RCRA Corrective Action
Environmental Indicator (EI) RCRIS Code (CA725)

Current Human Exposures Under Control

Facility Name: **Steelcote Manufacturing Company**
Facility Address: **One Steelcote Square, St. Louis, Missouri**
Facility EPA ID #: **MOD006275036**

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 #6 and enter"IN" (more information needed) status code.

Rationale and Reference(s):

The Steelcote Manufacturing Company (Steelcote) facility (site) is located at One Steelcote Square in St. Louis, Missouri (see Figure 1). About 80 percent of the site's areal extent is covered with buildings, structures, or concrete paving (see Figure 2; Shannon & Wilson, Inc. [S&W] 1992a). The site structures are described below:

Building 1

Building 1 is a five-story building, with a basement and two penthouses. The basement of the building is used to store hazardous wastes, and the first floor is used to store raw materials, and hazardous wastes in satellite accumulation containers. Mixers and three 500-gallon process tanks also are stored on the first floor. The quality assurance/quality control laboratory is located on the second floor of the building, as are the packaging and labeling (but not printing) operations. Ball mills for pigment grinding and three reduction tanks are located on the third floor. Grinding, mixing, solvent blending, and drying operations take place on the fourth floor, requiring two 100-gallon tanks and a 15- by 25-foot drying oven, heated with a water jacket. The oven is used to dry powders used in moisture-cured urethanes. The research and development laboratory and a mixing area are located on the fifth floor. The eastern penthouse is a paint spray booth, while the west penthouse holds about forty 100-gallon tanks containing raw vegetable oil, refined vegetable oil, naphtha, toluene, xylene, Oleum, and Hi-sol. The contents of the western penthouse tanks are transferred to various operations within the building by gravity feed (S&W 1992a).

Building 1A

Building 1A is a storage facility for drummed raw materials, including resins, solvents, and dry materials. The raised tin shed originally belonged to the Columbia Oil Company.

Building 2

Building 2 houses a small office, two storage rooms, and a valve control for storage tanks.

Building 3

Operations in Building 3 were closed in 1971; however, 55-gallon drums of vegetable oils and varnishes continue to be stored there. Tanks were once used for storage inside the building, but have since been removed. An inert nitrogen gas generator is located outside of the building's north wall, but the generator has never been used.

Building 3A

An operating, natural gas-fired boiler is located in Building 3A, immediately adjacent to building 3.

Structure 4

Structure 4 is a stone and reinforced concrete platform. Six 10,000-gallon, aboveground storage tanks (AST) are located on the platform, and two of the tanks are still in use. The tanks have been used to store fuel oil, Hi-sol, soya oil, xylene, toluene, and oleum. One 8,000-gallon, underground storage tank (UST) is located beneath the platform and the vertical ASTs. This tank once stored tung oil and is still present, but is no longer in use. Three 2,000-gallon, horizontal ASTs are located along the southern side of the platform, and one 2,000-gallon, horizontal AST is located along the northern side of the platform. The tanks are used to store xylene, Hi-sol, and butanol and are still operable.

Structure 4A

Structure 4A is located immediately north of structure 4 and was formerly the location of an 8,000-gallon Hi-sol storage tank. The UST was removed in 1990 or 1991. An existing 15,000-gallon UST is located east of Structure 4A and south of Structure 3A. This UST was used to store bunker (#6) oil.

Building 5

Building 5 previously was used for sandblasting but now is used for hazardous waste storage. A compressor also is stored in the building, A gas meter shed is attached to the building's southern side.

Building 6

Building 6 is a former fuel-operated varnish reducing unit that is no longer in service. Three burners and stacks for cooking varnish are located in the building.

Building 7

Building 7 is a former varnish reducing unit that is no longer in service.

