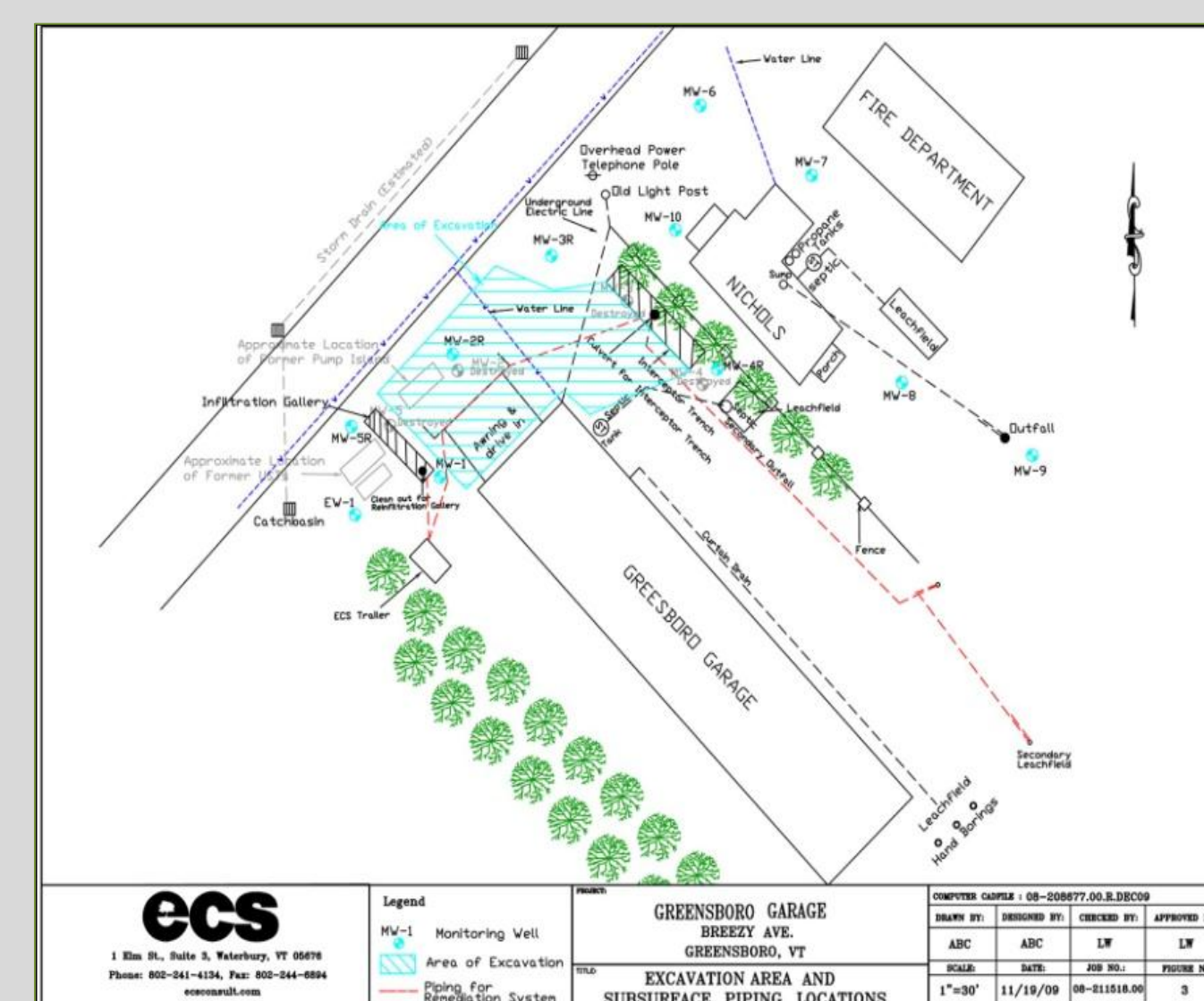


PROJECT OVERVIEW:

At this Site, two gasoline underground storage tanks (USTs) were removed in 1991 and the closure report indicated that no additional work was necessary based on field observations. No replacement USTs were installed. An impacted third party and subsequent investigations identified the former dispenser island, located downgradient of the former UST excavation, as the source of contamination at this site.

