**DOCUMENTATION OF ENVIRONMENTAL INDICATOR DETERMINATION**

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

**Facility Name:** **Clariant Corporation**
**Facility Address:** **Fair Lawn Avenue and Third Street, Fair Lawn, New Jersey 07410**
**Facility EPA ID#:** **NJD001213453**

## 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 Clariant Corporation (formerly Sandoz Chemicals) facility is a 13.5-acre property located at the intersection of Fair Lawn Avenue and Third Street in Fair Lawn, Bergen County, New Jersey. The facility is bounded to the west by the Passaic River and wooded areas, to the south and east by residential areas, and to the north by industrial properties.

Prior to 1946, the property was used as a sand and gravel mining operation. The property was mined to groundwater depth (approximately 30 feet below ground surface) over most of the site. The former quarry was then backfilled with a heterogeneous mixture of sand, gravel, and concrete rubble. Sandoz purchased the facility in 1946 from the Borough of Fair Lawn. Sandoz conducted specialty chemical manufacturing operations on approximately six acres at the southern end of the site until November 1992. Sandoz manufactured several products that were utilized by the textile and paper industries, such as softeners, optical brighteners, and dyes. In the process, Sandoz generated hazardous waste consisting primarily of a spent orthodichlorobenzene solvent mixture (ODCB-SM) which included 1,2-dichlorobenzene (1,2-DCB), 1,3-DCB, 1,4-DCB, chlorobenzene, 1,2,4-trichlorobenzene, and benzene. The facility also had several underground storage tanks (USTs) that held petroleum products and hazardous materials. Since 1991, approximately 1.5 acres at the far northern portion of the site have been leased to Joel Tanis and Sons, Inc., a manufacturer of ready-made concrete. In addition, since 1992, the site has supported a small applications laboratory for leather and textiles. In 1995, Sandoz Chemicals changed its name to Clariant Corporation and initiated remedial operations for treatment of soil and groundwater.

Upon ceasing manufacturing operations, the facility became subject to the regulations of the Industrial Site Recovery Act (ISRA), formerly known as the Environmental Cleanup Responsibility Act (ECRA). Since 1989, several site investigations and/or remediation activities have been conducted. Previous site investigations were related to the closure of a RCRA hazardous waste tank and the subsequent closure of the UST farm. Site-wide facility investigation reports include a 1992 Site Investigation (SI) Report, a 1993 Soil Sampling Plan and Report, a 1994 Groundwater Investigation Report, and a 1998 Remedial Action Report (RAR). Current site activities include ongoing ISRA remedial investigations and actions.

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 Areas of Environmental Concern (AECs)**: The Clariant facility has been the subject of ongoing investigations since 1989. Surface soil, subsurface soil, and groundwater contamination were identified during the 1992 SI. SI results were presented in the Site Investigation Plan and Results Report (Ref. 1). The SI identified 20 AECs at the property, including groundwater and site-wide historic fill. Figure 3-2, Layout 2 of the April 2003 Remedial Investigation (RI) Report on the Unconsolidated and Bedrock Groundwater Investigation presents a site plan of the Clariant facility, showing the AECs and sampling locations for groundwater and surface water (Ref. 11).

Several engineering and institutional controls have been implemented at Clariant to prevent exposures to elevated levels of polychlorinated biphenyls (PCBs), metals, and polycyclic aromatic hydrocarbons (PAHs). A site-wide Declaration of Environmental Restriction (DER) has been submitted to the New Jersey Department of Environmental Protection (NJDEP) based on the consistent and randomly distributed contaminants across the site due to the historic fill materials (including beryllium, lead, PAHs, and PCBs) and site activities at the former UST farm. In addition, a second DER area has been delineated to define the area where PCB levels exceed New Jersey Non-Residential Direct Contact Soil Cleanup Criteria (NJ NRDCSCC) in the central portion of the riverbank area and within the boundaries of the site-wide DER. Clariant maintains engineering controls (e.g., geotextile membrane, fencing) in this PCB-impacted area.

No further action (NFA) has been proposed for numerous AECs based on the absence of significant environmental contamination and/or implementation of corrective actions and appropriate engineering controls. NFA was subsequently approved for AECs B (Section A), D-005, E, F-4, F-5, F-6, F-8, F-9, F-10, G, H, I/J, and K. Although NFA has been proposed, the current status of NJDEP approval remains unclear for AECs D-001, D-002/003, D-004, F-1 F-2, F-3, F-7, L, and M. RCRA investigation and/or corrective action is ongoing at the remaining AECs. Brief descriptions of these active AECs are provided below, along with a summary of contaminants detected above NJDEP standards[1].

[1] Clariant has evaluated on-site surface soil contaminants using the New Jersey Residential Direct Contact Soil Cleanup Criteria (NJ RDCSCC) and/or New Jersey Non-Residential Direct Contact Soil Cleanup Criteria (NJ NRDCSCC). Subsurface soil contaminants were compared to the New Jersey Impact to Groundwater Soil Cleanup Criteria (IGWSCC). Groundwater concentrations were comparted to NJ Ground Water Quality Criteria (GWQC) for a Class IIA Aquifer.

**AEC A, Former UST Farm**: Six 500-gallon USTs were formerly located on the north side of the property. Tanks 1 through 4 were installed in 1968, and tanks 5 and 6 were installed in 1972. All tanks were taken out of service in December 1990 and removed in March 1992 per the approved UST closure plan. Five monitoring wells and 19 soil borings were installed during the SI. Sampling results indicated contamination in both the saturated and unsaturated zones (Ref. 3). Detected contaminants include volatile organic compounds (VOCs) originating from ODCB-SM components. Contaminants were detected in subsurface soil and groundwater in excess of NJ standards. Groundwater and soil contamination at this AEC are currently being remediated by an air sparging/soil vapor extraction (AS/SVE) system used in conjunction with a groundwater treatment system (GWTS). In addition, a draft DER was submitted to NJDEP in July 1998 as part of the RAR. The DER will restrict the use of impacted areas to non-residential use only to prevent exposure to elevated concentrations of contaminants in soil (Ref. 5).

