

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: Ross Incineration
Facility Address: 36790 Giles Road, Grafton, OH 44044
Facility EPA ID #: OHD048415665

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?

Y_____ 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).

**Current Human Exposures Under Control
Environmental Indicator (EI) RCRIS code (CA725)**

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)?

	<u>Yes</u>	<u>No</u>	<u>?</u>	<u>Rationale / Key Contaminants</u>
Groundwater	Y			
Air (indoors) ²				
Surface Soil (e.g., <2 ft)	Y			
Surface Water	Y			
Sediment	Y			
Subsurf. Soil (e.g., >2 ft)	Y			
Air (outdoors)				

— 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.

Y 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):

THE DRAFT RFI REPORT INDICATES THAT ARSENIC IN BACKGROUND SOILS RANGES FROM 9.5 ppm TO 43 ppm, OR FROM ABOUT A factor of from 4 TO 18 TIMES HIGHER THAN THE corresponding RBSL VALUE.

SWMUA#1:

Review of relevant groundwater data indicates both Till Zone of saturation and Berea sandstone aquifer are not highly contaminated. (References OEPA - Interoffice communication to Ahmed Hawari from Rich Kurlich, dated 5/18/99)

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.

Current Human Exposures Under Control
Environmental Indicator (EI) RCRIS code (CA725)

Page 4

Underlying clay is known to be “confining” in nature. However, measured in MW-26 and MW-27A (Berea sandstone aquifer) exceed lead, arsenic and cadmium RBSL criteria for human health (i.e. Pb - 4 ug/L; Sb - 15 ug/L; As - .045 ug/L). Of these, only antimony exceeded an MCL value (i.e. 6 ug/L). Note that these were isolated “hits”, and that they are not necessarily indicative of a “plume” of contamination.

Review of soil data reveals high levels of contamination under Fill caps, definitely exceeding protective levels for numerous constituents including metals, BTEX and SVOC compounds. (See 12/95 RFI Draft Report.) Exceedances are also noted in Freshwater Pond, where sediment EDQLs for zinc, lead, arsenic and nickel were exceeded in sediment samples.

SWMUA #2:

Draft RFI report reveals Region 5 RBSLs (Appendix D of May 1998 - QA Policy) are exceeded in groundwater; GWP-13 - (As) 6.6 ug/L; GWP-15 (As) - 164 ug/L; SI-9 (Sb) - 19.7 ug/L; (As) 3.3 ug/L; SB-07 (water) - Pb - 15.2 ug/L; As - 28.5 ug/L; SB-04 (water) - As - 3.7 ug/L; Pb - 7.9 ug/L. Only lead was below pertinent MCL values. Note that these were isolated “hits” unconfirmed in additional sampling rounds and may not be indicative of a “plume” of contamination. The Till zone saturation groundwater may be migrating offsite, as in Volume 1 of the Draft RFI Report (p. 2-11) it is stated that groundwater in the northern portion of the site migrates toward the west. There is no data available for the Berea sandstone aquifer associated with the SWMUA #2.

SWMUA #3:

There have been sporadic hits in the Till zone of saturation. MCL/RBSL values were exceeded on one occasion in MW-19 for lead (21 ug/L), and one time for arsenic in MW-20B (190 ug/L). RBSLs were not exceeded in the Berea sandstone wells situated in this area. Sediment samples at SED-8 contained .330 ppm of Aroclor 1254, which exceeds an EDQL of 34.1 ug/kg for PCBs. Also, a sediment sample contained a lead concentration of 124 ppm which exceeded the EDQL of 31 ug/kg. EDQL sediment values were also exceeded for mercury, zinc and nickel. Carbon disulfide and lead were found in the Rainwater pond, providing slight indication that the pond may have been impacted by SWMUA #3.

There is apparent impact on SWMUA #3 soils, as the Industrial RBSL for arsenic was exceeded (2.4 ppm). Also, at SB-13, Aroclor 1254 was found at 3-5' depth at 2,909 ppb, while Aroclor 1254 was detected at a 1-3' depth at a 490 ppb concentration. At TP-02, Aroclor 1016 was found at a concentration of 830 ppb. In SB-12, at a depth below 11', lead was found at 1,540 ppm, and arsenic was detected at 47.7 ppm.

