

DOCUMENTATION OF ENVIRONMENTAL INDICATOR DETERMINATION

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

Facility Name: The Southland Corporation
Facility Address: Alphano Road, Great Meadows, New Jersey 07838
Facility EPA ID#: NJD092225721

Definition of Environmental Indicators (for the RCRA Corrective Action)

Environmental Indicators (EIs) are measures being used by the Resource Conservation and Recovery Act (RCRA) Corrective Action program to go beyond programmatic activity measures (e.g., reports received and approved) 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 objective 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 Southland Corporation facility is located on Alphano Road, Great Meadows, in the Township of Independence, Warren County, New Jersey. The facility is situated in the Pequest River Valley adjacent to Bear Swamp, which borders the site to the north and west. Most of the adjoining land to the south and east is cultivated for agricultural and horticultural purposes. While the entire site encompasses approximately 277 acres, all activities associated with the chemical manufacturing operations and the wastewater treatment plant (WWTP) occurred primarily within 100 acres on the site. A residential area of the town of Alphano is located approximately one-half mile east of the site. Agricultural buildings and private residences are located adjacent to the Southland property to the northeast and southwest. Land use south and southeast of the site is primarily agricultural, with aerial photographs indicating one residence located one and one-half miles southwest of the Southland site. Areas west and south of the site consist of wetlands, forests, and borrow pits for sand excavation. Southland has indicated that the nearest residence to the southern property line is located approximately one mile from the site.

From 1950 to 1966, Gamma Chemical Company owned and operated the facility as a specialty chemical manufacturing operation. In 1966, Ashland Chemical Company purchased the facility and continued to operate the facility as a specialty chemical manufacturing operation until May 1978, when the facility was sold to the Southland Corporation. Southland operated the facility for the production and processing of specialty organic chemicals, and manufactured chemical intermediates for dyestuffs, pharmaceuticals, and industrial products until October 1988, when all operations at the facility ceased. From 1988 to present, 7-Eleven, Inc., (formerly the Southland Corporation) has continued to maintain ownership and conduct remedial activities. All industrial structures, with the exception of the WWTP, were demolished and removed by 1997. The WWTP continued operations until July 2000, when it was completely decommissioned and demolished.

Southland entered into an Administrative Consent Order with New Jersey Department of Environmental Protection (NJDEP) on February 21, 1986, to conduct a Remedial Investigation (RI) at the facility. The facility is currently regulated under New Jersey Industrial Site Recovery Act (ISRA). Site characterization activities have determined that certain volatile organic compounds (VOCs), metals (primarily arsenic), and polychlorinated biphenyls (PCBs) in soil, and VOCs and metals in groundwater, are present at the former chemical manufacturing and waste disposal areas in concentrations exceeding applicable standards. NJDEP directed Southland to remediate surface soil at the site to New Jersey Non-Residential Direct Contact Soil Cleanup Criteria (NJ NRDCSCC). Use of these industrial criteria requires that Southland restrict the site to non-residential use. Thus, Southland will initiate the development of a Deed Notice to restrict site usage to non-residential upon completion of site remediation activities. The Deed Notice will indicate the areas at the site where contamination exists in excess of relevant NJDEP screening criteria.

1. Has **all** available relevant/significant information on known and reasonably suspected releases to the groundwater media, subject to RCRA Corrective Action (e.g., from Solid Waste Management Units (SWMU), Regulated Units (RU), and Areas of Concern (AOC)), been **considered** in this EI determination?

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

If no - re-evaluate existing data, or

If data are not available, skip to #8 and enter "IN" (more information needed) status code.

Summary of Contaminated Areas: In 1987, a RI was conducted and identified 19 areas of investigation based on geographical area and functional activities while the facility was in operation. Additional environmental sampling and delineation of the investigation areas were conducted as part of the 1991 sampling plan addendum (SPA), 1992 and 1993 additional delineation sampling (ADS), and 1995 supplemental site characterization. Surface soil was compared to NJ NRDCSCC and New Jersey Residential Direct Contact Soil Cleanup Criteria (NJ RDCSCC). Subsurface soil was compared to NJ Impact to Groundwater Soil Cleanup Criteria (NJ IGWSCC). As described below, soil has been remediated to NJ NRDCSCC. In addition, NJDEP has approved a site-specific cleanup level for arsenic of 56 mg/kg (based on the natural background of the area as determined by the NJDEP Technical Requirements for Site Remediation) (Ref. 18).

Only those areas that have not received a no further action (NFA) determination by NJDEP are described below. NJDEP has approved NFA for the following areas: A, B, E, Q, R, T, and U. In addition, there is no indication that any areas were ever designated as Areas N, O, P, V, W, and X. Area S included soil stockpiles that were situated in Areas G, H, and M. A facility map displaying all investigation areas is provided as Attachment A in a September 22, 1998, letter from Environ to NJDEP (Ref. 6).

Area C, Former Tertiary Ponds: This area is located south of the back ditch in the southeastern portion of the site and was historically used for facility-related wastewater treatment and management purposes. Area C consists of approximately 2.5 acres of heavily vegetated wetlands. Sampling results indicated that arsenic concentrations exceeded respective NJ standards in soil, sediment, and groundwater (Ref. 4). Other metals, including chromium, copper, and zinc, also exceeded the NJ RDCSCC. Between August and October 2001, contaminated soil was excavated from this area and consolidated to Area F, where eventual grading and soil cover placement occurred (Ref. 16). Soil used as cover and fill material for Area C was obtained from the excavation of former storm water retention basins in accordance with NJDEP approval (Ref. 16). Based on the Landfill, Pond, and Lagoon Construction Completion Report dated April 2002, remedial activities were performed in accordance with a NJDEP comment letter dated January 3, 1997 (Ref. 16). The contaminated soil was delineated and all soil impacted above NJ NRDCSCC has been consolidated in designated areas (Areas F, M, and H) and capped. Southland has indicated that this area will be included in the Deed Notice (also known as a Declaration of Environmental Restriction) that will be prepared for the site (Ref. 17).

Recent groundwater monitoring results (2002) indicated that benzene, 1,2-dichloroethane (1,2-DCA), and arsenic were detected in monitoring well MW-34S, and arsenic was detected at MW-50S, in excess of New Jersey Ground Water Quality Criteria (NJ GWQC). These data indicate that groundwater contamination is present at Area C as well as downgradient areas north and west leading toward the back ditch. However, recent surface water sampling performed in April 2002 at location S-3, downgradient from Area C in the back ditch, indicated no exceedences of the NJ Surface Water Quality Criteria (SWQC). In addition, wells N-13 and N-2R, which are located downgradient from this area, did not show detects of VOCs during the April 2002 sampling event. There is currently no groundwater remediation system in place in this area. Further discussion on groundwater contamination in this area is provided in response to Question No. 2.

Area D, Sludge Lagoons: This area is located in the western part of the site and includes two primary lagoons that contained wastewater and dewatering sludge from the WWTP until 1976. Recent groundwater monitoring data (April 2002) indicate no exceedences of NJ GWQC. Analysis of lagoon sediments revealed the presence of zinc, chromium, and arsenic. Only arsenic exceeded the NJ direct exposure criterion at Area D. A background soil investigation was conducted to determine if the elevated concentrations of arsenic at Area D and the surrounding area could be attributed to naturally occurring background conditions. Results indicated that the presence of arsenic above NJ direct exposure criterion in soil west of Area D is due to natural background. NJDEP concurred with this conclusion and agreed that no further remedial investigations were necessary in the area west of Area D. Between August and October 2001, excavation of Area D was performed in conjunction with closing the lagoons. Material excavated from Area D was consolidated to Area F, where grading and soil cover placement occurred (Ref. 16). Soil used as cover and fill material was obtained from the excavation of the former storm water retention basins in accordance with NJDEP approval (Ref. 16). Based on the Landfill, Pond, and Lagoon Construction Completion Report dated April 2002, remedial activities were performed in accordance with a NJDEP comment letter dated January 3, 1997 (Ref. 16). The contaminated soil was delineated and all soil impacted above NJ NRDCSCC has been consolidated in designated areas (Areas F, M, and H) and capped. Southland has indicated that this area will be included in the Deed Notice that will be prepared for the site (Ref. 17).

