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: The Sherwin-Williams Company
Facility Address: 2325 Hollins Ferry Road, Baltimore, Maryland 21230
Facility EPA ID #: MDD000215160

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 #8 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?

   ☒ 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):

Groundwater monitoring conducted over ~ 20 years has shown the presence of 1,1,1-TCA and toluene at concentrations exceeding USEPA Tap Water RBCs. Other compounds such as 1,1,1-TCA degradation compounds and 1,4-dioxane have also been detected (see Remedial Action Progress reports dated January 10, 2008 and September 26, 2008).

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 appropriate "levels" (appropriate for the protection of the groundwater resource and its beneficial uses).

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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]).

   ☐ 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):

Excalibur Group, LLC's January 10, 2008 Remedial Progress Report[1] and early site investigation & ongoing monitoring reports provide groundwater data collected over almost two decades showing that the groundwater contaminant plumes are stable. Over this time the TCA, toluene and other contaminant plumes have remained stationary on site. Additionally, past source removal efforts (1988 over-excavation and removal of 800 cubic yards of impacted soil around the former TCA UST) and contaminant mass recovery and destruction from *in-situ* remediation (soil vapor and multi-phase extraction conducted over 6 years from 1997 through 2003) and natural attenuation processes has resulted in downward trending TCA concentrations in overburden and bedrock wells. There have been no VOCs above USEPA Tap Water RBCs or Drinking Water MCLs in groundwater at the down gradient property boundary. No toluene, TCA or any other VOCs were found above USEPA Tap Water RBCs in side gradient piezometer, SS-P1 (located adjacent to a storm sewer extending along the northwest property boundary) during the recent September 2008 sampling event. While earlier sampling events had variously detected benzene, toluene, xylenes (total) and / or 1,2 dichloroethane marginally above USEPA Tap Water RBCs in this piezometer, no VOCs have ever been detected above USEPA Tap Water RBCs at property line piezometers, SS-P2 and SS-P3, downgradient / downstream of SS-P1. As described in Excalibur's January 10, 2008 report, the 12-foot wide storm sewer is constructed into the shallow groundwater depressing the water table and inducing localized groundwater flow toward and then along side the structure. The shallow hydraulic boundary created by the higher permeability sewer bedding precludes shallow groundwater migration beyond the opposite side of the storm sewer. Captured groundwater moves preferentially along the sewer and northwest property line to the downgradient property line where piezometers SS-P2 and SS-P3 sample results have consistently shown the VOCs measured in SS-P1 to have fully attenuated to below USEPA Tap Water RBCs. The integrity of the storm sewer has been inspected along this entire length and it was found to be in excellent condition with no evidence of structural breaches that would allow groundwater entry. In summary, the extensive site-wide groundwater monitoring dataset shows the historical dissolved groundwater contaminant plumes to be contained on site and stable.

[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.

[1] Groundwater monitoring / remedial progress reports are prepared on a semi-annual basis. More recent reports include the March 14, 2008 and September 26, 2008 progress reports.

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.

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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):

"Contaminated" groundwater does not leave the Site and there are no on-Site surface water bodies.

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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)? **NA**

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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.

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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 implemented[4])? **NA**

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

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

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

Rationale and Reference(s):

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

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

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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?"

☒ 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):

Groundwater monitoring will continue through at least 2009 as described in Excalibur Group, LLC's January 25, 2008 Work Plan for Groundwater Monitoring & 700 Area Storm Sewer Integrity Evaluation as amended by Excalibur's March 11, 2008 Work Plan Addendum / Laboratory & QAPP Modification. A summary of the sampling schedule / locations through 2009 is provided in the below table.