SWMUA#4:

This SWMUA includes SWMUs with high concentrations of contaminants, many of which exceed Industrial RBSLs. In some cases the concentrations are excessively high and near the surface or at shallow depth. Because so many contaminants were detected, there is potential for encountering cumulative risks, factoring in compounds & analytes which individually may be below the Industrial RBSLs. While evidence for soil contamination was found in nearly all sampled cases, of particular note, the following borings & data should be itemized. (All data cited here may be found in Volume II of the Draft 1995 RFI Report.) Contaminants were detected at concentrations exceeding Industrial RBSLs, or the VOCs criteria for protection of groundwater, or the inhalation pathway (or any or all of the above criteria). An especially hot zone exists in the vicinity of borings PRIS-01, SC-09 and PRO-02, an area within the open burning/drum storage area SWMU. Lead was detected at a concentration of 13,100 ppm & chromium was detected at 1,760 ppm at a depth of less than 5 feet in PRIS-01. Many BTEX VOCs and SVOCs were found in PRO-02 (e.g. xylenes - 400 ppm; toluene - 690 ppm, ethyl benzene - 80 ppm; bis (2-ethyl hexyl) phthalate - 240 ppm; benzo(a)pyrene - 850 ppb; naphthalene - 170 ppm; lead - 1,590 ppm.... not all of these detections exceeded an industrial RBSL, but their presence at such high concentrations is potentially problematic. In SC-09, at a 2 foot depth, similarly high concentrations were detected - toluene - 7,800 ppm; trans 1,2 dichloroethene - 5.8 ppm; ethyl benzene - 160 ppm; m+p cresol - 6.8 ppm; benzene - 51 ppm; PCBs - 44 ppm; chromium - 790 ppm; lead- 3,550

Current Human Exposures Under Control
Environmental Indicator (EI) RCRIS code (CA725)

Page 5

ppm; benzo(a)anthracene - 3.6 ppm; benzo(b)fluoranthene - 4.1 ppm. Excessively high concentrations of contaminants were also found in SC-09 at the 4 foot depth - bis(2-ethylhexyl) phthalate - 1,200 ppm; pentachlorophenol - 21 ppm; ethyl benzene - 380 ppm; toluene - 8,700 ppm; trichloroethene - 16 ppm; xylenes - 1,800 ppm; PCBs - 80 ppm; chromium - 1,100 ppm; lead- 5,040 ppm; zinc - 71,200 ppm; Another boring, SC-07, is also worthy of mention. At the 4 foot depth - xylenes - 480 ppm; At the 10 foot depth in SC-07, - trichloroethene - 23 ppm; xylenes - 1,400 ppm; 1,4 dioxane - 177 ppm; 4-methyl-2-pentanone - 240 ppm; ethyl benzene - 250 ppm; benzene - 10 ppm; bis(2-ethylhexyl)phthalate - 180 ppm. Then, at the surface (0.0' depth), in SC-08, very high concentrations of bis (2-ethylhexyl)phthalate - 180 ppm; PCBs- 38 ppm; lead - 1,770 ppm; were detected. This represents a direct exposure route to individuals passing by the area of the facility. There is insufficient room either to list or summarize all of the contamination noted in these borings. Suffice it to say that the answer to this question must be a "Yes".

**Current Human Exposures Under Control
Environmental Indicator (EI) RCRIS code (CA725)**

Page 6

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	_Y__	_N__	_N__	_N__			_Y_
Air (indoors)	__N_	_N__	_N__				
Soil (surface, e.g., <2 ft)	__N_	Y___	_N__	_Y__	_Y__	_N__	_N_
Surface Water	_Y__	Y___			_N__	_N__	_N_
Sediment	__N_	_N_			_N__	_N__	_N_
Soil (subsurface e.g., >2 ft)				_N__			_N_
Air (outdoors)	___	Y___	_N__	_N__	_N__		

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).

 Y 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):

SWMUA#1:

Per Ross’ Jan 7, 2000 letter, specific use of crops bordering the site will be assessed. There is a likelihood of

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

**Current Human Exposures Under Control
Environmental Indicator (EI) RCRIS code (CA725)**

Page 7

existence of pathways to maintenance workers who share risk potential with trespassers per Ross' Jan 7, 2000 letter to U.S. EPA. Inhalation of VOCs through fill liner from SWMUA #1 remains a distinct possibility.

SWMUA#2:

Residents may potentially be exposed to offsite migration of contaminated groundwater to west of facility. No controls in place to prevent offsite residential use of this groundwater.

SWMUA #3:

Slight possibility till zone may discharge arsenic from SWMUA #3 to Rainwater pond. Additional sampling needs to be conducted in this SWMUA. Potential releases from several individual SWMUs undergoing closure proceedings are not represented.

SWMUA#4:

Evidently yes. (See response to item #1 on this CA-725 form.)

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)?

_____ 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.”

_____ **IN** If unknown (for any complete pathway) - skip to #6 and enter “IN” status code

Rationale and Reference(s):

SWMUA #1:

Awaiting information from Scott McCready of Ross Incineration.

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.

**Current Human Exposures Under Control
Environmental Indicator (EI) RCRIS code (CA725)**

Page 8

SWMUA#2:

Till zone of saturation contaminated groundwater may be migrating offsite. No data available for groundwater quality underlying SWMUA #2 in Berea sandstone aquifer which migrates west. Rationale in the Workplan was that low permeability of soil would attenuate mobility of contaminants into groundwater.

Current Human Exposures Under Control
Environmental Indicator (EI) RCRIS code (CA725)

Page 9

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.

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

Rationale and Reference(s):

Scott McCready of Ross Incineration to provide information.

**Current Human Exposures Under Control
Environmental Indicator (EI) RCRIS code (CA725)**

Page 10

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):

 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 **Ross Incineration** facility, EPA ID # OHD048415665, located at 35716 Royalton Road, Grafton, Ohio, 44044, 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 IN - More information is needed to make a determination. ** (see note below)

** Note that responses to questions # 4 and 5 are pending upon responses from Scott McCready, who will endeavor to summarize the results of recent human health risk assessments & in light of previous comments received from the U.S. EPA. Until this information is received, this must be regarded as an Incomplete determination. To date, the human health risk assessment component of the draft RFI Report has yet to be concluded and resubmitted, although this reviewer's assessment of the draft RFI Report & data indicates that there is a great deal of contamination left in the soil. Note that several other sections of this form may be subject to change depending on the nature of information to be supplied by Mr. McCready. Furthermore, results from the Dawley Ditch sediment & surface water have yet to be submitted in final form.

Completed by (signature) _____ Date _____
 (print) _____
 (title) _____

Supervisor (signature) _____ Date _____
 (print) _____
 (title) _____
 (EPA Region or State) _____

Locations where References may be found:

Cubicle 08087 and Administrative File at 77 West Jackson, Chicago, IL 60604

Contact telephone and e-mail numbers

US EPA ARCHIVE DOCUMENT

**Current Human Exposures Under Control
Environmental Indicator (EI) RCRIS code (CA725)**

Page 11

(name) Allen Debus
(phone #) (312) 886-6186
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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.

DOCUMENTATION OF ENVIRONMENTAL INDICATOR DETERMINATION

Interim Final 2/5/99

**RCRA Corrective Action
Environmental Indicator (EI) RCRIS code (CA750)**

Migration of Contaminated Groundwater Under Control

Facility Name: Ross Incineration
Facility Address: 36790 Giles Rd. Grafton, OH 44044
Facility EPA ID #: OHD 048415665

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

Y_____ 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 "Migration of Contaminated Groundwater Under Control" EI

A positive "Migration of Contaminated Groundwater Under Control" EI determination ("YE" status code) indicates that the migration of "contaminated" groundwater has stabilized, and that monitoring will be conducted to confirm that contaminated groundwater remains within the original "area of contaminated groundwater" (for all groundwater "contamination" subject to RCRA corrective action at or from the identified facility (i.e., site-wide)).

Relationship of EI to Final Remedies

While Final remedies remain the long-term objective of the RCRA Corrective Action program the EI are near-term objectives which are currently being used as Program measures for the Government Performance and Results Act of 1993, GPRA). The "Migration of Contaminated Groundwater Under Control" EI pertains **ONLY** to the physical migration (i.e., further spread) of contaminated ground water and contaminants within groundwater (e.g., non-aqueous phase liquids or NAPLs). Achieving this EI does not substitute for achieving other stabilization or final remedy requirements and expectations associated with sources of contamination and the need to restore, wherever practicable, contaminated groundwater to be suitable for its designated current and future uses.

Duration / Applicability of EI Determinations

EI 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).

**Migration of Contaminated Groundwater Under Control
Environmental Indicator (EI) RCRIS code (CA750)**

Page 2

2. Is **groundwater** known or reasonably suspected to be “contaminated”¹ above appropriately protective “levels” (i.e., applicable promulgated standards, as well as other appropriate standards, guidelines, guidance, or criteria) from releases subject to RCRA Corrective Action, anywhere at, or from, the facility?

_____ If yes - continue after identifying key contaminants, citing appropriate “levels,” and referencing supporting documentation.

No If no - skip to #8 and enter “YE” status code, after citing appropriate “levels,” and referencing supporting documentation to demonstrate that groundwater is not “contaminated.”

_____ If unknown - skip to #8 and enter “IN” status code.

Rationale and Reference(s):

Although instructions on this form lead to the determination of a “Yes” - “Migration of Contaminated Groundwater Under Control”, note that the form presumes that there is contaminated groundwater, when that does not appear to be the case in this instance. If there was a category for groundwater that is not contaminated it would be checked. Groundwater at the facility is not contaminated at the facility site. As presented in the rationale and references section, there is sufficient data supporting that potential migration to groundwater is being controlled by two natural barriers at the facility site (i.e. a glacial till deposit and a lacustrine deposit.

Note - Till zone water is not consumed as drinking water! It is laden with silt and wells screened in the till zone are pumped dry rapidly during purging.

There are 5 well locations monitored for background conditions. Three of these, MW-16, MW-17 & SI-08, are screened in the till zone of saturation and are located along the eastern margin of SWMUA #1. The other two background/upgradient wells are screened in the Berea sandstone. They are MW-05, situated near the aforementioned MW-16, and MW-02, situated west of SWMUA #4. Semi-annual sampling and analysis of these wells supports that they are unaffected by past or present facility operations.

¹ “Contamination” and “contaminated” describes media containing contaminants (in any form, NAPL and/or dissolved, vapors, or solids, that are subject to RCRA) in concentrations in excess of appropriate “levels” (appropriate for the protection of the groundwater resource and its beneficial uses).

**Migration of Contaminated Groundwater Under Control
Environmental Indicator (EI) RCRIS code (CA750)**

Page 3

Only the MCL for antimony (6 ug/L) was exceeded at two monitoring till zone wells, in SI-06, at a level of 27.6 ug/L, and in SI-05 at a level of 209 ug/L. However, based on the groundwater detection monitoring program in place, approved by the Agency for this RFI, including subsequent sampling events in these particular wells, these results were determined not to be statistically significant relative to approved background well data comparisons.

Detection Wells for the RCRA Facility Investigation:

There were 38 well locations used as detection wells for the purpose of making a groundwater determination under the Corrective Action RFI program. Detection wells are located in and immediately adjacent to SWMUAs and the ESA at the site. Twenty-six (26) detection wells are screened in the shallow till zone of saturation and 12 detection wells are screened in the deeper Berea sandstone aquifer.

Till wells are: GWP-6, GWP-13, GWP-15, GWP-18, MW-8, MW-11B, MW-13, MW-14B, MW-15, MW-18, MW-19, MW-20B, MW-21B, MW-22, MW-23B, MW-27B, MW-28B, MW-30B, MW-31B, SI-2, SI-3, SI-4, SI-5, SI-8, SI-9, SI-11

Berea wells are: MW-11A, MW-14A, MW-21A, MW-24A, MW-25A, MW-26, MW-27A, MW-28A, MW-29, MW-30A, MW-31A, SI-1

Appendix IX sampling and analysis results from two RFI sampling events conducted in 1994 supports the determinations in the ongoing interim status groundwater monitoring program at the site which are that the groundwater has not been contaminated by past or present facility operations. In 1994, Appendix IX sampling and analysis was also conducted of groundwater in the till zone of saturation by collection of one sample from the augers at each boring SB-04 and SB-07, respectively. This sampling was conducted in SWMUA #2 and also supports the determination that groundwater has not been contaminated by past or present facility operations.

Detection Wells for the ongoing Interim Status monitoring Program:

There are 15 well locations used as detection wells for the Interim Status groundwater monitoring program for the site. Twelve locations wells are screened in the shallow till zone of saturation and 3 detection wells are screened in the deeper Berea sandstone aquifer. All 15 of these wells were also used in the RFI detection well network.

Till wells are: GWP-6, GWP-18, MW-8, MW-11B, MW-13, MW-14B, MW-15, MW-19, MW-20B, MW-21B, MW-22, MW-23B

Berea wells are: MW-11, MW-24A, MW-25A

Appendix IX sampling and analysis results conducted at least semi-annually since 1986 through the present time supports that the groundwater has not been contaminated by past or present facility operations.

Barriers to Potential Migration of Contaminants to Groundwater:

Two natural barriers occur at the site and significantly minimize the potential for soil contamination to migrate to groundwater. An upper glacial till deposit is about twenty feet in thickness. Below the till a deposit of lacustrine clay (or lake clay) exists and is about fifteen feet in thickness. Both of these deposits together form a natural barrier above the Berea sandstone aquifer that is about 35 feet thick. Both of these deposits have very low permeability as demonstrated by laboratory determinations conducted during the RFI (i.e. ranging from 2.4×10^{-8} (E-8) cm/sec to 2.0×10^{-8} (E-8) cm/sec).

**Migration of Contaminated Groundwater Under Control
Environmental Indicator (EI) RCRIS code (CA750)**

Page 4

10 (E-8) cm/sec).

The till zone of saturation occurs at the base of the till deposits. Wells in this zone would first detect potential contaminant migration. Wells installed in the till zone of saturation therefore serve as an early warning system for potential contaminant migration. Till zone water is not consumed as drinking water and is not considered a potential drinking water source. Wells screened in the till zone are bailed to dryness rapidly during purging and require several hours of recovery time before a sufficient volume of groundwater is available for sampling. In fact, the estimated yield from a till well, based on a geometric mean groundwater velocity of 2.93×10^{-4} cm/sec, is estimated at about one-half gallon of water per day. The till zone of saturation is classified as a silt according to the USDA soil classification system and also contains lesser amounts of clay and fine to medium sand particles.

The Berea aquifer is the only useable source of groundwater in the vicinity of the site and is the upper-most aquifer for the site.

References:

Ross Incineration Services, Inc. Draft RFI Report, dated December 7, 1995. (7 volumes)

Ross Incineration Services, Inc. Groundwater monitoring Data Reports of Semi-Annual Groundwater Monitoring, (recent reports)

Teleconference Discussions with Rich Kurlich, OEPA groundwater hydrologist on June 15, 2000. The groundwater monitoring program at the site was discussed with OEPA's Division of Groundwater inspector for the facility, Mr. Rich Kurlich. According to Mr. Kurlich, OEPA is comfortable with the monitoring program at the facility and the results of the Appendix IX sampling and analysis supporting that a plume of contaminated groundwater does not exist at the Ross site. Furthermore, releases to groundwater are unlikely. Mr. Kurlich also supports background and detection well locations for the site. Mr. Kurlich explained that the glacial till and the lacustrine deposits have proved to be valuable as barriers to contaminant migration at the site.

Inter-Office Communication - from Rich Kurlich (OEPA) to Ahmed Hawari (OEPA), dated May 18, 1999, entitled, "Review of the Feb. 16, 1999, Facility Response Letter from Ross Incineration Services, Inc., Grafton, Lorain Co., OHD048415665"

3. Has the **migration** of contaminated groundwater **stabilized** (such that contaminated groundwater is expected to remain within "existing area of contaminated groundwater"² as defined by the monitoring locations designated at the time of this determination)?

_____ If yes - continue, after presenting or referencing the physical evidence (e.g., groundwater

² "existing area of contaminated groundwater" is an area (with horizontal and vertical dimensions) that has been verifiably demonstrated to contain all relevant groundwater contamination for this determination, and is defined by designated (monitoring) locations proximate to the outer perimeter of "contamination" that can and will be sampled/tested in the future to physically verify that all "contaminated" groundwater remains within this area, and that the further migration of "contaminated" groundwater is not occurring. Reasonable allowances in the proximity of the monitoring locations are permissible to incorporate formal remedy decisions (i.e., including public participation) allowing a limited area for natural attenuation.

**Migration of Contaminated Groundwater Under Control
Environmental Indicator (EI) RCRIS code (CA750)**

Page 5

sampling/measurement/migration barrier data) and rationale why contaminated groundwater is expected to remain within the (horizontal or vertical) dimensions of the “existing area of groundwater contamination”²).

_____ If no (contaminated groundwater is observed or expected to migrate beyond the designated locations defining the “existing area of groundwater contamination”²) - skip to #8 and enter “NO” status code, after providing an explanation.

_____ If unknown - skip to #8 and enter “IN” status code.

Rationale and Reference(s):

**Migration of Contaminated Groundwater Under Control
Environmental Indicator (EI) RCRIS code (CA750)**

Page 6

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

_____ If yes - continue after identifying potentially affected surface water bodies.

_____ If no - skip to #7 (and enter a “YE” status code in #8, if #7 = yes) after providing an explanation and/or referencing documentation supporting that groundwater “contamination” does not enter surface water bodies.

_____ If unknown - skip to #8 and enter “IN” status code.

Rationale and Reference(s):

Migration of Contaminated Groundwater Under Control
Environmental Indicator (EI) RCRIS code (CA750)

Page 7

5. Is the **discharge** of “contaminated” groundwater into surface water likely to be “**insignificant**” (i.e., the maximum concentration³ of each contaminant discharging into surface water is less than 10 times their appropriate groundwater “level,” and there are no other conditions (e.g., the nature, and number, of discharging contaminants, or environmental setting), which significantly increase the potential for unacceptable impacts to surface water, sediments, or eco-systems at these concentrations)?

_____ If yes - skip to #7 (and enter “YE” status code in #8 if #7 = yes), after documenting: 1) the maximum known or reasonably suspected concentration³ of key contaminants discharged above their groundwater “level,” the value of the appropriate “level(s),” and if there is evidence that the concentrations are increasing; and 2) provide a statement of professional judgement/explanation (or reference documentation) supporting that the discharge of groundwater contaminants into the surface water is not anticipated to have unacceptable impacts to the receiving surface water, sediments, or eco-system.

If no - (the discharge of “contaminated” groundwater into surface water is potentially significant) - continue after documenting: 1) the maximum known or reasonably suspected concentration³ of each contaminant discharged above its groundwater “level,” the value of the appropriate “level(s),” and if there is evidence that the concentrations are increasing; and 2) for any contaminants discharging into surface water in concentrations³ greater than 100 times their appropriate groundwater “levels,” the estimated total amount (mass in kg/yr) of each of these contaminants that are being discharged (loaded) into the surface water body (at the time of the determination), and identify if there is evidence that the amount of discharging contaminants is increasing.

_____ If unknown - enter “IN” status code in #8.

Rationale and Reference(s):

6. Can the **discharge** of “contaminated” groundwater into surface water be shown to be “**currently acceptable**” (i.e., not cause impacts to surface water, sediments or eco-systems that should not be allowed

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

**Migration of Contaminated Groundwater Under Control
Environmental Indicator (EI) RCRIS code (CA750)**

Page 8

to continue until a final remedy decision can be made and implemented⁴)?

_____ If yes - continue after either: 1) identifying the Final Remedy decision incorporating these conditions, or other site-specific criteria (developed for the protection of the site's surface water, sediments, and eco-systems), and referencing supporting documentation demonstrating that these criteria are not exceeded by the discharging groundwater; OR 2) providing or referencing an interim-assessment,⁵ appropriate to the potential for impact, that shows the discharge of groundwater contaminants into the surface water is (in the opinion of a trained specialists, including ecologist) adequately protective of receiving surface water, sediments, and eco-systems, until such time when a full assessment and final remedy decision can be made. Factors which should be considered in the interim-assessment (where appropriate to help identify the impact associated with discharging groundwater) include: surface water body size, flow, use/classification/habitats and contaminant loading limits, other sources of surface water/sediment contamination, surface water and sediment sample results and comparisons to available and appropriate surface water and sediment "levels," as well as any other factors, such as effects on ecological receptors (e.g., via bio-assays/benthic surveys or site-specific ecological Risk Assessments), that the overseeing regulatory agency would deem appropriate for making the EI determination.

_____ If no - (the discharge of "contaminated" groundwater can not be shown to be "**currently acceptable**") - skip to #8 and enter "NO" status code, after documenting the currently unacceptable impacts to the surface water body, sediments, and/or eco-systems.

_____ If unknown - skip to 8 and enter "IN" status code.

Rationale and Reference(s):

⁴ Note, because areas of inflowing groundwater can be critical habitats (e.g., nurseries or thermal refugia) for many species, appropriate specialist (e.g., ecologist) should be included in management decisions that could eliminate these areas by significantly altering or reversing groundwater flow pathways near surface water bodies.

⁵ The understanding of the impacts of contaminated groundwater discharges into surface water bodies is a rapidly developing field and reviewers are encouraged to look to the latest guidance for the appropriate methods and scale of demonstration to be reasonably certain that discharges are not causing currently unacceptable impacts to the surface waters, sediments or eco-systems.

Migration of Contaminated Groundwater Under Control
Environmental Indicator (EI) RCRIS code (CA750)

Page 9

7. Will groundwater **monitoring** / measurement data (and surface water/sediment/ecological data, as necessary) be collected in the future to verify that contaminated groundwater has remained within the horizontal (or vertical, as necessary) dimensions of the “existing area of contaminated groundwater?”
- Yes** - continue after providing or citing documentation for planned activities or future sampling/measurement events. Specifically identify the well/measurement locations which will be tested in the future to verify the expectation (identified in #3) that groundwater contamination will not be migrating horizontally (or vertically, as necessary) beyond the “existing area of groundwater contamination.”
- If no - enter “NO” status code in #8.
- If unknown - enter “IN” status code in #8.

Rationale and Reference(s):

**Migration of Contaminated Groundwater Under Control
Environmental Indicator (EI) RCRIS code (CA750)**

Page 10

8. Check the appropriate RCRIS status codes for the Migration of Contaminated Groundwater Under Control EI (event code CA750), and obtain Supervisor (or appropriate Manager) signature and date on the EI determination below (attach appropriate supporting documentation as well as a map of the facility).

Y YE - Yes, "Migration of Contaminated Groundwater Under Control" has been verified. Based on a review of the information contained in this EI determination, it has been determined that the "Migration of Contaminated Groundwater" is "Under Control" at the Ross Incineration facility, EPA ID # **0HD048415665**, located at 36790 Giles Rd., Grafton, Ohio. Specifically, this determination indicates that the migration of "contaminated" groundwater is under control, and that monitoring will be conducted to confirm that contaminated groundwater remains within the "existing area of contaminated groundwater" This determination will be re-evaluated when the Agency becomes aware of significant changes at the facility.

___ NO - Unacceptable migration of contaminated groundwater is observed or expected.

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

Completed by (signature) _____ Date _____
 (print) _____
 (title) _____

Supervisor (signature) _____ Date _____
 (print) _____
 (title) _____
 (EPA Region or State) _____

Locations where References may be found:

Cubicle # 08087 and the Administrative File room on the 7th floor - 77 West Jackson Blvd,
Chicago, IL 60604

Contact telephone and e-mail numbers

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**Migration of Contaminated Groundwater Under Control
Environmental Indicator (EI) RCRIS code (CA750)**

Page 11

(name)

Allen Debus
