



# Vacuum Enhanced Product Skimming BIO-VEPS

## "LONG" PILOT STUDY PROCEDURE

The purpose of this pilot study is to quickly determine the benefit of applying a low vacuum to an LNAPL recovery well. Data from this test should clearly indicate what the increased recovery rate of LNAPL will be and what the proper well spacing should be. Also, the data will provide a good idea what type of emissions treatment system would be required for the vacuum system.

Objective #1: "Establish a daily LNAPL recovery rate and radius of influence with skimming only.

### I. REQUIRED EQUIPMENT:

1. Product recovery system (Free from Xitech for 2 weeks)
2. Electronic Interface meter (consultant to supply)
3. 55 gallon drum for product storage (consultant to supply)
4. 235 cubic foot bottle of nitrogen for operating skimmer (consultant to supply)
5. 110AC power for Skimmer controller and vacuum blower (consultant to supply)
6. VEPS pipe TEE with ball valve and stopper (Xitech to supply)

### II. SET UP:

1. Install product recovery system using the VEPS pipe tee assembly (refer to drawing). (Xitech Representative will assist).

### III. OPERATION PROCEDURE:

1. Document the amount of time it takes to remove free product to a sheen.
2. Document the amount of time it takes for the free product to return to original static level.
3. Set the pumping time in minutes and cycles per day on the electronic controller to match the documented times in steps 1 and 2. Start the skimmer recovering product.  
NOTE: do not interrupt the skimming operation once the test has begun.
4. Operate the skimmer for 2 full 24 hour periods.

### IV. DATA COLLECTION:

1. Record the amount of LNAPL recovered for each 24 hour period.

Objective #2: Determine the effect vacuum has on the LNAPL recovery rate per day and radius of influence between wells. Determine air treatment requirements.

#### I. ADDITIONAL REQUIRED EQUIPMENT:

1. 90 CFM Vacuum source, Hose, and CFM gauge (Consultant to supply)
2. Dwyer gauges in low inches of H<sub>2</sub>O (0-1", 0-10", 0-50") (Consultant to supply)
3. Well cap with a sampling port for a Dwyer gauge (Consultant to supply)
4. Well cap with interface meter port (Xitech to supply)
5. VOC analyzer for measuring air emissions (Consultant to supply)

#### II. SET UP:

1. Attach vacuum source to the VEPS pipe tee assembly (refer to drawing). NOTE: you may need to install an additional air make-up intake on the vacuum line to obtain low vacuum at the well without damaging the vacuum source.
2. Cap all near by wells to reduce air leaks into the formation.
3. Turn off the vacuum at any nearby wells.
4. Install the well cap with a Dwyer gauge on a well closest to the test well.

#### III. OPERATION PROCEDURE:

1. Apply 10 inches of H<sub>2</sub>O vacuum to test well.
2. Double cycles per day on the timer.
3. Operate the system for 2 days

#### IV. DATA COLLECTION:

1. Record the amount of LNAPL recovered for each 24 hour period.
2. Record the vacuum force at any surrounding wells.
3. Record the VOC concentrations and CFM at the inlet to the vacuum source.
4. Repeat this data collection for additional vacuum settings.

# XITECH VACUUM ENHANCED PRODUCT SKIMMING

