

DOCUMENTATION OF ENVIRONMENTAL INDICATOR DETERMINATION

RCRA Corrective Action Environmental Indicator (EI) RCRAInfo code (CA750) Migration of Contaminated Groundwater Under Control

Facility Name: NWIRP Calverton
Facility Address: Grumman Boulevard, Calverton NY 11933
Facility EPA ID#: NYD003995198

1. Has **all** available relevant/significant information on known and reasonably suspected releases to the groundwater media, subject to RCRA Corrective Action (e.g., from Solid Waste Management Units (SWMU), Regulated Units (RU), and Areas of Concern (AOC)), been **considered** in this EI determination?

X If yes - check here and continue with #2 below.

If no - re-evaluate existing data, or

if data are not available, skip to #8 and enter "IN" (more information needed) status code.

BACKGROUND

Definition of Environmental Indicators (for the RCRA Corrective Action)

Environmental Indicators (EI) are measures being used by the RCRA Corrective Action program to go beyond programmatic activity measures (e.g., reports received and approved, etc.) to track changes in the quality of the environment. The two EI developed to-date indicate the quality of the environment in relation to current human exposures to contamination and the migration of contaminated groundwater. An EI for non-human (ecological) receptors is intended to be developed in the future.

Definition of "Migration of Contaminated Groundwater Under Control" EI

A positive "Migration of Contaminated Groundwater Under Control" EI determination ("YE" status code) indicates that the migration of "contaminated" groundwater has stabilized, and that monitoring will be conducted to confirm that contaminated groundwater remains within the original "area of contaminated groundwater" (for all groundwater "contamination" subject to RCRA corrective action at or from the identified facility (i.e., site-wide)).

Relationship of EI to Final Remedies

While Final remedies remain the long-term objective of the RCRA Corrective Action program the EI are near-term objectives which are currently being used as Program measures for the Government Performance and Results Act of 1993, GPRA). The "Migration of Contaminated Groundwater Under Control" EI pertains ONLY to the physical migration (i.e., further spread) of contaminated ground water and contaminants within groundwater (e.g., non-aqueous phase liquids or NAPLs). Achieving this EI does not substitute for achieving other stabilization or final remedy requirements and expectations associated with sources of contamination and the need to restore, wherever practicable, contaminated groundwater to be suitable for its designated current and future uses.

**Migration of Contaminated Groundwater Under Control
Environmental Indicator (EI) RCRAInfo code (CA750)
Page 2**

Duration / Applicability of EI Determinations

EI Determinations status codes should remain in RCRAInfo national database ONLY as long as they remain true (i.e., RCRAInfo status codes must be changed when the regulatory authorities become aware of contrary information).

2. Is **groundwater** known or reasonably suspected to be “**contaminated**”¹ above appropriately protective “levels” (i.e., applicable promulgated standards, as well as other appropriate standards, guidelines, guidance, or criteria) from releases subject to RCRA Corrective Action, anywhere at, or from, the facility?

 X If yes - continue after identifying key contaminants, citing appropriate “levels,” and referencing supporting documentation.

 If no - skip to #8 and enter “YE” status code, after citing appropriate “levels,” and referencing supporting documentation to demonstrate that groundwater is not “contaminated.”

 If unknown - skip to #8 and enter “IN” status code.

Rationale:

SITE DESCRIPTION

Location

The Naval Weapons Industrial Reserve Program facility in Calverton, New York (NWIRP Calverton) is located in Suffolk County on Long Island, New York, approximately 70 miles from New York City. The facility originally covered approximately 6,000 acres, 3,000 of which are enclosed by a fence. The site location is shown as Figure 1. A portion of the facility is located in the Town of Brookhaven. The majority is in the Town of Riverhead.

The facility is bordered by: Middle Country Road (Route 25), the Calverton National Cemetery and mixed use land to the north; agricultural land and a golf course to the east; River Road, a golf course and a rod and gun club to the south; and Wading River Road to the west. Two paved runways are located on the facility. Runway 5-23 is located on the western half of the facility and oriented southwest to northeast. Runway 32-14 is located on the eastern half of the property, and is oriented southeast to northwest. The site plan is provided in Figure 2.

Operations History

¹“Contamination” and “contaminated” describes media containing contaminants (in any form, NAPL and/or dissolved, vapors, or solids, that are subject to RCRA) in concentrations in excess of appropriate “levels” (appropriate for the protection of the groundwater resource and its beneficial uses).

**Migration of Contaminated Groundwater Under Control
Environmental Indicator (EI) RCRAInfo code (CA750)
Page 3**

NWIRP Calverton was a Government-Owned Contractor-Operated (GOCO) facility, operated by Northrop Grumman Corporation (aka Grumman Corporation) until February 1996. The facility was constructed by the US Navy in the early 1950s. Work at the site included assembly, testing, refitting and retrofitting naval combat aircraft, to support aircraft design and production at the Grumman's Bethpage Facility, in Nassau County, Long Island New York.

Most of the industrial activity was confined to the developed area in the center and south of the center of the site. Hazardous waste was generated by various activities at the site including metal cleaning and electroplating, maintenance, temporary hazardous waste storage, fueling and training.

