ACTION MEMORANDUM

DATE: 06/19/2009

FROM: Mr. William Cords

SUBJECT: Time Critical Removal Action – Off Site Soil Vapor Intrusion
Site 1- Former Drum Marshalling Area
Naval Weapons Industrial Reserve Plant
Bethpage, New York

1. PURPOSE

The purpose of this Action Memorandum is to document the decision by the United States Navy (Navy) to conduct time critical removal actions (TCRAs) to initially reduce exposure to and then prevent the intrusion of volatile organic compound (VOC)-contaminated soil vapor into off-base residential houses adjacent to Site 1, Naval Weapons Industrial Reserve Plant (NWIRP), Bethpage, New York.

These actions will reduce potential risks to the public health, welfare, or the environment posed by VOCs in the soil gas resulting from historic (pre-1984) handling of waste chlorinated and non-chlorinated solvents. Continued operation of Air Purifying Units (APUs) (initial interim action) and installation and operation of Sub-Slab Depressurization (SSD) Systems (subsequent abatement action) in residential homes will reduce indoor air concentrations to acceptable New York State Department of health (NYSDOH) criteria.

This TCRA is being conducted by the Navy under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and the New York State Department of Environmental Conservation (NYSDEC) for the Investigation and Remediation of Hazardous Material Releases (Remediation Regulations).

2. NWIRP BETHPAGE BACKGROUND

NWIRP Bethpage was established in 1941 (Attachment A, Figure 1). Since its inception, the plant's primary mission has been the research prototyping, testing, design engineering, fabrication, and primary assembly of military aircraft. The facilities at NWIRP included four plants used for assembly and prototype testing; a group of quality control laboratories, two warehouse complexes (north and south), a salvage storage area, water recharge basins, the Industrial Wastewater Treatment Plant, and several smaller support buildings (Attachment A, Figure 2). In 1998, manufacturing operations ended at the facilities.

Since 1998, activities occurring at the facility included facility maintenance (security and mowing), storage of Nassau County impounded vehicles, and environmental investigations and/or remediation of soil, groundwater, and soil vapor (described below). In 2002, approximately 4 acres (Plant No. 20) of the facility were transferred to Nassau County. The majority of the

remaining property (96 acres), including Installation Restoration (IR) Sites 2 and 3, was transferred to Nassau County in early 2008. The balance of the property (9 acres) is being retained by the Navy pending completion of remedial activities at Sites 1 and 4.

3. SITE DESCRIPTION

This section presents an assessment of the environmental conditions at the site. The site conditions have been evaluated through performance of several investigations conducted by the Navy.

a. Background.

Site 1 - Former Drum Marshalling Area – is relatively flat with a 4-foot vegetated windrow located along the eastern end of the site, and is mounded on the north to partially bury the abandoned sanitary settling tank (Attachment A, Figure 3). Site 1 - Former Drum Marshalling Area originally consisted of two former drum marshalling pads that were used to store drums containing waste materials from operations at Plant No. 3 and potentially other sources at the facility. The waste drums reportedly contained chlorinated and non-chlorinated solvents, liquid cadmium and chromium wastes. In addition, underlying most of Site 1 is approximately 120 abandoned cesspools that were designed to discharge sanitary waste waters from Plant No. 3. These cesspools were approximately 10 feet in diameter and 16 feet deep. Based on field observations, the cesspools are currently filled with soil. It is possible that non-sanitary wastes may have been discharged through this system. The drum marshalling areas and extent of the leach field were the original boundary of Site 1.

b. Removal Site Evaluation.

During a Remedial Investigation (RI) in 1992, results of a soil-gas survey indicated that a source area of VOC contamination was present near the former drum marshaling area and extended to the south (HNUS, 1992). The results of the soil boring program confirmed a source area of volatile organics contaminants near the former drum marshaling areas in the center of the site and a lesser source area near the southeast corner of the site. Tetrachloroethene (PCE) and trichloroethene (TCE) at levels up to 4,800 micrograms per kilogram (µg/kg) and 200 µg/kg, respectively, were found in Site 1 subsurface soils. Levels of inorganic contamination were relatively low, when compared to the VOC contamination. Cadmium, chromium, arsenic, and several other metals were found at concentrations greater than background. In addition, polychlorinated biphenyls (PCBs) (7,900 µg/kg), pesticides (440 µg/kg), polynuclear aromatic hydrocarbons (PAHs) were found in the soils at Site 1.

A groundwater monitoring well program confirmed that Site 1 is an apparent source area of groundwater contamination starting near the former drum marshaling area in the center of the site and extending southwest (hydraulically down gradient). TCE, PCE, and 1,1,1-trichloroethane (1,1,1-TCA) were detected at maximum concentrations of 1,500 micrograms per liter (µg/l), 7,700 µg/l, and 10,000 µg/l, respectively. Cadmium and chromium were found at concentrations greater than groundwater screening criteria.

During the 1993 Phase 2 RI, the soil testing program indicated wide-spread, low-level, PCB contamination in the surface soils at Site 1 (HNUS, 1993). The majority of the contaminated soils contained PCBs at a concentration of 10 milligrams per kilogram (mg/kg) or less. However, soils at two locations contained PCBs at concentrations greater than 10 mg/kg - near the southwestern portion of Site 1 (30 mg/kg PCBs) and along the western edge of Site 1 (1,470 mg/kg PCBs).

In 1993, as a result of the presence of PCBs in surface soils at a concentration significantly greater than 50 mg/kg, an interim action was taken to reduce potential dust migration of PCB-contaminated soil and protect site workers. This interim action reduced overall risks to off site residents and onsite workers by a factor of approximately 5 and 20, respectively.

