Documentation of Environmental Indicator Determination

RCRA Corrective Action
Environmental Indicator (EI) RCRIS Code (CA725)
Current Human Exposures Under Control

Facility Name: Safety-Kleen Linden Recycle Center
Facility Address: 1200 Sylvan Street, Linden, New Jersey 07036
Facility EPA ID#: NJD002182897

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 "Current Human Exposures Under Control" EI

A positive "Current Human Exposures Under Control" EI determination ("YE" status code) indicates that there are no unacceptable human exposures to "contamination" (i.e., contaminants in concentrations in excess of appropriate risk-based levels) that can be reasonably expected under current land- and groundwater-use conditions (for all contamination subject to RCRA corrective action at or from the identified facility [i.e., site-wide]).

Relationship of EI to Final Remedies

While final remedies remain the long-term objectives of the RCRA Corrective Action program, the EIs are near-term objectives, which are currently being used as program measures for the Government Performance and Results Act of 1993 (GPRA). The "Current Human Exposures Under Control" EI is for reasonably expected human exposures under current land- and groundwater-use conditions ONLY, and does not consider potential future land- or groundwater-use conditions or ecological receptors. The RCRA Corrective Action program's overall mission to protect human health and the environment requires that final remedies address these issues (i.e., potential future human exposure scenarios, future land and groundwater uses, and ecological receptors).

Duration / Applicability of EI Determinations

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

Facility Information

The Safety-Kleen Linden Recycle Center is located at 1200 Sylvan Street in the City of Linden, Union County, New Jersey. The site was previously owned and operated by Solvents Recovery Service of New Jersey, Inc., (SRSNJ) from 1942 until 1988, when Safety-Kleen acquired SRSNJ. The site is approximately 11.4 acres in size, five of which are active process areas. The property is open around the process area and contains undeveloped, wooded land in the eastern portion of the site. The facility is located within an area zoned H-1, which is the highest industrial classification in Union County. Surrounding land use is light and heavy industry and commercial. Contiguous land use includes a railroad branch line (on all but the western boundary); General Magnaplate, United Window & Door Manufacturing, K&G Liquidation Center, Inspectorate Worldwide Services, and Pro-Plastics (west); a municipal airport (north); shopping centers and other commercial establishments (south). There are no active withdrawal wells on site or within 1,000 feet of the site. Kings Creek is located about 1,500 feet southwest of the site.

The Linden Recycle Center is a material recovery facility that processes waste material to recover clean material for recycling or sale, and also serves as a waste transfer and transship station. The facility is currently operated under several different regulatory permits and orders. In 1981, an explosion occurred in the flash distillation and solvent recovery area that prompted the New Jersey Department of Environmental Protection (NJDEP) to issue an Administrative Order (AO) to SRSNJ. An Administrative Consent Order (ACO) was executed between SRSNJ and the NJDEP on July 16, 1982, which required physical improvements to the facility systems and submittal of an application for a Resource Conservation and Recovery Act (RCRA) Part B Permit. A hazardous waste facility permit was issued to the facility by NJDEP in January 1988, and subsequently modified in March 1992 and January 1998. Finally, a Hazardous and Solid Waste Amendment (HSWA) Permit (#NJD002182897) was issued by the U.S. Environmental Protection Agency (EPA) with an effective date of December 17, 1993. The facility also maintains a New Jersey Pollutant Discharge Elimination System (NJPDES) Discharge to Ground Water (DGW) Permit (#NJ0002224) effective January 29, 1988.

The Safety-Kleen Linden Recycle Center is an active facility and a majority of the process areas are still in use. This site has been the subject of extensive environmental remediation and monitoring activities since 1982, in cooperation with the NJDEP and/or EPA. Remediation has been conducted through agency oversight mechanisms included in the ACO, NJPDES-DGW Permit, and HSWA Permit. Investigation and remediation activities have included soil sampling, groundwater monitoring, and potential receptor evaluations. The solid waste management units (SWMUs) and areas of concern (AOCs) were identified based on a 1985 preliminary review/visual site inspection (PR/VSI).

Safety-Kleen has previously performed Phase I and Phase II RCRA Facility Investigations (RFIs) in accordance with the HSWA permit. The Phase II RFI was submitted to EPA and NJDEP in September 1996 and deemed conditionally approved in an EPA comment letter dated September 10, 2003. Safety-Kleen has moved into Phase III of the RFI, which will address off-site characterization, additional on-site characterization, and existing on-site surface soil issues. A Phase III RFI Workplan was submitted on November 23, 2003, and approved by EPA on April 7, 2004. Contamination at all of the SWMUs and AOCs are considered to be reasonably delineated for the EI evaluation.

Safety-Kleen has implemented corrective measures including the installation of one extraction well to address a contaminant hot-spot at the interior of the site, and a groundwater pump and treat (GWP&T) system to address on-site groundwater contamination and prevent potential off-site migration of contamination. The current phase of corrective action will gather data to optimize the extraction system. Safety-Kleen is currently conducting a RCRA corrective action program to gather data for developing a final remedy system. Remedies may include a combination of physical and/or chemical treatments and natural attenuation to address site-wide contamination and off-site impacts. The current and subsequent phases of the corrective action program will refine and confirm the characterization of the site contamination.

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 (SWMUs), regulated units (RUs), and areas of concern (AOCs)), 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 SWMUs and AOCs:

Five SWMUs, three AOCs, and two other areas of interest have been identified during previous investigations at this facility. Brief descriptions of these areas are provided below. The areas at this site have historically been defined on the basis of potential soil source areas and are not necessarily associated with areas displaying the highest concentrations of groundwater contamination. As such, groundwater contamination is discussed on a site-wide basis. A map of groundwater monitoring locations at the Safety-Kleen Linden facility is presented as Figure 1-9 of the Phase III RFI Workplan (Ref. 4).

SWMU 1, Settling Basin Adjacent to Tank Farm No. 1: This SWMU consists of a former settling basin that was located immediately south of Tank Farm No. 1. The settling basin was constructed of cinder blocks and received wastewater and storm water runoff from adjacent areas. Impacts to soil and groundwater may have occurred due to a leak in the basin or in the sewer lines connected to the basin (Ref. 4). An active wastewater basin with approximate dimensions of 30'L x 30'W x 6'D is currently operated in the same location. This basin receives wastewater from the secondary containment areas and blowdown from the boiler and cooling towers (Ref. 4). Surface/subsurface soil samples (zero to four feet below ground surface [bgs]) collected during the Phase II RFI (Ref. 3) reported volatile organic compounds (VOCs) and semi-volatile organic compounds (SVOCs) at concentrations above New Jersey Non-Residential Direct Contact Soil Cleanup Criteria (NJ NRDCSCC) and/or the New Jersey Impact to Groundwater Soil Cleanup Criteria (NJ IGWSCC)[1]. An asphalt cap has been installed over this unit (Ref. 4). No future investigations are planned for this SWMU.

