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U.S. Navy Ships Parts Control Center

Mechanicsburg, Pennsylvania
CERCLIS #PA3170022104

Site Exposure Potential

Drainage from the U.S. Navy Ships Parts Control Center (NSPCC) in Mechanicsburg, Pennsylvania discharges to a 2.4-km ditch that joins Trindle Spring Run. From the confluence of this ditch, Trindle Spring Run flows 1 km to Conodoguinet Creek, which meanders about 25 km to the Susquehanna River, a NOAA trust habitat (Figure 1; EA Engineering 1993). The Susquehanna River flows another 120 km before discharging to Chesapeake Bay.

Since NSPCC was established in 1942, site activities have included storage of metal ores, ammunition management, and maintenance and engineering support. Site investigations identified eleven disposal sites (EA Engineering 1993; Figure 2; Table 1):

1. Carter Road Landfill
2. Building 904 Landfill
3. Ball Road Landfill and Burn Pits
4. Radioactive Waste Disposal Area
5. Golf Course Landfill
6. Underground Fuel Tank Leak
7. Buildings 403/404 Solvent Disposal Area
8. Ore Storage Area
9. Stormwater Drainage Ditch
10. Building 608 Underground Storage Tanks
11. Ingot Storage Areas

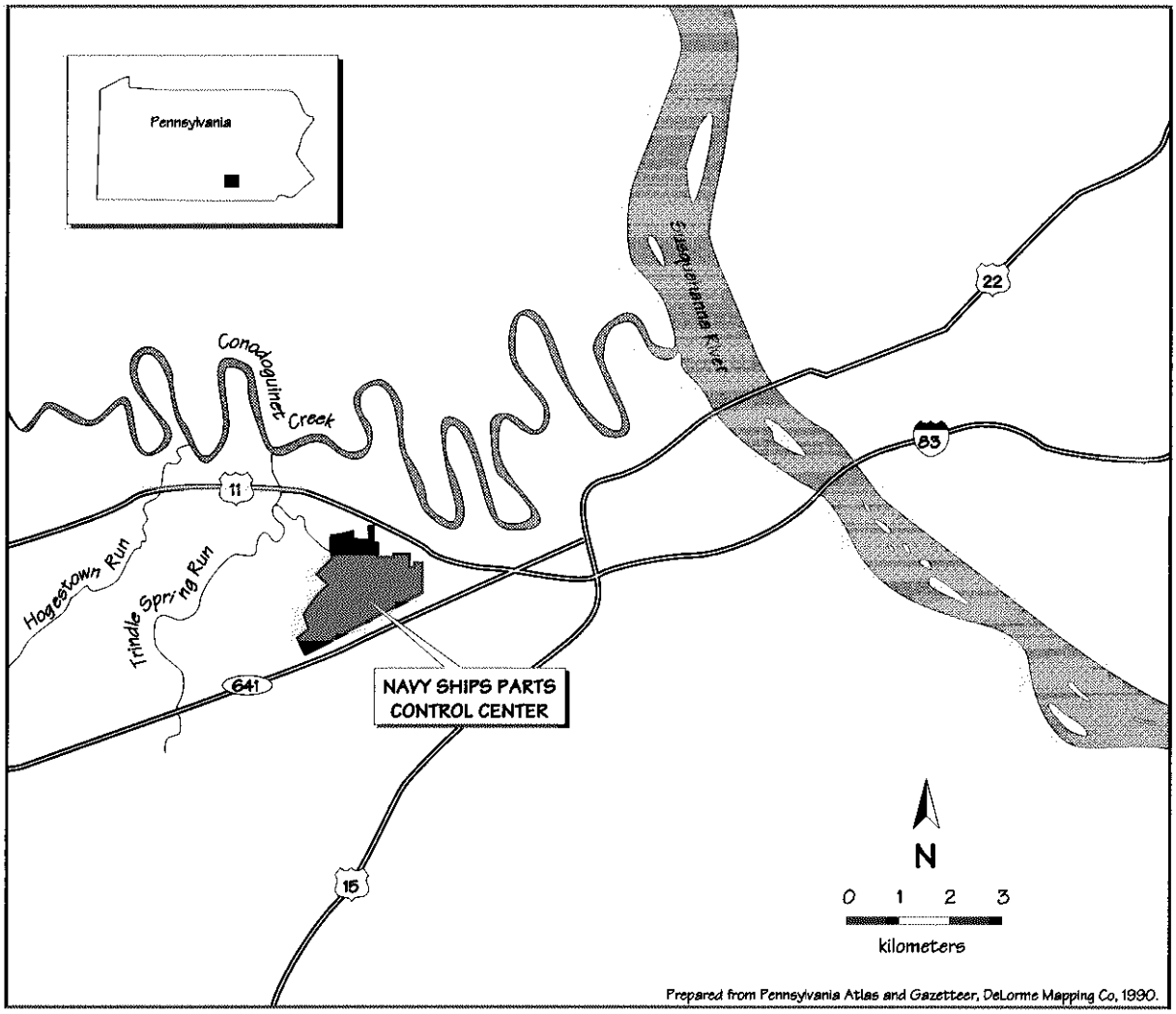

Figure 1. Location of Navy Ships Parts Control Center in Mechanicsburg, Pennsylvania.

Remedial investigations were completed at Sites 1, 3, 7, and 9. The Navy proposes no further investigations for Sites 2, 4, 5, 6, 7, 8, 10, and 11 based on evaluation of data collected during preliminary assessment, site inspection, and remedial investigation. A remedial action in 1990 and 1991 removed 6,100 metric tons of sediment contaminated with PCBs from Site 9, the 2.4-km stormwater drainage ditch. A long-term, post-remedial monitoring program is underway (EA Engineering 1993).

Surface water runoff and groundwater migration are contaminant transport pathways that could affect NOAA resources and associated habitats. The partially remediated drainage ditch on the northwestern edge of NSPCC (Site 9) collects most of the site's surface runoff. During heavy

