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MEMORANDUM

TO: Paul Doherty, EPA/START PO

FROM: Jeffrey Fletcher, E & E/STM

THRU: Hieu Q. Vu, P.E., CHMM, E & E/START PM

DATE: April 21, 1998

SUBJECT: SI Score, Recommendations, and Removal Site Evaluation for the Statewide Metal Recycling Site, Altoona, Iowa

TDD: S07-9707-005
PAN: 0590SMSIXX
CERCLIS No.: IA0001898907
EPA SAM: Don Hamera

INTRODUCTION

The Ecology and Environment, Inc. (E & E), Superfund Technical Assessment and Response Team (START) was tasked by the U.S. Environmental Protection Agency (EPA) Region 7 Site Assessment and Cost Recovery (SACR) program to conduct a Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Preliminary Assessment/Site Inspection (PA/SI) at the Statewide Metal Recycling site (SWMR) in Altoona, Iowa. This memorandum is being submitted in conjunction with the PA/SI report to:

1) Evaluate the site using the SI score under the Hazard Ranking System (HRS) methodology, to determine whether the site warrants further investigation. All references documenting this scoring are attached to the PA/SI report.

2) Provide recommendations for further action and to determine if the site poses a threat to human health and/or environment.

3) Evaluate whether any removal action is appropriate based on available information.

SITE SUMMARY

The SWMR site is located approximately 2 miles west of Altoona in Polk county, Iowa. The total area of the site is approximately 2.25 acres and is currently vacant and secured. A vacant house/office, a maintenance garage, and a debris pile composed of scrap metal are the only remaining features on the site.

The property is owned by Roy and Jeanette Burris of New Virginia, Iowa. The former Statewide Auto Crushing, Inc., reportedly operated at the site from 1981 until October, 1995 when Fred Bovee bought the former facility and named it Statewide Metal Recycling, Inc. Bovee lease the property from Roy Burris and operated at the site from October 1995 to March 1997. SWMR bought and sold scrap metal, including electric motors, vehicles, and household appliances. According to Bovee, appliances and other scrap metals were crushed and bailed at the site. Also during Bovee's authority PCB capacitors were stored on the property; however, these capacitors were removed from the site during the START integrated site/removal assessment. The contaminants of primary concern at the SWMR site are metals, specifically lead, and PCBs.

On February 6, 1997, TSCA conducted a site inspection and determined that the facility was operating in violation of state and federal regulations by failing to properly remove refrigerant and PCB-containing capacitors from household appliances prior to bailing them for disposal. The facility was also found to be improperly crushing appliances, allowing PCB-containing capacitors to leak PCB fluid. EPA issued a TSCA Notice of Violation to the SWMR on February 27, 1997.

Samples collected during the TSCA inspection showed PCB concentrations in leaking capacitor oil at up to 900,000 parts per million (ppm). PCBs were also detected at 960 ppm in a soil sample collected next to the appliance bailing equipment.

The site was subsequently referred to the EPA Superfund Division in May 1997. Integrated removal/site assessment activities were conducted in June and October, 1997 and included soil, container, and ground water sampling. The purpose of the sampling activity was to: 1) better define the extent and degree of soil contamination on-site and in the immediate area of the site; and 2) determine the quantity of contaminated debris, scrap, and PCB-containing components that remain on site and which require disposal. At the completion of the site characterization study it was determined that the SWMR met the

EPA removal criteria for PCB (10 ppm) and lead (500 ppm) contaminated soil, which were the results of the former recycling operations.

Prior to the removal action, total PCBs were predominantly found at concentrations greater than 10 ppm in the northern portion of the site, with total PCBs found as high as 209.8 mg/kg. In addition, analytical results identified several inorganic compounds in the northern portion of the site, with lead as high as 2,560 mg/kg.

Post excavation sampling results for the northern portion of the site indicated total PCBs and lead concentrations well below their respective removal action levels, however total PCBs concentrations remained above background concentrations and health-based benchmarks in some cells in the excavated area. Total PCBs ranged from 0.09 mg/kg to 7.39 mg/kg in the northern section of the site. Lead was also detected in the northern section after excavation at concentrations three times above background levels, but not above the EPA recommended benchmark for residential soils.

In addition, total PCBs were detected in the central and southern portions of the site during the June and October 1997 integrated removal/site assessment sampling activities. The highest total PCB concentration found in the central area was 6.30 mg/kg; with the highest total PCB concentration found in the southern portion at 0.780 mg/kg.

The removal activities were completed on November 23, 1997 and included the removal of all containerized wastes, as well as 1,363.28 tons of PCB and lead-contaminated soils to appropriate disposal facilities.

SCORING EVALUATION

as calculated utilizing the SI worksheets as outlined in the interim final Gui ections under CERCLA, dated August 1992. Attached are the SI worl alculate the SI score START reviewed existing EPA files, collected addi ed results of all previous field sampling activities.

An overall SI score of 1.75 was calculated for the site. The ground water pathway and the soil exposure were the only two pathways evaluated. A contaminant release to surface soils and ground water can be documented for the SWMR site. The surface water and air pathways were not evaluated and are believed to pose a low threat to the environment and/or human health.

Based on post-removal sampling results and the June and October 1997 integrated site/removal assessment results, one source was delineated for the site consisting of twenty-one soil cells previously identified during the 1997 site characterization study. These soil sections had levels of lead and PCBs greater than the expected background concentrations, but below the removal action level of 500 mg/kg and 10 ppm, respectively. Together, the twenty-one soil cells consist of an area of approximately 52,500 square feet. This source was assigned a hazardous waste quantity (HWQ) score of 10, based on the area of contaminated soil.

Ground Water Pathway

Total metals were the only compounds found in the shallow ground water at the SWMR site. PCBs and lead (primary targeted compounds) VOCs, and SVOCs were not detected in the ground water sampling conducted at the site. Total metals identified included: aluminum, arsenic, barium, iron, manganese, nickel, and zinc. Though these metals were detected only manganese at 1,350 μg/L and arsenic at 7.35 μg/L exceeded an EPA health-based benchmark or a removal action level. Overall, the analytical results indicated a minimal contamination to the underlying shallow aquifer.

The total metal constituents found in the on-site ground water well are most likely attributable to the site; and an observed release for nickel, iron, and zinc was scored for the surficial aquifer underlying the site. It should be noted that background concentrations for metals in ground water are unknown for the site vicinity.

The on-site ground water well located within the fenced area and sampled during field activities is not used for human consumption, and is therefore not scored as an actual ground water target of concern. Potential ground water targets within the 4-mile radius of the site include the three Altoona municipal wells finished in the deep Jordan Sandstone aquifer as well as private wells drawing water from the unconsolidated surficial or the Mississippian aquifers. Many rural residents within 4 miles of the site not utilizing public or private wells receive water via Des Moines PWS, which is composed of two surface intakes and a ground water infiltration gallery located greater than 4 miles from the site. The house/office located on-site but outside the fence area is connected to Des Moines Public Water System.

The Altoona municipal wells were not evaluated as potential targets for SI scoring because the wells are finished in a deep bedrock unit and there are several confining units overlying the aquifer restricting migration. The majority of rural residents in the 4-mile radius utilize the Mississippian aquifer for their water supply since the surficial aquifer has very low yields. The Mississippian and surficial aquifers were

evaluated separately for SI scoring purposes since aquifer interconnection can not be documented. A score of 3.49 is calculated for the pathway and is based on a potential to release to the Mississippian aquifer and the rural residents within the 4-mile radius utilizing the Mississippian and the surficial aquifer systems. If the Altoona municipal wells which utilize the Jordan aquifer system were evaluated for SI scoring the pathway score would only increase to 4.28.

A human health threat via the site is considered low for all ground water targets within 4 miles of the site because the majority of wells located within the area draw their drinking water supply from deeper confined bedrock aquifers or utilize the Des Moines PWS system which is located outside of the 4-mile target distance limit. In addition, the exposure threat is also considered low because of the 1997 removal of highly contaminated soils and the low concentrations and mobility factor of targeted constituents (PCBs and lead) remaining in surface soils at the site.

Surface Water Pathway

The surface water pathway was not evaluated for SI scoring purposes. There were no surface water samples collected for the SWMR site. The nearest perennial water body is Four Mile Creek located about 1½ miles downstream of the site (probable point of entry). From that point, Four Mile Creek flows to the south for 5½ miles, where it empties into the Des Moines River. There are no surface water intakes or known sensitive environments within 15 downstream miles of the site. Sport fishing is thought to occur along both the Des Moines River and Four Mile Creek.

The exposure threat via surface runoff from the site is considered low due to the low concentrations of remaining constituents in on-site surface soils and the distance and limited resource use of the nearest perennial water body. The overall SI pathway score would not increase significantly if the surface water pathway was evaluated for SI scoring.

Soil and Air Exposure Pathways

The 1997 site assessment and removal analytical data shows that elevated metals and PCB contamination exists in the surface soils (depth of 2 feet or less) at the SWMR site and this contamination is associated with former site operations. PCB and metal contaminant levels were detected above background concentrations within 200 feet of the on-site house/office however, only one location near the vacant house/office had elevated PCBs above EPA's recommended health-based benchmarks. Currently,

no one occupies the house/office. Sometime in late February or early March 1997 SWMR moved from the site location because the lease had expired and the house became vacant at that time.

The nearest occupied resident is located about 500 feet east of the site. No resident population targets were evaluated for SI scoring. Since no one lives in the on-site home the exposure threat via soil contact is considered low; however, a future evaluation may be warranted if someone occupies the home in the future. Further the threat via nearby targets is also considered low since the highest PCB and metal-contaminated soil was excavated and backfilled with clean clay. After the 1997 removal action the site is now secured with a fence and locked gate, thereby restricting trespassers. A score of 0 was calculated for the soil pathway. If the on-site house/office was evaluated for SI scoring the soil exposure pathway score would increase to 9.49, with an overall SI scoring of 5.06.

The exposure threat via the air pathway is minimal because the majority of waste has been removed, and is restricted to the soils ($\geq$ 6 inches deep). In addition, the remaining metal and PCB-contaminated soil has been capped with clean fill material.

RECOMMENDATIONS

The START recommends for EPA consideration that no further CERCLA action be taken at the SWMR site. This recommendation is based on the low SI score, the documented low contaminant concentrations levels remaining in on site soils, waste removal, and the physical conditions of the site. However, future surface soil sampling may be necessary adjacent to the home/office located on the site because metal and PCB contamination in surface soils still show concentrations above background levels.

Removal Considerations

Integrated site assessment/removal activities conducted in June and October 1997 revealed that the site met removal criteria for lead and PCB-contaminated soils, which were the result of former recycling operations. The removal activities were completed on November 23, 1997. A total 1,363.28 tons of waste soil located largely in the northern portion of the site was excavated and disposed at off-site facilities. Several structures including their contents were also removed from the site and included: an AST, 15 empty polyethylene gas tanks, a 500-gallon metal tank, and several 55-gallon drums.

No further removal recommendations appear to be warranted at the site because lead and PCB concentrations found in remaining contaminated soils on-site do not exceed any removal action level.

START believes that the remaining waste on site does not appear to be an imminent threat to the public health or the environment.

