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Cornell Dubilier Electronics, Inc.

South Plainfield, New Jersey
CERCLIS #NJ981557879

Site Exposure Potential

The Cornell Dubilier Electronics (CDE) property consists of approximately 10 hectares in South Plainfield, Middlesex County, New Jersey. An unnamed stream traverses wetlands on the southeast corner of the property, and then flows northwest approximately 1 km to Bound Brook. Bound Brook flows through New Market Pond, then joins Green Brook and discharges to the lower Raritan River approximately 10 km downstream from the site. From its confluence with Green Brook, the Raritan River flows approximately 25 km southeast to discharge into Raritan Bay (Figure 1; EPA 1997).

CDE manufactured electronic parts and components, including capacitors, from 1936 to 1962. In addition, the company tested transformer oils on the property for an unknown period of time. It has been alleged that CDE dumped transformer oils containing PCBs directly onto site soils, and buried transformers behind the facility. Soils at the rear of the property are reported to be saturated with PCB transformer oils. During a 1996 site investigation, discarded electrical and transformer parts were found in an uncovered, fenced area (EPA 1997). Site visits conducted between 1985 and 1994 revealed several aboveground storage tanks and areas of stained soil (EPA 1995; Figure 2).

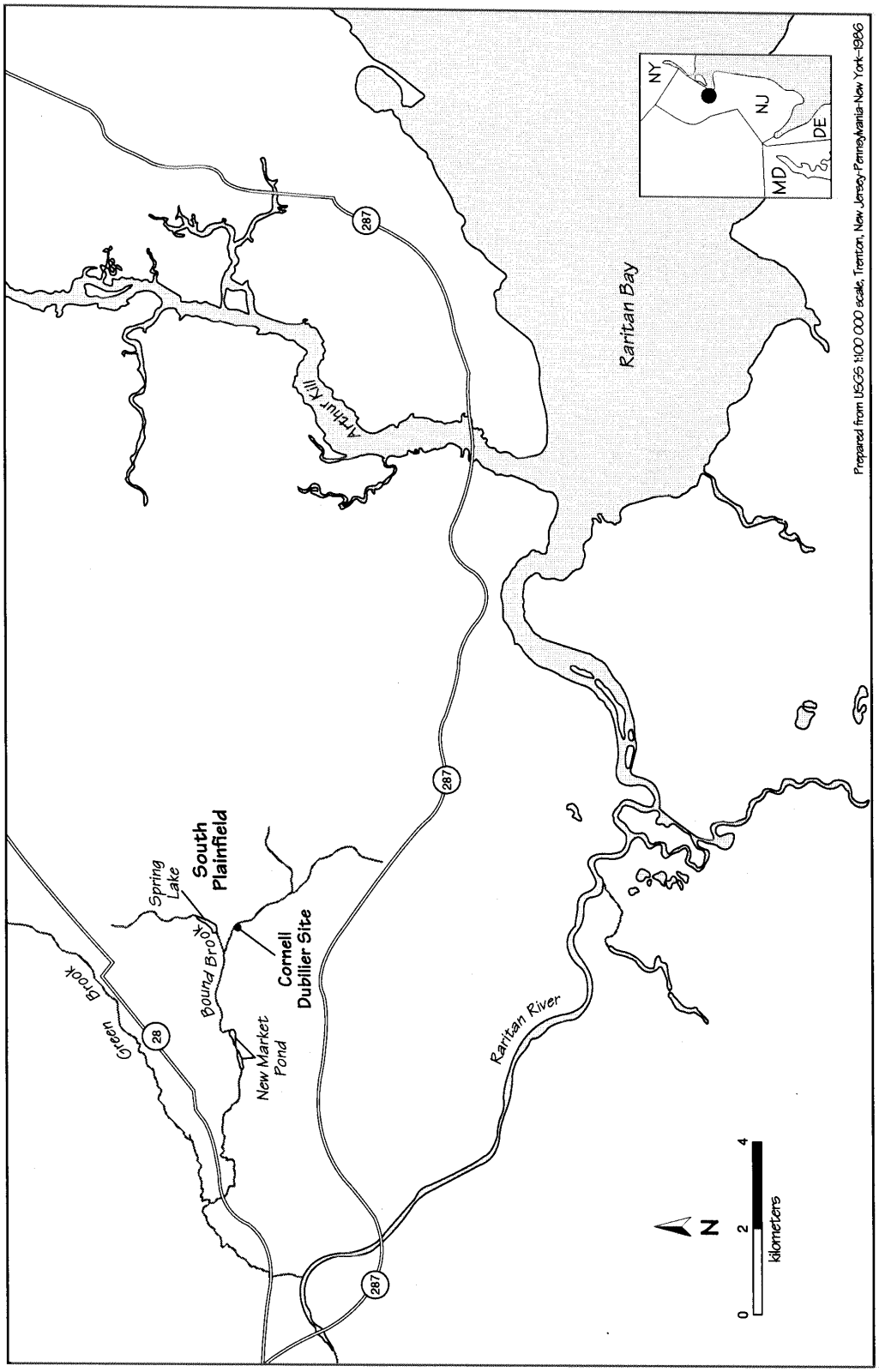

Figure 1. The Cornell-Dubilier Electronics site study area.

The site was proposed for addition to the NPL in September 1997. A Site Inspection Report, Removal Site Evaluation, and a Hazard Ranking Document were completed in 1995 and 1996 (EPA 1996). A contaminant pathway evaluation has not been completed, but site-related contamination may migrate from site source areas to the unnamed stream via erosion, stormwater runoff, and/or migration of NAPL and groundwater. Groundwater investigations have not yet been conducted, but test pit excavations in source areas have encountered groundwater at 1.4 to 2.7 m below ground surface.

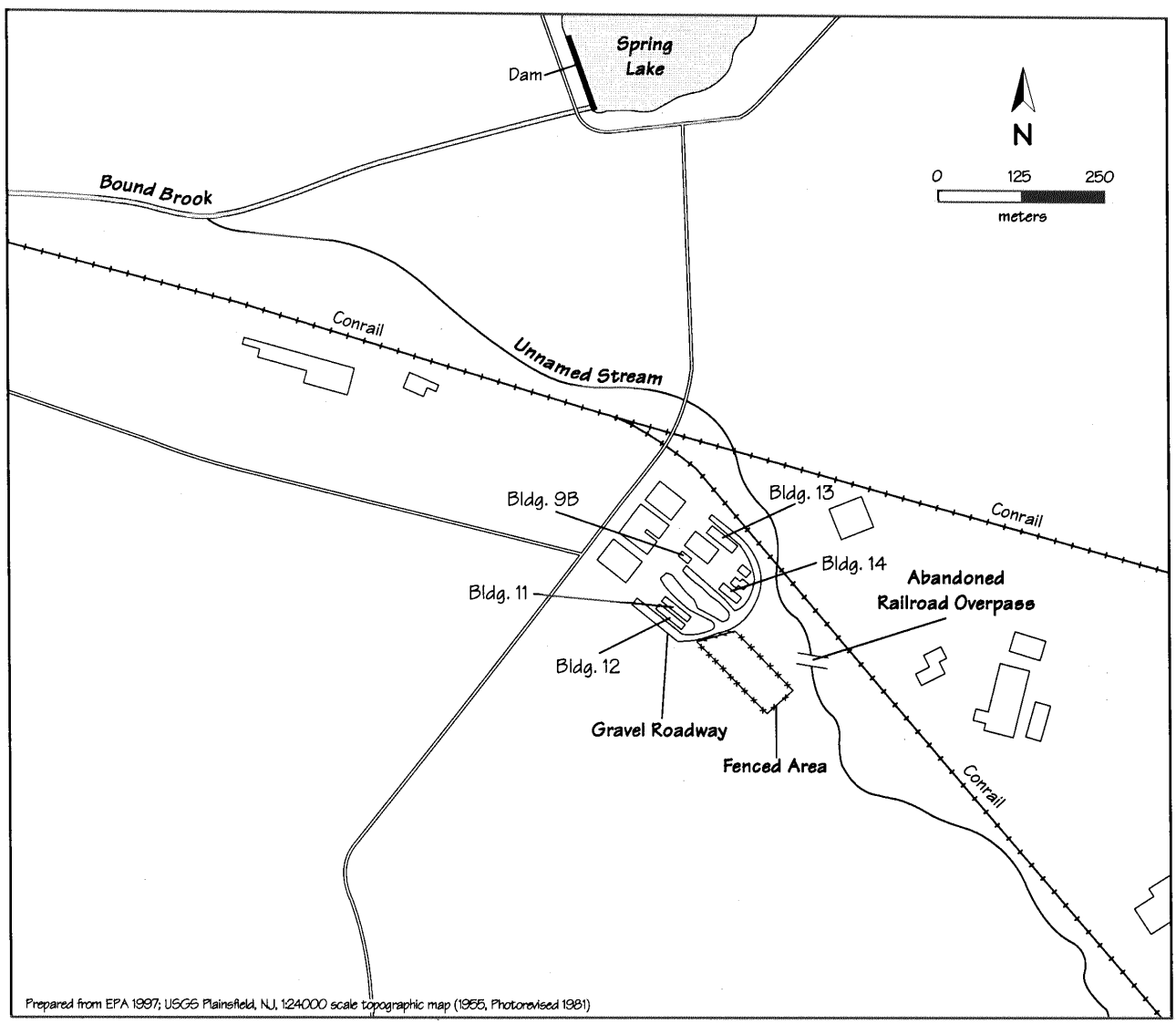

Figure 2. The Cornell Dubilier Electronics site.

