

Update on Review of Secondary Containment Liner Testing

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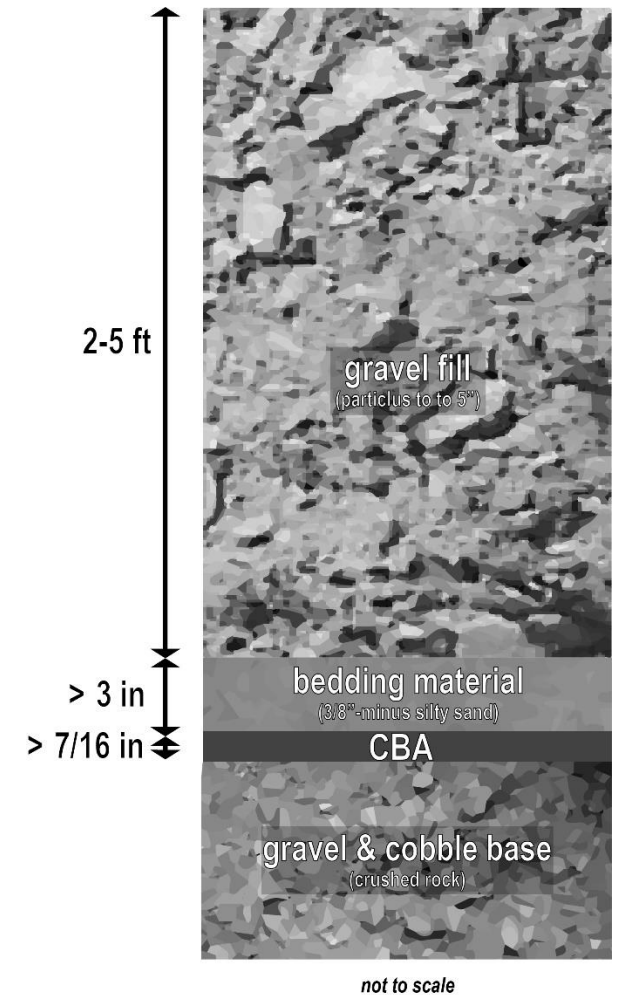
Presented to Prince Williams Sound Regional Citizens' Advisory Council

Board of Directors Meeting September 19-20, 2024



Pilot Testing Rational

- *Based on laboratory permeability test results , the CBA (catalytically lined asphalt) lined SCS (secondary containment system) will meet the 'sufficiently impermeable' criteria as defined in the State of Alaska Administrative Code 18 AAC 75.990 (124) as long as there are no open perforations in the SCS (emphasis added).* Conclusion from Golder 2018
- East Tank Farm (ETF) is $\sim 2,373,000 \text{ ft}^2$, but only $\sim 23,000 \text{ ft}^2$ have been visually inspected ($\sim 1\%$)
- **A verified method is needed to non-destructively evaluate integrity of CBA lined SCS**