**AEC B (Section B), Window Well Area:** The window well area consists of a trench built along the west side of Building 305, which provided ventilation for the basement in this building. Coarse gravel covers the bottom of the window well. Two separate process lines existed in Building 305: the southern half (Section A) produced only water-based product, while the northern half (Section B) housed the production of solvent-based products. Subsurface soil samples collected in Section B during the SI indicated the presence of several components of ODCB-SM at concentrations above NJ standards. Subsurface soil and groundwater contamination are being addressed through the AS/SVE and groundwater treatment systems implemented at AEC A (Ref. 4). Section B was also included in the draft DER submitted to NJDEP in July 1998 (Ref. 5).

**AEC C, Former Lime Pit:** From 1948 until 1973, sulfuric acid waste was discharged to a neutralization basin located northwest of the manufacturing buildings for neutralization with lime. Subsurface soil samples were obtained during the SI. No constituents were observed in the unsaturated zone in excess of NJ NRDCSCC; however, several organic parameters, including chlorobenzene and tetrachloroethylene (PCE), were detected in the saturated zone above New Jersey Residential Direct Contact Soil Cleanup Criteria (NJ RDCSCC) and New Jersey Impact to Groundwater Soil Cleanup Criteria (NJ IGWSCC) (Refs. 4 and 7). Subsurface soil and groundwater contamination in this area is currently being addressed by the AS/SVE system. This area was also included in the DER submitted to NJDEP in July 1998 (Ref. 5).

**Historic Fill**: Based on historical information, the site was a sand mining pit prior to being purchased by Sandoz chemicals in 1946. Historic fill was reportedly used to backfill the mine quarries in the late 1940s. In 1996, NJDEP requested that the extent of the fill area be delineated. The results presented in the 1998 RAR indicate that the majority of the fill was placed in the northern portion of the property at thicknesses of up to 30 feet, with the southern portion of the site consisting of less than 5 feet of fill material. Soil sample data collected during the 1992 SI indicate that the historic fill throughout the site contains concentrations of metals (beryllium and lead), PAHs, and PCBs in excess of NJ RDCSCC. Thus, a draft DER for the historic fill material has been submitted to NJDEP.

**Groundwater**: Groundwater investigations were initially conducted at this site in March 1992 as part of the closure operations of the Former UST Farm (AEC A). Additional investigations, including the 1994 Phase II Groundwater Investigation, were performed to delineate the extent of

the groundwater contamination and define the boundaries of the plume. Constituents detected during groundwater investigations consisted of components of ODCB-SM, VOCs (1,1-dichloroethene, 1,2,4-trichlorobenzene, PCE, trichloroethylene [TCE]), chromium, in excess of New Jersey Ground Water Quality Criteria (NJ GWQC) for Class IIA aquifers. These investigations also indicated the likelihood that free product contamination, or dense non-aqueous phase liquid (DNAPL), is present in the subsurface. Figure 5-5 of the January 2001 RI Report presents a map of the unconsolidated aquifer area suspected of being impacted by DNAPL (Ref. 7). Dissolved phase contamination and/or DNAPL are also present in bedrock fractures beneath the Clariant site but to a lesser degree than observed in the shallower unconsolidated aquifer, and concentrations generally decrease with depth (Ref. 11). The presence of DNAPL in fractured bedrock presents considerable difficulties with regard to delineation and remediation. Many fractures become narrow and dead end within the bedrock unit, trapping DNAPL, making access difficult, and hampering removal actions. Poor connectivity between fractures increases the complexity of required remedial actions and leads to uncertainty as to whether all source material has been remediated. As a result, Clariant has implemented remedial actions designed to reduce contaminant migration downward into bedrock fractures and remove it from the subsurface entirely.

In August 1995 Clariant received a New Jersey Pollutant Discharge Elimination System (NJPDES) discharge to groundwater (DGW) permit for effluent from the proposed GWTS. Construction of the GWTS, which included an AS/SVE system, was completed in August 1995. The system became operational in September 1995. At that time NJDEP mandated a quarterly monitoring program consisting of routine monitoring of specific on- and off-site wells and surface water samples from the Passaic River. In September 1998, Clariant received approval to change the GWTS DGW permit to discharge to surface water (DSW). In addition, a proposal for a Classification Exception Area (CEA) to restrict groundwater use in the impacted areas was submitted by the facility in August 1996, and was conditionally accepted by NJDEP in December 1996 (Ref. 5). The duration of the CEA in its current form will be at least until cessation of active remediation (Ref. 8).

**References:**

1. Site Investigation Plan and Results Report. Prepared by Camp, Dresser & McKee (CDM). Dated September 1992.
2. Letter from CDM to NJDEP. Re: Results–Surface Soils. Dated October 4, 1994.
3. Remedial Investigation Soil Delineation Report for Sandoz Chemicals Corporation. Prepared by CDM. Dated December 1994.
4. Letter from Randolph Kullman, CDM, to Linda Goldsworthy, NJDEP. Re: Clariant Corp. Remedial Action Work Plan. Dated August 1995.
5. Clariant Corporation Remedial Action Report. Prepared by CDM. Dated July 1998.
6. Letter from Randolph Kullman, CDM, to Wayne Bevan, NJDEP. Re: Remedial Investigation/Action Schedule–2000 Revision. Dated December 12, 2000.
7. Remedial Investigation Report. Prepared by CDM. Dated January 2001.
8. Personal communication from Clifford Ng, EPA Region 2, to Kathy Rogovin, Booz Allen Hamilton. Re: CEA status. Dated July 6, 2001.
9. Personal communication from Clifford Ng, EPA, to Kathy Rogovin, Booz Allen Hamilton. Re: AEC F-4 off-site PAH contamination. Dated July 20, 2001.

10. E-mail correspondence from Mike Teague, Clariant Corp., to Clifford Ng, EPA Region 2. Re: Clariant AEC F-4. Dated April 29, 2002.
11. Remedial Investigation Report on the Unconsolidated and Bedrock Groundwater Investigation. Prepared by CDM. Dated April 2003.