Between 1995 and 2001, supplemental soil investigations at the site determined that the extent of PCB-contamination was much more extensive vertically than had been estimated in the Record of Decision (ROD) (NFEC, 1995). In particular, the ROD estimated that the vertical extent of PCB contamination was approximately 7 feet and that 1,400 cubic yards of PCB-contaminated soil would have to be removed. Subsequent testing determined that the vertical extent of PCB contamination is approximately 65 feet and extends into the groundwater. Based on current data, approximately 78,100 cubic yards of PCB-contaminated soils (greater than 10 mg/kg) are present and the Navy is evaluating options for addressing the remaining soil contamination at Site 1. In addition to PCBs, site contaminants also include metals and PAHs at concentrations greater than potential remediation goals.

In January 2008, the Navy collected soil gas samples at the facility fence line, approximately 60 feet from residential housing. Samples were collected at depths of approximately 8, 20, and 45 feet below ground surface (bgs). This testing documented TCE at concentrations up to 19,000 micrograms per cubic meter of soil gas ($\mu g/m^3$) at 7 feet bgs, 180,000 $\mu g/m^3$ at 20 feet bgs, and 150,000 $\mu g/m^3$ at 45 feet bgs at Site 1 (TtNUS, 2008) (Attachment A, Figure 4). Other VOCs including PCE and 1,1,1-TCA were detected at elevated concentrations. There are no established standards for soil gas; however, for comparison, NYSDOH considers TCE at concentrations greater than 250 $\mu g/m^3$ in building sub-slab concentrations to require mitigation. Based on NYSDOH's decision matrix and indoor test results, mitigation and/or monitoring may also be required when TCE concentrations are less than 250 $\mu g/m^3$.

To determine whether VOC-contaminated soil vapor migrated off site, a Phase II soil vapor investigation was conducted in October 2008 and January 2009 along rights-of-way in the residential neighborhood located to the east of Site 1. Soil gas samples were collected at approximately 8, 20, and 50 ft bgs. Data were presented in the Site 1 Phase II Soil Vapor Testing Letter Report and documents findings of TCE at concentrations up to 34,000 $\mu g/m^3$ at 8 ft bgs, 89,000 $\mu g/m^3$ at 20 ft bgs, and 26,000 $\mu g/m^3$ at 44 ft bgs (2009a) (Attachment A, Figure 4). Other VOCs, including PCE and 1, 1, 1-TCA, were also detected at concentrations up to 90,000 $\mu g/m^3$ in the soil gas samples. These test results were used to delineate the potential extent of contaminated soil gas that may affect the residential housing. This area is approximately bounded by 10^{th} and 11^{th} Streets and Maple and Sycamore Avenues (Attachment A, Figure 5).

Based on sequentially-collected test results and access agreements with potentially affected residents, sub-slab soil gas, and basement and first floor indoor air samples were collected from 18 residential homes between January and May 2009. Detected TCE concentrations in sub-slab soil gas samples ranged from 0.35 µg/m^3 to 15,000 µg/m^3 and exceeded the 250 µg/m^3 guidance value for six homes. TCE concentrations in indoor air samples ranged from not detected to 180 µg/m^3 and exceeded a NYSDOH guidance value of 5 µg/m^3 in four homes. In total, based on the NYSDOH matrix evaluation of sub-slab soil gas and indoor air concentrations, additional action consisting of mitigation and/or monitoring is required in 13 homes.

c. Release or Threatened Release into the Environment of a Hazardous Substance, or Pollutant or Contaminant.

Chlorinated solvent-contaminated soil gas has migrated off site and accumulated under the residential basement slabs. The soil gas can then enter the homes through cracks and openings in the foundations and basement walls (soil vapor intrusion). The residents can then become exposed to the contaminants through inhalation. This exposure pathway is most significant in the winter months when natural ventilation is reduced and furnace operation creates a negative pressure within the homes. The chlorinated solvents include TCE, PCE, and TCA. Of the chlorinated solvents, based on concentrations and guidance values, TCE is driving the risk and the need for mitigation. Sampling results from soil gas testing are available in the Site 1 Soil Vapor Investigation Report and the Site 1 Phase 2 Soil Vapor Testing Report (TtNUS, 2008b and 2009a).

The data indicate TCE concentrations in onsite soil gas as high as 180,000 µg/m^3; indoor air samples as high as 180 µg/m^3; and sub-slab samples as high as 15,000 µg/m^3. NYSDOH guidelines require mitigation of indoor air that is at or exceeds 5 µg/m^3 TCE and sub-slab soil vapor that is at or exceeds 250 µg/m^3 TCE (NYSDOH, 2006). Mitigation may also be required at lower concentrations of TCE, based on a decision matrix that considers both the sub-slab soil gas concentration and the indoor air concentration.

Off site TCE-contaminated soil gas (greater than 5 µg/m^3) extends to a maximum distance of approximately 400 feet and affects an area of approximately 6 acres. The area in which mitigation and/or monitoring is required (greater than 250 µg/m^3) extends a maximum distance of approximately 250 feet and affects an area of approximately 2.5 acres (Attachment A, Figure 5). The depth of the contaminated soil gas is limited by the water table at approximately 50 feet bgs. Based on sub-slab soil gas and indoor air TCE concentrations, 13 homes require mitigation and/or monitoring.

d. National Priorities List (NPL) Status.

NWIRP Bethpage is not a Federal NPL site.

e. Maps, pictures, and other graphic representation.