Pilot Testing Objective

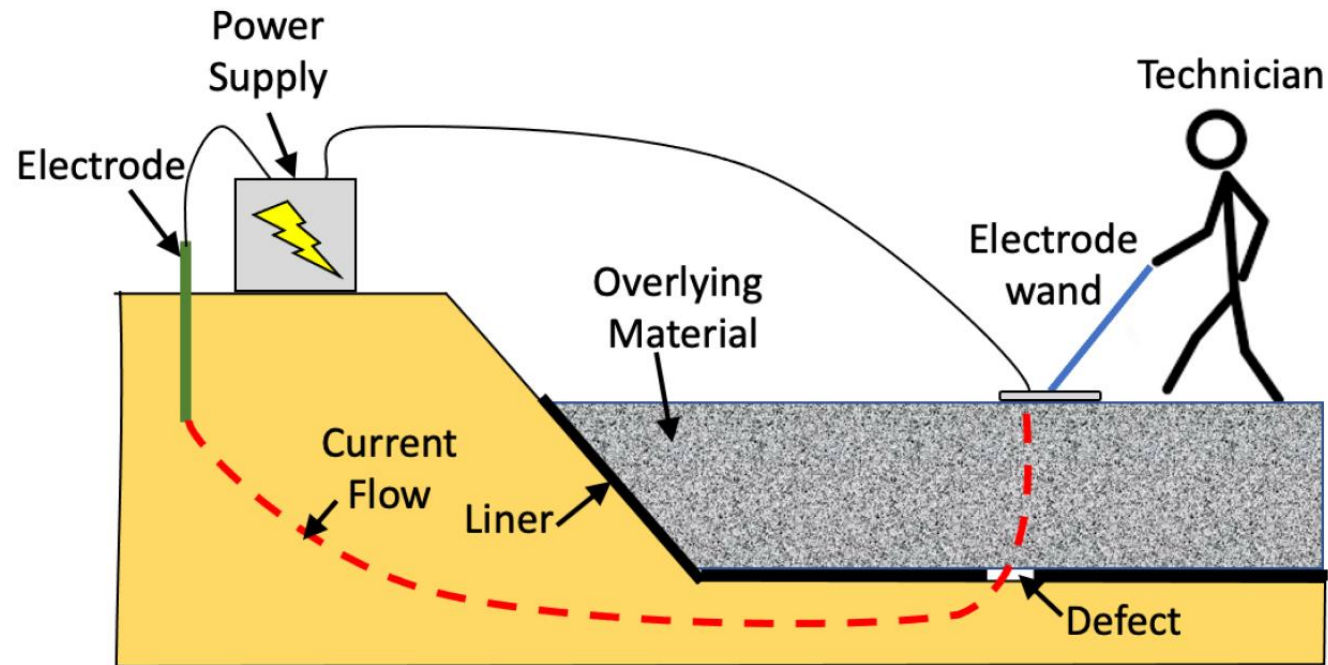
- Confirm the effectiveness of electrical leak location (ELL) electrical for detecting leaks* in catalytically blown asphalt (CPA) portion of secondary containment system (SCS)
- Test applicability of electrical resistivity tomography (ERT)
- Examine condition of a part of existing SCS in the West Tank Farm (WTF)



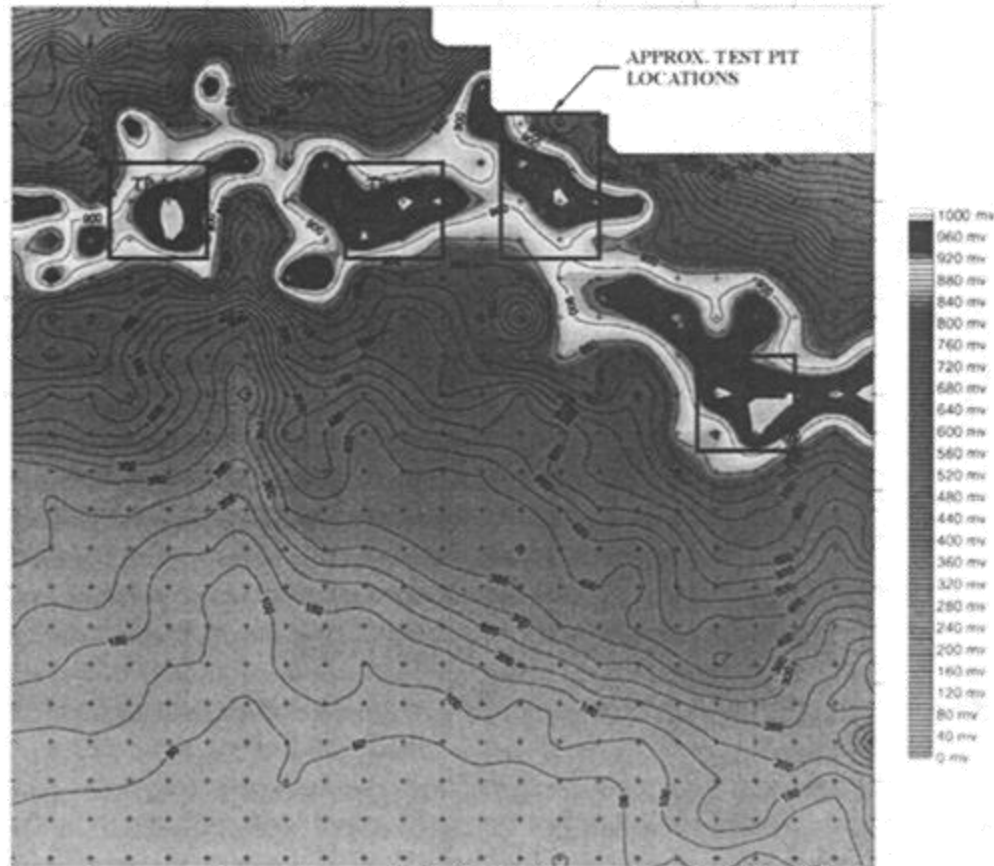
*Leaks = holes, punctures, tears, defects, cracks, or other similar breaches

Electrical Leak Location (ELL)

Following ASTM D7007 Standard Practices for Electrical Methods for Locating Leaks in Geomembranes Covered with Water or Earthen Materials



Electrical Leak Location (ELL)



TAPS Pump Station 5

Source: Google Earth

Example ELL results for 15×15-m region of TAPS Pump Station 5 SCS

Source: Anderson, S., Lai, A., and Tart, R. (2002), Evaluation of buried secondary containment liners, *Proc. 11th International Conference on Cold Regions Engineering*, ASCE, Reston, VA, 72-82.

