Department of Environmental Conservation

Division of Environmental Remediation

Record of Decision

Nassau Uniform Service Site
Freeport, Nassau County, New York
Site Number 1-30-063

March 2007

New York State Department of Environmental Conservation
ELIOT SPITZER, *Governor*

DECLARATION STATEMENT - RECORD OF DECISION

Nassau Uniform Service Inactive Hazardous Waste Disposal Site
Freeport, Town of Hempstead, Nassau County, New York
Site No. 1-30-063

Statement of Purpose and Basis

The Record of Decision (ROD) presents the selected remedy for the Nassau Uniform Service site, a Class 2 inactive hazardous waste disposal site. The selected remedial program was chosen in accordance with the New York State Environmental Conservation Law and is not inconsistent with the National Oil and Hazardous Substances Pollution Contingency Plan of March 8, 1990 (40CFR300), as amended.

This decision is based on the Administrative Record of the New York State Department of Environmental Conservation (the Department) for the Nassau Uniform Service inactive hazardous waste disposal site, and the public's input to the Proposed Remedial Action Plan (PRAP) presented by the Department. A listing of the documents included as a part of the Administrative Record is included in Appendix B of the ROD.

Assessment of the Site

Actual or threatened releases of hazardous waste constituents from this site, if not addressed by implementing the response action selected in this ROD, presents a current or potential significant threat to public health and/or the environment.

Description of Selected Remedy

Based on the results of the Remedial Investigation (RI) and supplemental investigations for the Nassau Uniform Service site and the criteria identified for evaluation of alternatives, the Department has selected excavation of a limited amount of contaminated soils in the vicinity of the oil/water separator on the northern side of the site, modification and operation of an existing soil vapor extraction system (SVES) to treat soil and soil vapor contamination, modification of an existing groundwater extraction and treatment system (GETS) to treat contaminated on-site groundwater and continued evaluation of potential vapor intrusion to off-site properties. The components of the remedy are as follows:

1. A soil excavation will be performed by the oil/water separator to remove semi-volatile organic compounds (SVOC) and inorganic contamination in the surface and sub-surface soils.

2. The existing on-site soil vapor extraction system will be modified to improve system performance.
3. After the initial modifications to the SVES have been implemented, soil vapor and indoor and outdoor air sampling will be conducted to further evaluate the performance of the modified system.

4. The existing on-site groundwater extraction and treatment system (GETS) will be modified. The treated groundwater will be discharged to the adjacent saltwater canal. The treatment system will treat on-site groundwater contamination and reduce the amount of contaminated groundwater that will discharge to the surface water and sediments in the adjacent saltwater canal.

5. Imposition of an institutional control in the form of an environmental easement that will require: a) compliance with the approved site management plan; b) restricting use of groundwater as a source of potable water or process water, without necessary water quality treatment as determined by NYSDOH; c) the property owner to complete and submit to the Department a periodic certification of institutional and engineering controls; and d) limiting site usage to restricted residential.

6. Development of a site management plan which will include the following institutional and engineering controls: a) excavated soil would be tested, properly handled to protect the health and safety of workers and the nearby community, and would be properly managed in a manner acceptable to the Department; b) continued evaluation of the potential for vapor intrusion for any buildings developed at the site in the future, including provision for mitigation if necessary; c) continued evaluation of the potential for vapor intrusion at nearby off-site structures, including provision for mitigation, if necessary, d) monitoring of groundwater, air effluent from the SVES and GETS, and water effluent from the GETS, e) identification of any use restrictions on the site; f) provisions for the continued operation and maintenance of the components of the remedy; and g) if the site building should be demolished for future restricted residential development, additional characterization of the soil beneath the building will be required and an appropriate cover system will be implemented, if necessary.

7. The property owner will provide a periodic certification of the institutional and engineering controls, prepared and submitted by a professional engineer or such other expert acceptable to the Department, until the Department notifies the property owner in writing that this certification is no longer needed. This submittal will: a) contain certification that the institutional controls and engineering controls put in place are still in place and are either unchanged from the previous certification or are compliant with Department-approved modifications; b) allow the Department access to the site; and c) state that nothing has occurred that would impair the ability of the control to protect public health or the environment, or constitute a violation or failure to comply with the site management plan unless otherwise approved by the Department.

New York State Department of Health Acceptance

The New York State Department of Health (NYSDOH) concurs that the remedy selected for this site is protective of human health.

Declaration

The selected remedy is protective of human health and the environment, complies with State and Federal requirements that are legally applicable or relevant and appropriate to the remedial action to the extent practicable, and is cost effective. This remedy utilizes permanent solutions and alternative treatment or resource recovery technologies, to the maximum extent practicable, and satisfies the preference for remedies that reduce toxicity, mobility, or volume as a principal element.

MAR 30 2007

Date

Dale A. Desnoyers, Director
Division of Environmental Remediation

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RECORD OF DECISION

Nassau Uniform Service Site
Freeport, Town of Hempstead, Nassau County,} New York
Site No. 1-30-063
March 2007

SECTION 1: SUMMARY OF THE RECORD OF DECISION

The New York State Department of Environmental Conservation (the Department), in consultation with the New York State Department of Health (NYSDOH), has selected this remedy for the Nassau Uniform Service (NUS) Site. The presence of hazardous waste has created significant threats to human health and/or the environment that are addressed by this remedy. As more fully described in Sections 3 and 5 of this document, leakage from a partially buried indoor waste oil/solvent storage tank, leakage from former dry cleaning machines, and spills by a hole in the compressor room floor, by the outdoor garbage disposal area, and by the outdoor oil/water separator resulted in the disposal of hazardous wastes, including waste chlorinated solvents consisting primarily of tetrachloroethene (PCE), the solvent used in former dry cleaning operations. These wastes have contaminated the soils, groundwater, and to a lesser degree, the sediments in the adjacent saltwater canal, and resulted in:

- a significant threat to human health associated with potential exposure to contaminated soils, groundwater, and vapor.
- a significant environmental threat associated with the potential impacts of contaminants to benthic organisms living in the adjacent surface water body and underlying sediments.
- a significant threat to the environment associated with the groundwater contamination of the underlying sole source aquifer.

To eliminate or mitigate these threats, the Department has selected excavation of a limited amount of contaminated soils in the vicinity of the oil/water separator on the northern side of the site, modification and operation of an existing soil vapor extraction system (SVES) to treat soil and soil vapor contamination, modification of an existing groundwater extraction and treatment system (GETS) to treat contaminated on-site groundwater and continued evaluation of potential vapor intrusion to off-site properties.

The selected remedy, discussed in detail in Section 8, is intended to attain the remediation goals identified for this site in Section 6. The remedy must conform with officially promulgated standards and criteria that are directly applicable, or that are relevant and appropriate. The selection of a remedy must also take into consideration guidance, as appropriate. Standards, criteria and guidance are hereafter called SCGs.

SECTION 2: SITE LOCATION AND DESCRIPTION

The NUS site is a 0.5 acre site located at 525 Ray Street in the western-most portion of Freeport located in an area slightly south of Atlantic Avenue. Figure 1 is an aerial photograph that illustrates the site location. It is bounded on the west by a man-made tidal canal, on the north by industrial properties, and on the east and south by residential properties. A new residential development is being constructed to the northwest of the site at the western end of Ray Street. The short saltwater canal adjacent to the site flows into Milburn Creek (see Figure 1). This creek is classified as a Class SC water body from the mouth of the creek to Merrick Road. The creek flows south to Freeport Bay.

The site geology consists of 3.5 to 8 feet of fill that was placed above a discontinuous layer of organic marsh sediments (peat) that is one or two feet thick in some locations. Before development, the site was apparently part of the marsh on the eastern bank of Milburn Creek. Beneath the organic peat layer, fine to medium and coarse-grained quartz sands contain various amounts of gravel. Fine sands, silt and traces of clay were encountered at 33' to 53' below ground surface (bgs). The clay was gray in color and not continuous.

The tidal action in the adjacent man-made, saltwater canal affects the groundwater flow direction at the site. The direction of groundwater flow during a low tide is predominantly toward the canal (west). As the tide floods, the direction of groundwater flow gradually changes and becomes predominantly to the south as high tide approaches. The groundwater beneath the western part of the site is brackish at locations near the canal due to saltwater intrusion. The creek water rises approximately five feet from a low tide to high tide. The extent of the rise and fall of the water table at the site is determined primarily by the distance from the tidal canal. For the main source area by a former waste storage tank that is approximately 27 feet from the bulkhead, the depth to the water table from the ground surface at that location varied between approximately four feet and six and one-half feet; a change of about two and one-half feet.

There are six additional east-west, man-made canals located south of the site. Figure 2 shows their locations with respect to the site. These canals are on the east side of Milburn Creek that flows to the south-southeast and discharges into Freeport Bay. The locations of these canals would cause tidal effects on the groundwater that is east of Milburn Creek and south and south-southeast of the site. The shallow groundwater near these water bodies would be expected to be brackish.

SECTION 3: SITE HISTORY

3.1: Operational/Disposal History

NUS is a uniform supply company that has operated at this location since the early 1960s. Figure 3 is a general site plan that includes features of interest on the ground floor of the site building. In the past, uniforms were dry cleaned in two large dry cleaning/degreasing machines using tetrachloroethene, the most common solvent used for dry cleaning. However, all dry cleaning was terminated more than four years ago and all cleaning is now done with washing machines using detergents. The wash water is discharged to the community sewer system.

On April 27, 1990, an indoor 2,000 gallon waste oil/PCE tank, which was partially buried in the ground, was removed. A limited amount of contaminated soils was excavated from beneath the tank. During tank removal activities, PCE contamination was detected in soil and groundwater samples collected from the site. This former tank area was the primary source of the soil and groundwater contamination. Spills to the exposed surface soils were also evident near the outdoor garbage disposal area in the northwest corner of the site. Discharge of waste liquids to a hole in the floor of the compressor room and solvent leakage from the two dry cleaning machines appeared to also have contributed to the soil and groundwater contamination.

On March 11, 2002, a blockage in a sewer line at the site caused wastewater from laundry operations inside the site building to overflow from an on-site oil/water separator located outside the north wall of the building. The wastewater flowed to a nearby stormwater catch basin on the south side of Ray Street and flowed by underground stormwater sewer piping to the adjacent saltwater canal. Waste oils and solvents were found in the discharged water. Sediments and sludges that had collected in the oil/water separator contained significant concentrations of oil and solvent contamination. These sediments/sludges are apparently the source of the contamination detected in the wastewater. Prior spills associated with the oil/water separator have impacted the soils in close proximity to the unit.

3.2: Remedial History

In 1993, the Department listed the site as a Class 2 site in the Registry of Inactive Hazardous Waste Disposal Sites in New York. A Class 2 site is a site where hazardous waste presents a significant threat to the public health or the environment and action is required.

