RESTORATION ADVISORY BOARD MEETING
NAVAL WEAPONS INDUSTRIAL RESERVE PLANT CALVERTON
CALVERTON COMMUNITY CENTER
CALVERTON, NEW YORK
THURSDAY, AUGUST 3, 2006

The twenty-first meeting of the RAB began at approximately 7:00 pm. Meeting attendees included representatives from the Navy (Susan Clarke), New York State Department of Environmental Conservation (Larry Rosenmann and Henry Wilkie), Suffolk County Department of Health Services (Sy Robbins), Restoration Advisory Board (RAB) community members (Sid Bail, Louis Cork, Bill Gunther, and Ann Miloski), Peconic River Group (Bob Conklin), and the TAPP Consultant (Frank Anastasi).

WELCOME AND AGENDA REVIEW

The Navy representative, Susan Clarke, Naval Facilities Engineering Command (NAVFAC) Mid-Atlantic, welcomed everyone to the RAB meeting and reviewed the meeting agenda. The agenda for the meeting is included as Attachment 1.

COMMUNITY UPDATE

Mr. Gunther, RAB Community Co-chair, asked the other community members present whether they had any input or concerns. Bob Conklin, from the Peconic River Group noted his concern with volatile organic compounds (VOCs) from Sites 6A and 10B, and Southern Area going into the Peconic River. His group does not want the river to be a recipient of contamination. Their concerns are related to whether there are sufficient data to understand contaminant migration, extent of contamination in groundwater and the river, and whether there are or may be adverse impacts to the river from contaminants from the site. They are looking for regulatory support to help understand whether the decisions being made are technically supported.

Mr. Bail agreed with Mr. Conklin's concerns and added that the RAB community members also rely on Frank Anastasi, RAB Community Technical Assistant for Public Participation (TAPP) consultant, to provide technical input to help the RAB community members understand the documents and decisions.

Mr. Gunther mentioned that RAB community member Vinny Racaniello was unable to attend the RAB meeting because he had another commitment, but Mr. Racaniello continues to be very interested in the environmental activities at NWIRP Calverton.

Ms. Clarke indicated that the subcontract for additional TAPP support has been awarded to Mr. Anastasi.

REVIEW AND APPROVAL OF MEETING MINUTES

At the April 20, 2006 RAB meeting, the RAB requested that the September 2005 minutes be redistributed and the discussion of the September 2005 minutes be tabled

until the August 2006 RAB meeting. Ms. Clarke inquired whether the RAB members received the September 2005 and April 2006 meeting minutes, which were distributed in May 2006. Mr. Gunther had forwarded several comments on the minutes and the revised minutes were distributed in July 2006. The RAB members indicated they had no further comments on the minutes and the minutes were approved.

GENERAL PROGRAM STATUS

Ms. Clarke provided a brief overview of the work accomplished since the last RAB meeting. The Navy has been working on modification of the RCRA permit and property transfer, the groundwater remediation project for the Site 7 - Fuel Depot Area, and the Corrective Measures Study (CMS) for Sites 6A and 10B, and Southern Area. Also, a site tour of Site 7 was conducted prior to the RAB meeting.

SITE 7 FUEL DEPOT AREA

Tetra Tech EC, Inc. (TtEC) hosted a tour of Site 7 prior to the start of the RAB meeting. The system was turned off for the tour and various features of the system were discussed. Mr. Stavros Patselas from TtEC provided an update on the Site 7 Fuel Depot Groundwater Remediation Project (Attachment 2). Mr. Patselas provided an overview of the project, system monitoring and operational information, groundwater and vapor results, operation and maintenance information, and the status of the project.

The presentation was similar to the April 2006 presentation. Updated items included:

- The full-scale remediation system was started on April 26, 2006. Based on the groundwater sampling results from March 2006 and June 2006, concentrations have decreased indicating effective treatment.
- System performance is proceeding as anticipated. Initially the system operator visited the site weekly and then visits were reduced to every other week. However, because of the recent hot weather, additional maintenance and system monitoring have been needed. Unscheduled shut downs (which triggered the auto-dial alarm system) have occurred because of power fluctuations. The system is still scheduled to be shut down at the end of October for the winter.
- A report on the results of the 6 month system operation will be prepared to assess remedial progress.
- The ozone system began operation on May 28, 2006.
- TtEC will provide operation training to other personnel and will prepare and submit the full-scale system Operation and Maintenance (O&M) manual by the end of August or early September 2006.
- The former fuel depot building is scheduled to be demolished in November and December 2006.
- Transfer of system operations to others is scheduled to occur by the end of March 2007.

During the discussion of groundwater and recovered soil vapor concentration results, Mr. Robbins asked what organic compounds were detected in the vapors. Mr. Patselas replied that primarily only BTEX (benzene, toluene, ethyl benzene, and xylene)

compounds and BTEX related compounds were detected; methyl tert-butyl ether (MTBE) was not detected in the vapors. Vapor concentration tables from the Pilot Study were provided in the Final Pilot Study Results Report submitted on December 9, 2005.

Mr. Bail asked how the Navy would respond to an anticipated major weather event and whether the system would be shut down. Mr. Patselas indicated that the only planned shut down was for the winter. If a weather event, such as a hurricane, affects any part of the system, the system will automatically shut down and the system operators would respond to the auto-dial alarm system. It was noted that the buildings are designed to withstand high winds. Also, there are no environmental concerns if the system shuts down.

In answer to a question of where the carbon filters were being sent for recycling, Mr. Patselas replied that they were being sent off site for recycling to a facility located in Pennsylvania.

Mr. Robbins asked which contaminants the Navy usually saw break through first. Mr. Patselas indicated that he would check the vapor data and provide that information at later time.

SITES 6A AND 10B AND SOUTHERN AREA

Mr. Dave Brayack of Tetra Tech NUS, Inc (TtNUS) provided a summary of the Sites 6A and 10B and Southern Area Corrective Measures Studies (CMS). The handout for the summary is included as Attachment 3.

The site conditions and CMS alternative summary were presented and discussed at the April 2006 RAB meeting. Based on community concerns expressed at the April 2006 RAB meeting, the Navy further evaluated potential risks related to groundwater migration to the Peconic River. The CMS was also updated to include recommended alternatives and the Site 6A/10B CMS was reissued in May 2006.

Mr. Brayack presented figures showing the source areas and the approximate extent of the groundwater contaminant plume, and discussed the CMS alternative summary for Site 6A/Site 10B source area soils and groundwater, the onsite portion of the southern area groundwater plume, and the offsite portion of the southern area groundwater plume. There were discussions at the RAB meeting related to the source area and groundwater plume. The discussion summary and action items identified are provided below.

