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:  Wheeling Pittsburgh Steel/RG Steel Steubenville aka River Rail
Facility Address:  440 South Third Street Extension, Steubenville, OH
Facility EPA ID #:  OH000810382

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 #3 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 EIs 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).

2. Is groundwater known or reasonably suspected to be "contaminated" 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):
Meets Ohio EPA Voluntary Action Program (VAP) applicable standards - See Attachment

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).
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):

\(^2\) "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.
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):
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 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\(^3\) 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.
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)?)

☐ 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,\(^4\) 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/habits 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.
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 Wheeling Pittsburgh Steel/RG Steel Steubenville aka River Rail facility, EPA ID No.: DHD000810382, located at 440 South Third Street Extension, Steubenville, OH. 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]
Kristin Vanecko
(Print)
Environmental Specialist
(Title)

Supervisor: [Signature]
Scott Bergreen
(Print)
Supervisor
(Title)
Ohio EPA SEDO
(EPA Region or State)

Date: 2/20/2020

Locations where References may be found:

Division of Environmental Response and Revitalization files located at Ohio EPA’s Southeast District Office in Logan, Ohio

Contact telephone and e-mail numbers:

Scott Bergreen, Supervisor
(Name)
(740) 380-5288
(Phone Number)
Scott.bergreen@epa.ohio.gov
(E-mail)
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):
Attachment
Facility History and Rationale/Key Contaminants

Facility History
The property was first developed by the Jefferson Iron Works in 1856 as a steel production facility, and steel production continued at the facility under various owners. Operations included a blast furnace (primary iron production), a pickling line for carbon steel and a temper mill. In 2005, Wheeling Pittsburgh Steel discontinued primary steel production activities, but ancillary steel processing operations continued for a few years. In 2012, River Rail Development, LLC purchased the property and began redeveloping the property for use as a commercial/industrial park. Tidewater River Rail Operating, LLC, acquired the property in July 2018. A 0.64 acre parcel along the Ohio River in the east-central portion of the property is owned by Mountain State Carbon, LLC. The property includes a Ranney collector well that provides non-potable water to the Mountain State Carbon (MSC) property located across the Ohio River in West Virginia.

PA/VSI
Due to past industrial activities at the site, the site is subject to RCRA Corrective Action (CA). In 2007, Booz Allen Hamilton (Booz Allen) was tasked by the US Environmental Protection Agency (EPA) Region 5 to complete Preliminary Assessment (PA) and Visual Site Inspection (VSI) activities at four Wheeling Pittsburgh Steel Corporation (WPSC) plants, including the plant in Steubenville. Booz Allen along with US EPA Region 5 and Ohio EPA conducted the VSI at the Steubenville plant on May 16 and 16, 2008. The November 2008 PA/VSI report identifies a total of 30 Solid Waste Management Units (SWMUs) and 18 Areas of Concern (AOCs). An April 25, 2011 US EPA memorandum revises the November 2008 report to correct errors and inconsistencies in the report.

Environmental Investigations
In 2007, WPSC submitted documentation to Ohio EPA to demonstrate participation in the Ohio EPA RCRA and Voluntary Action Program Memorandum of Agreement Track (VAP MOA) to address environmental contamination at the property. On February 21, 2008, Ohio EPA sent WPSC a letter stating that since the facility is the subject of federal enforcement or response action under RCRA, it is ineligible for the VAP MOA Track. In 2012, US EPA had discussions with Ohio EPA and a prospective buyer of the property about addressing the environmental contamination on the site through the VAP MOA process. US EPA also reviewed the Phase II Site Investigation report provided by the prospective purchaser. On May 25, 2012, US EPA issued a letter to Ohio EPA stating that US EPA would not object to inclusion of the site in the VAP MOA Track, excluding a defined easement containing the coke oven gas pipeline and storage tank. Ohio EPA then issued a letter to the prospective purchaser on July 13, 2012 stating that the property would be eligible to participate in the VAP and the VAP MOA, provided the active coke oven gas pipeline and storage tank is excluded from the VAP property. In August 2012, the property owner submitted a Notice of Entry into the VAP MOA Track and Ohio EPA responded with an Acknowledgement of Entry into the VAP MOA on October 15, 2012. The VAP MOA property does not include the coke oven gas pipeline and storage tank property nor does it include the parcel owned by MSC.