In July 1984, a tank test for a 2,000 gallon underground gasoline storage tank located outside the eastern side of the site building suggested potential leakage from the tank. The tank was removed and was discovered to have leaked. Three monitoring wells were installed to monitor this spill. The spill was closed in December 1998.

For the leaking waste oil/solvent tank that was removed in 1990, additional soil samples were collected in December 1991 from beneath the former tank location. Significant residual soil contamination was present. In September 1994, a Phase II Investigation was performed to further define the extent of the residual soil and groundwater contamination.

As a result of the March 2002 spill, approximately three cubic yards of contaminated sediments in the oil/water separator and in the nearby catch basin were removed.

SECTION 4: ENFORCEMENT STATUS

Potentially Responsible Parties (PRPs) are those who may be legally liable for contamination at a site. This may include past or present owners and operators, waste generators, and haulers.

The PRP for the site, documented to date, is the owner/operator of the site.

The NYSDEC and the Nassau Uniform Service, Inc. entered into a Consent Order on March 31, 1997. This Order obligates the responsible parties to implement a remedial investigation (RI) to define the extent of the on-site portion of the contamination and to implement an interim remedial measure to treat the on-site soil and groundwater contamination.

Nassau Uniform Services, Inc. entered into a subsequent Consent Order on May 8, 2000 to investigate the source of PCE detected in the oil/water separator unit.

Nassau Uniform Services, Inc. entered into another Consent Order on August 2, 2001 which resolved violations of 6 NYCRR Part 232.

Nassau Uniform Services, Inc. also entered into another consent order on March 11, 2003 to resolve violations of 6 NYCRR Part 373 and Part 232. As a result of this consent order, an investigation was performed to further evaluate the releases associated with the backup of the sanitary system in March 2002.

SECTION 5: SITE CONTAMINATION

A remedial investigation (RI) and numerous supplemental investigations have been conducted to determine the extent of the site-related contamination, both on-site and off-site. Three interim remedial measures were implemented to address most of the on-site portion of the contamination.

5.1: Summary of the Site Investigations

The purpose of the site investigations was to define the nature and extent of the contamination resulting from previous activities at the site. The RI was conducted in two phases between July 1997 and May 1998. The field activities and findings of both phases of the investigation are described in the RI report. The RI soil sampling locations are illustrated on Figure 4. The RI groundwater sampling locations are illustrated on Figure 5.

The following activities were conducted during the Phase One RI:

- Installation of 15 interior soil borings and 8 exterior soil borings to collect one shallow soil sample per boring in the interval from two to four feet below ground surface (bgs) to determine soil quality slightly above the water table;
- Soil vapor readings were collected in each of the above shallow soil borings;
- A soil sample was collected from beneath the hole in the compressor room floor;
- A sediment sample was collected from a dry well in the front of the facility;
- Soil samples at various depths were collected from a deep soil boring to 53 feet bgs by the location of the former waste oil/PCE tank to determine the vertical extent of the soil contamination and the underlying lithology;

- Four soil samples were collected from a deep off-site soil boring located south-southwest of the former tank area near the downgradient property border to determine whether contaminants were migrating towards the adjacent residential development (condominiums);

- The above deep borings discussed in the previous two bullets were each finished as deep groundwater monitoring wells to monitor deep groundwater quality. Two water table wells were also constructed at these same locations to evaluate shallow water quality;

- One of the existing monitoring wells (MW-1) from the 1984 gasoline tank removal was sampled to evaluate water quality in the vicinity of this former tank;

- A former, shallow supply well next to the dry cleaning machines was sampled;

- Collection of a water sample from the floor trench that received wastewater from the washing machines; and

- Groundwater flow direction was calculated during different tidal stages to determine how much the groundwater flow direction was affected by tidal action.

The following activities were conducted during the Phase Two RI:

- Three shallow soil samples were collected at 2' - 4' bgs by the outside garbage disposal area to better define the nature and extent of the soil contamination in this area;

- Three soil samples were collected from three soil borings north of the building near the oil/water separator to better define the soil contamination in this area;

- Five soil samples were collected slightly above the water table from five soil borings in the area near the dry cleaning machines to define the soil contamination in this area;

- Five additional borings, one upgradient and four south and west of the source areas identified in Phase One, were used to construct five additional monitoring wells. Soils cores were retrieved at selected intervals to determine the underlying lithology;

- Nine soil samples were collected from the above five monitoring well borings based on field screening readings of the soil cores to help define the mass of the contaminants above and below the water table; and

- The five existing wells and the five new wells were sampled to determine groundwater quality throughout the site.

Supplemental sampling was performed at various times based on data gaps that became evident based on the previous results, as follows:

- Between March 2000 and May 2000, six soil vapor samples from six separate borings were collected to determine whether soil vapor migration from the site to nearby properties was occurring. Figure 6 illustrates the sampling locations.

- On September 27, 2000, another round of groundwater samples was collected.

- On April 29, 2002, sediment and water samples were collected at six locations in the saltwater canal and interconnected Milburn Creek to determine impacts from the site on these surface water bodies. Figure 7 illustrates the sampling locations.

- In June 2003, the NYSDOH collected indoor air samples from selected residential properties east and south of the site to further evaluate potential impacts to indoor air quality.

- In July 2006, three outdoor soil vapor monitoring wells were installed and sampled by northwest, northeast, and southwest corners of the building to further evaluate whether soil vapor was migrating from the site. This investigation also included some additional soil sampling in the vicinity of the oil/water separator. The sampling locations are illustrated in Figure 8.

5.1.1: Standards, Criteria, and Guidance (SCGs)

To determine whether the soil, groundwater, soil vapor, creek water, and creek sediments contain contamination at levels of concern, data from the investigation were compared to the following SCGs:

- Groundwater, drinking water, and surface water SCGs are based on the Department's "Ambient Water Quality Standards and Guidance Values" and Part 5 of the New York State Sanitary Code.

- Soil SCGs are based on the Department's Cleanup Objectives ("Technical and Administrative Guidance Memorandum [TAGM] 4046; Determination of Soil Cleanup Objectives and Cleanup Levels" and 6 NYCRR Subpart 375-6 - Remedial Program Soil Cleanup Objectives).

- Sediment SCGs are based on the NYSDEC "Technical Guidance for Screening Contaminated Sediments."

- A sediment cleanup criterion for total dichloroethene in a saltwater environment was calculated by the NYSDEC.

- A sediment cleanup criterion for vinyl chloride was calculated for freshwater since saltwater guidance values for this compound were not available. The more restrictive freshwater criterion was then used to evaluate the detections of this compound in a saltwater environment.

- Concentrations of VOCs in air were evaluated using the air guidelines provided in the NYSDOH guidance document titled "Guidance for Evaluating Soil Vapor Intrusion in the State of New York," dated October 2006. For PCE, guidance values in Matrix 2 of this guidance document that are based on an air guideline value of 100 micrograms per cubic meter ($\mu g/m^3$) were used. For TCE, guidance values in Matrix 1 that are based on an air guideline value of 5 $\mu g/m^3$ were used.

- For other contaminants besides PCE and TCE, concentrations of VOCs in air were compared to typical background levels of VOCs in indoor and outdoor air using the background levels provided in the NYSDOH guidance document titled "Guidance for Evaluating Soil Vapor Intrusion in the State of New York," dated October 2006. The background levels are not SCGs and are used only as a general tool to assist in data evaluation.

Based on the RI results, in comparison to the SCGs and potential public health and environmental exposure routes, certain media and areas of the site require remediation. These are summarized in Section 5.1.2.

5.1.2: Nature and Extent of Contamination

This section describes the findings of the investigation for all environmental media that were investigated.

Many environmental samples (soil, groundwater, sediment, soil vapor, and indoor air quality samples) were collected during the two phases of the RI and in supplemental sampling events to characterize the nature and extent of contamination. As summarized in Tables 1, 2 and 3, the main category of contaminants that exceed their SCGs are primarily volatile organic compounds (VOCs). Some areas were also contaminated with semivolatile organic compounds (SVOCs) and inorganics (metals). For comparison purposes, where applicable, SCGs are provided for each medium.

The primary VOCs of concern are chlorinated solvents related to the former dry cleaning operations at the site. Tetrachloroethene (PCE) is the primary contaminant. However, trichloroethene (TCE), dichloroethene (DCE) and vinyl chloride, breakdown products resulting from the partial degradation of PCE, are also present at significant concentrations.

Other VOCs detected at low or trace concentrations in environmental samples are most likely attributable to the washing and dry cleaning of chemically contaminated uniforms and rags. The most prevalent of these other VOCs found at low concentrations were petroleum-related aromatic hydrocarbons such as toluene, ethylbenzene, and xylenes. Some of these contaminants may be remnants of the 1984 gasoline spill.

Acetone and methylene chloride were detected at trace or low concentrations in many of the environmental samples. These detections may be the result of laboratory contamination, since both compounds were also detected in method blank and trip blank samples.

Some SVOCs related to the discharge of waste oils have been detected. Waste oils were discharged in the vicinity of the former waste oil/PCE tank, around the garbage disposal area in the northwest corner of the site, in a hole in the compressor room floor, and by the oil/water separator.

Some phthalates have been detected in a few areas at low or trace concentrations. Of these phthalates, only bis(2-ethylhexyl)phthalate was detected slightly above its respective cleanup objectives.

Some inorganic contamination was discovered in the northwest corner of the property by the garbage disposal area. Elevated concentrations of cadmium, chromium, copper, lead, mercury, nickel and zinc were found in the shallow soils in this area. Visual observations suggested that someone in the general vicinity of the site may have regularly disposed of what appeared to be sand blasting wastes contaminated with flecks of paints in this area. Some limited inorganic contamination was detected in the soils near the oil/water separator.

As mentioned earlier, PCE is the primary contaminant at the NUS site. This contaminant is persistent and is only slightly soluble in groundwater. Since PCE is more dense than water and is only slightly soluble in water, it will tend to sink vertically downward in the aquifer due to gravity when discharged at high concentrations. The pockets of high concentration product that develop are known as Dense Non-Aqueous Phase Liquids (DNAPL). PCE tends to adsorb on to the finer particles in the aquifer making it difficult to effectively remove it from the groundwater.

Chemical concentrations are reported in soil, sediments, groundwater, surface water and air samples in parts per billion (ppb) for water, parts per million (ppm) for waste, soil, and sediment. Air samples are reported in micrograms per cubic meter ($\mu g/m^3$).

Table 1 summarizes the degree of contamination for the contaminants of concern in surface soils, subsurface soils, and creek sediments. Table 2 summarizes the degree of contamination in groundwater, and compares contaminant concentrations found in 1997, 2001 and 2005. Table 3 summarizes the degree of VOC contamination in surface water. All three tables compare the data with the SCGs for the site. The following are the media which were investigated and a summary of the findings of the investigation.

Surface Soil

Almost the entire site is paved or covered by the site building. Surface soil contamination was an issue in the northwest corner of the site by the garbage disposal area. Surface discharges of waste solvents were evident in this area. Additionally, elevated concentrations of heavy metals, such as cadmium, chromium, copper, iron, lead, mercury, nickel and zinc above typical background concentrations were detected in this area. The surface soils in this area have already been remediated by excavating the soils and disposing of them at an approved off-site location. See Section 5.2.1 for further details.