<u>Source Area</u>

Mr. Brayack indicated that the extents of soil and groundwater contamination in the source areas have been defined. Residual contamination at these sites is associated with residual petroleum smeared onto soils and/or as free product. Migration of contaminated groundwater beyond the source area is not apparent. There are also chlorinated solvents mixed in with the petroleum contamination. Periodically

contaminants can migrate from this area through upwelling of the groundwater during rain events and discharge into drainage swales. Other potential pathways, including periodic historic releases, are also possible.

For Site 6A, petroleum contamination was identified at the site early on and the source of the contamination was believed to be related to periodic spills and leaks from site operations. Recent information found that there was an underground storage tank in the area and that the tank was removed in the early 1990s at about the same time as the initial Navy investigations in the area.

For Site 6A and 10B source area soils, the Navy plans to remove all of the contaminated soil and free product. The removal would include soils below the water table in these areas as feasible. Mr. Gunther indicated that the report was not clear that all of the contamination would be removed, and that the Navy should clarify the approach in the report. The Navy agreed to review the report to clarify the language.

Mr. Rosenmann indicated that although groundwater contamination is not currently a problem at the site, excavation in the source areas would likely mobilize some of the contamination into the groundwater. As a result, Mr. Robbins and Mr. Rosenmann suggested that the Navy consider the use of an insitu oxidant during backfill to treat residual soil/groundwater contamination or to create a barrier down gradient of the excavation to control migration of contaminants from the source area during or after remediation. Mr. Brayack indicated that air sparging network downgradient of the source area could also be considered. The Navy agreed that they will consider adding this approach to remedial activities.

Mr. Cork asked about the buildings to west of plume. Mr. Brayack indicated that the buildings and foundations were removed and now it is a grassy field.

<u>Southern Area Groundwater Plume Conditions</u>

Mr. Brayack indicated that although the report figures show the Southern Area groundwater contamination as one continuous plume, based on groundwater data, the plume is not continuous. One theory is that contamination from the source area discharges to interconnected ditches and ponds and results in periodic releases to down gradient locations. Also it was discussed that a water discharge from a free product recovery system at Site 6A may have contributed to contamination in offsite areas. Northrop Grumman operated this system before 1992 and the water was pumped to the drainage ditch at Site 6A.

Also discussed was that the main contaminants of concern in Site groundwater are trichloroethane (TCA) and dichloroethane (DCA). VOCs with more toxic degradation products (such as trichloroethene degrading to vinyl chloride) have not been detected at significant concentrations in groundwater in this area.

Currently, the highest groundwater concentrations in the Southern Area are located in the down gradient portion of the plume, near the pistol range (in PZ123 at 60 to 80 feet below ground surface). Source area wells now contain lower concentrations of VOCs.

Historically, the source area wells contained much higher concentrations of VOCs than are currently observed in the down gradient wells. This discussion lead to the possibility that what is being observed near Connecticut Avenue may actually be the tail end of the plume. It was mentioned that a calculated seepage velocity could be used to determine the likely time for groundwater to reach the river. [Note, the seepage velocity is estimated to be approximately 400 to 500 feet per year. Based on the distance from Site 6A, groundwater from the site would require approximately 12 to 15 years to reach the river.]

Mr. Brayack also indicated that except for the down gradient edge of the plume (between Connecticut Avenue and the Peconic River), the extent of the groundwater plume is adequately defined. Based on figures in the RFI, the plume shape is very consistent with the flow direction of groundwater.

The down gradient edge of the Southern Area plume is not defined and it is not known whether groundwater contamination has reached the river yet. Because access to the area between the known groundwater contamination and the river is very difficult (because of the presence of wetlands and trees/brush along the river), the Navy has not been able to install monitoring wells in this area.

In addition, Mr. Brayack noted that sufficient data are available to determine that groundwater contamination is not flowing under the river. Rather, the Peconic River acts as a groundwater divide with groundwater on either side of the river generally flowing towards the river. One exception is the pond south of the pistol range that creates a localized groundwater mound. Groundwater in this area flows to the east and then south.

Potential Groundwater and Surface Water Concerns

Mr. Brayack indicated that the Navy evaluated human health and ecological concerns. Groundwater was evaluated for potential risk to human health and migration to surface water. Surface water was evaluated for potential risk to human health and ecological receptors. For human health consideration, VOC concentrations are compared to 5 ug/L, the drinking water criteria. Maximum projected VOC concentrations in the river would be less than 5 ug/L. Also, the Peconic River is not used as a source of drinking water.

Primary ecological screening criteria for site VOCs in surface water are not available. As a result, the Navy used secondary screening levels that are based on Oakridge National Laboratory (ORNL) values for potential impact to benthic organisms (organisms that live in and on the river bottom). This evaluation indicated that widespread impact to ecological receptors in the river would not be expected, but that some localized impacts may occur. Mr. Brayack also noted that exceeding the screening level did not mean there would be an adverse ecological impact.

The Navy has collected Peconic River water samples in the past in this area and VOCs were not detected. However, this is not unexpected because VOCs dissipate very

quickly. The Navy does not know whether contaminated groundwater is flowing into the river, but surface water samples are not showing an impact.

Mr. Rosemann and Mr. Wilkie indicated that they will contact US Fish and Wildlife to see what information they have on VOC concentrations that may be of concern for a point discharge and for specific tests that are required for point discharge to determine potential river impacts from VOCs. This information may give an understanding of how the site groundwater plume concentrations relate to levels allowable in point discharges to the river. Mr. Rosemann will email the information they obtain from US Fish and Wildlife to the Navy.

Additional Data Needs for the Southern Area

There was general agreement that additional data are needed to better define the leading edge of the groundwater plume, to determine whether the VOC-contaminated groundwater is entering the river, and to determine whether there are any adverse impacts to the river. Mr. Rosemann noted that currently he does not see an impact to the river, which could be because the VOC-contaminated groundwater has not reach the river yet or could be because the VOC-contaminated groundwater has reached the river but the VOC concentrations are not at levels that will cause an impact.

The Navy will try to collect groundwater data at the leading edge of the plume. Mr. Brayack indicated that the area was difficult to access from land and the Navy is looking into using a boat to access the area from the river to install hand-driven wells. Mr. Anatasi asked about whether surface water samples could be collected from the area where the Navy is targeting putting in groundwater wells. Mr. Brayack indicated that both surface water and sediment samples will be collected at these locations.

Remedial Options in the CMS

Mr. Brayack reviewed the CMS alternative summary table. RAB members indicated overall agreement with excavation of the source areas. The discussion on remedial options in the CMS focused on the options for the groundwater plume and whether sufficient data were available to select a remedy at this time, and in particular for the off site Southern Area.

Mr. Brayack indicated that as discussed at the April 2006 RAB meeting, there are concerns with attempting an active remedy in the off site Southern Area plume. Options to actively treat the plume may have more adverse impact on the wetlands and the river than the contaminated groundwater.