NOAA Trust Resources

The NOAA trust habitats of concern are the surface water and sediments in the unnamed stream, Bound Brook, New Market Pond, Green Brook, and the Raritan River. The unnamed stream on the southeast corner of the facility is between 3 and 6 m wide, and 0.3 to 1 m deep (EPA 1997). Bound Brook is slightly larger. Both are low-gradient streams, characterized by a warmwater fish assemblage including sunfish, shiners, bullhead catfish, and carp (Barno 1997). Approximately 2.5 km downstream from the site, Bound Brook is controlled by a dam constructed without provision for fish passage. This dam creates New Market Pond.

The catadromous American eel is the only trust resource documented in Bound Brook. American eel are found throughout the Brook and can traverse the dam that forms New Market Pond. No fishery surveys have been conducted on the unnamed tributary that traverses the site, but eel have access to this stream as well (Barno 1997).

Although the New Jersey Department of Environmental Protection has no current plans to restore Bound Brook above New Market Pond for use by anadromous fish species, there is active restoration in the Raritan River. These restoration efforts are designed to build upon recent water quality improvements (Barno 1997).

The Raritan River and Raritan Bay serve as habitat for a variety of NOAA trust species. The Raritan River is included in the New York/New Jersey Harbor Management Area under the National Estuary Program, a federal program designed to create management plans for estuaries of national significance (Rosman 1998).

Over the past several years, adult American shad have been stocked in the Raritan River in efforts to re-establish a spawning population. Shad prefer large rivers and are unlikely to spawn in Bound Brook. However, other anadromous species, such as alewife and blueback herring which formerly spawned in the Raritan basin, also may recover as water quality continues to improve. Habitats in Bound Brook and the unnamed stream at the site are suitable for spawning of alewife and blueback herring (Boriek 1997).

In 1997, the New Jersey Department of Environmental Protection issued a consumption advisory for all fish taken from Bound Brook because of PCB contamination (New Jersey 1998).

Site-Related Contamination

Data collected during field investigations indicate contamination of soils, surface water, and sediments at the CDE site. Over thirty surface and subsurface soil samples were collected during the Site Inspection and Removal Site Evaluation. Four co-located surface water and sediment samples were collected in the unnamed tributary adjacent to the site. The Site Inspection noted a 1989 investigation consisting of three soil and

two sediment samples, but exact sampling locations were not known, so these data are not included in this review. Groundwater sampling has not yet been undertaken.

The primary contaminants of concern to NOAA are PCBs and several trace elements found in widespread source areas on the facility, in the unnamed stream, and in Bound Brook. PAHs also have been detected, although less frequently. Maximum contaminant concentrations are summarized in Table 1, along with appropriate screening guidelines.

PCBs were the most widely detected hazardous substances at the site. High PCB concentrations were found in the fenced area, the gravel roadway near Buildings 11 and 12, and along a footpath between the fenced area and an abandoned railroad overpass (Figure 2). Soil in the northeast corner of the fenced area, where exposed electrical and transformer parts were found, had PCB concentrations at percent levels (e.g. 51,000 mg/kg or 5.1 percent). Surficial soil samples collected in other portions of the fenced area had PCB concentrations ranging from 98 to 4,700 mg/kg. Surface soils in the gravel roadway had PCB concentrations up to 340 mg/kg, and samples collected immediately beneath the surface of the road had PCB concentrations up to 22,000 mg/kg. Between the fenced area and railroad overpass, PCB concentrations ranged from 90 to 3,000 mg/kg.

PCB concentrations in sediment samples from the unnamed stream exceeded NOAA screening guidelines. The maximum sediment concentration (550 mg/kg) was from a sample collected near the abandoned railroad overpass. Other stream sediment samples had concentrations ranging from 0.064 to 140 mg/kg.

PCBs were measured in surface-water samples of the unnamed stream at concentrations above EPA ambient water quality criteria. One surface water sample collected near the overpass contained 24 µg/L (ppb) of Aroclor 1254 and 20 µg/L (ppb) of Aroclor 1248.

