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Chinook Energy Inc.

Gwich'in Reclamation Program

C-36

Outline

- Chinook Energy Gwich'in Sites Summary
- C-36 Sump Contents
- C-36 Reclamation Work Completed
- Next Steps
- Questions

Gwich'in Sites - Summary

Drilling sumps associated with C-36, N-73 and D-39 have been inspected and/or sampled with no indication of impacts.

C-36: Sump has settled. Reclamation work commenced in 2013. Difficulties due to high water flow within the site. Additional reclamation plan and implementation needed.

N-73: Sump has settled. Reclamation work completed in 2013. Final plan submitted waiting on approval.

D-39: Sump has settled – holding surface water but is well vegetated. The sump has not settled further over time and no reclamation recommended. Final plan submitted waiting on approval.

Location Map

C-36 Overview

- C- 36 is located at N67°15’09’’ and W131°51’39.4”
- The well was drilled and subsequently abandoned in January 2003.
- Sump is located directly northeast of well centre.
- Field and desktop assessment completed in 2006 to determine potential for contamination. No concerns were found.
- Desktop assessment updated in 2010 provided the same results.
- Field Assessment in 2010 to answer AANDC’s concern that the sump contents may not be contained. Results indicated no evidence of the leaching of sump contents.

C-36 Sump Contents

- Phase I Environmental Site Assessment (ESA) completed in 2006 indicated that the drilling waste products used passed Alberta Environmental (AENV) compliance checklists.
- These checklists help assess different potential concerns with the products used.
- The products used to drill this well were freshwater based gelchem systems.

C-36 Sump Contents

- Limited Phase II ESA was conducted in 2010 to assess the condition of the sump. Soil and water samples were taken.
- The findings from this investigation included:
  - The sump cap to be a minimum of 0.5m thick and intact.
  - There did not appear to be any residual impacts to the surface water from the drilling waste within the onsite sump.
  - Some residual salinity impacts to the soil within the sump area – typical given the nature of the drilling waste.
  - No evidence of the leaching of sump contents.

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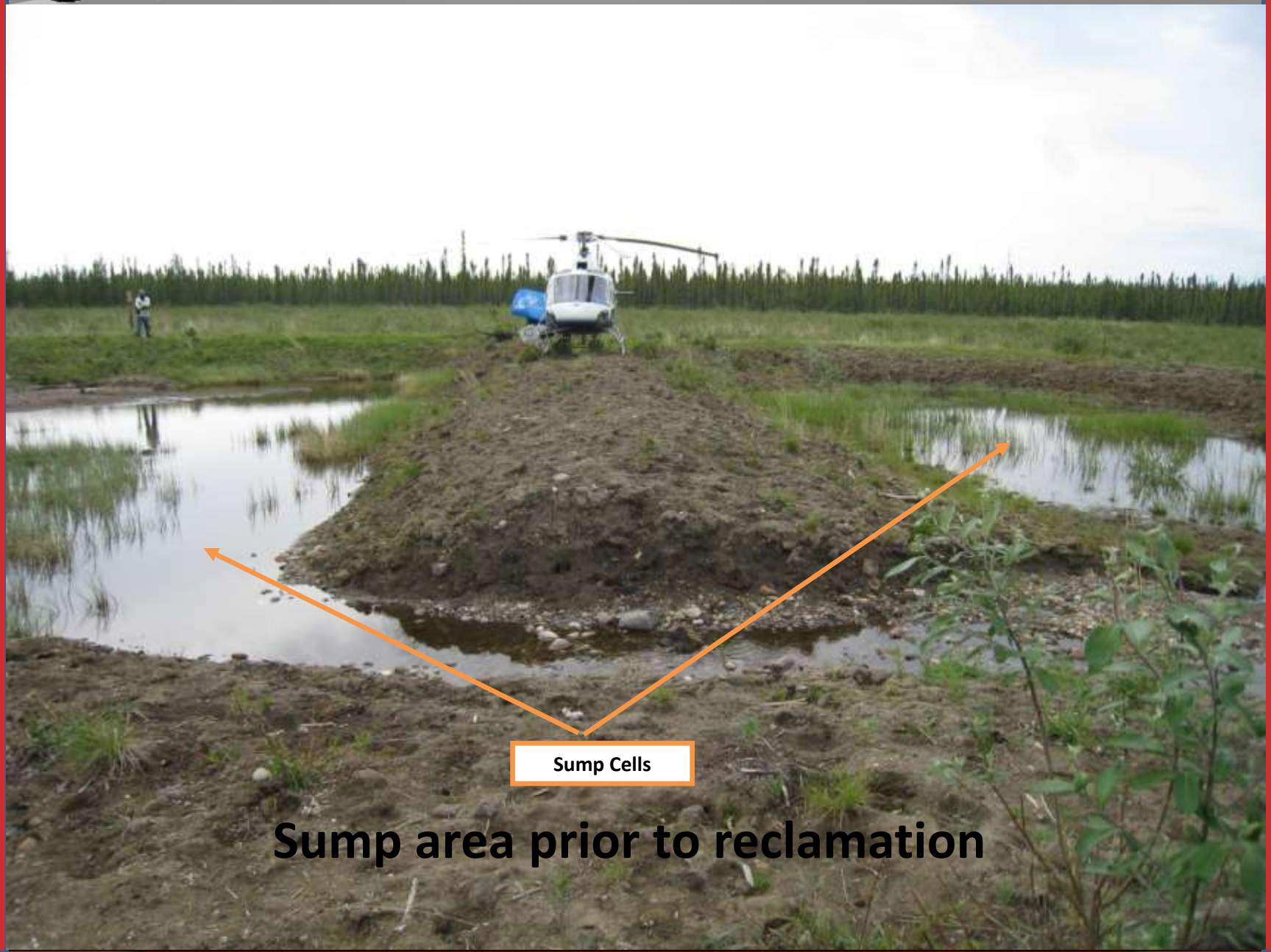
Site prior to reclamation