Area F, Unnamed Pond: This area is located just north of the main production area and south of the Former Tertiary Ponds (Area C), and was historically used for liquid waste disposal. Sample results collected in 1987 and 1990 indicated the presence of metals (arsenic, chromium, copper, and zinc) in sediments above the Ontario Sediment Screening Lowest Effects Level for ecological receptors. VOCs, PCBs, and arsenic were detected in surface soil at concentrations greater than NJ NRDCSCC. Surface water sampling showed no detectable levels of VOCs or PCBs, but some inorganics (lead, zinc, and copper) were detected above NJ SWQC during one of the three surface water sampling events (Ref. 9). VOCs and arsenic were detected in groundwater above NJ GWQC. Between August and October 2001, remedial activities were performed in this area. Based on the Landfill, Pond, and Lagoon Construction Completion Report dated April 2002, remedial activities were performed in accordance with a NJDEP comment letter dated January 3, 1997 (Ref. 16). The contaminated soil was delineated and all soil impacted above NJ NRDCSCC has been consolidated in designated areas (Areas F, M, and H) and capped. The unnamed pond was dewatered, and impacted sediments were excavated and consolidated above grade beneath a clean soil and vegetated cover in southern Area F (along with

soil from Areas C and D) (Ref. 16). The remainder of the pond area was subsequently allowed to refill with water naturally. Southland has indicated that this area will be included in the Deed Notice that will be prepared for the site (Ref. 17).

Area G, Fisher Pond: This area is located near the main production area and was used as a cooling water reservoir. The pond was subsequently filled with drums, railroad ties, and other debris material. Several VOCs and arsenic were detected in soil and sediment, but only benzene and PCBs exceeded NJ NRDCSCC in sediments (Ref. 4). VOCs were also detected in groundwater (Ref. 4). In September 2001, Fisher Pond closure activities occurred. Remedial activities included dewatering the pond, removing the debris and impacted sediment for off-site disposal, backfilling with clean fill from the former storm water retention basin, and installing a vegetative cover (Ref. 16). Based on the Landfill, Pond, and Lagoon Construction Completion Report dated April 2002, remedial activities were performed in accordance with a NJDEP comment letter dated January 3, 1997 (Ref. 16). The contaminated soil was delineated and all soil impacted above NJ NRDCSCC has been consolidated in designated areas (Areas F, M, and H) and capped. The soil stockpile located in this area (note that soil stockpiles in Areas G, H, and M were referred to as Area S) was used as a grading layer for the on-site landfill (Area M) per NJDEP approval (Ref. 6). Groundwater is being remediated in this area with the air sparging/soil vapor extraction (AS/SVE) system that has been installed along the location of the former groundwater containment well point and trench. Southland has indicated that this area will be included in the Deed Notice that will be prepared for the site.

Area H, Former Drum Storage Area Near Fisher Pond: This area is located in an unpaved area located between Fisher Pond and the fence line along the front ditch. This area was used for the storage of drums and used equipment. Approximately 500 to 600 drums containing off-specification solvents and production batches were once stored in this area. VOCs were detected in groundwater above the NJ GWQC, and VOCs, arsenic, and PCBs were detected in soil at levels in excess of the NJ NRDCSCC. Based on the October 29, 2002, Remedial Action Report, soil from Area Y was consolidated to Area H (see discussion under Area Y), a clean cover was placed over the excavated soil and seeded in accordance with the NJDEP approved work plan (Ref. 21). Because contamination in soil above NJ NRDCSCC remains at this area under a seeded cover, a Deed Notice will be implemented (Ref. 14). The soil stockpile located in this area (note that soil stockpiles in Areas G, H, and M were referred to as Area S) was used as a grading layer for the on-site landfill (Area M) per NJDEP approval (Ref. 6). Remedial efforts for groundwater include the installation and operation of an AS/SVE system to address groundwater contamination (Ref. 4). However, recent sampling data from monitoring well N-6RR, performed in July 2002, indicate that concentrations of benzene, chlorobenzene, and methylene chloride have increased from the prior quarter sampling round conducted during April 2002. While there are no wells downgradient of this location on the same side of the front ditch, well MW-39S, which is downgradient of N-6RR across the ditch, did not detect any VOCs during the April 2002 sampling event. Surface water sample S-8, which is in the ditch and is in the discharge path of N-6RR, has not been sampled since 1992. However, surface water sample S-7 is located downstream of S-8 and has been sampled twice annually for the last seven years. The most recent, documented sample results indicate that several VOCs (benzene, 1,2-DCA) and arsenic are present in surface water above New Jersey Surface Water Quality Criteria (NJ SWQC). Refer to Question No. 2 response for further discussion on groundwater contamination and surface water contamination in this area.

Area I, Western Section of Former Production Area: This area encompasses the paved, western portion of the production area located south of the former main production area tank farm. Historically, 1,2-DCA, PCBs, arsenic, and zinc were detected in soil above NJ NRDCSCC. Benzene, ethylbenzene, toluene, xylene (BTEX), chlorobenzene, and 1,2-DCA were detected at concentrations in excess of NJ GWQC. Relatively high concentrations of 1,2-DCA were detected in soil (40,000 mg/kg) and groundwater (48,000 µg/L). Remedial activities were performed in this area in 1999 and included the excavation of approximately 1,100 tons of impacted soil which was subsequently transferred off site. In addition, an AS/SVE system installed along the southern edge of the former production area was expanded to provide treatment of groundwater downgradient of any remaining secondary sources of contamination in this area after the excavation was completed. The remainder of the excavation was backfilled with clean on-site fill to grade (Ref. 10). Residual levels of 1,2-DCA and PCBs remain in subsurface soil at concentrations above the NJ IGWSCC. NJDEP indicated that the need for additional remediation will be contingent upon confirmatory sampling as well as future groundwater monitoring results (Ref. 12). Southland has indicated that Area I will be included in the Deed Notice for the site.

Area J, Former Tear Gas Manufacturing Area: This area was utilized to manufacture tear gas and was also the location of a RCRA-permitted drum storage area that closed in 1989. PCBs were detected in soil above NJ RDCSCC and NJ NRDCSCC, and VOCs (benzene, chlorobenzene, and 1,2-DCA) and manganese were detected in groundwater in excess of NJ GWQC. Between August and October 2001, remedial activities occurred for Area J. Remedial actions for soil included site clearing and removal of an existing stockpile to the landfill (Area M) (Ref. 16). After excavation of the existing soil stockpile, the area was capped with one foot of clean soil from the former storm water retention basins, and the area was re-seeded (Ref. 16). Per a July 2, 2002, letter, NJDEP required Southland to perform additional sampling to delineate PCB-contaminated soil in order to assess whether there had been off-site migration of contamination from the soil stockpile and to determine the boundaries for installing the soil cap (Ref. 18). In a September 19, 2002, letter to NJDEP Southland argued that additional soil samples were not necessary because the silten berm that was located around the soil stockpile prevented off-site runoff (Ref. 19). Southland also indicated this area would not be a human exposure concern because of the dense swamp vegetation and limited land use in the adjacent off-site area. In a September 25, 2002, letter NJDEP accepted this argument (Ref. 20) and indicated NFA is required for soil in Area J. Southland has indicated that this area will be included in the Deed Notice that will be prepared for the site (Ref. 17).

With regard to groundwater in Area J, NJDEP approved the Remedial Action Workplan (RAW) Addendum proposal to apply oxygen releasing compounds (ORC) to actively enhance ongoing biodegradation of VOCs in groundwater at this area (Ref. 13). The strong oxidant, namely potassium permanganate, is currently injected to address the high concentrations of VOCs in groundwater. Southland began ORC remedial efforts in mid-2000 and quarterly groundwater monitoring is still ongoing in this area. The October 2002 Remedial Action Report indicates that ORC treatment has reduced residual concentrations of VOCs (Ref. 21). However, the most recent sampling data from April 2002 indicates concentrations of VOCs (benzene, chlorobenzene, and 1,2-DCA) remain in excess of NJ GWQC at ORC-1, ORC-2, and N-16R. Manganese was also detected in concentrations in excess of the NJ GWQC; however, this is expected as it is used in the treatment process. In addition, manganese is a naturally occurring constituent in

sedimentary sequences with reducing conditions, such as those found beneath the Southland facility. In addition, although downgradient well MW-36S did not detect contaminants in excess of NJ GWQC or NJ SWQC, surface water from the agricultural ditch located downgradient of Area J was sampled in October 2002 and sample S-6 detected 1,2-DCA at concentrations slightly above the NJ SWQC. However, because contaminants have not been detected at the downgradient well (MW-36S) in excess of NJ GWQC, it can be concluded that the lateral extent of contamination in this area is now stable. It is also unlikely that current contaminant concentrations observed in Area J would migrate to the off-site downgradient well, as shallow groundwater in this area is expected to discharge to the front agricultural ditch. Based on these results, Southland proposed to continue the ORC for two years, and then implement monitored natural attenuation (MNA) for the remaining contaminant plume in Area J (Ref. 21). Southland also proposes to implement a groundwater Classification Exception Area (CEA) application for this area. Further discussion on groundwater contamination in this area is provided in Question No. 2. Further discussion of potentially complete exposure pathways to impacted surface water in the front ditch are discussed in Questions Nos. 3 and 4.