Figures 1, 2, 3, 4, and 5 depict the general location map, site location map, facility layout, soil gas sampling results, and TCE isoconcentration contours, respectively.

4. OTHER ACTIONS TO DATE

a. Previous Actions.

- In 1993, as an interim measure, a 6-inch soil cap was placed on PCB-contaminated surface soil at Site 1.

- In 1998, an air sparging/soil vapor extraction (AS/SVE) system was constructed to address VOC-contaminated soil and shallow groundwater at Site 1. At the time, soil vapor was not identified as a pathway. The site related volatile compounds of concern, based on distribution and maximum detected concentrations, included TCE, PCE, 1,1,1-TCA, 1,2-dichloroethane (1,2-DCA), 1,2-dichloroethene (1,2-DCE), and 1,1-dichloroethene (1,1-DCE). The remediation goals were established in the ROD prepared in May 1995 (NDNFEC/NYSDEC, 1995). The goals were established to control continuing releases of VOCs to groundwater.

- From August 1998 to March 2002, the AS/SVE system ran seasonally at Site 1 (non-winter operation). A total of approximately 4,500 pounds of VOCs were removed from the soils and shallow groundwater during the operation of the system.

- In the late 1990s, the Navy funded construction of a treatment system for VOC-contaminated groundwater impacting an off site public water supply well.

- The Navy is currently finalizing a design and preparing to construct a full-scale Soil Vapor Extraction Containment System along the Navy fence line. Anticipated startup of the full-scale system is December 2009.

- The Navy is currently constructing a treatment system to address an off site VOC-contaminated groundwater hot spot.

- The Navy is currently conducting an ongoing groundwater investigation to delineate the off site VOC-contaminated groundwater plume and assessing potential impacts to additional off site public water supplies.

b. Investigations and Assessments:

Several investigations have been conducted at the site and are described in the following reports:

Initial Assessment Study of NWIRP Bethpage and NWIRP Calverton, New York. Naval Energy and Environmental Support Activity (NEESA) 13-100, Rogers, Golden, & Halpern, Philadelphia, PA. December 1986.

Remedial Investigation Report Naval Weapons Industrial Reserve Plant Bethpage, NY. Halliburton NUS, May 1992.

Phase 2 Remedial Investigation Report for Naval Weapons Industrial Reserve Plant Bethpage, NY. Volume 1, Halliburton NUS, October 1993.

Feasibility Study Report for Naval Weapons Industrial Reserve Plant Bethpage, NY, Halliburton NUS, March 1994.

Proposed Remedial Action Plan for Operable Unit 1 Sites 1, 2, and 3 Naval Weapons Industrial Reserve Plant Bethpage, New York, Naval Facilities Engineering Command, October 1994.

Record of Decision. Naval Weapons Industrial Reserve Plant, Bethpage, New York, Sites 1, 2, and 3, NYS Registry: 1-30-003B. Engineering Field Activity, Northeast Naval Facilities Engineering Command and New York Department of Environmental Conservation, Naval Facilities Engineering Command, May 1995.

Existing Conditions Survey and Site Report for Remedial Design Site 1 at Naval Weapons Industrial Reserve Plant Bethpage, New York, C.F. Braun Engineering Corp., June 1995.

Draft Remedial Design (Acting as Final), Phase II Pre-Design Investigation Letter Report for Site 1 Former Drum Marshaling Area NWIRP Bethpage, NY, C.F. Braun Engineering Corp., July 1995.

Remedial Design, Phase II Pre-Design Investigation Supplemental Sampling Letter Report Number 2 for Site 1 Former Drum Marshalling Area NWIRP Bethpage, New York, C.F. Braun Engineering Corp., September 1995.

Analytical Results from the Pre-Excavation Soil Sampling and an Estimate on Excavation. The Naval Weapons Industrial Reserve Plant Bethpage, New York. Foster Wheeler Environmental Corp., December 1995.

Site 1 Pre-Excavation Sampling Results Draft Report (Acting as final). The Naval Weapons Industrial Reserve Plant Bethpage NY, Foster Wheeler Environmental Corp., July 1996.

Results Letter Report for Air Sparging/Soil Vapor Extraction System at Site 1 - Former Drum Marshalling Area Volume 1 Text and Volume 2 Appendices Naval Weapons Industrial Reserve Plant Bethpage, New York, C.F. Braun Engineering Corp., October 1997.

Report for Additional Soil Investigation to Assess the Performance of the Soil Vapor Extraction/Air Sparging System Naval Weapons Industrial Reserve Plant Bethpage, New York, Foster Wheeler Environmental Corp., April 2000.

Naval Facilities Engineering Command (NAVFAC), 2000. Final Environmental Impact Statement Transfer and Reuse of Naval Weapons Industrial Reserve Plant Bethpage, New York, November.

Letter Report on the Pre-Operational Groundwater Sampling and Analysis Results Naval Weapons Industrial Reserve Plant Bethpage, New York, Foster Wheeler Environmental Corp., September 2001.

Final Close-Out Report, Construction of a Soil Vapor Extraction/Air Sparging System at the Naval Weapons Industrial Reserve Plant Bethpage, NY, Foster Wheeler Environmental Corp., December 2003.

Groundwater Sampling Data Summary Site 1 – Former Drum Marshalling Area Naval Weapons Industrial Reserve Plant, Bethpage, New York, Tetra tech NUS, Inc. January 2008.

Site 1 Soil Vapor Investigation Naval Weapons Industrial Reserve Plant, Bethpage, New York, Tetra tech NUS, Inc., April 2008.

