

US EPA ARCHIVE DOCUMENT

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: AMT, Inc. (Hypothetical Case Example) DRAFT 12/10/99
Facility Address: 1001 Riverside Dr., Derekwood, BE, USA
Facility EPA ID #: BED000000001

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? (**Note this determination is site-wide and includes all identified contaminated media on- and off-site as shown in AMT, Inc. Reports 1, 2, and 3**)

- 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).

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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)?

Media Contaminated?	<u>Yes</u>	<u>No</u>	<u>?</u>	<u>Rationale / Key Contaminants</u>
Groundwater	x			TCA, DCA, DCE, Cr+6, Ba, above levels of concern
Soil Vapor/Air(indoors)	x			Geoprobe samples verified above volatile gw plume
Surface Soil (e.g., <2 ft)	x			Chromium (Cr+6) in former staging area
Surface Water		x		Unlikely, plume does not contact surface water
Sediment		x		No evidence for surface runoff in visual inspection
Subsurf. Soil (e.g., >2 ft)	x			Metals beneath closed lagoon, organics beneath tank
Air (outdoors)		x		Health & Safety monitoring = low conc. & veg. cover

_____ 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):

<u>Media</u>	<u>Contaminant</u>	<u>Levels of Concern</u>	<u>Max. Detected</u>	<u>Times above Std</u>	<u>Location</u>
Groundwater	TCA	200 ug/l	1,900 ug/l	10	MW-5A
Groundwater	DCA	70 ug/l	460 ug/l	7	MW-17A
Groundwater	DCE	7 ug/l	120 ug/l	17	MW-12B
Groundwater	Cr ⁺⁶	100 ug/l	280 ug/l	3	MW-3A
Groundwater	Ba	1,000 ug/l	4,600 ug/l	5	MW-3A
Surface Soil	Cr ⁺⁶	230 mg/kg	634 mg/kg	3	B-4
Soil Vapor/Indoor Air	1,1-DCE	1 ppm*	3 ppm (TVOC)	3**	GP-2

*= CT State Soil Vapor Std (ppm by volume) for 1,1 DCE for Residential Land Uses

**=If we assume all vapors in TVOC measurement are 1,1-DCE

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.

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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) via	no*	no*	no*				
Soil (surface, e.g., <2 ft)	no*	yes*	no*	no*	no*	no*	no*
Surface Water	---	---			---	---	---
Sediment	---	---			---	---	---
Soil (subsurface e.g., >2 ft)				no*			no*
Air (outdoors)	---	---	---	---	---		

Instructions for Summary Exposure Pathway Evaluation Table: (* = see below description of response)

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): (*) brief description of basis for response for each pathway is provided below:

Residents via “contaminated”:

- Groundwater = no complete pathway- Monitoring in adjacent and down gradient home wells has not detected contamination, composite plume is shown to stop short of down gradient (e.g., Smith) home

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

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- wells, monitoring at plume and nearest home wells will continue (see AMT, Inc., Monitoring Plan A).
- Soil Vapors/Air (indoors)= no complete pathway- No residences are located above or adjacent to volatile contaminated soil or groundwater (AMT will notify agency if changes, see Exposure Controls Report).
 - Soil (surface)= no complete pathway- The only surface soil contamination ALC is on-site, and no residences are on-site.

Workers via “contaminated”:

- Groundwater = no complete pathway- There are no on-site wells for production or water supply (or other opportunities for production worker contact with contaminated groundwater).
- Soil Vapors/Air (indoors)= no complete pathway- The workplace indoor air is being monitored for the parameters in groundwater and soil, and have been shown to be within OSHA stds and workers are aware of the potential for indoor air contamination from volatile contaminated environmental media (e.g., subfloor).
- Soil (surface)=**yes, a complete pathway can be reasonably expected**- Landscaper/maintenance worker contact with on-site surface soil contamination **is expected (under current conditions)**.

Day-Care (or other non-production and possibly sensitive receptor uses (e.g., schools, hospitals, etc.)) via

- Groundwater = no complete pathway- No Day Care or other non-production (e.g., schools, hospitals, commercial, etc.) uses exist near groundwater contaminated (ALC), and these receptors are not expected to have other contact with contaminated groundwater.
- Soil Vapor/Air (indoors)= no complete pathway- No Day Care or other non-production (e.g., commercial or sensitive) uses exist above or in close proximity to volatile contaminated soil or groundwater.
- Soil (surface)= no complete pathway- No Day Care or other non-production (e.g., commercial or sensitive) uses exist in close proximity to surface soil contaminated ALC (AMT will notify agency if changes).

