Pipelines, Wells and Blowouts…Oh My!

Environmental Challenges to a Highway Upgrading Project

Michael Halliwell, M. Eng., FEC, EP, CESA, C-NRPP, P.Eng.

March 2025

THURBER

Acknowledgements

THURBER

Who am I?

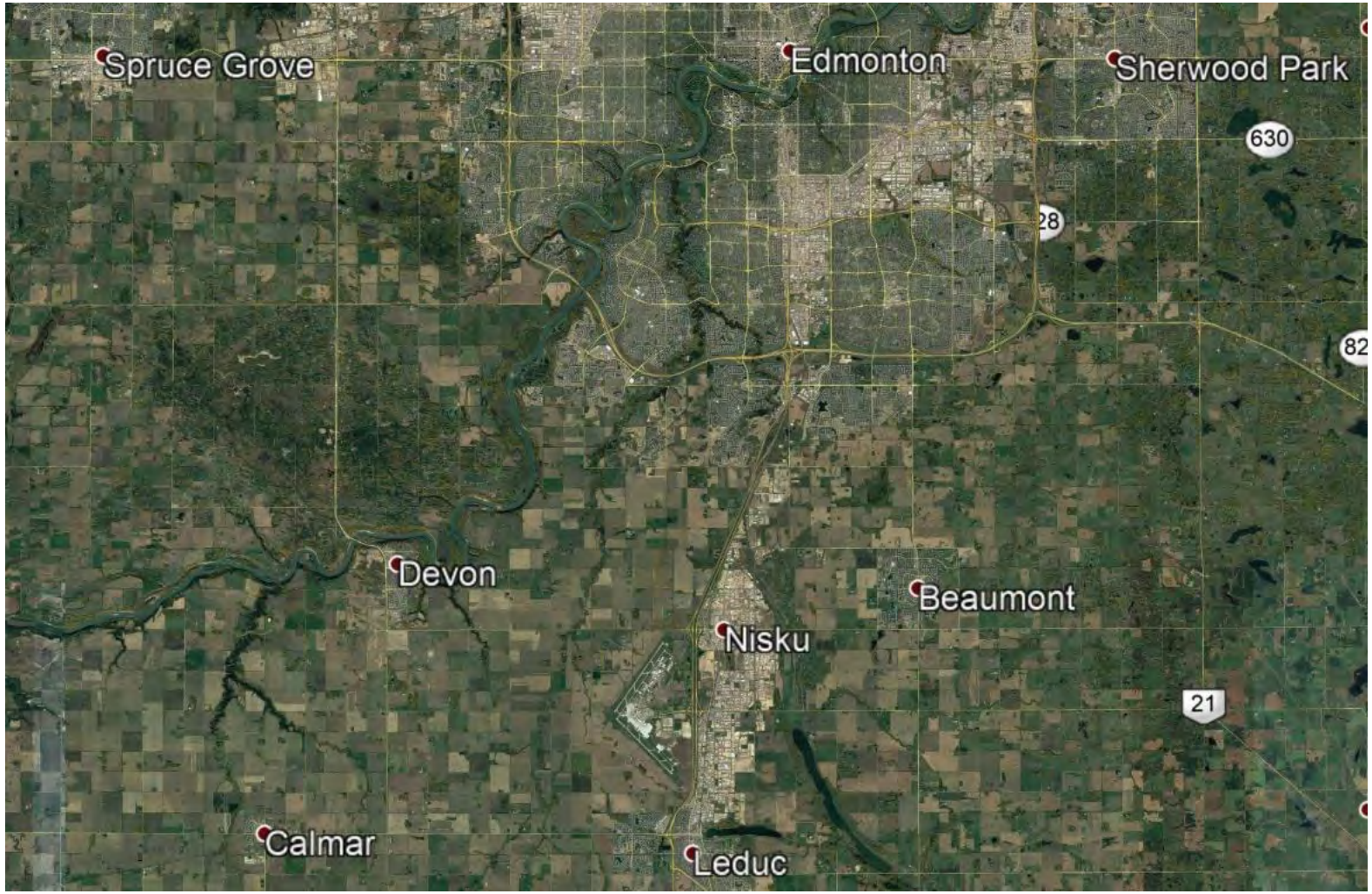
Senior Environmental Engineer with over 24 years of experience

- Phase 1 ESAs through remediation
- HBMS sampling
- Radon work
- Clients from “mom and pops” to government and multinational firms

Michael Halliwell, M.Eng., FEC, EP, CESA, C-NRPP, P.Eng.