Concentrations of seven trace elements were observed in source area soils at concentrations exceeding screening guidelines. Lead and cadmium had the greatest guideline exceedances. Percent-level concentrations of lead (67,000 mg/kg) were observed in the fenced area, and samples collected in the gravel road had concentrations ranging from 1,700 to 7,500 mg/kg. Concentrations of cadmium exceeded 200 mg/kg in these two areas.

Other trace elements were measured in sediment from the unnamed stream at concentrations exceeding screening guidelines. Concentrations of arsenic, cadmium, chromium, copper, lead, mercury, nickel, silver, and zinc in stream sediment exceeded their respective TEL concentrations. Stream water samples exceeded EPA ambient water quality criteria for cadmium, chromium, copper, lead, mercury, , silver, and zinc.

Table 1. Maximum concentrations of contaminants of concern observed in environmental media at the Cornell Dubilier Electronics site (EPA 1996, 1997, 1999).

Contaminant	Site Soils mg/kg	Mean U.S. Soil mg/kg[a]	Stream Sediments mg/kg	TEL mg/kg[b]	Surface Water µg/L	Chronic AWQC µg/L[c]
TRACE ELEMENTS						
Arsenic	35	5.0	24.0	5.9	16.0	190.0
Cadmium	370	0.06	25.0	.60	15.0	1.1
Chromium	280	100.0	78.0	37.0	26.0	11.0
Copper	12,000	30.0	220.0	36.0	90.0	12.0
Lead	67,000	10.0	550.0	35.0	180.0	3.2
Mercury	72	0.03	0.91	0.17	0.23	0.012
Nickel	150	40.0	52.0	18.0	41.0	160.0
Silver	27	0.05	11.0	1.0	3.8	0.12
Zinc	2,000	50.0	800.0	123.0	990.0	110.0
ORGANIC COMPOUNDS						
PCBs	51,000t	NA	550	0.034	44[d]	0.014t
Benz(a)anthracene	9.5	NA	8.3	0.032	1.0	NA
Benzo(a)pyrene	9.7	NA	13.0	0.032	ND	NA
Benzo(b)fluoranthene	15	NA	8.2	NA	2.0	NA
Benzo(g,h,i)perylene	6.4	NA	9.0	NA	ND	NA
Benzo(k)fluoranthene	4.2	NA	9.1	NA	0.6	NA
Chrysene	11.0	NA	9.4	0.057	2.0	NA
Dibenz(a,h)anthracene	1.0	NA	2.4	NA	ND	NA
Fluoranthene	12.0	NA	16.0	0.111	2.0	NA
Indeno(1,2,3-c,d)pyrene	6.0	NA	4.7	NA	ND	NA
Phenanthrene	9.4	NA	14	0.042	1.0	6.3p
Pyrene	16.0	NA	17	0.053	2.0	NA

NA: Data not available.
ND: Not detected; detection limits not available.
[a] Shacklette and Boerngen (1984), except for silver and cadmium which are average concentrations in the earth's crust as reported by Lindsay (1979).
[b] Threshold effect level; concentration below which adverse effects were rarely observed (geometric mean of the 15% concentration in the effects dataset) as compiled by Smith et al. (1996).
[c] Ambient Water Quality Criteria, freshwater (EPA 1993).
[d] Sum of Aroclor 1254 (24 µg/L) and Aroclor 1248 (20 µg/L).
p Proposed criterion.
t Sum of class.

Low to moderate concentrations of several PAHs were observed in site soil samples, although these substances were not as widespread as the PCBs or trace elements. Concentrations of individual PAHs in soil were generally below 2 mg/kg.

Higher concentrations were observed in sediment from the unnamed stream. Nine individual PAHs were observed in sediment at concentrations exceeding TELs. In all cases, concentrations in sediment were higher than those found in soils.

Summary

The CDE site is located on an unnamed tributary of Bound Brook within the Raritan River basin. Soils, stream surface water, and stream sediment on the site are widely contaminated with PCBs and trace elements at concentrations greatly exceeding NOAA screening guidelines, posing a threat to NOAA trust resources. The catadromous American eel, a NOAA trust species, is found in Bound Brook and is likely present in the unnamed tributary. Ongoing projects to restore water quality and anadromous populations in the Raritan River could bring spawning alewife and blueback herring to the suitable habitats found in Bound Brook. New Jersey maintains a fish consumption advisory for all fish taken from Bound Brook because of PCB contamination.

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