Supplemental surface soil samples that were collected in July 2006 in the vicinity of the oil/water separator detected oil-related SVOCs. Surface soil contamination in this area will be addressed in the remedy selection process.

Subsurface Soil

The main source of contamination was the former waste oil/PCE tank located inside the western portion of the building. A 1997 soil boring at the tank location identified significant concentrations of PCE in the soils below the water table in this area. The highest concentrations of PCE in soils at this location were detected at 1,300 ppm at 2'-4' bgs, at 580 ppm at 10'-12' bgs, and at 190 ppm PCE at 14'-16' bgs. Field screening and soil sampling during the RI suggests that the contamination below the tank has moved vertically downward to approximately 40' bgs.

The concentrations detected in soil and subsequent groundwater samples by the tank location and the fact that the contaminants have migrated vertically downward in the aquifer in this area all indicate that DNAPL was present. This data indicates that the highest residual mass in the groundwater is located below the former tank.

Significant concentrations of PCE were also detected in the soils at a location near the northern dry cleaning machine (sample location 18-I at 2'-4' detected 1,600 ppm PCE, see Figure 4), which may also be indicative of some DNAPL at this location.

Besides the former tank location discussed earlier in this section, the subsurface soils above the water table were found to be contaminated with PCE at significant concentrations in the following areas:

1) Under the garbage disposal area (sample location 23E).

2) Under a hole in the floor of the compressor room.

3) In the subsurface soils north of the site building near the oil/water separator unit (RI sample location 21E and July 2006 sample location SS-6). See Figures 4 and 8.

4) In the machine room and adjacent compressor room near the former locations of the two large dry cleaning machines (sample locations 8-I, 9-I, 10-I, 11-I, 12-I, 16-I, 17-I, 18-I, and 19-I).

5) Under a floor trench that carries waste water from washing machines. The Department's compliance inspector for this facility collected two samples under the floor trench near the former location of the north dry cleaning machine. PCE was detected in the north sample at 23 ppm and at 2.9 ppm in the south sample.

The subsurface soils by the garbage disposal area and the oil/water separator were/are also impacted by oil related SVOCs and heavy metals.

Figure 4 illustrates the subsurface soil sampling locations in the RI. Figure 8 shows the July 2006 sampling locations. Table 1 illustrates the range of concentrations detected in the RI.

Most of the impacted sub-surface soils by the garbage disposal area were removed during the soil excavation IRM that is discussed in Section 5.2.1. However, there was some residual VOC contamination in this area that was subsequently addressed by the SVES IRM discussed under Section 5.2.2.

The VOC impacted sub-surface soils in the source area and in the other five areas are currently being addressed by the SVES IRM discussed under Section 5.2.2.

The residual SVOC and heavy metal contamination by the oil/water separator will be addressed in the remedy selection process.

Groundwater

The groundwater flow direction is affected by the tidal conditions in the adjacent man-made canal on the western property border. Some flow to and from the adjacent saltwater body is apparently the predominant flow pattern. The bulkhead is old and has gaps in it that allow groundwater to discharge to the canal at low tides.

Based on groundwater sampling near the southern property border, groundwater flow to the south in the shallow portion of the aquifer is not appreciable. This may be due to other man-made canals running east-west that are located to the south of the site. Figure 2 shows the locations of nearby water bodies.

The groundwater throughout the western portion of the site is contaminated with PCE and related breakdown products (TCE, DCE, and vinyl chloride). These contaminants make up the majority of the groundwater contamination. As discussed above under "Subsurface Soil", the former presence of DNAPL in the sources area resulted in some vertical migration downward in groundwater to approximately 40' bgs.
To a lesser extent, petroleum-related VOCs and SVOCs, including xylenes, benzene, ethylbenzene, toluene, isopropylbenzene, n-propylbenzene, sec-butylbenzene, and naphthalene, have been detected above applicable groundwater standards. Earlier groundwater samples also detected some limited contamination by methylene chloride, acetone, phenol, and bis(2-ethylhexyl) phthalate at concentrations above groundwater standards.

Iron has been detected in both upgradient and downgadient groundwater samples at concentrations above the groundwater standard. Naturally occurring iron-rich deposits are common on Long Island. Consequently, the elevated detections of iron in groundwater may not be attributable to releases at the Nassau Uniform site.

Since on-site groundwater contamination in the western half of the site did not appreciably decrease during groundwater sampling events between 1994 and 2002 and only very limited concentrations were detected in the surface water in the adjacent canal in 2002, it is suspected that groundwater in the shallow aquifer moves back and forth under the western portion of the site near the groundwater source areas resulting in essentially the same groundwater shifting locations with the tides. The freshwater/saltwater interface may be at least partially responsible for this condition. This effect means that there was little actual discharge to the adjacent

saltwater body. This condition is beneficial in that, under the current conditions, there is little impact to the adjacent saltwater body, as will be discussed in the next section, and there is little migration of the groundwater contaminants towards the residential properties bordering the site on the south. Additionally, these conditions should reduce the volume of contaminated groundwater that would require treatment.

Significant improvement in groundwater quality was seen in the groundwater sampling event in March 2005. Some of this improvement is due to the treatment of soils impacted with chlorinated solvents by the SVES IRM that was initiated in August 2003. See Section 5.2.2 for further details. Table 2 gives a comparison between concentrations prior to remediation, as indicated by sampling rounds in August 1997 and March 2001, and concentrations after the removal of 262 pounds of contaminants from the subsurface soils, as indicated in the March 2005 sampling event. PCE was detected in the March 2005 sampling event in 7 out of 10 samples at concentrations up to 9,400 ppb. In 2005, TCE was also detected in 7 out of 10 samples up to 3,300 ppb. Cis 1,2-DCE, detected up to 1,900 ppb, and vinyl chloride, detected up to 280 ppb, were also significant contaminants that were detected during the March 2005 sampling event.

Although significant improvement was seen in the March 2005 sampling event in the shallow portion of the aquifer, the deeper groundwater at the south, downgradient property border, as indicated by the detections in deep monitoring well MW-3, have increased. In March 2005, a total of 377 ppb of chlorinated solvents was detected in MW-3. This indicates that some of the contaminants have migrated deeper in the aquifer since the initial groundwater sampling rounds.

On-site groundwater contamination identified during the RI and supplemental investigations is being addressed by the GETS IRM discussed under Section 5.2.3.

Surface Water

In 2002, one upgradient and five downgradient surface water samples were collected from the adjacent east-west canal and at various locations in Milburn Creek. Figure 7 illustrates the six sampling locations. It should be noted that sample location number 5 is not illustrated on this figure. Sample 5 was collected by buoy N-14 where Milburn Creek meets Freeport Bay. Of these six samples, only surface water sample CRK-1 that was collected immediately adjacent to the bulkhead for this site contained any site-related contaminants. PCE was detected at 22 ppb, above the NYSDEC guidance value of 1 ppb for this compound in class SC surface waters. Additionally, toluene was detected in this sample at 6 ppb, a concentration below the 92 ppb guidance value for SC waters. Benzene was detected at 0.7 ppb, a concentration below the 190 ppb guidance value for SC waters. However, since toluene and benzene are constituents found in gasoline and the canal is used for the docking of motor boats fueled by gasoline, there are potential sources of these contaminants other than the NUS site. Finally, 21 ppb of MTBE, a gasoline additive, was found in this surface water sample. There is no listed guidance value for MTBE for SC waters. Since MTBE was not detected during the RI, this contaminant is believed to be attributable to gasoline powered boats that use the canal.

The low concentrations of PCE detected in surface water sample CRK-1 do not warrant remediation. Therefore, no remedial alternatives need to be evaluated for surface water. The

GETS IRM discussed under Section 5.2.2. is treating the on-site groundwater contamination thereby reducing the amount of future site-related contaminants that would discharge to the adjacent surface water body.

Sediments

In 2002, one upgradient and five downgradient sediment samples were collected in the adjacent saltwater canal and at various locations in Milburn Creek at the same sample locations as the surface water samples (See Figure 7). Similar to the surface water results, only sediment sample CRK-1 that was collected at a location immediately adjacent to the site bulkhead contained any site-related contaminants. No PCE was detected. However, 3,830 ppb of cis 1,2-DCE, 550 ppb of vinyl chloride, and 18 ppb of trans 1,2-DCE were detected in this sediment sample and are considered to be site-related breakdown products.

Under saltwater conditions with an estimated 2% total organic carbon content, the site specific cleanup goal for the total sum of all of the isomers of dichloroethene in sediments for chronic exposures has been calculated as 4,300 ppb. Consequently, the only sediment sample with a detection of these compounds (3,848 ppb total DCE) is below the cleanup criteria.

There are no existing guidance values for vinyl chloride in saltwater that could be used to calculate a sediment criterion for this compound. A freshwater concentration for this compound has been calculated as 470 ppb. However, saltwater cleanup objectives are generally higher than those for freshwater. Consequently, although the only detection of vinyl chloride in sediments (550 ppb) was above the freshwater sediment cleanup objective, this concentration would be below the less restrictive cleanup objective for saltwater sediments.

The presence of only breakdown products in this sample indicates that natural biodegradation processes are at least partially degrading the contaminants. It should be noted that the GETS IRM discussed under Section 5.2.2. is treating the on-site groundwater contamination thereby reducing the amount of future site-related contaminants that would discharge to the adjacent sediments.

It has been concluded that no site-related sediment contamination of concern was identified during the 2002 investigation. Therefore, no remedial alternatives need to be evaluated for sediments.

Soil Vapor/Subslab Vapor/Air

Soil vapor samples were collected at six locations in March 2000 and May 2000 at four feet below ground surface. Five of them were collected in the driveway/parking area for the Water's Edge condominium complex located immediately adjacent to the site and one was collected in the northeastern corner of the site. Figure 6 illustrates the soil vapor sampling locations. No site-related contaminants were detected in these samples. However, it should be noted that the sampling methodology used was not capable of detecting very low concentrations of contaminants.

In June 2003, indoor air samples were collected by NYSDOH and NCDOH representatives using passive organic vapor monitoring badges inside some residences in close proximity to the site. Additionally, the representatives of the health departments also collected several outdoor air samples near to the site. All sample results were non-detect or within normal background levels.

In July 2006, three soil vapor monitoring wells were installed and sampled according to current sampling protocols with lower detection limits than the 2000 samples. These outdoor wells were installed by the northeast, northwest, and southwest corners of the site building. Figure 9 shows the sample locations and the concentrations detected in the July 2006 samples. The soil vapor concentrations by the southwest and northeast corners are elevated. To a lesser extent, the soil vapor concentrations by the northwest corner of the building are also elevated.