IMPACTS:

The Vermont Department of Environmental Conservation (VT DEC) received a report of strong petroleum odors in the adjacent residence and confirmed the presence of petroleum-related odors at the residence. Subsurface investigations were conducted to define the limits and extent of the dissolved-phase contaminant plume. A majority of the contaminant mass appeared to be located in the vicinity of the former gasoline dispenser island. Vapor mitigation efforts in the basement of the adjacent residence were performed until appropriate remedial efforts were implemented. Groundwater contaminated with petroleum hydrocarbons at concentrations above Vermont Groundwater Enforcement Standards (VGESs) was detected in the vicinity of the former gasoline dispenser island and in samples from two downgradient monitoring wells.



Remedial Excavation Area



Soil Excavation and Loading

IN SITU CHEMICAL OXIDATION (ISCO):

In areas where soil excavation was not possible, *in situ* remediation was performed using RegenOx®, an injectable/sprayable chemical oxidant which destroys subsurface contaminants on contact. RegenOx also offers the added benefit of being compatible for use in areas with sensitive infrastructure such as tanks, piping and utilities without causing damage.



Application of RegenOx to Sidewalls and Base of Excavation



DISSOLVED PHASE TREATMENT – RECIRCULATION SYSTEM WITH ENHANCED AEROBIC BIOREMEDIATION:

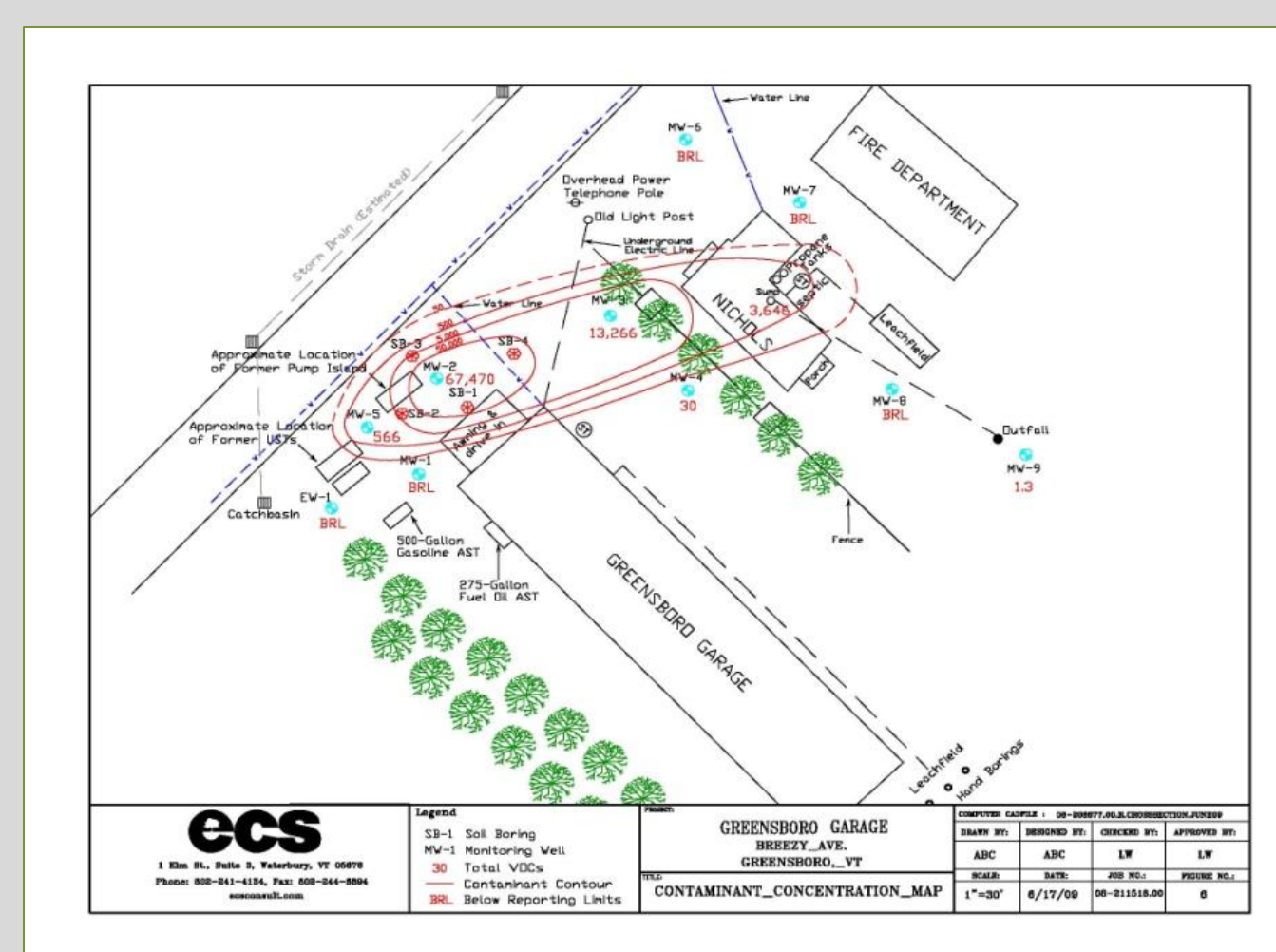
The remediation efforts also included the installation of an interceptor trench along the Site boundary, just upgradient of the impacted residence. The rationale behind the interceptor trench is to draw down the water table sufficiently to prevent contaminated water from entering the adjacent residential basement. Recovered water is treated through liquid-phase carbon units and recirculated through the source area until the dissolved-phase concentrations are acceptable for discharge to the northeastern corner of the Site. To enhance the aerobic biological degradation of any remaining residual contamination, Oxygen Release Compound ADVANCED (ORC Advanced®) was added to the upgradient infiltration gallery during installation.



