

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:	PPG Industries
Facility Address:	4829 Fairland Road, Barberton, OH, 44203-3913
Facility EPA ID #:	OHD004198917

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).

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2. Are groundwater, soil, surface water, sediments, or air **media** known or reasonably suspected to be “contaminated”¹ above appropriately protective risk-based “levels” (applicable promulgated standards, as well as other appropriate standards, guidelines, guidance, or criteria) from releases subject to RCRA Corrective Action (from SWMUs, RUs or AOCs)?

	<u>Yes</u>	<u>No</u>	<u>?</u>	<u>Rationale / Key Contaminants</u>
Groundwater	X			(see note below)
Air (indoors) ²	X			“
Surface Soil (e.g., <2 ft)	X			“
Surface Water	X			“
Sediment	X			“
Subsurf. Soil (e.g., >2 ft)	X			“
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):

For details and complete references, see comprehensive SWMU-specific CA-725 information dated July 2000 & amended on March 2001, held with the PPG Barberton Administrative Record.. (This is a comprehensive review of many SWMUs and Focus Areas compiled for the U.S. EPA by Techlaw Inc.) Also see correspondence from Allen Debus to Bill Lynch of PPG- Barberton dated March 19, 2001 (RE: CA-725 Reevaluation), and correspondence from Bill Lynch (PPG) to Allen Debus (U.S. EPA - Region 5) dated April 23, 2001.

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

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

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

Summary Exposure Pathway Evaluation Table

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

“Contaminated” Media	Residents	Workers	Day-Care	Construction	Trespassers	Recreation	Food ³
Groundwater	_N__	___	_N__	_N__			_N__
Air (indoors)	_N__	_Y__	_N__				
Soil (surface, e.g., <2 ft)	_N__	_Y__	_N__	_Y__	_Y__		___
Surface Water	0	_Y__			_Y__	_*_	_*
Sediment	_*_	_Y__			_Y__	_*_	_*
Soil (subsurface e.g., >2 ft)	Y			_Y__			_N__
Air (outdoors)	_Y__	_Y__	_N__	_Y__	_Y__		

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):

For SWMU and Focus Area specific details, see comprehensive CA-725 compilation document held in the PPG - Barberton Administrative Record. Explanation of “*” code above is that sitewide surface water pathway conditions would be complete were it not for the fact that access restrictions are in place. When heeded, these restrictions

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

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should effectively maintain isolation of affected media from potential receptors. See correspondence from Bill Lynch (PPG) to Allen Debus (U.S. EPA) dated April 23, 2001 for more on this subject.

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.”

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

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

Rationale and Reference(s):

The CA-725 compilation document prepared for the U.S. EPA by Techlaw documented that the following SWMUs & Focus Areas (i.e. sitewide surface water) scored a “Yes” under their evaluation, which has been accepted by the U.S. EPA Project Manager - Allen A. Debus. All other SWMUs under evaluation had scored a “No” under the previous question no. 3 in this CA-725 form.

West Plant, Former Sand Quarry, North Spoils Area, Lime Lakes # 1, Lime Lakes # 2, Lime Lakes # 4, Impounding Reservoir, Contractors’ Landfill, Former Ohio Brass Settling Basins, Sitewide Surface Water.

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

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

Y 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):

The following SWMUs and Focus Areas received ratings of “Yes” in the detailed compilation document prepared by Techlaw.

West Plant, Former Sand Quarry, north Spoils Area, Lime Lakes # 1, Lime Lakes # 2, Lime Lakes # 4, Impounding Reservoir, contractors’ landfill, Former Ohio Brass Company Settling Basin.

Note that if it were not for the institutional controls restricting human access to sitewide surface bodies, that sitewide surface bodies would be scored as a “no,” meaning that significant human health exposures are not within acceptable limits.

