Case Study: EC15
EN Rx Reagent

Powered by Synergist

Site
Convenience Store Facility, Jacksonville, FL

Contamination
Gasoline Range Organics in ground water

Background
A known release of gasoline fuel at this facility led to groundwater contamination. Due to site activities, the length of the plume, and multiple properties involved, typical technologies were determined to not be feasible. Implementation was completed using chemical injection via EN Rx Reagent through the Vertebrae™ horizontal nested well segments under a performance-based contract. The goal of the PBC was to remediate to Soil Cleanup Target Level concentrations (SCTLs) and Natural Attenuation Default Criteria (NADC) in the ~23,000 sf. groundwater plume.

Contaminate Distribution
Concentrations of BTEX constituents were in the parts per million (ppm) range in multiple monitoring wells across the site. The lithology is fine sand on top of a clayey sand at 23 ft. Soil and groundwater impacts were seen in the vadose, smear, surficial, and intermediate zones. It was determined that the groundwater plume migrated at a depth of 15-23 ft BGS, below the top of the water table recorded at 5 ft BGS. The lithology and hydrologic factors caused this occurrence.

EN Rx Reagent
EN Rx reagent is a modified Fenton's product powered by Hydrogen Peroxide and activated by Synergist-D a proprietary catalyst with a host of benefits. Our clients have come to realize these advantages are worth the cost.

- Stable
- Easy to Inject
- Work on PAHs
- Safe
- Easy to Mix
- Work on Isopropyl benzene
- Potent
- Suitable in various pHs
- Works on pesticides

Per pound this product uses a commodity like Hydrogen Peroxide to deliver the least expensive electron donor.

A summary of remediation activities
- The implementation of the full-scale approach began in February 2015 with the installation of four Vertebrae Well Systems and injection of the EN Rx Reagent. An automated injection system injected 3,000 pounds of activated reagent over 45 days per quarter.
- As the plume responded to treatment, the injection amount was reduced from 3,000 pounds to 2,000 pounds, then to 1,000 pounds per quarter until closure was reached.
- After 6 quarters of active injection all monitoring wells were below GCTLs and the site was recommended for Post Active Remediation Monitoring (PARM) followed by No Further Action with no conditions.

FIGURE 1
The Vertebrae well system layout provided complete coverage for the injection of the EN Rx Reagent. During the first two quarters of treatment the entire plume was targeted. Because the EN Rx Reagent is a dilute oxidant the treatment of the UST area was able to take place with no damage to the tanks or piping.

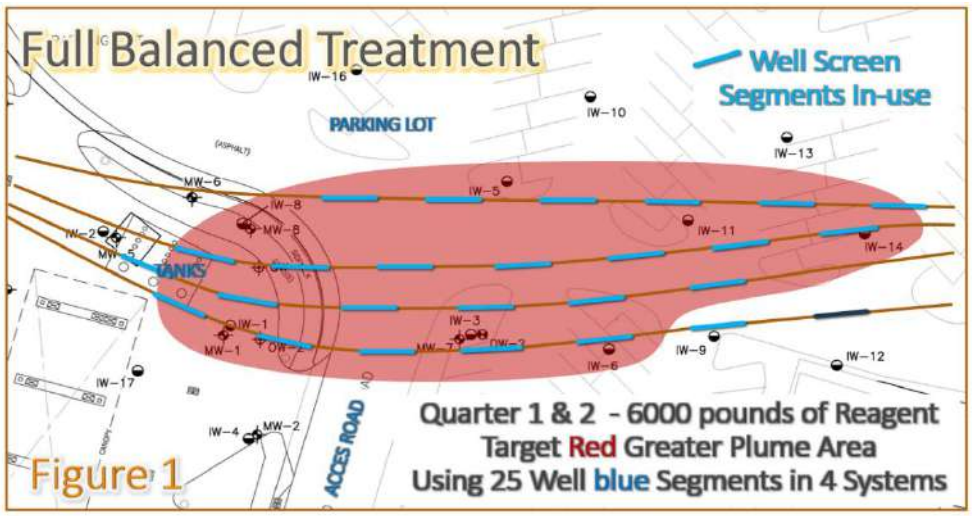


FIGURE 2
The third quarter injection strategy addressed the two remaining recalcitrant wells (orange shaded area). After sampling, one recalcitrant well remained which was addressed during the final quarter polish. (Figure 2, purple segments used for injection).

