

DOCUMENTATION OF ENVIRONMENTAL INDICATOR DETERMINATION

Interim Final 2/5/99

RCRA Corrective Action Environmental Indicator
(EI) RCRIS code (CA725) Current Human
Exposures Under Control

Facility Name: Former Cerro Metal Plant
Facility Address: 2022 Axemann Road, Bellefonte, PA 16823
Facility EPA ID #: PAD086733540

1. Has all available relevant/significant information on known and reasonably suspected releases to soil, groundwater, surface water/sediments, and air, 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 #6 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 Control” 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 “Current Human Exposures Under Control” EI are for reasonably expected human exposures under current land- and groundwater-use conditions ONLY, and do not consider potential future land- or groundwater-use conditions or ecological receptors. The RCRA Corrective Action program’s overall mission to protect human health and the environment requires that Final remedies address these issues (i.e., potential future human exposure scenarios, future land and groundwater uses, and ecological receptors).

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. Are groundwater, soil, surface water, sediments, or air **media** 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 (from SWMUs, RUs or AOCs)?

	<u>Yes</u>	<u>No</u>	<u>?</u>	<u>Rationale/Key Contaminants</u>
Groundwater	X			Plant 1, TCE (Trichloethylene) above Pennsylvania Department of Environmental Protection (PADEP) used aquifer Non Residential Medium Specific Concentrations (NR MSC), but below nonuse aquifer NR MSCs at the center of the property. Plant 4, Dense Non-aqueous phase liquid (DNAPL) containing polychlorinated biphenyl (PCB) Aroclor 1248. North Yard, volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs) and metals (likely related to historical steel operations). Point of compliance wells not impacted above used aquifer NR MSCs.
Air (indoors) ²		X		Releases have occurred to soil and groundwater; however, VOCs and SVOCs detected in indoor air were not above risk-based levels.
Surface Soil (e.g., <2 ft)	X			Plant 1-TCE above PADEP used but below nonuse aquifer soil to groundwater NR MSCs. Plant 4- DNAPL containing PCB Aroclor 1248. North Yard- VOCs, SVOCs and metals Facility demonstrated attainment of site- specific standard via pathway elimination.
Surface Water		X		Logan Branch runs through the property. PCB levels in fish are below PADEP levels.
Sediment		X		Logan Branch runs through the property. Brown trout tissue sampled for PCBs in 1996 show levels below PADEP 2 PPM threshold.
Subsurface Soil (e.g., >2 ft)	X			Plant 1-TCE above PADEP used aquifer but below nonuse aquifer soil to groundwater NR MSCs. Plant 4- DNAPL containing PCB Arcolor 1248. North Yard- VOCs, SVOCs and metals above PADEP used aquifer NR MSCs but below nonuse aquifer NR MSCs.
Air (outdoors)		X		Facility operated under Title V (synthetic minor) air permit for emissions sources. No known releases to outdoor air.

_____ If no (for all media) - skip to #6, and enter “YE,” status code after providing or citing appropriate “levels,” and referencing sufficient supporting documentation demonstrating that these “levels” are not exceeded.

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 appropriately protective risk-based “levels” (for the media, that identify risks within the acceptable risk range).

² Recent evidence (from the Colorado Dept. of Public Health and Environment, and others) suggest that unacceptable indoor air concentrations are more common in structures above groundwater with volatile contaminants than previously believed. This is a rapidly developing field and reviewers are encouraged to look to the latest guidance for the appropriate methods and scale of demonstration necessary to be reasonably certain that indoor air (in structures located above (and adjacent to) groundwater with volatile contaminants) does not present unacceptable risks.

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 X If yes (for any media) - continue after identifying key contaminants in each "contaminated" medium, citing appropriate "levels" (or provide an explanation for the determination that the medium could pose an unacceptable risk), and referencing supporting documentation.

 If unknown (for any media) - skip to #6 and enter "IN" status code.

