Stanton Cleaners Area Ground Water Contamination

Great Neck, New York

EPA Facility ID: NYD047650197

Basin: Northern Long Island

HUC: 02030201

Executive Summary

The Stanton Cleaners site operates as a dry cleaning facility approximately 1.5 km (.9 mi) east of Little Neck Bay, an estuary of Long Island Sound. Elevated concentrations of volatile organic compounds (VOCs) have been detected in soils near discharge areas on the site and concentrations of tetrachloroethene (PCE) in groundwater exceed screening guidelines. A groundwater plume contaminated with VOCs is migrating toward Little Neck Bay, although data show attenuation to below screening guidelines a few hundred meters southeast of the site.

Numerous NOAA trust fish and invertebrate species use Little Neck Bay, as well as commercial and recreational fisheries. A health advisory is in place for several fish and invertebrate species within Long Island Sound.

Site Background

The Stanton Cleaners Property consists of approximately 0.1 hectares (.2 acres) in the town of North Hempstead, Nassau County, New York and is approximately 1.5 km (.9 mi) east of Little Neck Bay, an estuarine embayment of Long Island Sound (Figure 1; USEPA 1999). Stanton Cleaners includes a two-story building and a separate boiler room in which a dry-cleaning business has operated since the 1950s (Figure 2). No details on site operations or disposal practices were available for this site. Groundwater contaminated with PCE was first detected in 1979. In 1983, a site inspection revealed accumulated debris and empty drums in the rear yard of the site and a pipe protruding from the rear side of the two-story building. Connected to a dry-cleaning, fluid-water separator, the pipe discharged dry-cleaning wastes directly to the ground (Dvirka and Bartilucci 1998).

A groundwater pathway via the shallow Upper Glacial aquifer is the primary contaminant pathway from the site to NOAA trust habitats. The depth to the water table within the Upper Glacial aquifer ranges at depths of 3.0 to 28.0 m (3.2 to 31 yards) below ground surface (bgs). Groundwater flows southwest near the site and in a more southerly direction south of the site toward Little Neck Bay. Groundwater flow direction appears to be controlled by two hydraulic boundaries: Little Neck Bay, which acts as a natural groundwater discharge area, and drinking water production wells located about 300 m (328 yds) south of the site, which act as local groundwater discharge points during pumping cycles (USEPA 1999). Surface water runoff from the site collects in a shallow sump on the site. Stormwater runoff collects either in a dry well or flows into the storm water collection system where it eventually discharges to Little Neck Bay (Dvirka and Bartilucci 1998).