ATTACHMENTS:

1. SI Worksheets and SI References
2. Removal Site Evaluation Form

ATTACHMENT 1

SI Worksheets & SI References

SITE INSPECTION WORKSHEETS

CERCLIS IDENTIFICATION NUMBER
IA0001898907

SITE LOCATION			
SITE NAME: LEGAL, COMMON, OR DESCRIPTIVE NAME OF SITE Statewide Metal Recycling, Inc.			
STREET ADDRESS, ROUTE, OR SPECIFIC LOCATION IDENTIFICATION 5310 East Broadway Ave.			
CITY Altoona	STATE Iowa	ZIP CODE 50009	TELEPHONE none
COORDINATES: LATITUDE & LONGITUDE 41° 38' 41.0" N 93° 30' 52.2" W	TOWNSHIP, RANGE, AND SECTION Section 15, Township 79 North, Range 23 West		

OWNER/OPERATOR IDENTIFICATION					
OWNER Roy and Jeanette Burris			OPERATOR Not Operating		
OWNER ADDRESS 352 Quincy			OPERATOR ADDRESS		
CITY New Virginia			CITY		
STATE Iowa	ZIP CODE 50210	TELEPHONE (515) 297-2364	STATE	ZIP CODE	TELEPHONE

SITE EVALUATION					
AGENCY/ORGANIZATION Ecology & Environment, Inc. / START			EPA REGION Region 7		
INVESTIGATOR Jeffrey D. Fletcher					
CONTACT Patty S. Roberts, CHMM			EPA CONTACT Paul Doherty		
ADDRESS 6405 Metcalf, Bldg. 3, Ste. 404			ADDRESS 726 Minnesota Avenue		
CITY Overland Park			CITY Kansas City		
STATE KS	ZIP CODE 66202	TELEPHONE (913)432-9961	STATE KS	ZIP CODE 66101	TELEPHONE (913)551-7702

GENERAL INFORMATION

Site Description:

When START/EPA conducted the first inspection of the site on May 14,1997, there were seven structures on site: a house, metal garage, three mobile homes, one metal trailer used as a storage shed, and a concrete well structure standing approximately 3 feet high (Figure 2-2). In addition, approximately 15 empty polyethylene gas tanks, a 500-gallon metal tank with an unknown substance inside, a 5-gallon bucket one-half full of oily liquid, an empty 500-gallon polyethylene tank, four 55-gallon drums containing trash, two 55-gallon drums with unknown contents, a large pile of refuse/debris, and used appliances were scattered about the site (Reference 3). As of November 23, 1997 after the removal action was completed the only remaining structures on site were the vacant house, the maintenance garage, and a debris pile. The debris pile consisted of dismantled trailer pieces, white goods, and household trash collected by the ERRs crew and place along the east boundary (Reference 4).

The subject site covers 2.25 acres and is located at 5310 East Broadway. The surrounding area includes a mix of residential and industrial uses.

Operational History:

The property is currently owned by Roy and Jeanette Burris of New Virginia, Iowa. Statewide Auto Crushing, Inc., reportedly operated at the site from 1981 until October 1995. Statewide Auto Crushing, Inc., was incorporated in October 1988. Glen B. Reed Jr., Des Moines, Iowa, was identified as the corporation director in the Articles of Incorporation.

In October 1995, Statewide Auto Crushing was purchased by Fred Bovee, West Des Moines, Iowa, and he continued to lease the location from the Burris's. Bovee is the president of the company and changed the name to Statewide Metal Recycling, Inc., in state incorporation papers executed in October 1995. Sometime in late February or early March 1997, SWMR moved from the East Broadway Avenue site to a new location at 4300 Northeast 22nd Street, in Des Moines, Iowa. The property on East Broadway Avenue remains vacant and secured. SWMR bought and sold scrap metal, including electric motors, vehicles, and household appliances (Reference 4).

On Febraury 6, 1997, TSCA conducted a site inspection and determined that the facility was operating in violation of state and federal regulations by failing to properly remove refrigerant and PCB-containing capacitors from household appliances prior to bailing them for disposal. EPA issued a TSCA Notice of Violation to the SWMR on February 27, 1997 (Reference 5). PCBs wre detected at 960 ppm in a soil sample collected next to the appliance bailing equipment.

The site was subsequently referred to EPA Superfund Division in May 1997. Integrated removal/site assessment activities were conducted in Jume and October, 1997 and included soil, container, and ground water sampling. At the completion of the site characterization study it was determined that the SWMR met the removal criteria for PCB (10 ppm) and lead (500 ppm) contaminated soils, which were the result of the facility's operations. The removal activities were completed on Nobember 23, 1997 and included the excavation and removal of 1,363.28 tons of soil. Elevated metal and PcB concentrations above background remain in residual soils in the central and southern sections of the site (Reference 4).

GENERAL INFORMATION (continued)

Site Sketch: Provide a sketch of the site. Indicate all pertinent features of the site and nearby environments including sources of waste, areas of visible and buried wastes, buildings, residences, access roads, parking areas, fences, fields, drainage patterns, water bodies, vegetation, wells, sensitive environments, and other features.

GENERAL INFORMATION (continued)

Site Sketch: (Continued)

GENERAL INFORMATION (continued)

Source Description: Describe all sources at the site. Identify source type and relate to waste disposal operations. Provide source dimensions and the best available waste quantity information. Describe the condition of sources and all containment structures. Cite references.

SOURCE TYPES

Landfill: A man-made (by excavating or construction) or natural hole in the ground into which wastes have come to be disposed by backfilling, or by contemporaneous soil deposition with waste disposal.

Surface Impoundment: A natural topographic depression, man-made excavation, or dike area, primarily formed from earthen materials (lined or unlined) and designed to hold an accumulation of liquid wastes, wastes containing free liquid, or sludge nor backfilled or otherwise covered; depression may be wet with exposed liquid or dry if deposited liquid has evaporated, volatilized, or leached; structures that may be described as lagoon, pond, tailings pond, sludge pit; also a surface impoundment that has been covered with soil after the final deposition of waste materials (i.e., buried or backfilled).

Drum: A portable container designed to hold a standard 55-gallon volume of waste.

Tank and Non-Drum Containers: Any device, other than a drum, designed to contain an accumulation of waste that provides structural support and is constructed primarily of fabricated materials (such as wood, concrete, steel, or plastic); any portable or mobile device in which waste is stored or otherwise handled.

Contaminated Soil: An area or volume of soil onto which hazardous substances have been spilled, spread, disposed, or deposited.

Pile: Any non-containerized accumulation above the ground surface of solid, non-flowing waste; includes open drums. Some types of waste piles are:

- Chemical Waste Pile: A pile consisting primarily of discarded chemical products, by-products, radioactive wastes, or used or unused feedstocks.
- Scrap Metal or Junk Pile: A pile consisting of scrap metal or discarded durable goods (such as appliances, automobiles, auto parts, batteries, etc.) composed of materials containing hazardous substances.
- Tailing Pile: A pile consisting primarily of any combination of overburden from a mining operation and tailings from a mineral mining, beneficiation, or processing operation.
- Trash Pile: A pile consisting primarily of paper, garbage, or discarded non-durable goods containing hazardous substances.

Land Treatment: Landfarming or other method of waste management in which liquid wastes or sludges are spread over land and tilled, or liquids are injected at shallow depths into soil.

Other: Sources not in categories listed above.

GENERAL INFORMATION (continued)

Source Description: Include description of containment per pathway for groundwater (see HRS Table 3-2), surface water (see HRS Table 4-2), and air (see HRS Tables 6-3 and 6-9).

Elevated metal and PCB concentrations above background concentration levels remain in residual soils in the excavated area (northern section) and in soils in the central and southern sections of the site. Each of the cells with elevated metals and PCBs after the removal action is considered a source for HRS purposes (References 1, 3, and 4). The single source is soil contaminated with fairly low levels of metals and PCBs.

The air pathway was not evaluated. The containment factor for the ground water and surface water pathways is 10 (Reference 1).

Hazardous Waste Quantity (HWQ) Calculation: SI Tables 1 and 2 (see HRS Tables 2-5, 2-6, and 5-2).

The single source is contaminated soil with an calculated area of approximately 52,500 ft^2. HWQ was taken from tier D of SI Table 1 (Reference 1).

Attach additional pages, if necessary	**HWQ =**	**10.00**

SI TABLE 1: HAZARDOUS WASTE QUANTITY (HWQ) SCORES FOR SINGLE SOURCE SITES AND FORMULAS FOR MULTIPLE SOURCE SITES

		Single Source Sites (assigned HWQ scores)	
(Column 1)	(Column 2)	(Column 3)	(Column 4)
TIER	Source Type	HWQ = 10	HWQ = 100
A Hazardous Constituent Quantity	N/A	HWQ = 1 if Hazardous Constituent Quantity data are complete HWQ = 10 if Hazardous Constituent Quantity data are not complete	> 100 to 10,000 lbs
B Hazardous Wastestream Quantity	N/A	≤ 500,000 lbs	> 500,000 to 50 million lbs
C Volume	Landfill	≤ 6.75 million ft^3 ≤ 250,000 yd^3	> 6.75 million to 675 million ft^3 > 250,000 to 25 million yd^3
	Surface Impoundment	≤ 6,750 ft^3 ≤ 250 yd^3	> 6,750 to 675,000 ft^3 > 250 to 25,000 yd^3
	Drums	≤ 1,000 drums	> 1,000 to 100,000 drums
	Tanks and Non-drum Containers	≤ 50,000 gallons	> 50,000 to 5 million gallons
	Contaminated Soil	≤ 6.75 million ft^3 ≤ 250,000 yd^3	> 6.75 million to 675 million ft^3 > 250,000 to 25 million yd^3
	Pile	≤ 6,750 ft^3 ≤ 250 yd^3	> 6,750 to 675,000 ft^3 > 250 to 25,000 yd^3
	Other	≤ 6,750 ft^3 ≤ 250 yd^3	> 6,750 to 675,000 ft^3 > 250 to 25,000 yd^3
D Area	Landfill	≤ 340,000 ft^2 ≤ 7.8 acres	> 340,000 to 34 million ft^2 > 7.8 to 780 acres
	Surface Impoundment	≤ 1,300 ft^2 ≤ 0.029 acres	> 1,300 to 130,000 ft^2 > 0.029 to 2.9 acres
	Contaminated Soil	≤ 3.4 million ft^2 ≤ 78 acres	> 3.4 million to 340 million ft^2 > 78 to 7,800 acres
	Pile	≤ 1,300 ft^2 ≤ 0.029 acres	> 1,300 to 130,000 ft^2 > 0.029 to 2.9 acres
	Land Treatment	≤ 27,000 ft^2 ≤ 0.62 acres	> 27,000 to 2.7 million ft^2 > 0.62 to 62 acres

SI TABLE 1 (CONTINUED)

Single Source Sites (assigned HWQ scores)		Multiple Source Sites		
(Column 5) HWQ = 10,000	(Column 6) HWQ = 1,000,000	(Column 7) Divisors for Assigning Source WQ Value	(Column 2) Source Type	(Column 1) TIER
> 10,000 to 1 million lbs	> 1 million lbs	lbs ÷ 1	N/A	A Hazardous Constituent Quantity
> 50 million to 5 billion lbs	> 5 billion lbs	lbs ÷ 5,000	N/A	B Hazardous Wastestream Quantity
> 675 million to 67.5 billion ft^3 > 25 million to 2.5 billion yd^3	> 67.5 billion ft^3 > 2.5 billion yd^3	ft^3 ÷ 67,500 yd^3 ÷ 2,500	Landfill	C Volume
> 675,000 to 67.5 million ft^3 > 25,000 to 2.5 million yd^3	> 67.5 million ft^3 > 2.5 million yd^3	ft^3 ÷ 67.5 yd^3 ÷ 2.5	Surface Impoundment	
> 100,000 to 10 million drums	> 10 million drums	drums ÷ 10	Drums	
> 5 million to 500 million gal.	> 500 million gal.	gallons ÷ 500	Tanks and Non-drum containers	
> 675 million to 67.5 million ft^3 > 25 million to 2.5 billion yd^3	> 67.5 billion ft^3 > 2.5 billion yd^3	ft^3 ÷ 67,500 yd^3 ÷ 2,500	Contaminated Soil	
> 675,000 to 67.5 million ft^3 > 25,000 to 2.5 million yd^3	> 67.5 million ft^3 > 2.5 million yd^3	ft^3 ÷ 67.5 yd^3 ÷ 2.5	Pile	
> 675,000 to 67.5 million yd^3 > 25,000 to 2.5 million yd^3	> 67.5 million ft^3 > 2.5 million yd^3	ft^3 ÷ 67.5 yd^3 ÷ 2.5	Other	
> 34 million to 3.4 billion ft^2 > 780 to 78,000 acres	> 3.4 billion ft^2 > 78,000 acres	ft^2 ÷ 3,400 acres ÷ 0.078	Landfill	D Area
> 130,000 to 13 million ft^2 > 2.9 to 290 acres	> 13 million ft^2 > 290 acres	ft^2 ÷ 13 acres ÷ 0.00029	Surface Impoundment	
> 340 million to 34 billion ft^2 > 7,800 to 780,000 acres	> 34 billion ft^2 > 780,000 acres	ft^2 ÷ 34,000 acres ÷ 0.78	Contaminated Soil	
> 130,000 to 13 million ft^2 > 2.9 to 290 acres	> 13 million ft^2 > 290 acres	ft^2 ÷ 13 acres ÷ 0.00029	Pile	
> 2.7 million to 270 million ft^2 > 62 to 6,200 acres	> 270 million ft^2 > 6,200 acres	ft^2 ÷ 270 acres ÷ 0.0062	Land Treatment	

HAZARDOUS WASTE QUANTITY (HWQ) CALCULATION

For each migration pathway, evaluate HWQ associated with sources that are available (i.e., incompletely contained) to migrate to that pathway. (Note: If *Actual Contamination Targets* exist for groundwater, surface water, or air migration pathways, assign the calculated HWQ score or 100, whichever is greater, as the HWQ score for that pathway). For each source, evaluate HWQ for one or more of the four tiers (SI Table 1, HRS Table 2-5) for which data exist: constituent quantity, wastestream quantity, source volume, and source area. Select the tier that gives the highest value as the source HWQ. Select the source volume HWQ rather than source area HWQ if data for both tiers are available.