Technical Memorandum for Evaluating Soil Remediation Technologies Site 1 - Former Drum Marshalling Area Naval Weapons Industrial Reserve Plant, Bethpage, New York, Tetra tech NUS, Inc., September 2008.

Indoor Air Sampling Work Plan Naval Weapons Industrial Reserve Plant, Bethpage, New York, Tetra tech NUS, Inc. November 2008.

Site 1-Phase 2 Soil Vapor Testing Letter Report Naval Weapons Industrial Reserve Plant, Bethpage, New York, USEPA ID # 002047967, Tetra tech NUS, Inc., January 2009.

c. Current Actions.

- Between February and March 2009, the Navy installed 16 APUs in 14 off site residential homes. Continued operation of these APUs is one of the subjects of this TCRA. APUs are a granular activated carbon-based filtration system that remove VOCs through recirculation of indoor air and chemical adsorption. The APUs were installed as an interim measure to reduce TCE concentrations in the indoor air while test results were being received and evaluated. Most of the units were installed in the basements. Because indoor air TCE concentrations were detected at elevated concentrations on the first floor in two homes, these two homes received an additional APU for use on the first floor. Based on indoor air sampling results and discussions with the residents, as of May 22, 2009, APUs were removed from two homes (14 units are operating in 12 homes). Based on final analysis of the test data, the remainder of the homes currently with APUs will be addressed by the SSD systems, monitoring, or require no further action. The APUs are expected to operate in 7 homes for a maximum of 2 years.

- A plan is being developed to identify APU and SSD system operation and maintenance requirements, stack and indoor air monitoring activities. Based on monitoring results, APUs and SSD systems will be removed.

- In June 2009, the Navy will award a contract to install a full-scale Soil Vapor Extraction Containment System to prevent further off site migration of VOC-contaminated soil vapor and to the extent practical capture off site contaminated soil vapors. In December 2009, the system is expected to operate for 4 years or more.

5. STATE AND LOCAL AUTHORITIES ROLE

a. State and Local Actions to Date.

The site is located on property held by the Navy, and as such the Navy holds responsibility for removal actions, risk reduction and remediation of the site as needed. The site was incorporated into the IR Program for NWIRP between 1986 and 1991. State and local authorities have not undertaken any removal actions at the site. NWIRP Bethpage is identified on the New York State List of Inactive Hazardous Waste Sites and is also regulated under a Resource Conservation and Recovery Act (RCRA) Permit. The State provides oversight of actions and review of documents for sites under the IR Program.

The local community provides input on the Navy's action through participation in the Restoration Advisory Board (RAB), which is a group of community members who meet with Navy representatives periodically to discuss progress and provide input on IR Program sites. The results of the soil gas investigation were presented at the April 2008, July 2008, November 2008, and March 2009 RABs. In addition, poster sessions were held in October 2008 and March 2009 to specifically address soil gas results and soil vapor intrusion.

b. Potential for Continued State and Local Response.

NYSDEC will continue to oversee the investigations and removal actions. NYSDEC is supported by NYSDOH and Nassau County Department of Health. The local community will continue to provide input on actions conducted at the site through the RAB.

6. THREATS TO PUBLIC HEALTH OR WELFARE OR THE ENVIRONMENT, AND STATUTORY AND REGULATORY AUTHORITIES

Potential threats to public health, welfare or the environment posed by site contaminants, and statutory and regulatory authorities that apply to the site are discussed in this section. Conditions at Site 1 present an endangerment to the public health at selected off site residents located next to Site 1 and meet the conditions for a removal action as stated in the National Contingency Plan (NCP), 40 code of federal regulations (CFR), Section 300.415 (b) (2) as follows:

a. Threats to Public Health or Welfare.

TCE-contaminated soil vapor intrusion is impacting residents within their homes at concentrations that exceed both United States Environmental Protection Agency (USEPA) Residential Regional Screening Levels of 1.2 $\mu g/m^3$ and NYSDOH criteria of 5 $\mu g/m^3$.

The primary source of off site soil gas contamination was addressed through the operation of the 1998 to 2002 AS/SVE system. Based on current date, contaminated soil gas remains in the southeastern corner of Site 1.

b. Threats to the Environment.

Sensitive ecological receptors are not present at NWIRP Bethpage and therefore a formal ecological risk assessment was not conducted for the site.

c. Regulatory Authorities.

Site 1 is being addressed under the Navy's IR Program. NYSDEC provides regulatory oversight through the Corrective Action portion of the RCRA Permit (Section 373) and the State Superfund Program (Section 375). In addition, the USEPA reviews documents prepared for the site. Criteria and mitigation is based on the NYSDOH *Guidance for Evaluation Soil Vapor Intrusion in the State of New York* (NYSDOH, 2006).

7. ENDANGERMENT DETERMINATION

Actual or threatened releases of hazardous substances from this site, if not addressed by implementing the response action selected in this Action Memorandum, would present an elevated risk to public health, welfare, or the environment. The Navy has determined that this threat can be eliminated by undertaking the removal action posed in this Action Memorandum.

8. PROPOSED ACTIONS AND ESTIMATED COSTS

This section describes the proposed removal action to mitigate the conditions cited in Section 6.

a. Proposed Action.

The proposed action consists of continued operation of up to 14 APU's in 12 homes (less than six months), long-term operation of 7 APUs in 7 homes (approximately 2 years), installation and operation of 6 SSD systems in six homes (approximately 2 years), and monitoring of subslab soil vapor and indoor air in 15 homes for a period of approximately 2 years. APUs are a granular activated carbon-based filtration system that remove VOCs through recirculation of indoor air and chemical adsorption. The SSD systems operate by purging TCE-contaminated soil vapors from underneath the houses and prevent soil vapor intrusion by creating a vacuum underneath the structure. Monitoring will be used to determine the protectiveness of the removal actions and to be the basis for removal of APUs and SSD systems.