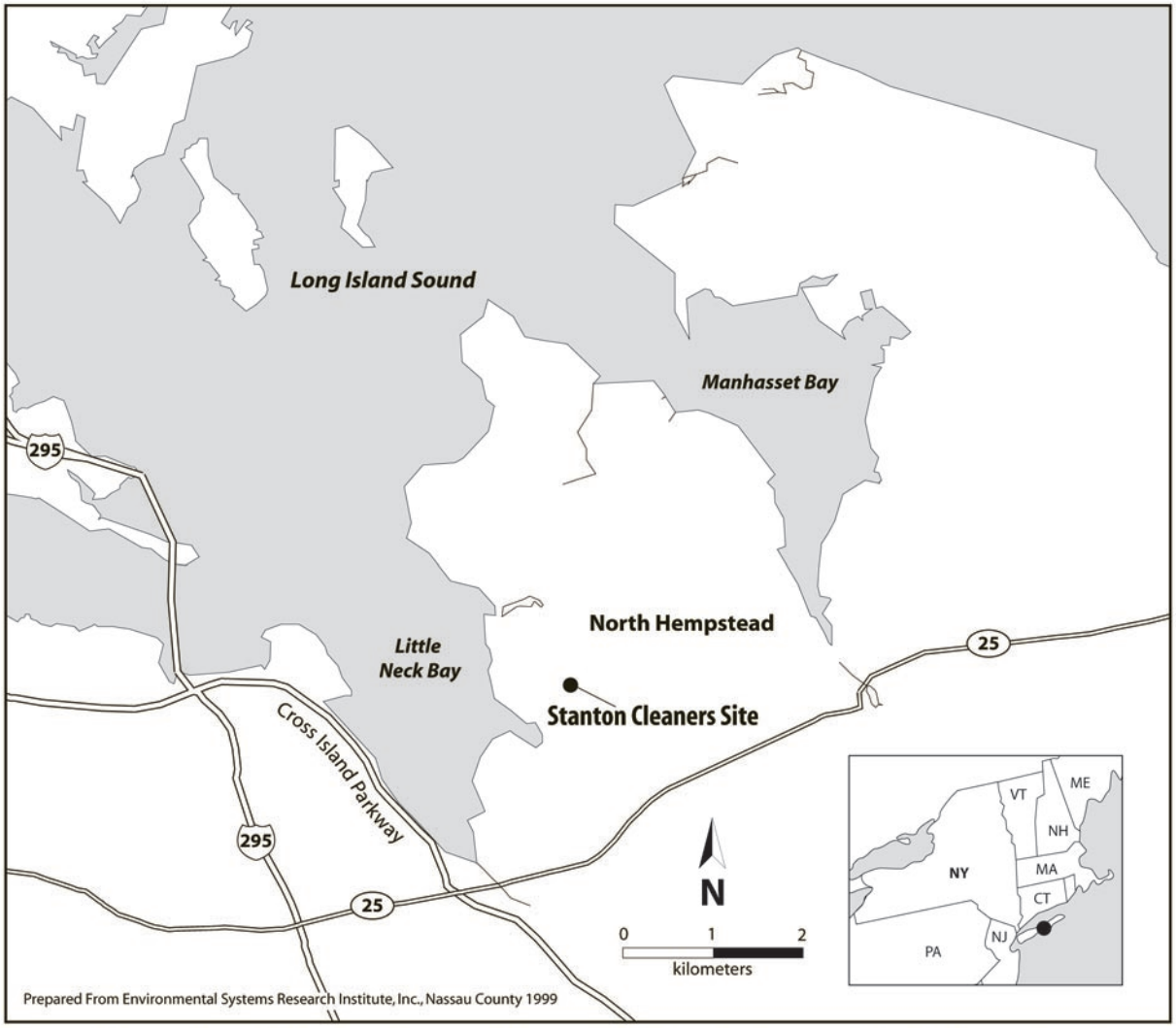

Figure 1. Location of Stanton Cleaners Property Site in the town of North Hempstead, New York.

In April 1985, Stanton Cleaners entered into a consent order with New York State Department of Environmental Conservation (NYSDEC). A groundwater extraction system and air stripper were installed to remove volatile organic compounds (VOCs). However, monitoring of the treated water revealed discharges from the system that exceeded permit limitations. In addition, the system was inoperable much of the time. In 1993, the ineffectiveness of this system to clean up the groundwater contamination and the persistence of soil contamination prompted NYSDEC to add the site to the New York State Registry of Inactive Hazardous Waste Disposal Sites. In April 1997, NYSDEC authorized the preparation of a Remedial Investigation/Feasibility Study, which was completed in November 1999. In January 1999, the U.S. Environmental Protection Agency proposed that the site be listed on the National Priorities List (Dvirka and Bartilucci 1998; USEPA 1999).

NOAA Trust Resources

The NOAA habitat of concern is Little Neck Bay, an estuary within Long Island Sound. Numerous marine and anadromous species use the estuary for spawning, rearing, and adult residence (Table 1).