Column 1 of SI table 1 indicates the quantity tier. Column 2 lists source types for the four tires. Columns 3, 4, 5, and 6 provide ranges of waste amount for sites with only one source, corresponding to HWQ scores at the tops of the columns. Column 7 provides formulas to obtain source waste quantity values at sites with multiple sources.

1. Identify each source type.
2. Examine all waste quantity data available for each source. Record constituent quantity and wastestream mass or volume. Record dimensions of each source.
3. Convert source measurements to appropriate units for each tier to be evaluated.
4. For each source, use the formulas in the last column of SI Table 1 to determine the waste quantity value for each tier that can be evaluated. Use the waste quantity value obtained from the highest tier as the quantity value for the source.
5. Sum the values assigned to each source to determine the total site waste quantity.
6. Assign HWQ score from SI Table 2 (HRS Table 2-6).

Note these exceptions to evaluate soil exposure pathway HWQ (see HRS Table 5-2):

- The divisor for the area (square feet) of a landfill is 34,000.
- The divisor for the area (square feet) of a pile is 34.
- Wet surface impoundments and tanks and non-drum containers are the only sources for which volume measurements are evaluated for the soil exposure pathway.

SI TABLE 2: HWQ SCORES FOR SITES

Site WQ Total	HWQ Score
0	0
1[a] to 100	1[b]
> 100 to 10,000	100
> 10,000 to 1 million	10,000
> 1 million	1,000,000

[a] If the WQ total is between 0 and 1, round it to 1.

[b] If the hazardous constituent quantity data are not complete, assign the score of 10.

SI TABLE 3:WASTE CHARACTERIZATION WORKSHEET

Site Name: Statewide Metal Recycling,Inc.

References: 1,2,3, and 4

Sources:

1. Contaminated Soils
2.
3.
4.
5.
6.
7.
8.
9.

Source	Hazardous Substance	Toxicity	GROUNDWATER PATHWAY		SURFACE WATER PATHWAY										
					OVERLAND/FLOOD MIGRATION							GROUNDWATER TO SURFACE WATER			
			GW Mobility (HRS Table 3-8)	Tox/ Mobility Value (HRS Table 3-9)	Per (HRS Tables 4-10 & 4-11)	Tox/ Per Value (HRS Table 4-12)	Bioac Pot (HRS Table 4-15)	Tox/ Per/ Bioac Value (HRS Table 4-16)	Ecotox (HRS Table 4-19)	Ecotox/ Pers (HRS Table 4-20)	Ecotox/ Pers/ Bioacc Value (HRS Table 4-21)	Tox/ Mob/ Pers Value (HRS Table 4-26)	Tox/ Mob/ Pers/ Bioacc Value (HRS Table 4-28)	Ecotox/ Mob/ Pers Value (HRS Table 4-29)	Ecotox/ Mob/ Per/ Bioacc Value (HRS Table 4-30)
1	Copper	0.00e+00	1.00e-02		1.00e+00		5.00e+04		1.00e+02						
1	Cadmiun	1.00e+04	2.00e-03	2.00e+01	1.00e+00	1.00e+04	5.00e+03	5.00e+07	1.00e+03	1.00e+03	5.00e+06	2.00e+01	1.00e+05	2.00e+00	1.00e+04
1	* Iron	1.00e+00	1.00e+00	1.00e+00	1.00e+00	1.00e+00	5.00e-01	5.00e-01	1.00e+00	1.00e+00	5.00e-01	1.00e+00	5.00e-01	1.00e+00	5.00e-01
1	Barium	1.00e+04	1.00e-02	1.00e+02	1.00e+00	1.00e+04	5.00e-01	5.00e+03	1.00e+00	1.00e+00	5.00e-01	1.00e+02	5.00e+01	1.00e-02	5.00e-03
1	Lead	1.00e+04	2.00e-05	2.00e-01	1.00e+00	1.00e+04	5.00e+03	5.00e+07	1.00e+03	1.00e+03	5.00e+06	2.00e-01	1.00e+03	2.00e-02	1.00e+02
1	PCBs	1.00e+04	2.00e-07	2.00e-03	1.00e+00	1.00e+04	5.00e+04	5.00e+08	1.00e+04	1.00e+04	5.00e+08	2.00e-03	1.00e+02	2.00e-03	1.00e+02
1	* Zinc	1.00e+01	1.00e+00	1.00e+01	1.00e+00	1.00e+01	5.00e+02	5.00e+03	1.00e+01	1.00e+01	5.00e+03	1.00e+01	5.00e+03	1.00e+01	5.00e+03
1	* Nickel	1.00e+04	1.00e+00	1.00e+04	1.00e+00	1.00e+04	5.00e+02	5.00e+06	1.00e+01	1.00e+01	5.00e+03	1.00e+04	5.00e+06	1.00e+01	5.00e+03

*** An Observed Release can be document for the above listed hazardous substances and there receive a mobility factor of 1 (Reference 1).**

Groundwater Observed Release Substances Summary Table

On SI Table 4, list the hazardous substances associated with the site detected in groundwater samples for that aquifer. Include only those substances directly observed or with concentrations significantly greater than background. Obtain toxicity values from the Superfund Chemical Data Matrix (SCDM). Assign mobility a value of 1 for all observed release substances regardless of the aquifer being evaluated. For each substance, multiply the toxicity by the mobility to obtain the toxicity/mobility factor value; enter the highest toxicity/mobility value for the aquifer in the space provided.

SI TABLE 4: GROUNDWATER OBSERVED RELEASE SUBSTANCES (BY AQUIFER)

Sample ID	Hazardous Substance	Background Concentration (μg/L)	Toxicity/ Mobility	References
		Highest Toxicity/Mobility		

Groundwater Actual Contamination Targets Summary Table

If there is an observed release at a drinking water well, enter each hazardous substance meeting the requirements for the observed release by well and sample ID on SI Table 5 and record the detected concentration. Obtain benchmark, cancer risk, and reference dose concentrations from SCDM. For MCL and MCLG benchmarks, determine the highest percentage of benchmark obtained for any substance. For cancer risk and reference dose, sum the percentages for the substances listed. If benchmark, cancer risk, or reference dose concentrations are not available for a particular substance, enter N/A for the percentage. If the highest benchmark percentage or the percentage sum calculated for cancer risk or reference dose equals 100%, evaluate the population using the well as a Level I target. If these percentages are less than 100% or all are N/A, evaluate the population using the well as a Level II target for that aquifer.

SI TABLE 5: GROUNDWATER ACTUAL CONCENTRATION TARGETS

Well ID: Level I: Level II: Population Served:

Sample ID	Hazardous Substance	Concentration (µg/L)	Benchmark Concentration (MCL or MCLG)	% Of Benchmark	Cancer Risk Concentration	% Of Cancer Risk Concentration	RfD	% Of RfD
			Highest Percent		Sum Of Percents		Sum Of Percents	

GROUNDWATER PATHWAY

GROUNDWATER USE DESCRIPTION

Describe Groundwater Use within 4 miles of the site: Describe generalized stratigraphy, aquifers, municipal and private wells.

The general classification of soils at the Statewide Metal Recycling Site area is loam of the Clarion series. This series consists of well-drained soils that developed from calcareous glacial till with the slope ranging from 2 to 5 percent (Reference 6).

The unconsolidated materials found in Polk County consist of glacial till of Quaternary-age. A well log (#5873) from a former private well located near the site shows glacial deposits to be about 70 feet thick. These deposits are typically composed of a mixture of clay, silt, sand, gravel and even boulders. Data for Well #5873 indicates that static water level is at 123 feet below ground surface (bgs) and the unconsolidated materials provide a surficial aquifer. The total well depth is 485 feet (Reference 7).

The bedrock underlying the unconsolidated materials consists of Pennsylvania-age shale sandstone and coal. The Pennsylvania aged rocks consist of the Marmaton Group and the Cherokee Group, which is about 270 feet thick (Reference 7). The Marmaton Group is composed of alternating shale and limestone, thin coal and sandstone. The Cherokee Group consists of shale, clay, siltstone, sandstone and coal beds. These Pennsylvanian rocks create an aquiclude between the surficial aquifer and the Mississippian aquifer (Reference 8).

The Pennsylvanian rocks are underlain by Mississippian limestones, dolostones and chert. The Mississippian System, which ranges in thickness from 285 to 450 feet in this area, is made up of three rock units. The three units are the Meramac Series, the Osage Series and the Kinderhook Series, respectively. The Mississippian aquifer yields fair to low amounts of water (Reference 8).

Beneath the Mississippian age rocks are Devonian aged shales, limestones and dolostones. The upper portion of the system is composed of the Maple Hill shale, Sheffield Formation and the Lime Creek Formation. This unit has a thickness from 150 to 250 feet and makes up the Devonian aquiclude. The lower portion of the Devonian System is composed of limestone and dolostone and ranges in thickness from 500 to 550 feet. These two units comprise the Devonian aquifer (Reference 8).

The Silurian System lies below the Devonian age rocks. The Silurian aged rocks are 50 to 100 feet of undifferentiated chert and limestone. Below the Silurian lies the thick Ordovician System which is composed of shale, dolostone, limestone and sandstone. The Ordovician System ranges in thickness from 950 to 1050 feet. The Cambrian System lies beneath the Ordovician. The Cambrian age rocks are composed of sandstone, dolostone and shale. The igneous and metamorphic basement rocks of the pre-Cambrian, lie below the Cambrian rock units (Reference 8).

Ground Water Use (Continued)

Ground water is the main source of water for domestic, irrigation and food processing use in the Altoona area. Currently, Altoona (population 7,191) uses three municipal wells finished in the Cambro-Ordovician aquifer (Reference 8). The municipal wells are identified as well number 1, 2, and 3 (Figure 5-2) and range in depth from 2,530 to 2,551 feet bgs. The Altoona public water supply (PWS) system does not serve any rural water districts (RWDs) or subdivisions outside the city limits

Approximately 93 residences located outside the city limits and within a 4-mile radius of the site rely on private wells completed in either the unconsolidated surficial materials or the Mississippian aquifers(References 7 and 8). At 2.41 persons per household, this equates to 226 persons (References 7, 8 and 9). The remainder of the rural population recieves its water supply via Des Moines PWS, which is composed of two surface intakes and a ground water infiltration gallery located outside the four-mile radius if the site.

Polk County average number of persons per household: 2.41 Reference(s): 8, 9, and 10

Show Calculations of Groundwater Drinking Water Populations for each aquifer: Provide apportionment calculations for blended supply systems.