In September 1998, the majority of the land within the developed section of the facility was transferred to the Town of Riverhead for redevelopment. In 1999, approximately 3,000 acres of undeveloped land was transferred to the Veterans Administration and the New York State Department of Environmental Conservation (NYSDEC). The Navy retained several parcels of land in the developed section for further investigation and potential remedial activities. These parcels and associated Navy facilities/remedial areas are listed below, and shown on Figure 2. These include:

- **Parcel A** (32 acres)
Site 2 - Fire Training Area

- **Parcel B1** (40 acres)
Site 6A - Fuel Calibration Area
Site 10B - Engine Test House

- **Parcel B2** (131 acres)
Southern Area

- **Parcel C** (10 acres)
Site 7 - Fuel Depot
Site 10A - Jet Fuel Systems Laboratory

- **Parcel D** (145 acres)
Site 1 - Northeast Pond Disposal Area
Site 9 Electronic Countermeasures (ECM) Area

- **Miscellaneous**
Agricultural Outlease Area

More detailed descriptions of these areas and activities can be found in the positive Environmental Indicator **Current Human Exposures Under Control (CA725)** for this facility dated September 31, 2004.

The facility's 6NYCRR Part 373 Hazardous Waste Permit for storage was modified and reissued for Corrective Action in April 2000 when all storage areas were closed.

Soils and Geology

NWIRP Calverton, and all of Long Island, is in the Atlantic Coast Plain, and is underlain by an extremely thick sequence of unconsolidated deposits. Ground surface elevations of Long Island's post-glacial surface topography range from sea level to approximately 400' above sea level. The two most prominent topographic features are the Ronkonkoma terminal moraine and the Harbor Hill end moraine. NWIRP Calverton occupies a relatively flat area between these two moraines.

Migration of Contaminated Groundwater Under Control
Environmental Indicator (EI) RCRAInfo code (CA750)
Page 4

NWIRP Calverton is underlain by approximately 1,300 feet of unconsolidated sediments containing four distinct geological units. From top to bottom these are: the Upper Glacial Formation, the Magothy Formation, the Raritan Clay Member of the Raritan Formation, and the Lloyd Sand Member of the Raritan Formation. The glacial sediments that make up the ground surface at NWIRP Calverton (Upper Glacial Formation) are approximately 250 feet thick and contain both glacial till and outwash deposits.

Surface Water Hydrology

The majority of NWIRP Calverton is located within the Peconic River drainage basin. The Peconic River is located approximately, 1,300 feet south of the facility at its closest point. The river discharges to the Peconic Bay, 8.5 stream miles west of the facility. Surface water in the northeastern quadrant of the site drains to the north and ultimately, to the Long Island Sound. No contaminated parcels are within this quadrant.

Major surface water features on the site include McKay Lake and the Northeast Pond. McKay Lake is a man-made groundwater recharge basin located north of River Road, midway along the southern site border. Several small drainage basins (Runway Ponds) exist near the Fuel Calibration Area. The location of these surface water features and the basin divide are shown on figures 3 and 4. These surface water features are generally land-locked except McKay Lake, which has an intermittent discharge to Swan Pond. In addition, flooding and overland flow periodically occur between the drainage basins and the Peconic River.

Surface Water Quality

Surface Water data collected under the ongoing site-wide remedial investigation have not shown contaminant levels above Part 703 New York State Surface Water Quality Standards. Potential impacts to the Northeast Pond were eliminated by removing the landfill and contaminated sediment. No impacts have been seen to date in the Peconic River.

References:

- Tetra Tech Nus, February 2001. Draft Phase 2 Remedial Investigation and for Site 2 - Fire Training Area, Naval Weapons Industrial Reserve Plant, Calverton, New York.
- Tetra Tech Nus, July 2001. Phase 2 Remedial Investigation for Site 6A - Fuel Calibration Area, Site 10B - Engine Test House, Southern Area, Naval Weapons Industrial Reserve Plant, Calverton, New York.
- Tetra Tech Nus, February 2002. Phase 2 Extended Site Investigation for Site 9 - Electronic Countermeasures (ECM) Area. Naval Weapons Industrial Reserve Plant, Calverton, New York.
- Tetra Tech Nus, February 2002. Phase 2 Remedial Investigation and Focused Feasibility Study for Site 1 - Northeast Pond Disposal Area. Naval Weapons Industrial Reserve Plant, Calverton, New York.
- Tetra Tech Nus, February 2002. Phase 2 Remedial Investigation/Focused Feasibility Study for Site 7 - Fuel Depot, Naval Weapons Industrial Reserve Plant, Calverton, New York.
- Tetra Tech Nus, October 2001. Site Investigation at the Agricultural Outlease in Zone II Southeast Buffer Zone for Naval Weapons Industrial Reserve Plant, Calverton, New York.

**Migration of Contaminated Groundwater Under Control
Environmental Indicator (EI) RCRAInfo code (CA750)
Page 5**

- Tetra Tech Nus, September 2005. Data Summary Report for Site 6A - Fuel Calibration and Southern Area. Naval Weapons Industrial Reserve Plant, Calverton, New York.