SWMU 2, Former Secondary Containment Structure for the Solvent Recovery and Fuel Blending Areas: This SWMU consisted of an unlined, soil-bermed secondary containment area that was located immediately east of Tank Farm No. 2. The impoundment collected surface runoff and spillage from the solvent recovery and fuel blending areas (Ref. 1). SRSNJ discontinued use of this structure in March 1982, and reportedly backfilled it by pushing in the earthen berms without removing any impacted soil (Ref. 4). The area was subsequently graded and covered with clean crushed stone (Ref. 3). Surface soil borings collected in this area in 1988 and 1993 contained concentrations of polychlorinated biphenyls (PCBs) and metals above NJ NRDCSCC. This SWMU is currently covered with gravel (Ref. 4). No future investigations are planned for this unit.

SWMU 3, Custom Distillation Area, Manifold Distribution Area, Former Tank Farm No. 4, and Settling Basin Adjacent to Tank Farm No. 4: This SWMU contains the former Custom Distillation and Bulk Storage Area, and the Finished Product Storage Area (also called the Tank Farm No. 4 area), located in the northeastern portion of the developed property. Facility operations have been conducted in this area since the 1960's. Spills have been documented in this area, including a release of dimethyl acetamide from a distillation column. Former Tank Farm No. 4 was taken out of service and dismantled in 1994 (Ref. 3). PCBs were detected above NJ NRDCSCC in surface soil borings collected in this area in 1988. Subsurface soil samples collected in 1996 contained concentrations of VOCs above NJ NRDCSCC and/or NJ IGWSCC. Surface cover at this SWMU currently consists of asphalt, gravel, and concrete, with a thin strip of grass/trees at the northern property boundary (Ref. 4). The draft Phase III RFI proposes additional surface and subsurface soil characterization to confirm the extent of elevated metal concentrations north and west of the railcar loading facility (four boring locations in AOC 3) (Ref. 4). See Figure 6-1 of the Phase III RFI Workplan for proposed soil sampling locations (Ref. 4). Soil samples from two depths will also be collected during the drilling of MW-13I in this AOC (Ref. 4).

SWMU 4, Solvent Recovery and Fuel Blending Areas: This SWMU consists of the Solvent Recovery and Fuel Blending Areas, which are now collectively referred to as Tank Farm No. 2. The solvent recovery and fuel blending areas have been in operation in the north-central portion of the site since the 1960's. Spills have been reportedly observed in this area and local surface water runoff was reportedly discharged to a former unlined lagoon at this location (Ref. 3). No soil investigations have been conducted within this unit, which is covered with surface structures (Ref. 4). However, in soil investigations conducted at adjacent areas, including SWMU 2, SWMU 5, and AOC 7, metals, PCBs, and VOCs were detected above NJ NRDCSCC and/or NJ IGWSCC in surface and subsurface soil. Tank Farm No. 2 currently has secondary containment consisting of a concrete floor and wall (Ref. 4). No future investigations are planned for this unit.

SWMU 5, Former Outdoor Drum Storage Area: This SWMU consisted of an outdoor drum storage area that was located at the current location of Building No. 10. The drum storage area was used prior to 1982 and stored drummed solvent waste prior to solvent recovery and fuel blending (Ref. 4). The drums were stacked three high on concrete pads that did not have secondary containment, and earthen troughs separated each pad (Ref. 4). In connection with the construction of Building 10, excavation and off-site disposal of soil occurred at this unit in 1984 and 1985; however, no further details are available in the historical information (Ref. 4). PCBs and metals were detected above NJ NRDCSCC in surface soil samples collected and analyzed in 1988 and 1992. In addition, subsurface soil borings taken at this SWMU during the Phase II RFI contained VOCs above NJ NRDCSCC and/or NJ IGWSCC. Sampling was performed in a narrow corridor between Building 10 and the concrete containment wall for Tank Farm No. 2 (known as the dissolved asphalt area) in August 2001, which identified a hotspot of VOCs and PCBs in subsurface soil in this area (Ref. 4). This unit is mostly covered with surface structures (including Building No. 10), asphalt, and concrete, with a small area of gravel cover (Ref. 4). Three soil borings were proposed in the dissolved asphalt area to better define the extent of PCB impacts in surface and subsurface soil during the Phase III RFI (Ref. 4).

AOC 6, Finished Product Storage Area: AOC 6 includes the Solvent Recovery Area and the Finished Product Storage Area (now known as Tank Farm No. 1). An explosion and fire occurred at this location in October 1981 (Ref. 3). The explosion was caused by an exothermic reaction in a horizontal batch still that caught fire and spread to adjacent tank farms and structures, resulting in product release. According to NJDEP, runoff associated with the release and firefighting water entered a storm sewer and flowed into King's Creek (Ref. 4). Facility operations were halted for approximately one year while the site was cleaned up and reconstructed (Ref. 1). Operations within this area are still active, and Tank Farm No. 1 has secondary containment consisting of a concrete floor and wall (Ref. 4). VOCs were detected above NJ NRDCSCC and/or NJ IGWSCC in surface soil borings taken at this SWMU during the Phase II RFI. This AOC is currently covered with surface structures (including half of Building No. 11), concrete, and asphalt (Ref. 4). No future investigations are planned for this AOC.

AOC 7, North-Central/North East Plan Area (Former Area No. 10): AOC 7 is an open area in the northeast section of the site that is utilized for temporary truck and tanker storage and general vehicular traffic. Up to three feet of soil was reportedly removed from this area during the mid-1980's, but no further details are available. This AOC is currently covered with gravel, asphalt, concrete, and surface structures, with a thin strip of grass/trees at the northern property boundary (Ref. 4). Surface soil samples collected from this AOC in 1992 contained metals and PCBs above NJ NRDCSCC. VOCs were detected above NJ NRDCSCC and/or NJ IGWSCC in subsurface soil borings taken at this AOC during the Phase II RFI. The draft Phase III RFI proposes additional surface and subsurface soil characterization to confirm the extent of elevated metal concentrations north and west of the railcar loading facility (two boring locations in AOC 7) (Ref. 4). Soil samples from two depths will also be collected during the drilling of MW-16I in this AOC (Ref. 4).

AOC 8, Railroad Spur (Former Area No. 11): AOC 8 consists of a portion of the railroad spur located along the northeast property boundary, east of the active plant area. The spur was operated as early as 1959 for the transport and staging of railroad tanker cars. Surface and subsurface soil borings collected at this AOC in 1993 indicated concentrations of metals were present above NJ NRDCSCC. Safety-Kleen acquired access to this spur in 1994 and constructed a rail car loading station. Prior to redevelopment by Safety-Kleen, the spur was inactive (rail removed) and only the track ballast, consisting of imported stone and slag material, remained (Ref. 3). Safety-Kleen installed an impermeable cover over the former ballast materials, installed new rails, and re-activated the spur in 1995 (Ref. 4). The spur is still in use today. The corrective measures study (CMS) proposed capping this entire AOC; however, this measure has not yet been implemented (Refs. 2, 4). Thus, contaminated surface soil is still exposed at this AOC. The draft Phase III RFI proposes additional surface and subsurface soil characterization to confirm the extent of elevated metal concentrations near the old rail spur (seven soil boring locations in AOC 8) (Ref. 4). Ten randomly selected soil boring locations are also proposed in the undeveloped portion of AOC 8 to assist in determining the background levels for metals in soil at the site (Ref. 4).

