



AGGRESSIVE SOIL AND GROUNDWATER REMEDIATION USING
THE 10-GPM IN SITU DELIVERY (DO-IT™) SYSTEM

Active Property - NJ Pinelands

Type of Project: Full-scale demonstration

Contaminants Treated: Fuel oil constituents

Soil Concentration: Maximum of 42,000 mg/kg TPH

Groundwater Concentration (Max): Free product assumed below structure

Technology Applied: Aerobic-Oxidative

Geology: Sand

Treatment Interval: 5 to 16 ft. bgs.

Reduction: Achieved site-wide groundwater PQL for organics and natural quality (background) for inorganics per N.J.A.C. 7:9C-1.7(b) and site-wide EPH standard of 5,100 mg/kg

Timeframe: 18 months of active soil flushing via GW recirculation. 2-years to closure.

DESCRIPTION: ETEC's Dissolved Oxygen In-situ Treatment (DO-IT™) process (oxygenation, amendments and recirculation) was utilized for the in-situ treatment of soil and groundwater at the site. The products used for this application were ETEC's PetroBac™ Stimulant Bundle (enzymes and bacteria) and Custom Blend Nutrients - CBN™ (macro-nutrients, micro-nutrients and secondary electron acceptors). Utilizing extracted groundwater as a carrier for biological amendments and dissolved oxygen, artificial groundwater gradients were created to increase contact with impacted soil and groundwater within the treatment area and maintain hydraulic control of the plume. Additionally, over the treatment timeframe seasonal fluctuations of groundwater helped further distribute the amendments.

The target treatment area was approximately 3,500 square feet with a saturated thickness of 11 feet (total volume near 40,000 cubic yards). The impacted zone lithology consists of sand. The 10-GPM SUPER-DX™ (oxygenation equipment) was fabricated and final installation completed by ETEC. Over 4.0 million gallons of groundwater was recirculated in an 18 month time-frame and amended with 7,600 lbs. of CBN™ and 200 gallons of PetroBac™. Groundwater was extracted from 4 extraction wells (shown on the figure as EX-1 through EX-4), automatically amended with DO and amendments and distributed into the subsurface via 5 horizontal injection wells (IW-1 through IW-5).

ETEC trained the local consultant to operate the system and provided the appropriate amendment addition and injection/extraction rate based on the mass of contaminants and estimated extraction rate. prior, during, and after the 18-month recirculation activity.

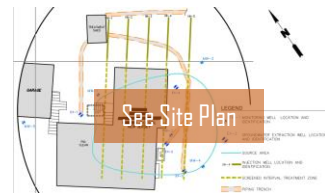
Due to the site location being in the Pinelands of NJ, the remediation standards were to **Practical Quantification Limit** (PQL's) for all monitored organic compounds and background for all monitored inorganic compounds (i.e. nitrates and sulfates included).

An NJDEP issues No Further Action and Covenant Not to Sue Letter was issued for the site and closure granted.



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- Watch a 3-minute movie: www.etecllc.com/movie
- Contact us for a free in-person or remote consultation: info@etecllc.com
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Treatment Interval: 5 to 22 ft. bgs.

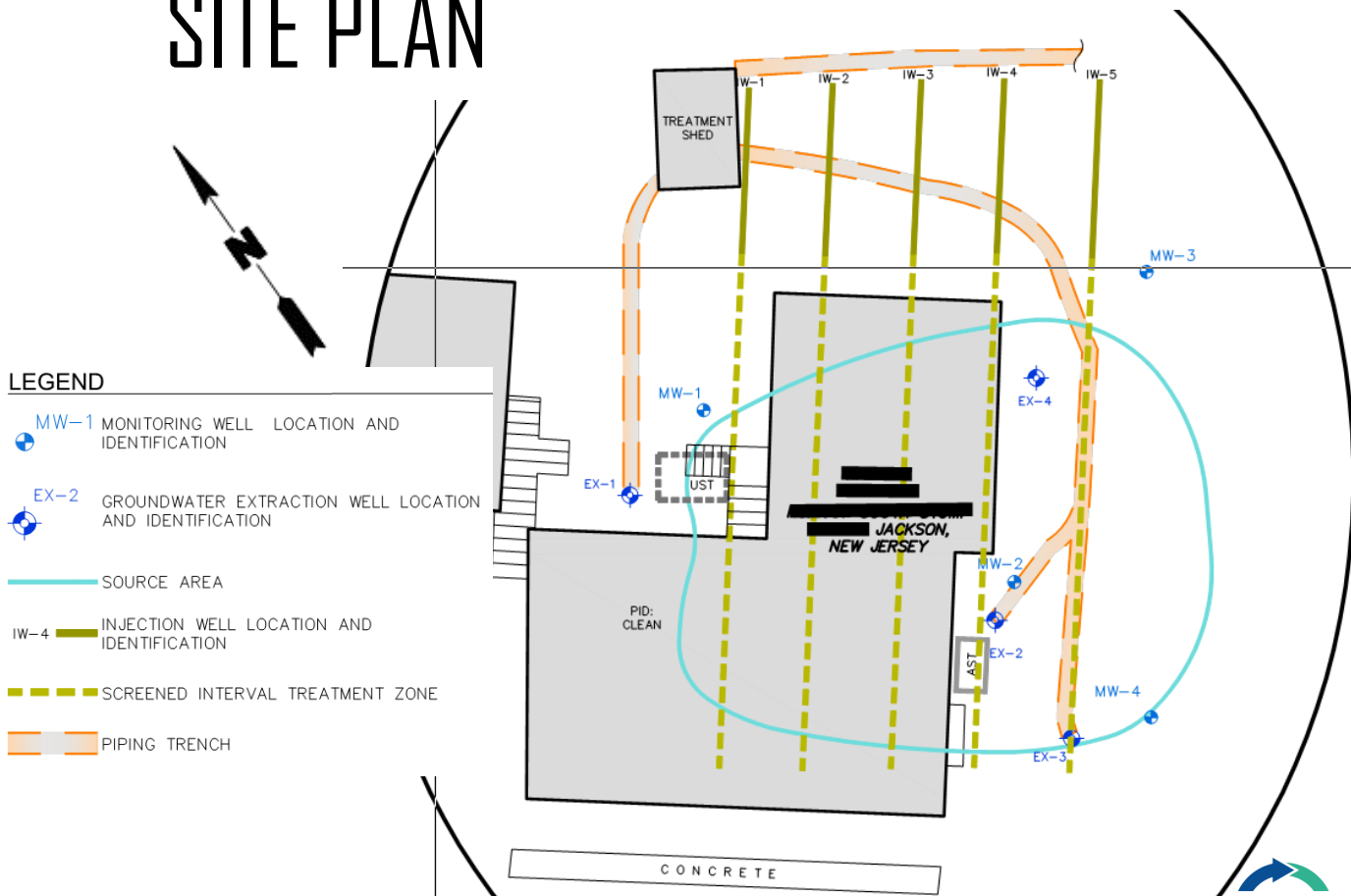
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SITE PLAN



LEGEND

- MW-1 MONITORING WELL LOCATION AND IDENTIFICATION
- EX-2 GROUNDWATER EXTRACTION WELL LOCATION AND IDENTIFICATION
- SOURCE AREA
- IW-4 INJECTION WELL LOCATION AND IDENTIFICATION
- SCREENED INTERVAL TREATMENT ZONE
- PIPING TRENCH