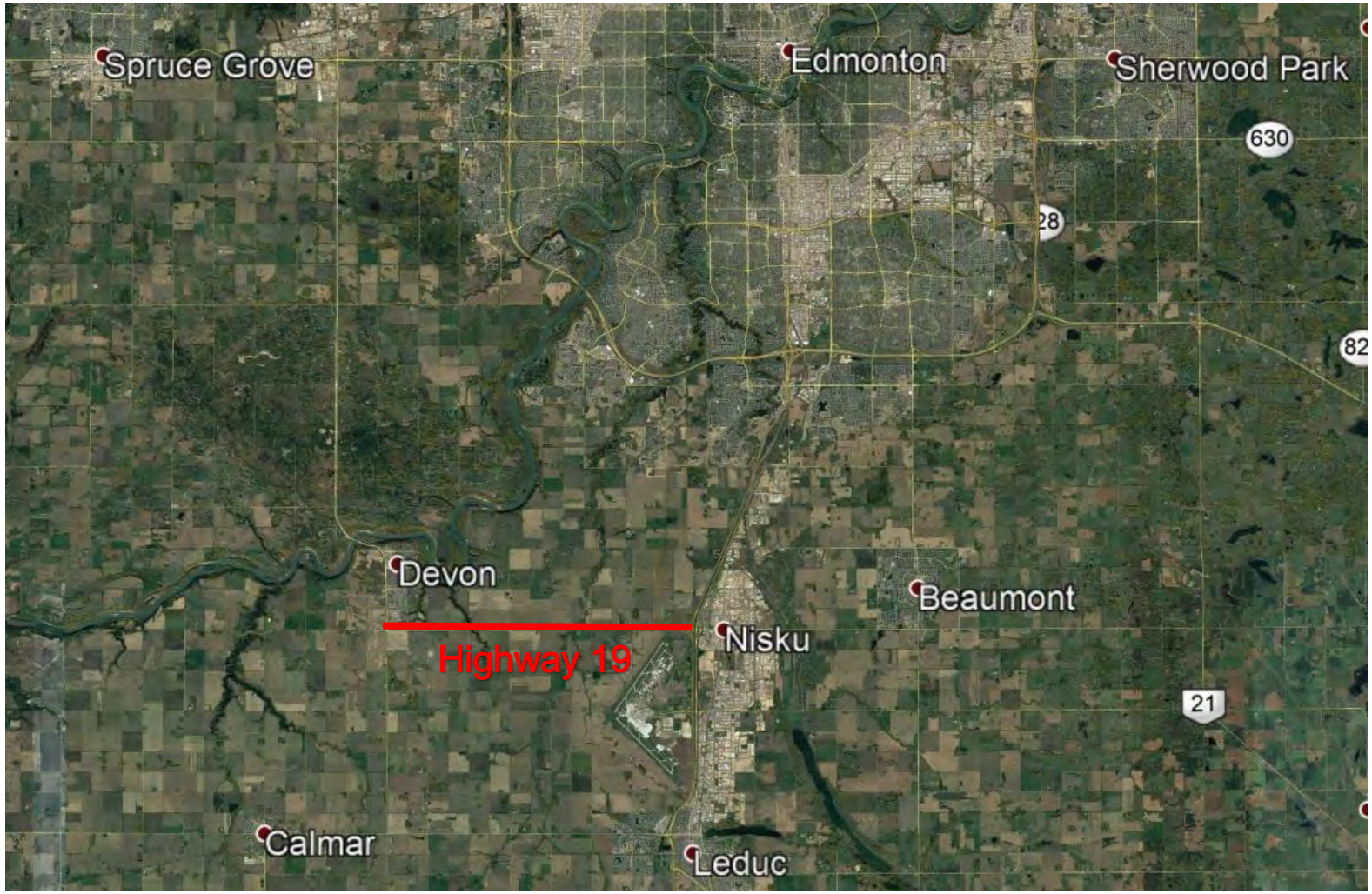
THURBER

The Site: Highway 19 (West Portion) Twinning



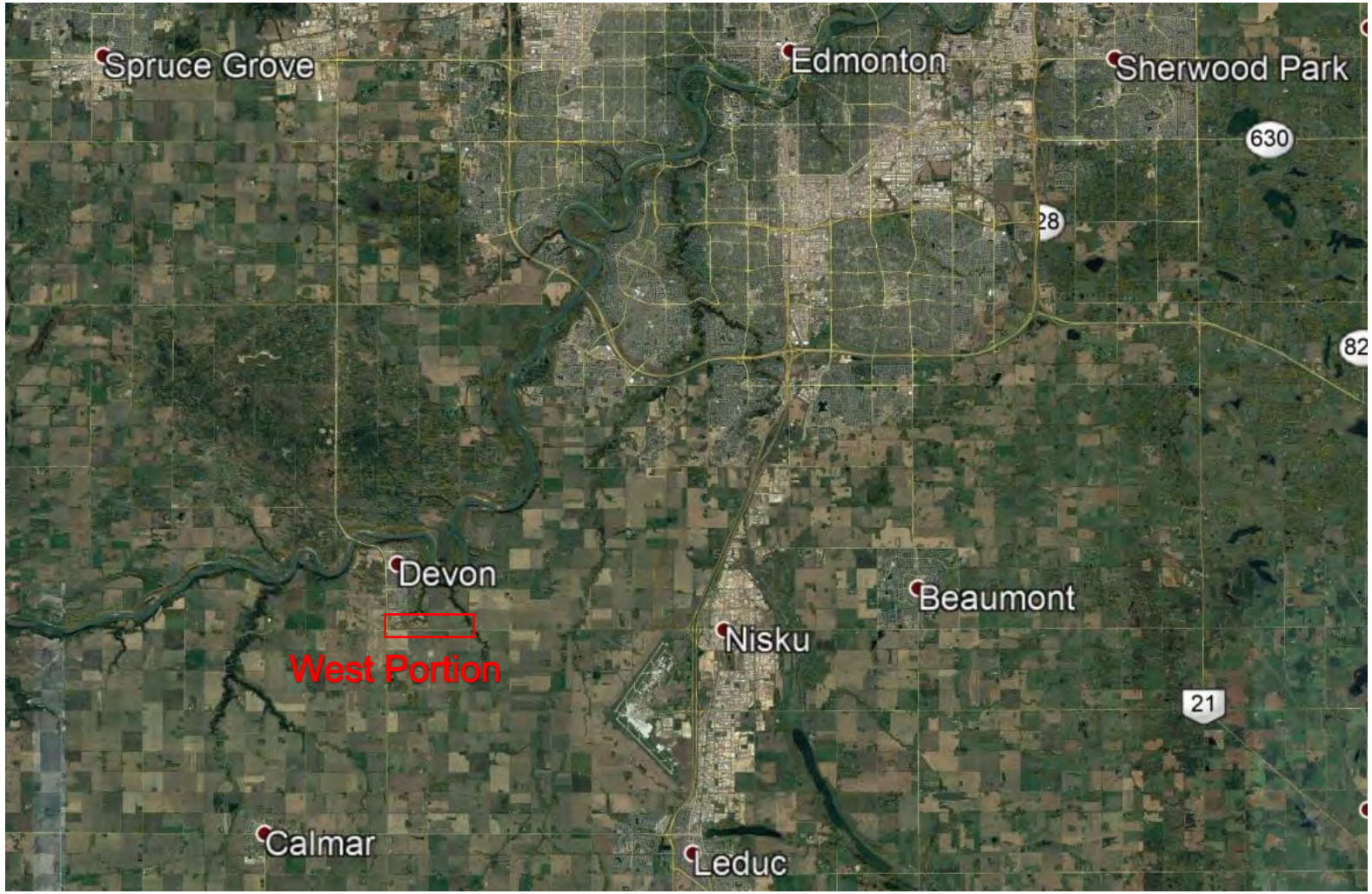
THURBER

The Site: Highway 19 (West Portion) Twinning



THURBER

The Site: Highway 19 (West Portion) Twinning



THURBER

Some History

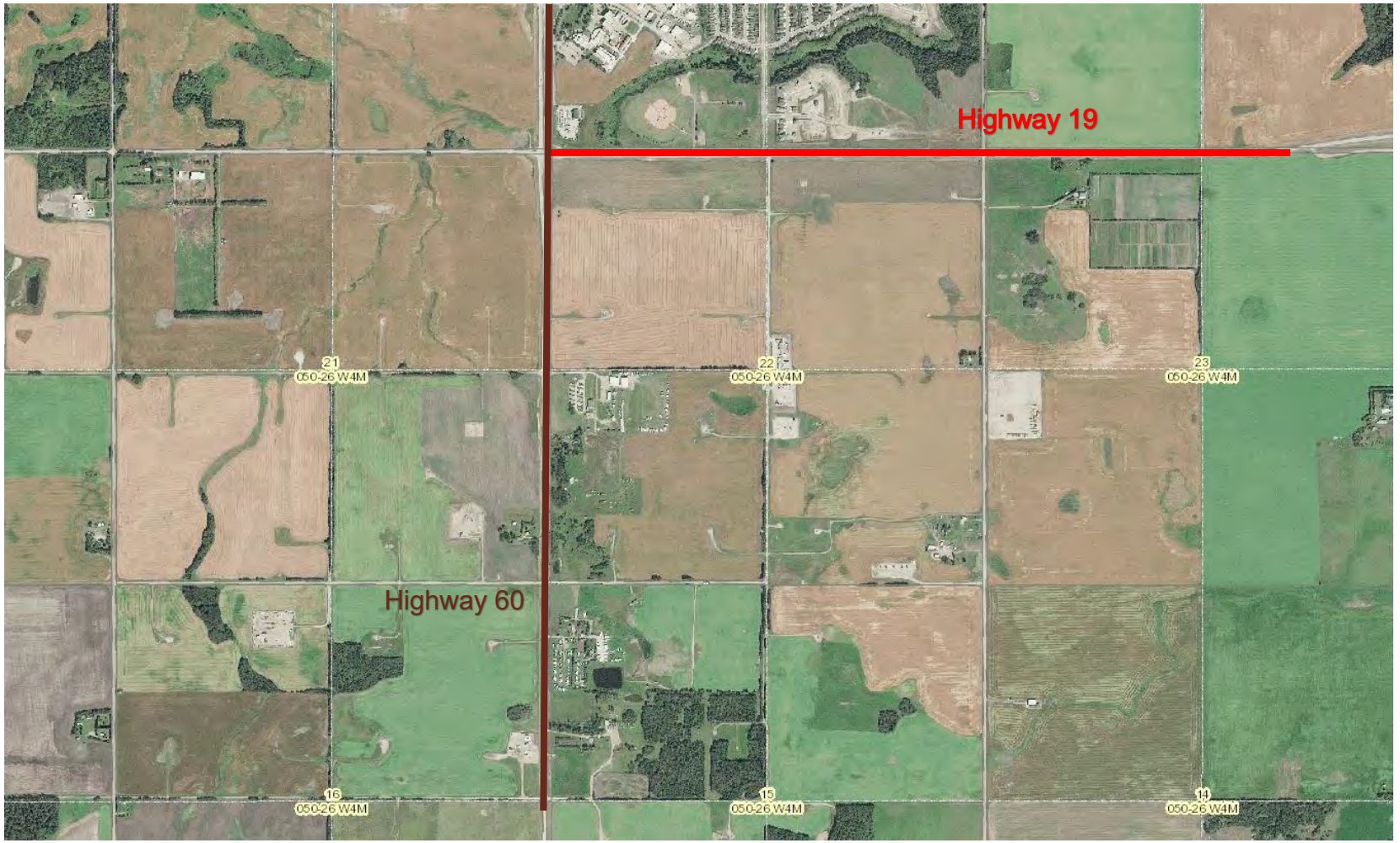
- Originally a Township Road (likely dirt road)
- 1956 was an “all weather gravel road”
- 1978 interchange at Nisku opened and roadway had been upgraded to a paved 2-way, undivided Secondary Highway
- Eventually became an Edmonton bypass route
- Traffic volumes, vehicle sizes and speeds exceeding the original design parameters, leading to more collisions and fatalities
- Only to get worse: part of future outer ring road for Edmonton

THURBER

The Plan: Highway 19 (West Portion) Twinning

The plan . . .

From:



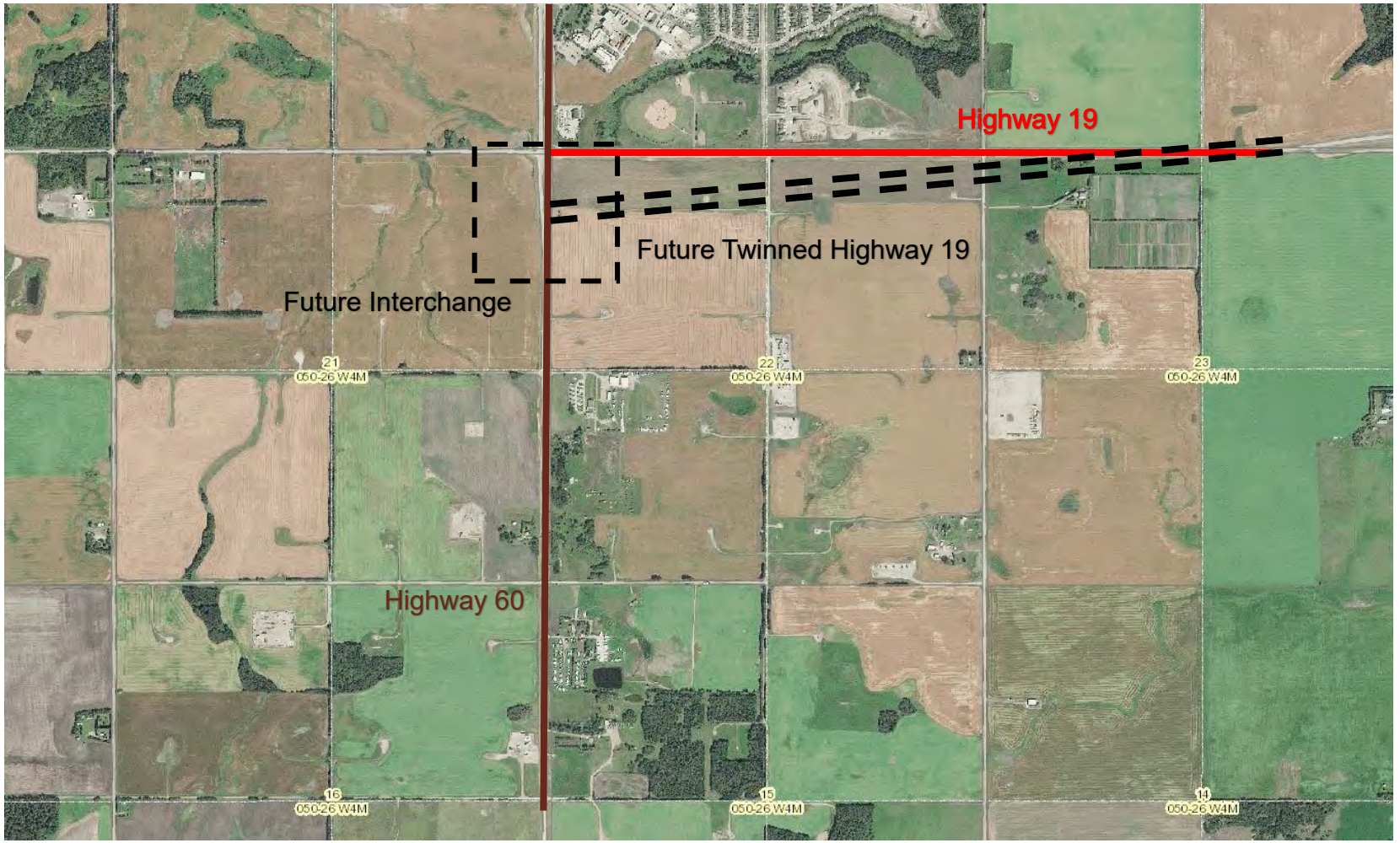
THURBER

The Plan: Highway 19 (West Portion) Twinning

The plan . . .

To:

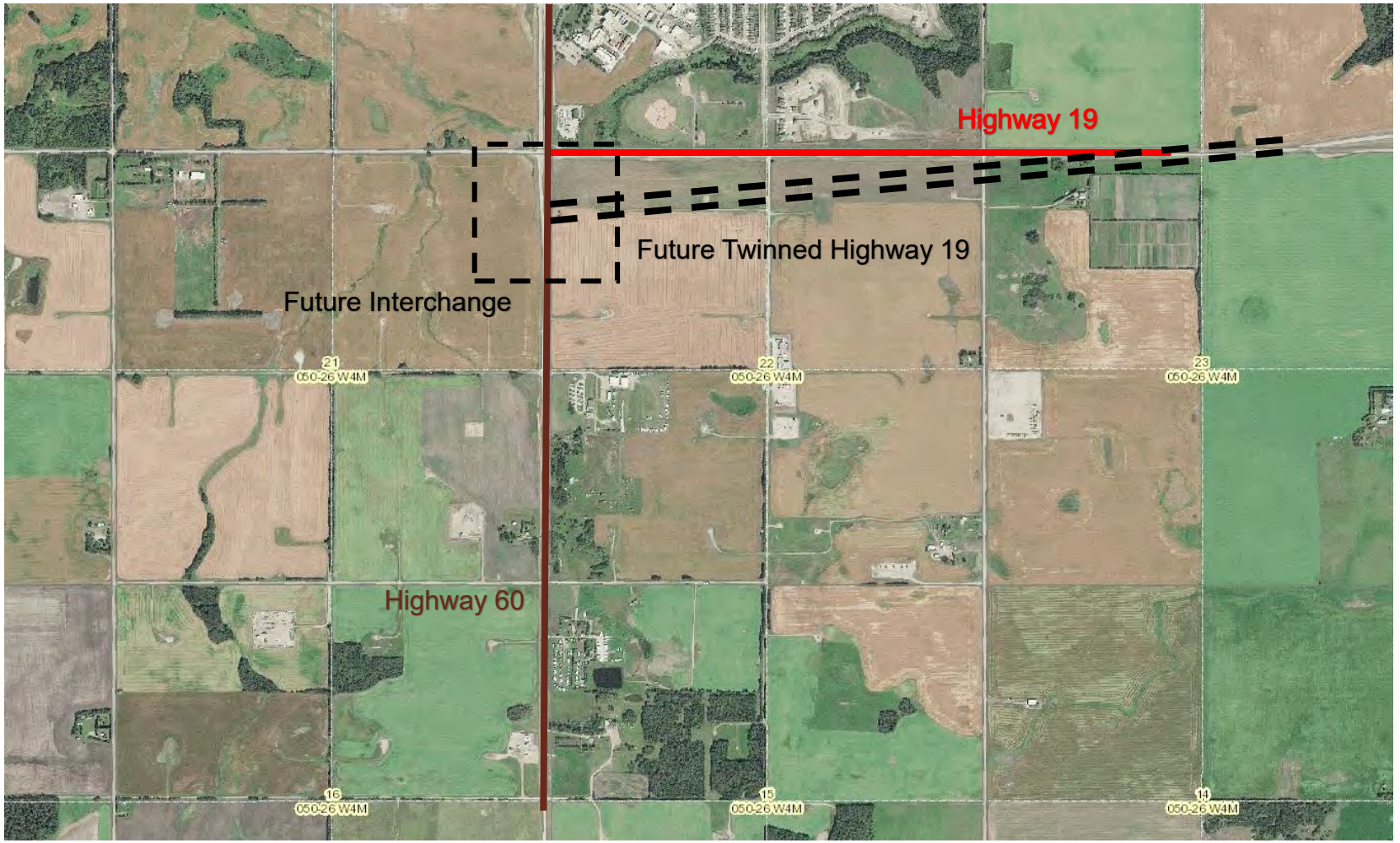
From a transportation standpoint: easy



THURBER

The Plan: Highway 19 (West Portion) Twinning

. . . but then there is the environmental side . . .