Purpose	General Sampling Order	Well ID	Well Construction			Analyte List	Location / Access		Schedule							
									2008				2009			
			Diameter	Screen Depth	Well Boring Depth		Exterior	Interior	March	June	September	December	March	June	September	December
PERIMETER MONITORING		T1S-R	2	5	20	A	X			X				X		
		T1D-R	2	25	35	A	X			X				X		
		T1	2	5	15	A	X			X				X		
		PW3	2	5	10	A	X			X				X		
		2D	4	33	43	A	X			X				X		
		T3	2	15	26.5	A	X			X				X		
		T3B	4	38	43	A	X			X				X		
		T2	2	15.5	25.5	A	X			X				X		
700 AREA MONITORING		SS-P3	2	5.5	15.5	D	X		X	X	X	X		X		X
		SS-P2	2	5	15	D	X		X	X	X	X		X		X
		1S	4	8	13	D	X		G	X	G	X		X		X
		MW18D	2	18	23	D	X		G	X	G	X		X		X
		MW17D	2	18	23	D	X		G	X	G	X		X		X
		MW16D	2	18.8	23.8	D	X		G	X	G	X		X		X
		A1D	2	18	23	D	X		G	X	G	X		X		X
		MW17S	2	3	13	D	X		G	X	G	X		X		X
		MW20S	2	2.5	12.5	D	X		G	X	G	X		X		X
		MW18S	2	3	11	D	X		G	X	G	X		X		X
		SS-P1	2	4.5	8.5	D	X		X	X	X	X		X		X
		MW19D	2	16	21	D	X		G	X	G	X		X		X
		A1S	2	7	12	D	X		G	X	G	X		X		X
		MW16S	2	4.5	14.5	D	X		G	X	G	X		X		X
		MW19S	2	3	12	D	X		G	X	G	X		X		X
100/500 AREA MONITORING		PI5	6	5.5	41.5	A	X			X				X		
		MW6B	2	36	46	A	X			X				X		
		9S	4	33	38	A	X			X				X		
		PI2	2	5	35	A		X		X				X		
		VE11	2	5	35	A		X		X				X		
		RW3	6	6.5	32	A	X			X				X		
		RW7	6	5.5	41	A	X			X				X		
		10D	4	40	63	A	X			X				X		
		13D	4	62.5	76	A	X			X				X		
		DB12	2	26.4	31.5	A	X			X				X		
		9D	4	85.7	95.7	A	X			X				X		

NOTES:

General Field measurements for all samples: dissolved oxygen, redox potential, pH and temperature. For all laboratory analyses, provide full CLP type data package for validation purposes

Analyte List

A Volatile organics, MEK, MIBK, and xylenes by USEPA Method 8260B.

B Volatile organics, MEK, MIBK, and xylenes by USEPA Method 8260 B. Also, chlorinated bio-indicator parameters: chloride, methane, ethane, ethene, nitrate,sulfate, sulfide, manganese, TOC, ferrous iron.

C Volatile organics, MEK, MIBK, and xylenes by USEPA Method 8260 B. Also, petroleum bio-indicator parameters, methane, nitrate,sulfate, manganese, total organic carbon, ferrous iron.

D Volatile organics 700 Area short list identified in Table 5-1 of QAPP by USEPA Method 8260B.

G Gauge depth to water only. No groundwater sampling / analysis

Duplicates One (1) blind duplicates shall be collected for every 10 samples.

Rinse Blanks One rinse blank shall be collected each day of sampling for VOC analysis.

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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 **The Sherwin-Williams Company facility, EPA ID # MDD000215160, located at 2325 Hollins Ferry Road, Baltimore, Maryland 21230.** Specifically, this determination indicates that the migration of "contaminated" groundwater is under control, and that monitoring will be conducted to confirm that contaminated groundwater remains within the "existing area of contaminated groundwater" This determination will be re-evaluated when the Agency becomes aware of significant changes at the facility.

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

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

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

Supervisor (signature) -s- Date 09/16/09
(print) Luis Pizarro
(title) _____
(EPA Region or State) _____

Locations where References may be found:

US EPA Region III
Waste & Chemicals Management Division
1650 Arch Street
Philadelphia, PA 19103

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