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Infrastructure, environment, buildings

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ENVIRONMENT

Mr. Steven Scharf, P.E.
New York State Department of Environmental Conservation
Division of Environmental Remediation
625 Broadway
Albany, New York 12233-7015

Date:
23 June 2005

Contact:
Michael F. Wolfert

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Our ref:
NY001348.1005

Dear Mr. Scharf:

Enclosed is a copy of our report summarizing the results of soil vapor sampling and analysis conducted along the former Northrop Grumman Plant 24 access road.

Please call if you have questions.

Sincerely,

ARCADIS G&M, Inc.

Michael F. Wolfert
Project Director

Copies:
Larry Leskovjan, NGC
John Cofman, NGC
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File

Northrop Grumman Corporation

Summary of Soil Vapor Sampling Results

Bethpage Community Park – Operable Unit 3

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Summary of Soil Vapor Sampling Results

Bethpage Community Park – Operable Unit 3

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1. Introduction

At the request of Northrop Grumman Corporation (NGC), ARCADIS collected soil vapor samples from a NGC-owned right-of-way located between the Bethpage Community Park and the Plant 24 Access Road. Soil vapor samples were collected as a preliminary step toward evaluating potential soil vapor intrusion issues. Limited on-site data indicates that volatile organic compounds (VOCs), including: 1,1-dichloroethane (1,1-DCA); cis-1,2-dichloroethene (cis-1,2-DCE); trichloroethane (TCE); and tetrachloroethane (PCE) have been detected in groundwater beneath the Bethpage Park. Based on New York State Department of Health (NYSDOH) guidance, the presence of VOCs in groundwater necessitates the investigation of vapor intrusion issues. Because soil gas may be a predictor, of potential vapor intrusion into buildings, these data can be used to make some initial findings and recommendations.

The purpose of this report is to summarize the soil vapor collection methodology, present and evaluate the soil vapor results, and make recommendations for future actions. In preparing this report, ARCADIS referred to the U.S. Environmental Protection Agency (EPA) Office of Solid Waste and Emergency Response's *Draft Guidance for Evaluating the Vapor Intrusion to Indoor Air Pathway from Groundwater and Soils* dated November 29, 2002, as well as New York State Department of Health's recent draft *Guidance for Evaluating Soil Vapor Intrusion in the State of New York* (NYSDOH 2005).

Overall, the results of our data evaluation indicate that 1,3-butadiene and TCE are present in soil vapor above conservative screening values. Based on these findings, ARCADIS recommends that NGC continue to delineate the groundwater plume, identify preferential pathways, and consider conducting additional soil vapor sampling.

2. Site History

The Bethpage Community Park (Park) is comprised of approximately 18 acres located on Stewart Avenue in Bethpage, Nassau County, New York. The entire Park property is currently owned by the Town of Oyster Bay and is used by community residents year round. The major features and structures located at the Park include tennis courts, picnic areas, playground areas, ball fields, an ice skating rink, a swimming pool, basketball courts, and park offices.

A figure showing the location of the property in relation to the surrounding areas is provided as Figure 1. The site is bordered by the Cherry Avenue Extension and the Robert Plan Company building (formerly NGC's Plant 30) to the north; Stewart Avenue and

Bethpage High School to the east; the Plant 24 Access Road to the south; and a second Robert Plan Company building (formerly NGC's Plant 24), the McKay Field property, ball fields, and former nursery areas (currently owned by NGC) to the west. A residential neighborhood is located south, across the Plant 24 Access Road.

The area comprising the Park was primarily farmland until the 1940s. Around that time, the property was purchased by Grumman Aircraft Engineering Corporation, a predecessor company of NGC. The site was not involved with manufacturing operations undertaken at the Bethpage Facility, and no buildings or structures were erected on the property by Grumman Aircraft Engineering Corporation. However, it appears that wastewater treatment sludge generated at the Grumman Aircraft Engineering Corporation Plant 2 Industrial Wastewater Treatment Facility was transported to the Park property and placed in one of two sludge drying beds. In addition, it appears that spent rags generated during the wipe-down of a paint booth water curtain located in Plant 2 were transported to the Park property and emptied into an on-site pit. Used oil may also have been discarded in this pit. Finally, the southwestern portion of the Park property was utilized as a fire training area where waste oil and jet fuel were ignited and extinguished (Dvirka and Bartilucci Consulting Engineers 2003).

According to NGC records, the property comprising the Park was donated by Grumman Aircraft Engineering Corporation to the Town of Oyster Bay on October 17, 1962. Shortly thereafter, the Park as it appears now was constructed on the property. A current site plan for the Park property is provided as Figure 2.

3. Conceptual Site Model

A conceptual site model was developed to support both the soil vapor sampling strategy and the interpretation of the soil vapor results. As described in American Petroleum Institute (API 2004) guidance, the conceptual site model describes the vapor source characteristics, the current and future buildings and the geologic profile of the subsurface. This information is used to develop a working hypothesis of the vapor-migration exposure pathway.

As shown on Figure 2, several structures, including an office building and a skating rink, are located at the Bethpage Community Park. Next to the Park are several commercial buildings, a school, and a residential neighborhood. Groundwater sampling in the Park indicates that VOCs including: 1,1-DCA; cis-1,2-DCE; TCE; and PCE are present in groundwater at a depth of approximately 60 to 300 feet below land surface (bls). Although the full extent of the groundwater plume has not been delineated, the available groundwater quality data and regional horizontal groundwater flow direction (i.e., south to southeast) indicate that the plume has potentially migrated off-site towards the residential neighborhood. Homes to the south/southeast of the Park are expected to include slab-on-grade construction, as well as crawl space and basement construction. Basements are estimated to be 8 feet in depth with 2 feet above the ground surface.

Information on subsurface geology is also limited. In general, soils in this area are characterized as fine to medium-grained sand with discontinuous silt and/or clay lenses. No preferential pathways have been specifically identified; however, it is expected that storm sewer and other utility lines parallel the residential streets and could provide pathways to the homes.

4. Sampling Methodology

As a preliminary step towards evaluating the potential vapor intrusion pathway, soil vapor samples were collected from the right-of-way between the Park and the Plant 24 Access Road. This location was selected because groundwater data were previously collected from this area and because the right-of-way is within 100 feet of residential homes. According to EPA (2002) guidance, vapor intrusion should be considered if homes or other buildings are within 100 feet of a groundwater source.

To characterize the nature of soil vapor impacts, ARCADIS collected soil vapor samples at several horizontal locations and at several different depths at each location. Obtaining data in this manner is useful for three reasons. First, it allows the refinement of the conceptual site model for the subsurface vapor movement. If groundwater is the only source of soil gas vapors, there should be a decrease in concentration with increasing distance from the source. Second, data from both horizontal and vertical locations increases confidence in the results. Chemicals that are detected at only one depth may indicate potential infiltration from ambient air or other sampling issues. Third, by collecting soil gas data close to the groundwater source, we can increase the chance of obtaining samples with analytical results that are greater than the detection limit. These results help confirm that field methods have been implemented correctly (i.e., that infiltration into the sample tubing has not diluted the sample results) (API 2004).

In the horizontal plane, ARCADIS collected soil vapor samples near vertical profile borings VP-2, VP-4, VP-12, and VP-7 (Figure 2). These sample locations corresponded to some of the highest groundwater concentrations (at VP-12) and to relatively low groundwater concentrations (at VP-7); thereby allowing for an evaluation of a range of concentrations along the entire Access Road. Pairing the soil vapor sampling locations with groundwater data also provides more information for the conceptual site model and enables a determination of potential background concentrations. At each horizontal location, ARCADIS collected soil vapor samples at three different depths: 40 feet, 15 feet, and 5 feet bls. These depths provide information on vapor concentrations close to the groundwater source and at depths associated with a potential residential basement and buildings with a slab on grade construction.

Finally, ARCADIS collected one ambient air sample near VP-4. The purpose of the ambient air sample was to confirm the presence or absence of background constituents that may be contributing to detections in soil vapor samples or potentially to indoor air concentrations in nearby residential homes.

4.1 Soil Gas Sampling Method

A total of 12 soil vapor samples were collected on October 26 and 27, 2004 from four previously sampled groundwater vertical profile boring (VP) locations using temporary soil vapor probes. Each sample was collected using the Geoprobe® Post Run Tubing System (PRT). The PRT System allows for the collection of soil vapor samples at the desired sampling depth while significantly reducing the chances of rod leakage and contamination. O-ring connections enable the PRT system to deliver a vacuum-tight seal that prevents sample contamination from ambient air, and assures that the sample is taken from the desired depth at the bottom of the boring.

The soil vapor probe consisted of a steel rod that can be hydraulically driven into the subsurface. Once at the desired depth, the rods were pulled up 6 to 12 inches and the drive point was knocked out of the point holder to create a clear pathway to the soil vapor. A disposable polyethylene tube was then inserted down the center of the steel rod to allow the extraction of the soil vapor sample. The Geoprobe® PRT System does not create annular space between the tooling and the borehole, thus sealing with bentonite clay is not necessary. Prior to the collection of the sample, the probe was purged, by removing approximately three liters from the tubing/steel rod assembly with a centrifugal pump. To connect the tubing to the SUMMA canister, a small length of VITON tubing was used as slightly larger diameter tubing was needed to match the diameter of the SUMMA intake. All tubing was replaced after each sample, thus eliminating potential sample carryover problems and the need to decontaminate the probe rods.

As stated previously, soil vapor samples were collected at 5 feet bls, 15 feet bls, and 40 feet bls. Consistent with NYSDOH (2005) guidance, the three soil vapor points were drilled separately within a five foot radius at each location. All samples were collected in six-liter SUMMA canisters obtained from Severn-Trent Laboratory (STL) in Burlington, Vermont. SUMMA canisters were preset by STL with a flow rate of approximately 0.2 liters per minute. Each sample took approximately 30 minutes to collect. Once the SUMMA canister was full (i.e., the canister has reached zero pressure as measured by a pressure gauge) the canister was sealed and labeled with the sample identification number for the soil vapor point. Samples were submitted to STL Burlington for analysis of the Target Compound List VOCs using EPA Method TO-15.

As described above, these procedures are consistent with recent NYSDOH (2005) guidance with one exception. NYSDOH guidance currently recommends that the collection of soil vapor samples include the use of a tracer gas such as helium, butane, or sulfur hexafluoride. The purpose of the tracer gas is to ensure that the sampling equipment (i.e., tubing) does not allow the infiltration of ambient air. Because NYSDOH (2005) guidance was not available at the time of this sampling event, a tracer analysis was not incorporated into the sampling protocol.

4.2 Ambient Air Sampling Method

In addition to soil vapor sampling, ARCADIS collected one ambient air sample. As stated above, this sample was used to provide information on potential background sources. The ambient air sample was collected using a six-liter Summa canister provided by STL. The canister was placed three feet above the ground near VP-4 for approximately 8 hours.

5. Results and Discussion

Section 5 describes the results of the soil vapor sampling including an evaluation of the data and a discussion of potential implications for vapor intrusion into nearby residential homes. The results of the soil vapor sampling are also used to refine the conceptual site model regarding potential vapor movement and determine whether additional sampling may be needed.

5.1 Evaluation of Soil Vapor Results

Table 1 presents the results of the soil vapor sampling. A total of 30 constituents were detected at least once in the soil vapor samples collected. The data were evaluated using the following steps. First, constituents of potential concern (COPCs) were identified based on a review of the groundwater and soil vapor data. Second, COPCs were compared to NYSDOH background concentrations and EPA target concentrations for soil vapor. Third, COPCs above screening concentrations were compared to EPA soil vapor concentrations using site-specific data on soil type and depth to sample (herein referred to as EPA site-specific concentrations). Each of these steps is described below in detail.

Table 2 presents the selection of COPCs. A constituent was retained as a COPC if it was detected in either groundwater or soil vapor. The groundwater data results for all Park locations are provided in Appendix A. Constituents not detected in either groundwater or soil vapor were eliminated from further analysis. A total of 37 COPCs were identified for the site. Of these, 16 constituents were only detected in soil vapor, and 7 were only detected in groundwater. The remaining 14 COPCs were detected in both soil vapor and groundwater. Of the constituents detected only in soil vapor, there was no discernable trend. About 1/3 were detected in all samples, 1/3 were detected in only Samples SVP-1 and SVP-2, and 1/3 were detected in some other combination.

All COPCs were further evaluated through a comparison to NYSDOH background concentrations. NYSDOH (2005) guidance indicates that no standards are available for soil vapor analysis. In the absence of standards, NYSDOH (2005) recommends comparing soil vapor results to outdoor air background concentrations and NYSDOH indoor air guidelines for those chemicals with available values. In contrast to NYSDOH (2005) guidance, ARCADIS believes it is more appropriate to compare soil vapor results to indoor air background concentrations, as the ultimate goal is to evaluate indoor air exposures not outdoor air exposures. In general, the outdoor background concentrations are lower than the indoor background concentrations because they do not account for or measure typical household uses of chemicals. However, to be consistent with NYSDOH (2005) guidance, the soil vapor data were compared to both the outdoor and indoor air background concentrations, although only the results of the comparison to indoor air background concentrations are used in the remaining steps of the analysis.

NYSDOH (2005) presents four studies that evaluated background indoor or outdoor air concentrations for residential homes and commercial buildings. Of the studies presented, NYSDOH (2005) recommends using the *Study of Volatile Organic Chemicals in Air of Fuel Oil Heated Homes* (NYSDOH Fuel Oil Study). This study was conducted from 1997 to 2003 and included the sampling of indoor and outdoor air at 104 homes using SUMMA canisters. NYSDOH (2005) presents the 25th to 75th percentile data, although no specific guidance is provided on which percentile should be used for comparative purposes. For this analysis, the 75th percentile was used as the screening benchmark because it serves as a reasonable benchmark for comparison considering other household chemical uses.

ARCADIS believes it is inappropriate to directly compare soil vapor results to background outdoor or indoor air samples. Indeed, NYSDOH (2005) indicates that because soil vapor standards are not available, soil vapor alone cannot be used to make determinations about potential indoor air issues. Therefore, as a means to more fully understand the soil vapor results, ARCADIS used an attenuation factor consistent with EPA (2002) guidance to conservatively convert the soil vapor concentration to an estimated concentration in indoor air. EPA (2002) guidance recommends using attenuation factors of 0.1 for shallow soil gas (<5 feet bls) and 0.01 for deep soil gas (> 5 feet bls). Data collected at the Endicott, New York site indicate that these values are highly conservative for shallow soil gas. Site-specific sampling from the Endicott site indicates that attenuation factors ranging from 0.01 to 0.001 may be more appropriate (Schuver 2004). However, as a conservative measure, an attenuation factor of 0.1 was used for soil gas taken at 5 feet bls and an attenuation factor of 0.01 was used for both the 15-foot and 40-foot soil vapor results. One half the detection limit times the attenuation factor was used for nondetect chemicals.

The results of the comparison of NYSDOH background concentrations to soil vapor data multiplied by the attenuation factor are presented in Tables 3 and 4 for indoor and outdoor background, respectively. Using the attenuation factor, Tables 3 and 4 provide a direct, although conservative, comparison of background indoor and outdoor air data to estimated indoor air data for most chemicals. For TCE, PCE, and methylene chloride, NYSDOH has calculated indoor air guidelines of 5 $\mu g/m^3$, 100 $\mu g/m^3$, and 60 $\mu g/m^3$, respectively. These values are used in Tables 3 and 4 instead of background concentrations. In addition, for several COPCs including: 1,3-butadiene; 1,4-dichlorobenzene; carbon disulfide; dichlorodifluoromethane; 2-butanone; trans-1,2-dichloroethene; and trichlorofluoromethane, no NYSDOH background values or indoor air guidelines are available. Instead, the EPA (2002) target indoor air screening concentration at a 1×10^{-6} risk level is used.

As shown in Table 3, eleven COPCs: 1,1,1-trichloroethane; 1,1-DCA; 1,1-dichloroethene (1,1-DCE); 1,2-dichloropropane; 1,3-butadiene; benzene; bromomethane; chlorobenzene; cis-1,2-dichloroethene (cis-1,2-DCE); TCE; and vinyl chloride had at least one soil gas result above the indoor air background concentration. For all chemicals except 1,3-butadiene and TCE, the exceedance was generally limited to one or two sample results, and most frequently at the 40-foot sample depth. For example, the only exceedance for vinyl chloride and bromomethane was a nondetect concentration at the 40-foot sample depth. Although vinyl chloride was never detected in soil gas, it was retained in the analysis because the detection limit was above the screening criteria. In contrast, 1,3-butadiene was detected in every sample and at every depth above the screening concentration.

In addition, to be consistent with NYSDOH guidance, the soil vapor data were also compared to outdoor background concentrations. The comparison of the soil vapor data multiplied by the attenuation factor (as was done in Table 3) to outdoor background is presented in Table 4. Using the more conservative outdoor values results in the identification of six additional COPCs: acetone; chloroform; n-hexane; styrene; toluene; and m,p-xylene. However, as stated earlier, these additional COPCs were not carried through the analysis as they screened out based on the comparison to indoor air background concentrations.

The final step in the analysis was the comparison of the 11 COPCs above the indoor air background concentrations to EPA site-specific concentrations. Site-specific screening criteria for soil gas are available in EPA's (2002) *Guidance for Evaluating the Vapor Intrusion to Indoor Air Pathway from Groundwater and Soils*. The site-specific criteria take into account the soil type at the site and the soil vapor sampling depth. Based on this information, a site-specific attenuation factor can be identified. EPA (2002) recommends only using the site-specific attenuation factors for soil gas samples collected at least 5 feet from the building foundation. Although there are no buildings at the sample location, it was assumed that a commercial building would be slab on grade and that a residential home would have an approximately 8-foot basement with 2 feet above grade. As a result, the 5-foot sample depth is relevant for a commercial setting and the 15- and 40-foot samples are relevant for a residential setting using the site-specific attenuation factors. For this analysis, the soil type was estimated to be sand. Based on this information, an attenuation factor of 2×10^{-3} was identified for the 5- and 15-foot samples and an attenuation factor of 1×10^{-3} was identified for the 40-foot samples. Using the site-specific attenuation factors, site-specific soil gas screening concentrations were identified from EPA (2002) guidance.