Installation of an onsite Soil Vapor Extraction Containment System is the final action and is intended to remediate chlorinated solvents in the soil gas in order to meet NYSDOH criteria. APUs and SSD systems will remain in use until it can be demonstrated that risk to residents through soil gas migration and soil vapor intrusion has been minimized.

The installation of 16 APU units in 14 homes immediately reduced VOC concentrations by approximately 75 to 98 percent as a temporary measure. As of the end of May 2009, the 6 SSD systems have been installed and are operating, but the effectiveness of the systems in reducing exposure has not yet been evaluated. In addition, based on evaluation of test data and discussions with the residences, 2 APU units have been removed from 2 homes. Pending additional test data and evaluation of the SSD systems, additional APUs will be removed.

The major components of the proposed mitigation action and the basis for the proposal are provided below. Details of the actions and methods to perform the TCRA will be described in the *Subslab Depressurization Systems Off-Base Residential Housing, Site 1, Letter Work Plan*. The following elements will be conducted under the removal action.

- Continued operation of APU's in 14 homes, with removal based on test results, implementation of SSD systems, and/or implementation of the Soil Vapor Extraction Containment System.
- Installation of SSD systems in 6 of the 14 homes with APU units.
- Stack and indoor air monitoring to evaluate the effectiveness of the APUs, SSD systems, and protection of human health. Monitoring will range from monthly initially to semi-annually overtime.

b. Contribution to Remedial Performance.

This action is anticipated to provide an interim remedy to reduce VOC concentrations in indoor air and to reduce or prevent continued contaminated soil vapor intrusion into residential homes. Remediation of the source and off site contaminated soil gas will be addressed by the Soil Vapor Extraction Containment System.

c. Alternative Actions Considered.

Based on the need for timely action, no other alternative actions were considered viable.

d. Engineering Evaluation/Cost Analysis (EE/CA)

An EE/CA was not prepared because it only applies to non-time-critical responses.

e. Applicable or Relevant and Appropriate Requirements (ARARs).

No Federal ARARs were identified that would directly effect the removal action. The need for an air discharge permit for the SSD systems was discussed during two teleconferences with NYSDEC, including the NYSDEC Region 1 air permitting group. State concurrence was received confirming that an air discharge permit was not required and that off gas treatment for the SSD systems was not required.

f. Project Schedule.

The APUs were installed in February and March 2009. The SSD systems were installed in May 2009. Operation and monitoring of the APUs and SSD systems are anticipated to continue through December 2011.

g. Estimated Costs.

The cost for the interim removal action (APU and SSD system installations) is approximately $120,000. Operation, maintenance, and monitoring costs through December 2011 are estimated to total $400,000.

9. EXPECTED CHANGE IN THE SITUATION SHOULD ACTION BE DELAYED OR NOT TAKEN

If the TCRA is not conducted, the contaminant migration via soil vapor intrusion into the residential homes will continue and may migrate further posing an increased risk to residents. Exposure will only slowly decrease over time.

10. OUTSTANDING POLICY ISSUES

None identified at this time.

11. ENFORCEMENT

The accelerated action is being undertaken voluntarily by the Navy. Regulatory agencies are anticipated to remain in an oversight role for the duration of the removal action, reviewing design documents, work plans and completion reports to assure compliance with regulations under the IR Program.

12. RECOMMENDATION

This decision document supports the installation of SSD systems and operation, maintenance, and monitoring of APUs and SSD systems for off site residential homes adjacent to NWIRP Site 1, in Bethpage, New York. The removal actions were developed in accordance with NYSDOH Soil Vapor Intrusion Guidance (NYSDOH, 2006). This decision is based on the administrative record for the site. The APUs and SSD systems will provide increased protection to the off site resident until the Soil Vapor Extraction Containment System is operating. Therefore, the Navy recommends the implementation of the proposed action.

Approvals:

_____ Date: _____

Mr. William Cords

Attachment A – Figures

Figure 1 – General Location Map
Figure 2 – Site Location Map
Figure 3 – Facility Layout
Figure 4 – Soil Gas Sampling Results, January 2008 to January 2009
Figure 5 – TCE Isoconcentration Contours