Monitored natural attenuation (MNA) is the Navy's proposed remedy for the plume because it would not adversely impact human health and the environment and would provide triggers (based on the monitoring data) to determine weather additional action is needed to provide adequate protection. Mr. Gunther indicated that he understands MNA as a remedial option better and understands that it is not a "do-nothing" remedy. However, the language in the CMS suggests that the Peconic River would be used as a discharge point. Mr. Rosemann suggested that the Navy should provide specific goals

for the monitoring in the CMS to show how MNA option would address current and future concerns. Mr. Rosemann also indicated that the natural systems in place (e.g., wetlands) may already be naturally attenuating any contamination.

It was agreed that additional data to understand impacts to the river are needed to determine whether active treatment of contaminated groundwater was needed. The data could be collected before selecting a remedy or as part of the selected remedy. Section of a remedy now does not preclude changing or selecting additional remedial options in the future. Often monitoring programs include triggers based on the data for when additional remedial action may be needed. The benefit of selecting a remedy now is that the remedy could be developed and implemented sooner and portions of the site where remediation is complete can be transferred soon.

In answer to whether it was easier to fund the additional data collection through site investigation stage or through the remediation stage, Ms. Clarke replied she did not believe it made a difference but she would check on funding methods. [Based on post-RAB discussions, the Navy is proceeding with sampling collection in the off site Southern Area].

<u>What's next?</u>

The Navy is waiting on comments on the CMS'. Further discussion may be needed to determine whether to move forward with the CMS and collect the additional data as part of the remedial action or to complete the CMS after collection of the additional data. Based on the comments the Navy may need to separate an on site remedy (source and onsite portion of plume) from the off site remedy.

Mr. Gunther indicated that the community members had some questions on the modeling that was conducted and they wanted Mr. Anastasi to review this portion of the CMS to provide an understanding of whether MNA would address human health concerns. Mr. Anastasi will begin review of the CMS and provide comments to the Navy. The NYSDEC and Suffolk County will also provide comments.

STATUS OF SITES 1, 9, 10A & AGRICULTURAL OUTLEASE RCRA PERMIT MODIFICATION AND PROPERTY TRANSFER

Ms. Clarke provided an update on Navy's request to NYSDEC for a modification to the Part 373 RCRA Permit for Sites 1, 9, 10A, and Agricultural Outlease. Sites 1 and 9 are part of Parcel D which is approximately 145 acres, Site 10A is about 1 acre, and the Agricultural Outlease is another 5 acres that runs along Grumman Road on the southeastern boundary of the facility. Site transfer is underway. There was an erosion problem at Site 1 and the Navy will address the erosion. The Navy will prepare and submit draft plans for the work soon. Mr. Patselas indicated that work would involve removing some of the silt from the pond and putting riprap in the major areas of erosion.

For Site 10A, the Navy is waiting on input from the NYSDEC for some specific deed language to include in the permit

CLOSING REMARKS

Ms. Clarke thanked everyone for coming to the meeting. The next RAB meeting was announced for Thursday, November 2, 2006 and would be held at the same location. Mr. Gunther suggested that the Navy provide budget information at the next RAB meeting.

No other RAB members had closing remarks and the meeting was adjourned at approximately 9:30 p.m.

Attachment 1
Agenda

Agenda

Restoration Advisory Board
Naval Weapons Industrial Reserve Plant Calverton

August 3, 2006
Calverton Community Center, Calverton NY
7:00 p.m.

Welcome and Agenda Review
Jim Colter, Engineering Field Activity Northeast

Distribution of Minutes
All Members

Community Update
Bill Gunther, RAB Co-chair

Technical Progress

General Program - Susan Clarke, NAVFAC MIDLANT

Site 7 Fuel Depot Area Operation - Stavros Patselas, Tetra Tech EC

Site 6A/Southern Area CMS - Susan Clarke

Status of Sites 1, 9, 10A & Agricultural Outlease RCRA Permit Modification and Property Transfer – Susan Clarke

Closing Remarks
Susan Clarke

Presenters will be available after the program for questions.

Attachment 2
Site 7 Fuel Depot Area

Groundwater Remediation Project

Naval Weapons Industrial Reserve Plant
Calverton, NY
Site 7: Former Fuel Depot

Restoration Advisory Board Meeting
August 3, 2006

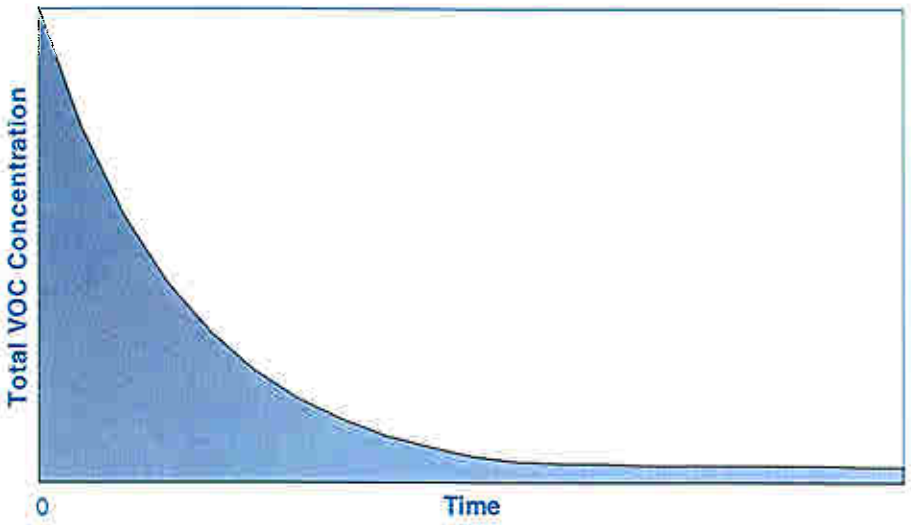
Area Map

OVERVIEW

- Contaminants of Concern:
  BTEX, Napthalene, and Freon in groundwater
- Air Sparge/Soil Vapor Extraction System constructed Summer-Fall '04
- Goal:
  - Mass removal of groundwater contaminants
  - Operate & Maintain in-situ treatment system for 2-4 years
- Three month pilot study conducted in Summer 2005
- Full scale system expansion completed Winter–Spring 2006