Table 5 presents the site-specific soil vapor screening concentrations and the soil vapor results for the 11 COPCs that exceeded the background screening. It is important to note that the results presented in Table 5 are the soil vapor data and therefore, are not adjusted to be representative of indoor air (as are the data in Tables 3 and 4). Similar to Tables 3 and 4, nondetect concentrations are reported as one-half the detection limit consistent with standard risk assessment protocol. As shown in Table 5, 1,3-butadiene exceeds the site-specific screening criteria at all sampling locations and TCE exceeds the site-specific criteria at several sampling locations. Although benzene exceeds the criteria at the 40-foot sampling depth at SVP-4, concentrations in soil vapor quickly decrease moving away from groundwater and are below criteria at the 5- and 15-foot sampling depths.

5.2 Discussion of Soil Vapor Results

Based on the evaluation of the soil vapor data, ARCADIS evaluated the potential for vapor migration into residential homes. In addition, ARCADIS reviewed the data to identify trends or other potential issues including the correlation of soil vapor and groundwater results, vertical profile results, and the presence of COPCs not previously detected in groundwater. These issues are discussed further below.

5.2.1 Evaluation of Potential for Vapor Migration

Section 5.1 demonstrates that potential vapor intrusion associated with groundwater at the Park is limited to TCE and 1,3-butadiene. Using conservative assumptions regarding vapor attenuation, all other chemicals were below either NYSDOH background concentrations or EPA site-specific screening concentrations. It is possible that preferential pathways or other soil heterogeneities under residential homes could cause different or unexpected results; however, based on the detected concentrations these two chemicals are likely to be of greatest concern. That said, soil vapor results are not representative of potential concentrations in residential homes and can only be used to identify the potential presence or absence of constituents. These data suggest that, if the plume has migrated near the residences, it is possible that COPCs may be present below foundations. However, there are no data regarding possible migration of COPC through basement floors into living spaces under these conditions.

5.2.2 Correlation of Soil Vapor and Groundwater Results

Further evaluation of the soil vapor data included a comparison of co-located soil vapor and groundwater results (Table 6). Overall, groundwater locations VP-12 and VP-4 had higher VOC concentrations compared to VP-7 and VP-2. As a result, it was expected that the highest soil vapor concentrations would be found at SVP-2 and SVP-3. The data, however, do not show a clear correlation with groundwater concentrations. Although the 40 ft sample depth at SVP-3 had the highest soil vapor concentrations correlating well with the highest shallow groundwater concentrations at VP-4, similar trends were not seen for other results. For example, the highest concentration of TCE in soil vapor at the 5-foot sampling depth was seen at SVP-4, while this location had much lower groundwater concentrations compared to SVP-2 and SVP-3. In another example, high concentrations of cis-1,2-DCE were detected in groundwater at VP-4 and VP-12; however, concentrations in soil vapor were only detected in SVP-3 (the soil vapor sample correlated with VP-4).

Due to the small sample size, it is difficult to make definitive conclusions regarding these results. Ideally, we would expect that soil vapor concentrations would correspond more closely to groundwater concentrations. There are several potential explanations for the results as reported. First, groundwater and soil gas samples were not temporally collocated. Because groundwater concentrations change over time, these fluctuations may cause fluctuations in soil vapor concentrations. Second, subsurface geological conditions can greatly influence the presence and concentration of soil vapors. Preferential pathways and/or soil heterogeneity may be affecting soil vapor concentrations, but are difficult to identify and monitor without more extensive soil investigations. Third, detection limits for groundwater and soil vapor may limit the ability to accurately predict the presence or absence of some chemicals. For example, considering the Henry's Law Constant for 1,3-butadiene together with the observed soil vapor concentrations suggests that it may be present in groundwater at concentrations below typical VOC detection limits. The EPA target groundwater concentration for 1,3-butadiene is 0.0029 µg/L, well below the detection limit of 1 µg/L. Finally, the identification of constituents in soil vapor not previously identified in groundwater may indicate the presence of an additional source. This issue is discussed further below.

5.2.3 Vertical Profile Results

Overall, the soil vapor results support the conceptual site model that vapor concentrations decrease with increasing distance from the groundwater source. For several chemicals, however, the data do not support this model. A review of the soil gas data for COPCs indicates that 1,1,1-TCA, carbon disulfide, PCE, and TCE have elevated soil vapor concentrations at 15 feet bls compared to 40 feet bls (Table 7). Because the 40-foot samples are closer to the groundwater source, it was expected that soil vapor concentrations would be the highest at this depth. These results may be due to several factors. First, there is some variability in laboratory results. For example, studies conducted by the California Air Resources Board report that responses from ten different laboratories were all within two standard deviations from the mean. As a result, differences in sample results for SVP-2 for 1,4-dichlorobenzene at the 15-foot (11 $\mu g/m^3$) and 40-foot (9.6 $\mu g/m^3$) sample depth are not considered significant. However, because of the consistency in results for carbon disulfide, TCE, and PCE, it is unlikely that this is the sole explanation for the variability reported.

Second, preferential pathways or soil heterogeneity may allow pockets of soil vapor to be present at intermediate depths from the groundwater table. As stated above, additional investigation of the subsurface would be necessary to determine the role of these factors. Finally, the presence of these chemicals at elevated levels at 15 feet bls may indicate that an additional subsurface soil source is present above the groundwater table. Additional subsurface soil testing would be necessary to determine if such a source is present.

5.2.4 COPCs Not Detected in Groundwater

As presented in Table 2, 16 constituents not previously detected in groundwater were identified in soil vapor. Of these chemicals, several including: 1,2,4-trimethylbenzene; 1,3-butadiene; 1,4-dichlorobenzene; 2,2,4-trimethylpentane; 4-ethyltoluene; cyclohexane; dichlorodifluoromethane; methyl butyl ketone; methyl tert-butyl ether; n-heptane; n-hexane; tert-butyl alcohol; and trichlorofluoromethane were not included in the sample analyte list for groundwater at the soil vapor sampling location. 1,3-Butadiene was subsequently sampled at two locations (B30MW-1 and BCPMW-3) and was not detected. As discussed in Section 5.2.5, it appears that a majority of the chemicals may be associated with the sample tubing used to collect the soil gas sample. For some constituents, however, these findings may simply be an artifact of the soil vapor and groundwater reporting limits. Depending on the Henry's Law Constant of the particular constituent, it is possible that the constituent is present at low levels in groundwater. In addition, although compounds not previously detected in groundwater were detected in soil vapor, these compounds were not detected in ambient air indicating that there was no leakage into the sample tubing.

For all chemicals except 1,3-butadiene, the end result is still that soil vapor concentrations are below NYSDOH background concentrations or EPA site-specific concentrations. Although some chemicals included on the TO-15 analyte list do not have screening concentrations for comparison, the lack of available standards generally indicates that the constituent is not of significant concern for vapor intrusion.

5.2.5 Tubing Blank Analysis

As stated above, several constituents were identified in soil gas that were not previously detected in groundwater. Of the constituents detected, only 1,3-butadiene is present above conservative screening benchmarks. To confirm that 1,3-butadiene was not an artifact of the tubing used to collect the sample, a tubing blank analysis was conducted. The tubing blank analysis was conducted on December 3, 2004 using the following methodology. First, new polyethylene tubing was procured from the original drilling subcontractor from the original storage location. SUMMA canisters were also obtained from the same laboratory used for the soil vapor sampling. Second, the polyethylene tubing was connected to two SUMMA canisters and staged near the original soil vapor sampling locations at a height of approximately 2-1/2 feet above land surface (to minimize the potential for cross contamination from surface soils). Another SUMMA canister without tubing attached was also staged in this area as a control. Of the two SUMMA canisters with tubing, the first (Ambient 1 Tube) was drawn using a new 40-foot length of polyethylene tubing, attached with the same type of quick connect devices previously used to join the tubing to the SUMMA canister fitting. The second (Ambient 2 Tube) was drawn using a second 40-foot length of polyethylene tubing from the same roll, with the addition of a short (<1.0-foot-long) piece of flexible VITON tubing. Third, all three vapor samples were drawn into six-liter SUMMA canisters over a time period corresponding to the original sampling event (approximately 30 minutes). Finally, all samples were analyzed using EPA Method TO-15 at STL in Burlington, Vermont, consistent with the original soil gas samples.

The results of the tubing blank analysis are provided in Table 8. 1,3-butadiene was not detected in the tubing blanks; however, several other chemicals not identified in groundwater were identified in the tubing including: 1,4-dichlorobenzene, 1,2,4-trimethylbenzene; 1,3,5-trimethylbenzene; 2,2,4-trimethylpentane; chloromethane; 4-ethyltoluene; benzene; cyclohexane; dichlorodifluoromethane; n-heptane; n-hexane; tetrachloroethene; and toluene. Although these results do not provide information on the potential source of 1,3-butadiene, they do indicate that the tubing used to collect samples contributed to detected concentrations of some constituents. Of the 16 constituents detected in soil gas and not previously identified in groundwater, 10 were identified in the tubing blank analysis. Another three chemicals were not included in the tubing blank analyte list (i.e., methyl butyl ketone, methyl tert-butyl ether, and tert-butyl alcohol). Only 1,3-butadiene, styrene, and trichlorofluoromethane were not detected in the tubing blank. After collecting samples using the tubing, ARCADIS learned that the tubing had been stored in a garage used by the drilling subcontractor.

6. Summary & Recommendations

This report presents the sample methodology and results analysis for soil vapor samples obtained from a right-of-way between the Bethpage Community Park and the Plant 24 Access Road. Soil vapor samples were collected as a preliminary step towards evaluating the potential for vapor intrusion. Consistent with EPA (2002) and NYSDOH (2005) guidance, vapor intrusion is of potential concern because VOCs have been detected in groundwater beneath the Park.

As described in Section 3.0, 12 soil vapor samples were collected south of the southern boundary of the Park. The soil vapor results were then evaluated using procedures described in EPA (2002) and NYSDOH (2005) guidance. This included comparing soil vapor results to NYSDOH background concentrations and EPA site-specific concentrations. Based on this evaluation, all soil vapor concentrations, except TCE and 1,3-butadiene, are below conservative screening concentrations including NYSDOH (2005) background values. Because these two constituents exceeded screening values they should be evaluated further. Moreover, NYSDOH (2005) guidance states that it is the State's experience that "soil vapor results alone cannot be relied upon to rule out the need for sampling or addressing exposures at nearby buildings" (p. 36). As a result, based on the soil gas results, it is unlikely that NYSDOH would agree that the vapor intrusion pathway has been fully evaluated.

Given the presence of VOCs in soil vapor, ARCADIS recommends additional investigation of the vapor intrusion pathway. This investigation should focus on the following items:

1. Continue with delineation of the groundwater plume. Because the presence of vapors within the vadose zone is closely tied to the groundwater source, the vapor intrusion pathway cannot be fully evaluated until the groundwater plume is delineated. As additional groundwater samples are collected, it will be possible to make inferences about potential soil gas concentrations and guide future soil vapor, subslab, or indoor air sampling. When collecting groundwater data, the possible use of lower detection limits should be examined to determine if 1,3-butadiene, trichlorofluoromethane, or styrene are present at levels below current detection limits[1].

2. Identify potential preferential pathways. Movement of vapors in the vadose zone is influenced by many factors including the presence of preferential pathways such as sewer lines or other utility lines. These pathways should be identified within the Park and the nearby residential neighborhood. Those pathways that are present over the groundwater plume should be investigated further to determine if they are acting as a conduit for vapor movement.

3. Conduct additional soil vapor sampling. Based on the results of additional groundwater sampling and the identification of preferential pathways, if any, a soil vapor survey plan should be developed. The soil vapor survey plan should

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[1] These three chemicals were only identified in soil vapor and not groundwater. The results were also nondetect in the tubing blank analysis (see Table 8).

target both areas of high and low groundwater concentrations to obtain information on soil vapor movement.

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Table 1. Soil Vapor and Ambient Air Sampling Results, Former Grumman Settling Ponds (OU3 - Bethpage Community Park), Bethpage, New York

Constituent	SVP-1 5 feet bls 10/27/2004 (ppbv)	SVP-1 5 feet bls 10/27/2004 (µg/m³)	SVP-1 15 feet bls 10/27/2004 (ppbv)	SVP-1 15 feet bls 10/27/2004 (µg/m³)	SVP-1 40 feet bls 10/27/2004 (ppbv)	SVP-1 40 feet bls 10/27/2004 (µg/m³)	SVP-2 5 feet bls 10/26/2004 (ppbv)	SVP-2 5 feet bls 10/26/2004 (µg/m³)	SVP-2 15 feet bls 10/26/2004 (ppbv)	SVP-2 15 feet bls 10/26/2004 (µg/m³)	SVP-2 40 feet bls 10/27/2004 (ppbv)	SVP-2 40 feet bls 10/27/2004 (µg/m³)
1,1,1-Trichloroethane	<0.5	<2.7	**1.8**	**9.8**	<0.5	<2.7	<0.5	<2.7	**0.71**	**3.9**	<0.5	<2.7
1,1,2,2-Tetrachloroethane	<0.5	<3.4	<0.5	<3.4	<0.5	<3.4	<0.5	<3.4	<0.5	<3.4	<0.5	<3.4
1,1,2-Trichloroethane	<0.5	<2.7	<0.5	<2.7	<0.5	<2.7	<0.5	<2.7	<0.5	<2.7	<0.5	<2.7
1,1-Dichloroethane	<0.5	<2	<0.5	<2	<0.5	<2	<0.5	<2	<0.5	<2	<0.5	<2
1,1-Dichloroethene	<0.5	<2	<0.5	<2	<0.5	<2	<0.5	<2	<0.5	<2	<0.5	<2
1,2,4-Trichlorobenzene	<0.5	<3.7	<0.5	<3.7	<0.5	<3.7	<0.5	<3.7	<0.5	<3.7	<0.5	<3.7
1,2,4-Trimethylbenzene	<0.5	<2.5	**1**	**4.9**	**0.92**	**4.5**	**0.94**	**4.6**	**1.3**	**6.4**	**1.4**	**6.9**
1,2-Dibromoethane	<0.5	<3.8	<0.5	<3.8	<0.5	<3.8	<0.5	<3.8	<0.5	<3.8	<0.5	<3.8
1,2-Dichlorobenzene	<0.5	<3	<0.5	<3	<0.5	<3	<0.5	<3	<0.5	<3	<0.5	<3
1,2-Dichloroethane	<0.5	<2	<0.5	<2	<0.5	<2	<0.5	<2	<0.5	<2	<0.5	<2
1,2-Dichloropropane	<0.5	<2.3	<0.5	<2.3	<0.5	<2.3	<0.5	<2.3	<0.5	<2.3	<0.5	<2.3
1,2-Dichlorotetrafluoroethane	<0.5	<3.5	<0.5	<3.5	<0.5	<3.5	<0.5	<3.5	<0.5	<3.5	<0.5	<3.5
1,3,5-Trimethylbenzene	<0.5	<2.5	<0.5	<2.5	<0.5	<2.5	<0.5	<2.5	<0.5	<2.5	<0.5	<2.5
1,3-Butadiene	**6.3**	**14**	**13**	**29**	**56**	**120** D	**5.4**	**12**	**16**	**35**	**60**	**130** D
1,3-Dichlorobenzene	<0.5	<3	<0.5	<3	<0.5	<3	<0.5	<3	<0.5	<3	<0.5	<3
1,4-Dichlorobenzene	**0.96**	**5.8**	**1.5**	**9**	**1.5**	**9**	**1.3**	**7.8**	**1.8**	**11**	**1.6**	**9.6**
1,4-Dioxane	<5	<18	<5	<18	<5	<18	<5	<18	<5	<18	<5	<18
2,2,4-Trimethylpentane	<0.5	<2.3	<0.5	<2.3	**1.1**	**5.1**	<0.5	<2.3	**0.56**	**2.6**	<0.5	<2.3
2-Chlorotoluene	<0.5	<2.6	<0.5	<2.6	<0.5	<2.6	<0.5	<2.6	<0.5	<2.6	<0.5	<2.6
3-Chloropropene	<0.5	<1.6	<0.5	<1.6	<0.5	<1.6	<0.5	<1.6	<0.5	<1.6	<0.5	<1.6
4-Ethyltoluene	<0.5	<2.5	**1.2**	**5.9**	**1.4**	**6.9**	<0.5	<2.5	<0.5	<2.5	<0.5	<2.5
Acetone	**98**	**230** D	**100**	**240** D	**500**	**1200** D	**160**	**380**	**71**	**170** D	**500**	**1200** D
Benzene	**3**	**9.6**	**8.3**	**27**	**24**	**77**	**3.9**	**12**	**9.7**	**31**	**28**	**89**
Bromodichloromethane	<0.5	<3.4	<0.5	<3.4	<0.5	<3.4	<0.5	<3.4	<0.5	<3.4	<0.5	<3.4
Bromoethene	<0.5	<2.2	<0.5	<2.2	<0.5	<2.2	<0.5	<2.2	<0.5	<2.2	<0.5	<2.2
Bromoform	<0.5	<5.2	<0.5	<5.2	<0.5	<5.2	<0.5	<5.2	<0.5	<5.2	<0.5	<5.2
Bromomethane	<0.5	<1.9	<0.5	<1.9	<0.5	<1.9	<0.5	<1.9	<0.5	<1.9	<0.5	<1.9
Carbon Disulfide	**3.2**	**10**	**5.7**	**18**	**3.9**	**12**	**7**	**22**	**18**	**56**	**8**	**25**
Carbon Tetrachloride	<0.5	<3.1	<0.5	<3.1	<0.5	<3.1	<0.5	<3.1	<0.5	<3.1	<0.5	<3.1
Chlorobenzene	<0.5	<2.3	<0.5	<2.3	<0.5	<2.3	<0.5	<2.3	<0.5	<2.3	<0.5	<2.3
Chloroethane	<0.5	<1.3	<0.5	<1.3	<0.5	<1.3	<0.5	<1.3	<0.5	<1.3	<0.5	<1.3
Chloroform	<0.5	<2.4	<0.5	<2.4	<0.5	<2.4	<0.5	<2.4	<0.5	<2.4	<0.5	<2.4
Chloromethane	<0.5	<1	<0.5	<1	<0.5	<1	<0.5	<1	<0.5	<1	<0.5	<1
cis-1,2-Dichloroethene	<0.5	<2	<0.5	<2	<0.5	<2	<0.5	<2	<0.5	<2	<0.5	<2
cis-1,3-Dichloropropene	<0.5	<2.3	<0.5	<2.3	<0.5	<2.3	<0.5	<2.3	<0.5	<2.3	<0.5	<2.3
Cyclohexane	**15**	**52**	<0.5	<1.7	**57**	**200** D	**15**	**52**	**23**	**79**	**38**	**130**
Dibromochloromethane	<0.5	<4.3	<0.5	<4.3	<0.5	<4.3	<0.5	<4.3	<0.5	<4.3	<0.5	<4.3
Dichlorodifluoromethane	<0.5	<2.5	<0.5	<2.5	**0.66**	**3.3**	<0.5	<2.5	<0.5	<2.5	<0.5	<2.5
Ethylbenzene	**0.73**	**3.2**	**1.8**	**7.8**	**3.8**	**17**	**1**	**4.3**	**2.5**	**11**	**4.4**	**19**
Freon TF	<0.5	<3.8	<0.5	<3.8	<0.5	<3.8	<0.5	<3.8	<0.5	<3.8	<0.5	<3.8
Hexachlorobutadiene	<0.5	<5.3	<0.5	<5.3	<0.5	<5.3	<0.5	<5.3	<0.5	<5.3	<0.5	<5.3
Isopropyl Alcohol	<5	<12	<5	<12	<5	<12	<5	<12	<5	<12	<5	<12
Methyl Butyl Ketone	<0.5	<2	<0.5	<2	**2.8**	**11**	**0.89**	**3.6**	<0.5	<2	**2.4**	**9.8**
2-Butanone (MEK)	**4**	**12**	**5.2**	**15**	**38**	**110**	**6.3**	**19**	**4.8**	**14**	**28**	**83**
Methyl Isobutyl Ketone	<0.5	<2	<0.5	<2	<0.5	<2	<0.5	<2	<0.5	<2	<0.5	<2
Methyl tert-Butyl Ether	**0.64**	**2.3**	**0.8**	**2.9**	**1.7**	**6.1**	**0.65**	**2.3**	**0.7**	**2.5**	**1.7**	**6.1**
Methylene Chloride	<0.5	<1.7	<0.5	<1.7	<0.5	<1.7	<0.5	<1.7	<0.5	<1.7	<0.5	<1.7
n-Heptane	**6.9**	**28**	**9.8**	**40**	**28**	**110**	<0.5	<2	**13**	**53**	**32**	**130**
n-Hexane	**2.2**	**7.8**	**6.5**	**23**	**23**	**81**	**2.3**	**8.1**	**8.8**	**31**	**33**	**120**
Styrene	<0.5	<2.1	<0.5	<2.1	<0.5	<2.1	<0.5	<2.1	<0.5	<2.1	<0.5	<2.1
tert-Butyl Alcohol	**6.4**	**19**	**6.1**	**18**	**10**	**30**	**5.3**	**16**	<5	<15	**13**	**39**
Tetrachloroethene	**2**	**14**	**8.1**	**55**	**3.2**	**22**	**2**	**14**	**6.8**	**46**	**3.4**	**23**
Tetrahydrofuran	<5	<15	<5	<15	<5	<15	<5	<15	<5	<15	<5	<15
Toluene	**4.8**	**18**	**11**	**41**	**26**	**98**	**5.7**	**21**	**13**	**49**	**30**	**110**
trans-1,2-Dichloroethene	<0.5	<2	<0.5	<2	<0.5	<2	<0.5	<2	<0.5	<2	<0.5	<2
trans-1,3-Dichloropropene	<0.5	<2.3	<0.5	<2.3	<0.5	<2.3	<0.5	<2.3	<0.5	<2.3	<0.5	<2.3
Trichloroethene	<0.5	<2.7	**4.4**	**24**	**0.88**	**4.7**	<0.5	<2.7	**16**	**86**	**3.1**	**17**
Trichlorofluoromethane	<0.5	<2.8	<0.5	<2.8	**0.96**	**5.4**	<0.5	<2.8	<0.5	<2.8	<0.5	<2.8
Vinyl Chloride	<0.5	<1.3	<0.5	<1.3	<0.5	<1.3	<0.5	<1.3	<0.5	<1.3	<0.5	<1.3
Xylene (m,p)	**2**	**8.7**	**5.2**	**23**	**7.2**	**31**	**3.2**	**14**	**6.9**	**30**	**8.8**	**38**
Xylene (o)	**0.68**	**3**	**1.7**	**7.4**	**3.2**	**14**	**1**	**4.3**	**2**	**8.7**	**3.5**	**15**