0 to ¼ mile (1 private well x 2.41) = 2.41

¼ to ½ mile (0 private wells) = 0

½ to 1 mile (0 private wells) = 0

1 to 2 miles 6 residences (15 x 2.41) = 14.46

2 to 3 miles 46 residences (46 x 2.41) = 110.86

3 to 4 miles 42 residences (42 x 2.41) = 101.22

231.36

GROUNDWATER PATHWAY WORKSHEET

LIKELIHOOD OF RELEASE	Score	Data Type	Refs
1. OBSERVED RELEASE: If sampling data or direct observation support a release to the aquifer, assign a score of 550. Record observed release substances on SI Table 4.			
2. POTENTIAL TO RELEASE: Depth to aquifer: 10-50 feet. If sampling data do not support a release to the aquifer, and the site is in karst terrain or the depth to aquifer is 70 feet or less, assign a score of 500; otherwise, assign a score of 340. Optionally, evaluate potential to release according to HRS Section 3.	500	H	7,8
LR =	500		

TARGETS			
Are any wells part of a blended system? Yes__ No X If yes, attach a page to show apportionment calculations.			
3. ACTUAL CONTAMINATION TARGETS: If analytical evidence indicates that any target drinking water well for the aquifer has been exposed to a hazardous substance from the site, evaluate the factor score for the number of people served (SI Table 5). Level I: ____people x 10 = _____ Level II: ____people x 1 = _____ Total =	0		
4. POTENTIAL CONTAMINATION TARGETS: Determine the number of people served by drinking water wells for the aquifer or overlying aquifers that are not exposed to a hazardous substance from the site; record the population for each distance category in SI Table 6a or 6b. Sum the population values and multiply by 0.1.	4.1		
5. NEAREST WELL: Assign a score of 50 for any Level I Actual Contamination Targets for the aquifer or overlying aquifer. Assign a score of 45 if there are Level II targets but no Level I targets. If no Actual Contamination Targets exist, assign the Nearest Well score from SI Table 6a or 6b. If no drinking water wells exist within 4 miles, assign 0.	20	E	7 to 11
6. WELLHEAD PROTECTION AREA (WHPA): In any source lies within or above a WHPA for the aquifer, or if a groundwater observed release has occurred within a WHPA, assign a score of 20; assign 5 if neither condition applies but a WHPA is within 4 miles; otherwise assign 0.	0	E	
7. RESOURCES: Assign a score of 5 if one or more groundwater resources applies; assign 0 if none applies: • Irrigation (5 acre minimum) of commercial food crops or commercial forage crops. • Watering of commercial livestock. • Ingredient in commercial food preparation. • Supply for commercial aquaculture. • Supply for a major or designated water recreation area, excluding drinking water use.	5	H	11
Sum of Targets T =	29.1		

: 6 (From HRS TABLE 3-12): VALUES FOR POTENTIAL CONTAMINATION GROUNDWATER TARGET TION

SI Table 6a: Other Than Karst Aquifers

	Pop.	Nearest Well (choose highest)	Population Served By Wells Within Distance Category												
			1 to 10	11 to 30	31 to 100	101 to 300	301 to 1000	1001 to 3000	3001 to 10,000	10,001 to 30,000	30,001 to 100,000	100,001 to 300,000	300,001 to 1,000,000	1,000,001 to 3,000,000	Pop. Value
le	3	20	4	17	53	164	522	1,633	5,214	16,325	52,137	163,246	521,360	1,632,455	4
le	0	18	2	11	33	102	324	1,013	3,233	10,122	32,325	101,213	323,243	1,012,122	0
le	0	9	1	5	17	52	167	523	1,669	5,224	16,684	52,239	166,835	522,385	0
:s	14	5	0.7	3	10	30	94	294	939	2,939	9,385	29,384	93,845	293,842	3
:s	111	3	0.5	2	7	21	68	212	678	2,122	6,778	21,222	67,777	212,219	21
:s	101	2	0.3	1	4	13	42	131	417	1,306	4,171	13,060	41,709	130,596	13
arest Well =		20												Total =	41

SI Table 6b: Karst Aquifers

:	Pop.	Nearest Well (choose highest)	Population Served By Wells Within Distance Category												
			1 to 10	11 to 30	31 to 100	101 to 300	301 to 1000	1001 to 3000	3001 to 10,000	10,001 to 30,000	30,001 to 100,000	100,001 to 300,000	300,001 to 1,000,000	1,000,001 to 3,000,000	Pop. Value
ile		20	4	17	53	164	522	1,633	5,214	16,325	52,137	163,246	521,360	1,632,455	
ile		20	2	11	33	102	324	1,013	3,233	10,122	32,325	101,213	323,243	1,012,122	
ile		20	2	9	26	82	261	817	2,607	8,163	26,068	81,623	260,680	816,227	
es		20	2	9	26	82	261	817	2,607	8,163	26,068	81,623	260,680	816,227	
es		20	2	9	26	82	261	817	2,607	8,163	26,068	81,623	260,680	816,227	
es		20	2	9	26	82	261	817	2,607	8,163	26,068	81,623	260,680	816,227	
Nearest Well =														Total = =	

GROUNDWATER PATHWAY WORKSHEET (continued)

WASTE CHARACTERISTICS	Score	Data Type	Does Not Apply
8. **If any Actual Contamination Targets exist for the aquifer or overlying aquifer, assign the calculated hazardous waste quantity score or a score of 100, whichever is greater; if no Actual Contamination Targets exist, assign the hazardous waste quantity score calculated for sources available to migrate to groundwater.**	10	H	
9. Assign the highest groundwater toxicity/mobility value from SI Tables 3 or 4	1.00e+02	H	
10. Multiply the groundwater toxicity/mobility and the hazardous waste quantity scores. Assign the Waste Characteristic score from the table below: (from HRS Table 2-7)			

Product =	1.00e+03	WC Score
0		0
> 0 to < 10		1
10 to < 100		2
100 to < 1,000		3
1,000 to < 10,000		6
10,000 to < 1E+05		10
1E+05 to < 1E+06		18
1E+06 to < 1E+07		32
1E+07 to < 1E+08		56
1E+08 or greater		100

WC = 6

GROUNDWATER PATHWAY SCORE: **LR x T x WC**
82,500

Multiply LR by T and by WC. Divide the product by 82,500 to obtain the groundwater pathway score for each aquifer. Select the highest aquifer score. If the pathway score is greater than 100, assign 100.

1.06
(Maximum of 100)

SURFACE WATER PATHWAY

Sketch of the Surface Water Migration Route: Label all surface water bodies. Include runoff and drainage direction, probable point of entry, and 15-mile target distance limit. Mark sample locations, intakes, fisheries, and sensitive environments. Indicate flow directions, tidal influences, and rate.

SURFACE WATER PATHWAY

Surface Water Observed Release Substances Summary Table

On SI Table 7, list the hazardous substances detected in surface water samples for the watershed, which can be attributed to the site. Include only those substances in observed releases (direct observation) or with concentration levels significantly above background levels. Obtain toxicity, persistence, bioaccumulation potential, and ecotoxicity values from SCDM. Enter the highest toxicity/persistence, toxicity/persistence/bioaccumulation, and ecotoxicity/persistence/ecobioaccumulation values in the spaces provided.

- TP = Toxicity x Persistence
- TPB = TP x Bioaccumulation
- ETPB = EP x Bioaccumulation (EP = Ecotoxicity x Persistence)

Drinking Water Actual Contamination Targets Summary Table

For an observed release at or beyond a drinking water intake, on SI Table 8 enter each hazardous substance by sample ID and the detected concentration. For surface water sediment samples detecting a hazardous substance at or beyond an intake, evaluate the intake as Level II contamination. Obtain benchmark, cancer risk, and reference dose concentrations for each substance from SCDM. For MCL and MCLG benchmarks, determine the highest percentage of benchmark obtained for any substance. For cancer risk and reference dose, sum the percentages of the substances listed. If benchmark, cancer risk, or references concentrations are not available for a particular substance, enter N/A for the percentage. If the highest benchmark percentage or the sum calculated for cancer risk or reference dose equals or exceeds 100%, evaluate the population served by the intake as a Level I target. If the percentages are less than 100% or all N/A, evaluate the population served by the intake as a Level II target.

SI TABLE 7: SURFACE WATER OBSERVED RELEASE SUBSTANCES

(All units are μg/L)

Sample ID	Hazardous Substance	Toxicity	EcoTox.	Persist.	Bioaccum.	Eco. Bioaccum.	Background Concentration	Analysis Concentration	Toxicity/ Persistence	Toxicity/ Persist./ Bioaccum.	Ecotoxicity/ Persist./ Ecobioaccum.	References
								Highest Values				

SI TABLE 8: SURFACE WATER DRINKING WATER ACTUAL CONCENTRATION TARGETS

No surface water intakes for drinking water.

Intake ID: Sample Type: Level I: Level II: Population Served: References:

Sample ID	Hazardous Substance	Concentration (µg/L)	Benchmark Concentration (MCL or MCLG)	% Of Benchmark	Cancer Risk Concentration	% Of Cancer Risk Concentration	RfD	% Of RfD
			Highest Percent		Sum Of Percents		Sum Of Percents	

Intake ID: Sample Type: Level I: Level II: Population Served: References:

Sample ID	Hazardous Substance	Concentration (µg/L)	Benchmark Concentration (MCL or MCLG)	% Of Benchmark	Cancer Risk Concentration	% Of Cancer Risk Concentration	RfD	% Of RfD
			Highest Percent		Sum Of Percents		Sum Of Percents	

SURFACE WATER PATHWAY
LIKELIHOOD OF RELEASE AND DRINKING WATER THREAT WORKSHEET

LIKELIHOOD OF RELEASE - OVERLAND/FLOOD MIGRATION	Score	Data Type	Refs
1. **OBSERVED RELEASE:** If sampling data or direct observation support a release to surface water in the watershed, assign a score of 550. Record observed release substances on SI Table 7.			
2. **POTENTIAL TO RELEASE:** Distance to surface water:_____ feet. If sampling data do not support a release to surface water in the watershed, use the table below to assign a score from the table below based on distance to surface water and flood potential.			

Distance to surface water body <2500 feet	500
Distance to surface water body >2500 feet, and	
Site in annual or 10-yr floodplain	500
Site in 100-yr floodplain	400
Site in 500-yr floodplain	300
Site outside 500-yr floodplain	100

Optionally, evaluate potential to release according to HRS Section 4.1.2.1.2.

LR = [ ]

LIKELIHOOD OF RELEASE GROUNDWATER TO SURFACE WATER MIGRATION	Score	Data Type	Refs
1. **OBSERVED RELEASE:** If sampling data or direct observation support a release to surface water in the watershed, assign a score of 550. Record observed release substances on SI Table 7. NOTE: Evaluate groundwater to surface water migration only for a surface water body that meets all of the following conditions: 1) A portion of the surface water is within 1 mile of site sources having a containment factor greater than 0. 2) No aquifer discontinuity is established between the source and the above portion of the surface water body. 3) The top of the uppermost aquifer is at or above the bottom of the surface water. Elevation of top of uppermost aquifer: _____ Elevation of bottom of surface water body: _____			
2. **POTENTIAL TO RELEASE:** Use the groundwater potential to release. Optionally, evaluate surface water potential to release according to HRS Section 3.1.2.			

LR = [ ]

SURFACE WATER PATHWAY
LIKELIHOOD OF RELEASE AND DRINKING WATER THREAT WORKSHEET (CONTINUED)

DRINKING WATER THREAT TARGETS	Score	Data Type	Refs

Record the water body type, flow, and number of people served by each drinking water intake within the target distance limit in the watershed. If there is no drinking water intake within the target distance limit, assign 0 to factors 3, 4, and 5.

Intake Name	Water Body Type	Flow	People Served
None			

Are any intake part of a blended system? Yes_____ No_____
If yes, attach a page to show apportionment calculations.

3. ACTUAL CONTAMINATION TARGETS: If analytical evidence indicates a drinking water intake has been exposed to a hazardous substance from the site, list the intake name and evaluate the factor score for the drinking water population (SI Table 8).

_____ , _____

Level I: _____ people x 10 = _____
Level II: _____ people x 1 = _____ Total =

4. POTENTIAL CONTAMINATION TARGETS: Determine the number of people served by drinking water intakes for the watershed that have not been exposed to a hazardous substance from the site. Assign the population values from SI Table 9. Sum the values and multiply by 0.1.