NAVFAC

Total VOC Concentrations Over Time



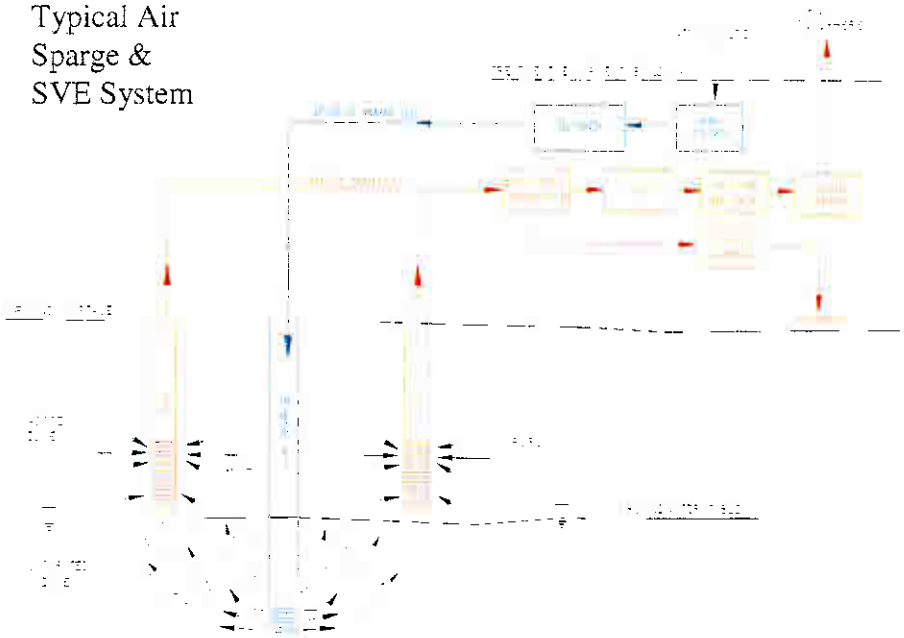
System Monitoring

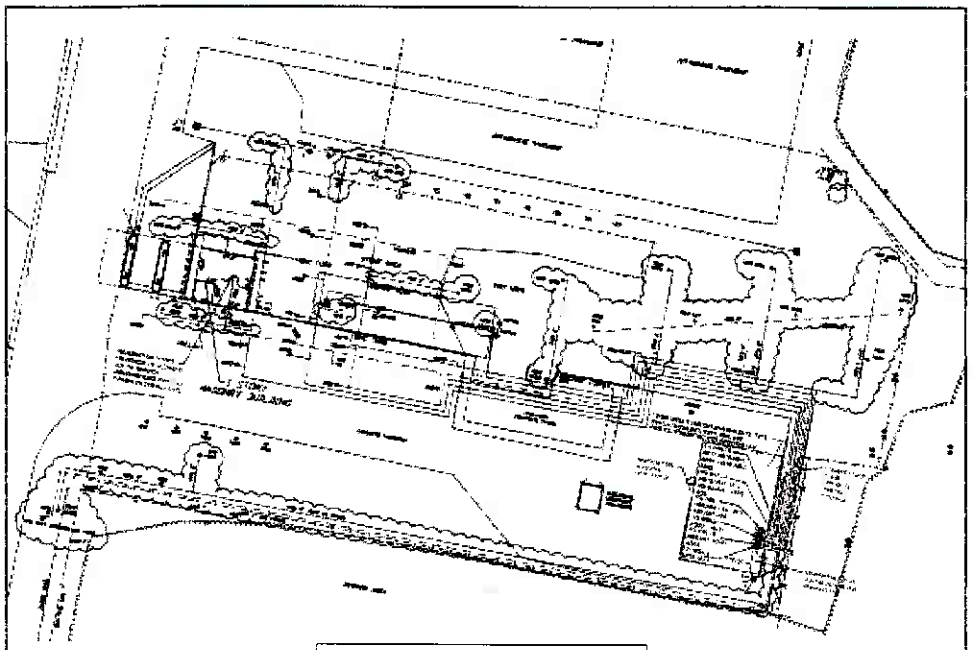
What is measured

- Changes in extracted organic vapor concentrations
- Changes in soil gas concentrations
- Changes in dissolved oxygen concentrations
- Changes in beneficial microbial activity
- Variations in depths to groundwater
- Changes in dissolved groundwater contaminant concentrations
- Treatment system performance parameters
- Equipment performance parameters

NAVFAC

Typical Air Sparge & SVE System





AS/SVE Piping Layout

Air Sparge System

- Total of thirty-four 2-inch diameter wells
- Sixteen wells added for full scale expansion
- Approx. depth of wells is 35 feet bgs
- 60 Hp AS blower with variable speed drive
- Typical injected air flow rate up to 180 cubic feet per minute (cfm)
- Finned pipe heat exchanger unit for temperature reduction

NAVFAC

Soil Vapor Extraction

- Total of thirteen 4-inch diameter wells
- Five wells added for full scale expansion
- Approx. depth of wells is 25 feet
- 75 Hp SVE blower with variable speed drive
- Typical vapor extraction flow rate up to 1,600 cfm
- 400 gallon moisture separator

Operational Data

Soil Vapor Extraction Wells

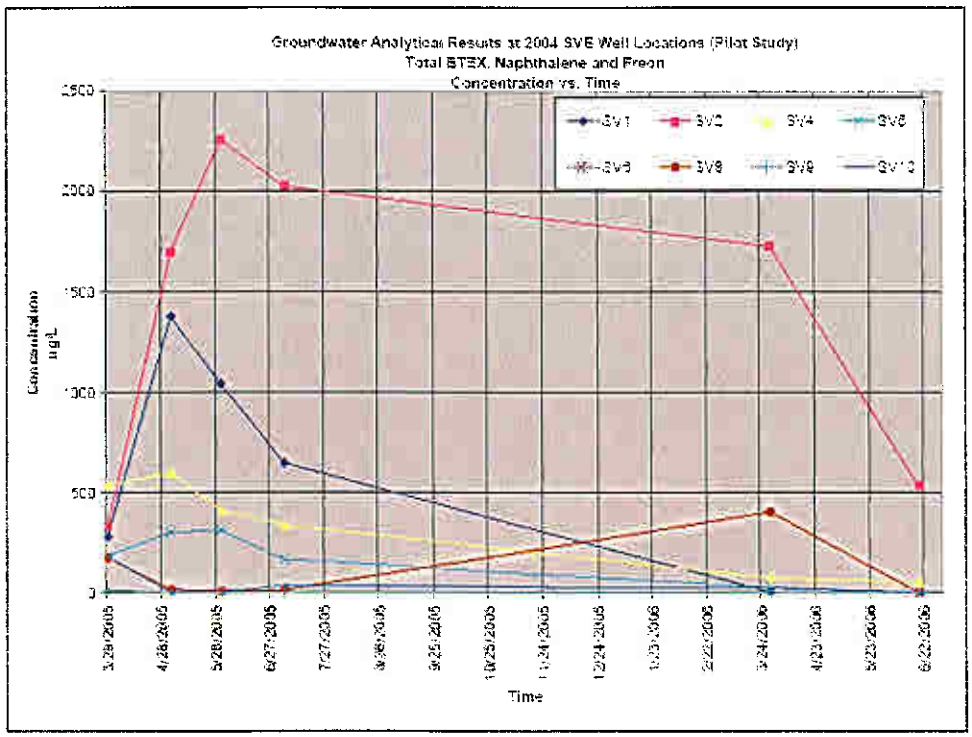
- Typical 40 inches of water vacuum pressure
- Typical 100 cubic feet per minute (cfm) flow rate
- 80 feet radius of influence