Notes:
Bold values indicate a detection.
Values marked with < were not detected at the reporting limit.
D = Consitutent identified at a secondary dilution.
bls = below land surface
NA = not applicable
ppbv = parts per billion by volume
ug/m³ micrograms per cubic meter

Table 1. Soil Vapor and Ambient Air Sampling Results, Former Grumman Settling Ponds (OU3 - Bethpage Community Park), Bethpage, New York

Constituent	SVP-3 5 feet bls 10/26/2004 (ppbv)	(µg/m³)	SVP-3 15 feet bls 10/26/2004 (ppbv)	(µg/m³)	SVP-3 40 feet bls 10/26/2004 (ppbv)	(µg/m³)	SVP-4 5 feet bls 10/26/2004 (ppbv)	(µg/m³)	SVP-4 15 feet bls 10/26/2004 (ppbv)	(µg/m³)	SVP-4 40 feet bls 10/26/2004 (ppbv)	(µg/m³)	Ambient Air NA 10/27/2004 (ppbv)	(µg/m³)
1,1,1-Trichloroethane	<0.5	<2.7	**28**	**150**	**56**	**310**	**3.7**	**20**	**13**	**71**	<21	<110	<0.5	<2.7
1,1,2,2-Tetrachloroethane	<0.5	<3.4	<3	<21	<10	<69	<0.5	<3.4	<2.5	<17	<21	<140	<0.5	<3.4
1,1,2-Trichloroethane	<0.5	<2.7	<3	<16	<10	<55	<0.5	<2.7	<2.5	<14	<21	<110	<0.5	<2.7
1,1-Dichloroethane	<0.5	<2	**7.1**	**29**	**40**	**160**	<0.5	<2	**4.7**	**19**	<21	<85	<0.5	<2
1,1-Dichloroethene	<0.5	<2	<3	<12	<10	<40	<0.5	<2	<2.5	<9.9	<21	<83	<0.5	<2
1,2,4-Trichlorobenzene	<0.5	<3.7	<3	<22	<10	<74	<0.5	<3.7	<2.5	<19	<21	<160	<0.5	<3.7
1,2,4-Trimethylbenzene	**1.3**	**6.4**	<3	<15	<10	<49	**1.3**	**6.4**	<2.5	<12	<21	<100	<0.5	<2.5
1,2-Dibromoethane	<0.5	<3.8	<3	<23	<10	<77	<0.5	<3.8	<2.5	<19	<21	<160	<0.5	<3.8
1,2-Dichlorobenzene	<0.5	<3	<3	<18	<10	<60	<0.5	<3	<2.5	<15	<21	<130	<0.5	<3
1,2-Dichloroethane	<0.5	<2	<3	<12	<10	<40	<0.5	<2	<2.5	<10	<21	<85	<0.5	<2
1,2-Dichloropropane	<0.5	<2.3	<3	<14	<10	<46	<0.5	<2.3	<2.5	<12	<21	<97	<0.5	<2.3
1,2-Dichlorotetrafluoroethane	<0.5	<3.5	<3	<21	<10	<70	<0.5	<3.5	<2.5	<17	<21	<150	<0.5	<3.5
1,3,5-Trimethylbenzene	<0.5	<2.5	<3	<15	<10	<49	<0.5	<2.5	<2.5	<12	<21	<100	<0.5	<2.5
1,3-Butadiene	**3.3**	**7.3**	**7.5**	**17**	**51**	**110**	**11**	**24**	**14**	**31**	**180**	**400**	<0.5	<1.1
1,3-Dichlorobenzene	<0.5	<3	<3	<18	<10	<60	<0.5	<3	<2.5	<15	<21	<130	<0.5	<3
1,4-Dichlorobenzene	**1.6**	**9.6**	<3	<18	<10	<60	**0.97**	**5.8**	<2.5	<15	<21	<130	<0.5	<3
1,4-Dioxane	<5	<18	<30	<110	<100	<360	<5	<18	<2.5	<90	<210	<760	<5	<18
2,2,4-Trimethylpentane	<0.5	<2.3	<3	<14	<10	<47	<0.5	<2.3	<2.5	<12	<21	<98	<0.5	<2.3
2-Chlorotoluene	<0.5	<2.6	<3	<16	<10	<52	<0.5	<2.6	<2.5	<13	<21	<110	<0.5	<2.6
3-Chloropropene	<0.5	<1.6	<3	<9.4	<10	<31	<0.5	<1.6	<2.5	<7.8	<21	<66	<0.5	<1.6
4-Ethyltoluene	**1.3**	**6.4**	<3	<15	<10	<49	**1.3**	**6.4**	<2.5	<12	<21	<100	<0.5	<2.5
Acetone	**32**	**76**	**140**	**330**	**240**	**570**	**36**	**86** D	**59**	**140**	**890**	**2100**	<5	<12
Benzene	**2.9**	**9.3**	**7**	**22**	**26**	**83**	**9.1**	**29**	**14**	**45**	**200**	**640**	<0.5	<1.6
Bromodichloromethane	<0.5	<3.4	<3	<20	<10	<67	<0.5	<3.4	<2.5	<17	<21	<140	<0.5	<3.4
Bromoethene	<0.5	<2.2	<3	<13	<10	<44	<0.5	<2.2	<2.5	<11	<21	<92	<0.5	<2.2
Bromoform	<0.5	<5.2	<3	<31	<10	<100	<0.5	<5.2	<2.5	<26	<21	<220	<0.5	<5.2
Bromomethane	<0.5	<1.9	<3	<12	<10	<39	<0.5	<1.9	<2.5	<9.7	<21	<82	<0.5	<1.9
Carbon Disulfide	**6.2**	**19**	**25**	**78**	**21**	**65**	**3.4**	**11**	**5.3**	**17**	<21	<65	<0.5	<1.6
Carbon Tetrachloride	<0.5	<3.1	<3	<19	<10	<63	<0.5	<3.1	<2.5	<16	<21	<130	<0.5	<3.1
Chlorobenzene	**0.76**	**3.5**	<3	<14	<10	<46	<0.5	<2.3	<2.5	<12	**22**	**100**	<0.5	<2.3
Chloroethane	<0.5	<1.3	<3	<7.9	<10	<26	<0.5	<1.3	<2.5	<6.6	<21	<55	<0.5	<1.3
Chloroform	<0.5	<2.4	<3	<15	<10	<49	<0.5	<2.4	<2.5	<12	<21	<100	<0.5	<2.4
Chloromethane	**1.1**	**2.3**	<3	<6.2	<10	<21	**0.51**	**1.1**	<2.5	<5.2	<21	<43	<0.5	<1
cis-1,2-Dichloroethene	<0.5	<2	**5.8**	**23**	**31**	**120**	<0.5	<2	<2.5	<9.9	<21	<83	<0.5	<2
cis-1,3-Dichloropropene	<0.5	<2.3	<3	<14	<10	<45	<0.5	<2.3	<2.5	<11	<21	<95	<0.5	<2.3
Cyclohexane	**12**	**41**	**22**	**76**	**63**	**220**	**8.1**	**28**	**21**	**72**	**76**	**260**	<0.5	<1.7
Dibromochloromethane	<0.5	<4.3	<3	<26	<10	<85	<0.5	<4.3	<2.5	<21	<21	<180	<0.5	<4.3
Dichlorodifluoromethane	<0.5	<2.5	<3	<15	<10	<49	**0.79**	**3.9**	<2.5	<12	<21	<100	<0.5	<2.5
Ethylbenzene	**1.1**	**4.8**	<3	<13	<10	<43	**1.1**	**4.8**	**2.7**	**12**	<21	<91	<0.5	<2.2
Freon TF	<0.5	<3.8	<3	<23	<10	<77	<0.5	<3.8	<2.5	<19	<21	<160	<0.5	<3.8
Hexachlorobutadiene	<0.5	<5.3	<3	<32	<10	<110	<0.5	<5.3	<2.5	<27	<21	<220	<0.5	<5.3
Isopropyl Alcohol	<5	<12	<30	<74	<100	<250	<5	<12	<25	<61	<210	<520	<5	<12
Methyl Butyl Ketone	<0.5	<2	<3	<12	<10	<41	<0.5	<2	<2.5	<10	<21	<86	<0.5	<2
2-Butanone (MEK)	**1.6**	**4.7**	**12**	**35**	**19**	**56**	**3.6**	**11**	**6.2**	**18**	**90**	**270**	<0.5	<1.5
Methyl Isobutyl Ketone	<0.5	<2	<3	<12	<10	<41	<0.5	<2	<2.5	<10	<21	<86	<0.5	<2
Methyl tert-Butyl Ether	<0.5	<1.8	<3	<11	<10	<36	0.58	2.1	<2.5	<9	<21	<76	<0.5	<1.8
Methylene Chloride	<0.5	<1.7	<3	<10	<10	<35	<0.5	<1.7	<2.5	<8.7	<21	<73	<0.5	<1.7
n-Heptane	**5.6**	**23**	**11**	**45**	**27**	**110**	**5.2**	**21**	**20**	**82**	**71**	**290**	<0.5	<2
n-Hexane	**1.5**	**5.3**	**5.3**	**19**	**21**	**74**	**3.8**	**13**	**21**	**74**	**96**	**340**	<0.5	<1.8
Styrene	<0.5	<2.1	<3	<13	<10	<43	**0.6**	**2.6**	<2.5	<11	<21	<89	<0.5	<2.1
tert-Butyl Alcohol	<5	<15	<30	<91	<100	<300	<5	<15	<25	<76	<210	<640	<5	<15
Tetrachloroethene	**2.4**	**16**	**12**	**81**	**23**	**160**	**3.5**	**24**	**8.3**	**56**	<21	<140	<0.5	<3.4
Tetrahydrofuran	<5	<15	<30	<88	<100	<290	<5	<15	<25	<74	<210	<620	<5	<15
Toluene	**5.2**	**20**	**12**	**45**	**29**	**110**	**6.9**	**26**	**17**	**64**	**150**	**570**	**0.66**	**2.5**
trans-1,2-Dichloroethene	<0.5	<2	3.2	**13**	10	**40**	<0.5	<2	<2.5	<9.9	<21	<83	<0.5	<2
trans-1,3-Dichloropropene	<0.5	<2.3	<3	<14	<10	<45	<0.5	<2.3	<2.5	<11	<21	<95	<0.5	<2.3
Trichloroethene	<0.5	<2.7	**160**	**860**	**470**	**2500**	**13**	**70**	**120**	**640**	<21	<110	<0.5	<2.7
Trichlorofluoromethane	<0.5	<2.8	<3	<17	<10	<56	<0.5	<2.8	<2.5	<14	<21	<120	<0.5	<2.8
Vinyl Chloride	<0.5	<1.3	<3	<7.7	<10	<26	<0.5	<1.3	<2.5	<6.4	<21	<54	<0.5	<1.3
Xylene (m,p)	**4**	**17**	**5.9**	**26**	**12**	**52**	**3.7**	**16**	**6.8**	**30**	**33**	**140**	<0.5	<2.2
Xylene (o)	**1.2**	**5.2**	<3	<13	<10	<43	**1.2**	**5.2**	**2.5**	**11**	<21	<91	<0.5	<2.2

Notes:
Bold values indicate a detection.
Values marked with < were not detected at the reporting limit.
D = Consitutent identified at a secondary dilution.
bls = below land surface
NA = not applicable
ppbv = parts per billion volume
ug/m³ micrograms per cubic meter

Table 2. Identification of COPCs, Former Grumman Settling Ponds (OU3 - Bethpage Community Park), Bethpage, New York

Constituent	Detected in Groundwater	Detected in Soil Gas	Detected in Ambient Air	COPC [a]
1,1,1-Trichloroethane	Y	Y	N	Y
1,1,2,2-Tetrachloroethane	N	N	N	N
1,1,2-Trichloroethane	N	N	N	N
1,1-Dichloroethane	Y	Y	N	Y
1,1-Dichloroethene	Y	N	N	Y
1,2,4-Trichlorobenzene	N	N	N	N
1,2,4-Trimethylbenzene	N	Y	N	Y
1,2-Dibromoethane	N	N	N	N
1,2-Dichlorobenzene	N	N	N	N
1,2-Dichloroethane	N	N	N	N
1,2-Dichloropropane	Y	N	N	Y
1,2-Dichlorotetrafluoroethane	N	N	N	N
1,3,5-Trimethylbenzene	N	N	N	N
1,3-Butadiene	N	Y	N	Y
1,3-Dichlorobenzene	N	N	N	N
1,4-Dichlorobenzene	N	Y	N	Y
1,4-Dioxane	N	N	N	N
2,2,4-Trimethylpentane	N	Y	N	Y
2-Butanone (MEK)	Y	Y	N	Y
2-Chlorotoluene	N	N	N	N
3-Chloropropene	N	N	N	N
4-Ethyltoluene	N	Y	N	Y
Acetone	Y	Y	N	Y
Benzene	N	Y	N	Y
Bromodichloromethane	N	N	N	N
Bromoethene	N	N	N	N
Bromoform	N	N	N	N
Bromomethane	Y	N	N	Y
Carbon disulfide	Y	Y	N	Y
Carbon tetrachloride	Y	N	N	Y
Chlorobenzene	Y	Y	N	Y
Chloroethane	N	N	N	N
Chloroform	Y	N	N	Y
Chloromethane	N	Y	N	Y
cis-1,2-Dichloroethene	Y	Y	N	Y
cis-1,3-Dichloropropene	N	N	N	N
Cyclohexane	N	Y	N	Y
Dibromochloromethane	N	N	N	N
Dichlorodifluoromethane	N	Y	N	Y
Ethylbenzene	Y	Y	N	Y
Freon TF	N	N	N	N
Hexachlorobutadiene	N	N	N	N
Isopropyl Alcohol	N	N	N	N
Methyl Butyl Ketone	N	Y	N	Y
Methyl Isobutyl Ketone	N	N	N	N
Methyl tert-Butyl Ether	N	Y	N	Y
Methylene Chloride	Y	N	N	Y
n-Heptane	N	Y	N	Y
n-Hexane	N	Y	N	Y
Styrene	N	Y	N	Y
tert-Butyl Alcohol	N	Y	N	Y
Tetrachloroethene	Y	Y	N	Y
Tetrahydrofuran	N	N	N	N
Toluene	Y	Y	Y	Y
trans-1,2-Dichloroethene	Y	Y	N	Y
trans-1,3-Dichloropropene	N	N	N	N
Trichloroethene	Y	Y	N	Y
Trichlorofluoromethane	N	Y	N	Y
Vinyl Chloride	Y	N	N	Y
Xylene (m,p)	Y	Y	N	Y
Xylene (o)	Y	Y	N	Y