Groundwater Hydrogeology

The unconsolidated sediments that underlie NWIRP Calverton are generally medium to coarse-grained sand with high porosities and permeabilities. These sediments create aquifers with high yields and transmissivities.

NWIRP Calverton straddles a regional groundwater divide. Shallow groundwater beneath the northern half of the facility flows to the northeast and, ultimately, into the Long Island Sound. (See figure 4) Shallow groundwater beneath the southern half of the facility flows to the southeast with the Peconic River basin is the likely discharge point. Groundwater on the fluctuating divide flows generally to the east.

Groundwater Quality

Groundwater quality at the site varies from parcel to parcel. In addition, for those parcels where remedial activities have already been undertaken, water quality often shows a marked improvement for parameters of concern. Table 1 shows monitoring data on those parameters detected at levels that exceeded Part 703 New York State Groundwater Quality Standards. For those parcels where remedial activities have been undertaken, the table also shows the water quality after these activities. As can be seen, remedial activities have significantly reduced the concentrations of several contaminants. In some cases, mostly for Volatile Organic Compounds (VOCs), this reduction has been several orders of magnitude. For example 1,1,1- trichloroethane at the fuel calibration area was reduced from 15,000 ppb before remedial activities to 24 ppb. Similarly, Toluene at the Fuel Calibration Area went from 330 ppb before remedial activities, to 2.6 ppb afterwards.

The groundwater quality and offsite migration are well characterized at this time.

The nature and of contamination in each area is described more fully in the discussion of Groundwater Corrective Actions in the response to Question #3.

References:

- Tetra Tech Nus, February 2001. Phase 2 Remedial Investigation and for Site 2 - Fire Training Area, Naval Weapons Industrial Reserve Plant, Calverton, New York..
- Tetra Tech Nus, July 2001. Phase 2 Remedial Investigation for Site 6A - Fuel Calibration Area, Site 10B - Engine Test House, Southern Area, Naval Weapons Industrial Reserve Plant, Calverton, New York..
- Tetra Tech Nus, February 2002, Phase 2 Extended Site Investigation for Site 9 - Electronic Countermeasures (ECM) Area. Naval Weapons Industrial Reserve Plant, Calverton, New York.
- Tetra Tech Nus, February 2002. Phase 2 Remedial Investigation and Focused Feasibility Study for Site 1 - Northeast Pond Disposal Area. Naval Weapons Industrial Reserve Plant, Calverton, New York..
- Tetra Tech Nus, February 2002. Phase 2 Remedial Investigation/Focused Feasibility Study for Site 7 - Fuel Depot, Naval Weapons Industrial Reserve Plant, Calverton, New York.

**Migration of Contaminated Groundwater Under Control
Environmental Indicator (EI) RCRAInfo code (CA750)
Page 6**

- Tetra Tech Nus, October 2001, Site Investigation at the Agricultural Outlease in Zone II Southeast Buffer Zone for Naval Weapons Industrial Reserve Plant, Calverton, New York.
- Tetra Tech Nus, September 2005. Data Summary Report for Site 6A - Fuel Calibration and Southern Area. Naval Weapons Industrial Reserve Plant, Calverton, New York.

Migration of Contaminated Groundwater Under Control
Environmental Indicator (EI) RCRIS code (CA750)
Page 7

Table 1 - Maximum Concentration Detected in Groundwater prior and during Remedial Activities

| Contaminant | Parcel A Fire Training Area | | Parcel B1 Fuel Calibration Area | | Parcel B1 Engine Test House | | Parcel B2 Southern Area | | Parcel C Fuel Depot Area | | Parcel C Jet Fuel Systems Laboratory | | Parcel D Northeast Pond Landfill | | Part 703 New York State Groundwater Quality Standards Groundwater |
|-----------------------|--------------------------------|---------------------|------------------------------------|---------------------|--------------------------------|---------------------|----------------------------|---------------------|-----------------------------|---------------------|---|---------------------|-------------------------------------|---------------------|---|
| | Prior | During ¹ | Prior | During ² | Prior | During ² | Prior | During ² | Prior | During ³ | Prior | During ³ | Prior | During ⁴ | |
| | ug/l | ug/l | ug/l | ug/l | ug/l | ug/l | ug/l | ug/l | ug/l | ug/l | ug/l | ug/l | ug/l | ug/l | |
| Benzene | 8 | ND | | | | | | | 17 | 52D | 17 | NT | | ND | 0.7 |
| 2-butanone | 140 | 100 | | | | | | | | | | | | ND | 50 |
| chloroethane | 1,100 | 40 | 430 | 26 | 152 | NT | 7 | 7.9 | | | | | | ND | 5 |
| 1,1-dichloroethane | | 69 | 5800 | 41 | | | 220 | 292 | | | | | 5.9 | ND | 5 |
| 1,1-dichloroethene | 1,200 | ND | 380 | 1.9 | | | | 19.1 | | | | | | | |
| Freon | | | | | | | | | 100 | 210E | 1100 | NT | | | 5 |
| 1,1,1-trichloroethane | 120 | 29 | 15000 | 24 | 188 | NT | 21 | 21.1 | | | 140 | NT | 5.9 | ND | 5 |
| tetrachloroethene | 140 | 37 | 6 | | 166 | NT | 19 | | | | | | | | 5 |
| ethyl benzene | | | 27 | | 1084 | NT | | | 480 | 580D | 8 | NT | | | 5 |
| toluene | 320 | 94 | 330 | 2.6 | 337 | NT | | | 710 | 85 | 710 | NT | | | 5 |
| xylene | 230 | 140 | 780 | 15 | 196 | NT | | | 2400 | 4040D | 99 | NT | | | 5 |
| Naphthalene | | | 120 | | | | | | 150 | 150 | | | | | 10 |
| 2-Methylnaphthalene | | | 74 | | | | | | 78 | 140 | | | | | 50 |
| Total PAHs | 94 | 94 | | | | | | | | NA | | | | | NA |
| Total PCBs | 18 | 20 | | | | | | | | | | | | | 1 |
| Lead | 30.80 | | | | | | | | 25 | | 45.3 | NT | | | 15 |
| Hexavalent Chromium | | | | | | | | | | | 76.0 | NT | | | 50 |
| Copper | | | | | | | | | | | | | | | 200 |
| Iron | | | | | | | | | | | 14,500 | NT | | | 300** |
| Manganese | | | | | | | | | | | 1,720 | NT | | | 300** |
| Mercury | | | | | | | | | | | 4.1 | NT | | | 0.7 |
| Thallium | | | | | | | | | | | 6.7 | NT | | | 0.5 |