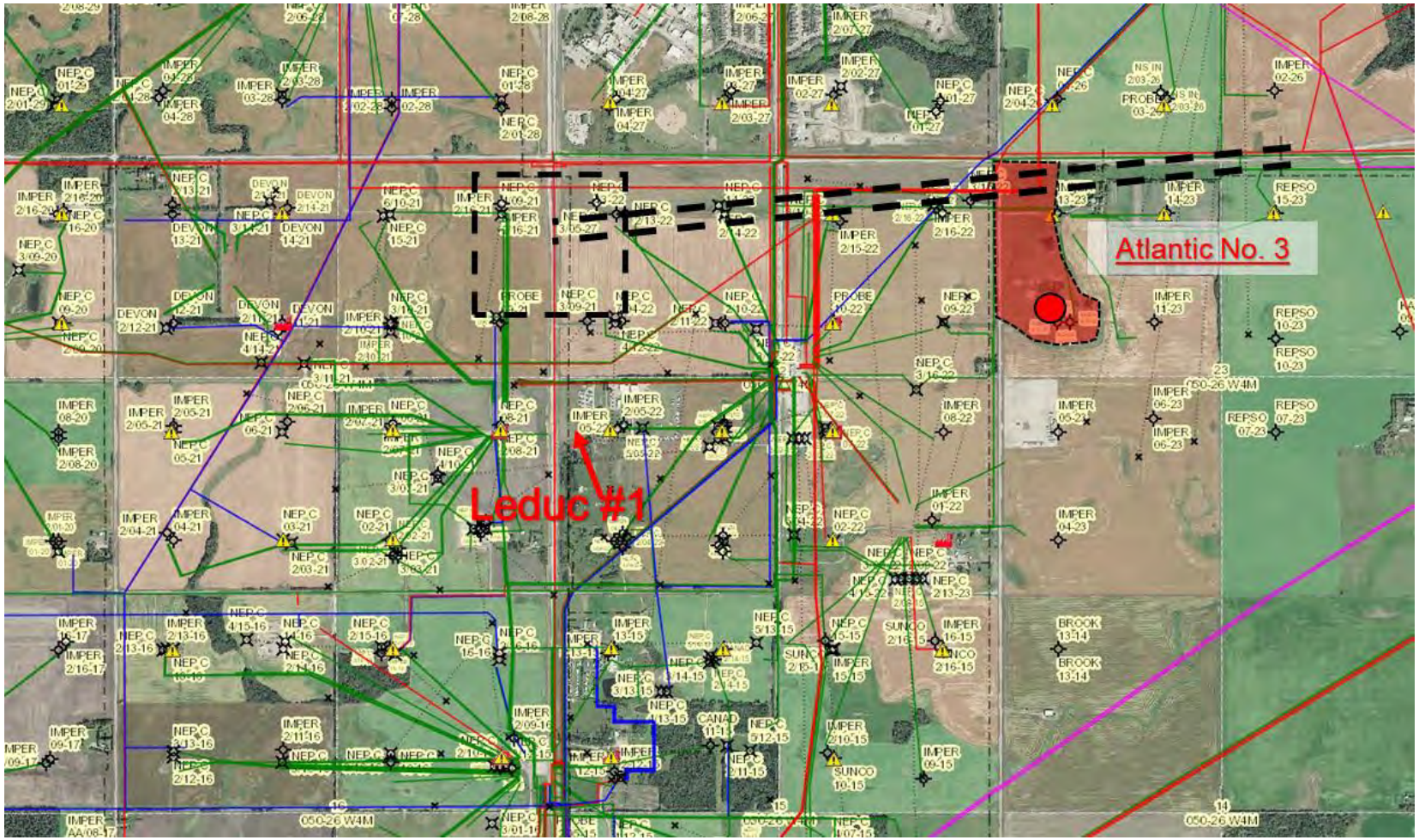


THURBER

The Plan: Highway 19 (West Portion) Twinning

. . . but then there is the environmental side . . .

NOTE: This is a rather extreme case



THURBER

The Challenge

For the proposed twinning itself, there are:

- 100 pipelines or pipeline crossings
- Active / Abandoned / Unusual pipes
- Found one cut and not capped
- Water Co-op pipeline (where is it?!)
- Well sites, facilities, spills and complaints (to the 1940's)

THURBER

The Challenge

For the proposed twinning itself, there are:

- Atlantic No. 3 impact zone and plume
  - Approximately 1.2-1.4 million barrels of overland flow collected (sent for processing)
  - Est. 1.5-2 million barrels of oil from the well
  - Pits (collection and incidental) and fires
  - Current status?