The first draft of the Phase I Property Assessment (Phase I) was submitted in May 2013 and the final version was approved by Ohio EPA in January 2017. Twenty-five identified areas were designated in Phase I. The first draft of the Phase II Property Assessment (Phase II) was submitted in August 2013 and the final report was approved in March 2017. Ground water assessment activities conducted as part of the Phase II included:

- The installation of 12 temporary wells and 25 permanent monitoring wells;
- The collection and submittal of ground water samples for laboratory chemical analysis;
- Multiple surveys measuring the elevations of the top of the monitoring well casings and ground water surface elevations of monitoring wells.
The data obtained by the Phase II activities demonstrated that ground water was contaminated with heavy metals, semi-volatile organic compounds (SVOCs) and volatile organic compounds (VOCs). The assessment's results determined the need to address the ground water contamination and the recommended mechanism was through an Environmental Covenant (EC) prohibiting potable use of ground water.

**Remedial Actions**

The remedy conducted at the property consisted of the following:

- Activity and Use Limitations described Environmental Covenant (EC) filed with the Jefferson County Recorder's Office on February 12, 2018. The activity and use limitations:
  - Restrict the entire property to commercial/industrial land use;
  - Restrict use of ground water underlying the entire property to prohibit its use as a water source; and
  - Prohibit the occupation of buildings within 100-feet of (and inclusive of) IA-19, IA-20, IA-21, IA-22, IA-24 and IA-25 due to potential vapor intrusion subsurface COCs. Human occupation may be possible with either the installation of vapor mitigation system or a demonstration that such system is not necessary for human occupancy.
- Engineering control that consists of an asphalt cap over soils in IA-2 that exceed the applicable standard for benzo(a)pyrene. An Operation and Maintenance (O&M) Agreement and O&M Plan are in place to ensure that the engineering control is maintained;
- Risk Mitigation Plan to provide protection from COCs to workers performing construction or excavation activities across the entire property.
- Excavation and off-site disposal of soils with COCs above applicable standards. Soils exceeding direct contact standards were excavated to a minimum of four feet below ground surface. Soils exceeding total petroleum hydrocarbon (TPH) soil saturation values were excavated to a minimum of ten feet below ground surface. Approximately 3,007 yd³ of soil were excavated, and the soils were transported to Republic Services Short Creek Landfill in Wheeling, WV. The area was backfilled with clean soil.

**Key Contaminants in Ground Water and Applicable Standards**

**Upper Silt Unit**

- Cadmium was detected in 2B-MW at 0.034 mg/L; the applicable standard is 0.005 mg/L
- TCE was detected in 2B-MW at 19.0 μg/L and in 27-MW at 9.1 μg/L; the applicable standard is 5 μg/L
- Cis-1,2 dichloroethene (cis 1,2 DCE) was detected in 27-MW at 220 μg/L; the applicable standard is 70 μg/L
- Vinyl chloride was detected in 27-MW at 6.51 μg/L; the applicable standard is 2 μg/L

**Lower Sand Unit**

- TCE was detected in D2-MW at 9.7 μg/L; the applicable standard is 5 μg/L
- Arsenic was detected in 2-MW at 0.130 mg/L; the applicable standard is 0.010 mg/L

**Migration of Contamination in Ground Water Stabilized**

The subsurface conditions beneath the property consist of sand and gravel within the bedrock valley overlain by fine grained flood plain deposits and miscellaneous fill materials (slag, etc). Fill material
extends across the majority of the property at thicknesses varying from 10 to 28 feet; fill material was encountered in each soil boring and monitoring well installed during the Phase II.

The upper unconsolidated geologic unit beneath the fill materials consists of alluvial floodplain sediments, primarily composed of fine-grained sediments deposited by the Ohio River. The Upper Silt Unit ranges in thickness from 0 to 30 feet; the thickness is greatest along the centerline of the property. The unit tapers out to the east and closer to the river and grades into the Lower Sand Unit. The Upper Silt Unit was not observed in wells and soil borings installed adjacent to the river.

The lower unconsolidated geologic unit consists of sand and gravel. The Lower Sand Unit varies in thickness across the property. The unit's surface and thickness increase from west to east across the property as it approaches the Ohio River where the sand and gravel outwash deposits are observed in surficial soils.

Based on monitoring well logs from the Phase II, the bedrock lies beneath the unconsolidated deposits approximately 68 feet below the surface of the property.