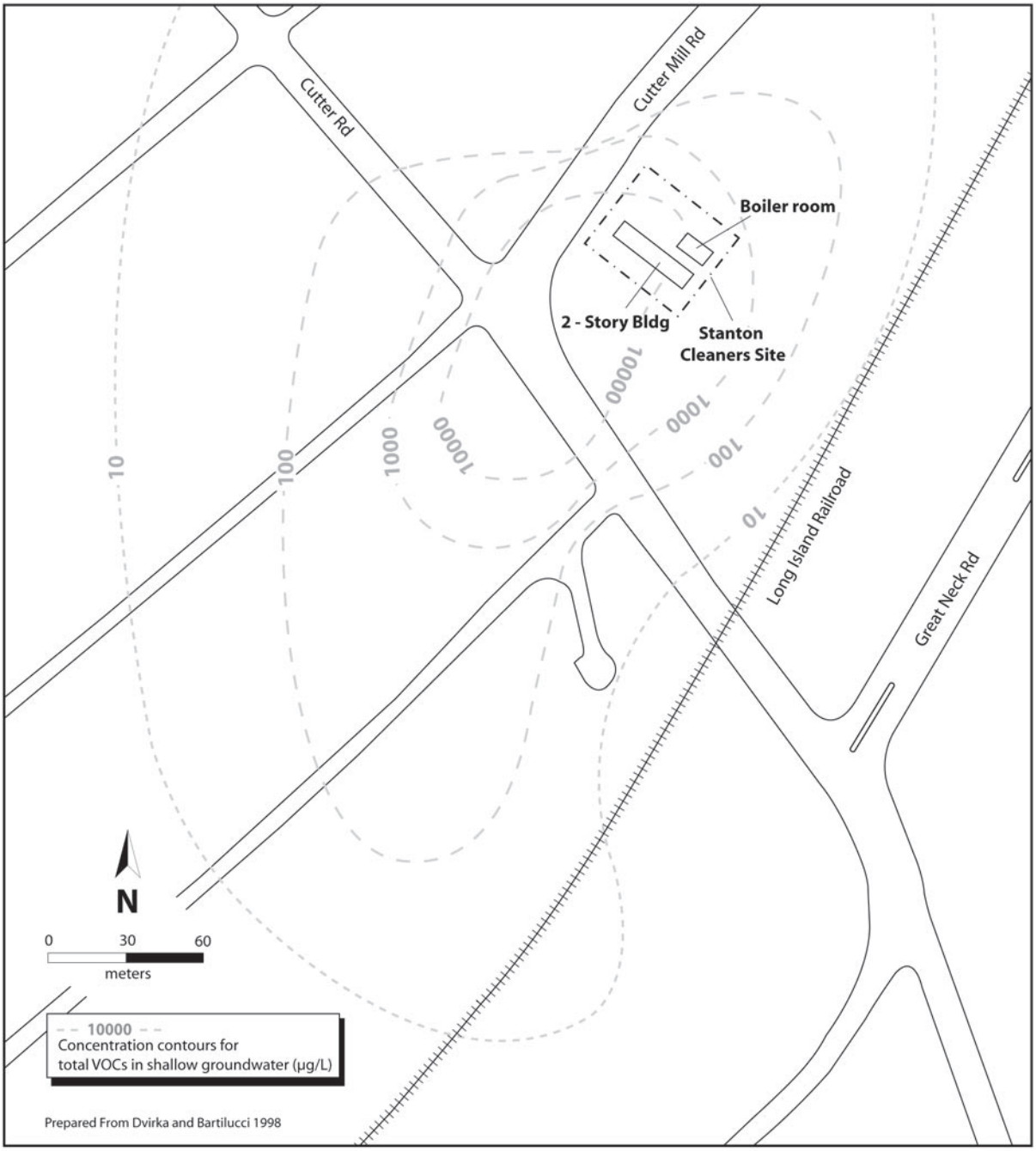

Figure 2. Detailed view of the New York Stanton Cleaners Site with total VOCs concentration contours in groundwater.

Little Neck Bay is a shallow embayment on the southwest shore of Long Island Sound with a maximum depth of 4 m (4.3 yds) MLLW (USGS 1995). Nearshore tidal flats of silty sands can be found at the head of the bay and up much of the eastern shore, nearest the site. Salinities are generally over 20 parts per thousand (ppt). Long Island Sound is a large coastal estuary measuring 170 km (106 mi) long, 34 km (21 mi) wide, with over 800 km (500 mi) of shoreline (USGS 1995; Long Island Sound Foundation 2000).

