Manitoba Hydro

October 15, 2009

8-Mile Channel

Remediation

Background / 1973 – ’77 / ’04 – ‘06

Discovery of contamination / Sep. ’06 – Mar. ‘07

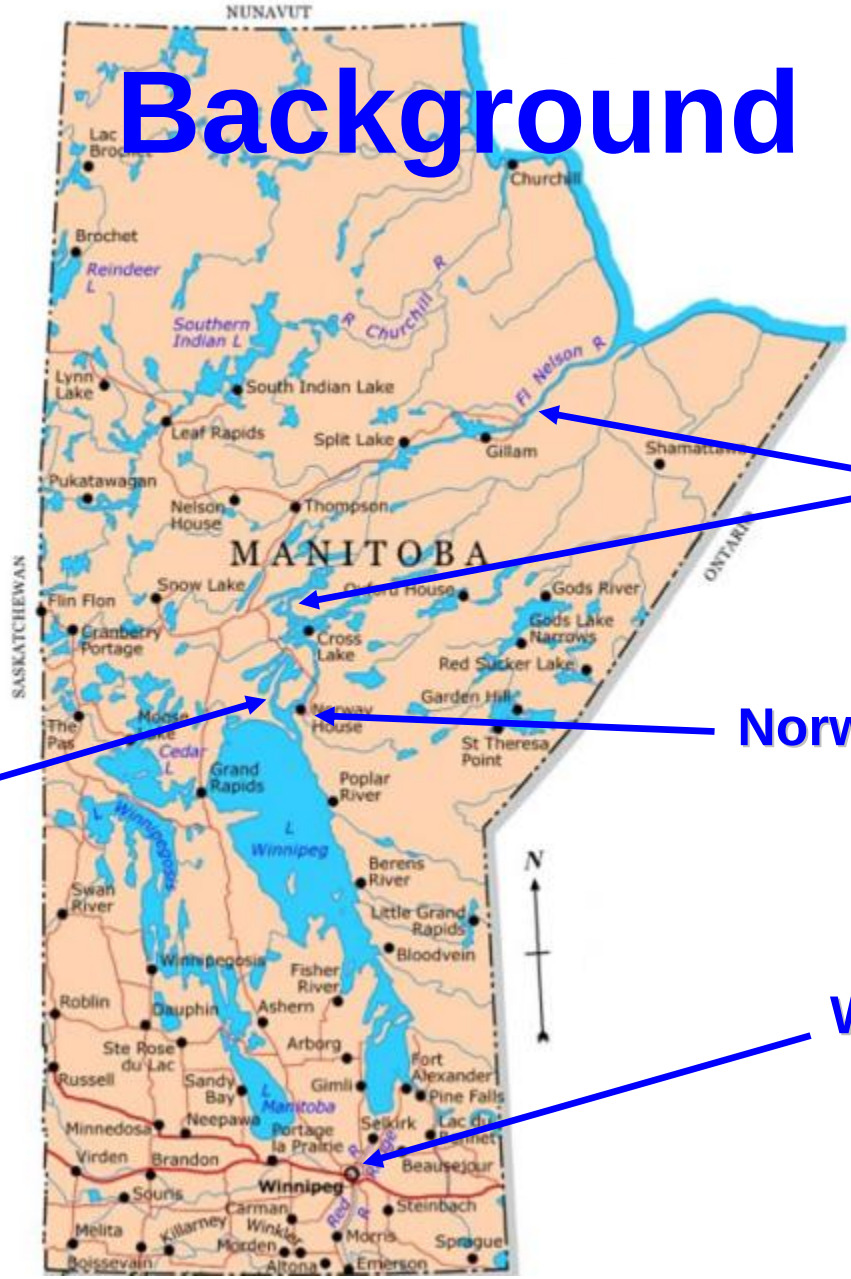
Remediation work plan / Oct. – Dec. ’07

In-channel works / Jan. – Mar. ’08

Borrow material / Feb. ’08

Single use treatment cell / Jan. ’08 to present

Background



Nelson River

Norway House

8-MILE CHANNEL

Winnipeg

Background

- Constructed in early- to mid-1970s
- Substandard clean-up
- Debris and petroleum (PHC) contamination left at channel
- Contractor now defunct

