

LOCATING BURIED PIPELINES AND UTILITY LINES IN NAVIGABLE WATERWAYS: CHALLENGES AND SOLUTIONS

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Henry B. Gonzalez Convention Center, San Antonio, Texas



Buried Pipelines and Utility Lines



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Navigable Waterways: Pipelines and Utility Lines

1. Exact Locations
2. Reasons for Inaccuracies
3. Current Location Methods
4. Revelation Technology as a Viable Solution

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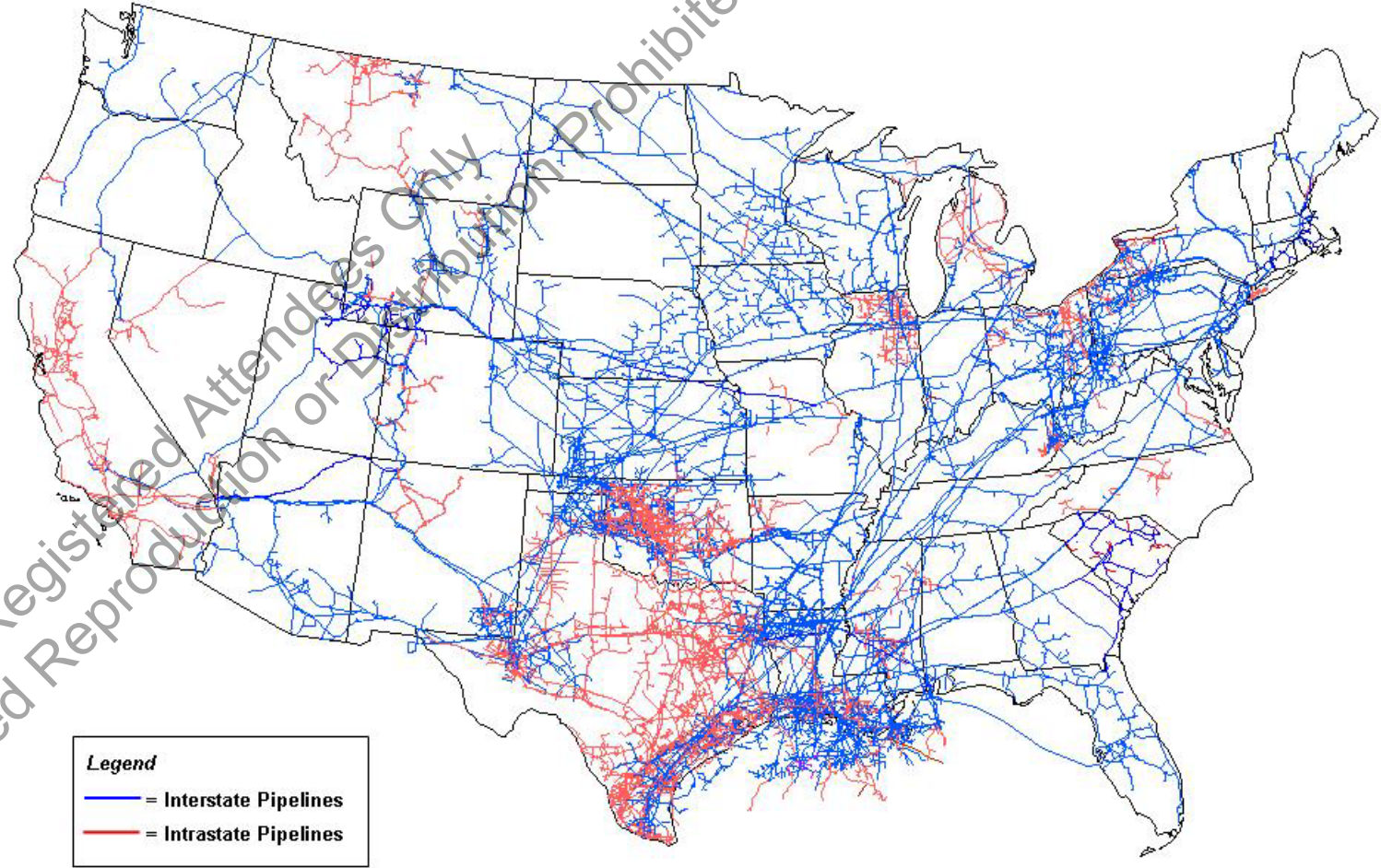
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United States' Pipelines

- 306,000+ miles (492,000 km) natural gas transmission lines
- + 1,000s distribution lines
- 9,500 miles (15,000 km) in the Gulf of America
- 190,000 miles (305,000 km) liquid petroleum lines



Source: Energy Information Administration, Office of Oil & Gas, Natural Gas Division, Gas Transportation Information System

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Navigable Waterways: Buried Pipelines

- 100+ pipelines crossing dredge work areas
- 8 required removal
- 14 required relocation



Portion of Houston Ship Channel Dredge Project

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Marine Pipeline Strikes Over the Past 20 Years



Pipeline Strikes Reported	~ 2500
Fatalities ~ 1 per Year Avg.	20
Personnel Injuries	17
Environmental Impact - Pipeline Spills	100,000 bbls (16,000 m³)

- **10X more impactful** (Response, Extended Downtime, Repair, Environment)
- **Draws more negative attention than onshore strikes**

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Why can Marine Pipeline Locations be Inaccurate?