Area K, Former Limefield: This area is situated in a wooded area, north and northeast of the former production areas, and was used for disposal of lime slurry wastes from chemical production processes. Several VOCs (BTEX, chlorobenzene, 1,2-dichlorobenzene, and 1,4-dichlorobenzene) were detected in soil and groundwater above relevant NJ standards. Approximately 3,600 cubic yards of soil were excavated from two areas and placed in biopiles for ex-situ bioremediation. The remedial action was completed in July 1999. Post-excavation sample results demonstrated that VOCs, primarily chlorobenzene, remained in subsurface soil at concentrations in excess of their respective NJ IGWSCC. Based on the horizontal and vertical delineation of these sample results, it was determined that the VOC-impacted soil was limited to a small amount of saturated soil. Southland proposed that the installation of an AS/SVE system will reduce the VOC residuals in the excavated areas. NJDEP conditionally approved this proposal with the requirement that at the termination of AS/SVE, post-remediation sampling be conducted to determine the necessity of institutional controls, such as a CEA (Ref. 12). Because Area K overlies the groundwater mound between the ditches, some of the groundwater beneath Area K may flow toward the back ditch, and toward the western property boundary at the Southland site. NJDEP has informed Southland that the need for additional action will depend upon results from post-remedial sampling and groundwater monitoring (Ref. 12).

Area L, Main Production Area including Tank Farm: This area includes most of the main production area and tank farm near the southeast boundary of the site. The majority of this area is covered by asphalt. Several VOCs were detected in subsurface soil above the NJ IGWSCC. VOCs were detected in groundwater at concentrations exceeding relevant NJ GWQC. In addition, monitoring wells (MW-18S, ASW-5) downgradient of Area L detected dense non-aqueous phase liquid (DNAPL). Remedial efforts for soil and groundwater include the installation of the AS/SVE system. Area L will also be included in the Deed Notice for the site (Ref. 4).

Area M, Landfill: The landfill covers approximately two acres and was active from 1954 to 1974. Historically, material placed in the landfill consisted of solid waste (e.g., cardboard, glass jars, plastic bags and sheeting, rubber hose). Soil and groundwater investigations indicated that VOCs and metals do not occur at concentrations in excess of the NJ RDCSCC, with the exception of the base neutral compound phenyl ether. Because there is a lack of adequate

toxicity data to develop a specific soil criterion for this compound, NJDEP developed a residential alternative criterion of 30 mg/kg based on the National Institute of Occupational Safety and Health (NIOSH) time-weighted average and other compounds that have similar time-weighted average concentrations (Ref. 3). It was determined that residuals of phenyl ether do not pose a significant risk, and NFA with regard to this compound was required (Ref. 3). Approximately 330 drums with residuals and approximately 14,000 square feet of soil were excavated during the drum removal action. Between September and October 2001, landfill closure activities occurred. Remedial activities included site clearing, soil stockpile relocation and consolidation to the landfill, and placement of a soil cap (Ref. 16). Area S soil stockpiles, which were situated at Areas G, H, and M, were approved for use by NJDEP as soil to regrade Area M and cap the landfill portion of this area (Ref. 6). Based on the Landfill, Pond, and Lagoon Construction Completion Report dated April 2002, remedial activities were performed in accordance with a NJDEP comment letter dated January 3, 1997 (Ref. 16). The landfill portion of this area is now capped and Southland has indicated that this area will be included in the Deed Notice for the site (Ref. 17). Groundwater remediation is being addressed by the AS/SVE system installed along the location of the former groundwater containment well point and trench (just north of the front ditch), which will capture contaminated groundwater from this area.

Area Y, Off-Site Farmland: This area consists of off-site farmland just south of the facility boundary adjacent to the former production areas. An agricultural ditch also runs along the southern property boundary and is included as part of Area Y. In January 1997, NJDEP accepted a proposal for NFA in this area based upon samples results indicating no contaminants were present above NJ RDCSCC (Ref. 5). However, in March 1998, Southland proposed to perform additional off-site soil sampling because numerous sediment and soil samples collected along the front ditch contained high concentrations of arsenic. NJDEP accepted this proposal by requesting verification that the front ditch functioned as an effective barrier to contain the migration of contaminants in shallow groundwater (Ref. 5). Results indicated that VOCs (primarily benzene and chlorobenzene) and arsenic were detected in subsurface soil in excess of NJ IGWSSC. Arsenic was also detected in surface soil above the site-specific cleanup level of 56 mg/kg, which was chosen based on the natural background of the area as determined by the NJDEP Technical Requirements for Site Remediation (Ref. 18). Based on these results, Southland submitted a Remedial Investigation Report/Remedial Action Workplan (RIR/RAW) for soil in the off-site area in October 2001. This report indicated that VOCs detected in subsurface soil are most likely due to impacted groundwater migrating off site prior to the installation of the interim remediation measure (IRM) of groundwater containment in 1993 and the current AS/SVE system. Southland proposed that the AS/SVE system and natural attenuation processes will substantially reduce residual concentrations of VOCs in soil. NJDEP has agreed with Southland's proposal (Ref. 16). Southland also proposed to delineate arsenic contaminated surface soil in excess of the site-specific criterion, excavate the impacted soil from this off-site area and place it in Area H beneath a soil cap (Ref. 16). NJDEP approved this proposal on July 2, 2002, when the site-specific remedial goal for arsenic was set at 56 mg/kg (Ref. 18). As documented in the October 29, 2002, Remedial Action Report, soil was excavated from this off-site area and consolidated into Area H, where it was covered with clean soil obtained from the former storm water retention basins and seeded. The excavated areas were backfilled with clean soil from the former storm water retention basins and seeded (Ref. 21). Southland has requested NFA with regard to soil for this area (Ref. 21).

With regard to groundwater, there are two off-site monitoring wells located in Area Y (MW -38S and MW-39S). These wells are located outside of and downgradient of the AS/SVE system, as well as outside of the property boundary. Southland monitors these wells on a semi-annual basis. In July 2002, MW-38S detected 1,2-DCA (3.4 µg/L). NJDEP has required Southland continue groundwater monitoring in this area (Ref. 1).

The most recent surface water sampling from April 2002 detected benzene (6.5 µg/L), 1,2-DCA (14 µg/L), and arsenic (51.9 µg/L) at surface water sample location S-7 in excess of NJ SWQC (0.150 µg/L, 0.291 µg/L, and 0.0170 µg/L, respectively). In addition, downstream surface water sample location S-6 (which is discussed as part of Area J) also detected 1,2-DCA (1.7 µg/L) in excess of NJ SWQC (0.291 µg/L). Surface water sampling at these locations will continue as part of the required groundwater monitoring.

Sediment sampling results from 1997 on the southern bank of the front ditch indicated that 1,2-DCA and benzene (sample DS11 only, which is south of well PX-3) were present at levels in excess of NJ RDCSCC. Southland has indicated that dredging upstream of S-7 (which includes sample location DS11) was performed infrequently (interval > 10 years) and contaminated material was consolidated on site within Area H prior to placement of the required soil cover (Ref. 24). Southland also indicated that dredging of the sediment in the front ditch from sample location S-7 to S-6 (where no contamination has been detected) has occurred routinely every two to three years for the past 15 years (Ref. 24). The dredged material from sample location S-7 to S-6 was placed on the north bank of the ditch. Thus, Southland has indicated that all impacted sediment has been removed from the front ditch and no additional sediment sampling has been required.