A site investigation (SI) report identifies the Structure 4A area, specifically, the 1991 UST excavation, as the only substantiated source of contamination at the site (S&W 1993d). The UST was excavated, decommissioned, and removed from the site in 1991; however, the contaminated soil surrounding the UST was never removed. Soil samples were collected, and the excavation was backfilled. Soil samples collected prior to backfilling indicated the presence of toluene at 12 milligrams per kilogram (mg/kg), ethylbenzene at 108 mg/kg, xylenes at 405 mg/kg, total petroleum hydrocarbons (TPH) at 750 mg/kg, and unknown alkyl benzenes at 228 mg/kg in the subsurface. Methylene chloride was detected in the method blank, qualifying its presence in the soil samples. Consistent xylene and toluene detections appear in groundwater samples from Monitoring Well SWGW-1(C), which is located near the former UST at the Structure 4A location. Lead is the inorganic contaminant of concern in groundwater at the site. However, because lead has been detected in samples collected upgradient of Steelcote, the facility claims an off-site source for this contaminant.

BACKGROUND

Definition of Environmental Indicators (for the RCRA Corrective Action)

EI are measures being used by the Resources Conservation and Recovery Act (RCRA) Corrective Action program to go beyond programmatic activity measures such as reports received and approved and so on 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 nonhuman (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," that is, 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 [sitewide]).

Relationship of EI to Final Remedies

While final remedies remain the long-term objective of the RCRA Corrective Action Program the EIs are near-term objectives that currently are being used as program measures for the Government Performance and Results Act of 1993. The "Current Human Exposures Under Control" EIs 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, such as potential future human exposure scenarios, future land and groundwater uses, and ecological receptors.

Duration / Applicability of EI Determinations

EI determination status codes should remain in the Resource Conservation and Recovery Information System (RCRIS) national database ONLY as long as they remain true. RCRIS status codes must be changed when 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 [e.g., Maximum Contaminant Levels (MCLs), the maximum permissible level of a contaminant in water delivered to any user of a public water system under the Safe Drinking Water Act] from releases subject to RCRA Corrective Action (from SWMUs, RUs or AOCs)?

	Yes	No	?	Rationale / Key Contaminants
Groundwater	x			
Air (indoors)[2]		x		
Surface Soil (e.g., <2 ft)		x		**Please See**
Surface Water	x			**Description Below**
Sediment		x		
Subsurf. Soil (e.g., >2 ft)	x			
Air (outdoors)		x		

_____ 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):

Steelcote is located in the Mill Creek Valley area of St. Louis, Missouri. Mill Creek Valley was one of the first industrialized areas within St. Louis, and the area's history of industrial development predates the Civil War. Steelcote currently is surrounded by industrial properties and is likely to remain so in the future. Prior to Steelcote's establishment, a number of operations, including a railroad line and a stockyard, occupied the site. Steelcote is located about 2.5 miles west of the Mississippi River and 18.5 miles south of the Missouri River. Mill Creek has been diverted to accommodate the industrial development of St. Louis. Engineered developments along the Mill Creek Valley include railroad lines and drainage ditches running parallel to the valley and storm sewers located beneath and adjacent to the railroad lines. The Mill Creek Valley area has been extensively filled and graded. Much of the placement fill used in the Mill Creek Valley area is industrial in origin, consisting of power plant ash, demolition debris, and other industrial waste products.

A RCRA Section 3013 Administrative Order on Consent dated September 30, 1991 required Steelcote to investigate contamination at the site based on two compliance evaluation inspections (CEI) previously conducted there. A 1992 SI (S&W 1993d) included excavation of seven soil borings (A through G) and installation of monitoring wells with 45- to 50-foot screens in four of the borings (A through D). Soil samples were collected at various depths from each of the borings, and groundwater samples were collected from the monitoring wells on a quarterly basis. After seven quarters of sampling, the monitoring wells were abandoned because of the inappropriate length of their screens. Four new soil borings (H through K) were excavated at the site in August 1994, and four new monitoring wells (H through K) with 10-foot screens were installed in those borings (S&W 1994; Environmetrics 1994). Soil samples were collected from each of the borings, and groundwater samples were collected from the new monitoring wells for three quarters. Although four quarters of sampling were proposed for these wells, Steelcote petitioned the U.S. Environmental Protection Agency (EPA) for termination of additional sampling after the third quarter of sampling. Termination was granted on June 19, 1995. No air sampling has been conducted by the facility to date.