Interceptor Trench Installation

RESULTS:

The April 2012 groundwater sampling event indicated that volatile organic compound (VOC) concentrations in monitoring wells continued to exhibit decreasing trends. VOC concentrations were detected in one of the six monitoring wells at concentrations below the Vermont Groundwater Enforcement Standards (VGESs). BTEX concentrations have decreased in the recovery well influent by 95 percent since the startup of the recirculation system in October 2009. Vapor mitigation efforts and corrective action measures have eliminated the impact of petroleum vapors to the residence.



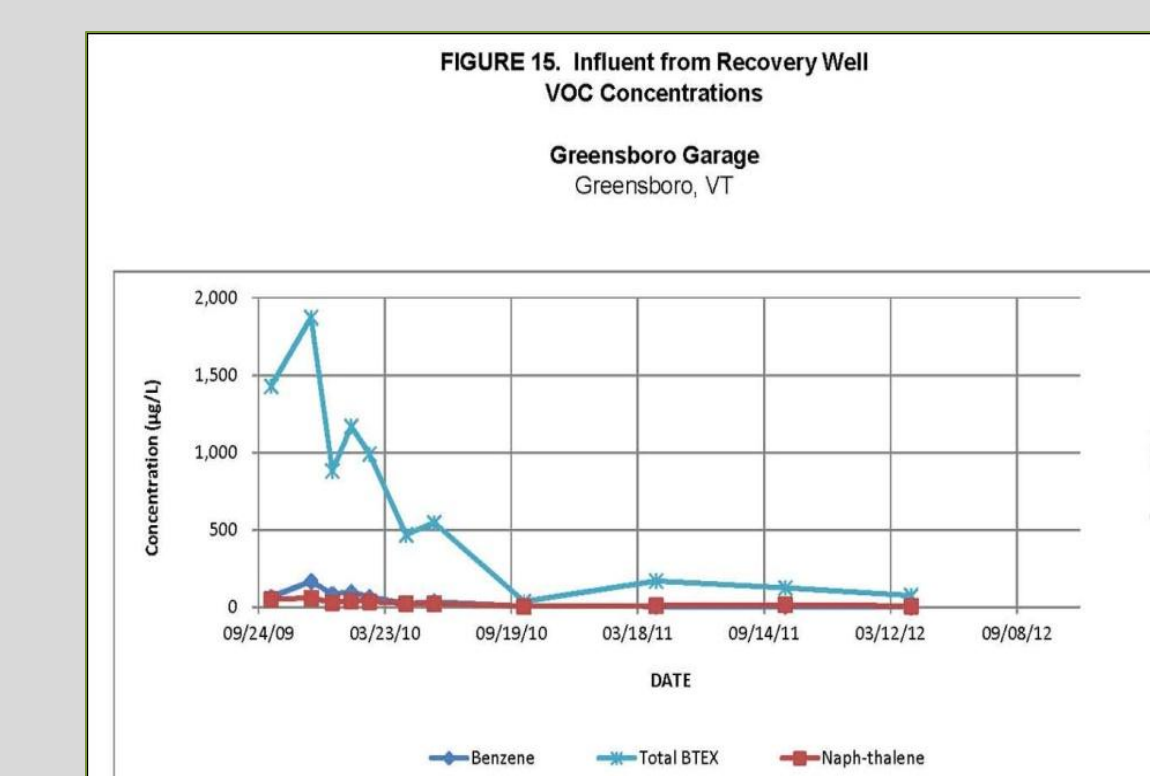
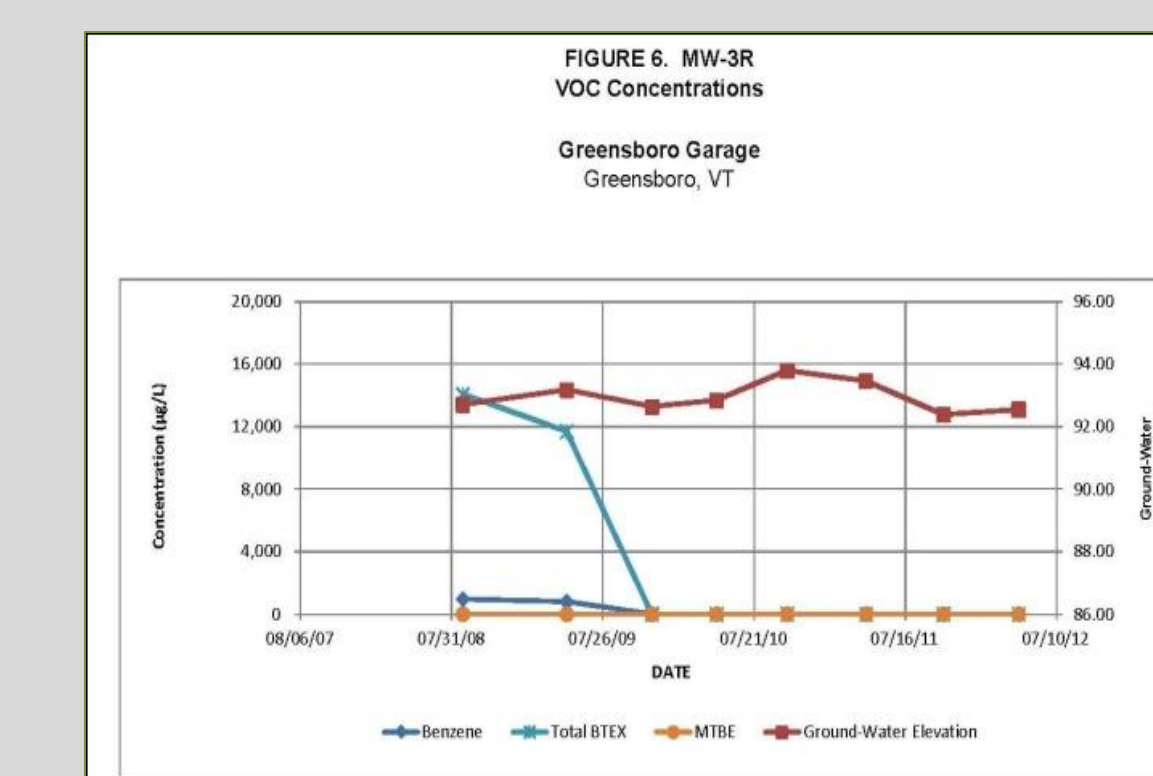
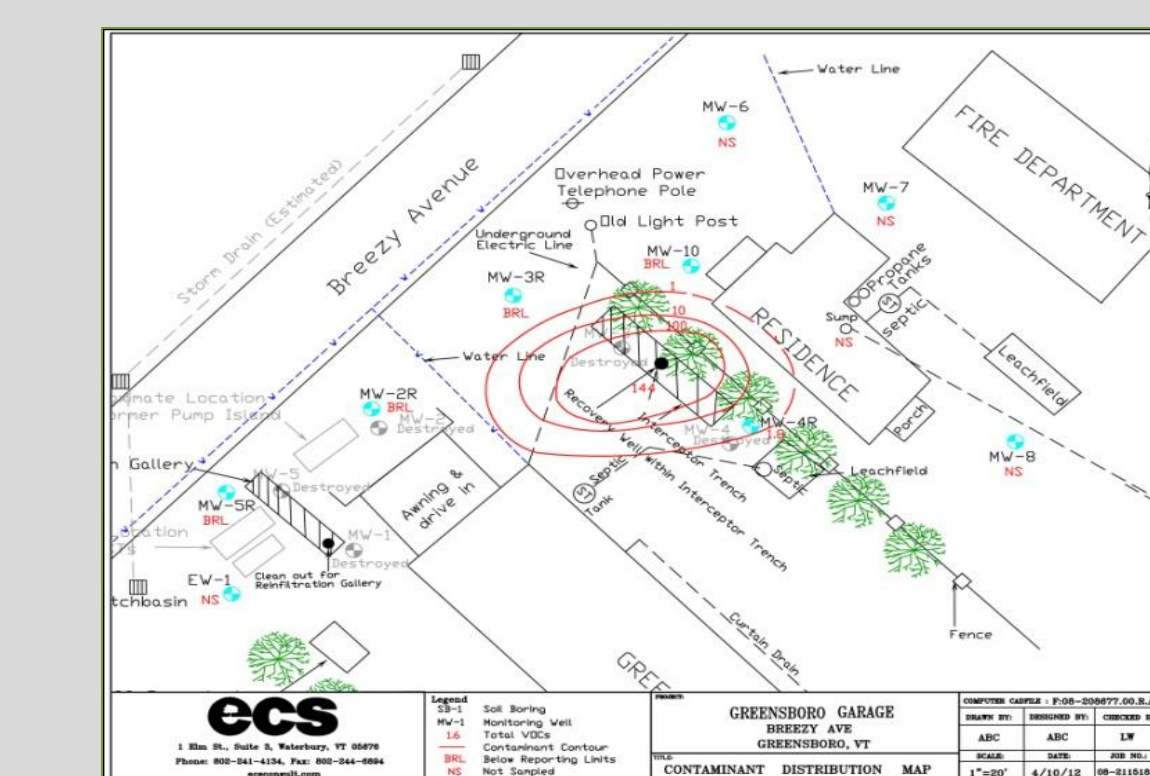
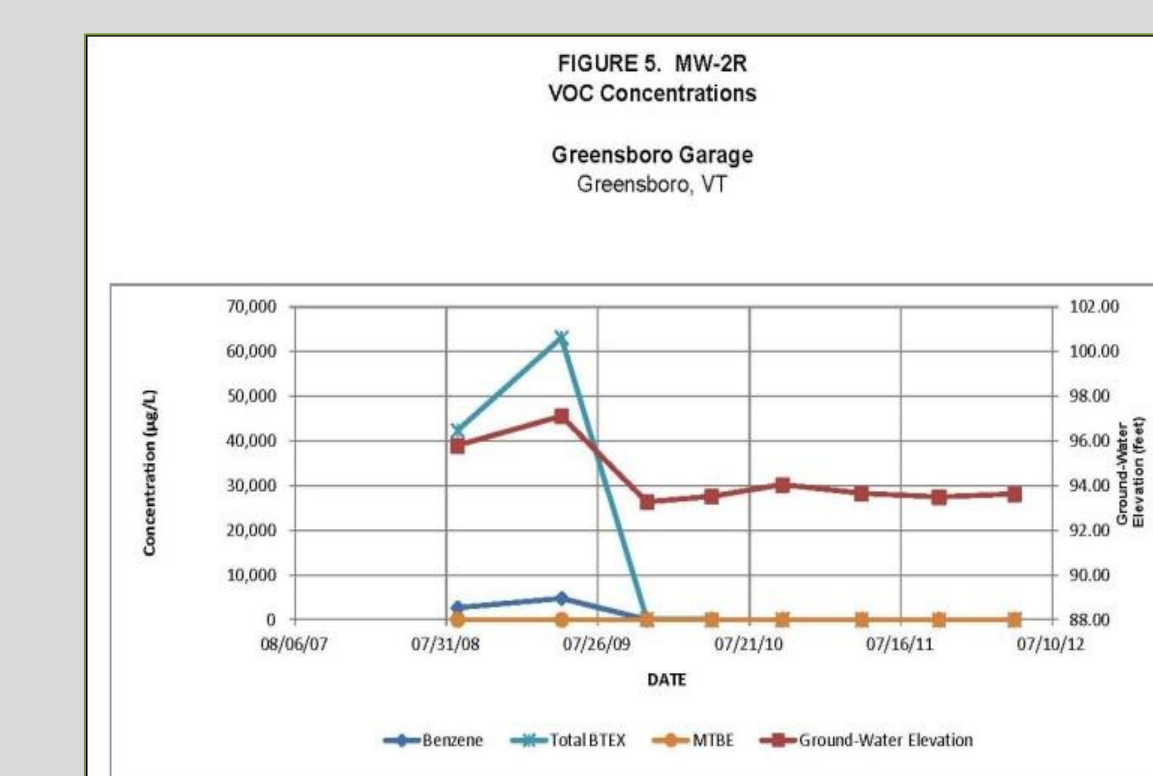
Site Map showing Contaminant Concentrations Prior to Remediation (May 2009)

