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:	Bayer Corporation
Facility Address:	State Route 2, New Martinsville, West Virginia 26155
Facility EPA ID #:	WVD 05 686 6312

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			metals and inorganics (see below)
Air (indoors) [2]		X		
Surface Soil (e.g., <2 ft)		X		
Surface Water		X		
Sediment		X		
Subsurf. Soil (e.g., >2 ft)	X			organics (see below)
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): **Analytical results of on-site groundwater samples have revealed several contaminates of concern. These contaminants include both organic and inorganic constituents at levels above risk based concentrations and or MCLs. Some of these contaminants include 1,2-Dichlorobenzene(1.68 PPM), 1,4-Dichlorobenzene(0.13 PPM), Benzene(1.23PPM), 2-Nitrotoluene(1.59PPM), lead (0.49 PPM), cadmium (.046 PPM), and others. Analytical results of groundwater samples from off-site wells revealed no contamination above benchmark concentrations.**

Analytical results of at depth soil samples revealed a few organic compounds including 2,4-toluenediamine (86 PPM) and o,p-toluidine (341 PPM) above their industrial risk based concentrations. These compounds were found in samples collected at a depth greater than two feet.

References:

Final RFI Report for the Bayer Corporation
New Martinsville, West Virginia Facility
Prepared by IT Corporation. Revision 1, December, 2001.

Proposed Revisions to the Final RFI Report
for Bayer Corporation, New Martinsville, West Virginia.
February, 2001.

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Footnotes:

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

[2] Recent evidence (from the Colorado Dept. of Public Health and Environment, and others) suggest that unacceptable indoor air concentrations are more common in structures above groundwater with volatile contaminants than previously believed. This is a rapidly developing field and reviewers are encouraged to look to the latest guidance for the appropriate methods and scale of demonstration necessary to be reasonably certain that indoor air (in structures located above (and adjacent to) groundwater with volatile contaminants) does not present unacceptable risks.

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

Summary Exposure Pathway Evaluation Table

Potential **Human Receptors** (Under Current Conditions)

"Contaminated" Media	Residents	Workers	Day-Care	Construction	Trespassers	Recreation	Food[3]
Groundwater	___	yes	___	___	____	____	___
~~Air (indoors)~~	___	___	___				
~~Soil (surface, e.g., <2 ft)~~	___	___	___	___	___	___	___
~~Surface Water~~	___	___			___	___	___
~~Sediment~~	___	___	___	___	___	___	___
Soil (subsurface e.g., >2 ft)	no	no	no	yes	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 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): **Site groundwater is used on a limited basis as non-contact cooling water and wash water on a RCRA pad. Although workers may come into contact with the wash water at the RCRA pad, the exposure is not considered to be significant and no health risks would be expected. As indicated, a few organic compounds have been identified in subsurface soil samples. Therefore, where necessary, a SWMU or SWMU Group will be included in an institutional control plan covering subsurface work.**

References:

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Prepared by IT Corporation. Revision 1, December, 2001.

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

4. Can the **exposures** from any of the complete pathways identified in #3 be reasonably expected to be **"significant"**[4] (i.e., potentially "unacceptable" because exposures can be reasonably expected to be: 1) greater in magnitude (intensity, frequency and/or duration) than assumed in the derivation of the acceptable "levels" (used to identify the "contamination"); or 2) the combination of exposure magnitude (perhaps even though low) and contaminant concentrations (which may be substantially above the acceptable "levels") could result in greater than acceptable risks)?

X If no (exposures can not be reasonably expected to be significant (i.e., potentially "unacceptable") for any complete exposure pathway) - skip to #6 and enter "YE" status code after explaining and/or referencing documentation justifying why the exposures (from each of the complete pathways) to "contamination" (identified in #3) are not expected to be "significant."

____ If yes (exposures could be reasonably expected to be "significant" (i.e., potentially "unacceptable") for any complete exposure pathway) - continue after providing a description (of each potentially "unacceptable" exposure pathway) and explaining and/or referencing documentation justifying why the exposures (from each of the remaining complete pathways) to "contamination" (identified in #3) are not expected to be "significant."

