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: Republic Engineered Products, Inc – Canton Facility
Facility Address: 2633 Eighth Street NE, Canton, Ohio 44704-2311
Facility EPA ID #: OHD 000-110-197

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?

__X__ If yes - check here and continue with #2 below.
_____ If no - re-evaluate existing data, or
_____ if data are not available, skip to #8 and enter"IN" (more information needed) status code.

BACKGROUND

Definition of Environmental Indicators (for the RCRA Corrective Action)

Environmental Indicators (EI) are measures being used by the RCRA Corrective Action program to go beyond programmatic activity measures (e.g., reports received and approved, etc.) to track changes in the quality of the environment. The two EI developed to-date indicate the quality of the environment in relation to current human exposures to contamination and the migration of contaminated groundwater. An EI for non-human (ecological) receptors is intended to be developed in the future.

Definition of "Current Human Exposures Under 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).

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)?

Media	Yes	No	?	Rationale/Key Contaminants
Groundwater	X			VOC's, Metals, PCB's, and PAH's
Air (indoor)		X		
Surface Soil (e.g<2ft)	X			PCB's, PAH's, Metals
Surface Water		X		
Sediment	X			PCB's, Metals, PAH's, SVOC's
Subsurface Soil	X			Metals, PAH's, SVOC's
Air (outdoor)		X		

*VOC: volatile organic compounds, PCB: polychlorinated biphenyl, PAH: polyaromatic hydrocarbons, SVOC: semi-volatile organic compounds

___ 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.

__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 site has been utilized for the production of steel and/or steel products since the early 1900s when the United Steel Company and Canton Sheet Steel Company began operating to supply steel to the neighboring Berger Manufacturing Company and Stark Rolling Mill Company.
Current operations at the Canton plant include electric arc furnace melting, ladle refining, vacuum degassing, continuous casting, hot rolled bar production, conditioning, non-destructive testing, and shipping. The hot-rolled bar is sold or shipped to other Republic sites for additional processing and finishing. Ancillary and support operations continue to include slag processing, wastewater treatment, air pollution controls, and maintenance activities. A significant portion of the site includes empty buildings.

The Administrative Order on Consent was issued on August 2, 2004. The investigation, beginning with the Current Conditions Report, began on September 30, 2004. That document resulted in the determination that 43 Solid Waste Management Units (SWMU) and 21 Areas of Concern (AOC) were located on the facility. Furthermore, it was determined that out of these 64 total areas, six SWMU's did not require further action due to previous voluntary remedial measures and investigations that were preformed at the facility.

This determination does not cover land which lies outside the facility property boundary as illustrated in the attached figure. In particular, it does not cover the location of the former coke plant, the area known as the Berger Triangle, or the land currently owned by Jeffries Paving and Trucking.

Groundwater: Ground water constituents were screened against drinking water standards; maximum contaminant levels (MCLs) and secondary maximum contaminant levels (SMCLs).

Constituent	**Maximum Concentration**	**Drinking Water Standard**
Antimony	0.0079 ppm	.006 ppm

Arsenic	0.058 ppm	.011 ppm
Cadmium	0.011 ppm	.005 ppm
Chromium	0.91 ppm	0.1 ppm
Cyanide	1.7 ppm	0.2 ppm
Lead	0.27 ppm	0.015 ppm
Aroclor 1016	11 ppb	0.5 ppb
Bis(2-Ethylhexyl)phthalate	31 ppb	.006 ppb
Benzo(a)pyrene	3.9 ppb	0.2 ppb
Methylene Chloride	150 ppb	5 ppb
Trichloroethene	24 ppb	5 ppb
Vinyl Chloride	8.9ppb	2 ppb

Air (indoor): Air quality sampling, conducted in July 2006, has indicated that potential constituents of concern are not present above screening criteria.