5. NEAREST INTAKE: Assign a score of 50 for any Level I Actual Contamination Drinking Water Target for the watershed. Assign a score of 45 if there are Level II targets for the watershed, but no Level I targets. If no Actual Contamination Drinking Water Targets exist, assign a score for the intake nearest the PPE from SI Table 9. If no drinking water intakes exist, assign 0.

6. RESOURCES: Assign a score of 5 if one or more surface water resources applies; assign 0 if none applies:
- Irrigation (5 acre minimum) of commercial food crops or commercial forage crops.
- Watering of commercial livestock.
- Ingredient in commercial food preparation.
- Major or designated water recreation area, excluding drinking water use.

SUM OF TARGETS T = 0

SI TABLE 9 (From HRS TABLE 4-14): DILUTION-WEIGHTED POPULATION VALUES FOR POTENTIAL CONTAMINATION FOR SURFACE WATER MIGRATION PATHWAY

Type Of Surface Water Body	Pop.	Nearest Intake	Number Of People														Pop. Value
			0	1 to 10	11 to 30	31 to 100	101 to 300	301 to 1,000	1,001 to 3,000	3,001 to 10,000	10,001 to 30,000	30,001 to 100,000	100,001 to 300,000	300,001 to 1,000,000	1,000,001 to 3,000,000	3,000,001 to 10,000,000	
Minimal stream (< 10 cfs)		20	0	4	17	53	164	522	1,633	5,214	16,325	52,137	163,246	521,360	1,632,455	5,213,590	
Small to moderate stream (10 to 100 cfs)		2	0	0.4	2	5	16	52	163	521	1,633	5,214	16,325	52,136	163,245	521,359	
Moderate to large stream (> 100 to 1,000 cfs)		0	0	0.04	0.2	0.5	2	5	16	52	163	521	1,633	5,214	16,325	52,136	
Large stream to river (> 1,000 to 10,000 cfs)		0	0	0.004	0.02	0.05	0.2	0.5	2	5	16	52	163	521	1,632	5,214	
Large river (> 10,000 to 100,000 cfs)		0	0	0	0.002	0.005	0.02	0.05	0.2	0.5	16	5	16	52	163	521	
Very large river (> 100,000 cfs)		0	0	0	0	0.001	0.002	0.005	0.02	0.05	0.2	0.5	2	5	16	52	
Shallow ocean zone or Great Lake (depth < 20 feet)		0	0	0	0.002	0.005	0.02	0.05	0.2	0.5	2	5	16	52	163	521	
Moderate ocean zone or Great Lake (depth 20 to 200 feet)		0	0	0	0	0.001	0.002	0.005	0.02	0.05	0.2	0.5	2	5	16	52	
Deep ocean zone or Great Lake (depth < 200 feet)		0	0	0	0	0	0.001	0.003	0.008	0.03	0.08	0.3	1	3	8	26	
3-mile mixing zone in quiet flowing river (> 10 cfs)		10	0	2	9	26	82	261	817	2,607	8,163	26,068	81,623	260,680	816,227	2,606,795	
	Nearest Intake															Sum =	

References

SURFACE WATER PATHWAY

Human Food Chain Actual Contamination Targets Summary Table

On SI Table 10, list the hazardous substances detected in sediment, aqueous, sessile benthic organism tissue, or fish samples (taken from fish caught within the boundaries of the observed release) by sample ID and concentration. Evaluate fisheries within the boundaries of observed releases detected by sediment or aqueous samples as Level II, if at least one observed release substance has a bioaccumulation potential factor value of 500 or greater (see SI Table 7). Obtain benchmark, cancer risk, and reference dose concentrations from SCDM. For FDAAL benchmarks, determine the highest percentage of benchmark obtained for any substance. For cancer risk and reference dose, sum the percentages for the substances listed. If benchmark, cancer risk, or reference dose concentrations are not available for a particular substance, enter N/A for the percentage. If the highest benchmark percentage sum calculated for cancer risk or reference dose equals or exceeds 100%, evaluate this portion of the fishery as subject to Level I concentrations. If the percentages are less than 100% or all are N/A, evaluate the fishery as a Level II target.

Sensitive Environment Actual Contamination Targets Summary Table

On SI Table 11, list each hazardous substance detected in aqueous or sediment sample at or beyond wetlands or a surface water sensitive environment by sample ID. Record the concentration. If contaminated sediments or tissues are detected at or beyond a sensitive environment, evaluate the sensitive environment as Level II. Obtain benchmark concentrations from SCDM. For AWQC/AALAC benchmarks, determine the highest percentage of benchmark of the substances detected in aqueous samples. If benchmark concentrations are not available for a particular substance, enter N/A for the percentage. If the benchmark percentage equals or exceeds 100%, evaluate that part of the sensitive environment subject to Level I concentrations. If the percentage is less than 100%, or all are N/A, evaluate the sensitive environment as Level II.

SI TABLE 10: HUMAN FOOD CHAIN ACTUAL CONTAMINATION TARGETS FOR WATERSHED

Fishery ID: Sample Type: Level I: Level II: References:

Sample ID	Hazardous Substance	Concentration (µg/L)	Benchmark Concentration (FDAAL)	% Of Benchmark	Cancer Risk Concentration	% Of Cancer Risk Concentration	RfD	% Of RfD
			Highest Percent		Sum Of Percents		Sum Of Percents	

Fishery ID: Sample Type: Level I: Level II: References:

Sample ID	Hazardous Substance	Concentration (µg/L)	Benchmark Concentration (FDAAL)	% Of Benchmark	Cancer Risk Concentration	% Of Cancer Risk Concentration	RfD	% Of RfD
			Highest Percent		Sum Of Percents		Sum Of Percents	

SI TABLE 11: SENSITIVE ENVIRONMENT ACTUAL CONTAMINATION TARGETS FOR WATERSHED

Environment ID: Sample Type: Level I: Level II: Environment Value:

Sample ID	Hazardous Substance	Concentration (µg/L)	Benchmark Concentration (AWQC or AALAC)	% Of Benchmark	References

Highest Percent

Environment ID: Sample Type: Level I: Level II: Environment Value:

Sample ID	Hazardous Substance	Concentration (µg/L)	Benchmark Concentration (AWQC or AALAC)	% Of Benchmark	References

Highest Percent

SURFACE WATER PATHWAY (continued)
HUMAN FOOD CHAIN THREAT WORKSHEET

HUMAN FOOD CHAIN THREAT TARGETS	Score	Data Type	Refs

Record the water body type and flow for each fishery within the target distance limit. If there is no fishery within the target distance limit, assign a score of 0 at the bottom of this page.

Fishery Name: Water Body:River cfs
Species_____ Production_____lbs/yr
Species_____ Production_____lbs/yr

Fishery Name: Water Body: Flow: cfs
Species_____ Production_____lbs/yr
Species_____ Production_____lbs/yr

Fishery Name: Water Body: Flow: cfs
Species_____ Production_____lbs/yr
Species_____ Production_____lbs/yr

FOOD CHAIN INDIVIDUAL

7. ACTUAL CONTAMINATION FISHERIES:

If analytical evidence indicates that a fishery has been exposed to a hazardous substance with a bioaccumulation factor greater than or equal to 500 (SI Table 10), assign a score of 50 if there is a Level I fishery. Assign 45 if there is a Level II fishery, but no Level I fishery.

8. POTENTIAL CONTAMINATION FISHERIES:

If there is a release of a substance with a bioaccumulation factor greater than or equal to 500 to a watershed containing fisheries within the target distance limit, but there are no Level I or Level II fisheries, assign a score of 20.

If there is no observed release to the watershed, assign a value for potential contamination fisheries from the table below using the lowest flow at all fisheries within the target distance limit:

Lowest Flow	FCI Value
< 10 cfs	20
10 to 100 cfs	2
> 100 cfs, coastal tidal waters, oceans, or Great Lakes	0
3-mile mixing zone in quiet flowing river	10

FCI Value = 0

SUM OF TARGETS T = 0

SURFACE WATER PATHWAY (continued)
ENVIRONMENTAL THREAT WORKSHEET

When measuring length of wetlands that are located on both sides of a surface water body, sum both frontage lengths. For a sensitive environment that is more than one type, assign a value for each type.

ENVIRONMENTAL THREAT TARGETS

	Score	Data Type	Refs

Record the water body type and flow for each surface water sensitive environment within the target distance (see SI Table 12). If there is no sensitive environment within the target distance limit, assign a score of 0 at the bottom of the page.

Environment Name	Water Body Type	Flow (cfs)

9. ACTUAL CONTAMINATION SENSITIVE ENVIRONMENTS: If sampling data or direct observation indicate any sensitive environment has been exposed to a hazardous substance from the site, record this information on SI Table 11, and assign a factor value for the environment (SI Tables 13 and 14).

Environment Name	Environment Type and Value (SI Tables 13 and 14)	Multiplier (10 for Level I, 1 for Level II)	Product
		x	=
		x	=
		x	=
		x	=
			Sum =

10. POTENTIAL CONTAMINATION SENSITIVE ENVIRONMENTS:

Flow (cfs)	Dilution Weight (SI Table 12)	Environment Type and Value (SI Tables 13 & 14)	Pot. Cont.	Product
	x	x	0.1 =	
	x	x	0.1 =	
	x	x	0.1 =	
	x	x	0.1 =	
			Sum =	

T = 0

SI TABLE 12 (HRS TABLE 4-13):
SURFACE WATER DILUTION WEIGHTS

TYPE OF SURFACE WATER BODY		Assigned Dilution Weight
Description	**Flow Characteristics**	
Minimal stream	< 10 cfs	1
Small to moderate stream	10 to 100 cfs	0.1
Moderate to large stream	> 100 to 1,000 cfs	0.01
Large stream to river	> 1,000 to 10,000 cfs	0.001
Large river	> 10,000 to 100,000 cfs	0.0001
Very large river	> 100,000 cfs	0.00001
Coastal tidal waters	Flow not applicable, depth not applicable	0.0001
Shallow ocean zone or Great Lakes	Flow not applicable, depth less than 20 feet	0.0001
Moderate depth ocean zone or Great Lakes	Flow not applicable, depth 20 to 200 feet	0.00001
Deep ocean zone or Great Lakes	Flow not applicable, depth greater than 200 feet	0.000005
3-mile mixing zone in quiet flowing river	10 cfs or greater	0.5

SI TABLE 13 (HRS TABLE 4-23)
SURFACE WATER AND AIR SENSITIVE ENVIRONMENTS VALUES

SENSITIVE ENVIRONMENT	ASSIGNED VALUE
Critical habitat for Federal designated endangered or threatened species Marine Sanctuary National Park Designated Federal Wilderness Area Ecologically important area identified under the Coastal Zone Wilderness Act Sensitive Areas identified under the National Estuary Program or Near Coastal Water Program of the Clean Water Act Critical Areas identified under the Clean Lakes Program of the Clean Water Act (subareas in lakes or entire small lakes) National Monument (air pathway only) National Seashore Recreation Area National Lakeshore Recreation Area	100
Habitat known to be used by Federal designated or proposed endangered or threatened species National Preserve National or Sate Wildlife Refuge Unit of Coastal Barrier Resources System Coastal Barrier (undeveloped) Federal land designated for the protection of natural ecosystems Administratively Proposed Federal Wilderness Area Spawning areas critical for the maintenance of fish/shellfish species within a river system, bay, or estuary Migratory pathway and feeding areas critical for the maintenance of anadromous fish species within river reaches or areas in lakes or coastal tidal waters in which the fish spend extended periods of time Terrestrial areas utilized by large or dense aggregations of vertebrate animals (semi-aquatic foragers) for breeding National river reach designated as recreation	75
Habitat known to be used by State designated endangered or threatened species Habitat known to be used by a species under review as to its Federal endangered or threatened status Coastal Barrier (partially developed) Federally designated Scenic or Wild River	50
State land designated for wildlife or game management State designated Scenic or Wild River State designated Natural Area Particular areas, relatively small in size, important to maintenance of unique biotic communities	25
State designated areas for the protection of maintenance of aquatic life under the Clean Water Act	5
Wetlands See SI table 14 (Surface Water Pathway) or SI Table 23 (Air Pathway)	

SI TABLE 14 (HRS TABLE 4-24): SURFACE WATER WETLANDS FRONTAGE VALUES

TOTAL LENGTH OF WETLANDS	ASSIGNED VALUE
Less than 0.1 mile	0
0.1 to 1 mile	25
Greater than 1 to 2 miles	50
Greater than 2 to 3 miles	75
Greater than 3 to 4 miles	100
Greater than 4 to 8 miles	150
Greater than 8 to 12 miles	250
Greater than 12 to 16 miles	350
Greater than 16 to 20 miles	450
Greater than 20 miles	500

SURFACE WATER PATHWAY (continued)
WASTE CHARACTERISTICS, THREAT, AND PATHWAY SCORE SUMMARY

WASTE CHARACTERISTICS — **Score**

11. If an Actual Contamination Target (drinking water, human food chain, or environmental threat) exists for the watershed, assign the calculated hazardous waste quantity score, or a score of 100, whichever is greater.	