** 500 Applies to the sum of these substances; also see individual standards for "Iron" and Manganese
 ND - Non- Detected

**Migration of Contaminated Groundwater Under Control
Environmental Indicator (EI) RCRAInfo code (CA750)
Page 8**

NA - Not Applicable

NT - Not Tested

D- Dilution

1- Pilot-scale air sparging/soil vapor extraction (AS/SVE) was installed in 1995, it ran from 1995 to 2000. GW was collected 1997.

2- Groundwater data was collected in 2005.

3- Groundwater data was collected 2002/2003 as part of the Pilot AS/SVE study.

4- Landfill was excavated and removed. Groundwater collected in 2002/2003.

Migration of Contaminated Groundwater Under Control
Environmental Indicator (EI) RCRAInfo code (CA750)
Page 9

3. Has the **migration** of contaminated groundwater **stabilized** (such that contaminated groundwater is expected to remain within “existing area of contaminated groundwater”² as defined by the monitoring locations designated at the time of this determination)?

 X If yes - continue, after presenting or referencing the physical evidence (e.g., groundwater sampling/measurement/migration barrier data) and rationale why contaminated groundwater is expected to remain within the (horizontal or vertical) dimensions of the “existing area of groundwater contamination”²).

 If no (contaminated groundwater is observed or expected to migrate beyond the designated locations defining the “existing area of groundwater contamination”²) - skip to #8 and enter “NO” status code, after providing an explanation.

 If unknown - skip to #8 and enter “IN” status code.

Rationale and Reference(s):

GROUNDWATER CORRECTIVE ACTION

Parcel A : Site 2 - Fire Training Area

Groundwater remedial activities at the Fire Training Area in 1987, included both active and passive recovery in the area outside the fire training ring. The active recovery included a groundwater pumping well, an oil recovery well, and an oil water separator tank. The passive recovery used hydrophobic filters in the shallow wells. The active recovery program was concluded in 1993. Free product recovery from the shallow monitoring wells using hand bailers continued until 1993. By December 1993, 270 gallons of petroleum product had been removed from the site.

A Remedial Feasibility Investigation (RFI) conducted in 1994 and 1995 documented the level of contaminants remaining at the site after groundwater recovery was completed. Figure 5 shows location and contaminant levels of the groundwater samples exceeding Part 703 New York State Groundwater Quality Standards during the 1994/ 1995 RFI.

In 1995, a pilot-scale air sparging/soil vapor extraction (AS/SVE) was installed to address this remaining contamination, as an Interim Corrective Measure (ICM). Groundwater samples collected throughout this pilot study are shown in Table 2. The values in this table are for samples taken from the most contaminated well in the Fire Training Area; monitoring well FT-MW-02. In total, the testing demonstrated that the concentration of chlorinated and non-chlorinated VOCs on the site decreased by approximately 90% and 60%, respectively during the operation of the trial. One month after the system was shutdown (1/23/96), the concentration of chlorinated and non-chlorinated VOCs rebounded, with an ultimate increase of 140% and 36% over the time when the AS/SVE system was shut off in December of 1995. This rebound can be seen in Table 2 where the

²“existing area of contaminated groundwater” is an area (with horizontal and vertical dimensions) that has been verifiably demonstrated to contain all relevant groundwater contamination for this determination, and is defined by designated (monitoring) locations proximate to the outer perimeter of “contamination” that can and will be sampled/tested in the future to physically verify that all “contaminated” groundwater remains within this area, and that the further migration of “contaminated” groundwater is not occurring. Reasonable allowances in the proximity of the monitoring locations are permissible to incorporate formal remedy decisions (i.e., including public participation) allowing a limited area for natural attenuation.