Rationale and Reference(s):

The Cerro site consists of approximately 150 acres, 19 of which the plant occupies. The site characterization was conducted in multiple phases in order to define specific areas for remediation. The facility ceased operations at the Bellefonte location on March 20, 2007. As part of the characterization process, Marmon (responsible party) submitted revised Notice of Intent to Remediate (NIR) documents to PADEP in July of 2009 to address specific sites as defined in PA Code, Title 25, Chapter §250.1. The characterization resulted in the identification of six distinct areas: the North Yard, Plant 1, South Spring, Plant 4, South Yard, and the Eastern Hillside. The characterization revealed soils and groundwater beneath Plant 4 were impacted with VOCs, metals, and Polychlorinated Biphenyl (PCB) Aroclor 1248. The characterization revealed soils and groundwater beneath the northwestern portion of Plant 1 are impacted with volatile organic compounds (VOCs). Various inorganic constituents are present in soil, but most groundwater samples are below their respective PADEP Used-Aquifer Non-Residential (total dissolved solids < 2,500 micrograms per liter (ug/l) Non Residential Statewide Health Standard (NRSHS) MSCs. Contamination on the Plant 1 property is attributed to historic oil leakage from a degreaser, iron and copper slag and ash buried beneath a significant portion of the plant, and periodic use and spillage of industrial degreasers in historic manufacturing operations. The site characterization revealed soils and groundwater beneath the North Yard portion of the site were also impacted with VOCs.

A Consent Order and Agreement (COA) was issued by the Pennsylvania Department of Environmental Resources (PADER), (now PADEP) on November 21, 1994 to address various issues regarding the characterization and remediation of certain areas of the Cerro plant. The COA required Cerro to address environmental and health and safety issues within and around the plant.

The facility historically operated under USEPA ID No. PAD086733540 for its hazardous waste operations. It was a large quantity generator (LQG) of hazardous waste, operated under a treatment/storage/disposal (TSD) permit. Historic operations at Cerro included forging, machining, melting, drawing, pickling, drawing, and the finishing of metals; specifically copper and brass. Cerro historically handled and stored various lubricants, oils, degreasers, sulfuric acid and hydrogen peroxide for operations conducted on site. The manufacturing operations flowed in a southern to northern direction through the site buildings. Raw and scrap metals, which included copper, zinc, lead, brass, and other alloy materials, were delivered to the South Yard before being deposited into Plant 4. The raw and scrap metals were melted in Plant 4 and turned into ingots. The ingots were then extruded into various shapes and lengths within the northern section of Plant 4.

Plant 1:

The characterization of the Plant 1 area of the property consisted of soil borings, groundwater monitoring well installation/sampling, soil vapor sampling, indoor air sampling, and surface water gauging/sampling. The field work for the characterization of groundwater beneath Plant 1 was initiated on July 21, 2007. A total of nine groundwater monitoring wells and one recovery well were installed in the Plant 1 vicinity in order to characterize and remediate groundwater. The monitoring wells were located in areas where the soil samples reportedly contained elevated concentrations of contaminants of concern (COC), areas where former equipment was located, areas downgradient of the former equipment, and between the suspected source area and the likely receptor (Logan Branch). The overburden within Plant 1 ranged from five feet below ground surface (ft-bgs) to 20 ft-bgs. Groundwater samples from the monitoring wells were analyzed for VOCs, PCBs, and metals or a variation of these constituents depending on the location and suspected contaminant. The Site characterization revealed soils and groundwater beneath the northwestern portion of Plant 1 were impacted with VOCs.

After site characterization, 238.5 cubic yards of contaminated soil was excavated from the northern portion of Plant 1. Soil removed was contaminated with TCE, tetrachloroethene (PCE), cis-1,2-dichloroethene, and vinyl chloride (VC). Confirmatory sampling showed that all samples in the excavation area were below PADEP's MSC TCE value of 180 mg/kg for the 2-15 ft zone in a nonresidential scenario. The highest reading of TCE was 37.4 mg/kg in sample P1BS-3 taken at a depth of 4.5'. After confirmatory sampling was complete, multiple injections of sodium persulfate (chemical oxidant) were injected during 2010 and 2011 to help remediate impacted groundwater. Prior to the last injection of persulfate, the monitoring wells for Plant 1 were

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sampled for VOCs. All results were below the Statewide Health Standards, and most results were non-detect. During the February 2014 sampling event one well showed an exceedance of the Statewide Health Standards, well SB-17B-s had a value of 224 ug/L, above the PADEP MSC of 5 ug/L for TCE. This appears have been an anomaly, because the next quarter TCE was observed at 1.01 ug/l at the same location.

The final report described the area(s) of the property characterized, contaminants identified, remediation performed, and that a site-specific standard was attained. PADEP approved this report for the substances identified in soil and groundwater and remediated to an Act 2 standard within the site(s) specified. As such, the facility attained the nonresidential (NR) site-specific standard for the following compounds in groundwater: TCE via pathway elimination.