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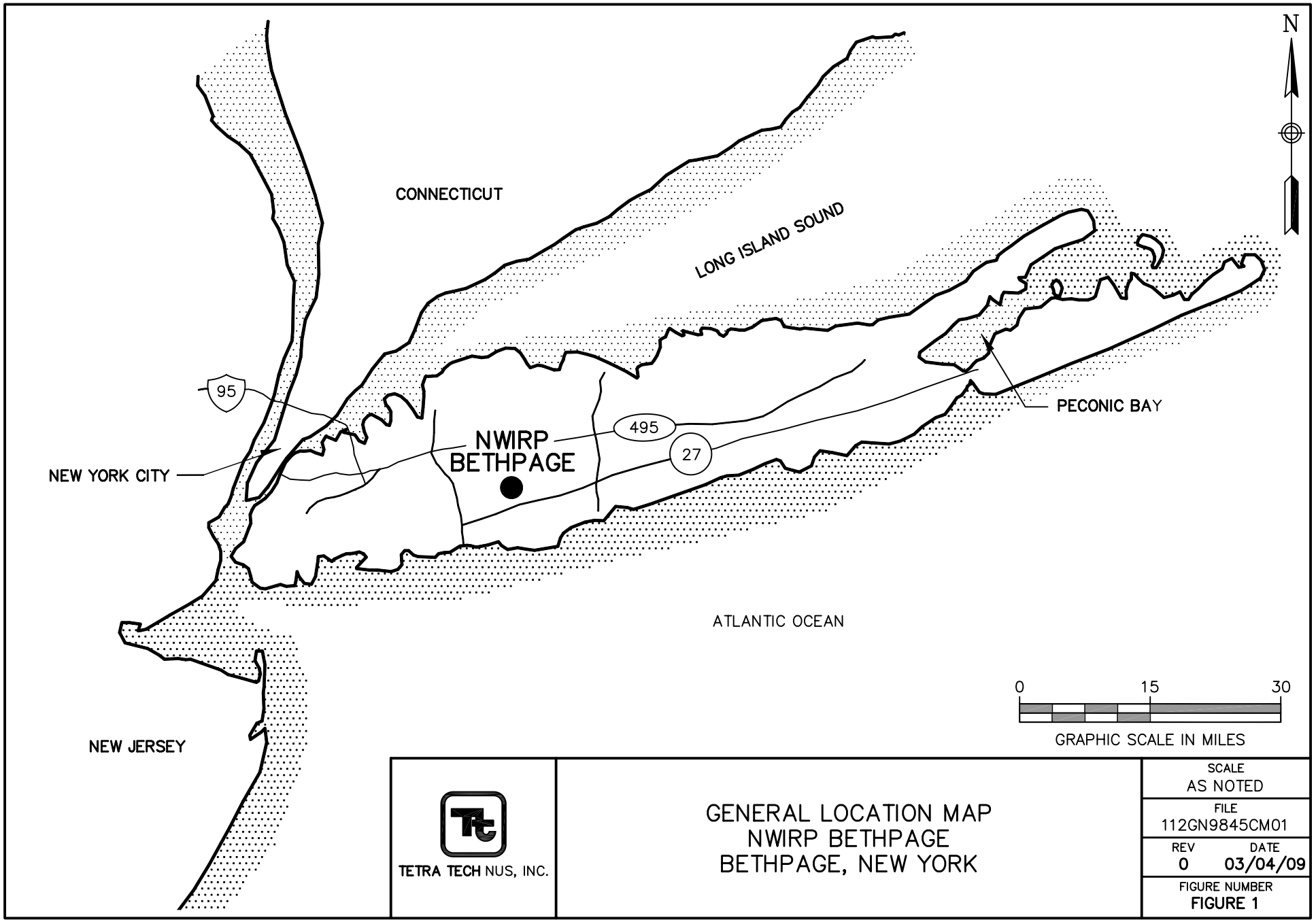

TETRA TECH NUS, INC.

GENERAL LOCATION MAP
NWIRP BETHPAGE
BETHPAGE, NEW YORK

SCALE	AS NOTED
FILE	112GN9845CM01
REV	0
DATE	03/04/09
FIGURE NUMBER	FIGURE 1

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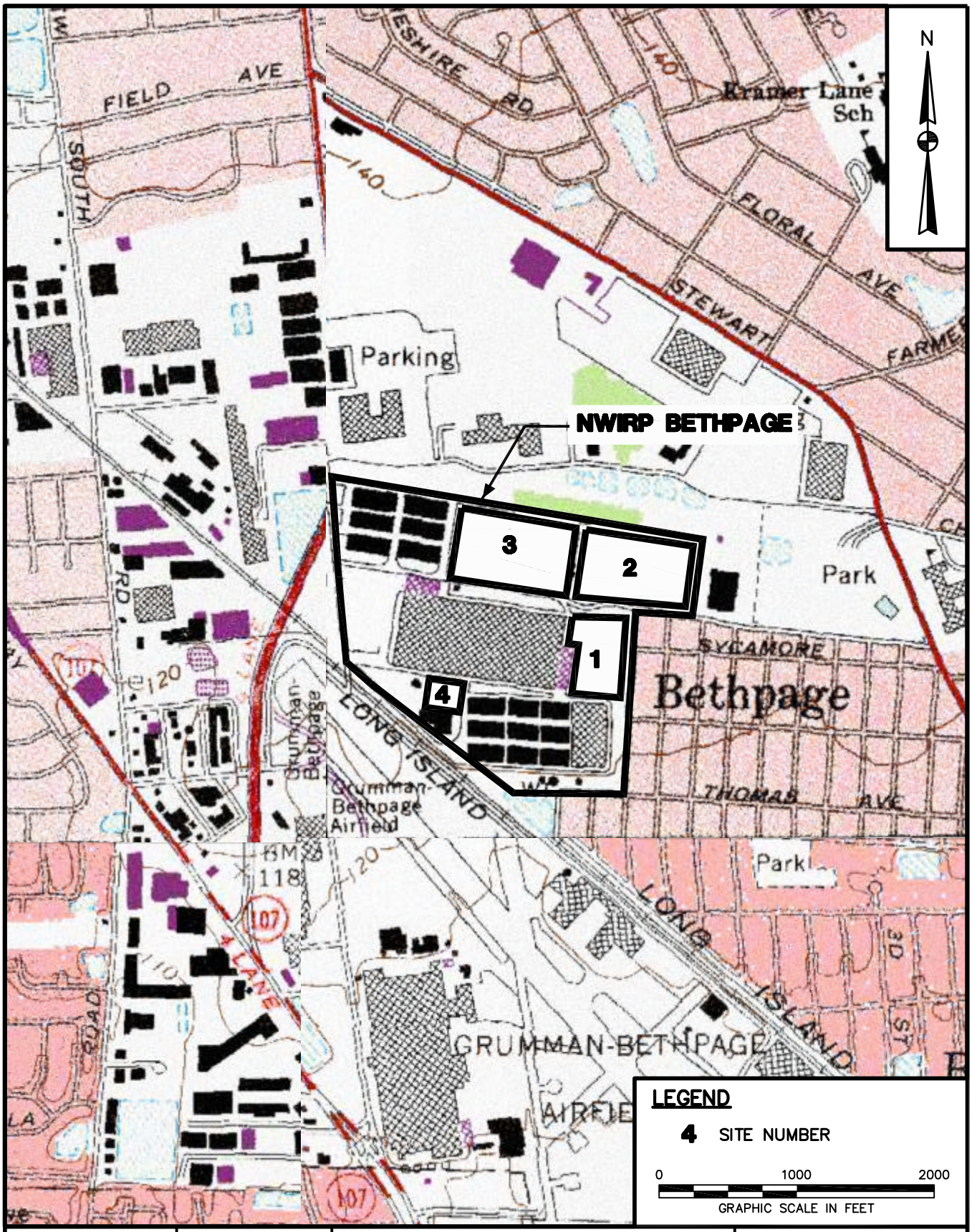