AOC 9, Soil Impacts in Southeastern Portion of Developed Site: AOC 9 consists of the southeastern portion of the developed site, and does not correspond to past operations or spills. This AOC was added in October 2003, following discussion between Safety-Kleen and EPA, to describe a large area of soil sampling performed between 1989 and 1992. PCBs and metals were detected above NJ NRDCSCC in surface and subsurface soil samples. This unit is currently covered with asphalt, surface structures (including Building No. 1 and the Groundwater Treatment Building), concrete, and an area with grass/trees outside of Building No. 1 (Ref. 4). No future investigations are planned for this AOC.

AOC 10, Soil Impacts in Southwestern Portion of Site: AOC 10 consists of the southwestern portion of the site. As with AOC 9, this AOC was added to correspond with soil impacts identified in various sampling programs in the southwestern portion of the site that were not encompassed by the original SWMUs and AOCs. Soil samples collected from newly developed periphery monitoring wells (MW-14D and MW-15D) indicated that VOCs and SVOCs were present above NJ NRDCSCC and/or NJ IGWSCC in subsurface soil. PCBs were also detected above NJ NRDCSCC in surface and subsurface soil samples. This unit is currently covered by asphalt, concrete, and surface structures including Building Nos. 2, 3, and half of Building No. 11 (Ref. 4). As part of the Phase III RFI, one surface and one subsurface soil sample will be collected from a monitoring well borehole installed adjacent to MW-14D and analyzed for VOCs.

In summary, the majority of the contaminated soil at all SWMUs and AOCs is under asphalt, gravel, concrete, or covered by buildings. However, there is still contaminated soil exposed at AOC 7, AOC 8, and AOC 9.

Site-Wide Groundwater: Groundwater monitoring was initiated in 1978 and has historically been performed on a site-wide basis. Two water-bearing units are present beneath the site, the glacial till unit and the bedrock unit. The lower glacial till, immediately above the bedrock surface, is considered the intermediate zone. Investigations have detected VOC concentrations in both units above New Jersey Ground Water Quality Criteria (NJ GWQC) for Class II-A potable groundwater. Groundwater remediation is currently being performed via one extraction well to address a contaminant hot-spot, and a groundwater pump and treat (GWP&T) system to address on-site groundwater contamination and prevent potential off-site migration of contamination. Current groundwater monitoring, sampling, and remediation are discussed in greater detail in the following sections.

<u>**References**</u>**:**

1. Task 1- Current Conditions and Task 2 - Pre-Investigation of Corrective Measure Technologies, RFI, Safety-Kleen Corp., Linden, New Jersey. Prepared by Groundwater Technology. Dated February 15, 1994.

2. Corrective Measures Study Work Plan, Safety-Kleen Corp., Linden, New Jersey. Prepared by Geraghty & Miller, Inc. Dated March 16, 1994.

3. Phase II RCRA Facility Investigation Report of Findings (Vol. 1-4), Safety-Kleen Corp., Linden, New Jersey. Prepared by Fluor Daniel GTI. Dated September 16, 1996.

4. Phase III RCRA Facility Investigation (RFI) Work Plan for the Safety-Kleen Linden Recycle Center, Linden, New Jersey. Prepared by Cameron-Cole. Dated November 25, 2003.

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

Media	**Yes**	**No**	**?**	**Rationale/Key Contaminants**
Groundwater	X			VOCs
Air (indoors)[3]		X		
Surface Soil (e.g., <2 ft)	X			VOCs, SVOCs, Metals, PCBs
Surface Water		X		
Sediment		X		
Subsurface Soil (e.g., >2 ft)	X			VOCs, SVOCs, Metals, PCBs
Air (Outdoor)		X		

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

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

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

Rationale:

Investigations have been performed on groundwater, surface soil, and subsurface soil at the Safety-Kleen Linden Recycle Center site. A brief discussion of the existing contaminant concentrations detected above relevant standards is presented below.

Groundwater

Two water-bearing units are present beneath the site: the unconsolidated glacial till unit and underlying fractured bedrock unit. The glacial till unit extends from the surface to a depth of approximately 25 to 45 feet bgs. The unit is comprised of unconsolidated and unstratified clay, silt, coarse- to fine-grained sand, and gravel. Two to four feet of fill material overlie the till. Depth to groundwater is generally encountered from three to five feet bgs in this unit, and groundwater flow is to the south-southeast (Ref. 10). The underlying bedrock unit consists of highly weathered and fractured marine shale and sandstone of the Brunswick Formation (Ref. 1). Competent bedrock is generally encountered at 25 to 35 feet bgs. Flow direction in the bedrock unit is towards the south, and the potentiometric surface for bedrock groundwater occurs at a depth of approximately nine to 15 feet bgs. A downward hydraulic gradient exists between the glacial till and bedrock unit, indicating a component of vertical downward flow along the vertical fractures.

Groundwater monitoring was initiated from 1978 to 1981 with the installation of nine monitoring wells (Ref. 1). The 30 current monitoring wells at the site were installed between 1988 and 1999 (Ref.10). A map of groundwater monitoring locations at the Safety-Kleen Linden facility is presented as Figure 1-12 of the Phase III RFI Work Plan (Ref. 10). Water quality samples and water level measurements are obtained at eight nested monitoring well sites as part of NJPDES-DGW monitoring requirements (Ref. 9). Each nest contains two wells: one completed in the glacial till unit and one completed in the bedrock unit. MW-2 also contains a third, deeper glacial till well (MW-2I).

VOC concentrations in excess of the NJ GWQC have been reported in all monitoring wells. However, MW-7S has only reported one detection slightly above GWQC; tetrachloroethylene was detected at an estimated concentration of 1.2 µg/L (below the detection limit) during the April 2004 sampling event (NJ GWQC = 1 µg/L) (Ref. 13). During the April 2004 sampling event, the highest total VOC concentrations were detected at MW-5S and MW-5D (Ref. 13), and MW-2S and MW-10D had the highest total VOC concentrations during the 2003 sampling events. The occurrence of VOCs in other wells across the site at lower concentrations likely reflects the migration of contaminants away from the MW-2 and MW-5/MW-10D hot spots, together with contributions from less significant on-site sources (Ref. 10). See Attachment 1, Maximum Concentrations of VOCs Detected Above NJ GWQC during Most Recent Groundwater Sampling Event (µg/L).