Background

Background

Background

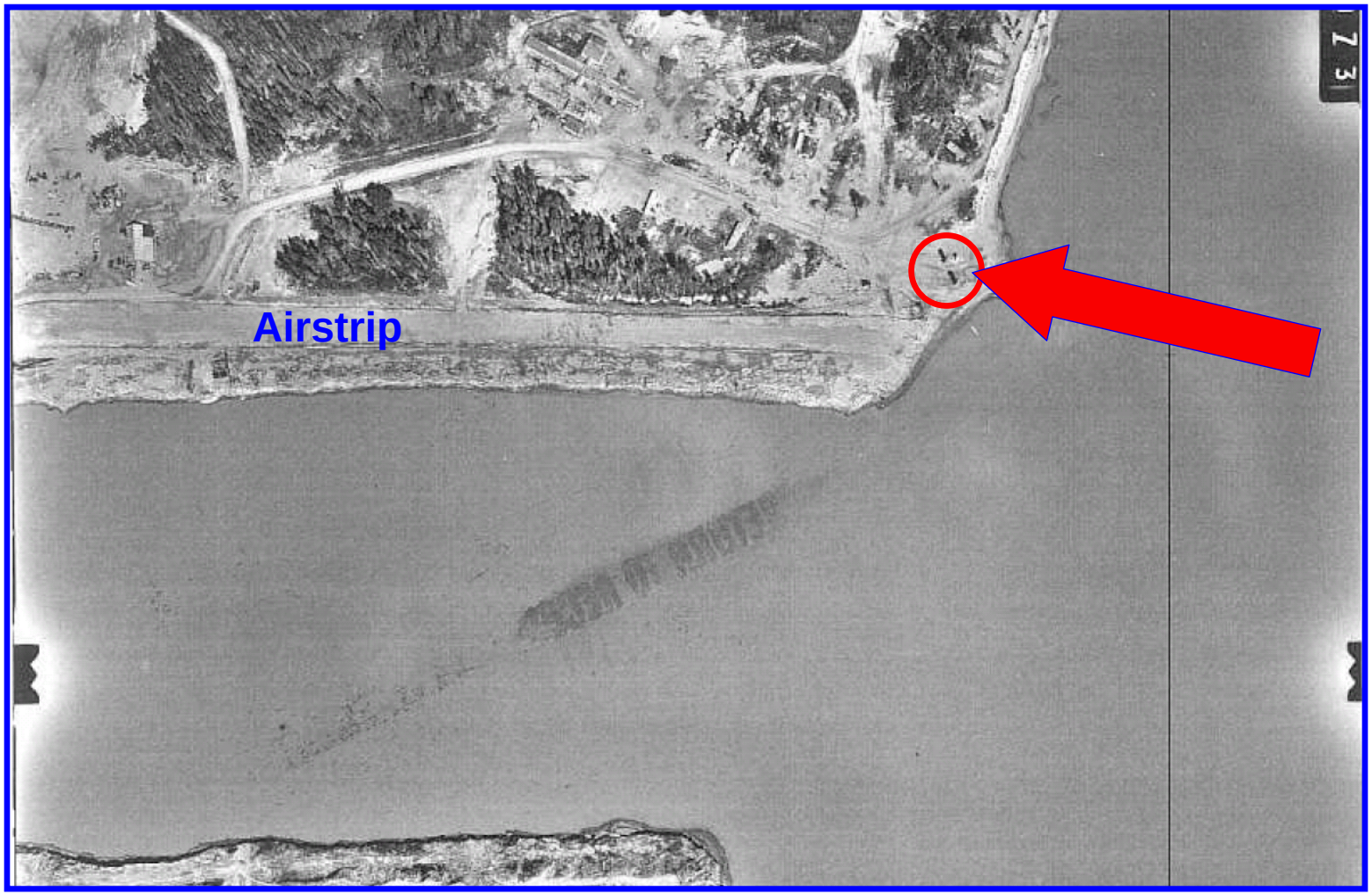
- Debris clean-up: 2004 through 2006
- Employed local Cree Nation Contractor
- Coordination with Cree Nation
- EM surveys & soil sampling programs
- Now complete

PHC Discovery

SEPTEMBER 2006

- Final inspection with Norway House Cree Nation
- Evidence of PHC contamination at shoreline
- Soil grab sample analyses confirmed contamination

PHC Discovery



PHC Discovery

- North side of 8-Mile Channel
- Inlet to channel at Playgreen Lake
- Straddling shoreline

