

Accelerated Remediation at a Region 1 Residential Clean-up Site Using PHILIS On-site Analytical Laboratories

U.S. Environmental Protection Agency

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St. Albans Site History

Spring 2011, heavy rains flooded Stevens Brook

- Residents in nearby apartments noticed odors and coal tar wastes in basement sumps
- Workers found coal tar wastes in area manholes
- VT DEC temporarily stabilized the situation by pumping out basements and ventilating buildings



Site History

The property was near the former St. Albans Gas & Light Company, where 4,000 tons of PAH-contaminated soils were excavated and disposed of off-site in 2005.



Site Conditions

- After Hurricane Irene in the Fall of 2011, additional complaints of tar and oil like odors came from the apartment residents
- Contamination was suspected in soil, sump water, and brook sediment
- VT DEC requested assistance from Region 1 EPA to determine whether coal tar waste contamination exists on residential properties abutting Stevens Brook

Region 1 Response

- Region 1 provided support to the VT DEC, responding as a Time Critical Removal under CERCLA authority
- Mike Nalipinski was assigned OSC for the St. Albans Gas & Light Site – Phase 2
- An Accelerated Remediation Clean-up Concept was proposed to minimize community impact
- Region 1 requested the use of OEM/CMAT's PHILIS mobile labs to provide on-site analysis of soil, water, soil gas and air samples

Accelerated Remediation Concept

- On-site sampling and analysis activities maximize the utilization of EPA response assets to reduce time and costs for effective site assessment and clean-up actions
- Rapid on-site laboratory results that meet all 2009 TNI requirements for accredited parameters from the PHILIS mobile labs will achieve accelerated clean-up objectives

Accelerated Remediation Goals

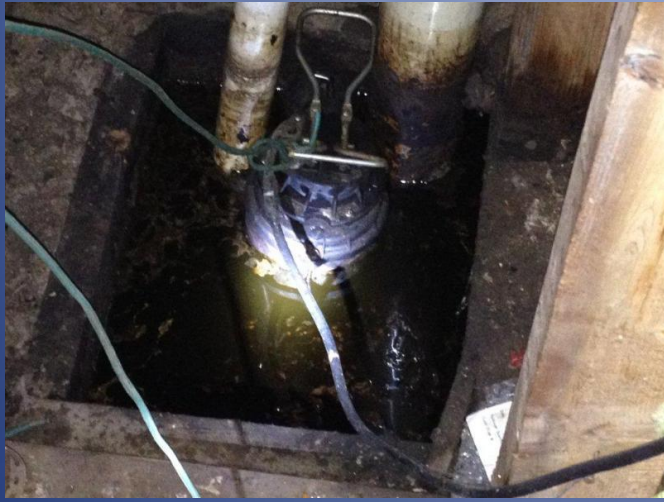
St. Albans Gas & Light – Phase 2

- Maximize site resources to reduce time to remediation
- Direct on-going soil coring activities using rapid analytical results to maximize usage of contractor and on-site assets
- Capture the boundaries of the vertical and horizontal extent of soil contamination in a single mobilization
- Determine the source and extent of the in-door air contamination in the apartment complex
- Provide rapid, on-site NELAC accredited, confirmatory data for daily decisions, briefings to local authorities (VT DEC)
- Reduce number and longevity of site visits normally required to support a Time Critical RAM
- Direct excavation activities based on data from a single site mobilization – “one and done” concept

Mobilization and Site Work

- On May 7th, 2012 START contractors and PHILIS mobile labs were deployed to conduct sampling and analysis to determine the extent of coal tar waste contamination
- Contaminants of concern included benzene, naphthalene and SVOCs, particularly PAHs and benzo(a)pyrene
- In the course of 4 days, over 250 samples were collected and analyzed on-site for PAH, benzene or naphthalene contamination