Soil vapor contamination is being partially addressed by the SVES IRM discussed under Section 5.2.2. However, the July 2006 soil vapor sampling indicates that either this system needs to be modified and/or additional remedial or mitigative measures will be needed to address this soil vapor contamination. This contamination will be addressed in the remedy selection process.

5.2: Interim Remedial Measures

An interim remedial measure (IRM) is conducted at a site when a source of contamination or exposure pathway can be effectively addressed before completion of the site investigations.

Three IRMs have been used to address surface soil, sub-surface soil, on-site groundwater and soil vapor contamination, as follows:

1) Northwest soil excavation: A limited soil excavation was performed in the northwestern portion of the site by the garbage disposal area to remediate soils that were impacted primarily by heavy metals and chlorinated solvents.

2) Soil vapor extraction system (SVES): Two separate extraction systems have been used in the past and are currently being used again to treat VOC contaminated soils and soil vapor above the water table under the western half of the site building and in a narrow strip of land immediately north of the site building.

3) Groundwater extraction and treatment system (GETS): On-site groundwater in the western half of the site that is contaminated with VOCs is being treated by extracting the groundwater with three extraction wells.

The subsequent sections provide further details on each of the IRMs.

5.2.1: Northwest Soil Excavation

On November 23, 1999, approximately 50 tons of contaminated soils were excavated from the northwestern corner of the site. A 16' x 15' rectangular area was excavated between the north wall of the building and the Ray Street roadway to an approximate depth of four feet. The soil in this area was contaminated primarily with both heavy metals and chlorinated solvents. This area was treated separately from other impacted areas due to the presence of heavy metals that would have made an in-situ treatment option ineffective for this area. The source of the heavy metal contamination was unknown. It is possible the other nearby commercial enterprises were discharging some of their wastes in this area.

Six closure samples were collected from the bottom and side walls of the excavation. The western bottom sample and the western wall sample detected significant residual concentrations of PCE, TCE and cis 1,2-DCE with the highest detections in these two samples being 52 ppm, 4.8 ppm and 30 ppm, respectively. The cleanup goal for PCE in soil is 1.4 ppm. The north wall sample also exceeded the cleanup objectives for cis and trans 1,2-DCE. The west wall sample also detected some oil-related SVOCs that were slightly above cleanup goals. Additionally, slightly elevated concentrations of copper, nickel, mercury, and zinc were detected in some of the closure samples. A subsequent SVES (see Section 5.2.2) has an extraction well in this area to treat the residual VOC contamination in this area.

5.2.2: Soil Vapor Extraction System

A SVES that essentially vacuums out contaminants above the water table was used to treat contaminated soils beneath the western half of the site building and in a narrow strip of land immediately north of the building. Based on the Department's past experience in site investigation and remedy selection at similar sites, soil vapor extraction (SVE) is included as one of the generally accepted presumptive/proven remedial technologies. SVE has been the most frequently in-situ remedy selected at similar sites to treat soil contamination in the unsaturated zone. A schematic of a typical SVES is attached as Figure 10. This IRM was discussed earlier in an October 2003 fact sheet that was distributed to the public contact list for this site. The overall system consists of two separate parts that have been designated as SVES #I and SVES #2. Each part treats different areas of the site. In total, both parts originally utilized 17 extraction wells to treat impacted areas in the western half of the site. See Figure 11 that illustrates the locations of the treatment areas and the extraction wells. One of these extraction wells was placed in the northwest corner of the site to treat residual VOC contamination that was not removed in that area during the soil excavation. The extracted vapors were initially treated by a series of treatment canisters to remove the contaminants from the air stream. The first set of canisters consisted of activated carbon that adsorbed most of the contaminants. A second set of canisters containing potassium permanganate was used to oxidize those contaminants that would not be treated well with carbon alone. The treated air, which met applicable air standards for release, was then discharged to a stack on top of the site building. The contaminants in the extracted air diminished in concentration with time. A short time after restarting the SVES in February 2006, it was observed during periodic monitoring of the air effluent that the concentrations being extracted by the system, as it was configured at that time, were within applicable air standards without treatment.

Besides treating the impacted soil and thereby reducing the amount of contaminants in the soils that would have migrated to the underlying groundwater, the SVES also acts to prevent potential vapor migration from the site and would also act to prevent potential impacts to the indoor air quality in the on-site building

SVES #1 operated almost continuously from August 2003 until June 2004. SVES #2 operated almost continuously from November 2003 until June 2004. Due to reduced recovery, the systems were pulsed on and off after June 2004 for periods of approximately one month to try to improve contaminant recovery rates. SVES #1 and #2 were operated until February 2005 when they were shut off. The system extracted approximately 262 pounds of contaminants up until February 2005. As will be discussed in Section 5.2.3, SVES #1 and SVES #2 were restarted on February 2, 2006 when the groundwater extraction and treatment system was first started up so that both systems could work together to treat the on-site soil and groundwater.

5.2.3: Groundwater Extraction and Treatment System

A groundwater extraction and treatment system (GETS) is currently treating on-site groundwater in the western portion of the site. Based on the Department's past experience in site investigation and remedy selection, groundwater extraction and treatment (GET) is recognized as one of the generally accepted presumptive/proven remedial technologies for treating groundwater contamination. GET has been a frequently selected remedy at similar sites. The locations of the treatment system and the extraction wells are illustrated on Figure 12. This IRM was discussed in a November 2004 fact sheet. The groundwater is primarily contaminated with PCE and related breakdown products. The source area groundwater consists of a relatively small volume of water beneath and in close proximity to the former dry cleaning machines and the former waste tank in the western portion of the site building. The source area groundwater starts at the water table and extends to approximately 40 feet below the water table.

The groundwater IRM was started up on February 2, 2006. Besides treating the on-site groundwater contamination, this IRM helps limit the discharge of contaminated groundwater to the sediments and surface water in the adjacent saltwater canal thereby allowing existing natural attenuation processes to be more effective in reducing the contamination that has migrated to the canal.

The GETS uses a total of three extraction wells. Two of these wells are screened to capture groundwater in the source area by the former dry cleaning machines (PW-3) and the former waste tank (PW-1). The third well (PW-2) is screened in the center of the main portion of the dissolved plume at a location approximately midway between the former waste tank and the bulkhead for the adjacent saltwater canal. Approximately ten gallons per minute is extracted from each of the wells. The volume of groundwater extracted has been set to ensure that mostly groundwater contamination with significant concentrations of contaminants in close proximity to the source areas will be extracted by the system without the capture of excessive amounts of saline water from the adjacent canal. The extracted water is sent to a low-profile stripper that volatilizes the contaminants from the water. The resultant air stream, which now contains the contaminants that were formerly in the extracted groundwater prior to treatment, was initially passed through a series of canisters containing activated carbon followed by potassium

permanganate to remove the contaminants from the air stream. The treated air is then discharged to a stack on top of the site building. Periodic monitoring of the air effluent prior to the treatment canisters indicates that the air effluent no longer requires treatment to meet applicable air standards for discharge. Consequently, the treatment canisters are no longer required.

Under an interim basis, the treated groundwater is currently being discharged under a permit with the Nassau County Department of Public Works to the community sewer system. There is appropriate periodic monitoring of the treated groundwater required under the permit to make sure the treated groundwater meets establish limits set in the permit. The use of the community sewer system is expected to be only a temporary method for the discharge of the treated water. A proposed modification to the GETS is being considered that would allow treated groundwater to be discharged to the adjacent saltwater canal. This proposed modification will be discussed later in the remedial selection process.

The SVES discussed in Section 5.2.2 is working in conjunction with the groundwater treatment system. This system was restarted on February 2, 2006. The extraction of groundwater results in some depression of the water table thereby exposing more soils/sediments for treatment by the SVES.

5.3: Summary of Human Exposure Pathways:

This section describes the types of human exposures that may present added health risks to persons at or around the site.

An exposure pathway describes the means by which an individual may be exposed to contaminants originating from a site. An exposure pathway has five elements: [1] a contaminant source, [2] contaminant release and transport mechanisms, [3] a point of exposure, [4] a route of exposure, and [5] a receptor population.

The source of contamination is the location where contaminants were released to the environment (any waste disposal area or point of discharge). Contaminant release and transport mechanisms carry contaminants from the source to a point where people may be exposed. The exposure point is a location where actual or potential human contact with a contaminated medium may occur. The route of exposure is the manner in which a contaminant actually enters or contacts the body (e.g., ingestion, inhalation, or direct contact). The receptor population is the people who are, or may be, exposed to contaminants at a point of exposure.

An exposure pathway is complete when all five elements of an exposure pathway exist. An exposure pathway is considered a potential pathway when one or more of the elements currently does not exist, but could in the future.

On-site groundwater is contaminated with volatile organic compounds (VOCs). However, the area is served by public water therefore, ingestion exposure is not expected.

On-site soil vapor is contaminated with VOCs. However, the on-site soil vapor is being captured by the soil vapor extraction system therefore, on-site inhalation exposures via vapor intrusion are not expected.

On-site soil is contaminated with VOCs. However, the contamination is at depth and is mostly covered with a cap (i.e., concrete/asphalt) therefore, direct contact exposure is not expected.

A limited area of VOC sediment contamination is present in the canal adjacent to the site. However, recreation (i.e., swimming and wading) does not occur in the area where sediment contamination was detected therefore, contact or ingestion exposures are not expected.

Off-site soil vapor may be contaminated with VOCs. Recent soil vapor sampling collected from the site perimeter detected elevated levels of VOCs which warrant additional investigation including off-site subslab soil vapor sampling. Therefore, off-site inhalation exposure via vapor intrusion is a potential exposure pathway.

In addition, it should be noted that indoor air sampling conducted at several residences near the site did not detect PCE above the NYSDOH air guideline.

5.4: Summary of Environmental Assessment

This section summarizes the existing and potential future environmental impacts presented by the site prior to the IRM. Environmental impacts include existing and potential future exposure pathways to fish and wildlife receptors, as well as damage to natural resources such as aquifers and wetlands.

In 2002, sediment and surface water samples were collected in the adjacent saltwater canal and in Milburn Creek, both of which are located to the west of the site. Based on this data, the following environmental exposure pathways and ecological risks through chronic exposures have been identified:

- Contaminated groundwater discharging to the adjacent canal and/or prior spills at the site that entered a stormwater drainage system on the north side of the site that discharged into the canal have resulted in contamination of the surface water and sediments.

- Sediments in the adjacent saltwater body contain low levels of chlorinated solvents.

Site contamination has also impacted the groundwater resource in the Upper Glacial aquifer, which is a sole source aquifer that is a source of drinking water in Nassau County. However, the hydrogeology of the area around the site and the site's location next to a saltwater canal indicate that impacted groundwater would not be a viable source for potential future drinking water due to saltwater intrusion.

SECTION 6: SUMMARY OF THE REMEDIATION GOALS

Goals for the remedial program have been established through the remedy selection process stated in 6 NYCRR Part 375-1.10. At a minimum, the remedy selected must eliminate or mitigate all significant threats to public health and/or the environment presented by the hazardous waste disposed at the site through the proper application of scientific and engineering principles.