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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):

Y 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 PPG - Industries facility, EPA ID # OHD 004198917, located at 4829 Fairland Road, Barberton, Ohio, 44203-3913 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 _____
 (print) _____
 (title) _____

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

Locations where References may be found:

PPG - Barberton Administrative Record, 77 West Jackson Blvd, Chicago, IL, 60604, 8th floor, cubicle 8087.

Contact telephone and e-mail numbers

(name) Allen A. Debus
(phone #) (312) 886-6186
(e-mail) debus.allen@epamail.epa.gov

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:	PPG Industries
Facility Address:	4829 Fairland Road, Barberton, OH 44203-3913
Facility EPA ID #:	OHD00498917

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?

- ☒ 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).

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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):

Overview - (NORTH and SOUTH PLANTS) - Numerous VOCs (e.g., PCE, TCE, DCE and vinyl chloride), SVOCs (including HCB and benzo(a)pyrene and metals (including antimony & nickel) exceeded MCLs in monitoring wells across the North Plant. References - RFI Report, App. I, Tables I.7-2 through I.7-5. Total VOCs detected in shallow groundwater at the North Plant exceeded 100,000 ug/L in several monitoring wells. The RFI Report data indicate that DNAPL containing various halogenated hydrocarbons may be present in the shallow groundwater, although subsequent consideration of this matter indicates that DNAPL, per se, may not be present.

In shallow groundwater (Main Plant Area and vicinity), constituents found greater than MCLs or background are - PCE, TCE, cis-1,2 DCE, vinyl chloride, carbon tetrachloride, chloroform, 1,1-DCA, HCB, HCBd, chloride, TDS, pH, dissolved calcium, dissolved iron, dissolved manganese, dissolved sodium. (References: RFI Appendix E, Sitewide Surface Water and Groundwater Report, Section 8.3.1, pp. E.8-2 through E.8-23)

In sitewide area shallow groundwater, constituents found greater than MCLs or background are PCE, TCE, cis-1,2 DCE, vinyl chloride, chloride, TDS, pH, dissolved barium, dissolved calcium, dissolved iron, dissolved manganese, dissolved magnesium, dissolved sodium. (References: RFI Appendix E, Sitewide Surface Water and

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).

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Question # 2 continued — (References & Rationale)

At the Base of the Sharon conglomerate constituents found greater than MCLs or background are PCE, TCE, trans-1,2 DCE, cis-1,2 DCE, vinyl chloride, carbon tetrachloride, chloroform, HCB, HCBd, chloride, TDS, dissolved barium, dissolved calcium, dissolved iron, dissolved magnesium, dissolved manganese, dissolved sodium (References: RFI Appendix E, Sitewide Surface Water and Groundwater Report, Section 8.4, pp. E.8-44b through E.8-53)

In the Mid Outwash Groundwater, constituents found greater than MCLs or background are PCE, TCE, cis-1,2 DCE, vinyl chloride, 1,1 DCA, HCB, HCBd, phenol, chloride, TDS, pH, dissolved barium, dissolved calcium, dissolved magnesium, dissolved manganese, dissolved sodium. (References: RFI Appendix E, Sitewide Surface Water and Groundwater Report, Section 8.5, pp. E.8-53 through E.8-72)

In Deep Outwash Groundwater, constituents found greater than MCLs or background are PCE, TCE, cis-1,2 DCE, vinyl chloride, carbon tetrachloride, HCB, HCBd, phenol, chloride, TDS, pH, dissolved barium, dissolved calcium, dissolved iron, dissolved magnesium, dissolved manganese, dissolved sodium. (References: RFI Appendix E, Sitewide Surface Water and Groundwater Report, Section 8.6, pp. E.8-72 through E.8-78)

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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).