Electrical Leak Location (ELL)

VMT WTF; note lack of pre-existing electrical isolation



Source: Google Earth

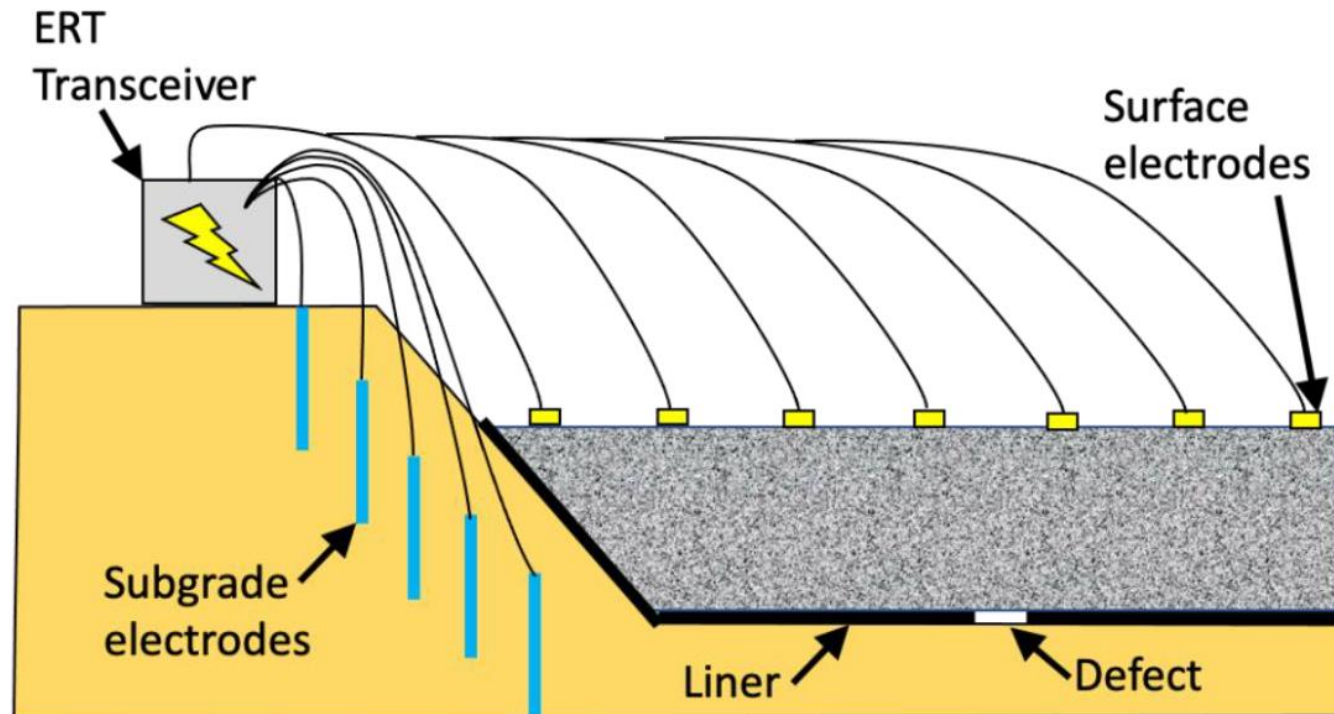


Example of ELL isolation trench
(not at VMT)

Source: TRI Environmental

Electrical Resistivity Tomography (ERT)