The remediation goals for this site are to eliminate or reduce to the extent practicable:

- exposures of persons at or around the site to chlorinated solvents, petroleum-related semi-volatile organics and heavy metals in soils;
- exposures of persons at or around the site to chlorinated solvents in groundwater;
- the release of contaminants from soil into groundwater that may create exceedances of groundwater quality standards;
- the release of contaminants from soil and groundwater into indoor air through soil vapor intrusion; and
- the discharge of contaminated groundwater to the sediments and surface water of the adjacent saltwater canal.

Further, the remediation goals for the site include attaining to the extent practicable:

- ambient groundwater quality standards
- soil cleanup goals in TAGM-4046 (Determination of Soil Cleanup Objectives and Cleanup Levels) and 6 NYCRR Subpart 375-6 (Remedial Program Soil Cleanup Objectives)
- air guidelines provided by the NYSDOH
- surface water quality standards

SECTION 7: SUMMARY OF THE EVALUATION OF ALTERNATIVES

The selected remedy must be protective of human health and the environment, be cost-effective, comply with other statutory requirements, and utilize permanent solutions, alternative technologies or resource recovery technologies to the maximum extent practicable.

Based on the Department's past experience in site investigation and remedy selection, the Department has found that there are categories of sites which have similar characteristics, such as types of contaminants present, past industrial use, or environmental media affected for which a "presumptive/proven remedy" approach is useful for streamlining site investigations and making remedy selection quicker and more consistent. The "presumptive/proven remedy" approach

would involve selecting remedies that have already been proven to be both feasible for specific site types and/or contaminants.

The presumptive/proven remedy approach has already been used at the Nassau Uniform Site for the selection of the IRMs discussed earlier in Section 5.2. The SVES and GETS IRMs are still operating and are successfully treating site-related contamination. Both of these systems are proven technologies that are effective at sites where dry cleaning wastes consisting primarily of tetrachloroethene and related breakdown products have impacted soil and groundwater. Continued operation of these IRMs, with appropriate modifications of these systems to make them work more efficiently, are two of the elements of the selected remedy.

Another presumptive/proven remedy is excavation/off-site disposal. This remedy has already been successfully implemented as an IRM in the northwest corner of the site, as discussed earlier under Section 5.2.1. The use of this presumptive remedy for some limited VOC, SVOC and metals soil contamination around the oil/water separator is another element of the selected remedy.

By using presumptive/proven remedies as the key elements of the remedy, the need for a detailed evaluation of remedial alternatives in a feasibility study was not deemed necessary. It should be noted that the following environmental conditions precluded the possible use of other presumptive remedies that have been commonly selected as remedies at similar sites with dry cleaning related wastes:

1. The tidal conditions at the site make those groundwater treatment remedies, such as chemical oxidation and enhanced bioremediation that rely on the injection of oxidants to oxidize the contaminants or the injection of additives to stimulate bacteria growth, ineffective because the constant movement of the groundwater near the tidal canal would dilute the injectants. Furthermore, some of the injectants would eventually discharge to the adjacent saltwater body where they could potentially cause adverse impacts to benthic organisms.

2. The presence of a wood bulkhead and wood support beams in the saturated zone preclude the use of strong oxidants used in many chemical oxidation remedies since these oxidants would oxidize this wood.

3. A thin layer of peat near the water table precludes that possible use of air sparging to treat the groundwater since the less porous peat layer would interfere in the recovery of the injected air.

A summary of the remedial alternatives that were considered for this site is discussed below. The present worth represents the amount of money invested in the current year that would be sufficient to cover all present and future costs associated with the alternative. This enables the costs of remedial alternatives to be compared on a common basis. As a convention, a time frame of 30 years is used to evaluate present worth costs for alternatives with an indefinite duration. This does not imply that operation, maintenance, or monitoring would cease after 30 years if remediation goals are not achieved. Since presumptive/proven remedies are proposed to

streamline the remedy selection process at this site, the proposed presumptive/proven remedy is only compared to the No Further Action alternative.

7.1: Description of Remedial Alternatives

The following potential remedies were considered to address the contaminated soils, sediments, surface water, groundwater, and soil vapor at the site.

Alternative 1: No Further Action

Present Worth: *$702,400*
Capital Cost: *$14,000*
Present Worth of Annual Costs:
(Years 1-5): *$612,900*
(Years 5-10): $52,600
(Years 10-30): $23,000

The No Further Action alternative recognizes remediation of the site conducted under previously completed IRMs. This alternative is evaluated as a procedural requirement and as a basis for comparison. Under this proposed remedy, the operation of the existing SVES and GETS IRMs would be continued. The treated water effluent from the GETS would continue to be discharged to the community sewer system and would still be subject to sewer use fees of approximately $70,000 per year. To evaluate the effectiveness of the remediation completed under the IRMs, continued monitoring is necessary.

This alternative would leave the site in its present condition and would not provide any additional protection to human health or the environment.

Under this alternative, an on-site groundwater, soil vapor and indoor air monitoring would be conducted. Institutional controls would be imposed to prevent the use of the groundwater beneath the site without adequate treatment.

It would take several months to develop a monitoring plan. The existing groundwater and soil vapor monitoring wells can be used for this monitoring.

Due to the degree and nature of the soil, soil vapor, and groundwater contamination, some of the remedial objectives would not be met within the foreseeable future.

Alternative #2: Soil Excavation/Off-site Disposal by the Oil/Water Separator Area and Continued Operation of Modified Versions of the Existing Soil Vapor Extraction System and Groundwater Extraction and Treatment System

Present Worth: *$535,800*
Capital Cost: *$105,500*
Present Worth of Annual Costs:
(Years 1-5): *$309,800*

(Years 5-10): $52,600
(Years 11-30): *$23,000*

Under this alternative, soil contamination in the surface and sub-surface soils by VOCs, SVOCs, and heavy metals in the vicinity of the oil/water separator would be excavated and disposed off-site in a permitted solid waste landfill or hazardous waste landfill based on the contamination levels and the results of TCLP tests. Soil samples would be collected from the bottom and sides of the excavation to determine whether the extent of the excavation was sufficient to remediate this area. If residual soil contamination remains after the initial excavation, either additional soils would be excavated or other remedial alternatives would be considered to address the remaining soil contamination. The SVES IRM could be used to address residual VOCs, if present, that could not be excavated due to structural safety issues related to the nearby building foundation.

Soil excavation is a conventional remedial method. Due to the size of the impacted area and nature of the contaminants, it is expected that this proposed remedy would be the most cost-effective remedy for this area. This element of the remedy is very quick to implement. This portion of the remedy, including work plan preparation and approval, can be implemented in approximately four or five months time.

The soil excavation would eliminate the potential for direct contact with the contaminated surface and sub-surface soils by the oil/water separator area and would reduce the mass of amount of VOCs on the northern side of the site thereby reducing the potential for off-site vapor migration.

Under this alternative, soil, soil vapor and potential indoor air contamination by VOCs in other areas of the site (besides the area around the oil/water separator) would be remediated by the operation of a modified version of the existing soil vapor extraction system. See Section 5.2.2 for a detailed discussion on the existing SVES. The system would be modified as follows:

1. The vacuum levels in the existing extraction wells would be adjusted. Some existing wells located towards the center of the site would be shut-off or throttled down in those wells that are not currently capturing appreciable concentrations of contaminants. As a result, vacuum would be increased in the existing wells that are still productive and/or are located towards the outer boundaries of the treatment system to improve capture in these wells. This would result in improved treatment of residual soil contamination and improvement in the system's ability to prevent vapor migration from the site to potential off-site receptors.

2. Additional extraction wells would be constructed and operated in areas where elevated soil vapor was detected in the July 2006 sampling. Most notably, additional extraction well(s) are needed by the northeast corner of the building near to soil vapor well #1.

3. The system would be inspected for possible short circuiting that would potentially reduce that capture zone of the system. Each existing extraction well that is proposed for continued use in the modified system would be inspected to make sure that it is properly sealed at the surface to prevent loss of vacuum by the introduction of ambient air at the top of the borehole and to prevent loss of vacuum to the space between the building slab and underlying soils.

4. Those existing extraction wells located outside the north wall of the building that are proposed for continued use in the modified system would be evaluated to see if there is loss of vacuum due to the surface cover. If appropriate, the surface soils would be covered in some manner, such as paving, to prevent short circuiting to amhient air.

5. The vacuum achieved by the modified system would be investigated to identify potential areas that would require further modifications to improve the capture area of the system.

6. The extraction wells would be evaluated to determine the source of excessive amounts of water vapor being currently captured by system. If appropriate, the system would be modified to reduce the volume of water captured by the system thereby reducing the operation and maintenance costs and improving system performance.

7. The air effluent from the modified SVES would be treated with activated carbon until system monitoring data indicates that such treatment is no longer necessary for the system to meet applicable air regulations.

The above modifications can be easily implemented. The air effluent from the SVES would be periodically monitored to ensure that the system meets applicable air regulations. Further modifications of the system would be initiated, as warranted, based on this periodic monitoring data. As contaminant levels diminish with time, the system would be downsized, as appropriate, to handle the reduced load on the system. It is expected that the modified system would have to operate for approximately one year to adequately treat the residual soil contamination and that a downsized system would be needed for two more years after that to adequately prevent vapor intrusion to nearby buildings.

After the initial modifications to the SVES have been implemented, soil vapor and indoor and outdoor air sampling would be conducted to further evaluate the performance of the modified system. Based on the results of this evaluation, additional mitigative measures would be implemented, if necessary, to prevent potential exposure to contaminated vapors by site workers or citizens living or working near to the site.

SVE is a primary presumptive/proven remedy that has been selected most frequently to address VOC contamination in soil, soil vapor and indoor air at sites with dry cleaning related wastes. Available performance data indicate that it effectively treats soils in place at a relatively low cost. SVE has been proven to be an effective technology for preventing vapor intrusion into nearby buildings. A more detailed discussion on the technical aspects of this element of the proposed remedy is presented in Section 5.2.2.

The modified SVES would treat subsurface soil contamination by VOCs thereby reducing the potential for direct contact with these contaminated soils and reducing the amount of contaminants in the soil that would migrate to the underlying groundwater and saltwater canal. The system would treat soil vapor contamination thereby reducing the potential for vapor migration to nearby buildings.

