- **Schedule had to be adapted to the Sky Park Miramichi economic development**
- **Changes in provincial regulations**
- **Presence of a lot of construction debris at the main site**

# Segregation of Concrete



# Specific Objectives

**Table I : Soil Clean-Up Criteria for Sub Site 18  
According to the Atlantic PIRI – Tier I Look-Up Table**

| Compound of Concern | Concentration (ppm)                    |                                       |
|---------------------|--|---------------------------------------|
|                     | Surface Soil (<1.0 m from the surface) | Sub-Surface (>1.0 m from the surface) |
| Benzene             | 120                                    | 1.4                                   |
| Toluene             | 4,800                                  | 34                                    |
| Ethylbenzene        | 2,400                                  | 20                                    |
| Xylenes             | 3,200                                  | 25                                    |
| Modified TPH        | 1,740                                  | 360                                   |

**Table II : Groundwater Clean-Up Criteria for Sub Site 18  
According to the Atlantic PIRI – Tier I Look-Up Table**

| Compound of Concern | Concentration (µg/L) |
|---------------------|----------------------|
| Benzene             | 4,700                |
| Toluene             | 20,000               |
| Ethylbenzene        | 20,000               |
| Xylenes             | 20,000               |
| Modified TPH        | 20,000               |



# Summary of Findings

- **Hydrogeology and geology**
- **Soil was mainly impacted with TPH (C<sub>6</sub>-C<sub>32</sub>) (start. concentration.: approx. 800 mg/kg)**
- **Groundwater was also impacted with TPH (C<sub>6</sub>-C<sub>32</sub>) in some areas (up to 23,000 ppb on Site 18)**
- **Bunker was identified in 2 areas (Sites 13 and 18)**