Pipeline Permitting in the United States

Pipelines in US waters

Army Corps of Engineers (USACE)

Interstate Pipelines on shore

US Department of Transportation (USDOT)

Intrastate Pipelines

State Agencies

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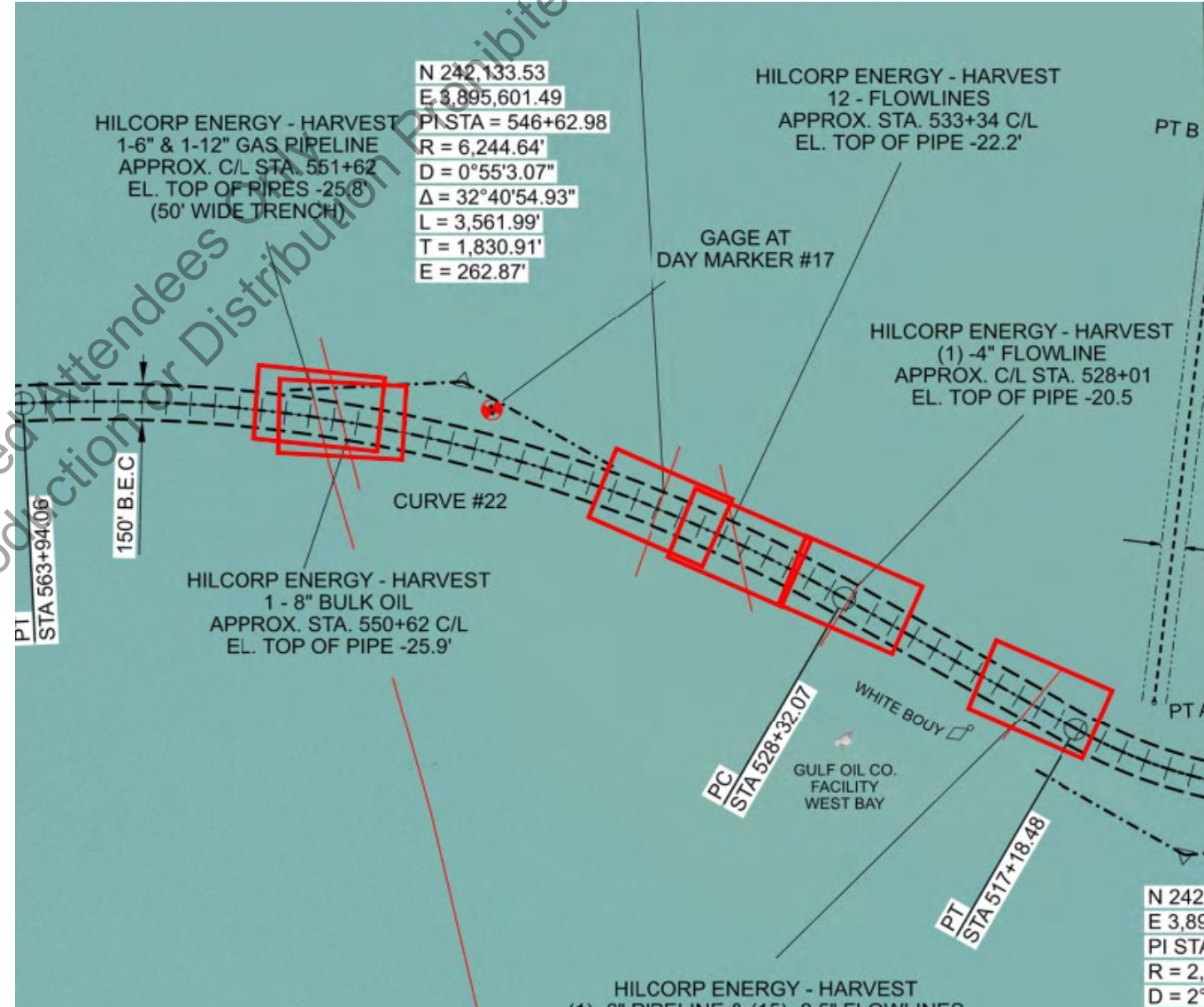
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Why can Marine Pipeline Locations be Inaccurate?

Missing or Incorrect As-Built Documents

- Permits often have only design drawings
- As-Built \neq Permits
- Older pipelines placed with limited technology to verify position