**Migration of Contaminated Groundwater Under Control
Environmental Indicator (EI) RCRAInfo code (CA750)
Page 10**

contaminant levels in most of the samples taken in January of 1996 are higher than those levels seen in November of 1995.

Figure 6 shows the final levels of chlorinated and non-chlorinated VOCs in temporary wells installed and sampled in 1997 as part of the 2nd phase RFI for the Fire Training area.

The AS/SVE was run from 1995 to 1996 and from 1997 to 2000. As of 2000, approximately 80 pounds of target VOCs had been removed. Since startup in 1995, this system has contributed to the biodegradation of approximately 50,000 pounds of hydrocarbons (as C), which is equivalent to approximately 8,400 gallons of diesel fuel (through December 2000).

The horizontal and vertical extent of groundwater contamination originating in the Fire Training Area has been adequately characterized. Based on the available data, the groundwater contamination has migrated towards the down-gradient fence line, but it has not passed the facility boundaries. This is corroborated by sampling of an off-site irrigation well near the Golf Course Club house. Where VOCs were not detected.

In 2006, the Navy plans to excavate the concrete fire training ring and the shallow contaminated soil and debris remaining at the site.

**Table 2
Select Groundwater Results from FT-MW-02S
Demonstrating the Effect of AS/SVE at the Fire Training Area**

| Sample Date | MDLs | 8/16/95 | 9/28/95 | 10/26/95 | 11/21/95 | 12/19/95 | 1/23/96 |
|-----------------------------|------|---------|---------|----------|----------|----------|---------|
| 2-Butanone | 3 | 140 | 40 | | 3 J | - | 100 |
| Chloroethane | 3 | 420 D | 21 | 20 | 17 | - | 40 J |
| 1,1-Dichloroethane | 2 | 200 | 39 | 36 | 24 | - | 69 |
| cis 1',2-Dichloroethene | 2 | 220 | 18 | 21 | 14 | - | 53 |
| 1,1,1-Trichloroethane | 1 | 59 | 20 | 41 | 26 | - | 29 J |
| Toluene | 2 | 250 | 78 | 75 | 62 | - | 94 |
| Total Xylenes | 1 | 110 | 120 | 120 | 100 | - | 140 |
| Total Chlorinated VOCs | | 948 | 103 | 137 | 95 | - | 228 |
| Total Non Chlorinated VOCs" | | 411 | 254 | 264 | 172 | - | 234 |
| Total Semivolatile VOCs | | 440 | 242 | 167 | 357 | 153 | 252 |
| PCB-1260 | 1 | 26 | 10 | 9 | 6 | 2.6 J | 20 |

- Sample not collected

Blank Chemical not detected above Method Detection Limit(MDL)

J Estimated value

D Analysis of a diluted sample

Totals do not include acetone and 2-butanone, which are likely to be laboratory contaminants.

**Migration of Contaminated Groundwater Under Control
Environmental Indicator (EI) RCRAInfo code (CA750)
Page 11**

Parcel B

Parcel B is divided into two areas:

- **Parcel B1:** Site 6A - Fuel Calibration Area and Site 10B - Engine Test House
- **Parcel B2:** Southern Area

The location of these sites are shown on Figure 7.

Table 3 shows the maximum concentration in each area of contaminants that exceeded Part 703 New York State Groundwater Quality Standards in the 2nd phase RFI in 1997 and the Supplemental Groundwater Investigation in 2000.

**Table 3
Contaminants of Concern found in Parcel B
During the 1997 Phase 2 Remedial Investigation
and the
2000 Supplemental Groundwater Investigation**

| | Fuel Calibration Area | Engine Test House | Southern Area |
|---------------------------|--|--------------------------------|--------------------------------|
| <u>Contaminant</u> | <u>Maximum Concentration Detected</u> | | |
| | <u>Groundwater ug/l</u> | <u>Groundwater ug/l</u> | <u>Groundwater ug/l</u> |
| chloroethane | 720 | 152 | 7 |
| 1,1-dichloroethane | 3600 | | 220 |
| 1,1-dichloroethene | 37 | 188 | 21 |
| 1,1,1-trichloroethane | 2200 | 166 | 19 |
| TCE | 6 | | |
| ethyl benzene | 27 | 1084 | |
| toluene | 180 | 337 | |
| xylenes | 570 | 196 | |

Higher concentrations have been observed in these areas in the initial stage of the RFI. Most of the historical, higher levels, however, have already been addressed by early remedial activities and natural degradation processes occurring in Parcel B. Accordingly, the more recent levels shown on table 3 present a more representative baseline for ongoing activities in Parcel B.

The groundwater sampling results exceeding Part 703 New York State Groundwater Quality Standards for Parcel B, in the investigations performed in 1997, 2004 and 2005, are shown graphically in Figures 8 through 12.

The historical and ongoing remedial efforts in Parcel B are discussed below:

B1: Site 6A - Fuel Calibration Area

The levels of groundwater contamination observed in the Fuel Calibration before and after remedial efforts are shown on table 1 as part of the discussion of groundwater contamination.