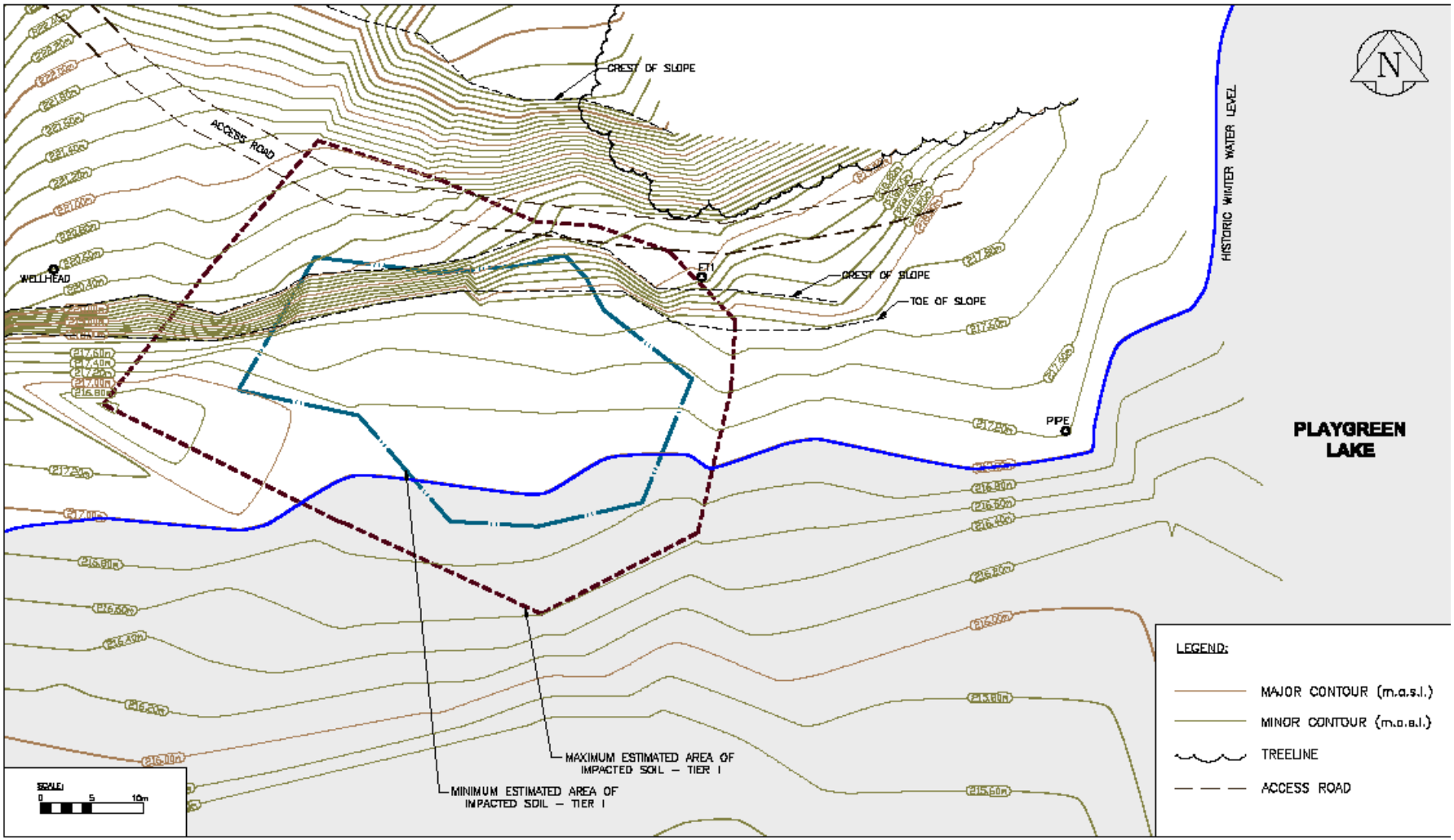
PHC Discovery

INVESTIGATION

- Conducted in March 2007
- Compared to CCME Tier 1 parkland criteria
- Established horizontal and vertical limits of contamination:
  - V ≈ 4000 m^3
  - A ≈ 1800 m^2
  - Max. depth ≈ 4 m
  - Approx. 50% below summer water level (by vol.)
  - Approx. 25% below winter water level (by vol.)

PHC Discovery

PHC Discovery



Remediation Work Plan

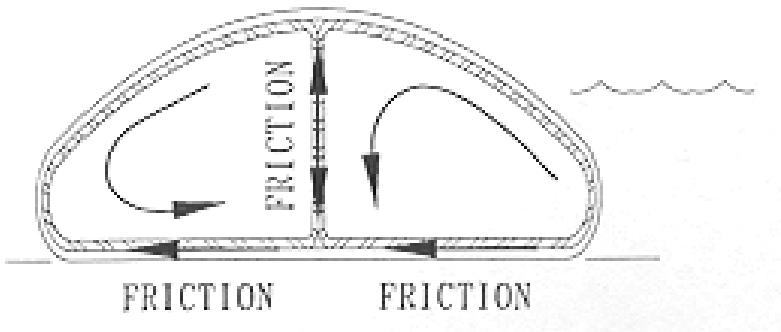
- Wet (e.g., dredge) or Dry (e.g., cofferdams)?
- Dry:
  - Reduced impact on channel and downstream waters
  - Greater control over excavation incl. sampling
  - Less water mixed with contaminated soil
  - Increased precision during backfilling

Remediation Work Plan

- Summer or Winter?
- Winter:
  - Eliminate wave action
  - Able to work from ice
  - Easier access to work site
  - Frost would provide additional stability