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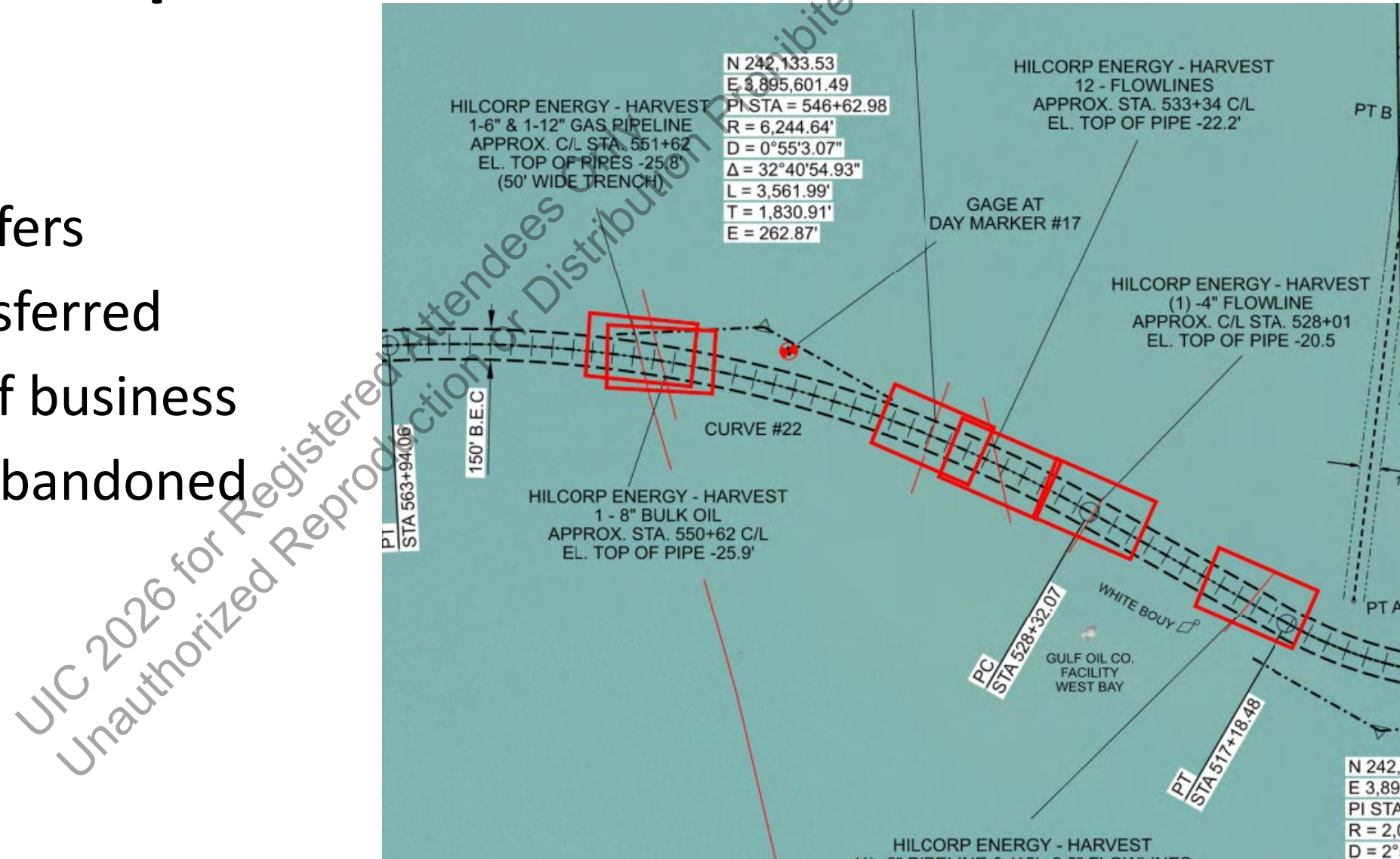
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Why can Marine Pipeline Locations be Inaccurate?

Unclear Ownership

- Ownership transfers
- Permits not transferred
- Owners go out of business
- Were pipelines abandoned properly?



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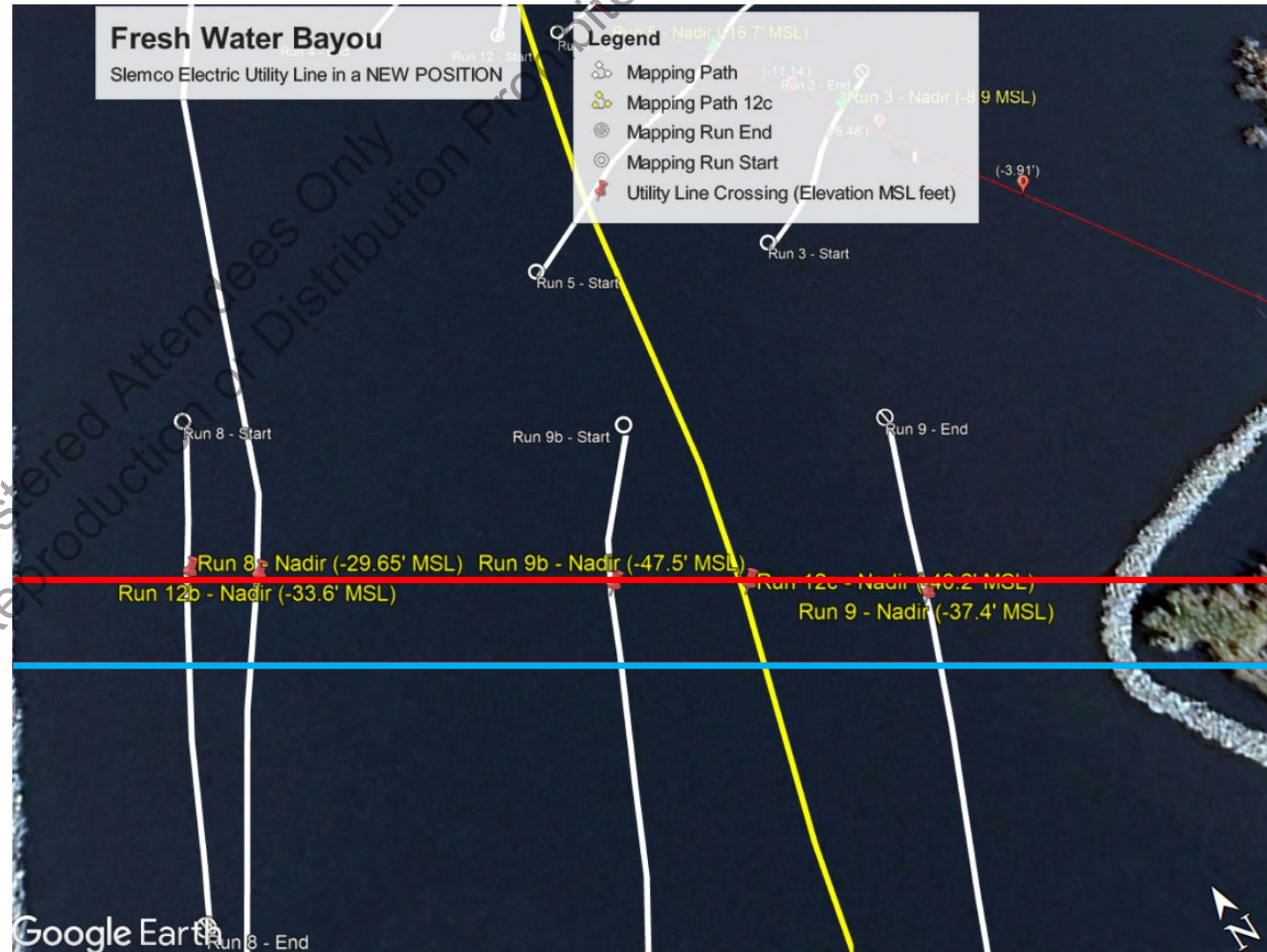
Why can Marine Pipeline Locations be Inaccurate?