Region 1 START Sampling Effort



Sampling water
from sump and
ambient air in
basements

Soil-gas samples in
Tedlar bags via
Geoprobe

Soil cores at surface
and at depth via
Geoprobe

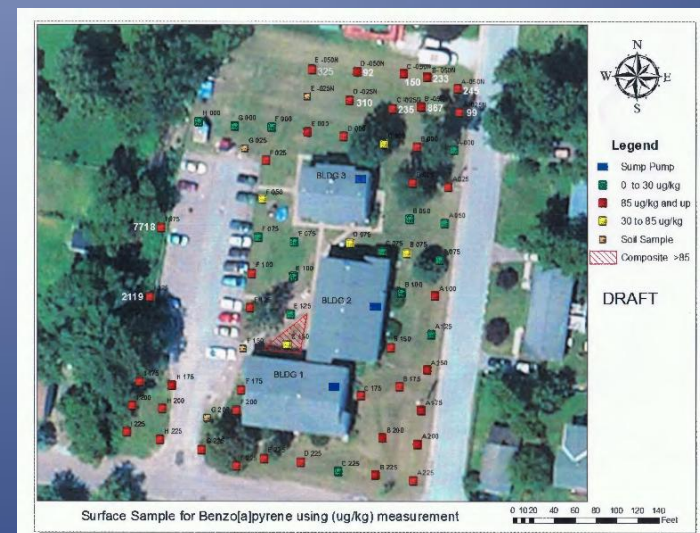


Daily Briefing and Data Depiction

- Region 1 OSC Mike Nalipinski conferred with the VT DEC representatives on a daily basis using analytical data presented in GIS site maps
- OSC used on-site data to direct daily site work



Daily briefing with VT DEC.



Daily posting of soil data on GIS site map

OEM Support to Region 1

PHILIS Mobile Laboratory Assets

- PHILIS units are the EPA's mobile laboratory assets under the Environmental Response Laboratory Network (ERLN)
- Mission Chemical Warfare Agents (CWA) and Toxic Industrial Chemicals (TIC) in environmental samples
- They are stationed in Edison, NJ and Castle Rock, CO and can be deployed within 24 to 48 hours to support emergency response and clean-up actions



PHILIS Capabilities

- Deployable within 6 hours of notification/operational within 6 hours of being on-site
- Operate via internal generators/supplies for 4 days before restocking/refueling required
- TNI accredited for VOCs, SVOCs and PCBs in water and soil using EPA Methods 8260c/8270d/8082a. Mobile lab confirmatory analysis meets 2009 TNI requirements
- Pursuing accreditation for TO air methods and LC/MS/MS methodology for carbamates and pharmaceutical compounds
- Estimate 100-200 samples/day for CWAs and TICs (24hr operations) for all matrices
- Analysis of environmental samples for CWAs via ERLN's Ultra-dilute agent (UDA) program. Detection limits to health-based clearance via EPA's SAM methods

PHILIS Labs at St. Albans Site



APL01 – Volatiles Mobile Lab for EPA method 8260 for soil, sediment and water samples via purge & trap.

Modified TO method for benzene and naphthalene in air and soil gas via automated thermal desorption unit



Purge & Trap for soils & waters

Tedlar bag analysis – soil gas

Tenax tube analysis - air

PHILIS Labs at St. Albans Site



APL02 – semi-volatiles lab, & sample prep trailer, set up for EPA prep methods 3535A and 3545A