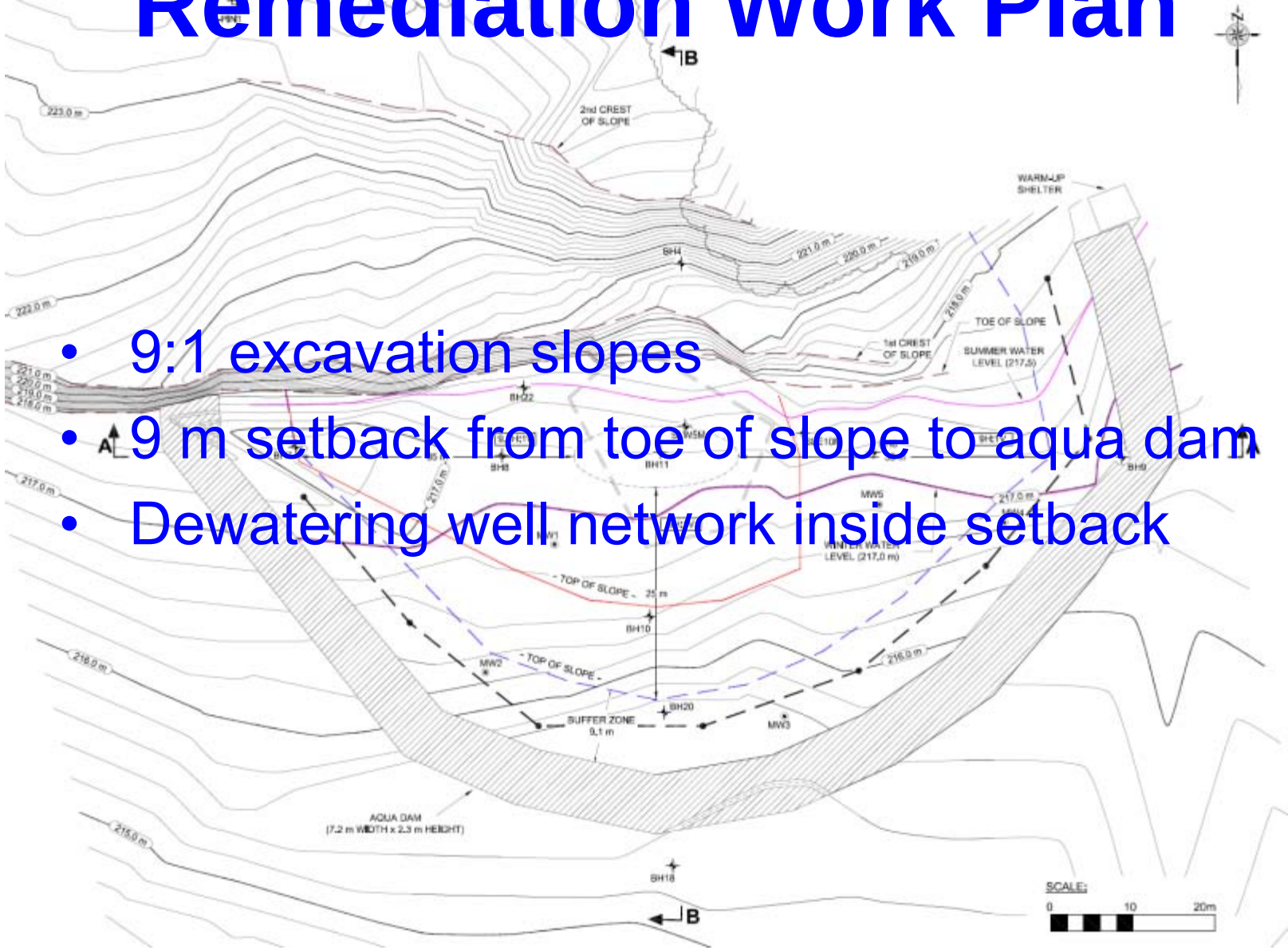
Remediation Work Plan

- Means of isolation?
- Aqua Dams:
  - Minimal disturbance of bottom sediments
  - More easily installed than sheet piling or cofferdams
  - Already successfully utilized in northern MB
  - Readily available



Remediation Work Plan

Remediation Work Plan

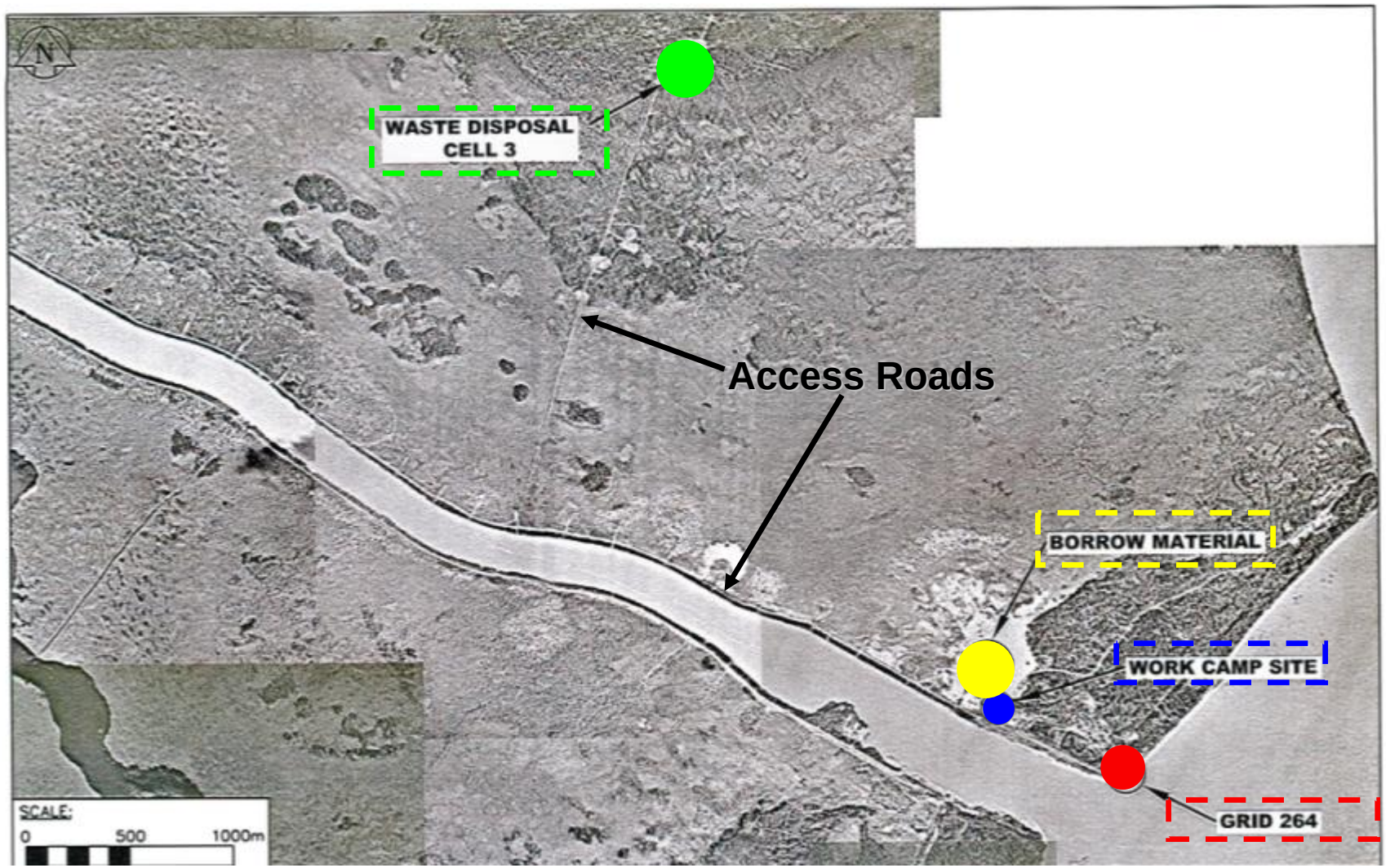


- 9:1 excavation slopes
- 9 m setback from toe of slope to aqua dam
- Dewatering well network inside setback