Plant 1 attained the NR site-specific standard for the following compounds in soil: arsenic and chromium via pathway elimination. Arsenic numbers were slightly elevated and may be attributed to background. The Total allowable EPA Industrial Soil Regional Screening Level for Chromium(VI) is 6.3 mg/kg (1×10^{-6} risk). Samples for Total Chromium on the Plant 1 site ranged from 7 mg/kg to 1040 mg/kg. Total chromium concentrations in U.S. soils range from 1 to 2,000 mg/kg, with a mean of 37.0 mg/kg (USGS 1984). This constituent was probably there from slag fill from previous operations or may be naturally occurring in the native soils. Hexavalent Chromium is not a suspected COC at the site. If we conservatively assume that 5% of the observed total chromium concentration is of the hexavalent species, all of the soil samples collected and analyzed were well within EPA's allowable risk range for that contaminant.

No metals, SVOCs, or PCB exceedances were reported in groundwater beneath Plant 1.

Plant 4:

Contamination of the Plant 4 property can be attributed to historic oil leakage from the hydraulic piston-pit of older melting furnaces (TAMAs), iron and copper slag and ash buried beneath a significant portion of Plant 4, and periodic use and spillage of industrial degreasers in historic manufacturing operations. The characterization of the Plant 4 area of the property consisted of soil borings, groundwater monitoring well installation/sampling, soil vapor sampling, and indoor air sampling.

The field work for the characterization of groundwater beneath Plant 4 was initiated on July 21, 2007. A total of thirty-two groundwater monitoring wells, and three recovery wells were installed in the Plant 4 vicinity in order to characterize and remediate groundwater. The monitoring wells were located in areas where the soil samples reportedly contained elevated COC concentrations, areas where former equipment was located, areas downgradient of the former equipment, and between the suspected source area and the likely receptor (Logan Branch). The overburden within Plant 4 ranged from five ft-bgs to 20 ft-bgs. Groundwater samples from the monitoring wells were analyzed for chlorinated solvents, aromatic hydrocarbons, hydraulic oil contaminated with PCBs, and metals or a variation of these constituents depending on the location and suspected contaminant.

Plant 4 had 3 recovery wells installed, pumped, and then closed to recover DNAPL from the site. DNAPL in the form of PCB Arochlor 1248 was present in groundwater in an isolated area beneath the Plant 4 building in the area that housed the furnaces.

Soil Attainment at Plant 4 was demonstrated through sampling and comparison of concentrations to soil to the NR groundwater MSCs using the PADEP 75-10 rule. This rule requires that 75% of the samples collected for demonstration attainment be equal to or below the risk-based cleanup standard and that no single sample result exceeds the risk-based standard by more than ten times. There were four soil samples that exceeded the hexavalent chromium standard. Lead was identified in five soil samples above its respective MSC values, mercury and silver in three soil samples, selenium in two soil samples, and zinc in two soil samples. (See Final report-Plant 4 for numerical results).

North Yard Plant:

The field work for the characterization of groundwater beneath North Yard was initiated with the NIR application in 2009. A total of thirty-one groundwater monitoring wells and four recovery wells were installed in the North Yard vicinity in order to characterize and remediate groundwater. The monitoring wells were located in areas where the soil samples reportedly contained elevated COC concentrations, areas where former equipment was located, areas downgradient of the former equipment, and between the suspected source area and the likely receptor (Logan Branch). The overburden within the North Yard ranged from 5 ft-bgs to 20 ft-bgs. Groundwater samples from the monitoring wells were analyzed for VOCs, PCBs, and metals or a variation of these constituents depending on the location and suspected contaminant.

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Seventeen groundwater gauging and sampling events were completed to determine the extent of contamination in groundwater. The PADEP requires post-remedial monitoring as part of pursuing site closure using site-specific standards (SSS) via pathway elimination. A post-remedial quarterly gauging and sampling program was initiated on March 22, 2013 and was completed on October 7, 2014. Groundwater gauging and sampling were completed using the USEPA Region 3 Low-Flow Sampling Procedure. The results of the quarterly gauging and sampling were summarized in quarterly reports which were submitted to the PADEP.

A groundwater extraction and treatment system was installed to remove TCE from groundwater at the plant on July 12, 2011. The system was removed from service on March 1, 2013. TCE Iso-concentration Contour maps from October 2014 show TCE with a value of 300 ppb in the well at the center of the property located in overburden. The TCE contamination drops to less than 5 ppb within 50 ft. of the well, based on groundwater data.

Groundwater usage in the vicinity of the facility is primarily for industrial purposes such as cooling and lawn irrigation. There were no known production wells at the facility. Potable water for the area is obtained from the local water utility, which receives water from various sources including wells, surface water, and reservoirs.