Table 1. Fish and invertebrate species commonly found in the Long Island Sound estuary (Stone et al. 1994).

Species		Habitat Use			Fisheries	
Common Name	**Scientific Name**	Spawning Ground	Nursery Ground	Adult Forage	Comm. Fishery	Recr. Fishery
ANADROMOUS/CATADROMOUS FISH						
Alewife	*Alosa pseudoharengus*		◆	◆		
American shad	*Alosa sapidissima*		◆	◆		
Blueback herring	*Alosa aestivalis*		◆	◆		
Rainbow smelt	*Osmerus mordax*		◆	◆		
Striped bass	*Morone saxatilis*		◆	◆		◆
White perch	*Morone americana*		◆	◆		◆
MARINE/ESTUARINE FISH						
American sandlance	*Ammodytes americanus*		◆	◆		
Atlantic herring	*Clupea harengus*		◆	◆		
Atlantic mackerel	*Scomber scombrus*		◆	◆		
Atlantic menhaden	*Brevoortia tyrannus*		◆	◆		
Atlantic tomcod	*Microgadus tomcod*		◆	◆		◆
Bay anchovy	*Anchoa mitchilli*		◆	◆		
Black sea bass	*Centropristis striata*		◆	◆		◆
Bluefish	*Pomatomus saltatrix*		◆	◆		◆
Butterfish	*Peprilus triacanthus*		◆	◆		
Cunner	*Tautogolabrus adspersus*		◆	◆		
Gobies	*Gobiosama spp.*	◆	◆	◆		
Hogchoker	*Trinectes maculatus*	◆	◆	◆		
Killifish	*Fundulus spp.*	◆	◆	◆		
Northern pipefish	*Syngnathus fuscus*	◆	◆	◆		
Northern searobin	*Prionotus carolinus*	◆	◆	◆		
Pollock	*Pollachius virens*		◆	◆		
Red hake	*Urophycis chuss*		◆	◆		
Oyster toadfish	*Opsanus tau*	◆	◆	◆		
Scup	*Stenotomus chrysops*		◆	◆		
Sheepshead minnow	*Cyprinodon variegatus*	◆	◆	◆		
Silversides	*Menidia spp.*	◆	◆	◆		
Skates	*Raja spp.*	◆	◆	◆		
Tautog	*Tautoga onitis*		◆	◆	◆	◆
Weakfish	*Cynoscion regalis*		◆	◆		
Windowpane flounder	*Scophthalmus aquosus*	◆	◆	◆		
Winter flounder	*Pleuronectes americanus*	◆	◆	◆		◆
INVERTEBRATES						
American lobster	*Homarus americanus*	◆	◆	◆	◆	◆
Bay shrimp	*Crangon septemspinosa*	◆	◆	◆		
Blue crab	*Callinectes sapidus*		◆	◆		◆
Blue mussel	*Mytilus edulis*	◆	◆	◆		
Eastern oyster	*Crassostrea virginica*	◆	◆	◆		
Grass shrimp	*Palaemonetes pugio*	◆	◆	◆		
Northern quahog	*Mercenaria spp.*	◆	◆	◆	◆	◆
Softshell clam	*Mya arenaria*	◆	◆	◆		

Small forage fish such as silversides, killifishes, gobies, sheepshead minnow, bay anchovy, oyster toadfish, and pipefish are common in Little Neck Bay and Long Island Sound, spending their entire lives within estuaries. Atlantic menhaden and Atlantic herring also are common forage fish that usually spawn in coastal waters, but their larvae are transported to estuaries where they reside through adulthood (Stone et al. 1994).

Larger demersal fish such as winter flounder, windowpane flounder, and skates are common, spending all or most of their lives in the estuary. Fish may spawn in either estuaries or coastal waters of the Sound (Stone et al. 1994).

Several cod species, including tomcod, red hake, and Pollock, use Long Island Sound, but are not as common as in more northern estuaries. Tomcod spawn in nearly fresh water and live in low salinities. Pollock and hake spawn in coastal waters with larval transport to estuaries where they reside as juveniles and adults (Stone et al. 1994).