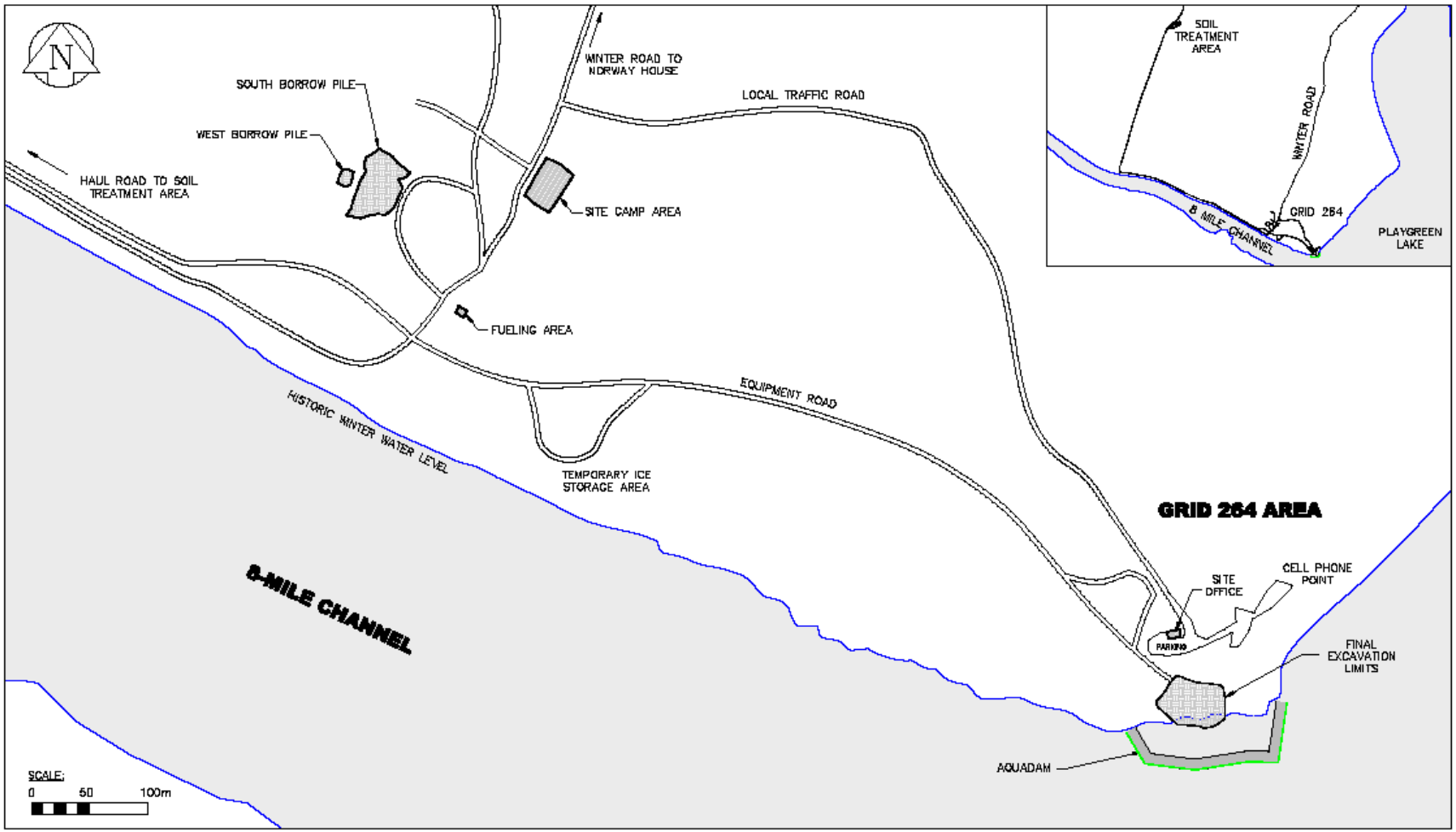
Remediation Work Plan

- Proposed re-use of previously disturbed areas
- Consulted with local resource management board for approval
- Applied for and acquired MB Conservation and DFO permits between October and end of December 2007!