Updates to Databases Take Time

- Re-bores
- Deconstruction
- Planned Moves

(RED) Utility Line mapped 42 feet upstream on 2/4/25

(BLUE) As-Built not updated with Re-boring's new position



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Why can Marine Pipeline Locations be Inaccurate?

Marine Pipelines Move

- Hurricanes/Floods
- Axial Stretching, Horizontally, Vertically



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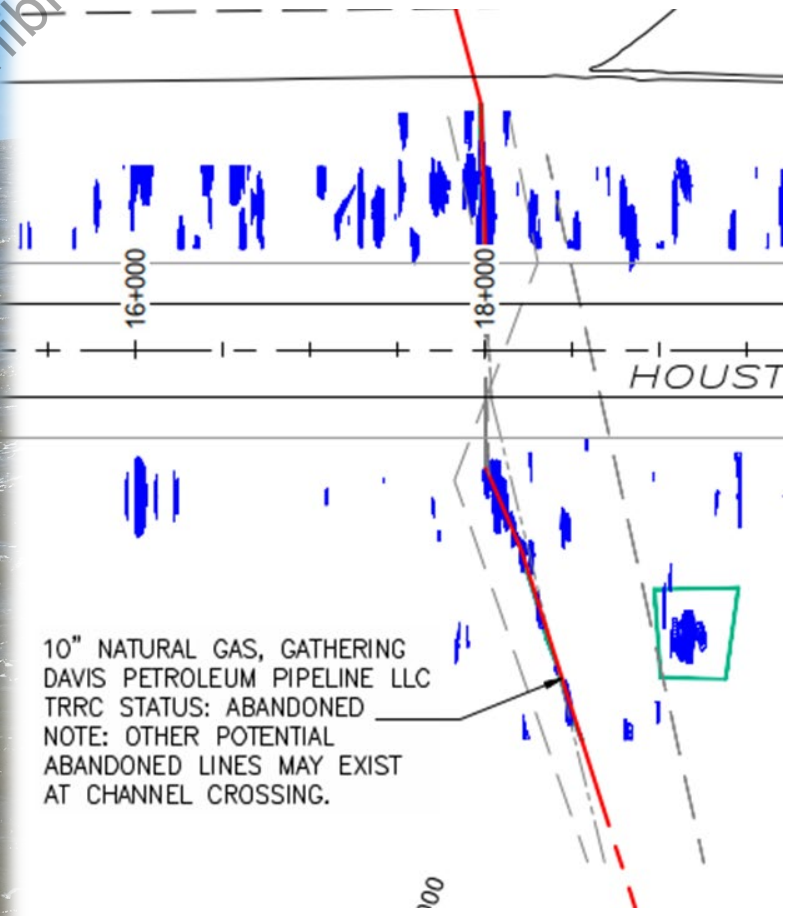
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Traditional Marine Pipeline Location Methods

- Divers
- Probes
- Magnetometers
- Sub-Bottom Profilers (SBP)
- Electronic/RDF Locators
- Pipeline Inspection Gauges



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Traditional Marine Pipeline Location Methods

Common Downsides

- General Location Must Be Known (All)
- Physical Contact Required (Probe, Divers, Locators, PIGs)
- False Positives
- 20-Foot Detection Limit (Mag, SBP)
- Penetration Limit of Cover (Diver, Mag, Probe)
- Expert post-processing (SBP)



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Revelation: Pipeline and Utility Line Mapping

- Generates X-Y-Z (latitude, longitude, elevation); regardless of cover
- Maps Unknown and Known Conductive Lines
- Non-Contact and Non-Destructive
- Offshore and Onshore