SVOCs, metals, and PCBs have also been detected above NJ GWQC more sporadically and at lower concentrations relative to the appropriate NJ GWQC. Sampling for SVOCs, metals (cadmium, chromium, and lead), and PCBs is performed annually at MW-1S/D through MW-8S/D. The SVOCs 2,4-dichlorophenol, 2,4-dimethylphenol, isophorone, and 1,2,4-trichlorobenzene were detected above NJ GWQC at MW-2S and MW-5S/D in the October 2002 sampling event. PCBs have been consistently detected above NJ GWQC (0.5 µg/L) in MW-2S, up to a concentration of 65 µg/L in the October 2002 sampling event (Ref. 10). Traces of light non-aqueous phase liquid (LNAPL) have been observed sporadically at MW-2S; however, MW-2S has not been sampled during the last three sampling events (October 2003, January 2004, and April 2004), due to the presence of product observed during water level measurements (Refs. 11, 12, and 13).

The Phase III RFI proposes 18 new on-site monitoring wells and three piezometers; see Figure 6-2 of the Phase III RFI Workplan for the locations (Ref. 10). As shown on Figure 6-2, ten of these wells will occur in the intermediate zone at locations where bedrock or shallow/bedrock well pairs currently exist, three deep bedrock wells will be installed near the locations of existing wells that monitor the upper bedrock, one source area well pair will be installed within the central area of the facility, and three wells (two intermediate-zone and one bedrock) will be installed near the downgradient edge of the property (Ref. 10). If groundwater quality is determined to be impacted in the intermediate zone along the downgradient property boundary, an additional contingency intermediate-zone monitoring well will be installed.

Additionally, three off-site, downgradient groundwater monitoring wells are planned in the upper bedrock unit; see Figure 6-2 of the Phase III RFI Workplan for proposed monitoring well locations (Ref. 10). Based on the results from these proposed wells, three contingency intermediate zone monitoring wells are proposed next to these locations (Ref. 10). However, analytical data from recently installed shallow monitoring wells located just downgradient (to the south-southwest) in the off-site shopping center were obtained from the off-site landowner. See Figure 1 in Attachment A of the Supporting Information for Environmental Indicator CA725 letter for the locations of off-site wells MW-1, MW-2, and MW-3 in relation to the Safety-Kleen facility (Ref. 14). Wells MW-1, MW-2, and MW-3 were sampled on April 5, 2004 (the only date for which results are available), and the results are summarized on Figure 1 (Ref. 14). Chlorobenzene (256 µg/L) was detected above NJ GWQC (4 µg/L) in MW-2, and vinyl chloride (13 µg/L, 29.5 µg/L) was detected above NJ GWQC (5 µg/L) in MW-1 and MW-3, respectively (Ref. 14).

In 1997, a groundwater extraction system was installed at MW-2S as part of interim measure (IM) activities to address a contaminant hot spot. The system pumped groundwater to a tanker truck for off-site treatment and disposal (Ref. 3). In 1999, MW-2I replaced MW-2S as the extraction well in response to a 1997 letter from EPA indicating the need for a greater extraction rate from the IM system (Ref. 5). The mean flow rate at MW-2I is approximately 0.05 gallons per minute (gpm), and the recovered groundwater is still pumped to a tanker truck and disposed of periodically off site (Ref. 10). Approximately 1,077 pounds of VOCs have been removed from the two wells since start-up (Ref. 14). Water-level measurements taken at well MW-2S following sustained pumping at MW-2I indicate that the interim pumping system does not exert hydraulic control on the contaminant plume; however, it appears that the pumping has contributed to a slight flattening of the hydraulic gradient beneath the central area of the facility (Ref. 10).

A site-wide GWP&T system was installed in 2000 to 2001 in response to HSWA permit requirements for completion of a CMS and implementation of corrective action prior to completion of the RFI; however, the system was not started up until June 2004 (Refs. 10, 13). The system's conceptual design dates from the mid-1980's and aims to prevent off-site migration of groundwater contamination via hydraulic control (Ref. 10). As designed, groundwater from the upper bedrock aquifer is pumped from wells MW-3D, MW-4D, and MW-7D. VOCs are removed from the recovered groundwater by an air stripper, and dissolved iron and manganese are then removed in an inorganic constituent reduction circuit (Ref. 10). The Linden-Roselle Sewerage Authority (LRSA) accepts the pre-treated groundwater into their publicly-owned treatment works (POTW). The system was started up on June 21, 2004, and has operated relatively continuously since then (Ref. 14). An effectiveness evaluation, including a capture zone analysis, is planned as part of the Phase III RFI field tasks (Ref. 10).

Air (Indoors)

To evaluate the potential for VOCs to migrate to indoor air at the Safety-Kleen Linden site, the maximum concentrations of VOCs detected in the most recent groundwater sampling event (April 2004) were compared to the State of Connecticut Proposed Revisions to the Groundwater Volatilization Criteria for the Industrial/Commercial Scenario (CT I/C GWVC) (March 2003). The proposed revisional values were used because they have been revised to be more consistent with EPA's 2002 Draft Guidance "Evaluating the Vapor Intrusion to Indoor Air Pathway from Groundwater and Soil." Thus, these updated values are based on the most up-to-date Johnson-Ettinger (J-E) Model, toxicity information, and exposure assumptions. Only the wells with VOC contamination located within 100 feet (horizontally and vertically) of active buildings are of concern for indoor air. MW-14D is located less than 100 feet from Building No. 2, the Employee Locker Room and is screened in the upper 20 to 30 feet of bedrock (Ref. 10). Therefore, the most recent groundwater analytical data for MW-14D (October 2003) were screened against the CT I/C GWVC. No constituents were detected above the applicable CT I/C GWVC.

Widespread VOC contamination occurs across the site, and it is possible that the contamination may extend beneath site buildings that are not within 100 feet downgradient of a current monitoring well. However, in the Draft Subsurface Vapor Intrusion Guidance (November 2003), EPA indicates that the Occupational Safety and Health Administration (OSHA) and EPA have agreed that OSHA will take the lead in industrial settings where vapor intrusion may be a concern. Based on information obtained from the facility, Safety-Kleen Linden conducts its operations in compliance with all applicable OSHA regulations found in 29 CFR 1910 (Ref. 15). Thus, because OSHA oversight applies, the migration of VOCs into indoor air on site is not currently a concern for this EI determination.

As discussed above, VOC concentrations in excess of NJ GWQC have been detected in three off-site shallow wells, located just downgradient of the southern site property boundary. Attachment A of Reference 14 contains a J-E Model analysis for VOCs detected in these three off-site wells (Ref. 14). The J-E Model was run by Safety-Kleen to verify that VOC levels detected in these wells associated with Safety-Kleen activities will not pose unacceptable potential risks or hazards to indoor air quality for off-site employees of the shopping mall located to the south of the site (Ref. 14). A separate analysis was run for each well, and incremental risk to indoor air quality was evaluated for the Wal-Mart store and the commercial buildings farther west based upon the proximity of the buildings to each of the monitoring wells (MW-1, MW-2, and MW-3). The site-specific parameters used in the J-E Model are outlined clearly in Attachment A of Reference 14, and are appropriately conservative. The model was run for each detected VOC constituent, regardless of whether they exceeded the NJ GWQC. Results from the J-E model indicate that all calculated Hazard Quotients are less than 1 for non-carcinogens, and all calculated risks for carcinogens are less than 1×10^{-6} (Ref. 14). Thus, the analysis did not identify any unacceptable risks to off-site receptors from potential exposure to contaminated indoor air at the shopping center buildings, and exposure to contaminated indoor air is not a complete exposure pathway for off-site receptors. Current and subsequent phases of corrective action will continue to confirm and refine the groundwater VOC contamination.