N_____ 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):

Rationale and Reference(s):

- (A) **Rationale: PPG believes that the migration of contaminated groundwater is stabilized and is expected to remain within the area of monitoring locations. Groundwater is present in a glacial outwash/bedrock aquifer. Groundwater flow is controlled by the physical boundaries of the valley and the presence of surface water drainages. Local groundwater flow patterns are complex but generally occur from the upland areas dominated by bedrock highs to the major surface water streams. The rate and direction of groundwater flow and solute transport were extensively studied during the RFI and documented. Monitoring wells were sited to measure the levels and extent of contaminated groundwater throughout the study area.**

Groundwater flow and solute transport computer modeling was conducted at the PPG facility during the RFI and CMS. The model was developed, calibrated, and sensitivity analysis performed following the USEPA approved work plan developed during the RFI. The modeling was conducted using the U.S Nuclear Regulatory Commission computer code SWIFT 486 after a review of available model codes. The model was peer reviewed by in-house IT experts in computer modeling and by third party experts (GeoTrans, Inc.). The groundwater flow and solute transport model code

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.

selection, development, calibration, peer review, and documentation are presented in Attachment E-6 (Groundwater Flow and Solute Transport Modeling), Appendix E (Site wide Groundwater and Surface Water) of the RFI Report. USEPA has reviewed the modeling, hired outside agency consultants to review the model (US Geological Survey), and approved the modeling along with other RFI documents. Application of the groundwater flow and solute transport model has been documented in various deliverables to the Agency such as the MNA pilot test. Other correspondence has been forwarded to the USEPA as it was developed (e.g., GeoTrans Peer Review Report).

PPG conducted off-site well surveys and sampling to evaluate possible offsite migration of contaminants. Surveys were conducted in 1983 in conjunction with the OEPA and in 1988 with the Summit County Health Department. These surveys and sampling are documented in the Main Body of the RFI Final Report Section 5.18 and Appendix U of the RFI Report. Eighty-nine wells were sampled in 1983 and 39 wells were sampled in 1988. Based on the sampling conducted for selected volatile organic and inorganic constituents water wells in the vicinity of the PPG facility met USEPA interim, primary, and secondary drinking water standards with some localized exceptions. (At the time of this writing, the quality of this historical data is unknown to the U.S. EPA.)

During the RFI, PPG surveyed off-site wells within a one half mile radius of the facility. Selected wells were sampled for VOCs, wet chemistry parameters, and selected metals. Analytical results were compared to primary and secondary drinking water standards as well as background concentrations. Results indicated that the vast majority of the off-site wells (108 of 115) sampled met USEPA primary drinking water standards. Only one well had an organic compound detection above a USEPA drinking water standard and this occurrence was not attributed to PPG.

Nevertheless, the fact remains that the groundwater plume is presently migrating into local surface water bodies, including the Tuscarawas River. Also, there is theoretical perception and some supporting empirical data indicating that the proposed remedy of monitored intrinsic natural bioremediation is essentially mitigating the migration of contaminants in non-surface water directions. At the time of this writing PPG's biodegradation hypothesis is unproven, however, and the effectiveness of MNA at PPG remains under evaluation. It will be a focus of scheduled performance based corrective action to prove how effective the proposed remedy for groundwater contamination will be. Other groundwater migration controls and measures are in place, however, until monitored intrinsic natural bioremediation can be shown to be

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effective and until the plume migration to surface water bodies ceases, then it cannot be said that migration of contaminated groundwater has been stabilized.

References: Appendix E of the RFI, Sitewide Surface Water and Groundwater Report and Appendix E, Attachment E-6, Groundwater Flow and Solute Transport Modeling Report. Appendix U of the RFI, Off-Site Well Sampling.

(Note: Even though the answer to this question suggests that the evaluator should skip to question no. 8 of this form, in this case for sake of informational completeness, I shall continue to complete the remaining questions on this form.)

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

Y 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):

Affected and potentially affected surface water bodies include: Wolf Creek, Lower Hudson Run, Tuscarawas River, Hudson Run Reservoir. As documented in the RFI, groundwater does discharge to local surface water bodies including Wolf Creek, Lower Hudson Run, Tuscarawas River, Hudson Run Reservoir. (References: Appendix E of the RFI, Sitewide Surface Water and Groundwater Report and Appendix E, Attachment E-6, Groundwater Flow and Solute Transport Modeling Report.)