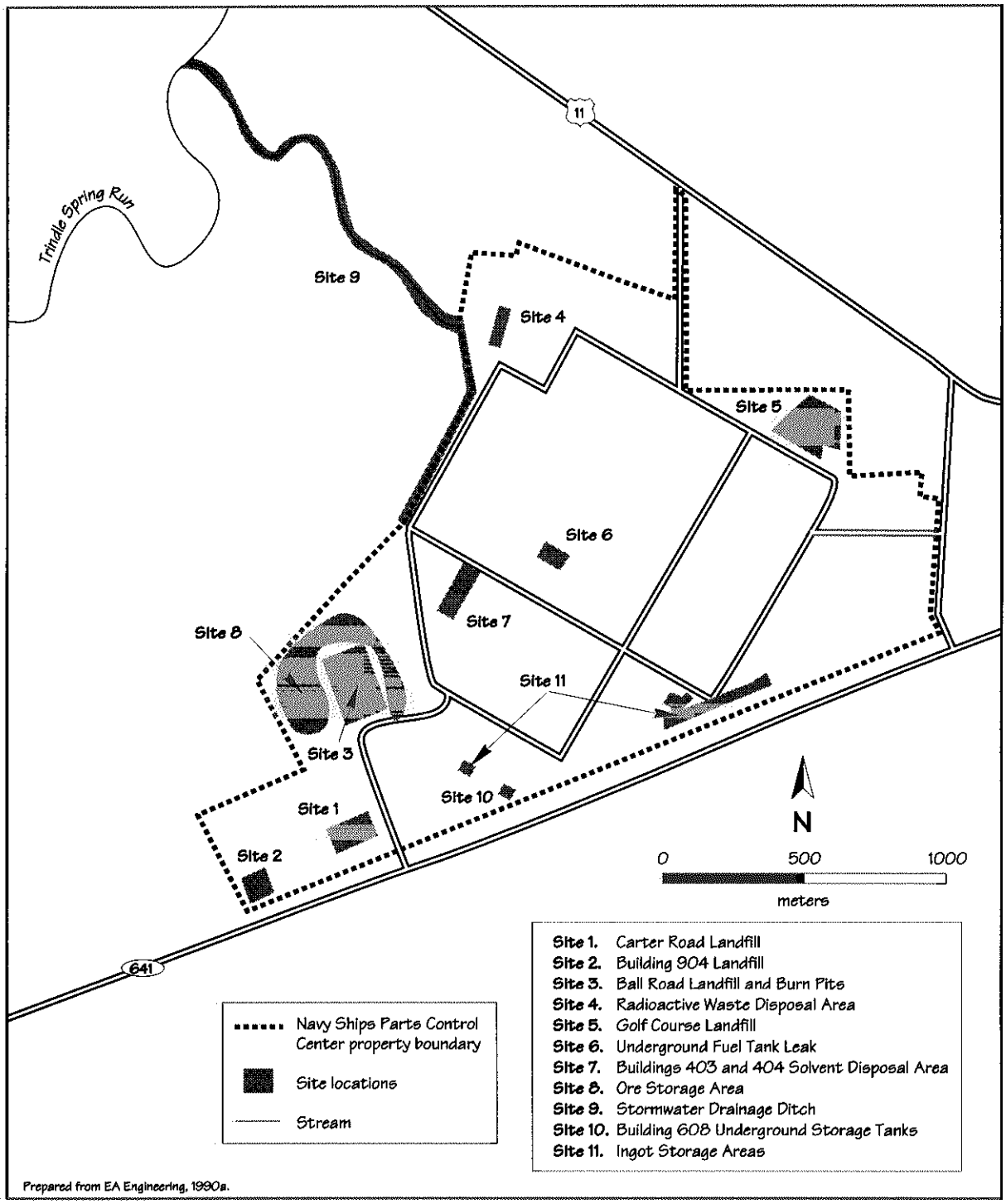

Figure 2. Detail of Navy Ships Parts Control Center.

Table 1. Individual site summaries for the Navy Ships Parts Control Center (EA Engineering 1993).

Site	Size/Volume	Period of Operation	Disposal/Operation	Contaminants of Concern/Media	Distance to Trindle Spring Run	Pathway	RI/FS Stage
1	1.8 hectares	1950-1962	Construction rubble and medical supplies were disposed in landfill.	PAHs, PCBs, DDTs, lead in soils	2 km	Groundwater	RA
2	0.4 hectares	1950s	Construction debris and medical supplies were disposed in landfill.	SVOCs in soils	2 km	Groundwater	NFA
3	8,400 m^3	1946-1977	Solvents, petroleum lubricants, paints, varnishes, gasoline, and medical supplies were disposed in landfill and burn pits. Wastes were doused with gasoline and burned weekly.	SVOCs, PCBs, arsenic, tin, mercury in soils and groundwater	1.4 km	Groundwater	RI
4	Unknown	1950s-1960s	Potential disposal of radioactive waste. Ground-penetrating radar and focused excavation at six test pits found only background radioactivity.	Radioactive substances in soils and groundwater	200 m	Groundwater/ Drainage ditch	NFA
5	1.6-2 hectares	~1946-1947	NSPCC waste material was disposed in this landfill in 1946 and 1947.	PAHs, trace elements in soils and groundwater	1.2 km	Drainage ditch	NFA