During the Phase II, ground water was observed in both the Upper Silt Unit and the Lower Sand Unit. The Upper Silt Unit is classified as Class A ground water and the Lower Sand Unit as a Critical Resource per Ohio Administrative Code (OAC) 3745-300-10. Ground water from the Upper Silt Unit mixes with ground water in the underlying Lower Sand Unit, and then ultimately with the Ohio River. Ground water was typically encountered within the Upper Silt Unit at approximately ten (10) feet below ground surface (bgs) with ground water flow generally to the east, toward the Ohio River. Ground water elevation data show the influence of the perched surface water infiltration within the overlying fill that serve as recharge points for the Upper Silt Unit and cause ground water flow to be deflected across the property. Ground water in the Upper Silt Unit is interpreted to discharge to the Lower Sand Unit and the Upper Silt Unit pinches out and grades into glacial outwash along the river.

Ground water was encountered in the Lower Sand Unit at approximately twenty (20) feet-bgs. Ground water elevation data show lateral ground water flow is generally to the east beneath the property moving toward the Ohio River; however, the flow regime shows ground water being deflected away from the river in the vicinity of 27-MW and D2-MW. The Lower Sand Unit is the ground water unit that is in contact and communication with the Ohio River. If the Ranney well located on the MSC property were to affect local ground water, it would be observed in the Lower Sand Unit ground water elevations, however, the Ohio River predominantly acts as a losing stream (i.e., high water levels in the Ohio River results in surface water flowing from the river and into the lower-lying ground water unit), demonstrating that the Ranney well does not affect local ground water conditions or serve as a preferential pathway.

The bedrock saturated zone underlying the Lower Sand Unit is reportedly comprised of thin layers of sandstone, shale and limestone at approximately 68 bgs. The bedrock produces very limited and often inadequate supplies with yields typically less than 2 gallons/minute according to the Groundwater Resources of Jefferson County. The horizontal hydraulic conductivity of the Lower Sand Unit is at least an order of magnitude greater than vertical hydraulic conductivity between this unit and the underlying bedrock. The differential hydraulic conductivity between the two zones will result in substantially greater horizontal flow than vertical mixing. Additionally, the Phase II discusses information from a nearby property that indicates that the bedrock aquifer system beneath the sand and gravel aquifer exhibits upward hydraulic gradients, with discharge from the bedrock aquifer to the sand and gravel aquifer. Based on this information, the Phase II concludes that it is reasonable to assume contaminants in the Lower Sand Unit would not reach the bedrock unit.

As identified in the previous section, ground water in the both the Upper Silt Unit and the Lower Sand Unit on property exceed the VAP unrestricted potable use standards (UPUS) at certain locations. To address the on property ground water pathway, an EC was filed with the Jefferson County Recorder's Office to restrict use of ground water underlying the entire property to prohibit its use as a water source.
The offsite MSC property is connected to the municipal water supply for potable water needs. Production water needs are met by surface waters from the Ohio River via the offsite Ranney well. Also, while ground water at the property exceeds the VAP UPUS at certain locations, multiple rounds of ground water sampling show that ground water at the MSC property boundary meets UPUS.

Ground water at the property meets UPUS at the property boundary with the offsite MSC property, and MCS's use of the Ranney well to extract offsite surface water from the Ohio River does not affect the local ground water flow or act as a preferential pathway for ground water flow.

The Phase II also demonstrates that ground water with concentrations of contaminants exceeding State of Ohio surface water quality criteria for the Ohio River drainage basin (applicable standards) will not migrate to the Ohio River.

In accordance with OAC 3745-300-10(E), UPUS must be met at the property boundary for both the Upper Silt Unit and the Lower Sand Unit. OAC 3745-300-10(E) requires the implementation of institutional controls or engineering controls that reliably prevent human exposure on property to ground water with concentrations of contaminants in excess of UPUS, or the restoration of ground water underlying the property to UPUS. The Phase II demonstrates that ground water is not migrating off property above UPUS, and an EC has been filed to restrict use of ground water beneath the property. Because the Phase II demonstrates that ground water is not migrating off property above UPUS and because the EC has been filed to restrict the use of ground water underlying the property, applicable standards associated with ground water have been met in accordance with the VAP rules. The information in the Phase II demonstrates that migration of contaminants in ground water is under control.

Documents Reviewed

TRC, Phase I Property Assessment - Former RG Steel Property located at 440 South Third Street, Steubenville, Jefferson County, Ohio. December 2016.


TRC, No Further Action Letter and Request for Covenant Not to Sue – Former RG Steel Property located at 440 South Third Street, Steubenville, Jefferson County, Ohio. April 2017.