Based on the information provided above, remedial activities for soil have been completed at Areas C, D, F, G, H, J, M, and Y. Contaminants remain in subsurface soil in excess of NJ IGWSCC at Areas I, K, and L. Groundwater remedial activities, including an AS/SVE system is ongoing and includes groundwater from Areas G, H, I, K, L, and M. Groundwater in Area J is being remediated by ORC injection. In addition, Southland plans to implement a Deed Notice at various areas on site; however, the Deed Notice will not be finalized at this time (Ref. 22).

References:

1. Letter from NJDEP to Southland Corporation, re: Southland Corporation. Dated September, 1993.
2. Letter from Environ to NJDEP, re: Results of Further Soil Delineation Sampling in Area R at the Great Meadows, NJ ISRA Site. Dated February 3, 1995.
3. Letter from Environmental Liability Management, Inc., to NJDEP, re: Development of Soil Criteria for Phenyl Ether. Dated October 31, 1996.
4. Letter from NJDEP to Southland Corporation, re: Southland Chemicals. Dated January 3, 1997.
5. Letter from Southland Chemical to NJDEP, re: Responses to NJDEP Conditions, dated October 30, 1997, Semi-annual Groundwater and Surface Water Monitoring Results, dated October 20, 1997, and Quarterly Progress Report, Fourth Quarter 1997, dated January 30, 1998. Dated March 26, 1998.
6. Letter from NJDEP to Southland Corporation, re: Responses to the March 26, 1998, NJDEP Letters, August 21, 1998, Site Visit and the 1998 Third Quarter Progress Report. Dated February 3, 1999.

7. Letter from Environmental Liability Management to NJDEP, re: Quarterly Progress Report, Second Quarter 1999. Dated July 30, 1999.
8. Letter from Southland Chemical to NJDEP, re: Ecological Assessment for Arsenic Area C and D Soils, dated April 30, 1999, and the Quarterly Progress Report, Second Quarter 1999, dated July 30, 1999. Dated August 11, 1999.
9. Unnamed Pond Remedial Action Workplan Summary, Great Meadows ISRA Site. Prepared by Environ Corporation. Dated January 2000.
10. Letter from the IT Group to Environmental Liability Management, Inc., re: Excavation and Disposal of Impacted Soil in the Former Building No. 2 Area. Dated January 26, 2000.
11. Letter from NJDEP to Southland Chemical, re: Southland Chemical, Inc. Dated April 14, 2000.
12. Letter from Southland Chemical to NJDEP, re: Remedial Action Reports dated February 1, 2000, May 1, 2000 and July 31, 2000. Dated August 21, 2000.
13. Area J Remedial Investigation Report. Prepared by Environmental Liability Management, Inc. Dated January 31, 2001.
14. Letter from Environmental Liability Management to NJDEP, re: Quarterly Progress Report, 4th Quarter 2000. Dated January 31, 2001.
15. Remedial Investigation Report/Remedial Action Workplan for Off Site Area: Former Rail Line/Siding. Prepared by Environmental Liability Management. Dated October 31, 2001.
16. Landfill, Pond & Lagoon Closer Construction Completion (As-Built) Report. Prepared by ENSR International. Dated April 2002.
17. Letter from Environmental Liability Management to NJDEP, re: Biannual Progress Report: October 2001 to March 2002. Dated April 30, 2002.
18. Letter from NJDEP to Environmental Liability Management, re: Remedial Report dated October 31, 2002. Dated July 2, 2002.
19. Letter from Environmental Liability Management to NJDEP, re: Area J Soil Sampling. Dated September 19, 2002.
20. Letter from NJDEP to Environmental Liability Management, re: Area J Soil Sampling. Dated September 25, 2002.
21. Remedial Action Report for Off-site Area–Former Railroad Right-of-Way. Environmental Liability Management. Dated October 29, 2002.
22. E-mail from Alan Straus, EPA Region 2, to Barry Tornick, EPA Region 2, re: Southland CA725 Update. Dated October 31, 2002.
23. E-mail from Alan Straus, EPA Region 2, to Barry Tornick, EPA Region 2, re: Southland CA50 Update. Dated January 16, 2003.
24. Letter from Phil Sandine, Environmental Liability Management to Alan Straus, EPA Region 2, re: Southland Requested Information. Dated February 25, 2003.

2. Is **groundwater** known or reasonably suspected to be “**contaminated**”¹ 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?

- 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:

Hydrogeology

Groundwater beneath the Southland site occurs at approximately five to seven feet below ground surface. Groundwater is closest to the ground surface at the eastern end of the site, and the depth of the water table increases beneath the south-central portion of the site. The uppermost aquifer beneath the site is located in unconsolidated fill and alluvial deposits that range from four to 28 feet in thickness (Ref. 2). The aquifer and fill materials include silt, silty clay, and sand lenses. Water production and drawdown data from a groundwater recovery trench that was operated at the southeastern boundary of the site has been used to estimate the hydraulic conductivity of the shallow materials at six feet per day. The shallow fill and alluvial deposits overlie a lacustrine clay sequence that is over 200 feet thick. Geotechnical analyses of the lacustrine clay material indicated a maximum horizontal hydraulic conductivity of 0.24 feet per day and a maximum vertical hydraulic conductivity of 0.014 feet per day. Based on the hydraulic properties and thickness of the lacustrine clay, including its low hydraulic conductivity and the upward hydraulic gradient present at the site, this unit is considered to be a barrier to downward contaminant migration from the overlying fill and alluvial materials. Bedrock beneath the site is a consolidated limestone that was used as the source for the former water supply well at the site (Ref. 2).

Water level measurements taken at the site show that the water table is typically between 520 and 522 feet above sea level (Ref. 1). The highest water levels in the shallow aquifer are observed along the central portion of the southeastern part of the site between the front and back ditches. This indicates that recharge is occurring in the general area of the unnamed pond (Area F) and the Former Limefield (Area K). Horizontal hydraulic gradients range from 0.0025 to 0.01, with steeper gradients near the front and back ditches. At the western third of the site, groundwater levels decrease toward the west and southwest, reflecting the flow from this part of the site toward the agricultural area west of the Southland site. Based on the performance of the former groundwater extraction trench and hydrogeologic data collected at the site, average groundwater flow velocities in sandy interbeds of shallow aquifer at this part of the site are estimated to range from 0.09 to 0.81 feet per day.

¹ “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).

The front and back ditches at the site, and other drainage ditches in this part of the Pequest River Valley, were excavated to improve drainage and allow cultivation in this part of the river valley. Because a groundwater mound is present on site between the front and back ditches, both ditches receive groundwater discharge from the site. Groundwater beneath the northern half of the former production area flows toward and into the back ditch, and groundwater beneath the southern half of the former production area flows toward and into the front ditch. At the west-central portion of the site, north of Area Q (the Fire Pond), groundwater also flows to the west-southwest, parallel to the ditches. The radial flow pattern from the groundwater mound indicates that contaminated groundwater migrates toward both ditches, and toward the western site boundary. These flow patterns have been observed during various investigation and remediation activities at the site, and are indicated on water level maps of the uppermost aquifer provided as Figures 1 and 2 (note that Figure 1 [Ground Water Elevations - April 22, 2002] is incorrectly identified as Figure 2 in the "Layout" box of the map legend) in the most recent biannual progress report (Ref. 3).

In addition, as determined by historical groundwater level data from monitoring wells MW-41S and MW-42S (which have been removed and were previously located further off-site than MW-38S and MW-39S, respectively), groundwater flows into surface water from both sides of the ditches at the Southland site. The ditches thereby serve as hydraulic barriers to downgradient groundwater flow away from the Southland site to the north and south. Boring logs and geologic cross sections developed to evaluate site hydrogeology, provided as Figures 11-7A and 11-7B of the Proposed Cleanup Plan (Ref. 1), also show that the bottom of each ditch is generally located within three to four feet of the bottom of the uppermost aquifer. Consequently, the hydraulic influence exerted by each ditch extends through the entire thickness of the aquifer, and significant groundwater underflow does not occur.

Current Groundwater Conditions

Groundwater contamination was initially detected at the site during investigation of groundwater quality at the site in 1988. Groundwater contamination has been detected in the shallow aquifer in three primary areas of the site: the former production areas (Areas G, H, I, K, L, M, U, and Y) and downgradient in the southern portion of the site, the Former Tear Gas Manufacturing Area (Area J) at the southwestern end of the site, and areas north of the former production areas (Areas C, F, and K) in the central portion of the site. Maximum detected contaminant concentrations for groundwater contaminants of concern (COCs) at the Southland site, as measured during the April and July 2002 groundwater monitoring events, are presented in Table 1.