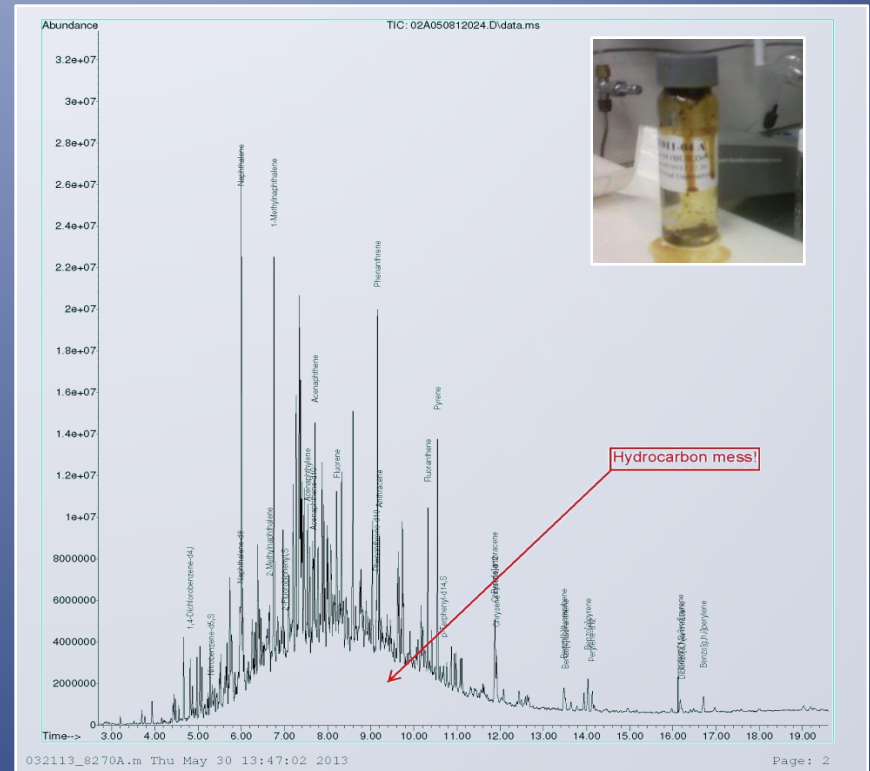
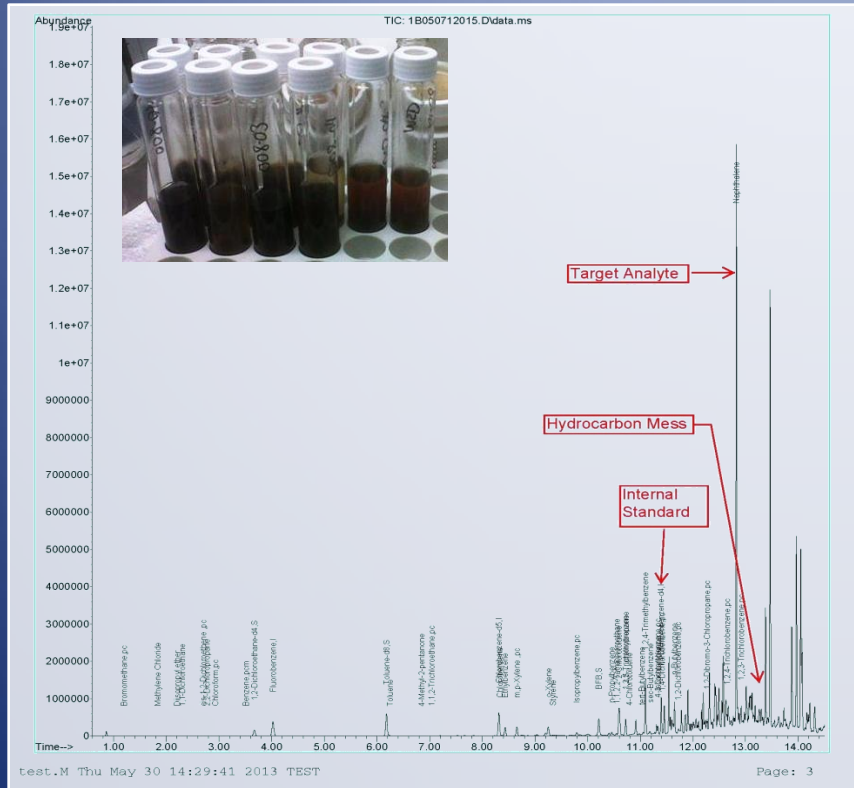
APL02 with GC/MS instruments set up for method 8270D.