Surface/Subsurface Soil

Soil contamination has been identified throughout each of the SWMUs and AOCs at the site, with the exception of AOC 4 (where no soil sampling has been conducted). Surface soil is defined as soil at ground level to two feet bgs. Subsurface soil is defined as soil occurring at depths below two feet. VOCs, SVOCs, PCBs, and metals have been detected in surface and subsurface soil at concentrations exceeding the NJ NRDCSCC. However, the majority of the process areas are covered with asphalt, concrete, gravel, or surface features that prevent direct contact with contaminated soil. Existing surface cover at the site is presented as Figure 4-1 of the Phase III RFI Workplan (Ref. 10). As a result, only the sample locations in areas that are covered with grass/trees were evaluated for exceedances of applicable standards (i.e., one location in AOC 7, 15 locations in AOC 8, and seven locations in AOC 9).

Soil analytical results for these 23 sample locations were compared to the NJ NRDCSCC, and only those that exceeded applicable criteria are discussed. PCBs were detected at 2.1 mg/kg in AOC 9 surface soil, which barely exceeds the NJ NRDCSCC value of 2 mg/kg and is not a concern. The following metals were detected at or above applicable NJ NRDCSCC values in AOC 8 surface soil: antimony (340 mg/kg; NJ NRDCSCC = 340 mg/kg), arsenic (620 mg/kg; NJ NRDCSCC = 20 mg/kg), chromium (170 mg/kg; NJ NRDCSCC = 20 mg/kg for inhalation exposure pathway), copper (5,900 mg/kg; NJ NRDCSCC = 600 mg/kg), lead (10,000 mg/kg; NJ NRDCSCC = 600 mg/kg), and zinc (46,000 mg/kg; NJ NRDCSCC = 1,500 mg/kg). Subsurface soil was not impacted above NJ NRDCSCC at these 23 sampling locations.

Surface Water/Sediment

There are no permanent surface water features located within site boundaries. A wetlands area borders the developed portion of the site to the east. Kings Creek, a freshwater stream located approximately one-fourth of a mile to the south of the site, drains to the southeast to the confluence with the Rahway River, a tidal estuary located approximately one mile to the south of the site (Ref. 14). The Rahway River discharges to the Arthur Kill approximately one and one-fourth miles downstream (southeast) of the site. No sediment or surface water samples have been collected to assess impacts to surface water and sediment in the area of the site.

Storm water from the western portion of the site drains to Kings Creek via storm sewers (Ref. 14). Storm water from the process area of the facility is conveyed via storm drains to an inspection area with a storm drain valve, located approximately 100 feet east of monitoring wells MW-4S/D. Collected storm water is then inspected and released by opening the valve, at which point the water flows to an outfall located near the Conrail easement south of the facility, and into Kings Creek (Refs. 10, 14). Storm water from the undeveloped, eastern portion of the facility drains overland directly to the Conrail easement; however, it is anticipated that storm water would only flow along the entire length of the Conrail easement during large storm events, due to the gentle slope and unpaved ground (Ref. 10). Surface water that does not infiltrate into the ground eventually drains into the Rahway River (Ref. 10). Based on the absence of on-site surface water bodies and the storm water management practices and controls in place, the potential for surface water quality impacts from direct drainage is considered unlikely (Ref. 14).

As outlined above, groundwater has been contaminated with VOCs above NJ GWQC in both the glacial till and bedrock units, and off-site wells located just downgradient of the facility have reported VOC impacts at much lower levels than on-site wells. Due to the presence of Kings Creek and the Rahway River further downgradient of the site, Safety-Kleen performed a conservative screening-level analysis to determine the potential for groundwater contaminated as a result of site activities to discharge into these surface water bodies (Ref. 14). The MYGRT model was used to simulate the maximum predicted extent of the groundwater plume for 12 key VOC constituents reported in on-site monitoring wells, based on a 60-year simulation with a constant source. The maximum concentration of each of the 12 VOC constituents detected in on-site downgradient wells over the past two years of available monitoring data was used as the concentration of the source term in the model (Ref. 14). The predicted extent of the plume in the glacial till unit was compared to the distance to Kings Creek because it is an expected discharge point for shallow groundwater; in contrast, the predicted extent of the plume in the bedrock unit was compared to the distance to the Rahway River because groundwater from this deeper unit would not be likely to contribute a significant component of discharge to Kings Creek, which is a shallow surface stream (Ref. 14). The simulation results for the glacial till unit indicate that most constituents are not predicated to extend beyond 50 meters (160 feet), and none of the constituents have a predicted extent greater than 200 meters (650 feet); thus, the groundwater plume is not expected to reach Kings Creek, which is 400 meters (1,320 feet) away at its closest point (Ref. 14). Similarly, the results for the bedrock unit indicate that most of the constituents have a predicted extent of less than 200 meters (650 feet), and none of the constituents are expected to extend beyond around 400 meters (1,320 feet); thus, the groundwater plume is not expected to reach the Rahway River, which is 1,400 meters (4,600 feet) from the facility (Ref. 14).

Based on the results of the MYGRT mode, no surface water impacts due to discharge of contaminated groundwater from the site is expected; thus, exposure to contaminated surface water is not a complete exposure pathway for off-site receptors. This screening tool adds useful information to the conceptual model for the site, outlined in the Phase III RFI Workplan (Ref. 10). The Phase III RFI Workplan proposes the collection of additional information to address the potential for groundwater to impact surface water, based on off-site groundwater analytical data obtained during the Phase III RFI (Ref. 10).

Air (Outdoors)

No assessment of the impacts to outdoor air has been conducted at the site. However, limited migration of contaminants bound to airborne particulate matter is expected at this site because the surface soil throughout the site is covered with asphalt capping, concrete, gravel, or surface features (with the exception of the undeveloped eastern area of the site, which is wooded). The asphalt cap and other surface cover limits wind erosion, thus reducing the potential for contaminated soil to become airborne. Migration of VOCs from groundwater into outdoor air is not expected to be of concern due to the natural dispersion of contaminants once they reach the surface, resulting in potential exposures below acceptable risk levels. Thus, the migration of particulates entrained on dust and/or volatile emissions are not expected to be significant exposure pathways of concern at the Safety-Kleen Linden site.

References:

1. Task 1- Current Conditions and Task 2 - Pre-Investigation of Corrective Measure Technologies, RFI, Safety-Kleen Corp., Linden, New Jersey. Prepared by Groundwater Technology. Dated February 15, 1994.