A number of historic releases occurred in the former production areas at the southeastern portion of the site, and VOCs and arsenic are still present in groundwater up to four orders of magnitude above NJ GWQC. Monitoring wells ASMW-1 through 6, PX-1 through 3, MW-18S, and MW-32WP reflect the highly contaminated areas in the shallow aquifer associated with the former manufacturing area (Ref. 1). DNAPL consisting of chlorobenzene, benzene, and toluene was also detected at the eastern end of the Former Main Production Area (Area L) in wells MW-18S and ASMW-5.

Area J is located in the southwestern corner of the site. Although the specific source of groundwater contamination in this area is unknown, it was probably located near well ORC-2. Wells ORC-1 through ORC-3 are located within the suspected source area and reported exceedences of NJ GWQC for 1,2-DCA, benzene, and chlorobenzene during the April and July 2002 sampling rounds. Benzene,

chlorobenzene, and 1,2-dichloropropane were also detected in excess of the NJ GWQC in downgradient well N-16R.

Table 1 - Most Recent Maximum Concentrations Associated with Each Area of Groundwater Contamination (April or July 2002)

Well Number	Contaminant	Maximum Concentration (µg/L)	NJ GWQC (µg/L)
Former Production Area			
ASMW-1	Chlorobenzene	42,000	50*
ASMW-1	1,2-Dichlorobenzene	4,300	600
ASMW-1	1,4-Dichlorobenzene	2,000	75
ASMW-2	Ethylbenzene	7,600	700
ASMW-2	Xylenes	31,000	1000*
ASMW-4	Methylene Chloride	570	3*
ASMW-5	Tetrachloroethene	15	1
ASMW-5	Trichloroethene	11	1
PX-3	Acetone	1,200	700
PX-3	Benzene	7,200	1
PX-3	Carbon Tetrachloride	19,000	2
PX-3	Chloroform	10,000	6
PX-3	1,2-DCA	24,000	2
PX-3	Toluene	4,200	1,000
PX-3	1,1,2-Trichloroethane	47	3*
Former Tear Gas Manufacturing Area			
ORC-1	Chlorobenzene	650	50*
ORC-2	Benzene	150	1
N-16R	1,2-Dichloropropane	2.4	1
Central Area			
MW-34S	Benzene	65	1
MW-34S	1,2-DCA	18	2
MW-34S	Arsenic	300	8

* Interim specific criterion developed by NJDEP on an as-needed basis for constituents with no criteria in the NJ GWQS.

(Although reported above the applicable NJ GWQC, manganese concentrations in Area J groundwater are not a significant concern. Rather than being associated with historic releases from the Southland site, manganese is being introduced into groundwater as part of the NJDEP-approved VOC treatment process. Manganese is also a naturally occurring constituent in sedimentary sequences with reducing conditions, such as those found beneath the Southland facility. For these reasons, manganese is not being carried forward in this EI determination as a COC for groundwater.)

At the Former Tertiary Ponds (Area C), samples from well MW-34S contained benzene, 1,2-DCA, and arsenic above NJ GWQC. Arsenic was also detected in excess of NJ GWQC at well MW-50S (located further downgradient of the source area and closer to the back ditch). These data indicate that groundwater contamination is present at Area C, as well as in downgradient areas north and west leading toward the back ditch. Because groundwater flows radially from the groundwater mound north of the former production areas toward the ditches and to the west, contamination at MW-34S and MW-50S reflects impacts from sources southeast and due east of this part of the site, and may include Areas C, F, and K.

References:

1. Proposed Cleanup Plan for the Great Meadows, New Jersey, ECRA Site, ECRA Case Nos. 87596 and 88646. Prepared by Environ Corporation. Dated July 10, 1992.
2. Remedial Action Work Plan Addendum/Remedial Design Report, 7-Eleven Site, Great Meadows, New Jersey. Prepared by the IT Group. Dated June 16, 1999.
3. Biannual Progress Report, April-September 2002, 7-Eleven, Inc., Great Meadows Facility. Prepared by Environmental Liability Management. Dated November 6, 2002.
4. Letter from Phil Sandine, Environmental Liability Management to Alan Straus, EPA Region 2, re: Southland Requested Information. Dated February 25, 2003.

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)?

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:

At NJDEP’s direction, Southland conducts routine monitoring of the shallow aquifer at selected on-site locations and additional locations downgradient and/or outside of the zone of influence of the active remedial systems for groundwater at the site. Southland uses the monitoring data to evaluate the effectiveness of ongoing corrective actions and to assess any changes in the nature or extent of existing contamination in groundwater. Available monitoring data indicate that the highest groundwater contaminant concentrations have been reduced, and the approximate extent of contamination emanating from the three groundwater source areas at the Southland site has been delineated.

Stabilization in the Former Production Area

A number of remedial actions have been implemented for this portion of the Southland site, including excavation of highly contaminated soil from selected areas (Areas C, D, F, I, and K), DNAPL recovery from Area L, and operation of an interim groundwater extraction and treatment system. Groundwater was extracted from two trenches at the eastern end of the former production areas and from a series of wells along the southern edge of the former production area and the western edge of the site. Extracted groundwater was pumped to the former WWTP for treatment and eventual discharge to the back ditch under the facility’s New Jersey Pollutant Discharge Elimination System permit.

The interim extraction and treatment system was taken out of service in early 2000, and replaced with the air sparging/soil vapor extraction (AS/SVE) system at Areas I and L. The AS/SVE system consists of over eighty air sparge well points, SVE collection trenches, a barrier/treatment trench located on site along the southern boundary of the former production area, and various monitoring wells and piezometers installed throughout the eastern treatment area to monitor effectiveness of the system. As designed, the system serves two objectives: reduction of VOC mass in source area soil and groundwater, and containment and prevention of off-site migration of impacted groundwater south of the site. The SVE

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.

system is used to extract vapors from the thin unsaturated zone within close proximity to the ground surface. The AS well points are used to move air into the saturated zone, stimulating volatilization of VOCs and removal of arsenic from the groundwater via oxidation and precipitation. Startup of the AS/SVE system occurred during the first half of 2000, and operations continue to date. By September 2002, the facility estimates that over 4,000 pounds of VOCs had been extracted from the subsurface using the AS/SVE system (Ref. 5). Natural attenuation processes are also likely occurring in this portion of the site.

Since the remedial actions were implemented, maximum groundwater contaminant concentrations in the former production area have decreased by more than a factor of ten. The highest benzene concentrations in this area dropped from 120,000 micrograms per liter ($\mu\text{g/L}$) in October 1996 to 7,200 $\mu\text{g/L}$ in July 2002. Maximum chlorobenzene concentrations decreased from 110,000 to 42,000 $\mu\text{g/L}$ during the same time period. Well-specific contaminant concentrations have also generally declined, with the most significant reductions observed in wells MW-32WP, PX-2, and PX-3. Recent sampling data from monitoring well N-6RR indicate that concentrations of benzene, chlorobenzene, and methylene chloride increased between April and July 2002. However, the latest concentrations are still several orders of magnitude below the maximum contaminant concentrations reported during the 1992 Remedial Investigation.

Impacts downgradient of the former production area are monitored in wells MW-39S and MW-38S. No contamination above NJ GWQC was reported in monitoring well MW-39S (located across the ditch from well N-6RR) during the April 2002 sampling event. However, as shown in Table 2 below, samples from monitoring well MW-38S (located off-site outside and downgradient of the AS/SVE system) did report concentrations of 1,2-DCA (3.4 $\mu\text{g/L}$) slightly above NJ GWQC (2 $\mu\text{g/L}$), indicating that contamination is present on the opposite side of the front ditch. The presence of contaminants in this well at concentrations below 10 $\mu\text{g/L}$ likely reflects residual contamination that migrated beyond the hydraulic barrier of the ditch due to diffusive transport from the former production area prior to installation of the interim and AS/SVE treatment systems when contaminant concentrations were orders of magnitude higher than they are now. Migration of 1,2-DCA contamination in MW-38S is not expected to be significant for several reasons. First, water level measurements in this area indicate that groundwater flow from the vicinity of well MW-38S is also toward the front ditch. Second, concentrations in well MW-38S are expected to naturally decline given that the contaminant source is being addressed by the AS/SVE system. Finally, the front ditch serves as a point of discharge for shallow groundwater along the southern property boundary, and Southland has indicated that, based on the most recently available data and the groundwater treatment system, it is reasonable to conclude that ongoing off-site migration of contaminated groundwater is not occurring (Ref. 6).