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

During the initial SI, groundwater contamination was found in the former UST farm area (AEC A). Additional investigations were performed in 1994 to delineate the extent of the groundwater contamination (Ref. 2). Wells were installed in both the unconsolidated aquifer and the fractured bedrock aquifer as shown in Figure 3-2, Layout 2 of the RI Report on the Unconsolidated and Bedrock Groundwater Investigation (Ref. 15).

As part of the semiannual groundwater monitoring program, groundwater samples are analyzed for VOCs, methyl tertiary butyl ether (MTBE) and 1,2,4-trichlorobenzene. Samples from well MW-9 are also analyzed for metals content. Several chlorinated hydrocarbons and aromatic hydrocarbons (including ODCB-SM components) are present at the site at concentrations exceeding NJ GWQC for Class II-A (potable) aquifers. Table 1 lists the maximum concentration of those hazardous constituents exceeding NJ GWQC in Clariant groundwater during the most recent semiannual monitoring event in March 2004 (Ref. 17).

**Table 1. Maximum Concentrations Exceeding NJ GWQC in March 2004 (μg/L)**

| Compound | NJ GWQC | Maximum Concentration | Sample Location |
|---|---|---|---|
| 1,2-Dichlorobenzene | 600 | 79,300 | MW-28R-40 |
| 1,3-Dichlorobenzene | 600 | 765 | MW-28R-40 |
| 1,4-Dichlorobenzene | 75 | 4,720 | MW-28R-40 |
| Chlorobenzene | 50 | 3,650 | MW-25-40 |
| MTBE | 70 | 2,000 | MW-30RD-40 |
| Tetrachloroethene (PCE) | 1 | 15.5 | MW-20-40 |
| Trichloroethene (TCE) | 1 | 14.1 | MW-9RS-40 |
| Methylene Chloride | 3 | 12.1 | MW-10-40 |
| Chromium | 100 | 221 | MW-9 |

Note: The NJ GWQC is the higher of the GWQC or the Practical Quantitation Level (PQL).

The most significant dissolved phase groundwater contamination is situated near the northwest corner of Building 306. The horizontal extent of the ODCB-SM/VOC groundwater plume has been estimated to be approximately 350 feet by 500 feet (Ref. 6), extending to the downgradient edge of the property along the

Passaic River. As will be discussed in Question 3, upwelling and discharge of groundwater to the river prevents contaminant migration further downgradient to the southwest. March 2004 groundwater monitoring data from the overburden and bedrock wells at the downgradient property boundary adjacent to the Passaic River are presented in Table 3 in the response to Question 5. As shown, maximum reported concentrations in groundwater along the Passaic River were frequently an order of magnitude greater than applicable NJ GWQC, with the most significant impacts reported in the shallow monitoring wells and in groundwater extracted from well MW-13R for treatment.

Vertically, dissolved groundwater contamination extends into the fractured bedrock, but at lower concentrations than in the shallower unconsolidated aquifer (Ref. 17). The fact that contaminant concentrations decrease with depth appears to be attributable to a generally upward flow gradient from the bedrock aquifer to shallower groundwater, and preferential flow within, rather than across, subsurface strata, as indicated by recent aquifer testing (Ref. 15).

Several areas of the site are believed to be impacted by free product DNAPL. Criteria suggesting the presence of DNAPL include particularly high groundwater concentrations, observation of free product in wells and soil samples, elevated soil contaminant concentrations, and specific free product testing (e.g., jar testing, fluorescent light testing, and hydrophobic dye testing). The areal footprint potentially impacted by DNAPL (in saturated zone soils and in the shallow unconsolidated aquifer) is estimated at approximately 270 feet by 240 feet (Ref. 6). As shown on Figure 5-5 of the January 2001 RI Report, this area extends from the main source area near Building 306, through the current area of investigation, and off site to the west (Ref. 10). The figure also shows another small potential area of DNAPL situated around extraction well WEW-1, just south of the larger suspected DNAPL impact area. There is also the possibility that some DNAPL may be present in bedrock fractures, particularly in the vicinity of MW-29R (Ref. 15).

To assess the potential for contaminant migration off-site in the shallow aquifer, two monitoring wells (MW-100 and MW-100R) were installed across the Passaic River from Clariant. These wells are located approximately 1,100 feet southwest (downgradient) of MW-13R and are set back approximately 50 feet from the riverbed. MW-100R was completed within the fractured bedrock, and MW-100 was completed in the unconsolidated sediments. These wells were found to be impacted by concentrations of MTBE (MW-100R only), PCE, and TCE in excess of NJ GWQC (Ref. 17). Although these constituents were also reported in on-site groundwater samples, this off-site contamination is apparently not attributable to Clariant. A recent review of hydrogeology at the former Lyons Piece Dye Works site (immediately southwest of Clariant on the opposite bank of the Passaic River) indicates easterly bedrock groundwater flow, toward and discharging into the Passaic River (Ref. 16). Further review of available file material indicates the presence of MTBE, TCE, and PCE in groundwater elsewhere on the Lyons Piece property (Ref. 16). Thus, it appears that elevated VOCs in well MW-100 and MW-100R are attributable to former or current Lyons Piece operations, and not to Clariant facility operations. Consequently, off-site exceedances in shallow groundwater beyond the Passaic River will not be addressed further in this EI determination.

To assess the potential for contaminant migration off-site in deeper groundwater, Clariant also completed an investigation of bedrock flow conditions and groundwater quality down dip of the site (Ref. 14). According to available information, primary porosity in the bedrock unit is negligible, but groundwater flow does appear to occur within fractures and along bedding planes. Bedding in the vicinity of Clariant strikes about six degrees east of north, and dips about seven degrees westerly (Ref. 14). Several Fair Lawn Water Department public water supply wells (part of the Memorial Park well field) are located along the

strike of Clariant, and industrial wells at the Mona and Paperboard Specialties sites are directly down dip of Clariant, on the opposite side of the Passaic River. Data from these wells indicate no contamination attributable to Clariant (Ref. 14).