Soil

Soil samples were collected during May and June 1992 (S&W 1993d) and August and September 1994 (S&W 1994; Environmetrics 1994). Compounds detected during these sampling events are summarized in Table 1. Soil samples were also collected prior to backfilling the excavated UST at Structure 4A. The excavation soil samples revealed toluene at 12 mg/kg, ethylbenze at 108 mg/kg, xylenes at 405 mg/kg, TPH at 750 mg/kg, methylene chloride at 42 mg/kg, and unknown alkyl benzenes at 228 mg/kg in the subsurface. The detection of methylene chloride was qualified, due to the presence of this compound in the method blank. The depths at which the excavation soil samples were collected were not reported to the EPA.

TABLE 1

SUMMARY OF SUBSURFACE SOIL DETECTIONS
AS COMPARED TO REGION 9 INDUSTRIAL
PRELIMINARY REMEDIATION GOALS (PRG)

Analyte	Maximum Concentration (mg/kg)	EPA Region 9 Industrial Prelimnary Remediation Goals (mg/kg)
Barium	243	100,000
Cadmium	2.5	810
Chromium	33.5	450
Nickel	46.8	4,100
Lead	675	750
Benzene	0.003	1.5
bis(2-Ethylhexyl)phthalate	0.57	180
Ethylbenzene	108	230
Formaldehyde	104	100,000
Methyl Ethyl Ketone	0.18	28,000
Naphthalene	22	Not available
Toluene	12	520
Xylene	430	210
Dibutylphthalate	0.12	88,000
Methylene Chloride	0.3	21
Unknown alkyl benzenes	228	Not available

Notes:
mg/kg - milligrams per kilogram
Shading - Analytical results for this sample exceeded EPA Region 9 preliminary remediation goals

Soil sample analytical results were screened against EPA Region 9 industrial soil preliminary remediation goals (PRG) which are based on exposures of 250 days per year for 25 years. Only xylene was detected in subsurface soil, that is soil from a depth greater than 2 feet, at a concentration greater than the PRG for that compound. Only one surface soil sample, that is a soil sample from a depth of less than 2 feet, was collected during these investigations. The surface sample was collected from a depth of 0.6 to 2.6 feet at Soil Boring E. This sample had a xylene concentration of 190 mg/kg, which did not exceed the Region 9 PRG of 210 mg/kg. An estimated 1 mg/kg of toluene was also detected in this sample, but this concentration fell well below the Region 9 PRG of 520 mg/kg. Table 1 contains a summary of subsurface soil analytes, their maximum concentrations, and their corresponding PRGs. Concentrations in exceedence of EPA Region 9 industrial PRGs are highlighted.

Groundwater

Groundwater samples were collected from the former monitoring wells (A through D) during June 1992 (S&W 1992b, 1993d), August 1992 (S&W 1992c), November 1992 (S&W 1993a), February 1993 (S&W 1993b), June 1993 (S&W 1993c), August 1993 (S&W 1993d), and November 1993 (S&W 1993e). Groundwater samples were collected from the current four monitoring wells (H through K) during September 1994 (S&W 1994; Environmetrics 1994), December 1994 (S&W 1995a), and March 1995 (S&W 1995b). Groundwater analytical results were screened against EPA maximum contaminant levels (MCL) and EPA Region 9 tap water PRGs. Five compounds were detected in groundwater at concentrations greater than their respective MCLs or tap water PRGs. These contaminants consisted of chromium, lead, bis(2-ethylhexyl)phthalate, toluene, and xylene. Table 2 provides a summary of groundwater sample analytes, their maximum concentrations, and their corresponding MCLs or PRGs. Concentrations in exceedence of EPA MCLs or EPA Region 9 tap water PRGs are highlighted.

