NovelEsolutions
Engineering | Environment | Earth

# P&B Sales & Service, Brooksville, FL

FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION

Relevant Services:
- Permitting and Compliance
- Contamination Assessment and Remediation
- Soil sampling
- Groundwater Sampling
- Risk Management

Prime Contractor:
Barry Murphree, PG
Principal Geologist,
Environmental Risk Management, Inc.
6835 International Center Blvd.
Fort Myers, FL 33912
Telephone: 239.834.9066
Email: BMurphree@ermi.net

## *OVERVIEW*

NovelEsolutions, Inc. (NovelE) is a sub-consultant on this Petroleum Restoration Program (PRP) contract with the Florida Department of Environmental Protection (FDEP). Liza Grudin, PE serves as the Engineer-of-Record providing management and completion of comprehensive environmental assessment and remediation activities for the facility. Stephen Pitts, Senior Field Technician, provides field oversight for assessment and remediation activities.

The lithology in Hernando County, especially Brooksville, is variable consisting of a tight formation of clays and clayey sands. This type of lithology is typically difficult to remediate, and site-specific conditions should be taken into account whenever possible. In addition, the presence of the abandoned in place underground storage tanks (USTs) factors into the radius of influence, flow rate and ultimate vacuum required for remediation. For these reasons, NovelE recommended that a pilot test be conducted at the site to determine the feasibility of multi-phase extraction. Ms. Grudin prepared a signed and sealed Pilot Test Plan outlining the proposed testing of a multi-phase extraction system (MPE), which was approved by the Pinellas County Health Department with no comments.

## *ASSESSMENT, SOIL SAMPLING AND GROUNDWATER SAMPLING*

Stephen Pitts provided oversight for sub-contracted soil boring and piezometer installation activities. Soil samples were collected for total organic carbon (TOC) laboratory analysis during installation of the soil boring. Mr. Pitts also conducted the pilot test for MPE. Mr. Pitts provided oversight for the equipment subcontractor and led the pilot testing activities providing recommendations for design vacuums and flow rates. Active coordination with the site owner for access and Maintenance of Traffic (MOT) was required as this site is an active lawnmower servicing center. The scope of work for the pilot test included collection of air and groundwater samples for confirmatory laboratory analysis.

## *REMEDIATION AND RISK MANAGEMENT*

Although MPE is particularly effective in low permeability soils, it was expected that some areas of petroleum-impacted soil and groundwater may not be effectively remediated with this technology. The pilot test confirmed that the radius of influence for the system was limited to the underground storage tank (UST) area and surrounding non-native lithology. A Pilot Test Report was submitted summarizing the site activities and recommendations and approved with no regulatory comments.

# P&B Sales & Service, Brooksville, FL

NovelE prepared a Level 2 Remedial Action Plan (RAP) for site cleanup in accordance with Chapter 62-780, Florida Administrative Code (FAC). Dual phase extraction is a remediation method which allows for the simultaneous remediation of soil vapor and groundwater contaminated with petroleum hydrocarbons. Dual phase extraction is an effective remediation strategy in low permeability aquifers and typically increases the recovery rate of pumping by three to ten times the recovery rate of conventional pump and treat methods. In addition, dual phase extraction can remove residuals from dewatered aquifer soils. Dual phase extraction is similar to standard vacuum extraction in the equipment required, with the exception that it is designed to actively remove contaminated groundwater from the extraction well along with the vapor phase contamination.

The effectiveness of dual phase is in the ability of the high applied subsurface vacuum to strip dissolved constituents in-situ with a higher order of magnitude (i.e., 1 to 3) of petroleum mass being removed in the vapor phase than in the liquid phase of the air/water extract. Upwelling occurs with dual phase due to the high induced vacuum within the well, in the sand pack, and within the radius of influence of the high vacuum immediately surrounding the extraction well. As long as a high vacuum is applied within the well and along the well screen within and above the upwelling, contaminant desorption should be predominant over smearing.

The proposed remedial action for the site included extraction of groundwater and vapors from three (3) vertical dual phase wells across the site (DP-1 through DP-3); treatment of the extracted soil vapor stream with vapor phase granular activated carbon (GAC); and treatment of the extracted groundwater with an air stripper prior to onsite disposal to an infiltration gallery. The RAP was approved by the Pinellas County Department of Health with no comments.

## *PERMITTING AND COMPLIANCE*

Construction Drawings were prepared by NovelE in sufficient detail to be used for bidding of the construction and installation portion of the project. The Construction Drawings were submitted to the Pinellas County Department of Health and approved with no comments. The Prime Contractor is currently awaiting a Purchase Order for the installation of the remediation system. It is anticipated that NovelE will provide engineering support for the construction and operation and maintenance (O&M) activities.

## *VOLUNTEER OPPORTUNITY*

Liza Grudin, PE, worked with the University of South Florida's Green Engineering Spring 2017 semester class on a volunteer basis. NovelE provided technical information to the undergraduate team for evaluation of bioremediation design options. The opportunity provided a chance for the team to learn the difference between the classroom setting and a real-world application for their remediation solutions. The USF Team presented a remediation strategy of phytoremediation as the preferred option for cleanup.