DOCUMENTATION OF ENVIRONMENTAL INDICATOR DETERMINATION

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

Facility Name: F. Bowie Smith
Facility Address: 4500 East Lombard Street Baltimore, Maryland 21244
Facility EPA ID #: MDD003100336

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):

The former F. Bowie Smith & Sons wood preserver site is an approximately 10 acre parcel of land located in a heavily industrialized mixed use area in the City of Baltimore, Maryland. The site is owned by Birchwood Realty Company, Inc. and is currently undeveloped, containing foundations from some of the former F. Bowie Smith facilities.

The site is located approximately 0.2 miles west of the Lombard Street interchange with Interstate 895 (Harbor Tunnel Throughway). The site is bound to the east, north and west by CSX railroad track rights of way and to the south by Lombard Street. Industrial properties are located north, northwest, east and south of the site. The nearest residences are row homes located on North Kristen Street approximately 500 feet west of the site.

The site was a stove, bathtub and sink foundry from the late 1800s to 1945. In 1952 F. Bowie Smith & Sons Inc. purchased the property and redeveloped the site into a wood treatment facility. F. Bowie Smith operated on the site until the late 1980s.

According to the Maryland Department of the Environment (MDE) fact sheet, the wood preserving process at this site involved using pressure vessels to saturate wood with the preserving chemicals. Pentachlorophenol (PCP) was used as the preserving chemical until 1961, fluorochrome arsenate phosphate was used until 1976, creosote was used until 1983 and copper chromate arsenate was used from 1976 until 1988.

Drip areas were located in the north-central portion of the site to allow excess preservatives to drain from the wood. Two concrete collection tanks were used to capture solution not absorbed during the treatment process. In 1983, a closed treatment system was installed, allowing reuse of excess solution. Several storage tanks for holding the treatment chemicals and diesel fuel, used as a solvent during the creosote treatment process, were also located on the site, including along the northwest property boundary.

Four ground water monitoring wells were installed during the initial site investigation in 1986. These wells are located on the north, east, west and south of the contaminated areas and are identified as the North, South, East and West wells. Groundwater flow was determined to be towards the northwest. The south well became the up gradient well, or background well, for the analysis.

Twenty-one ground water sampling events were performed on the site from August 13, 1986 through February 14, 2003. The data showed concentrations of arsenic, chromium, naphthalene and pentachlorophenol (PCP) from the four monitoring wells above MCLs or Risk Based Screening Levels.

Since 2006 East Star has performed four on-site groundwater sampling events and one off-site groundwater sampling event. The on-site sampling was performed in July 2006, November 2007, May 2010 and December 2010. The November 2007 sampling event included installation and sampling of five temporary monitoring wells along the northwest property boundary to better define the groundwater gradient and delineate the conditions along the down gradient property line.

In December 2010, high concentrations of PCP (MCL of 1 ug/l) were found in the east and west wells which are near the location of the previous chemical storage tanks surrounding the wood treatment building. Well concentrations were at 290 ug/l (East well) and 1,200 ug/l (West well).

Concentrations of Naphthalene (RSL of .17 ug/l) also exist in the east and west wells. Well concentrations were at 54 ug/l (East well) and 27 ug/l (West well).

The east well also had concentrations of arsenic (38 ug/l) and chromium (790 ug/l) exceeding MCLs (arsenic MCL of 10 ug/l and chromium MCL of 100 ug/l).

Reference:
RCRA Facility Investigation - Corrective Measures Study of the 4500 East Lombard Street Site (former F. Bowie Smith & Sons Inc. Site) December 12, 2012

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):

East Star has performed four on-site groundwater sampling events and one off-site groundwater sampling event. The on-site sampling was performed in July 2006, November 2007, May 2010 and December 2010. The November 2007 sampling event included installation and sampling of five temporary monitoring wells along the northwest property boundary to better define the groundwater gradient and delineate the conditions along the down gradient property line. Groundwater sampling at the edge of the property has shown the contaminants are not leaving the site.

Reference(s):

RCRA Facility Investigation - Corrective Measures Study of the 4500 East Lombard Street Site (former F. Bowie Smith & Sons Inc. Site) December 12, 2012

[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):

East Star has performed four on-site groundwater sampling events and one off-site groundwater sampling event. The on-site sampling was performed in July 2006, November 2007, May 2010 and December 2010. The November 2007 sampling event included installation and sampling of five temporary monitoring wells along the northwest property boundary to better define the groundwater gradient and delineate the conditions along the down gradient property line. Groundwater sampling at the edge of the property has shown the contaminants are not leaving the site and not reaching surface waters.

Reference(s):

RCRA Facility Investigation - Corrective Measures Study of the 4500 East Lombard Street Site (former F. Bowie Smith & Sons Inc. Site) December 12, 2012

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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)?

☐ 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])?

☐ 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):

The final remedy will consist of ongoing groundwater monitoring of the existing well network for site related constituents including naphthalene, pentachlorophenol and related constituents exceeding risk based standards. The proposed monitoring program would include annual monitoring of facility wells.

Reference(s):

RCRA Facility Investigation - Corrective Measures Study of the 4500 East Lombard Street Site (former F. Bowie Smith & Sons Inc. Site) December 12, 2012

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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 F. Bowie Smith Baltimore facility, EPA ID # MDD003100336, located at 4500 East Lombard St, Baltimore, MD 21244. 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) Leonard E Hotham Date 2/9/15
Leonard E. hotham
Environmental Engineer

Supervisor (signature) Date 2/9/15
Luis Pizarro
Associate Director Land and Chemicals Division
EPA Region III

Locations where References may be found:

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