Groundwater samples from the current wells (H through K) were all within MCLs and Region 9 tap water PRGs, except for Monitoring Well K, during the second quarter. This sample revealed chromium concentrations at 173 micrograms per liter (µg/L) and lead at 59 µg/L, values in exceedence of the MCL of 100 µg/L for chromium and the PRG of 50 µg/L for lead. A letter dated April 5, 1995, from S&W to EPA, on behalf of Steelcote, disregards the second quarter metal concentrations for Monitoring Well K and requests termination of sampling activities at the facility. An EPA letter, dated June 19, 1995, grants authority to Steelcote to terminate the RCRA Section 3013 Administrative Order on Consent. A second EPA letter, dated July 10, 1995, grants Steelcote the authority to terminate financial assurance requirements. The original April 5, 1995, letter from S&W to EPA states that "the apparent increase in metals concentrations in the second quarter of sampling (well K) is likely due to a one-time change in sample collection procedure. Normally, water samples are collected and placed into clean, empty, plastic sample bottles provided by the laboratory. The samples are filtered at the laboratory, and then analyzed. For the second quarter only, the bottles sent by the laboratory were not empty, but contained acid. We believe that the acid leached some metals out of the sediment in the samples, causing the apparent increase in metals levels." The plan of study for the Steelcote facility specifies that metals samples will be preserved with nitric acid to a pH of less than two. The plan of study does not state that groundwater samples will be filtered either in the field or laboratory. Acidifying the samples acts to keep metals in

TABLE 2

SUMMARY OF GROUNDWATER DETECTIONS
AS COMPARED TO EPA MCLs OR REGION 9 TAP WATER PRGs

Analyte	Maximum Concentration (µg/L)	Maximum Contaminant Level (µg/L)	Region 9 Tap Water Preliminary Remediation Goal (µg/L)

Barium	736	2,000	2,600
Chromium	173	100	55,000
Lead	59	TT at 15	Not available
bis (2-Ethylhexyl)	72	6	4.8
Formaldehyde	1,100	Not available	5,500
Toluene	2,000	1,000	720
Xylene	2,100	10,000	1,400

Notes:
µg/L - micrograms per liter
TT - treatment technique action level
Shading - Analytical results for this sample exceeded EPA Region 9 preliminary remediation goals or maximum contaminant levels

solution, rather than allowing them to precipitate and be filtered out. The metals results that were used as a basis for terminating the RCRA Section 3013 Administrative Order on Consent were filtered samples from containers that were not preserved properly.

<u>Surface Water and Sediment</u>

Steelcote is located about 2.5 miles west of the Mississippi River and about 18.5 miles south of the Missouri River. Mill Creek has been diverted to accommodate industrial development in the area. No surface water is present on the site; however, storm water samples were collected from four locations at Steelcote during August 1992 (S&W 1993d). Storm water analytical results were screened against EPA MCLs and EPA Region 9 tap water PRGs. Four compounds were detected in storm water at concentrations greater than their respective MCL or PRG. Cadmium exceeded the MCL but not the PRG, while benzene exceeded the PRG but not the MCL. Lead and methylene chloride exceeded both the MCL and the PRG. Because lead was detected in an upgradient storm water sample at 389 µg/L, Steelcote has claimed an upgradient source of lead. Table 3 provides a summary of storm water sample analytes, their maximum concentrations, and their corresponding state and federal WQC. Concentrations in exceedence of state or federal WQC are highlighted.

TABLE 3

SUMMARY OF STORM WATER DETECTIONS
AS COMPARED TO EPA MCLs OR REGION 9 TAP WATER PRGs

Analyte	Maximum Concentration (µg/L)	Maximum Contaminant Level (µg/L)	Region 9 Tap Water Preliminary Remediation Goal (µg/L)

Barium	126	2,000	2,600
Cadmium	7.2	5	18
Chromium	11.5	100	55,000
Nickel	11.9	Not available	730
Lead	417	TT at 15	Not available
Formaldehyde	158	Not available	5,500
Toluene	1	1,000	720
Butyl Benzyl Phthalate	4	Not available	7,300
Methylene Chloride	10	5	4.3
Benzene	1	5	0.35

Notes:µg/L - micrograms per liter
Shading - Analytical results for this sample exceeded EPA Region 9 preliminary remediation goals or maximum contaminant levels

Sediment sampling has not been conducted at the site. However, the site is 80 percent paved or covered with structures, and no surface water bodies exist on the site. From a risk assessment perspective, human exposure through this pathway unlikely.