Surface Soil: Arochlor-1242, Arochlor-1248, arsenic, benzo(a)pyrene, iron, lead, manganese were detected in soil at concentrations above the Region IX Industrial PRG for non-carcinogens, 10 times the Region IX Industrial PRG for carcinogens, Ohio background concentration for arsenic, and the calculated mill fill background determined by the Mill Fill Study.

Surface water: The Ohio EPA water quality criteria for the protection of human health has a drinking water screening level of 10 ppb for arsenic, the only metal found in the surface water. None of the surface water samples exceed the Ohio EPA standard for arsenic.

Sediment: Arochlor 1242 and lead were detected at concentrations above the Region IX Residential PRG and upstream background locations. Arsenic, benzo[a]pyrene, benzo[k]fluoranthene, dibenz[a,h]anthracene, n-nitrosodipropylamine, and pentachlorophenol, were detected in upstream background sediment samples from the East Branch of Nimishillen Creek at concentrations above the Region IX Residential PRG, but lower than the upstream background concentration and not considered to be site related. Arsenic, benzo[a]anthracene, benzo[a]pyrene, benzo[b]fluoranthene, benzo[k]fluoranthene, dibenz[a,h]anthracene, 1,4-dichlorobenzene, indeno(1,2,3-cd)pyrene, naphthalene, n-nitrosodipropylamine, pentachlorophenol, and benzene were detected in upstream background sediment samples from the East Branch of Nimishillen Creek above the Region IX Residential PRG.

Subsurface Soil: Arsenic, benzene, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, chromium, dibenz(a,h)anthracene, indeno(1,2,3-cd)pyrene, iron, lead, naphthalene, manganese, total xylenes were detected in soil at concentrations above the Region IX Industrial PRG for non-carcinogens, 10 times the Region IX Industrial PRG for carcinogens, Ohio background concentration for arsenic, and the calculated mill fill background determined by the Mill Fill Study.

Air (outdoor): Air quality sampling, conducted in July 2006, has indicated that potential constituents of concern are not present above screening criteria.

References:

Attachment A of the Environmental Indicator Report. August 2006. Civil and Environmental Consultants, Inc
Current Conditions Report. September 2004. Civil and Environmental Consultants, Inc.
RCRA Facility Investigation Phase I and II submittals. October 2004-July 2006. Civil and Environmental Consultants, Inc.

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 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.

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
Potential Human Receptors (Under Current Conditions)

Contaminated Media	**Residents**	**Workers**	**Day Care**	**Construction**	**Trespassers**	**Recreation**	**Food[3]**
Groundwater	NO	NO	NO	YES	NO	NO	NO
~~Air (indoor)~~	----	----	----	----	----	----	----
Surface Soil (e.g<2ft)	NO	YES	NO	YES	NO	NO	NO
~~Surface Water~~	----	----	----	----	----	----	----
Sediment	YES	YES	NO	YES	YES	YES	YES
Subsurface Soil	NO	NO	NO	YES	NO	NO	NO
~~Air (outdoor)~~	----	----	----	----	----	----	----

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 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).

___X__ 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):
Receptor

Residents: Residents are not exposed to groundwater because the Offsite Well Location Study, included in the Current Conditions Report, did not locate any drinking water wells within 1-mile downgradient of the Republic site. Residents can be exposed to sediments in the portions of the East Branch of Nimishillin Creek that are located outside the facility's fence.

Workers: Workers are not exposed to groundwater because water used at the site is provided by the City of Canton Public Water System. Workers can be exposed to surface soil via dermal contact, inhalation and ingestion. Workers can be exposed to sediment via dermal contact and ingestion in the East Branch Nimishillin Creek or Johnson's Pond because there are no physical boundaries separating the facility from these areas. Workers cannot be exposed to subsurface soils since their duties do not include excavation to depths greater than two feet.

Construction Workers: Construction workers could be exposed to groundwater via dermal contact, inhalation, and ingestion if excavations extend below the water table. Construction workers can be exposed to surface and subsurface soil via dermal contact, inhalation and ingestion. Construction workers can be exposed to sediment.