In addition, floating free product has been identified at the site in the area coincident to the area of the most

**Migration of Contaminated Groundwater Under Control
Environmental Indicator (EI) RCRAInfo code (CA750)
Page 12**

contaminated groundwater.

A groundwater recovery unit was installed in 1987 to address this contamination. This unit included a pumping well, an oil recovery well and an oil/water separator tank. Active Groundwater and free product extraction continued until 1993. After that, passive product recovery was initiated and continued until 1996. Free product recovery continued until 1997.

A pilot study was conducted for a Vacuum Oil Skimming Unit, in September 1999, to further address remnant free product (sheens) on the watertable surface. The pilot study has demonstrated that the volume of product available for recovery is too small and inconsistent for this type of system.

Passive free product recovery was restarted in 2000 and it continues today.

Parcel B1: Site 10B - Engine Test House

Based on the RFI 1994/ 1995 investigation and the 2nd phase RFI performed in 1997, Chlorinated VOC contaminated groundwater is present east of the Engine Test House. The most likely source of this contamination is discharge of contaminated groundwater from the Fuel Calibration Area via the drainage swale and culvert.

The groundwater sampling results for the Engine Test House Area, exceeding Part 703 New York State Groundwater Quality Standards, in the 2nd phase RFI performed in 1997, are shown graphically in Figures 8 through 12.

No Remedial efforts were required in the Engine Test House Area.

Parcel B2: Southern Area

The groundwater sampling results for the Southern Area, exceeding Part 703 New York State Groundwater Quality Standards, in the 2nd phase RFI performed in 1997, are shown graphically in Figures 8 through 12.

In 1997, during the Phase 2 RFI at Sites 6A - Fuel Calibration Area and 10B - Engine Test House, the Navy identified two non-continuous areas of chlorinated VOC contamination at depth with the potential to migrate off site. This potential was confirmed when an offsite, Suffolk County monitoring well detected VOC contamination in the groundwater beyond the site boundary at depths of 5 to 45 feet below the water table. A Supplemental Groundwater Investigation was conducted between June 2000 and October 2000 to further delineate the extent of the groundwater plume both on site and offsite. The down gradient area, between the Fuel Calibration Area and the Peconic River, is referred to as the Southern Area.

Work completed in the RFI and the 2000 Supplemental Groundwater Investigation has identified solvent contamination as far as 6,000 feet down gradient of Site 6a. The contamination is not continuous. Large portions of the Southern area exist where contamination has not been found. Based upon these investigations the horizontal extent of the contamination had been adequately defined in the Southern area. However, there were outstanding questions regarding the vertical extent of the contamination, which still needed to be answered for the Southern area.

A second Supplemental Groundwater Investigation was conducted in 2004/2005 to answer these questions. Specifically, the investigation:

- Determined the extent of deep groundwater contamination at Site 6A;
- Delineated the extent of off-site groundwater contamination in the Pistol Range Area of the

**Migration of Contaminated Groundwater Under Control
Environmental Indicator (EI) RCRAInfo code (CA750)
Page 13**

- Peconic River Sportsman's Club;
- Determined if contaminated groundwater migrates into or beneath the Peconic River, and
- Verified the southwestern extent of off-site contaminated groundwater near Swan Pond.

Parcel C: Site 7 - Fuel Depot

The RFI investigation conducted at the fuel depot area from 1994 to 2000 showed that the horizontal and vertical extent of groundwater contamination had been adequately characterized. The VOC-plume remains within the boundaries of the fuel depot area.

A pilot-scale air sparging/soil vapor extraction (AS/SVE) was installed to remove the fuel-VOC and Freon contamination at the fuel depot area in 2004. During the 1 year pilot program the AS/SVE system was estimated to have removed 4,500 pounds of total VOCs. This system will be running for at least 2 to 5 years.

Parcel C: Site 10A- Jet Fuel Systems Laboratory

The groundwater contamination related to Site 10-A is being addressed in the remedial work performed in the Site 7- Fuel Depot Area.

Parcel D: Site 1 - Northeast Pond Disposal Area

As January 28, 2003, a Record of decision (ROD) was issued and approved by the United State Navy, with concurrence by the NYSDEC and New York State Department of Health. The selected remedy in this ROD consists of excavating all land filled waste materials, contaminated soil and contaminated sediment with subsequent off-site disposal. The removal was completed and groundwater sampling data has shown that NYS Groundwater Quality Standards are being met. Because the entire landfill has been removed and standards have been achieved, no further investigation or remedial work is planned for this site.

Parcel D: Site 9 - Electronic Countermeasures (ECM) Area

The contaminant source (building, equipment and soil) was removed as part of the Interim Corrective Action at Site 9. Subsequent to this removal, TCA and its breakdown product are no longer being detected at concentrations that exceed state drinking water standards in groundwater at or down-gradient of the site. or in down gradient areas. Based on the absence of contamination, no further investigation is recommended or warranted at this site.

Agricultural Out-Lease Area

All buildings tanks and associated fixtures were removed from the site in July, 1999. In addition, all the soil and adjacent to and underlying the buildings and tanks was excavated for offsite disposal.