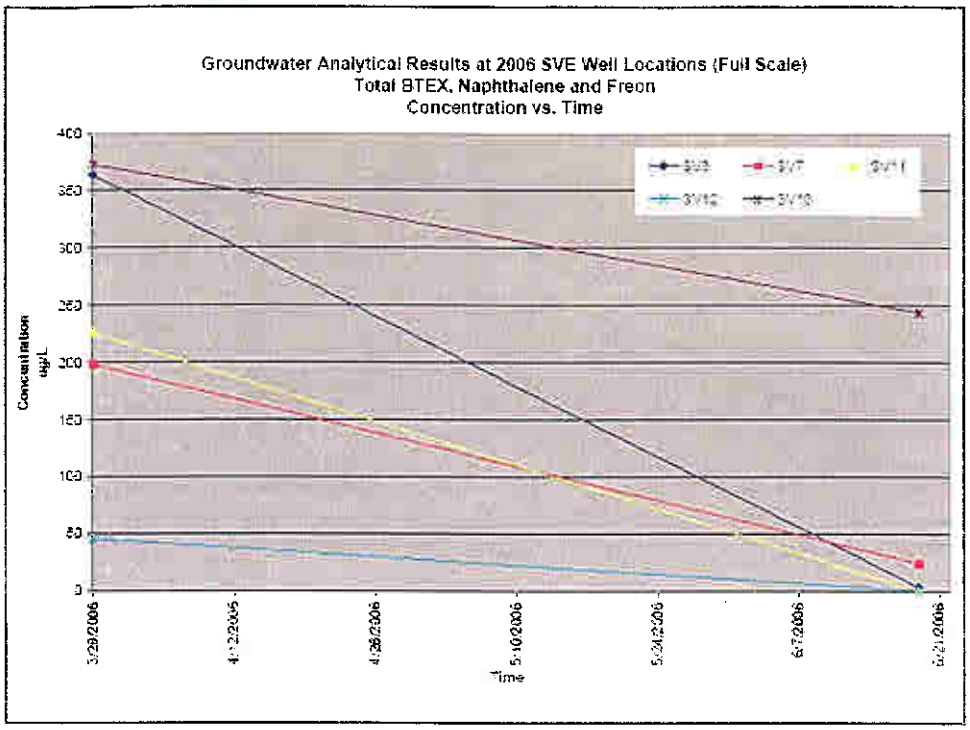
Air Sparge Wells

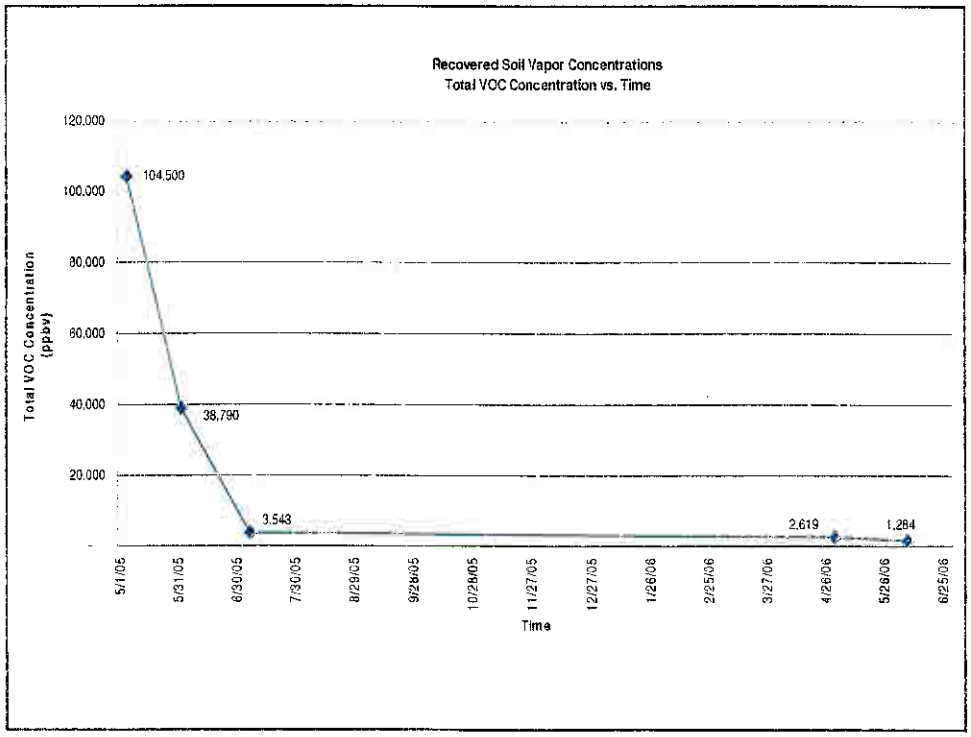
- Typical 8 - 10 pounds per square inch injection pressure
- Typical 10 - 15 cfm injection flow rate
- 25 feet radius of influence in east – west direction
- 40 feet radius of influence in north – south direction

Operational Data (cont'd)

- Overall, system performance is as anticipated and actually exceeds original design assumptions.
- Dissolved oxygen levels increased significantly during the pilot operations.
- Microbial activity was greatly increased as a result of the increased dissolved oxygen levels.
- 42,000 pounds of carbon has been spent.