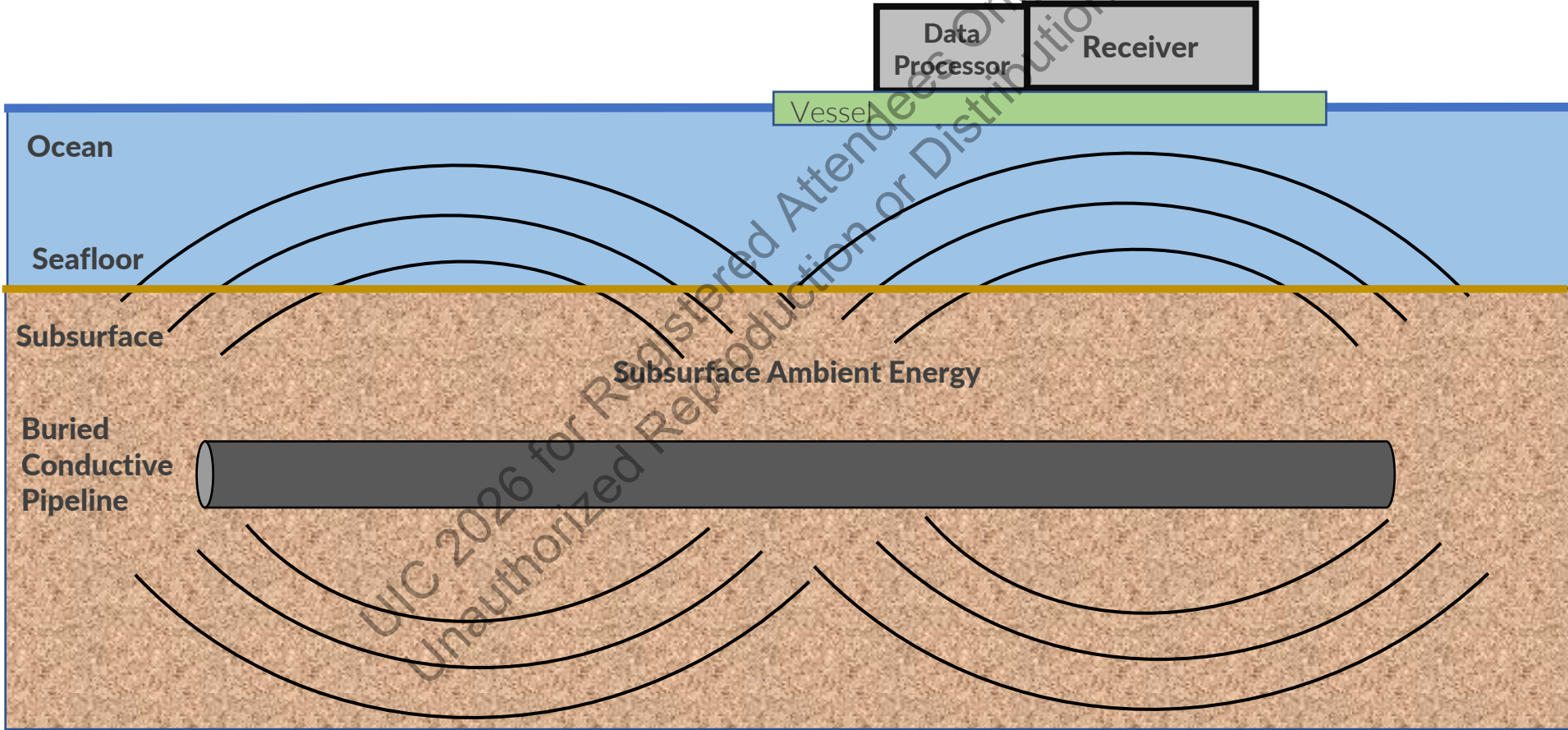
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Revelation measures the electromagnetic differences of the ambient energy in the earth's subsurface with man-made conductive cylindrical-shaped anomalies, i.e. pipelines, conduits, and utility lines.



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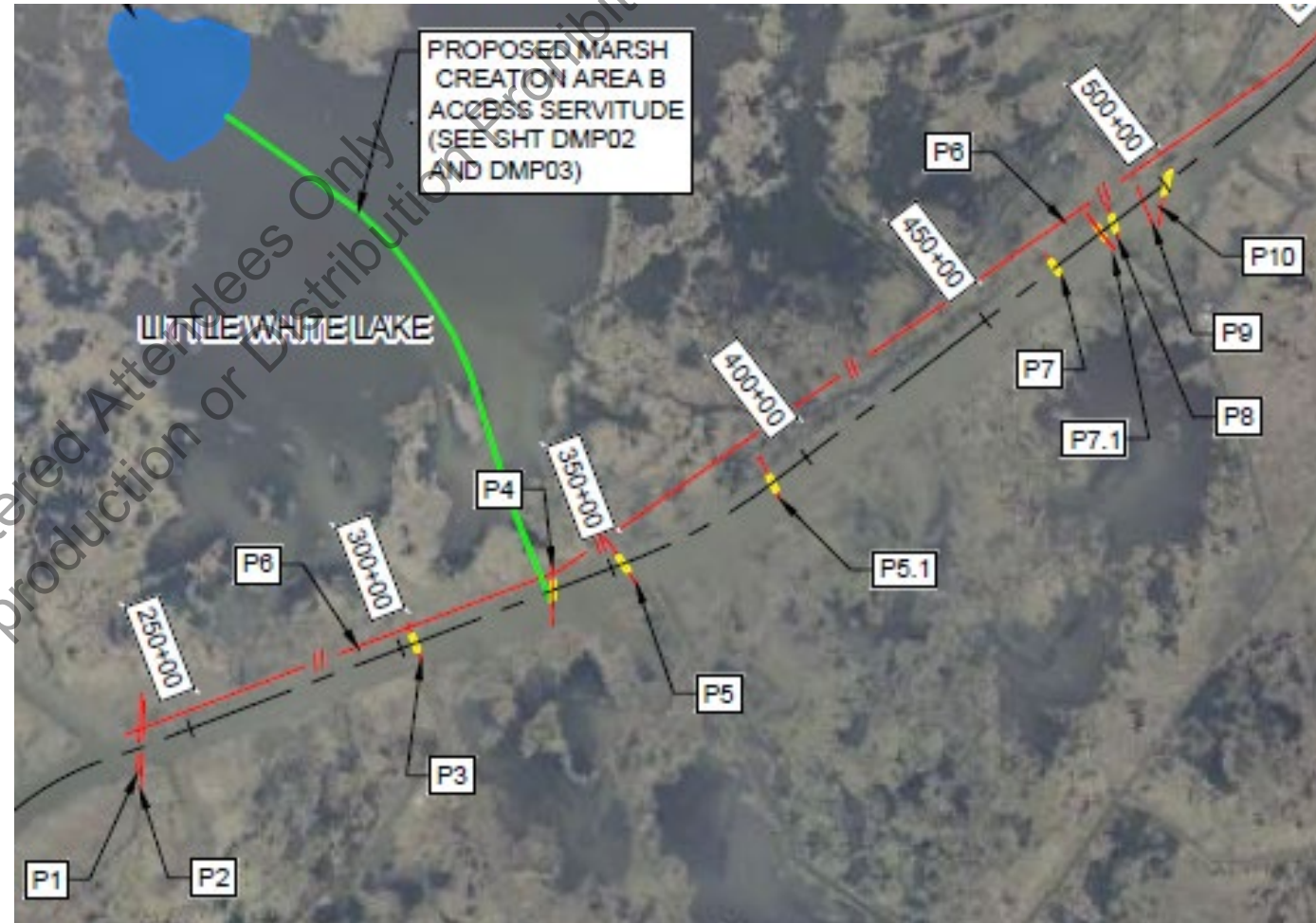
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Revelation: Cost-Effective & Saves Time