Under this alternative, residual on-site groundwater contamination would be addressed by continued operation of a modified version of the existing groundwater extraction and treatment system. To

reduce the strain on the community sewer system and to reduce operation and maintenance costs associated with operation of the system, the treated groundwater would be discharged to an adjacent saltwater canal instead of the current use of the community sewer system. This modification would eliminate the sewer use fees of approximately $70,000 per year for the existing GETS. The approximate location of the discharge piping for treated groundwater under the modified system is illustrated in Figure 12. The monitoring data for current system indicates that this treatment system is capable of meeting the standards for the discharge of treated groundwater to the adjacent canal. The system would be periodically monitored to ensure that the treated groundwater and treated air from the stripper portion of the system meet applicable limits for these discharges. A groundwater monitoring plan would be developed to monitor the progress of the groundwater treatment system. A more detailed discussion on the technical aspects of this element of the proposed remedy is presented in Section 5.2.3. The proposed modification to the GETS can be easily implemented in several months time. It is estimated that the modified system would operate for five years before the reduced amount of contaminants being recovered by the system would not justify further system operation. It is estimated that the groundwater would be monitored for an additional five years after system shutdown. In the event of significant rebound, the system would be restarted.

The treatment system would reduce the mass of contaminants in the groundwater. Besides improving groundwater quality, this treatment would also be beneficial in reducing potential vapor intrusion caused by volatilization of the contaminants near the water table. The treatment system would also limit the amount of contaminated groundwater that would discharge to the adjacent surface water body. This would allow the existing natural attenuation processes to more effectively reduce the contaminant levels in the surface water and sediments that are immediately adjacent to the bulkhead.

As part of the remedy, a site management plan would be developed. All institutional and engineering controls required for the site would be included in this plan. This plan would include a soil management plan for handling residually contaminated soils in case of future redevelopment of the site. The plan would include an operation, maintenance and monitoring plan for maintaining the elements of the remedy and would include details on the periodic monitoring of air and groundwater.

Institutional controls would restrict the use of the groundwater as a source of potable water or process water, without necessary water quality treatment, would limit site usage to restricted residential and would require the periodic certification for the institutional and engineering controls.

7.2 Evaluation of Remedial Alternatives

The criteria to which potential remedial alternatives are compared are defined in 6 NYCRR Part 375, which governs the remediation of inactive hazardous waste disposal sites in New York are listed below:

The first two evaluation criteria are termed "threshold criteria" and must be satisfied in order for an alternative to be considered for selection.

1. Protection of Human Health and the Environment. This criterion is an overall evaluation of each alternative's ability to protect public health and the environment.

2. Compliance with New York State Standards, Criteria, and Guidance (SCGs). Compliance with SCGs addresses whether a remedy will meet environmental laws, regulations, and other standards and criteria. In addition, this criterion includes the consideration of guidance which the Department has determined to be applicable on a case-specific basis.

The next five "primary balancing criteria" are used to compare the positive and negative aspects of each of the remedial strategies.

3. Short-term Effectiveness. The potential short-term adverse impacts of the remedial action upon the community, the workers, and the environment during the construction and/or implementation are evaluated. The length of time needed to achieve the remedial objectives is also estimated and compared against the other alternatives.

4. Long-term Effectiveness and Permanence. This criterion evaluates the long-term effectiveness of the remedial alternatives after implementation. If wastes or treated residuals remain on-site after the selected remedy has been implemented, the following items are evaluated: 1) the magnitude of the remaining risks, 2) the adequacy of the engineering and/or institutional controls intended to limit the risk, and 3) the reliability of these controls.

5. Reduction of Toxicity, Mobility or Volume. Preference is given to alternatives that permanently and significantly reduce the toxicity, mobility or volume of the wastes at the site.

6. Implementability. The technical and administrative feasibility of implementing each alternative are evaluated. Technical feasibility includes the difficulties associated with the construction of the remedy and the ability to monitor its effectiveness. For administrative feasibility, the availability of the necessary personnel and materials is evaluated along with potential difficulties in obtaining specific operating approvals, access for construction, institutional controls, and so forth.

7. Cost-Effectivness. Capital costs and annual operation, maintenance, and monitoring costs are estimated for each alternative and compared on a present worth basis. Although cost-effectiveness is the last balancing criterion evaluated, where two or more alternatives have met the requirements of the other criteria, it can be used as the basis for the final decision. The costs for each alternative are presented in Table 4.

This final criterion is considered a "modifying criterion" and is taken into account after evaluating those above. It is evaluated after public comments on the Proposed Remedial Action Plan have been received.

8. Community Acceptance - Concerns of the community regarding the RI report, the supplemental investigation reports and the PRAP have been evaluated. The responsiveness summary (Appendix A) presents the public comments received and the manner in which the Department addressed the concerns raised. No significant public comments were received.

Since the three primary elements of the selected remedy (soil excavation/off-site disposal, SVE and GETS) are presumptive/proven remedies, it has already been demonstrated that these remedies compare well with other potential remedies for the first seven criteria for evaluating remedial alternatives.

SECTION 8: SUMMARY OF THE SELECTED REMEDY

Based on the Administrative Record (Appendix B) and the discussion presented below, the Department has selected Alternative #2, Soil Excavation/Off-site Disposal by the Oil/Water Separator Area and Continued Operation of Modified Versions of the Existing Soil Vapor Extraction System and Groundwater Extraction and Treatment System, as the remedy for this site. The elements of this remedy are described at the end of this section.

The selected remedy is based on the results of the RI and the various supplemental investigations that have been performed and review of system performance data for the SVES and GETS IRMs. The three primary elements of the selected remedy (soil excavation, soil vapor extraction, and groundwater extraction and treatment) are presumptive/proven remedies that have been used successfully at similar sites with dry cleaning wastes. The continued use of the modified versions of the existing SVE and GETS IRMs appears to be the most cost effective alternative to achieve the remedial goals for this site since these treatment systems are already in place and the modifications can be completed with little additional expenditures. The soil excavation for the limited amount of soil contamination in the oil/water separator area is the only feasible remedy for this area due to the size of the area and the nature and extent of the soil contamination. The primary elements of the selected remedy can be implemented in a short time period and will result in a permanent solution that will result in the removal of the hazardous wastes from the site.

Alternative #1, No Further Action, was not a viable alternative since this alternative would not meet the "threshold criteria" for evaluating potential alternatives, which are "protection of public health and the environment" and "compliance with SCGs".

The estimated present worth cost to implement the remedy is $535,800. The cost to construct the remedy is estimated to be $150,500 and the present worth of estimated annual costs for the first 5 years is $309,800, for years 6 though 10 is $52,600, and for years 11 through 30 is $23,000.

The main SCGs applicable to this project and the corresponding remedial measures which address exceedences of the SCGs are as follows:

- Exceedances of GA groundwater standards for the underlying groundwater are being addressed by the GETS IRM;
- The IRM soil removal by the garbage disposal area and the continued operation of the SVES IRM are addressing exceedences of the soil cleanup goals in TAGM-4046 and 6 NYCRR Subpart 375-6 for volatile organic compounds;
- The SVES IRM captures soil vapor to help prevent potential soil vapor intrusion and any resultant exposures;

- The SVES and GETS IRMs help limit further discharges of contaminants to the surface water and sediments, thereby allowing naturally occurring biodegradation processes to attenuate the exceedance of the Class SC surface water guidance value for tetrachloroethene and levels near the sediment cleanup criteria for DCE and vinyl chloride.

- The soil excavation by the oil/water separator will address exceedences of soil cleanup goals in TAGM-4046 and 6 NYCRR Subpart 375-6 for SVOCs and inorganics.

The basis for this selection is the NYSDEC's conclusion that the soil excavation by the oil/water separator with continued operation of modified versions of the SVES and GETS IRMs and the institutional and engineering controls listed below will be protective of human health and the environment and will satisfy all SCGs, as described above.

The elements of the selected remedy are as follows:

1. A soil excavation will be performed by the oil/water separator to remove SVOC and inorganic contamination in the surface and sub-surface soils. Closure samples will be collected from the bottom and side-walls of the excavation. If after this soil excavation is conducted there is significant residual soil contamination by VOCs in this area that cannot be easily removed by excavation, the existing SVES extraction well in this area will be used to treat this residual VOC contamination.

2. The existing on-site SVES will be modified to improve system performance. The system will continue to operate to treat the on-site soil contamination, limit migration of contaminants in the soils to the underlying groundwater, prevent on-site vapor migration from contaminated soils and groundwater to the site building and help prevent off-site vapor migration to nearby buildings.

3. After the initial modifications to the SVES have been implemented, soil vapor and indoor and outdoor air sampling will be conducted to further evaluate the performance of the modified system. If needed, the SVES will be further modified and/or supplemental measures will be implemented to minimize potential exposures to contaminated vapors at off-site locations.

4. The existing on-site GETS will be modified. The treated groundwater will be discharged to the adjacent saltwater canal. The treatment system will treat on-site groundwater contamination and reduce the amount of contaminated groundwater that will discharge to the surface water and sediments in the adjacent saltwater canal. By limiting the amount of contaminants that will continue to migrate to the adjacent saltwater body, naturally occurring degradation processes will result in attenuation of the limited contamination present in the sediments and canal water. The GETS will also help prevent potential future impacts to the off-site groundwater.

5. Imposition of an institutional control in the form of an environmental easement that will require: a) compliance with the approved site management plan; b) restricting use of

groundwater as a source of potable water or process water, without necessary water quality treatment as determined by NYSDOH; c) the property owner to complete and submit to the Department a periodic certification of institutional and engineering controls; and d) limiting site usage to restricted residential.

6. Development of a site management plan which will include the following institutional and engineering controls: a) excavated soil would be tested, properly handled to protect the health and safety of workers and the nearby community, and would be properly managed in a manner acceptable to the Department; b) continued evaluation of the potential for vapor intrusion for any buildings developed at the site in the future, including provision for mitigation if necessary; c) continued evaluation of the potential for vapor intrusion at nearby off-site structures, including provision for mitigation, if necessary, d) monitoring of groundwater, air effluent from the SVES and GETS, and water effluent from the GETS, e) identification of any use restrictions on the site; f) provisions for the continued operation and maintenance of the components of the remedy; and g) if the site building should be demolished for future restricted residential development, additional characterization of the soil beneath the building will be required and an appropriate cover system will be implemented, if necessary.

7. The property owner will provide a periodic certification of the institutional and engineering controls, prepared and submitted by a professional engineer or such other expert acceptable to the Department, until the Department notifies the property owner in writing that this certification is no longer needed. This submittal will: a) contain certification that the institutional controls and engineering controls put in place are still in place and are either unchanged from the previous certification or are compliant with Department-approved modifications; b) allow the Department access to the site; and c) state that nothing has occurred that would impair the ability of the control to protect public health or the environment, or constitute a violation or failure to comply with the site management plan unless otherwise approved by the Department.

SECTION 9: HIGHLIGHTS OF COMMUNITY PARTICIPATION

As part of the remedial investigation process, a number of Citizen Participation activities were undertaken to inform and educate the public about conditions at the site and the potential remedial alternatives. The following public participation activities were conducted for the site:

1. Repositories for documents pertaining to the site were established.

2. A public contact list, which included nearby property owners, elected officials, local media and other interested parties, was established.

3. A Citizen Participation Plan was developed for the site in March1997.

4. A fact sheet was distributed to the public contact list in July 1997 to solicit public comments on the Remedial Investigation Work Plan.