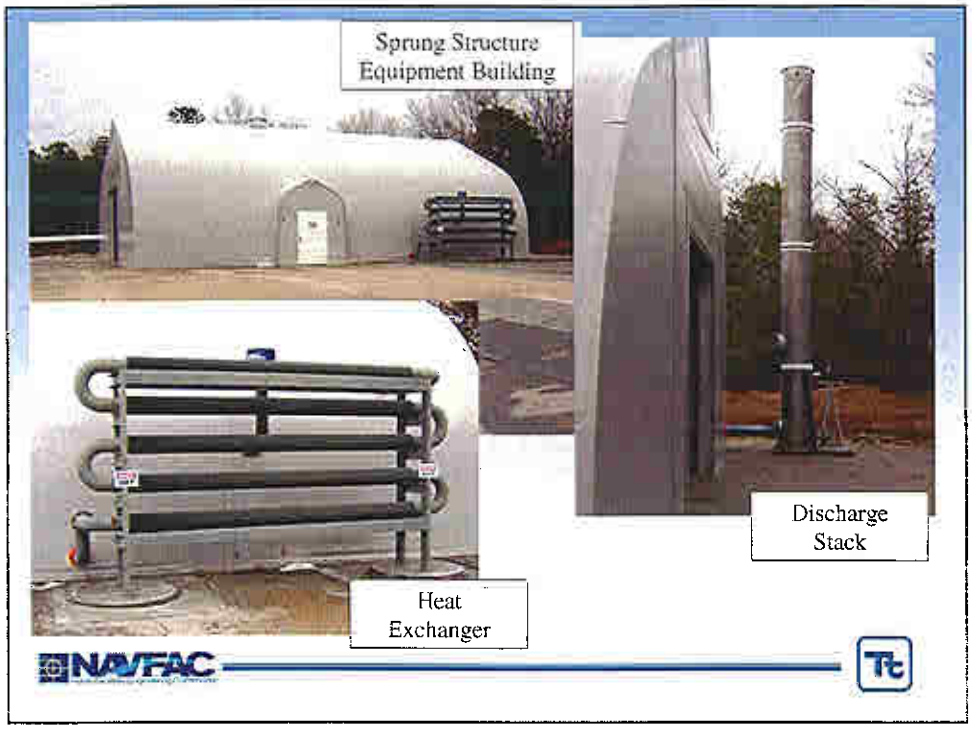


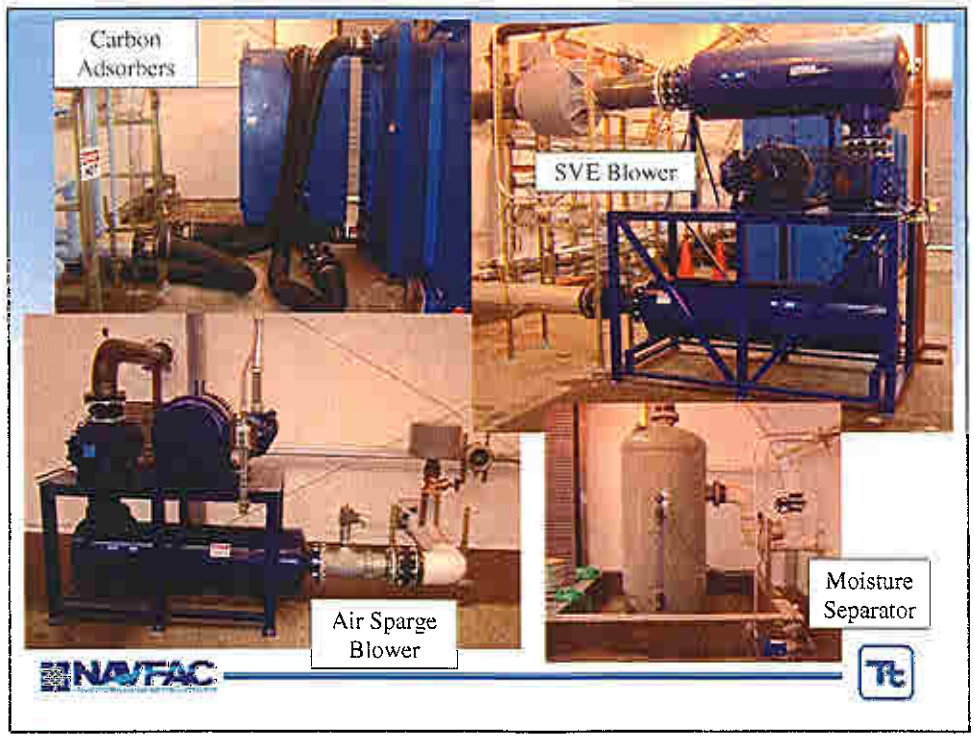

Groundwater Analytical Results at 2006 SVE Well Locations (Full Scale)
Total BTEX, Naphthalene and Freon
Concentration vs. Time
Concentration ug/L
Time

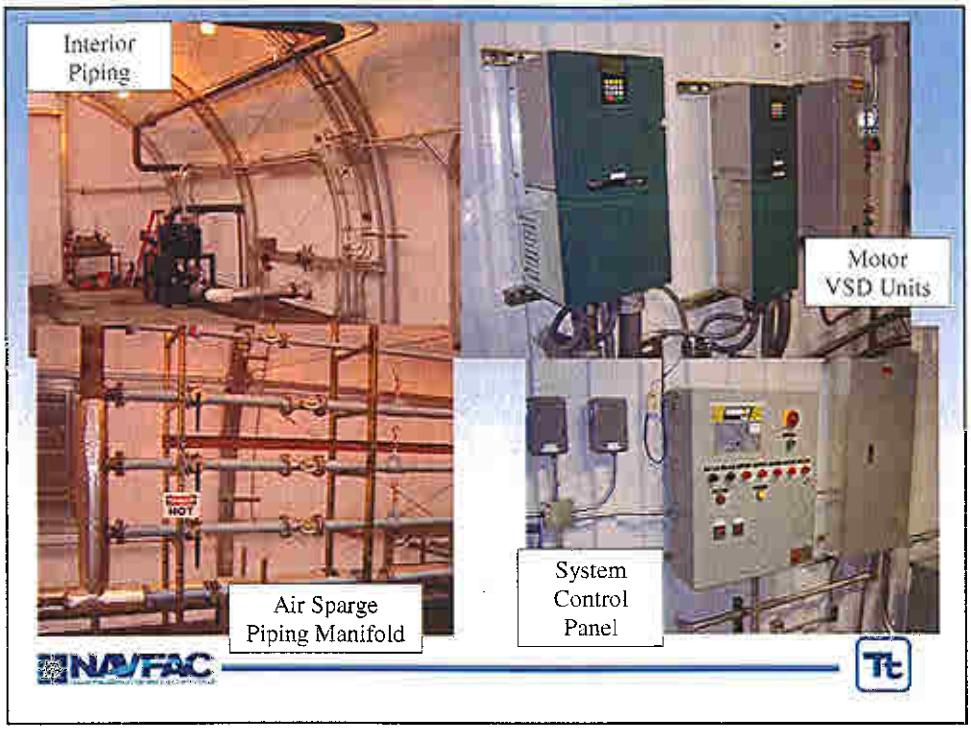

Recovered Soil Vapor Concentrations
Total VOC Concentration vs. Time
Total VOC Concentration (ppbv)
120,000
100,000
80,000
60,000
40,000
20,000
104,500
38,790
3,543
2,619
1,284
5/1/05
5/31/05
6/30/05
7/30/05
8/29/05
9/28/05
10/28/05
11/27/05
12/27/05
1/26/06
2/25/06
3/27/06
4/26/06
5/26/06
6/25/06
Time

Operation & Maintenance

- Full Scale System
  - Started on April 24, 2006
  - Trained technician(s) to visit the site 1-2 times per week normally.
  - Equipment maintenance and system monitoring to be done weekly.
  - Groundwater and vapor samples to be collected during operational period.
  - Additional engineering support used as needed.
  - System shutdown by end of October 2006


Sprung Structure
Equipment Building
Discharge
Stack
Heat
Exchanger
NAVFAC


Carbon
Adsorbers
SVE Blower
Air Sparge
Blower
Moisture
Separator
NAVFAC



Ozone System Description

- System contained in a portable self-contained trailer
- Produces approximately five pounds of ozone per day
- Fourteen injection points, eight installed for full scale expansion
- Produces variable injection pressures and adjustable time intervals
- Ozone creates low temperature combustion which oxidizes the contaminant
- Capable of eliminating dissolved contaminants in-situ such as freon
- Works effectively as a supplement to AS / SVE system

Status

Where we are right now

- Full scale expansion of AS / SVE system is complete
- System tested, started, and to operate 6 months from April 24, 2006
- Ozone system fully operation since May 28, 2006
- Bi-weekly operation and maintenance of both systems
- Monitoring includes groundwater and vapor sampling
- Provide operations training to other personnel
- Prepare and submit Full Scale O&M manual by end of August 2006
- Demolish former fuel depot building in November – December 2006
- Transfer system operations to others by end of March 2007

Wrap-up

Questions?

