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:	Rogers Delinted Cottonseed Co.
Facility Address:	U.S. Highway 77 north of Robstown, Texas 78380
Facility EPA ID #:	TXD980873160

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			Arsenic, benzene
Air (indoors)[2]		X		
Surface Soil (e.g., <2 ft)	X			Arsenic, lead,chromium
Surface Water	X			Arsenic in ditch
Sediment	X			Arsenic in ditch
Subsurf. Soil (e.g., >2 ft)	X			Arsenic, H_2S
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: August 2003 sampling by TCEQ from the two downgradient wells found arsenic at 83, 93, and 26 µg/l (one duplicate sample) (MCL=10 µg/l); benzene in one well at 7.2 µg/l (MCL= 5 µg/l), alpha-BHC at 3.2 µg/l, and delta-BHC at 1.5 µg/l in the other well. Note that these wells are also adjacent to a closed municipal landfill. TCEQ noted strong (H_2S?) odors from the wells during 2003 sampling, along with the unusual fact that the white sampling cord was turned black in the well casing.

The facility disposed of waste process acids, which had pH of 1-2 (D002 waste) into four Acid Ponds. This waste acid, and the partially dissolved cotton fibers it contained, resulted in the generation of sulfates, low pH in soils and in groundwater (which may have mobilized soil metals), high TDS and high TOC. The sulfate, pH, TDS and TOC are all secondary water quality standards, so are not actionable. The arsenic may have come from the cotton lint and been a component of the waste acid. Benzene, if from site activities, would have been from spilled fuel.

Depth to groundwater is about 21'; regional and site head gradient is to the southeast, toward Nueces Bay. Groundwater in this area is rarely used due to its high salinity; well water must be mixed with municipal water to be used for irrigation. The nearest well is 1300' NW of the site; it is 250' deep.

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[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.

Drinking water is supplied from the Nueces River 20 miles upstream of the site.

Air (indoors): Fungicides and pesticides were applied in the Process Building, including Thiram, LC-8 Thimet, Demosan 65W, and Ceresan M (contains Hg); spills of the fungicide Demosan (which has low toxicity) were seen on the ground (Aug.1987 EPA PR/VSI Report). Some spilled chemicals and containers in and around the Process Building were noted during TCEQ's 2003 site visit. The buildings are abandoned and unlocked, with several missing corrugated-metal wall/door/ceiling panels.

One VOC, benzene, was found in groundwater in one of two wells in 2003, at 7.2 µg/l, above the MCL of 5 µg/l. This VOC may be from the adjacent landfill.

Hydrogen sulfide gas was detected under the clay cap on Acid Pond 1 in the 1980s, resulting from the combination of the sulfates and cotton organics buried there. The Process Building is 80-90' from Acid Pond 1.

Surface Soil: August 2003 sampling by TCEQ found arsenic residential SSL exceedances (above 0.39 mg/kg) in 10 of twelve samples, from 1.66 mg/kg to 15.1 mg/kg; nine samples exceeded the industrial SSL of 1.8 mg/kg.

The arsenic could have originated from the cotton lint and thus been part of the wastewater. The common historic use of arsenical compounds in cotton defoliation may also have contributed to site soil arsenic from crop-dusting of adjacent fields.

Acid Pond sludges were used as berms and were redistributed around the site (7-2-1971 TWQB memo). So areas beyond the four ponds are likely to have contaminated soils. During closure actions, the soils in Ponds 1-3 were treated with lime to neutralize those soils, but the neutralization was incomplete.

Most of the site has limited accessibility due to heavy vegetation, with the exception of the cap on former Acid Pond 1. The site is abandoned and is not fenced. Some spilled chemicals, containers, and strong chemical odors in and around the Process Building were noted during TCEQ's 2003 site visit.

EPA visited the site on August 4, 2004, and found ample evidence of site current use by paintball players in two buildings and the Yard Area. Surface soil contamination is a concern for these receptors.