Notes:
[a] Constituent retained as COPC if detected in either groundwater or soil gas
COPC = constituents of potential concern
N = no
VOC = volatile organic compound
Y = yes

Table 3. Comparison of COPCs to NYSDOH Indoor Background Concentrations, Former Grumman Settling Ponds (OU3 - Bethpage Community Park), Bethpage, New York

Constituent	NYSDOH [a] Fuel Oil Homes Indoor (µg/m³)	SVP-1 5 feet bls [d] 10/27/04 (µg/m³)	SVP-1 15 feet bls [e] 10/27/04 (µg/m³)	SVP-1 40 feet bls [e] 10/27/04 (µg/m³)	SVP-2 5 feet bls [d] 10/26/04 (µg/m³)	SVP-2 15 feet bls [e] 10/26/04 (µg/m³)	SVP-2 40 feet bls [e] 10/27/04 (µg/m³)
1,1,1-Trichloroethane	<0.25 - 1.4	*0.135*	**0.098**	*0.0135*	*0.135*	**0.039**	*0.0135*
1,1-Dichloroethane	<0.25	*0.1*	*0.01*	*0.01*	*0.1*	*0.01*	*0.01*
1,1-Dichloroethene	<0.25	*0.1*	*0.01*	*0.01*	*0.1*	*0.01*	*0.01*
1,2,4-Trimethylbenzene	0.78 - 4.4	*0.125*	**0.049**	**0.045**	**0.46**	**0.064**	**0.069**
1,2-Dichloropropane	<0.25	*0.115*	*0.0115*	*0.0115*	*0.115*	*0.0115*	*0.0115*
1,3-Butadiene	0.0087 [b]	**1.4**	**0.29**	**1.2** D	**1.2**	**0.35**	**1.3** D
1,4-Dichlorobenzene	800 [b]	**0.58**	**0.09**	**0.09**	**0.78**	**0.11**	**0.096**
2,2,4-Trimethylpentane	NA	*0.115*	*0.0115*	**0.051**	*0.115*	**0.026**	*0.0115*
4-Ethyltoluene	NA	*0.125*	**0.059**	**0.069**	*0.125*	*0.0125*	*0.0125*
Acetone	10 - 46	**23** D	**2.4** D	**12** D	**38**	**1.7** D	**12** D
Benzene	1.2 - 5.7	**0.96**	**0.27**	**0.77**	**1.2**	**0.31**	**0.89**
Bromomethane	<0.25	*0.095*	*0.0095*	*0.0095*	*0.095*	*0.0095*	*0.0095*
Carbon Disulfide	700 [b]	**1**	**0.18**	**0.12**	**2.2**	**0.56**	**0.25**
Carbon Tetrachloride	<0.25 - 0.68	*0.155*	*0.0155*	*0.0155*	*0.155*	*0.0155*	*0.0155*
Chlorobenzene	<0.25	*0.115*	*0.0115*	*0.0115*	*0.115*	*0.0115*	*0.0115*
Chloroform	<0.25 - 0.54	*0.12*	*0.012*	*0.012*	*0.12*	*0.012*	*0.012*
Chloromethane	<0.25 - 2.0	*0.05*	*0.005*	*0.005*	*0.05*	*0.005*	*0.005*
cis-1,2-Dichloroethene	<0.25	*0.1*	*0.01*	*0.01*	*0.1*	*0.01*	*0.01*
Cyclohexane	NA	**5.2**	*0.0085*	**2** D	**5.2**	**0.79**	**1.3**
Dichlorodifluoromethane	200 [b]	*0.125*	*0.0125*	**0.033**	*0.125*	*0.0125*	*0.0125*
Ethylbenzene	0.43 - 2.8	**0.32**	**0.078**	**0.17**	**0.43**	**0.11**	**0.19**
Methyl Butyl Ketone	NA	*0.1*	*0.01*	**0.11**	**0.36**	*0.01*	**0.098**
2-Butanone (MEK)	1,000 [b]	**1.2**	**0.15**	**1.1**	**1.9**	**0.14**	**0.83**
Methyl tert-Butyl Ether	<0.25 - 6.7	**0.23**	**0.029**	**0.061**	**0.23**	**0.025**	**0.061**
Methylene Chloride	60 [c]	*0.085*	*0.0085*	*0.0085*	*0.085*	*0.0085*	*0.0085*
n-Heptane	NA	**2.8**	**0.4**	**1.1**	*0.1*	**0.53**	**1.3**
n-Hexane	0.63 - 6.5	**0.78**	**0.23**	**0.81**	**0.81**	**0.31**	**1.2**
Styrene	<0.25 - 0.68	*0.105*	*0.0105*	*0.0105*	*0.105*	*0.0105*	*0.0105*
tert-Butyl Alcohol	NA	**1.9**	**0.18**	**0.3**	**1.6**	*0.075*	**0.39**
Tetrachloroethene	100 [c]	**1.4**	**0.55**	**0.22**	**1.4**	**0.46**	**0.23**
Toluene	4.2 - 25	**1.8**	**0.41**	**0.98**	**2.1**	**0.49**	**1.1**
trans-1,2-Dichloroethene	70 [b]	*0.1*	*0.01*	*0.01*	*0.1*	*0.01*	*0.01*
Trichloroethene	5 [c]	*0.135*	**0.24**	**0.047**	*0.135*	**0.86**	**0.17**
Trichlorofluoromethane	700 [b]	*0.14*	*0.014*	**0.054**	*0.14*	*0.014*	*0.014*
Vinyl Chloride	<0.25	*0.065*	*0.0065*	*0.0065*	*0.065*	*0.0065*	*0.0065*
Xylene (m,p)	0.52 - 4.7	**0.87**	**0.23**	**0.31**	**1.4**	**0.3**	**0.38**
Xylene (o)	0.39 - 3.1	**0.3**	**0.074**	**0.14**	**0.43**	**0.087**	**0.15**

Notes:
Bold values indicate a detection.
Boxes indicate that the concentration exceeds the background concentration.
Italicized values are 1/2 the detection limit.
[a] Unless noted, value is from NYSDOH Study of Volatile Organic Chemicals in Air of Fuel Oil Heated Homes; 1997 - 2003
[b] NYSDOH value not available, EPA target concentration for indoor air used instead
[c] Air guideline value, NYSDOH (2005)
[d] Attenuation factor of 0.1 used to calculate indoor air concentration
[e] Attenuation factor of 0.01 used to calculate indoor air concentration
bls = below land surface
COPC = constituents of potential concern
D = Consitutent identified at a secondary dilution.
EPA = U.S. Environmental Protection Agency
µg/m³ = micrograms per cubic meter
NA = not available
NYSDOH = New York State Department of Health

Table 3. Comparison of COPCs to NYSDOH Indoor Background Concentrations, Former Grumman Settling Ponds (OU3 - Bethpage Community Park), Bethpage, New York

Constituent	NYSDOH Fuel Oil Homes Indoor (µg/m^3)		SVP-3 5 feet bls [d] 10/26/04 (µg/m^3)	SVP-3 15 feet bls [e] 10/26/04 (µg/m^3)	SVP-3 40 feet bls [e] 10/26/04 (µg/m^3)	SVP-4 5 feet bls [d] 10/26/04 (µg/m^3)	SVP-4 15 feet bls [e] 10/26/04 (µg/m^3)	SVP-4 40 feet bls [e] 10/26/04 (µg/m^3)	Exceed NYSDOH or EPA Standards?
1,1,1-Trichloroethane	<0.25 - 1.4		*0.135*	**1.5**	**3.1**	**2**	**0.71**	*0.55*	Yes
1,1-Dichloroethane	<0.25		*0.1*	**0.29**	**1.6**	*0.1*	**0.19**	*0.425*	Yes
1,1-Dichloroethene	<0.25		*0.1*	*0.06*	*0.2*	*0.1*	*0.0495*	*0.415*	Yes
1,2,4-Trimethylbenzene	0.78 - 4.4		**0.64**	*0.075*	*0.245*	**0.64**	*0.06*	*0.5*	No
1,2-Dichloropropane	<0.25		*0.115*	*0.07*	*0.23*	*0.115*	*0.06*	*0.485*	Yes
1,3-Butadiene	0.0087	[b]	**0.73**	**0.17**	**1.1**	**2.4**	**0.31**	**4**	Yes
1,4-Dichlorobenzene	800	[b]	**0.96**	*0.09*	*0.3*	**0.58**	*0.075*	*0.65*	No
2,2,4-Trimethylpentane	NA		*0.115*	*0.07*	*0.235*	*0.115*	*0.075*	*0.49*	No
4-Ethyltoluene	NA		**0.64**	*0.075*	*0.245*	**0.64**	*0.075*	*0.5*	No
Acetone	10 - 46		**7.6**	**3.3**	**5.7**	**8.6** D	**1.4**	**21**	No
Benzene	1.2 - 5.7		**0.93**	**0.22**	**0.83**	**2.9**	**0.45**	**6.4**	Yes
Bromomethane	<0.25		*0.095*	*0.06*	*0.195*	*0.095*	*0.0485*	*0.41*	Yes
Carbon Disulfide	700	[b]	**1.9**	**0.78**	**0.65**	**1.1**	**0.17**	*0.325*	No
Carbon Tetrachloride	<0.25 - 0.68		*0.155*	*0.095*	*0.315*	*0.155*	*0.08*	*0.65*	No
Chlorobenzene	<0.25		**0.35**	*0.07*	*0.23*	*0.115*	*0.06*	**1**	Yes
Chloroform	<0.25 - 0.54		*0.12*	*0.075*	*0.245*	*0.12*	*0.06*	*0.5*	No
Chloromethane	<0.25 - 2.0		**0.23**	*0.031*	*0.105*	**0.11**	*0.026*	*0.215*	No
cis-1,2-Dichloroethene	<0.25		*0.1*	**0.23**	**1.2**	*0.1*	*0.0495*	*0.415*	Yes
Cyclohexane	NA		**4.1**	**0.76**	**2.2**	**2.8**	**0.72**	**2.6**	No
Dichlorodifluoromethane	200	[b]	*0.125*	*0.075*	*0.245*	**0.39**	*0.06*	*0.5*	No
Ethylbenzene	0.43 - 2.8		**0.48**	*0.065*	*0.215*	**0.48**	**0.12**	*0.455*	No
Methyl Butyl Ketone	NA		*0.1*	*0.06*	*0.205*	*0.1*	*0.05*	*0.43*	No
2-Butanone (MEK)	1000	[b]	**0.47**	**0.35**	**0.56**	**1.1**	**0.18**	**2.7**	No
Methyl tert-Butyl Ether	<0.25 - 6.7		*0.09*	*0.055*	*0.18*	**0.21**	*0.045*	*0.38*	No
Methylene Chloride	60		*0.085*	*0.05*	*0.175*	*0.085*	*0.0435*	*0.365*	No
n-Heptane	NA		**2.3**	**0.45**	**1.1**	**2.1**	**0.82**	**2.9**	No
n-Hexane	0.63 - 6.5		**0.53**	**0.19**	**0.74**	**1.3**	**0.74**	**3.4**	No
Styrene	<0.25 - 0.68		*0.105*	*0.065*	*0.215*	**0.26**	*0.055*	*0.445*	No
tert-Butyl Alcohol	NA		*0.75*	*0.455*	*1.5*	**0.75**	*0.38*	*3.2*	No
Tetrachloroethene	100	[c]	**1.6**	**0.81**	**1.6**	**2.4**	**0.56**	*0.7*	No
Toluene	4.2 - 25		**2**	**0.45**	**1.1**	**2.6**	**0.64**	**5.7**	No
trans-1,2-Dichloroethene	70	[b]	*0.1*	**0.13**	**0.4**	*0.1*	*0.0495*	*0.415*	No
Trichloroethene	5	[c]	*0.135*	**8.6**	**25**	**7**	**6.4**	*0.55*	Yes
Trichlorofluoromethane	700	[b]	*0.14*	*0.085*	*0.28*	*0.14*	*0.07*	*0.6*	No
Vinyl Chloride	<0.25		*0.065*	*0.0385*	*0.13*	*0.065*	*0.032*	*0.27*	Yes
Xylene (m,p) [a]	0.52 - 4.7		**1.7**	**0.26**	**0.52**	**1.6**	**0.3**	**1.4**	No
Xylene (o)	0.39 - 3.1		**0.52**	*0.065*	*0.215*	**0.52**	**0.11**	*0.455*	No

Notes:
Bold values indicate a detection.
Boxes indicate that the concentration exceeds the background concentration.
Italicized values are 1/2 the detection limit.
[a] Unless noted, value is from NYSDOH Study of Volatile Organic Chemicals in Air of Fuel Oil Heated Homes; 1997 - 2003
[b] NYSDOH value not available, EPA target concentration for indoor air used instead
[c] Air guideline value, NYSDOH (2005)
[d] Attenuation factor of 0.1 used to calculate indoor air concentration
[e] Attenuation factor of 0.01 used to calculate indoor air concentration
bls = below land surface
COPC = constituents of potential concern
D = Consitutent identified at a secondary dilution.
EPA = U.S. Environmental Protection Agency
µg/m^3 = micrograms per cubic meter
NA = not available
NYSDOH = New York State Department of Health

Table 4. Comparison of COPCs to NYSDOH Outdoor Background Concentrations, Former Grumman Settling Ponds (OU3 - Bethpage Community Park), Bethpage, New York

Constituent	NYSDOH [a] Fuel Oil Homes Outdoor (μg/m^3)	SVP-1 5 feet bls [d] 10/27/04 (μg/m^3)	SVP-1 15 feet bls [e] 10/27/04 (μg/m^3)	SVP-1 40 feet bls [e] 10/27/04 (μg/m^3)	SVP-2 5 feet bls [d] 10/26/04 (μg/m^3)	SVP-2 15 feet bls [e] 10/26/04 (μg/m^3)	SVP-2 40 feet bls [e] 10/27/04 (μg/m^3)
1,1,1-Trichloroethane	<0.25 - 0.38	*0.135*	**0.098**	*0.0135*	*0.135*	**0.039**	*0.0135*
1,1-Dichloroethane	<0.25	*0.1*	*0.01*	*0.01*	*0.1*	*0.01*	*0.01*
1,1-Dichloroethene	<0.25	*0.1*	*0.01*	*0.01*	*0.1*	*0.01*	*0.01*
1,2,4-Trimethylbenzene	<0.25 - 1.0	*0.125*	**0.049**	**0.045**	**0.46**	**0.064**	**0.069**
1,2-Dichloropropane	<0.25	*0.115*	*0.0115*	*0.0115*	*0.115*	*0.0115*	*0.0115*
1,3-Butadiene	0.0087 [b]	**1.4**	**0.29**	**1.2** D	**1.2**	**0.35**	**1.3** D
1,4-Dichlorobenzene	800 [b]	**0.58**	**0.09**	**0.09**	**0.78**	**0.11**	**0.096**
2,2,4-Trimethylpentane	NA	*0.115*	*0.0115*	**0.051**	*0.115*	**0.026**	*0.0115*
4-Ethyltoluene	NA	*0.125*	**0.059**	**0.069**	*0.125*	*0.0125*	*0.0125*
Acetone	3.9 - 23	**23** D	**2.4** D	**12** D	**38**	**1.7** D	**12** D
Benzene	<0.25 - 2.6	**0.96**	**0.27**	**0.77**	**1.2**	**0.31**	**0.89**
Bromomethane	<0.25	*0.095*	*0.0095*	*0.0095*	*0.095*	*0.0095*	*0.0095*
Carbon Disulfide	700 [b]	**1**	**0.18**	**0.12**	**2.2**	**0.56**	**0.25**
Carbon Tetrachloride	<0.25 - 0.68	*0.155*	*0.0155*	*0.0155*	*0.155*	*0.0155*	*0.0155*
Chlorobenzene	<0.25	*0.115*	*0.0115*	*0.0115*	*0.115*	*0.0115*	*0.0115*
Chloroform	<0.25	*0.12*	*0.012*	*0.012*	*0.12*	*0.012*	*0.012*
Chloromethane	<0.25 - 2.0	*0.05*	*0.005*	*0.005*	*0.05*	*0.005*	*0.005*
cis-1,2-Dichloroethene	<0.25	*0.1*	*0.01*	*0.01*	*0.1*	*0.01*	*0.01*
Cyclohexane	NA	**5.2**	*0.0085*	**2** D	**5.2**	**0.79**	**1.3**
Dichlorodifluoromethane	200 [b]	*0.125*	*0.0125*	**0.033**	*0.125*	*0.0125*	*0.0125*
Ethylbenzene	<0.25 - 0.61	**0.32**	**0.078**	**0.17**	**0.43**	**0.11**	**0.19**
Methyl Butyl Ketone	NA	*0.1*	*0.01*	**0.11**	**0.36**	*0.01*	**0.098**
2-Butanone (MEK)	1,000 [b]	**1.2**	**0.15**	**1.1**	**1.9**	**0.14**	**0.83**
Methyl tert-Butyl Ether	<0.25 - 1.0	**0.23**	**0.029**	**0.061**	**0.23**	**0.025**	**0.061**
Methylene Chloride	60 [c]	*0.085*	*0.0085*	*0.0085*	*0.085*	*0.0085*	*0.0085*
n-Heptane	NA	**2.8**	**0.4**	**1.1**	*0.1*	**0.53**	**1.3**
n-Hexane	<0.25 - 1.1	**0.78**	**0.23**	**0.81**	**0.81**	**0.31**	**1.2**
Styrene	<0.25	*0.105*	*0.0105*	*0.0105*	*0.105*	*0.0105*	*0.0105*
tert-Butyl Alcohol	NA	**1.9**	**0.18**	**0.3**	**1.6**	*0.075*	**0.39**
Tetrachloroethene	100 [c]	**1.4**	**0.55**	**0.22**	**1.4**	**0.46**	**0.23**
Toluene	0.68 - 3.3	**1.8**	**0.41**	**0.98**	**2.1**	**0.49**	**1.1**
trans-1,2-Dichloroethene	70 [b]	*0.1*	*0.01*	*0.01*	*0.1*	*0.01*	*0.01*
Trichloroethene	5 [c]	*0.135*	**0.24**	**0.047**	*0.135*	**0.86**	**0.17**
Trichlorofluoromethane	700 [b]	*0.14*	*0.014*	**0.054**	*0.14*	*0.014*	*0.014*
Vinyl Chloride	<0.25	*0.065*	*0.0065*	*0.0065*	*0.065*	*0.0065*	*0.0065*
Xylene (m,p)	<0.25 - 0.69	**0.87**	**0.23**	**0.31**	**1.4**	**0.3**	**0.38**
Xylene (o)	<0.25 - 0.74	**0.3**	**0.074**	**0.14**	**0.43**	**0.087**	**0.15**