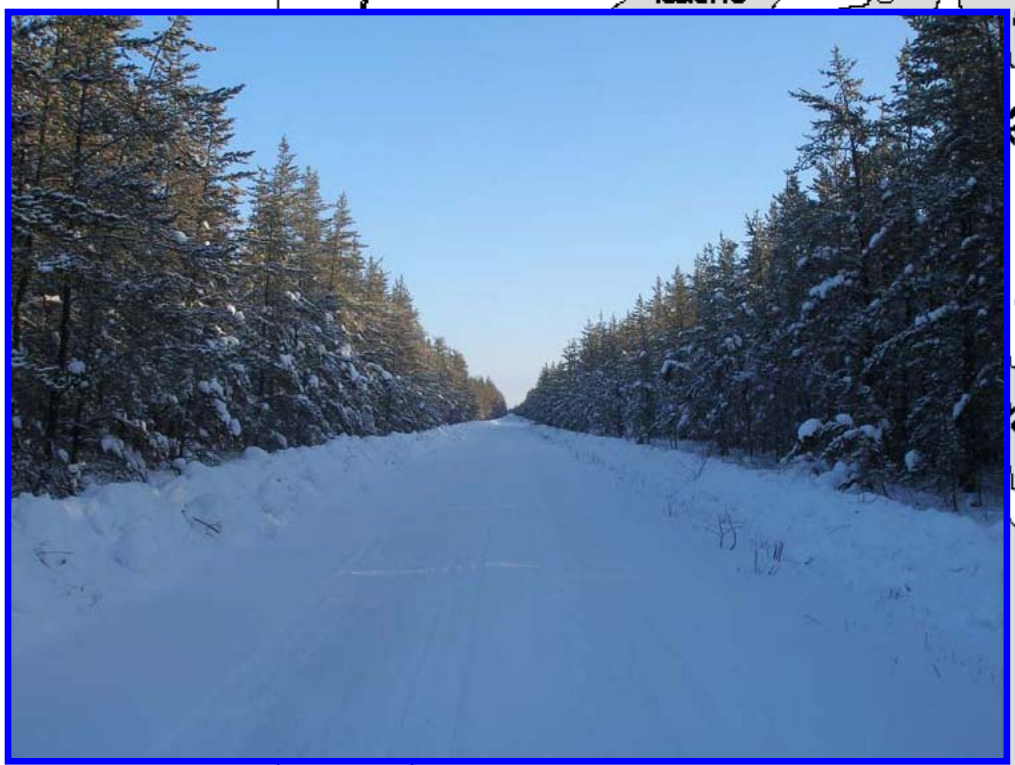
Remediation Work Plan



Remediation Work Plan



Remediation Work Plan



In-Channel Works

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In-Channel Works

- Seepage under the dam at SE corner
- Shored dam using silty backfill dike along inner face
- Dewatering successful, though continuous

In-Channel Works

In-Channel Works

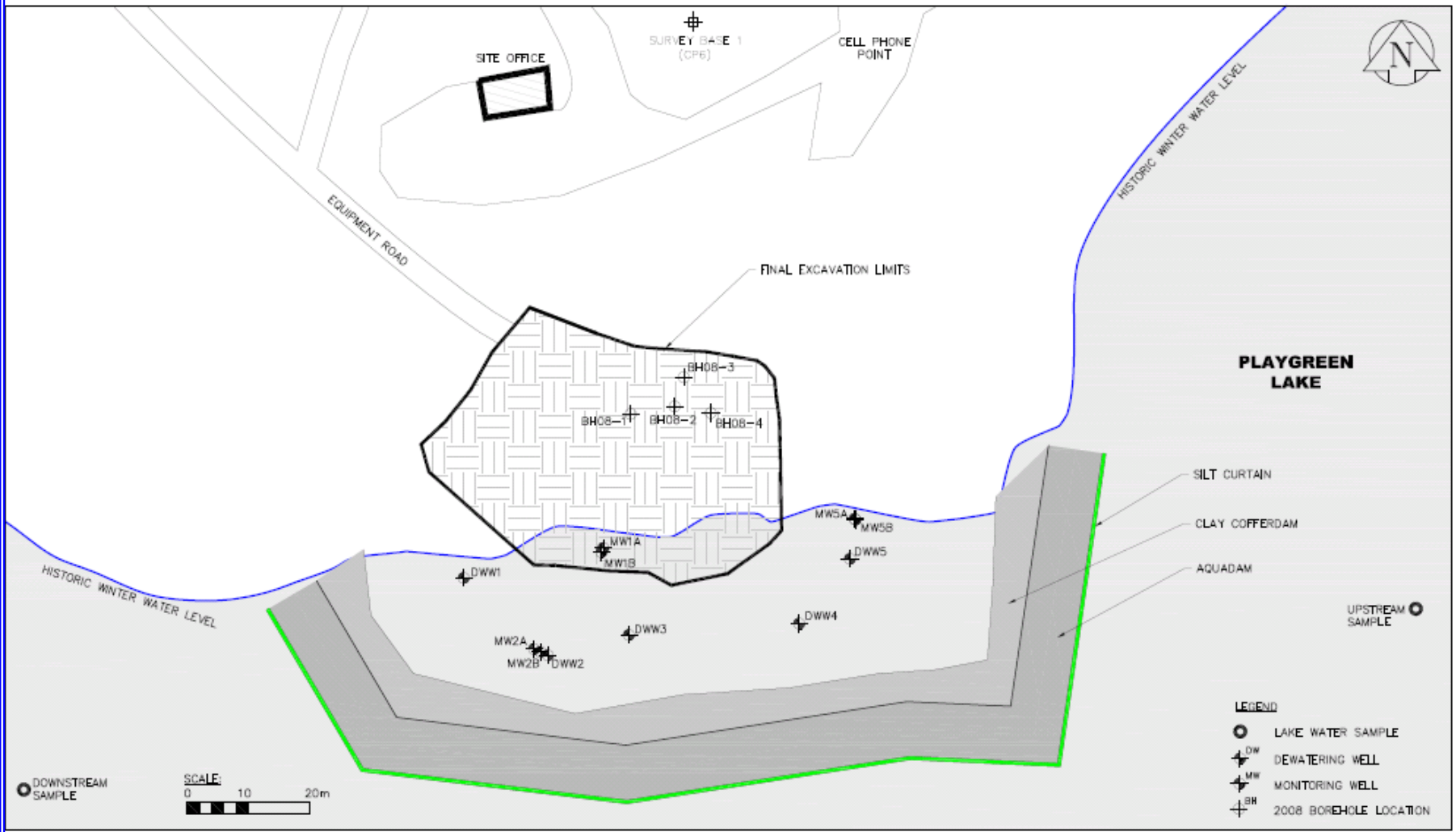
- All pump intakes were fitted with fish screen structures
- A fish biologist conducted the salvage operation
- 248 fish were salvaged with 97 mortalities