Construction (workers) via “contaminated”:

- Groundwater = no complete pathway- No construction in area of plume is planned or anticipated (see AMT letter that says this, and states they will notify us (regulators) if this changes).
- Soil (surface)= no complete pathway- No construction in area of contamination ALC is planned or anticipated (see AMT letter that says this, and states they will notify us (regulators) if this changes).
- Soil (subsurface)= no complete pathway- No construction in area of contaminated subsurface soil (ALC) is planned or anticipated (see AMT letter that says this, and states they will notify us (regulators) if this changes).

Trespassers via “contaminated”:

- Soil (surface)= no complete pathway- No trespassers are expected as facility is surrounded by well maintained fence and inspection of facility has not provided evidence of trespassers being present under current conditions (also see AMT, Inc., Site Report stating this to be the case).

Recreation (users) via “contaminated”:

- Soil (surface)= no complete pathway- Recreational users are not expected to come into contact with contamination since the facility is surrounded by well maintained fence and inspection of facility has not provided evidence of recreational users under current conditions (also see AMT Site Report stating this to be the case).

Food contaminated via:

- Groundwater = no complete pathway- No food items are produced/grown in contact with “contaminated” groundwater.
- Soil (surface)= no complete pathway- No food items are produced/grown in contact with “contaminated” surface soil (for example no foods are produced on-site and no off-site surface soil has been identified to be contaminated ALC).
- Soil (subsurface)= no complete pathway- No food items are produced/grown in contact with “contaminated” subsurface soil (for example no foods are produced on-site and no off-site surface soil has been identified to be “contaminated” above levels of concern (ALC)).

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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):

The only complete exposure pathway (contaminated media - receptor combination) was Surface soil and Worker.

While landscaping (grass mowing) and general maintenance workers do conducted work activities in the Staging Pile area of the site, and some contact (exposure) with the metallic contaminants in the surface soils in this area can reasonably be expected, these exposures are not be reasonably expected to be significant (i.e., potentially “unacceptable”) because; 1) the duration (and intensity) of these exposures is very low, and 2) the concentrations of contaminants present are only slightly above the standards (which are based on assumptions of much higher exposure durations). (*Note: a made up 500 ppm Cr+6 level of concern “std” is used for educational purposes).

The applicable concentration reference level “standard” for identifying unacceptable exposures is the State of Beryllium’s Industrial/Non-Residential surface soil risk-based concentration for Cr+6 is 500* ppm. This concentration “standard” is based on an assumption of an exposure duration of 8 hr/day, five days per week, for 50 weeks per year, over a 30 year career. The landscaping and maintenance activities that are permitted to take place in this area limited to no more than one hr/month and for no more than six months per year (Additionally, 1- workers are aware of this contamination and 2- required to wear protective dust masks while working in this area) (see AMT Report of Exposure Controls). Thus, because the concentrations of contaminants in the Staging Pile area are only slightly above the applicable concentrations standards and the exposures are far less than one percent of that assumed in derivation of standard concentration ($0.3\% = (6 \text{ hr/yr for actual exposure}) / (2000 \text{ hr/hr assumed in derivation of standard concentration})$) this qualitative/semi-quantitative analysis can be used to show that “no” response is appropriate since the exposures can not be reasonably expected to be significant (i.e., unacceptable).

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.

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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):

Note: The time and expense for a Quantitative Risk Assessment was not necessary to demonstrate, to a reasonable degree of certainty, that Current Human Exposures are Under Control at this facility, and therefore this question could be skipped.

Additional information/note [regarding potential new question?].

[5.5 Has the responsible party (RP) committed to conduct monitoring and/or make observations through time to verify that controls for human exposures remain adequate and effective?]

The RP has submitted explanations of the exposure controls in place along with statements of their intent to maintain the effectiveness of these controls through time (see AMT’s Exposure Controls submittal).

Additionally, this office will be sending letters periodically (e.g., annually) to remind the facility of their on-going and continuous responsibility to notify their regulatory authorities (State and EPA) of changes in conditions that could affect the accuracy of this determination and/or negatively impact human health or the environment.