Most of the remaining fish species exhibit the common marine life cycle of spawning in coastal areas with larval transport to estuaries where juveniles rear. Adults use estuaries seasonally, usually moving offshore during the winter (Stone et al. 1994).

Many of the East Coast anadromous fish species are common to abundant in Long Island Sound. Juvenile white perch, American shad, alewife, blueback herring, and striped bass rear in estuaries through the summer and fall. Adults generally dwell in coastal areas of the Sound (Stone et al. 1994).

The shellfish species spend their entire lives within the estuary. The northern quahog is the most common shellfish species in Long Island Sound, followed by the American oyster. Grass shrimp, bay shrimp, and American lobster are common, spending most or all of their lives within the estuary. Blue crabs are common but not as abundant as in estuaries further south on the East Coast. Both juvenile and adult blue crab use the estuary while brooding females generally move offshore (Stone et al. 1994).

Little Neck Bay supports commercial and recreational fisheries for fish and shellfish. American lobster, tautog, and quahog are the primary commercial fisheries. Recreational species most actively sought include striped bass, winter flounder, tautog, bluefish, American lobster, and hardshell clam (NYSDOH 1999).

The New York State Department of Health issued a general health advisory because of PCB contamination in marine waters of Long Island Sound. This advisory advises against the consumption of crab and lobster hepatopancreas. The advisory also limits the consumption of striped bass to no more than one meal per month and bluefish and American eel to no more than one meal per week (NYSDOH 1999).

Site-Related Contamination

Data collected during field investigations indicate contamination of soils and groundwater at the site. A total of 49 subsurface soil borings and 22 groundwater monitoring wells were sampled during the Remedial Investigation. Samples were analyzed for VOCs, iron, and manganese (Dvirka and Bartilucci 1998; USEPA 1999).

The primary contaminants of concern to NOAA are the VOCs tetrachloroethene (PCE) and trichloroethene (TCE), which were found in soils and groundwater on the facility. The maximum concentrations of PCE and TCE are listed in Table 2, along with appropriate screening guidelines.

Table 2. Maximum concentrations of contaminants of concern found at Stanton Cleaners Area Groundwater Contamination (Dvirka and Bartilucci 1998, USEPA 1999).

	Soils (mg/kg)		Water (µg/L)	
Contaminant	Site Soils	Mean U.S. Soil	Site Groundwater	LOEL[a]
Tetrachloroethene	6,200	NA	18,000	450[b]
Trichloroethene	38	NA	300	2,000[c]

NA: Data not available
a: Lowest Observable Effects Level.
b: Marine chronic value presented.
c: Marine chronic value not available; marine acute value presented.

The greatest concentrations of PCE and TCE in soils were located behind the facility where historical discharges had occurred. Elevated concentrations were observed in nine of 13 borings collected in this area. Although mean U.S. soil concentrations are not available for VOCs in soils, the Remedial Investigation estimated an area of 139 m^2 where VOC concentrations exceeded the New York soil standards of 1.4 mg/kg TCE and 0.7 mg/kg PCE (Dvirka and Bartilucci 1998). Given the average depth of groundwater at approximately 21 m bgs, the Remedial Investigation estimated that up to 2,900 m^3 of soilmay require remediation. Several other VOCs were observed in soils on the site, but at relatively lower concentrations.

The maximum concentrations of PCE in groundwater were two orders of magnitude greater than the AWQC screening value. No other VOCs exceeded screening guidelines. The greatest concentrations of VOCs were observed immediately downgradient of the site and a plume of VOC contamination is migrating in a southwesterly direction toward Little Neck Bay. Total VOCs at a concentration of 10,000 ug/L has been detected approximately 100 m downgradient of the site. Total VOCs of 1,000 ug/L has been detected approximately 150 m downgradient of the site. The total VOC contours of 100 and 10 ug/L are approximately 250 m and 300 m downgradient of the site, respectively (Figure 2).

References

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