

## DOCUMENTATION OF ENVIRONMENTAL INDICATOR DETERMINATION

### RCRA Corrective Action Environmental Indicator (EI) RCRIS code (CA 725) Current Human Exposures Under Control

**Facility Name:** Witco Corporation (currently known as Crompton Corporation)  
**Facility Address:** 1000 Convery Boulevard, Perth Amboy, New Jersey  
**Facility EPA ID#:** NJD002165561

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#### **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 EIs 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 “Current Human Exposures Under Control” EI**

A positive “Current Human Exposures Under Control” EI determination (“YE” status code) indicates that there are no unacceptable human exposures to “contamination” (i.e., contaminants in concentrations in excess of appropriate risk-based levels) that can be reasonably expected under current land- and groundwater-use conditions (for all 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 objectives of the RCRA Corrective Action program, the EIs are near-term objectives which are currently being used as Program measures for the Government Performance and Results Act of 1993 (GPRA). The “Current Human Exposures Under Control” EI is for reasonably expected human exposures under current land- and groundwater-use conditions ONLY, and does not consider potential future land- or groundwater-use conditions or ecological receptors. The RCRA Corrective Action program’s overall mission to protect human health and the environment requires that Final remedies address these issues (i.e., potential future human exposure scenarios, future land and groundwater uses, and ecological receptors).

#### **Duration / Applicability of EI Determinations**

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

#### **Facility Information**

The Witco Corporation (currently Crompton Corporation) site is a 44.7-acre active manufacturing facility located in Perth Amboy, New Jersey. The facility is bounded to the north by Spa Spring Creek and manufacturing facilities on the Russell Stanley property, to the east by single-family residences on Amboy Avenue, to the south by Chevron Oil Company and high-rise multi-family housing, and to the west by

commercial and single-family property along Convery Boulevard. The Witco facility is locally zoned as M-1 and M-3 (manufacturing).

Until the late 1970's, Witco's Performance Chemicals (Organics) Division and Asphalt Division operated concurrently at the property. Presently, only the Performance Chemicals (Organics) Division is operational. The facility currently manufactures polyester resins, blended emulsifiers, sulfosuccinates, lusterary compounds, alkane sulfonates, anionic surfactants, specialty amides, and non-metallic and metallic stearates.

Polychlorinated biphenyls (PCBs) were used at the facility as a heat transfer medium for polyester process heaters until 1972. During the period when PCBs were utilized at the facility, various media were impacted including soil, sediments (drainage ditches), and groundwater. In addition, off-site locations such as the Perth Amboy Sewer system and associated surcharges, Spa Spring Creek, and Cranes Creek were impacted by PCBs emanating from the Witco facility. The State of New Jersey filed suit against Witco in 1983 for clean up of the on- and off-site contamination and Witco responded by entering into a Stipulation of Settlement with the State in September 1985 and an Amendment to the Stipulation of Settlement in January 1993. These settlements defined PCB cleanup levels and placed the responsibility for investigation and clean up at the site on Witco Corporation. Remedial actions, including excavation and disposal of impacted soil and closure of former process areas (e.g., fuel tanks, heater pads, lagoon), have been occurring at the facility since 1983, in order to address the contamination both on- and off-site.

Witco has controlled all off-site migration of contamination. The Perth Amboy Sewer system and associated surcharges are no longer being impacted by the Witco facility due to the remedial activities that have been conducted at the site. In addition, Witco constructed and activated a wastewater collection and treatment system in 1993 to treat wastewater before it is discharged to the Perth Amboy Sewer system. Witco has also performed remedial activities in Cranes Creek and was granted a No Further Action designation from NJDEP for this area on November 30, 1995. Remedial activities conducted in the Spa Spring Creek have been completed and are discussed in the EI responses that follow.

1. Has **all** available relevant/significant information on known and reasonably suspected releases to soil, groundwater, surface water/sediments, and air, 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?

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

If no - re-evaluate existing data, or

If data are not available skip to #6 and enter IN (more information needed) status code

**Summary of Solid Waste Management Units (SWMUs) and Areas of Concern (AOCs):** While conducting the Remedial Investigation (RI) at the property, the site was divided into different AOCs. In general, the specific AOCs consist of areas where releases occurred or where materials were disposed or buried. During the early 1980s, releases of PCBs from heat exchangers at the property contaminated surrounding environmental media. PCBs were also found in demolition rubble piles, at a former burial site for two large vanadium pentoxide catalytic reactors, in buried drums of waste polyester stearates and surfactants, and in soil surrounding an underground solvent storage tank which has since been removed. Soil excavation and removal has been implemented at most of the areas outlined below; specific remedial actions, soil screening criteria, and residual soil contamination levels are presented in greater detail in the sections that follow. All excavated areas have been backfilled with at least two feet of clean soil and restored to their pre-remedial condition with regard to topography, surface hydrology, and vegetation. A map indicating the location of the AOCs identified below is provided in Attachment 1.

**AOC A:** This is a 15.5-acre wooded area on the eastern side of the property, including the drainage ditches located along Amboy Avenue and Spa Spring Creek and associated wetlands. Elevated levels of PCBs have been detected in soil and sediment in this area. Approximately 850 tons of non-TSCA<sup>1</sup> soil and sediment have been removed as part of remedial activity at this unit. Sample results indicate remaining constituents are below relevant standards for subsurface soil and sediment. Witco has installed an asphalt cover over one small area that contained surface soil above the 2 mg/kg site-specific standard. During investigation and remedial action, this area was further subdivided into:

**AOC A-1:** A geophysical survey conducted at the site detected an anomaly in this area, leading to the excavation of test pits 11 and 12. Buried drums were found, along with volatile organic compounds (VOCs) and metals contamination above industrial standards. The buried drums and approximately 450 tons of TSCA soil were removed from this area. Post-excavation samples indicated metal and VOC results were below industrial standards.

**AOC A-2:** On September 24, 1996, a tar-like substance was noted seeping from the ground in this area. Results indicated elevated levels of methylene chloride and total

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<sup>1</sup>Toxic Substances Control Act (TSCA) soil refers to soil contaminated with PCBs above 50 mg/kg, while non-TSCA soil refers to soil contaminated with PCBs above 2 mg/kg but below 50 mg/kg.

petroleum hydrocarbons (TPH). Visually impacted soil was excavated and confirmatory sampling concluded that the contaminated material had been removed.

**AOC A-3:** A geophysical survey conducted at the site also detected an anomaly in this area, leading to the excavation of test pit one (1). No garbage or debris was encountered and post-excavation samples indicated constituents were below relevant standards.

**AOC A-4:** A geophysical survey conducted at the site also detected an anomaly in this area, leading to the excavation of test pit two (2). Upon initial excavation, a variety of construction debris and 55-gallon steel drums were encountered. Elevated levels of lead, PCBs, benzene, toluene, ethylbenzene, and xylenes (BTEX) were detected. Post-excavation samples indicated constituents were below relevant standards.

**AOC B:** A geophysical survey conducted at the site detected an anomaly in this area. The area consists of a two-acre rubble pile that was fully surrounded by AOC A. The pile was found to contain soil, demolition rubble, asphalt, and coal tars with elevated levels of PCBs. Seven soil excavation areas (hot spots) were removed in this area, and the soil was managed as TSCA waste. Confirmation samples indicated that remaining constituents were below relevant standards.

**AOC C:** This is a six-acre area that includes the former asphalt manufacturing, storage, administrative, and service buildings. A geophysical survey conducted at the site detected an anomaly in this area. A test pit was excavated, and elevated levels of PCBs were detected. Approximately 1,924 tons of TSCA soil and 740 tons of non-TSCA soil were excavated from this area. Post-excavation sampling confirmed that remaining constituents were below relevant standards. During investigation and remedial activity, this area was further subdivided into:

**AOC C-1:** This area is the former location of the above-ground No. 6 fuel oil storage tank removed in 1996. During tank removal, a small soil excavation was conducted in the area of the tank and associated piping. Additional sampling of this area was conducted as part of the 1997 RI. Analytical results indicated that no constituents exceeded industrial standards for any of the Target Compound List/Target Analyte List constituents.

**AOC D:** This is a 1.5-acre area surrounding and including the polyester building, drum filling building, and hot oil heater areas. Test pits excavated in this area indicated that elevated levels of PCBs were present. Approximately 7,600 tons of TSCA soil and 2,800 tons of non-TSCA soil were excavated. All confirmatory sample results were within or below relevant standards. During investigation and remedial activity, this area was further subdivided into:

**AOC D-1:** A geophysical survey conducted at the site detected an anomaly in this area. Test pits T1A, D1A, T1B, and D1B were excavated, and buried drums were found. All of the buried drums were excavated and removed and confirmatory sampling revealed that remaining constituents in soil were below relevant standards.

**AOC D-2:** This area consisted of the heater pad area which, based upon RI sampling results, apparently released PCBs to surrounding soil. In February 1999, two areas of contaminated subsurface soil surrounding this unit were excavated. A 40-mil PVC liner

and water collection system was placed in each excavation, and the excavations were backfilled and topped with a concrete cap. Due to structural stability difficulties encountered during the excavation, some soil with PCB concentrations above the site-approved industrial subsurface standards (50 mg/kg) was allowed to remain in place under the capped area, per NJDEP and USEPA approval.

**AOC E:** This area consists of the remaining 19.7 acres at the site, including the active manufacturing, storage, administrative, and service buildings. According to the Remedial Action Report (Reference No. 3, pg. 4-27), a settling lagoon located in this area was closed following removal of PCB-contaminated sediments, backfilling of the area with clean soil, and grading. Elevated levels of PCBs were found throughout the AOC and, in total, approximately 300 tons of TSCA-regulated soil and sediment and 990 tons of non-TSCA-regulated soil were excavated and removed. Confirmatory sample results indicated that remaining constituents in subsurface soil are below relevant standards. Witco has installed an asphalt cover over one small area that contained surface soil above the 2 mg/kg site-specific standard.

**AOC F:** This AOC consists of the contaminated groundwater underlying the facility. Witco maintains a network of 28 monitoring wells to analyze groundwater conditions at the site. Contaminants that have been detected in groundwater include PCBs, VOCs, semivolatile base neutral acid-extractable compounds (BNAs), and metals. However, the ongoing monitoring program identifies only a few constituents above relevant screening criteria. These constituents include 1,1-dichloroethene (1,1-DCE), cis-1,2-dichloroethene (cis-1,2-DCE), trichloroethene (TCE), benzene, xylene, PCBs, lead, chromium, nickel, barium, cadmium, arsenic, and TPH. Groundwater investigation activities performed to date have demonstrated that contamination is maintained within property boundaries. Groundwater is currently monitored on an annual basis, and four complete rounds of data are currently available. NJDEP has conditionally approved natural attenuation as the remedial action for AOC F (Reference No. 9, pg. 1). Witco is also in the process of establishing a groundwater Classification Exception Area (CEA) encompassing the entire 44.7-acre site. The natural attenuation remedy and CEA require four additional annual rounds of monitoring through June 2004 to ensure that natural attenuation is adequately controlling and reducing contaminant concentrations in groundwater. A pilot study is also in progress to determine if nutrients added to the subsurface environment can enhance biodegradation of the observed contaminants.

All excavation and removal actions at AOC A through AOC E are completed. Witco is currently in the process of filing a Deed Notice with local agencies as part of the Remedial Action Plan for these AOCs. A No Further Action determination from NJDEP is imminent for all remedial actions at the site associated with soil, sediment, and surface water (Reference No. 9, pg. 1). Remedial Actions at AOC F are underway and will occur over the next four years. The CEA will be filed with the local agencies as soon as the final elements of the natural attenuation remedial action and monitoring program are agreed upon between Witco, NJDEP, and USEPA.

#### **References:**

- (1) Stipulation of Settlement between NJDEP and Witco, dated September 10, 1985.
- (2) Second Amendment to the Stipulation of Settlement between NJDEP and Witco, dated January 12, 1993.

- (3) Remedial Action Report, prepared by Foster Wheeler Environmental Corporation (Foster Wheeler), dated November 1998.
- (4) Remedial Action Report Addendum, prepared by Foster Wheeler, dated July 1999.
- (5) Memo from David Kaplan, NJDEP, to Gary Lipsius, NJDEP, Re: Witco Remedial Action Report Addendum, dated August 18, 1999.
- (6) Memo from Andrew Marinucci, NJDEP, to Gary Lipsius, NJDEP, Re: Review of Remedial Action Report Addendum, dated September 14, 1999.
- (7) Letter from Stephen Kohlhase, Witco, to Gary Lipsius, NJDEP, Re: Submittal of Remedial Action Report Addendum No. 2, dated December 17, 1999.
- (8) Memo from Andrew Marinucci, NJDEP, to Christopher Kanakas, NJDEP, Re: Review of Draft Deed Notice, dated March 29, 2000.
- (9) Letter from Patricia Conti, NJDEP to Stephen Kohlhase, Crompton, Re: Remedial Action Report Addendum Dated July 1999, dated July 27, 2000.
- (10) Letter from Patricia Conti, NJDEP to Stephen Kohlhase, Crompton, Re: Remedial Action Report Addendum No 2 (December 1999), dated July 27, 2000.

2. Are groundwater, soil, surface water, sediments, or air **media** known or reasonably suspected to be “**contaminated**”<sup>2</sup> above appropriately protective risk-based levels (applicable promulgated standards, as well as other appropriate standards, guidelines, guidance, or criteria) from releases subject to RCRA Corrective Action (from SWMUs, RUs or AOCs)?

Media	Yes	No	?	Rationale/Key Contaminants
Groundwater	X			VOCs, PCBs, TPH, metals
Air (indoors) <sup>3</sup>		X		
Surface Soil (e.g., <2 ft)	X			PCBs
Surface Water		X		
Sediment		X		
Subsurface Soil (e.g., >2 ft)	X			PCBs
Air (Outdoor)		X		

\_\_\_\_\_ If no (for all media) - skip to #6, and enter YE, status code after providing or citing appropriate levels, and referencing sufficient supporting documentation demonstrating that these levels are not exceeded.

  X   If yes (for any media) - continue after identifying key contaminants in each contaminated medium, citing appropriate levels (or provide an explanation for the determination that the medium could pose an unacceptable risk), and referencing supporting documentation.

\_\_\_\_\_ If unknown (for any media) - skip to #6 and enter IN status code.

**Ratio nale :**

**Groundwater**

The Witco site is underlain by a regional water-table aquifer (Woodbridge water-table aquifer) which generally corresponds to sandy lenses within the clayey Woodbridge Member of the Raritan Formation.

<sup>2</sup> “Cont amination” 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 appropriately protective risk-based “levels” (for the media, that identify risks within the acceptable risk range).

<sup>3</sup> Recent evidence (from the Colorado Dept. of Public Health and Environment, and others) suggests that unacceptable indoor air concentrations are more common in structures above groundwater with volatile contaminants than previously believed. This is a rapidly developing field and reviewers are encouraged to look to the latest guidance for the appropriate methods and scale of demonstration necessary to be reasonably certain that indoor air (in structures located above (and adjacent to) groundwater with volatile contaminants) does not present unacceptable risks .

The shallow clays of the Woodbridge Member in some cases cause localized shallow perched water-table units to form in the overlying glacial drift and fill material. The Woodbridge water-table aquifer overlies a leaky confined aquifer in the Farrington Member (Farrington aquifer). The Farrington aquifer is confined by Woodbridge Member clays. Witco maintains a network of 28 monitoring wells to analyze groundwater conditions at the site. Monitoring wells have been screened into both the Woodbridge and Farrington Aquifers and individual perched water table units.

Groundwater is currently monitored on an annual basis. Between 1995 and 1998, groundwater beneath the Witco site was sampled semiannually. During the semiannual sampling, groundwater samples collected during the January rounds were analyzed for PCBs only. Samples collected during the June rounds were analyzed for VOCs, PCBs, BNAs, pesticides, and total and dissolved metals. During the RI/FS, NJDEP and Witco established site-specific groundwater quality standards (SSGWQS). Of all constituents which remain a concern at the Witco site, only the PCB standard varies from the generic NJ Ground Water Quality Criteria (GWQC), as published in N.J.A.C. 7-9-6. The SSGWQS for PCBs is 1.0 ug/L, whereas the NJ GWQC is 0.5 ug/L. Contaminants detected at or below these SSGWQS do not pose unacceptable risks. Groundwater investigation activities performed to date have demonstrated that contamination is maintained within property boundaries. Specific recent sampling data is discussed below.

During the most recent round of sampling (June 1998), 12 contaminants were detected in groundwater above the SSGWQS (Reference Nos. 1 and 3). The maximum values for these contaminants were found in seven plume monitoring wells. Table 1 identifies the highest level for each contaminant, the well in which the concentration was detected, and the corresponding SSGWQS.

**Table 1 - Contaminant Concentrations Observed in Groundwater Above the SSGWQS (June 1998)**

Contaminant	SSGWQS (ug/L)	Observed Concentration at Well Locations (ug/L)						
		1S	3D	4S	6S	8P	11S	14P
1,1-DCE	2	10						
cis-1,2-DCE	10	11						
Benzene	1				6.3		15	
TCE	280	280						1.1
Xylene	1000						3500	
PCBs	1.0					1.1		
Arsenic	8							
Barium	2000						16.4	
Cadmium	4							12.3
Chromium	100			439				
Lead	10		138					

Nickel	100			315				
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<sup>1</sup>P - perched groundwater, S - shallow Woodbridge water-table aquifer, D - deep Farrington groundwater

TPH was detected in three monitoring locations (MW-3D, MW-6S, and MW11S) above the applicable GWQC, which requires a finding of no noticeable TPH in groundwater. The detected concentration of TPH in June, 1998 ranged from 1,100 ug/L to 5,000 ug/L.

In summary, classes of contaminants detected at the Witco facility in past monitoring rounds have included VOCs, BNA, PCBs, and metals. However, for the purposes of the EI determination, only current contaminant concentration above standards are of concern. Thus, the contaminants of concern for groundwater at the site consist of 1,1-DCE, cis-1,2-DCE, TCE, benzene, xylene, PCBs, lead, chromium, nickel, barium, cadmium, arsenic, and TPH.

### Air (Indoors)

Groundwater contamination at the site includes VOCs. Despite the limited VOC detections on site, the Johnson-Ettinger Model was used to calculate the incremental risk and hazard values associated with the potential migration of volatile contaminants into indoor air. The maximum concentrations of VOCs detected on site were used to calculate risk and hazard estimates. The maximum concentrations detected on site and used in the model have not, however, been detected beneath buildings. Therefore, use of these maximum detected values provides conservative calculated risk and hazard values. Other site-specific input parameters used in the model include: the depth below grade to bottom of enclosed space floor, depth below grade to water table, soil type, and soil/groundwater temperature. USEPA-approved default values were used for the remaining parameters for which site-specific values were not readily available. In addition, industrial exposure assumptions (i.e., exposure duration and exposure frequency) were used in the calculations due to the current industrial nature of the property and given that a Deed Notice has been prepared by Witco. This Deed Notice will be submitted to the Middlesex County Clerk, the City of Perth Amboy Clerk, and the City of Perth Amboy Health Department, in order to ensure that future use of the site is for non-residential purposes only.

Table 2 identifies the volatile contaminants detected on site above relevant standards and the calculated Incremental Risk Value (IRV) or Hazard Quotient (HQ) for each contaminant for vapor intrusion into indoor air.

**Table 2 - Calculated Incremental Risk Values and Hazard Quotients**

Constituent	Calculated Incremental Risk Value (IRV)/Hazard Quotient (HQ)
1,1-DCE	2.8E-07 (IRV)
cis-1,2-DCE	5.0E-05 (HQ)
TCE	7.8E-08 (IRV)
Benzene	1.3E-08 (IRV)
Xylene	1.1E-4 (HQ)

The calculated IRVs and HQs for each organic constituent are below the EPA acceptable risk range of 1.0E-4 to 1.0E-6 and below the target HQ of 1.0. In addition, cumulative risk associated with exposure to carcinogenic compounds is below the EPA acceptable risk range of 1.0E-4 to 1.0E-6. The noncarcinogenic hazard index, considering all noncarcinogenic compounds and their target organs, does not exceed 1.0. Based upon these conservative estimates, volatilization of groundwater contaminants into indoor air at the Witco site does not appear to pose an unacceptable risk. See Attachment 2 for Johnson-Ettinger Model results for the three carcinogenic compounds.

### **Surface/Subsurface Soil**

Surface and subsurface soil at the property was impacted by PCBs above both NJDEPs unrestricted (i.e., residential) use direct contact soil criteria of 0.49 mg/kg and NJDEP's site-specific (i.e., industrial) cleanup criterion of 2 mg/kg. There is currently no impacted off-site soil. The NJDEP approved Remedial Action Work Plan required Witco to excavate and remove all PCB contaminated soils above the 2 mg/kg level from 0 to 2 feet bgs. NJDEP allowed soil contaminated with PCBs at concentrations between 2 mg/kg and 50 mg/kg to remain in the subsurface if covered by two feet of clean soil. All soils above 50 mg/kg were to be removed regardless of depth (Reference No. 1, pg. 3-2).

**Surface Soil:** All contaminated surface soil (0 to 2 feet bgs) above the site-specific cleanup criterion (2 mg/kg) has been excavated and removed from the site. Excavation and removal of contaminated surface soil is documented in the Remedial Action Report (November 1998), the Remedial Action Report Addendum (July 1999) and the Remedial Action Report Addendum No. 2 (December 1999), and discussed in Question #1. Witco has installed asphalt covers over two areas of concern (AOC A, AOC E) that contained surface soil above the 2 mg/kg site-specific standard. Attachment 3 visually presents the areas where PCBs exceed the NJDEP unrestricted use soil cleanup criterion (0.49 mg/kg) and the areas where an asphalt cap was installed. Therefore, because the current use of the property is industrial in nature, there is no exposed surface soil present at the site that exceeds the site-specific cleanup criterion (2 mg/kg).

**Subsurface Soil:** In all areas, except AOC D-2, subsurface soil contaminated with PCBs above the 50 mg/kg level have been excavated and removed and covered with two feet of clean soil. During remediation at AOC D-2 (Heater Pad Area), it was determined that soil contaminated above the 50 mg/kg level would need to remain in order to ensure the integrity of site structures in the Heater Pad Area. Due to the difficulties encountered, soil with PCB concentrations in excess of the soil cleanup criterion (50 mg/kg) remain in AOC D-2, per NJDEP and USEPA concurrence. Therefore, contaminated soil above appropriate standards does remain at the Witco site and a potential pathway between a receptor and contaminated subsurface soil does exist.

### **Surface Water**

Spa Spring Creek, located in the northern section of the property, flows northeastward and discharges to estuarine Woodbridge Creek (a tributary of Arthur Kill) approximately 1,500 feet east of the northern tip of the site. The Remedial Action Report documents that all site-related surface waters are non-tidal. Surface water samples were collected from four sampling locations (SW-001, SW-002, SW-003, and SW-

004) in Spa Spring Creek during the period of June, 1995 through June, 1998. According to the most recent sample results collected in June, 1998, no hazardous constituents were detected above the NJ Surface Water Quality Criteria.

### **Sediment**

According to the NJDEP-approved Remedial Action Work Plan, all sediments contaminated with PCBs above the site-specific cleanup criteria (2 mg/kg) from 0 to 2 feet bgs have been excavated and removed. Confirmatory sampling has been conducted to ensure that all remaining sediments at depths greater than 2 feet bgs are within the NJDEP approved remediation level range of 2 mg/kg to 50 mg/kg. As discussed in Question #1, sediments were removed in AOC A (drainage ditches, Spa Spring Creek, and wetland areas) and AOC E (former lagoon). All remaining sediments at the property are within the NJDEP approved remediation levels (2 mg/kg to 50 mg/kg).

### **Air (Outdoors)**

Due to the nature of the contamination in soil (i.e., PCBs) and the relatively low volatile concentrations in groundwater, it is unlikely that outdoor air would be impacted by volatile migration from soil or groundwater to outdoor air. In addition, soil has been remediated to the NJDEP approved levels (2 mg/kg) for PCBs. Therefore, it is unlikely that inhalation of particulates entrained on dust will result in unacceptable levels of exposure.

### **References:**

- (1) Remedial Action Report, prepared by Foster Wheeler Environmental Corporation (Foster Wheeler), dated November 1998.
- (2) Remedial Action Report Addendum, prepared by Foster Wheeler, dated July 1999.
- (3) Memo from David Kaplan, NJDEP, to Gary Lipsius, NJDEP, Re: Witco Remedial Action Report Addendum, dated August 18, 1999.
- (4) Memo from Andrew Marinucci, NJDEP, to Gary Lipsius, NJDEP, Re: Review of Remedial Action Report Addendum, dated September 14, 1999.
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3. Are there **complete pathways** between “contamination” and human receptors such that exposures can be reasonably expected under the current (land- and groundwater-use) conditions?

Summary Exposure Pathway Evaluation Table  
*Potential **Human Receptors** (Under Current Conditions)*

“Contaminated” Media	Resident s	Worker s	Day- Care	Construction	Trespasser	Recreation	Food <sup>4</sup>
Groundwater	No	No	No	No	--	--	No
Air (indoor)							
Surface Soil (e.g. < 2 ft)	No	No	No	No	No	No	No
Surface Water							
Sediment							
Subsurface Soil (e.g., > 2	--	--	--	No	--	--	No
Air (outdoors)							

Instruction for Summary Exposure Pathway Evaluation Table:

1. Strike-out specific Media including Human Receptors’ spaces for Media which are not “contaminated” as identified in #2 above.
2. Enter “yes” or “no” for potential “completeness” under each “Contaminated”Media — Human Receptor combination (Pathway).

Note: In order to focus the evaluation to the most probable combinations some potential “Contaminated” Media - Human Receptor combinations (Pathways) do not have check spaces. These spaces instead have dashes (“--”). While these combinations may not be probable in most situations they may be possible in some settings and should be added as necessary.

- If no (pathways are not complete for any contaminated media-receptor combination) - skip to #6, and enter “YE” status code, after explaining and/or referencing condition(s) in-place, whether natural or man-made, preventing a complete exposure pathway from each contaminated medium (e.g., use optional Pathway Evaluation Work Sheet to analyze major pathways).
- If yes (pathways are complete for any “Contaminated” Media - Human Receptor combination) - continue after providing supporting explanation.
- If unknown (for any “Contaminated” Media - Human Receptor combination) - skip to #6 and enter “IN” status code

<sup>4</sup> Indirect Pathway/Receptor (e.g., vegetables, fruits, crops, meat and dairy products, fish, shellfish, etc.)

**Ratio nale :****Groundwater**

Historic monitoring results indicate that groundwater c ontaminants at the property have been decreasing substantially over time and have not migrated off site. Therefore, only on-site receptors have the potential to be exposed to contaminated groundwater. However, groundwater beneath the site is not used for potable purposes. Therefore, there is no potential for on-site exposure to contaminated groundwater via ingestion. It should be noted that Witco has c ontacted local officials regarding groundwater use in the area of the site. According to the Remedial Action Report Addendum (Reference No. 2, pg. 30), limited wells exist within a one-mile radius of the site. However, these wells are used only for industrial purposes; none are used as a source of potable water. Furthermore, Perth Amboy officials indicated that there are no long-term plans to use the Woodbridge Aquifer as a source of potable water.

NJDEP has c onditionally approved natural attenuation as the remedial action for c ontaminated groundwater at the site. Witco is in the process of filing a groundwater CEA encompassing the entire 44.7-acre site with local agencies. Witco also plans to file a Deed Notice with the appropriate local agencies which will: 1) ensure that the property is used only for non-residential use in the future, 2) notify prospective site users of the contaminant concentrations present in soil at the site, and 3) ensure that the proper health and safety measures are taken when contaminated media at the site are disturbed. Based upon this information, it is unlikely that a complete direct exposure pathway will exist for the on-site construction worker to contamination groundwater.

Based upon available information, there are no c urrent, complete exposure pathw ays to c ontaminated groundwater.

**Surface/Subs urface Soil**

Witco has installed asphalt covers over the two areas of concern (AOC A, AOC E) that contained surface soil above the 2 mg/kg site-specific standard. Attachment 3 visually presents the areas where an asphalt cap was installed. Therefore, because the current use of the property is industrial in nature, there is no exposed surface soil present at the site that exceeds the site-specific cleanup criterion (2 mg/kg).

All subsurface soil, except subsurface soil in AOC D-2, has been remediated to the approved range of 2 mg/kg to 50 mg/kg for PCBs. Due to difficulties encountered during the excavation of this area, soil contaminated with PCBs above the 50 mg/kg level were allowed to remain in the subsurface (per NJDEP and USEPA approval). The c ontaminated soil is covered by a 40-mil PVC liner topped by a water collection system, clean backfill, and a concrete cap. Thus, the only receptors that may potentially be exposed to this contaminated medium are on-site construction workers. Witco has prepared a Deed Notice to notify potential site users of the contamination that remains in this area. This Deed Notice also requires that contaminated soil areas not be disturbed without appropriate notification and health and safety procedures. Therefore, a complete exposure pathway between an on-site construction worker and contaminated soil in the area of AOC D-2 is extremely unlikely under current site conditions.

**References:**

- (1) Remedial Action Report, prepared by Foster Wheeler Environmental Corporation (Foster Wheeler), dated November 1998.
- (2) Remedial Action Report Addendum, prepared by Foster Wheeler, dated July 1999.
- (3) Memo from David Kaplan, NJDEP, to Gary Lipsius, NJDEP, Re: Witco Remedial Action Report Addendum, dated August 18, 1999.
- (4) Memo from Andrew Marinucci, NJDEP, to Gary Lipsius, NJDEP, Re: Review of Remedial Action Report Addendum, dated September 14, 1999.
- (5) Letter from Stephen Kohlhase, Witco, to Gary Lipsius, NJDEP, Re: Submittal of Remedial Action Report Addendum No. 2, dated December 17, 1999.
- (6) Memo from Andrew Marinucci, NJDEP, to Christopher Kanakas, NJDEP, Re: Review of Draft Deed Notice, dated March 29, 2000.
- (7) Letter from Patricia Conti, NJDEP to Stephen Kohlhase, Crompton, Re: Remedial Action Report Addendum Dated July 1999, dated July 27, 2000.
- (8) Letter from Patricia Conti, NJDEP to Stephen Kohlhase, Crompton, Re: Remedial Action Report Addendum No 2 (December 1999), dated July 27, 2000.

4. Can the **exposures** from any of the complete pathways identified in #3 be reasonably expected to be **significant**<sup>5</sup> (i.e., potentially “unacceptable” because exposures can be reasonably expected to be: 1) greater in magnitude (intensity, frequency and/or duration) than assumed in the derivation of the acceptable “levels” (used to identify the “contamination”); or 2) the combination of exposure magnitude (perhaps even though low) and contaminant concentrations (which may be substantially above the acceptable “levels”) could result in greater than acceptable risks?

\_\_\_\_\_ If no (exposures cannot be reasonably expected to be significant (i.e., potentially “unacceptable”) for any complete exposure pathway) - skip to #6 and enter “YE” status code after explaining and/or referencing documentation justifying why the exposures (from each of the complete pathways) to “contamination” (identified in #3) are not expected to be “significant.”

\_\_\_\_\_ If yes (exposures could be reasonably expected to be “significant” (i.e., potentially “unacceptable”) for any complete exposure pathway) - continue after providing a description (of each potentially “unacceptable” exposure pathway) and explaining and/or referencing documentation justifying why the exposures (from each of the remaining complete pathways) to “contamination” (identified in #3) are not expected to be “significant.”

\_\_\_\_\_ If unknown (for any complete pathway) - skip to #6 and enter “IN” status code

**Ratio nale :**

This question is not applicable. See response to question #3.

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<sup>5</sup> If there is any question on whether the identified exposures are “significant” (i.e., potentially “unacceptable”) consult a human health Risk Assessment specialist with appropriate education, training and experience.

5. Can the “significant” **exposures** (identified in #4) be shown to be within acceptable limits?

\_\_\_\_\_ If yes (all “significant” exposures have been shown to be within acceptable limits) - continue and enter “YE” after summarizing and referencing documentation justifying why all “significant” exposures to “contamination” are within acceptable limits (e.g., a site-specific Human Health Risk Assessment).

\_\_\_\_\_ If no (there are current exposures that can be reasonably expected to be “unacceptable”)- continue and enter “NO” status code after providing a description of each potentially “unacceptable” exposure.

\_\_\_\_\_ If unknown (for any potentially “unacceptable” exposure) - continue and enter “IN” status code

**Ratio nale :**

This question is not applicable. See response to question #3.

6. Check the appropriate RCRIS status codes for the Current Human Exposures Under Control EI event code (CA725), and obtain Supervisor (or appropriate Manager) signature and date on the EI determination below (and attach appropriate supporting documentation as well as a map of the facility):

YE - Yes, "Current Human Exposures Under Control" has been verified. Based on a review of the information contained in this EI Determination, "Current Human Exposures" are expected to be "Under Control" at the Witco Corporation (currently known as Crompton Corporation) facility, EPA ID# NJD002165561, located at 1000 Convery Boulevard, in Perth Amboy, New Jersey, under current and reasonably expected conditions. This determination will be re-evaluated when the Agency/State becomes aware of significant changes at the facility.

NO - "Current Human Exposures" are NOT "Under Control."

IN - More information is needed to make a determination.

**Completed by:** original signed by \_\_\_\_\_ Date: 03/23/01 \_\_\_\_\_

Kristin McKenney  
Risk Assessor  
Booz Allen & Hamilton

**Reviewed by:** original signed by \_\_\_\_\_ Date: 03/26/01 \_\_\_\_\_

Kathy Rogovin  
Sr. Risk Assessor  
Booz Allen & Hamilton

\_\_\_\_\_ original signed by \_\_\_\_\_ Date: 03/27/01 \_\_\_\_\_

Andy Park, RPM  
RCRA Programs Branch  
EPA Region 2

original signed by \_\_\_\_\_ Date: 03/28/01 \_\_\_\_\_

Barry Tornick, Section Chief  
RCRA Programs Branch  
EPA Region 2

**Approved by:** original signed by \_\_\_\_\_ Date: 03/28/01 \_\_\_\_\_

Raymond Basso, Chief  
RCRA Programs Branch  
EPA Region 2

**Locations where references may be found:**

References reviewed to prepare this EI determination are identified after each response. Reference materials are available at the USEPA Region 2, RCRA Records Center, located at 290 Broadway, 15<sup>th</sup> Floor, New York, New York, and the New Jersey Department of Environmental Protection Office located at 401 East State Street, Records Center, 6<sup>th</sup> Floor, Trenton, New Jersey.

**Contact telephone and e-mail numbers:** Andy Park, EPARPM  
(212) 637-4184

[park.andy@epa.gov](mailto:park.andy@epa.gov)

**FINAL NOTE: THE HUMAN EXPOSURES EI IS A QUALITATIVE SCREENING OF EXPOSURES AND THE DETERMINATIONS WITHIN THIS DOCUMENT SHOULD NOT BE USED AS THE SOLE BASIS FOR RESTRICTING THE SCOPE OF MORE DETAILED (E.G., SITE-SPECIFIC) ASSESSMENTS OF RISK.**

**Attachments**

The following attachments have been provided to support this EI determination.

Attachment 1 - Site and AOC Map

Attachment 2 - Johnson-Ettinger Model Results

Attachment 3 - Affected Soil Areas Map

Attachment 4 - Summary of Media Impacts Table

Attachments truncated, see facility file (MSS, 06/13/02)