C-36



Sump area prior to reclamation

Original Reclamation Plan (summer heli-portable):

- Pump out the standing water.
- Cement from D-07 site (located within the Sahtu Region) to be used as the base layer of fill in the sump.
- Re-direct drainage using weeping tile.
- Re-grade the sumps using the soil material contained in the berms.
- Install sediment stop and coconut matting on top (to prevent erosion) as needed.
- Re-seed with an approved seed mix.

Reclamation work completed in 2013

- Pump out water was done daily as water was not standing but flowing.
- Approximately 30 loads of cement from D-07 site were used as the base layer of fill in the sump.
- Attempts to re-direct drainage were unsuccessful.
- Partially re-graded the sump using the soil material contained in the berms.
- Installed erosion control measures to minimize erosion from flowing water.
- Seeded the re-graded areas.

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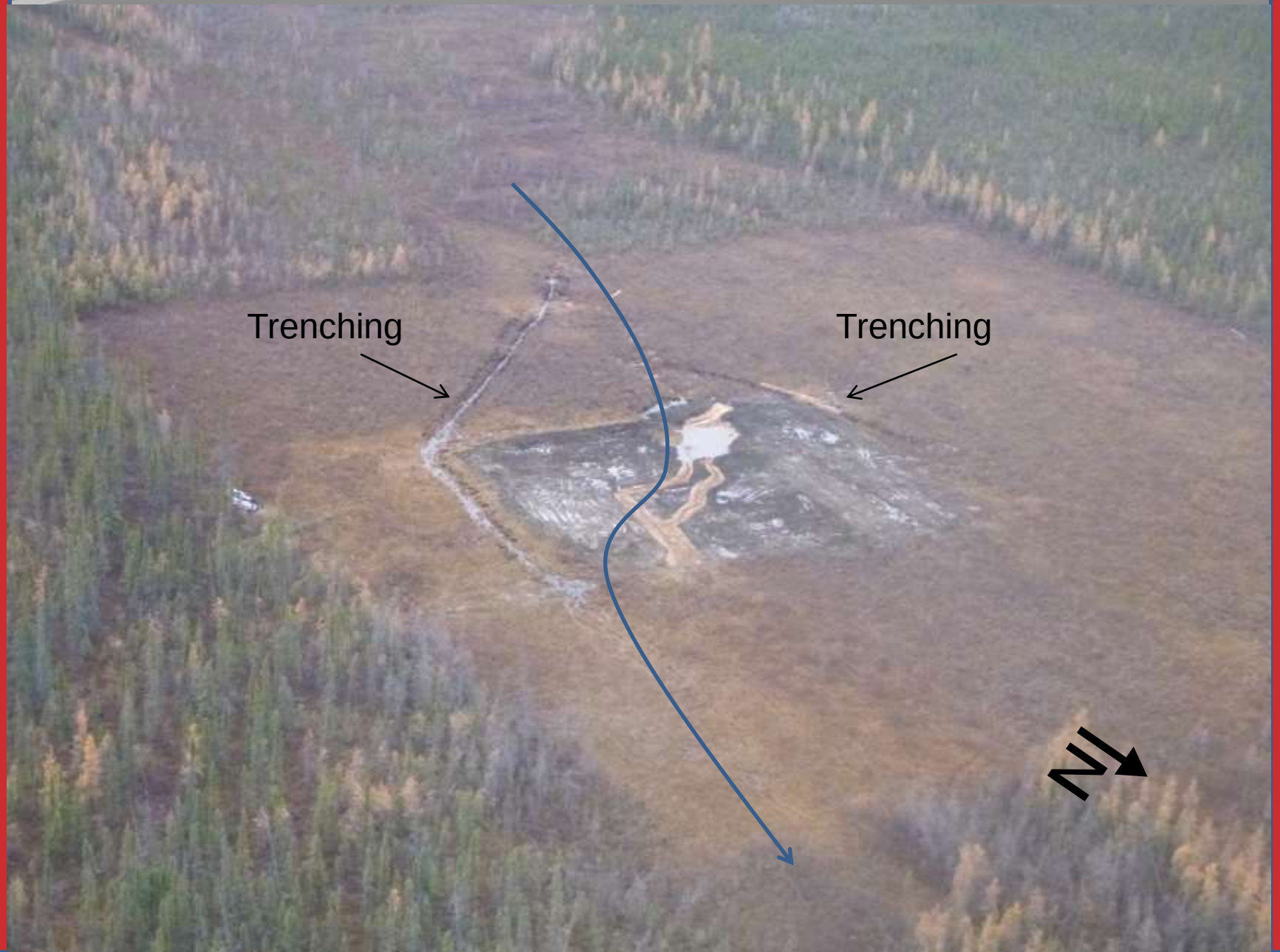
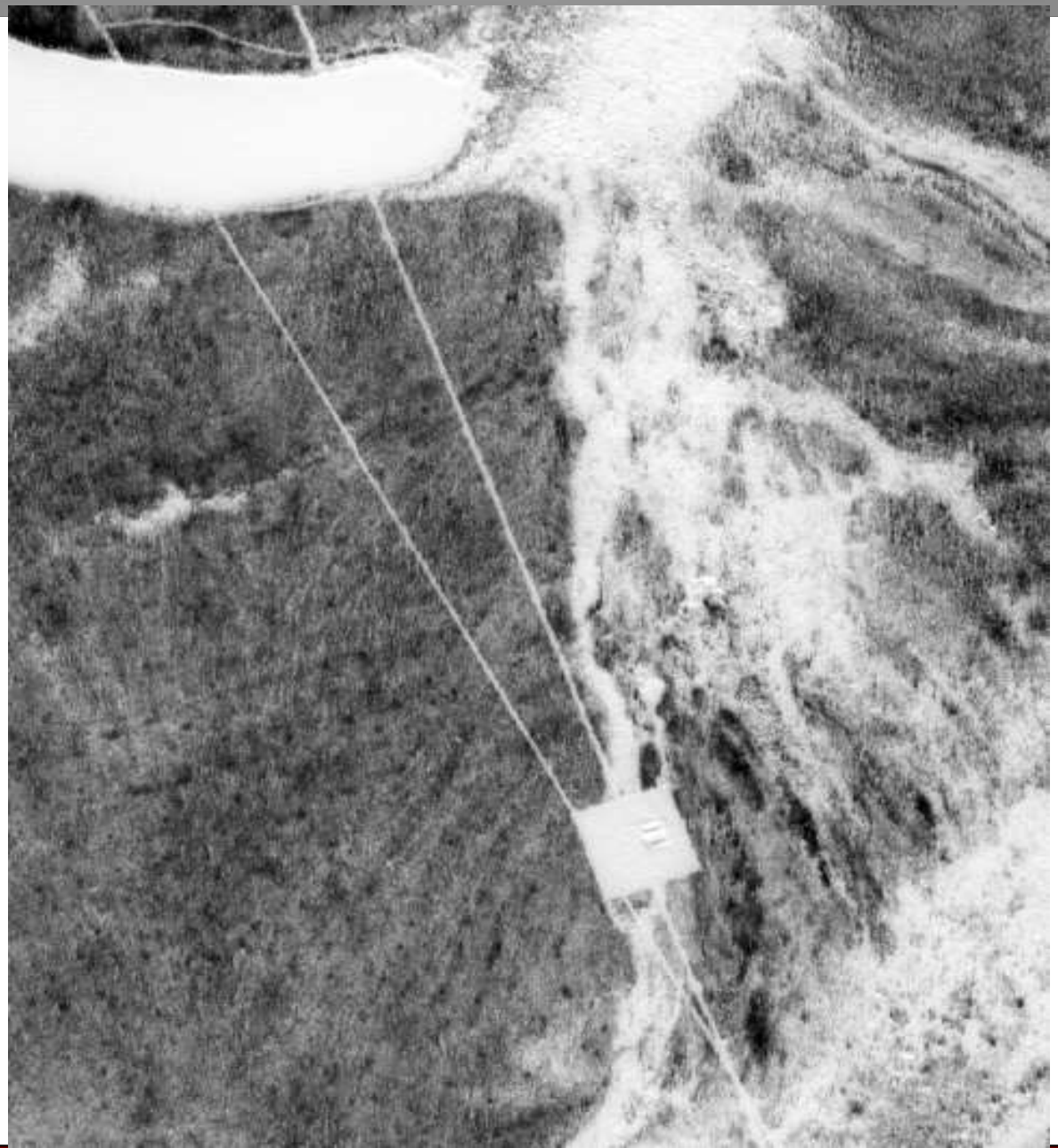
Sump area after 2013 reclamation work

C-36



C-36



C-36

Flowing water through the site

View of trenching in attempt to divert surficial flow from the sump area

From the ground view of the difficult conditions for heli-portable equipment

Next Steps

2014 Reclamation Plan (summer heli-portable):

- Improvements have been made at the C-36 site.
- Hydrology review indicates it is unlikely that water can be permanently diverted from the sump.
- Historical review indicates that the sump was built in a creek.

- Ideas/concept of an end point that GNWT/GLWB is looking for?

Questions

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