

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: | <u>Brush Wellman, Inc. (Materion Corporation)</u> |
| Facility Address: | <u>100 Shoemakersville Road, Shoemakersville, PA 19107</u> |
| Facility EPA ID #: | <u>PAD 002 387 835</u> |

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?

 X 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 "Current Human Exposures Under Controls" 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 "Migration of Contaminated Groundwater Under Control" EI pertains ONLY to the physical migration (i.e., further spread) of contaminated groundwater 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 risk-based "levels" (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 (for any media) – skip to #8 and enter "IN" status code.

Rationale and Reference(s):

Process

Brush Wellman operates an Industrial Wastewater Treatment Plant under NPDES Permit. All non-sanitary wastewater is treated in the Industrial Wastewater Treatment Plant. Wastewater is treated before entering the reactor clarifier. Effluent from the clarifier enters a surface impoundment for additional solids separation. Approximately 30% of the treated wastewater is recycled back to the plant. The remaining wastewater is pumped through a multi-media filter for solids removal and discharged along with treated sanitary wastewater under NPDES Permit. In a March 17, 1995 letter PADEP granted Brush Wellman Permit by Rule (PBR) status for the Industrial Wastewater Treatment Plant.

Former Units

Historically, the Industrial Wastewater Treatment System included three settling lagoons and a clay lined surface impoundment. Settling Lagoons A, B, and C collectively held a capacity of 255,000 gallons. The liquid fraction was decanted to the Surface Impoundment where it was further treated and then recycled as process water or discharged under permit.

The clay-lined Surface Impoundment (also called the 1.6-Acre Lagoon) was constructed to the east of the treatment building in 1960 to store treated wastewater from the pickling and annealing lines. The walls were constructed from earth moved from the inner portion of the Surface Impoundment. The bottom of the Surface Impoundment was compacted with a six-inch layer of clay.

The Settling Lagoons were closed in 1982. Use of the Surface Impoundment ceased prior to 1984 when Brush Wellman discontinued the electroplating process that used cadmium. This surface impoundment was never permitted. According to an August 15, 1984 letter, this unit was the only one requiring a hazardous waste permit. With the approval of PADEP and USEPA, Brush Wellman opted to close the Surface Impoundment instead of continuing with the hazardous waste permit application

Brush Wellman opted to remove all of the hazardous waste from this unit to avoid post closure care obligations. A closure plan was submitted to USEPA in 1985 and revised closure plans followed in January 1986, April 1987, and June 1987. PADEP approved changes to the revised closure plan in a July 13, 1987 letter. PADEP also noted that prior to clean closure, groundwater samples were to be collected from 5M, 6M, 7M, 8M, 9M, 10M, and 11M.

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).

Current Units

In early 1981, Settling Lagoons were replaced by the Synthetically Lined Surface Impoundment. This unit is still in operation as part of the Industrial Wastewater Treatment Plant. Brush Wellman drained the Synthetically Lined Surface Impoundment in July 2004 to assess the condition of the liner material. The inspection revealed neither breach nor sign of potential failure.

Sampling

Quarterly groundwater monitoring has been on-going at the Brush Wellman facility since the early 1980s. Monitoring was initiated in response to elevated nitrate-nitrogen concentrations observed in the production wells at the facility. Upon closure of the Surface Impoundment, monitoring parameters were expanded to include metals associated with the discharge to this former unit (i.e. nickel, cyanide, and cadmium.)

Groundwater results have been compared to PADEP's Medium Specific Concentrations (MSCs). Through the years, beryllium, cadmium, and nitrate-nitrogen occasionally have been found above their respective MSCs. Primarily, nitrate-nitrogen exceed its MSC of 10 mg/l in the late 1990s and early 2000s with levels up to 22 mg/l in wells 7M, 8M, 10M, and 11M. Sampling in recent years shows consistent levels that do not exceed MSCs.

Beryllium and other metals have not always been a part of the sampling parameters. As part of a split sampling event in 1999, PADEP collected groundwater samples and analyzed them for arsenic, beryllium, cadmium, chromium, copper, lead, nickel, selenium, cyanide, phenols, total organic carbon, and sulfate. Total beryllium concentrations of 4 µg/l (5M) and 2,330 µg/l (6M) were noted. Dissolved beryllium in 6M was 1,720 µg/l. The applicable standard is 4 µg/l. It should be noted that 6M was installed as an upgradient monitoring well for the Surface Impoundment. The source of this beryllium spike in well 6M has not been found. Recent sampling has shown beryllium to slightly exceed its MSC, with results ranging from non-detection to 5 ug/l.

References:

Final Environmental Indicator Inspection Report, December 2005
Materion Response to USEPA, September 2012
Results of Groundwater Sampling, from PADEP Landlinks database

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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)?

X _____ 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):

Based on the past sampling, contaminants of concern are nitrate-nitrogen and beryllium. In recent sampling, nitrate-nitrogen has been below its MSC standard of 10 ug/l. Beryllium slightly exceeds its MSC of 4 ug/l, occasionally. The consistent levels of the constituents of concern show contamination has stabilized.

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): _____

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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 judgment/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 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 "level(s)," and if 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 cannot be shown to be "**currently acceptable**") – skip to #8 and enter a "NO" status, 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?"

X

_____ 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 continues under PADEP oversight.

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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).

X 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 Brush Wellman (Materion Corporation) facility, EPA ID # PAD 002 387 835 located at 100 Shoemakersville Road, Shoemakersville, PA 19107. 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 09/30/2020

(print) Linda Matyskiela

(title) RCRA Project Manager

Supervisor:



Date 9/30/2020

Paul Gotthold

Chief CA Branch no 2

Region 3

Locations where References may be found:

All reference documents are appended to the EI Report which can be found at USEPA's
Region III office in Philadelphia or PADEP's Southcentral Regional office in
Harrisburg, PA.

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