6	At least 13,600-l of gasoline leaked	Unknown	Two leaking underground storage tanks were discovered, one in 1977, the other in 1984. Both have been removed.	Low-lead gasoline, # 2 fuel oil in soils and groundwater	1 km	Groundwater	NFA
7	Unknown	1950s	Large quantities of spent trichloroethylene and stoddard solvent were poured onto the ground. Spent solvents were used to remove preservative oils and grease. Hydraulic fluid contaminated with PCBs may have been cleaned off machinery.	PCBs, trace elements in soils and groundwater	1 km	Groundwater/ Drainage ditch	NFA
8	Unknown	Unknown	Stockpiles of mineral ores including chromite and manganese, kyanite, and aluminum oxide were stored at Site 8.	PAHs, PCBs, trace elements in soils and sediments	1.4 km	Drainage ditch	NFA
9	2.4-km drainage ditch	Unknown	Site 9 collects stormwater from the entire NSPCC and discharges to Trindle Spring Run. In 1990-1991, 6,700 tons of sediment highly contaminated with PCBs, trace elements, and PAHs were removed. Post-remedial monitoring shows signifcant residual PCB contamination.	PCBs, PAHs, trace elements in sediments	Direct discharge	Direct discharge	RD/RA
10	Two 76,000-l underground storage tanks	Unknown	In 1970, water was discovered in fuel oil stored in the tanks. The tanks were emptied and filled with sand.	VOCs, SVOCs in soils	1.6 km	Groundwater	NFA
11	Unknown	Unknown	Lead and zinc ingots were stored at the site.	Trace elements in soils	1.5 km	Drainage ditch	NFA