Trespassers: Trespassers can be exposed to surface soils. Trespassers can be exposed to sediments in the portions of the East Branch Nimishillin Creek that are located outside the facility's fence.

Recreation: Recreational users cannot access the groundwater because the Offsite Well Location Study, included in the Current Conditions Report, did not locate any drinking water wells within 1 mile down gradient of the Republic site. Recreational users cannot be exposed to surface soils or subsurface soils because the facility is secured with a fence and gate system to control site access and is staffed with security guards who patrol the property 24 hours per day. Recreational users can be exposed to sediments in the portions of the East Branch of Nimishillin Creek that are located outside the facility's fence.

Food: Food sources can not be exposed to groundwater, surface soils or subsurface soils because the facility is a steel making facility without any horticultural activity. Also, the facility is secured with a fence and gate system to control site access and is staffed with security guards who patrol the property 24 hours per day. Food, specifically fish, can be exposed to sediments in the portions of the East Branch of Nimishillin Creek that are located outside the facility's fence.

[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."

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

Surface Soil: SWMU 9,22, 48 and 94 exceeded the screening criteria for contaminants such as arsenic, lead, benzo(a)pyrene, chromium, dibenz(a,h)anthracene, indeno(1,2,3-cd)pyrene, and naphthalene. Therefore, they pose a complete pathway for facility workers and potential trespassers. The risk estimates of site related cumulative cancer and non cancer risks wre compared to US EPA's cancer risk limit of 10^{-4} and HI limit of 1 respectively. Except AOC 94, site specific risk assessment based on infrequent exposure to the above mentioned SWMUs resulted in a cumulative cancer risk and non cancer hazard below EPA accepted limits.

Subsurface Soil: SWMU 3, 13, 14,45,48,64,65,88,97 pose complete exposure pathways for construction workers. The subsurface soil contamination in these SWMUs pose a non cancer hazard which exceeds USEPA accepted limit of one.

Sediment: A site specific risk assessment was performed for constituents such as metals and PAHs in SWMU 30 (Johnson's pond) and the East branch of the Nimishillen Creek. The risks associated with residential exposure to sediments in the above areas fell within the 10^{-4} to 10^{-6} risk management range. Noncancer risk estimates did not exceed a hazard quotient of one. Additionally, there is a PCB fish consumption advisory on the entire Nimishillen Creek, which includes the East branch of the Nimishillen Creek.

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[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.

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

___X__ 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):

Surface soil: In order to meet the EIs, an Interim Measure (IM) at AOC 94 was required for benzo(a)pyrene in surface soil. The IM consisted of excavating the impacted railroad ballast. The area between the rails in each set of tracks was excavated to the top of the railroad ties. The areas between each set of tracks and outside the outer tracks were

excavated to the base of the railroad ties. Clean railroad ballast was placed to provide a pathway elimination barrier and to return the area to existing grades.

Subsurface soil: Although the non-carcinogenic risk posed by the COCs detected in the subsurface soil is greater than the EPA HI, there is no construction planned for this area under current conditions. Additionally, should construction need to take place, Republic will prepare a Health & Safety Plan requiring the use of personal protective equipment.

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):

__X__ 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 Republic Engineered Products, Inc. – Canton Plant, EPA ID # OHD 000-110-197, located at 2633 Eighth Street NE, Canton, Ohio 44704-2311 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 _____
(print)_____
(title) _____

Supervisor (signature) _____ Date _____
(print) _____
(title) _____
(EPA Region or State) _____

Locations where References may be found:
Civil & Environmental Consultants (CEC). (2006). Environmental Indicators Report for Republic Engineered Products, Inc. – Canton Plant, June 2006.
Civil & Environmental Consultants (CEC). (2004). Current Conditions Report for Republic Engineered Products, Inc. – Canton Plant. September 2004.

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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 RISK.