10 Miles with 10 Pipeline Profiles

- HydroJet Probing + Survey
 - 25 days
 - \$175,000
- Revelation + Survey
 - 3 days
 - \$80,000



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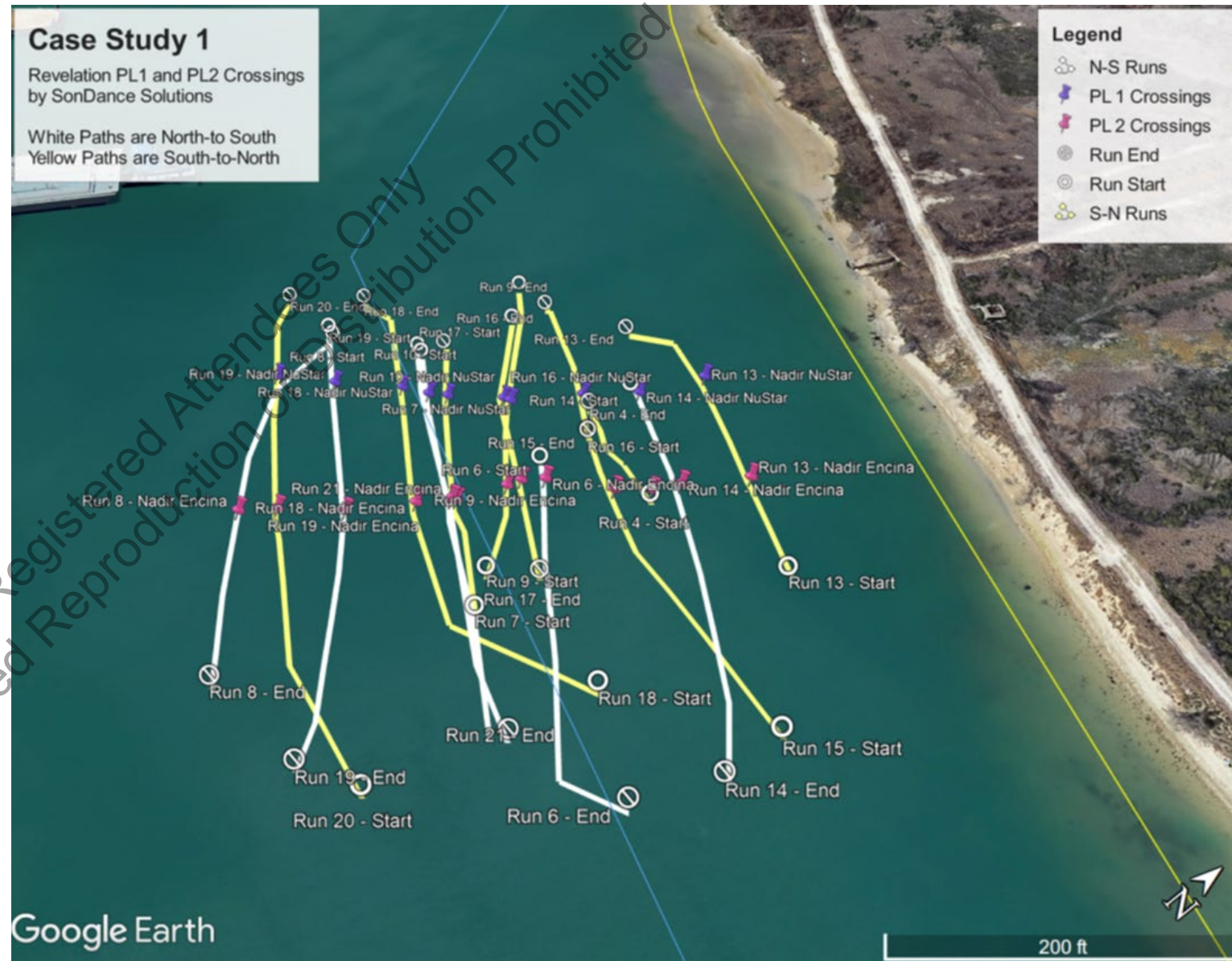
Case Study #1 - Harbor

Large Dredge Company

- Mapping Emergency
- Verify 2 Pipelines in Path

Impact

- Saved Client \$540,000
- Faster than Traditional
- Discovered 3rd Unknown Hazard in Dredger's Path



