



CASE STUDY

#0138

FOCIS AT FLY BUY # 2, NICEVILLE, FL

SITE OVERVIEW

Abandoned gas station in Niceville, FL
 FDEP Site Number: 8512291

CONTAMINATION

Gasoline contaminants in ground water

The Feedback Optimized Continuous Injection System, or FOCIS, has several very practical benefits. The system eliminates manpower and allows injections to be completed smoothly. These two features can easily be appreciated by anyone with experience completing difficult injections and having issues with short-circuiting or needing extra days in the field to complete the task. FOCIS also allows more oxidant to be injected and allows additional time for more matrix diffusion to occur over the course of the injection. These two features are much harder to quantify for their productivity. We have attempted to quantify the difference the system creates by focusing on contact (as we create twice or triple the contact), or by studying half-life of oxidants in the subsurface, desorption rates, and the relation of the two. However, all this becomes very assumptive and site dependent. So rather than create a very long winded study, its best just to show you one of our first sites to use the technology.

The below preapproval site utilized a FOCIS temporarily installed at the site for just over two months. All connections were made aboveground were made possible by the abandoned status of the site. Ten injection wells were installed for the application at three depths. Six operation and maintenance visits were made to the site to ensure proper operation.

HISTORY

- Leaking Underground Storage Tank (UST) had contaminated an area at this former gas station.
- Upper sandy clays and sand stringers and lower sandier lithologies characterize the site.
- A groundwater recovery system and then later and AS/ SVE system was installed for the shallow zone (pre 2007).
- Contamination continued to migrate downward to the lower aquifer units.

PRE-CLEAN DATA

- Groundwater contamination from 30-70ft bls.
- BTEX contaminant mass is characterized by four wells. One well with high ppm range total BTEX (27,340 ug/L).
- Vertical migration clearly dominants the plume leaving a small footprint with 40+ ft of impact.

REMEDIATION ACTIVITIES

- An application of 9,000 pounds of EN Rx reagent was applied to the zones of contamination (shallow, intermediate and deep).
- 90 Day results have been reported which indicate **incredible** results by the FOCIS.

| Zone | Well | Benzene | Toluene | Ethyl | Xylenes | Nap | 1-Methyl | 2-Methyl | Reduction |
|--------------|-------|---------|---------|-------|---------|------|----------|----------|-----------|
| shallow | SW-2A | < 30 | 2800 | 740 | 3900 | 300 | 85 | 160 | |
| | post | <0.34 | <0.34 | <0.34 | <0.1 | ND | ND | ND | 100% |
| intermediate | DW-2 | <25 | 2480 | 4160 | 20700 | 833 | 106 | 196 | |
| | post | <0.34 | <0.34 | <0.34 | <0.1 | <0.6 | <0.6 | <0.6 | 100% |
| intermediate | DW-3 | 5.4 | 30 | 170 | 140 | 43 | 14 | 9.2 | |
| | post | <0.34 | <0.34 | <0.34 | <0.1 | <0.6 | <0.6 | <0.6 | 100% |
| deep | DW-4 | 0.89 | 45 | 100 | 260 | ND | ND | ND | |
| | post | <0.34 | <0.34 | <0.34 | <0.1 | <0.6 | <0.6 | <0.6 | 100% |

All results in micrograms per liter. ND=no data/not analyzed. Results from October 2012 and February 2013. One additional well outside of the treatment zone indicates additional mass is present. The site will require re-treatment of the shallow zone in an alternate location.