12. Assign the highest value from SI Table 7 (observed release) or SI Table 3 (no observed release) for the hazardous substance waste characterization factors below. Multiply each by the surface water hazardous waste quantity score and determine the waste characteristics score for each threat.

	Substance Value	HWQ (or 100)	Product	WC Scores (from Table below)
Drinking Water Threat Toxicity/Persistence			0.00e+00	0
Food Chain Threat Toxicity/Persistence/ Bioaccumulation			0.00e+00	0
Environment Threat Ecotoxicity/Persistence/ Ecobioaccumulation			0.00e+00	0

Product	WC Score
0	0
> 0 to < 10	1
10 to < 100	2
100 to < 1,000	3
1,000 to < 10,000	6
10,000 to < 1E+05	10
1E+05 to < 1E+06	18
1E+06 to < 1E+07	32
1E+07 to < 1E+08	56
1E+08 to < 1E+09	100
1E+09 to < 1E+10	180
1E+10 to < 1E+11	320
1E+11 to < 1E+12	560
1E+12 or greater	1000

SURFACE WATER PATHWAY THREAT SCORES

Threat	Likelihood of Release (LR) Score	Target (T) Score	Pathway (WC) Score (determined above)	LR x T x WC 82,500
Drinking Water		0	0	(maximum of 100) 0.00
Human Food Chain		0	0	(maximum of 100) 0
Environment		0	0	(maximum of 60) 0.00

SURFACE WATER PATHWAY SCORE
(Drinking Water Threat + Human Food Chain Threat + Environmental Threat) — 0.00 (maximum of 100)

SOIL EXPOSURE PATHWAY

If there is no observed contamination (e.g., groundwater plume with no known surface source), do not evaluate the soil exposure pathway. Discuss evidence for no soil exposure pathway.

Soil Exposure Resident Population Targets Summary

For each residential, school or day care property (duplicate page 32 if necessary):

If there is an area of observed contamination on the property and within 200 feet of a residence, school, or day care center, enter on Table 15 each hazardous substance by sample ID. Record the detected concentration. Obtain cancer risk, and reference dose concentrations from SCDM. Sum the cancer risk and reference dose percentages for the substances listed. If cancer risk or reference dose concentrations are not available for a particular substance, enter N/A for the percentage. If the percentage sum calculated for cancer risk or reference dose equals 100%, evaluate the residents and students as Level I. If both percentages are less than 100% or all are N/A, evaluate the targets as Level II.

SI TABLE 15: SOIL EXPOSURE RESIDENT POPULATION TARGETS

Residence ID: Level I: Level II: Population:

Sample ID	Hazardous Substance	Concentration (mg/kg)	Cancer Risk Concentration	% Of Cancer Risk Conc.	RfD	% Of RfD	Toxicity Value	References
			Highest Percent		Sum Of Percents			

Residence ID: Level I: Level II: Population:

Sample ID	Hazardous Substance	Concentration (mg/kg)	Cancer Risk Concentration	% Of Cancer Risk Conc.	RfD	% Of RfD	Toxicity Value	References
			Highest Percent		Sum Of Percents			

SOIL EXPOSURE PATHWAY WORKSHEET

RESIDENT POPULATION THREAT

LIKELIHOOD OF EXPOSURE	Score	Data Type	Refs
1. OBSERVED CONTAMINATION: If evidence indicates presence of observed contamination (depth of 2 feet or less), assign a score of 550; otherwise, assign a 0. Note that a likelihood of exposure score of 0 results in a soil exposure pathway score of 0.	550	H	4
LE =	550		

TARGETS

2. RESIDENT POPULATION: Determine the number of people occupying residences or attending school or day care on the property and within 200 feet of areas of observed contamination (HRS Section 5.1.3). Level I: ____ people x 10 = ____ Level II: ____ people x 1 = ____ Sum =			
3. RESIDENT INDIVIDUAL: Assign a score of 50 if any Level I resident population exists. Assign a score of 45 if there are Level II targets but no Level I targets. If no resident population exists (i.e., no Level I or Level II targets), assign 0. (HRS Section 5.1.3).			
4. WORKERS: Assign a score from the table below for the total number of workers at the site and nearby facilities and within 200 feet of areas of observed contamination associated with the site.			

Number of Workers	Score
0	0
1 to 100	5
101 to 1,000	10
> 1,000	15

5. TERRESTRIAL SENSITIVE ENVIRONMENTS: Assign a value for each terrestrial sensitive environment (SI Table 16) in an area of observed contamination.			

Terrestrial Sensitive Environmental Type	Value

Sum =

6. RESOURCES: Assign a score of 5 if one or more of the following resources is present on an area of observed contamination at the site; assign 0 if none applies: • Commercial agriculture. • Commercial silverculture. • Commercial livestock production or commercial livestock grazing.			
Sum of Targets T =	0		

SI TABLE 16 (HRS TABLE 5-5): SOIL EXPOSURE PATHWAY TERRESTRIAL SENSITIVE ENVIRONMENT VALUES

TERRESTRIAL SENSITIVE ENVIRONMENT	ASSIGNED VALUE
Terrestrial critical habitat for Federal designated endangered or threatened species National Park Designated Federal Wilderness Area National Monument	100
Terrestrial habitat known to be used by Federal designated or proposed threatened or endangered species National Preserve (terrestrial) National or Sate terrestrial Wildlife Refuge Federal land designated for protection of natural ecosystems Administratively proposed Federal Wilderness Area Terrestrial areas utilized by large or dense aggregations of animals (vertebrate species) for breeding	75
Terrestrial habitat used by State designated endangered or threatened species Terrestrial habitat used by species under review for Federal designated endangered or threatened status	50
State lands designated for wildlife or game management State designated Natural Areas Particular areas, relatively small in size, important to maintenance of unique biotic communities	25

SI TABLE 17 (HRS TABLE 5-6): ATTRACTIVENESS / ACCESSIBILITY VALUES

AREA OF OBSERVED CONTAMINATION	ASSIGNED VALUE
Designated recreational area	100
Regularly used for public recreation (for example, vacant lots in urban area)	75
Accessible and unique recreational area (for example, vacant lots in urban area)	75
Moderately accessible (may have some access improvements - for example, gravel road) with some public recreation use	50
Slightly accessible (for example, extremely rural area with no road improvement) with some public recreation use	25
Accessible with no public recreation use	10
Surrounded by maintained fence or combination of maintained fence and natural barriers	5
Physically inaccessible to public, with no evidence of public recreation use	0

SOIL EXPOSURE PATHWAY WORKSHEET
NEARBY POPULATION THREAT

LIKELIHOOD OF EXPOSURE		Score	Data Type	Refs
7. **Attractiveness/Accessibility** (from SI Table 17 or HRS Table 5-6)	Value 10		H	1,3,4
Area of Contamination (from SI Table 18 or HRS Table 5-7)	Value 20			
Likelihood of Exposure (from SI Table 19 or HRS Table 5-8)				
	LE =	5		

TARGETS	Score	Data Type	Refs
8. Assign a score of **0** if Level I or Level II resident individual has been evaluated or if no individuals live within ¼ mile travel distance of an area of observed contamination. Assign a score of 1 if nearby population is within ¼ mile travel distance and no Level I or Level II resident population has been evaluated.	1	H	3,9,10
9. Determine the population within 1 mile travel distance that is not exposed to a hazardous substance from the site (i.e., properties that are not determined to be Level I or Level II); record the population for each distance category in SI table 20 (HRS Table 5-10). Sum the population values and multiply by 0.1.	0.407	H	9,10
Sum of Targets T =	1.407		

SI TABLE 18 (HRS TABLE 5-7): AREA OF CONTAMINATION FACTOR VALUES

TOTAL AREA OF THE AREAS OF OBSERVED CONTAMINATION (SQUARE FEET)	ASSIGNED VALUE
≤ 5,000	5
> 5,000 to 125,000	20
> 125,000 to 250,000	40
> 250,000 to 375,000	60
> 375,000 to 500,000	80
> 500,000	100

SI TABLE 19 (HRS TABLE 5-8): NEARBY POPULATION LIKELIHOOD OF EXPOSURE FACTOR VALUES

AREA OF CONTAMINATION FACTOR VALUE	ATTRACTIVENESS/ACCESSIBILITY FACTOR VALUE						
	100	**75**	**50**	**25**	**10**	**5**	**0**
100	500	500	375	250	125	50	0
80	500	375	250	125	50	25	0
60	375	250	125	50	25	5	0
40	250	125	50	25	5	5	0
20	125	50	25	5	5	5	0
5	50	25	5	5	5	5	0

SI TABLE 20 (HRS TABLE 5-10): DISTANCE-WEIGHTED POPULATION VALUES FOR NEARBY POPULATION THREAT

Travel Distance Category (miles)	Number Of People Within The Travel Distance Category													
	Pop.	0	1 to 10	11 to 30	31 to 100	101 to 300	301 to 1,000	1,001 to 3,000	3,001 to 10,000	10,001 to 30,000	30,001 to 100,000	100,001 to 300,000	300,000 to 1,000,000	**Pop. Value**
> 0 to ¼	34	0	0.1	0.4	1.0	4	13	41	130	408	1,303	4,081	13,034	1.0
> ¼ to ½	74	0	0.05	0.2	0.7	2	7	20	65	204	652	2,041	6,517	0.07
> ½ to 1	803	0	0.02	0.1	0.3	1	3	10	33	102	326	1,020	3,258	3
													Sum =	4.07

References: 9 and 10

SOIL EXPOSURE PATHWAY WORKSHEET (continued)

WASTE CHARACTERISTICS

10. Assign the hazardous waste quantity score calculated for soil exposure.	10
11. Assign the highest toxicity value from SI Table 15 or SI Table 3	1.00e+04
12. Multiply the toxicity and hazardous waste quantity score. Assign the Waste Characteristic score from the table below:	

Product = 1.00e+05	WC Score
0	0
> 0 to < 10	1
10 to < 100	2
100 to < 1,000	3
1,000 to < 10,000	6
10, 000 to < 1E+05	10
1E+05 to < 1E+06	18
1E+06 to < 1E+07	32
1E+07 to < 1E+08	56
1E+08 or greater	100

WC = 18

RESIDENT POPULATION THREAT SCORE (Likelihood of Exposure, Question 1; Target = Sum of Questions 2, 3, 4, 5, 6)	**LE x T x WC 82,500**	0
NEARBY POPULATION THREAT SCORE: (Likelihood of Exposure, Question 7; Targets = Sum of Questions 8, 9)	**LE x T x WC 82,500**	0.00
SOIL EXPOSURE PATHWAY SCORE: Resident Population Threat + Nearby Population Threat		0.00 (Maximum of 100)

AIR PATHWAY

Air Pathway Observed Substances Summary Table

On SI Table 21, list the hazardous substances detected in air samples of a release from the site (also see HRS Sections 6.2.1.1 through 6.2.1.3). Include only those substances significantly greater than background levels. Obtain benchmark, cancer risk, and reference dose concentrations from SCDM. For NAAQS/NESHAPS benchmarks, determine the highest percentage of benchmark obtained for any substance. For cancer risk and reference dose, sum the percentages for the substances listed. If benchmark, cancer risk, or reference dose concentrations are not available for a particular substance, enter N/A for the percentage. If the highest benchmark percentage or the percentage sum calculated for cancer risk or reference dose equals or exceeds 100%, evaluate targets in the distance category from which the sample was taken and any close distance categories as Level I. If the percentages are less than 100% or all are N/A, evaluate targets in that distance category and any closer distance category that are nor Level I as Level II.