**References:**

1. Site Investigation Plan and Results Report. Prepared by CDM. Dated September 1992.
2. Phase II Groundwater Investigation Report. Preparer unknown. Dated January 1994.
3. Letter from Douglas Stuart, NJDEP, to Victor Ethridge, Sandoz/Clariant. Re: Reinjection Wells Report dated October 4, 1994. Dated March 14, 1995.
4. Letter from Randolph Kullman, CDM, to Wayne Bevan, NJDEP. Re: Classification Exception Area and Surface Water Impact Evaluation. Dated August 16, 1996.
5. Clariant Corporation Remedial Action Report. Prepared by CDM. Dated July 1998.
6. Letter from Randolph Kullman, CDM, to Wayne Bevan, NJDEP. Re: Bedrock/Free Product Remedial Investigation Report. Dated September 30, 1999.
7. Letter from Randolph Kullman, CDM, to Wayne Bevan, NJDEP. Re: Quarterly Monitoring Report–Third Quarter 1999. Dated November 30, 1999.
8. Letter from Stephen Maybury, NJDEP, to Randolph Kullman, CDM. Re: Clariant Corp. Dated October 6, 2000.
9. Letter from Randolph Kullman, CDM, to Wayne Bevan, NJDEP. Re: Six-Month Remedial Progress/Summary Report–October 2000. Attachment C: Bedrock/Memorial Park Well Field Investigation. Dated November 3, 2000.
10. Remedial Investigation Report. Prepared by CDM. Dated January 2001.
11. Letter from Randolph Kullman, CDM, to Wayne Bevan, NJDEP. Re: Quarterly Monitoring Report–Fourth Quarter 2000. Dated March 2, 2001.
12. Letter from Randolph Kullman, CDM, to Wayne Bevan, NJDEP. Re: Quarterly Monitoring Report–First Quarter 2001. Dated May 21, 2001.
13. Personal communication from Clifford Ng, EPA Region 2, to Kathy Rogovin, Booz Allen Hamilton. Re: CEA status. Dated July 6, 2001.
14. Remedial Investigation Report on Off-Site Bedrock and Surface Water Hydrology. Prepared by CDM. Dated May 2002.
15. Remedial Investigation Report on the Unconsolidated and Bedrock Groundwater Investigation. Prepared by CDM. Dated April 2003.
16. Groundwater Remedial Investigation Report and Remedial Action Work Plan for the Former Lyons Piece Dye Works. Prepared by TRC Raviv Associates, Inc. Dated December 11, 2003.
17. Semiannual Remedial Progress/Monitoring Report. Prepared by CDM. Dated May 2004.

3. Has the **migration** of contaminated groundwater **stabilized** (such that contaminated groundwater is expected to remain within "existing area of contaminated groundwater"[2] 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:**

**Local Hydrogeology**

The hydrogeologic setting in this region consists of surficial unconsolidated material and an underlying fractured bedrock system. The stratigraphy at the site consists of 5 to 30 feet of sand and gravel fill, 20 to 30 feet of sand and gravel glacial deposits, and then 5 to 10 feet of till overlying the bedrock.

The surficial fill is typically unsaturated, but the underlying stratified unconsolidated glacio-fluvial or glacio-lacustrine material is a water-bearing zone. The depth to the water table aquifer fluctuates up to 10 feet seasonally. Groundwater flow in this unit is toward the Passaic River in a general southwest direction. Hydraulic conductivity for this unconfined aquifer is estimated to be 30 feet per day (ft/day), and the transmissivity is estimated at 750 $ft^2$/day (Ref. 2). Till material underlying the unconsolidated aquifer consists of silty sand and gravel which can potentially act as an aquitard.

The bedrock formation underlying the unconsolidated material is known as the Passaic Formation, formerly designated as the Late Triassic Brunswick Formation. The bedrock consists of interbedded red/brown sandstone and mudstone. The bedrock does not outcrop at or near the Clariant site. Bedding in the vicinity of Clariant strikes about six degrees east of north, and dips about seven degrees westerly (Ref. 14). The top 30 to 50 feet of the bedrock is fractured, and flow within these fractures is generally to the southwest (Ref. 4). Primary porosity in the Brunswick Formation is negligible, but bedrock groundwater flow does appear to occur within fractures and along bedding planes (Ref. 15). According to the most recent bedrock groundwater evaluation (Ref. 15), flow in this unit ranges from south to southwest as it travels off site.

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[2] "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.

There is evidence of interaction between the fractured bedrock aquifer and the unconsolidated aquifer. The interaction has been inferred from water level measurements taken from locations with couplet wells (Ref. 2). Vertical flow gradients between the bedrock groundwater and overlying unconsolidated sediments vary across the site, trending upward close to the Passaic River and downward in the contaminant source area near wells MW-23 and MW-24 (Ref. 17). This flow variability is attributed to vertical heterogeneity across the site and extraction well pumping on and off site. Nevertheless, recent aquifer testing indicates that preferential flow paths move within, rather than across, subsurface strata (Ref. 15). This condition, in conjunction with the upward flow gradient (where present), serves to minimize downward contaminant migration from the shallow unconsolidated aquifer to the bedrock aquifer. Accordingly, contaminant concentrations across large portions of the site appear to decrease with depth (Refs. 15 and 17).

**Contaminant Concentration Stabilization**

Contaminated groundwater on site is currently being remediated via groundwater extraction and air stripping. The extraction system consists of nine water extraction wells strategically located to maximize contaminant reduction and groundwater capture (limiting off-site contaminant migration). This groundwater treatment system is supplemented by a combined AS/SVE system to reduce soil contaminant concentrations and mitigate an ongoing contaminant source for groundwater impacts.

According to the most recent semiannual progress report (Ref. 17), approximately 18,800 pounds of VOC contamination has been removed by the groundwater extraction and air stripping system since operations began in September 1995. The effectiveness of this remedial approach is also apparent in declining contaminant concentrations. Chlorobenzene and 1,2-DCB concentrations are particularly relevant to and considered indicator compounds for this trends analysis because the dichlorobenzene family of compounds comprises the majority of groundwater contamination and because chlorobenzene is a breakdown product of those constituents.