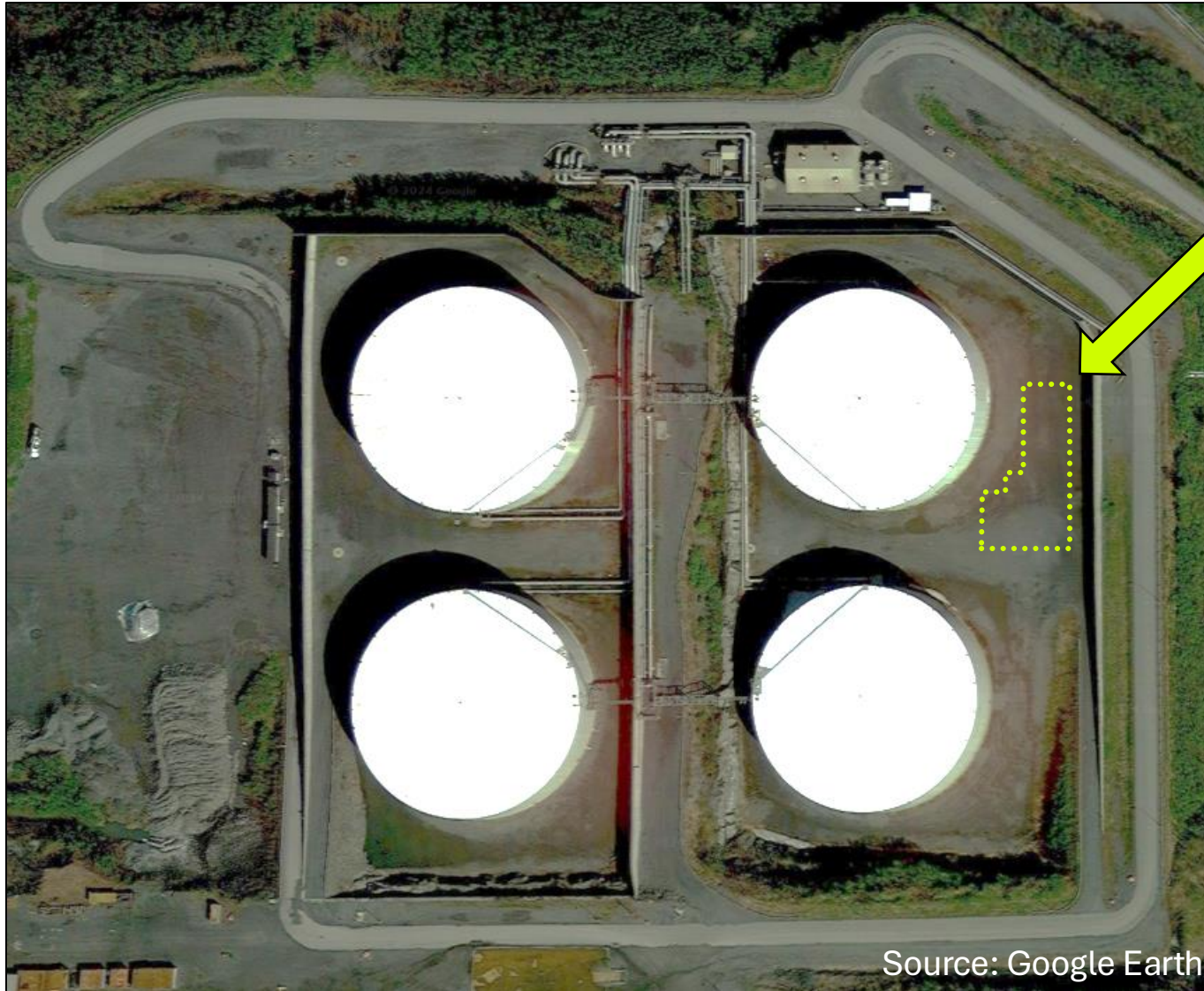
- More elaborate version of ELL
- Generates 3D map of subsurface current flow



Pilot Testing

- Testing performed by Alyeska's contractor (WSP) July 22-29, 2024
- Testing consisted of:
 - Establishment and verification of electrical isolation...

Pilot Testing



Source: Google Earth

Approximate pilot test location
($\approx 15,000$ sf)



Example photo
(not from pilot testing)

Source: Golder (2015), Field Inspection and Liner Evaluation for Catalytically Blown Asphalt CBA Liner at the Valdez Marine Terminal, report to Alyeska Pipeline Service Company by Golder Associates Inc., Anchorage, Alaska. PHOTOB02 (pg 50).

Pilot Testing

- Testing performed by Alyeska's contractor (WSP) July 22-29, 2024
- Testing consisted of:
 - Establishment and verification of electrical isolation
 - ELL testing
 - ERT testing
 - Investigation of identified (minor) anomaly identified by ELL
 - Installed and buried three defects (large gash, small gash, knife slit)
 - ELL testing
 - SCS repair
- As of now, photos and a report providing the results of testing have not been received

Applicability to East Tank Farm?



VMT East Tank Farm

Source: Google Earth