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: ____**Risdon Corporation**_____
Facility Address: ____**Old Newtown Road Danbury CT**_____
Facility EPA ID #: ____**CTD001168558**_____

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_	___	___	__**volatile organics, inorganics**_____
Air (indoors)[2]	_X_	___	___	___**volatile organics**_____
Surface Soil (e.g., <2 ft)	___	_X_	___	_____
Surface Water	___	_X_	___	_____
Sediment	___	_X_	___	_____
Subsurface Soil (e.g., >2 ft)	___	_X_	___	_____
Air (outdoors)	___	_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 and Reference(s) **Groundwater:** The area is classified as a GB area with designated uses defined as "Industrial process water and cooling waters, base-flow for hydraulically-connected surface water bodies; presumed not suitable for human consumption without treatment." Sampling indicates that cyanide, beryllium, copper, nickel, silver and zinc were detected in the groundwater samples in excess of the CT Department of Environmental Protection (CTDEP) Remediation Standard Regulations (RSRs) Surface Water Protection Criteria (SWPC). Volatile organic constituents of concern (COC) results were screened against the CTDEP SWPC and Volatilization Criteria. Exceedance of these criteria were noted for 1,1-DCE, PCE, 1,1,1-TCA, and TCE.

Indoor air: Indoor air sampling at two off-site residential properties was conducted. The results were compared to te CTDEP RSR Target Indoor Air Concentrations (current and proposed [March 2003] revisions). The results indicated that concentrations of 1,1-DCE were detected in excess of the current standards but not the proposed standards. TCE was detected in one home in excess of both current and proposed standards and in one home proposed standard only. Vinyl chloride was detected in one home in excess of the current but not the proposed standard.

Surface water and sediments: Surface water and sediment sampling has not been conducted in the Still River adjacent to the facility. Based on concentration of COCs detected in groundwater on site, VOCs and metals in surface water proper are not expected to be contaminated above appropriately protective risk based levels (CTDEP RSRs Surface Water Protection Criteria, EPA National Primary Drinking Water Standards Maximum Contaminant Levels (MCLs) and the CTDEP GA Groundwater Protection Criteria (GWPC)). Please refer to question #4 for rationale.

Footnotes:
[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.

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	No			No
Air (indoors)	Yes	Yes	No				
Soil (surface, e.g., <2 ft)							
Surface Water	No	No			No	No	No
Sediment	No	No			No	No	No
Soil (subsurface e.g., >2 ft)							
Air (outdoors)							

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.

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

Rationale and Reference(s): **Indoor Air**: The vapor intrusion pathway from impacted groundwater to indoor air is a likely pathway for both residents and workers given that:

(1) concentrations of VOCs were detected in on-property and off-property groundwater (residential and commercial/industrial properties), soil gas (residential and commercial/industrial properties), and sub/slab soil gas beneath the residences and Risdon Facility building; and
(2) Site COCs (concentrations of contaminants detected on the Risdon facility) were detected in indoor air samples collected from the two off-property residences and decreasing indoor air concentrations of TCE from the basement to the upper floors were detected.

Refer to the Off-Property Soil Vapor and Groundwater Sampling Report (April 18, 2002) and the Environmental Indicator CA725 Vapor Intrusion to Indoor Air Pathway from Groundwater and Soils (May 2003).

Surface water/sediment: Access to the Still River in the vicinity of facility is not physically restricted. Trespassers, recreators and residents can access the river.

Footnotes:

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

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): **Indoor Air Residential**: A September 2003 Health Consultation has determined that there is no immediate risk but that a pathway exists and should be eliminated within a few years. The May 2003 EI CA 725 Vapor Intrusion Pathway Report also concluded that based on the information collected to date, a vapor intrusion pathway is present at the two residences; however, there is some uncertainty associated with the potential influences/contribution from background or other sources to the indoor air concentrations. Risdon will work with EPA and the CT Department of Public Health (DPH) to ensure that the appropriate measures are taken to address the vapor intrusion pathway within one year of the signature date of this EI. If the pathway has not been eliminated within one year of the signature date of this EI, the determination will be revisited to evaluate if a change to an "IN" or "NO" determination would be appropriate. Refer to the September 2003 CT DPH Health Consult, the Off-Property Soil Vapor and Groundwater Sampling Report (April 18, 2002) and the Environmental Indicator CA725 Vapor Intrusion to Indoor Air Pathway from Groundwater and Soils (May 2003).

Indoor Air Industrial/commercial: As part of the entrance/access agreement process in order to collect soil vapor and groundwater samples on these adjacent commercial/industrial properties, the property owners were notified and made aware of the investigation and remediation activities being conducted on the Risdon facility and the need to conduct sampling on their property. All detected concentrations of VOCs in soil vapor on these properties were well below their respective OSHA PELs and below the CTDEP Remediation Standard Regulation Industrial/Commercial Volatilization Criteria. Refer to the Off-Property Soil Vapor and Groundwater Sampling Report (April 18, 2002) and the July 30, 2003 EI CA725 Vapor Intrusion Pathway Evaluation and Work Plan - On the Facility.