Linear regression plots in the most recent semiannual progress report (Ref. 17) show declining or stable concentrations for both indicator compounds in most of the Clariant extraction and monitoring wells in the main contaminant area. Several examples of these declining contaminant trends are noted in Table 2 below. Although not presented in the table, contaminant concentrations in monitoring wells downgradient of the core contaminated area have also declined. Indicator compound concentrations in monitoring wells MW-02, MW-08, and MW-12 were all reported below NJ GWQC during the March 2004 groundwater monitoring event (Ref. 17).

The only exception to these downward contaminant trends is slightly increasing concentrations of 1,2-DCB in well MW-23. However, a review of the regression plot and associated data tables (Ref. 17) suggests that contaminant concentrations only appear to be increasing in this well because of a high outlying data point (19,200 micrograms per liter [µg/L]) measured in September 2002. The highest 1,2-DCB concentrations reported in this well prior to September 2002 was 5,300 µg/L in March 1999. Of the three well MW-23 groundwater samples collected since September 2002, two were at or below the NJ GWQC of 600 µg/L, and one was reported at 1,290 µg/L (only twice the NJ GWQC and significantly less than the concentration reported in September 2002). Consequently, the contaminant concentration trend for well MW-23 may not reflect actual site conditions with regard to groundwater quality and stabilization. This well will continue to be monitored (along with other Clariant wells in the same area) as part of the semiannual groundwater monitoring program to verify contaminant stabilization.

**Table 2. Indicator Compound Concentrations in Clariant Wells Over Time (µg/L)**

| Well | Well Function | Historic Maximum | Date of Maximum | September 2003 Concentration | March 2004 Concentration |
|---|---|---|---|---|---|
| **Chlorobenzene (GWQC = 50 µg/L)** | | | | | |
| WEW-01 | Extraction | 1,620 | 09/96 | 173 | 166 |
| WEW-02A | Extraction | 4,600 | 01/96 | 518 | 570 |
| WEW-05 | Extraction | 3,120 J | 09/00 | 533 | 313 |
| MW-13 | Source Monitoring | 35,000 | 01/96 | 1,380 | 1,160 |
| MW-24 | Source Monitoring | 7,500 | 03/99 | 38.5 | 15.9 |
| MW-28R | Source Monitoring | 7,530 | 06/01 | 3,750 | 2,320 |
| **1,2-Dichlorobenzene (GWQC = 600 µg/L)** | | | | | |
| WEW-01 | Extraction | 40,800 | 03/97 | 5,060 | 3,830 |
| MW-05 | Extraction (converted) | 353,000 | 03/98 | 12,600 | 4,020 |
| MW-13R | Extraction (converted) | 110,000 | 06/99 | 31,300 | 49,000 |
| MW-24 | Source Monitoring | 33,600 | 09/99 | 924 | 96.6 |
| MW-26 | Source Monitoring | 69,100 | 12/99 | 35,500 | 19,700 |
| MW-28R | Source Monitoring | 191,000 | 06/01 | 121,000 | 79,300 |

"J" qualifier indicates concentration is an estimated value.
Source: Ref. 17.

The data presented in Table 2 clearly indicates that, although significant decreases have been observed in Clariant groundwater, contaminant levels frequently remain above NJ GWQC. Furthermore, contaminant concentrations are still high enough to indicate the continued presence of DNAPL.

**Hydrologic Stabilization**

According to the most recent semiannual progress report (Ref. 17), the groundwater recovery system produces significant cones of depression around several extraction wells in the main contaminant area. This deflection in the natural flow direction results in capture of the most significantly impacted groundwater in the unconsolidated (upper) aquifer and minimizes flow away from the area beneath Buildings 305 and 306. Inward flow is also observed in bedrock groundwater beneath a majority of the Clariant site under current pumping conditions, as shown on Figure 5-7 of the Unconsolidated and Bedrock Groundwater Investigation RI Report (Ref. 15). Thus, contaminated overburden and bedrock groundwater in the source area is expected to remain within the current area of impact.

According to water table contour maps presented in the latest semiannual progress report (Ref. 17), specifically Figure 4-3, shallow groundwater not captured by the extraction system flows southwest

toward the Passaic River. Groundwater beneath the Lyons Piece property on the opposite bank of the Passaic River has been recorded as flowing easterly toward the river (Ref. 16). Furthermore, water level measurements indicate an upward vertical gradient from bedrock groundwater to the shallow overburden aquifer adjacent to the Passaic River (Ref. 16). This flow pattern indicates shallow groundwater and upwelling bedrock groundwater discharge into the Passaic River from both the Clariant and Lyons Piece sites. Thus, the river serves as a hydraulic boundary for shallow groundwater and portions of the bedrock aquifer, preventing contaminant migration from Clariant off-site to the southwest. As a result, contamination in the overburden aquifer and in upwelling bedrock groundwater is expected to remain within the current area of impact. The downgradient edge of the dissolved phase plume in the overburden aquifer is not expected to move beyond the edge of the Clariant property and the Passaic River under current hydrogeological conditions.

As discussed previously, bedrock groundwater not affected by pumping is also expected to flow to the south and southwest. In development of the July 1998 RAR (Ref. 4), Clariant completed an investigation of contaminant fate and transport in the bedrock groundwater flowing under the Passaic River. The model was designed with the conservative assumption that once contaminants were in the bedrock, they would remain in the bedrock and migrate in a southwesterly direction as discussed above (Ref. 4). Contaminant travel distance and length of time required to attenuate below NJ GWQC were calculated to be highest for the mobile constituent benzene. Using the highest benzene concentrations recorded in Clariant bedrock wells between 1996 and 1998. This analysis indicates that contamination reported in well MW-13R would be expected to travel in bedrock fractures a maximum distance of only 1,500 feet over 24.2 years before dropping below NJ GWQC. Under this scenario, the off-site contaminant plume area exceeding NJ GWQC would remain within an area between the Clariant site and just beyond the Passaic River into Patterson, New Jersey (Ref. 4). In the time since this analysis was completed, Clariant has converted deep monitoring well MW-13R into an extraction well for groundwater recovery and treatment. Pumping at this well frequently results in a reversal of groundwater flow direction from the Passaic River area back toward the well. Furthermore, benzene concentrations in Clariant groundwater have dropped to nondetect levels as a result of onsite extraction and air stripping (Ref. 17). Consequently, the conclusions reached during the RAR modeling effort are likely overestimating the duration and extent of contaminant transport in bedrock groundwater under current site conditions.