In-Channel Works

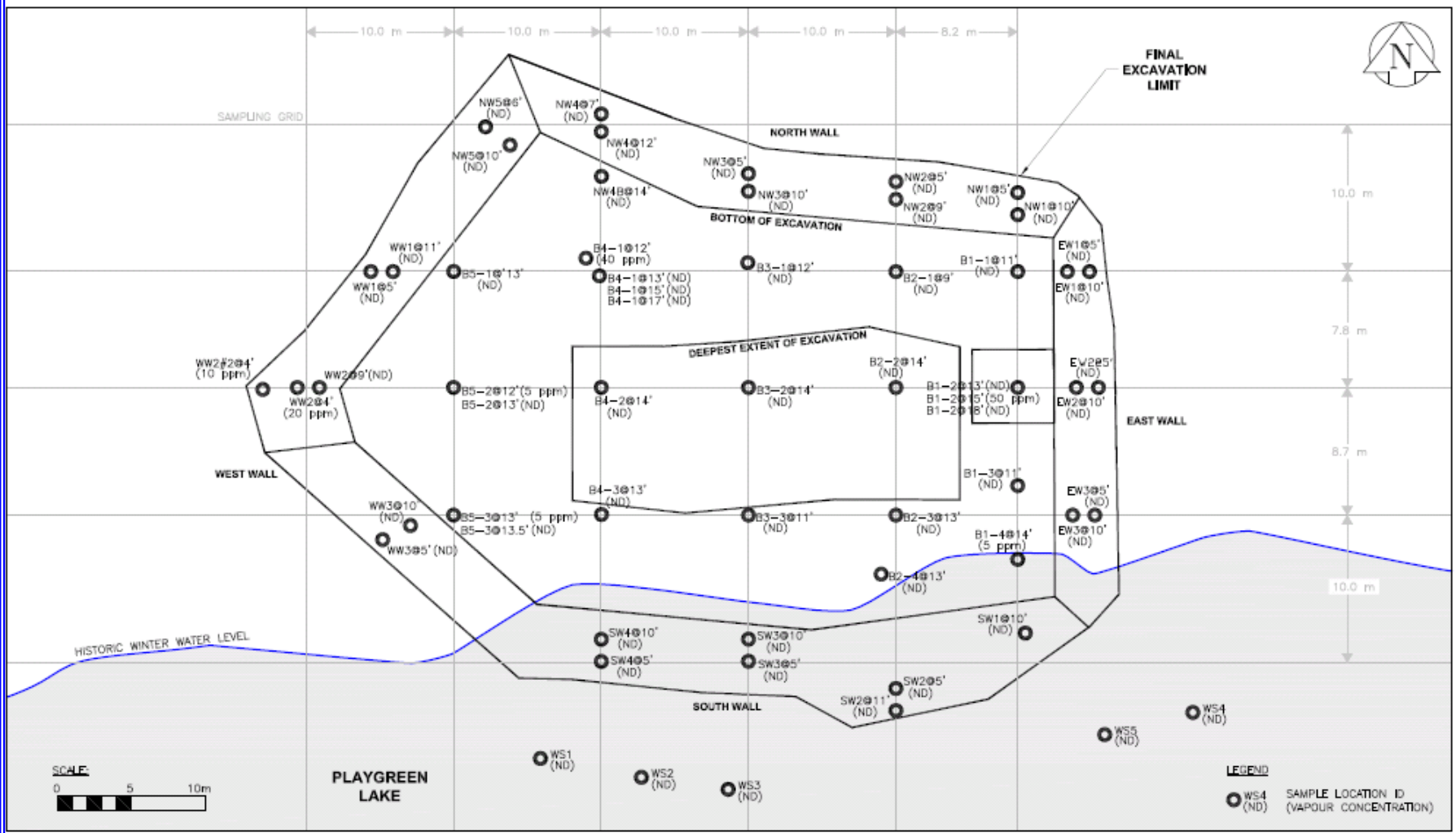
In-Channel Works

In-Channel Works

In-Channel Works



In-Channel Works



In-Channel Works

In-Channel Works

In-Channel Works

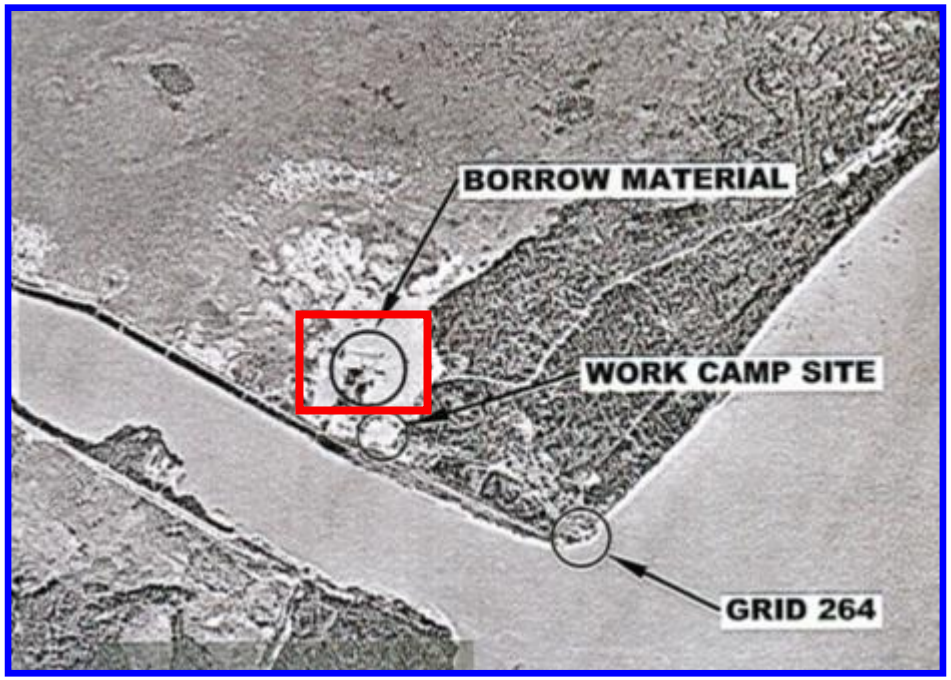
- Inner earth dyke was removed and used as backfill
- Aqua dams were removed by first allowing controlled flooding of isolated work area
- Dams were pulled from channel using cables manipulated by backhoes
- Destroyed dam material and silt curtain hauled to Jenpeg landfill

