

DOCUMENTATION OF ENVIRONMENTAL INDICATOR DETERMINATION

**RCRA Corrective Action
Environmental Indicator (EI) RCRIS code (CA750)
Migration of Contaminated Groundwater Under Control**

Facility Name: ABB Inc.
Facility Address: Muse- Bishop Road, Muse, PA 15350
Facility EPA ID #: PAD045873197

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

The property is 87 acres located Muse Bishop Road in Cecil Township, Washington County, Pennsylvania with an operational history of various coal mining and manufacturing companies from 1923 to 1987. In the 1970s CE Cast began investigating soil and the surface water in the unnamed tributary at the Site in conjunction with PADER (Pennsylvania Department of Environmental Resources), which led to a COA (Consent Order and Agreement) between them. The agreement required the removal of impacted soil and drums and the construction of a landfill to contain this material. By 1990s, over 90 ASTs and at least three underground storage tanks (USTs) were removed. Since the closure of the On-Site solid waste landfill in 2008-2009, the Site is currently vacant open land owned by ABB. The closure included removal of the landfill (cap, contents, and liner) and disposed of the impacted material off-Site. PADEP determined successful execution of the work. Since 2000s, the facility has provided copies of semi-annual Site wide groundwater monitoring reports.

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):

There are currently 27 active monitoring wells installed at the Site. For the 2019 groundwater results volatile organic compound (VOC) and semi-VOC (SVOC) analytical results from the 2019 events were compared to the PADEP’s Statewide Health Standards (SHS) Medium-Specific Concentrations (MSC) for organic substances in groundwater. Contaminants of concern in groundwater for 2019 are listed below:

Parameter	SHS MSC (µg/L)	MW-2		MW-204		MW-105		MW-3		MW-205		MW-103		MW-153		MW-102		MW-6	
		8/6/2019	12/20/2019	8/6/2019	12/20/2019	8/6/2019	12/20/2019	8/6/2019	12/20/2019	8/6/2019	12/20/2019	8/6/2019	12/20/2019	8/6/2019	12/20/2019	8/6/2019	12/20/2019	8/7/2019	12/21/2019
1,1,1-Trichloroethane	200	10000																	
1,1-Dichloroethane	160	5100																	
1,1-Dichloroethene	7	660																	
1,4-Dioxane	32	97		170				160		95	76	180	96	35		36	4.6		
Bis (2-Ethylhexyl) phthalate (DEHP)	6			8.2 J															
cis-1,2-Dichloroethene	70	1300		1700				390											
Tetrachloroethene	5			140												<25	5.2	31	23
Trichloroethene	5															<25	14	38	36
Vinyl chloride	2			160		13/16		47											

Historically, PCE and TCE were the primary VOCs detected in the groundwater near the Main Plant Area. However, 2019 data for MW-2, MW-6, MW-105, and MW-204 continues to demonstrate the overall decrease in reported parent compound concentrations of PCE and TCE. Also, the data shows continuing degradation process in the chlorinated aliphatic group of VOCs. daughter compounds such as cis-1,2-dichloroethene (DCE), 1,1-DCE, and vinyl chloride are generally increasing or stabilizing, while the parent compound concentrations (i.e., PCE and TCE) are generally decreasing. In terms of SVOCs, 1,4-dioxane has been detected historically. The greatest concentration has been in the former landfill area and hydraulically downgradient of the former landfill in monitoring wells MW-2, MW-101, MW-202, and MW-203. The concentrations in these wells have demonstrated to decrease with time. Off-Site, monitoring wells MW-501 through MW-503 were below the MSC for 1,4-dioxane.

Reference(s):

1. Annual Groundwater Monitoring Report -2019, prepared by GHD Services Inc., dated December 2019.

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):

Concentrations of PCE, TCE, and 1,4-dioxane are decreasing. Daughter compounds such as cis-1,2-DCE, 1,1-DCE, and vinyl chloride are generally increasing or stabilizing. The concentrations of 1,4-dioxane detected in sentinel monitoring wells does not present a concern for exposure due to the chemical and structural makeup, lack of receptors and potential migration pathways to the south of the Property.

Reference(s):

1. Annual Groundwater Monitoring Report -2019, prepared by GHD Services Inc., dated December 2019.

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.

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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):

A groundwater elevation data calculated from the August 6, 2019 and December 20, 2019 well gauging events demonstrated a groundwater flow direction to the south and southwest/southeast to an unnamed tributary. The only concentration detected in monitoring wells MW-501, MW-502 and MW-503 who are closed to the tributary is SVOC 1,4-dioxane. Downgradient monitoring wells installed and sampled by AGI in 2018 showed that the concentration of 1,4-dioxane were below the MSC.

Reference(s):

1. Annual Groundwater Monitoring Report -2019, prepared by GHD Services Inc., dated December 2019.

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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 concentrations 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 concentrations 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 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 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-assessment⁵, 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):

⁴Note, 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.

⁵The 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):

ABB will continue to monitor groundwater in 2020. The findings and results for the 2020 monitoring will be included in an annual report and submitted to PADEP in early 2021.

Reference(s):

1. Annual Groundwater Monitoring Report -2019, prepared by GHD Services Inc., dated December 2019.

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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 Crompton Corporation Petrolia facility, EPA ID # PAD004388500, located at Route 269, Petrolia, Pennsylvania 16050. 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)  Date 10/27/2020
(print) Priscilla Ortiz Carrero
(title) Physical Scientist

Supervisor (signature)  Date 10/30/20
(print) Paul Gotthold
(title) Chief CA Branch No 2
EPA Region 3

Locations where References may be found:

US EPA Region III
Land Chemical and Land Recycling Division
1650 Arch Street
Philadelphia, PA 19103

Contact telephone and e-mail numbers

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