During EPA's March 1, 2005 sampling visit, potentially hazardous waste in two small areas was picked up and bagged for disposal. Analyses of these wastes indicated that one of them (RDC-W-01) was an atrazine-based pesticide, while the other (RDC-W-02) had elevated values of lead (730 & 150 mg/kg), chromium (99 & 150 mg/kg), and thiram (1.13 ug/g & ND). Of the four surface soil samples taken in areas accessed by paintball players, none had pesticide detections but one sample (RDC-SO-03)and its duplicate had elevated levels of lead (2600 & 4100 mg/kg), which has a residential screening level of 400 mg/kg. Of three floor sweepings samples, one was clean while the other two had elevated levels of arsenic (28 & 42 mg/kg), lead (2100 & 140 mg/kg), and chromium (315 & 95 mg/kg). These sweepings were considered similar to surface soil for potential impact to the receptors.

EPA also tested pH at the Sulfuric Acid Storage Tank. Waste solids along breached seams near the base of the tank had pH less than 2; surface soil pH values ranged from 2 to 8, with values less than 6 limited to a very small area generally within 1-2 feet of the wastes.

Surface Water:, The ditch at the south edge of the site holds fairly deep standing water. This water has not been sampled. The underlying sediment is contaminated with arsenic above residential SSLs.

Sediment: There is a drainage ditch along the south end of the site that leads offsite to the west. Results from TCEQ's sediment samples in 2003 found arsenic exceedances of residential soil screening levels (>0.39 mg/kg) at 2.5 to 6.01 mg/kg in four of the six samples.

The arsenic could have originated from the cotton lint and thus been part of the wastewater. The common historic use of arsenical compounds in cotton farming may also have contributed to site soil arsenic from adjacent fields.

Subsurface Soil: Leaching from the four Acid Ponds, three of which were 12' deep, likely affected a large volume of subsurface soil. These soils likely still have low pH and contamination of sulfate and arsenic.

The lowest soil pH sampled in 1987, 2.4, was above the threshold value of 2.0 for a hazardous waste. The toxic gas H_2S was found under the cap on Acid Pond 1 in 1987.

Air (outdoor): Though the facility has been inactive since 1984, spilled chemicals, drums, and strong chemical odors on site were noted by TCEQ in 2003. EPA noted no such odors outdoors on March 1, 2005. The potential for air-blown particles of acidic waste has been minimized by heavy vegetative growth and the leaching of the surface soils by rainwater over the last 20 years. Bare soil remains only on some berm areas of Acid Pond 2-4.

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	Recre ationF ood[3]
Groundwater	No	No	No	No	No	No	No
Air (indoors)	--	--	--	--	--	--	--
Soil (surface, e.g., <2 ft)	No	No	No	No	Yes	No	No
Surface Water	No	No	No	No	No	No	No
Sediment	No	No	No	No	No	No	No
Soil (subsurface e.g., >2 ft)	No	No	No	No	No	No	No
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_

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

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):

Groundwater: Groundwater is not used for potable water in the region, and is rarely used for irrigation. So there is no potential complete exposure pathway.

Surface Soil: One surface soil sample in the Yard Area exceeds residential SSLs for lead. Also, there are spilled chemicals and strong chemical odors on the site. Trespassers such as the paintball players known to use this site would be potential receptors of these contaminants.

Surface Water: The only surface water on the site is in the drainage ditch at the south end of the site. This water has not been analyzed, but the underlying sediment contains arsenic. Recreational use of the water by trespassers on the site is unlikely due to difficult access and stagnation, but is possible in offsite surface waters into which this ditch drains.

Sediment: There is limited access to the drainage ditch in which this sediment lies and little likelihood of a complete exposure pathway to trespassers.

Subsurface Soil: The site is abandoned. There is no current exposure pathway to subsurface soils.

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."

__X__ 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):

Surface soil: The exposure area for the paintball players is limited to bare areas of soil in the Yard Area and to areas within the Process Building and the Warehouse, both of which have some soil-like detritus on concrete floors. Soil and sweep pesticide analytical results are negative for the most toxic pesticide, phorate, while thiram was detected in one of seven samples at 3.07 ug/g. Elevated lead (up to 2100 mg/kg) and chromium (up to 315 mg/kg) were detected in two of three sweep samples, with lead (up to 4100 mg/kg) at one soil sample location where a doorway drained from the Warehouse. Residential soil screening levels for these contaminants are: thiram - 390 mg/kg; lead - 400 mg/kg; chromium - 300 mg/kg (at 10^{-5} risk level).

[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?

X 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):

Surface soil: A site-specific risk analysis was performed based on a paintball player lead ingestion scenario with an exposure of 24 hours per month for six months each year. This analysis indicated that soil lead levels of up to about 4500 mg/kg sitewide would be acceptable for this current use scenario; since the highest level is 4100 mg/kg (with 2600 mg/kg in the duplicate sample) and the other samples have much lower lead levels, exposures are deemed acceptable.

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 Rogers Delinted Cottonseed Co. facility, EPA ID # TXD980873160, located at Robstown, Texas 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)	*<u>/s/ Charles R. Hendrickson</u>*	Date 4/18/2005
	(print)	Charles Hendrickson	
	(title)	Environmental Scientist	

Supervisor	(signature)	*<u>/s/ Laurie King</u>*	Date 4/22/2005
	(print)	Laurie King	
	(title)	Section Chief, 6PD-F	
	(EPA Region or State)	EPA Region 6	

Locations where References may be found:

EPA Region 6 RCRA Technical File: Site Inspections, PR/VSI report, enforcement letters, and corrective action letters.

Contact telephone and e-mail numbers

(name)	Saru Basnet, TCEQ Superfund
(phone #)	512-239-2234
(e-mail)	SBasnet@tceq.state.tx.us

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:	Rogers Delinted Cottonseed Co.
Facility Address:	U.S. Highway 77 north of Robstown, Texas 78380
Facility EPA ID #:	TXD980873160

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?

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 "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).

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?

X If yes - continue after identifying key contaminants, citing appropriate "levels," and referencing supporting documentation.

____ 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):

August 2003 sampling by TCEQ from the two downgradient wells found arsenic at 83, 93, and 26 µg/l (duplicate sample) (MCL=10 µg/l); benzene in one well at 7.2 µg/l (MCL= 5 µg/l), alpha-BHC at 3.2 µg/l, and delta-BHC at 1.5 µg/l in the other well. Note that these wells are also adjacent to a closed municipal landfill. TCEQ noted strong (probably H_2S) odors from the wells during 2003 sampling, along with the unusual fact that the white sampling cord was turned black in the well casing.

The facility disposed of waste process acids, which had pH of 1-2 (D002 waste) into four Acid Ponds. This waste acid, and the partially dissolved cotton fibers it contained, resulted in the generation of sulfates, low pH in soils and in groundwater (which may have mobilized soil metals), high TDS and high TOC. The sulfate, pH, TDS and TOC are all secondary water quality standards, so are not actionable. The arsenic may have come from the cotton lint and been a component of the waste acid. Benzene, if from site activities, would have been from spilled fuel.

Depth to groundwater is about 21'; regional and site head gradient is to the southeast, toward Nueces Bay. Groundwater in this area is rarely used due to its high salinity; well water must be mixed with municipal water to be used for irrigation. The nearest well is 1300' NW of the site; it is 250' deep. Drinking water is supplied from the Nueces River 20 miles upstream of the site.

[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).

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 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.

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

Rationale and Reference(s):

In 2003 TCEQ found only two remaining wells on the site. Without any other well data, we have no information on whether groundwater contamination migration has stabilized.

[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.

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):

5. Is the **discharge** of "contaminated" groundwater into surface water likely to be **"insignificant"** (i.e., the maximum concentration[3] 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)?

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_____ If yes - skip to #7 (and enter "YE" status code in #8 if #7 = yes), after documenting: 1) the maximum known or reasonably suspected concentration[3] 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 concentration[3] 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 concentrations[3] 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):

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

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 to continue until a final remedy decision can be made and implemented[4])?

_____ 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):

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

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[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.

horizontal (or vertical, as necessary) dimensions of the "existing area of contaminated groundwater?"

_____ If 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):

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).

_____ 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 _____ _____facility , EPA ID # _____ , located at_____. 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.

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

Completed by	(signature)	*/s/ Charles R. Hendrickson*	Date 4/18/2005
	(print)	Charles R. Hendrickson	
	(title)	Environmental Scientist	

Supervisor	(signature)	*/s/ Laurie King*	Date 4/22/2005
	(print)	Laurie King	
	(title)	Section Chief, 6PD-F	
	(EPA Region or State)	EPA Region 6	

Locations where References may be found:

EPA Region 6 RCRA Technical File: Site Inspections, PR/VSI report, enforcement letters, and corrective action letters.

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