Table 2 - Downgradient Groundwater Monitoring Results from April and July 2002

Well Number	Contaminant	Maximum Concentration (µg/L)	NJ GWQC (µg/L)
Former Production Area			
MW-38S	1,2-DCA	3.4	2
MW-39S	No reported contamination.		
Former Tear Gas Manufacturing Area			
N-16R	Benzene	22	1
N-16R	Chlorobenzene	51	50*
N-16R	1,2-Dichloropropane	2.4	1
MW-28S	No exceedences of COCs.		
MW-36S	No reported contamination.		
Central Area			
MW-34S	Benzene	65	1
MW-34S	1,2-DCA	18	2
MW-34S	Arsenic	300	8
MW-50S	Arsenic	139	8

* Interim specific criterion developed by NJDEP on an as-needed basis for constituents with no criteria in the NJ GWQS.

Stabilization in the Former Tear Gas Manufacturing Area (Area J)

Southland has implemented a remedial program involving injection of ORC (oxygen releasing compound) potassium permanganate into the subsurface at Area J to actively enhance natural biodegradation of VOCs in groundwater. The treatment area covered approximately 10,000 square feet within Area J, and over 80 ORC injection points were installed. The injection points allowed for placement of ORC materials within the shallow groundwater zone and up to an approximate depth of ten feet below grade (the top of the confining clay layer). ORC injection was completed in April 2000. Since that time, concentrations of benzene, chlorobenzene, and 1,2-DCA in the source area have decreased by several orders of magnitude. Results from well ORC-3 indicate that contaminant concentrations have been substantially reduced in the source area. Groundwater contaminant concentrations are expected to continue to decline in this area of the site due to natural attenuation processes (Ref. 4).

As shown in Table 2, samples recently collected from Area J well N-16R reported benzene, chlorobenzene and 1,2-dichloropropane in excess of the NJ GWQC. This well is located near the southwestern corner of the Southland property, downgradient of the ORC injection wells. The benzene concentration was detected well above the NJ GWQC of 1 µg/L. The reported concentrations of chlorobenzene and 1,2-dichloropropane were just slightly above their respective NJ GWQC. However, contaminant concentrations in this well have been observed at comparable levels since 1997 and appear to be stable. Also, no contaminants of concern above NJ GWQC were reported in well MW-28S (on-site and downgradient of Area J to the west) and MW-36S (off-site and downgradient of Area J). Thus, the lateral extent of groundwater contamination in this area has been delineated by clean wells and the front

ditch. Groundwater discharge to the drainage ditches is discussed in the responses to Questions 4, 5 and 6.

Stabilization in the Central Portion of the Site

As stated in the response to Question 2, samples from well MW-34S in the central portion of the site contained benzene, 1,2-DCA, and arsenic at levels above NJ GWQC. Arsenic was also detected above the NJ GWQC in samples from well MW-50S (located further downgradient from the source areas and closer to the back ditch), but benzene and 1,2-DCA were not detected. Furthermore, wells N-13, N-2R, and MW-33S reported no NJ GWQC exceedences during the April 2002 sampling event. Consequently, these wells and the back ditch (into which shallow groundwater discharges) establish the lateral extent of known groundwater contamination in the central portion of the site.

References:

1. Proposed Cleanup Plan for the Great Meadows, New Jersey, ECRA Site, ECRA Case Nos. 87596 and 88646. Prepared by Environ Corporation. Dated July 10, 1992.
2. Remedial Action Workplan Addendum and Remedial Design Report, 7-Eleven, Inc., Great Meadows Facility. Prepared by IT Corporation. Dated June 16, 1999.
3. Quarterly Progress Report, Fourth Quarter 2000, 7-Eleven, Inc., Great Meadows Facility. Prepared by Environmental Liability Management. Dated January 2001.
4. Remedial Action Report for Area J Groundwater, Great Meadows, New Jersey Facility, ISRA Cases 87596 and 88646. Prepared by Environmental Liability Management. Dated October 29, 2002.
5. Biannual Progress Report, April-September 2002, 7-Eleven, Inc., Great Meadows Facility. Prepared by Environmental Liability Management. Dated November 6, 2002.
6. Letter from Phil Sandine, Environmental Liability Management, to Alan Straus, EPA Region 2, re: Southland Requested Information. Dated February 25, 2003.

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

- 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 Southland site is situated in a flat, marshy area known as Bear Swamp. During the 1930's, a network of drainage channels were excavated across the valley. Facility operations and waste disposal primarily occurred between two parallel drainage ditches (front and back ditches) that ultimately discharge to the Pequest River. According to the surface water protection criteria specified in NJDEP regulations (NJAC 7:9B-1), the ditches are classified as FW2 – fresh water bodies that are not set aside for special resource values such as clarity, color, or ecological significance.

As stated previously, groundwater flows radially from the center of the site toward both ditches and the western site boundary. Because the ditches are approximately seven to nine feet deep, and depth to groundwater is approximately five to seven feet bgs, the ditches physically intercept the shallow aquifer beneath the Southland site. Historic water level data from monitoring wells and surface water gauging stations confirm that groundwater from the site discharges to surface water in the agricultural ditches (Ref. 1). Convergent flow into the ditches from off-site areas, as documented on maps provided by the facility in correspondence to EPA (Ref. 3), prevents significant underflow of impacted groundwater.

Groundwater contamination exceeding NJ GWQC was reported in a number of wells adjacent to the front and back ditches during the most recent sampling rounds for which data are available (April and July 2002). Major contaminants identified in the former production area wells along the front ditch included benzene, chlorobenzene, 1,2 dichlorobenzene, 1,4-dichlorobenzene 1,2-DCA, toluene, xylene, and ethylbenzene. Similarly, groundwater samples from well N-16R (downgradient of Area J) exceeded NJ GWQC for benzene, chlorobenzene, and 1,2-dichloropropane during the April and July 2002 sampling rounds. Finally, groundwater contamination exceeding NJ GWQC was detected in the central portion of the property at wells MW-34S and MW-50S, south of the back ditch (Ref. 2). Given the existing hydrogeological regime discussed above, contaminated groundwater appears to discharge to surface water in the vicinity of the Southland site.

References:

1. Proposed Cleanup Plan for the Great Meadows, New Jersey, ECRA Site, ECRA Case Nos. 87596 and 88646. Prepared by Environ Corporation. Dated July 10, 1992.
2. Biannual Progress Report, April-September 2002, 7-Eleven, Inc., Great Meadows Facility. Prepared by Environmental Liability Management. Dated November 6, 2002.
3. Letter from Phil Sandine, Environmental Liability Management to Alan Straus, EPA Region 2, re: Southland Requested Information. Dated February 25, 2003.

5. Is the **discharge** of “contaminated” groundwater into surface water likely to be “**insignificant**” (i.e., the maximum concentration³ 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 concentration³ 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 concentration³ 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 concentrations³ 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:

In determining whether groundwater to surface water discharges are significant for EI purposes, reported contaminant concentrations are compared to both New Jersey Surface Water Criteria (NJ SWQC) and NJ GWQC (multiplied by a factor of ten to account for dilution, dispersion, and other mitigating factors). The NJ SWQC were developed to ensure that surface water quality is acceptable for various activities which may include human consumption, primary and secondary contact recreation, and industrial or agricultural usage. Based on current status of surface water in the front and back ditches, NJ SWQC for Class FW-2 surface water bodies apply to the Southland site. Table 3 provides a comparison between these water quality criteria and maximum contaminant concentrations in groundwater discharging to the ditches at the Southland site.

Groundwater monitoring results from April and July 2002 indicated contamination above acceptable levels for discharge to surface water in the former production area. As shown in Table 3, eight organic constituents and arsenic were detected in wells near to and upgradient of the front ditch at concentrations more than ten times their corresponding NJ GWQC and/or above the NJ SWQC. Because the applicable standards were exceeded, there is the possibility that contaminant concentrations in wells ASMW-6, PX-

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

2, PX-3, N-5 and N6-RR represent potentially significant groundwater discharges to surface water in the former production area. However, the potential for surface water degradation is presumably mitigated to some extent by the presence of the AS/SVE barrier/treatment trench between the front ditch and those wells listed above which have reported exceedences. The trench was installed and is operated to contain impacted groundwater from the former production area and prevent contaminant migration to off-site areas. Similarly, discharges of contaminated groundwater from the former tear gas manufacturing area (Area J) to surface water in the front ditch are potentially significant because detected concentrations at well N-16R (downgradient of the ORC injection wells and adjacent to the ditch) exceeded relevant NJ criteria for benzene and chlorobenzene (Ref. 1).