Not Evaluated

SI TABLE 21: AIR PATHWAY OBSERVED RELEASE SUBSTANCES

Sample ID: Level I: Level II: Distance From Sources (miles): References:

Hazardous Substance	Concentration ($\mu g/m^3$)	Toxicity/ Mobility	Benchmark Concentration (NAAQS or NESHAPS)	% Of Benchmark	Cancer Risk Concentration	% Of Cancer Risk Concentration	RfD	% Of RfD
	Highest Toxicity / Mobility		Highest Percent		Sum Of Percents		Sum Of Percents	

Sample ID: Level I: Level II: Distance From Sources (miles): References:

Hazardous Substance	Concentration ($\mu g/m^3$)	Toxicity/ Mobility	Benchmark Concentration (NAAQS or NESHAPS)	% Of Benchmark	Cancer Risk Concentration	% Of Cancer Risk Concentration	RfD	% Of RfD
	Highest Toxicity / Mobility		Highest Percent		Sum Of Percents		Sum Of Percents	

AIR PATHWAY WORKSHEET

LIKELIHOOD OF RELEASE	Score	Data Type	Refs
1. OBSERVED CONTAMINATION: If sampling data or direct observation support a release to air, assign a score of 550. Record observed release substances on SI table 21.			
2. POTENTIAL TO RELEASE: If sampling data do not support a release to air, assign a score of 500. Optionally, evaluate air migration gaseous and particulate potential to release (HRS Section 6.1.2).			
LR =			

TARGETS

3. ACTUAL CONTAMINATION POPULATION: Determine the number of people within the target distance limit subject to exposure from a release of a hazardous substance to the air. Level I: ____ people x 10 = ____ Level II: ____ people x 1 = ____ Total =			
4. POTENTIAL TARGET POPULATION: Determine the number of people within the target distance limit not subject to exposure from a release of a hazardous substance to the air, and assign a total population score from SI Table 22. Sum the values and multiply the sum by 0.1.			
5. NEAREST INDIVIDUAL: Assign a score of 50 if there are any Level I targets. Assign a score of 45 if there are Level II targets but no Level I targets. If no Actual Contamination Population exists, assign ther Nearest Individual score from SI Table 22.			
6. ACTUAL CONTAMINATION SENSITIVE ENVIRONMENTS: Sum the sensitive environment values (SI table 13) and wetland acreage values (SI table 23) for environments subject to exposure from the release of a hazardous substance to the air.			
7. POTENTIAL CONTAMINATION SENSITIVE ENVIRONMENTS: Use SI Table 24 to evaluate sensitive environments not subject to exposure from a release.			
8. RESOURCES: Assign a score of 5 if one or more resources apply within ½ mile of the source; assign a 0 if none applies. • Commercial agriculture. • Commercial silverculture. • Major or designated recreation area.			
T =	0.00		

Terrestrial Sensitive Environmental Type	Value

Wetland Acreage	Value

SI TABLE 22 (From HRS TABLE 6-17): VALUES FOR POTENTIAL CONTAMINATION AIR TARGET POPULATION

Distance from Site	Pop.	Nearest Indiv. (choose highest)	Number Of People Within The Distance Category											
			1 to 10	11 to 30	31 to 100	101 to 300	301 to 1000	1001 to 3000	3001 to 10,000	10,001 to 30,000	30,001 to 100,000	100,001 to 300,000	300,001 to 1,000,000	1,000,001 to 3,000,000	**Pop. Value**
On A Source		20	4	17	53	164	522	1,633	5,214	16,325	52,137	163,246	521,360	1,632,455	
0 to ¼ mile		*	1	4	13	41	131	408	1,304	4,081	13,034	40,812	130,340	408,114	
¼ to ½ mile		2	0.2	0.9	3	9	28	88	282	882	2,815	8,815	28,153	88,153	
½ to 1 mile		1	0.06	0.3	0.9	3	8	26	83	261	834	2,612	8,342	26,119	
1 to 2 miles		0	0.02	0.09	0.3	0.8	3	8	27	83	266	833	2,659	8,326	
2 to 3 miles		0	0.009	0.04	0.1	0.4	1	4	12	38	120	375	1,199	3,755	
3 to 4 miles		0	0.005	0.002	0.07	0.2	0.7	2	7	28	73	229	730	2,285	

Nearest Individual = [ ] References: Sum = [ ]

* Score = 20 if the Nearest Individual is within ⅛ mile of a source; score = 7 if the Nearest Individual is between ⅛ and ¼ mile of a source.

SI TABLE 23 (HRS TABLE 6-18): AIR PATHWAY VALUES FOR WETLAND AREA

WETLAND AREA	ASSIGNED VALUE
< 1 acre	0
1 to 50 acres	25
> 50 to 100 acres	75
> 100 to 150 acres	125
> 150 to 200 acres	175
> 200 to 300 acres	250
> 300 to 400 acres	350
> 400 to 500 acres	450
> 500 acres	500

SI TABLE 24: DISTANCE WEIGHTS AND CALCULATIONS FOR AIR PATHWAY POTENTIAL CONTAMINATION SENSITIVE ENVIRONMENTS

Distance	Distance Weight	Sensitive Environment Type and Value (from SI tables 13 and 20)		Product
		Type	Value	
On A Source	0.10	x		
	0.10	x		
	0.10	x		
0 - ¼ mile	0.025	x		
	0.025	x		
	0.025	x		
¼- ½ mile	0.0054	x		
	0.0054	x		
	0.0054	x		
½- 1 mile	0.0016	x		
	0.0016	x		
	0.0016	x		
1 - 2 miles	0.0005	x		
	0.0005	x		
	0.0005	x		
2 - 3 miles	0.00023	x		
	0.00023	x		
	0.00023	x		
3 - 4 miles	0.00014	x		
	0.00014	x		
	0.00014	x		
> 4 miles	0	x		
			Total Environments Score =	

AIR PATHWAY (continue)

WASTE CHARACTERISTICS

9. **If any Actual Contamination Targets exist for the air pathway, assign the calculated hazardous waste quantity score or a score of 100, whichever is greater; if there are no Actual Contamination Targets for the air pathway, assign the calculkated HWQ score for sources available to air migration.**	
10. Assign the highest toxicity/mobility value from SI Table 21 and HRS Sections 6.2.1.1 through 6.2.1.3.	
11. Multiply the air pathway toxicity/mobility and the hazardous waste quanity scores. Assign the Waste Characteristics score from the table below:	

Product =		WC Score
0		0
> 0 to < 10		1
10 to < 100		2
100 to < 1,000		3
1,000 to < 10,000		6
10, 000 to < 1E+05		10
1E+05 to < 1E+06		18
1E+06 to < 1E+07		32
1E+07 to < 1E+08		56
1E+08 or greater		100

WC = 0

AIR PATHWAY SCORE: (maximum of 100)	0.00

SITE SCORE CALCULATION	S	S^2
GROUNDWATER PATHWAY SCORE (S_{GW})	1.06	1.12
SURFACE WATER PATHWAY SCORE (S_{SW})	0.00	0.00
SOIL EXPOSURE SCORE (S_S)	0.00	0.00
AIR PATHWAY SCORE (S_A)	0.00	0.00
SITE SCORE = $\sqrt{\frac{S_{GW}^2 + S_{SW}^2 + S_S^2 + S_A^2}{4}}$		**0.53**

COMMENTS

The Air Pathway and Surface Water Pathway were not evaluated. The overall site score indicates a very low threat to human health and the environment.

SI WORKSHEET REFERENCES

1. U.S. Environmental Protection Agency, December 14, 1990, Hasardous Ranking System, Final Rule, 55FR 51583-51667, Washington, D.C.

2. U.S. Environmental Protection Agency, Office of Emergency and Remedial Response, July 1996, Superfund Chemical Data Matrix (SCDM) Table, Washington, D.C.

3. Ecology & Environment, Inc., (E & E), 1997, Removal Log Book for Statewide Metal Recycling, Inc., USEPA Region 7, START, TDD S07-9710-009, Overland Park, Kansas, November, 1997.

4. _____, 1998, Removal Action Report for the Statewide Metal Recycling Site, USEPA Region 7, START, TDD S07-9710-009, Overland Park, Kansas, January, 1998.

5. Bovee, Fred, 1997, Report of Investigation, Iowa Department of Natural Resources, Toxic Substances Prevention & Planning Branch, February 27, 1997.

6. U.S. Department of Agriculture (USDA), Soil Survey of Polk County, Iowa, 1953.

7. Thorpe Well Company, 1951, Well Log #5873.

8. Iowa Geologic Survey, Undated, Ground Water Resources, Polk County, Iowa.

9. U.S. Department of Commerce (USDC),1993, 1990 Census of Population and Housing, Population and Housing Unit Counts, Iowa, March, 1993.

10. U.S. Geological Survey, 7.5-Minute Topographic Map of Iowa, Des Moines (NE) Quadrangle, Iowa, 1956; Photo-inspected 1971; Altoona Quradrangle, Iowa, 1972; Des Moines (SE) Quadrangle, Iowa, 1956; Photo-inspected 1976; Rising Sun Quadrangle, Iowa, 1972.

11. Iowa Department of Natural Resources, Geologic Survey Bureau, 1997, Water Well Certification Information, Data Base Search, Iowa.

ATTACHMENT 2

Removal Site Evaluation Form

SUPERFUND REMOVAL SITE EVALUATION
and
REMOVAL PRELIMINARY ASSESSMENT

I. SITE NAME AND LOCATION:

NAME: Statewide Metal Recycling, Inc.

ADDRESS OR OTHER LOCATION IDENTIFIER: 5310 E. Broadway

CITY: Altoona	**STATE:** IA	**ZIP:** 50009

DIRECTIONS TO SITE: From Kansas City, take I-35 North to I-235East. Take I-235 to Broadway Ave East. Take Broadway Ave. East to site (approx. 3 miles)

MAP ATTACHED: N

II. PROGRAM CONTACTS:

REQUESTED BY: Paul Doherty	**DATE OF REQUEST:** 05/07/97

AGENCY/OFFICE: EPA/SUPR

MAILING ADDRESS: 726 Minnesota

CITY: Kansas City	**STATE:** KS	**ZIP:** 66101
TELEPHONE: (913) 551-7924	**FAX:** (913) 551-7063	

EVALUATOR: Jeffrey Fletcher

AGENCY/OFFICE: Ecology & Environment, Inc.

MAILING ADDRESS: 6405 Metcalf, Building #3

CITY: Overland Park	**STATE:** KS	**ZIP:** 66202
TELEPHONE: (913) 432-9961	**FAX:** (913) 432-0670	

III. REMOVAL SITE EVALUATION CRITERIA [40 CFR 300.410(e)]

IS THERE A RELEASE AS DEFINED BY THE NCP: **YES X or NO**

EXPLAIN: Elevated metal and PCB concentrations above background remain in residual soils in the excavated area (northern section) and in soils in the central and southern sections of the site. This contaminated soil area is attributable to the former SWMR site.

*(A **RELEASE** is defined as any spilling, leaking, pumping, pouring, emitting, emptying, discharging, injecting, escaping, leaching, dumping, or disposing into the environment (including the abandonment of barrels, containers, and other closed receptacles containing any hazardous substances or pollutant or contaminant), but excludes: workplace exposures; engine exhaust emissions; nuclear releases otherwise regulated; and the normal application of fertilizer. For purposes of the NCP, release also means threat of release.)*

IS THE SOURCE A FACILITY OR VESSEL AS DEFINED BY THE NCP: **YES X or NO**

EXPLAIN: The presence of hazardous substances (including PCBs and metals) in soils on site qualifies the source area as a facility as defined by the NCP.