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Case Study #2 - River

Oil & Gas Major

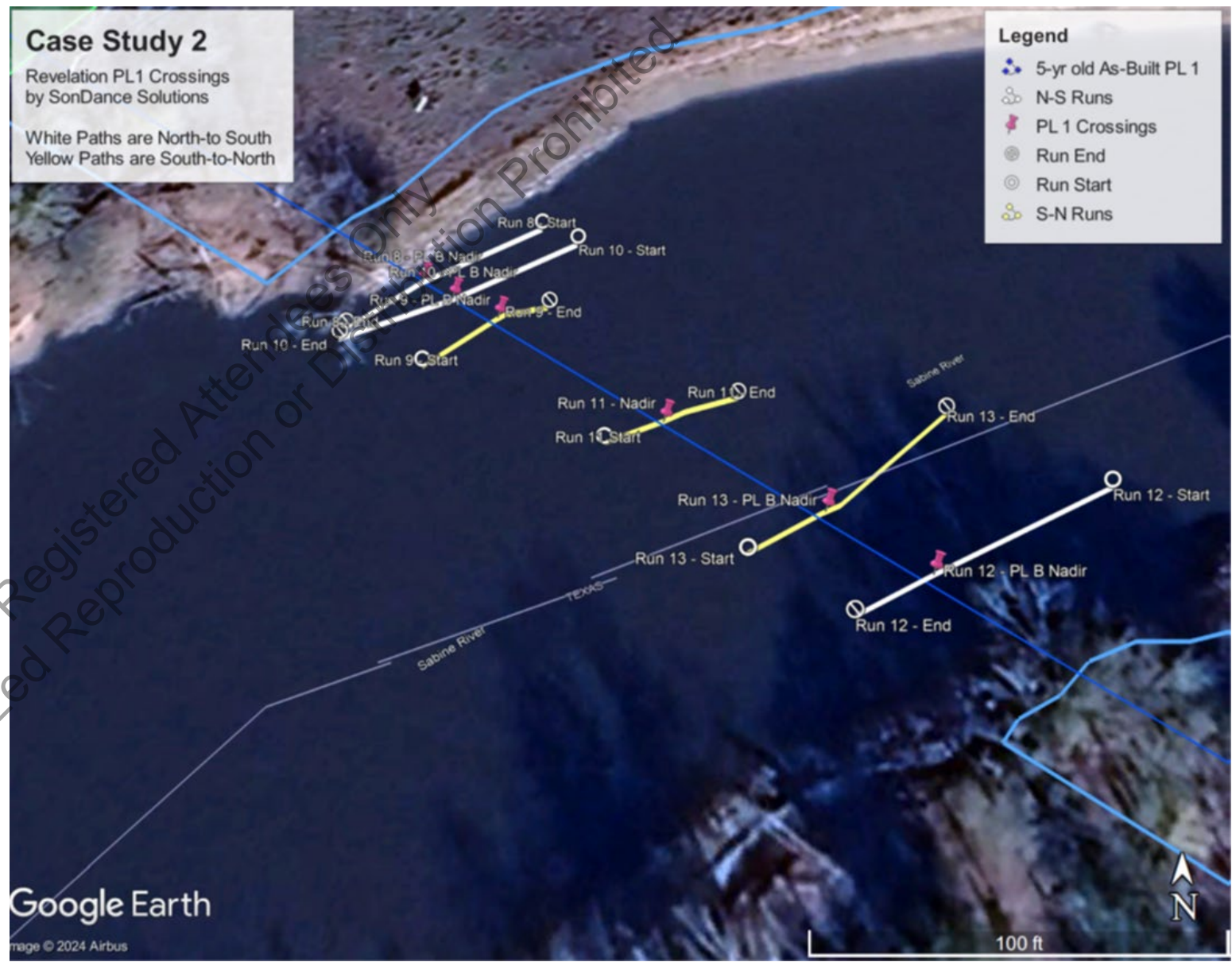
- Bank exposure emergency
- Locate, remove, rebore

Tried 3 Location Methods

- Divers
- PIG ILI
- Revelation technology

Impact

- Quick deployment & results met timeline



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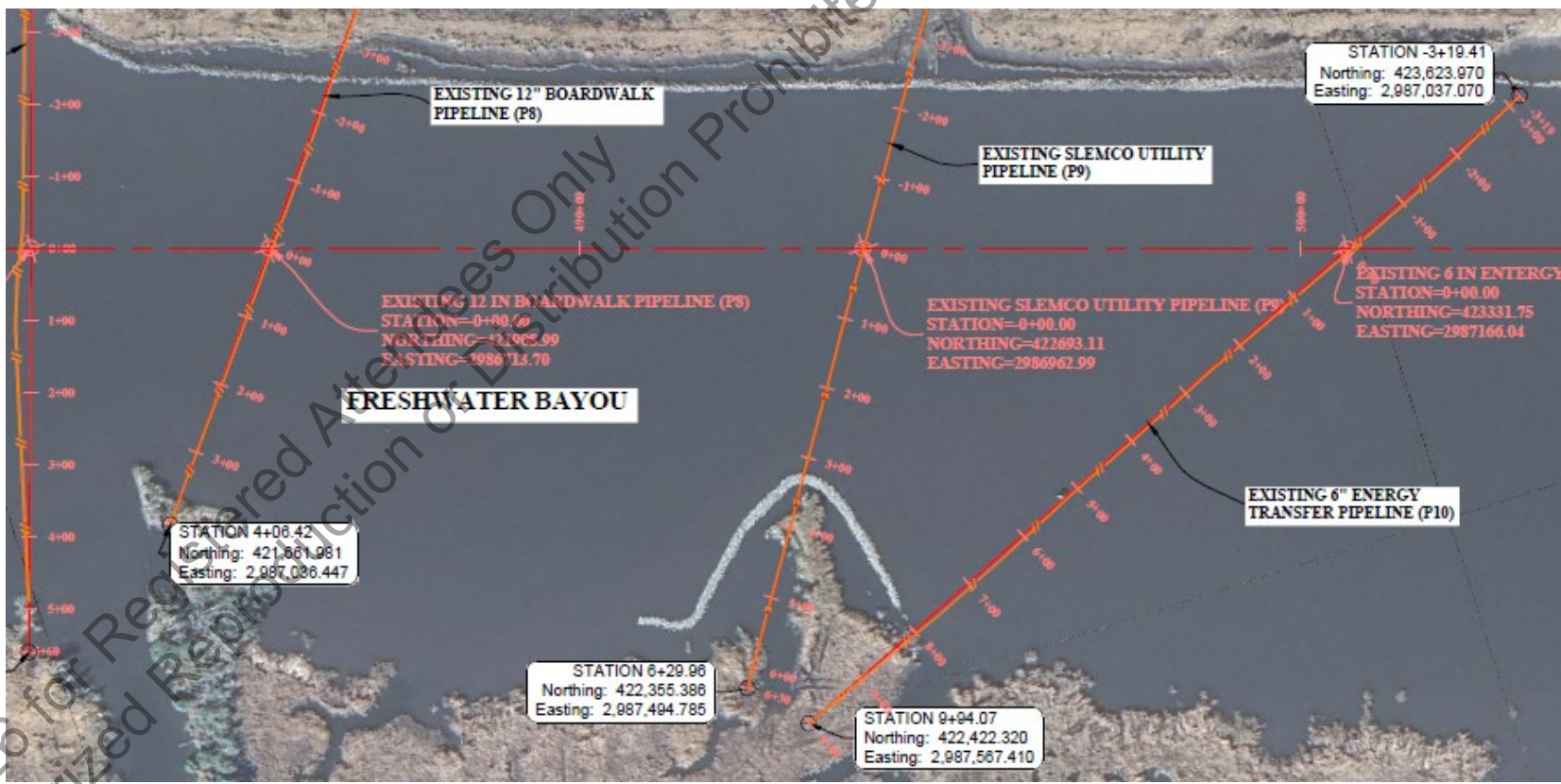
Case Study #3 - Bayou