Groundwater discharges from the central area of the Southland site to the back ditch may also be significant. Because well MW-50S is closest to the back ditch in this area, April 2002 data from this monitoring well were compared to relevant NJ water quality criteria in Table 3. The arsenic concentration in well MW-50S exceeded both the NJ SWQC and ten times the NJ GWQC.

Table 3. Maximum Groundwater Contaminant Concentrations Potentially Discharging to Surface Water Above Relevant NJ Criteria (µg/L)

Well	Contaminant	Concentration	10 x NJ GWQC	NJ SWQC
Former Production Area				
PX-3	Benzene	7,200	10	0.150
PX-3	Carbon Tetrachloride	19,000	20	0.363
PX-3	Chlorobenzene	4,000	500*	22
PX-3	Chloroform	10,000	60	5.67
PX-3	1,2-DCA	24,000	20	0.291
PX-3	Methylene Chloride	200	30*	2.49
PX-3	1,1,2-Trichloroethane	47	30*	13.5
N-5	Trichloroethene	8.2	10	1.09
N-5	Arsenic	79.3	80	0.0170
Former Tear Gas Manufacturing Area				
N-16R	Benzene	22	10	0.150
N-16R	Chlorobenzene	51	500*	22
Central Area				
MW-50S	Arsenic	139	80	0.0170

* Based on interim specific criterion developed by NJDEP for constituents with no criteria in the NJ GWQS.

References:

1. Biannual Progress Report April-September 2002, 7-Eleven, Inc., Great Meadows Facility. Prepared by Environmental Liability Management. Dated November 6, 2002.

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 implemented⁴)?

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-assessment⁵, 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:

As part of the ongoing remediation efforts at the site required by the administrative consent order issued by NJDEP, Southland conducts semiannual surface water monitoring at a number of locations to assess any impacts to surface water quality due to migration of contamination from the site. Monitoring is conducted upstream, adjacent to, and within the facility boundaries along the front and back ditches, and at the downstream boundaries of the facility. Surface water sampling locations are shown on Figure 1 in the most recent correspondence received from Southland (Ref. 3).

⁴ 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.

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.

Surface water samples were collected in April 2002 from the back ditch sampling locations S-3 (approximately 20 feet downstream of the area immediately adjacent to MW-50S) and S-5 (upstream of suspected source areas at the site but still within the property boundary). As shown in Table 4, the surface water sample from upstream location S-5 contained benzene (2.7 µg/L) above the applicable NJ SWQC (0.150 µg/L), but no such exceedences were reported at downstream location S-3 (Ref. 2). These data suggest that groundwater discharges from the central area of the Southland site are not having sustained impacts on surface water quality in the back ditch.

Surface water samples collected from the front ditch in October 2002 reported contaminant concentrations exceeding applicable NJ SWQC at sampling locations S-7 and S-6 (adjacent to the former production area and at the downstream corner of the facility, respectively). As shown in Table 4, benzene, 1,2-DCA, and arsenic exceeded the NJ SWQC at location S-7. However, only 1,2-DCA was reported above NJ SWQC at location S-6. The more limited nature and extent of contamination at location S-6 (approximately 1,000 feet downstream of location S-7) is likely related to dilution and dispersion processes, but also indicates that the impacts of groundwater discharges to the front ditch are short-lived.

Table 4. Key Surface Water Contaminant Concentrations, NJ SWQC, and Toxicological Screening Benchmarks (µg/L)

Sampling Location	COC	Concentration	NJ SWQC	Chronic Screening Benchmark*	Acute Screening Benchmark*
S-5 (Back Ditch– Upstream of Source Areas)	Benzene	2.7	0.150	130	2,300
S-3 (Back Ditch– Downstream Adjacent to Well MW-50S)	No Exceedences				
S-7 (Front Ditch– Adjacent to Former Production Area)	Benzene	6.5	0.150	130	2,300
	1,2-DCA	14	0.291	910	8,800
	Arsenic	51.9	0.017	3.1**	66**
S-6 (Front Ditch– Downstream at Southeast Corner of Facility)	1,2-DCA	1.7	0.291	910	8,800

* Tier II toxicological screening values were used because they were calculated using EPA methodology. The Lowest Chronic Values were based upon literature searches conducted at the time this guidance was developed (Ref. 1).

** Benchmarks were not available for total arsenic; listed values refer to arsenic V concentrations only.

Despite these recent exceedences along the length of the front ditch, current surface water quality appears to be acceptable from a human health risk standpoint. As stated previously, the NJ SWQC have been developed to be protective of primary and secondary contact recreation, human consumption after treatment, and industrial and agricultural water supply uses. Neither of the Southland ditches currently serves these purposes and, thus, evaluation of observed surface water contaminant concentrations against the NJ SWQC is overly conservative. Furthermore, Southland has determined that the potential for human exposure to contaminants in surface water (on or off site) is “effectively zero” based on a variety of factors including the steep-sided nature of the ditches, the low flow conditions, and the lack of likely human receptors in the area (Ref. 3).

Also despite the recent exceedences, current surface water quality in the front ditch appears to be acceptable from an ecological risk standpoint. Southland has performed an ecological assessment to determine the potential exposures and receptors present at the drainage ditch. The assessment revealed that, during base flow, the depth of water in the front ditch is only about two inches resulting in extremely minimal water flow and flow velocities approaching nearly stagnant conditions. Additionally, during dry periods, there is little or no flow in the ditch and sections become dry. Southland argues that the front ditch provides “minimal aquatic habitat” of “poor quality” for bottom-dwelling or swimming organisms based on current flow conditions and the fact that the ditch is dredged on a routine basis (Ref. 3). Nevertheless, to be conservative, surface water data have also been evaluated using Toxicological Benchmarks for Screening Potential Contaminants of Concern for Effects on Aquatic Biota (Ref. 1). Table 4 lists toxicological benchmarks for the key surface water contaminants under both acute and chronic exposure scenarios. As shown in the table, only arsenic exceeded its corresponding benchmark, and only for chronic exposure conditions. Given the current flow conditions in the ditch however, the ecological habitat in this ditch could be classified as opportunistic—making chronic exposure scenarios less likely than acute ones. Because none of the contaminant concentrations exceeded the acute toxicological benchmarks, current surface water quality appears to pose no unacceptable ecological risks.

It can also be noted that the measured arsenic value at location S-7 (51.9 µg/L) falls within the reported range of background concentrations (up to 55 µg/L) historically observed at location S-9, approximately 2,500 feet upstream of the site. Because the measured arsenic concentration is typical of background conditions in surface water in the vicinity of the site, it is unlikely that impacted groundwater from the Southland site is contributing significantly and detrimentally to arsenic concentrations in the ditch.

References:

1. Toxicological Benchmarks for Screening Potential Contaminants of Concern for Effects on Aquatic Biota on Oak Ridge Reservation (Document ES/ER/TM-96/R2). Prepared by Oak Ridge National Laboratory. Revised 1996. Found at <http://www.hsr.gov/ecorisk/reports.html>.
2. Biannual Progress Report, 7-Eleven, Inc., Great Meadows Facility. Prepared by Environmental Liability Management. Dated November 6, 2002.
3. Letter from Phil Sandine, Environmental Liability Management to Alan Straus, EPA Region 2, re: Southland Requested Information. Dated February 25, 2003.

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:

The site is currently being remediated under an Administrative Consent Order issued to Southland by NJDEP under the Environmental Cleanup and Recovery Act. In addition to implementing corrective actions to address soil and groundwater contamination at the site, the facility is required to conduct area-specific and site-wide groundwater monitoring, and site-wide surface water monitoring on a semi-annual or quarterly basis. The facility will be released from these requirements only after all established remedial action objectives have been satisfied. Wells used for performance monitoring of the ORC and AS/SVE are monitored quarterly, while the site-wide monitoring wells are sampled semi-annually. Surface water monitoring is conducted on a semi-annual basis. The monitoring requirements, frequencies, and sampling locations are summarized in Table 5. Any changes in the monitoring program proposed by the facility prior to completion of remediation and site closure must be approved by NJDEP prior to implementation.