Notes:
Bold values indicate a detection.
Boxes indicate that the concentration exceeds the background concentration.
Italicized values are 1/2 the detection limit.
[a] Unless noted, value is from NYSDOH Study of Volatile Organic Chemicals in Air of Fuel Oil Heated Homes; 1997 - 2003
[b] NYSDOH value not available, EPA target concentration for indoor air used instead
[c] Air guideline value, NYSDOH (2005)
[d] Attenuation factor of 0.1 used to calculate indoor air concentration
[e] Attenuation factor of 0.01 used to calculate indoor air concentration
bls = below land surface
COPC = constituents of potential concern
D = Consitutent identified at a secondary dilution.
EPA = U.S. Environmental Protection Agency
μg/m^3 = micrograms per cubic meter
NA = not available
NYSDOH = New York State Department of Health

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Table 4. Comparison of COPCs to NYSDOH Outdoor Background Concentrations, Former Grumman Settling Ponds (OU3 - Bethpage Community Park), Bethpage, New York

Constituent	NYSDOH Fuel Oil Homes Outdoor (µg/m³)		SVP-3 5 feet bls [d] 10/26/04 (µg/m³)	SVP-3 15 feet bls [e] 10/26/04 (µg/m³)	SVP-3 40 feet bls [e] 10/26/04 (µg/m³)	SVP-4 5 feet bls [d] 10/26/04 (µg/m³)	SVP-4 15 feet bls [e] 10/26/04 (µg/m³)	SVP-4 40 feet bls [e] 10/26/04 (µg/m³)	Exceed NYSDOH or EPA Standards?
1,1,1-Trichloroethane	<0.25 - 0.38		*0.135*	**1.5**	**3.1**	**2**	**0.71**	*0.55*	Yes
1,1-Dichloroethane	<0.25		*0.1*	**0.29**	**1.6**	*0.1*	**0.19**	*0.425*	Yes
1,1-Dichloroethene	<0.25		*0.1*	*0.06*	*0.2*	*0.1*	*0.0495*	*0.415*	Yes
1,2,4-Trimethylbenzene	<0.25 - 1.0		**0.64**	*0.075*	*0.245*	**0.64**	*0.06*	*0.5*	No
1,2-Dichloropropane	<0.25		*0.115*	*0.07*	*0.23*	*0.115*	*0.06*	*0.485*	Yes
1,3-Butadiene	0.0087	[b]	**0.73**	**0.17**	**1.1**	**2.4**	**0.31**	**4**	Yes
1,4-Dichlorobenzene	800	[b]	**0.96**	*0.09*	*0.3*	**0.58**	*0.075*	*0.65*	No
2,2,4-Trimethylpentane	NA		*0.115*	*0.07*	*0.235*	*0.115*	*0.075*	*0.49*	No
4-Ethyltoluene	NA		**0.64**	*0.075*	*0.245*	**0.64**	*0.075*	*0.5*	No
Acetone	3.9 - 23		**7.6**	**3.3**	**5.7**	**8.6** D	**1.4**	**21**	Yes
Benzene	<0.25 - 2.6		**0.93**	**0.22**	**0.83**	**2.9**	**0.45**	**6.4**	Yes
Bromomethane	<0.25		*0.095*	*0.06*	*0.195*	*0.095*	*0.0485*	*0.41*	Yes
Carbon Disulfide	700	[b]	**1.9**	**0.78**	**0.65**	**1.1**	**0.17**	*0.325*	No
Carbon Tetrachloride	<0.25 - 0.68		*0.155*	*0.095*	*0.315*	*0.155*	*0.08*	*0.65*	No
Chlorobenzene	<0.25		**0.35**	*0.07*	*0.23*	*0.115*	*0.06*	**1**	Yes
Chloroform	<0.25		*0.12*	*0.075*	*0.245*	*0.12*	*0.06*	*0.5*	Yes
Chloromethane	<0.25 - 2.0		**0.23**	*0.031*	*0.105*	**0.11**	*0.026*	*0.215*	No
cis-1,2-Dichloroethene	<0.25		*0.1*	**0.23**	**1.2**	*0.1*	*0.0495*	*0.415*	Yes
Cyclohexane	NA		**4.1**	**0.76**	**2.2**	**2.8**	**0.72**	**2.6**	No
Dichlorodifluoromethane	200	[b]	*0.125*	*0.075*	*0.245*	**0.39**	*0.06*	*0.5*	No
Ethylbenzene	<0.25 - 0.61		**0.48**	*0.065*	*0.215*	**0.48**	**0.12**	*0.455*	No
Methyl Butyl Ketone	NA		*0.1*	*0.06*	*0.205*	*0.1*	*0.05*	*0.43*	No
2-Butanone (MEK)	1000	[b]	**0.47**	**0.35**	**0.56**	**1.1**	**0.18**	**2.7**	No
Methyl tert-Butyl Ether	<0.25 - 1.0		*0.09*	*0.055*	*0.18*	**0.21**	*0.045*	*0.38*	No
Methylene Chloride	60		*0.085*	*0.05*	*0.175*	*0.085*	*0.0435*	*0.365*	No
n-Heptane	NA		**2.3**	**0.45**	**1.1**	**2.1**	**0.82**	**2.9**	No
n-Hexane	<0.25 - 1.1		**0.53**	**0.19**	**0.74**	**1.3**	**0.74**	**3.4**	Yes
Styrene	<0.25		*0.105*	*0.065*	*0.215*	**0.26**	*0.055*	*0.445*	Yes
tert-Butyl Alcohol	NA		*0.75*	*0.455*	*1.5*	**0.75**	*0.38*	*3.2*	No
Tetrachloroethene	100	[c]	**1.6**	**0.81**	**1.6**	**2.4**	**0.56**	*0.7*	No
Toluene	0.68 - 3.3		**2**	**0.45**	**1.1**	**2.6**	**0.64**	**5.7**	Yes
trans-1,2-Dichloroethene	70	[b]	*0.1*	**0.13**	**0.4**	*0.1*	*0.0495*	*0.415*	No
Trichloroethene	5	[c]	*0.135*	**8.6**	**25**	**7**	**6.4**	*0.55*	Yes
Trichlorofluoromethane	700	[b]	*0.14*	*0.085*	*0.28*	*0.14*	*0.07*	*0.6*	No
Vinyl Chloride	<0.25		*0.065*	*0.0385*	*0.13*	*0.065*	*0.032*	*0.27*	Yes
Xylene (m,p) [a]	<0.25 - 0.69		**1.7**	**0.26**	**0.52**	**1.6**	**0.3**	**1.4**	Yes
Xylene (o)	<0.25 - 0.74		**0.52**	*0.065*	*0.215*	**0.52**	**0.11**	*0.455*	No

Notes:
Bold values indicate a detection.
Boxes indicate that the concentration exceeds the background concentration.
Italicized values are 1/2 the detection limit.
[a] Unless noted, value is from NYSDOH Study of Volatile Organic Chemicals in Air of Fuel Oil Heated Homes; 1997 - 2003
[b] NYSDOH value not available, EPA target concentration for indoor air used instead
[c] Air guideline value, NYSDOH (2005)
[d] Attenuation factor of 0.1 used to calculate indoor air concentration
[e] Attenuation factor of 0.01 used to calculate indoor air concentration
bls = below land surface
COPC = constituents of potential concern
D = Consitutent identified at a secondary dilution.
EPA = U.S. Environmental Protection Agency
µg/m³ = micrograms per cubic meter
NA = not available
NYSDOH = New York State Department of Health

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Table 5. Comparison of COPCs to EPA Site-Specific Concentrations, Former Grumman Settling Ponds (OU3 - Bethpage Community Park), Bethpage, New York

Constituent	EPA Site-Specific Soil Vapor Concentration 5 feet bls [a] (µg/m³)	15 feet bls [b] (µg/m³)	40 feet bls [b] (µg/m³)	SVP-1 5 feet bls 10/27/04 (µg/m³)	SVP-1 15 feet bls 10/27/04 (µg/m³)	SVP-1 40 feet bls 10/27/04 (µg/m³)	SVP-2 5 feet bls 10/26/04 (µg/m³)	SVP-2 15 feet bls 10/26/04 (µg/m³)	SVP-2 40 feet bls 10/27/04 (µg/m³)	SVP-3 5 feet bls 10/26/04 (µg/m³)	SVP-3 15 feet bls 10/26/04 (µg/m³)	SVP-3 40 feet bls 10/26/04 (µg/m³)	SVP-4 5 feet bls 10/26/04 (µg/m³)	SVP-4 15 feet bls 10/26/04 (µg/m³)	SVP-4 40 feet 10/26/ (µg/m
1,1,1-Trichloroethane	1,100,000	1,100,000	2,200,000	*1.35*	**9.8**	*1.35*	*1.35*	**3.9**	*1.35*	*1.35*	**150**	**310**	**20**	**71**	*55*
1,1-Dichloroethane	250,000	250,000	500,000	*1*	*1*	*1*	*1*	*1*	*1*	*1*	**29**	**160**	*1*	**19**	*42.5*
1,1-Dichloroethene	100,000	100,000	200,000	*1*	*1*	*1*	*1*	*1*	*1*	*1*	6	20	*1*	*4.95*	*41.5*
1,2-Dichloropropane	2,000	2,000	4,000	*1.15*	*1.15*	*1.15*	*1.15*	*1.15*	*1.15*	*1.15*	*7*	*23*	*1.15*	*6*	*48.5*
1,3-Butadiene	4.3	4.3	8.7	**14**	**29**	**120** D	**12**	**35**	**130**	**7.3**	**17**	**110**	**24**	**31**	**400**
Benzene	160	160	310	**9.6**	**27**	**77**	**12**	**31**	**89**	**9.3**	**22**	**83**	**29**	**45**	**640**
Bromomethane	2,500	2,500	5,000	0.95	***0.95***	*0.95*	*0.95*	*0.95*	*0.95*	*0.95*	*6*	*19.5*	*0.95*	*4.85*	*41*
Chlorobenzene	30,000	30,000	60,000	*1.15*	*1.15*	*1.15*	*1.15*	*1.15*	*1.15*	**3.5**	*7*	*23*	*1.15*	*6*	**100**
cis-1,2-Dichloroethene	18,000	18,000	35,000	*1*	*1*	*1*	*1*	*1*	*1*	*1*	**23**	**120**	*1*	*4.95*	*41.5*
Trichloroethene	11	11	22	*1.35*	**24**	**4.7**	*1.35*	**86**	**17**	*1.35*	**860**	**2500**	**70**	**640**	*55*
Vinyl Chloride	140	140	280	*0.65*	*0.65*	*0.65*	*0.65*	*0.65*	*0.65*	*0.65*	*3.85*	*13*	*0.65*	*3.2*	*27*

Notes:
Bold values indicate a detection.
Boxes indicate that the concentration exceeds the site specific soil gas concentration.
Italicized values are 1/2 the detection limit.
[a] Only relevant for slab on grade construction
[b] Assumes residential home with 8-foot basement; attenuation factor calculated from depth below foundation
bls = below land surface
COPC = constituents of potential concern
D = Consitutent identified at a secondary dilution
EPA = U.S. Environmental Protection Agency
µg/m³ = micrograms per cubic meter

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Table 6. Comparison of Soil Vapor and Groundwater VOC Concentrations, Former Grumman Settling Ponds (OU3 - Bethpage Community Park), Bethpage, New York

Sample ID:	SVP-1	SVP-1	SVP-1	VP-7	VP-7	VP-7
Depth (feet bls):	5	15	40	65-70	85-90	105-110
Sample Date:	10/27/2004	10/27/2004	10/27/2004	8/4/04	8/4/04	8/4/04
Constituent / Units:	(µg/m³)	(µg/m³)	(µg/m³)	(µg/L)	(µg/L)	(µg/L)
1,1,1-Trichloroethane	<2.7	**9.8**	<2.7	<5	<5	<5
1,1-dichloroethane	<2	<2	<2	<5	<5	<5
1,1-dichloroethene	<2	<2	<2	<5	<5	<5
1,2,4-Trimethylbenzene	<2.5	**4.9**	**4.5**	. . .	. . .	. . .
1,3-Butadiene	**14**	**29**	**120** D	. . .	. . .	. . .
1,4-Dichlorobenzene	**5.8**	**9**	**9**	. . .	. . .	. . .
2,2,4-Trimethylpentane	<2.3	<2.3	**5.1**	. . .	. . .	. . .
2-Butanone (MEK)	**12**	**15**	**110**	<10	<10	<10
4-Ethyltoluene	<2.5	**5.9**	**6.9**	. . .	. . .	. . .
Acetone	**230** D	**240** D	**1200** D	<10	<10	<10
Benzene	**9.6**	**27**	**77**	<5	<5	<5
Bromomethane	<2.2	<2.2	<2.2	<5	**2**	<5
Carbon disulfide	**10**	**18**	**12**	<5	<5	<5
Carbon tetrachloride	<3.1	<3.1	<3.1	<5	<5	<5
Chlorobenzene	<2.3	<2.3	<2.3	<5	<5	<5
Chloroform	<2.4	<2.4	<2.4	**15**	**8**	<5
Chloromethane	<1	<1	<1	<5	<5	<5
cis-1,2-dichloroethene	<2	<2	<2	<5	<5	**3** J
Cyclohexane	**52**	<1.7	**200** D	. . .	. . .	. . .
Dichlorodifluoromethane	<2.5	<2.5	**3.3**	. . .	. . .	. . .
Ethylbenzene	**3.2**	**7.8**	**17**	<5	<5	<5
Methyl Butyl Ketone	<2	<2	**11**	. . .	. . .	. . .
Methylene Chloride	<1.7	<1.7	<1.7	<5	<5	<5
n-Heptane	**28**	**40**	**110**	. . .	. . .	. . .
n-Hexane	**7.8**	**23**	**81**	. . .	. . .	. . .
Styrene	<2.1	<2.1	<2.1	<5	<5	<5
Tetrachloroethene	**14**	**55**	**22**	**5**	**3**	<5
Toluene	**18**	**41**	**98**	<5	<5	<5
trans-1,2-dichloroethene	<2	<2	<2	<5	<5	<5
Trichloroethene	<2.7	**24**	**4.7**	**1**	<5	**9**
Trichlorofluoromethane	<2.8	<2.8	**5.4**	. . .	. . .	. . .
Vinyl Chloride	<1.3	<1.3	<1.3	<2	<2	<2
Xylene (m,p) [a]	**8.7**	**23**	**31**	<5	<5	<5
Xylene (o)	**3**	**7.4**	**14**	<5	<5	<5

Notes:
Bold values indicate a detection.
Values marked with < were not detected at the reporting limit.
. . . = not analyzed
bls = below land surface
D = Consitutent identified at a secondary dilution.
J = Estimated concentration
µg/L = micrograms per liter
µg/m³ = micrograms per cubic meter
VOC = volatile organic compound

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Table 6. Comparison of Soil Vapor and Groundwater VOC Concentrations, Former Grumman Settling Ponds (OU3 - Bethpage Community Park), Bethpage, New York

Sample ID:	SVP-2		SVP-2		SVP-2		VP-12		VP-12	VP-12	
Depth (feet bls):	5		15		40		70-75		90-95	110-115	
Sample Date:	10/26/2004		10/26/2004		10/27/2004		8/31/04		8/31/04	8/31/04	
Constituent Units:	(μg/m³)		(μg/m³)		(μg/m³)		(μg/L)		(μg/L)	(μg/L)	
1,1,1-Trichloroethane	<2.7		**3.9**		<2.7		<5		<5	<5	
1,1-dichloroethane	<2		<2		<2		<5		<5	<5	
1,1-dichloroethene	<2		<2		<2		<5		<5	<5	
1,2,4-Trimethylbenzene	**4.6**		**6.4**		**6.9**		. . .		. . .	. . .	
1,3-Butadiene	**12**		**35**		**130**	D	. . .		. . .	. . .	
1,4-Dichlorobenzene	**7.8**		**11**		**9.6**		. . .		. . .	. . .	
2,2,4-Trimethylpentane	<2.3		**2.6**		<2.3		. . .		. . .	. . .	
2-Butanone (MEK)	**19**		**14**		**83**		<10		<10	<10	
4-Ethyltoluene	<2.5		<2.5		<2.5		. . .		. . .	. . .	
Acetone	**380**		**170**	D	**1200**	D	<10		**23**	<10	
Benzene	**12**		**31**		**89**		<5		<5	<5	
Bromomethane	<1.9		<1.9		<1.9		<5		<5	<5	
Carbon disulfide	**22**		**56**		**25**		<5		<5	<5	
Carbon tetrachloride	<3.1		<3.1		<3.1		<5		<5	<5	
Chlorobenzene	<2.3		<2.3		<2.3		. . .		. . .	. . .	
Chloroform	<2.4		<2.4		<2.4		**23**		**43**	**35**	
Chloromethane	<1		<1		<1		<5		<5	<5	
cis-1,2-dichloroethene	<2		<2		<2		**860**		**690**	**690**	
Cyclohexane	**52**		**79**		**130**		. . .		. . .	. . .	
Dichlorodifluoromethane	<2.5		<2.5		<2.5		. . .		. . .	. . .	
Ethylbenzene	**4.3**		**11**		**19**		<5		<5	<5	
Methyl Butyl Ketone	**3.6**		<2		9.8		. . .		. . .	. . .	
Methylene Chloride	<1.7		<1.7		<1.7		**7**	J	<5	**8**	J
n-Heptane	<2		**53**		**130**		. . .		. . .	. . .	
n-Hexane	**8.1**		**31**		**120**		. . .		. . .	. . .	
Styrene	<2.1		<2.1		<2.1		<5		<5	<5	
Tetrachloroethene	**14**		**46**		**23**		<5		<5	<5	
Toluene	**21**		**49**		**110**		<5		<5	<5	
trans-1,2-dichloroethene	<2		<2		<2		<5		<5	<5	
Trichloroethene	<2.7		**86**		**17**		**66**		**79**	**110**	
Trichlorofluoromethane	<2.8		<2.8		<2.8		. . .		. . .	. . .	
Vinyl Chloride	<1.3		<1.3		<1.3		<2		<2	<2	
Xylene (m,p) [a]	**14**		**30**		**38**		<5		<5	<5	
Xylene (o)	**4.3**		**8.7**		**15**		<5		<5	<5	