Attachment 3
Site 6A and 10B, and Southern Area
Site Conditions and CMS Alternative Summary

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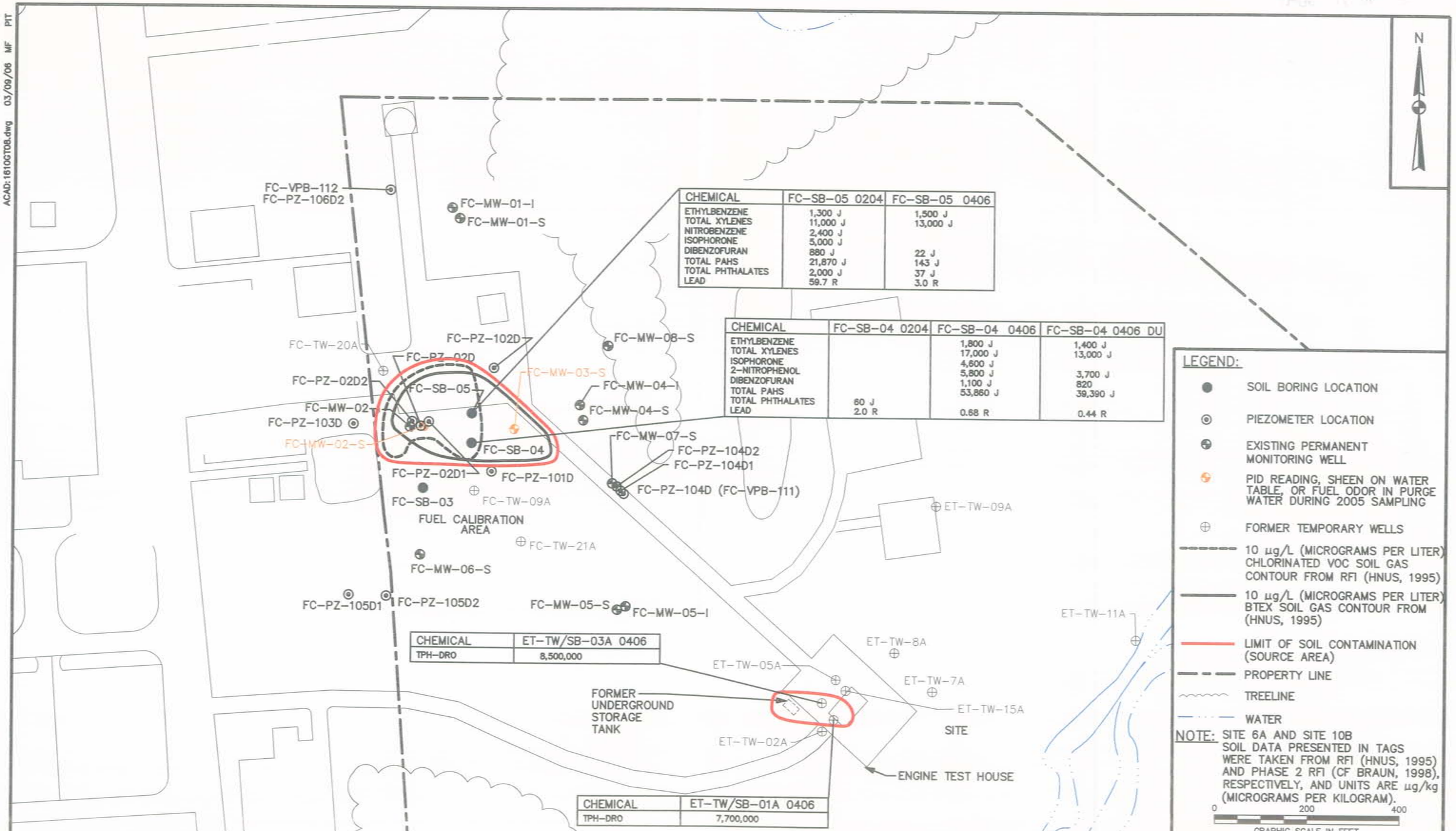


CHEMICAL	FC-SB-05 0204	FC-SB-05 0406
ETHYLBENZENE	1,300 J	1,500 J
TOTAL XYLENES	11,000 J	13,000 J
NITROBENZENE	2,400 J	
ISOPHORONE	5,000 J	
DIBENZOFURAN	880 J	22 J
TOTAL PAHS	21,870 J	143 J
TOTAL PHTHALATES	2,000 J	37 J
LEAD	59.7 R	3.0 R

CHEMICAL	FC-SB-04 0204	FC-SB-04 0406	FC-SB-04 0406 DU
ETHYLBENZENE		1,800 J	1,400 J
TOTAL XYLENES		17,000 J	13,000 J
ISOPHORONE		4,600 J	
2-NITROPHENOL		5,800 J	3,700 J
DIBENZOFURAN		1,100 J	820
TOTAL PAHS		53,860 J	39,390 J
TOTAL PHTHALATES	60 J		
LEAD	2.0 R	0.68 R	0.44 R

CHEMICAL	ET-TW/SB-03A 0406
TPH-DRO	8,500,000

CHEMICAL	ET-TW/SB-01A 0406
TPH-DRO	7,700,000

LEGEND:

- SOIL BORING LOCATION
- PIEZOMETER LOCATION
- EXISTING PERMANENT MONITORING WELL
- PID READING, SHEEN ON WATER TABLE, OR FUEL ODOR IN PURGE WATER DURING 2005 SAMPLING
- FORMER TEMPORARY WELLS
- 10 µg/L (MICROGRAMS PER LITER) CHLORINATED VOC SOIL GAS CONTOUR FROM RFI (HNUS, 1995)
- 10 µg/L (MICROGRAMS PER LITER) BTEX SOIL GAS CONTOUR FROM (HNUS, 1995)
- LIMIT OF SOIL CONTAMINATION (SOURCE AREA)
- PROPERTY LINE
- TREELINE
- WATER

NOTE: SITE 6A AND SITE 10B SOIL DATA PRESENTED IN TAGS WERE TAKEN FROM RFI (HNUS, 1995) AND PHASE 2 RFI (CF BRAUN, 1998), RESPECTIVELY, AND UNITS ARE µg/kg (MICROGRAMS PER KILOGRAM).