SPA01 Trailer w/automated PSE & SPE Apparatus.



Analysis of Samples



Region 1 Removal Action

- Using the rapid site sampling and analysis capability brought to bear at the St. Albans Gas & Light Site – Phase 2, the OSC was able to prepare a Time Critical Removal Action Memo (RAM) recommending soil excavation at the Colony Apartments and the installation of a system to mitigate in-door air contamination posed by the coal tar wastes

In-door air basement mitigation system



Excavations Begins

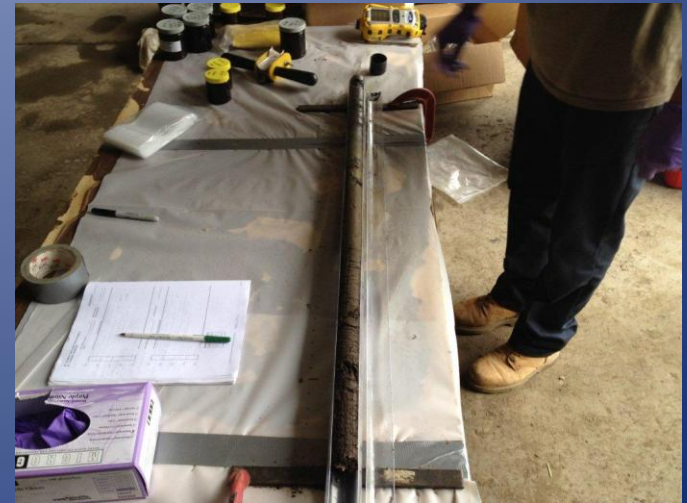
- On-site sampling and analysis defined the spatial and subsurface extent of contamination



Excavation starts at the Colony Square Apts



Common borrow Place at corner of Maple & Lasalle



Soil cores are “logged”, screened and Sampled at discrete depths

Goals of Accelerated remediation Concept were Meet

- In the course of approximately 4 days, over 250 samples were collected and analyzed on-site for PAHs, benzene or naphthalene contamination in air, soil and water matrices
- Expedited RAM was issued was issued
- Accelerated remediation completed using initial data set – no new samples required
- The on-site abilities provided by PHILIS allowed the OSC to complete all the site soil assessments, excavation, removal and site restoration activities within 90 days of the initial site visit

Colony Apts Remediated

- The accelerated remediation plan for the Colony Apts accomplished on-site sampling and analysis data from a single site visit
- Top 2 feet of soil removed from specific zones identified by PHILIS on-site analysis and sent for disposal. Backfill with clean top soil
- The possibility of runoff to Steven Brooks was reduced by the rip-rap and other soil retention measures
- Official demobilization on October 2012



Colony Square Apts, September 2012
after backfill and hydro-seeding



Stevens Brook- runoff and soil retention
measures, rip rap, & geo-fabric

Costs/Benefits

- Estimations of actual PHILIS analytical cost/sample from the St. Albans site effort were determined to be below most commercial lab costs, ranging from \$250-325/sample which included fuel, mob/demob costs, travel, pre diem, sample analysis, QA review and report writing
- Man-hours for St Albans site were covered under the PHILIS contract. Future mobilizations may not
- Cost sharing options can be explored for future sites.
- PHILIS costs should drop ~ \$50-100/sample based on “lessons learned” and optimization of assets
- The greater time and cost savings were realized for the OSC by having the most effective use of their site assets in an accelerated time frame

Future Work

- The mobilization to the Region 1's St. Albans site has provided CMAT with useful experience and “lessons learned” which will be used to further reduce costs for future Accelerated Remediation efforts and PHILIS mobilizations
- The Accelerated Remediation Concept and on-site analytical support via PHILIS or other mobile assets can be provided to EPA regional OSCs across the country
- PHILIS is an OEM national asset for the use of EPA regional and programmatic response efforts

Questions

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