2. Phase II RCRA Facility Investigation Report of Findings (Vol. 1-4), Safety-Kleen Corp., Linden, New Jersey. Prepared by Fluor Daniel GTI. Dated September 16, 1996.

3. Letter from Anne M. Lunt, Safety-Kleen Corp. to Michael Kramer, USEPA Region 2, re: RCRA Corrective Action Quarterly Progress Report, Interim Measure Final Design Documents, and Draft Interim Measures Report. Dated August 1, 1997.

4. Letter from Keith Marcott, Safety-Kleen Corporation to Michael Kramer, USEPA,, re: Facility Improvements and Interim Measures Implementation, Safety-Kleen Corp., Linden Recycle Center, Linden, Union County, New Jersey. Dated August 8, 1997.

5. Letter from Barry Tornick, USEPA, to Anne M. Lunt, Safety-Kleen Corporation, re: Phase II RCRA Facility Investigation (RFI)/Interim Measures - Linden Recycling Facility. Dated December 9, 1997.

6. Final Preliminary Design of a Groundwater Pump and Treat System and Design Analysis Report, Safety-Kleen Corp., Linden, New Jersey. Prepared by Earth Tech, Inc. Dated July 1999.

7. Letter from Scott Davies, Safety-Kleen Corp. to Clifford Ng, USEPA Region 2, re: Summary of March 22, 2000 Meeting Between USEPA, NJDEP, and Safety-Kleen Corp. Dated April 17, 2000.

8. Letter from Robert Schoepke, Safety-Kleen Corp. to Clifford Ng, USEPA Region 2, re: RCRA Corrective Action Quarterly Progress Report Fourth Quarter (October 200 through January 2001). Dated January 22, 2001.

9. Letter from Robert Schoepke, Safety-Kleen Corp. to Clifford NG, USEPA Region 2, re: RCRA Corrective Action Quarterly Progress Report First Quarter (January 2001 through April 2001), Safety-Kleen Corp. Linden Recycling Center, Linden, New Jersey. Dated April 26, 2001.

10. Phase III RCRA Facility Investigation (RFI) Work Plan for the Safety-Kleen Linden Recycle Center, Linden, New Jersey. Prepared by Cameron-Cole. Dated November 25, 2003.

11. RCRA Corrective Action Quarterly Progress Report, Third Quarter (October 2003 through December 2003). Prepared by Safety-Kleen Systems, Inc. Dated January 8, 2004.

12. RCRA Corrective Action Quarterly Progress Report, First Quarter (January 2004 through March 2004). Prepared by Safety-Kleen Systems, Inc. Dated April 30, 2004.

13. RCRA Corrective Action Quarterly Progress Report, First Quarter (April 2004 through June 2004). Prepared by Safety-Kleen Systems, Inc. Dated July 30, 2004.

14. Letter from Robert Schoepke, Safety-Kleen Systems, Inc., to Clifford Ng, EPA, re: Supporting Information for Environmental Indicator CA725. Dated September 27, 2004.

15. E-mail correspondence from Robert Schoepke, Safety-Kleen Systems, Inc., to Clifford Ng, EPA, re: CA 725 minor question. Dated September 28, 2004.

3. Are there **complete pathways** between "contamination" and human receptors such that exposures can be reasonably expected under the current (land- and groundwater-use) conditions?

Summary Exposure Pathway Evaluation Table

*Potential **Human Receptors** (Under Current Conditions)*

"Contaminated" Media	Residents	Workers	Day-Care	Construction	Trespasser	Recreation	Food[4]
Groundwater	No	No	No	Yes	–	–	No
Air (indoor)	No	No	No	–	–	–	–
Surface Soil (e.g. < 2 ft)	No	Yes	No	Yes	No	No	No
Surface Water	No	No	–	–	No	No	No
Sediment	No	No	–	–	No	No	No
Subsurface Soil (e.g., > 2 ft)	–	–	–	Yes	–	–	No
Air (outdoors)	No	No	No	No	No	–	–

Instruction for Summary Exposure Pathway Evaluation Table:

1. Strike-out specific Media including Human Receptors' spaces for Media which are not "contaminated" as identified in #2 above.

2. Enter "yes" or "no" for potential "completeness" under each "Contaminated"Media — Human Receptor combination (Pathway).

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

___ If no (pathways are not complete for any contaminated media-receptor combination) - skip to #6, and enter "YE" status code, after explaining and/or referencing condition(s) in-place, whether natural or man-made, preventing a complete exposure pathway from each contaminated medium (e.g., use optional Pathway Evaluation Work Sheet to analyze major pathways).

_X_ If yes (pathways are complete for any "Contaminated" Media - Human Receptor combination) - continue after providing supporting explanation.

___ If unknown (for any "Contaminated" Media - Human Receptor combination) - skip to #6 and enter "IN" status code

Rationale:

Groundwater

As discussed in response to Question 2, VOC concentrations in excess of NJ GWQC have been detected on site. Safety-Kleen performed well inventories in 1992 and 1998. Two privately-owned wells are located within a one-half-mile radius of the site. One well was installed in 1952 for domestic purposes and is located upgradient (northwest) of the site. The Elizabeth Water Company confirmed that the address associated with this well is serviced by public water (Ref. Phase III RFI); thus, it is unlikely that the well is still in use as a drinking water source. The other well is located crossgradient (east-northeast) of the site, at the Linden Municipal Airport, and was reportedly used for commercial, non-potable purposes (Ref. 1). The City of Linden has indicated that all residences in the area covered by the 1998 well search are connected to public water supply (Ref. 1). Thus, current information indicates that no potable wells are located within a one-half-mile radius of the site. Safety-Kleen will perform a one-mile well inventory during the Phase III RFI to verify this information (Ref. 1). Groundwater is not used on site; thus, there is no complete exposure pathway via ingestion of contaminated groundwater for on- or off-site receptors.

However, given that shallow groundwater is found at depths of less than five feet bgs on site, the potential exists for construction workers (e.g., remedial workers) to come into contact with contaminated shallow groundwater during excavation /remedial activities. Thus, direct contact with impacted shallow groundwater is being considered a potentially complete exposure pathway for on-site remedial workers.

As discussed in response to Question 2, VOC concentrations in excess of NJ GWQC have been detected in three off-site shallow wells, just downgradient of the southern site property boundary. Attachment B of Reference 2 contains a focused risk assessment for incidental construction worker exposure to groundwater, which was conducted by Safety-Kleen to verify that VOC levels detected in these wells associated with Safety-Kleen activities will not pose unacceptable potential risks or hazards to off-site construction workers engaged in excavation activities (Ref. 2). The assessment used appropriately conservative assumptions in calculating potential risk or hazard associated with all VOC, SVOC, and inorganic concentrations detected in the three off-site shallow wells (MW-1, MW-2, MW-3) and four on-site shallow wells on the downgradient, southern property boundary (MW-3S, MW-4SR, MW-7S, and MW-12S), regardless of whether they exceeded the NJ GWQC. The results from one sampling event were available for the off-site wells (April 2004) and on-site well MW-12S (October 2003), while data from the July and October 2003, and January and April 2004 sampling events for on-site wells MW-3S, MW-4SR, and MW-7S were used (Ref. 2). The risk assessment concluded that total hazard indices were below the benchmark value of 1 for adverse noncarcinogenic effects, and total excess lifetime cancer risks were within EPA's acceptable range of 1 x 10^{-4} to 1 x 10^{-6}. These results were calculated considering incidental ingestion and dermal contact pathways. Exposure of construction workers to shallow VOC-contaminated groundwater via the inhalation pathway was not considered; thus, this pathway will be considered potentially complete for conservativeness.

Surface/Subsurface Soil

As discussed in response to Question 2, VOCs, SVOCs, PCBs, and metals have been detected in surface and subsurface soil at concentrations exceeding the NJ NRDCSCC. However, the majority of the process areas are covered with asphalt, concrete, gravel, or surface features to prevent contact with contaminated soil. As a result, the only uncovered surface/subsurface contamination of concern on site is in AOC 8, near the railroad tracks. To address the potential exposure of on-site workers to this area, Safety-Kleen performed a focused risk assessment for maintenance worker exposure to on-site surface soils along the northern property boundary (Ref. 2). It was assumed that the maintenance worker does not perform intrusive activities; thus, the incidental ingestion, dermal contact, and inhalation of particulates pathways were considered for shallow soil (e.g., zero to one foot bgs interval). The risk assessment concluded that the potential exposure of a maintenance worker to arsenic and lead in surface soil will result in noncarcinogenic hazard indices, excess lifetime cancer risks, and blood lead levels that do not pose unacceptable risks (Ref. 2). Thus, direct contact with contaminated surface soil along the northern portion of the site is not considered a complete exposure pathway for on-site workers (e.g., maintenance workers).

However, given that ongoing remedial activities are occurring on site, direct contact with on-site contaminated surface and subsurface soil is being considered a potentially complete exposure pathway for on-site remedial workers at this time.

In addition, Safety-Kleen currently has measures in place to prevent trespasser exposure to uncovered soil contamination. The facility is completely surrounded by a six-foot high chain-link fence with three strands of barbed wire to restrict trespasser access; this fence is maintained in good condition (Ref. 1). The western gate comprises the sole entry to the facility, and it is monitored seven days a week, 24 hours a day (Ref. 1). Only authorized personnel are permitted access to the process and hazardous waste areas, and visitors are expressly prohibited from any contact with the wastes or waste constituents (Ref. 1). Additionally, signs are posted at the entrance to the facility and other locations, such that they are visible from any approach from a distance of 25 feet; these signs are marked "Danger - Unauthorized Personnel Keep Out" (Ref. 1). Given these existing controls, trespasser exposure to surface soil contamination is not a complete exposure pathway.

References:

1. Phase III RCRA Facility Investigation (RFI) Work Plan for the Safety-Kleen Linden Recycle Center, Linden, New Jersey. Prepared by Cameron-Cole. Dated November 25, 2003.

2. Letter from Robert Schoepke, Safety-Kleen Systems, Inc., to Clifford Ng, EPA, re: Supporting Information for Environmental Indicator CA725. Dated September 27, 2004.

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

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

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

___ If unknown (for any complete pathway) - skip to #6 and enter "IN" status code.

Rationale:

Groundwater

As discussed in response to Question 3, the potential for on-site remedial workers to come in direct contact with contaminated shallow groundwater is being considered a potentially complete exposure pathway. However, the Safety-Kleen Linden facility conducts its operations in compliance with all applicable OSHA regulations in 29 CFR 1910, as well as in accordance with the corporate health and safety manual and site-specific policies (Ref. 1). Periodic industrial hygiene studies are conducted to ensure that the appropriate levels of personal protective equipment (PPE) are being utilized by site personnel, and hazard assessments have been conducted for all on-site tasks to determine the required PPE for each task (Ref. 1). Exposure to contaminated groundwater for on-site remedial workers (considered to be construction workers for the purposes of this EI determination) are not expected to be significant. These protections would also apply to off-site construction workers (e.g., remedial workers); thus, exposures to contaminated groundwater via the inhalation pathway are not expected to be significant.

Surface/Subsurface Soil

As discussed in the response to Question 3, the potential for on-site remedial workers to come in direct contact with contaminated surface and subsurface soil is being considered a potentially complete exposure pathway. However, as mentioned above, the Safety-Kleen Linden facility conducts its operations in compliance with all applicable OSHA regulations in 29 CFR 1910, as well as in accordance with the corporate health and safety manual and site-specific policies (Ref. 1). Periodic industrial hygiene studies are conducted to ensure that the appropriate levels of PPE are being utilized by site personnel, and hazard assessments have been conducted for all on-site tasks to determine the required PPE for each task (Ref. 1). Thus, exposure to contaminated soil for on-site remedial workers (considered to be construction workers for the purposes of this EI determination) are not expected to be significant.

References:

1. E-mail correspondence from Robert Schoepke, Safety-Kleen Systems, Inc., to Clifford Ng, EPA, re: CA 725 minor question. Dated September 28, 2004.

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

____ If yes (all "significant" exposures have been shown to be within acceptable limits) - continue and enter "YE" after summarizing <u>and</u> referencing documentation justifying why all "significant" exposures to "contamination" are within acceptable limits (e.g., a site-specific Human Health Risk Assessment).

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

____ If unknown (for any potentially "unacceptable" exposure) - continue and enter "IN" status code.

This question is not applicable. See the response to Question 4.

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

_X_ YE - Yes, "Current Human Exposures Under Control" has been verified. Based on a review of the information contained in this EI Determination, "Current Human Exposures" are expected to be "Under Control" at the Safety-Kleen

Linden site, EPA ID# NJD002182897, located at 1200 Sylvan Street in Linden, New Jersey, under current and reasonably expected conditions. This determination will be re-evaluated when the Agency/State becomes aware of significant changes at the facility.

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

____ IN - More information is needed to make a determination.

Completed by: ______________________________ Date: __________________
Amy Brezin
Environmental Consultant
Booz Allen Hamilton

Reviewed by: ______________________________ Date: ___________________
Kathy Rogovin
Senior Risk Assessor
Booz Allen Hamilton

Also Reviewed by: ___________________________ Date: ___________________
Clifford Ng, RPM
RCRA Programs Branch
EPA Region 2

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

Approved by: Original signed by: Date: September 30, 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 EPA 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: Clifford Ng, EPA RPM, (212) 637-4113, Ng.Clifford@epa.gov

Final Note: The Human Exposures EI is a Qualitative Screening of exposures and the determinations within this document should not be used as the sole basis for restricting the scope of more detailed (e.g., site-specific) assessments of risk.

Attachments

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

* Attachment 1 – Maximum Concentrations of VOCs Detected Above NJ GWQC during Most Recent Groundwater Sampling Event (µg/L)

* Attachment 2 – Summary of Media Impacts Table

Attachment 1 - Maximum Concentrations of VOCs Detected Above NJ GWQC during Most Recent Groundwater Sampling Event [1] (µg/L)

Contaminant	NJ GWQC	Maximum Concentration, Glacial Till Unit	Well(s) Exceeding NJ GWQC[2], Glacial Unit	Maximum Concentration, Bedrock Unit	Well(s) Exceeding NJ GWQC[2], Bedrock Unit
Acetone	700	32,000	**MW-2S**	20,000	MW-2D, MW-10D, **MW-14D**
2-Butanone	300	37,000	**MW-2S**	20,000	MW-2D, MW-10D, **MW-14D**
4-methyl-2-pentanone	400	50,000	**MW-2S**	14,000	MW-2D, **MW-14D**
Benzene	1	20	MW-1S, MW-3S, **MW-8S**	620 J	MW-2D, MW-6D, MW-8D, **MW-10D**, MW-11A, MW-11B, MW-12D, MW-13DR, MW-14D, MW-15D, MW-16DR, MW-17DR
cis-1,2-Dichloroethene	10	36,000	MW-1S, MW-3S, MW-4SR, **MW-5S**, MW-6S	100,000	MW-1D, MW-3D, MW-4D, MW-5D, MW-6D, MW-7D, MW-9, **MW-10D**, MW-12D, MW-13DR, MW-14D, MW-15D, MW-17DR
Chlorobenzene	4	6,200	**MW-5S**, MW-6S, MW-8S	42,000	MW-1D, MW-2D, MW-4D, MW-5D, MW-6D, MW-7D, MW-8D, **MW-10D**, MW-11A, MW-11B, MW-12D, MW-13DR, MW-14D, MW-15D, MW-16DR, MW-17DR
Chloroethane	100	NA	NA	12,000	MW-2D, MW-11B, **MW-14D**
Chloroform	6	20	**MW-12S**	26 J	**MW-15D**
1,1-Dichloroethane	70	12,000	MW-1S, **MW-2S**, MW-3S	1,500	MW-1D, MW-2D, MW-12D, MW-14D, **MW-15D**
1,2-Dichloroethane	2	3,900 J	**MW-2S**	140	MW-2D, MW-14D, **MW-15D**
1,1-Dichloroethene	2	87	**MW-1S**, MW-3S, MW-4SR	220	MW-1D, MW-3D, **MW-15D**
cis-1,2-Dichloroethene	10	130,000	**MW-2S**	NA	NA
trans-1,2-Dichloroethene	100	NA	NA	15,000	MW-5D, MW-6D, MW-8D, **MW-10D**, MW-13DR
Ethylbenzene	700	3,300 J	**MW-2S**	NA	NA
Methylene Chloride	30	130,000	**MW-2S**, MW-5S	25,000	**MW-10D**, MW-14D
Tetrachloroethene	1	190 J	MW-1S, MW-3S, MW-4SR, **MW-5S**, MW-7S	5,000	MW-9, MW-16DR, **MW-17DR**
1,1,2,2-Tetrachloroethane	2	NA	NA	920 J	**MW-5D**, MW-13DR, MW-17DR
Toluene	1,000	110,000	**MW-2S**	12,000	**MW-10D**, MW-14D, MW-15D
1,1,1-Trichloroethane	30	12,000	**MW-2S**, MW-3S	4,900	MW-1D, MW-2D, **MW-10D**, MW-13DR, MW-14D, MW-15D, MW-17DR
Trichloroethene	1	810 J	MW-1S, **MW-2S**, MW-3S, MW-4SR, MW-5S, MW-6S, MW-13S	500	MW-3D, MW-6D, MW-9, MW-12D, **MW-17DR**
Vinyl chloride	5	3,000 J	MW-1S, **MW-2S**, MW-3S, MW-4SR, MW-5S	20,000	MW-1D, MW-2D, MW-3D, MW-4D, MW-5D, MW-6D, MW-7D, MW-9, **MW-10D**, MW-12D, MW-13DR, MW-15D, MW-17DR
Total Xylenes	40	26,000	**MW-2S**	2,000	MW-2D, **MW-14D**, MW-15D

[1] Groundwater samples collected in April 2004, except for monitoring well MW-2S samples (July 2003); and MW-9, MW-10D, MW-11A/B, MW-12S/D, MW-13S/DR, MW-14D, MW-15D, MW-16DR, and MW-17DR samples (October 2003).

[2] Well locations where maximum detected concentrations were found are in **bold.**

NA indicates that the constituent was not detected in the applicable water-bearing unit.

J = Estimated result. Result is less than the reporting limit.

Attachment 2 - Summary of Media Impacts Table
Safety-Kleen Linden

	Gw	**Air (indoors)**	**Surf soil**	**Surf water**	**Sed**	**Sub surf soil**	**Air (outdoors)**	**Corrective action measure**	**Key contaminants**
SWMU 1	No	No	Yes	No	No	Yes	No	Installation of asphalt cap	VOCs, SVOCs
SWMU 2	No	No	Yes	No	No	No	No	Backfilling and regrading of surface impoundment; covering with clean crushed stone	Metals, PCBs
SWMU 3	No	No	Yes	No	No	Yes	No	Installation of asphalt cap	VOCs, PCBs
SWMU 4	No	No	No	No	No	No	No	None	None
SWMU 5	No	No	Yes	No	No	Yes	No	Excavation and off-site disposed of soil; installation of asphalt cap	VOCs
AOC 6	No	No	Yes	No	No	No	No	Installation of asphalt cap	VOCs
AOC 7	No	No	Yes	No	No	Yes	No	Removal of up to three feet of soil; Installation of asphalt cap	VOCs, metals, PCBs
AOC 8	No	No	Yes	No	No	Yes	No	Installation of impermeable cover over former ballast materials	Metals
AOC 9	No	No	Yes	No	No	Yes	No	Installation of asphalt cap	Metals, PCBs
AOC 10	No	No	Yes	No	No	Yes	No	Installation of asphalt cap	VOCs, SVOCs
Site-Wide Groundwater	Yes	No	No	No	No	No	No	Groundwater pump and treat system and groundwater extraction well	VOCs

[1] The NJ NRDCSCC and the NJ IGWSCC were selected as the appropriate soil screening criteria because the Safety-Kleen Linden Recycle Center is still an active industrial facility.

[2] "Contamination" and "contaminated" describe media containing contaminants (in any form, NAPL and/or dissolved, vapors, or solids, that are subject to RCRA) in concentrations in excess of appropriately protective risk-based "levels" (for the media, that identify risks within the acceptable risk range).

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

[4] Indirect Pathway/Receptor (e.g., vegetables, fruits, crops, meat and dairy products, fish, shellfish)

[5] If there is any question on whether the identified exposures are "significant" (i.e., potentially "unacceptable") consult a Human Health Risk Assessment specialist with appropriate education, training, and experience.