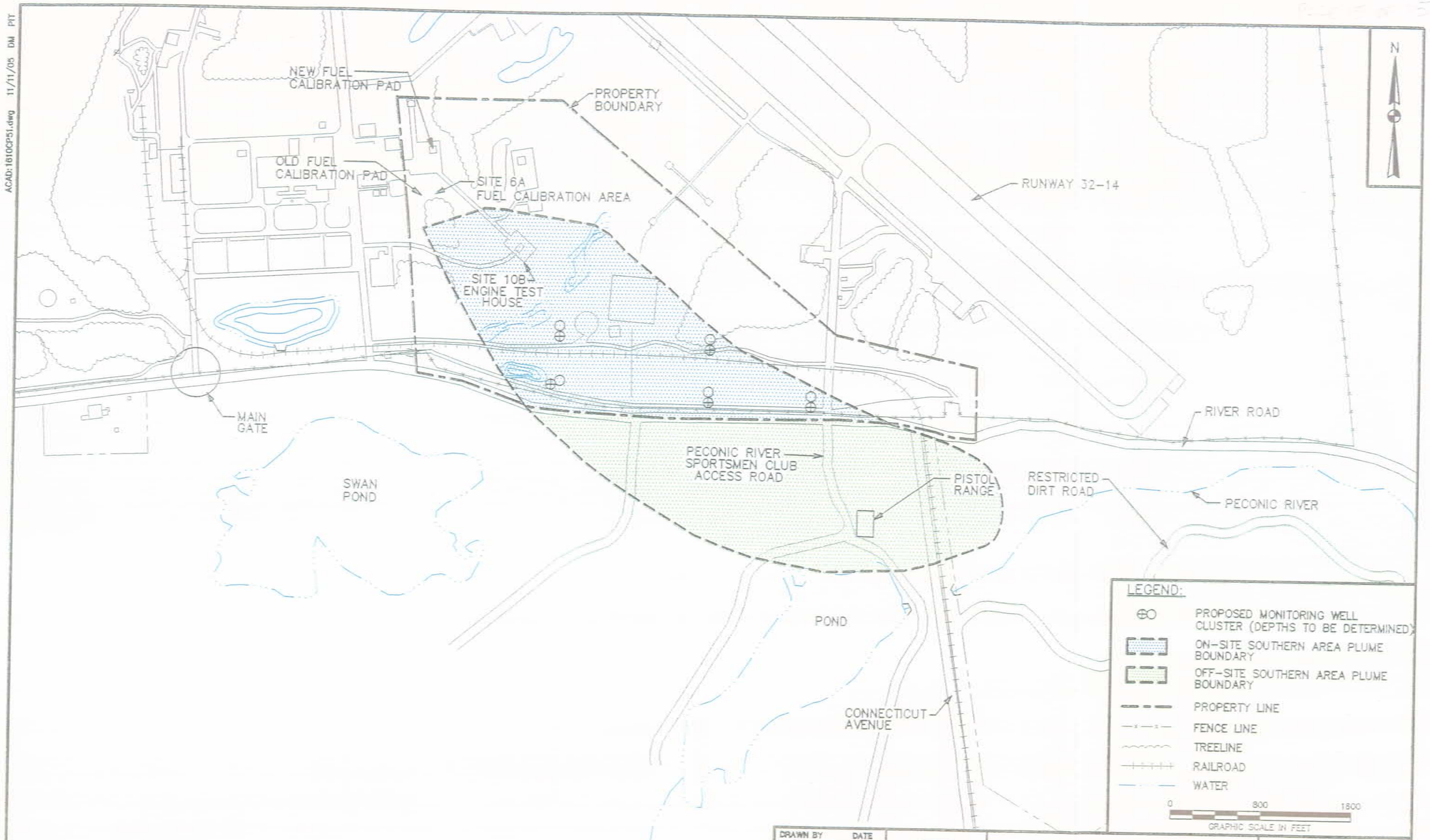
0 200 400
GRAPHIC SCALE IN FEET

DRAWN BY DM	DATE 6/17/05	Tetra Tech NUS, Inc.	SOIL SOURCE AREA BASED ON HISTORIC DATA SITE 6A - FUEL CALIBRATION AREA AND SITE 10B - ENGINE TEST HOUSE NWIRP CALVERTON CALVERTON, NEW YORK
CHECKED BY	DATE		
REVISED BY	DATE		
SCALE AS NOTED			

CONTRACT NO. 1610
OWNER NO. 0004
APPROVED BY DATE
DRAWING NO. FIGURE
REV. 0

FORM CADD NO. TTNUS-BHDWG - REV 1 - 9/10/98

ACAD:1610CP51.dwg 11/11/05 DM PIT



DRAWN BY HJB DATE 10/18/05	Tetra Tech NUS, Inc.	ALTERNATIVE OSAGP2 - MONITORING WELL NETWORK ON-SITE SOUTHERN AREA PLUME NWIRP CALVERTON CALVERTON, NEW YORK	CONTRACT NO. 1610
CHECKED BY DATE			OWNER NO. 0004
REVISED BY DATE			APPROVED BY DATE
SCALE AS NOTED			DRAWING NO. FIGURE A-1 / REV. 0

FORM CADD NO. TTNUS-BH.DWG - REV 1 - 9/10/98

Corrective Measures Study – Alternative Summary

Site 6A/Site 10 Soils	Site 6A/10B (Source Area) Groundwater	Onsite Southern Area	Offsite Southern Area
S1 – No Action	SAGW1 – No Action	OSAGP1 – No Action	1 – No Action
S2 – Land Use Controls, Deed Notifications, and Monitoring	SAGW2 – Natural Attenuation with Monitoring	OSAGP2 – Natural Attenuation with Monitoring	2 – Natural Attenuation with Monitoring
S3 – Excavation and Offsite Disposal (All contaminated soils)	SAGW3 – Groundwater Extraction and Treatment	OSAGP3 – Groundwater Extraction and Treatment	3 – Groundwater Excavation and Treatment
S4 – Excavation and Onsite Thermal Treatment	SAGW4 – Air Sparging	OSAGP4 – Insitu Biological Treatment	4 – Insitu Biological Treatment (Hot spot)
S5 – Soil Vapor Extraction	SAGW5 – Insitu Biological Treatment		5 – Insitu Biological Treatment (Barrier)
S6 - Excavation and Off Site Disposal of PCB Contaminated Soil			6 – Insitu Air Sparging
S7 – Alternative S5 and S6			