THURBER

Atlantic No. 3 – Blowout (March 8, 1948)

THURBER

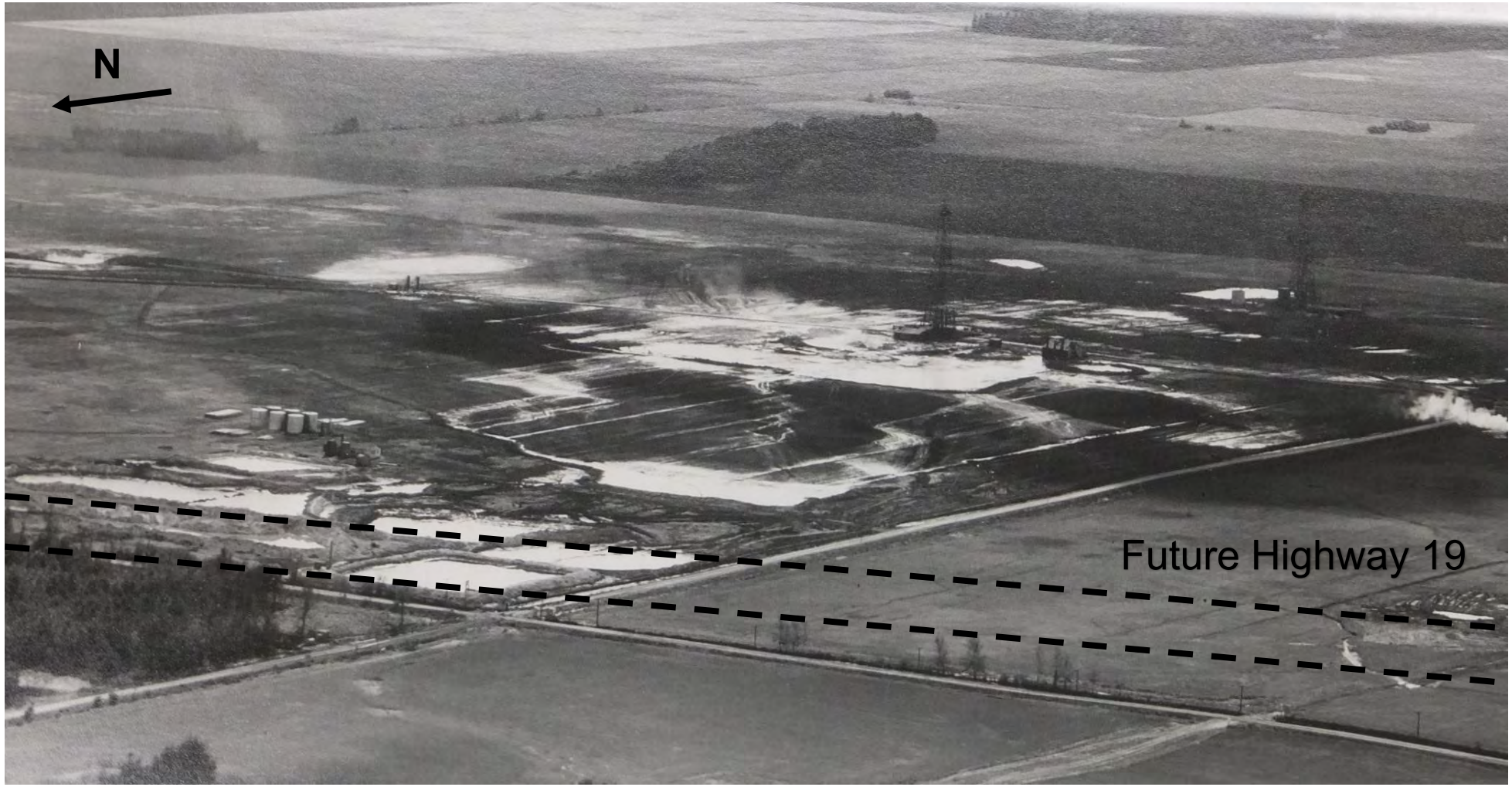
Atlantic No. 3

THURBER

Atlantic No. 3

THURBER

Atlantic No. 3



THURBER

Assessment

- Ltd. Phase 1 ESA / Environmental Overview (EO)
- Daylighting of pipelines and crossings to confirm location, cover and to collect samples
- EM Survey
- Phase 2 ESA

