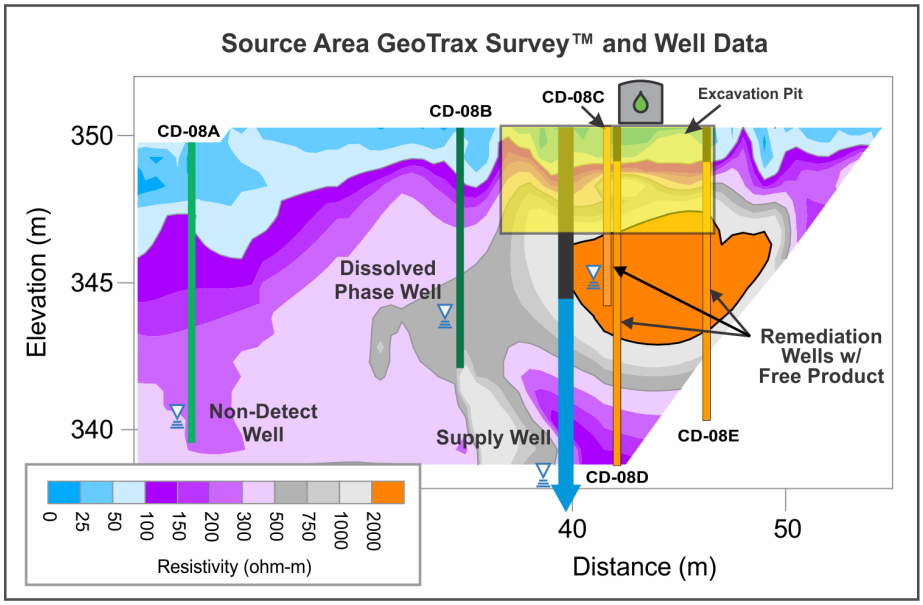
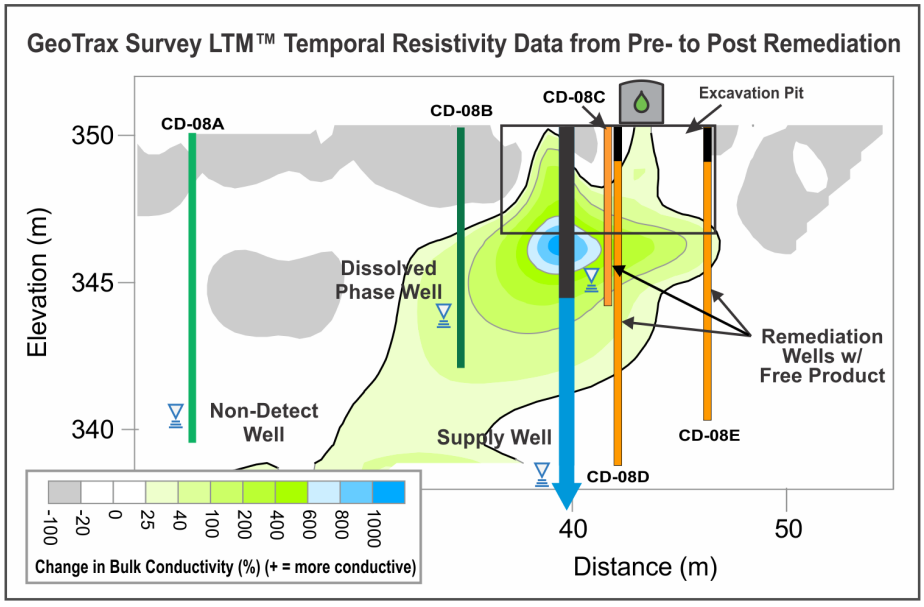
Case Study
Karst LNAPL Remediation (<2 Years)

Approximately 2,000-gallons of diesel fuel was released into a City of Ada, Oklahoma municipal water supply well screened in karst geology. After contaminated soil excavation, approximately 1 m (3 ft) of free-phase LNAPL persisted at 30 m (100 ft) BGS in the water supply well. Aestus used our GeoTrax Survey™ scanning technology to image the site and guide follow-up confirmation drilling and remediation work.



Following the targeted remediation work, Aestus scanned the site using our GeoTrax Survey LTM™ temporal imaging technology and confirmed the highly resistive NAPL orange zone (above image), changed to a highly electrically conductive green zone (below image) from mass removal and biodegradation within 548 days.