Notes:
Bold values indicate a detection.
Values marked with < were not detected at the reporting limit.
. . . = not analyzed
bls = below land surface
D = Consitutent identified at a secondary dilution.
J = Estimated concentration
μg/L = micrograms per liter
μg/m³ = micrograms per cubic meter
VOC = volatile organic compound

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Table 6. Comparison of Soil Vapor and Groundwater VOC Concentrations, Former Grumman **Settling Ponds** (OU3 - Bethpage Community Park), Bethpage, New York

Sample ID:	SVP-3	SVP-3	SVP-3	VP-4		VP-4		**VP-4**
Depth (feet bls):	5	15	40	65-70		85-90		**105-110**
Sample Date:	10/26/2004	10/26/2004	10/26/2004	8/3/04		8/3/04		**7/30/04**
Constituent / Units:	(μg/m³)	(μg/m³)	(μg/m³)	(μg/L)		(μg/L)		**(μg/L)**
1,1,1-Trichloroethane	<2.7	**150**	**310**	**1**		<5		<5
1,1-dichloroethane	<2	**29**	**160**	**7**		**5**		<5
1,1-dichloroethene	<2	<12	<40	**6**		<5		<5
1,2,4-Trimethylbenzene	**6.4**	<15	<49	...		...		...
1,3-Butadiene	**7.3**	**17**	**110**	...		...		...
1,4-Dichlorobenzene	**9.6**	<18	<60	...		...		...
2,2,4-Trimethylpentane	<2.3	<14	<47	...		...		...
2-Butanone (MEK)	**4.7**	**35**	**56**	<10		<10		<10
4-Ethyltoluene	**6.4**	<15	<49	...		...		...
Acetone	**76**	**330**	**570**	<10		**3**		<10
Benzene	**9.3**	**22**	**83**	<5		<5		<5
Bromomethane	<1.9	<12	<39	**5**		**2**		**4**
Carbon disulfide	**19**	**78**	**65**	<5		<5		<5
Carbon tetrachloride	<3.1	<19	<63	<5		<5		<5
Chlorobenzene	3.5	<14	<46	...		...		...
Chloroform	<2.4	**<15**	<49	<5		**2**		**7**
Chloromethane	**2.3**	<6.2	<21	<5		<5		<5
cis-1,2-dichloroethene	<2	**23**	**120**	**420**	D	**240**	D	**2**
Cyclohexane	**41**	**76**	**220**	...		...		...
Dichlorodifluoromethane	<2.5	<15	<49	...		...		...
Ethylbenzene	**4.8**	<13	<43	<5		<5		<5
Methyl Butyl Ketone	<2	<12	<41	...		...		...
Methylene Chloride	<1.7	<10	<35	**3**		<5		<5
n-Heptane	**23**	**45**	**110**	...		...		...
n-Hexane	**5.3**	**19**	**74**	...		...		...
Styrene	<2.1	<13	<43	<5		<5		<5
Tetrachloroethene	**16**	**81**	**160**	**2**		**3**		<5
Toluene	**20**	**45**	**110**	<5		<5		<5
trans-1,2-dichloroethene	<2	**13**	**40**	**2**		<5		<5
Trichloroethene	<2.7	**860**	**2500**	**94**		**82**		**9**
Trichlorofluoromethane	<2.8	<17	<56	...		...		...
Vinyl Chloride	<1.3	<7.7	<26	**26**		<2		<2
Xylene (m,p) [a]	**17**	**26**	**52**	<5		<5		<5
Xylene (o)	**5.2**	<13	<43	<5		<5		<5

Notes:
Bold values indicate a detection.
Values marked with < were not detected at the reporting limit.
. . . = not analyzed
bls = below land surface
D = Consitutent identified at a secondary dilution.
J = Estimated concentration
μg/L = micrograms per liter
μg/m³ = micrograms per cubic meter
VOC = volatile organic compound

Table 6. Comparison of Soil Vapor and Groundwater VOC Concentrations, Former Grumman Settling Ponds (OU3 - Bethpage Community Park), Bethpage, New York

Sample ID:	SVP-4		SVP-4	SVP-4	VP-2	VP-2	VP-2
Depth (feet bls):	5		15	40	65-70	87-92	105-110
Sample Date:	10/26/2004		10/26/2004	10/26/2004	8/2/04	8/2/04	7/29/04
Constituent Units:	(µg/m3)		(µg/m3)	(µg/m3)	(µg/L)	(µg/L)	(µg/L)
1,1,1-Trichloroethane	**20**		**71**	<110	<5	<5	<5
1,1-dichloroethane	<2		**19**	<85	<5	<5	<5
1,1-dichloroethene	<2		<9.9	<83	<5	<5	<5
1,2,4-Trimethylbenzene	**6.4**		<12	<100	...	...	...
1,3-Butadiene	**24**		**31**	**400**	...	...	...
1,4-Dichlorobenzene	**5.8**		<15	<130	...	...	...
2,2,4-Trimethylpentane	<2.3		<12	<98	...	...	...
2-Butanone (MEK)	**11**		**18**	**270**	**32**	<10	<10
4-Ethyltoluene	**6.4**		<12	<100	...	...	...
Acetone	**86**	D	**140**	**2100**	**5**	<10	<10
Benzene	**29**		**45**	**640**	<5	<5	<5
Bromomethane	<1.9		<9.7	<82	**3**	**2**	**3**
Carbon disulfide	**11**		**17**		<5	<5	<5
Carbon tetrachloride	<3.1		<16	<130	<5	<5	<5
Chlorobenzene	<2.3		<12	**100**	...	...	...
Chloroform	<2.4		<12	<100	<5	<5	**0.9**
Chloromethane	**1.1**		<5.2	<43	<5	<5	<5
cis-1,2-dichloroethene	<2		<9.9	<83	**11**	**5**	**1**
Cyclohexane	**28**		**72**	**260**	...	...	...
Dichlorodifluoromethane	**3.9**		<12	<100	...	...	...
Ethylbenzene	**4.8**		**12**	<91	<5	<5	<5
Methyl Butyl Ketone	<2		<10	<86	...	...	...
Methylene Chloride	<1.7		<8.7	<73	<5	<5	<5
n-Heptane	**21**		**82**	**290**	...	...	...
n-Hexane	**13**		**74**	**340**	...	...	...
Styrene	**2.6**		<11	<89	<5	<5	<5
Tetrachloroethene	**24**		**56**	<140	<5	<5	**0.5**
Toluene	**26**		**64**	**570**	**1**	<5	<5
trans-1,2-dichloroethene	<2		<9.9	<83	<5	<5	<5
Trichloroethene	**70**		**640**	<110	**14**	**10**	**2**
Trichlorofluoromethane	<2.8		<14	<120	...	...	...
Vinyl Chloride	<1.3		<6.4	<54	<2	<2	<2
Xylene (m,p) [a]	**16**		**30**	**140**	<5	<5	<5
Xylene (o)	**5.2**		**11**	<91	<5	<5	<5

Notes:
Bold values indicate a detection.
Values marked with < were not detected at the reporting limit.
. . . = not analyzed
bls = below land surface
D = Consitutent identified at a secondary dilution.
J = Estimated concentration
µg/L = micrograms per liter
µg/m^3 = micrograms per cubic meter
VOC = volatile organic compound

Table 7. Soil Vapor Trend Analysis, Former Grumman Settling Ponds (OU3 - Bethpage Community Park), Bethpage, New York

Constituent	SVP-1 5 feet bls 10/27/04 (µg/m³)	SVP-1 15 feet bls 10/27/04 (µg/m³)	SVP-1 40 feet bls 10/27/04 (µg/m³)	SVP-2 5 feet bls 10/26/04 (µg/m³)	SVP-2 15 feet bls 10/26/04 (µg/m³)	SVP-2 40 feet bls 10/27/04 (µg/m³)	SVP-3 5 feet bls 10/26/04 (µg/m³)	SVP-3 15 feet bls 10/26/04 (µg/m³)	SVP-3 40 feet bls 10/26/04 (µg/m³)	SVP-4 5 feet bls 10/26/04 (µg/m³)	SVP-4 15 feet bls 10/26/04 (µg/m³)	SVP-4 40 feet bls 10/26/04 (µg/m³)
1,1,1-Trichloroethane	*1.35*	**9.8**	*1.35*	*1.35*	**3.9**	*1.35*	*1.35*	**150**	**310**	**20**	**71**	*55*
1,1-Dichloroethane	*1*	*1*	*1*	*1*	*1*	*1*	*1*	**29**	**160**	*1*	**19**	*42.5*
1,1-Dichloroethene	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*6*	*20*	*1*	*4.95*	*41.5*
1,2,4-Trimethylbenzene	*1.25*	**4.9**	**4.5**	**4.6**	**6.4**	**6.9**	**6.4**	*7.5*	*24.5*	**6.4**	*6*	*50*
1,3-Butadiene	**14**	**29**	**120** D	**12**	**35**	**130** D	**7.3**	**17**	**110**	**24**	**31**	**400**
1,4-Dichlorobenzene	**5.8**	**9**	**9**	**7.8**	**11**	**9.6**	**9.6**	*9*	*30*	**5.8**	*7.5*	*65*
2,2,4-Trimethylpentane	*1.15*	*1.15*	**5.1**	*1.15*	**2.6**	*1.15*	*1.15*	*7*	*23.5*	*1.15*	*7.5*	*49*
4-Ethyltoluene	*1.25*	**5.9**	**6.9**	*1.25*	*1.25*	*1.25*	**6.4**	*7.5*	*24.5*	**6.4**	*7.5*	*50*
Acetone	**230** D	**240** D	**1200** D	**380**	**170** D	**1200** D	**76**	**330**	**570**	**86** D	**140**	**2100**
Benzene	**9.6**	**27**	**77**	**12**	**31**	**89**	**9.3**	**22**	**83**	**29**	**45**	**640**
Bromomethane	*0.95*	*0.95*	*0.95*	*0.95*	*0.95*	*0.95*	*0.95*	*6*	*19.5*	*0.95*	*4.85*	*41*
Carbon Disulfide	**10**	**18**	**12**	**22**	**56**	**25**	**19**	**78**	**65**	**11**	**17**	*32.5*
Carbon Tetrachloride	*1.55*	*1.55*	*1.55*	*1.55*	*1.55*	*1.55*	*1.55*	*9.5*	*31.5*	*1.55*	*8*	*65*
Chlorobenzene	*1.15*	*1.15*	*1.15*	*1.15*	*1.15*	*1.15*	**3.5**	*7*	*23*	*1.15*	*6*	**100**
Chloroform	*1.2*	*1.2*	*1.2*	*1.2*	*1.2*	*1.2*	*1.2*	*7.5*	*24.5*	*1.2*	*6*	*50*
Chloromethane	*0.5*	*0.5*	*0.5*	*0.5*	*0.5*	*0.5*	**2.3**	*3.1*	*10.5*	**1.1**	*2.6*	*21.5*
cis-1,2-Dichloroethene	*1*	*1*	*1*	*1*	*1*	*1*	*1*	**23**	**120**	*1*	*4.95*	*41.5*
Cyclohexane	**52**	*0.85*	**200** D	**52**	**79**	**130**	**41**	**76**	**220**	**28**	**72**	**260**
Dichlorodifluoromethane	*1.25*	*1.25*	3.3	*1.25*	*1.25*	*1.25*	*1.25*	*7.5*	*24.5*	**3.9**	*6*	*50*
Ethylbenzene	**3.2**	**7.8**	**17**	**4.3**	**11**	**19**	**4.8**	*6.5*	*21.5*	**4.8**	**12**	*45.5*
Methyl Butyl Ketone	*1*	*1*	**11**	**3.6**	*1*	**9.8**	*1*	*6*	*20.5*	*1*	*5*	*43*
2-Butanone (MEK)	**12**	**15**	**110**	**19**	**14**	**83**	**4.7**	**35**	**56**	**11**	**18**	**270**
Methyl tert-Butyl Ether	**2.3**	**2.9**	**6.1**	**2.3**	**2.5**	**6.1**	*0.9*	*5.5*	*18*	*2.1*	*4.5*	*38*
Methylene Chloride	*0.85*	*0.85*	*0.85*	*0.85*	*0.85*	*0.85*	*0.85*	*5*	*17.5*	*0.85*	*4.35*	*36.5*
n-Heptane	**28**	**40**	**110**	*1*	**53**	**130**	**23**	**45**	**110**	**21**	**82**	**290**
n-Hexane	**7.8**	**23**	**81**	**8.1**	**31**	**120**	**5.3**	**19**	**74**	**13**	**74**	**340**
Styrene	*1.05*	*1.05*	*1.05*	*1.05*	*1.05*	*1.05*	*1.05*	*6.5*	*21.5*	**2.6**	*5.5*	*44.5*
tert-Butyl Alcohol	**19**	**18**	**30**	**16**	*7.5*	**39**	*7.5*	*45.5*	*150*	*7.5*	*38*	*320*
Tetrachloroethene	**14**	**55**	**22**	**14**	**46**	**23**	**16**	**81**	**160**	**24**	**56**	*70*
Toluene	**18**	**41**	**98**	**21**	**49**	**110**	**20**	**45**	**110**	**26**	**64**	**570**
trans-1,2-Dichloroethene	*1*	*1*	*1*	*1*	*1*	*1*	*1*	**13**	**40**	*1*	*4.95*	*41.5*
Trichloroethene	*1.35*	**24**	**4.7**	*1.35*	**86**	**17**	*1.35*	**860**	**2500**	**70**	**640**	*55*
Trichlorofluoromethane	*1.4*	*1.4*	**5.4**	*1.4*	*1.4*	*1.4*	*1.4*	*8.5*	*28*	*1.4*	*7*	*60*
Vinyl Chloride	*0.65*	*0.65*	*0.65*	*0.65*	*0.65*	*0.65*	*0.65*	*3.85*	*13*	*0.65*	*3.2*	*27*
Xylene (m,p)	**8.7**	**23**	**31**	**14**	**30**	**38**	**17**	**26**	**52**	**16**	**30**	**140**
Xylene (o)	**3**	**7.4**	**14**	**4.3**	**8.7**	**15**	**5.2**	*6.5*	*21.5*	**5.2**	**11**	*45.5*

Notes:
Bold values indicate a detection.
Boxes indicate concentration outside expected trend
Italicized values are 1/2 the detection limit.
bls = below land surface
D = Consitutent identified at a secondary dilution.
µg/m³ = micrograms per cubic meter

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Table 8. Concentrations of VOCs Detected in Ambient Air and Sample Tubing
Former Grumman Settling Ponds (OU3 - Bethpage Community Park), Bethpage, New York

Constituent		Ambient Air [a]		Ambient Tube 1 [b]		Ambient Air 2 [c]	
		ppbv	µg/m³	ppbv	µg/m³	ppbv	µg/m³
1,1,1-Trichloroethane		0.5 U	2.7 U	0.5 U	2.7 U	0.5 U	2.7 U
1,1,2,2-Tetrachloroethane		0.5 U	3.4 U	0.5 U	3.4 U	0.5 U	3.4 U
1,1,2-Trichloroethane		0.5 U	2.7 U	0.5 U	2.7 U	0.5 U	2.7 U
1,1-Dichloroethane		0.5 U	2 U	0.5 U	2 U	0.5 U	2 U
1,1-Dichloroethene		0.5 U	2 U	0.5 U	2 U	0.5 U	2 U
1,2,4-Trichlorobenzene		0.5 U	3.7 U	0.5 U	3.7 U	0.5 U	3.7 U
1,2,4-Trimethylbenzene	[d]	0.5 U	2.5 U	**1.5**	**7.4**	**2.7**	**13**
1,2-Dibromoethane		0.5 U	3.8 U	0.5 U	3.8 U	0.5 U	3.8 U
1,2-Dichlorobenzene		0.5 U	3 U	0.5 U	3 U	0.5 U	3 U
1,2-Dichloroethane		0.5 U	2 U	0.5 U	2 U	0.5 U	2 U
1,2-Dichloropropane		0.5 U	2.3 U	0.5 U	2.3 U	0.5 U	2.3 U
1,2-Dichlorotetrafluoroethane		0.5 U	3.5 U	0.5 U	3.5 U	0.5 U	3.5 U
1,3,5-Trimethylbenzene		0.5 U	2.5 U	0.5 U	2.5 U	**0.62**	**3**
1,3-Butadiene	[d]	0.5 U	1.1 U	0.5 U	1.1 U	0.5 U	1.1 U
1,3-Dichlorobenzene		0.5 U	3 U	0.5 U	3 U	0.5 U	3 U
1,4-Dichlorobenzene	[d]	0.5 U	3 U	0.5 U	3 U	**0.56**	**3.4**
2,2,4-Trimethylpentane	[d]	0.5 U	2.3 U	**0.65**	**3**	0.5 U	2.3 U
2-Chlorotoluene		0.5 U	2.6 U	0.5 U	2.6 U	0.5 U	2.6 U
3-Chloropropene		0.5 U	1.6 U	0.5 U	1.6 U	0.5 U	1.6 U
4-Ethyltoluene	[d]	0.5 U	2.5 U	**1.8**	**8.8**	**2.2**	**11**
Benzene	[d]	0.5 U	1.6 U	**1.1**	**3.5**	**0.83**	**2.7**
Bromodichloromethane		0.5 U	3.4 U	0.5 U	3.4 U	0.5 U	3.4 U
Bromoethene		0.5 U	2.2 U	0.5 U	2.2 U	0.5 U	2.2 U
Bromoform		0.5 U	5.2 U	0.5 U	5.2 U	0.5 U	5.2 U
Bromomethane		0.5 U	1.9 U	0.5 U	1.9 U	0.5 U	1.9 U
Carbon Disulfide		0.5 U	1.6 U	0.5 U	1.6 U	0.5 U	1.6 U
Carbon Tetrachloride		0.5 U	3.1 U	0.5 U	3.1 U	0.5 U	3.1 U
Chlorobenzene		0.5 U	2.3 U	0.5 U	2.3 U	0.5 U	2.3 U
Chloroethane		0.5 U	1.3 U	0.5 U	1.3 U	0.5 U	1.3 U
Chloroform		0.5 U	2.4 U	0.5 U	2.4 U	0.5 U	2.4 U
Chloromethane	[d]	0.5 U	1 U	**0.83**	**1.7**	0.5 U	1 U
cis-1,2-Dichloroethene		0.5 U	2 U	0.5 U	2 U	0.5 U	2 U
cis-1,3-Dichloropropene		0.5 U	2.3 U	0.5 U	2.3 U	0.5 U	2.3 U
Cyclohexane	[d]	0.5 U	1.7 U	**31**	**110**	**26**	**89**
Dibromochloromethane		0.5 U	4.3 U	0.5 U	4.3 U	0.5 U	4.3 U
Dichlorodifluoromethane	[d]	**0.89**	**4.4**	**1.2**	**5.9**	**1.1**	**5.4**
Ethylbenzene		0.5 U	2.2 U	**2**	**8.7**	**1.5**	**6.5**
Freon TF		0.5 U	3.8 U	0.5 U	3.8 U	0.5 U	3.8 U
Hexachlorobutadiene		0.5 U	5.3 U	0.5 U	5.3 U	0.5 U	5.3 U
Methylene Chloride		0.5 U	1.7 U	0.5 U	1.7 U	0.5 U	1.7 U
n-Heptane	[d]	0.5 U	2 U	**8.3**	**34**	**6.7**	**27**
n-Hexane	[d]	0.5 U	1.8 U	**1.8**	**6.3**	**1.7**	**6**
Styrene	[d]	0.5 U	2.1 U	0.5 U	2.1 U	0.5 U	2.1 U
Tetrachloroethene		0.5 U	3.4 U	**2.7**	**18**	**2.1**	**14**
Toluene		0.5 U	1.9 U	**8.3**	**31**	**6.2**	**23**
trans-1,2-Dichloroethene		0.5 U	2 U	0.5 U	2 U	0.5 U	2 U
trans-1,3-Dichloropropene		0.5 U	2.3 U	0.5 U	2.3 U	0.5 U	2.3 U
Trichloroethene		0.5 U	2.7 U	0.5 U	2.7 U	0.5 U	2.7 U
Trichlorofluoromethane	[d]	0.5 U	2.8 U	0.5 U	2.8 U	0.5 U	2.8 U
Vinyl Chloride		0.5 U	1.3 U	0.5 U	1.3 U	0.5 U	1.3 U
Xylene (m,p)		0.5 U	2.2 U	**7.2**	**31**	**5.6**	**24**
Xylene (o)		0.5 U	2.2 U	**2.2**	**9.6**	**1.8**	**7.8**