As part of the off-site bedrock groundwater investigation (Ref. 14), Clariant groundwater models were updated with current data. These efforts confirm very little movement of Clariant contamination offsite toward the Memorial Park well field in bedrock groundwater. TCE is predicted to migrate the farthest, about 1,800 feet in 31 years, before degrading to the NJ GWQC of 1 μg/L. The expected maximum travel range is shown on Figure 5-9 of the April 2003 RI Report (Ref. 15). Thus, based on the results of two separate modeling events, none of the Clariant bedrock groundwater contaminants is expected to reach the Memorial Park well field (located approximately 2,600 feet from the site) at concentrations exceeding Class IIA criteria (Ref. 14). Allowing for a limited area where natural attenuation will be occurring (as mentioned in footnote 2 above), contamination in bedrock groundwater at Clariant is expected to remain within the existing area of impact — onsite and offsite to the southwest up to 1,800 feet from the downgradient property boundary. Furthermore, as indicated in the response to Question 2, none of the Memorial Park well field Fair Lawn public water supply wells show evidence of site-related contamination. As indicated in the response to Question 7, Clariant will continue to evaluate data independently obtained for these wells to ensure that site-related groundwater contamination remains within the existing area of impact.

**Institutional Controls**

Due to the degree of groundwater contamination at the site, Clariant submitted a request for a CEA. The CEA was conditionally accepted by NJDEP in December 1996 (Ref. 4). The CEA applies to approximately the southern four fifths of the property, excluding the leased area located at the northern portion of the property. The bank of the Passaic River is the downgradient limit of the CEA. The CEA includes the ODCB-SM plume, as well as the effluent reinjection area at the southwest corner of the site. The CEA includes both the unconsolidated aquifer and the bedrock aquifer, and includes ODCB-SM constituents, TCE, PCE, chloroform, and MTBE, arsenic, chromium, nickel, and lead. The duration of the CEA in its current form will be at least until cessation of active remediation (Ref. 13).

**Stabilization Summary**

In summary, contaminant concentrations in groundwater at Clariant continue to decline, are being addressed via an ongoing groundwater extraction and treatment program, and are bound in large part by natural hydrogeologic conditions (laterally by discharge to the Passaic River and vertically by the presence of competent bedrock beneath the fractured bedrock zone). Modeling results indicate very limited ongoing contaminant migration in that portion of bedrock groundwater that continues to flow beneath the Passaic River. Consequently, groundwater contaminant plumes beneath the Clariant site appear to be stable at this time and are expected to remain within the current area of impact.

**References:**

1. Phase II Groundwater Investigation Report. Preparer unknown. Dated January 1994.
2. Groundwater Injection Test, Sandoz Chemicals Corporation. Prepared by CDM. Dated September 1994.
3. Letter from Randolph Kullman, CDM, to Wayne Bevan, NJDEP. Re: Classification Exception Area and Surface Water Impact Evaluation. Dated August 16, 1996.
4. Clariant Corporation Remedial Action Report. Prepared by CDM. Dated July 1998.
5. Bedrock/Free Product Remedial Investigation Report for Sandoz Chemicals Corporation. Prepared by CDM. Dated September 1999.
6. Letter from Randolph Kullman, CDM, to Wayne Bevan, NJDEP. Re: Bedrock/Free Product Remedial Investigation Report. Dated September 30, 1999.
7. Letter from Randolph Kullman, CDM, to Wayne Bevan, NJDEP. Re: Six-Month Remedial Progress/Summary Report–October 2000. Attachment C: Bedrock/Memorial Park Well Field Investigation. Dated November 3, 2000.
8. Letter from Randolph Kullman, CDM, to Wayne Bevan, NJDEP. Re: Remedial Investigation/Action Schedule–2000 Revision. Dated December 12, 2000.
9. Letter from Randolph Kullman, CDM, to Wayne Bevan, NJDEP. Re: Quarterly Monitoring Report–Fourth Quarter 2000. Dated March 2, 2001.
10. Six Month Remedial Progress/Summary Report–April 2001. Prepared by CDM. Dated May 1, 2001.
11. Letter from Randolph Kullman, CDM, to Wayne Bevan, NJDEP. Re: Quarterly Monitoring Report–First Quarter 2001. Dated May 21, 2001.
12. Detailed Well Search. Prepared by CDM. Dated July 2001.
13. Personal communication from Clifford Ng, EPA Region 2, to Kathy Rogovin, Booz Allen Hamilton. Re: CEA status. Dated July 6, 2001.

14. Remedial Investigation Report on Off-Site Bedrock and Surface Water Hydrology. Prepared by CDM. Dated May 2002.
15. Remedial Investigation Report on the Unconsolidated and Bedrock Groundwater Investigation. Prepared by CDM. Dated April 2003.
16. Groundwater Remedial Investigation Report and Remedial Action Work Plan for the Former Lyons Piece Dye Works. Prepared by TRC Raviv Associates, Inc. Dated December 11, 2003.
17. Semiannual Remedial Progress/Monitoring Report. Prepared by CDM. Dated May 2004.

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:**

Monitoring wells installed on the western edge of the Clariant site continue to show contaminated groundwater adjacent to the Passaic River, and confirm that contamination extends into the fractured bedrock. As stated previously in the response to Question 3, shallow groundwater and upwelling bedrock groundwater discharge into the Passaic River along the Clariant property.