Air

Air sampling has not been reported by the facility. Most contaminants are metals and therefore do not pose a hazard to employees at the facility. However, several volatile organic compounds are present and should be assessed to determine their potential for being an indoor air contaminant. The Johnson-Ettinger model was used to calculate indoor air quality from contaminant concentrations in underlying soils. The model is based on values derived for residential exposures. This forms a conservative estimate when used in an industrial setting, because exposure times higher than actual exposures to workers are factored in. Xylene concentrations were used for soil to soil gas modeling, and xylene, toluene, and bis(2-ethylhexyl)phthalate concentrations were used for groundwater to soil gas modeling. These compounds were selected because they exceeded regulatory standards for the matrices in question. Results of the Johnson-Ettinger model indicated that indoor air did not pose a hazard to workers at Steelcote. The modeled hazard quotients from vapor intrusion to indoor air based on xylene concentrations in soil and bis(2-ethylhexyl)phthalate concentrations in groundwater were at or below the 10^{-6} level. The modeled hazard quotients from vapor intrusion to indoor air based on toluene and xylene in groundwater fell between the 10^{-4} and 10^{-6} levels. Consequently, outdoor air also would not pose a hazard because of dispersion and the lack of a confined space. Appendix A shows the calculations and results of the Johnson-Ettinger model.

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?
<u>Summary Exposure Pathway Evaluation Table</u>

	<u>Potential Human Receptors</u> (Under Current Conditions)						
<u>"Contaminated" Media</u>	~~Residents~~	Workers	~~Day-Care~~	~~Construction~~	Trespassers	~~Recreation~~	~~Food~~[3]
Groundwater	________	Yes			Yes		
~~Air (indoors)~~							
~~Soil (surface, e.g., <2 ft)~~							
Surface Water		Yes			Yes		
~~Sediment~~							
Soil (subsurface e.g., >2 ft)		No			No		
~~Air (outdoors)~~							

Instructions for <u>Summary Exposure Pathway Evaluation Table</u>:

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):

Because the facility and surrounding area are highly industrial, residential, daycare, and recreational pathways were not considered to be viable exposure pathways. Because the facility is industrial and 80 percent paved or covered with structures, the food pathway was not considered to be a viable exposure pathway. Potentially viable exposure pathways for evaluation include worker, construction worker, and trespasser.

St. Louis City Ordinance 64771 regulates grading, excavation, construction, and demolition. A permit is required to perform an excavation or undertake construction activities. Ordinance 64771 designates the head of the Division of Building and Inspection as the code official that is responsible for administration of ordinance 64771. On September 21, 2000, and on August 31, 2001, the St. Louis Division of Building stated that there were no permits for construction or demolition at One Steelcote Square. Based on this information, construction is not likely to be a viable exposure pathway for the near future.

The trespasser is a potentially exposed population at the Steelcote facility. No fences, gates, or walls prohibit entry to the facility. Additionally, a drill rig was vandalized during sampling activities at the site, demonstrating that it is possible to trespass on the property. Workers are present on site, and they provide the second potentially exposed population at the Steelcote facility. The trespasser pathway and the worker pathways are the viable exposure pathways for this site.

Contaminated media at the Steelcote facility are limited to subsurface soil, groundwater, and storm water. The air pathway is not considered to be significant, based on the discussion under question 2 above. Sediment sampling has not been conducted at the site. However, the site is 80 percent paved or covered with structures, and no surface water bodies exist there. From a risk assessment perspective, human exposure through this pathway unlikely. Similar rationale applies to the surface soil pathway. Only one surface soil sample has been collected at the site; however, because the site is 80 percent paved or covered with structures, this exposure pathway is not viable. Additionally, the surface soil sample was not contaminated above appropriate PRGs. Soil contamination deeper than 2 feet is not likely to be encountered by either the trespasser or the worker population. If construction activities were to be conducted on site, the impact of the xylene PRG exceedence in subsurface soil would be reduced by the limited exposure time for the construction worker as opposed to the occupational industrial worker.