On April 23, 2015, PADEP notified Cerro that they had received and reviewed the March 10, 2015, Final Report for Soil and Groundwater. The final report described the area(s) of the property characterized, contaminants identified, remediation performed, and that a site-specific standard was attained. PADEP approved this report for the substances identified in soil and groundwater, and affirmed the sites specified were remediated to an Act 2 standard. As such, the facility attained the nonresidential (NR) site-specific standard for the following compounds in soil: arsenic, chromium, and mercury via pathway elimination. The site-specific standard has been attained for the following compound in groundwater: TCE via pathway elimination.

Since the Cerro facilities Plant 1, Plant 4, and North Yard Plant had to demonstrate attainment of the site-specific standards through pathway elimination, environmental covenants have been recorded that include the following activity and use limitations for these plant parcels:

Plant 1:

- The use of the Property is restricted to non-residential purposes as that term is defined in the Land Recycling and Environmental Remediation Standard Act (Act 2) and its regulations (this restriction also excludes schools, nursing homes or other residential-style facilities or recreational areas); and,
- Groundwater underlying the area restricted by the covenant may not be used as a potable water supply nor for agricultural purposes unless tested and treated accordingly, for its intended purposes, as approved in writing by the PADEP; and,
- A soil management plan that includes notification to the PADEP shall be developed if soil within the area restricted by the covenant will be disturbed, and the handling of all soil must comply with the Management of Fill Policy, Document Number 258-2182-773; and,
- The ground surface must remain sealed with an impermeable material such as concrete or asphalt.

Plant 4:

- The use of the Property is restricted to non-residential purposes as that term is defined in the Land Recycling and Environmental Remediation Standard Act (Act 2) and its regulations (this restriction excludes schools, nursing homes or other residential-style facilities or recreational areas); and,
- Groundwater may not be used as a potable water supply nor for agricultural purposes unless tested and treated accordingly for its intended purposes, as approved in writing by the Department of Environmental Protection; and,
- A soil management plan that includes notification to the Department of Environmental Protection shall be developed if soil will be disturbed within Plant 4, and the handling of all soil must comply with the Management of Fill Policy, Document Number 258-2182-773.

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North Yard Plant:

- The use of the Property is restricted to non-residential purposes as that term is defined in the Land Recycling and Environmental Remediation Standard Act (Act 2) and its regulations (this restriction also excludes schools, nursing homes or other residential-style facilities or recreational areas); and,
- Groundwater underlying the area restricted by the covenant may not be used as a potable water supply nor for agricultural purposes unless tested and treated accordingly for its intended purposes, as approved in writing by the PADEP; and,
- A soil management plan that includes notification to the PADEP shall be developed if soil within the area restricted by the covenant will be disturbed, and the handling of all soil must comply with the Management of Fill Policy, Document Number 258-21 82-773.
- The ground surface must remain sealed with an impermeable material such as concrete or asphalt.

To eliminate the exposure pathway to soils where the direct contact numeric values are exceeded in localized areas, the asphalt/concrete and gravel cap will be maintained (as an engineering control) across these areas of the site and an annual inspection will be performed as part of the Post Remediation Care Plan (PRCP).

3. Are there **complete pathways** between “contamination” and human receptors such that exposures can be reasonably expected under the current (land- and groundwater-use) conditions?

Summary Exposure Pathway Evaluation Table

Contaminated Media	Potential Human Receptors (Under Current Conditions)						
	<u>Residents</u>	<u>Workers</u>	<u>Day-Care</u>	<u>Construction</u>	<u>Trespassers</u>	<u>Recreation</u>	<u>Food</u> ³
Groundwater							
Air (indoors)							
Soil (surface, e.g., <2 ft.							
Surface Water							
Sediment							
Soil (subsurface e.g., >2 ft.							
Air (outdoors)							

Instructions for Summary Exposure Pathway Evaluation Table:

1. Strike-out specific Media including Human Receptors' spaces for Media which are not “contaminated” as identified in #2 above.
2. enter “yes” or “no” for potential “completeness” under each “Contaminated” Media -- Human Receptor combination (Pathway).

Note: In order to focus the evaluation to the most probable combinations some potential “Contaminated” Media - Human Receptor combinations (Pathways) do not have check spaces (“___”). While these

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combinations may not be probable in most situations they may be possible in some settings and should be added as necessary.

- If no (pathways are not complete for any contaminated media-receptor combination) - skip to #6, and enter "YE" status code, after explaining and/or referencing condition(s) in-place, whether natural or man-made, preventing a complete exposure pathway from each contaminated medium (e.g., use optional Pathway Evaluation Work Sheet to analyze major pathways).
- If yes (pathways are complete for any "Contaminated" Media - Human Receptor combination) - continue after providing supporting explanation.
- If unknown (for any "Contaminated" Media - Human Receptor combination) - skip to #6 and enter "IN" status code.