**References:**

1. Groundwater Remedial Investigation Report and Remedial Action Work Plan for the Former Lyons Piece Dye Works. Prepared by TRC Raviv Associates, Inc. Dated December 11, 2003.
2. Semiannual Remedial Progress/Monitoring Report. Prepared by CDM. Dated May 2004.

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

____ 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.

__X__ 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:**

As stated in the responses to Questions 3 and 4, shallow groundwater and at least some bedrock groundwater discharges into the Passaic River along the western Clariant property line. To determine if these discharges are significant, groundwater contaminant concentrations closest to the river have been compared to applicable NJ GWQC (multiplied by a factor of ten to account for dilution and mixing). As shown in Table 3 below, several constituents of concern were reported at levels greater than ten times the relevant NJ GWQC in March 2004 (Ref. 1).

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

**Table 3. Maximum Groundwater Exceedances Adjacent to the Passaic River in March 2004 (μg/L)**

| Contaminant | NJ GWQC | 10 x NJ GWQC | Maximum Concentration | Well* | Potentially Significant? |
|---|---|---|---|---|---|
| **Groundwater Extracted from MW-13R** | | | | | |
| Chlorobenzene | 50 | 500 | 735 | MW-13R | Y |
| 1,2-Dichlorobenzene | 600 | 6,000 | 49,000 | MW-13R | Y |
| 1,4-Dichlorobenzene | 75 | 750 | 2,920 | MW-13R | Y |
| **Shallow Monitoring Wells MW-2, MW-10RS, MW-11, MW-12, MW-13, MW-20, MW-33, MW-34** | | | | | |
| Chlorobenzene | 50 | 500 | 1,160 | MW-13 | Y |
| 1,2-Dichlorobenzene | 600 | 6,000 | 9,470 | MW-34 | Y |
| 1,4-Dichlorobenzene | 75 | 750 | 726 | MW-34 | N |
| PCE | 1 | 10 | 15.5 | MW-20 | Y |
| TCE | 1 | 10 | 6.61 | MW-10RS | N |
| Chromium | 100 | 1,000 | 221 | MW-9** | N |
| **Bedrock Monitoring Wells MW-9RD, MW-10RD, MW-30RD** | | | | | |
| MTBE | 70 | 700 | 2,000 | MW-30RD | Y |
| PCE | 1 | 10 | 1.61 | MW-10RD | N |

Source: Ref. 1

* The most downgradient wells at Clariant were considered in this evaluation. Some of the indicated wells are not directly adjacent to the Passaic River. Although some attenuation would be expected to occur between these wells and upgradient of the surface water body (prior to discharge), this process has not been factored into the analysis.
** Only well MW-9 was sampled for metals analysis during the March 2004 monitoring event (Ref. 1).

## References:

1. Semiannual Remedial Progress/Monitoring Report. Prepared by CDM. Dated May 2004.

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[4])?

X 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[5], 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 can not 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:**

Surface water samples are collected quarterly at three locations along the Passaic River. Sample location PR-01 is situated at the upstream Clariant fence line. Sample location PR-02 is situated downgradient of the main groundwater impact area where contaminated groundwater is most likely to discharge to surface water. Sample location PR-03 is situated at the downstream edge of the Clariant property and would be expected to show any impacts from groundwater discharge to surface water at the southwestern corner

[4] Note, because areas of inflowing groundwater can be critical habitats (e.g., nurseries or thermal refugia) for many species, an 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.

[5] 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 ecosystems.

of the site. These locations are shown on Figure 3-2, Layout 2 of the April 2003 RI Report (Ref. 1). Samples are collected in low flow areas adjacent to the river bank abutting the Clariant property.

Like groundwater, river water samples are analyzed for VOCs, MTBE, and 1,2,4-trichlorobenzene. During the last two rounds of sampling for which data are available (December 2003 and March 2004), no compounds were detected above the NJDEP surface water quality criteria (NJ SWQC). Historic concentration tables in Appendix D to the May 2004 semiannual monitoring report (Ref. 2) indicate very few detections and no exceedances in Passaic River surface water samples over the past several years. Based on these results, and despite exceedances reported in onsite groundwater, it appears that actual groundwater to surface water impacts associated with Clariant are negligible.

**References:**

1. Remedial Investigation Report on the Unconsolidated and Bedrock Groundwater Investigation. Prepared by CDM. Dated April 2003.
2. Semiannual Remedial Progress/Monitoring Report. Prepared by CDM. Dated May 2004.

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:**

A detailed program of quarterly and semiannual monitoring is conducted at the Clariant facility, as required by NJDEP (Ref. 2). Monitoring and extraction wells are sampled semiannually. Surface water samples from the Passaic River are sampled quarterly. Influent and effluent sampling associated with the groundwater treatment system is also required by NJDEP. Specific sampling locations are indicated below.

| | |
|---|---|
| Monitoring wells: | MW-02, MW-3R, MW-04, MW-06, MW-07, MW-08, MW-09, MW-9RD, MW-9RS, MW-10, MW-10RD, MW-10RS, MW-11, MW-12, MW-13, MW-18, MW-20, MW-21, MW-22, MW-23, MW-24, MW-25, MW-26, MW-27, MW-28R, MW29RD, MW-29RS, MW-30RD, MW-30RS, MW-31, MW-32, MW-33, MW-34, MW-100, and MW-100R. |
| Extraction wells: | MW-01, MW-05, MW-13R, WEW-01. WEW-02A, WEW-03A, WEW-04, WEW-05, and WEW-06 |
| River samples: | PR-01, PR-02, and PR-03 |

All groundwater and surface water samples are analyzed for VOCs, MTBE, and 1,2,4-trichlorobenzene. Samples from well MW-09 are also analyzed for metals content. This program is expected to continue in conjunction with the approved CEA until contaminant concentrations in groundwater drop below applicable standards and ongoing treatment operations are concluded. In addition, Clariant will continue to evaluate data from off-site wells investigated during the recent bedrock groundwater investigation (Ref. 1). These wells include the Fair Lawn public supply wells, an industrial well at Tanis Concrete that borders Clariant to the north, and industrial wells at the Monas and Paperboard Specialties sites down dip of Clariant.