DRAWN BY MF	DATE 6/13/07	Tetra Tech NUS, Inc.	CONTRACT NO. 0804
CHECKED BY	DATE	SITE LOCATION MAP SITE 1 NWIRP BETHPAGE BETHPAGE, NEW YORK	OWNER NO.
REVISED BY	DATE		APPROVED BY DATE
SCALE AS NOTED			DRAWING NO. FIGURE 2 REV. 0

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

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SITE 1

BUILDING 03

SITE 4

TREATMENT BUILDING

WAREHOUSE I

WAREHOUSE J

WAREHOUSE K

WAREHOUSE L

BUILDING 10

WAREHOUSE M

WAREHOUSE E

WAREHOUSE F

WAREHOUSE G

WAREHOUSE H

WAREHOUSE N

WAREHOUSE A

WAREHOUSE B

WAREHOUSE C

WAREHOUSE D

0 160 320

SCALE IN FEET

LEGEND

FORMER NWIRP BOUNDARY

CURRENT NWIRP BOUNDARY

TETRA TECH NUS, INC.

FACILITY LAYOUT
NWIRP BETHPAGE
BETHPAGE, NEW YORK

FILE	SCALE
112GN9845GM03-1	AS NOTED
FIGURE NUMBER	REV / DATE
FIGURE 3	0 / 05/26/09

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AOC 30
AOC 35
AOC 23
SETTLING TANK
PLANT NO. 3
SITE 1
METAL STORAGE BUILDINGS
PAD
PLANT 17 SOUTH
11TH STREET
10TH STREET
9TH STREET
SYCAMORE AVENUE
MAPLE AVENUE

BPSI-SG1005	8 ft bgs	20 ft bgs	45 ft bgs
Compound	ug/m3	ug/m3	ug/m3
PCE	15	59	60
TCE	1.5	16	71
TCA	3.4	11	27

BPSI-SG1004	5.5 ft bgs	20 ft bgs	45 ft bgs
Compound	ug/m3	ug/m3	ug/m3
PCE	22	ND	78
TCE	5.2	ND	820
TCA	3.9	ND	430

BPSI-SG2004	8 ft bgs	20 ft bgs	49 ft bgs
Compound	ug/m3	ug/m3	ug/m3
PCE	1.8	1,000	580
TCE	1.0	550	600
TCA	1.4	460	480

BPSI-SG1003	5.5 ft bgs	20 ft bgs	45 ft bgs
Compound	ug/m3	ug/m3	ug/m3
PCE	540 E	1,300	250
TCE	110	590	750
TCA	440 E	790	780

SVPM11	49 ft bgs
Compound	ug/m3
PCE	ND
TCE	0.29
TCA	ND

BPSI-SG1001	7 ft bgs	20 ft bgs	45 ft bgs
Compound	ug/m3	ug/m3	ug/m3
PCE	170	1,200	5.9
TCE	19,000	180,000	1,400
TCA	16,000	90,000	890

SVPM12	50 ft bgs
Compound	ug/m3
PCE	ND
TCE	150,000
TCA	75,000

SVPM12S	25 ft bgs
Compound	ug/m3
PCE	ND
TCE	73,000
TCA	36,000

BPSI-SG2003	8 ft bgs	20 ft bgs	49 ft bgs
Compound	ug/m3	ug/m3	ug/m3
PCE	19	14	8.9
TCE	20	82	710
TCA	66	170	720

BPSI-SG2010	8 ft bgs	24 ft bgs	49 ft bgs
Compound	ug/m3	ug/m3	ug/m3
PCE	3.7	4.9	2.3
TCE	2.8	19	5.5
TCA	1.4	2.2	1.0

BPSI-SG1002	8 ft bgs	20 ft bgs	45 ft bgs
Compound	ug/m3	ug/m3	ug/m3
PCE	1,700	960	20
TCE	3,300	4,400	320
TCA	740	1,900	550

SVPM11S	24 ft bgs
Compound	ug/m3
PCE	5,300
TCE	7,200
TCA	ND

BPSI-SG2001	8 ft bgs	20 ft bgs	49 ft bgs
Compound	ug/m3	ug/m3	ug/m3
PCE	4,000	5,000	720
TCE	1,700	2,700	1,500
TCA	1,300	1,700	1,400