In-Channel Works

In-Channel Works

In-Channel Works

Borrow Material



- Texture consistent with channel bottom material
- Initial samples showed no contamination
- Discovered limited debris and evidence of PHC impact during final removal of borrow

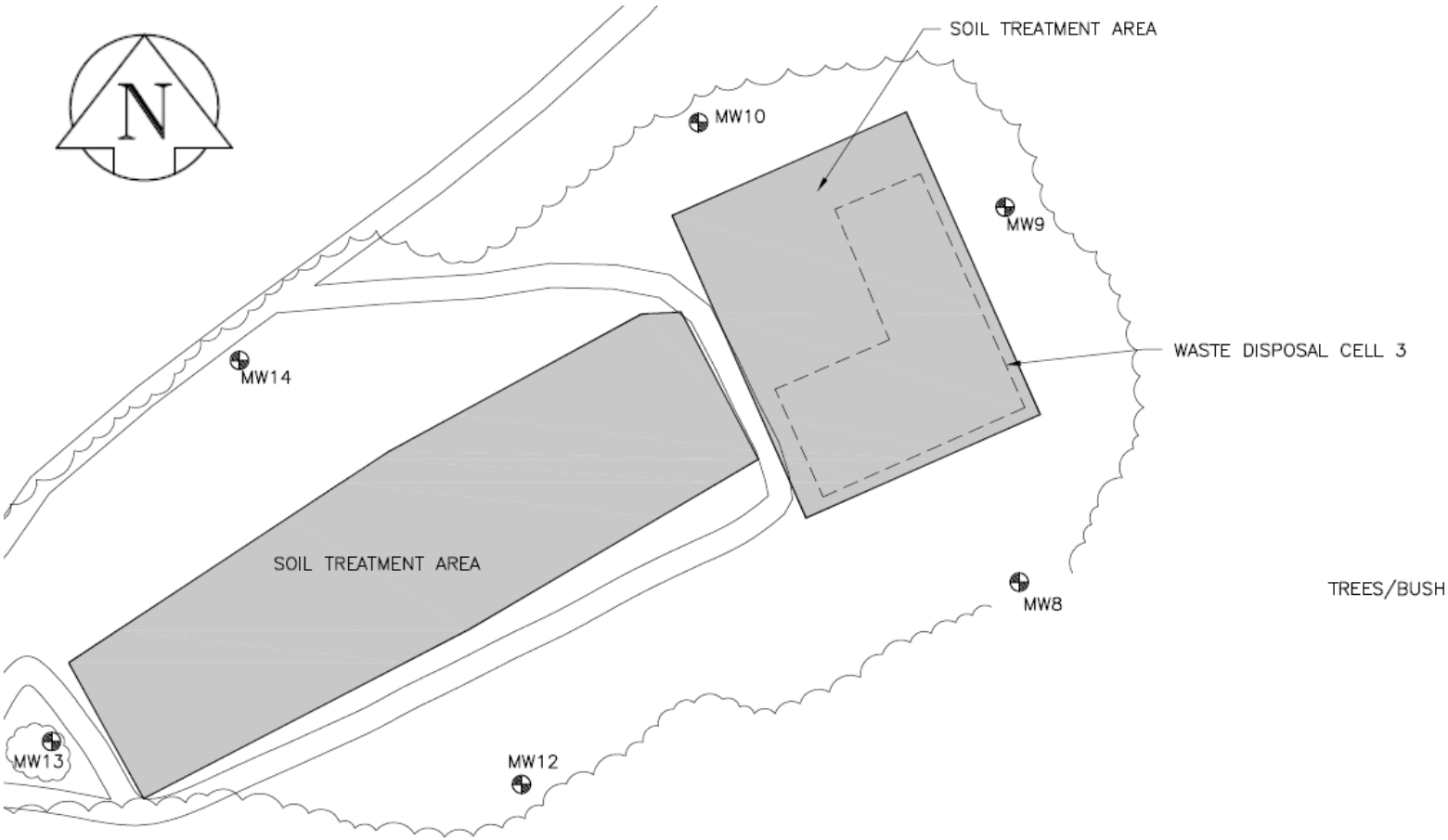
Borrow Material

- Potentially contaminated material was disposed of in treatment cell
- Debris was removed by hand to maximum extent and diverted to Norway House in solid waste stream
- Test pitting determined contamination was very limited (< 20 m^3) and debris was isolated

Borrow Material

Treatment Cell

Proposed cell area: > 7500 m^2



Treatment Cell

Treatment Cell

Treatment Cell

Treatment Cell

- Actual combined volume of material placed in both cells:

$7000\ m^3$

- Demobilization from site completed by late March 2008

Treatment Cell

- Returned to treatment cell in September 2008
- Turned soils and collected soil samples
- Results: 13 of 32 soil samples exceeded
- One ‘hot spot’
- Turned and sampled again in September 2009
- Results are pending

Acknowledgements

AECOM

TEAM HAZCO

A CCS Company


SLOW
THANK YOU
QUESTIONS?