DOCUMENTATION OF ENVIRONMENTAL
Interim Final 2/5/99
INDICATOR DETERMINATION

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

Facility Name: DuPont Martinsville
Facility Address: 1000 DuPont Road, Martinsville, VA, 24112
Facility EPA ID #: VAD 00 311 4865

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).

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[1]
Surface Soil (e.g., <2 ft) (see section 4.1)	X			Based on a comparison with EPA Region III's industrial RBC's. the following were identified: Unit H (arsenic and iron), Unit D (arsenic), and construction landfill and incinerator area (PAHs and arsenic).
Subsurface Soil (e.g., >2 ft) (see section 4.2)	X			Based on a comparison with EPA Region III's industrial RBC's. the following were identified Unit I (carbon tetrachloride and 1,1 trichloroethylene), Unit H (arsenic), Unit D (arsenic), and AOC FTA (PAHs).
Groundwater (see section 4.3)	X			Groundwater results are compared against Region III tap water RBCs or against Federal MCL, or Virginia groundwater standard. Units identified are: Unit I (VOCs especially carbon tetrachloride, metals, nitrate), Unit D (metals and chlorinated VOCs). Unit G & H (VOCs, pesticides, metals), AOC DPC (chlorinated VOCs), AOC FTA (total lead). Note that groundwater is not used as drinking water onsite, and that groundwater discharges to Smith River.
Surface Water (see section 4.4)	X			Surface water samples are compared to Federal MCLs and Virginia water quality criteria for use as a drinking water source and public consumption of fish. Surface water in the Intake Canal and from near Unit I as well as Spring 2 were identified based on these criteria. However, surface water in this area is not currently used for drinking and recreational activities are not common in this location.
Sediment (see section 4.5)	X			Carbon tetrachloride was detected in one sample from removed dredged solids in 2001.
Air (indoors)[2] (see section 4.6)		X		The only existing buildings that could be influenced by VOCs from impacted soil and groundwater are the DPC and Administration buildings. Both buildings are occupied by industrial facilities. Indoor air measurements in 1998 showed no indoor air contamination. J&E model results indicate no potential indoor air concerns using conservative residential building characteristics with American Conference of Government Industrial Hygienist (ACGIH) threshold limit values.
Air (outdoors) (see section 4.7)		X		Volatilization of constituents to outdoor air can occur from soil. When compared to the indoor air assessment, the dilution is dramatically larger and therefore the impact to outdoor air is not expected to result in concentrations of concern.

_____ 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): Additional supporting information and references are provided in Section 4 of this report.

Footnotes:

[1]"Contamination" and "contaminated" describes media containing contaminants (in any form, NAPL and/or dissolved, vapors, or solids, that are subject to RCRA) in concentrations in excess of appropriately protective risk-based "levels" (for the media, that identify risks within the acceptable risk range).

[2]Recent evidence (from the Colorado Dept. of Public Health and Environment, and others) suggest that unacceptable indoor air concentrations are more common in structures above groundwater with volatile contaminants than previously believed. This is a rapidly developing field and reviewers are encouraged to look to the latest guidance for the appropriate methods and scale of demonstration necessary to be reasonably certain that

indoor air (in structures located above (and adjacent to) groundwater with volatile contaminants) does not present unacceptable risks.

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Are there **complete pathways** between "contamination" and human receptors such that exposures can be reasonably expected under the current (land- and groundwater-use) conditions?

Summary Exposure Pathway Evaluation Table

Potential Human Receptors (Under Current Conditions)

Contaminated Media	Residents	Workers	Day-Care	Construction	Trespassers	Recreation	Food[3]
Groundwater	No	No	No	**YES**	No	No	No
Air (indoors)[1]	Media unimpacted						
Soil (surface, e.g., <2 ft)	No	**YES**	No	**YES**	**YES**	No	No
Surface Water	No	**YES**	No	**YES**	No	**YES**	**YES**
Sediment	No	No	No	**YES**	No	**YES**	No
Soil (subsurface e.g., >2 ft)	No	No	No	**YES**	No	No	No
Air (outdoors)[1]	Media unimpacted						

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.
   Enter "yes" or "no" for potential "completeness" under each "Contaminated" Media – Human Receptor combination (Pathway).
   Indirect Pathway/Receptor (e.g., vegetables, fruits, crops, meat and dairy products, fish, shellfish, etc.)

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):

Potential human receptors include:

Onsite maintenance workers repairing equipment may come into contact with surface water in pumps and pipes. Site workers may also come into contact with impacted surface soil.

Construction workers may come in contact with soils and groundwater as well as dredge spoils (sediment) and surface water when dredging.

Trespassers may come into contact with surface soils at Unit H and Unit D.

Recreational Users of the Smith River may potentially come in contact with sediments close to the Intake Canal. Although surface water levels are below detection levels, the DL is above the ambient water criterion for the consumption of water and *fish* for arsenic.