BPSI-SG2002	8 ft bgs	20 ft bgs	44 ft bgs
Compound	ug/m3	ug/m3	ug/m3
PCE	420	740	48 J
TCE	34,000	89,000	26,000
TCA	21,000	52,000	27,000

BPSI-SG2008	8 ft bgs	20 ft bgs	48 ft bgs
Compound	ug/m3	ug/m3	ug/m3
PCE	12.0	2.1	7.4
TCE	4.7	6.8	26.0
TCA	52	80	130

BPSI-SG1006	7 ft bgs	20 ft bgs	45 ft bgs
Compound	ug/m3	ug/m3	ug/m3
PCE	19	28	44
TCE	1.2	2	2.1
TCA	ND	ND	0.95

BPSI-SG2005	8 ft bgs	20 ft bgs	49 ft bgs
Compound	ug/m3	ug/m3	ug/m3
PCE	16.0	9.7	3.8
TCE	0.52	0.8	1.0
TCA	3.2	3.2	3.2

BPSI-SG2006	8 ft bgs	20 ft bgs	49 ft bgs
Compound	ug/m3	ug/m3	ug/m3
PCE	14	29	11
TCE	32	71	61
TCA	12	22	35

BPSI-SG2011	8 ft bgs	24 ft bgs	48 ft bgs
Compound	ug/m3	ug/m3	ug/m3
PCE	1.6	0.57	2.9
TCE	0.9	0.14	0.34
TCA	1.5	0.50	1.0

BPSI-SG2007	8 ft bgs	20 ft bgs	49 ft bgs
Compound	ug/m3	ug/m3	ug/m3
PCE	13	25	5.3 J
TCE	29	87	400
TCA	150	260	870

BPSI-SG2009	8 ft bgs	20 ft bgs	49 ft bgs
Compound	ug/m3	ug/m3	ug/m3
PCE	4.8	3.2	2.0
TCE	0.2	0.23	0.4
TCA	1.1	1.6	1.1

N

LEGEND

- OFFSITE SOIL GAS SAMPLE LOCATION
- ONSITE SOIL GAS SAMPLE LOCATION
- SOIL VAPOR PRESSURE MONITORING POINT (SVPM)
- *420* SOIL GAS VALUE in ug/m 3
- *J* ESTIMATED VALUE
- bgs BELOW GROUND SURFACE
- PCE TETRACHLOROETHENE
- TCE TRICHLOROETHENE
- TCA 1,1,1 - TRICHLOROETHANE
- PROPERTY LINE
- FENCE LINE
- SITE BOUNDARY

PARAMETER	NYSDOH SUBSLAB VALUE	NYSDOH INDOOR AIR VALUE
Compound	ug/m3	ug/m3
PCE	1,000	100
TCE	250	5

NOTE:
NYSDOH HAS NOT ESTABLISHED A SCREENING VALUE FOR TCA. A PROJECT-SCREENING VALUE OF 5,200 UG/M3 FOR TCA HAS BEEN ESTABLISHED.

0 100 200

SCALE IN FEET

TETRA TECH NUS, INC.

SOIL GAS SAMPLING RESULTS JANUARY 2008 TO JANUARY 2009 SITE 1 NWIRP BETHPAGE BETHPAGE, NEW YORK

FILE	SCALE
112GN9845GM16	AS NOTED
FIGURE NUMBER	REV / DATE
FIGURE 4	0 / 03/22/09

112GN9845/3110/112GN9845GM01-2.DWG 05/26/09 MKB

B'

2.1
BPS1-SG1006

71
BPS1-SG1005

5

250

AOC 30

AOC 35

SETTLING TANK

AOC 23

BPS1-SG1004
820*

750
BPS1-SG1003

1.0
BPSI-SG2005

PLANT NO. 3

SITE 1

BPSI-SG2004
600

SYCAMORE AVENUE

METAL STORAGE BUILDINGS

4,400
BPS1-SG1002

SVPM11

SVPM11S
7,200

PAD

71
BPSI-SG2006

BPSI-SG2001
2,700

9TH STREET

10TH STREET

11TH STREET

180,000
BPS1-SG1001

SVE-101D

SVE-101I

0.9
BPS1-SG2011

150,000
SVPM12

SVPM12S
73,000

BPSI-SG2007
400*

BPSI-SG2002
89,000

PLANT 17 SOUTH

BPSI-SG2008
26

MAPLE AVENUE

BPSI-SG2003
710*

250

BPSI-SG2009
0.4

19
BPSI-SG2010

5

B

N

LEGEND

- OFFSITE SOIL GAS SAMPLE LOCATION
- ONSITE SOIL GAS SAMPLE LOCATION
- SOIL VAPOR PRESSURE MONITORING POINT (SVPM)
- SVE CONTAINMENT WELL LOCATION
- 5 — TCE ISOCONCENTRATION CONTOUR in ug/m^3
- 710 TCE CONCENTRATION in ug/m^3
- * INDICATES TCE GREATER THAN 250 ug/m^3 IS FOUND IN DEEP SAMPLE ONLY
- PROPERTY LINE
- FENCE LINE
- SITE BOUNDARY

0 100 200

SCALE IN FEET

TETRA TECH NUS, INC.

TCE ISOCONCENTRATION CONTOURS
SITE 1
NWIRP BETHPAGE
BETHPAGE, NEW YORK

FILE	SCALE
112GN9845GM01-2	AS NOTED
FIGURE NUMBER: FIGURE 5	REV: 0 DATE: 05/26/09