**References:**

1. Remedial Investigation Report on Off-Site Bedrock and Surface Water Hydrology. Prepared by CDM. Dated May 2002.
2. Semiannual Remedial Progress/Monitoring Report. Prepared by CDM. Dated May 2004.

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 Clariant Corporation Facility, EPA ID# NJD001213453, located at Fair Lawn, 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:_____
Michele Benchouk
Environmental Consultant
Booz Allen Hamilton

**Reviewed by:** _____ Date:_____
Lucas Kingston
Hydrogeologist
Booz Allen Hamilton

_____ Date:_____
Shane Nelson, RPM
RCRA Programs Branch
EPA Region 2

_____ Date:_____
Barry Tornick, Section Chief
RCRA Programs Branch
EPA Region 2

**Approved by:** original signed by: Date: 8/10/2004
Adolph Everett, 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, 15th Floor, New York, New York, and the NJDEP Office located at 401 East State Street, Records Center, 6th Floor, Trenton, New Jersey.

**Contact telephone number and e-mail:** Shane Nelson, EPA RPM
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nelson.shane@epamail.epa.gov

## Attachments

The following attachment has been provided to support this EI determination:

- Attachment 1 - Summary of Media Impacts Table

**Attachment 1 - Summary of Media Impacts Table**
**Clariant Corporation**

| | GW | AIR (Indoors) | SURF SOIL | SURF WATER | SED | SUB SURF SOIL | AIR (Outdoors) | CORRECTIVE ACTION MEASURE | KEY CONTAMINANTS |
|---|---|---|---|---|---|---|---|---|---|
| AEC A. Former UST Farm | Yes | No | Yes | No | No | Yes | No | ▸ GWTS<br>▸ AS/SVE<br>▸ DER | VOCs |
| AEC B - A/B. Window Well Area | Yes | No | Yes | No | No | Yes | No | ▸ GWTS<br>▸ AS/SVE<br>▸ Soil excavation<br>▸ DER (Section B only) | VOCs, SVOCs Metals, Aroclor 1260 |
| AEC C. Former Lime Pit | Yes | No | No | No | No | Yes | No | ▸ GWTS<br>▸ AS/SVE<br>▸ DER | VOCs |
| AEC D-001. NJPDES Outfall 001 | No | No | Yes | No | No | No | No | ▸ Capping*<br>▸ Fencing<br>▸ DER | PAHs, VOCs, Cadmium, Aroclor 1260 |
| AEC D-002/D-003. NJPDES Outfall 002 and 003 | No | No | Yes | No | No | No | No | ▸ Capping*<br>▸ Fencing<br>▸ DER | PAHs, Cadmium, Aroclor 1260 |
| AEC D-004. NJPDES Outfall 004 | No | No | Yes | No | No | No | No | ▸ Capping*<br>▸ Fencing<br>▸ DER | Lead, Cadmium, Aroclor 1260 |
| AEC D-005. NJPDES Outfall 005 | No | No | No | No | No | No | No | ▸ DER | NA |
| AEC E. AST Farm | No | No | Yes | No | No | No | No | No Further Action | NA |
| AEC F-1. Former Storage Area | No | No | Yes | No | No | No | No | ▸ Capping*<br>▸ Fencing<br>▸ DER | PAHs, Lead, Cadmium, Aroclor 1260 |
| AEC F-2. Former Storage Area at Garbage Shed | No | No | No | No | No | No | No | ▸ Soil excavation | Contamination removed |

| | GW | AIR (Indoors) | SURF SOIL | SURF WATER | SED | SUB SURF SOIL | AIR (Outdoors) | CORRECTIVE ACTION MEASURE | KEY CONTAMINANTS |
|---|---|---|---|---|---|---|---|---|---|
| AEC F-3. Former Storage Area at Southwest Corner | No | No | No | No | No | No | No | ▸ Soil excavation | Contamination removed |
| AEC F-4. Former Waste Oil Storage Area | No | No | Yes | No | No | No | No | ▸ Soil excavation<br>▸ DER | PAHs, Metals, Aroclor 1254 |
| AEC F-5. Former ASTs | No | No | No | No | No | No | No | ▸ Soil excavation | Metals |
| AEC F-6. Former Drumming Station | No | No | No | No | No | No | No | No Further Action | Contamination removed |
| AEC F-7. Solvent Shed and O/S Area | No | No | Yes | No | No | No | No | ▸ Asphalt cap | Cadmium |
| AEC F-8. Leucophor Loading Dock Area | No | No | No | No | No | No | No | No Further Action | NA |
| AEC F-9. Main Loading Dock Area | No | No | No | No | No | No | No | No Further Action | NA |
| AEC F-10. Outside Drum Storage and Flammable Storage Shed Area | No | No | No | No | No | No | No | No Further Action | NA |
| AEC G. Existing and Former Heating Oil USTs | No | No | No | No | No | No | No | No Further Action | NA |
| AEC H. Transformer Pad | No | No | No | No | No | No | No | No Further Action | NA |
| AEC I/J. Fill Characterization | No | No | No | No | No | No | No | No Further Action | NA |
| AEC K. Gypsum Pile Characterization | No | No | No | No | No | No | No | No Further Action | NA |
| AEC L. Former Building 302 Dry Well | No | No | No | No | No | No | No | No Further Action | NA |
| AEC M. Former Building 302 Dry Well | No | No | No | No | No | No | No | No Further Action | NA |
| Historic Fill Material | No | No | Yes | No | No | Yes | No | ▸ DER | PAHs, Metals |

| | GW | AIR (Indoors) | SURF SOIL | SURF WATER | SED | SUB SURF SOIL | AIR (Outdoors) | CORRECTIVE ACTION MEASURE | KEY CONTAMINANTS |
|---|---|---|---|---|---|---|---|---|---|
| Groundwater | Yes | No | No | No | No | No | No | ▸ GWTS<br>▸ AS/SVE<br>▸ CEA | VOCs, DNAPL |

* Capping includes a geotextile cover overlaid with soil and a vegetation layer.