Potential Exposure Pathways by Media:

Groundwater: Onsite industrial worker, onsite construction worker – incidental ingestion, dermal contact, and inhalation of volatile compounds. Overall potential for exposure to groundwater is low, because groundwater is not used for potable or industrial purposes. Exposure may occur during excavation activities. Groundwater containing site-related constituents is limited to Site. Potential offsite residential wells are on the other side of the Smith River, which is the regional sink for groundwater.

Surface Soil: Onsite industrial worker, onsite construction worker, and trespassers – incidental ingestion, dermal contact, and inhalation of volatile compounds. Soil contamination is only present onsite, and exposure potential is low because site is inactive.

Surface Water: onsite industrial worker (pump maintenance at Intake Pump House) and onsite construction worker (dredging) – incidental ingestion and dermal contact. Although surface water levels are below detection levels, the DL is above the ambient water criterion for the consumption of water and fish for arsenic. Nearest downstream public drinking water withdraw is at Eden, NC, which is slightly more than 15 miles downstream of the site.

Subsurface Soil: Onsite construction worker – incidental ingestion, dermal contact, and inhalation. Subsurface soil contamination is only found onsite and is only accessible during intrusive activities.

Sediment: Onsite construction worker – incidental ingestion, dermal contact, and inhalation. Although unlikely, the Smith River and intake canal may be used for recreation.

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):

Groundwater Exposure Pathways: (Section 6.1)

-Construction /excavation worker scenario: ***not a significant exposure*** - all construction work must comply with plant excavation program and OSHA regulations. Excavation permit process currently takes into account contaminated areas.

Surface Soil Exposure Pathways: (Section 6.2)

-Industrial worker scenario: ***not a significant exposure*** - very low exposure frequency to soils at surface of Unit H – access restricted/reduced by locked gate across road. Exposure at Unit I is also a low frequency event because no site activities occur near Unit I. In addition, stabilization recently performed at Unit I will preclude exposures with surface soil.

-Construction /excavation worker scenario: ***not a significant exposure*** - all construction work must comply with plant excavation program and OSHA regulations.

-Trespasser scenario: ***not a significant exposure*** - frequency is very low, guards patrol site, guards present continuously, type of trespassing that has been seen is hunters. Currently, some portions of the site are unfenced (access to Unit H is difficult because road has a locked gate, but not impossible – wooded area adjacent to Unit H is accessible from trails (trespasser scenario)). Other onsite areas are fenced, and therefore controlled by administrative means.

Subsurface Soil Exposure Pathways: (Section 6.3)

-Construction /excavation worker scenario: ***not a significant exposure*** - all construction work must comply with plant excavation program and OSHA regulations.

Surface Water Exposure Pathways: (Section 6.4)

-Recreational user: ***not a significant exposure*** – exposures would be very infrequent, the Smith River in vicinity of site lacks public access and is relatively less attractive for recreational users than other nearby recreational areas.

-Food pathway: ***not a significant exposure*** – exposures via fish ingestions is highly unlikely. The Smith River in vicinity of site lacks public access and is relatively less attractive for recreational users than other nearby recreational areas. The area is 303d listed for fecal coliform.

-Onsite maintenance workers: ***not a significant exposure*** - very infrequent, currently the surface water intake is inactive therefore no maintenance is taking place.

-Construction /excavation worker scenario: ***not a significant exposure*** – dredging of intake canal very infrequent and all construction work must comply with plant excavation program and OSHA regulations. Also, levels are expected to be low. Only one sample was found to have detectable levels of carbon tetrachloride in a recent dredging event.

Sediment Exposure Pathways: (Section 6.5)

-Recreational user: ***not a significant exposure*** – exposures are likely to be very infrequent, The Smith River in vicinity of site lacks public access and is relatively less attractive for recreational users than other recreational areas.

-Construction /excavation worker scenario: ***not a significant exposure*** – dredging of intake canal very infrequent and all construction work must comply with plant excavation program and OSHA regulations. Like surface water, exposure of construction workers to sediment is considered insignificant.

[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.

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):

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

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 DuPont Martinsville Site, EPA ID # VAD 00 311 4865, located at 1000 DuPont Road, Martinsville, VA, 24112, 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) /s/ Date 9/27/04
(print)
(title)

Supervisor (signature) /s/ Date 9/27/04
(print) -
(title)
(EPA Region or State)

Locations where References may be found:

Contact telephone and e-mail numbers

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FINAL NOTE: THE HUMAN EXPOSURES EI IS A QUALITATIVE SCREENING OF EXPOSURES AND THE DETERMINATIONS WITHIN THIS DOCUMENT SHOULD NOT BE USED AS THE SOLE BASIS FOR RESTRICTING THE SCOPE OF MORE DETAILED (E.G., SITE-SPECIFIC) ASSESSMENTS OF RISK.