

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: Baldwin Hardware Corporation
Facility Address: 841 E. Wyomissing Blvd, Reading, PA 19612
Facility EPA ID #: PAD002350833

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):

Rationale:

Facility Background:

The Baldwin Hardware Corporation (Baldwin) facility primarily manufactures solid brass mortise locks, forged materials and bathroom and desk accessories. Historically, plant operations included electroplating, polishing and lacquer clear coating.

Two former unlined surface impoundments (drying beds) were used to store sludge from the wastewater treatment system. These impoundments were the source of groundwater contamination on the site. Closure of the impoundments occurred between 1983 and 1984; and included excavation of contaminated soil and installation of a groundwater monitoring system. Clean closure of the impoundments soils was certified by Pennsylvania’s RCRA program July 20, 1984. On April 13, 1987, EPA Region III issued a RCRA 3008(h) Consent Order requiring Baldwin to establish a pump and treat system for contaminated groundwater. Baldwin has been recovering and treating the groundwater since April 1988.

TCE

Groundwater contamination exists on site. The main constituents of the contamination from the former impoundments are halogenated hydrocarbons, primarily trichloroethylene (TCE) and its associated degradation products. Currently, TCE is the only halogenated hydrocarbon found above its health-based standard. In April 2007, the maximum TCE concentration found was 54.6 ppb and the drinking water standard is 5 ppb.

Benzene – from off-site

Benzene has been found in the groundwater, in an upgradient monitoring well, OW-3D since 1993. Concentration has varied from non-detection to 79.7 ppb over the years. The monitoring well is the most-upgradient (northwestern) corner of the site and there is no on-site source or industrial activity which would explain the presence of benzene. Therefore, it is believed that the benzene is from an off-site source. As benzene is a commonly found contaminant, more research will be needed to find the source. Historically, benzene has not been found above drinking water standards in any other well, therefore its presence in this isolated location is not considered a concern for evaluation of groundwater contamination from site activities.

References:

1. Quarterly Monitoring Report, Baldwin Hardware Corporation, prepared by Environmental Resources Management, Inc., dated - July 2006
2. Groundwater Investigation, Baldwin Hardware Manufacturing Company, prepared by Keck Consulting Services, Inc., dated November 1984

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).

References: cont'

3. USEPA Region III Administrative Order on Consent, Baldwin Hardware Corporation, dated April 13, 1987
4. Purge and Treatment Certification Report, prepared by Keck Consulting Services, Inc., dated September 2, 1988
5. Comprehensive Groundwater Monitoring Evaluation, Baldwin Hardware Corporation, prepared by PADEP, dated 1993
6. Comprehensive Groundwater Monitoring Evaluation, Baldwin Hardware Corporation, prepared by PADEP, dated 1996
7. Comprehensive Groundwater Monitoring Evaluation, Baldwin Hardware Corporation, prepared by PADEP, dated 1999
8. Comprehensive Groundwater Monitoring Evaluation, Baldwin Hardware Corporation, prepared by PADEP, dated 2002

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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):

Rationale

The groundwater pump and treat system currently consists of three pumping wells and two back-up pumping wells, along with four monitoring wells and ten piezometers. There are also three offsite wells which have been used to provide water level measurements. The recovery wells pump continuously at a rate of 300 gallons per minute. The recovered groundwater is treated in an air-stripping tower and then used for plant processes. Any excess treated water is discharged with other plant wastewater through an NPDES permit issued by PADEP.

Groundwater contamination has shown a steady reduction since the recovery system was installed in 1988.

TCE Concentration in ppb. Drinking water standard is 5 ppb.

Recovery Well	03/1988	03/1990	04/1998	04/2007
PS-1	4900	900	232	4.3
PS-2	1100	760	93.1	7.5
PS-3	97	4	ND	2.4
PW-4	1600	270	428	2.8
PW-5	4000	600	524	54.6

References: See References for Question 2 on Pages 2 and 3

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):

Rationale

The water level measurements have consistently shown that the pumping wells are keeping the groundwater contamination on-site. The contaminants are not flowing off-site, nor to the Schuylkill River, which is less than half a mile to the northeast. Baldwin will continue pumping and will continue to keep the contaminant plume on-site.

References: See References for Question 2 on Pages 2 and 3

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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.
- 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):

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):

Rationale

On April 13, 1987, EPA Region III issued a RCRA 3008(h) Consent Order requiring Baldwin to establish a pump and treat system for contaminated groundwater. Baldwin has been recovering and treating the groundwater since April 1988.

The clean-up goals contained in the Consent Order are MCLs, which has not been achieved for TCE. The groundwater pump and treat system currently consists of three pumping wells and two back-up pumping wells, along with four monitoring wells and ten piezometers. There are also three offsite wells which have been used to provide water level measurements. EPA requires quarterly groundwater monitoring to confirm that the pump and treat system is operational and effective in keeping the contamination on-site.

References: See References for Question 2 on Pages 2 and 3