Groundwater monitoring wells were installed in June 2000. Samples were analyzed for VOCs, semi-VOCs, pesticides and PCBs, metals and cyanide. None of these potential contaminants were detected in the groundwater samples. Based on the absence of contamination, no further investigation is recommended or warranted for this area.

**Migration of Contaminated Groundwater Under Control
Environmental Indicator (EI) RCRAInfo code (CA750)
Page 14**

4. Does “contaminated” groundwater **discharge** into **surface water** bodies?

If yes - continue after identifying potentially affected surface water bodies.

If no - skip to #7 (and enter a “YE” status code in #8, if #7 = yes) after providing an explanation and/or referencing documentation supporting that groundwater “contamination” does not enter surface water bodies.

If unknown - skip to #8 and enter “IN” status code.

Rationale:

Groundwater beneath the southern half (Site 6 - Fuel Calibration, Site 10B - Engine Test House and the Southern Area) of the facility flows to the southeast with the Peconic River as a potential discharge point. The nature of this contamination is sporadic so that contaminants are present in some localized portions of the Southern Area but not in others. Presently, wells closest to the Peconic River and surface water samples do not show the presence of site related contaminants. (See Figure 11 and 12)

This item could be checked as “no” because there is no current discharge. This item has been checked “yes,” however, to reflect the potential impact.

References:

Tetra Tech Nus, September 2005, Site 6A - Fuel Calibration Area and Southern Area Data Summary Report for Naval Weapons Industrial Reserve Plant, Calverton, New York

Migration of Contaminated Groundwater Under Control
Environmental Indicator (EI) RCRAInfo code (CA750)
Page 15

5. Is the **discharge** of “contaminated” groundwater into surface water likely to be “**insignificant**” (i.e., the maximum concentration³ of each contaminant discharging into surface water is less than 10 times their appropriate groundwater “level,” and there are no other conditions (e.g., the nature, and number, of discharging contaminants, or environmental setting), which significantly increase the potential for unacceptable impacts to surface water, sediments, or eco-systems at these concentrations)?

 X If yes - skip to #7 (and enter “YE” status code in #8 if #7 = yes), after documenting: 1) the maximum known or reasonably suspected concentration³ of key contaminants discharged above their groundwater “level,” the value of the appropriate “level(s),” and if there is evidence that the concentrations are increasing; and 2) provide a statement of professional judgement/explanation (or reference documentation) supporting that the discharge of groundwater contaminants into the surface water is not anticipated to have unacceptable impacts to the receiving surface water, sediments, or eco-system.

 If no - (the discharge of “contaminated” groundwater into surface water is potentially significant) - continue after documenting: 1) the maximum known or reasonably suspected concentration³ of each contaminant discharged above its groundwater “level,” the value of the appropriate “level(s),” and if there is evidence that the concentrations are increasing; and 2) for any contaminants discharging into surface water in concentrations³ greater than 100 times their appropriate groundwater “levels,” the estimated total amount (mass in kg/yr) of each of these contaminants that are being discharged (loaded) into the surface water body (at the time of the determination), and identify if there is evidence that the amount of discharging contaminants is increasing.

 If unknown - enter “IN” status code in #8.

Rationale and Reference(s):

Based on the results of the most recent groundwater and surface water sampling, wells along Connecticut Avenue do show the presence of site related contaminants at levels above Part 703 New York State Groundwater Quality standards. For example Well SA-PZ-123 contains 1,1 Dichloroethane at levels around 100 ug/l. Wells closer to the Peconic River, SA-PZ-118S and SA-PZ-118I and surface water samples in from the River SA-SW-101 and 103 are non-detect for this and all other site related VOCs. (See Figure 9 and Figure 10)

Currently, there is no known contaminant discharge into the Peconic River. While at some future date up-gradient contaminants have the potential to migrate to the river, their concentrations will likely be reduced to insignificant levels before they reach the river. In addition, the Navy is currently preparing a Corrective Measures Study (CMS) for the Site 6A - Fuel Calibration Area, Site 10B - Engine test House and the Southern Area. The Goals for this CMS are: Comply with New York State Groundwater Standards, Comply with New York State Surface Water Protection Standards for Peconic River. Meeting this goal will preclude a future significant impact.

References:

Tetra Tech Nus, September 2005, Site 6A - Fuel Calibration Area and Southern Area Data Summary Report for Naval Weapons Industrial Reserve Plant, Calverton, New York

³ As measured in groundwater prior to entry to the groundwater-surface water/sediment interaction (e.g., hyporheic) zone.

**Migration of Contaminated Groundwater Under Control
Environmental Indicator (EI) RCRAInfo code (CA750)
Page 16**

6. Can the **discharge** of “contaminated” groundwater into surface water be shown to be “**currently acceptable**” (i.e., not cause impacts to surface water, sediments or eco-systems that should not be allowed to continue until a final remedy decision can be made and implemented⁴)?