Table 5. Monitoring Well and Surface Water Monitoring Locations, Frequencies, and Analytical Parameters for the Southland Great Meadows Site¹

Purpose of Monitoring	Sampling Locations	Frequency	Parameters
Site-Wide Monitoring	N-13, N-16R ² , MW-23S, MW-24R, MW-25S, MW-26S, MW-28S ² , MW-32WP, MW-33S, MW-34S, MW-36S ² , MW-50S ³	Semi-Annual	VOCs, General Chemistry
Remediation System Performance Monitoring	N-2R ⁴ , N-16R ² , MW-18S, MW-28S ² , MW-36S ² , ORC-1 ⁵ , ORC-2 ⁵ , ORC-3 ⁵ , ASMW-1, ASMW-2, ASMW-3, ASMW-4, ASMW-5, ASMW-6, N-4, N-5 ³ , N-6RR, PX-2, PX-3, MW-38S ³ , MW-39S ³ , MW-43WPR	Quarterly	VOCs, Metals, General Chemistry
Surface Water Monitoring	S-3, S-4, S-5, S-6, S-7, S-9	Semi-Annual	VOCs, Total Arsenic

¹ Water level elevations are measured during the scheduled parameter monitoring sample collection (Ref. 3).

² Wells N-16R, MW-28S, and MW-36S were proposed for semi-annual sampling in the October 2002 Remedial Action Report for Area J Groundwater; however, it is unclear from available information whether this proposal has been approved by NJDEP. N-16R, MW-28S, and MW-36S were all sampled on a quarterly basis through April 2002, but were not sampled during the July 2002 quarterly sampling event. MW-28S was sampled quarterly through the July 2002 quarterly sampling event (Ref. 2).

³ Arsenic analyses are also conducted at each of these wells during the scheduled monitoring events. Arsenic analyses are only performed at well N-5 on a semi-annual basis (Ref. 1).

⁴ Southland requested that Well N-2R be closed in the October 2002 Remedial Action Report for Area J Groundwater; however, it is unclear from available information whether this proposal has been approved by NJDEP. Quarterly samples were collected from N-2R through April 2002, but no quarterly sample was collected during the July 2002 sampling event (Ref. 2)

⁵ Southland requested that wells ORC-1, ORC-2, and ORC-3 be sampled upon completion of the proposed two year semi-annual sampling of wells N-16R, MW-28S, and MW-36S in the October 2002 Remedial Action Report for Area J Groundwater; however, it is unclear from available information whether this proposal has been approved by NJDEP. Quarterly samples were collected from ORC-1, ORC-2, and ORC-3 through April 2002, but no quarterly sample was collected during the July 2002 sampling event (Ref. 2).

References:

1. Letter from Phil Sandine, Environmental Liability Management, to Alan Straus, USEPA Region 2, re: Requested Information for the Great Meadows Site. Dated July 8, 2002.
2. Remedial Action Report for Area J Groundwater. Prepared by Environmental Liability Management. Dated October 2002.
3. Biannual Progress Report for Period 4/1/02 to 9/30/02, 7-Eleven, Inc., Great Meadows Facility. Prepared by Environmental Liability Management. Dated November 2002.

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).

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 "Migration of Contaminated Groundwater" is "Under Control" at the Southland Corporation site (EPA ID# NJD092225721), located at Alphano Road, Great Meadows, New Jersey. Specifically, this determination indicates that 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 if 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:** _____
Stuart Strum
Hydrogeologist
Booz Allen Hamilton

Reviewed by: _____ **Date:** _____
Michele Benchouk
Engineering Consultant
Booz Allen Hamilton

Also Reviewed by: _____ **Date:** _____
Alan Straus, RPM
RCRA Programs Branch
USEPA Region 2

Barry Tornick, Section Chief
RCRA Programs Branch
USEPA Region 2

Approved by: original signed by: _____ **Date:** 6/5/2003
Adolph Everett, Acting 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: Alan Straus, USEPA RPM
(212) 637-4160
straus.alan@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
Southland Corporation**

	GW	AIR (Indoors)	SURF SOIL	SURF WATER	SED	SUB SURF SOIL	AIR (Outdoors)	CORRECTIVE ACTION MEASURE	KEY CONTAMINANTS
Area A. Hair Dye Disposal Area	NFA	NFA	NFA	NFA	NF A	NFA	NFA	NFA	NFA
Area B. Former Effluent Spray Irrigation Field	NFA	NFA	NFA	NFA	NF A	NFA	NFA	NFA	NFA
Area C. Former Tertiary Ponds	Yes	No	No	No	No	Yes	No	<ul style="list-style-type: none"> ▸ Soil excavated and consolidated to Area F ▸ Clean soil cover installed ▸ Deed Notice planned 	Metals, VOCs
Area D. Sludge Lagoons	No	No	No	No	No	No	No	<ul style="list-style-type: none"> ▸ Soil excavated and consolidated to Area F ▸ Clean soil cover installed ▸ Deed Notice planned 	Metals
Area E. Former Drum Storage Area	NFA	NFA	NFA	NFA	NF A	NFA	NFA	NFA	NFA
Area F. Unnamed Pond	Yes	No	No	No	No	Yes	No	<ul style="list-style-type: none"> ▸ Soil/sediment removal ▸ Clean soil cover installed ▸ Deed Notice planned ▸ AS/SVE system 	VOCs, PCBs, Metals
Area G. Fisher Pond	Yes	No	No	No	No	Yes	No	<ul style="list-style-type: none"> ▸ Pond dewatering and debris removal ▸ Clean soil cover installed ▸ Deed Notice planned ▸ AS/SVE system 	VOCs, PCBs, Metals
Area H. Former Drum Storage Area near Fisher Pond	Yes	No	No	No	No	Yes	No	<ul style="list-style-type: none"> ▸ Drum and soil removal ▸ Clean soil cover installed ▸ Deed Notice planned ▸ AS/SVE system 	VOCs, PCBs, Metals
Area I. Southern Section of Former Production Area	Yes	No	No	No	No	Yes	No	<ul style="list-style-type: none"> ▸ Soil removal ▸ Deed Notice planned ▸ AS/SVE system 	VOCs, PCBs, Metals

	GW	AIR (Indoors)	SURF SOIL	SURF WATER	SED	SUB SURF SOIL	AIR (Outdoors)	CORRECTIVE ACTION MEASURE	KEY CONTAMINANTS
Area J. Former Tear Gas Manufacturing Area	Yes	No	No	No	No	Yes	No	<ul style="list-style-type: none"> ▸ Soil excavated and consolidated to Area M ▸ Clean soil cover installed ▸ Deed Notice planned ▸ ORC injection 	VOCs, PCBs, Metals
Area K. Former Limefield	Yes	No	No	No	No	Yes	No	<ul style="list-style-type: none"> ▸ Ex-situ bioremediation ▸ AS/SVE system 	VOCs
Area L. Main Production Area including Tank Farm	Yes	No	No	No	No	Yes	No	<ul style="list-style-type: none"> ▸ Pavement cap ▸ Deed Notice planned ▸ AS/SVE system 	VOCs
Area M. Landfill	Yes	No	No	No	No	Yes	No	<ul style="list-style-type: none"> ▸ Drum and soil removal ▸ Clean soil cover installed ▸ Deed Notice planned ▸ AS/SVE system 	Phenyl ether
Area Q. Fire Pond	NFA	NFA	NFA	NFA	NF A	NFA	NFA	NFA	NFA
Area R. Former Process Waste Lines and Sludge Pipelines	Yes	No	No	No	No	Yes	No	NFA	TPH, VOCs
Area S. Soil Stockpile	No	No	No	No	No	Yes	No	NFA	NFA
Area T. Six Aboveground Storage Tanks	NFA	NFA	NFA	NFA	NF A	NFA	NFA	NFA	NFA
Area U. Building 3 Sump	NFA	NFA	NFA	NFA	NF A	NFA	NFA	NFA	NFA
Area Y. Off-Site Farmland	Yes	No	NFA	No	NF A	Yes	No	<ul style="list-style-type: none"> ▸ Soil excavated and consolidated to Area H ▸ Clean soil cover installed ▸ AS/SVE system 	VOCs, Metals