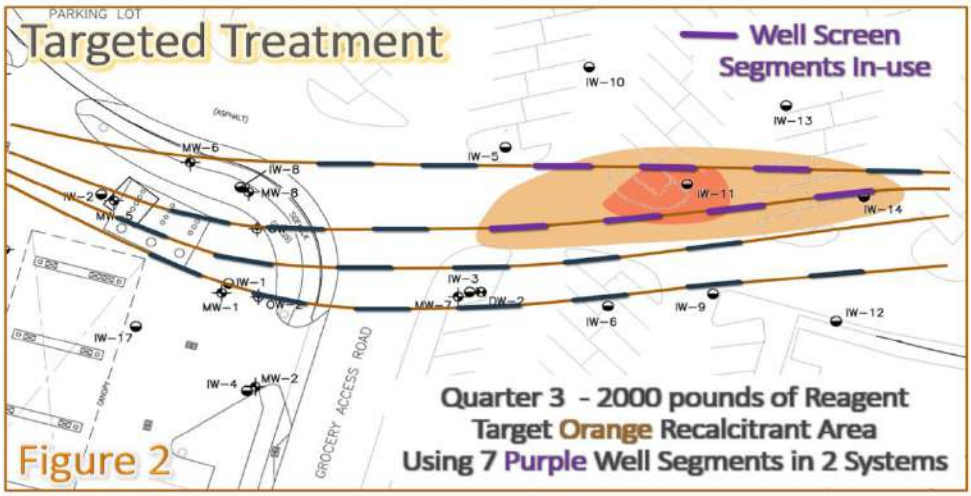
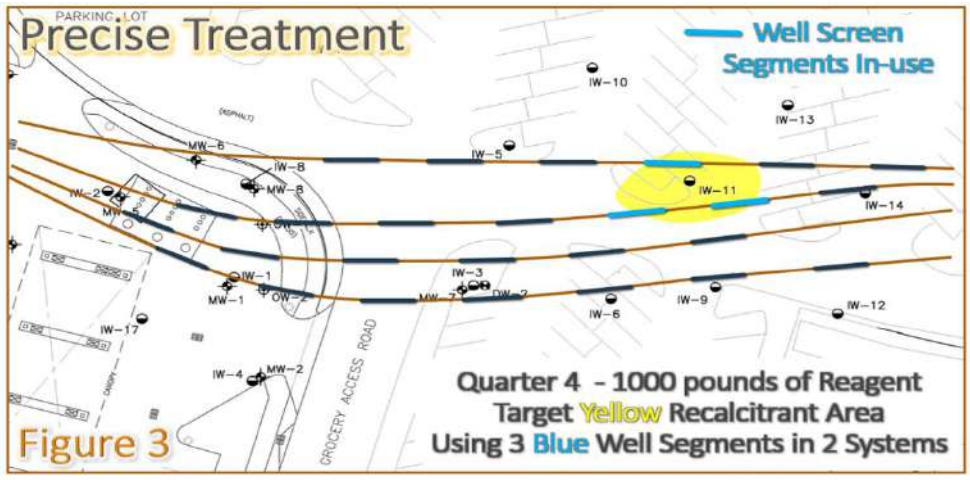


FIGURE 3
The fourth quarter injection strategy addressed the one remaining recalcitrant well (yellow shaded area) with 1,000 pounds of oxidant. Once all other monitoring wells reached GCTL's no rebound was observed. (Figure 3, blue segments used for injection).



RESULTS SUMMARY

The reduction at the site was quick and goals were met on time. After 6 quarters of EN Rx Reagent injection the site was recommended for No Further Action status and was closed in May 2018. The benefits of implementing an EN Rx Reagent oxidant injection strategy was clear and evident in this application. The reagent was applied in a controlled and robust way, and the mass was quickly reduced and resulted in successful closure of the site.

CONCLUSION

EN Rx Reagent proved to be the ideal solution to not only reach the client's goal of NADCs, but also led to successful site closure. The highly stable nature of the oxidizer allowed treatment of the entire plume, including the UST area, without concern of damage. Using EN Rx Reagent completely remediated the site while being faster, safer and more cost effective than other compared remediation strategies.

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