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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.

N_____ 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):

Contaminants as measured in groundwater adjacent to Wolf Creek, Lower Hudson Run, Tuscarawas River and Hudson Run reservoir are at significant concentrations.

Rationale and Reference(s):

- (A) **Rational: Concentration of key groundwater constituents (PCE, TCE, CIS-1,2-DCE, vinyl chloride, carbon tetrachloride, chloroform, and 1,1 DCE are more than ten times the MCLs measured in groundwater adjacent to the streams in the vicinity of the Main Plant (North and South Plants, Lime Lakes 1 and 2). A smaller number of key groundwater constituents (PCE, TCE, and vinyl chloride) exceed 10 times the MCLs**

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

adjacent to Lime Lakes 5 and 6. Some of these constituents in the Main Plant area are more than 100 times the MCL level. Groundwater modeling was performed for PCE, TCE, Cis-1,2-DCE, vinyl chloride, carbon tetrachloride, and chloroform to predict contaminant mass discharge to the streams. PCE, TCE, and carbon tetrachloride discharges are predicted to decrease with time. Cis-1,2-DCE, vinyl chloride and chloroform discharges are predicted to increase with time since these compounds are biodegradation products of PCE, TCE, and carbon tetrachloride. Groundwater discharges will be dispersed over long reaches of stream and these compounds readily degrade so surface water concentrations are not expected to increase.

Measured concentrations of these key constituents in surface water are much reduced or non-detect from measured concentrations in groundwater. Interim Measures (e.g., Low Head Impoundment in Lower Hudson Run and Leachate Collection System in Lime Lakes 1 and 2 and Contractors Landfill) and voluntary actions (e.g., Reclamation of Lime Lakes 3, 4, 5, and 6) were implemented to reduce discharges of site contamination until corrective measures can be implemented.

- (B) "Appropriate levels" for groundwater protection standards have not been established. RFI Main Body Chapter 7.0 indicates that protection standards shall be based on site-specific risk assessments.

HCB has been detected in surface water sediments and TDS is a known contributor to habitat degradation. Both of these parameters are components of the contaminated plume. TDS is thought to be linked to formation of the habitat-diminishing concretions in the Tuscarawas River.

References: Appendix E of the RFI, Sitewide Surface Water and Groundwater Report (Chapters 7 and 8), along with Attachment E-6 (Chapter 12), Groundwater Flow and Solute Transport Modeling Report, and Volume One and Two for the Draft CMS "Description of Current Situation" and "Detailed Evaluation of Alternatives". Main Body of the RFI Final Report Chapter 7.0 (Protection Standards).

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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 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.

 N 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): There are problems in surface water ecological conditions stemming from TDS

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.

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transport into the river system. Also, as noted previously sediments contaminated with HCB have been identified. These impacts to ecological conditions are presently unacceptable. (Reference: Biological, Sediment and Water Quality Study of the Tuscarawas River, Wolf Creek and Hudson Run, OEPA Technical Report EAS/1994-8-7, July 30, 1994, by David Altfader and Bernie Counts, (State of Ohio, Ohio EPA, Ecological Assessment Section, Division of Surface Water)

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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?"

Y 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): Volume Four of the CMS documents post-corrective measures implementation monitoring. This plan is currently subject to review by the U.S. EPA and Ohio EPA. Revisions are anticipated.

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 PPG Industries facility, EPA ID # **OHD004198917**, located at 4829 Fairland Road, Barberton, OH, 44203-3913. 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.

N 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) U.S. EPA - Region 5

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Locations where References may be found:

U.S. EPA - Region 5, 77 West Jackson Blvd., Chicago, IL 60604,
8th floor, Cubicle no. 8087.

Contact telephone and e-mail numbers

(name)	<u>Allen A. Debus</u>
(phone #)	<u>(312) 886-6186</u>
(e-mail)	<u>debus.allen@epamail.epa.gov</u>
	<u> </u>