____ If unknown (for any complete pathway) - skip to #6 and enter "IN" status code

Rationale and Reference(s): **In 1987, EPA issued a RCRA corrective action permit to the company to proceed with site cleanup at the New Martinsville facility. A RCRA Facility Investigation (RFI) Work Plan, consisting of a three phased approach, was submitted by Bayer to EPA in October 1995. The RFI was conducted in three phases, allowing the scope of each phase to incorporate the results of the previous phase. Phase 1 work was initiated in October 1996. An accelerated Phase 2 Program addressing Solid Waste Management Units (SWMU) 1, 2, 4,and 30 began in October 1996, and the remaining Phase 2 scope of work commenced in June 1997. Phase 3 scope of work was implemented in November 1999. Several discussions took place between EPA and Bayer representatives during the RFI process and a Final RFI Report, Revision 1 was submitted in December, 2001. The RFI included the collection of surface and subsurface soils, surface water and sediments, groundwater, and concrete chips. A risk driven approach was applied at the 30 SWMU's that were evaluated as part of the RFI. The purpose of the risk assessment for the New Martinsville facility was to assist in the process of deciding the appropriate action to take at each SWMU.**

Maximum detected concentrations and detection limits from analytical results of samples collected at the various SWMU's were compared to conservative screening criteria. A total of 482 soil samples were collected from the various SWMU's during Phase 2 of the RFI. SWMU's that contained constituents exceeding Risk Based Concentrations (RBC's) or site specific Soil Screening Levels (SSL's) were recommended for further evaluation during Phase 3 of the investigation. Based on the results of the screening-level risk assessment of the data from Phase 2 of the RFI, EPA agreed with Bayer that 14 of the 30 SWMU's and the surface water and sediments of Beaver Run should be assigned a No Further Action (NFA) recommendation. The remaining 16 SWMU's were grouped based on proximity, usage, and similar analytical results. An additional 74 samples were collected to fill data gaps for the remaining 16 SWMU's during Phase 3. Human health risks for each of the SWMU groups were evaluated using all of the RFI analytical data for the SWMU groups evaluated. If constituents of interest exceeded the screening values, a site-specific risk assessment was performed during Phase 3. The site-specific risk assessment evaluated potential exposure to industrial workers and construction workers. Because the Bayer facility is an industrial facility with controlled access, industrial workers and construction workers are the only likely individuals to be exposed to site soils. The facility received EPA approval of an industrial land use designation in a letter dated August 29. 2000. The industrial worker and the construction worker scenarios evaluated soils to depths of 2 and 5 feet, respectively. Based on all of the analytical results of samples collected during the RFI, a no further action is warranted at the remaining 16 SWMU's. This conclusion is based on the fact that the calculated risks for industrial and construction worker scenarios are within the acceptable range defined by EPA. However, several of the SWMU's will be included in a institutional control plan covering subsurface work.

References:

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[4] If there is any question on whether the identified exposures are "significant" (i.e., potentially "unacceptable") consult a human health Risk Assessment specialist with appropriate education, training and experience.

5. Can the "significant" **exposures** (identified in #4) be shown to be within **acceptable** limits?

_____ If yes (all "significant" exposures have been shown to be within acceptable limits) - continue and enter "YE" after summarizing and referencing documentation justifying why all "significant" exposures to "contamination" are within acceptable limits (e.g., a site-specific Human Health Risk Assessment).

_____ If no (there are current exposures that can be reasonably expected to be "unacceptable")- continue and enter "NO" status code after providing a description of each potentially "unacceptable" exposure.

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

Rationale and Reference(s): _____

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

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 **Bayer Corporation** facility, **EPA ID # WVD 05 686 6312**, located at **New Martinsville, West Virginia** 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)		Date 01-29-02
	(print)	William Wentworth	
	(title)	Remedial Project Manager	

Supervisor	(signature)		Date 01-29-02
	(print)	Robert E. Greaves	
	(title)	Chief, General Operations Branch	
	(EPA Region or State)	EPA Region 3	

Locations where References may be found:
Hard copy files at EPA Region III, Waste and Chemicals Management Division, 1650 Arch Street, Philadelphia, Pa. 19103-2029.

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.