Notes:
Bold values indicate a detection.
[a] Sample collected of ambient air with no tubing attached
[b] Sample collected of ambient air with polyethylene tubing
[c] Sample collected of ambient air with polyethylene and VITON tubing
[d] Constituent detected in soil gas, but not previously detected in groundwater
µg/m³ = micrograms per cubic meter
ppbv = parts per billion volume
U = Chemical not detected, detection limit reported
VOC = volatile organic compound

ad Version : R16.2s (LMS Tech)
er Name : ehughes

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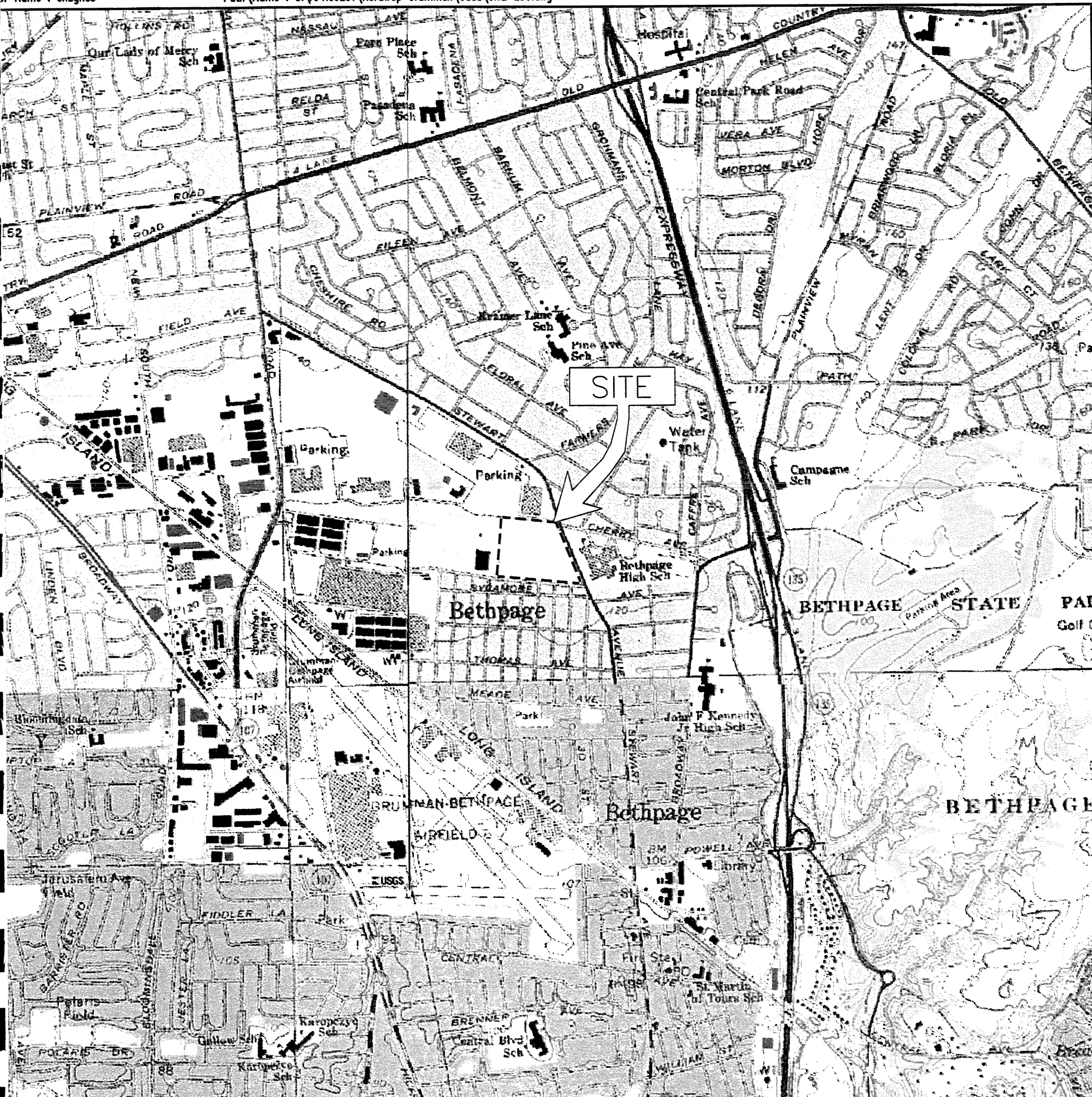
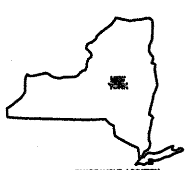
Path\Name : G:\APROJECT\Northrop Grumman\Cadd\SITE-LOC.dwg





EXPLANATION

— — — PROPERTY BOUNDARY

SOURCE: USGS 7.5 MIN. AMITYVILLE QUADRANGLE, AMITYVILLE, NY. 1994
USGS 7.5 MIN. FREEPORT QUADRANGLE, FREEPORT, NY. NASSAU CO., 1994
USGS 7.5 MIN. HICKSVILLE QUADRANGLE, HICKSVILLE, NY. NASSAU CO., 1967, PHOTOREVISED 1979
USGS 7.5 MIN. HUNTINGTON QUADRANGLE, HUNTINGTON, NY. 1967, PHOTOREVISED 1979

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PROJECT MANAGER C. SAN GIOVANNI	DEPARTMENT MANAGER M. WOLFEERT	LEAD DESIGN PROF.	CHECKED BY D. STERN
SHEET TITLE SITE LOCATION OPERABLE UNIT 3 FORMER GRUMMAN SETTLING PONDS BETHPAGE, NEW YORK		TASK/PHASE NUMBER 00005	DRAWN BY T. PERRET
		PROJECT NUMBER NY001348.0104	DRAWING NUMBER 1

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Appendix A

Groundwater Data

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Table A-1. VOC Concentrations in On-Site Wells and VPB Groundwater Samples, Former Grumman Settling Ponds (OU3 - Bethpage Community Park), Bethpage, New York.

CONSTITUENT (units in ug/L)	NYSDEC SCGs	Sample ID: Depth bls: Date:	BCPMW-1 (1) (55-72) 06/19/2003	BCPMW-1 (1) (55-72) 09/12/2003	BCPMW-1 (1) (55-72) 11/25/2003	B30MW-1 (55-72) 12/08/2004	BCPMW-2 (1) (55-72) 06/19/2003	BCPMW-2 (1) (55-72) 09/12/2003	BCPMW-2 (1) (55-72) 11/25/2003	BCPMW-3 (1) (55-72) 06/19/2003	BCPMW-3 (1) (55-72) 09/12/2003	BCPMW-3 (1) (55-72) 11/25/2003	BCPMW-3 (55-72) 12/08/2004
Site-Related VOCs													
1,1,1-Trichoroethane	5		<5	<5	<5	...	<5	<5	<5	<5	6	<5	...
1,1-Dichloroethane	5		<5	<5	<5	...	18	18	16	<5	10	18	...
1,1-Dichloroethene	5		<5	<5	<5	...	<5	<5	<5	<5	11	44	...
Carbon disulfide	50		<5	<5	<5	...	<5	<5	<5	<5	<5	<5	...
Carbon tetrachloride	5		<5	<5	<5	...	<5	<5	<5	<5	<5	<5	...
Chloroethane	5		<5	<5	<5	...	<5	<5	<5	<5	<5	<5	...
Chloroform	5		4	3	2	...	<5	2	<5	<5	6	<5	...
cis-1,2-Dichloroethene	5		4	6	5	...	120	150	120	5300	2900	5200	...
trans-1,2-Dichloroethene	5		<5	<5	<5	...	<5	<5	<5	<5	2	<5	...
Tetrachloroethene	5		<5	<5	<5	...	<5	2	<5	<5	<5	<5	...
Trichloroethene	5		83	76	60	...	230	280	210	620	760	1800	...
Trichlorotrifluoroethane	5		<5	<5	<5	...	<5	<5	<5	<5	<5	<5	...
Vinyl Chloride	2		<2	<2	<2	...	<2	<2	<2	<2	6	70	...
Other VOCs													
Ethylbenzene	5		<5	<5	<5	...	<5	<5	<5	<5	<5	<5	...
1,2-Dichloropropane	1		<5	<5	<5	...	<5	<5	<5	<5	<5	<5	...
Xylenes	5		<5	<5	<5	...	<5	<5	<5	<5	<5	<5	...
Toluene	5		<5	<5	<5	...	<5	<5	<5	<5	<5	<5	...
2-Butanone (MEK)	50		<10	<10	<10	...	<10	<10	<10	<10	<10	<10	...
Acetone	50		<10	<10	<10	...	<10	<10	<10	<10	<10	<10	...
Bromomethane	5		<5	<5	<5	...	<5	<5	<5	<5	<5	<5	...
Methylene Chloride	50		<5	<5	<5	...	<5	<5	<5	<5	<5	<5	...
Chloromethane	NE		<5	<5	<5		<5	<5	<5	<5	<5	<5	...
1,3-Butadiene	NE		...	...	...	<1	...	...	...	...	...	...	<1
Total VOCs	--		91	85	67	<1	368	452	346	5,920	3,701	7,132	<1

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Table A-1. VOC Concentrations in On-Site Wells and VPB Groundwater Samples, Former Grumman Settling Ponds (OU3 - Bethpage Community Park), Bethpage, New York.

CONSTITUENT (units in ug/L)	NYSDEC SCGs	Sample ID: / Depth bls: / Date:	VP-1 (67-72) 07/28/2004	VP-1 (85-90) 07/28/2004	VP-1 (105-110) 07/28/2004	VP-2 (65-70) 08/02/2004	VP-2 (87-92) 08/02/2004	VP-2 (105-110) 07/29/2004	VP-3 (65-70) 07/30/2004	VP-3 (85-90) 07/30/2004	VP-3 (110-115) 07/30/2004	VP-4 (65-70) 08/03/2004	VP-4 (85-90) 08/03/2004	VP-4 (105-110) 07/30/2004
Site-Related VOCs														
1,1,1-Trichoroethane	5		<5	<5	<5	<5	<5	<5	0.6	<5	<5	1	<5	<5
1,1-Dichloroethane	5		<5	<5	<5	<5	<5	<5	1	<5	<5	7	5	<5
1,1-Dichloroethene	5		<5	<5	<5	<5	<5	<5	2	<5	<5	6	<5	<5
Carbon disulfide	50		<5	<5	<5	<5	<5	<5	1	<5	<5	<5	<5	<5
Carbon tetrachloride	5		<5	<5	<5	<5	<5	<5	0.5	<5	<5	<5	<5	<5
Chloroethane	5		<5	<5	<5	<5	<5	<5	0.7	<5	<5	<5	<5	<5
Chloroform	5		<5	<5	<5	<5	<5	0.9	4	19	4	<5	2	7
cis-1,2-Dichloroethene	5		29	<5	<5	11	5	1	160	70	2	420 D	240 D	2
trans-1,2-Dichloroethene	5		<5	<5	<5	<5	<5	<5	1	<5	<5	2	<5	<5
Tetrachloroethene	5		<5	0.9	0.5	<5	<5	0.5	5	2	0.3	2	3	<5
Trichloroethene	5		3	<5	<5	14	10	2	5	6	3	94	82	9
Trichlorotrifluoroethane	5		<5	<5	<5	<5	<5	<5	0.8	<5	<5	<5	<5	<5
Vinyl Chloride	2		<2	<2	<2	<2	<2	<2	18	5	<2	26	<2	<2
Other VOCs														
Ethylbenzene	5		<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
1,2-Dichloropropane	1		<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Xylenes	5		<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Toluene	5		<5	<5	<5	1	<5	<5	0.5	<5	<5	<5	<5	<5
2-Butanone (MEK)	50		<10	<10	<10	32	<10	<10	<10	<10	<10	<10	<10	<10
Acetone	50		3	4	<10	5	<10	<10	6	<10	<10	<10	3	<10
Bromomethane	5		<5	3	2	3	2	3	2	4	2	5	2	4
Methylene Chloride	50		5	0.3	<5	<5	<5	<5	1	0.3	<5	3	<5	<5
Chloromethane	NE		<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
1,3-Butadiene	NE		...	...	...	...	...	...	...	...	...	...	...	...
Total VOCs	--		**40**	**8**	**3**	**66**	**17**	**7**	**209**	**106**	**11**	**566**	**337**	**22**

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Table A-1. VOC Concentrations in On-Site Wells and VPB Groundwater Samples, Former Grumman Settling Ponds (OU3 - Bethpage Community Park), Bethpage, New York.

CONSTITUENT (units in ug/L)	NYSDEC SCGs	Sample ID: / Depth bls: / Date:	VP-5 (65-70) 08/04/2004	VP-5 (85-90) 08/04/2004	VP-5 (105-110) 07/30/2004	VP-6 (65-70) 08/05/2004	VP-6 (85-90) 08/05/2004	VP-6 (105-110) 08/05/2004	VP-7 (65-70) 08/04/2004	VP-7 (85-90) 08/04/2004	VP-7 (105-110) 08/04/2004	VP-8 (75-80) 09/23/2004	VP-8 (95-100) 09/23/2004	VP-8 (115-120) 09/22/2004
Site-Related VOCs														
1,1,1-Trichoroethane	5		<5	<5	<5	<5	<5	<5	<5	<5	<5	6	<5	<5
1,1-Dichloroethane	5		<5	2	2	<5	<5	<5	<5	<5	<5	<5	<5	<5
1,1-Dichloroethene	5		<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Carbon disulfide	50		<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Carbon tetrachloride	5		<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Chloroethane	5		<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Chloroform	5		<5	3	15	34	58	17	15	8	<5	37	4	4
cis-1,2-Dichloroethene	5		62 D	690	240 D	2	3	54	<5	<5	3 J	10	81	28
trans-1,2-Dichloroethene	5		<5	1	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Tetrachloroethene	5		2	2	<5	2	2	<5	5	3	<5	<5	<5	<5
Trichloroethene	5		12	69	80	2	2	24	1	<5	9	10	47	11
Trichlorotrifluoroethane	5		<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Vinyl Chloride	2		<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
Other VOCs														
Ethylbenzene	5		<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
1,2-Dichloropropane	1		<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Xylenes	5		<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Toluene	5		<5	<5	<5	2	<5	<5	<5	<5	<5	<5	<5	<5
2-Butanone (MEK)	50		5	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Acetone	50		4	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Bromomethane	5		<5	<5	3	<5	<5	<5	<5	2	<5	<5	<5	<5
Methylene Chloride	50		<5	<5	3	<5	<5	<5	<5	<5	<5	<5	<5	<5
Chloromethane	NE		<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
1,3-Butadiene	NE		...	...	...	...	...	...	...	...	...	...	...	...
Total VOCs	--		85	767	343	42	65	95	21	13	12	63	132	43

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Table A-1. VOC Concentrations in On-Site Wells and VPB Groundwater Samples, Former Grumman Settling Ponds (OU3 - Bethpage Community Park), Bethpage, New York.