_____ If yes - continue after either: 1) identifying the Final Remedy decision incorporating these conditions, or other site-specific criteria (developed for the protection of the site’s surface water, sediments, and eco-systems), and referencing supporting documentation demonstrating that these criteria are not exceeded by the discharging groundwater; OR

2) providing or referencing an interim-assessment⁵, appropriate to the potential for impact, that shows the discharge of groundwater contaminants into the surface water is (in the opinion of a trained specialists, including ecologist) adequately protective of receiving surface water, sediments, and eco-systems, until such time when a full assessment and final remedy decision can be made. Factors which should be considered in the interim-assessment (where appropriate to help identify the impact associated with discharging groundwater) include: surface water body size, flow, use/classification/habitats and contaminant loading limits, other sources of surface water/sediment contamination, surface water and sediment sample results and comparisons to available and appropriate surface water and sediment “levels,” as well as any other factors, such as effects on ecological receptors (e.g., via bio-assays/benthic surveys or site-specific ecological Risk Assessments), that the overseeing regulatory agency would deem appropriate for making the EI determination.

_____ If no - (the discharge of “contaminated” groundwater can not be shown to be “**currently acceptable**”) - skip to #8 and enter “NO” status code, after documenting the currently unacceptable impacts to the surface water body, sediments, and/or eco-systems.

_____ If unknown - skip to 8 and enter “IN” status code.

Rationale and Reference(s):

⁴ Note, because areas of inflowing groundwater can be critical habitats (e.g., nurseries or thermal refugia) for many species, appropriate specialist (e.g., ecologist) should be included in management decisions that could eliminate these areas by significantly altering or reversing groundwater flow pathways near surface water bodies.

⁵ The understanding of the impacts of contaminated groundwater discharges into surface water bodies is a rapidly developing field and reviewers are encouraged to look to the latest guidance for the appropriate methods and scale of demonstration to be reasonably certain that discharges are not causing currently unacceptable impacts to the surface waters, sediments or eco-systems.

**Migration of Contaminated Groundwater Under Control
Environmental Indicator (EI) RCRAInfo code (CA750)
Page 17**

7. Will groundwater **monitoring** / measurement data (and surface water/sediment/ecological data, as necessary) be collected in the future to verify that contaminated groundwater has remained within the horizontal (or vertical, as necessary) dimensions of the “existing area of contaminated groundwater?”

If yes - continue after providing or citing documentation for planned activities or future sampling/measurement events. Specifically identify the well/measurement locations which will be tested in the future to verify the expectation (identified in #3) that groundwater contamination will not be migrating horizontally (or vertically, as necessary) beyond the “existing area of groundwater contamination.”

If no - enter “NO” status code in #8.

If unknown - enter “IN” status code in #8.

Rationale and Reference(s):

The Navy is planning to continue groundwater monitoring to verify that contaminated groundwater has remained within the existing area of contaminated groundwater.

**Migration of Contaminated Groundwater Under Control
Environmental Indicator (EI) RCRAInfo code (CA750)
Page 18**

8. Check the appropriate RCRIS status codes for the Migration of Contaminated Groundwater Under Control EI (event code CA750), and obtain Supervisor (or appropriate Manager) signature and date on the EI determination below (attach appropriate supporting documentation as well as a map of the facility).

 X YE - Yes, "Migration of Contaminated Groundwater Under Control" has been verified. Based on a review of the information contained in this EI determination, it has been determined that the "Migration of Contaminated Groundwater" is "Under Control" at the **NWIRP Calverton** facility, EPA ID # NYD003995198, located at Grumman Boulevard, Calverton, NY 11933. Specifically, this determination indicates that the migration of "contaminated" groundwater is under control, and that monitoring will be conducted to confirm that contaminated groundwater remains within the "existing area of contaminated groundwater" This determination will be re-evaluated when the Agency becomes aware of significant changes at the facility.

 NO - Unacceptable migration of contaminated groundwater is observed or expected.

 IN - More information is needed to make a determination.

**Migration of Contaminated Groundwater Under Control
Environmental Indicator (EI) RCRAInfo code (CA750)
Page 19**

Completed by: _____ \s\ _____ Date: Sept 30, 2005

Henry Wilkie
Environmental Engineer I
New York State Department of Environmental Conservation

And

_____ \s\ _____ Date: Sept 30, 2005

Larry A. Rosenmann
Engineering Geologist II
New York State Department of Environmental Conservation

Supervisor: _____ \s\ _____ Date: Sept 30, 2005

Denise Radtke
Chief, Engineering Geology Section
New York State Department of Environmental Conservation

Director: Original signed by: \s\ _____ Date: Sept 30, 2005

Ed Dassatti
Bureau of Hazardous Waste and Radiation Management
New York State Department of Environmental Conservation

Locations where references may be found:

New York State Department of Environmental Conservation
Division of Solid and Hazardous Materials
625 Broadway
Albany, NY 12233-7258

Contact telephone number and e-mail address

| | | |
|----------------|----------------|------------------------------|
| Henry Wilkie | (518) 402-8594 | hjlwilkie@gw.dec.state.ny.us |
| Larry Rosenman | (518) 402-8594 | larosenm@gw.dec.state.ny.us |

Figures 1 - 12 follow: