DOCUMENTATION OF ENVIRONMENTAL INDICATOR DETERMINATION

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

Facility Name: **PolyOne Corp. Burlington Plant (fka Occidental Chemical Corporation)**
Facility Address: **1804 River Road, Burlington, New Jersey 08016**
Facility EPA ID#: **NJD043973122**

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 "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 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 "Migration of Contaminated Groundwater Under Control" EI pertains ONLY to the physical migration (i.e., further spread) of contaminated groundwater 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.

Duration / Applicability of EI Determinations

EI Determination status codes should remain in the 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).

Facility Information

The PolyOne Corp. Burlington Plant (fka Occidental Chemical Corporation [OCC]) is located in an industrial area of Burlington, New Jersey north of the confluence of Bustleton Creek and the Delaware River. The site occupies 187 acres adjacent to the Delaware River at 1804 River Road. The site is bounded on the west by the Delaware River, on the north by the National Gypsum Company, and to the south and east by vacant land covered by shrubs and trees. Farther to the east is a light industrial and commercial area adjacent to Route 130 (Ref. 2).

The facility has operated as a resin production and packaging, and product manufacturing facility since construction in 1967. The facility currently manufactures polyvinyl chloride (PVC) compounds and calendered film. The production of PVC resin was discontinued in July 1990. An embossed and printed fabric production process was discontinued in 1976. The production area occupies approximately 32 acres in the northern portion of the western half of the property. The remaining portions of the property consist of unused open and wooded areas (Ref. 2).

The Colorado Fuel & Iron Corporation owned the property from 1963 to 1966. The site was vacant and used for agricultural purposes until Hooker Chemical (for which OCC became corporate successor in 1982) purchased the property in 1966 and constructed the first industrial structure at the site in 1967. The facility was acquired by the Geon Company on May 1, 1999. The Geon Company and M.A. Hanna merged to become PolyOne Corp., effective September 1, 2000.

According to the Site Investigation (SI) Report, the facility is a RCRA Small Quantity Generator. There are no RCRA-regulated treatment, storage, or disposal units at the facility. OCC initiated an Environmental Cleanup and Responsibility Act (ECRA) investigation of the site in February 1989 as a prelude to selling the property. OCC is currently under a Remediation Agreement with the New Jersey Department of Environmental Protection (NJDEP) (Ref. 1). OCC has performed an SI, a Remedial Investigation (RI), and a Supplemental Remedial Investigation (SRI) at the site to investigate impacts to on- and off-site environmental media due to historic activities at the site. The SRI documents the proposed remedial actions at the site. NJDEP has verbally approved the SRI Report (Ref. 3). OCC will perform all the remedial activities presented in the SRI; however, PolyOne will work simultaneously with OCC to conduct additional remediation at the site to remove all impacted soil above the New Jersey Residential Direct Contact Soil Cleanup Criteria (NJ RDCSCC). PolyOne will conduct this additional remediation to the more stringent cleanup criteria (NJ RDCSCC) in order to avoid the need for a Deed Notice for the property (Ref. 3). Remedial actions (e.g., excavation) began in February 2002 (Ref. 3).

1. Site Investigation Report, Occidental Chemical Corporation. Prepared by Conestoga-Rovers & Associates. Dated March 19, 1999.
2. Remedial Investigation Report, Occidental Chemical Corporation. Prepared by Conestoga-Rovers & Associates. Dated October 12, 2000.
3. Telephone conversation between Elizabeth Butler, USEPA, and Richard Burgos, NJDEP. February 4, 2002.

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?

   _X_ 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 AOCs: Based upon historical activities at the site, several AOCs have been identified and investigated during the SI (1999), RI (2000), and SRI (2001). Generally, the AOCs identified at the site are based on two primary categories of identified contamination:

1. The *Surface Ditch System*, which has been impacted by the release of polychlorinated biphenyls (PCBs) along with *other PCB-impacted areas*,

2. *Volatile organic compound (VOC) source areas*, which have impacted on-site soil, groundwater, and downgradient surface water.

For a figure showing the layout of the site and the AOCs discussed below, refer to the Master Site Plan (Drawing No. 1) in the RI Report (Ref. 3).

SURFACE DITCH SYSTEM AND OTHER PCB-IMPACTED AREAS

Resin Ditch/South Ditch/Corrugated Metal Piping (CMP) and Catch Basins (CB): Wastewater from plant processes was discharged to an on-site ditch conveyance system under a New Jersey Pollutant Discharge Elimination System (NJPDES) permit until mid-1987. Sediments[1] would accumulate in the ditch system and were removed periodically after characterization sampling. In late 1998 and early 1999, characterization sampling detected PCBs (primarily Aroclor 1242) in ditch soil at concentrations up to 200 mg/kg. Results from the initial investigation, and subsequent soil investigations conducted during the RI and SRI, indicate that most of the PCB soil contamination was found in the on-site Resin Ditch (non-detect [ND] to 310 mg/kg), and to a lessor extent in the on-site South Ditch (ND to 45 mg/kg). The source of PCBs in the surface ditch system is believed to be spills or leakage from the maintenance of heat transfer units formerly located in the northwest corner of the Compound Building (Ref. 3). PCBs were also detected in soil at the influent and effluent locations of the underground CMP (maximum of 25 mg/kg) and CBs (maximum of 72 mg/kg) along the CMP that extends from the Compound Building. Although PCB concentrations in ditch soil are above the NJ NRDCSCC, the levels are not a concern for exposure because the ditch areas are fenced and are not accessible to receptors at the site. The CMP and CB areas are also not likely to be a concern for direct exposure because they are below ground within the subsurface drainage piping system. It

[1] For purposes of this EI, sediments in the ditch system will be discussed as on-site soil because they have been evaluated against New Jersey **Soil** Cleanup Criteria (SCC) (e.g., NJ RDCSCC and New Jersey Non-Residential Direct Contact Soil Cleanup Criteria [NJ NRDCSCC]) for exposure analysis and because they have not been identified as a concern for ecological receptors.

should be noted that all soil impacted with PCBs above NJ RDCSCC[2] (0.49 mg/kg) will eventually be excavated to avoid having a Deed Notice in place at the site. This includes all impacted soil in the CMP and CBs. Excavation of impacted soil began in February 2002 (Ref. 8).

Transformers: Five transformers were located at buildings throughout the site as described below. The RI indicates no documented spills or leaks have been identified at any of these transformers.

Fabric Transformer (Building 30): Soil sampling performed during the RI detected PCBs in surface soil ranging from 1.5 to 22 mg/kg. Additional soil samples were collected during the SRI and PCB results ranged from ND to 2.1 mg/kg in surface soil, only slightly above the NJ NRDCSCC (2 mg/kg).

Silo/Oil Compound Transformer (Building 37): Soil sampling performed during the RI detected PCBs in surface soil ranging from 1.2 to 13 mg/kg. All PCB concentrations were below the NJ NRDCSCC (2 mg/kg) in additional samples collected during the SRI.

Utility Transformer (Building 4/4A): Soil sampling performed during the RI detected PCBs in surface soil ranging from 0.12 to 2.0 mg/kg. Given that the maximum detection (2.0 mg/kg) was equivalent to the NJ NRDCSCC for PCBs, this area was determined to be fully delineated and no additional sampling was required.

Main Transformer (Building 23): Soil sampling performed during the RI detected PCBs in this area ranging from ND to 0.21 mg/kg, below the NJ NRDCSCC.

Recovery Transformer (Building 17): Soil sampling performed during the RI detected PCBs in surface soil ranging from 4.7 to 9.2 mg/kg. All PCB concentrations were below the NJ NRDCSCC in additional samples collected during the SRI.

All PCB-impacted soil at each of the transformer areas described above are located within a fenced/secured area, with the exception of one surface soil sample location at the Fabric Transformer Area (PS-62, 0-0.5 ft) that is located just outside the fence line (PCBs detected at 2.1 mg/kg) (Ref. 3). Thus, there is a potential concern that on-site receptors may be exposed to this PCB-impacted surface soil outside the fenced area. All soil impacted with PCBs above the NJ RDCSCC (0.49 mg/kg) will eventually be excavated to avoid having a Deed Notice in place at the site. Excavation of impacted soil began in February 2002 (Ref. 8).

VOC SOURCE AREAS

Former Vinyl Chloride Monomer (VCM) Recovery Area: VCM was used in the PVC resin production process. Condensate containing VCM from the steaming portion of the resin production process was discharged to the ground surface near the Resin Building prior to 1978. After 1978, the condensate was treated on site prior to discharge. Soil in this area was sampled

[2] The NJ NRDCSCC are considered the relevant screening criteria for this site given that the site is an active industrial facility. OCC proposed to remediate soil at the site to relevant industrial cleanup criteria (i.e., NJ NRDCSCC or NJDEP-approved site-specific criteria). However, PolyOne has proposed to further remediate soil down to unrestricted use criteria (NJ RDCSCC) in order to avoid the need for a Deed Notice at the site which would restrict future use to non-residential only. Thus, PolyOne will work with OCC to remediate soil at the site to the NJ RDCSCC.

during the SI and RI for tetrachloroethene (PCE), trichloroethene (TCE), 1,2-dichloroethene (DCE), and VCM. PCE was the only contaminant detected, but it was detected at concentrations below the NJ RDCSCC and NJ NRDCSCC. NJDEP concurred that no further investigation[3] of soil was required in this area (Ref. 4).

Former PCE Drum Storage Area: 55-gallon drums of PCE were used for cleaning equipment in the Calendar Building. The drums were stored on the east side of the Calendar Building. In March 1983, PCE was detected in the groundwater in this area (Ref. 3). Since that time, PCE has been purchased in five-gallon containers to minimize the amount of solvent present at one time and to provide greater material control to eliminate releases from spills or leaks. Soil samples were collected during the SI and analyzed for PCE, TCE, 1,2-DCE, and VCM. Although PCE was detected, concentrations were below the NJ NRDCSCC. Additional soil samples were required as part of the RI. Results indicated PCE (20 mg/kg) was present in surface soil above NJ RDCSCC (4.0 mg/kg), NJ NRDCSCC (6.0 mg/kg), and New Jersey Impact to Groundwater Soil Cleanup Criteria (NJ IGWSCC) (1.0 mg/kg) at one sample location (PS-25), and above only the NJ IGWSCC (1.0 mg/kg) in surface soil at one other sample location (PS-24). The RI and SRI indicate that the PCE detected in this area was likely the result of a small spill and did not require any additional investigation. NJDEP concurred that no further investigation of soil was required in this area (Ref. 4). According to the Surface Characterization Map (Figure 1.3) in the SI Report (Ref. 1), this area is covered by concrete or pavement. The Former PCE Drum Storage Area was located just to the right of Building 2 on Figure 1.3. Thus, current exposure to elevated levels of PCE in this area is not a concern. The SRI Report indicates that this area will be included in the Classification Exception Area (CEA) to address the historic presence of PCE in groundwater. In addition, all soil impacted with PCE above the NJ RDCSCC (4 mg/kg) will eventually be excavated to avoid having a Deed Notice at the site. Excavation of impacted soil began in February 2002 (Ref. 8).

Chiller House: According to the SI Report, trichlorofluoromethane (TCFM), historically used at the Chiller House as a refrigerant, was suspected to be the source of TCFM sporadically detected in shallow groundwater. However, TCFM has not been recently detected in groundwater and is no longer identified as a constituent of concern (COC). Low levels of PCE and VCM have been detected in shallow well nest MW-2 (in the vicinity of the Chiller House) in recent groundwater sampling (2000). However, only PCE (23 µg/L in MW-2S) remains above NJ GWQC (1 µg/L). Soil samples were collected adjacent to the Chiller House during the SI and RI. Samples were analyzed for TCFM, PCE, TCE, 1,2-DCE, and VCM. PCE was the only contaminant detected (ND to 9.6 mg/kg). PCE was detected in the subsurface (3.5 to 6.0 feet below ground surface [bgs]) above the NJ NRDCSCC (6.0 mg/kg) and the NJ IGWSCC (1.0 mg/kg) at two sample locations. Therefore, this area was not identified as a concern for direct contact to on-site workers. However, on-site construction workers could potentially be exposed to elevated levels of PCE while performing intrusive activities in this area. The SRI Report indicates that this area will be included in the CEA to address the historic groundwater impacts in this area. In addition, all soil impacted with PCE above the NJ RDCSCC (4 mg/kg) will eventually be excavated to avoid having a Deed Notice at the site. Excavation of impacted soil began in February 2002 (Ref. 8).

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[3] NJDEP has indicated that no further investigation is necessary at various AOCs at the site. No further investigation simply implies that contaminant concentrations have been adequately delineated at the current time and no additional sampling is necessary. This is different from a No Further Action determination which indicates that no further remedial action is necessary at an AOC. Based upon available information, NJDEP has not issued any No Further Action determinations for AOCs at this site.

Four Former Underground Storage Tanks (USTs): Four USTs were located at the facility as described below.

10,000 gallon Unused Tank: This tank was installed in a concrete vault in 1978 for VCM recovery, but was never used. It was abandoned in place. Given no products were stored in this tank, this tank is not a concern (Ref. 3).

50,000 gallon No. 6 Fuel Oil Tank: This tank is located north of the Boiler House and was installed in 1966. According to the RI, the tank was filled with concrete and soil, and clean closed pursuant to an approved closure plan (Ref. 3). Given that clean closure was documented, this area was not investigated in the RI (Ref. 3).

Two 1,000 gallon No. 2 Fuel Oil Tanks: One tank, located under the concrete floor of the Resin Building, was closed in place by filling with concrete in 1975. According to the SI, this tank was clean closed and thus was not determined to be a concern (Ref. 1). The second tank was located east of the Resin Building and was removed in the late 1980s. The RI Report indicates that no documentation could be found that provided details of the closure and dimensions for this tank. Soil samples were collected in the area of this second tank during the SI and RI. PCE was detected (maximum of 4.0 mg/kg) at concentrations below the NJ NRDCSCC (6.0 mg/kg). Thus, this area is not currently a direct exposure concern. The RI and SRI Report indicate that this area will be included in the CEA application given that the PCE concentrations in soil were slightly above the NJ IGWSCC (1.0 mg/kg). NJDEP concurred that no further investigation of soil was required in this area (Ref. 4). In addition, all soil impacted with PCE above the NJ RDCSCC (4 mg/kg) will eventually be excavated to avoid having a Deed Notice at the site. Excavation of impacted soil began in February 2002 (Ref. 8).

Welex Building: PCE was used in the Welex Building for equipment cleaning. Because PCE was detected at elevated concentrations in shallow well nest MW-5, soil samples were collected during the SI in this area and analyzed for PCE, TCE, 1,2-DCE, and VCM. No constituents were detected. NJDEP concurred that no further investigation of soil was required in this area (Ref. 4). PCE (maximum of 220 µg/L) and TCE (maximum of 2 µg/L) have been detected in groundwater during recent groundwater sampling events (Third and Fourth Quarter 2000) above New Jersey Ground Water Quality Criteria (NJ GWQC) for Class II-A potable groundwater. This area is being included in the CEA and an active groundwater remediation system (air sparging or density driven connection [DDC]) system will be initiated in this area (expected in Spring 2002) to further reduce the concentration of VOCs in groundwater (Refs. 3, 6).

Empty Drum Storage Area: This area, located north of the Warehouse, was used to store empty drums. A portion of the area is covered with gravel and the balance is covered with asphalt. Soil samples were collected during the SI and analyzed for PCE, TCE, 1,2-DCE and VCM. No constituents were detected. NJDEP concluded that no further investigation of soil was required in this area (Ref. 4).

Obsolete Equipment Storage Area: This area, located just outside of the Resin Building, was used to store obsolete equipment. The SI and RI Reports also indicate that PCB-impacted soil historically removed from the Resin Ditch and South Ditch were once temporarily staged in this area. Soil samples were collected during the SI and RI and analyzed for PCBs, PCE, TCE, 1,2-DCE, and VCM. PCE was the only contaminant detected, but concentrations were below the NJ

RDCSCC, NJ NRDCSCC, and the NJ IGWSCC. NJDEP concurred that no further investigation of soil was required in this area (Ref. 4).

Resin Building: PVC Resin was produced in this building from 1968 to July 1990. The SI Report indicates that chemicals used in the Resin Building could have penetrated the building floor and impacted underlying soil. Soil samples were collected during the SI and analyzed for PCE, TCE, 1,2-DCE and VCM. PCE was the only contaminant detected, but concentrations were below the NJ RDCSCC, NJ NRDCSCC, and NJ IGWSCC. NJDEP concurred that no further investigation of soil was required in this area (Ref. 4).

Bulk Storage Tanks: According to the SI, 16 bulk storage tanks are utilized throughout the site. All of the bulk storage tanks, with the exception of the 300,000-gallon Aboveground No. 6 Fuel Oil Tank, are located within paved/concrete areas that have had secondary containment since their date of installation. All tanks have also been subject to integrity testing and results have shown no leaks. The 300,000-gallon Aboveground No. 6 Fuel Oil Tank is located southeast of the parking lot and is underlain by clay. Surface soil samples were collected during the SI and results indicated that one of two samples (AST-1) contained 20,900 mg/kg total petroleum hydrocarbons (TPH). Additional samples were collected during the RI; however, all results (maximum of 38.0 mg/kg) were well below the NJDEP-approved cleanup criterion for TPH (10,000 mg/kg). Thus, the RI Report concludes that the elevated concentration (20,900 mg/kg at AST-1) was a localized impact given that the sample was collected beneath the tank valving from soil overlying the clay liner, and surrounding samples were all well below the elevated concentration detected at AST-1. The area where the 300,000-gallon Aboveground No. 6 Fuel Oil Tank is located is surrounded by fencing, and thus is not a concern for direct exposure. The RI Report proposed to excavate soil in the vicinity of sample location AST-1 down to the top of the clay liner, in order to remove all TPH-impacted soil above 10,000 mg/kg (Ref. 5). NJDEP approved this recommended remedial action (Ref. 4). Excavation of impacted soil began in February 2002 (Ref. 8).

Current Drum Storage Areas: Drums containing hazardous substances or hazardous waste are stored either inside the buildings or at other areas with secondary containment. The secondary containment consists of either containment dikes or prefabricated containment pads. According to the RI, there are no designated areas for drum storage within buildings. Although there may have been small volumes of chlorinated solvents stored inside buildings, the RI Report indicates that these materials were not stored adjacent to building floor drains. The RI Report also documents that many of the floor drains have been sealed. Thus, the RI Report indicates this area was not a concern given that the floor drains have been sealed and that the buildings provide secondary containment. NJDEP concurred that no further investigation was required in these areas (Ref. 4).

Process Lines/Equipment/Material Handling Areas: VCM was historically shipped to the site by rail car. The material was off-loaded and pumped to a VCM sphere and stored as a liquid (Ref. 3). The RI indicates that the methods used during off-loading provided low possibility of VCM leakage/spillage to the ground. Soil samples were collected during the RI for VCM and no contamination was detected. Thus, the RI Report indicates these areas were not a concern. No other areas of concern were identified at the site relative to process lines/equipment/material handling areas based upon the physical features and procedures used to prevent chemical releases. NJDEP concurred that no further investigation was required in these areas (Ref. 4).

Groundwater: Three principal hydrogeologic units are present in the unconsolidated sediment beneath the site: the shallow aquifer (Cape May Formation), the confining clay aquitard (low permeability clay layer), and the Potomac-Raritan-Magothy (PRM) Aquifer. Historic activities at the site have impacted the shallow aquifer. Currently, only PCE and TCE are detected in shallow groundwater at concentrations above the NJ GWQC. The most significant impacts have been detected in well nest MW-5 and slightly upgradient, beneath the Welex Building. Several potential source areas for PCE impacts to groundwater have been identified at the site, including: soils in the area of the Chiller House, the Former PCE Drum Storage Area, and the Former UST located adjacent to the Resin Building. PCE was detected in soil in each of these areas above the NJ IGWSCC of 1 mg/kg. The extent of contamination in each area is considered to be relatively minimal (maximum of 20 mg/kg in the Former PCE Drum Storage Area) and is not believed to provide significant sources of contamination based on the infrequent and low level concentrations detected in the groundwater located downgradient of these areas. The proposed remedial strategy presented in the SRI will implement either an air sparging system or a DDC system near the area of well nest MW-5 and upgradient thereof. The CEA application indicates that this active remediation system will reduce VOC concentrations at greater rates than have been being observed through natural attenuation. Installation of the system in less contaminated areas is not proposed because natural attenuation is significantly reducing VOC concentrations prior to discharge at Bustleton Creek (Refs. 3, 5, 6). A CEA application also addresses impacted areas in the shallow aquifer. The CEA boundary extends from immediately north of the site's facilities (i.e., buildings) where releases may have occurred (as discussed above), and extends south and southwest to the Bustleton Creek and the Delaware River, which is the current extent of the PCE plume. In addition, the CEA indicates that a groundwater monitoring program will be re-established at the site as part of the proposed remediation system. The proposed monitoring strategy includes MW-5S/5D (quarterly), MW-6S/6D (annually) and MW-8S/8D (annually), as well as PW-1 and PW-2 according to Safe Drinking Water Act (SDWA) requirements.

The bottom of the shallow aquifer is defined by the low permeability clay layer. The presence of the confining clay between the shallow aquifer and the PRM aquifer effectively prevents vertical migration in the area of the site (Ref. 4). Two production wells (PW-1 and PW-2) are utilized at the site and withdraw groundwater from the PRM aquifer. PW-1 and PW-2 have been sampled during selected quarterly events in 1998, 1999, and 2000. No VOCs have been detected in PW-1, while PCE has been detected in PW-2 at a maximum concentration of 2 µg/L during sampling events conducted from May 1998 to November 2000 (Ref. 2). The RI Report indicates that PCE contamination detected in PW-2 is not site related, but is representative of general groundwater conditions in the industrial area within which the site is located (further discussed in Questions #2 and #3).

In summary, there are several areas for which remedial actions are planned and documented in the RI and SRI Reports. These include: excavation of PCB-contaminated soil in the area of the Resin and South Ditch; excavation of TPH-impacted soil in the area of the 300,000-gallon Aboveground No. 6 Fuel Oil Tank; and development of a CEA which includes the areas of the Chiller House, Former Drum Storage Area, and Former 1,000-gallon No. 2 Fuel Oil UST Area. The CEA application also proposes to install a groundwater remediation system to reduce concentrations of contamination in groundwater in the area of well nest MW-5 and implementation of a groundwater monitoring program. All other areas of concern identified and investigated at the site have been determined to require no additional investigation at this time. As previously noted, OCC has proposed to remediate the site to the currently relevant NJ SCC (i.e., industrial criteria). However, PolyOne, the current site owners, will remediate all impacted areas at

the site to the more stringent unrestricted use criteria (i.e., NJ RDCSCC) to avoid having a Deed Notice at the site. Thus, OCC and PolyOne will be working in conjunction to remediate the site to desired levels.

References:

1. Site Investigation Report, Occidental Chemical Corporation. Prepared by Conestoga-Rovers & Associates. Dated March 19, 1999.
2. Well Search Results, Occidental Chemical Corporation. Prepared by Conestoga-Rovers & Associates. Dated May 21, 1999.
3. Remedial Investigation Report, Occidental Chemical Corporation. Prepared by Conestoga-Rovers & Associates. Dated October 12, 2000.
4. Letter from Wayne Howitz, NJDEP, to David P. Steele, Glenn Springs Holdings, Inc., re: Remedial Investigation Report, dated October 12, 2000, Draft Response to Draft Comments on the RI Report dated January 19, 2001. Dated August 13, 2001.
5. Supplemental Remedial Investigation Report, Occidental Chemical Corporation. Prepared by Conestoga-Rovers & Associates. Dated September 7, 2001.
6. Addendum to RI Report, Classification Exception Area, Occidental Chemical Corporation. Prepared by Conestoga-Rovers & Associates. Dated September 7, 2001.
7. Letter from David Steele, Glen Springs Holdings, Inc., to Richard Burgos, NJDEP, re: Responses to Comments on the Remedial Investigation Report. Dated September 10, 2001.
8. Telephone conversation between Elizabeth Butler, USEPA, and Richard Burgos, NJDEP. February 4, 2002.

2. Is **groundwater** known or reasonably suspected to be "**contaminated**"[4] 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:

Groundwater Conditions

Three principal hydrogeologic units are present in the unconsolidated sediments that underlie the PolyOne facility: the shallow aquifer, the confining clay aquitard, and the Potomac-Raritan-Magothy (PRM) aquifer (Ref. 4). The shallow aquifer occurs within the Cape May Formation and consists of sand, gravel, and cobbles with some clay lenses. This unit is continuous across the site. Unit thickness ranges from 20 feet to 60 feet and averages 35 feet. Groundwater occurs under unconfined conditions and is encountered at depths ranging from approximately 8 feet to 17 feet below ground surface. Groundwater flow direction is towards the southwest at an average velocity of one foot per day (assuming 30 percent porosity). Groundwater recharge to the shallow aquifer occurs via infiltration of precipitation through the soil zone and groundwater inflow from upgradient areas. Groundwater discharges to Bustleton Creek, and to the Delaware River to a lessor extent (Ref. 4).

The underlying confining clay aquitard is represented by the lower sandy clay unit of the Cape May Formation and the upper red clay unit of the Raritan Formation (Ref. 4). The aquitard is continuous and approximately 30 feet thick (Ref. 1). Although slight vertical downward gradients are reported in the overlying shallow aquifer, the aquitard effectively prevents groundwater movement between the shallow aquifer and the underlying PRM aquifer (Ref. 4). The PRM aquifer consists of a sand sub-unit of the Raritan Formation. The aquifer ranges in thickness from 80 feet to 90 feet and is underlain by bedrock. The PRM aquifer outcrops at the Delaware River, where active recharge occurs.

A well search conducted in 1999 determined that the shallow aquifer beneath the site was not utilized for potable water supply (Ref. 5). The underlying PRM aquifer is an important source of water for the region according to the RCRA Fact Sheet (Ref. 6). Four public supply wells operated by the Florence Township Water Department are located approximately 1.2 miles northeast of the site. The wells intersect the PRM aquifer and yield approximately 1.9 million gallons per day. Other public supply wells tap the PRM 3.5 miles south of the facility and also on Burlington Island.

Groundwater Quality

[4] "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).

Hydrogeologic investigations were initiated following the discovery that impacted groundwater from the facility was discharging to Bustleton Creek. These investigations were performed from 1982 to 1987 to define the site geology, hydrogeology, and contaminant distribution. Quarterly monitoring was initiated in 1988 as part of a NJPDES permit (Ref. 1). The monitoring network included nine monitoring well nests, each of which included a well completed near the water table (designated as "shallow") and one near the base of the Shallow Aquifer (designated as "deep"). The monitoring network included three background well nests (MW-1S/1D, MW-7S/7D, MW-8S/8D), three source area nests (MW-2S/2D, MW-5S/5D, MW-9S/9D), and three downgradient nests (MW-3S/3D, MW-4S/4D, MW-6S/6D). In 1998, three additional downgradient wells (MW-10, MW-11, TW-20) and the two on-site production wells (PW-1, PW-2) were added to the network. See the Location of Monitoring Wells map, Figure 3.1 in the RI Report (Ref. 4) for monitoring well locations. According to the RI Report, quarterly monitoring ceased in November 2000, with NJDEP approval (Ref. 4).

VOC contamination in excess of the NJ GWQC, for Class II-A potable groundwater, has been reported in the shallow aquifer. The primary COCs are PCE, TCE, VCM and 1,2-DCE (Ref. 1). Concentrations that exceeded the NJ GWQC in the most recent sampling event (November 2000) (Ref. 5) are summarized in Table 1. PCE is the most laterally extensive and is reported in the highest concentrations. The highest PCE concentrations occur in MW-5D (220 µg/L), which is located downgradient of the Welex Building. Elevated PCE concentrations ranging from 1 µg/L to 47 µg/L surround this area and extend to Bustleton Creek and the Delaware River. TCE is reported in lower concentrations over smaller areas. See the November 2000 PCE Concentrations - Shallow Wells map, Figure 2.1, and the Deep Wells map, Figure 2.2, in the Addendum to the RI Report, Classification Exception Area (Ref. 5) for a depiction of PCE plume boundaries. Potential source areas, as identified by soil concentrations that exceeded the NJ IGWSCC of 1 mg/kg for PCE, are the Chiller House, Former PCE Drum Storage Area, and the former UST located adjacent to the Resin Building (Ref. 4). The Welex Building is also a potential source area due to the elevated PCE concentrations encountered in underlying groundwater and due to the history of PCE use to clean machinery in the building (Ref. 4).

PCE concentrations in excess of the NJ GWQC are reported in areas upgradient of known source areas on site, which indicates that an off-site source(s) has contributed to on-site PCE contamination in the shallow aquifer. Elevated PCE concentrations were reported in upgradient wells MW-1S (7 µg/L) and MW-8D (1 µg/L) in November 2000. According to the Addendum to the RI Report, historic water quality results indicate that these wells, along with MW-1D and MW-8S, have intermittently exceeded the NJ GWQC with PCE concentrations up to 7 µg/L from 1998 to 2000 and up to 44 µg/L in prior years (Ref. 5). Possible off-site sources are not documented in available file materials.

PCE concentrations in excess of the NJ GWQC are also reported in the PRM aquifer in PW-2, one of the two on-site production wells (Ref. 5). PW-2 is located on the southeastern border of the facility approximately 525 feet north of Bustleton Creek and is used when additional water is required for heat exchange. Elevated PCE concentrations were detected in 1998 (2 µg/L, 2 µg/L), 1999 (2 µg/L, 2 µg/L, 1 µg/L), and 2000 (1.5 µg/L, 2.2 µg/L). With the exception of one detection of methylene chloride (2 µg/L), no other VOCs have been detected in PW-2. The RI Report indicates that the PCE detected in PW-2 is not site related, but is representative of general groundwater conditions in the industrial area within which the site is located. The COCs have not been detected in the other production well, PW-1, which is located approximately 750 feet northeast of PW-2 and is the primary water supply for the facility. PW-1 is completed in the deeper portion and PW-2 in the shallower portion of the PRM aquifer.

Table 1 - VOC Concentrations Above NJ GWQC - November 2000 (µg/L)

Aquifer	Constituent	Well I.D.	Concentration[1]	NJ GWQC[2]
Shallow	PCE	MW-1S	7	1
		MW-2S	23	
		MW-2D	1	
		MW-3S	20	
		MW-3D	16	
		MW-4S	9	
		MW-5D	220	
		MW-6S	47	
		MW-6D	26	
		MW-8D	1	
		MW-9S	1	
		MW-9D	4	
		TW-20	23	
	TCE	MW-3S	2	1
		MW-5D	2	
		MW-6S	2	
PRM	PCE	PW-2	2.2	1

[1] Ref. 5 is the data source, where concentrations in summary tables were rounded to the nearest whole number (2.2 µg/L reported for PW-2 was obtained from the text).

[2] Criteria listed are the higher of NJ GWQC and the Practical Quantitation Level (PQL)

The existence of dense nonaqueous phase liquids (DNAPL) in groundwater underlying the facility is unlikely and has not been documented. USEPA expressed concern about the occurrence and migration of DNAPL in a July 31, 1998 letter (Ref. 2). Occidental responded in a September 15, 1998 letter (Ref. 3) that explained that DNAPL is not present based on 1) the lack of observations of DNAPL during the entire well drilling program, including wells that were drilled into depressions in the shallow aquifer / aquitard surface, 2) VOC concentrations that are generally well below one percent of the constituent's solubility, and 3) no observations of DNAPL during any groundwater sampling event. Although a USEPA /NJDEP response letter was not found in file materials, approval is implicit in NJDEP acceptance of the RI Report.

References:

1. Summary of Hydrogeologic and Water Quality Data, Occidental Chemical Corporation Burlington North Plant, Burlington, New Jersey. Prepared by Conestoga-Rovers & Associates. Dated March 23, 1998.
2. Letter from Raymond Basso, USEPA, to S. A. Morris, Occidental Chemical Company, re: Occidental Chemical Corporation, Burlington, New Jersey, EPA I.D. No. NJD043973122. Dated July 31, 1998.
3. Letter from David Steele, Occidental Chemical Corporation, to Raymond Basso, USEPA, re: Occidental Chemical Corporation, Burlington Facility, Burlington, New Jersey. Dated September 15, 1998.
4. Remedial Investigation Report, Occidental Chemical Corporation. Prepared by Conestoga-Rovers & Associates. Dated October 2000.
5. Addendum to RI Report, Classification Exception Area, Occidental Chemical Company. Prepared by Conestoga-Rovers & Associates. Dated September 2001.

6. RCRA Fact Sheet. Prepared by the New Jersey Department of Environmental Protection. Not dated.

3. Has the **migration** of contaminated groundwater **stabilized** (such that contaminated groundwater is expected to remain within "existing area of contaminated groundwater"[5] 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:

Contaminant Migration

Control of source material can be an important consideration when assessing the stabilization of contaminant migration. Long-term reductions in contaminant concentrations in groundwater can provide assurance that control has been achieved. For the purposes of this report, time series plots of COC concentrations reported at monitoring wells completed within the shallow aquifer were reviewed. The plots indicate that four source area wells do not exhibit declining trends in PCE and TCE concentrations. These wells, and the COCs, are MW-2S (PCE), MW-2D (PCE), MW-5D (PCE, TCE) and MW-9S (PCE). The lack of contaminant reductions in these wells suggests that the contaminant source material in these areas is not controlled. However, despite the apparent lack of control, the migration of contaminated groundwater can be considered stabilized at the PolyOne facility as evidenced by the following conditions:

- The vertical extent of VOC contamination is limited to the base of the shallow aquifer due to the low hydraulic conductivity and continuous distribution of the underlying aquitard.

  In a July 31, 1998 letter, USEPA questioned whether the aquitard was continuous and expressed concern that the installation of wells 10 to 20 feet into the aquitard may have increased the risk of cross contamination (Ref. 1). In a subsequent letter, USEPA and NJDEP reiterated these concerns and further suggested that sand lenses reported within the aquitard would provide an

[5] "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.

avenue for downward vertical migration of VOCs into the PRM aquifer (Ref. 2). OCC responded to these concerns in a January 19, 1999 letter which stated that vertical migration was not a significant concern (Ref. 3). The response letter noted that 1) the aquitard was continuous across the site as evidenced by intersections in every boring, 2) the lack of VOCs in areas where the aquitard was penetrated, and 3) the unlikelihood of discontinuous sands enhancing vertical migration. The letter concluded that additional investigation of the PRM aquifer was not warranted, a position that was later accepted by NJDEP (Ref. 5).

- The shallow aquifer fully discharges to Bustleton Creek and the Delaware River, thus limiting the lateral extent of VOC migration.

  Water level data collected on the north (facility) side of Bustleton Creek (MW-6S/6D), the south side of the creek (MW-7S/7D), and in the creek indicate that the groundwater flow is towards the creek from the south and the north (Ref. 4). Tidal fluctuations, reported as high as 2.3 feet at the waste water outfall on the creek, impact the magnitude of the hydraulic gradient, but do not reverse flow direction (Ref. 4).

  Water quality data confirm that flow within the shallow aquifer does not bypass Bustleton Creek. Quarterly water samples collected from 1987 to 2000 from MW-7S/7D, which is located approximately 50 feet south of Bustleton Creek, report VOC non-detects for the majority of the monitoring events. The last VOC detection in MW-7S (PCE - 2 µg/L, TCE 2 µg/L) occurred in June 1995. This information is presented in the RI Report, which was conditionally accepted by NJDEP in an August 13, 2001 letter (Ref. 5).

  According to the RI Report, the underlying PRM aquifer outcrops at the Delaware River (Ref. 4), which indicates that flow from the shallow aquifer does not bypass the Delaware River.

- VOC concentrations in the majority of the wells completed in the shallow aquifer, including all downgradient wells, have declined due to natural attenuation.

  The Addendum to the RI Report presents time series plots of PCE, TCE, 1,2-DCE, and VCM concentrations from November 1984 to November 2000 (Ref. 7). The plots clearly indicate declining concentrations for the majority of the wells, including the three downgradient well nests (with the exception of MW-3S for PCE). Table 2 presents average concentrations for PCE and TCE from 1984 and 2000 for downgradient wells and provides an indication of the magnitude of the decreases in VOC concentrations.

Table 2 - Comparison of VOC Concentrations Over Time in Downgradient Wells (µg/L)

Well I.D.	VOC	NJ GWQC	1985 Average Concentration[1]	2000 Average Concentration[1]
MW-3S	PCE TCE	1 1	10.3 1.3	13.5 1
MW-3D	PCE TCE	1 1	134.3 15.5	10 0
MW-4S	PCE TCE	1 1	21.8 0	6.8 0
MW-4D	PCE TCE	1 1	1.5 2.3	0.5 0
MW-6S	PCE TCE	1 1	241.5 4.3	30.5 1.3
MW-6D	PCE TCE	1 1	322.3 41.0	16.5 0.3

[1] Average concentration was calculated due to data variability. Quarterly sampling results were used in the calculation. Non-detects were considered zero for the calculation. Data sources are Refs. 4 and 7.

Proposed Remedial Action and Monitoring

Occidental proposes to remediate the most highly contaminated area of the shallow aquifer, in the vicinity of MW-5S/5D and the Welex Building, through the use of either an air sparging system or a DDC system (Ref. 6). An air injection system injects pressurized air into the saturated soils surrounding the extraction well; whereas the DDC system injects air at the base of the well and discharges the exhausted air to vadose zone soils via the unwetted portion of the upper screen (Ref. 7). Installation of the system in less contaminated areas is not proposed because natural attenuation is significantly reducing VOC concentrations prior to discharge at Bustleton Creek. Air sparging was proposed in the RI Report, which received NJDEP approval. Subsequently, the DDC system was proposed as an alternative in the SRI Report (Ref. 6), which has not been reviewed by NJDEP. The proposed remediation program will include a monitoring program to track the effectiveness of remedial measures (Ref. 7). Details of the proposed monitoring program are provided in the response to Question #7.

At the request of NJDEP (Ref. 5), the facility has proposed to establish a CEA (Ref. 7). The CEA is an institutional control that designates an area of the shallow aquifer that is currently, and is anticipated in the future, to be impacted above the NJ GWQC. The VOCs specified in the CEA are PCE, TCE, 1,2-DCE, and VCM. The CEA covers much of the central and southwestern portions of the site and extends off site to Bustleton Creek and the Delaware River. See the CEA Location Map, Figure 2.3 in the Addendum to the RI Report, Classification Exception Area (Ref. 7) for a depiction of the CEA boundaries. The CEA duration is estimated at 33 years, but will be recalculated as new monitoring data are collected. The proposal does not include the establishment of a well restriction area (WRA) because the shallow aquifer is not currently used for potable water supply and is unlikely to be used for such in the future due to the industrial setting and the limited area. The CEA proposal was submitted in September 2001. NJDEP approval of the CEA proposal will be provided upon activation and documented adequacy of the proposed remediation system.

References:

1. Letter from Raymond Basso, USEPA, to S. A. Morris, Occidental Chemical Company, re: Occidental Chemical Corporation, Burlington, New Jersey, EPA I.D. No. NJD043973122. Dated July 31, 1998.
2. Letter from Barry Tornick, USEPA, to S. A. Morris, Occidental Chemical Company, re: Scope of Proposed Investigative Activities, Occidental Chemical Corporation, Burlington, New Jersey, EPA I.D. No. NJD043973122. Dated December 29, 1998.
3. Letter from David Steele, Glenn Springs Holdings, Inc., to Barry Tornick, USEPA, re: Scope of Proposed Investigative Activities, Occidental Chemical Corporation, Burlington, New Jersey, EPA I.D. No. NJD043973122, ISRA Case No. 98439. Dated January 19, 1999.
4. Remedial Investigation Report, Occidental Chemical Corporation. Prepared by Conestoga-Rovers & Associates. Dated October 2000.
5. Letter from Wayne Howitz, NJDEP, to David Steele, Glenn Spring Holdings, Inc., re: Remediation Agreement in the Matter of Occidental Chemical Corporation, Location: River Road, City of Burlington, Burlington County, Block: 154, Lot: 12-YB, Transaction: Sale of Property, ISRA Case #E98439, Remedial Investigation Report, dated October 12, 2000, Draft Response to Draft Comments on the RI Report dated January 19, 2001. Dated August 13, 2001.
6. Supplemental Remedial Investigation Report, Occidental Chemical Corporation. Prepared by Conestoga-Rovers & Associates. Dated September 2001.
7. Addendum to RI Report, Classification Exception Area, Occidental Chemical Company. Prepared by Conestoga-Rovers & Associates. Dated September 2001.

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

__X__ 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:

The Delaware River is oriented north-south along the western side of the facility. Distance from the facility boundary ranges from approximately 450 feet at the northwest corner to approximately 850 feet at the southwest corner. The river is used for industrial, recreational, and potable purposes. The Burlington City Water Company withdraws water from the river for potable supply at an intake located approximately 2.25 miles south of the site (Ref. 3). Bustleton Creek is oriented east-west along the southern side of the facility. Distance from the facility boundary ranges from approximately 30 feet to 400 feet.

The RI Report identified that groundwater in the shallow aquifer discharges to Bustleton Creek, and to the Delaware River to a lessor extent (Ref. 1). As mentioned in the Question #3 response, water level and water quality data collected in monitoring wells located to the north and south of Bustleton Creek indicate that groundwater flow does not bypass the creek. It is also known that flow does not bypass the Delaware River due to the fact that the underlying PRM directly discharges to the Delaware River. This information is presented in the RI Report (Ref. 1), which was conditionally accepted by NJDEP in a August 13, 2001 letter (Ref. 2).

References:

1. Remedial Investigation Report, Occidental Chemical Corporation. Prepared by Conestoga-Rovers & Associates. Dated October 2000.
2. Letter from Wayne Howitz, NJDEP, to David Steele, Glenn Spring Holdings, Inc., re: Remediation Agreement in the Matter of Occidental Chemical Corporation, Location: River Road, City of Burlington, Burlington County, Block: 154, Lot: 12-YB, Transaction: Sale of Property, ISRA Case #E98439, Remedial Investigation Report, dated October 12, 2000, Draft Response to Draft Comments on the RI Report dated January 19, 2001. Dated August 13, 2001.
3. RCRA Fact Sheet. Prepared by the New Jersey Department of Environmental Protection. Not dated.

5. Is the **discharge** of "contaminated" groundwater into surface water likely to be **"insignificant"** (i.e., the maximum concentration[6] 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 ecosystems 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 concentration[3] 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 ecosystem.

____ If no - (the discharge of "contaminated" groundwater into surface water is potentially significant) - continue after documenting: 1) the maximum known or reasonably suspected concentration[3] 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 concentrations[3] 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:

The VOC concentrations in groundwater that discharge into the Bustleton Creek can be roughly estimated by reviewing data collected from monitoring wells adjacent to the creek (MW-3S/3D, MW-4S/4D, and MW-6S/6D). Table 3 presents the range of concentrations detected in these wells in the 2000 quarterly monitoring events. The table shows that PCE concentrations exceed the NJ GWQC and sometimes exceed 10 times the NJ GWQC. However, water samples collected from Bustleton Creek indicate that elevated PCE concentrations do not currently exist in the creek. The difference in adjacent groundwater concentrations and creek concentrations can be attributed to dilution. The most recent creek samples were collected as part of the RI investigation (Ref. 1) in April 2000 from five locations (BC-1 through BC-5) that were distributed over approximately 3,200 feet of creek along the southern boundary of the site. Analytical results indicate that PCE, TCE, VCM, and 1,2-DCE were not detected, with the exception of PCE (1 µg/L) in BC-2. Sediment samples were also collected from Bustleton Creek adjacent to four of the surface water stations (BC-1 through BC-4). Sample results indicate that PCE, TCE, VCM, and 1,2-DCE were not detected.

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

Table 3 - VOC Concentrations Detected Adjacent to the Bustleton Creek in 2000 (µg/L)

Constituent	Well I.D.	Concentration Range[1] Feb. 2000 - Nov. 2000	Concentration[1] Nov. 2000	NJ GWQC[2]	10x NJ GWQC
PCE	MW-3S	8 - 20	20	1	10
	MW-3D	7 - 16	16		
	MW-4S	4 - 9	9		
	MW-4D	ND - 2	ND		
	MW-6S	16 - 47	47		
	MW-6D	9 - 26	26		
TCE	MW-3S	ND - 2	2	1	10
	MW-3D	ND	ND		
	MW-4S	ND	ND		
	MW-4D	ND	ND		
	MW-6S	ND - 2	2		
	MW-6D	ND - 1	ND		

[1] Ref. 2.

[2] Criteria listed are the higher of NJ GWQC and PQL.

Occidental preformed an ecological evaluation to determine the impacts to Bustleton Creek caused by facility activities (Ref. 1). The evaluation concluded that VOCs would not impact the creek because VOCs were not detected in sediment samples and only one low level concentration of PCE (1 µg/L) was detected in a surface water sample (BC-2). The surface water data were compared to toxicological benchmarks developed by the Delaware River Basin Commission (DRBC) for the protection of consumers of aquatic life and protection of aquatic life. The DRBC criteria are 8.85 µg/L for PCE, 80.7 µg/L for TCE, 3.2 µg/L for DCE, and 525 µg/L for VCM. The RI reports that PCE concentrations were at or near the level of detection in 1988 and 1999 and that the long-term average concentration has always been below the standard of 8.85 µg/L. Surface water data were also compared to the Pennsylvania toxicological benchmarks for protection of aquatic life, which are 139 µg/L for PCE, 450 µg/L for TCE, and 1,492 µg/L for DCE. The surface water data were also below these criteria as these benchmarks are less stringent than the DRBC.

Thus, based upon a review of current available groundwater and surface water data, impacts from discharge of contaminated groundwater beneath the PolyOne site into Bustleton Creek appear to be insignificant.

References:

1. Remedial Investigation Report, Occidental Chemical Corporation. Prepared by Conestoga-Rovers & Associates. Dated October 2000.
2. Addendum to RI Report, Classification Exception Area, Occidental Chemical Company. Prepared by Conestoga-Rovers & Associates. Dated September 2001.

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 ecosystems that should not be allowed to continue until a final remedy decision can be made and implemented[7])?

____ 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 ecosystems), and referencing supporting documentation demonstrating that these criteria are not exceeded by the discharging groundwater; OR 2) providing or referencing an interim-assessment[8], appropriate to the potential for impact, that shows the discharge of groundwater contaminants into the surface water is (in the opinion of a trained specialist, including an ecologist) adequately protective of receiving surface water, sediments, and ecosystems, 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 cannot 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 ecosystem.

____ If unknown - skip to 8 and enter "IN" status code.

Rationale:

This question is not applicable. See response to Question #5.

[7] 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.

[8] 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.

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?"

__X__ 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:

According to the CEA proposal, the proposed remediation system will include a monitoring program to track the effectiveness of remedial measures (Ref. 1). The proposed monitoring program, includes the following:

- Annual monitoring of MW-6S/6D to assess conditions downgradient of the remediation zone and prior to discharge to Bustleton Creek.
- Annual monitoring of MW-8S/8D to assess conditions upgradient of the remediation zone.
- Monthly monitoring of MW-5S/5D for a period of six months after system startup, followed by quarterly monitoring, to assess conditions immediately downgradient of the highest PCE concentrations.
- Monitoring of PW-1 and PW-2 according to SDWA requirements.
- Abandonment of wells MW-1S/1D, MW-2S/2D, MW-3S/3D, MW-4S/4D, MW-9S/9D, MW-10, MW-11, TW-10, TW-11, and TW-20.

NJDEP approval of the CEA proposal will be provided upon activation and documented adequacy of the proposed remediation system.

References:

1. Addendum to RI Report, Classification Exception Area, Occidental Chemical Company. Prepared by Conestoga-Rovers & Associates. Dated September 2001.

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 PolyOne Corp. facility (fka Occidental Chemical Corporation), EPA ID# NJD043973122, located at 1804 River Road, Burlington, New Jersey. 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.

Completed by: _____ Date:_____

Lucas Kingston
Hydrogeologist
Booz Allen Hamilton

Reviewed by: _____ Date:_____

Pat Shanley
Geologist
Booz Allen Hamilton

Also Reviewed by: _____ Date:_____

Elizabeth Butler, RPM
RCRA Programs Branch
USEPA Region 2

_____ Date:_____

Barry Tornick, Section Chief
RCRA Programs Branch
USEPA Region 2

Approved by: Original signed by: Date: May 10, 2002

Raymond Basso, Chief
RCRA Programs Branch
USEPA 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, 15th Floor, New York, New York, and the New Jersey Department of Environmental Protection Office located at 401 East State Street, Records Center, 6th Floor, Trenton, New Jersey.

Contact telephone and e-mail numbers: Elizabeth Butler, USEPA RPM
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Attachments

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

- Attachment 1 - Summary of Media Impacts Table

Attachment 1 - Summary of Media Impacts Table

PolyOne Corp. (fka Occidental Chemical Corporation)

AOC	GW	AIR (Indoors)	SURF SOIL	SURF WATER	SED	SUB SURF SOIL	AIR (Outdoors)	CORRECTIVE ACTION MEASURE	CONTAMINANTS
Resin Ditch/South Ditch/CMPs/CBs	No	No	Yes	No	No	Yes	No	▸ Fencing surrounds all impacted areas ▸ Planned excavation and off-site disposal of PCB-impacted soil above NJ RDCSCC	PCBs
Transformers	No	No	Yes	No	No	No	No	▸ Fencing surrounds all impacted transformer areas ▸ Planned excavation and off-site disposal of PCB-impacted soil above NJ RDCSCC	PCBs
Former VCM Recovery Area	No	No	No	No	No	No	No	NA	NA
Former PCE Drum Storage Area	Yes	No	Yes	No	No	No	No	▸ Area included in CEA to address contamination above NJ IGWSCC ▸ Area covered by concrete/asphalt ▸ Planned excavation and off-site disposal of PCE-impacted soil above NJ RDCSCC	PCE
Chiller House	Yes	No	No	No	No	Yes	No	▸ Area included in CEA to address groundwater contamination above NJ GWQC and soil contamination above NJ IGWSCC ▸ Planned excavation and off-site disposal of PCE-impacted soil above NJ RDCSCC	PCE
Former USTs (1,000-gallon No. 2 Fuel Oil UST)	Yes	No	No	No	No	Yes	No	▸ Area included in CEA to address groundwater contamination above NJ GWQC and soil contamination above NJ IGWSCC ▸ Planned excavation and off-site disposal of PCE-impacted soil above NJ RDCSCC	PCE

AOC	GW	AIR (Indoors)	SURF SOIL	SURF WATER	SED	SUB SURF SOIL	AIR (Outdoors)	CORRECTIVE ACTION MEASURE	CONTAMINANTS
Welex Building	Yes	No	No	No	No	No	No	▸ Area included in CEA to address contamination above the NJ GWQC	PCE, TCE
Empty Drum Storage Area	No	No	No	No	No	No	No	NA	NA
Obsolete Equipment Storage Area	No	No	No	No	No	No	No	NA	NA
Resin Building	No	No	No	No	No	No	No	NA	NA
Bulk Storage Tanks (300,000 gallon Aboveground No. 6 Fuel Oil Tank)	No	No	Yes	No	No	No	No	▸ Fencing surrounds area to prevent exposure ▸ Planned excavation of TPH impacted soil down to clay layer	TPH
Current Drum Storage Area	No	No	No	No	No	No	No	NA	NA
Process Lines/Equipment/ Material Handling Areas	No	No	No	No	No	No	No	NA	NA
Groundwater	Yes							▸ Install an active groundwater remediation system (i.e., air sparging or DDC system) to reduce concentrations of contaminants in groundwater ▸ Implement CEA ▸ Continue groundwater monitoring	PCE, TCE

NA - Not applicable

* Groundwater contamination is being addressed on a site-wide basis. However, for purposes of relating impacts to potential source areas, specific areas where groundwater impacts have been shown are identified in the table.