DOCUMENTATION OF ENVIRONMENTAL INDICATOR DETERMINATION

Interim Final 2/5/99

RCRA Corrective Action
Environmental Indicator (EI) RCRIS code (CA725)

Current Human Exposures Under Control

Facility Name:	Solutia Inc.
Facility Address:	500 Monsanto Ave., Sauget, IL 62206-1198
Facility EPA ID #:	ILD 000 802 702

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

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

____ If no - re-evaluate existing data, or

____ if data are not available skip to #6 and enter"IN" (more information needed) status code.

BACKGROUND

Definition of Environmental Indicators (for the RCRA Corrective Action)

Environmental Indicators (EI) are measures being used by the RCRA Corrective Action program to go beyond programmatic activity measures (e.g., reports received and approved, etc.) to track changes in the quality of the environment. The two EI 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 objective of the RCRA Corrective Action program the EI 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 are for reasonably expected human exposures under current land- and groundwater-use conditions ONLY, and do 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 Determinations status codes should remain in 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).

2. Are groundwater, soil, surface water, sediments, or air **media** known or reasonably suspected to be **"contaminated"**[1] 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)?

	Yes	No	?	Rationale / Key Contaminants
Groundwater	X			Numerous VOCs and SVOCs (see table below)
Air (indoors)[2]	X			VOCs evaluated in air quality sampling program; VOCs in soil vapor exceed target concentrations in seven on-site areas.
Air (outdoors)	X			VOCs evaluated in air quality sampling program; VOCs in subsurface soil vapor exceed OSHA PELs at some locations.
Surface Soil (e.g., <2 ft)	X			Benzene, chlorobenzene, dichlorobenzenes, trichlorobenzene, and PCBs. All contaminated soil at the facility covered with asphalt, concrete, or a minimum of 1-foot gravel.
Subsrf. Soil (e.g., >2 ft)	X			Benzene, chlorobenzene, dichlorobenzenes, trichlorobenzene, and PCBs. Contaminated water table occasionally within 10-feet of ground surface.
Surface Water		X		Mississippi River currently protected by a three-well extraction and slurry wall system.
Sediment		X		Mississippi River currently protected by a three-well extraction and slurry wall system.

____ 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 and Reference(s):

---

[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 appropriately protective risk-based "levels" (for the media, that identify risks within the acceptable risk range).

[2] Recent evidence (from the Colorado Dept. 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.

References:

- *Administrative Order on Consent*. U.S. EPA Docket No., R8H-5-00-003. May 3, 2000.
- *Description of Current Conditions, W.G. Krummrich Plant, Sauget, Illinois*. August 1, 2000.
- *Description of Current Conditions, W.G. Krummrich Plant, Sauget, Illinois, Volumes 2 and 3*. September 1, 2000.
- February 9, 2001, letter from EPA to Solutia providing and interpreting sediment sampling results for the October/November 2000 sampling event in the Mississippi River.
- *Ecological Risk Assessment for WG Krummrich Plant, Sauget, St. Clair County, Illinois*. June 1, 2001. Menzie-Cura & Associates, Inc.
- November 30, 2001, letter from Solutia to EPA providing a design for a well extraction system to be placed at the edge of the Mississippi River on Solutia property to capture contaminated groundwater from the Krummrich Plant and other Superfund areas.
- *Groundwater Discharge Control System, W.G. Krummrich, Sauget, Illinois, Design Basis and Response to Comments*. January 28, 2002.
- *Administrative Order for Remedial Design and Interim Remedial Action.* U.S. EPA Docket No. V-W-02-C-716. September 30, 2002.
- October 29, 2002, letter from Solutia to EPA providing the conceptual site model for the human health environmental indicator.
- November 18, 2002, e-mail from EPA to Solutia providing comments on the conceptual site model.
- *Focused Feasibility Study Volume 1, Interim Groundwater Remedy, Sauget Area 2 Sites O, Q, R, and S.* July 3, 2003.
- *CA 725 Current Human Exposures Under Control, W.G. Krummrich Plant, Sauget, IL, Volumes I, II, and III*. August 2003. URS Corporation.
- *Results of RCRA CA-725 Environmental Indicators Air Quality Sampling.* December 10, 2003. TRC Environmental Corporation.
- *CA 750 Groundwater Migration Control Addendum, W.G. Krummrich Plant, Sauget, Illinois*. April 19, 2004. Solutia Inc.