RA: Remedial Action RI: Remedial Investigation
NFA: No Further Action RD: Remedial Design

rains, flow from the drainage ditch discharges to Trindle Spring Run, a tributary of Conodoguinet Creek. At other times, discharges to the ditch are intercepted by a series of sinkholes percolating to the water table, providing a pathway for site-related contamination to be transported by groundwater to Conodoguinet Creek. There are several unconfined, water-bearing formations beneath the site. Depending on the season, groundwater is encountered at 1.5 to 24 m bgs (EA Engineering 1990a, 1993).

NOAA Trust Habitats and Species

Habitats of concern to NOAA are surface waters, bottom substrates, and associated wetlands of Trindle Spring Run, Conodoguinet Creek, and the Susquehanna River. NSPCC is located in the lower Susquehanna River Subbasin, which has a drainage area of 54,488 km^2 encompassing eleven watersheds covering 46 percent of the state of Pennsylvania. The NSPCC straddles the Conodoguinet Creek and Yellow Breeches Creek watersheds, but all NSPCC drainage flows into the Conodoguinet Creek watershed.

Bottom substrates of Trindle Spring Run, Conodoguinet Creek, and the Susquehanna River are primarily gravel and cobble intermixed with areas of sand and silt. The downstream reaches of Trindle Spring Run and Conodoguinet Creek near the site are low-gradient, highly productive limestone streams. Conodoguinet Creek is approximately 15 m wide near the site. In the summer months, the Creek averages 1.0 to 1.5 m deep, but depth increases considerably during the spring. The Susquehanna River is a slow-moving, meandering river with many switchbacks and oxbows. In this area, it is about 1 km wide and 1 to 2.5 m deep (St. Pierre personal communication 1995a).

No wetlands have been identified within the boundaries of the NSPCC. Two small wetlands immediately outside the perimeter fence to the northwest are classified as Palustrine Unconsolidated Bottom, Permanent Excavated Wetlands (EA Engineering 1993).

Riparian modifications and construction of hydroelectric dams on the Susquehanna River have significantly reduced habitat accessible to NOAA trust resources. Four major dams control the river downstream of the site. Only Conowingo Dam, less than 20 km from the River mouth, has fish passage facilities. The Holtwood Dam, approximately 42 river km upstream from the River mouth, restricts natural upstream migration of anadromous NOAA trust resources. American shad and American eel are the only NOAA trust resources recently identified in the Susquehanna River above the York Haven Dam, 54 km upstream of the Holtwood dam and 24 km downstream from NSPCC. Shad are maintained in the upper river through stocking of juveniles and adults above the York Haven Dam, in the Harrisburg area. Although there are American eel throughout the river basin, there

has been an unexplained decline in the population over the past ten years. There is no established eel stocking program (St. Pierre personal communication 1995a).