Assessment

Ltd. Phase 1 ESA / EO

1950s

2021

THURBER

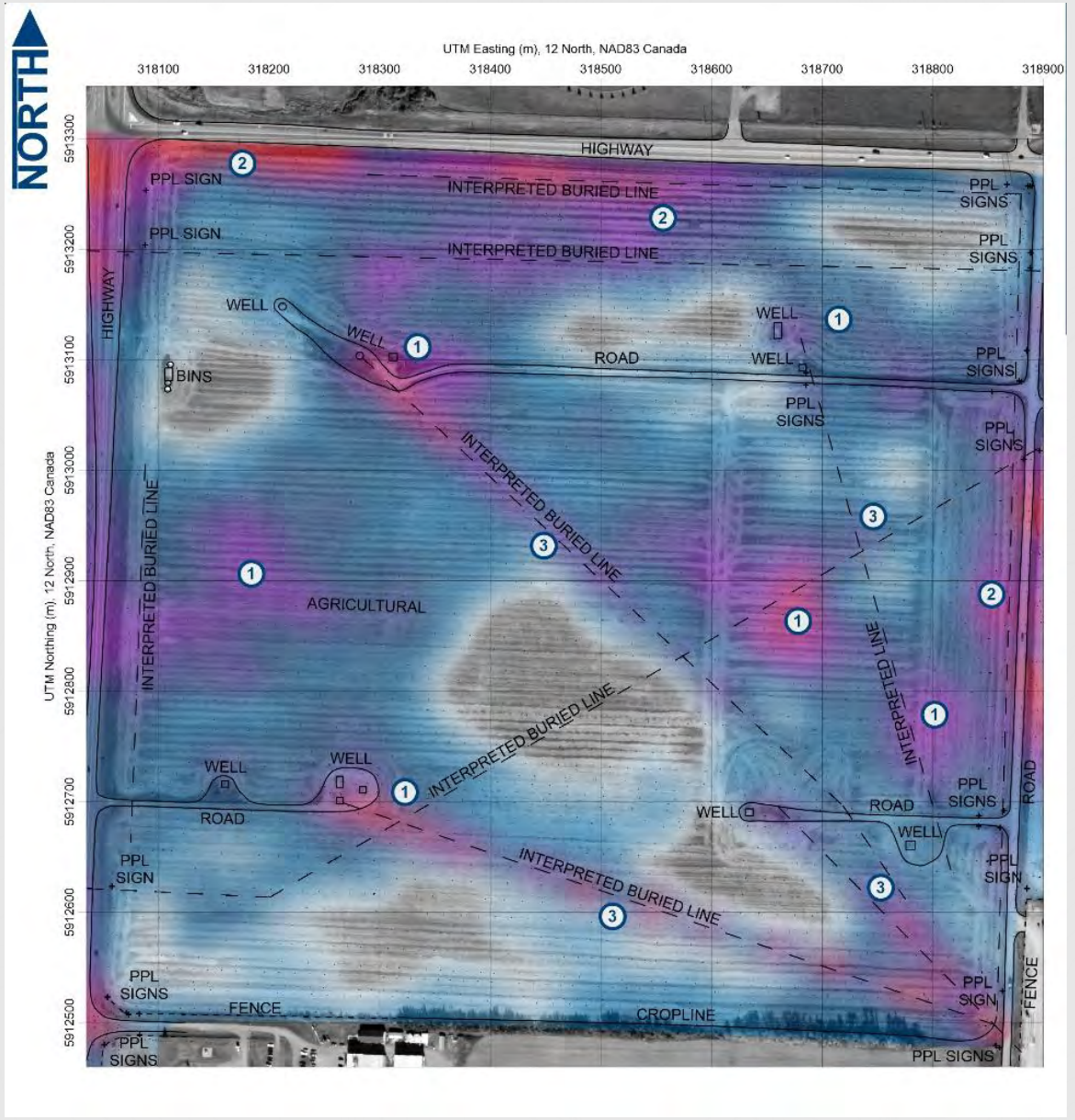
Assessment

Daylighting to confirm locations / depths and to collect samples . . .

THURBER

Assessment

EM Survey



THURBER

Assessment

Phase 2 ESA

- 50+ environmental test holes (plus geo inv.)
- Crops and farming (club root)
- Access issues with landowners / tenants
- Cooperative efforts with oil and gas companies

THURBER

Assessment

- Ultimately, approximately 300 test holes were drilled by our team and the oil and gas companies
- Multiple remediations and reclamations were carried out
- Lots of stakeholders were involved in the process

THURBER

Takeaways

- Highway projects have a lot of clout, but it is far better to take a cooperative approach
  - Less duplication
  - Better results (outcomes and $)
- Local knowledge is a huge asset
- Many stakeholders can complicate the work (in this case: ATEC, AER, EPA, Town of Devon, Leduc County, U of A, landowners, tenants, oil and gas companies and other utilities) and communication between parties is critical

THURBER

Takeaways

- A good Phase I ESA can be invaluable, though they may lead to additional investigations
- Though, admittedly, most highway projects do not have this magnitude of an environmental component
- It's important to carry out the environmental work up front to avoid unpleasant surprises later on in the project (spend a few dollars early vs. much, much more later)

THURBER

Thank You

Comments /

Questions?

THURBER