5. A fact sheet was distributed to the public contact list in October 2003 to solicit public comments on the proposed IRM to treat the on-site soil contamination using a soil vapor extraction system.

6. A fact sheet was distributed to the public contact list in November 2004 to solicit public comments on the proposed groundwater extraction and treatment system to treat on-site groundwater.

7. A public meeting was held on February 26, 2007 to present and receive comment on the PRAP.

8. A responsiveness summary (Appendix A) was prepared to address the comments received during the public comment period for the PRAP.

TABLE 1[d] - Page 1 of 2

Nature and Extent of Contamination in Surface and Sub-Surface Soil and Creek Sediments
Sub-Surface Soil Concentrations Based on Remedial Investigation Sampling 1997/1998
Creek Sediment Sampling Based on 2002 Sampling
Surface Soil Sampling Based on July 2006 Sampling

SURFACE SOIL	Contaminants of Concern	Concentration Range Detected (ppm)[a]	SCG[b] (ppm)[a]	Frequency of Exceeding SCG
Semi-Volatile Organic Compounds (SVOCs)[e]	benzo(a)anthracene	ND - 2.1	0.224 or MDL	3 of 4
	benzo(a)pyrene	ND - 1.9	0.061 or MDL	3 of 4
	benzo(b)fluoranthene	ND - 2.6	0.224 or MDL	3 of 4
	benzon(k)fluoranthene	ND - 2.6	0.224 or MDL	3 of 4
	bis(2-ethylhexyl)phthalate	3 - 52	50	1 of 4
	chrysene	ND - 2.4	0.4	3 of 4
SEDIMENTS	**Contaminants of Concern**	**Concentration Range Detected (ppb)[a]**	**SCG[b] (ppb)[a]**	**Frequency of Exceeding SCG**
Volatile Organic Compounds (VOCs)[f]	cis 1,2-dichloroethene	ND - 3830	4,300	0 of 6
	vinyl chloride	ND - 550	n/a	0 of 6

[a] ppm = parts per million, which is equivalent to milligrams per kilogram, mg/kg, in soil or sediments;
ppb = parts per billion, which is equivalent to micrograms per liter, ug/L, in water;
[b] SCG = standards, criteria, and guidance values; soil cleanup goals are from Technical and Administrative Guidance Memorandum 4046: Determination of Soil Cleanup Objectives and Cleanup Levels including proposed April 1995 revisions for inorganics and 6NYCRR Subpart 375-6;
[d] Contaminants listed in Table 1 include only those contaminants that were detected in at least one sample above its respective SCG.
[e] The 2006 surface soil samples were only analyzed for semi-volatile organic compounds.
[f] The 2002 sediment samples were only analyzed for volatile organic compounds.
[g] The concentrations were compared to a more restrictive freshwater criteria. See the discussion on page 10.
ND = not detected
N/A = not applicable
MDL = method detection limit

TABLE 1[d] - Page 2 of 2

Nature and Extent of Contamination in Surface and Sub-Surface Soil and Creek Sediments
Sub-Surface Soil Concentrations Based on Remedial Investigation Sampling 1997/1998
Creek Sediment Sampling Based on 2002 Sampling
Surface Soil Sampling Based on July 2006 Sampling

SUB-SURFACE SOIL	Contaminants of Concern	Concentration Range Detected (ppm)[a]	SCG[b] (ppm)[a]	Frequency of Exceeding SCG
Volatile Organic Compounds (VOCs)	tetrachloroethene	ND - 1600	1.4	13 of 54
	trichloroethene	ND - 21	0.7	4 of 54
	trans 1,2-dichloroethene	ND - 0.333	0.3	1 of 54
	cis 1,2-dichloroethene	ND - 15	0.25	8 of 35
Semi-Volatile Organic Compounds (SVOCs)	benzo(a)anthracene	ND - 0.47	0.224 or MDL	1 of 3
	chrysene	ND - 0.48	0.4	1 of 3
	phenol	ND - 0.11	0.03 or MDL	1 of 3
	bis(2-ethylhexyl)phthalate	ND - 78	50	1 of 3
Inorganic Compounds	cadmium	ND - 20	10	1 of 6
	chromium	ND - 424	50	1 of 6
	copper	ND - 4330	25 or SB	1 of 3
	lead	ND - 2390	200 - 500	1 of 6
	mercury	ND -641	0.1	1 of 6
	nickel	ND - 641	13 or SB	1 of 3
	zinc	ND - 4080	20 or SB	1 of 3

[a] ppm = parts per million, which is equivalent to milligrams per kilogram, mg/kg, in soil or sediments;
[b] SCG = standards, criteria, and guidance values; soil cleanup goals are from Technical and Administrative Guidance Memorandum 4046: Determination of Soil Cleanup Objectives and Cleanup Levels including proposed April 1995 revisions for inorganics and 6NYCRR Subpart 375-6;
[d] Contaminants listed in Table 1 include only those contaminants that were detected in at least one sample above its respective SCG.
ND = not detected
SB = site background
MDL = method detection limit

TABLE 2
Nature and Extent of Contamination in Groundwater
Comparison of Concentrations Detected in 1997, 2001, and 2005

GROUND WATER	Contaminants of Concern	August 1997 Concentration Range Detected (ppb)[a]	March 2001[c] Concentration Range Detected (ppb)[a]	March 2005[d] Concentration Range Detected (ppb)[a]	SCG[b] (ppb)[a]	Frequency of Exceeding SCG (2005 only)
Volatile Organic Compounds (VOCs)	tetrachloroethene	nd - 140000	nd - 140000	nd -9400	5	7 of 10
	trichloroethene	nd - 19000	nd - 2100	nd - 3300	5	7 of 10
	cis 1,2-dichloroethene	nd - 15000	na	nd - 1900	5	5 of 6
	trans 1,2-dichloroethene	nd - 91	nd	nd - 10	5	2 of 6
	1,1-dichloroethene	nd - 22	nd - 200	nd - 3	5	0 of 10
	vinyl chloride	nd - 1770	nd - 1300	nd -280	2	7 of 10
	1,1,1-trichloroethane	nd - 34.5	nd -8	nd -13	5	1 of 10
	total xylenes	nd - 252	na	nd - 30	5	2 of 10
	toluene	nd - 35	na	nd -7	5	1 of 10
	ethylbenzene	nd - 42	na	nd -17	5	1 of 10
	benzene	nd - 67	na	nd -230	0.7	1 of 10
	isopropylbenzene	na	na	nd -52	5	1 of 6
	n-propylbenzene	na	na	nd - 110	5	1 of 6
	sec-butylbenzene	na	na	nd -6	5	1 of 6
	methylene chloride	nd - 71	nd -230	nd	5	0 of 10
	acetone	nd - 460	na	nd - 22	50	0 of 10
Semi-Volatile Organic Compounds	naphthalene	nd - 54	na	nd - 27	10	1 of 6
	bis(2-ethylhexyl) phthalate	nd - 66	na	na	5	na in 2005
	phenol	nd - 24	na	na	1	na in 2005
Inorganic Compounds	iron	nd - 12600	na	nd - 5800	300	4 of 4

[a] ppb = parts per billion, which is equivalent to micrograms per liter, ug/L, in water;
[b] SCG = standards, criteria, and guidance values; GA groundwater standards and guidance values are utilized as the SCGs for groundwater;
[c] Groundwater samples collected in 2001 were only analyzed for volatile organic compounds.
[d] Groundwater samples in 2005 were collected from four new wells that were constructed for the GETS to be used as extraction wells. Only three of these wells were actually used for the GETS. These four wells were sampled for volatile and semi-volatile organic compounds and inorganic compounds. The 2005 sampling event also included the sampling of six existing monitoring wells for volatile organic compounds and a reduced list of semi-volatile organic compounds only. The most contaminated well (P-1) in prior sampling rounds was not included in the 2005 sampling event because a new extraction well at the same location was sampled instead. However, it should be noted that the screen

zone for new extraction well covers a broader interval than P-1 so that a direct comparison of prior concentrations detected in P-1with the concentrations in the new extraction well probably is not be truly representative of improvement in groundwater quality at this particular sampling location.
nd = nondeteet
na = not analyzed

TABLE 3
Nature and Extent of Contamination in Surface Water in 2002 Sampling Event

SURFACE WATER	Contaminants of Concern	Concentration Range Detected (ppb)[a]	SCG[b] (ppb)[a]	Frequency of Exceeding SCG
Volatile Organic Compounds (VOCs)[a]	tetrachloroethene	nd - 22	1.0	1 of 6

[a] ppb = parts per billion, which is equivalent to micrograms per liter, ug/L, in water;
[b]SCG = standards, criteria, and guidance values; the water quality guidance value of 1.0 ppb for tetrachloroethene is from Table 1 of the Technical Guidance for Screening of Contaminated Sediments.
nd = nondetect
na = not analyzed

Table 4
Remedial Alternative Costs

Remedial Alternative	Capital Cost ($)	Annual Costs ($)[a]	Total Present Worth ($)[b]
#1- No Further Action	14,000	688,400[c]	702,400
#2 - Soil excavation, modified SVES and GETS	150,500	385,300	535,800

[a] Estimate present worth of operation and monitoring costs for 30 years

[b] Estimate includes capital cost plus 30 years of operation and monitoring costs

[c] Includes $70,000 per year for sewer use fees during the first 5 years of operation

APPENDIX A

Responsiveness Summary

RESPONSIVENESS SUMMARY

Nassau Uniform Service
Freeport, Town of Hempstead, Nassau County, New York
Site No. 1-30-063

The Proposed Remedial Action Plan (PRAP) for the Nassau Uniform Service site, was prepared by the New York State Department of Environmental Conservation (the Department) in consultation with the New York State Department of Health (NYSDOH) and was issued to the document repositories on February 17, 2007. The PRAP outlined the remedial measure proposed for the contaminated soil, soil vapor, groundwater, and surface water at the Nassau Uniform Service site.

The release of the PRAP was announced by sending a notice to the public contact list, informing the public of the opportunity to comment on the proposed remedy.

A public meeting was held on February 26, 2007, which included a presentation of the Remedial Investigation (RI) and the supplemental investigations as well as a discussion of the proposed remedy. The meeting provided an opportunity for citizens to discuss their concerns, ask questions and comment on the proposed remedy. These comments have become part of the Administrative Record for this site. The public comment period for the PRAP ended on March 21, 2007.

This responsiveness summary responds to all questions and comments raised during the public comment period. The following are the comments received, with the Department's responses:

Comments 1 through 5 were received during the February 26, 2007 public meeting and involve questions about the proposed remedy or about the site.

COMMENT 1: What does restricted residential mean? What type of homes can be built at the site in the future? Can the site ever have an unrestricted use?