A restoration program has been instituted for American shad, blueback herring, alewife, and American eel. The scope of this program is to (1) encourage the utilities to implement facility improvements that will enable migration, and (2) sustain hatchery stocking as well as lift, trap, and transport stocking of juveniles and adults until the fish populations naturally rejuvenate. A permanent passageway completed at the Conowingo Dam in 1991 passed 25,000 American shad during its first two years of operation. Utilities that maintain the other dams are planning similar construction programs. Proposed fish passage facilities on the Holtwood and Safe Harbor dams are projected to be completed in 1997 (St. Pierre personal communication 1995a). These fish passage projects are expected to restore multi-species migration to the NSPCC area by the year 2000. In addition, the fish passages would greatly reduce out-migration mortality caused by the hydroelectric turbines.

Authorities hope that near-historic patterns of migration and spawning populations of American shad, blueback herring, alewife, and American eel can be restored. There has been targeted stocking along several tributaries in the area. American shad larvae were released into the Conodoguinet Creek during Spring 1995. Approximately 230,000 differentially tagged larvae were released at the mouth of the Conodoguinet Creek, and 220,000 tagged larvae were released above blockages on the river near the town of Carlisle. Recovery catch of the juvenile American shad was completed in Fall 1995 to measure current habitat value of this area and natural production. A good percentage of those recovered were from Conodoguinet Creek (St. Pierre personal communication 1995b).

Adult herring were stocked during Summer 1995 on tributaries near Conodoguinet Creek. Though no herring were released directly into Conodoguinet Creek during 1995, approximately 5,000 herring are targeted for release in late April or early May 1996. In 1996, there may be further habitat evaluations, removal of fish ladders, and, potentially, dam removals. Although there are no commercial or recreational fisheries for NOAA trust resources near the site, these fisheries are expected to reappear as habitats are restored and stocks proliferate (St. Pierre personal communication 1995b).

Site-Related Contamination

Nine trace elements, PCBs, and PAHs are the major contaminants of concern to NOAA. Table 2 presents maximum concentrations reported from site inspections for Sites 1-8, 10, and 11 (EA Engineering 1990a). (Maximum concentrations of PCBs in the Stormwater Drainage Ditch following sediment removal are presented for Site 9; EA Engineering 1994).

Table 2. Maximum concentrations of contaminants of concern at sites on the Navy Ships Parts Control Center compared with applicable screening criteria (EA Engineering 1990a, 1994).

	Groundwater		Soils		Sediment		
Contaminant	Maximum (µg/l) Total/Dissolved	AWQC[1] (µg/l)	Maximum (mg/kg)	Average Soil (mg/kg)[2]	Trindle Spring Run (mg/kg)	On-site (mg/kg)	ERL (mg/kg)[3]
INORGANIC SUBSTANCES							
Arsenic	24/170	190	380	5	15	38	8.2
Cadmium	150/2.8	1.1+	75	0.06	0.6	2.8	1.2
Chromium	1000/12	11	120	100	29	89	34
Copper	2000/14	12+	3100	30	47	200	81
Lead	27000/1.7	3.2+	1100	10	0.15	130	46.7
Mercury	33/3.5	0.012+	3.3	0.03	0.23	ND	0.15
Nickel	940/170	160	87	40	ND	46	20.9
Silver	72/23	0.12	89	0.05	0.23	15	1.0
Zinc	8400/45	110+	3600	50	68	130	150
ORGANIC COMPOUNDS							
Anthracene	ND	300*	1.3	NA	ND	0.86	0.0853
Benz(a)anthracene	ND	300*	6.2	NA	ND	4.9	0.26
Benzo(a)pyrene	ND	300*	5.6	NA	ND	5	0.43
Benzo(b)fluoranthene	ND	300*	5.9	NA	ND	5.5	3.2**
Benzo(k)fluoranthene	ND	300*	4.1	NA	ND	3.4	3.2**
Fluoranthene	ND	3980	12	NA	ND	11	0.6
Naphthalene	68	620†	2.1	NA	ND	0.13	0.16
2-methylnaphthalene	ND	300*	28	NA	ND	0.16	0.07
Phenanthrene	ND	6.3	7.5	NA	ND	7.8	0.24
Pyrene	ND	300*	12	NA	ND	11	0.665
Chrysene	ND	300*	7.4	NA	ND	5.7	0.384
1,4-Dichlorobenzene	140	763***	14	NA	ND	ND	0.11
PCBs	83	0.014	240	NA	2.7	200	0.0227
DDD	ND	0.6†	0.46	NA	ND	ND	NA
DDE	ND	1050†	0.89	NA	ND	ND	0.002
DDT	ND	0.001	1.8	NA	ND	ND	0.0016