Dave Visintainer, Water Commissioner for the St. Louis Department of Public Utilities, stated on August 31, 2001, that residents of the City of St. Louis are required to be connected to city water and that an ordinance by the City of St. Louis prohibits the use of groundwater wells for drinking, fire suppression, or irrigation. (Various City of St. Louis sources believed that this ordinance was passed in the late 1800s, but the ordinance was not produced in a library search of City of St. Louis ordinances through 1900). Monitoring wells and test wells are not regulated by the City of St. Louis if they are installed on private property, and monitoring wells and test wells are permissible in city rights-of-way with a permit by the City of St. Louis. Personnel at the City of St. Louis declined to produce permits for wells drilled within city rights-of-way because there was no organization system to distinguish well permits from other right-of-way permits. Monitoring wells related to the Steelcote investigations have been abandoned. A high-capacity industrial well was installed within a block of the Steelcote facility in 1942, but has since been abandoned. A water well survey, conducted in the vicinity of the Steelcote facility, produced two water wells, used to wash trucks and equipment, within two blocks of the Steelcote facility (see Appendix B). These water wells, while they are located on an adjacent property, provide a complete pathway between the contaminated media and the worker or trespasser receptor.

Storm water provides another complete pathway to the worker and trespasser receptor. Cadmium exceeded the MCL but not the PRG, while benzene exceeded the PRG but not the MCL. Lead and methylene chloride exceeded both the MCL and the PRG. Because lead was detected in an upgradient storm water sample, Steelcote claimed an upgradient source of lead.

[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)?

__X__ 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") 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):

The complete exposure pathways (contaminated media - receptor combination) identified above include Worker and Storm Water or Groundwater, and Trespasser and Storm Water or Groundwater.

Trespassers and workers may come into contact with storm water during outdoor activities in low or draining areas of the site. While some contact (exposure) with the contaminants in site storm water can reasonably be expected, these exposures are not reasonably expected to be significant, that is, potentially "unacceptable," because (1) the duration (and intensity) of these exposures is very low, and (2) the concentrations of contaminants present are only slightly above the standards (which are based on assumptions of much higher exposure durations. Elevated concentrations of lead in storm water have been attributed to an off-site, upgradient source.

With regard to the groundwater exposure pathway, corrective action has been terminated at the site. No groundwater sampling has been conducted at the site since 1995, and all monitoring wells have been abandoned. The metals results used as a basis for terminating corrective action were from filtered samples that were not preserved properly. While a City of St. Louis ordinance prohibiting water well use for drinking, fire suppression, and irrigation appears to provide exposure control for this pathway, two water wells are located within two blocks of the Steelcote facility (see Appendix B). In spite of this, the applicable concentration reference level "standard" for identifying unacceptable exposures is the federal MCL or tap water PRG, which is based on an assumption of residential exposure. The exposure incurred by trespassing or equipment washing is not expected to exceed 1 week per month for no more than 6 months per year.

[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?

_____ 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):

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 Steelcote Manufacturing Company facility , EPA ID # MOD006275036, located at One Steelcote Square, St. Louis, Missouri 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) Original signed by William F. Lowe for Date __3/29/02__ ___
Mary Grisolano
Project Manager, RCRA Corrective Action & Permits Branch
EPA Region 7

Supervisor (signature) Original signed by Date ___3/29/02______
John Smith
Branch Chief, RCRA Corrective Action & Permits Branch
EPA Region 7

Locations where References may be found:

(1) Steelcote Facility, One Steelcote Square, St. Louis, Missouri

(2) EPA Region 7 Headquarters, RCRA Files, 901 North 5th Street, Kansas City, Kansas

(3) St. Louis Central Public Library, 1301 Olive Street, St. Louis, Missouri

Contact telephone and e-mail numbers:

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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.

REFERENCES

Environmetrics. 1994. Laboratory Results from Soil and Groundwater Sampling at Steelcote Facility. October 14.

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FIGURES

APPENDIX A

Johnson-Ettinger Models

APPENDIX B

Well Location Report