Rationale: **Groundwater** - A large groundwater contaminant plume containing VOCs and SVOCs is present beneath the entire facility and extends westward one-half mile to the Mississippi River. The plume is approximately 3,500-feet wide and 7,000-feet long. It is controlled at its westernmost extent, before it can discharge to the Mississippi River, by a slurry barrier wall and three-well extraction system. Collected groundwater is routed to the American Bottoms Regional Treatment Facility. Maximum contaminant concentrations detected in the plume at and from the facility and corresponding Illinois EPA TACO groundwater remediation objectives are:

Groundwater Contaminant	Maximum Concentration (ppb)	Illinois EPA TACO Groundwater Remediation Objective (ppb)
Volatile Organics		
Acetone	22,000	700
Benzene	1,600,000	5
Chlorobenzene	350,000	100
1,2-DCA	14,000	5
1,2-DCE	420	70
Ethylbenzene	29,000	700
Methylene chloride	680	5
4-methyl-2-pentanone	3,100	560
1,1,1-TCA	560	200
Toluene	71,000	100
Xylenes	150,000	10,000
Vinyl chloride	350	2
Semi-volatile Organics		
Aniline	62,000	23
4-chloroaniline	25,000	28
2-chlorophenol	540,000	35
Dichlorobenzenes	23,000,000	75
2,4-dichlorophenol	340,000	21
Methylphenols	280,000	350
2-nitroaniline	1,100	6.3
Nitrobenzene	14,000	3.5
Naphthalene	86,000	140
Pentachlorophenol	18,000	1
Phenol	1,100,000	100
1,2,4-trichlorobenzene	1,400	70
2,4,6-trichlorophenol	2,700	10

Air (indoors and outdoors) - Indoor air, ambient air, and soil vapor were sampled from March 31 through April 2, 2003, and again from August 19 through September 6, 2003. Indoor air sampled from four buildings was found to contain benzene, chlorobenzene, dichlorobenzenes, methylene chloride, MIBK, MEK, 1,1,1-TCA, and acetone. However, OSHA PELs were not exceeded during either sampling event.

Ambient air sampling during both sampling episodes detected methylene chloride, chlorobenzene, acetone, 1,4-dichlorobenzene, and 1,1,1-trichloroethane. None of the ambient air concentrations exceeded a HQ of 1 or 10^{-4} cancer risk under a worker exposure scenario.

Soil vapor was sampled approximately 5-feet below the surface at 18 locations. MIBK, 1,1,1-TCA, PCE, vinyl chloride, MEK, TCE, carbon disulfide, cis-1,2-DCE, chlorobenzene, dichlorobenzenes, chloroform, benzene, acetone, nitrobenzene, and aniline were detected. Two sample locations (SVP-10 and SVP-14) at the chlorobenzene production area and at the ketone manufacturing area, contained significant MIBK, benzene, chlorobenzene, and 1,4-dichlorobenzene contamination. Benzene concentrations were 680 and 1100 ppbv (OSHA PEL = 1000 ppbv); MIBK was as high as 72,000ppbv (OSHA PEL = 200,000 ppbv); chlorobenzene was as high as 31,000 ppbv (OSHA PEL = 75,000 ppbv); and 1,4-dichlorobenzene was as high as 14,000 ppbv (OSHA PEL = 10,000 ppbv).

The target shallow soil gas concentrations for soil vapor samples were exceeded for MIBK, chlorobenzene, dichlorobenzenes, and benzene at the chlorobenzene production area and at the ketone manufacturing area. The target concentrations are screening levels for the potential intrusion of the compounds into overlying or immediately adjacent buildings.

No benzene was detected in soil vapor along the benzene pipeline from the river to the facility. None or only trace amounts of contaminants were detected in soil vapor at four locations at the facility perimeter indicating little, if any, off-site soil vapor contamination.

Surface and Subsurface Soil - Approximately 70% (52 of 76) of the on-site soil boring sample locations from closure investigations have significant organic contamination at some depth (*Description of Current Conditions*, September 1, 2000, Appendices 16 and 17, and Figure 20). Closure investigations show that the Illinois EPA Tier 1 TACO Industrial-Commercial Criteria for soil are exceeded in the surface (0' - 3') and subsurface (3' - 10') soil at 34 boring locations for:

Benzene - inhalation exposure route for industrial/commercial and construction worker scenario and ingestion exposure route for industrial/commercial scenario;

Chlorobenzene - inhalation exposure route for industrial/commercial and construction worker scenario and ingestion exposure route for construction worker scenario;

1,2 and 1,4-dichlorobenzene - inhalation exposure route for industrial/commercial and construction worker scenario;

1,2,4-trichlorobenzene - inhalation exposure route for industrial/commercial and construction worker scenario and ingestion exposure route for construction worker scenario; and

PCBs - ingestion exposure route for industrial/commercial and construction worker scenario.

Surface water and sediment - The only surface water at or near the facility is the Mississippi River which lies approximately one-half mile west of the Lot F portion of the facility. Site contaminants were historically detected in the river water and sandy sediment approximately 150' from the east riverbank located just west of Lot H (CERCLA Site R). The contamination was determined to pose an unacceptable ecological risk.

Pursuant to the CERCLA Administrative Order for Remedial Design and Interim Remedial Action, a three-well extraction system was installed in the summer of 2003 on Lot H just above the east riverbank of the Mississippi River. Required slurry wall construction began in September 2003 and is partially completed. The groundwater barrier/control system is currently maintaining hydraulic control of the groundwater, effectively capturing the contaminant plume before it discharges to the Mississippi River. Captured groundwater is routed and treated at the American Bottoms Regional Treatment Facility and discharged to the Mississippi River pursuant to an NPDES permit.

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	Trespassers	Recreation	Food[3]
Groundwater	No	No	No	Yes	No	No	No
Air (indoors)	No	Yes	No	No	No	No	No
Air (outdoors)	No	Yes	No	Yes	No	No	No
Soil (surface, e.g., <2 ft)	No	No	No	Yes	No	No	No
Soil (subsurface, e.g., >2 ft)	No	No	No	Yes	No	No	No
Surface water	No	No	No	No	No	No	No
Sediment	No	No	No	No	No	No	Yes

Instructions 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 ("___"). 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.

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

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

Rationale and Reference(s):

References:

- *Administrative Order on Consent*. U.S. EPA Docket No., R8H-5-00-003. May 3, 2000.
- *Description of Current Conditions, W.G. Krummrich Plant, Sauget, Illinois*. August 1, 2000.
- *Description of Current Conditions, W.G. Krummrich Plant, Sauget, Illinois, Volumes 2 and 3*. September 1, 2000.
- November 30, 2001, letter from Solutia to EPA providing a design for a well extraction system to be placed at the edge of the Mississippi River on Solutia property to capture contaminated groundwater from the Krummrich Plant and other Superfund areas.
- *Groundwater Discharge Control System, W.G. Krummrich, Sauget, Illinois, Design Basis and Response to Comments*. January 28, 2002.
- *Administrative Order for Remedial Design and Interim Remedial Action.* U.S. EPA Docket No. V-W-02-C-716. September 30, 2002.
- October 29, 2002, letter from Solutia to EPA providing the conceptual site model for the human health environmental indicator.
- November 18, 2002, e-mail from EPA to Solutia providing comments on the conceptual site model.
- *Focused Feasibility Study Volume 1, Interim Groundwater Remedy, Sauget Area 2 Sites O, Q, R, and S.* July 3, 2003.
- *CA 725 Current Human Exposures Under Control, W.G. Krummrich Plant, Sauget, IL, Volumes I, II, and III*. August 2003. URS Corporation.
- October 13, 2003, letter from Solutia to EPA providing a map where augmentation of gravel thickness is necessary to ensure a minimum 12-inch gravel layer.
- *Results of RCRA CA-725 Environmental Indicators Air Quality Sampling.* December 10, 2003. TRC Environmental Corporation.
- *Gravel Addition Implementation and Confirmation, Solutia Inc., W.G. Krummrich Facility, Sauget, IL*. December 10, 2003. URS Corporation.
- *Human Health Risk Assessment, Sauget Area 2, Sauget, Illinois, Volumes I and II.* August 31, 2003. ENSR Corporation.
- *CA 750 Groundwater Migration Control Addendum, W.G. Krummrich Plant, Sauget, Illinois*. April 19, 2004. Solutia Inc.
- April 19, 2004, letter from Solutia to EPA providing additional information on the risk analysis performed for the recreational fisher and trespassing teenager exposure scenarios.

Rationale: **Groundwater** - The groundwater contaminant plume is controlled by a slurry wall and captured by a system of three extraction wells. The groundwater barrier/control system currently captures contaminants before they discharge to the Mississippi River. The wells and barrier wall maintain hydraulic control of the plume. Upgradient of the extraction wells, the plume underlies only open land and industrial facilities. There are no residences in the area of the groundwater contaminant plume.

The facility contaminant plume commingles with other contaminant plumes from surrounding industries and historical disposal areas. There are no known water wells located within the plume boundary; contaminated groundwater is not used at or near the facility. Potable water is supplied to area industry and residents by a public water supply system that obtains its water from a surface water intake in the Mississippi River located upstream of the facility.

Because of heavy industry and widespread groundwater contamination, the Villages of Cahokia and Sauget

have local groundwater ordinances enacted in June 2000, and October 1999, respectively, that prohibit the use of groundwater as a potable water supply by the installation or use of potable water supply wells or by any other method. "Potable water" is defined in the ordinances as any water used for human or domestic consumption, including, but not limited to, water used for drinking, bathing, swimming, washing dishes, garden or lawn watering, or preparing foods.

The interim groundwater remedy and local ordinances eliminate the complete pathway between groundwater contamination and human receptors. Exposures are not reasonably expected under the current land and groundwater use conditions.

The water table is seasonally present within 10-feet or less of the ground surface at the facility. Significant concentrations of benzene (up to 1,600 ppm), chlorobenzene (up to 350 ppm), and dichlorobenzenes (up to 40,000 ppm) are present in shallow water table beneath the facility. Construction workers may come into contact with contaminated groundwater when working in deep excavations (10-feet +) involving buried piping at the facility. The exposure pathway is potentially complete for construction workers.

Air (indoors and outdoors) - Indoor air exposures are complete based on the air quality sampling program. VOCs were detected in four buildings but were below the OSHA PELs. Soil vapor target gas concentrations were exceeded, indicating that intrusion of significant VOC contamination into buildings is possible.

Outdoor air exposures are complete for construction workers based on the air quality sampling program. Specifically, the OSHA PEL for benzene was exceeded in soil vapor at 5-feet bgs at the ketone manufacturing area and the OSHA PEL for 1,4-dichlorobenzene was exceeded in soil vapor at 5-feet bgs at the chlorobenzene production area. Construction workers working in confined spaces underground or in deep excavations may be exposed to unacceptable levels of benzene and/or 1,4-dichlorobenzene.

Outdoor air exposure to workers is complete based on ambient air data and the potential for volatilization of VOCs from near-surface groundwater to air. On-site ambient air monitoring detected five VOCs. Sources of VOCs in ambient air are incidental releases from production units and volatilization of VOCs from near-surface groundwater that is heavily contaminated with VOCs.

Surface and subsurface soil - Most of the facility where contaminated surface soil has been found is overlain by buildings, roads, and industrial process units. Therefore, the surface soil is overlain by concrete or asphalt. The remainder of the facility is overlain by gravel. The depth of gravel was measured and amended to ensure that gravel thickness was a minimum of 12-inches to prevent incidental exposure. Placement of additional gravel and in some areas, asphaltic concrete, began on November 3, 2003 and was completed on December 5, 2003. Physical barriers over the surface soil eliminate the complete pathway between surface soil and human receptors. Exposures are not reasonably expected under the current land and groundwater use conditions.

Construction workers may come into contact with contaminated surface and subsurface soil when working in excavations that may be required at the facility to repair buried piping. These soils have locally elevated concentrations of benzene, chlorobenzene, dichlorobenzenes, trichlorobenzene, and PCBs that exceed inhalation and ingestion exposure routes for an industrial scenario. The exposure pathway is potentially complete for construction workers.

Surface Water and sediment - The pathway between contaminated groundwater and surface water/sediment in the Mississippi River has been minimized by the installation of the three-well extraction and barrier wall system along the eastern riverbank. The groundwaterbarrier/control system is designed to collect contaminated groundwater before it can discharge to the Mississippi River. The partially-completed slurry wall is expected to be completed in November 2004.

Contaminated river sediment from the historical discharge of contaminated groundwater has been identified. A baseline human health risk assessment was performed to assess risks from contaminated sediment and fish consumption under a recreational fisher and trespassing teenager scenario.

4. Can the **exposures** from any of the complete pathways identified in #3 be reasonably expected to be **"significant"**[4] (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 can not 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 and Reference(s):

References:

- *Description of Current Conditions, W.G. Krummrich Plant, Sauget, Illinois*. August 1, 2000.
- *Description of Current Conditions, W.G. Krummrich Plant, Sauget, Illinois, Volumes 2 and 3*. September 1, 2000.
- October 29, 2002, letter from Solutia to EPA providing the conceptual site model for the human health environmental indicator.
- November 18, 2002, e-mail from EPA to Solutia providing comments on the conceptual site model.
- *CA 725 Current Human Exposures Under Control, W.G. Krummrich Plant, Sauget, IL, Volumes I, II, and III*. August 2003. URS Corporation.
- *Results of RCRA CA-725 Environmental Indicators Air Quality Sampling.* December 10, 2003. TRC Environmental Corporation.
- *Human Health Risk Assessment, Sauget Area 2, Sauget, Illinois, Volumes I and II.* August 31, 2003. ENSR Corporation.
- April 19, 2004, letter from Solutia to EPA providing additional information on the risk analysis performed

[4] 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.

for the recreational fisher and trespassing teenager exposure scenarios.

Rationale:

Groundwater - Risks posed by exposure to construction workers who may come into contact with contaminated groundwater during deep intrusive activities is controlled by an excavation permit program. An excavation permit must be obtained before any intrusive activities are allowed at the facility. Solutia's Environmental, Safety, and Health Department issues a written permit for any intrusive work based on all available subsurface information, including historical groundwater data. A written excavation procedure (revised July 2003) is provided in Volume III, Attachment D of the *CA 725 Current Human Exposures Under Control, W.G. Krummrich Plant, Sauget, IL,* (August 2003). Additional sampling and analyses may be conducted to assess the potential hazards. The permit may require workers to wear certain personal protective equipment and conduct monitoring (almost always required) based on the conditions expected to be encountered in the excavation area. Workers are also required to have the appropriate health and safety training and are familiar with hazard recognition and response measures.

Air (indoors and outdoors) - Although indoor air exposures are occurring, exposures are not expected to be significant. For example, the air quality sampling program did not detect any VOC concentrations in buildings that exceeded their applicable OSHA PEL. Also, any vapor intrusion into on-site buildings is not expected to be significant because of their type of construction and ventilation systems.

The majority of enclosed buildings on-site are plant control room structures.. The buildings have all been replaced over the past several years and the new structures have elevated floor slabs (2-feet above surrounding grade). In addition, the buildings are equipped with high volume filtered air exchange (HVAC) systems that maintain a small positive pressure in the building. Details of the foundation and HVAC systems are provided in Attachment B of the *CA 725 Current Human Exposures Under Control, W.G. Krummrich Plant, Sauget, IL, Volumes II* (August 2003). Because of this design, its is unlikely that these buildings would be affected by the intrusion of organic vapors from subsurface sources.

The four older plant buildings that were sampled do not have the high volume air exchange present in the newer buildings and they are routinely occupied by workers. Two of the buildings are also located in areas of heavily impacted groundwater and one building has a basement. Indoor air samples were analyzed for VOCs and SVOCs; no concentrations exceeded their OSHA PEL.

Soil vapor exceeded target (screening) concentrations at five locations. This screening process is only relevant as an indicator of possible intrusion into buildings. Only one sample location was located in the immediate proximity to a building. The location, SPV-6, is immediately across the street from the BK office building and had PCE above its screening level. However, PCE was not detected in the indoor air samples.

Although outdoor air exposures may occur under a worker and construction worker scenario, exposures are not expected to be significant[5]. Risks posed by exposure to construction workers who may encounter contaminated soil vapor during deep intrusive activities is controlled by an excavation permit program. An excavation permit must be obtained before any intrusive activities are allowed at the facility. Solutia's Environmental, Safety, and Health Department issues a written permit for any intrusive work based on all

[5] Because of the dynamic nature of VOCs in ambient air due to varying site operations, weather, seasons, groundwater levels, groundwater contaminant concentrations, etc., it is imperative that an ambient air monitoring program be developed and implemented to assure that the data and assumptions provided in this determination are correct. Solutia must continue to demonstrate that ambient air exposure is insignificant through continual evaluation of this determination based on future ambient air data.

available subsurface information, including data from the air quality sampling program. A written excavation procedure (revised July 2003) is provided in Volume III, Attachment D of the *CA 725 Current Human Exposures Under Control, W.G. Krummrich Plant, Sauget, IL,* (August 2003). Additional sampling and analyses may be conducted to assess the potential hazards. The permit may require workers to wear certain personal protective equipment and conduct monitoring (almost always required) based on the conditions expected to be encountered in the excavation area. Workers are also required to have the appropriate health and safety training and are familiar with hazard recognition and response measures.

Significant VOC concentrations were detected in soil vapor at sample locations SVP-13A, SVP-7A, SVP-14, and SVP-10. An ambient air sample was taken at SVP-13A on August 20, 2003. Acetone, chlorobenzene, and 1,1,1-TCA were detected but were calculated to pose an insignificant risk under an industrial scenario. In addition, this area is isolated with no production units or buildings nearby where workers might be exposed.

Location SVP-7A is at the CCB building where the firehouse and maintenance shop are located. Acetone, benzene, chlorobenzene, and methylene chloride were detected in indoor air but were well below the corresponding OSHA PEL. Outdoor air at the building intake detected only trace (<4 ppbv) amounts of the VOCs. An ambient air sample located approximately 1000' to the east detected only trace amounts of acetone, chlorobenzene, and 1,4-dichlorobenzene. VOCs in ambient air pose an insignificant risk in this area.

The area at SVP-14 is overlain by tanks, asphalt, and concrete. The nearest gravel surface is approximately 150' to the north and east. The presence of asphalt and concrete is expected to minimize or prevent worker exposure to the release of VOCs from soil vapor into ambient air.

The area at SVP-10 is covered with at least 12" of gravel. The area immediately to the west and north is covered by roadways or production areas paved with asphalt and concrete. The closest worker exposure point to the gravel area and SVP-10 is approximately 100'. The working area is paved and expected to minimize or prevent worker exposure to the release of VOCs from soil vapor into ambient air. OSHA monitoring is performed at the chlorobenzene production area near SVP-10. Personnel monitoring has not detected any exceedances of OSHA PELs.

Surface and subsurface soil - Risks posed by exposure to construction workers who come into contact with contaminated surface and subsurface soil is controlled by an excavation permit program. An excavation permit must be obtained before any intrusive activities are allowed at the facility. Solutia's Environmental, Safety, and Health Department issues a written permit for any intrusive work based on all available subsurface information, including recent closure and RFI data. A written excavation procedure (revised July 2003) is provided in Volume III, Attachment D of the *CA 725 Current Human Exposures Under Control, W.G. Krummrich Plant, Sauget, IL,* (August 2003). Additional sampling and analyses may be conducted to assess the potential hazards. The permit may require workers to wear certain personal protective equipment and conduct monitoring (almost always required) based on the conditions expected to be encountered in the excavation area. Workers are also required to have the appropriate health and safety training and are familiar with hazard recognition and response measures.

Sediment - The baseline human health risk assessment calculated the potential risks and hazard index (HI) for the Mississippi River recreational fisher and trespassing teenager scenarios. They are within or below the target risk range of 10^{-6} and 10^{-4} and below the target HI of 1.

In addition, Illinois has issued a fish advisory for the consumption of carp and channel catfish for the entire Mississippi River. In the area of the former discharge of contaminated groundwater to the Mississippi River, access to potentially contaminated sediment is limited. A locked gate and fencing prevents access to Site R

and the river. A rip rap revetment and steep slope further restricts access to the river bank below Site R. High river velocity also limits access to the water. In conclusion, exposures to the recreational fisher and trespassing teenager are minimized due to access restrictions and a fish advisory, and potential exposures do not pose an unacceptable risk.

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

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

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

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

Rationale and Reference(s):

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 Solutia Inc. facility, EPA ID # ILD 000 802 702, located at Sauget, Illinois 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 (signature) _____ Date May 26, 2004
(print) Kenneth S. Bardo
(title) Environmental Scientist

Supervisor (signature) _____ Date _____
(print) George Hamper
(title) Section Chief
(EPA Region or State) EPA Region 5

Locations where References may be found:

RCRA 7th Floor File Room, EPA Region 5 Office, 77 W. Jackson Blvd., Chicago, IL

Contact telephone and e-mail numbers

(name) Kenneth S. Bardo
(phone #) (312) 886-7566
(e-mail) bardo.kenneth@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.