1: Ambient water quality criteria for the protection of aquatic organisms. Freshwater chronic criteria presented (EPA 1993).
2: EPA (1983)
3: Effects range-low; the concentrations repreesenting the lowest 10 percentile value for the data in which effects were observed or predicted in studies compiled by Long and MacDonald (1992).
*: Value for chemical class
**: Apparent effects threshold value.
***: Value for the summation of all isomers
†: Criteria have not been developed; concentration presented is the lowest observed effect level.
ND: Not detected
NA: Guidelines not available
+: Hardness-dependent criterion (100 mg/l $CaCO_3$ used)

Based upon current data, Site 9 continues to be the primary threat to NOAA trust resources. As reported, this site receives runoff from much of the NSPCC and discharges to Trindle Spring Run, a potential habitat for NOAA trust species. Before remedial sediment removal at Site 9,

maximum concentrations of PCBs in sediment exceeded 1,000 mg/kg, and concentrations over 100 mg/kg were commonly observed in the upstream half of the ditch (EA Engineering 1990b). Elevated concentrations of trace elements and PAHs were also measured. Concentrations up to 200 mg/kg PCBs were measured in the drainage ditch following the remedial action. Only PCBs were analyzed during post-remedial sampling (EA Engineering 1994).

During several post-remedial sampling rounds, PCBs were found in sediment collected from Trindle Spring Run at concentrations exceeding NOAA screening guidelines. Concentrations ranged from 0.04 to 2.7 mg/kg at stations immediately downgradient of the Stormwater Drainage Ditch (EA Engineering 1994). Concentrations of lead and mercury also slightly exceeded NOAA screening guidelines (EA Engineering 1990b). Sampling has not been conducted farther downstream in Trindle Spring Run or Conodoguinet Creek.

Current data indicate that Site 3, Ball Road Landfill and the Burn Pits, may contribute PCBs to the Stormwater Drainage Ditch. Rhodamine dye studies conducted during the Site 3 remedial investigation indicate that groundwater beneath the site flows to Trindle Spring Run and Conodoguinet Creek. Maximum concentrations of PCBs were 240 mg/kg in soil samples and 83 µg/l in groundwater (EA Engineering 1993).

The data also indicate that Site 1, Carter Road Landfill, may contribute trace elements to the Stormwater Drainage Ditch. Nine elements were measured in soils at concentrations one to three orders of magnitude above average soil concentrations in the U.S. (EA Engineering 1993). Neither dye studies nor an extensive evaluation of surface pathways were conducted at this site.

Concentrations of trace elements in unfiltered groundwater exceeded freshwater AWQC at most NSPCC sites. Dissolved concentrations of mercury, nickel, and silver exceeded screening guidelines at Sites 2, 3, 5, and 8. One element exceeded the screening guideline at Sites 1 and 11 (EA Engineering 1990a).

Soil samples collected at Sites 2 and 5, and sediment samples at Site 8, contained moderate to high concentrations of PAHs. Concentrations of ten PAHs in sediment collected from Site 8 exceeded NOAA screening guidelines. These contaminated sediments appear to be within the drainage area of the Stormwater Drainage Ditch (EA Engineering 1990a).

Summary

Hazardous wastes were disposed at the NSPCC; site-related contamination has been found in the Stormwater Drainage Ditch, which discharges to a Susquehanna River tributary. Restoration plans for anadromous fish on the Susquehanna River could allow NOAA trust resources access to the

immediate area of the ditch by the year 2000. PCB concentrations detected in the sediment of the drainage ditch exceeded NOAA screening guidelines by several orders of magnitude. PCBs detected in sediment downstream of the site in Trindle Spring Run at concentrations above screening guidelines indicate a potential risk to NOAA trust resources that may use the stream in the future.

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