USACE

- Prove Technology
- Map Multiple Pipelines

Impact

- Verified Revelation
- Mapped Utility Line
- 6 Targets in 1 Day
 - Versus 15 Days of Traditional Probing



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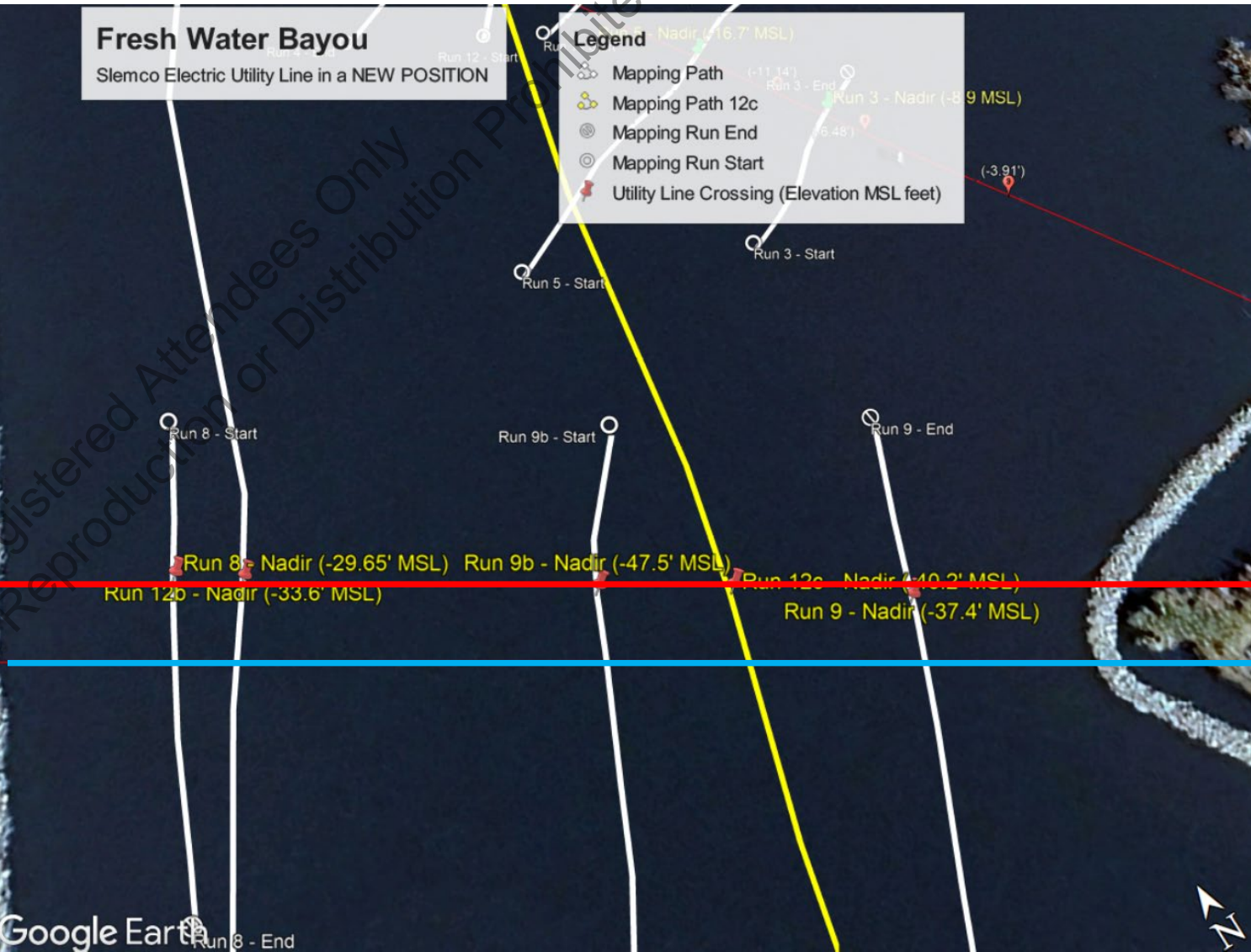
Case Study #3 – Bayou – Utility Line’s New Location

USACE

- Prove Technology

Impact

- Verified Revelation
- New Location of Utility Line
- Probing Electric Lines is Unsafe



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Revelation: Viable Solution

- Determines the Elevation (Z), regardless of cover
- Maps UNKNOWN and Known Buried Pipelines
- Maps utility lines
- Pipelines and utilities can move
- Deeper cover accuracy than mechanical probes
- Confirm other technology's data
- Currently deployed as a towable

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Resources



<https://marinesafe811.org>



<https://www.npms.phmsa.dot.gov>



<https://www.camogroup.org>



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