Results

- ☑ GeoTrax Survey™ detected LNAPL in vadose zone
- ☑ Identified preferential pathway of free-phase diesel into karst geology
- ☑ Provided specific targets for remediation wells
- ☑ GeoTrax Survey LTM™ temporal electrical imaging confirmed remediation effectiveness
- ☑ All wells non-detect in <2 years

More Certainty & Optimal Outcomes

Our client needed more certainty in their subsurface data. We integrated existing site data, our GeoTrax Survey™ electrical images, and targeted confirmation drilling data to yield a more complete understanding of the subsurface. This allowed them to:

- ☑ Make better technical/business decisions
- ☑ Have clear roadmap for next steps
- ☑ Achieve project goals faster and cheaper

Aestus

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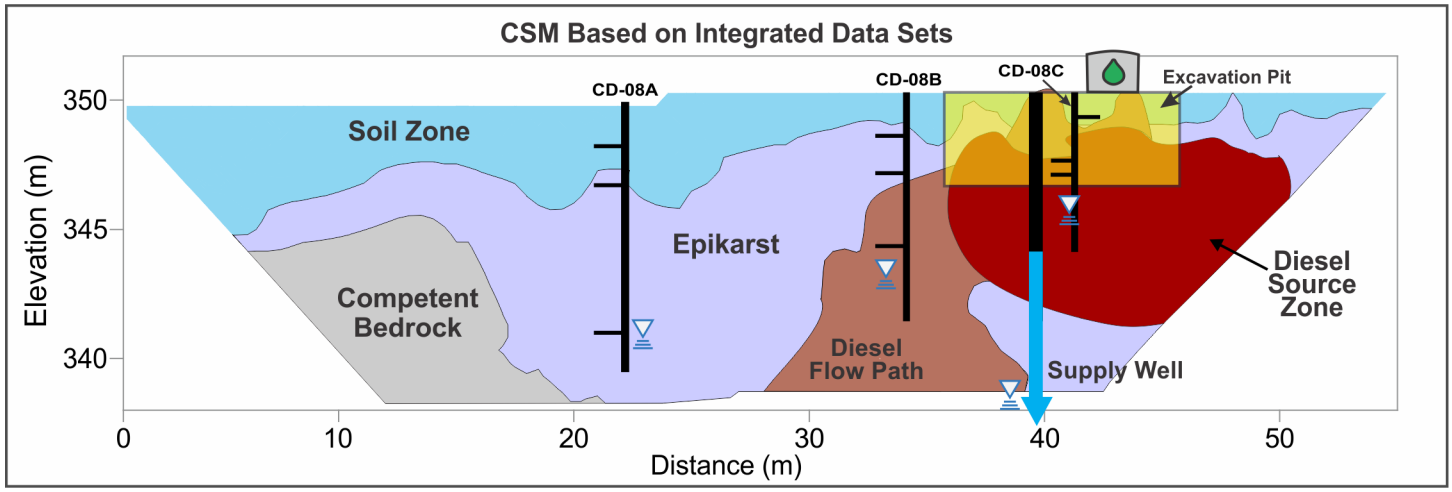
Aestus GeoTrax CSM+™ conceptual site model update process integrated the 2D imaging and confirmation drilling data to develop the below CSM:



Detailed study available as Pickens, C., 2018, A comparison between model and field diesel mass recovery in dolomite karst, M.S. Thesis, Oklahoma State University, Boone Pickens School of Geology, Stillwater, OK.

The above graphical CSM was used to guide targeted remediation work involving the following remediation technologies:

1. Extraction pumping
2. Soil vapor extraction (SVE)
3. Surfactant flushing

The image-guided remediation work was completed within 2 years and the municipal well was brought back online to safely serve the community of Ada.

Client Testimonial: Guy W. Sewell - President, Ada Water Resources Board

"Utilizing advanced characterization and remediation methods, the [City of Ada] site reached non-detect for impacts in all of the municipal supply wells and was back online within two years. I believe a key factor in the success of the project was due to the expertise of Aestus and their use of ultra-high resolution methods for the characterization of the release and the local hydrogeologic environment. Their efforts allowed for the effective design, operation and evaluation of the remedial efforts."

"Aestus has provided the City of Ada with outstanding, and much needed, technical consulting support for several years in this area. The City of Ada highly recommends their services."

You Deserve More Certainty in your Subsurface Data

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