CONSTITUENT (units in ug/L)	NYSDEC SCGs	Sample ID: / Depth bls: / Date:	VP-8 (135-140) 09/21/2004	VP-8 (155-160) 09/21/2004	VP-8 (175-180) 09/21/2004	VP-8 (204-209) 09/20/2004	VP-8 (226-231) 09/17/2004	VP-8 (235-240) 09/17/2004	VP-8 (255-260) 09/16/2004	VP-8 (275-280) 09/16/2004	VP-8 (296-301) 09/10/2004	VP-9 (65-70) 08/27/2004	VP-9 (75-80) 08/26/2004	VP-9 (95-100) 08/26/2004
Site-Related VOCs														
1,1,1-Trichoroethane	5		<5	<5	<5	<5	<5	<5	<5	<5	<5	3	<5	<5
1,1-Dichloroethane	5		<5	<5	<5	<5	<5	<5	<5	<5	<5	2	<5	<5
1,1-Dichloroethene	5		<5	<5	<5	<5	<5	<5	<5	<5	<5	1	<5	<5
Carbon disulfide	50		<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Carbon tetrachloride	5		<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Chloroethane	5		<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Chloroform	5		0.7	2	12	1	1	2	<5	<5	0.7	1	2	13
cis-1,2-Dichloroethene	5		8	<5	<5	<5	<5	<5	<5	<5	<5	96	9	2
trans-1,2-Dichloroethene	5		<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Tetrachloroethene	5		<5	<5	<5	<5	<5	6	13	4	5	<5	<5	<5
Trichloroethene	5		6	3	7	14	13	2	3	6	7	190	30	7
Trichlorotrifluoroethane	5		<5	<5	<5	<5	<5	<5	<5	<5	<5	3	<5	<5
Vinyl Chloride	2		<2	<2	<2	<2	<2	<2	<2	<2	<2	7	2	<2
Other VOCs														
Ethylbenzene	5		<5	<5	<5	<5	<5	<5	<5	<5	<5	3	0.8	<5
1,2-Dichloropropane	1		<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Xylenes	5		<5	<5	<5	<5	<5	<5	<5	<5	<5	4	2	<5
Toluene	5		<5	<5	<5	<5	<5	<5	<5	<5	<5	43	16	<5
2-Butanone (MEK)	50		<10	<10	<10	<10	<10	<10	<10	<10	<10	3	<10	<10
Acetone	50		<10	<10	<10	<10	<10	<10	<10	<10	<10	8	<10	<10
Bromomethane	5		<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Methylene Chloride	50		<5	<5	<5	<5	<5	<5	<5	<5	<5	3	<5	<5
Chloromethane	NE		<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
1,3-Butadiene	NE		...	...	...	...	...	...	...	...	...	...	...	...
Total VOCs	--		**15**	**5**	**19**	**15**	**14**	**10**	**16**	**10**	**13**	**367**	**62**	**22**

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Table A-1. VOC Concentrations in On-Site Wells and VPB Groundwater Samples, Former Grumman Settling Ponds (OU3 - Bethpage Community Park), Bethpage, New York.

CONSTITUENT (units in ug/L)	NYSDEC SCGs	Sample ID: / Depth bls: / Date:	VP-9 (115-120) 08/26/2004	VP-9 (135-140) 08/25/2004	VP-9 (153-158) 08/25/2004	VP-9 (175-180) 08/23/2004	VP-9 (195-200) 08/20/2004	VP-9 (215-220) 08/19/2004	VP-9 (235-240) 08/19/2004	VP-9 (255-260) 08/18/2004	VP-9 (296-301) 08/17/2004	VP-10 (65-70) 08/23/2004	VP-10 (85-90) 08/20/2004
Site-Related VOCs													
1,1,1-Trichoroethane	5		<5	<5	<5	<5	<5	<5	<5	<5	<5	0.7	<5
1,1-Dichloroethane	5		<5	<5	<5	<5	<5	<5	<5	<5	<5	2	<5
1,1-Dichloroethene	5		<5	<5	<5	<5	<5	<5	<5	<5	<5	1	<5
Carbon disulfide	50		<5	<5	<5	<5	<5	<5	<5	1 J	<5	<5	<5
Carbon tetrachloride	5		<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Chloroethane	5		<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Chloroform	5		8	0.7	<5	<5	<5	<5	<5	<5	<5	2	11
cis-1,2-Dichloroethene	5		<5	<5	<5	<5	<5	<5	<5	<5	<5	160	15 J
trans-1,2-Dichloroethene	5		<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Tetrachloroethene	5		<5	<5	<5	<5	<5	<5	2 J	2 J	2 J	4	<5
Trichloroethene	5		2	<5	<5	<5	1 J	3 J	4 J	5 J	5 J	47	13 J
Trichlorotrifluoroethane	5		<5	<5	<5	<5	<5	<5	<5	2 J	2 J	<5	<5
Vinyl Chloride	2		<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
Other VOCs													
Ethylbenzene	5		<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
1,2-Dichloropropane	1		<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Xylenes	5		<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Toluene	5		2	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
2-Butanone (MEK)	50		4	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Acetone	50		<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Bromomethane	5		<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Methylene Chloride	50		<5	<5	<5	<5	<5	<5	3 J	2 J	<5	<5	<5
Chloromethane	NE		<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
1,3-Butadiene	NE		...	...	...	...	...	...	...	...	...	...	...
Total VOCs	--		16	1	0	0	1	3	9	12	9	217	39

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Table A-1. VOC Concentrations in On-Site Wells and VPB Groundwater Samples, Former Grumman Settling Ponds (OU3 - Bethpage Community Park), Bethpage, New York.

CONSTITUENT (units in ug/L)	NYSDEC SCGs	Sample ID: Depth bls: Date:	VP-10 (105-110) 08/20/2004	VP-10 (125-130) 08/19/2004	VP-10 (145-150) 08/19/2004	VP-11 (65-70) 08/31/2004	VP-11 (85-90) 08/31/2004	VP-11 (105-110) 08/31/2004	VP-11 (125-130) 08/30/2004	VP-11 (145-150) 08/30/2004	VP-12 (70-75) 08/31/2004	VP-12 (90-95) 08/31/2004
Site-Related VOCs												
1,1,1-Trichoroethane	5		<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
1,1-Dichloroethane	5		<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
1,1-Dichloroethene	5		<5	<5	<5	1 J	8 J	2 J	<5	<5	<5	<5
Carbon disulfide	50		<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Carbon tetrachloride	5		<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Chloroethane	5		<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Chloroform	5		5	8	2 J	<5	<5	7	6	0.7 J	23	43
cis-1,2-Dichloroethene	5		2	2 J	4 J	68	280	150	3 J	<5	860	690
trans-1,2-Dichloroethene	5		<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Tetrachloroethene	5		<5	<5	<5	3 J	<5	<5	2 J	<5	<5	<5
Trichloroethene	5		6	4 J	6	16	100	48	71	4 J	66	79
Trichlorotrifluoroethane	5		<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Vinyl Chloride	2		<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
Other VOCs												
Ethylbenzene	5		<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
1,2-Dichloropropane	1		<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Xylenes	5		<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Toluene	5		<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
2-Butanone (MEK)	50		<10	<10	<10	<5	<5	<5	<10	<10	<10	<10
Acetone	50		<10	<10	<10	<10	<10	<10	<10	<10	<10	23
Bromomethane	5		<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Methylene Chloride	50		<5	<5	<5	<5	<5	<5	<5	<5	7 J	<5
Chloromethane	NE		<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
1,3-Butadiene	NE		...	...	...	...	...	...	...	...	...	...
Total VOCs	--		13	14	12	88	388	207	82	5	956	835

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Table A-1. VOC Concentrations in On-Site Wells and VPB Groundwater Samples, Former Grumman Settling Ponds (OU3 - Bethpage Community Park), Bethpage, New York.

CONSTITUENT (units in ug/L)	NYSDEC SCGs	Sample ID: / Depth bls: / Date:	VP-12 (110-115) 08/31/2004	VP-12 (130-135) 08/30/2004	VP-12 (150-155) 08/30/2004	VP-13 (92-97) 01/13/2005	VP-13 (105-110) 01/12/2005	VP-13 (2) (60-65) 1/26/2005	VP-13 (2) (70-75) 1/26/2005	VP-13 (2) (80-85) 1/26/2005	VP-14 (65-70) 01/11/2005	VP-14 (75-80) 01/11/2005
Site-Related VOCs												
1,1,1-Trichoroethane	5		<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
1,1-Dichloroethane	5		<5	<5	<5	<5	<5	<5	<5	<5	<5	2 J
1,1-Dichloroethene	5		<5	<5	<5	<5	<5	<5	<5	<5	<5	0.9 J
Carbon disulfide	50		<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Carbon tetrachloride	5		<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Chloroethane	5		<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Chloroform	5		35	5	14	2 J	<5	100	110	56	26	23
cis-1,2-Dichloroethene	5		690	2 J	1	31	0.5 J	2 J	1 J	<5	220 D	580 D
trans-1,2-Dichloroethene	5		<5	<5	<5	<5	<5	<5	<5	<5	<5	2 J
Tetrachloroethene	5		<5	<5	<5	<5	<5	1 J	1 J	<5 B	0.5 J	1 J
Trichloroethene	5		110	4 J	6	23	2 J	2 J	1 J	0.7 J	21	46
Trichlorotrifluoroethane	5		<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Vinyl Chloride	2		<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
Other VOCs												
Ethylbenzene	5		<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
1,2-Dichloropropane	1		<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Xylenes	5		<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Toluene	5		<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
2-Butanone (MEK)	50		<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Acetone	50		<10	<10	<10	<10	<10	20	<10	<10	<10	<10
Bromomethane	5		<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Methylene Chloride	50		8	<5	<5	<5	<5	<5	<5	<5	<5	<5
Chloromethane	NE		<5	<5	<5	<5	<5	<5	<5	<5	<5	1 J
1,3-Butadiene	NE		...	...	...	...	...	...	...	...	...	...
Total VOCs	--		843	11	21	56	3	125	113	57	268	656

See footnotes on last page.

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Table A-1. VOC Concentrations in On-Site Wells and VPB Groundwater Samples, Former Grumman Settling Ponds (OU3 - Bethpage Community Park), Bethpage, New York.

CONSTITUENT (units in ug/L)	NYSDEC SCGs	Sample ID: / Depth bls: / Date:	VP-14 (85-90) 01/11/2005	VP-14 (95-100) 01/10/2005	VP-14 (105-110) 01/07/2005	VP-14 (115-120) 01/07/2005	VP-15 (65-70) 01/06/2005	VP-15 (75-80) 01/06/2005	VP-15 (85-90) 01/05/2005	VP-15 (95-100) 01/05/2005	VP-15 (105-110) 01/04/2005	VP-16 (65-70) 01/03/2005
Site-Related VOCs												
1,1,1-Trichoroethane	5		<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
1,1-Dichloroethane	5		3 J	2 J	2 J	<5	2 J	2 J	<5	<5	<5	3 J
1,1-Dichloroethene	5		1 J	0.6 J	0.8 J	<5	<5	<5	<5	<5	<5	<5
Carbon disulfide	50		<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Carbon tetrachloride	5		<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Chloroethane	5		<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Chloroform	5		27	60	83	24	1 J	2 J	4 J	9	18	2 J
cis-1,2-Dichloroethene	5		650 D	240 D	370 D	73	630 D	600 D	230 D	1 J	11	530 D
trans-1,2-Dichloroethene	5		2 J	0.7 J	1 J	<5	1 J	1 J	<5	<5	<5	0.8 J
Tetrachloroethene	5		1 J	0.7 J	1 J	<5	0.8 J	0.6 J	<5	<5	<5	0.7 J
Trichloroethene	5		69	53	72	25	34	54	22	1 J	10	73
Trichlorotrifluoroethane	5		<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Vinyl Chloride	2		<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
Other VOCs												
Ethylbenzene	5		<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
1,2-Dichloropropane	1		<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Xylenes	5		<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Toluene	5		<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
2-Butanone (MEK)	50		<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Acetone	50		<10	<10	20	11	<10	<10	<10	<10	<10	<10
Bromomethane	5		<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Methylene Chloride	50		<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Chloromethane	NE		<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
1,3-Butadiene	NE		...	...	...	...	...	...	...	...	...	...
Total VOCs	--		753	357	550	133	669	660	256	11	39	610

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Table A-1. VOC Concentrations in On-Site Wells and VPB Groundwater Samples, Former Grumman Settling Ponds (OU3 - Bethpage Community Park), Bethpage, New York.

CONSTITUENT (units in ug/L)	NYSDEC SCGs	Sample ID: / Depth bls: / Date:	VP-16 (75-80) 01/03/2005	VP-16 (85-90) 12/21/2004	VP-16 (95-100) 12/21/2004	VP-16 (105-110) 12/17/2004	VP-17 (65-70) 11/23/2004	VP-17 (75-80) 11/23/2004	VP-17 (85-90) 11/23/2004	VP-17 (95-100) 11/22/2004	VP-17 (105-110) 11/22/2004	VP-18 (65-70) 11/30/2004
Site-Related VOCs												
1,1,1-Trichoroethane	5		<5	<5	<5	<5	<5	<5	<5	<5	<5	11
1,1-Dichloroethane	5		3 J	5	1 J	<5	6	6	4 J	<5	<5	12
1,1-Dichloroethene	5		<5	<5	<5	<5	0.5 J	<5	<5	<5	<5	10
Carbon disulfide	50		<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Carbon tetrachloride	5		<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Chloroethane	5		<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Chloroform	5		5 J	3 J	5	13	1 J	2 J	3 J	7	5 J	3 J
cis-1,2-Dichloroethene	5		400 D	660 D	33	3 J	350 D	430 D	270 D	22	1 J	2800 D
trans-1,2-Dichloroethene	5		0.9 J	1 J	<5	<5	1 J	1 J	<5	<5	<5	8
Tetrachloroethene	5		0.7 J	1 J	<5	<5	0.9 J	0.9 J	<5	<5	<5	1 J
Trichloroethene	5		54	77	20	13	140	150	72	17	10	150 D
Trichlorotrifluoroethane	5		<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Vinyl Chloride	2		<2	<2	<2	<2	<2	<2	<2	<2	<2	0.8 J
Other VOCs												
Ethylbenzene	5		<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
1,2-Dichloropropane	1		<5	<5	<5	<5	<5	<5	<5	<5	<5	1 J
Xylenes	5		<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Toluene	5		<5	<5	<5	<5	<5 B	<5 B	<5 B	<5 B	<5 B	<5 B
2-Butanone (MEK)	50		<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Acetone	50		<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Bromomethane	5		<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Methylene Chloride	50		<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Chloromethane	NE		<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
1,3-Butadiene	NE		...	...	...	...	...	...	...	...	...	...
Total VOCs	--		464	747	59	29	499	590	349	46	16	2,997

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Table A-1. VOC Concentrations in On-Site Wells and VPB Groundwater Samples, Former Grumman Settling Ponds (OU3 - Bethpage Community Park), Bethpage, New York.

CONSTITUENT (units in ug/L)	NYSDEC SCGs	Sample ID: / Depth bls: / Date:	VP-18 (75-80) 11/30/2004	VP-18 (85-90) 11/29/2004	VP-18 (95-100) 11/29/2004	VP-18 (105-110) 11/23/2004	VP-19 (65-70) 12/17/2004	VP-19 (75-80) 12/02/2004	VP-19 (85-90) 12/02/2004	VP-19 (95-100) 12/15/2004	VP-19 (105-110) 12/15/2004	VP-20 (65-70) 12/02/2004
Site-Related VOCs												
1,1,1-Trichoroethane	5		<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
1,1-Dichloroethane	5		4 J	<5	<5	<5	<5	<5	<5	<5	<5	0.9 J
1,1-Dichloroethene	5		<5	<5	<5	<5	<5	<5	<5	<5	<5	0.7 J
Carbon disulfide	50		<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Carbon tetrachloride	5		<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Chloroethane	5		<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Chloroform	5		3 J	4 J	7	6	8	8	13	10	9	1 J
cis-1,2-Dichloroethene	5		36	5	4 J	2 J	0.6 J	0.5 J	2 J	2 J	0.5 J	54
trans-1,2-Dichloroethene	5		<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Tetrachloroethene	5		<5	<5	<5	<5	<5	<5	<5	<5	<5	<5 H
Trichloroethene	5		22	5	9	3 J	3 J	3 J	4 J	3 J	1 J	290
Trichlorotrifluoroethane	5		<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Vinyl Chloride	2		<2	<2	<2	<2	<2	<2	<2	<2	<2	0.6 J
Other VOCs												
Ethylbenzene	5		<5	<5	<5	<5	<5	<5	<5	<5	<5	<5 H
1,2-Dichloropropane	1		<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Xylenes	5		<5	<5	<5	<5	<5	<5	<5	<5	<5	1 J
Toluene	5		<5 B	<5 B	<5 B	<5 B	<5	<5 B	<5 B	<5	<5	14
2-Butanone (MEK)	50		<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Acetone	50		<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Bromomethane	5		<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Methylene Chloride	50		<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Chloromethane	NE		<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
1,3-Butadiene	NE		...	...	...	...	...	...	...	...	...	...
Total VOCs	--		**65**	**14**	**20**	**11**	**12**	**12**	**19**	**15**	**11**	**362**

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Table A-1. VOC Concentrations in On-Site Wells and VPB Groundwater Samples, Former Grumman Settling Ponds (OU3 - Bethpage Community Park), Bethpage, New York.

CONSTITUENT (units in ug/L)	NYSDEC SCGs	Sample ID: / Depth bls: / Date:	VP-20 (75-80) 12/02/2004	VP-20 (85-90) 12/02/2004	VP-20 (95-100) 12/01/2004	VP-20 (105-110) 12/01/2004
Site-Related VOCs						
1,1,1-Trichoroethane	5		<5	<5	<5	<5
1,1-Dichloroethane	5		<5	<5	<5	<5
1,1-Dichloroethene	5		<5	<5	<5	<5
Carbon disulfide	50		<5	<5	<5	<5
Carbon tetrachloride	5		<5	<5	<5	<5
Chloroethane	5		<5	<5	<5	<5
Chloroform	5		8	4 J	11	5
cis-1,2-Dichloroethene	5		0.8 J	0.6 J	3 J	1 J
trans-1,2-Dichloroethene	5		<5	<5	<5	<5
Tetrachloroethene	5		<5	<5	<5	<5
Trichloroethene	5		3 J	3 J	15	9
Trichlorotrifluoroethane	5		<5	<5	<5	<5
Vinyl Chloride	2		<2	<2	<2	<2
Other VOCs						
Ethylbenzene	5		<5	<5	<5	<5
1,2-Dichloropropane	1		<5	<5	<5	<5
Xylenes	5		<5	<5	<5	<5
Toluene	5		<5	<5	<5	<5
2-Butanone (MEK)	50		<5	<10	<10	<10
Acetone	50		<10	<10	<10	<10
Bromomethane	5		<5	<5	<5	<5
Methylene Chloride	50		<5	<5	<5	<5
Chloromethane	NE		<5	<5	<5	<5
1,3-Butadiene	NE		...	...	...	...
Total VOCs	--		12	8	29	15

Table A-1. VOC Concentrations in On-Site Wells and VPB Groundwater Samples, Former Grumman Settling Ponds (OU3 - Bethpage Community Park), Bethpage, New York.

(1)	Data obtained from Table B-5, Investigation Sampling Program, Bethpage Community Park (Dvirka & Bartilucci, 2003).
[box]	Exceeds associated SCG value
Bold	Detected compound
bls	below land surface
J	Estimated Value
D	Constituent quantified at a secondary dilution.
H	Alternate peak was selected upon review by the laboratory analyst.
NYSDEC SCG	New York State Department of Environmental Conservation Standards Criteria and Guidance Values.
. . .	Not Analyzed
NE	Not Established
B	Constituent also identified in associated blank sample.
ug/L	Micrograms per liter.