RESPONSE 1: In 6 NYCRR Part 375-1.8(g)(2)(ii), it states:
"Restricted-residential use" which is the land use category which shall only be considered when there is a common ownership or a single/managing entity of the site. Restricted-residential use:
(a) shall, at a minimum, include restrictions which prohibit:

(1) any vegetable gardens on a site, although community vegetable gardens may be considered with Departmental approval; and

(2) single family housing; and

(b) includes active recreational uses, which are public uses with a reasonable potential for soil contact;

The most common construction for restricted-residential would be condominiums. The above definition means that typical one family homes cannot be built on this property. An amendment to the ROD would be required to change to a lesser restrictive use, such as unrestricted. The property owner would have to first demonstrate that the site would be suitable for that less-restrictive use.

COMMENT 2: How long will it take for the cleanup to reach the state's goals.

RESPONSE 2: The time frame for complete remediation is difficult to estimate based on the complexity of the contaminants and the site geologic conditions. The primary contaminants are chlorinated solvents that bind strongly to the underlying formation, particularly to less porous layers with high organic content, such as the thin layers of peat and bands of clay that underlie the facility. Consequently, these conditions can limit the effectiveness of the groundwater extraction and treatment system to remediate the on-site groundwater. The groundwater treatment system will eventually reach a point at which the bulk of the groundwater contamination mass has been removed, but there will be some remaining contamination that cannot be effectively remediated with this system. The majority of the groundwater contamination will be remediated by the groundwater extraction and treatment system (GETS) within an expected 5 year timeframe. At that time, the State will determine if the remaining contamination is still presenting significant impacts to public heath and/or the environment. If the impacts are not significant, the groundwater treatment system would be shut off and the remaining contamination would be allowed to naturally attenuate. Groundwater monitoring may be necessary to demonstrate that the contamination does not rebound after the system is shut off.

COMMENT 3: Explain what tanks were/are present at the site.

RESPONSE 3: The most significant storage tank at the site was a steel, indoor 2,000 gallon waste oil/solvent tank that was inside the western portion of the site building. It was partially buried in the soils. It was removed in 1990 and some contaminated soils beneath the tank were removed at that time. However, structural safety issues prevented a more extensive soil removal. Spillage is believed to have been the source of contamination, due to overfilling of the tank.

A 2,000 gallon underground gasoline storage tank existed outside of the eastern side of the site building. A tank test conducted in 1984 indicated a potential leak and the tank was removed. This investigation was conducted under the Spills program of the NYSDEC.

An oil/water separator tank exists on the north wall of the site building. It is part of the industrial waste water system. It's purpose is to prevent waste oils from going to the community sewage treatment system. It is a small concrete tank around five feet long and four feet wide with baffles that allows petroleum-related contaminants in the waste water to rise to the surface of the water and be separated from the water. The waste oil collection area of the tank has to be periodically emptied and the waste oils disposed of at an approved off-site disposal facility.

COMMENT 4: What were the results of the soil vapor samples that were collected at condominium complex located to the south of the site?

RESPONSE 4: Five soil vapor samples on the condominium property were first collected in 2000. The sampling locations are illustrated on Figure 6. None of these samples detected any site related contaminants. However, the detection limits for these samples were not capable of detecting the very low concentrations necessary for evaluation of potential exposure according to the current NYSDOH guidance, issued final in October 2006.

In July 2005, a new soil vapor monitoring well (soil vapor well #3) was constructed outside the southwest corner of the site building to further evaluate soil vapor concentrations using the new procedures established by NYSDOH. The sample detected 3,100 micrograms per cubic meter of tetrachloroethene. See Figure 9 for the sample location and a full list of the compounds that were detected in that sample. The soil vapor extraction system (SVES) will be modified to enhance capture of soil vapors detected at this location. The Site Management Plan addresses future soil vapor investigations offsite, following modification of the current SVES.

COMMENT 5: What heavy metals have been detected and where were they found?

RESPONSE 5: Heavy metals were primarily found by the garbage disposal area outside the northwest corner of the site building. The surface soils in this area appeared to contain sand blasting wastes, which may have been dumped there by other facilities operating in this area. Cadmium, chromium, copper, iron, lead, mercury, nickel and zinc were all present at concentrations above typical background concentrations for these compounds. This area was excavated in November 1999 and the impacted soils were disposed of at an approved off-site disposal facility.

The other area where heavy metals have been found was in the soils surrounding the location of the oil/water separator on the north side of the site building. Cadmium, chromium, copper, iron, lead, mercury, nickel, and zinc were also detected at concentrations above typical background concentrations in this area. This contamination will be addressed by soil excavation, which is one element of the selected remedy.

Comments 6 and 7 that were received during the public meeting involve health related issues.

COMMENT 6: Would there be any exposures associated with the use of the canal by boaters, jet skiers, etc.?

RESPONSE 6: It is not expected that boating activities in the canal will result in exposures to site contamination. This area of the canal is a slow zone, with a posted 5 miles per hour speed limit, affecting the speed at which jet skiers would be allowed to travel and create a spray or splash potential exposure. Sediments outside of the site contained slightly elevated levels of

chlorinated compounds, however, it is not a regulated bathing facility and it is not recommended that swimming or other bathing recreation occur in this canal due to boat traffic. The potential for the future discharge of contaminated groundwater to the canal has been reduced due to the operation of the groundwater extraction and treatment system.

COMMENT 7: What is the possibility of there being contamination in the uncapped area south of the site by the southwestern portion of the building? What sort of exposures do pets receive who walk along the unpaved strip by tbe south side of the site? What sort of exposure do children who then play with the pets who have been walking on this unpaved strip of land?

RESPONSE 7: The thin, unpaved strip of land immediately adjacent to the south wall of the Nassau Uniform is inaccessible from the Nassau Uniform facility. Consequently, there is no known mechanism by which tbe employees at the site could discharge wastes to these soils. The NYSDEC project manager for this site inspected this area before the preparation of the Remedial Investigation Work Plan and decided not to sample this area based on his observations. It has been concluded that it would be highly unlikely that the surface soils in this small area had been impacted by site operations. Thus, it is not expected that normal access along this section of the site would result in an exposure concern.

Comments 8 and 9 that were received during the public meeting involve questions related to a partially completed condominium complex that is being constructed to the northwest of the site.

COMMENT 8: Is there any threat to the new condominiums under construction from the Nassau Uniform Service site?

RESPONSE 8: The contamination detected at the Nassau Uniform site is primarily restricted to the site boundaries. Soil contamination does not present a threat to the new condominium complex as any surficial soils have been excavated or will be excavated as part of this remedy, with subsurface soils capped through asphalt/concrete or the building foundation. Thus, surficial runoff of contamination should not present a threat to the condominium complex. Soil vapor sampling conducted this past summer indicated elevated levels exist at the site boundaries. Additional soil vapor investigation is a component of the remedy, as well as part of the Site Management Plan. Further, one component of the selected remedy is that the SVES will be modified to restrict vapor migration offsite. The modifications will include measures to increase the radius of influence of the soil vapor extraction well that is located by the property border between the site and the new condominium development. There is no expected pathway for contaminated groundwater to impact the condominium complex.

Additionally, the Nassau County Health Department has jurisdiction on realty subdivisions and approves the realty subdivision map which is required before construction begins and a Certificate of Occupancy can be issued from the Building Department. It should be noted that the

new condominium site was formerly used as a boat yard and has the potential to be contaminated from former operations at the site such as boat painting and boat maintenance activities.

Considering the prior use of the site and the proximity of the Nassau Uniform Site, the Nassau County Health Department will evaluate the environmental conditions at the site and require a soil vapor intrusion investigation to evaluate the potential for soil vapor intrusion, prior to approval of the realty subdivision map. If necessary, mitigation systems will be required on the new condominiums.

COMMENT 9: Does a prospective buyer have to wait until these new condominium units are built before knowing if these unit will be safe?

RESPONSE 9: No. A prospective buyer will be assured that the condominium units will be suitable for occupancy after the realty subdivision map is approved by the Nassau County Health Department. After the map is approved, any necessary soil vapor mitigation systems must be installed in accordance with the approved plans. Usually construction does not begin until after the Nassau County Health Department has evaluated the environmental conditions at the site and approved the realty subdivision map. At this particular site, construction commenced prior to the Health Department's review and approval. However, The Nassau County Health Department will still evaluate the environmental conditions at the site and the potential for soil vapor intrusion prior to approving the realty subdivision map. If necessary, mitigation systems will be installed on the new condominiums prior to occupancy. For additional information, please contact the Nassau County Health Department at (516) 571-3323.

APPENDIX B

Administrative Record

Administrative Record

Nassau Uniform Service

Site No. 1-30-063

1. Proposed Remedial Action Plan for the Nassau Uniform Service site, dated February 2007, prepared by the Department.

2. Order on Consent, Index No. W1-0740-95-11, between the Department and Nassau Uniform Service, Inc., executed on March 31, 1997.

3. Focused Remedial Investigation Work Plan, March 25, 1997, Volume 1, prepared by Anson Environmental, Ltd.

4. Focused Remedial Investigation Work Plan, March 25, 1997, Volume 2, prepared by Anson Environmental, Ltd.

5. Fact Sheet for the Focused Remedial Action Work Plan, July 1997, prepared by the Department

6. Focused Remedial Investigation Report, January 27, 1999, prepared by Anson Environmental, Ltd.

7. Nassau County Department of Health Freedom of Information Search Report, January 1997, prepared by Anson Environmental, Ltd.

8. Soil Excavation and Disposal Report, October 11, 1999, prepared by Anson Environmental, Ltd.

9. Off-Site Soil Gas Sampling Report, May 24, 2000, prepared by Anson Environmental, Ltd.

10. On-Site Groundwater Investigation Report, March 22, 2001, prepared by Anson Environmental, Ltd.

11. Milburn Creek Investigation Report, May 9, 2002, prepared by Anson Environmental, Ltd.

12. Final Design Work Plan for Soil Vapor Extraction System, January 6, 2003, prepared by Anson Environmental, Ltd.

13. Conceptual Design for Groundwater Pump and Treat System, August 21, 2003, prepared by Anson Environmental, Ltd.

14. Fact Sheet for the Soil Vapor Extraction System Interim Remedial Measure, October 2003, prepared by the Department

15. Groundwater Pump and Treat System Pilot Test Report, February 5, 2004, prepared by Anson Environmental, Ltd.

16. Final Design for a Groundwater Pump and Treat System, July 7, 2004, prepared by Anson Environmental, Ltd.

17. Fact Sheet for the Groundwater Pump and Treat System Interim Remedial Measure, November 2004, prepared by the Department

18. 3/22/05 and 3/23/05 Groundwater Sampling Results, Received April 7, 2005, prepared by Anson Environmental, Ltd.

19. Remedial Action Report for Groundwater Remediation Pump and Treat System, June 22, 2006, prepared by Anson Environmental, Ltd.

20. Supplemental Investigation Report for Soil Vapor Extraction System Radius of Influence, Oil/Water Separator Soil Sampling, and Soil Gas Sampling, October 12, 2006, prepared by Anson Environmental, Ltd.

21. Fact Sheet for the Proposed Remedial Action Plan, February 9, 2007, prepared by the Department