*(A **FACILITY** is defined as any building, structure, installation, equipment, pipe or pipeline (including any pipe into a sewer or POTW), well, pit, pond, lagoon, impoundment, ditch, landfill, storage container, motor vehicle, rolling stock, or aircraft or any site or area, where a hazardous substance has been deposited, stored, disposed of, or placed, or otherwise come to be located; but does not include any consumer product in consumer use or any vessel. A **VESSEL** is defined as any description of watercraft or other artificial contrivance used, or capable of being used, as a means of transportation on water other than a public vessel.)*

SUPERFUND REMOVAL SITE EVALUATION
and
REMOVAL PRELIMINARY ASSESSMENT

III. REMOVAL SITE EVALUATION CRITERIA [40 CFR 300.410(e)](continued):

DOES THE RELEASE INVOLVE A HAZARDOUS SUBSTANCE, OR POLLUTANT OR CONTAMINANT AS DEFINED BY THE NCP: **YES X or NO**

EXPLAIN: Lead and PCBs are hazardous substances as defined by the NCP

*(A **HAZARDOUS SUBSTANCE** means any substance, element, compound, mixture, solution, hazardous waste, toxic pollutant, hazardous air pollutant, or imminently hazardous chemical substance or mixture designated pursuant to the CWA, CERCLA, SDWA, CAA or TSCA. The term does not include petroleum products, natural gas, natural gas liquids, liquified natural gas, synthetic gas or mixtures of natural and synthetic gas. The definition of **POLLUTANT or CONTAMINANT** includes, but is not limited to, any element, substance, compound, or mixture, including disease-causing agents, which after release into the environment and upon exposure, ingestion, inhalation, or assimilation into any organism, either directly from the environment or indirectly by ingestion through food chains, will or may reasonably be anticipated to cause death, disease, behavioral abnormalities, cancer, genetic mutation, physiological malfunctions or physical deformations, in such organisms or their offspring. The term does not include petroleum products, natural gas, natural gas liquids, liquified natural gas, synthetic gas or mixtures of natural and synthetic gas.)*

IS THE RELEASE SUBJECT TO THE LIMITATIONS ON RESPONSE: **YES or NO X**

EXPLAIN: No limitations on the response apply.

*(The **LIMITATIONS ON RESPONSE** provisions of the NCP (40 CFR 300.400(B) states that removals shall not be undertaken in response to a release of a naturally occurring substance in its unaltered or natural form; from products that are a part of the structure of, and result in exposure within, residential buildings or business or community structures; or into public or private drinking water supplies due to deterioration of the system through ordinary use.)*

DOES THE QUANTITY OR CONCENTRATION WARRANT RESPONSE: **YES or NO X**

EXPLAIN: Analytical results of soil sampling conducted after the 1997 soil removal activitiy indicated that no lead or PCB concentrations exceeded removal action levels.

HAS A PRP BEEN IDENTIFIED: **YES X or NO**

EXPLAIN: Mr. Fred Bovee, 4300 Northeast 22nd Street, in Des Moines, Iowa, was the operator of the facility from 1995 to 1997. The property is currently owned by Ray and Jeanette Burris of New Virginia, Iowa.

IV. CONDITIONS TO WARRANT REMOVAL [40 CFR 300.415(b)(2)]:

ACTUAL OR POTENTIAL EXPOSURE TO HAZARDOUS SUBSTANCES, OR POLLUTANTS, OR CONTAMINANTS: **YES X or NO**

EXPLAIN: A removal of contaminants from the Statewide Metal Recycling site was conducted in the fall of 1997. The highly contaminanted soil area in the northern portion of the site (concentrations > 500 mg/kg for lead and > 10 mg/kg for PCBs) have been removed. Post excavation soil samples in the northern section indicated lead and PCB concentrations below removal action levels. The potential for exposure from the remaining waste (contaminated soil) at the site is believed to be minimal.

ACTUAL OR POTENTIAL CONTAMINATION OF DRINKING WATER SUPPLIES: **YES or NO X**

EXPLAIN: No actual contamination with metals or other materials from the site has been reported in any nearby drinking water well.

SUPERFUND REMOVAL SITE EVALUATION
and
REMOVAL PRELIMINARY ASSESSMENT

IV. CONDITIONS TO WARRANT REMOVAL [40 CFR 300.415(b)(2)] (continued):

HAZARDOUS SUBSTANCES, POLLUTANTS, OR CONTAMINANTS IN DRUMS, BARRELS, OR BULK STORAGE CONTAINERS: YES or NO X

EXPLAIN: Currently, no drums, barrels, or bulk storage containers were identified on the site.

HIGH LEVELS OF HAZARDOUS SUBSTANCES, POLLUTANTS, OR CONTAMINANTS IN NEAR-SURFACE SOILS: YES or NO X

EXPLAIN: No lead or PCB concentrations exceed the EPA removal action levels.

CONDITIONS SUSCEPTIBLE TO IMPACT FROM ADVERSE WEATHER CONDITIONS: YES X or NO

EXPLAIN: Heavy rainfall may increase the potential for contaminants to migrate to surrounding soils and/or groundwater.

THREAT OF FIRE OR EXPLOSION: YES or NO X

EXPLAIN: No threat of fire or explosion has been identified.

POTENTIAL FOR OTHER FEDERAL OR STATE RESPONSE MECHANISMS: YES or NO X

EXPLAIN:

OTHER SITUATIONS OR FACTORS WHICH POSE A THREAT: YES or NO X

EXPLAIN: No such situations or factors exist.

SUPERFUND REMOVAL SITE EVALUATION
and
REMOVAL PRELIMINARY ASSESSMENT

V. POTENTIAL REMOVAL ACTIONS [40 CFR 300.415(d)]:

(NOTE: The following identifies potential removal actions which may be determined to be appropriate pending further review and study. The proposed actions should be considered preliminary proposals and are subject to change.)

SITE SECURITY: **YES X or NO**

EXPLAIN: The portion of the site where the highest PCB and metal contaminated soil was excavated is now secured within a fence and locked gate, thereby restricting trespassers.

STABILIZATION OR REMOVAL OF SURFACE IMPOUNDMENTS: **YES or NO X**

EXPLAIN: No surface impoundments are located on the site.

CAPPING OF CONTAMINATED SOIL: **YES X or NO**

EXPLAIN: Capping of the remaining contaminated area was completed during the November 1997 removal action to prevent surface exposure to the surrounding population and environment and to minimize further leaching/migration of any subsurface contamination.

USE OF CHEMICALS TO CONTROL/RETARD SPREAD OF CONTAMINATION: **YES or NO X**

EXPLAIN:

CONTAMINATED SOIL EXCAVATION: **YES or NO X**

EXPLAIN:

REMOVAL OF DRUMS, TANKS, OR BULK STORAGE CONTAINERS: **YES or NO X**

EXPLAIN:

CONTAINMENT, TREATMENT, OR DISPOSAL OF HAZARDOUS SUBSTANCES, POLLUTANTS, OR CONTAMINANTS: **YES or NO X**

EXPLAIN:

PROVIDE ALTERNATIVE WATER SUPPLIES: **YES or NO X**

EXPLAIN: No contaminated drinking water supplies associated with the site have been identified.

SUPERFUND REMOVAL SITE EVALUATION
and
REMOVAL PRELIMINARY ASSESSMENT

VI. REMOVAL SITE EVALUATION DETERMINATION AND REMOVAL PRELIMINARY ASSESSMENT FINDINGS AND RECOMMENDATIONS:

X	REMOVAL NOT WARRANTED - REMOVAL SITE EVALUATION TERMINATED

(Cite one or more of the criteria from SECTION III. **REMOVAL SITE EVALUATION CRITERIA**, as the basis for the above determination.)

		NOT A RELEASE			NOT A FACILITY OR VESSEL
		NOT A HAZARDOUS SUBSTANCE OR POLLUTANT OR CONTAMINANT			SUBJECT TO RESPONSE LIMITATIONS
	X	INSUFFICIENT QUANTITY OR CONCENTRATION			WILLING/CAPABLE PRP IDENTIFIED

COMMENT: A removal of contaminants (including all containerized waste and contaminated soil) from the Statewide Metal Recycling site was conducted in the fall of 1997. During removal activities high lead and PCB-contaminated soils were excavated and removed from the site. After the soil was excavated, confirmation sampling showed no lead or PCB concentrations exceeding removal action levels. In addition, PCBs and lead concentrations found in other portions of the site were also below removal action levels. Therefore, no removal recommendations appear to be warranted at this site due to the lead and PCB concentrations being below removal action levels.

	REMOVAL RECOMMENDED [EMERGENCY TIME-CRITICAL NON-TIME-CRITICAL]

(Cite one or more of the conditions or factors from Section IV. **CONDITIONS TO WARRANT A REMOVAL ACTION**, as a basis for recommending that a removal action be conducted.)

		EXPOSURE TO HAZARDOUS SUBSTANCES OR POLLUTANTS OR CONTAMINANTS					ADVERSE WEATHER IMPACTS
		CONTAMINATED DRINKING WATER		FIRE/EXPLOSION THREAT			CONTAMINATED SOIL
		DRUMS, BARRELS OR CONTAINERS		NO OTHER RESPONSE MECHANISM			OTHER FACTORS

(Identify one or more of the removal actions listed in Section V. **REMOVAL ACTIONS WHICH MAY BE APPROPRIATE**, as examples of the types of response actions which are recommended.)

		SITE SECURITY		DRAINAGE CONTROL			IMPOUNDMENT STABILIZATION
		REMOVAL OF DRUMS, BARRELS, ETC.		SOIL CAPPING			SOIL EXCAVATION
		CONTAIN/TREAT/DISPOSE OF WASTES		CHEMICAL CONTROLS			ALT. DRINKING WATER SUPPLIES

COMMENT:

SUPERFUND REMOVAL SITE EVALUATION
and
REMOVAL PRELIMINARY ASSESSMENT

VI. REMOVAL SITE EVALUATION DETERMINATION AND REMOVAL PRELIMINARY ASSESSMENT FINDINGS AND RECOMMENDATIONS (continued):

	ADDITIONAL REMOVAL SITE EVALUATION RECOMMENDED

(Cite one or more of the conditions or factors from Section IV. **CONDITIONS TO WARRANT A REMOVAL ACTION**, as a basis for recommending that additional site evaluation be performed.)

		EXPOSURE TO HAZARDOUS SUBSTANCES OR POLLUTANTS OR CONTAMINANTS				ADVERSE WEATHER IMPACTS
		CONTAMINATED DRINKING WATER		FIRE/EXPLOSION THREAT		CONTAMINATED SOIL
		DRUMS, BARRELS OR CONTAINERS		NO OTHER RESPONSE MECHANISM		OTHER FACTORS

(Identify one or more of the removal actions listed in Section V. **REMOVAL ACTIONS WHICH MAY BE APPROPRIATE**, as examples of the types of response actions which may be appropriate pending the results of further site evaluation.)

		SITE SECURITY		DRAINAGE CONTROL		IMPOUNDMENT STABILIZATION
		REMOVAL OF DRUMS, BARRELS, ETC.		SOIL CAPPING		SOIL EXCAVATION
		CONTAIN/TREAT/DISPOSE OF WASTE		CHEMICAL CONTROLS		ALTERNATIVE DRINKING WATER SUPPLIES

COMMENT:

VII. ADDITIONAL INFORMATION OR COMMENTS

EPA USE ONLY

VIII. CERTIFICATION

SIGNATURE: _____ **DATE**

POSITION/TITLE:

OFFICE/AGENCY:

SUPERFUND REMOVAL SITE EVALUATION
and
REMOVAL PRELIMINARY ASSESSMENT
(Supplemental Waste Inventory Sheet)

IX. HAZARDOUS SUBSTANCES, POLLUTANTS OR CONTAMINANT INFORMATION:

MATERIAL DESCRIPTION	CONTAINER INFORMATION					
TRADE NAME/ACTIVE INGREDIENTS	NUMBER of CONTAINERS	SIZE	TYPE	SOLID or LIQUID	% FULL	CONDITION