# Installation of Piping Network



FEDERAL CONTAMINATED SITES  
SITES CONTAMINÉS FÉDÉRAUX



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# Stockpiling of soil



95-11-17

# Site 18 (Fire-Fighting Training Area)



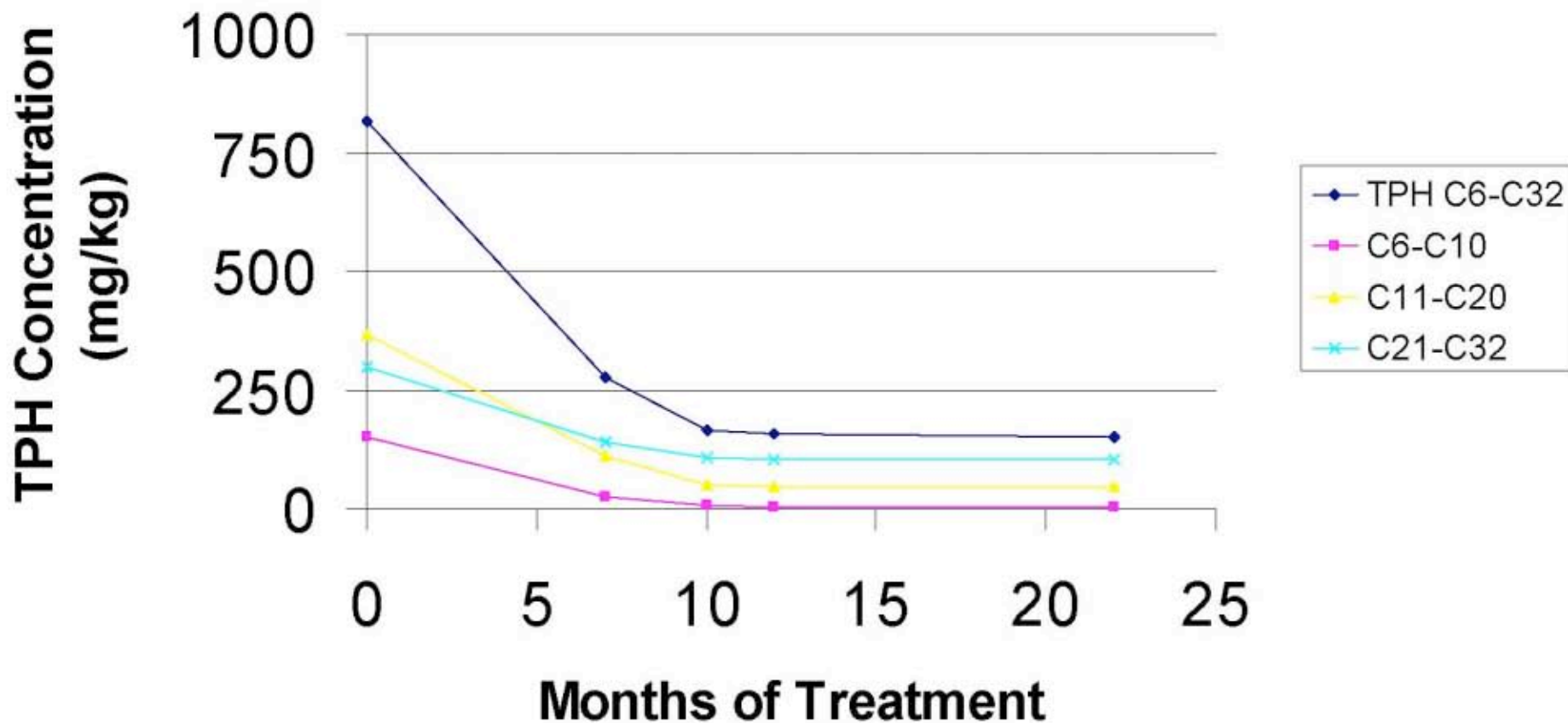
# Volume Summary

| Origin<br>(Sub Site)  | Date of Receipt                              | Quantity<br>(metric tons)                    |
|---|--|--|
| 18 (Initial and Area 2)   | In place                                     | 52,920 m.t. (33,075 m <sup>3</sup> )         |
| 2 (Former Scrap Yard)   | Jan. 20 and 21, 1999<br>Nov. 17 and 18, 1999 | 496 m.t. (300 m <sup>3</sup> )<br>1,124 m.t. |
| 4 (Former Coal Storage Area),<br>9 (Sewage Treatment Plant),<br>POL Compound, and Building 66 | Oct. 26, 2000 to<br>Feb. 8, 2001             | 24,796 m.t.                                  |
| 5 (Former Building 11)  | Dec. 9, 1999                                 | 374 m.t. (234 m <sup>3</sup> )               |
| 12 (Fire Fighting Training Area)  | Dec. 9 to 11, 1999                           | 1,328 m.t. (830 m <sup>3</sup> )             |
| 13 (Sludge Disposal Area)   | Jan. 22 and Dec. 9, 1999                     | 224 m.t. (140 m <sup>3</sup> )               |
| 18 (Areas 1 and 3)  | May and June 2000                            | 14,000 m.t.                                  |
| 18 (Area 4)   | June, Oct., Nov. 2001                        | 2,080 m.t.                                   |
| 19 (Old Engine Test Cell Site)  | Oct. 1 to Nov. 3, 2001 and<br>June 25, 2002  | 5,461 m.t.                                   |
| Stockpiled Material   | Nov. 4 and 5, 1999                           | 960 m.t. (600 m <sup>3</sup> )               |
| Concrete Apron  | Nov. 4 and 5, 1999                           | 480 m.t. (300 m <sup>3</sup> )               |
| <b>TOTAL</b>  |  | <b>104,243 metric tons</b>                   |



# Biotreatment Results

## Evolution of Average TPH (C<sub>6</sub>-C<sub>32</sub>) Concentrations



# Soil undergoing treatment



# POL Dismantling



# Tank Dismantling



10/17/93

# Decommissioning

- **113 monitoring wells were decommissioned in 2004**

# Decommissioning



# Project Results

- **Remediation objectives were met for more than 99% of the soil undergoing treatment**
- **Groundwater showed final TPH concentrations below the applicable criteria and near the detection limits**
- **Air emissions showed concentrations below the NBDOE Atmospheric Emission Standard**
- **A risk assessment and closure report prepared by a third party and accepted by the Province**
- **No incident**

# Acknowledgements

- **Captain Matt Braid, Emmanuel Saydeh and Sonia Powell from DND**
- **Alain Dufresne from DCC**
- **Michel Pouliot from Biogenie**