Rationale and reference(s):

³ Indirect Pathway/Receptor (e.g., vegetables, fruits, crops, meat and dairy products, fish, shellfish, etc.

4. Can the **exposures** from any of the complete pathways identified in #3 be reasonably expected to be "**significant**"⁴ (i.e., potentially "unacceptable" because exposures can be reasonably expected to be: 1) greater in magnitude (intensity, frequency and/or duration) than assumed in the derivation of the acceptable "levels" (used to identify the "contamination"); or 2) the combination of exposure magnitude (perhaps even though low) and contaminant concentrations (which may be substantially above the acceptable "levels") could result in greater than acceptable risks)?

If no (exposures can not be reasonably expected to be significant (i.e., potentially "unacceptable") for any complete exposure pathway) - skip to #6 and enter "YE" status code after explaining and/or referencing documentation justifying why the exposures (from each of the complete pathways) to "contamination" (identified in #3) are not expected to be "significant."

If yes (exposures could be reasonably expected to be "significant" (i.e., potentially "unacceptable"))

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for any complete exposure pathway) - continue after providing a description (of each potentially "unacceptable" exposure pathway) and explaining and/or referencing documentation justifying why the exposures (from each of the remaining complete pathways) to "contamination" (identified in #3) are not expected to be "significant."

_____ If unknown (for any complete pathway) - skip to #6 and enter "IN" status code

Rationale and Reference(s):

5. Can the "significant" exposures (identified in #4) be shown to be within **acceptable** limits?

_____ If yes (all "significant" exposures have been shown to be within acceptable limits) - continue and enter "YE" after summarizing and referencing documentation justifying why all "significant" exposures to "contamination" are within acceptable limits (e.g., a site-specific Human Health Risk Assessment).

_____ If no (there are current exposures that can be reasonably expected to be "unacceptable") - continue and enter "NO" status code after providing a description of each potentially "unacceptable" exposure.

_____ If unknown (for any potentially "unacceptable" exposure) - continue and enter "IN" status code

Rationale and Reference(s):

⁴ If there is any question on whether the identified exposures are "significant" (i.e., potentially "unacceptable") consult a human health Risk Assessment specialist with appropriate education, training and experience.

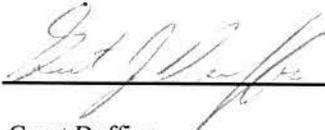
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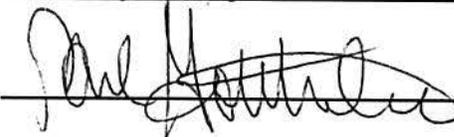
6. Check the appropriate RCRIS status codes for the Current Human Exposures Under Control EI event code (CA725), and obtain Supervisor (or appropriate Manager) signature and date on the EI determination below (and attach appropriate supporting documentation as well as a map of the facility):

YE - Yes, "Current Human Exposures Under Control" has been verified. Based on a review of the Information contained in this EI Determination, "Current Human Exposures" are expected to be "Under Control" at the Former Cerro Metal Plant facility, EPA ID # PAD086733540, located at 2022 Axemann Road, Bellefonte, PA16823 under current and reasonably expected conditions. This determination will be re-evaluated when the Agency/State becomes aware of significant changes at the facility.

NO - "Current Human Exposures" are NOT "Under Control."

IN - More information is needed to make a determination.

Completed by (signature)  Date 9-28-17
(print) Grant Dufficy
(title) RCRA Project Manager

Supervisor (signature)  Date 9-28-17
(print) Paul Gotthold
(title) Assoc. Director Office of PA Remediation
(EPA Region or State) EPA Region III

Locations where References may be found:

USEPA Region III
Land & Chemicals Division
1650 Arch Street
Philadelphia, PA 19103

PADEP North Central Regional Office
208 West Third Street
Williamsport PA 17701

Contact telephone and e-mail numbers:

Grant Dufficy
215-814-3455
Dufficy.grant@epa.gov

FINAL NOTE: THE HUMAN EXPOSURES EI IS A QUALITATIVE SCREENING OF EXPOSURES AND THE DETERMINATIONS WITHIN THIS DOCUMENT SHOULD NOT BE USED AS THE SOLE BASIS FOR RESTRICTING THE SCOPE OF MORE DETAILED (E.G., SITE-SPECIFIC) ASSESSMENTS OF RIS