Surface water and sediment: The Still River is classified by the State as a Class B river, which means that it is not used for drinking water supply and can be used for agricultural or industrial supply, recreational uses, and fish and wildlife habitat. Site-specific surveys of the river in the vicinity of the Risdon facility have been conducted in the past and more recently on September 3, 2003. Based on information discussed below, the river, in the vicinity of the facility, flows through a developed area consisting of industrial and residential properties and appears to have limited use. The CTDEP Boaters

guide shows no listing for public boat launches on the Still River and based on visual inspections there were limited access points for boats. Given the narrowness and shallow depth of the river, only smaller vessels (i.e., canoes, etc.) could navigate the river at times of high water. Visual inspection of the river in the vicinity of Old Newtown Road showed no signs of swimming such as beach areas, chairs on the banks, rope swings, or fishing activity such as worn paths along the banks or fishing line and other discarded fishing equipment. According to the CTDEP, the Still River is stocked with trout from Eagle Street in Danbury downstream to "the town linear park." This area is approximately 7 tenths of a mile downstream from the point at which the Still River crosses Old Newtown Road. Further indication of fish stocking was found at the Still River Greenway located off Eagle Road (downstream). Informative signs at this location indicate that trout stocking is performed in the area and that habitat improvement projects have been completed along the Greenway.

With respect to concentrations of VOCs in groundwater potentially discharging into the River, groundwater samples have been collected from three off-property locations positioned hydraulically downgradient between the facility and the Still River (monitoring wells MW-14, MW-15, and a Geoprobe location on a downgradient property). The well locations are shown on attached Figure 1. Based on the last two years of groundwater data, the only VOC detected in excess of the CTDEP's Remediation Standard Regulations (RSRs) Surface Water Protection Criteria (SWPC) was trichloroethene (TCE), which was detected in the Geoprobe location at Old Newtown Road. TCE was detected at a concentration of 2,700 micrograms per liter (ug/l) at this location compared to a SWPC of 2,340 ug/l. In July 2003, three new groundwater extraction wells were installed along the downgradient property line of the facility in order to create a series of extraction wells along the downgradient perimeter of the facility (see attached Figure 1). Once operational, the enhanced remediation system will further reduce the concentrations of VOCs migrating off of the facility and potentially discharging into the Still River. Given the current VOC concentrations in groundwater upgradient of the Still River (either below or only slightly above SWPC), the installation of a property line hydraulic containment groundwater extraction system (further reducing the VOC concentrations migrating from the facility), and the limited uses of the Still River in the suspected groundwater plume discharge areas, potential current exposures in the river from the groundwater plume is not reasonably expected to be significant. SWPC criteria have been used when evaluating volatile organic constituents as these criteria reflect the tendency of many VOCs to have a low persistence in surface water and thus need concentrations much higher than MCLs to lead to an unacceptable exposure risk. This is certainly appropriate in the Still River which is not used as a drinking water supply.

For inorganics, the MCLs and the CTDEP GWPC, where no MCL exists, are used for screening. These screening criteria are expected to be conservative for the expected exposure since (1) this number can be adjusted at least an order of magnitude up in consideration of dilution prior to discharge to surface water and (2) only incidental ingestion of surface water and limited dermal contact would be the expected exposure based on the limited usage described in the previous paragraph.

- The maximum cyanide concentration detected is just below the MCL.
- The maximum copper concentration detected is an order of magnitude greater than the MCL.
- The maximum nickel concentration detected is an order of magnitude greater than the CTDEP GWPC.
- The maximum silver concentration detected is an order of magnitude less than the MCL.
- The maximum zinc concentration detected is just below the CT DEP GWPC.
- The maximum beryllium concentration detected is two times the CT DEP GWPC.

Refer to the Risdon Facility periodic groundwater monitoring reports.

Where exceedances of the MCL or GWPC have been observed, the approximate distance from the wells to the river is 600 feet, allowing sufficient distance for an order of magnitude dilution or more. Furthermore,

once operational, the enhanced remediation system may further reduce the concentrations of metals migrating off of the facility and potentially discharging into the Still River.

Ongoing ground water monitoring will allow us to detect if this situation changes and if the EI determination should be changed. It should be noted that there are exceedances of the Aquatic Life WQC (2 orders of magnitude for zinc) and SWPC that are driven by the Aquatic Life Criteria (2-3 orders of magnitude for copper) that will need further evaluation under final remedy.

Footnotes:

[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.

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 **Risdon Corporation** facility, EPA ID # **CTD001168558**, located on **Old Newtown Road in Danbury CT** 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) Carolyn J. Casey Date 9/22/03
(print) Carolyn J. Casey
(title) RCRA Facility Manager

Supervisor (signature) Matthew R. Hoagland Date 11/26/03
(print) Matthew R. Hoagland
(title) Section Chief, RCRA Corrective Action
(EPA Region or State) EPA New England

Locations where References may be found:

The references used in this submission can be found at the U.S. EPA Records Center located at 1 Congress Street Boston MA, at the Connecticut Department of Environmental Protection located at 79 Elm Street Hartford CT, and at the Risdon Corporation Facility located on Old Newtown Road in Danbury Connecticut.

Contact telephone and e-mail numbers

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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.