MAGNITUDE OF IMPACTS AND LOCATION:

Approximately 11,764 pounds of gasoline-related hydrocarbons were estimated to be present within the 5,000 microgram per liter (µg/L) total VOC isopleth from the Spring 2009 monitoring event. It was estimated that approximately 40 percent was in the vadose zone above the water table and 60 percent of the total contaminant mass was in the saturated zone.

REMEDIAL EXCAVATION:

The remediation plan for this Site involved the excavation of grossly contaminated soils from the former dispenser island (source area) of the Site. As a result, approximately 885 tons of gasoline contaminated soils were excavated and transported off-site for treatment and disposal. Complete source removal by excavation was challenged along the road and adjacent to the site building, where it was necessary to maintain an adequate slope to preserve the structural integrity of the building and utilities. In an effort to remove as much mass as possible, the Site building awning was removed and replaced post-excavation.



CONCLUSIONS:

If the October 2012 groundwater data continues to show non-detect and stable VOC concentrations, then ECS will recommend discontinuing active remediation activities with continued groundwater monitoring. Continued groundwater monitoring for one year is typically required by the VT DEC to determine if concentrations rebound or nearby sensitive receptors are impacted. If off-site contaminant concentrations remain low, the VT DEC will assign a Sites Management Activity Completed (SMAC) designation to this property, which is the ultimate goal of the site remediation efforts at this property.